Appendix B
Drainage Plan

Kimley»Horn

TECHNICAL MEMORANDUM – NOT FOR CONSTRUCTION

To: City of Menifee

From: Kimley-Horn and Associates – Ashley Teani, PE

Date: February 3, 2025

Subject: Double Butte Storage Project
Preliminary Drainage Study
Menifee, California



Kimley-Horn and Associates, Inc. (Kimley-Horn) has prepared a preliminary drainage study for the potential Double Butte Storage Project in the City of Menifee, California. The intent of this study is to evaluate the approximate 100-year peak flows and runoff volumes within the subject tract due to proposed grading changes and increased impervious area. Flows will be attenuated for the 100-year storm as to not exceed existing conditions. This study is in support of the preliminary grading and drainage plans prepared by Stantec.

The Double Butte Storage Project (Project) is located on approximately 30 acres of vacant land in the City of Menifee. The site is located southwest of the intersection of Case Road and Palomar Road. It is bordered by Palomar Road to the east and San Jacinto Road to the west. Approximately 20 acres of offsite flow is conveyed through the site to the existing Riverside County Flood Control District (RCFCD) channel to the south of the site.

The following memorandum describes the methodology used to perform this analysis and results of the study.

METHODOLOGY

The design criteria for the hydrologic and hydraulic calculations for this project were performed in accordance with the Riverside County Hydrology Manual, April 1978 (Hydrology Manual) and through conversations with the City of Menifee (City).

Rational Method Hydrology

Runoff calculations were performed using the modified rational method computer program HydroWIN 2011 developed by Advanced Engineering Software (AES). This method calculates time of concentration and runoff rates using criteria specified in the Hydrology Manual. Rainfall values were obtained from National Oceanic and Atmospheric Administration (NOAA) Atlas 14. Loss rates were calculated using soil data obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey for Riverside County, California, Santa Ana River Area.

Existing elevation data for travel flow paths were obtained from the ALTA land title survey completed for the project site in October 2021.

Hydrograph Determination

Hydrograph calculations were performed using the HydroWIN 2011 computer program developed by Advanced Engineering Software (AES). This method calculates a unit hydrograph using lag time, maximum watershed loss rates, low loss fraction, and an S-graph as specified in the Hydrology Manual. Lag was calculated using the time of concentration calculated from the rational method analysis, multiplied by a factor of 0.8, as required within the AES program. The maximum watershed loss rate was obtained directly from the rational method analysis. The low loss fraction was calculated using soil data obtained from the NRCS Web Soil Survey for Riverside County, California. The Valley Developed S-graph was used to develop the unit hydrograph. The 100-year, 1-hour and 2-year, 24-hour hydrographs were calculated for the site. Results from these calculations are included in **Attachment B.**

Detention Sizing

Detention calculations were performed using PondPack. The outflow hydrographs for the drainage area onsite were used as the inflow parameters to the detention pond. The detention basin was sized to attenuate both the 100-year, 1-hour and 2-year, 24-hour storm events. Results from these calculations are included in **Attachment C**.

ANALYSIS

Existing Conditions

The existing site is comprised of two drainage areas with one outfall in the southwest corner of the site. Currently, the majority of runoff flows to the south, to an existing RCFCD channel that flows westerly at the southern border of the site. A portion of the site drains to a low point in the northwest corner with no outlet. It is assumed that in existing conditions, runoff collected in the northwest corner ponds until it overflows to the south, and remaining water evaporates over time or infiltrates into the soil. Existing drainage conditions are shown on the Existing Drainage Area Map in **Attachment A**.

The site is in the Federal Emergency Management Administration (FEMA), Flood Insurance Rate Map (FIRM) panel number 06065C2060H, effective 8/8/2014. The floodplain associated with the tributary flowing through the site is identified by the Federal Emergency Management Agency (FEMA) as Zone A, which is an area of unstudied floodplain with no established regulatory flows and Base Flood Elevations. The source of flooding comes from a tributary to the northeast of the site. Historically, flows overtopped Palomar Road and Case Road, and continued southwesterly through the site and flowed west through a natural drainage. Current site conditions include a small catch basin at the northeast corner of the site, which drops into a RCFCD reinforced concrete box culvert, that outlets to the RCFCD concrete channel running along the southern border of the site. Per conversations with RCFCD and review of aerial imagery and construction plans, the source of FEMA flooding is planned to be conveyed under Palomar and Case Road by the completion of Romoland Line A-3, thus removing the subject tract from the FEMA Zone A by 2026. The Project's proposed Commercial Operations Date (COD) is early 2027, therefore the FEMA Zone A has not been considered in this study. Correspondence with RCFCD and Record Drawings supporting this proposed upgrade and timeline are included in **Attachment D**.

Proposed Conditions

Offsite improvements to the streets San Jacinto Road and Palomar Road are required by the City. These drainage improvements have been included as impervious area on the plans, and as such require treatment prior to flow being returned to the RCFCD channel. All flow from these newly created impervious areas will be routed to one of the proposed Modular Wetland Systems units (MWS) prior to returning to the RCFCD channel. The treatment calculations are included in **Attachment C**.

Onsite, the proposed condition will generally maintain existing onsite drainage patterns. Low flows will enter the water quality BMP for treatment, and high flows will overtop and sheet flow into the detention basin in the southwest corner of the site. Proposed drainage conditions including graded elevations are shown on the Proposed Drainage Area Map in **Attachment A**. Attenuated flows will discharge into the existing RCFCD channel. Record drawings of the proposed RCFCD culvert under the site are included in **Attachment D**.

RESULTS

Results of the hydrologic routing and detention analysis are shown in Tables 1 and 2. Full hydrologic calculations are included in **Attachment B**. Detention sizing and parameters are included in **Attachment C**. Onsite flows will be routed to the onsite bio-filtration basin prior to entering the RCFCD channel. Offsite low flows will be captured and treated through use of multiple MWS units, constructed for flow-based treatment before entering the RCFCD channel.

Table 1: Overall Results

Storm	Existing Condition Qp (CFS)	Proposed Condition Qp (CFS)	Prop-Ex (%)
100-yr, 1-hr	34.74	32.48	-6.5%
2-yr, 24-hr	5.37	5.03	- 6.3%

Table 2: Pond 1 Results

Storm	Inflow Qp (CFS)	Outflow Qp (CFS)	Peak Storage (AC-FT)	Peak WSEL (FT)
100-yr, 1-hr	34.74	32.48	0.982	1445.94
2-yr, 24-hr	5.37	5.03	0.310	1443.69

ATTACHMENTS

Attachment A

- Existing Conditions Drainage Exhibit
- Proposed Conditions Drainage Exhibit

Attachment B

- Hydrologic Calculations
- AES Outputs

Attachment C

- Detention Calculations
- Treatment Design Calculations

Attachment D

- FEMA Firmette
- RCFCD Correspondene
- Annotated Satellite Image
- Annotated RCFCD Romoland Master Drainage Plan
- Annotated RCFCD Romoland Topographic Workmap - CLOMR
- Annotated RCFCD Line A-3 Pre-Project Hydrology Map
- RCFCD Record Drawings

ATTACHMENT A

Existing Conditions Drainage Exhibit
Proposed Conditions Drainage Exhibit

Legend
- Drainage Areas
- AES Nodes
- Flowpaths
- 1-ft Contours (2021 Survey)

remove dashes from both, it looks like the elevation is negative

Node-100
EL. 1454.6

Node-101
EL. 1459.8'

Node-102
EL. 1449.6

Node-200
EL. 1458.5'

Node-201
EL. 1454.5'

Node-202
EL. 1451.5'

Node-203
EL. 1449.5'

Node-204
EL. 1444'

A-1
A-2
OA-1
OA-2
OB-1
OB-2
RCFCD Channel
Russell Rd
Matthews Rd
Pelonan Rd
McLaughlin Rd
Byers Rd
Forest Rd
San Jacinto Rd
Stowe Pedro Rd

Document Path: C:\Users\nicholas.naylor\Desktop\DB\GIS\Double Butte.aprx

DESIGN: NBN
DRAWN: NBN
REVIEW: AAT

Kimley»Horn
1100 W TOWN AND COUNTY ROAD, SUITE 700
ORANGE, CA 92868
PHONE: 714-939-1030

N
1 inch = 80 feet

DOUBLE BUTTE BESS
MENIFEE, CA

EXISTING CONDITION DRAINAGE AREA MAP

DATE
FEBRUARY 2024

PROJECT NO.
094817130

SHEET NUMBER
1

Document Path: C:\Users\Nicholas.Naylor\Desktop\Double Butte CO4\DB GIS\Double Butte.aprx

	DESIGN:	NBN
	DRAWN:	NBN
	REVIEW:	AAT

Kimley»Horn
1100 W TOWN AND COUNTY ROAD, SUITE 700
ORANGE, CA 92868
PHONE: 714-939-1030

N

1 inch = 80 feet

DOUBLE BUTTE BESS
MENIFEE, CA

PROPOSED CONDITION DRAINAGE AREA MAP

DATE
JULY 2024

PROJECT NO.
094817130

SHEET NUMBER
2

ATTACHMENT B

Hydrologic Calculations
AES Outputs

Synthetic Unit Hydrograph Method
Loss Rate Estimates

100-year
Existing Conditions

Drainage Area	Soil Group	Cover Type	Curve (RI) Number	Pervious Area Infiltration Rate (in/hr)	Land Use	Decimal Percent of Impervious Area	Adj Infiltration Rate (in/hr)	Subarea (acres)	Total Area (acres)	Subarea/Total Area	Avg Adjusted Infiltration Rate (in/hr)**	Min Loss Rate (inch/hr)	Low Loss Developed Condition = 0.9 - (0.8 x % Impervious) = *
A	C	Grass, Good Cover	88	0.06	Undeveloped, Grassland	0.00	0.06	23.60	23.60	1.00	0.06	0.03	0.90

100-year
Proposed Conditions

Drainage Area	Soil Group	Cover Type	Curve (RI) Number	Pervious Area Infiltration Rate (in/hr)	Land Use	Decimal Percent of Impervious Area	Adj Infiltration Rate (in/hr)	Subarea (acres)	Total Area (acres)	Subarea/Total Area	Avg Adjusted Infiltration Rate (in/hr)**	Min Loss Rate (inch/hr)	Low Loss Developed Condition = 0.9 - (0.8 x % Impervious) = *
A	C	Grass, Good Cover	88	0.06	BESS Development	0.41	0.04	23.60	23.60	1.00	0.04	0.02	0.57

*Minimum low loss value in AES is 0.5; therefore, 0.5 was used for the study where calculated value was less.

**Minimum value in AES is 0.05; therefore, 0.05 was used for the study for areas with a value less than 0.05.

Drainage Area Parameters

Existing Condition

Name	Land Use Type	Soil Type	Area (SF)	Area (AC)	Impervious %
A1	Undeveloped, Grassland	C	85,813.20	1.97	0%
A2	Undeveloped, Grassland	C	943,074.00	21.65	0%
A1	Compacted Earthen Roads	C	96,189.00	2.21	40%
OA-1	Undeveloped, Grassland	C	37,026.00	0.85	0%
OA-2	Undeveloped, Grassland	C	381,587.00	8.82	0%
OB-1	Developed, Commercial	C	28,750.00	3.93	50%
OB-2	Undeveloped, Grassland	C	341,510.00	9.82	0%
			Total Site	49.25	6%

Drainage Area Parameters

Proposed Condition

Name	Land Use Type	Soil Type	Area (SF)	Area (AC)	Impervious Land Cover Type	Area (AC)	Effective Impervious Fraction	Effective Impervious Area (AC)	Composite Impervious Percent (%)
A-1	Developed, Commercial	C	17,860.00	0.41	Native Soil (Type C)	0.16	0.0	0.00	0%
					Earthen Road (Compacted Soil)	0.13	0.4	0.05	12%
					BESS/Substation Pads	0.13	1.0	0.13	32%
A-2	Developed, Commercial	C	982,714.00	22.56	Native Soil (Type C)	12.60	0.0	0.00	0%
					Earthen Road (Compacted Soil)	3.87	0.4	1.55	7%
					BESS/Substation Pads	5.25	1.0	5.25	23%
					Vegetative Buffer	0.84	0.0	0.00	0%
B-1	Paved Road	C	11,534.00	0.26	Paved Road	0.26	1.0	0.26	100%
B-2	Paved Road	C	31,506.58	0.72	Paved Road	0.72	1.0	0.72	100%
C-1	Landscaped Area	C	9,831.45	0.23	Vegetative Buffer	0.23	0.0	0.00	0%
C-2	Landscaped Area	C	19,544.34	0.45	Vegetative Buffer	0.45	0.0	0.00	0%
C-3	Landscaped Area	C	2,130.59	0.05	Vegetative Buffer	0.05	0.0	0.00	0%
D	Paved Road	C	20,037.81	0.46	Paved Road	0.46	1.0	0.46	100%
E	Paved Road	C	14,121.93	0.32	Paved Road	0.32	1.0	0.32	100%
F-1	Landscaped Area	C	9,442.29	0.22	Vegetative Buffer	0.22	0.0	0.00	0%
F-2	Landscaped Area	C	30,210.42	0.69	Vegetative Buffer	0.69	0.0	0.00	0%
O1-1	Developed, Commercial	C	22,651.00	0.52	Native Soil (Type C)	0.26	0.0	0.00	0%
					Development	0.26	0.9	0.23	45%
O1-2	Developed, Commercial	C	136,778.00	3.14	Native Soil (Type C)	3.14	0.0	0.00	0%
O2-1	Undeveloped	C	19,602.00	0.45	Native Soil (Type C)	0.45	0.0	0.00	0%
O2-2	Undeveloped	C	229,997.00	5.28	Native Soil (Type C)	5.28	0.0	0.00	0%
O3-1	Undeveloped	C	29,185.00	0.67	Native Soil (Type C)	0.67	0.0	0.00	0%
O3-2	Undeveloped	C	355,885.00	8.17	Native Soil (Type C)	8.17	0.0	0.00	0%
			Total	48.54			Total Impervious	8.97	18%
			Project Site (Offsite not included)	23.60			Project Site Impervious (Offsite not included)	8.74	37%

NOAA Atlas 14, Volume 6, Version 2
Location name: Menifee, California, USA*
Latitude: 33.7382°, Longitude: -117.1653°
Elevation: 1452.48 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	0.085 (0.072-0.103)	0.123 (0.103-0.148)	0.174 (0.145-0.211)	0.218 (0.180-0.266)	0.280 (0.224-0.355)	0.331 (0.258-0.428)	0.384 (0.292-0.510)	0.442 (0.326-0.604)	0.524 (0.370-0.748)	0.591 (0.403-0.874)
10-min	0.123 (0.103-0.148)	0.176 (0.147-0.213)	0.250 (0.208-0.302)	0.312 (0.258-0.382)	0.402 (0.320-0.509)	0.474 (0.370-0.613)	0.551 (0.419-0.731)	0.633 (0.467-0.865)	0.750 (0.531-1.07)	0.846 (0.577-1.25)
15-min	0.148 (0.124-0.179)	0.213 (0.178-0.257)	0.302 (0.252-0.366)	0.378 (0.312-0.462)	0.486 (0.388-0.615)	0.573 (0.447-0.742)	0.666 (0.506-0.884)	0.765 (0.565-1.05)	0.907 (0.642-1.30)	1.02 (0.698-1.52)
30-min	0.241 (0.202-0.291)	0.347 (0.290-0.419)	0.491 (0.410-0.595)	0.615 (0.508-0.751)	0.791 (0.631-1.00)	0.933 (0.728-1.21)	1.08 (0.824-1.44)	1.25 (0.920-1.70)	1.48 (1.05-2.11)	1.67 (1.14-2.47)
60-min	0.353 (0.296-0.426)	0.507 (0.424-0.613)	0.719 (0.600-0.872)	0.900 (0.744-1.10)	1.16 (0.924-1.47)	1.37 (1.07-1.77)	1.59 (1.21-2.11)	1.82 (1.35-2.50)	2.16 (1.53-3.09)	2.44 (1.66-3.61)
2-hr	0.524 (0.439-0.632)	0.712 (0.595-0.860)	0.965 (0.804-1.17)	1.18 (0.972-1.44)	1.47 (1.17-1.86)	1.71 (1.33-2.21)	1.95 (1.48-2.59)	2.21 (1.63-3.02)	2.56 (1.81-3.66)	2.85 (1.95-4.22)
3-hr	0.644 (0.539-0.777)	0.857 (0.717-1.04)	1.14 (0.952-1.39)	1.38 (1.14-1.69)	1.71 (1.36-2.16)	1.97 (1.53-2.54)	2.23 (1.70-2.96)	2.51 (1.86-3.44)	2.90 (2.05-4.14)	3.21 (2.19-4.75)
6-hr	0.911 (0.763-1.10)	1.19 (0.997-1.44)	1.57 (1.31-1.90)	1.87 (1.55-2.29)	2.30 (1.83-2.91)	2.63 (2.05-3.40)	2.96 (2.25-3.94)	3.32 (2.45-4.53)	3.80 (2.69-5.43)	4.18 (2.85-6.19)
12-hr	1.20 (1.00-1.45)	1.57 (1.31-1.90)	2.06 (1.72-2.50)	2.47 (2.04-3.02)	3.03 (2.42-3.84)	3.47 (2.71-4.49)	3.92 (2.98-5.21)	4.39 (3.25-6.01)	5.04 (3.57-7.20)	5.55 (3.79-8.22)
24-hr	1.56 (1.38-1.79)	2.06 (1.82-2.38)	2.74 (2.42-3.18)	3.31 (2.89-3.87)	4.10 (3.47-4.94)	4.72 (3.92-5.81)	5.37 (4.35-6.76)	6.05 (4.77-7.83)	7.00 (5.30-9.43)	7.75 (5.68-10.8)
2-day	1.83 (1.62-2.12)	2.48 (2.19-2.87)	3.36 (2.96-3.89)	4.09 (3.58-4.78)	5.13 (4.34-6.18)	5.95 (4.93-7.32)	6.81 (5.52-8.58)	7.73 (6.09-10.00)	9.01 (6.83-12.1)	10.0 (7.36-14.0)
3-day	1.95 (1.72-2.25)	2.67 (2.36-3.09)	3.66 (3.22-4.24)	4.49 (3.93-5.25)	5.68 (4.81-6.84)	6.62 (5.50-8.15)	7.62 (6.18-9.60)	8.69 (6.85-11.2)	10.2 (7.72-13.7)	11.4 (8.36-15.9)
4-day	2.09 (1.85-2.41)	2.90 (2.56-3.35)	4.00 (3.53-4.64)	4.94 (4.32-5.77)	6.28 (5.32-7.57)	7.36 (6.11-9.05)	8.50 (6.89-10.7)	9.72 (7.66-12.6)	11.5 (8.67-15.4)	12.9 (9.42-17.9)
7-day	2.35 (2.08-2.71)	3.32 (2.93-3.84)	4.67 (4.11-5.41)	5.82 (5.09-6.80)	7.48 (6.33-9.02)	8.83 (7.32-10.9)	10.3 (8.31-12.9)	11.8 (9.31-15.3)	14.0 (10.6-18.9)	15.9 (11.6-22.1)
10-day	2.47 (2.18-2.85)	3.54 (3.12-4.09)	5.02 (4.43-5.82)	6.31 (5.51-7.36)	8.16 (6.91-9.83)	9.67 (8.02-11.9)	11.3 (9.15-14.2)	13.1 (10.3-16.9)	15.6 (11.8-21.0)	17.7 (13.0-24.6)
20-day	2.90 (2.56-3.35)	4.22 (3.73-4.87)	6.09 (5.36-7.05)	7.72 (6.75-9.01)	10.1 (8.56-12.2)	12.1 (10.0-14.9)	14.3 (11.6-18.0)	16.6 (13.1-21.5)	20.1 (15.2-27.1)	23.0 (16.9-32.0)
30-day	3.45 (3.05-3.98)	5.01 (4.43-5.79)	7.25 (6.39-8.40)	9.23 (8.07-10.8)	12.2 (10.3-14.7)	14.6 (12.1-18.0)	17.3 (14.0-21.8)	20.3 (16.0-26.2)	24.7 (18.7-33.2)	28.4 (20.8-39.6)
45-day	4.04 (3.57-4.66)	5.80 (5.12-6.70)	8.36 (7.36-9.68)	10.6 (9.29-12.4)	14.0 (11.9-16.9)	16.9 (14.1-20.8)	20.1 (16.3-25.4)	23.7 (18.7-30.7)	29.1 (22.0-39.2)	33.7 (24.7-46.9)
60-day	4.71 (4.16-5.43)	6.65 (5.87-7.68)	9.49 (8.36-11.0)	12.0 (10.5-14.1)	15.9 (13.5-19.2)	19.2 (15.9-23.6)	22.9 (18.5-28.8)	27.0 (21.3-35.0)	33.3 (25.2-44.8)	38.7 (28.4-53.9)

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

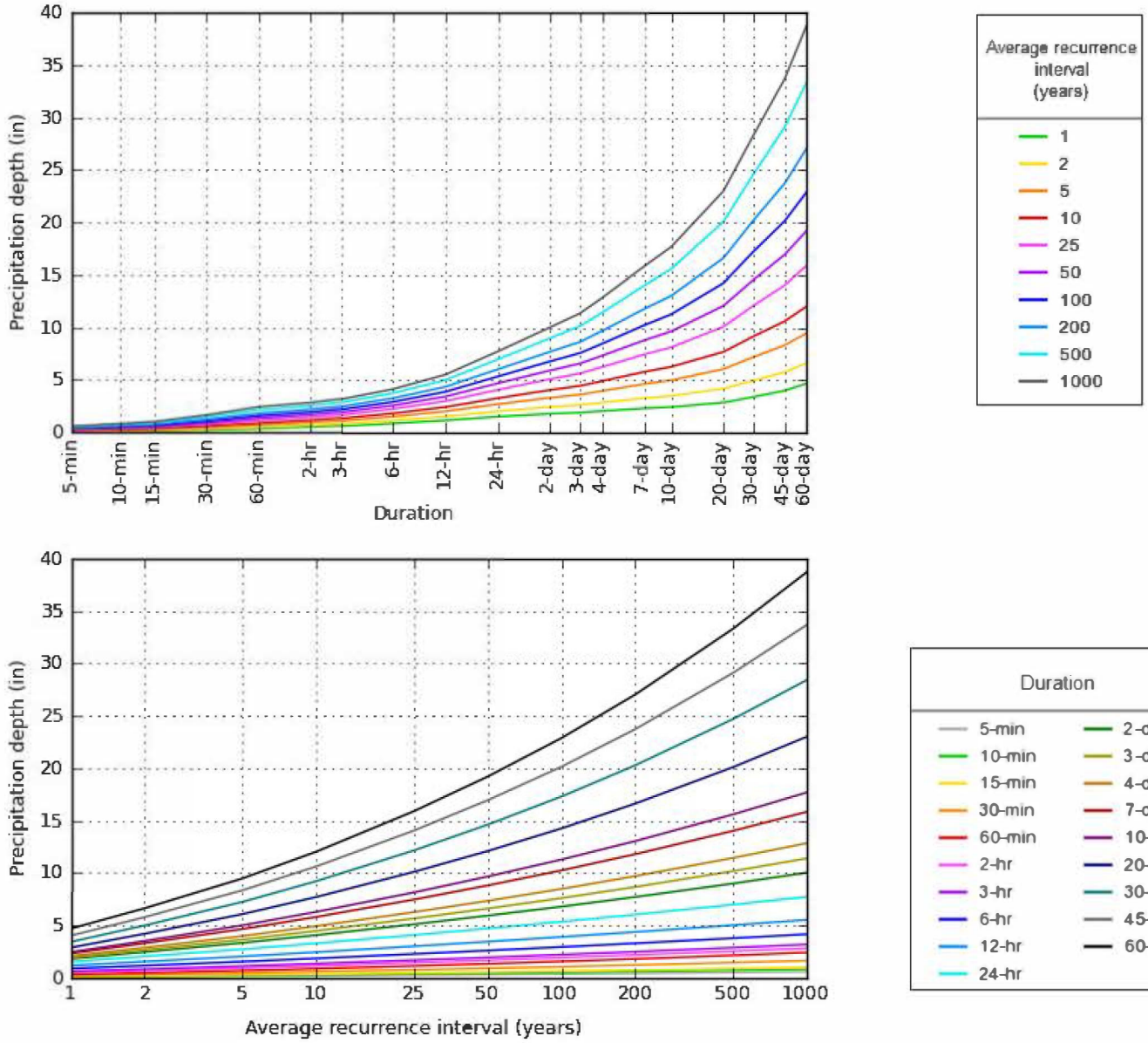
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper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

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.7382°, Longitude: -117.1653°



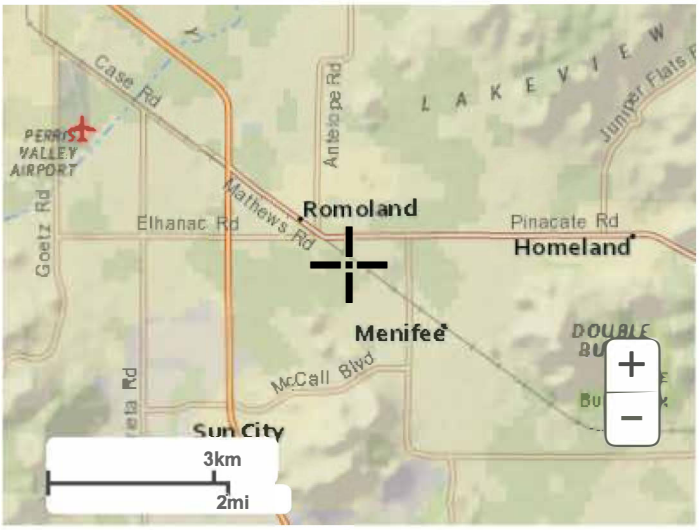
NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Fri Dec 2 04:50:39 2022

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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



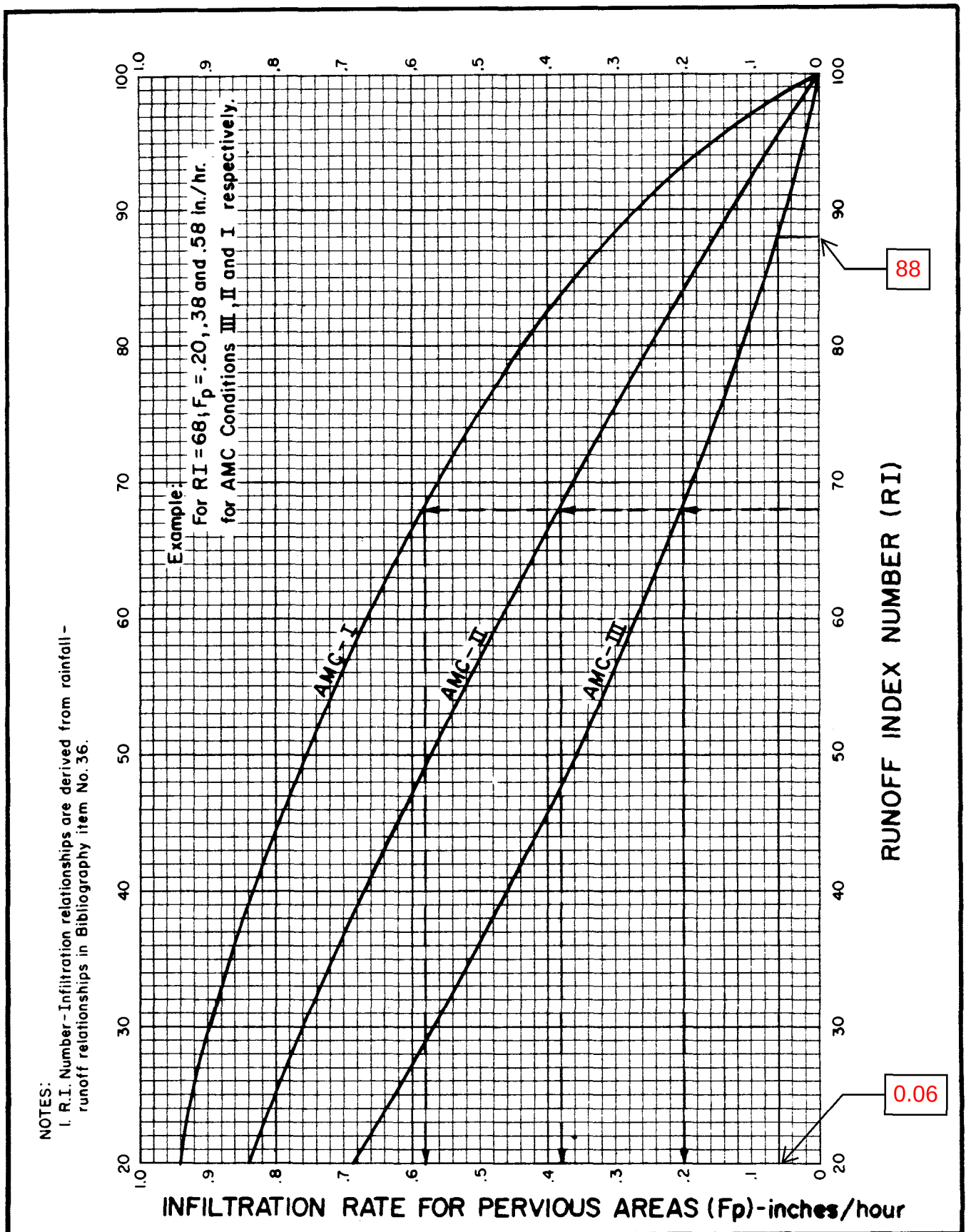
Large scale aerial



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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



NOTES:
1. R.I. Number-Infiltration relationships are derived from rainfall-runoff relationships in Bibliography item No. 36.

RCFC & WCD

HYDROLOGY MANUAL

INFILTRATION RATE FOR PERVIOUS AREAS VERSUS RUNOFF INDEX NUMBERS

PLATE E-6.2

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             F L O O D    R O U T I N G    A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 18.0)
                 Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* DOUBLE BUTTE                                                          *
* EXISTING CONDITION                                                    *
* 2 YR HYDROGRAPH                                                       *
 ************************************************************************

  FILE NAME: DB2EXUH.DAT
  TIME/DATE OF STUDY: 21:41 07/09/2024


**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    102.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      23.600 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.590 HOURS
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.060
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.030
         USER-ENTERED RAINFALL =  2.06 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  42.373
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	4.642	4.416
2	24.169	18.577
3	52.484	26.939
4	68.438	15.178
5	76.597	7.763
6	81.865	5.012
7	85.688	3.637
8	88.521	2.695
9	90.796	2.164
10	92.610	1.726
11	94.121	1.437
12	95.391	1.208
13	96.421	0.980
14	97.243	0.783
15	97.979	0.700
16	98.328	0.333
17	98.633	0.289
18	98.937	0.289
19	99.241	0.289
20	99.545	0.289
21	99.849	0.289
22	100.000	0.144

TOTAL STORM RAINFALL(INCHES) = 2.06
TOTAL SOIL-LOSS(INCHES) = 1.00
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.06

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.9629
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.0874

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)

(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0000	0.00	Q	.	.	.	.
0.250	0.0000	0.00	Q	.	.	.	.
0.333	0.0001	0.01	Q	.	.	.	.
0.417	0.0002	0.01	Q	.	.	.	.
0.500	0.0003	0.01	Q	.	.	.	.
0.583	0.0004	0.03	Q	.	.	.	.
0.667	0.0006	0.03	Q	.	.	.	.
0.750	0.0008	0.03	Q	.	.	.	.
0.833	0.0010	0.04	Q	.	.	.	.
0.917	0.0013	0.04	Q	.	.	.	.
1.000	0.0016	0.04	Q	.	.	.	.
1.083	0.0019	0.05	Q	.	.	.	.
1.167	0.0022	0.05	Q	.	.	.	.
1.250	0.0025	0.05	Q	.	.	.	.
1.333	0.0029	0.05	Q	.	.	.	.
1.417	0.0033	0.05	Q	.	.	.	.
1.500	0.0036	0.05	Q	.	.	.	.
1.583	0.0040	0.05	Q	.	.	.	.
1.667	0.0044	0.05	Q	.	.	.	.
1.750	0.0047	0.05	Q	.	.	.	.
1.833	0.0051	0.05	Q	.	.	.	.
1.917	0.0055	0.05	Q	.	.	.	.
2.000	0.0058	0.05	Q	.	.	.	.
2.083	0.0062	0.06	Q	.	.	.	.
2.167	0.0066	0.06	Q	.	.	.	.
2.250	0.0070	0.06	Q	.	.	.	.
2.333	0.0075	0.07	Q	.	.	.	.
2.417	0.0079	0.07	Q	.	.	.	.
2.500	0.0084	0.07	Q	.	.	.	.
2.583	0.0089	0.07	Q	.	.	.	.
2.667	0.0094	0.07	Q	.	.	.	.
2.750	0.0098	0.07	Q	.	.	.	.
2.833	0.0104	0.08	Q	.	.	.	.
2.917	0.0109	0.08	Q	.	.	.	.
3.000	0.0114	0.08	Q	.	.	.	.
3.083	0.0120	0.08	Q	.	.	.	.
3.167	0.0126	0.08	Q	.	.	.	.
3.250	0.0131	0.08	Q	.	.	.	.
3.333	0.0137	0.09	Q	.	.	.	.
3.417	0.0143	0.09	Q	.	.	.	.
3.500	0.0149	0.09	Q	.	.	.	.
3.583	0.0156	0.09	Q	.	.	.	.
3.667	0.0162	0.09	Q	.	.	.	.

3.750	0.0168	0.09	Q	.	.	.	.
3.833	0.0174	0.09	Q	.	.	.	.
3.917	0.0181	0.09	Q	.	.	.	.
4.000	0.0187	0.09	Q	.	.	.	.
4.083	0.0194	0.10	Q	.	.	.	.
4.167	0.0201	0.10	Q	.	.	.	.
4.250	0.0207	0.10	Q	.	.	.	.
4.333	0.0215	0.11	Q	.	.	.	.
4.417	0.0222	0.11	Q	.	.	.	.
4.500	0.0229	0.11	Q	.	.	.	.
4.583	0.0237	0.11	Q	.	.	.	.
4.667	0.0245	0.11	Q	.	.	.	.
4.750	0.0252	0.11	Q	.	.	.	.
4.833	0.0261	0.12	Q	.	.	.	.
4.917	0.0269	0.12	Q	.	.	.	.
5.000	0.0278	0.12	Q	.	.	.	.
5.083	0.0286	0.13	Q	.	.	.	.
5.167	0.0295	0.13	Q	.	.	.	.
5.250	0.0304	0.13	Q	.	.	.	.
5.333	0.0313	0.13	Q	.	.	.	.
5.417	0.0322	0.13	Q	.	.	.	.
5.500	0.0331	0.13	Q	.	.	.	.
5.583	0.0340	0.13	Q	.	.	.	.
5.667	0.0349	0.13	Q	.	.	.	.
5.750	0.0358	0.13	Q	.	.	.	.
5.833	0.0367	0.14	Q	.	.	.	.
5.917	0.0376	0.14	Q	.	.	.	.
6.000	0.0386	0.14	Q	.	.	.	.
6.083	0.0395	0.14	Q	.	.	.	.
6.167	0.0405	0.14	Q	.	.	.	.
6.250	0.0415	0.14	Q	.	.	.	.
6.333	0.0426	0.15	Q	.	.	.	.
6.417	0.0436	0.15	Q	.	.	.	.
6.500	0.0447	0.15	Q	.	.	.	.
6.583	0.0458	0.16	Q	.	.	.	.
6.667	0.0469	0.16	Q	.	.	.	.
6.750	0.0480	0.16	Q	.	.	.	.
6.833	0.0491	0.17	Q	.	.	.	.
6.917	0.0503	0.17	Q	.	.	.	.
7.000	0.0515	0.17	Q	.	.	.	.
7.083	0.0527	0.18	QV	.	.	.	.
7.167	0.0539	0.18	QV	.	.	.	.
7.250	0.0551	0.18	QV	.	.	.	.
7.333	0.0565	0.19	QV	.	.	.	.
7.417	0.0578	0.19	QV	.	.	.	.
7.500	0.0591	0.19	QV	.	.	.	.
7.583	0.0608	0.25	QV	.	.	.	.
7.667	0.0625	0.25	QV	.	.	.	.
7.750	0.0642	0.25	QV	.	.	.	.
7.833	0.0668	0.36	.Q	.	.	.	.

7.917	0.0693	0.36	.Q	.	.	.	.
8.000	0.0718	0.36	.Q	.	.	.	.
8.083	0.0754	0.52	.VQ	.	.	.	.
8.167	0.0790	0.52	.VQ	.	.	.	.
8.250	0.0826	0.52	.VQ	.	.	.	.
8.333	0.0876	0.72	.VQ	.	.	.	.
8.417	0.0926	0.72	.VQ	.	.	.	.
8.500	0.0976	0.72	.VQ	.	.	.	.
8.583	0.1039	0.92	.V Q	.	.	.	.
8.667	0.1102	0.92	. VQ	.	.	.	.
8.750	0.1166	0.92	. VQ	.	.	.	.
8.833	0.1241	1.09	. V Q	.	.	.	.
8.917	0.1315	1.09	. V Q	.	.	.	.
9.000	0.1390	1.09	. V Q	.	.	.	.
9.083	0.1478	1.27	. V Q	.	.	.	.
9.167	0.1566	1.27	. V Q	.	.	.	.
9.250	0.1653	1.27	. V Q	.	.	.	.
9.333	0.1757	1.51	. V Q	.	.	.	.
9.417	0.1861	1.51	. V Q	.	.	.	.
9.500	0.1965	1.51	. V Q	.	.	.	.
9.583	0.2086	1.76	. V Q	.	.	.	.
9.667	0.2207	1.76	. V Q	.	.	.	.
9.750	0.2329	1.76	. V Q	.	.	.	.
9.833	0.2466	2.00	. V Q	.	.	.	.
9.917	0.2604	2.00	. V Q	.	.	.	.
10.000	0.2741	2.00	. V Q	.	.	.	.
10.083	0.2889	2.15	. V Q	.	.	.	.
10.167	0.3037	2.15	. V Q	.	.	.	.
10.250	0.3185	2.15	. V Q	.	.	.	.
10.333	0.3326	2.05	. V Q	.	.	.	.
10.417	0.3468	2.05	. V Q	.	.	.	.
10.500	0.3609	2.05	. V Q	.	.	.	.
10.583	0.3735	1.83	. Q	.	.	.	.
10.667	0.3860	1.83	. Q	.	.	.	.
10.750	0.3986	1.83	. Q	.	.	.	.
10.833	0.4116	1.88	. Q	.	.	.	.
10.917	0.4246	1.88	. QV	.	.	.	.
11.000	0.4375	1.88	. QV	.	.	.	.
11.083	0.4520	2.11	. Q	.	.	.	.
11.167	0.4665	2.11	. Q	.	.	.	.
11.250	0.4811	2.11	. QV	.	.	.	.
11.333	0.4963	2.21	. QV	.	.	.	.
11.417	0.5115	2.21	. QV	.	.	.	.
11.500	0.5267	2.21	. Q V	.	.	.	.
11.583	0.5420	2.21	. Q V	.	.	.	.
11.667	0.5572	2.21	. Q V	.	.	.	.
11.750	0.5725	2.21	. Q V	.	.	.	.
11.833	0.5874	2.17	. Q .V	.	.	.	.
11.917	0.6024	2.17	. Q .V	.	.	.	.
12.000	0.6173	2.17	. Q .V	.	.	.	.

12.083	0.6324	2.19	.	Q . V . . .
12.167	0.6476	2.19	.	Q . V . . .
12.250	0.6627	2.19	.	Q . V . . .
12.333	0.6798	2.49	.	Q. V . . .
12.417	0.6970	2.49	.	Q. V . . .
12.500	0.7141	2.49	.	Q. V . . .
12.583	0.7345	2.96	.	.Q V . . .
12.667	0.7550	2.96	.	.Q V . . .
12.750	0.7754	2.96	.	.Q V . . .
12.833	0.7984	3.34	.	. Q V . . .
12.917	0.8214	3.34	.	. Q V . . .
13.000	0.8444	3.34	.	. Q V . . .
13.083	0.8699	3.70	.	. Q V . . .
13.167	0.8954	3.70	.	. Q V . . .
13.250	0.9209	3.70	.	. Q V . . .
13.333	0.9493	4.12	.	. Q V . . .
13.417	0.9776	4.12	.	. Q V . . .
13.500	1.0060	4.12	.	. Q V. . .
13.583	1.0365	4.44	.	. Q V. . .
13.667	1.0671	4.44	.	. Q V . .
13.750	1.0977	4.44	.	. Q V . .
13.833	1.1271	4.28	.	. Q .V . .
13.917	1.1566	4.28	.	. Q . V . .
14.000	1.1861	4.28	.	. Q . V . .
14.083	1.2127	3.87	.	. Q . V . .
14.167	1.2393	3.87	.	. Q . V . .
14.250	1.2660	3.87	.	. Q . V . .
14.333	1.2920	3.78	.	. Q . V . .
14.417	1.3181	3.78	.	. Q . V . .
14.500	1.3441	3.78	.	. Q . V . .
14.583	1.3709	3.88	.	. Q . V . .
14.667	1.3976	3.88	.	. Q . V . .
14.750	1.4244	3.88	.	. Q . V . .
14.833	1.4513	3.91	.	. Q . V . .
14.917	1.4782	3.91	.	. Q . V . .
15.000	1.5051	3.91	.	. Q . V . .
15.083	1.5318	3.87	.	. Q . V. .
15.167	1.5584	3.87	.	. Q . V. .
15.250	1.5851	3.87	.	. Q . V .
15.333	1.6112	3.79	.	. Q . V .
15.417	1.6373	3.79	.	. Q . V .
15.500	1.6634	3.79	.	. Q . V .
15.583	1.6886	3.65	.	. Q . . V .
15.667	1.7137	3.65	.	. Q . . V .
15.750	1.7389	3.65	.	. Q . . V .
15.833	1.7624	3.41	.	. Q . . V .
15.917	1.7859	3.41	.	. Q . . V .
16.000	1.8094	3.41	.	. Q . . V .
16.083	1.8303	3.03	.	. Q . . V .
16.167	1.8512	3.03	.	. Q . . V .

16.250	1.8720	3.03	. . Q . . V .
16.333	1.8884	2.37	. Q. . . V .
16.417	1.9047	2.37	. Q. . . V .
16.500	1.9211	2.37	. Q. . . V .
16.583	1.9318	1.56	. Q . . . V .
16.667	1.9425	1.56	. Q . . . V .
16.750	1.9533	1.56	. Q . . . V .
16.833	1.9608	1.09	. Q . . . V .
16.917	1.9682	1.09	. Q . . . V .
17.000	1.9757	1.09	. Q . . . V .
17.083	1.9815	0.83	. Q . . . V .
17.167	1.9872	0.83	. Q . . . V .
17.250	1.9929	0.83	. Q . . . V .
17.333	1.9976	0.67	. Q . . . V .
17.417	2.0022	0.67	. Q . . . V .
17.500	2.0069	0.67	. Q . . . V .
17.583	2.0107	0.56	. Q . . . V .
17.667	2.0146	0.56	. Q . . . V .
17.750	2.0185	0.56	. Q . . . V .
17.833	2.0218	0.47	.Q . . . V .
17.917	2.0250	0.47	.Q . . . V .
18.000	2.0283	0.47	.Q . . . V .
18.083	2.0310	0.40	.Q . . . V .
18.167	2.0337	0.40	.Q . . . V .
18.250	2.0364	0.40	.Q . . . V.
18.333	2.0387	0.33	.Q . . . V.
18.417	2.0409	0.33	.Q . . . V.
18.500	2.0432	0.33	.Q . . . V.
18.583	2.0450	0.27	.Q . . . V.
18.667	2.0469	0.27	.Q . . . V.
18.750	2.0488	0.27	.Q . . . V.
18.833	2.0503	0.22	Q . . . V.
18.917	2.0518	0.22	Q . . . V.
19.000	2.0533	0.22	Q . . . V.
19.083	2.0546	0.18	Q . . . V.
19.167	2.0558	0.18	Q . . . V.
19.250	2.0570	0.18	Q . . . V.
19.333	2.0581	0.15	Q . . . V.
19.417	2.0591	0.15	Q . . . V.
19.500	2.0602	0.15	Q . . . V.
19.583	2.0611	0.13	Q . . . V.
19.667	2.0620	0.13	Q . . . V.
19.750	2.0629	0.13	Q . . . V.
19.833	2.0637	0.12	Q . . . V.
19.917	2.0645	0.12	Q . . . V.
20.000	2.0653	0.12	Q . . . V.
20.083	2.0661	0.10	Q . . . V.
20.167	2.0668	0.10	Q . . . V.
20.250	2.0675	0.10	Q . . . V.
20.333	2.0681	0.09	Q . . . V.

20.417	2.0687	0.09	Q	.	.	.	V.
20.500	2.0693	0.09	Q	.	.	.	V.
20.583	2.0698	0.08	Q	.	.	.	V.
20.667	2.0704	0.08	Q	.	.	.	V.
20.750	2.0709	0.08	Q	.	.	.	V.
20.833	2.0714	0.07	Q	.	.	.	V.
20.917	2.0719	0.07	Q	.	.	.	V.
21.000	2.0724	0.07	Q	.	.	.	V.
21.083	2.0728	0.06	Q	.	.	.	V.
21.167	2.0732	0.06	Q	.	.	.	V.
21.250	2.0736	0.06	Q	.	.	.	V.
21.333	2.0740	0.05	Q	.	.	.	V.
21.417	2.0743	0.05	Q	.	.	.	V.
21.500	2.0747	0.05	Q	.	.	.	V.
21.583	2.0750	0.05	Q	.	.	.	V.
21.667	2.0754	0.05	Q	.	.	.	V.
21.750	2.0758	0.05	Q	.	.	.	V.
21.833	2.0761	0.05	Q	.	.	.	V.
21.917	2.0765	0.05	Q	.	.	.	V.
22.000	2.0768	0.05	Q	.	.	.	V.
22.083	2.0772	0.05	Q	.	.	.	V.
22.167	2.0775	0.05	Q	.	.	.	V.
22.250	2.0779	0.05	Q	.	.	.	V.
22.333	2.0782	0.05	Q	.	.	.	V.
22.417	2.0786	0.05	Q	.	.	.	V.
22.500	2.0789	0.05	Q	.	.	.	V.
22.583	2.0792	0.05	Q	.	.	.	V.
22.667	2.0796	0.05	Q	.	.	.	V.
22.750	2.0799	0.05	Q	.	.	.	V.
22.833	2.0802	0.05	Q	.	.	.	V.
22.917	2.0806	0.05	Q	.	.	.	V.
23.000	2.0809	0.05	Q	.	.	.	V.
23.083	2.0812	0.04	Q	.	.	.	V.
23.166	2.0815	0.04	Q	.	.	.	V.
23.250	2.0818	0.04	Q	.	.	.	V.
23.333	2.0821	0.04	Q	.	.	.	V.
23.416	2.0824	0.04	Q	.	.	.	V.
23.500	2.0826	0.04	Q	.	.	.	V.
23.583	2.0829	0.04	Q	.	.	.	V.
23.666	2.0832	0.04	Q	.	.	.	V.
23.750	2.0835	0.04	Q	.	.	.	V.
23.833	2.0838	0.04	Q	.	.	.	V.
23.916	2.0841	0.04	Q	.	.	.	V.
24.000	2.0843	0.04	Q	.	.	.	V.
24.083	2.0846	0.04	Q	.	.	.	V.
24.166	2.0849	0.04	Q	.	.	.	V.
24.250	2.0852	0.04	Q	.	.	.	V.
24.333	2.0854	0.03	Q	.	.	.	V.
24.416	2.0856	0.03	Q	.	.	.	V.
24.500	2.0858	0.03	Q	.	.	.	V.

24.583	2.0859	0.02	Q	.	.	.	V.
24.666	2.0861	0.02	Q	.	.	.	V.
24.750	2.0862	0.02	Q	.	.	.	V.
24.833	2.0863	0.01	Q	.	.	.	V.
24.916	2.0864	0.01	Q	.	.	.	V.
25.000	2.0865	0.01	Q	.	.	.	V.
25.083	2.0865	0.01	Q	.	.	.	V.
25.166	2.0866	0.01	Q	.	.	.	V.
25.250	2.0867	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1515.0
10%	600.0
20%	510.0
30%	450.0
40%	405.0
50%	255.0
60%	225.0
70%	195.0
80%	165.0
90%	45.0

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END OF FLOODSCx ROUTING ANALYSIS

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             F L O O D    R O U T I N G    A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 18.0)
                 Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* DOUBLE BUTTE                                                          *
* PROPOSED CONDITION                                                    *
* 2 YR HYDROGRAPH                                                       *
 ************************************************************************

  FILE NAME: DB2PRUH.DAT
  TIME/DATE OF STUDY: 14:42 02/07/2024



**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    102.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      23.600 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.290 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.050
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.600
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.030
         USER-ENTERED RAINFALL =  2.06 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000
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UNIT HYDROGRAPH TIME UNIT = 15.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 86.207

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	14.833	14.112
2	61.256	44.166
3	79.677	17.525
4	87.444	7.389
5	91.978	4.314
6	94.996	2.870
7	97.016	1.923
8	98.251	1.175
9	98.874	0.592
10	99.421	0.520
11	99.768	0.331
12	99.942	0.165
13	100.000	0.055

TOTAL STORM RAINFALL(INCHES) = 2.06
TOTAL SOIL-LOSS(INCHES) = 0.75
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.31

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1.4784
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.5716

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0

0.083	0.0002	0.02	Q	.	.	.	.
0.167	0.0003	0.02	Q	.	.	.	.
0.250	0.0005	0.02	Q	.	.	.	.
0.333	0.0012	0.11	Q	.	.	.	.
0.417	0.0020	0.11	Q	.	.	.	.
0.500	0.0027	0.11	Q	.	.	.	.
0.583	0.0039	0.17	Q	.	.	.	.
0.667	0.0051	0.17	Q	.	.	.	.
0.750	0.0063	0.17	Q	.	.	.	.
0.833	0.0077	0.21	Q	.	.	.	.
0.917	0.0092	0.21	Q	.	.	.	.
1.000	0.0106	0.21	Q	.	.	.	.
1.083	0.0124	0.25	Q	.	.	.	.
1.167	0.0141	0.25	Q	.	.	.	.
1.250	0.0158	0.25	Q	.	.	.	.
1.333	0.0174	0.24	Q	.	.	.	.
1.417	0.0190	0.24	Q	.	.	.	.
1.500	0.0207	0.24	Q	.	.	.	.
1.583	0.0223	0.23	Q	.	.	.	.
1.667	0.0239	0.23	Q	.	.	.	.
1.750	0.0255	0.23	Q	.	.	.	.
1.833	0.0272	0.25	Q	.	.	.	.
1.917	0.0288	0.25	Q	.	.	.	.
2.000	0.0305	0.25	Q	.	.	.	.
2.083	0.0325	0.28	VQ	.	.	.	.
2.167	0.0344	0.28	VQ	.	.	.	.
2.250	0.0364	0.28	VQ	.	.	.	.
2.333	0.0384	0.30	VQ	.	.	.	.
2.417	0.0405	0.30	VQ	.	.	.	.
2.500	0.0425	0.30	VQ	.	.	.	.
2.583	0.0447	0.32	VQ	.	.	.	.
2.667	0.0469	0.32	VQ	.	.	.	.
2.750	0.0490	0.32	VQ	.	.	.	.
2.833	0.0515	0.36	VQ	.	.	.	.
2.917	0.0539	0.36	VQ	.	.	.	.
3.000	0.0564	0.36	VQ	.	.	.	.
3.083	0.0589	0.37	VQ	.	.	.	.
3.167	0.0615	0.37	VQ	.	.	.	.
3.250	0.0641	0.37	VQ	.	.	.	.
3.333	0.0667	0.38	.Q	.	.	.	.
3.417	0.0693	0.38	.Q	.	.	.	.
3.500	0.0719	0.38	.Q	.	.	.	.
3.583	0.0746	0.38	.Q	.	.	.	.
3.667	0.0772	0.38	.Q	.	.	.	.
3.750	0.0799	0.38	.Q	.	.	.	.
3.833	0.0826	0.40	.Q	.	.	.	.
3.917	0.0854	0.40	.Q	.	.	.	.
4.000	0.0881	0.40	.Q	.	.	.	.
4.083	0.0911	0.44	.Q	.	.	.	.

4.167	0.0941	0.44	.Q	.	.	.	.
4.250	0.0971	0.44	.Q	.	.	.	.
4.333	0.1003	0.46	.Q	.	.	.	.
4.417	0.1035	0.46	.Q	.	.	.	.
4.500	0.1067	0.46	.Q	.	.	.	.
4.583	0.1102	0.51	.VQ	.	.	.	.
4.667	0.1137	0.51	.VQ	.	.	.	.
4.750	0.1172	0.51	.VQ	.	.	.	.
4.833	0.1209	0.54	.VQ	.	.	.	.
4.917	0.1246	0.54	.VQ	.	.	.	.
5.000	0.1283	0.54	.VQ	.	.	.	.
5.083	0.1322	0.56	. Q	.	.	.	.
5.167	0.1360	0.56	. Q	.	.	.	.
5.250	0.1399	0.56	. Q	.	.	.	.
5.333	0.1435	0.52	. Q	.	.	.	.
5.417	0.1470	0.52	. Q	.	.	.	.
5.500	0.1506	0.52	. Q	.	.	.	.
5.583	0.1544	0.55	. Q	.	.	.	.
5.667	0.1581	0.55	. Q	.	.	.	.
5.750	0.1619	0.55	. Q	.	.	.	.
5.833	0.1660	0.59	. Q	.	.	.	.
5.917	0.1700	0.59	. Q	.	.	.	.
6.000	0.1741	0.59	. Q	.	.	.	.
6.083	0.1784	0.62	. Q	.	.	.	.
6.167	0.1826	0.62	. Q	.	.	.	.
6.250	0.1869	0.62	. Q	.	.	.	.
6.333	0.1915	0.66	. Q	.	.	.	.
6.417	0.1961	0.66	. QV	.	.	.	.
6.500	0.2006	0.66	. QV	.	.	.	.
6.583	0.2054	0.69	. QV	.	.	.	.
6.667	0.2102	0.69	. QV	.	.	.	.
6.750	0.2150	0.69	. QV	.	.	.	.
6.833	0.2200	0.74	. QV	.	.	.	.
6.917	0.2251	0.74	. QV	.	.	.	.
7.000	0.2302	0.74	. QV	.	.	.	.
7.083	0.2355	0.76	. Q	.	.	.	.
7.167	0.2407	0.76	. Q	.	.	.	.
7.250	0.2459	0.76	. Q	.	.	.	.
7.333	0.2513	0.78	. Q	.	.	.	.
7.417	0.2567	0.78	. Q	.	.	.	.
7.500	0.2620	0.78	. QV	.	.	.	.
7.583	0.2678	0.84	. QV	.	.	.	.
7.667	0.2736	0.84	. QV	.	.	.	.
7.750	0.2793	0.84	. QV	.	.	.	.
7.833	0.2858	0.94	. QV	.	.	.	.
7.917	0.2922	0.94	. QV	.	.	.	.
8.000	0.2987	0.94	. QV	.	.	.	.
8.083	0.3064	1.12	. Q	.	.	.	.
8.167	0.3142	1.12	. Q	.	.	.	.
8.250	0.3219	1.12	. QV	.	.	.	.

8.333	0.3313	1.37	.	Q	.	.	.	.
8.417	0.3407	1.37	.	Q	.	.	.	.
8.500	0.3501	1.37	.	Q	.	.	.	.
8.583	0.3605	1.50	.	VQ	.	.	.	.
8.667	0.3708	1.50	.	VQ	.	.	.	.
8.750	0.3812	1.50	.	VQ	.	.	.	.
8.833	0.3928	1.68	.	Q	.	.	.	.
8.917	0.4044	1.68	.	Q	.	.	.	.
9.000	0.4160	1.68	.	Q	.	.	.	.
9.083	0.4291	1.91	.	VQ	.	.	.	.
9.167	0.4423	1.91	.	VQ	.	.	.	.
9.250	0.4555	1.91	.	Q	.	.	.	.
9.333	0.4706	2.21	.	VQ	.	.	.	.
9.417	0.4858	2.21	.	VQ	.	.	.	.
9.500	0.5010	2.21	.	VQ	.	.	.	.
9.583	0.5179	2.45	.	VQ.	.	.	.	.
9.667	0.5347	2.45	.	VQ.	.	.	.	.
9.750	0.5516	2.45	.	VQ.	.	.	.	.
9.833	0.5700	2.67	.	V Q	.	.	.	.
9.917	0.5884	2.67	.	VQ	.	.	.	.
10.000	0.6068	2.67	.	VQ	.	.	.	.
10.083	0.6251	2.66	.	VQ	.	.	.	.
10.167	0.6434	2.66	.	Q	.	.	.	.
10.250	0.6616	2.66	.	Q	.	.	.	.
10.333	0.6762	2.12	.	Q V	.	.	.	.
10.417	0.6908	2.12	.	Q V	.	.	.	.
10.500	0.7053	2.12	.	Q V	.	.	.	.
10.583	0.7196	2.07	.	Q .V	.	.	.	.
10.667	0.7338	2.07	.	Q .V	.	.	.	.
10.750	0.7480	2.07	.	Q .V	.	.	.	.
10.833	0.7649	2.46	.	Q.V	.	.	.	.
10.917	0.7818	2.46	.	Q. V	.	.	.	.
11.000	0.7988	2.46	.	Q. V	.	.	.	.
11.083	0.8165	2.58	.	Q V	.	.	.	.
11.167	0.8342	2.58	.	Q V	.	.	.	.
11.250	0.8520	2.58	.	Q V	.	.	.	.
11.333	0.8695	2.54	.	Q V	.	.	.	.
11.417	0.8870	2.54	.	Q V	.	.	.	.
11.500	0.9045	2.54	.	Q V	.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
11.583	0.9217	2.49	.	Q. V	.	.	.
11.667	0.9388	2.49	.	Q. V	.	.	.
11.750	0.9559	2.49	.	Q. V	.	.	.
11.833	0.9721	2.35	.	Q. V	.	.	.
11.917	0.9883	2.35	.	Q. V	.	.	.
12.000	1.0045	2.35	.	Q. V	.	.	.
12.083	1.0223	2.59	.	Q V	.	.	.

12.167	1.0401	2.59	.	Q	V	.	.	.
12.250	1.0580	2.59	.	Q	V	.	.	.
12.333	1.0805	3.27	.	.	Q V	.	.	.
12.417	1.1031	3.27	.	.	Q V	.	.	.
12.500	1.1256	3.27	.	.	Q V	.	.	.
12.583	1.1510	3.69	.	.	Q V	.	.	.
12.667	1.1764	3.69	.	.	Q V	.	.	.
12.750	1.2018	3.69	.	.	Q V	.	.	.
12.833	1.2296	4.05	.	.	Q V	.	.	.
12.917	1.2575	4.05	.	.	Q V	.	.	.
13.000	1.2854	4.05	.	.	Q V	.	.	.
13.083	1.3161	4.45	.	.	Q V		.	.
13.167	1.3467	4.45	.	.	Q V		.	.
13.250	1.3773	4.45	.	.	Q V		.	.
13.333	1.4120	5.03	.	.	QV		.	.
13.417	1.4466	5.03	.	.	Q V		.	.
13.500	1.4813	5.03	.	.	Q V		.	.
13.583	1.5155	4.97	.	.	Q. V		.	.
13.667	1.5498	4.97	.	.	Q. V		.	.
13.750	1.5840	4.97	.	.	Q. V		.	.
13.833	1.6123	4.10	.	.	Q .	V	.	.
13.917	1.6405	4.10	.	.	Q .	V	.	.
14.000	1.6688	4.10	.	.	Q .	V	.	.
14.083	1.6956	3.90	.	.	Q .	V	.	.
14.167	1.7225	3.90	.	.	Q .	V	.	.
14.250	1.7494	3.90	.	.	Q .	V	.	.
14.333	1.7778	4.13	.	.	Q .	V	.	.
14.417	1.8062	4.13	.	.	Q .	V	.	.
14.500	1.8346	4.13	.	.	Q .	V	.	.
14.583	1.8631	4.13	.	.	Q .	V	.	.
14.667	1.8915	4.13	.	.	Q .	V.	.	.
14.750	1.9199	4.13	.	.	Q .	V.	.	.
14.833	1.9480	4.09	.	.	Q .	V	.	.
14.917	1.9762	4.09	.	.	Q .	V	.	.
15.000	2.0043	4.09	.	.	Q .	V	.	.
15.083	2.0317	3.97	.	.	Q .	.V	.	.
15.167	2.0590	3.97	.	.	Q .	. V	.	.
15.250	2.0863	3.97	.	.	Q .	. V	.	.
15.333	2.1126	3.82	.	.	Q .	. V	.	.
15.417	2.1388	3.82	.	.	Q .	. V	.	.
15.500	2.1651	3.82	.	.	Q .	. V	.	.
15.583	2.1897	3.57	.	.	Q .	. V	.	.
15.667	2.2143	3.57	.	.	Q .	. V	.	.
15.750	2.2389	3.57	.	.	Q .	. V	.	.
15.833	2.2606	3.15	.	. Q	.	. V	.	.
15.917	2.2823	3.15	.	. Q	.	. V	.	.
16.000	2.3040	3.15	.	. Q	.	. V	.	.
16.083	2.3220	2.62	.	Q	.	. V	.	.
16.167	2.3400	2.62	.	Q	.	. V	.	.
16.250	2.3580	2.62	.	Q	.	. V	.	.

16.333	2.3676	1.39	.	Q	.	.	V	.
16.417	2.3772	1.39	.	Q	.	.	V	.
16.500	2.3868	1.39	.	Q	.	.	V	.
16.583	2.3929	0.88	.	Q	.	.	V	.
16.667	2.3990	0.88	.	Q	.	.	V	.
16.750	2.4050	0.88	.	Q	.	.	V	.
16.833	2.4093	0.62	.	Q	.	.	V	.
16.917	2.4136	0.62	.	Q	.	.	V	.
17.000	2.4179	0.62	.	Q	.	.	V	.
17.083	2.4214	0.50	.	Q	.	.	V	.
17.167	2.4248	0.50	.	Q	.	.	V	.
17.250	2.4283	0.50	.	Q	.	.	V	.
17.333	2.4316	0.48	.	Q	.	.	V	.
17.417	2.4349	0.48	.	Q	.	.	V	.
17.500	2.4382	0.48	.	Q	.	.	V	.
17.583	2.4413	0.45	.	Q	.	.	V	.
17.667	2.4444	0.45	.	Q	.	.	V	.
17.750	2.4475	0.45	.	Q	.	.	V	.
17.833	2.4504	0.41	.	Q	.	.	V	.
17.917	2.4532	0.41	.	Q	.	.	V	.
18.000	2.4561	0.41	.	Q	.	.	V	.
18.083	2.4586	0.36	.	Q	.	.	V	.
18.167	2.4611	0.36	.	Q	.	.	V	.
18.250	2.4636	0.36	.	Q	.	.	V	.
18.333	2.4659	0.34	.	Q	.	.	V	.
18.417	2.4682	0.34	.	Q	.	.	V	.
18.500	2.4706	0.34	.	Q	.	.	V	.
18.583	2.4727	0.31	.	Q	.	.	V	.
18.667	2.4749	0.31	.	Q	.	.	V	.
18.750	2.4770	0.31	.	Q	.	.	V	.
18.833	2.4788	0.26	.	Q	.	.	V	.
18.917	2.4806	0.26	.	Q	.	.	V	.
19.000	2.4824	0.26	.	Q	.	.	V	.
19.083	2.4839	0.22	Q	.	.	.	V	.
19.167	2.4854	0.22	Q	.	.	.	V	.
19.250	2.4869	0.22	Q	.	.	.	V	.
19.333	2.4886	0.24	Q	.	.	.	V	.
19.417	2.4902	0.24	Q	.	.	.	V	.
19.500	2.4919	0.24	Q	.	.	.	V	.
19.583	2.4938	0.27	.	Q	.	.	V	.
19.667	2.4957	0.27	.	Q	.	.	V	.
19.750	2.4975	0.27	.	Q	.	.	V	.
19.833	2.4992	0.24	Q	.	.	.	V	.
19.917	2.5008	0.24	Q	.	.	.	V	.
20.000	2.5025	0.24	Q	.	.	.	V	.
20.083	2.5039	0.21	Q	.	.	.	V	.
20.167	2.5053	0.21	Q	.	.	.	V	.
20.250	2.5067	0.21	Q	.	.	.	V	.
20.333	2.5083	0.22	Q	.	.	.	V	.
20.417	2.5098	0.22	Q	.	.	.	V	.

20.500	2.5114	0.22	Q	.	.	.	V.
20.583	2.5130	0.23	Q	.	.	.	V.
20.667	2.5145	0.23	Q	.	.	.	V.
20.750	2.5161	0.23	Q	.	.	.	V.
20.833	2.5177	0.22	Q	.	.	.	V.
20.917	2.5192	0.22	Q	.	.	.	V.
21.000	2.5207	0.22	Q	.	.	.	V.
21.083	2.5221	0.20	Q	.	.	.	V.
21.167	2.5234	0.20	Q	.	.	.	V.
21.250	2.5248	0.20	Q	.	.	.	V.
21.333	2.5262	0.21	Q	.	.	.	V.
21.417	2.5277	0.21	Q	.	.	.	V.
21.500	2.5291	0.21	Q	.	.	.	V.
21.583	2.5304	0.19	Q	.	.	.	V.
21.667	2.5317	0.19	Q	.	.	.	V.
21.750	2.5331	0.19	Q	.	.	.	V.
21.833	2.5345	0.21	Q	.	.	.	V.
21.917	2.5359	0.21	Q	.	.	.	V.
22.000	2.5373	0.21	Q	.	.	.	V.
22.083	2.5386	0.19	Q	.	.	.	V.
22.167	2.5399	0.19	Q	.	.	.	V.
22.250	2.5412	0.19	Q	.	.	.	V.
22.333	2.5426	0.20	Q	.	.	.	V.
22.417	2.5440	0.20	Q	.	.	.	V.
22.500	2.5454	0.20	Q	.	.	.	V.
22.583	2.5467	0.18	Q	.	.	.	V.
22.667	2.5479	0.18	Q	.	.	.	V.
22.750	2.5491	0.18	Q	.	.	.	V.
22.833	2.5503	0.17	Q	.	.	.	V.
22.917	2.5514	0.17	Q	.	.	.	V.
23.000	2.5526	0.17	Q	.	.	.	V.
23.083	2.5537	0.16	Q	.	.	.	V.
23.166	2.5548	0.16	Q	.	.	.	V.
23.250	2.5559	0.16	Q	.	.	.	V.
23.333	2.5570	0.16	Q	.	.	.	V.
23.416	2.5581	0.16	Q	.	.	.	V.
23.500	2.5592	0.16	Q	.	.	.	V.
23.583	2.5603	0.16	Q	.	.	.	V.
23.666	2.5614	0.16	Q	.	.	.	V.
23.750	2.5625	0.16	Q	.	.	.	V.
23.833	2.5636	0.16	Q	.	.	.	V.
23.916	2.5647	0.16	Q	.	.	.	V.
24.000	2.5658	0.16	Q	.	.	.	V.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
24.083	2.5667	0.13	Q	.	.	.	V.
24.166	2.5676	0.13	Q	.	.	.	V.
24.250	2.5686	0.13	Q	.	.	.	V.

```
  24.333      2.5690      0.06  Q         .         .         .         V.
  24.416      2.5694      0.06  Q         .         .         .         V.
  24.500      2.5698      0.06  Q         .         .         .         V.
  24.583      2.5701      0.03  Q         .         .         .         V.
  24.666      2.5703      0.03  Q         .         .         .         V.
  24.750      2.5705      0.03  Q         .         .         .         V.
  24.833      2.5706      0.02  Q         .         .         .         V.
  24.916      2.5708      0.02  Q         .         .         .         V.
  25.000      2.5709      0.02  Q         .         .         .         V.
  25.083      2.5710      0.01  Q         .         .         .         V.
  25.166      2.5711      0.01  Q         .         .         .         V.
  25.250      2.5712      0.01  Q         .         .         .         V.
  25.333      2.5712      0.01  Q         .         .         .         V.
  25.416      2.5713      0.01  Q         .         .         .         V.
  25.500      2.5713      0.01  Q         .         .         .         V.
--------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                Duration
       Peak Flow Rate                     (minutes)
   ======================                 =========
              0%                           1530.0
             10%                            750.0
             20%                            510.0
             30%                            450.0
             40%                            420.0
             50%                            315.0
             60%                            225.0
             70%                            195.0
             80%                            120.0
             90%                             30.0


********************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    206.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
================================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       1.140 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
  Warning: Watershed Area is less than 10 acres
        *USER ENTERED "LAG" TIME =    0.100 HOURS
         CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
         THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
```

MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.050
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
MINIMUM SOIL-LOSS RATE(INCH/HOUR) = 0.030
USER-ENTERED RAINFALL = 2.06 INCHES
RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
*USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000

UNIT HYDROGRAPH TIME UNIT = 15.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 250.000

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	50.817	2.335
2	90.903	1.842
3	97.798	0.317
4	99.444	0.076
5	99.778	0.015
6	99.944	0.008
7	100.000	0.003

TOTAL STORM RAINFALL(INCHES) = 2.06
TOTAL SOIL-LOSS(INCHES) = 0.69
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.37

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.0657
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 0.1299

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0001	0.00	Q	.	.	.	.
0.250	0.0001	0.00	Q	.	.	.	.
0.333	0.0002	0.01	Q	.	.	.	.
0.417	0.0003	0.01	Q	.	.	.	.
0.500	0.0003	0.01	Q	.	.	.	.
0.583	0.0004	0.01	Q	.	.	.	.
0.667	0.0005	0.01	Q	.	.	.	.
0.750	0.0006	0.01	Q	.	.	.	.
0.833	0.0007	0.02	Q	.	.	.	.
0.917	0.0008	0.02	Q	.	.	.	.
1.000	0.0009	0.02	Q	.	.	.	.
1.083	0.0011	0.02	Q	.	.	.	.
1.167	0.0012	0.02	Q	.	.	.	.
1.250	0.0013	0.02	Q	.	.	.	.
1.333	0.0014	0.01	Q	.	.	.	.
1.417	0.0015	0.01	Q	.	.	.	.
1.500	0.0016	0.01	Q	.	.	.	.
1.583	0.0017	0.01	Q	.	.	.	.
1.667	0.0018	0.01	Q	.	.	.	.
1.750	0.0019	0.01	Q	.	.	.	.
1.833	0.0020	0.02	Q	.	.	.	.
1.917	0.0021	0.02	Q	.	.	.	.
2.000	0.0022	0.02	Q	.	.	.	.
2.083	0.0023	0.02	Q	.	.	.	.
2.167	0.0025	0.02	Q	.	.	.	.
2.250	0.0026	0.02	Q	.	.	.	.
2.333	0.0027	0.02	Q	.	.	.	.
2.417	0.0029	0.02	Q	.	.	.	.
2.500	0.0030	0.02	Q	.	.	.	.
2.583	0.0031	0.02	Q	.	.	.	.
2.667	0.0033	0.02	QV	.	.	.	.
2.750	0.0034	0.02	QV	.	.	.	.
2.833	0.0036	0.02	QV	.	.	.	.
2.917	0.0037	0.02	QV	.	.	.	.
3.000	0.0039	0.02	QV	.	.	.	.
3.083	0.0041	0.02	QV	.	.	.	.
3.167	0.0042	0.02	QV	.	.	.	.
3.250	0.0044	0.02	QV	.	.	.	.
3.333	0.0046	0.02	QV	.	.	.	.
3.417	0.0047	0.02	QV	.	.	.	.
3.500	0.0049	0.02	QV	.	.	.	.
3.583	0.0050	0.02	QV	.	.	.	.
3.667	0.0052	0.02	QV	.	.	.	.
3.750	0.0054	0.02	QV	.	.	.	.
3.833	0.0056	0.03	QV	.	.	.	.
3.917	0.0057	0.03	QV	.	.	.	.

4.000	0.0059	0.03	QV	.	.	.	.
4.083	0.0061	0.03	QV	.	.	.	.
4.167	0.0063	0.03	QV	.	.	.	.
4.250	0.0065	0.03	QV	.	.	.	.
4.333	0.0067	0.03	Q V	.	.	.	.
4.417	0.0069	0.03	Q V	.	.	.	.
4.500	0.0071	0.03	Q V	.	.	.	.
4.583	0.0073	0.03	Q V	.	.	.	.
4.667	0.0076	0.03	Q V	.	.	.	.
4.750	0.0078	0.03	Q V	.	.	.	.
4.833	0.0080	0.04	Q V	.	.	.	.
4.917	0.0083	0.04	Q V	.	.	.	.
5.000	0.0085	0.04	Q V	.	.	.	.
5.083	0.0088	0.03	Q V	.	.	.	.
5.167	0.0090	0.03	Q V	.	.	.	.
5.250	0.0092	0.03	Q V	.	.	.	.
5.333	0.0094	0.03	Q V	.	.	.	.
5.417	0.0096	0.03	Q V	.	.	.	.
5.500	0.0099	0.03	Q V	.	.	.	.
5.583	0.0101	0.04	Q V	.	.	.	.
5.667	0.0103	0.04	Q V	.	.	.	.
5.750	0.0106	0.04	Q V	.	.	.	.
5.833	0.0108	0.04	Q V	.	.	.	.
5.917	0.0111	0.04	Q V	.	.	.	.
6.000	0.0114	0.04	Q V	.	.	.	.
6.083	0.0116	0.04	Q V	.	.	.	.
6.167	0.0119	0.04	Q V	.	.	.	.
6.250	0.0122	0.04	Q V	.	.	.	.
6.333	0.0125	0.04	Q V	.	.	.	.
6.417	0.0128	0.04	Q V	.	.	.	.
6.500	0.0131	0.04	Q V	.	.	.	.
6.583	0.0134	0.04	Q V	.	.	.	.
6.667	0.0137	0.04	Q V	.	.	.	.
6.750	0.0140	0.04	Q V	.	.	.	.
6.833	0.0143	0.05	Q V	.	.	.	.
6.917	0.0146	0.05	Q V	.	.	.	.
7.000	0.0150	0.05	Q V	.	.	.	.
7.083	0.0153	0.05	Q V	.	.	.	.
7.167	0.0156	0.05	Q V	.	.	.	.
7.250	0.0159	0.05	Q V	.	.	.	.
7.333	0.0163	0.05	Q V	.	.	.	.
7.417	0.0166	0.05	Q V	.	.	.	.
7.500	0.0170	0.05	Q V	.	.	.	.
7.583	0.0173	0.05	Q V	.	.	.	.
7.667	0.0177	0.05	Q V	.	.	.	.
7.750	0.0181	0.05	Q V	.	.	.	.
7.833	0.0185	0.06	Q V	.	.	.	.
7.917	0.0189	0.06	Q V	.	.	.	.
8.000	0.0193	0.06	Q V	.	.	.	.
8.083	0.0198	0.07	Q V	.	.	.	.

8.167	0.0202	0.07	Q	V . . . .
8.250	0.0207	0.07	Q	V . . . .
8.333	0.0212	0.08	Q	V . . . .
8.417	0.0217	0.08	Q	V . . . .
8.500	0.0223	0.08	Q	V . . . .
8.583	0.0228	0.08	Q	V . . . .
8.667	0.0234	0.08	Q	V . . . .
8.750	0.0240	0.08	Q	V . . . .
8.833	0.0246	0.09	Q	V . . . .
8.917	0.0252	0.09	Q	V . . . .
9.000	0.0259	0.09	Q	V . . . .
9.083	0.0266	0.11	Q	V . . . .
9.167	0.0273	0.11	Q	V . . . .
9.250	0.0281	0.11	Q	V . . . .
9.333	0.0289	0.12	Q	V . . . .
9.417	0.0297	0.12	Q	V. . . .
9.500	0.0305	0.12	Q	V. . . .
9.583	0.0315	0.13	Q	V. . . .
9.667	0.0324	0.13	Q	V. . . .
9.750	0.0333	0.13	Q	V . . .
9.833	0.0342	0.14	Q	V . . .
9.917	0.0352	0.14	Q	V . . .
10.000	0.0362	0.14	Q	V . . .
10.083	0.0370	0.11	Q	.V . . .
10.167	0.0378	0.11	Q	.V . . .
10.250	0.0385	0.11	Q	.V . . .
10.333	0.0391	0.09	Q	. V . . .
10.417	0.0398	0.09	Q	. V . . .
10.500	0.0404	0.09	Q	. V . . .
10.583	0.0411	0.11	Q	. V . . .
10.667	0.0419	0.11	Q	. V . . .
10.750	0.0426	0.11	Q	. V . . .
10.833	0.0435	0.13	Q	. V . . .
10.917	0.0444	0.13	Q	. V . . .
11.000	0.0452	0.13	Q	. V . . .
11.083	0.0461	0.13	Q	. V . . .
11.167	0.0470	0.13	Q	. V . . .
11.250	0.0479	0.13	Q	. V . . .
11.333	0.0487	0.12	Q	. V . . .
11.417	0.0496	0.12	Q	. V . . .
11.500	0.0504	0.12	Q	. V . . .

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
11.583	0.0512	0.11	Q	. V .	.	.	
11.667	0.0520	0.11	Q	. V .	.	.	
11.750	0.0528	0.11	Q	. V .	.	.	
11.833	0.0536	0.11	Q	. V .	.	.	
11.917	0.0543	0.11	Q	. V .	.	.	

12.000	0.0551	0.11	Q	.	V	.	.	.	
12.083	0.0561	0.15	Q	.	V	.	.	.	
12.167	0.0572	0.15	Q	.	V	.	.	.	
12.250	0.0582	0.15	Q	.	V	.	.	.	
12.333	0.0594	0.18	Q	.	V	.	.	.	
12.417	0.0607	0.18	Q	.	V	.	.	.	
12.500	0.0619	0.18	Q	.	V	.	.	.	
12.583	0.0633	0.20	Q	.	V	.	.	.	
12.667	0.0647	0.20	Q	.	V	.	.	.	
12.750	0.0661	0.20	Q	.	V	.	.	.	
12.833	0.0675	0.21	Q	.	V	.	.	.	
12.917	0.0690	0.21	Q	.	V	.	.	.	
13.000	0.0705	0.21	Q	.	V	.	.	.	
13.083	0.0722	0.25	Q	.	V	.	.	.	
13.167	0.0739	0.25	Q	.	V	.	.	.	
13.250	0.0756	0.25	Q	.	V	.	.	.	
13.333	0.0774	0.27	.Q	.	V	.	.	.	
13.417	0.0792	0.27	.Q	.	V	.	.	.	
13.500	0.0811	0.27	.Q	.	V	.	.	.	
13.583	0.0826	0.22	Q	.	V	.	.	.	
13.667	0.0841	0.22	Q	.	V	.	.	.	
13.750	0.0855	0.22	Q	.	V	.	.	.	
13.833	0.0868	0.18	Q	.	V	.	.	.	
13.917	0.0880	0.18	Q	.	V	.	.	.	
14.000	0.0892	0.18	Q	.	V	.	.	.	
14.083	0.0905	0.19	Q	.	V	.	.	.	
14.167	0.0918	0.19	Q	.	V	.	.	.	
14.250	0.0931	0.19	Q	.	V	.	.	.	
14.333	0.0945	0.20	Q	.	V	.	.	.	
14.417	0.0959	0.20	Q	.	V	.	.	.	
14.500	0.0972	0.20	Q	.	V	.	.	.	
14.583	0.0986	0.20	Q	.	V	.	.	.	
14.667	0.0999	0.20	Q	.	V	.	.	.	
14.750	0.1013	0.20	Q	.	V	.	.	.	
14.833	0.1026	0.19	Q	.	V	.	.	.	
14.917	0.1040	0.19	Q	.	V	.	.	.	
15.000	0.1053	0.19	Q	.	V	.	.	.	
15.083	0.1066	0.19	Q	.	V	.	.	.	
15.167	0.1079	0.19	Q	.	V	.	.	.	
15.250	0.1091	0.19	Q	.	V	.	.	.	
15.333	0.1104	0.18	Q	.	V	.	.	.	
15.417	0.1116	0.18	Q	.	V	.	.	.	
15.500	0.1128	0.18	Q	.	V	.	.	.	
15.583	0.1138	0.15	Q	.	V	.	.	.	
15.667	0.1149	0.15	Q	.	V	.	.	.	
15.750	0.1160	0.15	Q	.	V	.	.	.	
15.833	0.1169	0.14	Q	.	V	.	.	.	
15.917	0.1179	0.14	Q	.	V	.	.	.	
16.000	0.1188	0.14	Q	.	V	.	.	.	
16.083	0.1193	0.08	Q	.	V	.	.	.	

16.167	0.1199	0.08	Q	.	.	.	V .
16.250	0.1204	0.08	Q	.	.	.	V .
16.333	0.1206	0.03	Q	.	.	.	V .
16.417	0.1208	0.03	Q	.	.	.	V .
16.500	0.1210	0.03	Q	.	.	.	V .
16.583	0.1211	0.02	Q	.	.	.	V .
16.667	0.1213	0.02	Q	.	.	.	V .
16.750	0.1214	0.02	Q	.	.	.	V .
16.833	0.1215	0.02	Q	.	.	.	V .
16.917	0.1216	0.02	Q	.	.	.	V .
17.000	0.1217	0.02	Q	.	.	.	V .
17.083	0.1218	0.02	Q	.	.	.	V .
17.167	0.1220	0.02	Q	.	.	.	V .
17.250	0.1221	0.02	Q	.	.	.	V .
17.333	0.1223	0.02	Q	.	.	.	V .
17.417	0.1224	0.02	Q	.	.	.	V .
17.500	0.1226	0.02	Q	.	.	.	V .
17.583	0.1227	0.02	Q	.	.	.	V .
17.667	0.1229	0.02	Q	.	.	.	V .
17.750	0.1231	0.02	Q	.	.	.	V .
17.833	0.1232	0.02	Q	.	.	.	V .
17.917	0.1234	0.02	Q	.	.	.	V .
18.000	0.1235	0.02	Q	.	.	.	V .
18.083	0.1236	0.02	Q	.	.	.	V .
18.167	0.1238	0.02	Q	.	.	.	V .
18.250	0.1239	0.02	Q	.	.	.	V .
18.333	0.1240	0.02	Q	.	.	.	V .
18.417	0.1242	0.02	Q	.	.	.	V .
18.500	0.1243	0.02	Q	.	.	.	V .
18.583	0.1244	0.02	Q	.	.	.	V .
18.667	0.1245	0.02	Q	.	.	.	V .
18.750	0.1246	0.02	Q	.	.	.	V .
18.833	0.1247	0.01	Q	.	.	.	V .
18.917	0.1248	0.01	Q	.	.	.	V .
19.000	0.1249	0.01	Q	.	.	.	V .
19.083	0.1250	0.01	Q	.	.	.	V .
19.167	0.1251	0.01	Q	.	.	.	V .
19.250	0.1252	0.01	Q	.	.	.	V .
19.333	0.1253	0.02	Q	.	.	.	V .
19.417	0.1254	0.02	Q	.	.	.	V .
19.500	0.1255	0.02	Q	.	.	.	V .
19.583	0.1256	0.02	Q	.	.	.	V .
19.667	0.1257	0.02	Q	.	.	.	V .
19.750	0.1258	0.02	Q	.	.	.	V .
19.833	0.1259	0.01	Q	.	.	.	V .
19.917	0.1260	0.01	Q	.	.	.	V .
20.000	0.1261	0.01	Q	.	.	.	V .
20.083	0.1262	0.01	Q	.	.	.	V .
20.167	0.1262	0.01	Q	.	.	.	V .
20.250	0.1263	0.01	Q	.	.	.	V .

20.333	0.1264	0.01	Q	.	.	.	V .
20.417	0.1265	0.01	Q	.	.	.	V .
20.500	0.1266	0.01	Q	.	.	.	V .
20.583	0.1267	0.01	Q	.	.	.	V.
20.667	0.1268	0.01	Q	.	.	.	V.
20.750	0.1269	0.01	Q	.	.	.	V.
20.833	0.1270	0.01	Q	.	.	.	V.
20.917	0.1271	0.01	Q	.	.	.	V.
21.000	0.1271	0.01	Q	.	.	.	V.
21.083	0.1272	0.01	Q	.	.	.	V.
21.167	0.1273	0.01	Q	.	.	.	V.
21.250	0.1274	0.01	Q	.	.	.	V.
21.333	0.1275	0.01	Q	.	.	.	V.
21.417	0.1276	0.01	Q	.	.	.	V.
21.500	0.1276	0.01	Q	.	.	.	V.
21.583	0.1277	0.01	Q	.	.	.	V.
21.667	0.1278	0.01	Q	.	.	.	V.
21.750	0.1279	0.01	Q	.	.	.	V.
21.833	0.1280	0.01	Q	.	.	.	V.
21.917	0.1281	0.01	Q	.	.	.	V.
22.000	0.1281	0.01	Q	.	.	.	V.
22.083	0.1282	0.01	Q	.	.	.	V.
22.167	0.1283	0.01	Q	.	.	.	V.
22.250	0.1284	0.01	Q	.	.	.	V.
22.333	0.1285	0.01	Q	.	.	.	V.
22.417	0.1285	0.01	Q	.	.	.	V.
22.500	0.1286	0.01	Q	.	.	.	V.
22.583	0.1287	0.01	Q	.	.	.	V.
22.667	0.1288	0.01	Q	.	.	.	V.
22.750	0.1288	0.01	Q	.	.	.	V.
22.833	0.1289	0.01	Q	.	.	.	V.
22.917	0.1290	0.01	Q	.	.	.	V.
23.000	0.1290	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1380.0
10%	750.0
20%	525.0
30%	450.0
40%	405.0
50%	255.0
60%	195.0
70%	135.0
80%	60.0

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            90%                                30.0


**************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    304.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       1.070 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
  Warning: Watershed Area is less than 10 acres
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.050
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.030
         USER-ENTERED RAINFALL =  2.06 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 250.000



==========================================================================
                     UNIT HYDROGRAPH DETERMINATION

--------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
--------------------------------------------------------------------------
        1                50.817                2.192
        2                90.903                1.729
        3                97.798                0.297
        4                99.444                0.071
        5                99.778                0.014
        6                99.944                0.007
        7               100.000                0.002


--------------------------------------------------------------------------
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TOTAL STORM RAINFALL(INCHES) = 2.06
TOTAL SOIL-LOSS(INCHES) = 0.69
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.37

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.0617
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 0.1219

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
0.083	0.0000	0.00	Q	.	.	.	.
0.167	0.0001	0.00	Q	.	.	.	.
0.250	0.0001	0.00	Q	.	.	.	.
0.333	0.0002	0.01	Q	.	.	.	.
0.417	0.0002	0.01	Q	.	.	.	.
0.500	0.0003	0.01	Q	.	.	.	.
0.583	0.0004	0.01	Q	.	.	.	.
0.667	0.0005	0.01	Q	.	.	.	.
0.750	0.0006	0.01	Q	.	.	.	.
0.833	0.0007	0.02	Q	.	.	.	.
0.917	0.0008	0.02	Q	.	.	.	.
1.000	0.0009	0.02	Q	.	.	.	.
1.083	0.0010	0.02	Q	.	.	.	.
1.167	0.0011	0.02	Q	.	.	.	.
1.250	0.0012	0.02	Q	.	.	.	.
1.333	0.0013	0.01	Q	.	.	.	.
1.417	0.0014	0.01	Q	.	.	.	.
1.500	0.0015	0.01	Q	.	.	.	.
1.583	0.0016	0.01	Q	.	.	.	.
1.667	0.0017	0.01	Q	.	.	.	.
1.750	0.0018	0.01	Q	.	.	.	.
1.833	0.0019	0.02	Q	.	.	.	.
1.917	0.0020	0.02	Q	.	.	.	.
2.000	0.0021	0.02	Q	.	.	.	.
2.083	0.0022	0.02	Q	.	.	.	.
2.167	0.0023	0.02	Q	.	.	.	.
2.250	0.0024	0.02	Q	.	.	.	.
2.333	0.0026	0.02	Q	.	.	.	.
2.417	0.0027	0.02	Q	.	.	.	.

2.500	0.0028	0.02	Q	.	.	.	.
2.583	0.0029	0.02	Q	.	.	.	.
2.667	0.0031	0.02	QV	.	.	.	.
2.750	0.0032	0.02	QV	.	.	.	.
2.833	0.0034	0.02	QV	.	.	.	.
2.917	0.0035	0.02	QV	.	.	.	.
3.000	0.0037	0.02	QV	.	.	.	.
3.083	0.0038	0.02	QV	.	.	.	.
3.167	0.0040	0.02	QV	.	.	.	.
3.250	0.0041	0.02	QV	.	.	.	.
3.333	0.0043	0.02	QV	.	.	.	.
3.417	0.0044	0.02	QV	.	.	.	.
3.500	0.0046	0.02	QV	.	.	.	.
3.583	0.0047	0.02	QV	.	.	.	.
3.667	0.0049	0.02	QV	.	.	.	.
3.750	0.0050	0.02	QV	.	.	.	.
3.833	0.0052	0.02	QV	.	.	.	.
3.917	0.0054	0.02	QV	.	.	.	.
4.000	0.0055	0.02	QV	.	.	.	.
4.083	0.0057	0.03	QV	.	.	.	.
4.167	0.0059	0.03	QV	.	.	.	.
4.250	0.0061	0.03	QV	.	.	.	.
4.333	0.0063	0.03	Q V	.	.	.	.
4.417	0.0065	0.03	Q V	.	.	.	.
4.500	0.0067	0.03	Q V	.	.	.	.
4.583	0.0069	0.03	Q V	.	.	.	.
4.667	0.0071	0.03	Q V	.	.	.	.
4.750	0.0073	0.03	Q V	.	.	.	.
4.833	0.0075	0.03	Q V	.	.	.	.
4.917	0.0078	0.03	Q V	.	.	.	.
5.000	0.0080	0.03	Q V	.	.	.	.
5.083	0.0082	0.03	Q V	.	.	.	.
5.167	0.0084	0.03	Q V	.	.	.	.
5.250	0.0086	0.03	Q V	.	.	.	.
5.333	0.0088	0.03	Q V	.	.	.	.
5.417	0.0090	0.03	Q V	.	.	.	.
5.500	0.0093	0.03	Q V	.	.	.	.
5.583	0.0095	0.03	Q V	.	.	.	.
5.667	0.0097	0.03	Q V	.	.	.	.
5.750	0.0099	0.03	Q V	.	.	.	.
5.833	0.0102	0.04	Q V	.	.	.	.
5.917	0.0104	0.04	Q V	.	.	.	.
6.000	0.0107	0.04	Q V	.	.	.	.
6.083	0.0109	0.04	Q V	.	.	.	.
6.167	0.0112	0.04	Q V	.	.	.	.
6.250	0.0114	0.04	Q V	.	.	.	.
6.333	0.0117	0.04	Q V	.	.	.	.
6.417	0.0120	0.04	Q V	.	.	.	.
6.500	0.0123	0.04	Q V	.	.	.	.
6.583	0.0125	0.04	Q V	.	.	.	.

6.667	0.0128	0.04	Q	V	.	.	.	.
6.750	0.0131	0.04	Q	V	.	.	.	.
6.833	0.0134	0.04	Q	V	.	.	.	.
6.917	0.0137	0.04	Q	V	.	.	.	.
7.000	0.0140	0.04	Q	V	.	.	.	.
7.083	0.0143	0.04	Q	V	.	.	.	.
7.167	0.0146	0.04	Q	V	.	.	.	.
7.250	0.0150	0.04	Q	V	.	.	.	.
7.333	0.0153	0.05	Q	V	.	.	.	.
7.417	0.0156	0.05	Q	V	.	.	.	.
7.500	0.0159	0.05	Q	V	.	.	.	.
7.583	0.0163	0.05	Q	V	.	.	.	.
7.667	0.0166	0.05	Q	V	.	.	.	.
7.750	0.0170	0.05	Q	V	.	.	.	.
7.833	0.0173	0.06	Q	V	.	.	.	.
7.917	0.0177	0.06	Q	V	.	.	.	.
8.000	0.0181	0.06	Q	V	.	.	.	.
8.083	0.0185	0.06	Q	V	.	.	.	.
8.167	0.0190	0.06	Q	V	.	.	.	.
8.250	0.0194	0.06	Q	V	.	.	.	.
8.333	0.0199	0.07	Q	V	.	.	.	.
8.417	0.0204	0.07	Q	V	.	.	.	.
8.500	0.0209	0.07	Q	V	.	.	.	.
8.583	0.0214	0.08	Q	V	.	.	.	.
8.667	0.0220	0.08	Q	V	.	.	.	.
8.750	0.0225	0.08	Q	V	.	.	.	.
8.833	0.0231	0.09	Q	V	.	.	.	.
8.917	0.0237	0.09	Q	V	.	.	.	.
9.000	0.0243	0.09	Q	V	.	.	.	.
9.083	0.0250	0.10	Q	V	.	.	.	.
9.167	0.0256	0.10	Q	V	.	.	.	.
9.250	0.0263	0.10	Q	V	.	.	.	.
9.333	0.0271	0.11	Q	V	.	.	.	.
9.417	0.0279	0.11	Q	V	.	.	.	.
9.500	0.0287	0.11	Q	V	.	.	.	.
9.583	0.0295	0.12	Q	V	.	.	.	.
9.667	0.0304	0.12	Q	V	.	.	.	.
9.750	0.0312	0.12	Q	V	.	.	.	.
9.833	0.0321	0.13	Q	V	.	.	.	.
9.917	0.0331	0.13	Q	V	.	.	.	.
10.000	0.0340	0.13	Q	V	.	.	.	.
10.083	0.0347	0.11	Q	V	.	.	.	.
10.167	0.0354	0.11	Q	V	.	.	.	.
10.250	0.0362	0.11	Q	V	.	.	.	.
10.333	0.0367	0.08	Q	V	.	.	.	.
10.417	0.0373	0.08	Q	V	.	.	.	.
10.500	0.0379	0.08	Q	V	.	.	.	.
10.583	0.0386	0.10	Q	V	.	.	.	.
10.667	0.0393	0.10	Q	V	.	.	.	.
10.750	0.0400	0.10	Q	V	.	.	.	.

10.833	0.0408	0.12	Q	. V . . .
10.917	0.0416	0.12	Q	. V . . .
11.000	0.0425	0.12	Q	. V . . .
11.083	0.0433	0.12	Q	. V . . .
11.167	0.0441	0.12	Q	. V . . .
11.250	0.0449	0.12	Q	. V . . .
11.333	0.0457	0.12	Q	. V . . .
11.417	0.0465	0.12	Q	. V . . .
11.500	0.0473	0.12	Q	. V . . .

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2.5	5.0	7.5	10.0
11.583	0.0481	0.11	Q	. V .	.	.	
11.667	0.0488	0.11	Q	. V .	.	.	
11.750	0.0495	0.11	Q	. V .	.	.	
11.833	0.0503	0.11	Q	. V .	.	.	
11.917	0.0510	0.11	Q	. V .	.	.	
12.000	0.0517	0.11	Q	. V .	.	.	
12.083	0.0527	0.14	Q	. V .	.	.	
12.167	0.0536	0.14	Q	. V .	.	.	
12.250	0.0546	0.14	Q	. V .	.	.	
12.333	0.0558	0.17	Q	. V .	.	.	
12.417	0.0570	0.17	Q	. V .	.	.	
12.500	0.0581	0.17	Q	. V.	.	.	
12.583	0.0594	0.19	Q	. V.	.	.	
12.667	0.0607	0.19	Q	. V.	.	.	
12.750	0.0620	0.19	Q	. V	.	.	
12.833	0.0634	0.20	Q	. V	.	.	
12.917	0.0648	0.20	Q	. V	.	.	
13.000	0.0662	0.20	Q	. V	.	.	
13.083	0.0678	0.23	Q	. V	.	.	
13.167	0.0693	0.23	Q	. V	.	.	
13.250	0.0709	0.23	Q	. V	.	.	
13.333	0.0726	0.25	Q	. V	.	.	
13.417	0.0744	0.25	Q	. V	.	.	
13.500	0.0761	0.25	Q	. V	.	.	
13.583	0.0775	0.20	Q	. V	.	.	
13.667	0.0789	0.20	Q	. V	.	.	
13.750	0.0803	0.20	Q	. V	.	.	
13.833	0.0814	0.17	Q	. V	.	.	
13.917	0.0826	0.17	Q	. V	.	.	
14.000	0.0837	0.17	Q	. V	.	.	
14.083	0.0849	0.18	Q	. V	.	.	
14.167	0.0862	0.18	Q	. V .	.	.	
14.250	0.0874	0.18	Q	. V .	.	.	
14.333	0.0887	0.19	Q	. V.	.	.	
14.417	0.0900	0.19	Q	. V.	.	.	
14.500	0.0913	0.19	Q	. V.	.	.	
14.583	0.0925	0.19	Q	. V	.	.	

14.667	0.0938	0.19	Q	.	.	V .
14.750	0.0951	0.19	Q	.	.	V .
14.833	0.0963	0.18	Q	.	.	.V .
14.917	0.0976	0.18	Q	.	.	. V .
15.000	0.0988	0.18	Q	.	.	. V .
15.083	0.1000	0.17	Q	.	.	. V .
15.167	0.1012	0.17	Q	.	.	. V .
15.250	0.1024	0.17	Q	.	.	. V .
15.333	0.1036	0.17	Q	.	.	. V .
15.417	0.1047	0.17	Q	.	.	. V .
15.500	0.1059	0.17	Q	.	.	. V .
15.583	0.1069	0.14	Q	.	.	. V .
15.667	0.1078	0.14	Q	.	.	. V .
15.750	0.1088	0.14	Q	.	.	. V .
15.833	0.1097	0.13	Q	.	.	. V .
15.917	0.1106	0.13	Q	.	.	. V .
16.000	0.1115	0.13	Q	.	.	. V .
16.083	0.1120	0.07	Q	.	.	. V .
16.167	0.1125	0.07	Q	.	.	. V .
16.250	0.1130	0.07	Q	.	.	. V .
16.333	0.1132	0.03	Q	.	.	. V .
16.417	0.1134	0.03	Q	.	.	. V .
16.500	0.1136	0.03	Q	.	.	. V .
16.583	0.1137	0.02	Q	.	.	. V .
16.667	0.1138	0.02	Q	.	.	. V .
16.750	0.1139	0.02	Q	.	.	. V .
16.833	0.1140	0.01	Q	.	.	. V .
16.917	0.1141	0.01	Q	.	.	. V .
17.000	0.1142	0.01	Q	.	.	. V .
17.083	0.1144	0.02	Q	.	.	. V .
17.167	0.1145	0.02	Q	.	.	. V .
17.250	0.1146	0.02	Q	.	.	. V .
17.333	0.1148	0.02	Q	.	.	. V .
17.417	0.1149	0.02	Q	.	.	. V .
17.500	0.1151	0.02	Q	.	.	. V .
17.583	0.1152	0.02	Q	.	.	. V .
17.667	0.1154	0.02	Q	.	.	. V .
17.750	0.1155	0.02	Q	.	.	. V .
17.833	0.1157	0.02	Q	.	.	. V .
17.917	0.1158	0.02	Q	.	.	. V .
18.000	0.1159	0.02	Q	.	.	. V .
18.083	0.1160	0.02	Q	.	.	. V .
18.167	0.1162	0.02	Q	.	.	. V .
18.250	0.1163	0.02	Q	.	.	. V .
18.333	0.1164	0.02	Q	.	.	. V .
18.417	0.1165	0.02	Q	.	.	. V .
18.500	0.1167	0.02	Q	.	.	. V .
18.583	0.1168	0.02	Q	.	.	. V .
18.667	0.1169	0.02	Q	.	.	. V .
18.750	0.1170	0.02	Q	.	.	. V .

18.833	0.1171	0.01	Q	.	.	.	V .
18.917	0.1171	0.01	Q	.	.	.	V .
19.000	0.1172	0.01	Q	.	.	.	V .
19.083	0.1173	0.01	Q	.	.	.	V .
19.167	0.1174	0.01	Q	.	.	.	V .
19.250	0.1175	0.01	Q	.	.	.	V .
19.333	0.1176	0.02	Q	.	.	.	V .
19.417	0.1177	0.02	Q	.	.	.	V .
19.500	0.1178	0.02	Q	.	.	.	V .
19.583	0.1179	0.02	Q	.	.	.	V .
19.667	0.1180	0.02	Q	.	.	.	V .
19.750	0.1181	0.02	Q	.	.	.	V .
19.833	0.1182	0.01	Q	.	.	.	V .
19.917	0.1183	0.01	Q	.	.	.	V .
20.000	0.1183	0.01	Q	.	.	.	V .
20.083	0.1184	0.01	Q	.	.	.	V .
20.167	0.1185	0.01	Q	.	.	.	V .
20.250	0.1186	0.01	Q	.	.	.	V .
20.333	0.1187	0.01	Q	.	.	.	V .
20.417	0.1187	0.01	Q	.	.	.	V .
20.500	0.1188	0.01	Q	.	.	.	V .
20.583	0.1189	0.01	Q	.	.	.	V.
20.667	0.1190	0.01	Q	.	.	.	V.
20.750	0.1191	0.01	Q	.	.	.	V.
20.833	0.1192	0.01	Q	.	.	.	V.
20.917	0.1193	0.01	Q	.	.	.	V.
21.000	0.1193	0.01	Q	.	.	.	V.
21.083	0.1194	0.01	Q	.	.	.	V.
21.167	0.1195	0.01	Q	.	.	.	V.
21.250	0.1196	0.01	Q	.	.	.	V.
21.333	0.1197	0.01	Q	.	.	.	V.
21.417	0.1197	0.01	Q	.	.	.	V.
21.500	0.1198	0.01	Q	.	.	.	V.
21.583	0.1199	0.01	Q	.	.	.	V.
21.667	0.1200	0.01	Q	.	.	.	V.
21.750	0.1200	0.01	Q	.	.	.	V.
21.833	0.1201	0.01	Q	.	.	.	V.
21.917	0.1202	0.01	Q	.	.	.	V.
22.000	0.1203	0.01	Q	.	.	.	V.
22.083	0.1203	0.01	Q	.	.	.	V.
22.167	0.1204	0.01	Q	.	.	.	V.
22.250	0.1205	0.01	Q	.	.	.	V.
22.333	0.1206	0.01	Q	.	.	.	V.
22.417	0.1206	0.01	Q	.	.	.	V.
22.500	0.1207	0.01	Q	.	.	.	V.
22.583	0.1208	0.01	Q	.	.	.	V.
22.667	0.1208	0.01	Q	.	.	.	V.
22.750	0.1209	0.01	Q	.	.	.	V.
22.833	0.1210	0.01	Q	.	.	.	V.
22.917	0.1210	0.01	Q	.	.	.	V.

```
   23.000      0.1211      0.01  Q         .         .         .        V.
--------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1380.0
              10%                            750.0
              20%                            525.0
              30%                            450.0
              40%                            405.0
              50%                            255.0
              60%                            195.0
              70%                            135.0
              80%                             60.0
              90%                             30.0
 ================================================================================

   END OF FLOODSCx ROUTING ANALYSIS
```

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

             F L O O D    R O U T I N G    A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 18.0)
                 Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* DOUBLE BUTTE                                                          *
* EXISTING CONDITION                                                    *
* 100-YEAR 1-HOUR HYDROGRAPH                                            *
 ************************************************************************

  FILE NAME: DB100UH.DAT
  TIME/DATE OF STUDY: 21:52 07/09/2024


**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    102.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      23.600 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.590 HOURS
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.050
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.600
         USER-ENTERED RAINFALL =  1.59 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.50)
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  14.124
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.182	3.375
2	4.107	8.346
3	8.638	12.933
4	15.006	18.174
5	23.742	24.934
6	33.759	28.592
7	44.149	29.654
8	53.365	26.305
9	59.938	18.759
10	64.762	13.770
11	68.755	11.394
12	71.796	8.679
13	74.488	7.684
14	76.666	6.216
15	78.639	5.630
16	80.382	4.976
17	81.940	4.448
18	83.274	3.806
19	84.591	3.758
20	85.721	3.226
21	86.753	2.946
22	87.698	2.696
23	88.518	2.339
24	89.348	2.371
25	90.135	2.245
26	90.799	1.895
27	91.456	1.875
28	92.082	1.789
29	92.613	1.514
30	93.136	1.493
31	93.659	1.493
32	94.143	1.383
33	94.560	1.189
34	94.975	1.186
35	95.391	1.186
36	95.806	1.186
37	96.146	0.971
38	96.420	0.782
39	96.695	0.782
40	96.969	0.783

41	97.243	0.783
42	97.517	0.782
43	97.792	0.784
44	98.019	0.647
45	98.125	0.305
46	98.227	0.290
47	98.328	0.288
48	98.430	0.290
49	98.531	0.290
50	98.632	0.289
51	98.734	0.290
52	98.835	0.289
53	98.937	0.290
54	99.038	0.289
55	99.139	0.289
56	99.240	0.289
57	99.342	0.289
58	99.443	0.289
59	99.544	0.289
60	99.645	0.289
61	99.746	0.289
62	99.848	0.289
63	99.949	0.289
64	100.000	0.146

TOTAL STORM RAINFALL(INCHES) = 1.59
TOTAL SOIL-LOSS(INCHES) = 0.05
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.54

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.0983
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3.0271

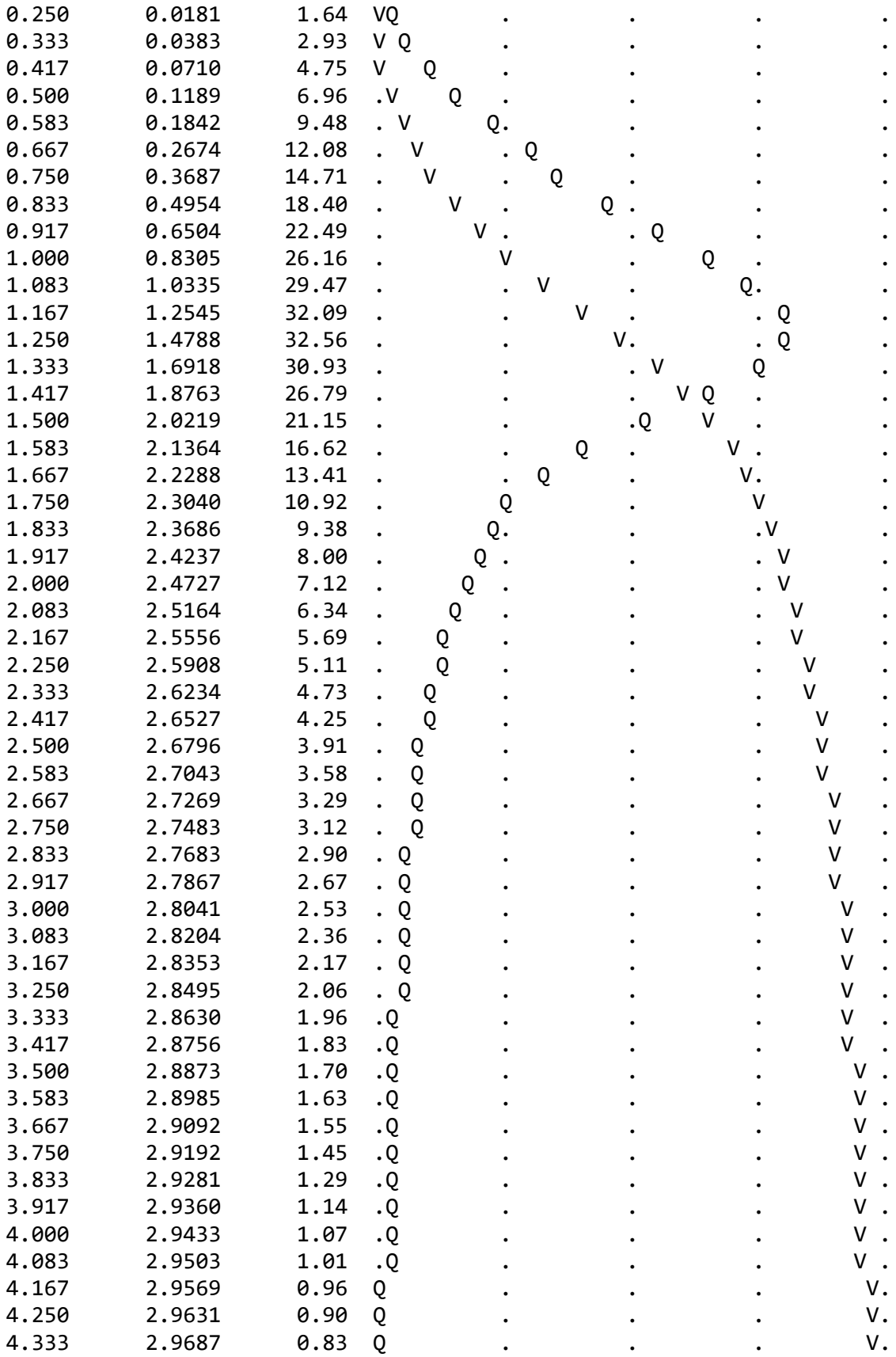
==========

1 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	10.0	20.0	30.0	40.0
0.083	0.0015	0.22	Q	.	.	.	.
0.167	0.0068	0.77	Q	.	.	.	.



4.417	2.9735	0.69	Q	.	.	.	V.
4.500	2.9772	0.53	Q	.	.	.	V.
4.583	2.9804	0.47	Q	.	.	.	V.
4.667	2.9835	0.45	Q	.	.	.	V.
4.750	2.9866	0.45	Q	.	.	.	V.
4.833	2.9896	0.45	Q	.	.	.	V.
4.917	2.9927	0.45	Q	.	.	.	V.
5.000	2.9958	0.45	Q	.	.	.	V.
5.083	2.9988	0.45	Q	.	.	.	V.
5.167	3.0019	0.45	Q	.	.	.	V.
5.250	3.0050	0.44	Q	.	.	.	V.
5.333	3.0080	0.44	Q	.	.	.	V.
5.417	3.0108	0.42	Q	.	.	.	V.
5.500	3.0136	0.40	Q	.	.	.	V.
5.583	3.0161	0.37	Q	.	.	.	V.
5.667	3.0185	0.35	Q	.	.	.	V.
5.750	3.0208	0.32	Q	.	.	.	V.
5.833	3.0228	0.29	Q	.	.	.	V.
5.917	3.0245	0.26	Q	.	.	.	V.
6.000	3.0260	0.21	Q	.	.	.	V.
6.083	3.0268	0.12	Q	.	.	.	V.
6.167	3.0270	0.04	Q	.	.	.	V.
6.250	3.0271	0.01	Q	.	.	.	V

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	375.0
10%	140.0
20%	95.0
30%	70.0
40%	60.0
50%	50.0
60%	40.0
70%	30.0
80%	30.0
90%	20.0

==========

END OF FLOODSCx ROUTING ANALYSIS

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**************************************************************************

             F L O O D    R O U T I N G    A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2011 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 18.0)
                 Release Date: 05/01/2011  License ID 1499

                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* DOUBLE BUTTE                                                          *
* PROPOSED CONDITION                                                    *
* 100-YEAR 1-HOUR HYDROGRAPH                                            *
 ************************************************************************

  FILE NAME: DB100UH.DAT
  TIME/DATE OF STUDY: 13:52 02/07/2024



**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    102.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      23.600 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.290 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.050
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.600
         USER-ENTERED RAINFALL =  1.59 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.50)
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000
```

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 28.736

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	2.704	7.718
2	12.172	27.022
3	29.624	49.811
4	49.812	57.618
5	63.099	37.923
6	70.858	22.147
7	76.063	14.855
8	79.951	11.096
9	83.018	8.754
10	85.517	7.133
11	87.554	5.815
12	89.262	4.872
13	90.753	4.257
14	92.046	3.690
15	93.136	3.110
16	94.148	2.890
17	95.004	2.443
18	95.834	2.370
19	96.459	1.781
20	97.017	1.593
21	97.574	1.592
22	98.037	1.320
23	98.255	0.622
24	98.462	0.589
25	98.668	0.588
26	98.874	0.589
27	99.080	0.589
28	99.286	0.589
29	99.493	0.589
30	99.699	0.589
31	99.905	0.589
32	100.000	0.271

TOTAL STORM RAINFALL(INCHES) = 1.59
TOTAL SOIL-LOSS(INCHES) = 0.05
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.54

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.0983
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3.0271

==========

1 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 12.5 25.0 37.5 50.0
0.083	0.0034	0.50	Q . . . .
0.167	0.0190	2.26	VQ . . . .
0.250	0.0575	5.60	V Q . . . .
0.333	0.1242	9.69	.V Q . . . .
0.417	0.2127	12.85	. V Q . . .
0.500	0.3183	15.34	. V . Q . . .
0.583	0.4407	17.77	. V . Q . . .
0.667	0.5818	20.49	. V . Q . . .
0.750	0.7479	24.11	. V. Q. . .
0.833	0.9603	30.84	. . V . Q . .
0.917	1.2398	40.59	. . V . . Q .
1.000	1.5764	48.88	. . V . Q.
1.083	1.9096	48.37	. . . V . Q .
1.167	2.1644	37.00	. . . VQ. .
1.250	2.3420	25.79	. . Q V .
1.333	2.4650	17.86	. . Q . . V .
1.417	2.5557	13.17	. Q . . V .
1.500	2.6273	10.40	. Q . . . V .
1.583	2.6859	8.50	. Q . . . V .
1.667	2.7346	7.08	. Q . . . V .
1.750	2.7760	6.01	. Q . . . V .
1.833	2.8119	5.20	. Q . . . V .
1.917	2.8427	4.48	. Q . . . V .
2.000	2.8694	3.87	. Q . . . V .
2.083	2.8928	3.41	. Q . . . V .
2.167	2.9132	2.95	. Q . . . V .
2.250	2.9312	2.62	. Q . . . V .
2.333	2.9462	2.18	.Q . . . V .
2.417	2.9593	1.91	.Q . . . V.
2.500	2.9710	1.69	.Q . . . V.

```
   2.583      2.9807      1.42  .Q        .         .         .         V.
   2.667      2.9880      1.05  Q         .         .         .         V.
   2.750      2.9942      0.90  Q         .         .         .         V.
   2.833      2.9998      0.81  Q         .         .         .         V.
   2.917      3.0050      0.76  Q         .         .         .         V.
   3.000      3.0099      0.71  Q         .         .         .         V.
   3.083      3.0144      0.66  Q         .         .         .         V.
   3.167      3.0185      0.59  Q         .         .         .         V.
   3.250      3.0220      0.52  Q         .         .         .         V.
   3.333      3.0249      0.42  Q         .         .         .         V.
   3.417      3.0265      0.22  Q         .         .         .         V.
   3.500      3.0270      0.07  Q         .         .         .         V.
   3.583      3.0271      0.02  Q         .         .         .         V.
--------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                Duration
       Peak Flow Rate                     (minutes)
   ======================                 =========
              0%                            215.0
             10%                            100.0
             20%                             70.0
             30%                             55.0
             40%                             40.0
             50%                             30.0
             60%                             25.0
             70%                             20.0
             80%                             15.0
             90%                             10.0



 ********************************************************************************
   FLOW PROCESS FROM NODE    200.00 TO NODE    206.00 IS CODE =   1
 --------------------------------------------------------------------------------
   >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
 ================================================================================

       (UNIT-HYDROGRAPH ADDED TO STREAM #1)

          WATERSHED AREA =       1.140 ACRES
          BASEFLOW =   0.000 CFS/SQUARE-MILE
   Warning: Watershed Area is less than 10 acres
          *USER ENTERED "LAG" TIME =    0.100 HOURS
           CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
           THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
           MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
          VALLEY S-GRAPH SELECTED
```

UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.050
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
USER-ENTERED RAINFALL = 1.59 INCHES
RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
(SLOPE OF INTENSITY-DURATION CURVE = 0.50)
*USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 83.333

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	13.994	1.929
2	59.664	6.297
3	78.792	2.637
4	86.766	1.099
5	91.428	0.643
6	94.514	0.426
7	96.650	0.294
8	98.044	0.192
9	98.699	0.090
10	99.289	0.081
11	99.716	0.059
12	99.929	0.029
13	100.000	0.010

TOTAL STORM RAINFALL(INCHES) = 1.59
TOTAL SOIL-LOSS(INCHES) = 0.05
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.54

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.0047
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 0.1462

1 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)

(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 2.5 5.0 7.5 10.0
0.083	0.0009	0.12	Q . . . .
0.167	0.0045	0.54	.VQ . . . .
0.250	0.0096	0.74	. Q . . . .
0.333	0.0156	0.87	. QV . . . .
0.417	0.0224	0.99	. Q V . . . .
0.500	0.0299	1.10	. Q V . . . .
0.583	0.0386	1.26	. Q V . . .
0.667	0.0487	1.46	. Q . V . . .
0.750	0.0608	1.76	. Q . V . . .
0.833	0.0797	2.74	. Q .V . . .
0.917	0.1060	3.82	. . Q . V. . .
1.000	0.1225	2.40	. Q. . . V .
1.083	0.1327	1.48	. Q . . . V .
1.167	0.1380	0.76	. Q . . . V .
1.250	0.1410	0.45	.Q . . . V .
1.333	0.1430	0.29	.Q . . . V.
1.417	0.1443	0.19	Q . . . V.
1.500	0.1451	0.11	Q . . . V.
1.583	0.1456	0.08	Q . . . V.
1.667	0.1459	0.05	Q . . . V.
1.750	0.1461	0.03	Q . . . V.
1.833	0.1462	0.01	Q . . . V.
1.917	0.1462	0.00	Q . . . V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	115.0
10%	70.0
20%	50.0
30%	35.0
40%	20.0
50%	15.0
60%	15.0
70%	10.0
80%	5.0
90%	5.0

```
****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    304.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       1.070 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
  Warning: Watershed Area is less than 10 acres
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.050
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  1.59 INCHES
         RCFC&WCD 1-Hour Storm (5-Minute period) SELECTED
         (SLOPE OF INTENSITY-DURATION CURVE = 0.50)
         *USER SPECIFIED PRECIPITATION DEPTH-AREA ADJUSTMENT FACTOR = 1.0000


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333



============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1               13.994                1.811
        2               59.664                5.910
        3               78.792                2.475
        4               86.766                1.032
        5               91.428                0.603
        6               94.514                0.399
        7               96.650                0.276
        8               98.044                0.180
        9               98.699                0.085
       10               99.289                0.076
       11               99.716                0.055
       12               99.929                0.028
       13              100.000                0.009
```

TOTAL STORM RAINFALL(INCHES) = 1.59
TOTAL SOIL-LOSS(INCHES) = 0.05
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.54

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.0045
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 0.1372

==========

1 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 2.5 5.0 7.5 10.0
0.083	0.0008	0.12	Q
0.167	0.0043	0.50	.VQ
0.250	0.0090	0.69	. Q
0.333	0.0146	0.81	. QV
0.417	0.0210	0.92	. Q V
0.500	0.0281	1.03	. Q V
0.583	0.0363	1.18	. Q V
0.667	0.0457	1.37	. Q . V
0.750	0.0571	1.65	. Q . V
0.833	0.0748	2.57	. Q .V
0.917	0.0995	3.59	. . Q . V.
1.000	0.1150	2.25	. Q. . . V
1.083	0.1246	1.39	. Q . . . V
1.167	0.1295	0.71	. Q . . . V
1.250	0.1324	0.42	.Q . . . V .
1.333	0.1343	0.27	.Q . . . V.
1.417	0.1355	0.17	Q . . . V.
1.500	0.1362	0.10	Q . . . V.
1.583	0.1367	0.07	Q . . . V.
1.667	0.1370	0.05	Q . . . V.
1.750	0.1371	0.03	Q . . . V.
1.833	0.1372	0.01	Q . . . V.
1.917	0.1372	0.00	Q . . . V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have

an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	115.0
10%	70.0
20%	50.0
30%	35.0
40%	20.0
50%	15.0
60%	15.0
70%	10.0
80%	5.0
90%	5.0

END OF FLOODSCx ROUTING ANALYSIS

```
******************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                    (Rational Tabling Version 18.0)
                Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* DOUBLE BUTTE                                                          *
* EXISTING CONDITION                                                    *
* 2-YEAR                                                                *
 ************************************************************************

  FILE NAME: DB2EX.DAT
  TIME/DATE OF STUDY: 00:07 07/10/2024
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.870
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.900
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.310
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.590
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4081456
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4092145
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) =   0.418
  SLOPE OF INTENSITY DURATION CURVE = 0.4081
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
```

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

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH GOOD COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1454.60
  DOWNSTREAM ELEVATION(FEET) =   1450.80
  ELEVATION DIFFERENCE(FEET) =      3.80
  TC = 0.937*[(  300.00**3)/(     3.80)]**.2 =   21.991
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.629
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4611
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      1.97   TOTAL RUNOFF(CFS) =      0.57

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.80  DOWNSTREAM(FEET) =   1445.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   850.00   CHANNEL SLOPE =  0.0061
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.57
  FLOW VELOCITY(FEET/SEC) =   1.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  12.07   Tc(MIN.) =   34.07
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.526
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4209
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =   21.65   SUBAREA RUNOFF(CFS) =    4.80
  TOTAL AREA(ACRES) =       23.6   TOTAL RUNOFF(CFS) =       5.37
  TC(MIN.) =   34.07
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH GOOD COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1451.50
  DOWNSTREAM ELEVATION(FEET) =   1449.50
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.937*[(  300.00**3)/(     2.00)]**.2 =   25.003
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.597
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4493
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.23
  TOTAL AREA(ACRES) =      0.85   TOTAL RUNOFF(CFS) =      0.23

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1449.50  DOWNSTREAM(FEET) =   1444.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.00   CHANNEL SLOPE =  0.0056
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.23
  FLOW VELOCITY(FEET/SEC) =   1.12 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  14.13   Tc(MIN.) =   39.13
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =    1250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.497
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4082
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    8.76   SUBAREA RUNOFF(CFS) =    1.78
  TOTAL AREA(ACRES) =        9.6   TOTAL RUNOFF(CFS) =       2.01
  TC(MIN.) =   39.13

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1456.50
  DOWNSTREAM ELEVATION(FEET) =   1454.50
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.303*[(  300.00**3)/(     2.00)]**.2 =    8.084
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.947
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8651
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.66   TOTAL RUNOFF(CFS) =      0.54

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1454.50  DOWNSTREAM(FEET) =   1451.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   285.00   CHANNEL SLOPE =  0.0105
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.54
  FLOW VELOCITY(FEET/SEC) =   1.54 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.09   Tc(MIN.) =   11.17
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.830
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .5226
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    7.84   SUBAREA RUNOFF(CFS) =    3.40
  TOTAL AREA(ACRES) =        8.5   TOTAL RUNOFF(CFS) =       3.94
  TC(MIN.) =   11.17
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.5  TC(MIN.) =     11.17
  PEAK FLOW RATE(CFS)   =       3.94
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                    (Rational Tabling Version 18.0)
                Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* DOUBLE BUTTE                                                          *
* PROPOSED CONDITION                                                    *
* 2-YEAR                                                                *
 ************************************************************************

  FILE NAME: DB2PR.DAT
  TIME/DATE OF STUDY: 15:49 07/15/2024
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.870
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.900
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.310
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.590
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4081456
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4092145
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) =   0.418
  SLOPE OF INTENSITY DURATION CURVE = 0.4081
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
```

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

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1452.00
  DOWNSTREAM ELEVATION(FEET) =   1451.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  TC = 0.303*[(  300.00**3)/(     1.00)]**.2 =    9.287
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.895
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8639
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1451.00  DOWNSTREAM ELEVATION(FEET) = 1446.40
  STREET LENGTH(FEET) =   850.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.22
    HALFSTREET FLOOD WIDTH(FEET) =    3.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.37
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.31
```

```
  STREET FLOW TRAVEL TIME(MIN.) =  10.31   Tc(MIN.) =   19.60
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.659
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8572
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    0.72      SUBAREA RUNOFF(CFS) =    0.41
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       0.61

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   5.34
  FLOW VELOCITY(FEET/SEC.) =  1.35   DEPTH*VELOCITY(FT*FT/SEC.) =   0.35
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   190.00
  UPSTREAM ELEVATION(FEET) =   1458.50
  DOWNSTREAM ELEVATION(FEET) =   1456.00
  ELEVATION DIFFERENCE(FEET) =      2.50
  TC = 0.303*[(  190.00**3)/(     2.50)]**.2 =    5.878
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.078
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8679
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.41   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1456.00  DOWNSTREAM(FEET) =   1447.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   845.00   CHANNEL SLOPE =  0.0107
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.38
  FLOW VELOCITY(FEET/SEC) =   1.55 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   9.10   Tc(MIN.) =   14.98
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =    1035.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
    2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.736
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8596
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =   22.55   SUBAREA RUNOFF(CFS) =   14.27
  TOTAL AREA(ACRES) =       23.0   TOTAL RUNOFF(CFS) =      14.65
  TC(MIN.) =   14.98

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  UPSTREAM ELEVATION(FEET) =   1455.10
  DOWNSTREAM ELEVATION(FEET) =   1453.00
  ELEVATION DIFFERENCE(FEET) =      2.10
  TC = 0.303*[(  200.00**3)/(     2.10)]**.2 =    6.277
    2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.050
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8673
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.46   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   235.00
  UPSTREAM ELEVATION(FEET) =   1454.00
  DOWNSTREAM ELEVATION(FEET) =   1451.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  TC = 0.303*[(  235.00**3)/(     3.00)]**.2 =    6.439
    2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.039
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8671
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   160.00
  UPSTREAM ELEVATION(FEET) =   1457.00
  DOWNSTREAM ELEVATION(FEET) =   1455.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.393*[(  160.00**3)/(     2.00)]**.2 =    7.182
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.993
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7307
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.38
  TOTAL AREA(ACRES) =      0.52   TOTAL RUNOFF(CFS) =      0.38

****************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    602.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1455.00  DOWNSTREAM(FEET) =   1454.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00   CHANNEL SLOPE =  0.0019
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.38
  FLOW VELOCITY(FEET/SEC) =   0.65 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  13.56   Tc(MIN.) =   20.74
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    602.00 =     690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    602.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.644
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6832
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    3.14   SUBAREA RUNOFF(CFS) =    1.38
  TOTAL AREA(ACRES) =        3.7   TOTAL RUNOFF(CFS) =       1.76
  TC(MIN.) =   20.74

****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =   1455.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1453.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.533*[(  250.00**3)/(     2.00)]**.2 =   12.734
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.786
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .5109
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.45   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    702.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1453.00  DOWNSTREAM(FEET) =   1451.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   405.00   CHANNEL SLOPE =  0.0049
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.18
  FLOW VELOCITY(FEET/SEC) =   1.05 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   6.40   Tc(MIN.) =   19.14
  LONGEST FLOWPATH FROM NODE    700.00 TO NODE    702.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    702.00 TO NODE    702.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.666
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4738
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    5.28   SUBAREA RUNOFF(CFS) =    1.67
  TOTAL AREA(ACRES) =        5.7   TOTAL RUNOFF(CFS) =       1.85
  TC(MIN.) =   19.14

****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =   1451.50
  DOWNSTREAM ELEVATION(FEET) =   1449.50
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.533*[(  250.00**3)/(     2.00)]**.2 =   12.734
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.786
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .5109
```

```
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.67   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
  FLOW PROCESS FROM NODE    801.00 TO NODE    802.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1449.50  DOWNSTREAM(FEET) =   1444.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.00   CHANNEL SLOPE =  0.0052
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.27
  FLOW VELOCITY(FEET/SEC) =   1.08 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  15.84   Tc(MIN.) =   28.57
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    802.00 =    1275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    802.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
     2 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.565
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4370
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    8.17   SUBAREA RUNOFF(CFS) =    2.02
  TOTAL AREA(ACRES) =        8.8   TOTAL RUNOFF(CFS) =       2.29
  TC(MIN.) =   28.57
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.8  TC(MIN.) =     28.57
  PEAK FLOW RATE(CFS)   =       2.29
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
          RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                      (RCFC&WCD)  1978 HYDROLOGY MANUAL
           (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                      (Rational Tabling Version 18.0)
                  Release Date: 07/01/2011  License ID 1499

                              Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* DOUBLE BUTTE                                                          *
* EXISTING CONDITION                                                    *
* 100-YEAR                                                              *
 ************************************************************************

  FILE NAME: DB100EX.DAT
  TIME/DATE OF STUDY: 00:09 07/10/2024
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.870
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.900
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.310
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.590
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4081456
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4092145
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.590
  SLOPE OF INTENSITY DURATION CURVE = 0.4092
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
```

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

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH GOOD COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1454.60
  DOWNSTREAM ELEVATION(FEET) =   1450.80
  ELEVATION DIFFERENCE(FEET) =      3.80
  TC = 0.937*[(  300.00**3)/(     3.80)]**.2 =   21.991
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.398
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7201
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.40
  TOTAL AREA(ACRES) =      1.97   TOTAL RUNOFF(CFS) =      3.40

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1450.80  DOWNSTREAM(FEET) =   1445.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   850.00   CHANNEL SLOPE =  0.0061
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.40
  FLOW VELOCITY(FEET/SEC) =   1.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   9.38   Tc(MIN.) =   31.37
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.073
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6982
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =   21.65   SUBAREA RUNOFF(CFS) =   31.34
  TOTAL AREA(ACRES) =      23.6   TOTAL RUNOFF(CFS) =      34.74
  TC(MIN.) =   31.37
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH GOOD COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1451.50
  DOWNSTREAM ELEVATION(FEET) =   1449.50
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.937*[(  300.00**3)/(     2.00)]**.2 =   25.003
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.275
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7124
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.38
  TOTAL AREA(ACRES) =      0.85   TOTAL RUNOFF(CFS) =      1.38

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1449.50  DOWNSTREAM(FEET) =   1444.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   950.00   CHANNEL SLOPE =  0.0056
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.38
  FLOW VELOCITY(FEET/SEC) =   1.19 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  13.29   Tc(MIN.) =   38.29
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =    1250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.911
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6852
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    8.76   SUBAREA RUNOFF(CFS) =   11.47
  TOTAL AREA(ACRES) =        9.6   TOTAL RUNOFF(CFS) =      12.85
  TC(MIN.) =   38.29

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
```

```
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1456.50
  DOWNSTREAM ELEVATION(FEET) =   1454.50
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.303*[(  300.00**3)/(     2.00)]**.2 =    8.084
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.611
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8872
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.11
  TOTAL AREA(ACRES) =      0.66   TOTAL RUNOFF(CFS) =      2.11

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1454.50  DOWNSTREAM(FEET) =   1451.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   285.00   CHANNEL SLOPE =  0.0105
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.11
  FLOW VELOCITY(FEET/SEC) =   1.79 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.66   Tc(MIN.) =   10.74
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =     585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.214
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7586
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    7.84   SUBAREA RUNOFF(CFS) =   19.12
  TOTAL AREA(ACRES) =        8.5   TOTAL RUNOFF(CFS) =      21.23
  TC(MIN.) =   10.74
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        8.5  TC(MIN.) =     10.74
  PEAK FLOW RATE(CFS)   =      21.23
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2011 Advanced Engineering Software (aes)
                    (Rational Tabling Version 18.0)
                Release Date: 07/01/2011  License ID 1499

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* DOUBLE BUTTE                                                          *
* PROPOSED CONDITION                                                    *
* 100-YEAR                                                              *
 ************************************************************************

  FILE NAME: DB100PR.DAT
  TIME/DATE OF STUDY: 12:07 07/15/2024
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   8.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.870
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.900
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.310
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.590
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4081456
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4092145
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.590
  SLOPE OF INTENSITY DURATION CURVE = 0.4092
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
```

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

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1452.00
  DOWNSTREAM ELEVATION(FEET) =   1451.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  TC = 0.303*[(  300.00**3)/(     1.00)]**.2 =    9.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.412
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8866
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.79
  TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.79

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1451.00  DOWNSTREAM ELEVATION(FEET) = 1446.40
  STREET LENGTH(FEET) =   850.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.62
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =    9.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.53
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   8.90   Tc(MIN.) =   18.19
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.591
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8831
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    0.72      SUBAREA RUNOFF(CFS) =    1.65
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       2.43

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  11.60
  FLOW VELOCITY(FEET/SEC.) =  1.74   DEPTH*VELOCITY(FT*FT/SEC.) =   0.64
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH GOOD COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1452.00
  DOWNSTREAM ELEVATION(FEET) =   1451.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  TC = 0.937*[(  300.00**3)/(     1.00)]**.2 =   28.721
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.149
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7038
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.28   TOTAL RUNOFF(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1451.00  DOWNSTREAM(FEET) =   1446.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   750.00   CHANNEL SLOPE =  0.0063
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.42
  FLOW VELOCITY(FEET/SEC) =   1.19 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  10.53   Tc(MIN.) =   39.25
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =    1050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.892
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6835
 SOIL CLASSIFICATION IS "C"
 SUBAREA AREA(ACRES) =    0.45   SUBAREA RUNOFF(CFS) =    0.58
 TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       1.01
 TC(MIN.) =   39.25

****************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   190.00
 UPSTREAM ELEVATION(FEET) =   1458.50
 DOWNSTREAM ELEVATION(FEET) =   1456.00
 ELEVATION DIFFERENCE(FEET) =      2.50
 TC = 0.303*[(  190.00**3)/(     2.50)]**.2 =    5.878
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.114
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8886
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      1.50
 TOTAL AREA(ACRES) =      0.41   TOTAL RUNOFF(CFS) =      1.50

****************************************************************************
 FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  52
----------------------------------------------------------------------------
 >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1456.00  DOWNSTREAM(FEET) =   1447.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   845.00   CHANNEL SLOPE =  0.0107
 CHANNEL FLOW THRU SUBAREA(CFS) =       1.50
 FLOW VELOCITY(FEET/SEC) =   1.67 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
 TRAVEL TIME(MIN.) =   8.41   Tc(MIN.) =   14.29
 LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =    1035.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    302.00 TO NODE    302.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.860
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8844
 SOIL CLASSIFICATION IS "C"
 SUBAREA AREA(ACRES) =   22.55   SUBAREA RUNOFF(CFS) =   57.04
 TOTAL AREA(ACRES) =       23.0   TOTAL RUNOFF(CFS) =      58.54
 TC(MIN.) =   14.29
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  UPSTREAM ELEVATION(FEET) =   1455.10
  DOWNSTREAM ELEVATION(FEET) =   1453.00
  ELEVATION DIFFERENCE(FEET) =      2.10
  TC = 0.303*[(  200.00**3)/(     2.10)]**.2 =    6.277
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.005
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8883
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.64
  TOTAL AREA(ACRES) =      0.46   TOTAL RUNOFF(CFS) =      1.64

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   235.00
  UPSTREAM ELEVATION(FEET) =   1454.00
  DOWNSTREAM ELEVATION(FEET) =   1451.00
  ELEVATION DIFFERENCE(FEET) =      3.00
  TC = 0.303*[(  235.00**3)/(     3.00)]**.2 =    6.439
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.963
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8882
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.20
  TOTAL AREA(ACRES) =      0.34   TOTAL RUNOFF(CFS) =      1.20

****************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   160.00
  UPSTREAM ELEVATION(FEET) =   1457.00
  DOWNSTREAM ELEVATION(FEET) =   1455.00
```

```
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.393*[(  160.00**3)/(     2.00)]**.2 =    7.182
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.790
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8386
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.65
  TOTAL AREA(ACRES) =      0.52   TOTAL RUNOFF(CFS) =      1.65

****************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    602.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1455.00  DOWNSTREAM(FEET) =   1454.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00   CHANNEL SLOPE =  0.0019
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.65
  FLOW VELOCITY(FEET/SEC) =   0.72 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  12.29   Tc(MIN.) =   19.47
  LONGEST FLOWPATH FROM NODE    600.00 TO NODE    602.00 =     690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    602.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.520
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8136
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    3.14   SUBAREA RUNOFF(CFS) =    6.44
  TOTAL AREA(ACRES) =       3.7   TOTAL RUNOFF(CFS) =       8.09
  TC(MIN.) =   19.47

****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =   1455.00
  DOWNSTREAM ELEVATION(FEET) =   1453.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.533*[(  250.00**3)/(     2.00)]**.2 =   12.734
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.998
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7501
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.01
```

```
  TOTAL AREA(ACRES) =      0.45   TOTAL RUNOFF(CFS) =      1.01

****************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    702.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1453.00  DOWNSTREAM(FEET) =   1451.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   405.00   CHANNEL SLOPE =  0.0049
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.01
  FLOW VELOCITY(FEET/SEC) =   1.06 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   6.39   Tc(MIN.) =   19.12
  LONGEST FLOWPATH FROM NODE    700.00 TO NODE    702.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    702.00 TO NODE    702.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.539
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7282
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    5.28   SUBAREA RUNOFF(CFS) =    9.76
  TOTAL AREA(ACRES) =        5.7   TOTAL RUNOFF(CFS) =      10.77
  TC(MIN.) =   19.12

****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =   1451.50
  DOWNSTREAM ELEVATION(FEET) =   1449.50
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.533*[(  250.00**3)/(     2.00)]**.2 =   12.734
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.998
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7501
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.51
  TOTAL AREA(ACRES) =      0.67   TOTAL RUNOFF(CFS) =      1.51

****************************************************************************
  FLOW PROCESS FROM NODE    801.00 TO NODE    802.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1449.50  DOWNSTREAM(FEET) =   1444.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1025.00   CHANNEL SLOPE =  0.0052
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.51
  FLOW VELOCITY(FEET/SEC) =   1.17 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  14.63   Tc(MIN.) =   27.36
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    802.00 =    1275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    802.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.193
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7069
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    8.17   SUBAREA RUNOFF(CFS) =   12.66
  TOTAL AREA(ACRES) =        8.8   TOTAL RUNOFF(CFS) =      14.17
  TC(MIN.) =   27.36

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH GOOD COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  UPSTREAM ELEVATION(FEET) =   1453.80
  DOWNSTREAM ELEVATION(FEET) =   1453.50
  ELEVATION DIFFERENCE(FEET) =      0.30
  TC = 0.937*[(  300.00**3)/(     0.30)]**.2 =   36.539
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.948
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6883
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    902.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1453.50  DOWNSTREAM(FEET) =   1453.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1100.00   CHANNEL SLOPE =  0.0005
  NOTE: CHANNEL FLOW OF 1. CFS WAS ASSUMED IN VELOCITY ESTIMATION
  NOTE: CHANNEL SLOPE OF .001 WAS ASSUMED IN VELOCITY ESTIMATION
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.20
  FLOW VELOCITY(FEET/SEC) =   0.47 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =  38.65   Tc(MIN.) =   75.19
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =    1400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    902.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.450
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6369
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    0.69   SUBAREA RUNOFF(CFS) =    0.64
  TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       0.84
  TC(MIN.) =   75.19
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.8  TC(MIN.) =     75.19
  PEAK FLOW RATE(CFS)   =       0.84
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

ATTACHMENT C

Detention Calculations

Catchment Detailed Report: Project Site

<General>			
ID	16	Notes	
Label	Project Site	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

Geometry

X (ft)	Y (ft)
-110.54	100.18
-147.32	95.54
-154.11	35.54
-85.18	21.96
-34.82	44.46
-34.46	74.11
-70.89	101.25

Active Topology	
Is Active?	True

Catchment	
Outflow Node	PO-1

Runoff			
Runoff Method	User Defined Hydrograph	Hydrograph	2-YR 24-HR ()

Results (Computed)			
Computational Time Increment	(N/A) min	Time to Peak (Computed)	(N/A) min
Flow (Peak, Computed)	(N/A) ft³/s		

Results (Interpolated)			
Flow (Peak Interpolated Output)	5.03 ft³/s	Time to Flow (Peak Interpolated Output)	800.000 min
Volume	2.572 ac-ft		

Results (Modified Rational Method)			
Frequency	(N/A) years	Area (Modified Rational, Composite)	(N/A) acres
C Adjustment Factor	(N/A)	C Coefficient (Modified Rational, Weighted)	(N/A)
Flow (Modified Rational, Allowable)	(N/A) ft³/s	C Coefficient (Modified Rational, Adjusted)	(N/A)

Catchment Detailed Report: Project Site

Results (Modified Rational Method)			
Storage (Modified Rational, Estimated)	(N/A) ac-ft	Second Outflow Breakpoint (Modified Rational)	(N/A) min
Time of Duration (Modified Rational, Critical)	(N/A) min	First Outflow Breakpoint (Modified Rational, Method T)	(N/A) min
Time of Concentration (Modified Rational, Composite)	(N/A) min	Intensity (Modified Rational, Critical)	(N/A) in/h
Intensity (Modified Rational, Peak)	(N/A) in/h	Flow (Modified Rational, Critical)	(N/A) ft³/s
Flow (Modified Rational, Peak)	(N/A) ft³/s		

Results (SCS Unit Hydrograph)			
Unit Hydrograph Shape Factor	(N/A)	Unit peak time, Tp	(N/A) min
K Factor	(N/A)	Unit receding limb, Tr	(N/A) min
Receding/Rising, Tr/Tp	(N/A)	Total unit time, Tb	(N/A) min
Unit peak, qp	(N/A) ft³/s	Percent Volume under Rising Limb	(N/A) %

Results			
Flow (Total)	0.00 ft³/s	Flow (Peak) + Flow (Base)	(N/A) ft³/s
Cumulative Runoff Depth (Pervious)	(N/A) in	Maximum Retention (Pervious)	(N/A) in
Runoff Volume (Impervious)	(N/A) ac-ft	Maximum Retention (Pervious, 20 percent)	(N/A) in
Runoff Volume (Pervious)	(N/A) ac-ft	Maximum Retention (Impervious)	(N/A) in
Cumulative Runoff Depth (Impervious)	(N/A) in	Maximum Retention (Impervious, 20 percent)	(N/A) in

Calculation Messages

Time (min)	Message

Pond Detailed Report: Pond

<General>			
ID	21	Notes	
Label	PO-1	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

Geometry

X (ft)	Y (ft)
-80.89	0.54
-111.61	-18.39
-92.32	-41.96
-37.68	-42.32
-30.18	-16.96
-49.46	-0.89

Active Topology	
Is Active?	True

Infiltration	
Infiltration Method	No Infiltration

Initial Conditions			
Is Outflow Averaging On?	False	Define Starting Water Surface Elevation	Pond Invert

Output	
Detention Time	None

Runoff	
Scaled Area	0.061 acres

Volume			
Pond Type	Elevation-Area	Use Void Space?	False

Elevation-Area

Pond Elevation (ft)	Pond Area (acres)
1,442.00	0.142
1,443.00	0.191
1,444.00	0.249
1,445.00	0.309

Pond Detailed Report: Pond

Elevation-Area

Pond Elevation (ft)	Pond Area (acres)
1,446.00	0.379

Results (Detention Time)			
Time to Peak (Outflow + Infiltration, Peak to Peak Detention Time)	(N/A) min	Weighted Average Plug Time	(N/A) min
Time to Peak (Inflow, Peak to Peak Detention Time)	(N/A) min	Maximum Plug Volume Plug Time	(N/A) min
Detention Time (Peak to Peak)	(N/A) min	Maximum Inflow Plug Volume	(N/A) ac-ft
Time to Centroid (Outflow)	(N/A) min	Time (Maximum Plug Volume, Start)	(N/A) min
Time to Centroid (Inflow)	(N/A) min	Time (Maximum Plug Volume, End)	(N/A) min
Detention Time (Centroid to Centroid)	(N/A) min		

Results (Flows)			
Flow (Outlet)	0.00 ft³/s	Flow (Peak Total)	4.90 ft³/s
Flow (Total In)	0.00 ft³/s	Time to Peak (Total Out)	825.000 min
Flow (Total Out)	0.00 ft³/s	Volume (Total Out)	2.393 ac-ft

Results (ICPM Initial Conditions)			
Elevation (Starting Water Surface Computed)	(N/A) ft	Outflow (Starting)	(N/A) ft³/s
Volume (Starting)	(N/A) ac-ft	Infiltration (Starting ICPM)	(N/A) ft³/s

Results (ICPM Mass Balance)			
Volume (Initial ICPM)	(N/A) ac-ft	Difference	(N/A) ac-ft
Volume (Total In ICPM)	(N/A) ac-ft	Elevation (Ending)	(N/A) ft
Volume (Total Out ICPM)	(N/A) ac-ft	Percent of Inflow Volume (Interconnected Pond Mass Balance)	(N/A) %
Volume (Ending)	(N/A) ac-ft		

Results (ICPM Maximum Storage)			
Time to Maximum Storage	(N/A) min	Volume (Maximum)	(N/A) ac-ft
Elevation (Maximum)	(N/A) ft		

Results (ICPM Routing)			
Time to Peak (Pond Inflow, Forward Flow)	(N/A) min	Pond Inflow, Total Volume In	(N/A) ac-ft
Pond Inflow, Forward Flow Peak	(N/A) ft³/s	Direction (Forward, Total In)	(N/A)
Time to Peak (Infiltration, Forward Flow)	(N/A) min	Pond Outflow, Total Volume In	(N/A) ac-ft

Pond Detailed Report: Pond

Results (ICPM Routing)			
Infiltration, Forward Flow Peak	(N/A) ft³/s	Direction (Forward, Total Out)	(N/A)
Time to Peak (Pond Outflow, Forward Flow)	(N/A) min	Pond Inflow, Total Volume Out	(N/A) ac-ft
Pond Outflow, Forward Flow Peak	(N/A) ft³/s	Direction (Reverse, Total In)	(N/A)
Time to Peak (Pond Inflow, Reverse Flow)	(N/A) min	Pond Outflow, Total Volume Out	(N/A) ac-ft
Pond Inflow, Reverse Flow Peak	(N/A) ft³/s	Direction (Reverse, Total Out)	(N/A)
Time to Peak (Infiltration, Reverse Flow)	(N/A) min	Infiltration, Total Volume Out	(N/A) ac-ft
Infiltration, Reverse Flow Peak	(N/A) ft³/s	Direction (Reverse, Total Infiltration Out)	(N/A)
Time to Peak (Pond Ouflow, Reverse Flow)	(N/A) min	Infiltration, Total Volume In	(N/A) ac-ft
Pond Outflow, Reverse Flow Peak	(N/A) ft³/s	Direction (Forward, Total Infiltration In)	(N/A)

Results (Infiltration)			
Infiltration	0.00 ft³/s	Infiltration Method (Computed)	No Infiltration

Results (Level Pool Initial Conditions)			
Elevation (Water Surface, Initial)	1,442.00 ft	Flow (Initial Infiltration)	0.00 ft³/s
Volume (Initial)	0.000 ac-ft	Flow (Initial, Total)	0.00 ft³/s
Flow (Initial Outlet)	0.00 ft³/s	Time Increment	3.000 min

Results (Level Pool Mass Balance)			
Volume (Total Inflow)	2.566 ac-ft	Volume (Retained)	0.171 ac-ft
Volume (Total Infiltration)	0.000 ac-ft	Volume (Unrouted)	-0.001 ac-ft
Volume (Total Outlet Outflow)	2.393 ac-ft	Error (Mass Balance)	0.0 %

Results (Pond Routing)			
Flow (Peak In)	5.03 ft³/s	Time to Peak (Infiltration)	(N/A) min
Time to Peak (Flow, In)	801.000 min	Elevation (Water Surface, Peak)	1,443.69 ft
Flow (Peak Outlet)	4.90 ft³/s	Volume (Peak)	0.310 ac-ft
Time to Peak (Flow, Outlet)	825.000 min	2S/t - O	0.00 ft³/s
Infiltration (Peak)	(N/A) ft³/s	2S/t + O	0.00 ft³/s

Elevation-Volume-Flow Table

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)
1,442.00	0.00	0.000	0.142	0.00	0.00
1,442.50	0.00	0.077	0.166	0.00	0.00
1,443.00	0.00	0.166	0.191	0.00	0.00

Pond Detailed Report: Pond

Elevation-Volume-Flow Table

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
1,443.50	2.49	0.268	0.219	0.00	2.49	0.00
1,444.00	8.89	0.385	0.249	0.00	8.89	37.17
1,444.50	17.38	0.516	0.278	0.00	17.38	80.25
1,445.00	24.78	0.663	0.309	0.00	24.78	132.26
1,445.50	29.93	0.826	0.343	0.00	29.93	195.16
1,446.00	32.86	1.007	0.379	0.00	32.86	267.36
						345.83
						429.90
						520.16

Results			
Volume	0.000 ac-ft	Elevation	1,442.00 ft

Calculation Messages

Time (min)	Message

Catchment Detailed Report: Project Site

<General>			
ID	16	Notes	
Label	Project Site	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

Geometry

X (ft)	Y (ft)
-110.54	100.18
-147.32	95.54
-154.11	35.54
-85.18	21.96
-34.82	44.46
-34.46	74.11
-70.89	101.25

Active Topology	
Is Active?	True

Catchment	
Outflow Node	PO-1

Runoff			
Runoff Method	User Defined Hydrograph	Hydrograph	100-YR 1-HR ()

Results (Computed)			
Computational Time Increment	(N/A) min	Time to Peak (Computed)	(N/A) min
Flow (Peak, Computed)	(N/A) ft³/s		

Results (Interpolated)			
Flow (Peak Interpolated Output)	48.88 ft³/s	Time to Flow (Peak Interpolated Output)	60.000 min
Volume	3.027 ac-ft		

Results (Modified Rational Method)			
Frequency	(N/A) years	Area (Modified Rational, Composite)	(N/A) acres
C Adjustment Factor	(N/A)	C Coefficient (Modified Rational, Weighted)	(N/A)
Flow (Modified Rational, Allowable)	(N/A) ft³/s	C Coefficient (Modified Rational, Adjusted)	(N/A)

Catchment Detailed Report: Project Site

Results (Modified Rational Method)			
Storage (Modified Rational, Estimated)	(N/A) ac-ft	Second Outflow Breakpoint (Modified Rational)	(N/A) min
Time of Duration (Modified Rational, Critical)	(N/A) min	First Outflow Breakpoint (Modified Rational, Method T)	(N/A) min
Time of Concentration (Modified Rational, Composite)	(N/A) min	Intensity (Modified Rational, Critical)	(N/A) in/h
Intensity (Modified Rational, Peak)	(N/A) in/h	Flow (Modified Rational, Critical)	(N/A) ft³/s
Flow (Modified Rational, Peak)	(N/A) ft³/s		

Results (SCS Unit Hydrograph)			
Unit Hydrograph Shape Factor	(N/A)	Unit peak time, Tp	(N/A) min
K Factor	(N/A)	Unit receding limb, Tr	(N/A) min
Receding/Rising, Tr/Tp	(N/A)	Total unit time, Tb	(N/A) min
Unit peak, qp	(N/A) ft³/s	Percent Volume under Rising Limb	(N/A) %

Results			
Flow (Total)	0.00 ft³/s	Flow (Peak) + Flow (Base)	(N/A) ft³/s
Cumulative Runoff Depth (Pervious)	(N/A) in	Maximum Retention (Pervious)	(N/A) in
Runoff Volume (Impervious)	(N/A) ac-ft	Maximum Retention (Pervious, 20 percent)	(N/A) in
Runoff Volume (Pervious)	(N/A) ac-ft	Maximum Retention (Impervious)	(N/A) in
Cumulative Runoff Depth (Impervious)	(N/A) in	Maximum Retention (Impervious, 20 percent)	(N/A) in

Calculation Messages

Time (min)	Message

Pond Detailed Report: Pond

<General>			
ID	21	Notes	
Label	PO-1	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

Geometry

X (ft)	Y (ft)
-80.89	0.54
-111.61	-18.39
-92.32	-41.96
-37.68	-42.32
-30.18	-16.96
-49.46	-0.89

Active Topology	
Is Active?	True

Infiltration	
Infiltration Method	No Infiltration

Initial Conditions			
Is Outflow Averaging On?	False	Define Starting Water Surface Elevation	Pond Invert

Output	
Detention Time	None

Runoff	
Scaled Area	0.061 acres

Volume			
Pond Type	Elevation-Area	Use Void Space?	False

Elevation-Area

Pond Elevation (ft)	Pond Area (acres)
1,442.00	0.142
1,443.00	0.191
1,444.00	0.249
1,445.00	0.309

Pond Detailed Report: Pond

Elevation-Area

Pond Elevation (ft)	Pond Area (acres)
1,446.00	0.379

Results (Detention Time)			
Time to Peak (Outflow + Infiltration, Peak to Peak Detention Time)	(N/A) min	Weighted Average Plug Time	(N/A) min
Time to Peak (Inflow, Peak to Peak Detention Time)	(N/A) min	Maximum Plug Volume Plug Time	(N/A) min
Detention Time (Peak to Peak)	(N/A) min	Maximum Inflow Plug Volume	(N/A) ac-ft
Time to Centroid (Outflow)	(N/A) min	Time (Maximum Plug Volume, Start)	(N/A) min
Time to Centroid (Inflow)	(N/A) min	Time (Maximum Plug Volume, End)	(N/A) min
Detention Time (Centroid to Centroid)	(N/A) min		

Results (Flows)			
Flow (Outlet)	0.00 ft³/s	Flow (Peak Total)	32.48 ft³/s
Flow (Total In)	0.00 ft³/s	Time to Peak (Total Out)	72.000 min
Flow (Total Out)	0.00 ft³/s	Volume (Total Out)	2.861 ac-ft

Results (ICPM Initial Conditions)			
Elevation (Starting Water Surface Computed)	(N/A) ft	Outflow (Starting)	(N/A) ft³/s
Volume (Starting)	(N/A) ac-ft	Infiltration (Starting ICPM)	(N/A) ft³/s

Results (ICPM Mass Balance)			
Volume (Initial ICPM)	(N/A) ac-ft	Difference	(N/A) ac-ft
Volume (Total In ICPM)	(N/A) ac-ft	Elevation (Ending)	(N/A) ft
Volume (Total Out ICPM)	(N/A) ac-ft	Percent of Inflow Volume (Interconnected Pond Mass Balance)	(N/A) %
Volume (Ending)	(N/A) ac-ft		

Results (ICPM Maximum Storage)			
Time to Maximum Storage	(N/A) min	Volume (Maximum)	(N/A) ac-ft
Elevation (Maximum)	(N/A) ft		

Results (ICPM Routing)			
Time to Peak (Pond Inflow, Forward Flow)	(N/A) min	Pond Inflow, Total Volume In	(N/A) ac-ft
Pond Inflow, Forward Flow Peak	(N/A) ft³/s	Direction (Forward, Total In)	(N/A)
Time to Peak (Infiltration, Forward Flow)	(N/A) min	Pond Outflow, Total Volume In	(N/A) ac-ft

Pond Detailed Report: Pond

Results (ICPM Routing)			
Infiltration, Forward Flow Peak	(N/A) ft³/s	Direction (Forward, Total Out)	(N/A)
Time to Peak (Pond Outflow, Forward Flow)	(N/A) min	Pond Inflow, Total Volume Out	(N/A) ac-ft
Pond Outflow, Forward Flow Peak	(N/A) ft³/s	Direction (Reverse, Total In)	(N/A)
Time to Peak (Pond Inflow, Reverse Flow)	(N/A) min	Pond Outflow, Total Volume Out	(N/A) ac-ft
Pond Inflow, Reverse Flow Peak	(N/A) ft³/s	Direction (Reverse, Total Out)	(N/A)
Time to Peak (Infiltration, Reverse Flow)	(N/A) min	Infiltration, Total Volume Out	(N/A) ac-ft
Infiltration, Reverse Flow Peak	(N/A) ft³/s	Direction (Reverse, Total Infiltration Out)	(N/A)
Time to Peak (Pond Ouflow, Reverse Flow)	(N/A) min	Infiltration, Total Volume In	(N/A) ac-ft
Pond Outflow, Reverse Flow Peak	(N/A) ft³/s	Direction (Forward, Total Infiltration In)	(N/A)

Results (Infiltration)			
Infiltration	0.00 ft³/s	Infiltration Method (Computed)	No Infiltration

Results (Level Pool Initial Conditions)			
Elevation (Water Surface, Initial)	1,442.00 ft	Flow (Initial Infiltration)	0.00 ft³/s
Volume (Initial)	0.000 ac-ft	Flow (Initial, Total)	0.00 ft³/s
Flow (Initial Outlet)	0.00 ft³/s	Time Increment	3.000 min

Results (Level Pool Mass Balance)			
Volume (Total Inflow)	3.027 ac-ft	Volume (Retained)	0.166 ac-ft
Volume (Total Infiltration)	0.000 ac-ft	Volume (Unrouted)	0.000 ac-ft
Volume (Total Outlet Outflow)	2.861 ac-ft	Error (Mass Balance)	0.0 %

Results (Pond Routing)			
Flow (Peak In)	48.88 ft³/s	Time to Peak (Infiltration)	(N/A) min
Time to Peak (Flow, In)	60.000 min	Elevation (Water Surface, Peak)	1,445.94 ft
Flow (Peak Outlet)	32.48 ft³/s	Volume (Peak)	0.982 ac-ft
Time to Peak (Flow, Outlet)	72.000 min	2S/t - O	0.00 ft³/s
Infiltration (Peak)	(N/A) ft³/s	2S/t + O	0.00 ft³/s

Elevation-Volume-Flow Table

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)
1,442.00	0.00	0.000	0.142	0.00	0.00
1,442.50	0.00	0.077	0.166	0.00	0.00
1,443.00	0.00	0.166	0.191	0.00	0.00

Pond Detailed Report: Pond

Elevation-Volume-Flow Table

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
1,443.50	2.49	0.268	0.219	0.00	2.49	0.00
1,444.00	8.89	0.385	0.249	0.00	8.89	37.17
1,444.50	17.38	0.516	0.278	0.00	17.38	80.25
1,445.00	24.78	0.663	0.309	0.00	24.78	132.26
1,445.50	29.93	0.826	0.343	0.00	29.93	195.16
1,446.00	32.86	1.007	0.379	0.00	32.86	267.36
						345.83
						429.90
						520.16

Results			
Volume	0.000 ac-ft	Elevation	1,442.00 ft

Calculation Messages

Time (min)	Message

Double Butte Detention Calculations

Detention Results

Storm	Existing Condition Qp (CFS)	Proposed Condition Qp (CFS)	Prop-Ex (%)
100-yr, 1-hr	34.74	32.48	-6.5%
2-yr, 24-hr	5.37	5.03	-6.3%

POND - Results

Storm	Inflow Qp (CFS)	Outflow Qp (CFS)	Peak Storage (AC-FT)	Peak WSEL (FT)
100-yr, 1-hr	34.74	32.48	0.982	1445.94
2-yr, 24-hr	5.37	5.03	0.310	1443.69

POND

Pond EL	Area SF	Area AC	Volume (AC-FT)	Cumulative Volume (AC-FT)
1442	6187	0.1420	0	0
1443	8310	0.1908	0.166	0.166
1444	10830	0.2486	0.220	0.386
1445	13478	0.3094	0.279	0.665
1446	16500	0.3788	0.344	1.009

ATTACHMENT D

FEMA Firmette
RCFCD Correspondene
Annotated Satellite Image
Annotated RCFCD Romoland Master Drainage Plan
Annotated RCFCD Romoland Topographic Workmap - CLOMR
Annotated RCFCD Line A-3 Pre-Project Hydrology Map
RCFCD Record Drawings

National Flood Hazard Layer FIRMette

FEMA

117°10'9"W 33°44'32"N



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

1:6,000

117°9'31"W 33°44'2"N

Basemap Imagery Source: USGS National Map 2023

Legend

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

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

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

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

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/23/2024 at 1:13 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Naylor, Nicholas

From: de Chambeau, Deborah <dldecham@RIVCO.ORG>
Sent: Wednesday, February 23, 2022 7:32 AM
To: Adam Furman; Anita Munkres; Sara Carroll; Bossu, David; Sells, Nathan
Subject: RE: Energy Storage Project in Menifee

Categories: External

Some people who received this message don't often get email from dldecham@rivco.org. Learn why this is important

Hello-

I received an update on the CLOMR/LOMR status. Line A-3 Stage 2 and 3 are currently under construction but accept mostly local flows and will serve as the outlet for local developments. Stage 4 and 5 along Varela (between Palomar Rd and Malone Ave) will be the primary collection of offsite flows coming from the north of Varela which is currently causing the floodplain. Stages 4 and 5 are under design and construction is expected to finish in 2026. A CLOMR will likely be submitted in 2024 when the design of Stage 4 and 5 is further along. A LOMR to remove the floodplain mapping in the area won't be submitted to 2026 when the construction of Stages 2-5 are completed. Therefore, if the Energy Storage Project moves forward before 2026 the current floodplain will still be impacting your site.

Regards,

Deborah de Chambeau, MS, PE, CFM

From: de Chambeau, Deborah
Sent: Thursday, February 17, 2022 7:01 AM
To: Adam Furman <adam.furman@aes.com>; Anita Munkres <anita.munkres@aes.com>; Sara Carroll <sara.carroll@aes.com>; Bossu, David <david.bossu@kimley-horn.com>; Sells, Nathan <Nathan.Sells@kimley-horn.com>
Subject: Energy Storage Project in Menifee

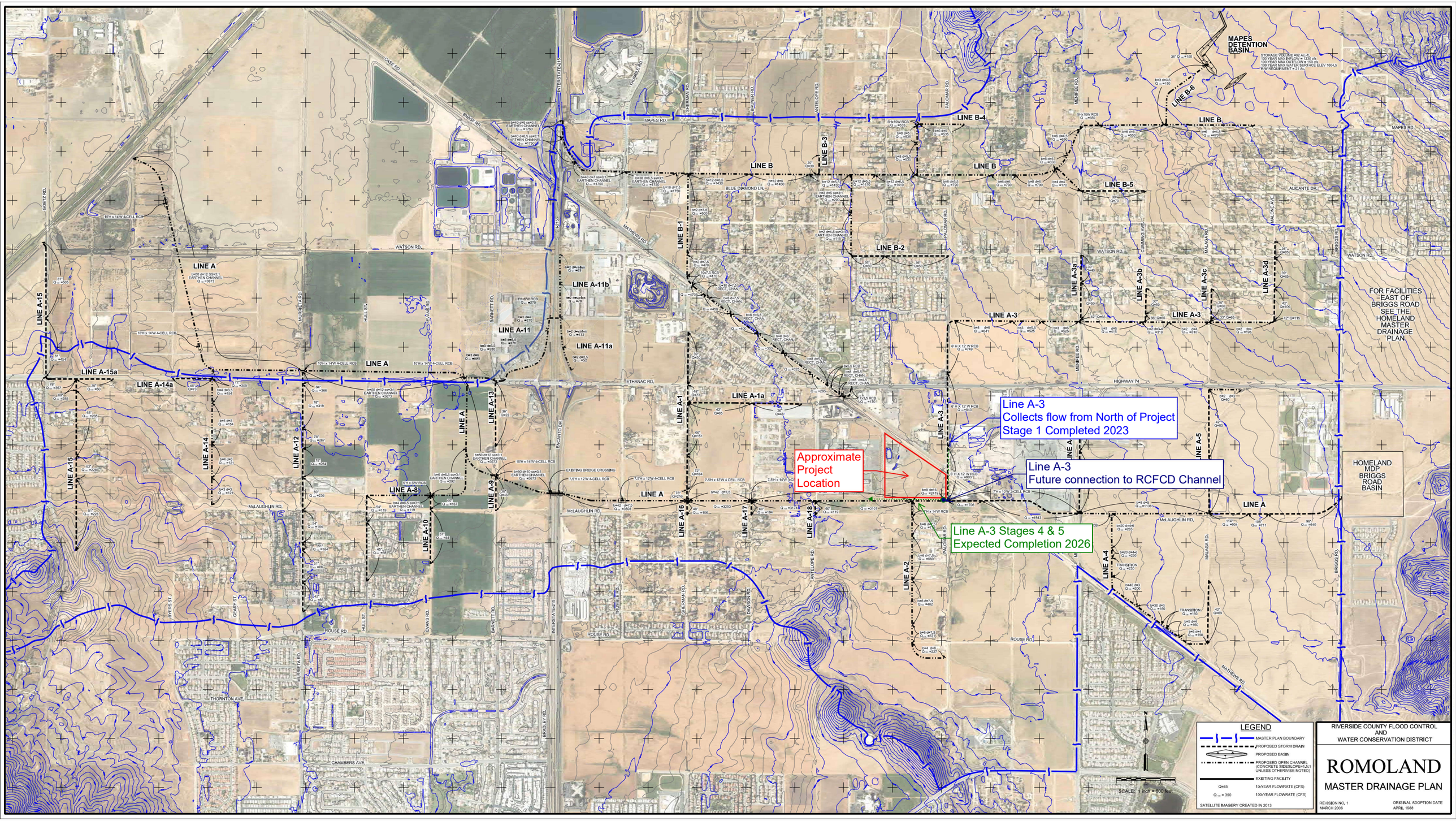
Stage 2 and 3 of Romoland Line A-3 shown on Dwg No. 4-1119 has started construction and the anticipated completion date is August 2022. The supervisor for the District Floodplain Management section is out of the office until March 14. I won't be able to get an update on the CLOMR/LOMR status until he returns.

Deborah de Chambeau, MS, PE, CFM
Engineering Project Manager –Development Review
RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
951.955.1214

Confidentiality Disclaimer

This email is confidential and intended solely for the use of the individual(s) to whom it is addressed. The information contained in this message may be privileged and confidential and protected from disclosure.


Street View along Case Road looking east/southeast towards Palomar Road. Flow direction onsite indicated with blue arrow.
Trench location of RCFCD RCB
Existing inlet to RCFCD RCB. KH assumed flows are intercepted by this inlet and routed to RCFCD RCB before entering the onsite channel. RCB as-builts indicate it is sized for the 100-year storm, so the same assumption was made here.
Case Rd
Google


MAPES DETENTION BASIN
STORAGE VOLUME =50 Ac.-ft.
100 YEAR MAX INFLOW = 1230 cfs
100 YEAR MAX OUTFLOW = 150 cfs
100 YEAR MAX WATER SURFACE ELEV 1604.5
R/W REQUIRMENT = 21 Ac.
LINE B-6
LINE B
LINE B-4
LINE B-3
LINE B-2
LINE B-1
LINE B-5
LINE A-15
LINE A-15a
LINE A-14
LINE A-14a
LINE A-13
LINE A-12
LINE A-11
LINE A-11a
LINE A-11b
LINE A-10
LINE A-9
LINE A-8
LINE A-1
LINE A-1a
LINE A-2
LINE A-3
LINE A-3a
LINE A-3b
LINE A-3c
LINE A-3d
LINE A-4
LINE A-5
LINE A
MAPES RD.
WATSON RD.
ALICANTE DR.
BLUE DIAMOND LN.
McLAUGHLIN RD.
ROUSE RD.
ETHANAC RD.
HIGHWAY 74
MATHEWS RD.
CASE RD.
BYARS ST.
GEARY ST.
THORNTON AVE.
CHAMBERS AVE.
INTERSTATE-215
I-215
GRETT RD.
MURRIETA RD.
HULL ST.
EVANS RD.
BARNETT RD.
ENCANTO DR.
TRUMBLE RD.
SHERMAN RD.
TURNER RD.
ANTELOPE RD.
PALOMAR RD.
MENIFEE RD.
CUMMING AVE.
MALAGA RD.
BRIGGS RD.
DAVISON RD.
BRADLEY RD.
Approximate Project Location
Line A-3
Collects flow from North of Project
Stage 1 Completed 2023
Line A-3
Future connection to RCFCD Channel
Line A-3 Stages 4 & 5
Expected Completion 2026
FOR FACILITIES EAST OF BRIGGS ROAD SEE THE HOMELAND MASTER DRAINAGE PLAN
HOMELAND MDP BRIGGS ROAD BASIN
SCALE: 1 inch = 600 feet
LEGEND
MASTER PLAN BOUNDARY
PROPOSED STORM DRAIN
PROPOSED BASIN
PROPOSED OPEN CHANNEL (CONCRETE SIDESLOPE=1:1c1 UNLESS OTHERWISE NOTED)
EXISTING FACILITY
Qm45 10-YEAR FLOWRATE (CFS)
Q100 = 350 100-YEAR FLOWRATE (CFS)
SATELLITE IMAGERY CREATED IN 2013
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
ROMOLAND
MASTER DRAINAGE PLAN
REVISION NO. 1
MARCH 2006
ORIGINAL ADOPTION DATE
APRIL 1988

Known flowpath of flooding
Captured by Line A-3
Stage 1 completed 2023

Line A-3
Routes source of flooding directly to RCFCD channel
Stages 4 & 5 to be completed in 2026

Approximate
Project
Location

FEMA Special Flood Hazard Area Zone A
Expected to be removed with completion of Line A-3

Watershed A
A = 301.1 ac
L = 7,285 ft
Lca = 4,053 ft
H = 64 ft

Watershed B
A = 900.5 ac
L = 15,835 ft
Lca = 6,871 ft
H = 843 ft

Watershed C
A = 704.4 ac
L = 12,012 ft
Lca = 5,513 ft
H = 927 ft

Watershed D
A = 3,327.4 ac
L = 24,321 ft
Lca = 11,285 ft
H = 988 ft

A | Q 400
B | Q 1090
C | Q 945
D | Q 3810

MAPES ROAD
ANTELOPE ROAD
PALOMAR ROAD
MENIFEE ROAD
BRIGGS ROAD
JUNIPER FLATS ROAD
BLUE DIAMOND LANE
BARON ROAD
WATSON ROAD
ALICANTE DRIVE
GADENA DRIVE
CUMMINGS AVENUE
VARELA LANE
MALONE AVENUE
SILL TWIN ROAD
ETIWANDA ROAD
HIGHWAY 74

RIVERSIDE COUNTY FLOOD CONTROL AND
WATER CONSERVATION DISTRICT

ROMOLAND MDP LINE A, STAGES 4, 5, AND 6,
HOMELAND MDP LINE 1 BRIGGS BASIN,
ROMOLAND MDP LINE A-2, AND
ROMOLAND MDP LINE A-3

PRE-PROJECT HYDROLOGY MAP

1/14/2015 9:14:12 AM G:\Project Planning\PLANNING SECTION\FPM Requests\Project No. 4-0-00310-04\DGN\4-0-00310-04 Hydrology.dgn

TOPOGRAPHIC WORKMAP - CLOMR
ROMOLAND MDP LINE A-3, STAGE 4 & 5 - MR380

ALICANTE DRIVE
CADENA DRIVE
WATSON DRIVE
WATSON ROAD
ROMOLAND MDP LINE A-3 STAGE 4 & 5
ROAD
MENIFEE
PROPOSED 1% ANNUAL CHANCE FLOOD CONTAINED IN CHANNEL
MALAGA
CALLE DE CABALLOS
AVENUE
MALONE
BRIGGS ROAD
VARELA LANE
ROMOLAND MDP LINE A-3 STAGE 4 & 5
PROPOSED 1% ANNUAL CHANCE FLOOD CONTAINED IN CHANNEL
ROMOLAND MDP LINE A-3 STAGE 4 & 5
ETHANAC WASH NORTH 2 (CAPTURED BY PROPOSED PROJECT)
ROMOLAND MDP LINE A-3 STAGE 2 & 3 RCFC DWG NO. 4-119
ETHANAC WASH NORTH 1 (CAPTURED BY PROPOSED PROJECT)
CITY OF MENIFEE
Z 10589
HIGHWAY 74
Z 16579
PALOMAR ROAD
MCKINLEY RD
MENIFEE ROAD
ANTELOPE ROAD
SAN JACINTO ROAD
MATTHEWS ROAD
Project Location
Source of Flooding Captured
Current FEMA Zone A
Proposed FEMA Zone X
ROMOLAND MDP LINE A-3 ,STAGE 1 RCFC DWG NO. 4-0871
ROMOLAND MDP LINE A ,STAGE 4 RCFC DWG NO. 4-0846

STATS OVERALL:		
# Structures Removed	Acres Removed	# Parcels Removed
15	58	44

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
ROMOLAND MDP LINE A-3, STAGE 4 & 5 - MR380

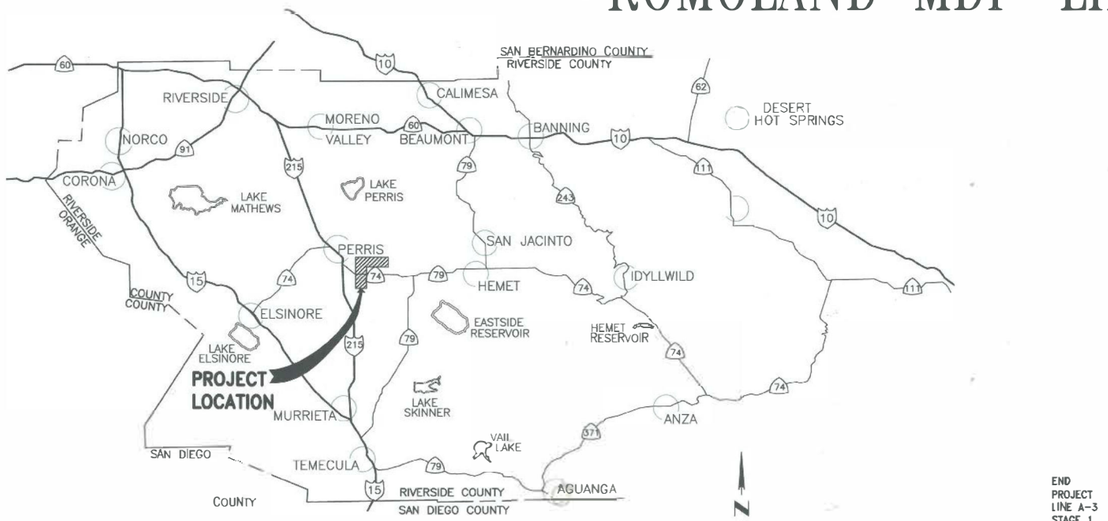
- EFFECTIVE FEMA ZONE A (100-YEAR FLOODPLAIN)
- EFFECTIVE FEMA SHADED ZONE X FLOODPLAIN
- PROPOSED FEMA SHADED ZONE X FLOODPLAIN
- PROPOSED ROMOLAND MDP LINE A-3 STAGE 4 & 5
- CITY BOUNDARIES
- RCFC EXISTING FACILITIES

N W E S

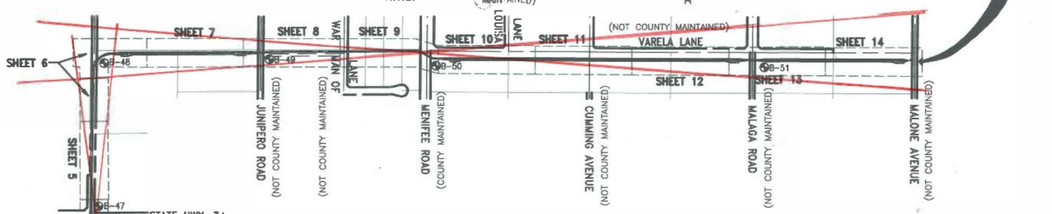
0' 175' 350' 700'

PHOTOGRAPHY DATA	TOPOGRAPHY DATA	BENCHMARK DATA
BY: COUNTY OF RIVERSIDE DATE: 2019	DATUM: NAD83, NAVD88 BY: RCFC&WCD DATE: MARCH 26, 2008 & 2017	Z 10589 Z 16579

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
ROMOLAND MDP-LINE A-3 STAGE 1



VICINITY MAP
N.T.S.



INDEX MAP
SECTIONS 11, 12, AND 14
T. 5 S. R. 3 W.
SCALE: 1"=600'

END PROJECT LINE A-3, STG. 1

BASIS OF BEARINGS:

THE CENTERLINE OF SAN JACINTO AVENUE TAKEN AS NORTH 89°36'00" EAST PER MAP OF FIGADOTA FARMS NO. 5, AS SHOWN BY MAP ON FILE IN BOOK 16, PAGE 78 OF MAPS, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

SEE ROMOLAND MDP PLANS
LINE "A", STAGE 4
PROJECT NO. 4-0310
DWG. NO. 4-846

GENERAL NOTES

1. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION.
2. ALL CHANNEL/STORM DRAIN REFERENCES AND CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
3. TOPOGRAPHY BY AERIAL PHOTOGRAPHS TAKEN AT AN ALTITUDE NOT TO EXCEED A FLYING HEIGHT TO CONTOUR INTERVAL RATIO OF 1800. PHOTOGRAPHY DATED 11-15-03.
4. THE VERTICAL DATUM IS DERIVED FROM (NGVD 29) THE HORIZONTAL DATUM IS DERIVED FROM (NAD 83).
5. STANDARD DRAWINGS CALLED FOR ON THE PLAN & PROFILE SHALL CONFORM TO R.C.F.C. & W.C.D. STD. DRAWINGS, OR CALTRANS/ COUNTY STANDARD PLANS.
6. ELEVATIONS AND LOCATIONS OF UTILITIES WERE OBTAINED FROM AVAILABLE INFORMATION AND ARE SHOWN APPROXIMATELY ON THESE PLANS. 48 HOURS BEFORE EXCAVATION CALL UNDERGROUND SERVICE ALERT AT 1-800-227-2600. ALL UTILITIES SHALL BE PROTECTED IN PLACE EXCEPT AS NOTED ON PLANS AND SPECIFICATIONS.
7. THE CONTRACTOR IS REQUIRED TO CONTACT ALL UTILITY AGENCIES REGARDING TEMPORARY SUPPORT AND SHORING REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
8. ALL OPENINGS RESULTING FROM CUTTING OR PARTIAL REMOVAL OF EXIST. CULVERTS, PIPES, OR SIMILAR STRUCTURES TO BE ABANDONED, SHALL BE SEALED AT BOTH ENDS WITH 6" MIN. CLASS "B" CONCRETE OR REMOVED.
9. ALL RECONSTRUCTION, RESURFACING AND PAVEMENT DELINEATION, CURBS, SIDEWALKS AND OTHER IMPROVEMENTS ARE TO BE RECONSTRUCTED IN KIND USING THE SAME STRUCTURAL SECTIONS, LOCATIONS AND ELEVATIONS AS THE EXISTING IMPROVEMENTS, UNLESS OTHERWISE NOTED.
10. ⊕ INDICATES APPROX. SOIL BORING LOCATION PER SOILS REPORT DATED APRIL 2004.
11. THE RC BOX WALL AND SLAB THICKNESSES SHALL BE INCREASED TO HAVE 2 1/2" CONCRETE COVER BETWEEN THE INSIDE RCB AND THE REINFORCING STEEL. FOR FLOW VELOCITIES BETWEEN 20 AND 30 fps F'c = 5000 PSI AND FOR VELOCITIES GREATER THAN 30 fps F'c = 6000 PSI UNLESS OTHERWISE SPECIFIED.
12. ~~THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S MEMORANDUM OF UNDERSTANDING STANDARD SPECIFICATIONS DATED SEPTEMBER 1984, AND DESIGN MANUAL. STANDARD DRAWINGS DATED APRIL 2004.~~
13. AN ENROACHMENT PERMIT IS REQUIRED FROM R.C.T.D. PLEASE CONTACT MOJAHED SALAMA AT (951) 955-6790. ~~IF AN ENCROACHMENT PERMIT IS REQUIRED FROM RIVERSIDE COUNTY FLOOD CONTROL, THEN CONTACT ED LOTZ AT (951) 955-1266. AFTER THE PERMIT IS ISSUED, THE DISTRICT MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTON.~~
14. ~~CONSTRUCTION INSPECTON MAY BE PERFORMED BY RIVERSIDE COUNTY FLOOD CONTROL. CONTACT KENT ALLEN AT (951) 955-1288 THE DISTRICT MUST BE NOTIFIED 20 DAYS PRIOR TO CONSTRUCTION. ALTERNATELY, CONSTRUCTION INSPECTION MAY BE PERFORMED BY AN OUTSIDE CONSULTANT.~~

MAINTENANCE RESPONSIBILITIES:

R.C.F.C. & W.C.D. MAINTAINS:

6.5'H x 12.0'W RCB (SINGLE CELL)
FROM STA. 10+92.52 TO STA. 47+50.00
TRAPEZOIDAL CHANNEL AND TRANSITION STRUCTURES
FROM STA. 47+50.00 TO STA. 59+09.02
6.0'H x 10.0'W RCB (SINGLE CELL)
FROM STA. 59+09.02 TO STA. 74+40.00
TRAPEZOIDAL CHANNEL AND TRANSITION STRUCTURES
FROM STA. 74+40.00 TO STA. 86+02.48
FROM STA. 86+62.48 TO STA. 99+02.35
FROM STA. 100+02.35 TO STA. 112+15.00
48" R.C.P.
FROM STA. 112+15.00 TO STA. 112+21.59

R.C.T.D. MAINTAINS:

STRUCTURAL INTEGRITY OF:
6.0'H x 10.0'W RCB (SINGLE CELL)
FROM STA. 86+02.48 TO STA. 86+62.48 (CUMMING AVE.)
6.0'H x 10.0'W RCB (SINGLE CELL)
FROM STA. 99+02.35 TO STA. 100+02.35 (MALAGA RD.)

RECORD DRAWINGS
APPROVED BY: Alan French
DATE: 2/9/07

INDEX

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LATERAL A-3-3 PLAN & PROFILE	21
RAILROAD ~~CIRC CAST~~ RCB DETAILS (RCTC/~~BNSF~~) SCRRA	22
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NOTICE TO CONTRACTOR:

THE EXISTENCE AND LOCATIONS OF ALL UNDERGROUND UTILITIES (UTILITY PIPES, STRUCTURES, ETC.) SHOWN ON THESE PLANS WERE ASCERTAINED BY A REVIEW OF RECORDS PROVIDED BY THESE MEMBER AGENCIES AND ARE APPROXIMATE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. LOCATIONS OF UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION.

CALL UNDERGROUND SERVICE ALERT (U.S.A.) 1-800-227-2600 AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION.

R.C.F.C. & W.C.D. STANDARD DRAWINGS

MH253	MANHOLE NO. 3
CH326	TRAPEZOIDAL CHANNEL
CH329	TRANSITION STRUCTURE
CH330	MAINTENANCE RAMP
M801	CHAINLINK FENCE AND GATE
M814	ABBREVIATIONS AND SYMBOLS
M815	BEDDING AND PAY LINES
M816	CONCRETE BULKHEAD
JS226	JUNCTION STRUCTURE NO. 1

CALTRANS STANDARDS

B11-47	CABLE RAILING
D81	REINFORCED CONCRETE DOUBLE BOX CULVERT
D82	PARAPET WALL
D86B	WARPED ENDWALL
D73	DRAINAGE INLET (TYPE G1)

APWA STANDARD

610-1 RETAINING WALL (TYPE 1)

⚠ SEE SHEET 1A AND SPECIAL PROVISIONS FOR SCRRA AND RCTC NOTES.

BNSF AND RCTC NOTES:

1. CONTRACTOR SHALL CONTACT THE BURLINGTON NORTHERN SANTA FE (BNSF) ROADMASTER, DAVE GONZALES; PHONE NO. 909-386-4061, AT LEAST FIVE (5) WORKING DAYS (MONDAY THROUGH FRIDAY) BEFORE STARTING CONSTRUCTION.

2. CONTRACTOR SHALL CONTACT THE BURLINGTON NORTHERN SANTA FE (BNSF) ROADMASTER, DAVE GONZALES; PHONE NO. 909-386-4061, AT LEAST TEN (10) WORKING DAYS (MONDAY THROUGH FRIDAY) IN ADVANCE OF WHEN FLAGGING SERVICES WILL BE REQUIRED. EACH TIME A FLAGGER IS CALLED, THE MINIMUM PERIOD OF BILLING SHALL BE THE EIGHT (8) HOUR BASIC DAY. THE COST OF FLAGGING SERVICES PROVIDED BY THE RAILWAY, WHEN DEEMED NECESSARY BY THE RAILWAY'S REPRESENTATIVE, WILL BE BORNE BY THE CONTRACTOR.

3. CONTRACTOR SHALL CONTACT THE RIVERSIDE COUNTY TRANSPORTATION COMMISSION, CLAUDIA CHASE 951-787-7937, AT LEAST 5 WORKING DAYS (MONDAY THROUGH FRIDAY) BEFORE STARTING CONSTRUCTION.

4. RAIL TRACK ELEVATIONS OVER THE RCB SHALL BE PROFILED TO DETECT ANY CHANGE IN ELEVATION. BEFORE AND AFTER PROFILES SHALL BE PERFORMED BY A LICENSED SURVEYOR. A LETTER REPORT FROM THE SURVEYOR SHALL BE SUBMITTED TO BNSF AND RCTC STATING MONITORING RESULTS, WITHIN SEVEN (7) DAYS OF THE COMPLETION WORK WITHIN THE RCTC R/W. THE REPORT SHALL BE SENT TO GREG ROUSSEAU OF BNSF AT 740 EAST CARNEGIE DRIVE, SAN BERNARDINO, CALIFORNIA 92408 AND CLAUDIA CHASE OF RCTC AT POST OFFICE BOX 12008, RIVERSIDE, CALIFORNIA 92502-2208.

5. A SAFETY ORIENTATION COURSE SHALL BE COMPLETED BY ALL WORKERS PRIOR TO ENTERING RAILROAD PROPERTY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONDUCT THE SAFETY TRAINING AND IMPLEMENTATION OF A SAFETY PROGRAM FOR ITS EMPLOYEES. TRAINING MATERIALS ARE AVAILABLE ON THE WEB SITE: WWW.CONTRACTORORIENTATION.COM THE CONTRACTOR MUST COMPLY WITH ALL FEDERAL, STATE AND LOCAL SAFETY REGULATIONS.

6. THE CONTRACTOR SHALL NOTIFY BNSF, RCTC AND RCFCD WITHIN FORTY FIVE (45) DAYS OF THE DATE AND LOCATION FOR FABRICATION OF RCB ELEMENTS. INSPECTIONS OF THESE ELEMENTS WILL BE MADE BY RCFCD PERSONNEL DURING FABRICATION. THE CONTRACTOR WILL BE REQUIRED TO PRESENT A COPY OF THE RCFCD INSPECTION CERTIFICATION TO THE BNSF AND RCTC REPRESENTATIVES AT THE CONSTRUCTION COORDINATION MEETING.

7. CONTRACTOR SHALL CONTACT BNSF, RCTC AND RCFCD FOR A CONSTRUCTION COORDINATION MEETING, PRIOR TO BNSF PROVIDING A TRACK OUTAGE SCHEDULE.

IP 050154 MS 4051
CALTRANS PERMIT NUMBER: 08-05-N MC-0356

SEAL-COUNTY
REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. R.C.E. 45702 EXP. 12-31-08 — DATE
RECOMMENDED BY — DATE 12/18/07

REGISTERED PROFESSIONAL ENGINEER SCOTT R. WILDERMUTH NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
FAX (951) 788-1256
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST R, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED H 327 1935 AND SET IN THE TOP OF A CONCRETE POST
ELEVATION: 1478.07

REF.	REVISIONS	APPR.	DATE
	P8/246680		
1	ADDED NOTES.	RR	2/9/07

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: Stuart E. Mckibbin PLANNING ENGINEER DATE: 1-3-2008
APPROVED BY: CHIEF ENGINEER DATE: 1-3-08

ROMOLAND MDP LINE A-3 STAGE 1
TITLE SHEET

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 1 OF 25

96

D:\2003\03-0338\DWG\PSP\D\03338_LNE_A3.pro | Dec 10, 2007 | 1:12AM

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

SCRRA AND RCTC NOTES:

1. CONTRACTOR SHALL CONTACT THE SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY (SCRRA), CHRISTOS SOURMELIS 909–394–3418, AT LEAST 5 WORKING DAYS (MONDAY THROUGH FRIDAY) BEFORE STARTING CONSTRUCTION.

2. CONTRACTOR SHALL CONTACT THE RIVERSIDE COUNTY TRANSPORTATION COMMISSION, RUBY ARELLANO 951–787–7141, AT LEAST 5 WORKING DAYS (MONDAY THROUGH FRIDAY) BEFORE STARTING CONSTRUCTION.

3. RAIL TRACK ELEVATIONS OVER THE RCB SHALL BE PROFILED TO DETECT ANY CHANGE IN ELEVATION. BEFORE AND AFTER PROFILES SHALL BE PERFORMED BY A LICENSED SURVEYOR.

4. A LETTER REPORT FROM THE SURVEYOR SHALL BE SUBMITTED TO SCRRA AND RCTC STATING MONITORING RESULTS, WITHIN SEVEN (7) DAYS OF THE COMPLETION WORK WITHIN THE RCTC R/W. THE REPORT SHALL BE SENT TO CHRISTOS SOURMELIS OF SCRRA AT 279 E. ARROW HIGHWAY, SUITE 101, SAN DIMAS, CA 91773 AND RUBY ARELLANO OF RCTC AT POST OFFICE BOX 12008, RIVERSIDE, CALIFORNIA 92502–2208.

5. THE CONTRACTOR SHALL NOTIFY SCRRA, RCTC AND RCFCD WITHIN FORTY FIVE (45) DAYS OF THE DATE AND LOCATION FOR FABRICATION OF RCB ELEMENTS. INSPECTIONS OF THESE ELEMENTS WILL BE MADE BY RCFCD PERSONNEL DURING FABRICATION. THE CONTRACTOR WILL BE REQUIRED TO PRESENT A COPY OF THE RCFCD INSPECTION CERTIFICATION TO THE SCRAA AND RCTC REPRESENTATIVES AT THE CONSTRUCTION COORDINATION MEETING.

6. BEFORE EXCAVATING, THE CONTRACTOR MUST DETERMINE WHETHER ANY UNDERGROUND PIPE LINES, ELECTRIC WIRES, OR CABLES, INCLUDING FIBER OPTIC CABLE SYSTEMS, ARE PRESENT AND LOCATED WITHIN THE PROJECT WORK AREA BY CALLING THE SOUTHERN CALIFORNIA UNDERGROUND SERVICE ALERT AT 811.

7. CONTRACTOR IS TO COMPLETE SCRRA'S TEMPORARY RIGHT OF ENTRY AGREEMENT, FORM 6". THIS FORM IS AVAILABLE ON SCRRA'S WEBSITE AT WWW.METROLINKTRAINS.COM ("ABOUT US", AND "ENGINEERING AND CONSTRUCTION").

8. THE PIPELINE CROSSING CONSTRUCTION WILL BE DONE AS PER SCRRA ENGINEERING STANDARD ES5001.

9. ANY PROPOSED EXCAVATION THAT MAY OCCUR IN SCRRA RIGHT–OF–WAY OR THAT MAY AFFECT OPERATIONS ON SCRRA TRACKS MUST ADHERE TO THE DESIGN, SUBMITTAL AND REVIEW REQUIREMENTS PRESENTED IN SCRRA'S EXCAVATION SUPPORT GUIDELINES AND SHALL NOT PROCEED WITHOUT ACCEPTANCE BY SCRRA. THE GUIDELINES ARE AVAILABLE ON SCRRA'S WEBSITE WWW.METROLINKTRAINS.COM, (ABOUT US, AND ENGINEERING AND CONSTRUCTION).

RECORD DRAWINGS

APPROVED BY: _____

DATE: 2/9/17

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



TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
B.M. NO. S 327–1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON, TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW. OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK AND 4.5 FT. NE OF THE STATION SIGN, A STANDARD DISK, STAMPED R 327 1935, AND SET IN THE TOP OF A CONCRETE POST.
EL. 1478.07

REF.	P8/248680 REVISIONS	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

DESIGNED BY: ROHINI MUSTAFA
DRAWN BY: MICHAEL ARMENTA
DATE DRAWN: AUGUST 2014

RECOMMENDED FOR APPROVAL BY: _____ DATE: 9/23/2014

APPROVED BY: _____ DATE: 22 Sept 2014

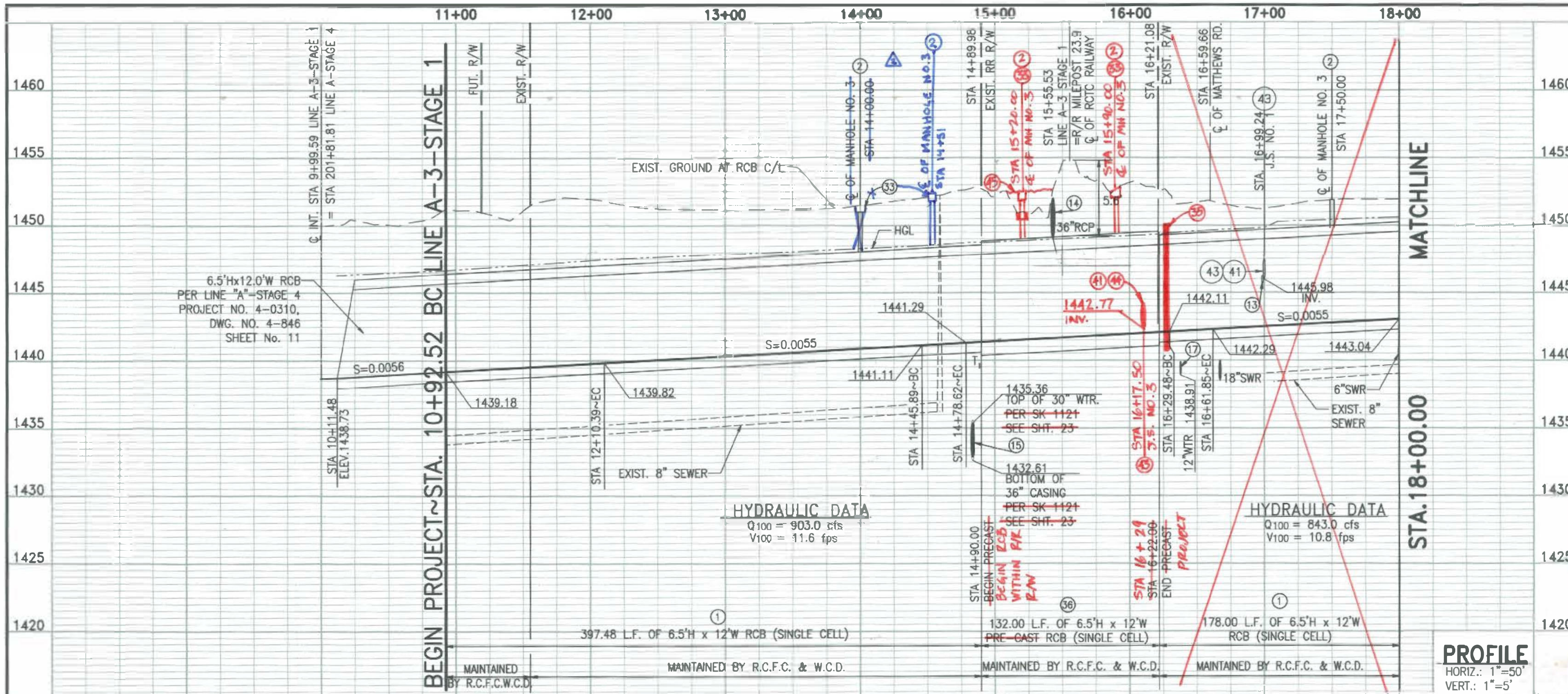
ROMOLAND MDP LINE A–3
STAGE 1

TITLE SHEET
SCRRA AND RCTC NOTES

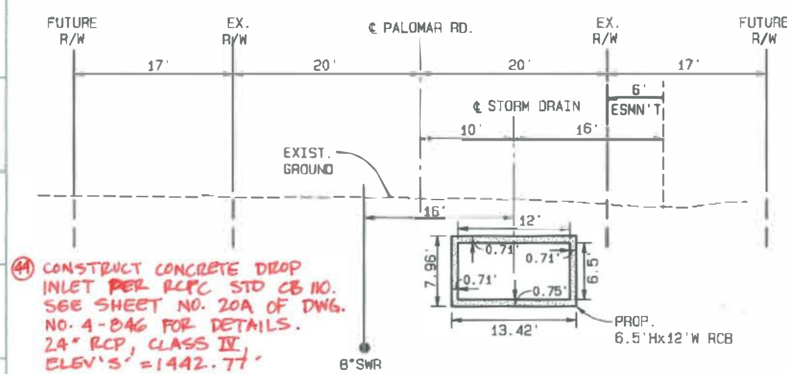
PROJECT NO. 4–0–00431
DRAWING NO. 4–871
SHEET NO. 1A OF 25

97

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



PROFILE
HORIZ.: 1"=50'
VERT.: 1"=5'



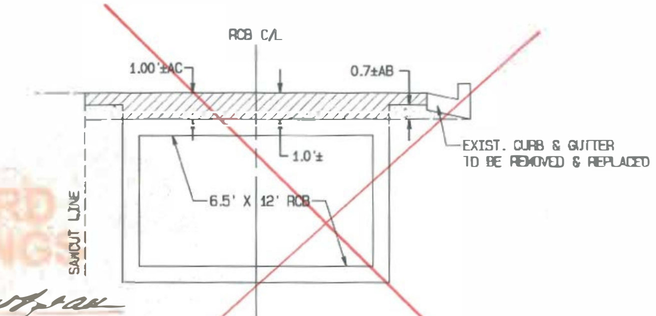
(44) CONSTRUCT CONCRETE DROP INLET PER RCFC STD CB 110. SEE SHEET NO. 20A OF DWG. NO. 4-846 FOR DETAILS. 24" RCP, CLASS IV, ELEV'S' =1442.77'.

(45) PROVIDE MIN. 4' COVER WITHIN 45 FEET OF R/R TRACKS WHILE MAINTAINING POSITIVE DRAINAGE. ADDITIONAL BACKFILL SHALL BE DIRECTED BY FIELD ENGINEER.

SECTION AT STA. 13+00.00

TYPICAL FROM 12+10.39 TO 14+45.89

GRAPHIC SCALE 1"=10'

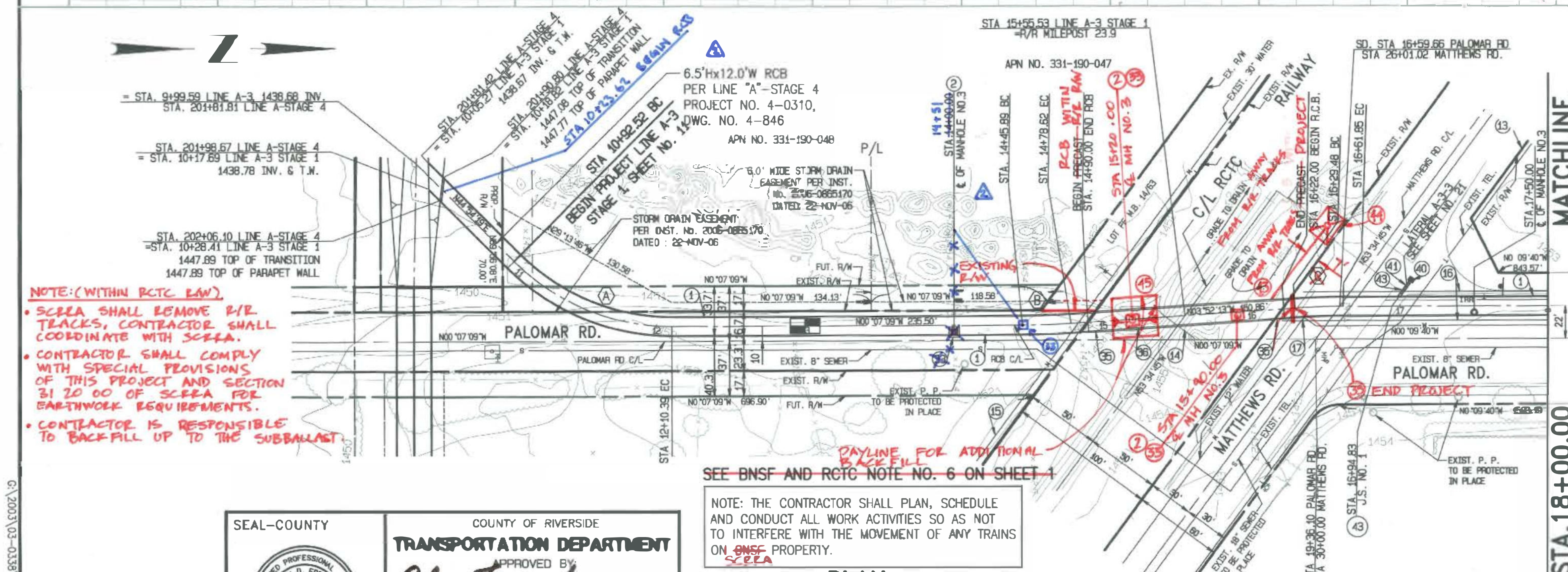


RECORD DRAWINGS
APPROVED BY
DATE: 2/9/17

PALOMAR ROAD REMOVE & REPLACE SECTION

(16) STA. 16+22.00 TO STA. 32+76.85 & STA. 33+75.00 TO STA. 46+00.00
N.T.S.

~~NOTE: THE CONTRACTOR SHALL PLACE A 12" LAYER OF COMPACTED GRANULAR MATERIAL ON TOP OF A LAYER OF GEOTEXTILE FABRIC AT THE BOTTOM OF THE PRECAST SECTION OF BOX. PER BNSF REQUIREMENTS.~~



NOTE: (WITHIN RCTC R/W)
- SCRRA SHALL REMOVE R/R TRACKS, CONTRACTOR SHALL COORDINATE WITH SCRRA.
- CONTRACTOR SHALL COMPLY WITH SPECIAL PROVISIONS OF THIS PROJECT AND SECTION 31 20 00 OF SCRRA FOR EARTHWORK REQUIREMENTS.
- CONTRACTOR IS RESPONSIBLE TO BACKFILL UP TO THE SUBBALLAST.

~~SEE BNSF AND RCTC NOTE NO. 6 ON SHEET 1~~

NOTE: THE CONTRACTOR SHALL PLAN, SCHEDULE AND CONDUCT ALL WORK ACTIVITIES SO AS NOT TO INTERFERE WITH THE MOVEMENT OF ANY TRAINS ON ~~BNSF~~ SCRRA PROPERTY.

PLAN

GRAPHIC SCALE 1"=50'
0 50 100 150

NOTE: A READILY IDENTIFIABLE AND SUITABLE MARKER SHALL BE PLACED AT EACH RAILROAD PROPERTY LINE WHERE IT IS CROSSED BY AN UNDERGROUND IMPROVEMENT.

CONSTRUCTION NOTES

1. CONSTRUCT 6.5'Hx12.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
2. CONSTRUCT MANHOLE NO. 3 PER RCFCWCD STD. DWG. MH253
13. EXISTING TELEPHONE LINE TO BE REMOVED & REPLACED (2 PLACES), BY OTHERS
14. EXISTING 24' LONG 36" RC PIPE CULVERT TO BE REMOVED ~~AND REPLACED AS DIRECTED BY ENGINEER~~
15. EXISTING 30" CML&C WATER LINE RELOCATED, ~~SEE SHEET No. 23 (E.M.W.D. SK-1121)~~ BY EMWD.
16. EXISTING IMPROVEMENTS TO BE REMOVED AND REPLACED AS NECESSARY
17. EXISTING 12" PVC WATER LINE TO BE REMOVED AND REPLACED AS NECESSARY
31. EXISTING 16" IRRIGATION LINE TO BE REMOVED
33. CONSTRUCT 7'x7'x6" CONCRETE APRON WITH NO. 4 BARS AT 18" EACH WAY
36. CONSTRUCT 6.5'Hx12.0'W ~~PRE-CAST~~ CAST-IN-PLACE RCB (SINGLE CELL) PER DETAIL ON SHEET No. 22A WITHIN R/R, R/W
40. ~~CONSTRUCT DRAINAGE INLET TYPE G1 PER CALTRANS STD. PLAN D73~~
41. INSTALL ~~18"~~ 24" CLASS IV DIA. RCP PER CALTRANS SPECIFICATIONS
43. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCWCD STD. DWG. JS228
35. CONSTRUCT CONCRETE BULKHEAD ~~PER DETAIL ON SHEET~~ NO. 26 OF DRAWING NO. 4-846.

(A) ℄ CURVE DATA	(B) ℄ CURVE DATA	~~(C) ℄ CURVE DATA~~
Δ = 45°01'28"	Δ = 03°45'04"	~~Δ = 03°42'33"~~
R = 150.00'	R = 500.00'	~~R = 500.00'~~
T = 62.17'	T = 16.37'	~~T = 16.19'~~
L = 117.87'	L = 32.73'	~~L = 32.37'~~
BC = STA. 10+92.52	BC = STA. 14+45.89	~~BC = STA. 16+29.48~~
EC = STA. 12+10.39	EC = STA. 14+78.62	~~EC = STA. 16+61.85~~

IP 050154 MS 4051

SEAL-COUNTY

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: ALAN D. FRENCH, P.E. DATE 12-18-07
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY DATE 12/18/07

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER 3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND. 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/246680 REVISIONS		
1	ADDED NOTES AND PLANIMETRICS		2/9/17
2	ADDED NOTES AND REVISED MH LOCATION		2/9/17

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

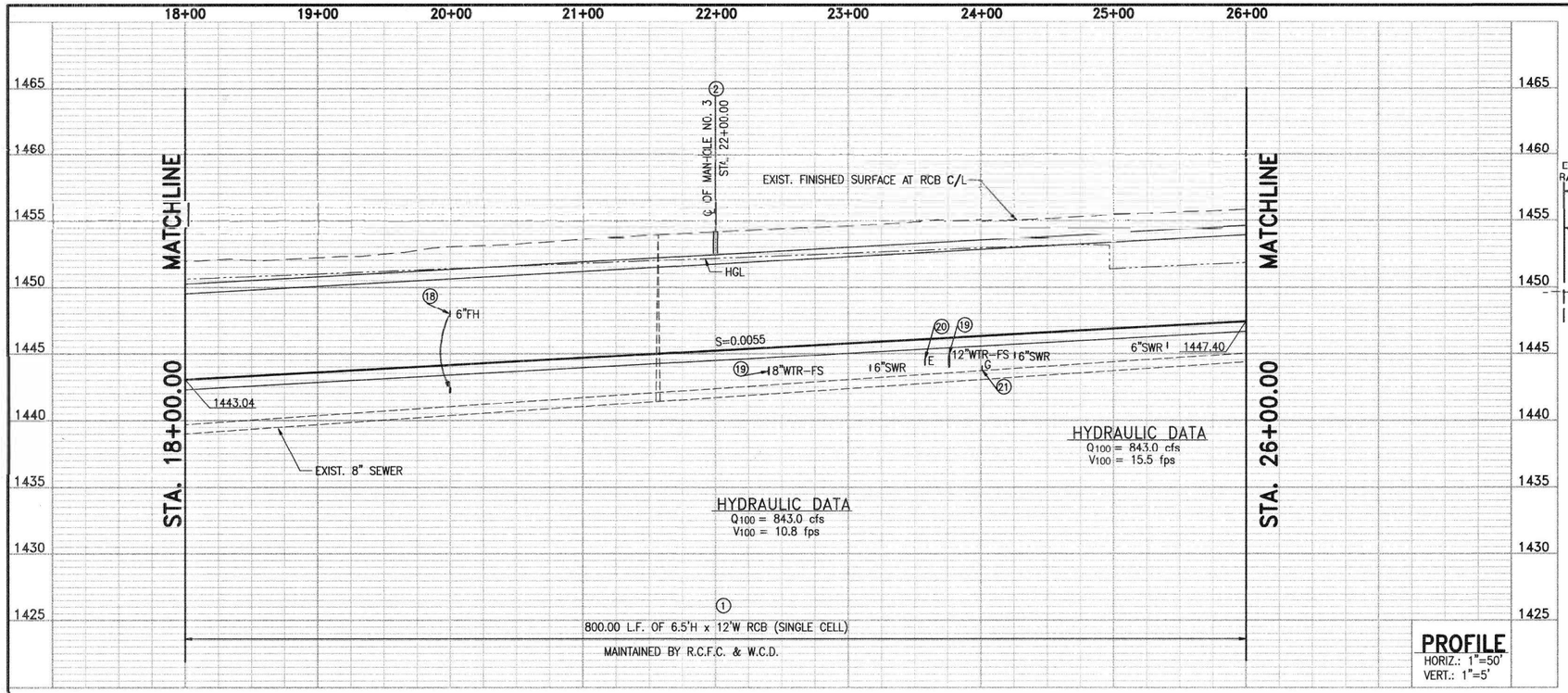
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/28/07
APPROVED BY: Stuart E. McKibbin DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 10+92.52~BC TO STA. 18+00.00

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 2 OF 25

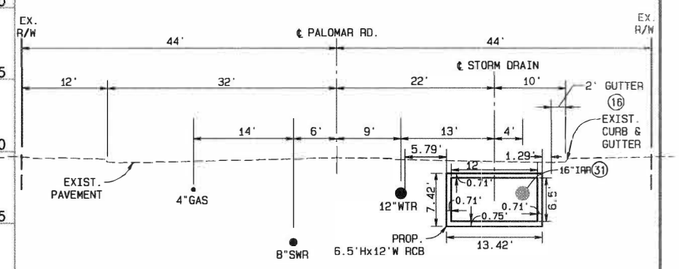
98

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PROFILE
HORIZ.: 1"=50'
VERT.: 1"=5'

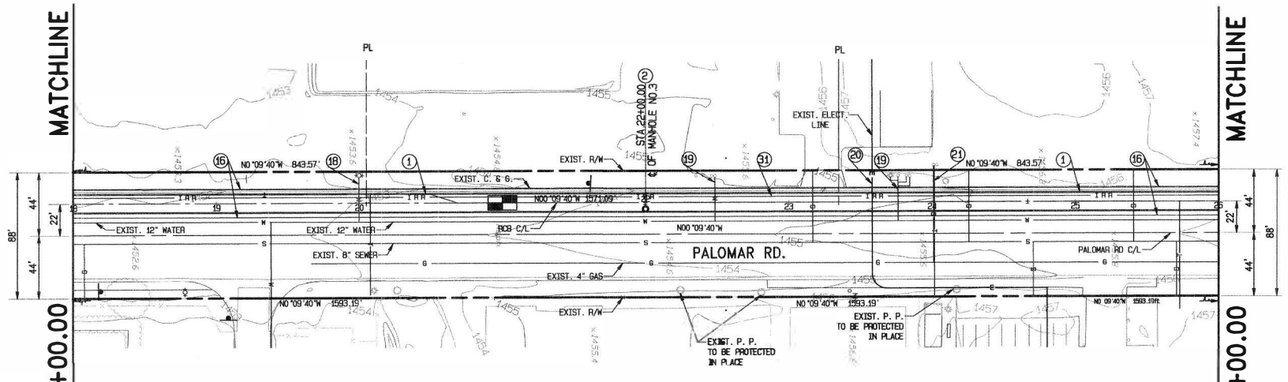
NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE CHANNEL UNLESS OTHERWISE NOTED.



SECTION AT STA. 21+00.00

TYPICAL FROM 18+00.00 TO 26+00.00

GRAPHIC SCALE 1"=10'
0 10 20 30



CONSTRUCTION NOTES

1. CONSTRUCT 6.5'Hx12.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
2. CONSTRUCT MANHOLE NO. 3 PER RCFCWCD STD. DWG. MH253
18. EXISTING IMPROVEMENTS TO BE REMOVED AND REPLACED
18. EXISTING 6" FIRE HYDRANT CONNECTION TO BE REMOVED AND REPLACE
19. EXISTING FIRE SERVICE TO BE REMOVED AND REPLACED AS SHOWN
20. EXISTING ELECTRIC LINE TO BE REMOVED AND REPLACED **BY SCE**
21. EXISTING GAS LATERAL RELOCATED AS SHOWN BY OTHERS
31. EXISTING 16" IRRIGATION LINE TO BE REMOVED

PLAN

GRAPHIC SCALE 1"=50'
0 50 100 150

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY 12/18/07
DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. WILGENBUSH NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	PB 248880 REVISIONS		

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

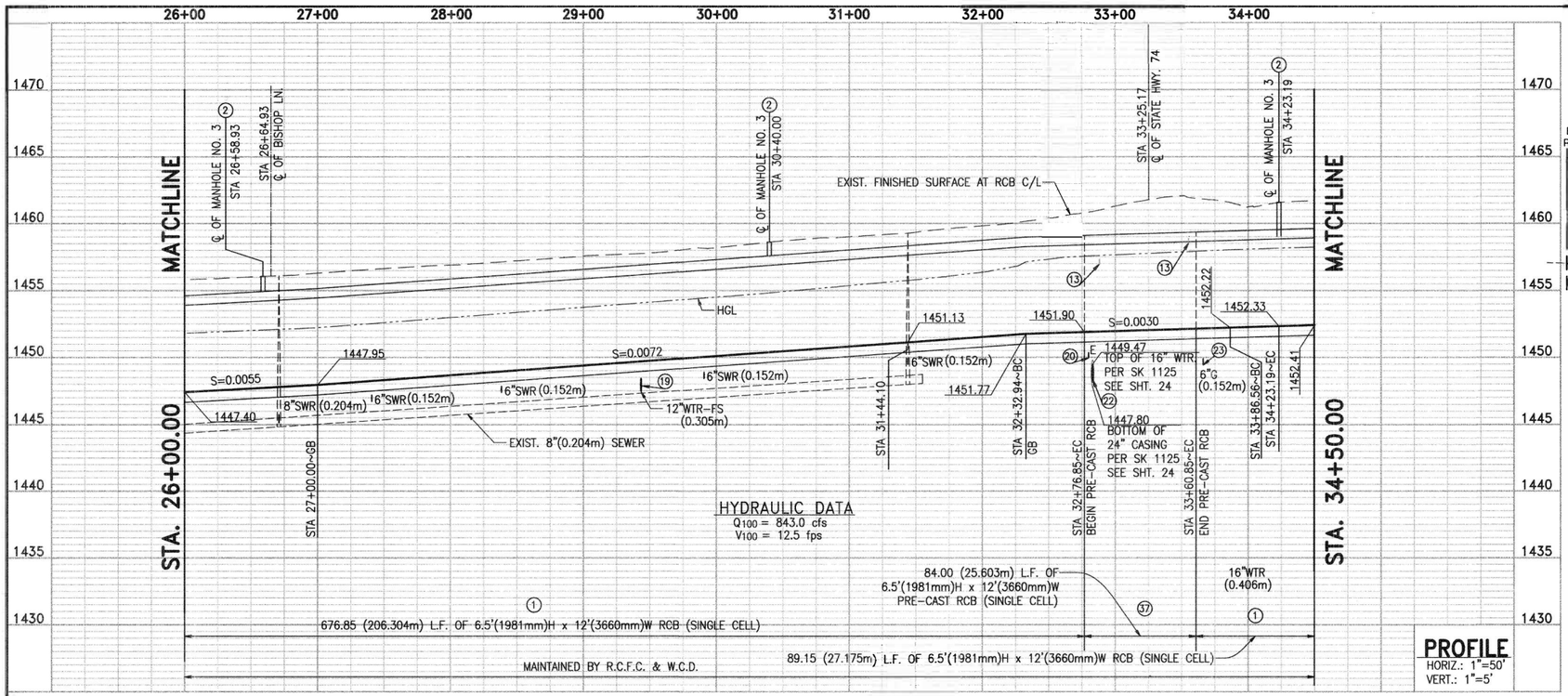
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 18+00.00 TO STA. 26+00.00

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 3 OF 25

IP 050154 MS 4051

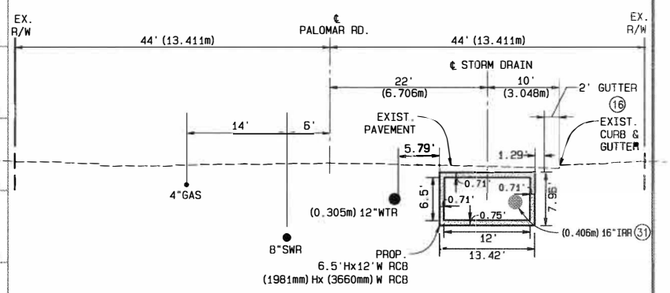
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PROFILE

HORIZ.: 1"=50'
VERT.: 1"=5'

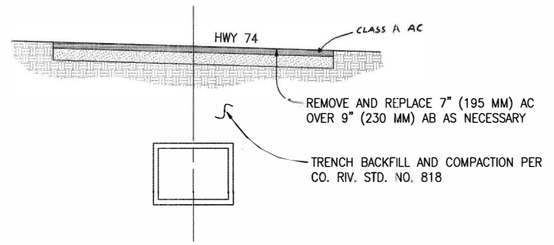
NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE CHANNEL UNLESS OTHERWISE NOTED.



SECTION AT STA. 29+00.00

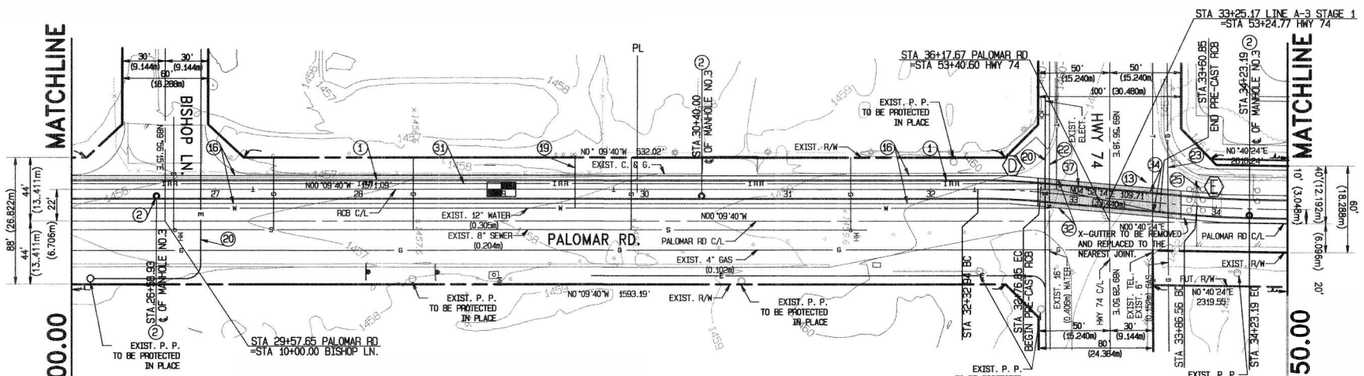
TYPICAL FROM 26+00.00 TO 32+32.94

GRAPHIC SCALE 1"=10'
0 10 20 30



SECTION AT STA. 33+25.17

N.T.S.



PLAN

GRAPHIC SCALE 1"=50'
0 50 100 150

CONSTRUCTION NOTES

1. CONSTRUCT 6.5'(1981mm)Hx12.0'(3660mm)W RCB (SINGLE CELL) PER CALTRANS STD. D80
2. CONSTRUCT MANHOLE NO. 3 PER RCFCWCD STD. DWG. MH253
13. EXISTING TELEPHONE LINE TO BE REMOVED & REPLACED BY OTHERS
16. EXISTING IMPROVEMENTS TO BE REMOVED AND REPLACED
19. EXISTING FIRE SERVICE TO BE REMOVED AND REPLACED AS SHOWN
20. EXISTING ELECTRIC LINE TO BE REMOVED AND REPLACED BY SCE
22. EXISTING 16"(0.406m) WATER LINE TO BE RELOCATED PER SK-1125 SEE SHEET 24
23. EXISTING 6"(0.152m) GAS LINE RELOCATED BY OTHERS AS SHOWN
25. EXISTING TRAFFIC SIGNAL DETECTOR SENSORS TO BE REMOVED AND REPLACED
31. EXISTING 16"(0.406m) IRRIGATION LINE TO BE REMOVED
32. REMOVE AND REPLACE 7" (195 MM) AC OVER 9" (230 MM) AB AS NECESSARY PER SECTION HEREON
57. INSTALL PRE-CAST 6.5'(1981mm)Hx12.0'(3660mm)W RCB (SINGLE CELL) PER DETAIL ON SHT. NO. 20

℄ CURVE DATA (D)

Δ = 05°01'54"
R = 500.00' (152.400m)
T = 21.97' (6.697m)
L = 43.91' (13.384m)
BC = STA. 32+32.94
EC = STA. 32+76.85

℄ CURVE DATA (E)

Δ = 04°11'50"
R = 500.00' (152.400m)
T = 18.32' (5.584m)
L = 36.63' (11.165m)
BC = STA. 33+86.56
EC = STA. 34+23.19

CALTRANS PERMIT NUMBER: 08-05-N-MC-0356
IP 050154 MS 4051

SEAL-COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY: 12/18/07 DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
P8/248880	REVISIONS		

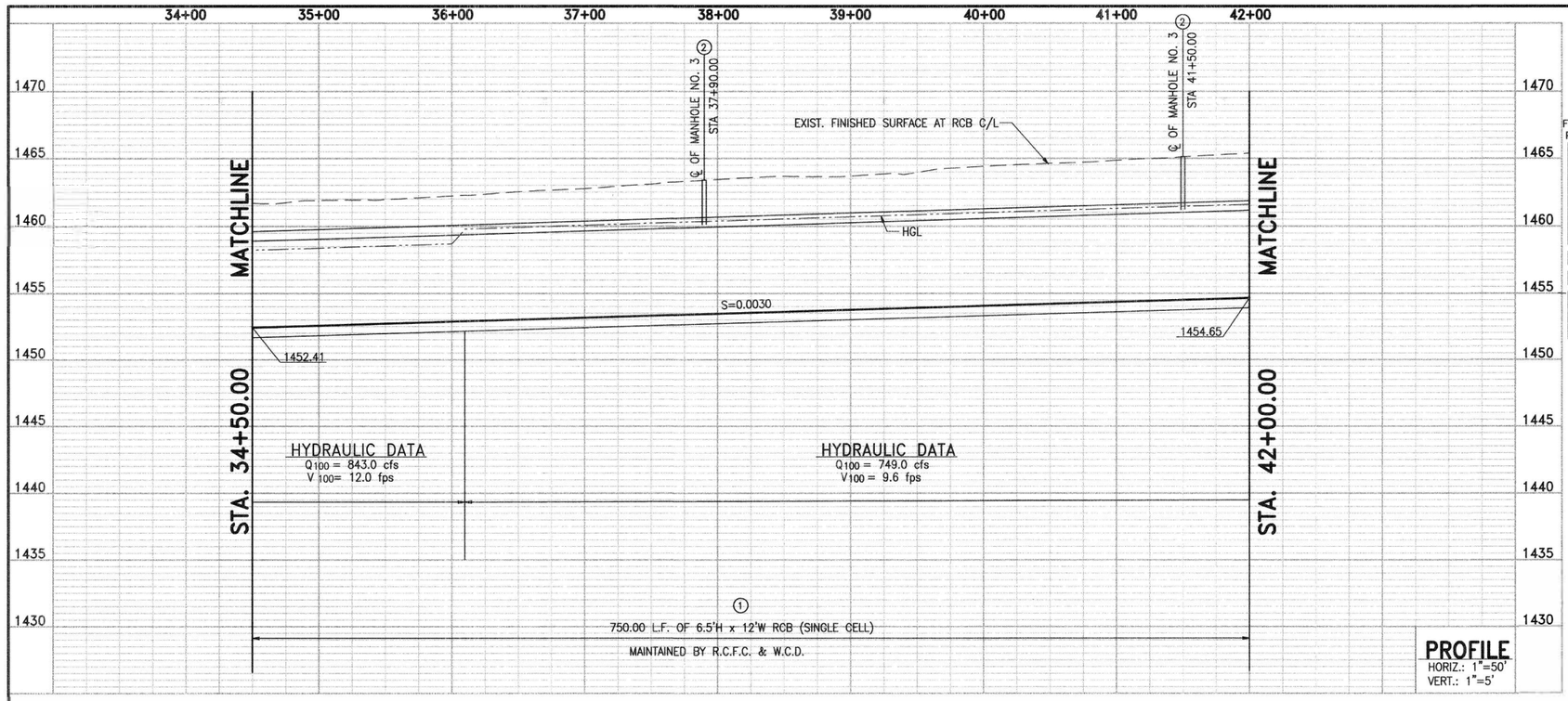
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 26+00.00 TO STA. 34+50.00

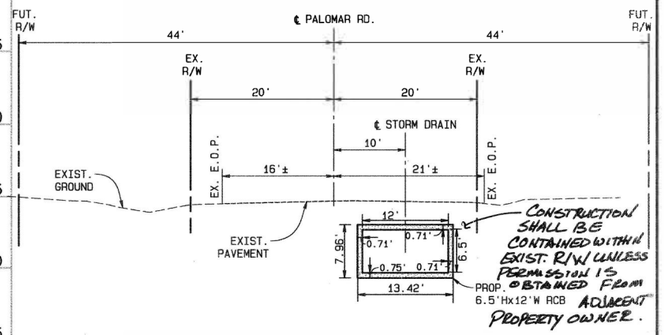
PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 4 OF 25

G:\2003\03-0338\DWG&PRO\03338LINE_A3.prn 12/10/2007



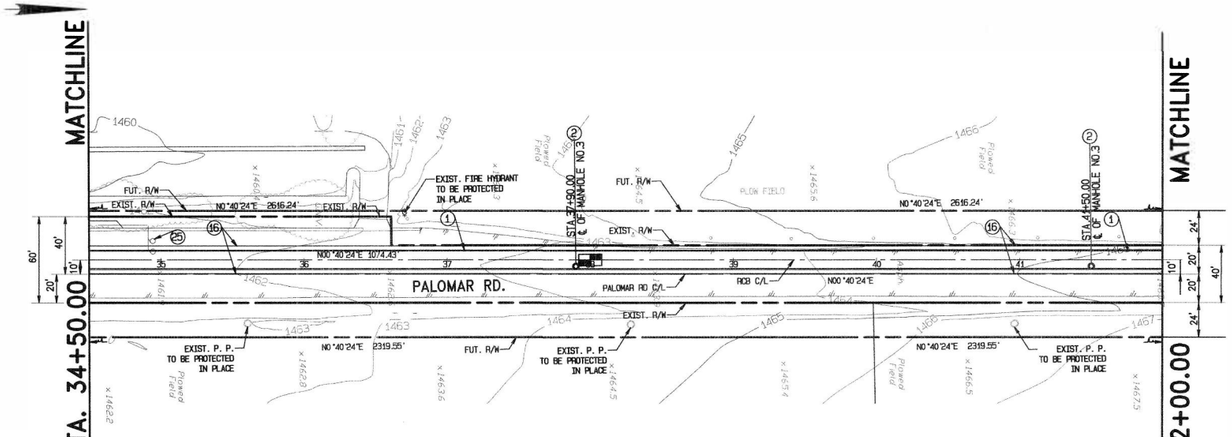
PROFILE
HORIZ.: 1"=50'
VERT.: 1"=5'

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



SECTION AT STA. 38+00.00
TYPICAL FROM 34+50.00 TO 42+00.00

GRAPHIC SCALE 1"=10'
0 10 20 30



CONSTRUCTION NOTES

1. CONSTRUCT 6.5'Hx12.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
2. CONSTRUCT MANHOLE NO. 3 PER RCFCWCD STD. DWG. MH253
16. EXISTING IMPROVEMENTS TO BE REMOVED AND REPLACED AS NECESSARY
25. EXISTING TRAFFIC SIGNAL DETECTOR SENSORS TO BE REMOVED AND REPLACED AS NECESSARY

PLAN
GRAPHIC SCALE 1"=50'
0 50 100 150

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07 DATE
ALAN D. FRENCH, P.E.
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY 12/18/07 DATE

RECORD DRAWING
APPROVED BY
DATE

IP 050154 MS 4051

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12/3/07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	PB/248&60 REVISIONS		

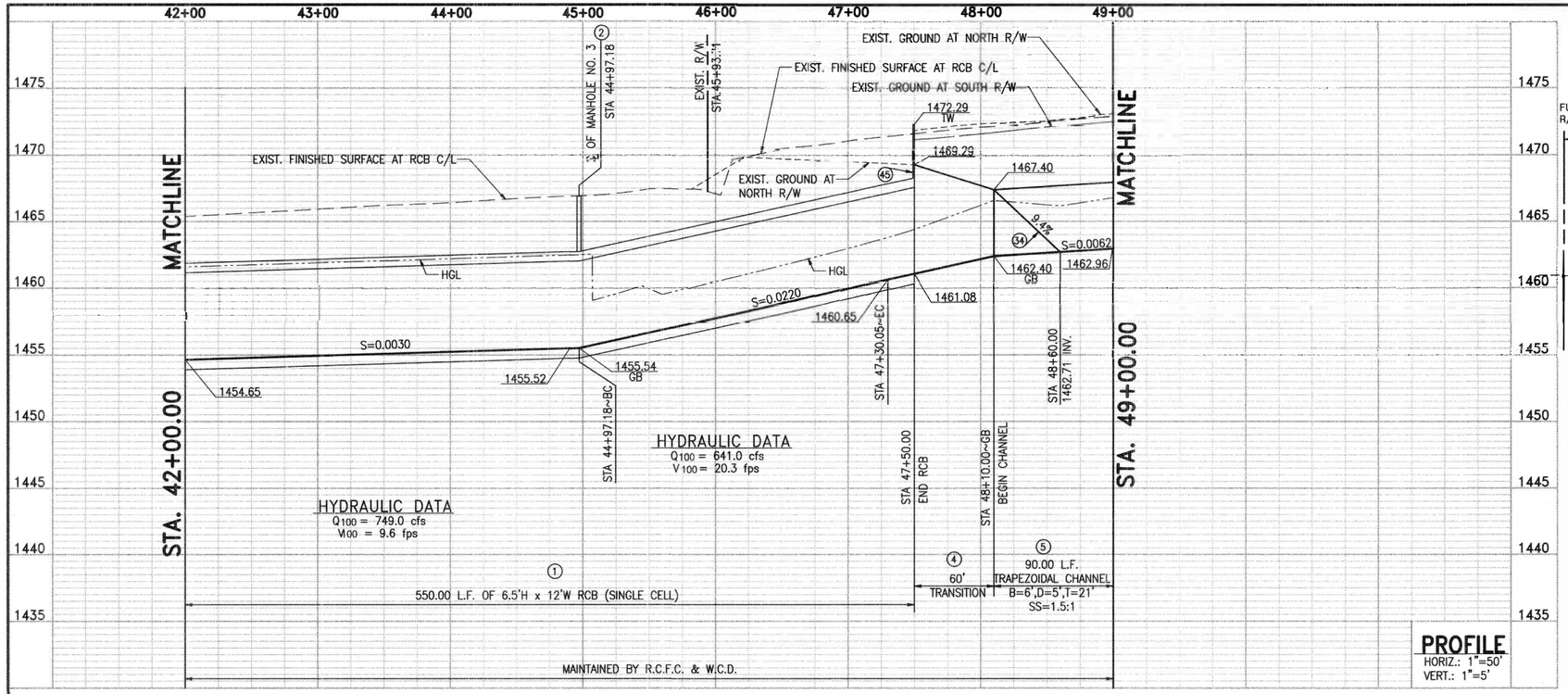
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 34+50.00 TO STA. 42+00.00

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 5 OF 25

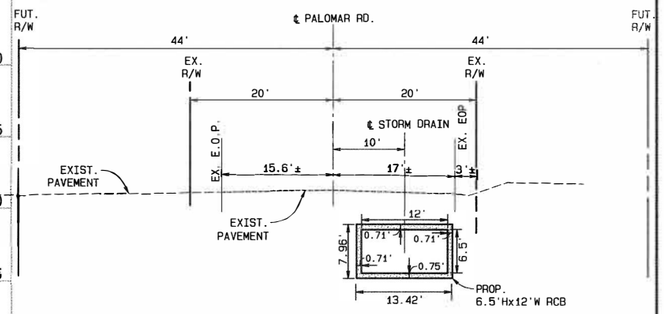
G:\2003\03-0338\DWG&PRO\03338LINE_A3.pro 12/10/2007



PROFILE

HORIZ.: 1"=50'
VERT.: 1"=5'

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

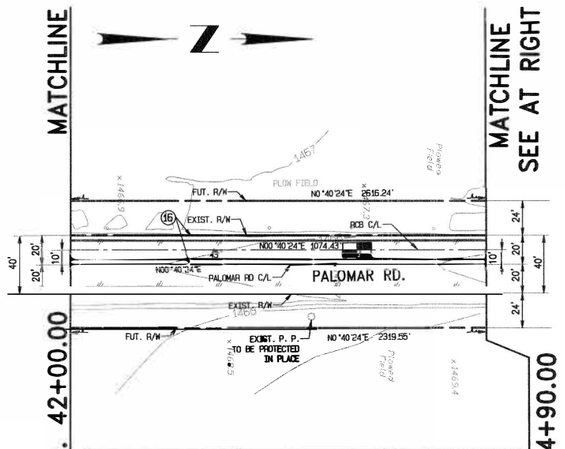


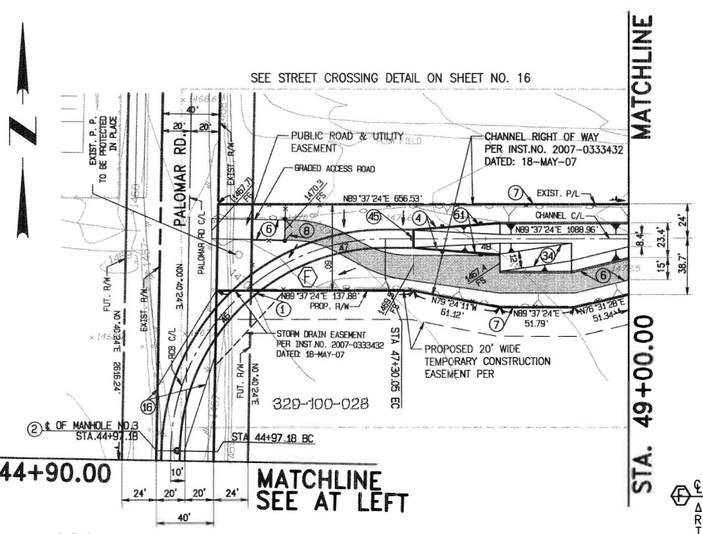
SECTION AT STA. 44+00.00

TYPICAL FROM 42+00.00 TO 44+97.18

GRAPHIC SCALE 1"=10'

0 10 20 30





PLAN

GRAPHIC SCALE 1"=50'

0 50 100 150

CONSTRUCTION NOTES

1. CONSTRUCT 6.5'Hx12.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
2. CONSTRUCT MANHOLE NO. 3 PER RCFCWCD STD. DWG. MH253
4. CONSTRUCT TRANSITION STRUCTURE PER RCFCWCD STD. DWG. CH329 AND DETAIL ON SHEET NO. 15
5. CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
6. INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
7. INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
8. INSTALL 14' DOUBLE DRIVE GATE PER RCFCWCD STD. DWG. M801
16. EXISTING IMPROVEMENTS TO BE REMOVED AND REPLACED AS NECESSARY.
34. CONSTRUCT MAINTENANCE RAMP FOR TRAPEZOIDAL CHANNEL PER STD. CH330
45. CONSTRUCT PARAPET WALL PER CALTRANS STD. D82 AND DETAIL ON SHEET NO. 16
51. CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47

℄ CURVE DATA

A = 88°57'00"
R = 150.00'
T = 147.28'
L = 232.87'
BC = STA. 44+97.18
EC = STA. 47+30.05

SEAL-COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12.18.07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY 12/18/07 DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: 12-13-07 DATE
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/248680 REVISIONS		

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

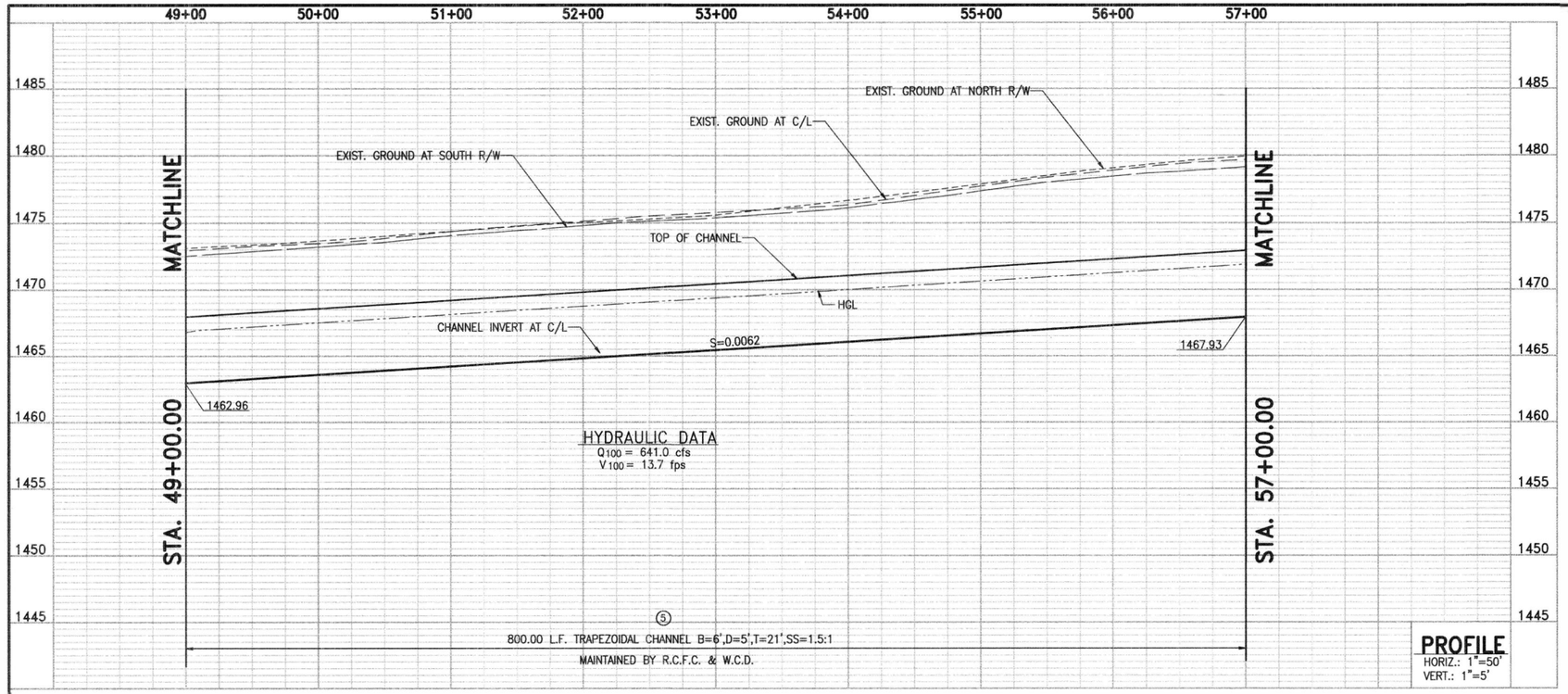
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

IP 050154 MS 4051

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 42+00.00 TO STA. 49+00.00

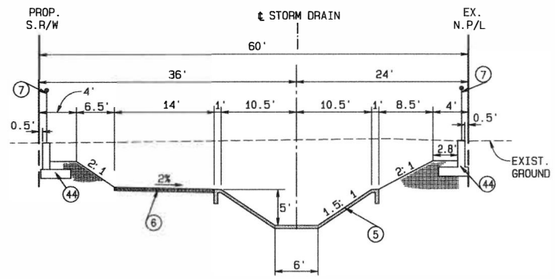
PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 6 OF 25

G:\2003\03-0338\DWG&PRO\03338LINE_A3.pro12/10/2007



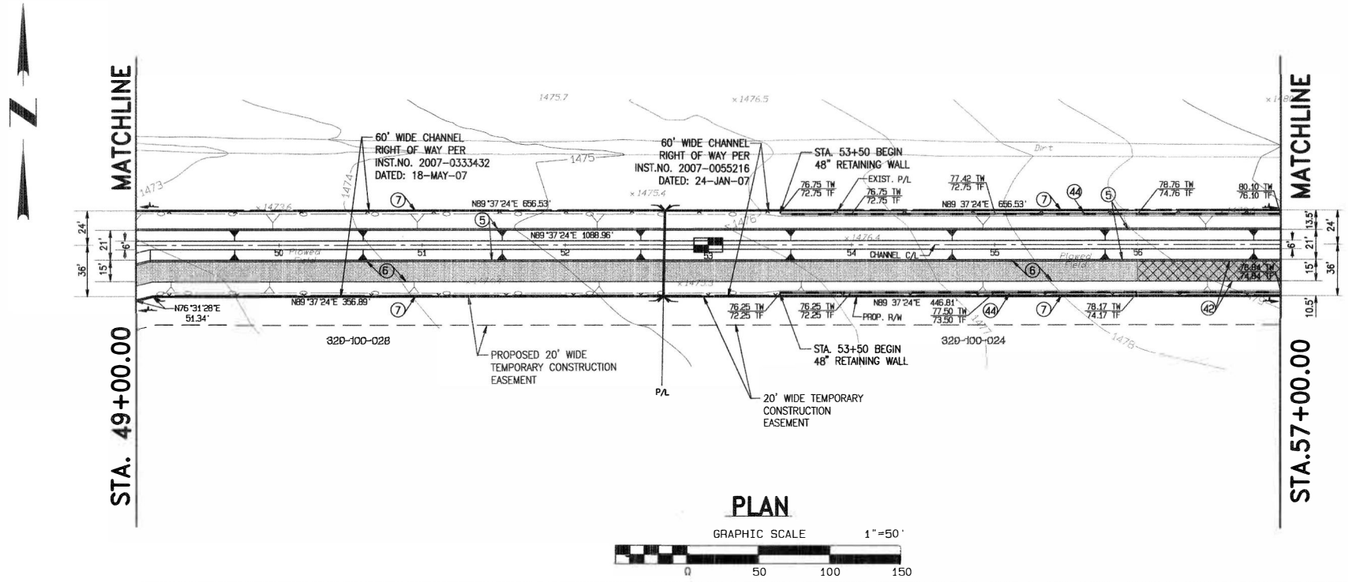
PROFILE
HORIZ.: 1"=50'
VERT.: 1"=5'

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



SECTION AT STA. 53+00.00
TYPICAL FROM 49+00.00 TO 57+00.00

GRAPHIC SCALE 1"=10'
0 10 20 30



PLAN
GRAPHIC SCALE 1"=50'
0 50 100 150

CONSTRUCTION NOTES

⑤ CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
⑥ INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
⑦ INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
㊷ CONSTRUCT 6" THICK PC CONCRETE ON 14' ACCESS ROAD AS SHOWN ON PLAN
㊹ CONSTRUCT RETAINING WALL (H=4') PER CITY OF RIVERSIDE STD. NO. 708.

RECORD DRAWINGS
IP 050154 MS 4051

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRAND NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	PB/248880 REVISIONS		

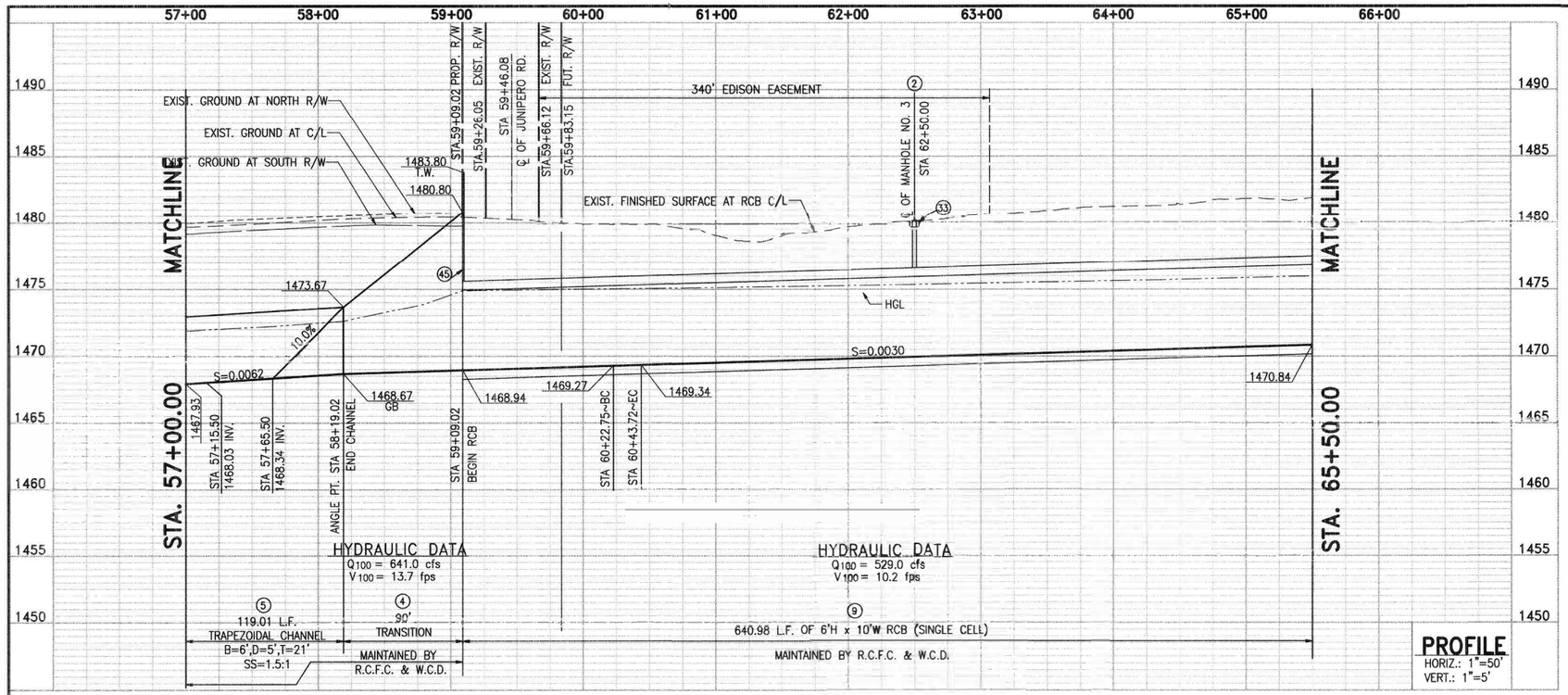
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: Stuart E. McKibbin DATE: 1-3-2008

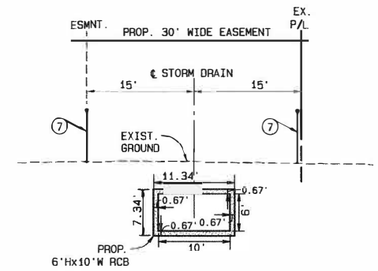
ROMOLAND MDP
LINE A-3 STAGE 1
STA. 49+00.00 TO STA. 57+00.00

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 7 OF 25

G:\2003\03-0338\DWG&PRO\0338LINE_A3.pro 12/10/2007



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



SECTION AT STA. 63+00.00

TYPICAL FROM 60+43.77 TO STA. 65+50.00

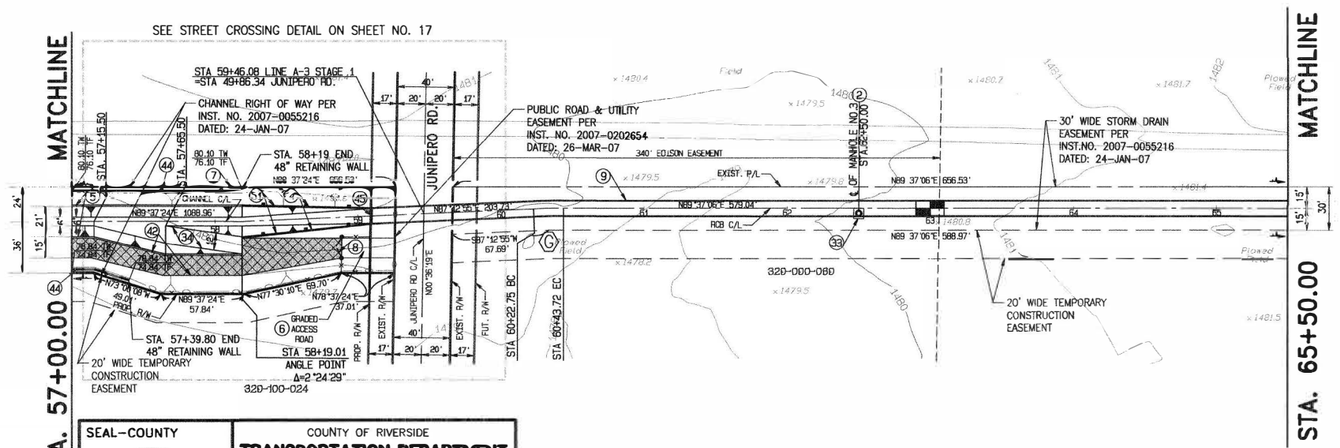
GRAPHIC SCALE 1"=10'

0 10 20 30

RECORD DRAWINGS

APPROVED BY

DATE



PLAN

GRAPHIC SCALE 1"=50'

0 50 100 150

CONSTRUCTION NOTES

(2) CONSTRUCT MANHOLE NO. 3 PER RCFCWCD STD. DWG. MH253
(4) CONSTRUCT TRANSITION STRUCTURE PER RCFCWCD STD. DWG. CH329 AND DETAIL ON SHEET NO. 15
(5) CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
(6) INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
(7) INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
(8) INSTALL 14' DOUBLE DRIVE GATE PER RCFCWCD STD. DWG. M801
(9) CONSTRUCT 6.0'H x 10.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
(33) CONSTRUCT 7'x7'x6" CONCRETE APRON WITH NO. 4 BARS AT 18" EACH WAY
(34) CONSTRUCT MAINTENANCE RAMP FOR TRAPEZOIDAL CHANNEL PER RCFCWCD STD DWG CH330
(42) CONSTRUCT 6" THICK PC CONCRETE ON 14' ACCESS ROAD AS SHOWN ON PLAN
(44) CONSTRUCT RETAINING WALL (H=4') PER CITY OF RIVERSIDE STD. NO. 708.
(45) CONSTRUCT PARAPET WALL PER CALTRANS STD. D82 AND DETAIL ON SHEET NO. 16
(51) CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47

℄ CURVE DATA

Δ = 02°24'12"
R = 500.00'
T = 10.49'
L = 20.97'
BC = STA. 60+22.75
EC = STA. 60+43.72

SEAL-COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY DATE 12/18/07

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12/3/07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
P8/248660	REVISIONS		

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

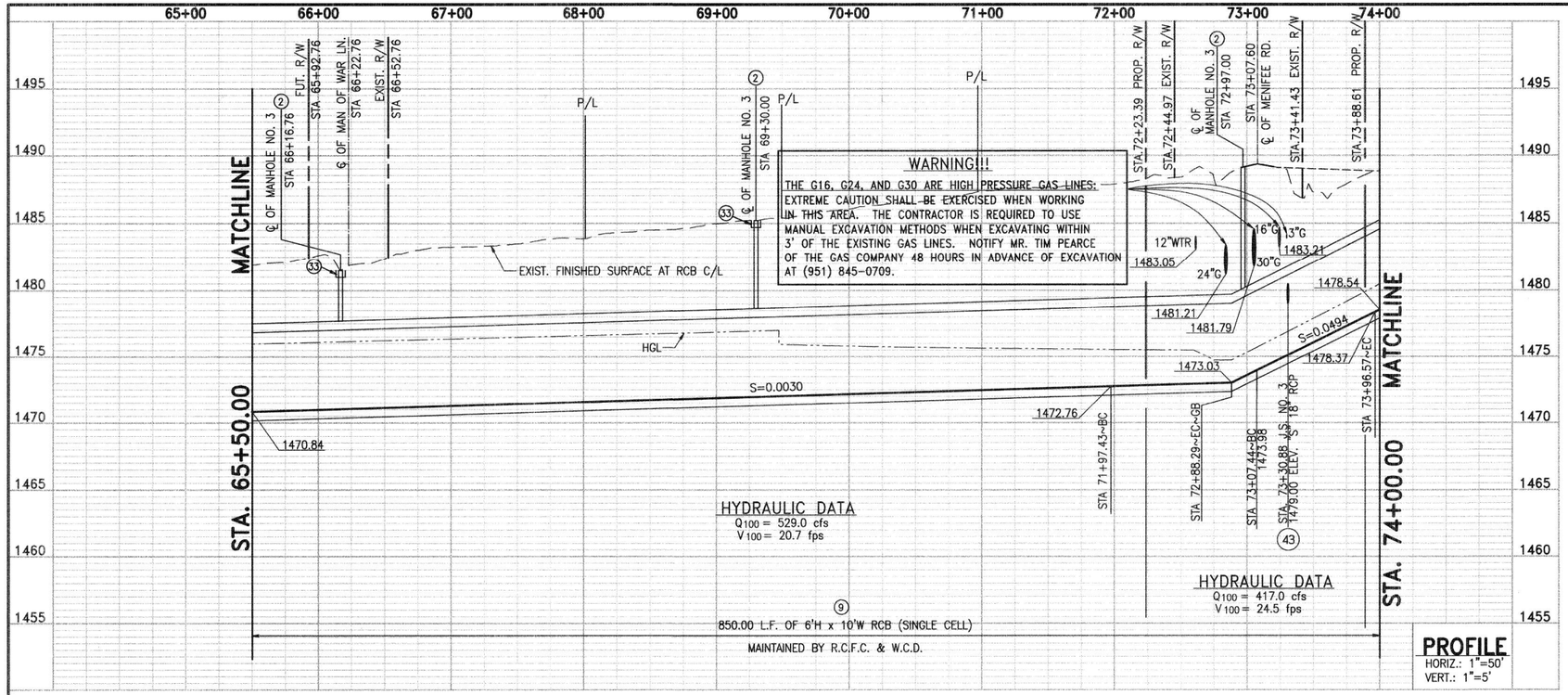
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: Stuart E. McKibbin DATE: 1-3-2008

IP 050154 MS 4051

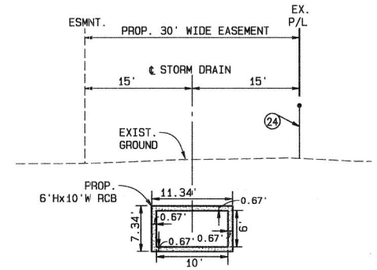
ROMOLAND MDP
LINE A-3 STAGE 1
STA. 57+00.00 TO STA. 65+50.00

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 8 OF 25

G:\2003\03-0338\DWG&PRO\0338LINE_A3.pro 12/10/2007



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

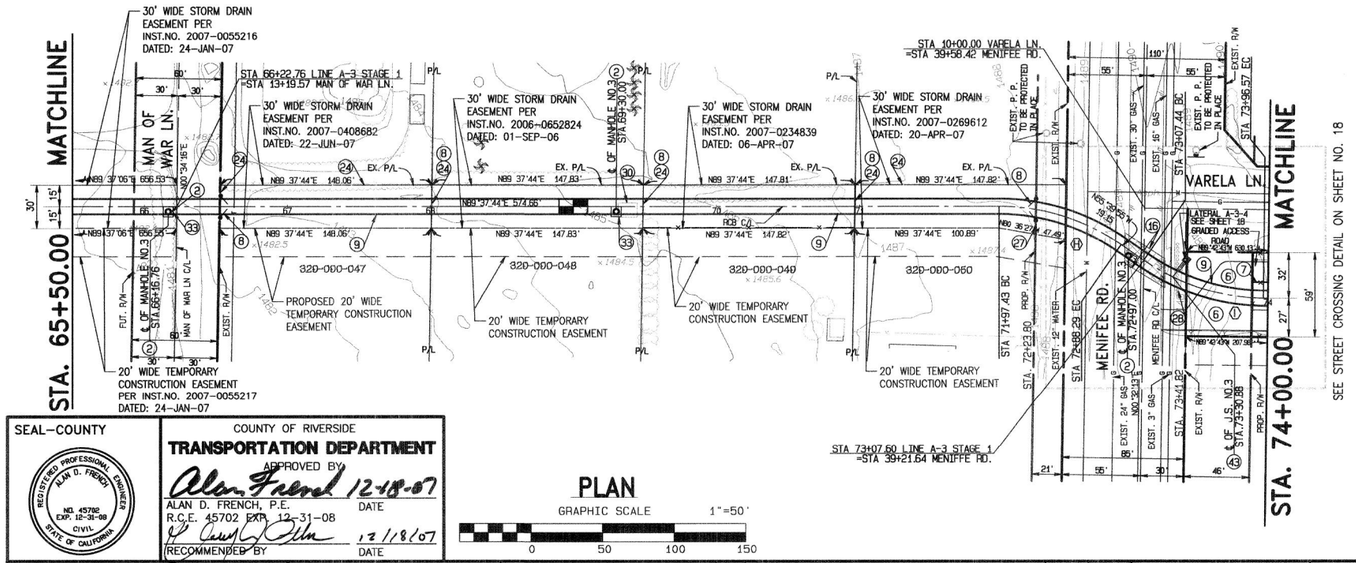


SECTION AT STA. 69+00.00

TYPICAL FROM 66+53.18 TO 71+97.87

GRAPHIC SCALE 1"=10'

0 10 20 30



PLAN

GRAPHIC SCALE 1"=50'

0 50 100 150

CONSTRUCTION NOTES

(2) CONSTRUCT MANHOLE NO. 3 PER RCFCWCD STD. DWG. MH253
(6) INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
(7) INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
(8) INSTALL 6' DOUBLE WING GATE PER RCFCWCD STD. DWG. M801
(9) CONSTRUCT 6.0'H x 10.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
(16) EXISTING IMPROVEMENTS TO BE REMOVED AND REPLACED AS NECESSARY
(24) EXISTING GATE AND/OR CHAINLINK TO BE REMOVED AND REPLACED
(27) EXISTING CHAINLINK AND WOOD FENCES TO BE REMOVED AND REPLACED AS NECESSARY
(28) EXISTING MAILBOXES TO BE REMOVED AND REPLACED AS NECESSARY
(30) EXISTING SHED TO BE RELOCATED
(33) CONSTRUCT 7'x7'x6" CONCRETE APRON
(43) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCWCD STD. DWG. JS228

(H) ℄ CURVE DATA

Δ = 34°42'21"
R = 150.00'
T = 46.87'
L = 90.86'
BC = STA. 71+97.43
EC = STA. 72+88.29

(I) ℄ CURVE DATA

Δ = 34°02'48"
R = 150.00'
T = 45.93'
L = 89.13'
BC = STA. 73+07.44
EC = STA. 73+96.57

WARNING!!!

THE G16, G24, AND G30 ARE HIGH PRESSURE GAS LINES: EXTREME CAUTION SHALL BE EXERCISED WHEN WORKING IN THIS AREA. THE CONTRACTOR IS REQUIRED TO USE MANUAL EXCAVATION METHODS WHEN EXCAVATING WITHIN 3' OF THE EXISTING GAS LINES. NOTIFY MR. TIM PEARCE OF THE GAS COMPANY 48 HOURS IN ADVANCE OF EXCAVATION AT (951) 845-0709.

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY: 12/18/07
DATE

IP 050154 MS 4051

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070

PREPARED BY: DATE: 12-3-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
P8/248680	REVISIONS		

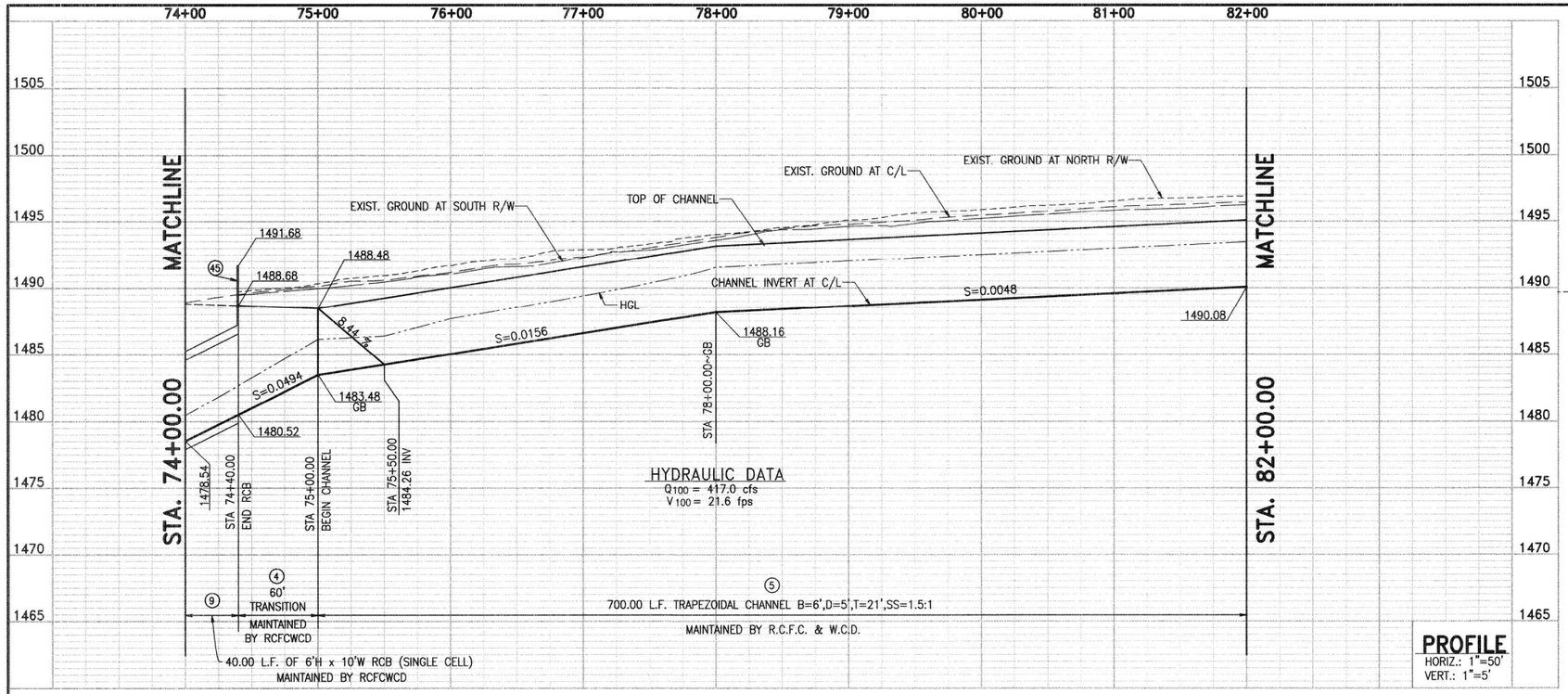
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 65+50.00 TO STA. 74+00.00

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 9 OF 25

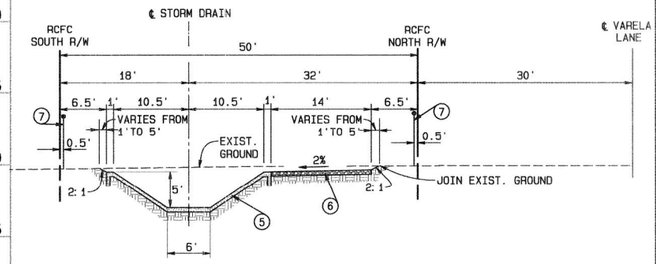
G:\2003\03-0338\DWG&PRO\0338LINE_A3.pro 12/10/2007



PROFILE

HORIZ.: 1"=50'
VERT.: 1"=5'

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

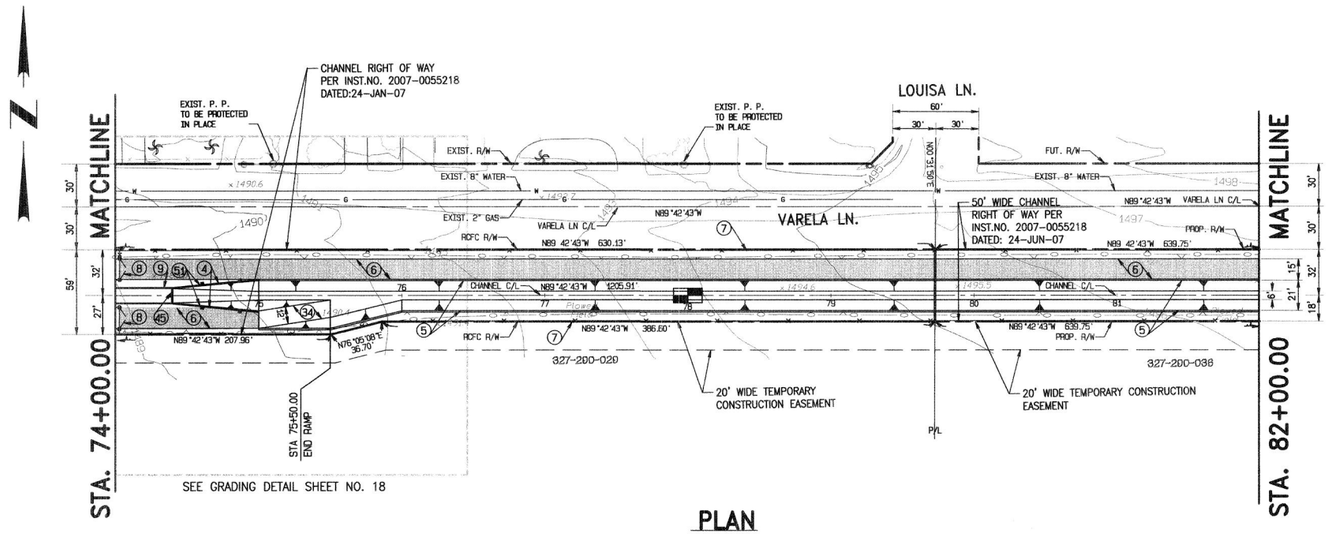


SECTION AT STA. 78+00.00

TYPICAL FROM 75+00.00 TO 82+00.00

GRAPHIC SCALE 1"=10'

0 10 20 30



PLAN

GRAPHIC SCALE 1"=50'

0 50 100 150

CONSTRUCTION NOTES

4. CONSTRUCT TRANSITION STRUCTURE PER RCFCWCD STD. DWG. CH329 AND DETAIL ON SHEET NO. 15
5. CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
6. INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
7. INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
8. INSTALL 6' DOUBLE WING GATE PER RCFCWCD STD. DWG. M801
9. CONSTRUCT 5.0'H x 10.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
34. CONSTRUCT MAINTENANCE RAMP FOR TRAPEZODIAL CHANNEL PER STD. CH330
45. CONSTRUCT PARAPET WALL PER CALTRANS STD. D82 AND DETAIL ON SHT. 16
51. CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47

RECORD DRAWINGS
APPROVED BY:
DATE:

IP 050154 MS 4051

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08
REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
PB/248&80	REVISIONS		

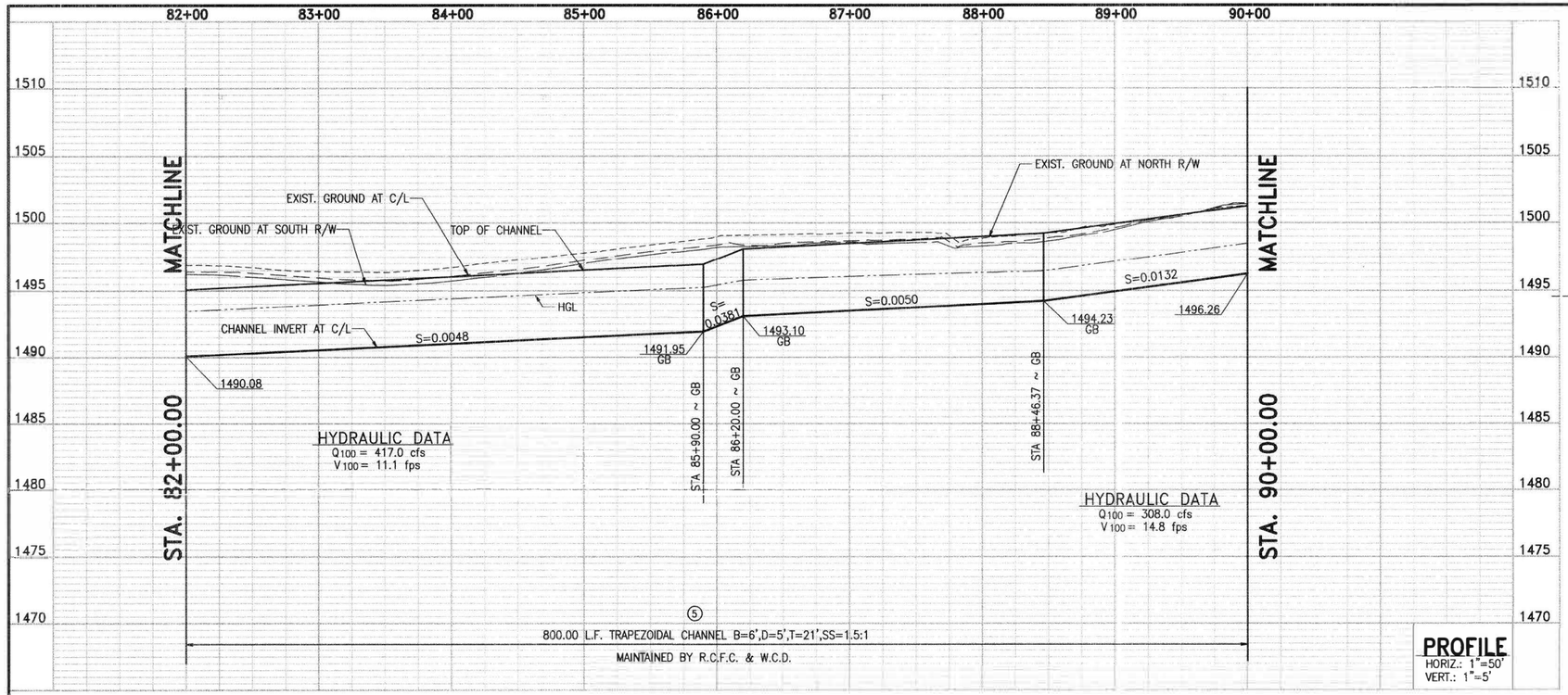
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 74+00.00 TO STA. 82+00.00

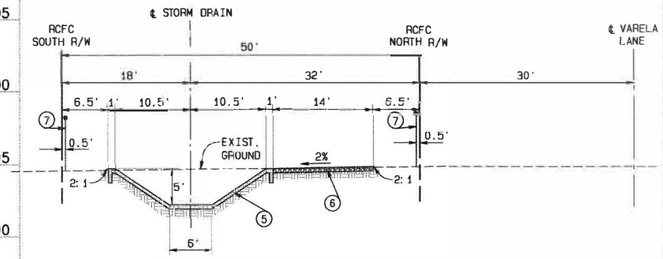
PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 10 OF 25

G:\2003\03-0338\DWG&PRO\0338LINE_A3.pro 12/10/2007



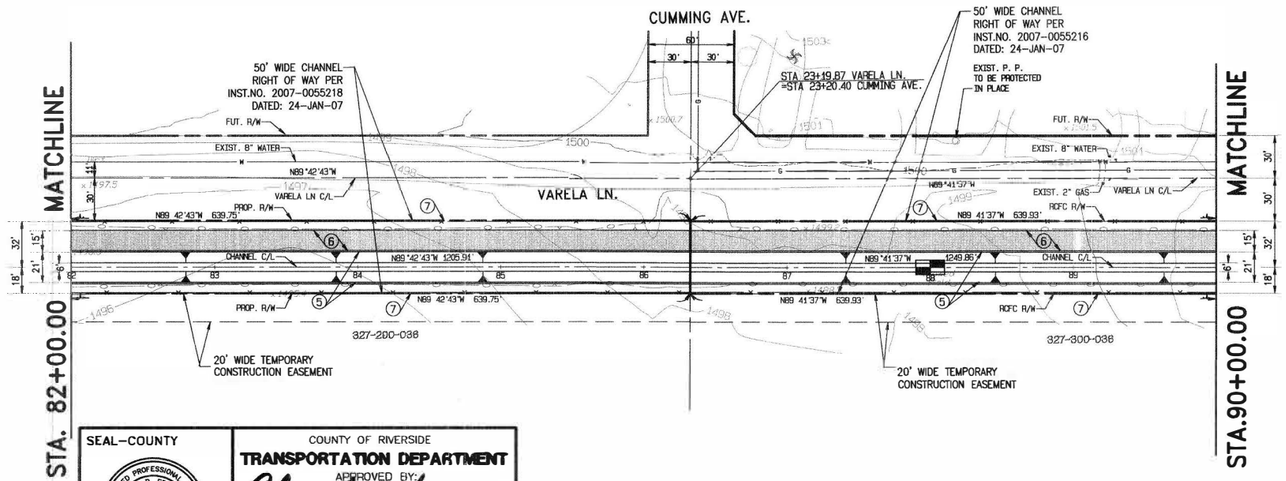
PROFILE
HORIZ.: 1"=50'
VERT.: 1"=5'

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



SECTION AT STA. 88+00.00
TYPICAL FROM 82+00.00 TO 90+00.00

GRAPHIC SCALE 1"=10'
0 10 20 30



CONSTRUCTION NOTES
⑤ CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
⑤ INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
⑦ INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801

PLAN
GRAPHIC SCALE 1"=50'
0 50 100 150

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY DATE 12/18/07

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: [signature] DATE: 12/13/07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
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ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/248680 REVISIONS		

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

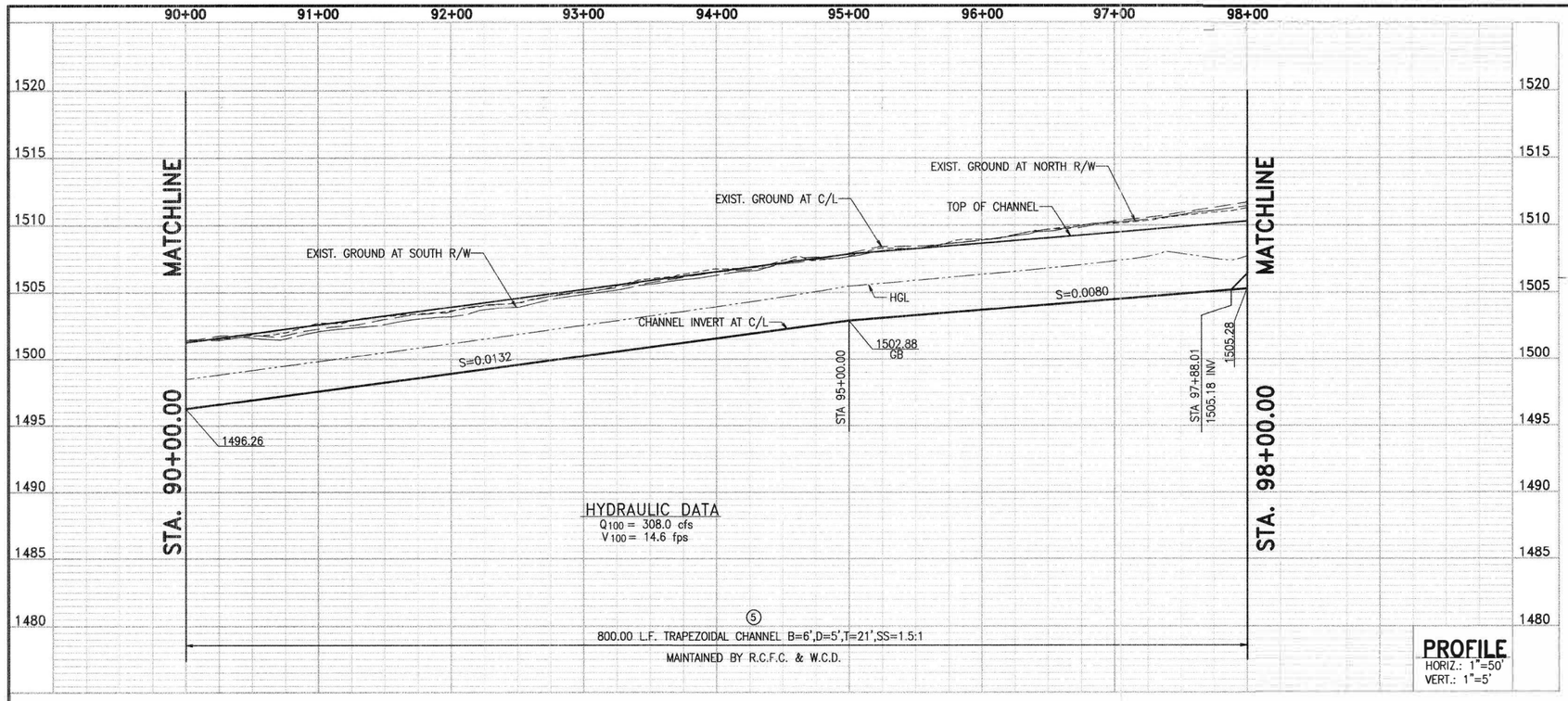
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 12/20/07
APPROVED BY: Stuart E. McKibbin DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 82+00.00 TO STA. 90+00.00

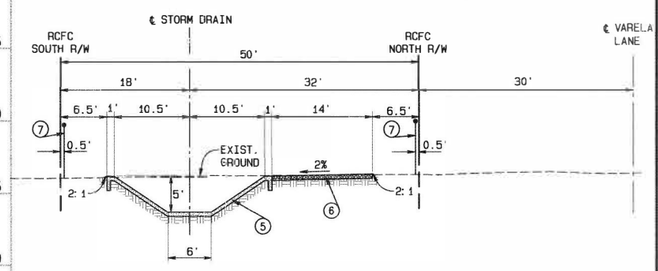
PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 11 OF 25

RE: LAD DRAWINGS
IP 050154 MS 4051

G:\2003\03-0338\DWG&PRO\0338LINE_A3.pro 12/10/2007



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

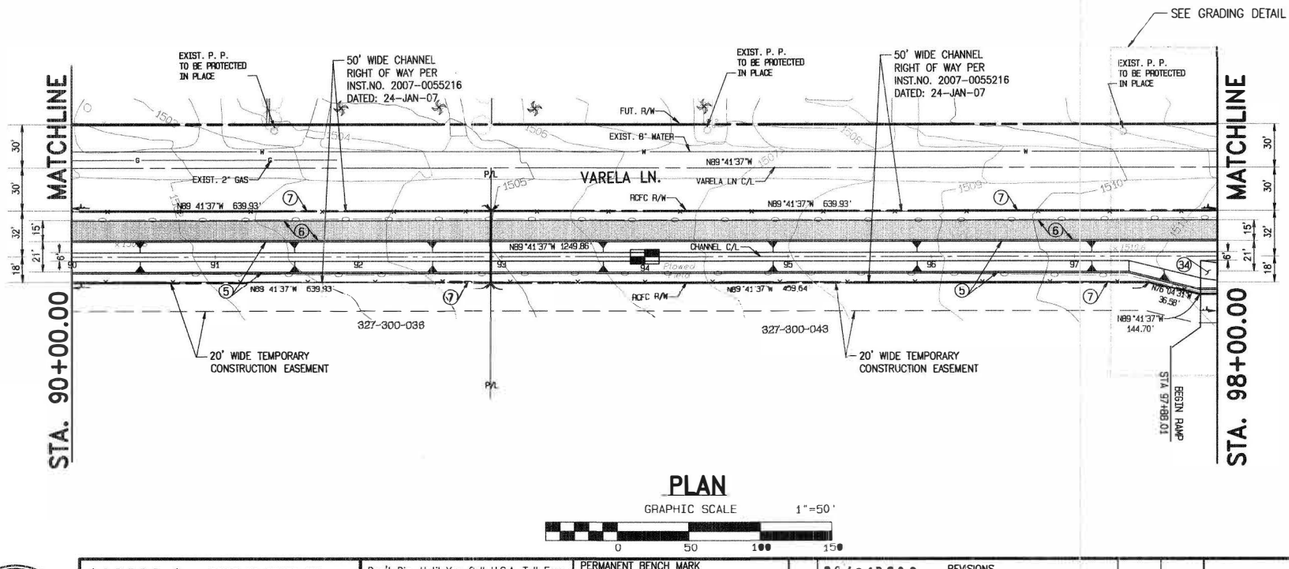


SECTION AT STA. 94+00.00

TYPICAL FROM 90+00.00 TO 98+00.00

GRAPHIC SCALE 1"=10'

0 10 20 30



PLAN

GRAPHIC SCALE 1"=50'

0 50 100 150

CONSTRUCTION NOTES

⑤ CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
⑥ INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
⑦ INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
㉞ CONSTRUCT MAINTENANCE RAMP FOR TRAPEZODIAL CHANNEL PER STD. CH330

RECORD DRAWING
APPROVED BY:
DATE:

IP 050154 MS 4051

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRAND NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 5, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
P6/248680	REVISIONS		

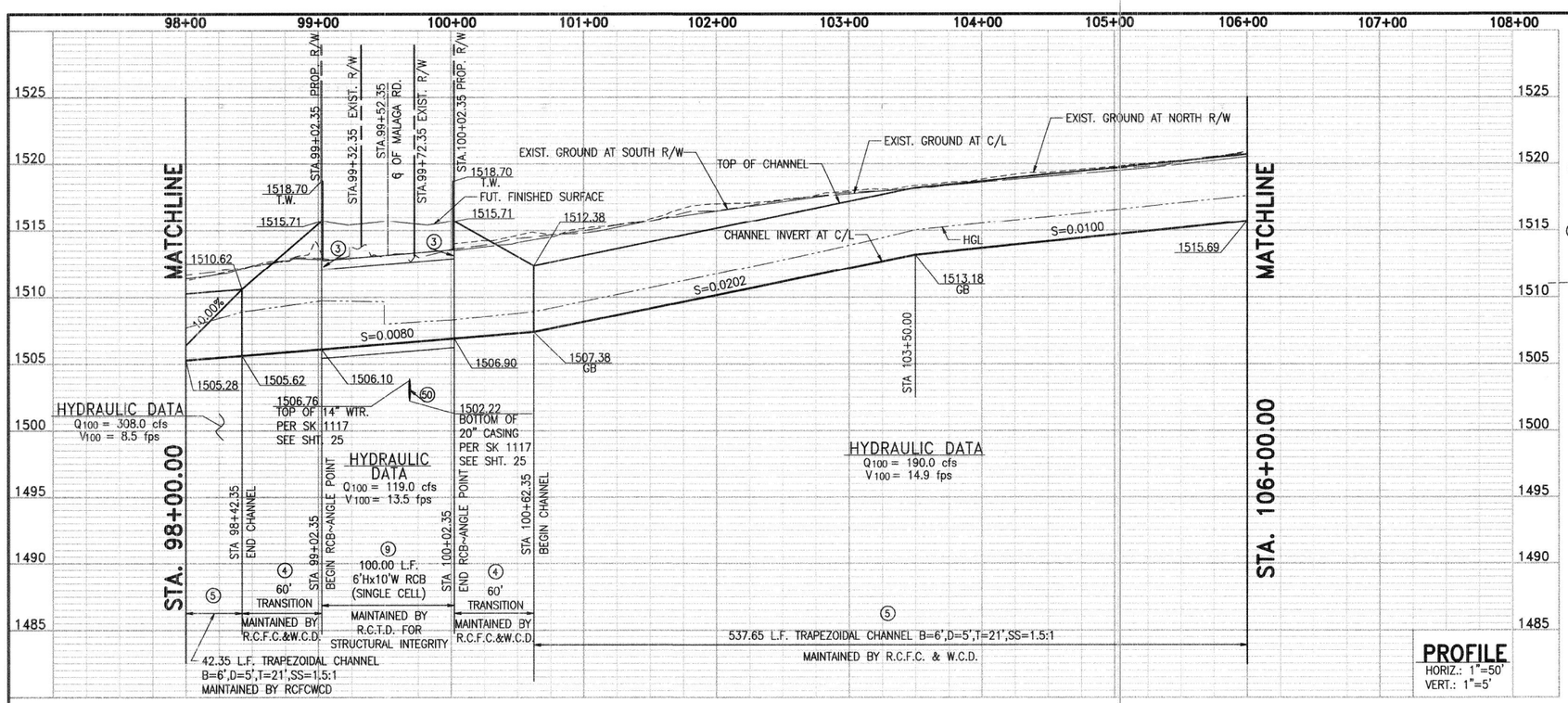
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/28/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 90+00.00 TO STA. 98+00.00

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 12 OF 25

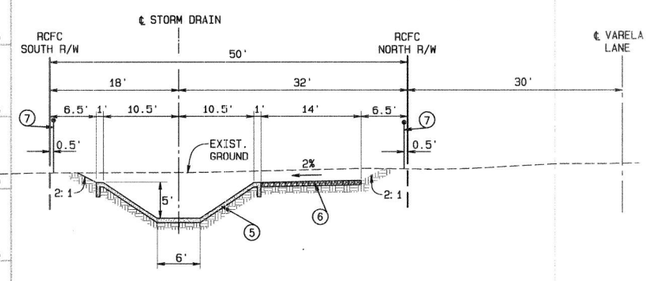
G:\2003\03-0338\DWG&PRO\0338LINE_A3.pro 12/10/2007



PROFILE

HORIZ.: 1"=50'
VERT.: 1"=5'

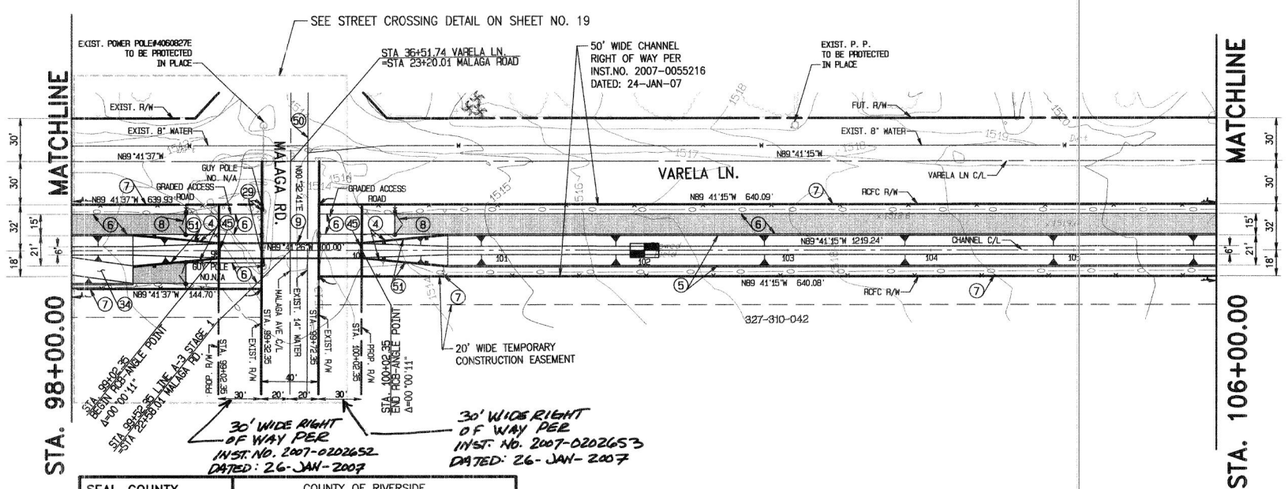
NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE CHANNEL UNLESS OTHERWISE NOTED.



SECTION AT STA. 102+00.00

TYPICAL FROM 100+62.35 TO 106+00.00

GRAPHIC SCALE 1"=10'
0 10 20 30



PLAN

GRAPHIC SCALE 1"=50'
0 50 100 150

CONSTRUCTION NOTES

(4) CONSTRUCT TRANSITION STRUCTURE PER RCFCWCD STD. DWG. CH329 AND DETAIL ON SHEET NO. 15
(5) CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
(6) INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
(7) INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
(8) INSTALL 14' DOUBLE DRIVE GATE PER RCFCWCD STD. DWG. M801
(9) CONSTRUCT 6.0'H x 10.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
(29) EXISTING GUY WIRE AND GUY POLE TO BE RELOCATED BY OTHERS
(34) CONSTRUCT MAINTENANCE RAMP FOR TRAPEZOIDAL CHANNEL PER STD. CH330
(45) CONSTRUCT PARAPET WALL PER CALTRANS STD. D82 AND DETAIL ON SHEET NO. 16
(50) EXISTING 14" WATER LINE RELOCATED, SEE SHEET No. 25 (E.M.W.D. SK-1117)
(51) CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47

RECEIVED DRAWINGS

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH No. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY: 12/18/07
DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRAND No. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

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B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY; AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND. 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN, A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
P8/248680	REVISIONS		

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

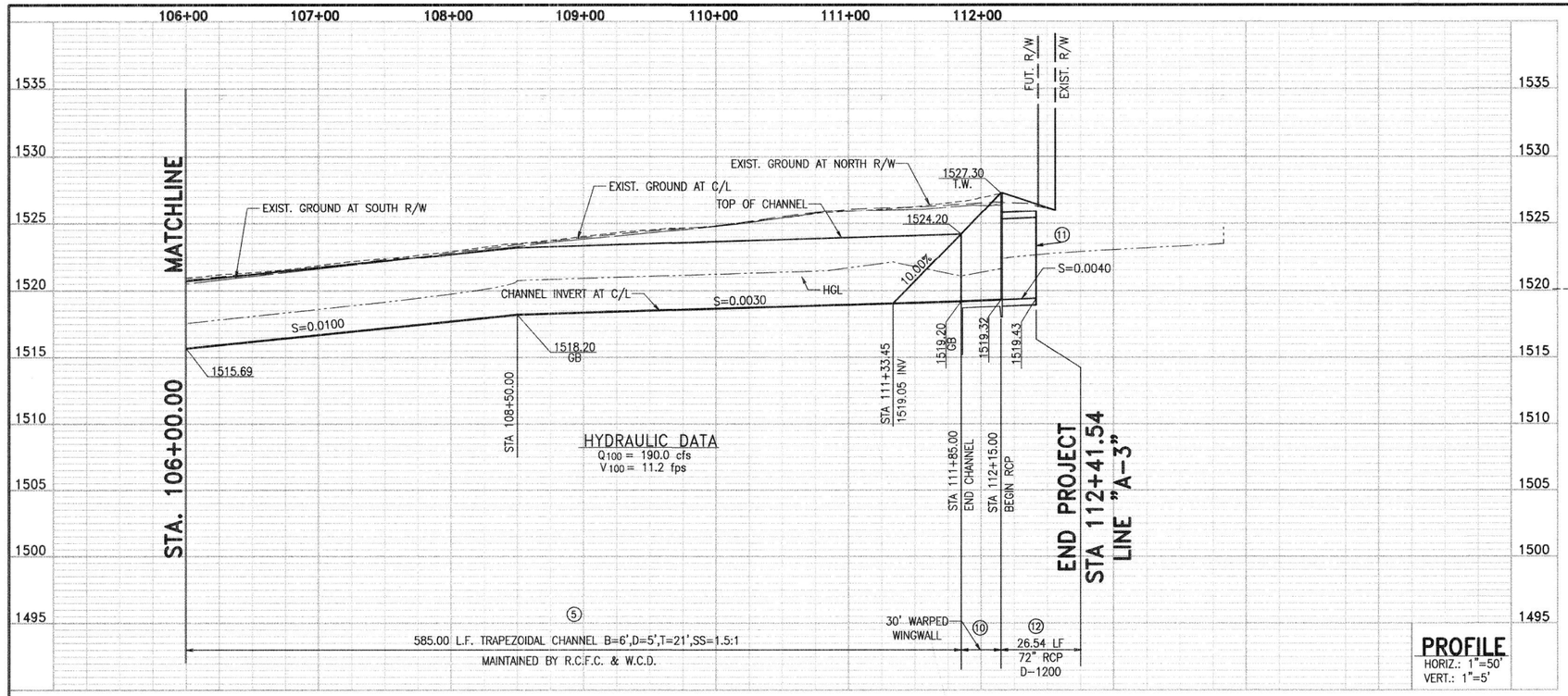
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: Gary Ohlsen DATE: 12/20/07
APPROVED BY: Stuart E. McKibbin DATE: 1-3-2008

IP 050154 MS 4051

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 98+00.00 TO STA. 106+00.00

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 13 OF 25

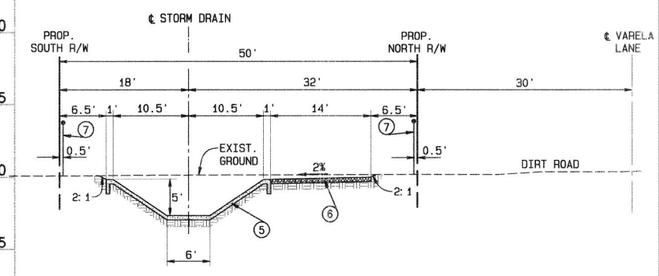
G:\2003\03-0338\DWG&PRO\0338LINE_A3.pro 12/10/2007



PROFILE

HORIZ.: 1"=50'
VERT.: 1"=5'

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



SECTION AT STA. 109+00.00

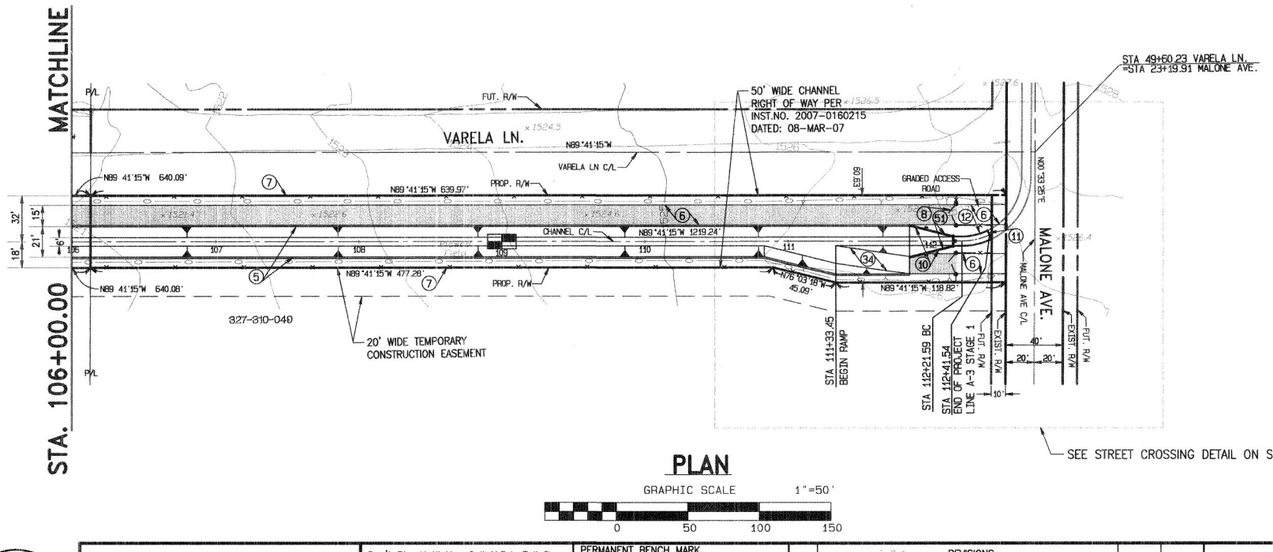
TYPICAL FROM 106+00.00 TO 112+21.97

GRAPHIC SCALE 1"=10'

0 10 20 30

CONSTRUCTION NOTES

(5) CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
(6) INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
(7) INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
(8) INSTALL 14' DOUBLE DRIVE GATE PER RCFCWCD STD. DWG. M801
(10) CONSTRUCT WARPED WINGWALL PER CALTRANS STD. D86B AND DETAIL HEREON
(11) CONSTRUCT CONCRETE BULKHEAD PER RCFCWCD STD. DWG. M816
(12) INSTALL 72" RCP (D-1200), BEDDING PER RCFCWCD STD. M815
(34) CONSTRUCT MAINTENANCE RAMP FOR TRAPEZOIDAL CANNEL PER RCFCWCD STD. DWG. CH330
(51) CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47



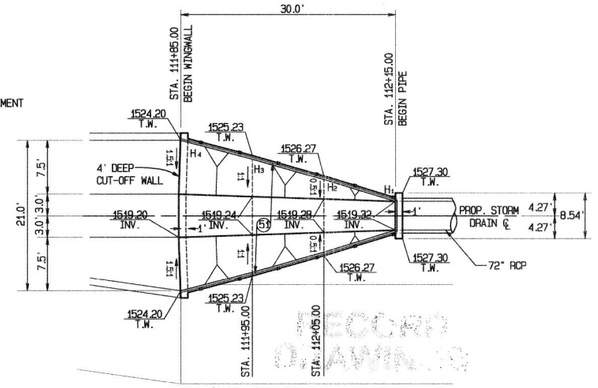
PLAN

GRAPHIC SCALE 1"=50'

0 50 100 150

NOTE:
FOR CONCRETE THICKNESS AND REINFORCEMENT SEE CALTRANS STD. PLAN D86B..

L = 30.00'
W = 3.00'
D = 6"
H_1 = 7.98'
H_2 = 6.99'
H_3 = 5.99'
H_4 = 5.00'
ANGLE = 14°02'10"



(10) WARPED WINGWALL DETAIL

SCALE 1" = 10'
FROM STA. 111+85.00 TO STA. 112+15.00

IP 050154 MS 4051

G:\2003\03-0338\DWG&PRO\0338LINE_A3.pro12/10/2007

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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ELEVATION: 1478.07

P8/246680 REVISIONS

REF.	DESCRIPTION	APPR.	DATE

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
STA. 106+00.00 TO STA. 112+21.59

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 14 OF 25

DETAIL SCHEDULE

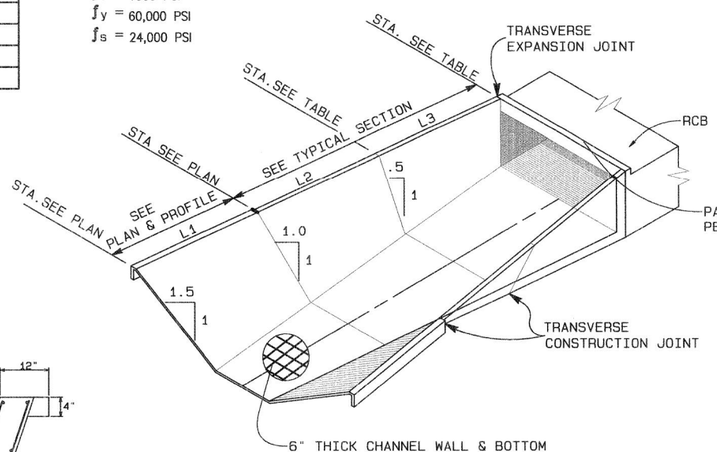
DATA																			
LOCATION	UPSTREAM PALOMAR RD. (SHEET NO. 6)				DOWNSTREAM JUNIPERO RD. (SHEET NO. 8)				UPSTREAM MENIFEE RD. (SHEET NO. 10)				DOWNSTREAM MALAGA RD. (SHEET NO. 13)				UPSTREAM MALAGA RD. (SHEET NO. 13)			
STA. TO STA.	47+50.00 TO 47+70.00		47+70.00 TO 47+90.00		58+49.01 TO 58+79.01		58+79.01 TO 59+09.02		74+40.00 TO 74+60.00		74+60.00 TO 74+80.00		98+62.35 TO 98+82.35		98+82.35 TO 99+02.35		100+02.35 TO 100+22.35		100+22.35 TO 100+42.35	
X	6.00'	5.00'	5.00'	4.00'	3.67'	4.34'	4.34'	5.00'	5.00'	4.33'	4.33'	3.67'	3.67'	4.33'	4.33'	5.00'	5.00'	4.33'	4.33'	3.67'
Y	6.00'	8.57'	8.57'	10.07'	10.98'	9.12'	9.12'	5.00'	5.00'	7.88'	7.88'	9.71'	10.20'	8.36'	8.36'	5.00'	5.00'	8.10'	8.10'	9.94'
HEIGHT	8.21'	7.14'	7.14'	6.07'	7.28'	9.57'	9.57'	11.86'	8.16'	7.10'	7.10'	6.04'	6.53'	8.07	8.07'	9.61'	8.81'	7.54'	7.54'	6.27'
WALLS=T_1	10"		10"		10.50"		10.50"		10"		10"		10"		10"		10"		10"	
BOTT. SLAB=T_2	10"		10"		11.50"		11.50"		10"		10"		10"		10"		10"		10"	
"A" BARS	#5 BAR @ 12" O.C.		#5 BAR @ 12" O.C.		#5 BAR @ 6" O.C.		#5 BAR @ 6" O.C.		#5 BAR @ 12" O.C.		#5 BAR @ 12" O.C.		#7 BAR @ 12" O.C.		#7 BAR @ 12" O.C.		#6 BAR @ 12" O.C.		#6 BAR @ 12" O.C.	
HORIZ. LENGTH	3.20'	3.20'	3.20'	3.20'	4.40'	4.40'	4.40'	4.40'	3.30'	3.30'	3.30'	3.30'	4.60'	4.60'	4.60'	4.60'	3.90'	3.90'	3.90'	3.90'
SLOPE LENGTH	8.63'	8.45'	8.45'	9.17'	11.06'	11.31'	11.31'	12.40'	8.58'	8.40'	8.40'	9.13'	9.82'	9.49'	9.49'	10.03'	9.23'	8.90'	8.90'	9.46'
"B" BARS	#6 BAR @ 12" O.C.		#6 BAR @ 12" O.C.		#6 BAR @ 6" O.C.		#6 BAR @ 6" O.C.		#6 BAR @ 12" O.C.		#6 BAR @ 12" O.C.		#6 BAR @ 12" O.C.		#6 BAR @ 12" O.C.		#6 BAR @ 12" O.C.		#6 BAR @ 12" O.C.	
HORIZ. LENGTH	8.07'	7.07'	7.07'	6.07'	5.78'	6.45'	6.45'	7.11'	7.07'	6.40'	6.40'	5.74'	5.74'	6.40'	6.40'	7.07'	7.07'	6.40'	6.40'	5.74'
SLOPE LENGTH	3.80'	4.25'	4.25'	5.37'	7.07'	5.59'	5.59'	5.00'	3.80'	4.25'	4.25'	5.37'	4.67'	3.69'	3.69'	3.30'	3.10'	3.47'	3.47'	4.38'
"C" BARS	#4 BAR @ 12" O.C.		#4 BAR @ 12" O.C.		#5 BAR @ 6" O.C.		#5 BAR @ 6" O.C.		#4 BAR @ 12" O.C.		#4 BAR @ 12" O.C.		#5 BAR @ 12" O.C.		#5 BAR @ 12" O.C.		#5 BAR @ 12" O.C.		#5 BAR @ 12" O.C.	
SLOPE LENGTH	8.63'	8.45'	8.45'	9.17'	11.06'	11.31'	11.31'	12.40'	8.58'	8.40'	8.40'	9.13'	9.82'	9.49'	9.49'	10.03'	9.23'	8.90'	8.90'	9.46'
"D" BARS	#5 BAR @ 12" O.C.		#5 BAR @ 12" O.C.		#6 BAR @ 6" O.C.		#6 BAR @ 6" O.C.		#5 BAR @ 12" O.C.		#5 BAR @ 12" O.C.		#6 BAR @ 12" O.C.		#6 BAR @ 12" O.C.		#5 BAR @ 12" O.C.		#5 BAR @ 12" O.C.	
HORIZ. LENGTH	7.84'	6.84'	6.84'	5.84'	5.78'	6.45'	6.45'	7.11'	6.84'	6.17'	6.17'	5.51'	5.74'	6.40'	6.40'	7.07'	6.84'	6.17'	6.17'	5.51'
CONCRETE $^{CY}/_{LF}$	0.9±	0.8±	0.8±	0.8±	1.0±	1.1±	1.1±	1.2±	0.9±	0.8±	0.8±	0.8±	0.8±	0.9±	0.9±	1.0±	0.9±	0.8±	0.8±	0.8±
STEEL $^{LBS}/_{LF}$	115±	108±	108±	108±	249±	252±	252±	269±	108±	104±	104±	106±	152±	152±	152±	161±	130±	124±	124±	125±

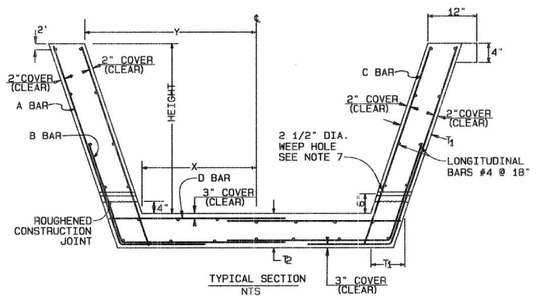
SPLICES

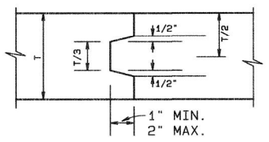
BAR	LENGTH	REMARKS
B	34"	PALOMAR RD., MENIFEE RD., MALAGA RD. (UP STREAM)
D	28.5"	PALOMAR RD., MENIFEE RD., MALAGA RD. (UP STREAM)
B	34"	JUNIPERO RD.
D	34"	JUNIPERO RD.
B	34"	MALAGA RD. (DOWN STREAM)
D	34"	MALAGA RD. (DOWN STREAM)

DESIGN DATA

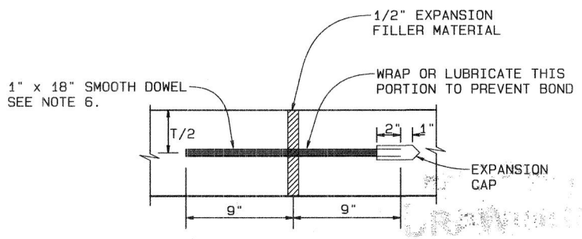
LIVE LOAD = 16000 LBS (TRUCK AXLE)
SOIL DENSITY = 130 PCF
ALLOWABLE STRESSES:
f'_c = 4000 PSI
f_c = 1800 PSI
f_y = 60,000 PSI
f_s = 24,000 PSI







TRANSVERSE CONSTRUCTION JOINT
DETAIL A



TRANSVERSE EXPANSION JOINT
DETAIL B

NOTES

1. STRUCTURAL CONCRETE SHALL BE CLASS "A".
2. ALL LONGITUDINAL BARS SHALL BE #4 @ 18 INCHES. PLACE BARS IN BOTTOM SLAB SYMMETRICALLY ABOUT CENTERLINE. PLACE BARS IN WALLS STARTING AT TOP WITH 2 INCHES CLEAR COVER.
3. CLEAR COVER FOR STEEL SHALL BE 2 INCHES EACH FACE FOR WALLS AND 3 INCHES EACH FACE FOR BOTTOM SLAB.
4. STEEL IS DIMENSIONED TO BACK OF BAR BEND.
5. FOR CONSTRUCTION ON CURVES, STRAIGHT TRANSVERSE BARS IN THE SLAB SHALL BE ALIGNED RADIALLY WITH SPACING MEASURED AT WALLS. FOR L-BARS IN WALLS, SPACING SHALL BE MEASURED BETWEEN VERTICAL LEGS OF BARS.
6. ALL TRANSVERSE CONSTRUCTION JOINTS SHALL BE IN A VERTICAL PLANE NORMAL TO THE CENTERLINE. CONTINUOUS KEYWAYS SHALL BE CONSTRUCTED AS SHOWN IN DETAIL A. A COMPLETE CURTAIN OF TRANSVERSE STEEL SHALL BE PLACED 3 INCHES FROM EACH FACE OF THE JOINTS AND LONGITUDINAL STEEL WILL NOT BE CONTINOUS THROUGH THE JOINTS. AN EXPANSION JOINT SHALL BE CONSTRUCTED BETWEEN THE REINFORCED CONCRETE TRANSITION AND REINFORCED CONCRETE BOX SECTIONS AS SHOWN DETAIL B. DOWELS SHALL BE PLACED AT 18 INCH SPACING CENTERED IN THE MIDDLE OF THE BOTTOM SLAB AND THE TOP THIRD OF SIDE WALLS. A MINIMUM OF 3 DOWELS PER SLAB AND WALLS SHALL BE PLACED.
7. WEEPHOLES SHALL BE FORMED IN BOTH WALLS PER STD. CH326 AT A SPACING OF 10 FEET.
8. ALL QUANTITIES SHOWN ARE APPROXIMATE.
9. ALL SPLICES ARE SUBJECT TO APPROVAL BY THE ENGINEER.
10. SECTION L1 PAY LIMIT PER STANDARD CH326.
11. T_1 SHOULD BE 12" OR LESS. IF T_1 IS LESS THAN 12", WIDEN TOP TO 12" AS SHOWN.

IP 050154 MS 4051

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRAND NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/246680 REVISIONS		

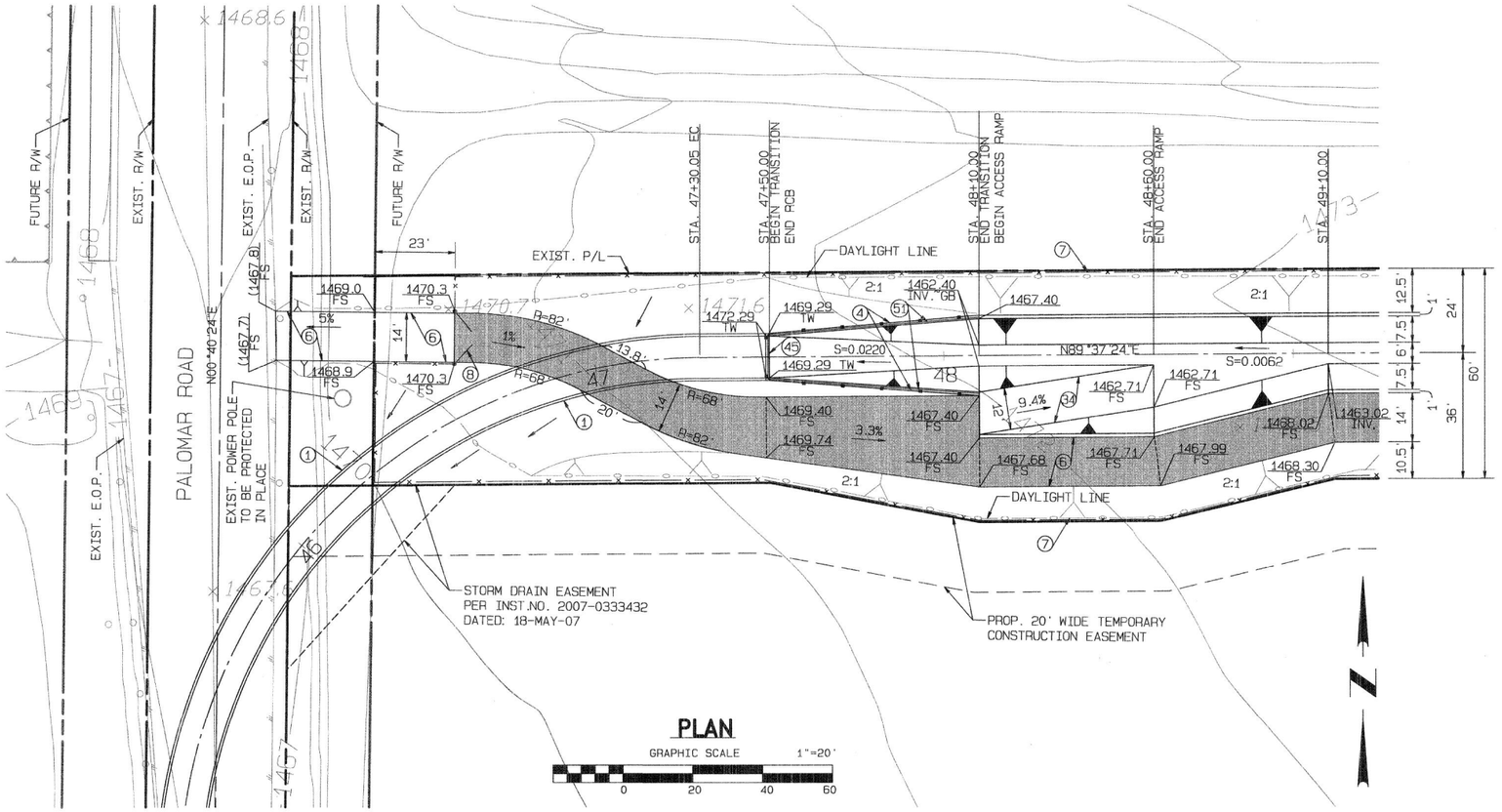
DESIGNED BY: V.S.
DRAWN BY: J.P.
DATE DRAWN: MARCH 2006
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: Stuart E. McKibbin DATE: 1-3-2008

ROMOLAND MDP
LINE A-3
TRANSITION DETAILS

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 15 OF 22

G:\2003\03-0238\DWG\FRD\03238L1NE_A3.prn 12/19/2007



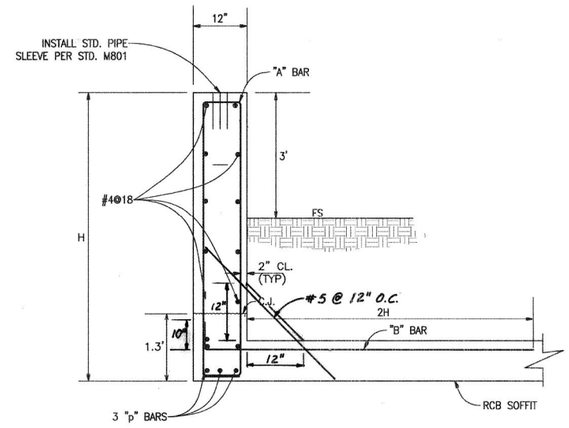
PLAN

GRAPHIC SCALE 1"=20'

0 20 40 60

GRADING DETAIL AT PALOMAR ROAD

SEE SHT NO. 6

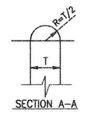


(45) PARAPET WALL DETAIL

N.T.S.

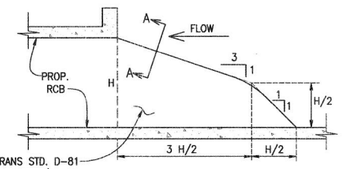
f'c= 4,000 psi
fy = 60,000 psi

CROSSING	"A" BAR	"B" BAR	"p" BAR	H	SPAN
STA. 59+09.02 @ JUNIPERO RD.	#6 @ 12	#5 @ 6	#8	8.86'	10'
STA.99+02.35 @ MALAGA RD.	#6 @ 12	#5 @ 6	#8	6.60'	10'
STA. 100+02.35 @ MALAGA RD.	#6 @ 12	#5 @ 6	#8	5.80'	10'
STA.47+50.00 @ PALOMAR RD.	#6 @ 12	#5 @ 6	#8	4.71'	10'
STA.74+40.00 @ MENIFEE RD.	#6 @ 12	#5 @ 6	#8	5.16'	10'



CONSTRUCTION NOTES

(1) CONSTRUCT 6.5'Hx12.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
(4) CONSTRUCT TRANSITION STRUCTURE PER RCFCWCD STD. DWG. CH329 AND DETAIL ON SHEET NO. 15
(6) INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
(7) INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
(8) INSTALL 14' DOUBLE DRIVE GATE PER RCFCWCD STD. DWG. M801
(34) CONSTRUCT MAINTENANCE RAMP FOR TRAPEZOIDAL CHANNEL PER RCFCWCD STD. CH330
(45) CONSTRUCT PARAPET WALL PER CALTRANS STD. D82 AND DETAIL SHOWN HEREON
(51) CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47



NOSE DETAIL

N.T.S.

RECORD DRAWINGS

IP 050154 MS 4051

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45760 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. R.C.E. 45702 EXP. 12-31-08 DATE
RECOMMENDED BY 12/18/07 DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12/3/07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN, A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/248888 REVISIONS		

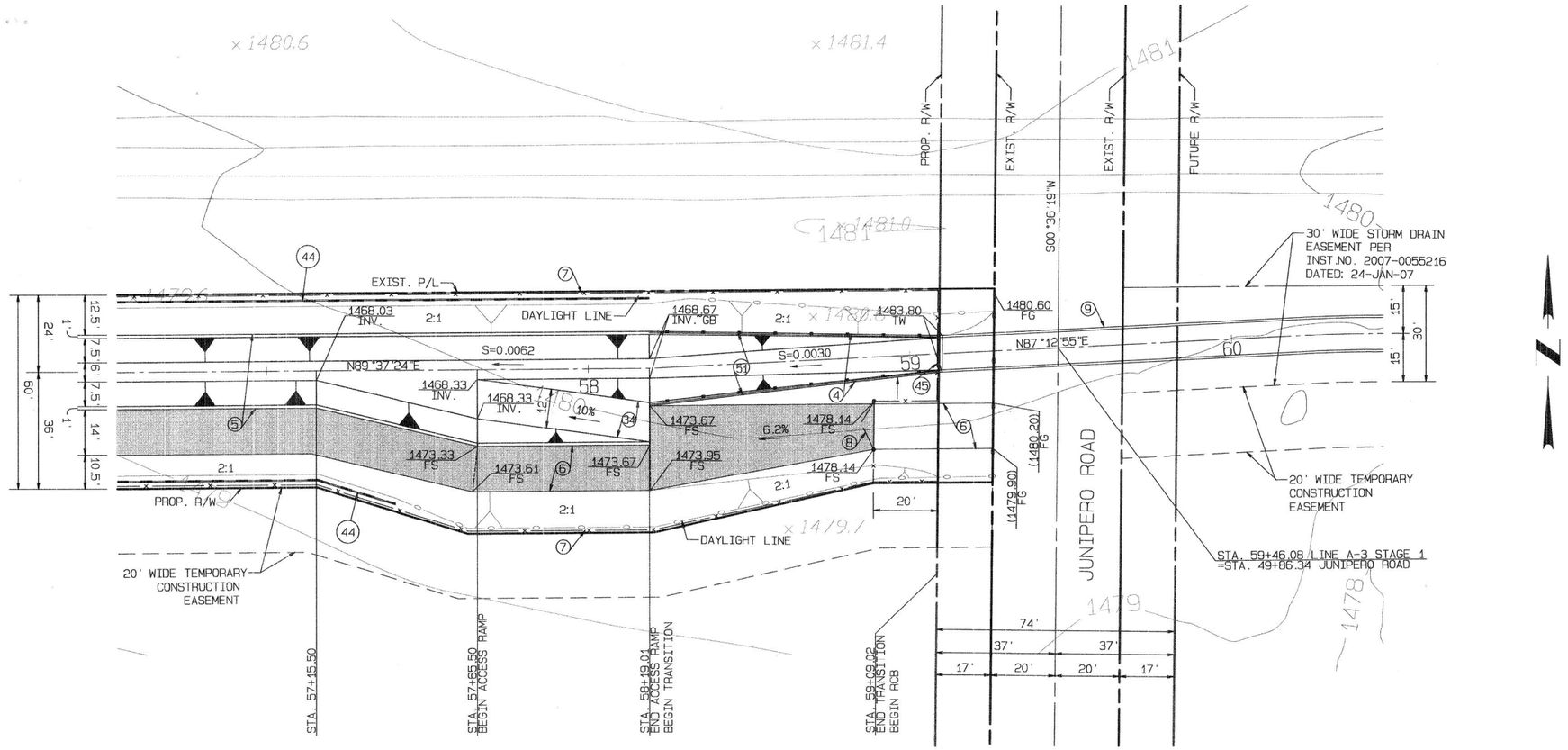
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/28/07
APPROVED BY: Stuart E. McKibbin DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
GRADING DETAILS

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 16 OF 25

G:\2003\03-0386\DWG\PHO\03386_1NE_A3.prc12/10/2007



GRADING DETAIL AT JUNIPERO ROAD

SEE SHT NO. 8

CONSTRUCTION NOTES

(4) CONSTRUCT TRANSITION STRUCTURE PER RCFCWCD STD. DWG. CH329 AND DETAIL ON SHEET NO. 15
(5) CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
(6) INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
(7) INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
(8) INSTALL 14' DOUBLE DRIVE GATE PER RCFCWCD STD. DWG. M801
(9) CONSTRUCT 6.0'H x 10.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
(34) CONSTRUCT MAINTENANCE RAMP FOR TRAPEZOIDAL CHANNEL PER RCFCWCD STD. CH330
(44) CONSTRUCT RETAINING WALL (H=4') PER APWA STD. 610-1.
(45) CONSTRUCT PARAPET WALL PER CALTRANS STD. D82 AND DETAIL ON SHEET NO. 16
(51) CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47

RECORD DRAWINGS

PLAN

GRAPHIC SCALE 1"=20'
0 20 40 60

IP 050154 MS 4051

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY 12/18/07 DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRAND NO. C44782 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE 12/13/07
R.C.E. NO. C44782 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 199 YRDS. NW OF THE SE SWITCH STAND. 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	REVISIONS	APPR.	DATE
	P8/248880		

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

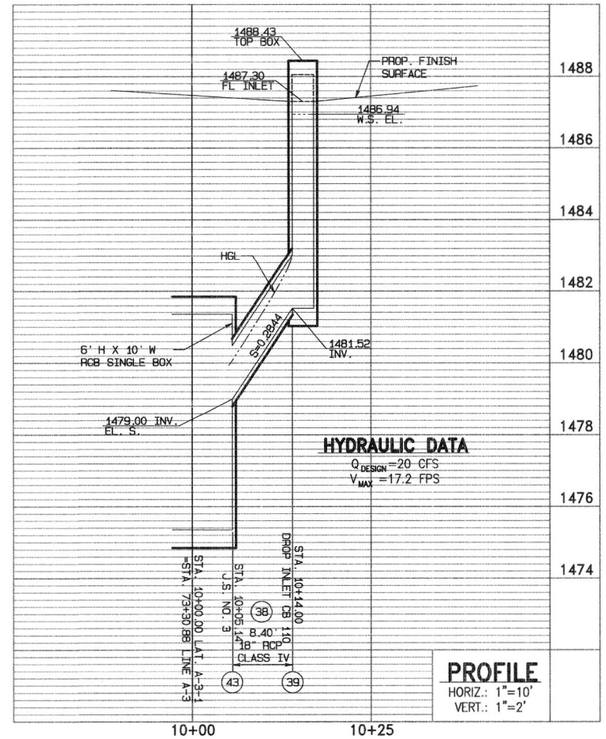
ROMOLAND MDP
LINE A-3 STAGE 1
GRADING DETAILS

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 17 OF 25

G:\2003\03-0398\DWG\PHO\03398_1NE_A3.prt12/10/2007

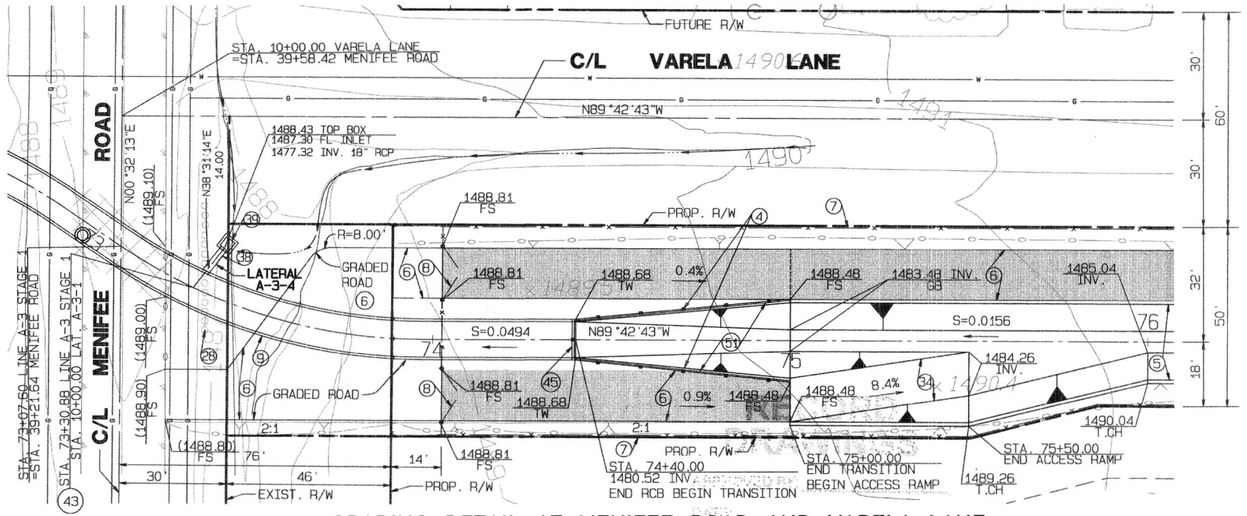
CONSTRUCTION NOTES

(4) CONSTRUCT TRANSITION STRUCTURE PER RCFCWCD STD. DWG. CH329 AND DETAIL ON SHEET NO. 15
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(6) INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
(7) INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
(8) INSTALL 14' DOUBLE DRIVE GATE PER RCFCWCD STD. DWG. M801
(9) CONSTRUCT 6.0'H x 10.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
(28) EXISTING MAILBOXES TO BE REMOVED AND REPLACED AS NECESSARY
(34) CONSTRUCT MAINTENANCE RAMP FOR TRAPEZOIDAL CHANNEL PER RCFCWCD STD. CH330
(38) INSTALL 18" RCP CLASS IV PER RCFCWCD SPECIFICATIONS
(39) CONSTRUCT DROP INLET PER RCFCWCD STD. DWG. CB110 (MODIFIED) INLET WINDOW THREE (3) SIDES, V=6.91', H=0.75'
(43) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCWCD STD. DWG. JS228
(45) CONSTRUCT PARAPET WALL PER CALTRANS STD. D82 AND DETAIL ON SHEET NO. 16
(51) CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47



LATERAL A-3-4

18" RCP AT STA. 73+30.88



GRADING DETAIL AT MENIFEE ROAD AND VARELA LANE

SEE SHT NOS. 9 & 10 IP 050154 MS 4051

GRAPHIC SCALE 1"=20'
0 20 40 60

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY 12/18/07
DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. MILDENBERGER NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: 12-13-07 DATE
R.C.E. NO. C44762 EXP. DATE 3-31-08

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3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	REVISIONS	APPR.	DATE
P8/248880			

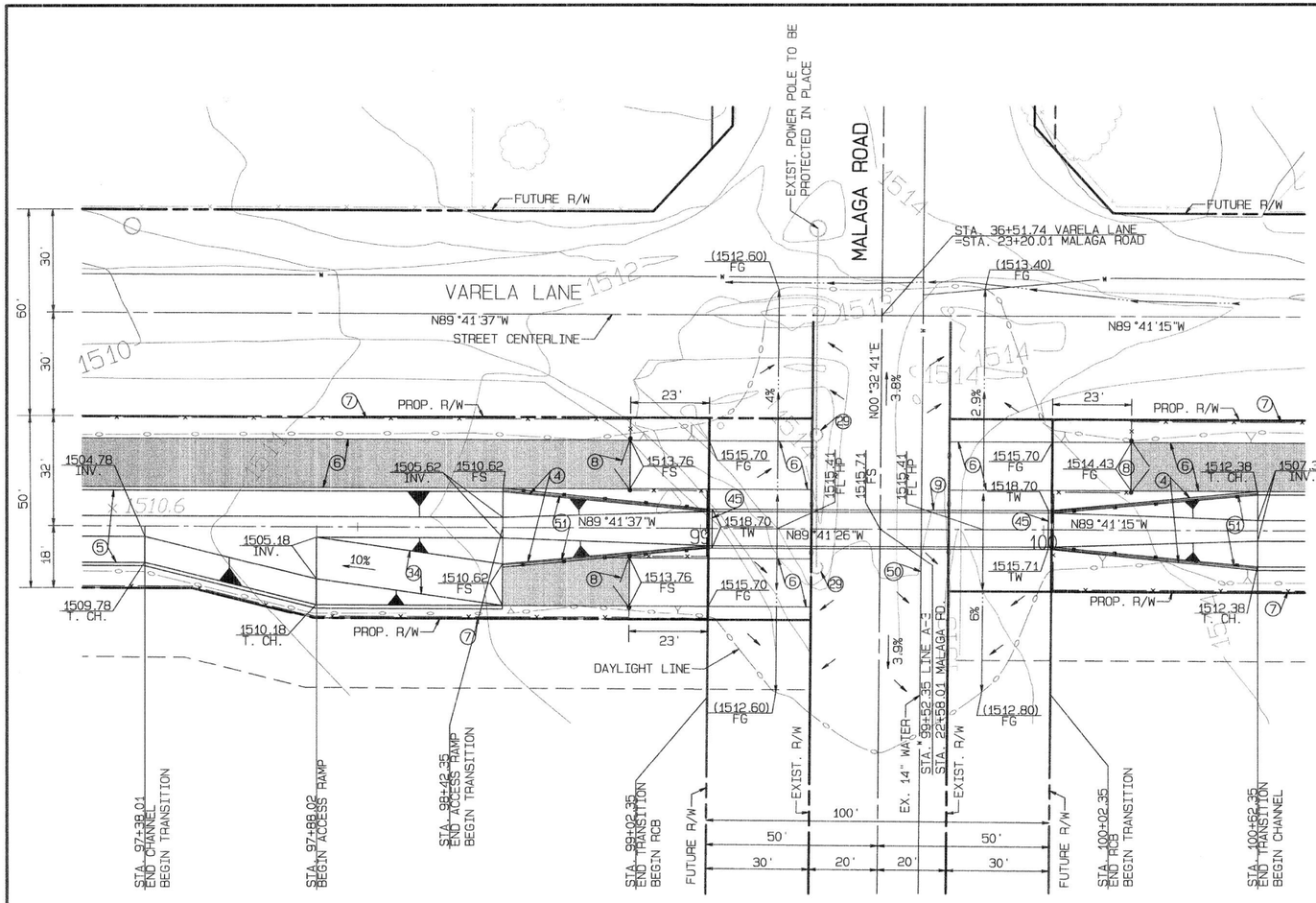
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/19/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
GRADING DETAILS
LATERAL A-3-1

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 18 OF 25

G:\2003\03-0830-DWG\GRADING\0830GD18.dwg 12/19/2007



GRADING DETAIL AT MALAGA ROAD AND VARELA LANE

SEE SHT NOS. 12 & 13

GRADING DETAIL AT VARELA LANE AND MALONE AVENUE

SEE SHT NO. 14

CONSTRUCTION NOTES

(4) CONSTRUCT TRANSITION STRUCTURE PER RCFCWCD STD. DWG. CH329 AND DETAIL ON SHEET NO. 15
(5) CONSTRUCT TRAPEZOIDAL CHANNEL PER RCFCWCD STD. DWG. CH326 ("B","D" & "T" PER PLAN)
(6) INSTALL 3" THICK CLASS II AGGREGATE BASE OVER 90% COMPACTED NATIVE
(7) INSTALL 6' HIGH CHAINLINK FENCE PER RCFCWCD STD. DWG. M801
(8) INSTALL 14' DOUBLE DRIVE GATE PER RCFCWCD STD. DWG. M801
(9) CONSTRUCT 6.0'H x 10.0'W RCB (SINGLE CELL) PER CALTRANS STD. D80
(10) CONSTRUCT WARPED WINGWALL PER CALTRANS STD. D86B AND DETAIL ON SHEET NO. 14
(11) CONSTRUCT CONCRETE BULKHEAD PER RCFCWCD STD. DWG. M816
(12) INSTALL 72" RCP (D-1200), BEDDING PER RCFCWCD STD. M815
(29) EXISTING GUY WIRE AND GUY POLE TO BE RELOCATED BY OTHERS
(34) CONSTRUCT MAINTENANCE RAMP FOR TRAPEZOIDAL CHANNEL PER RCFCWCD STD. CH330
(45) CONSTRUCT PARAPET WALL PER CALTRANS STD. D82 AND DETAIL ON SHEET NO. 16
(50) EXISTING 14" WATER LINE TO BE RELOCATED, SEE SHEET No. 25
(51) CONSTRUCT CABLE RAILING PER CALTRANS STD B11-47

RECORD DRAWINGS

APPROVED BY: .....
DATE: .....

PLAN

GRAPHIC SCALE 1"=20'
0 20 40 60

IP 050154 MS 4051

SEAL—COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY 12/18/07 DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 8, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	PS/246000 REVISIONS		

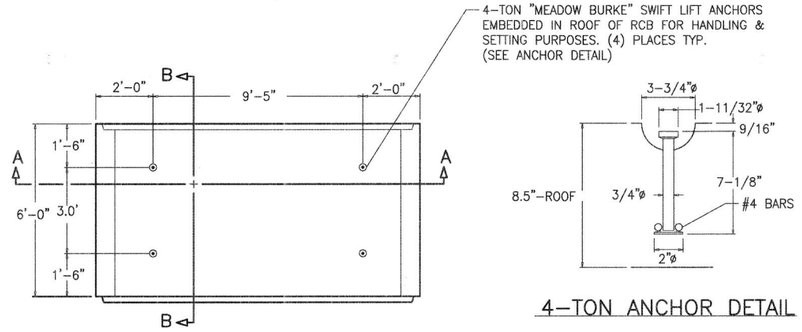
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/20/07
APPROVED BY: DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
GRADING DETAILS

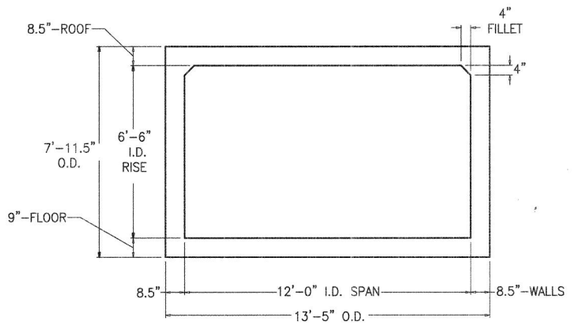
PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 19 OF 25

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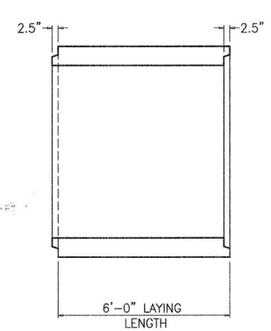


PLAN VIEW SECTION

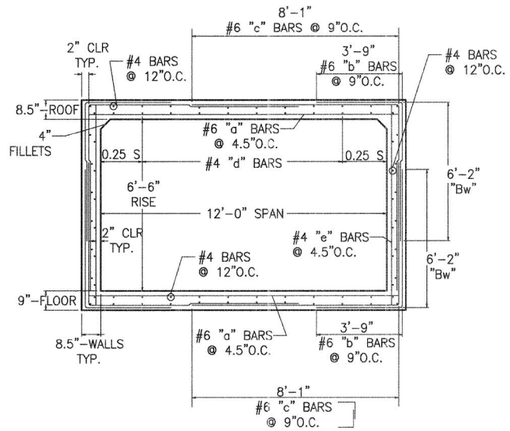
4–TON ANCHOR DETAIL



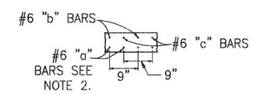
SECTION A–A



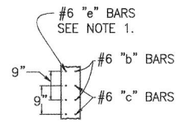
SECTION B–B



SECTION A–A



ROOF SECTION DETAIL



SIDE WALL SECTION DETAIL

NOTES (PER D80):

1. "e" BARS ARE AT HALF SPACING.
2. "a" BARS ARE AT HALF SPACING.

(37) 6.5'HX12.0'W SINGLE RCB DETAIL PER CALTRANS STD. D-80

FROM STA. 32+76.85 TO STA. 33+60.85
SEE SHEET NO. 4

1. GENERAL

1.1 Scope

This specification covers the materials for and manufacture of reinforced precast concrete single box culvert that are produced in accordance with the plans and these specifications.

1.2 Standards

Where applicable, the latest editions of the following standards shall be considered a part of these specifications. In case of conflict, these specifications shall take precedence over the listed standard. (See also Section 2, Materials)

1.2.1 American Society For Testing and Materials (ASTM)

ASTM C789 "Specifications for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers"

ASTM C850 "Specifications for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers with Less Than 2 ft Cover Subjected to Highway Loading.

1.2.2 American Concrete Institute (ACI)

ACI 318 "Building Code Requirements for Reinforced Concrete"

1.2.3 American Association of State Highway and Transportation Officials (AASHTO)
"Standard Specification for Highway Bridges"

1.2.4 American Welding Society
Structural Welding Code – Reinforcing Steel AWS D1.4

1.2.5 State Of California Department Of Transportation
Per CALTRANS Std. Plan "D–80" / Reinforced Concrete Single Box Culvert.

2. MATERIALS

2.1 Concrete

Raw materials for concrete shall meet the following standards.

2.1.1 Portland Cement: ASTM C150, Type II.

2.1.2 Aggregates: ASTM C33 or C330

2.1.3 Water: Potable or free deleterious substances in amounts harmful to concrete or embedded metals

2.1.4 Admixtures:
1. Air–entraining: ASTM C260
2. Water reducing, retarding, accelerating, high range water reducing: ASTM C494

2.2 Reinforcing Steel shall be intermediate or hard grade billet steel conforming to ASTM A615 or ASTM A706, grade 60.

2.3 Inserts and Embedded Metal

All items embedded in concrete shall be of the type required for the intended task, and meet the following standards:

2.3.1 Structural steel plates, angles, etc: ASTM A36

2.3.2 Welded studs: AWS D1.1

2.3.3 Finishes (as required):
1. Shop primer: As required
2. Hot–dipped galvanized: ASTM A152 or ASTM 123
3. Zinc–rich coating: MIL–P–2135 self curing, one component, sacrificial

3. MANUFACTURE

3.1 Forms:

Forms for manufacturing precast concrete products shall be of the type and design consistent with industry standards. They shall be capable of consistently providing uniform products and dimensions. Forms shall be constructed so that no product damage shall be caused by the forces and vibrations to which the forms will be subjected. Forms shall be cleaned of concrete buildup after each use. Coating of form release agents shall not be allowed to build up.

3.2 Reinforcement:

Cages of reinforcement shall be fabricated either by tying the bars into rigid assemblies or by welding where permissible in accordance with AWS D1.4.

3.3 Embedded items:

Embedded items shall be positioned at locations specified in the design documents. Inserts, plates, weldments, lifting devices and other items to be imbedded in precast concrete products shall be held rigidly in place so that they do not move significantly during casting operations.

3.4 Placing Concrete

Concrete shall be deposited into forms as near to its location as practical. The free fall of the concrete shall be kept to a minimum.

Concrete shall be consolidated in such a manner that segregation of the concrete is minimized and honey–combed areas are eliminated. Vibrators used to consolidate concrete shall have frequencies and amplitudes sufficient to produce well consolidated concrete.

3.5 Curing:

3.5.1 Curing by Moisture Retention

Moisture shall be prevented from evaporating from exposed surfaces until adequate strength for stripping is reached by one of the following methods.

1. Cover with polyethylene sheets a min. of 6 mils. Thick
2. Cover with burlap or other absorptive material and keep continually moist.
3. Curing compounds applied at a rate not to exceed 200 sq.ft. per gallon.

CALTRANS PERMIT NUMBER: 08–05–N–MC–0356

IP 050154 MS 4051

©2003 \03-0336\DWG\PRO\0336L_LNE_A3.pro 12/10/2007

REGISTERED PROFESSIONAL ENGINEER SCOTT K. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH: (951) 686-1070
PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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



TWO WORKING DAYS BEFORE YOU DIG

PERMANENT BENCH MARK
B.M. NO. S 327–1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN, A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/248660 REVISIONS		

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: DATE: 12/18/07

APPROVED BY: DATE: 1-3-2008

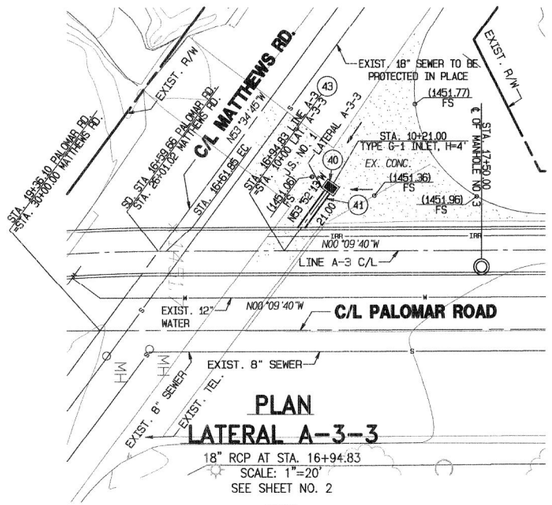
ROMOLAND MDP
LINE A–3 STAGE 1
6.5'H x 12.0W SINGLE RCB DETAIL

PROJECT NO. 4–0–00431
DRAWING NO. 4–871
SHEET NO. 20 OF 25



PROFILE
HORIZ.: 1"=10'
VERT.: 1"=2'

LATERAL A-3-3
18" RCP AT STA. 16+94.83



PLAN
LATERAL A-3-3
18" RCP AT STA. 16+94.83
SCALE: 1"=20'
SEE SHEET NO. 2

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

CONSTRUCTION NOTES

(40) CONSTRUCT DRAINAGE INLET TYPE G1 PER CALTRANS STD. PLAN D73

(41) INSTALL 18" CLASS IV DIA. RCP PER CALTRANS SPECIFICATIONS

(43) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCWCD STD. DWG. JS228

SEAL-COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED BY: 12/18/07
DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. WILDERMUTH NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070

PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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ELEVATION: 1478.07

REF.	REVISIONS	APPR.	DATE
	PB/248666		

DESIGNED BY: V.S.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

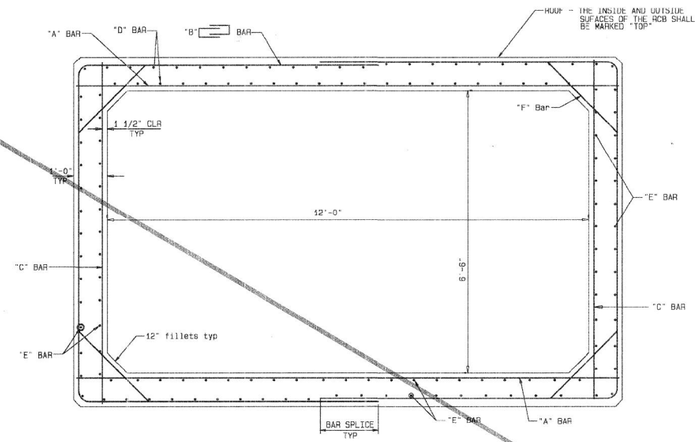
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

ROMOLAND MDP
LINE A-3 STAGE 1
LATERAL A-3-3
STA. 16+94.83

IP 050154 MS 4051

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 21 OF 25

G:\2003\03-0338\DWG\PRO\03338LINE_A3.pro | Dec 10, 2007 | 3:54PM



TYPICAL SECTION

NO SCALE

THIS SHEET HAS BEEN REPLACED BY SHEET 22A ⚠

12/7/07
DATE

REGISTERED PROFESSIONAL ENGINEER
CURTISS W. GILLEY
No. 14434
Exp. 3-31-09
CIVIL
STATE OF CALIFORNIA

REGISTER CIVIL ENGINEER

DESIGN DATA

DESIGN: BRIDGE DESIGN SPECIFICATIONS (1983 AASHTO WITH INTERIMS AND REVISIONS BY CALTRANS) DEPTH OF COVER IS ASSUMED TO BE UNIFORM

EARTH LOAD: EARTH PRESSURES FOR TWO CONDITIONS
130 LB/CF VERT, 36.75 LB/CF HORIZ
130 LB/CF VERT, 130 LB/CF HORIZ

LIVE LOAD: COOPER E80

UNIT STRESSES: f'_c = 5000 PSI
f_y = 60,000 PSI

SHEAR: MAXIMUM ALLOWABLE SHEAR, $V = 3\sqrt{f'c}$ PSI

COVER: 5.5 FEET

CONSTRUCTION NOTES

CONSTRUCTION LOADS:
STRUTTING MAY BE REQUIRED NEAR TEMPORARY ENDS. FOR CONSTRUCTION LOADS ON CULVERTS, SEE STANDARD PLAN D86.

SHOP PLAN:
CONTRACTOR SHALL SUBMIT SHOP PLANS FOR PRECAST REINFORCED CONCRETE BOX TO RCFC&WCD, RCTC, AND ENGINEER OF RECORD.

NOTE: THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

PRECAST SEGMENTS ADJACENT TO CAST-IN-PLACE ELEMENTS SHALL BE CONNECTED USING TRANVERSE EXPANSION JOINT DETAILED HEREON. DOWELS SHALL BE PLACED AT 18 INCH SPACING CENTERED IN THE MIDDLE OF THE BOTTOM SLAB AND THE TOP THIRD OF SIDE WALLS. A MINIMUM OF 3 DOWELS PER SLAB AND WALLS SHALL BE PLACED.

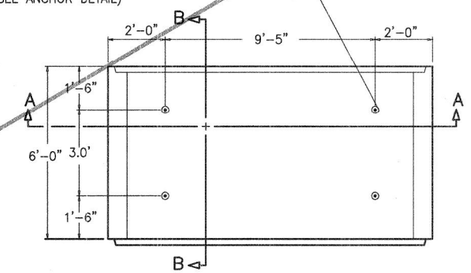
TERRAIN ENGINEERING
3609 MAIDU PLACE
DAVIS, CA 95618
Tel 916.952.0004
Fax 530.458.2122

ROMOLAND MDP-LINE A-3, STAGE 1
12x6.5 PRECAST RCB
© BNSF/MTA CROSSING

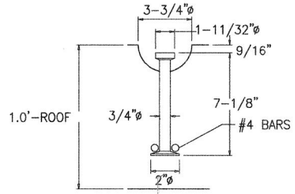
DATE: December 2005

PROJECT NO. 4-0-310
DRAWING: S-1
SHT 1 OF 1

4-TON "MEADOW BURKE" SWIFT LIFT ANCHORS EMBEDDED IN ROOF OF RCB FOR HANDLING & SETTING PURPOSES. (4) PLACES TYP. (SEE ANCHOR DETAIL)



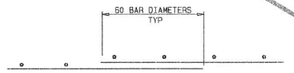
PLAN VIEW SECTION



4-TON ANCHOR DETAIL

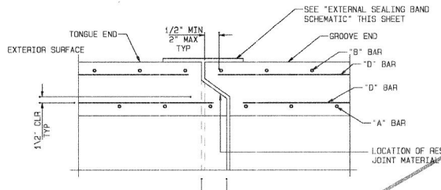
REINFORCING TABLE

BAR	
"A"	#6 @ 7"
"B"	#6 @ 6"
"C"	#6 @ 6"
"D"	#5 @ 10"
"E"	#4 @ 12"
"F"	#4 @ 6"



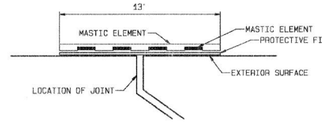
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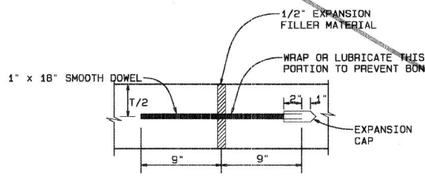
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NO SCALE



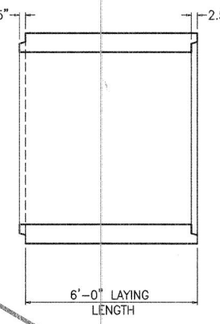
EXTERNAL SEALING BAND SCHEMATIC

NO SCALE



TRANSVERSE EXPANSION JOINT

NO SCALE



SECTION B-B

STA. 14+90 TO STA. 16+22

(36) 6.5' HIGH X 12' WIDE PRE-CAST RCB SECTION

N.T.S.

SEE SHEET NO. 2

NOTE: THE CONTRACTOR SHALL PLACE A 12" LAYER OF COMPACTED GRANULAR MATERIAL ON TOP OF A LAYER OF GEOTEXTILE FABRIC AT THE BOTTOM OF THE PRECAST SECTION OF BOX. PER BNSF REQUIREMENTS.

RECORD DRAWINGS
APPROVED BY: Stuart E. Knill
DATE: 2/9/17

RECORD DRAWINGS
APPROVED BY:
DATE:

IP 050154 MS 4051

REGISTERED PROFESSIONAL ENGINEER
SCOTT R. HILDEBRAND
NO. C44762
EXP. 3-31-08
CIVIL
STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070

PREPARED BY: [signature] DATE 12-13-07

R.C.E. NO. C44762 EXP. DATE 3-31-08

Don't Dig...Until You Call U.S.A. Toll Free
1-800-227-2600
for the location of buried utility lines.
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REF.	DESCRIPTION	APPR.	DATE
	P8/248880 REVISIONS		
⚠1	ADDED NOTE	SEK	2/9/17

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

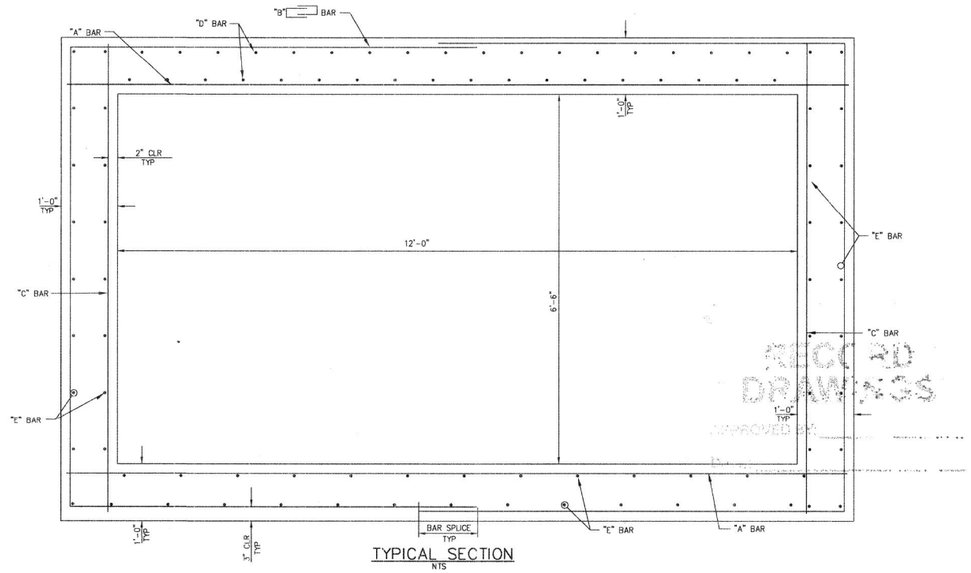
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 12/28/07
APPROVED BY: [signature] DATE: 1-3-2008

ROMOLAND MDP
LINE A-3 STAGE 1
RCTC/BNSF PRECAST RCB DETAIL

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 22 OF 25

99

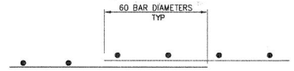
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TYPICAL SECTION
NTS

RAIL CROSSING REINFORCING TABLE

BAR	
"A"	#7 @ 5
"B"	#6 @ 5
"C"	#6 @ 5
"D"	#5 @ 8
"E"	#4 @ 12



BAR SPLICE DETAIL
NO SCALE

DESIGN DATA

DESIGN: BRIDGE DESIGN SPECIFICATIONS (1983 AASHTO WITH INTERIMS AND REVISIONS BY CALTRANS) DEPTH OF COVER IS ASSUMED TO BE UNIFORM

EARTH LOAD: EARTH PRESSURES FOR TWO CONDITIONS
140 LB/CF VERT, 42 LB/CF HORIZ
140 LB/CF VERT, 140 LB/CF HORIZ
MIN. FILL HEIGHT = 2.0 FT

LIVE LOAD: COOPER E80 PER AREMA 2.3.3

UNIT STRESSES: f'_c = 5000 PSI
f_y = 60,000 PSI

SHEAR: MAXIMUM ALLOWABLE SHEAR, $V = 3\sqrt{f'_c}$ PSI

CONSTRUCTION NOTES

CUTOFF WALLS:
4' CUTOFF WALLS ARE TO BE PROVIDED AT INLET AND/OR OUTLET UNLESS CHANNEL IS LINED AND UNLESS OTHERWISE SHOWN. THESE WALLS ARE TO BE EXTENDED IF SCOUR CONDITIONS WARRANT. SEE STANDARD PLANS D84, D85, AND D86A.

WINGWALLS:
WINGWALLS SHALL BE CAST-IN-PLACE AND SHALL CONFORM TO STANDARD PLAN DETAILS FOR BOX CULVERT WINGWALLS. SEE STANDARD PLANS D84, D85 AND D86A.

CONSTRUCTION LOADS:
STRUTTING MAY BE REQUIRED NEAR TEMPORARY ENDS. FOR CONSTRUCTION LOADS ON CULVERTS, SEE STANDARD PLAN D88

REINFORCEMENT:
TRANSVERSE REINFORCEMENT TO BE PLACED PERPENDICULAR TO CENTER LINE OF RCB. LONGITUDINAL REINFORCEMENT TO BE PLACED PARALLEL TO CENTER LINE OF RCB. RAIL SECTION LONGITUDINAL REINFORCEMENT SHALL EXTEND 3'-0" BEYOND THE RAIL CROSSING SECTION.

NOTE: THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

FOR LIMITS OF RAIL CROSSING SEE CIVIL SHEET 22A

SEPTEMBER 11, 2014
DATE

REGISTERED PROFESSIONAL ENGINEER
CURTISS W. GILLEY
No. 14434
Exp. 3-31-15
CIVIL
STATE OF CALIFORNIA

REGISTER CIVIL ENGINEER

TERRAIN ENGINEERING
3609 MAIDU PLACE
DAVIS, CA 95618
Tel 916.952.0704
Fax 530.456.2122

ROMOLAND MDP-LINE A-3, STAGE 1
12x6.5 RCB
@ METROLINK (SCRRA) CROSSING-MILEPOST 23.9
DATE: SEPTEMBER 2014

PROJECT NO. 4-0-310
DRAWING S-1
SHT 1 OF 1

RECORD DRAWINGS
APPROVED BY
DATE: 2/9/17

STA. 14+90 TO STA. 16+22
(36) 6.5' HIGH X 12' WIDE RCB SECTION
N.T.S.
SEE SHEET NO. 2

REGISTERED PROFESSIONAL ENGINEER
JOSEPH CHRISTIAN CALDWELL
NO. C67239
CIVIL
STATE OF CALIFORNIA

100

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070

PREPARED BY: [signature] DATE: 24 Sep 14
R.C.E. NO. C67239 EXP. DATE 9-30-16

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 8, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/248660 REVISIONS		

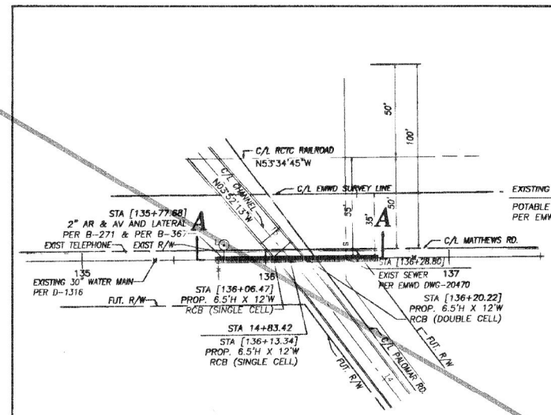
DESIGNED BY: E.T.M.
DRAWN BY: E.T.M.
DATE DRAWN: Sep 2014
CHECKED BY: C.G.

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 9/25/2014
APPROVED BY: [signature] DATE: 25 Sept 2014

ROMOLAND MDP
LINE A-3 STAGE 1
RCTC/BNSF RCB DETAIL

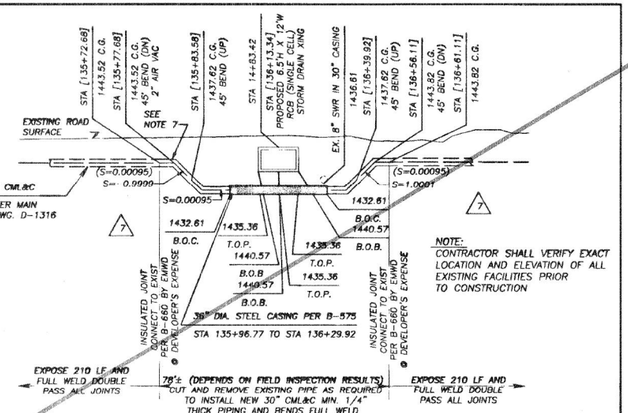
PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 22A OF 25

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PLAN

1"=40'



SECTION "A-A"

NO. TO SCALE

NOTE:
CONTRACTOR SHALL VERIFY EXACT LOCATION AND ELEVATION OF ALL EXISTING FACILITIES PRIOR TO CONSTRUCTION

STA= STREET STATIONING
BOB= BOTTOM OF BOX
BOC= BOTTOM OF CASING
BOS= BOTTOM OF SEWER
INV= INVERT
NTS= NOT TO SCALE
TOP= TOP OF PIPE
14+50 STATION PER RCTC RAILROAD STORM DRAIN
[136+00] STATION PER EMWD DWG. D-1316

NOTES:

1. 30" CML&C OFFSET TO BE FULLY WELDED DOUBLE PASS EACH JOINT
2. FABRICATION TO CONFORM TO AWWA C-200 AND EMWD SPECIFICATIONS
3. SHOP DRAWINGS MUST BE SUBMITTED PRIOR TO FABRICATION FOR EMWD APPROVAL
4. 48 HOURS NOTICE IS REQUIRED BEFORE FABRICATION FOR INSPECTION
5. C.G. = CENTER GRADE OF WATER LINE
6. TIE-IN LOCATIONS AND PIPE O.D. TO BE POT-HOLED AND VERIFIED PRIOR TO FABRICATION
7. INSTALL 2" OUTLET PER STANDARD PLAN B-271 FOR 2" AIR VAC PER B-367
8. CONNECTIONS TO EXISTING WATER LINE TO BE DONE BY EMWD @ DEVELOPERS EXPENSE CONTRACTOR TO SUPPLY ALL MATERIAL.

7 RELOCATE WTR AT STA. 135+72.68 TO 136+61.11 (D-1316)

W.O. 11-579 C.O.

REVISIONS DESCRIPTION	NO.	DATE	APP'D	DATE

APPROVALS		
	INITIAL	DATE
DESIGN	JHP	10/19/06
CONSTRUCTION		
INSPECTION		
OPERATIONS		
SUBMITTED		

REFERENCES: DWGS. D-1316
SCALE: 1" = 40'
DRAWN BY: AWA

NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA 10-19-06

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

30" CML & C MODIFICATION
SURVEY LINE (20'S & R.R.)
STA. 135+72.68 TO 136+61.11

APPROVED: Joseph A. Tagliaferri 10/19/06 SK-1121

SURVEY LINE (20'S & R.R.) 30" WATER CROSSING
E.M.W.D. REFERENCE DWG. D-1316
SEE SHEET NO. 2

RECORD DRAWINGS
APPROVED BY:
DATE:

IP 050154 MS 4051

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070

PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P0/248680 REVISIONS		

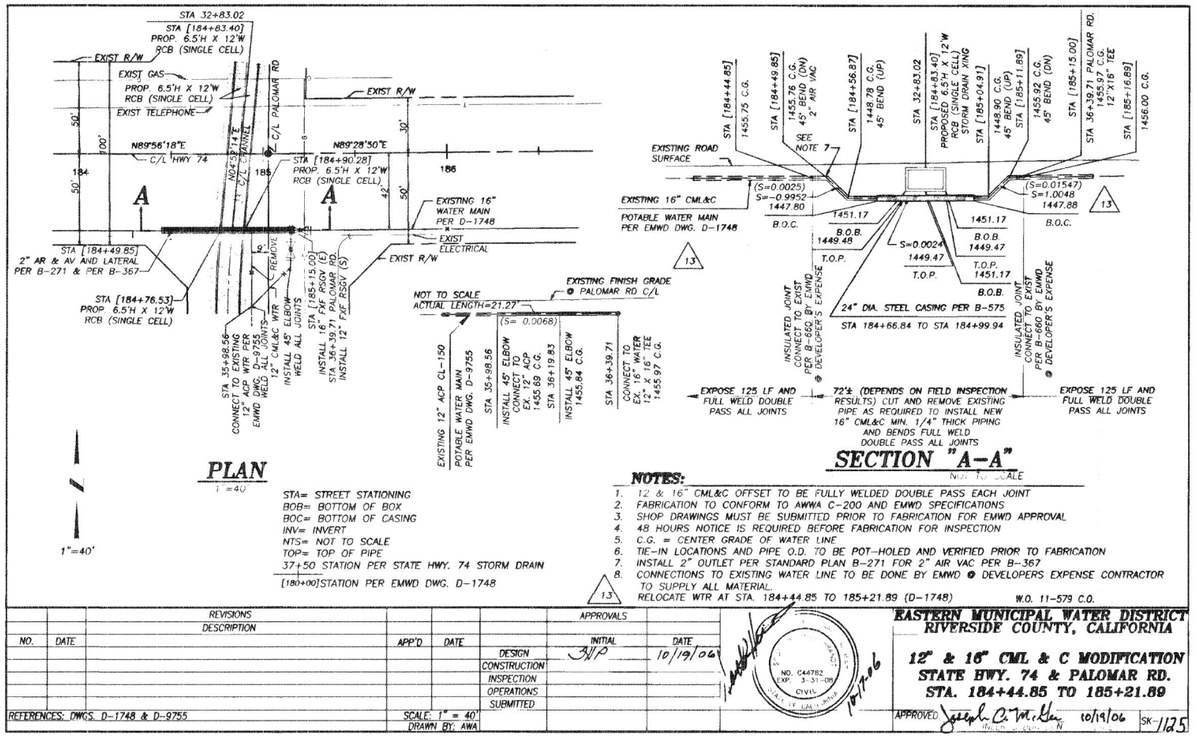
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

ROMOLAND MDP
LINE A-3 STAGE 1
R.R. 30" WATER CROSSING

PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 23 OF 25

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STA= STREET STATIONING
BOB= BOTTOM OF BOX
BOC= BOTTOM OF CASING
INV= INVERT
NTS= NOT TO SCALE
TOP= TOP OF PIPE
37+50 STATION PER STATE HWY. 74 STORM DRAIN
[180+00]STATION PER EMWD DWG. D-1748

NOTES:

1. 12 & 16" CML&C OFFSET TO BE FULLY WELDED DOUBLE PASS EACH JOINT
2. FABRICATION TO CONFORM TO AWWA C-200 AND EMWD SPECIFICATIONS
3. SHOP DRAWINGS MUST BE SUBMITTED PRIOR TO FABRICATION FOR EMWD APPROVAL
4. 48 HOURS NOTICE IS REQUIRED BEFORE FABRICATION FOR INSPECTION
5. C.G. = CENTER GRADE OF WATER LINE
6. TIE-IN LOCATIONS AND PIPE O.D. TO BE POT-HOLED AND VERIFIED PRIOR TO FABRICATION
7. INSTALL 2" OUTLET PER STANDARD PLAN B-271 FOR 2" AIR VAC PER B-367
8. CONNECTIONS TO EXISTING WATER LINE TO BE DONE BY EMWD @ DEVELOPERS EXPENSE CONTRACTOR TO SUPPLY ALL MATERIAL.

13 RELOCATE WTR AT STA. 184+44.85 TO 185+21.89 (D-1748) W.O. 11-579 C.O.

REVISIONS DESCRIPTION			APP'D	DATE
NO.	DATE			
REFERENCES: DWGS. D-1748 & D-9755				

APPROVALS		
	INITIAL	DATE
DESIGN	JJP	10/19/06
CONSTRUCTION		
INSPECTION		
OPERATIONS		
SUBMITTED		

SCALE: 1" = 40'
DRAWN BY: AWA

NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA
10/19/06

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

12" & 16" CML & C MODIFICATION
STATE HWY. 74 & PALOMAR RD.
STA. 184+44.85 TO 185+21.89

APPROVED Joseph A. McKee 10/19/06 SK-1175

STATE HWY. 74 & PALOMAR RD. 12" & 16" WATER CROSSING
E.M.W.D. REFERENCE DWG. D-1748
SEE SHEET NO. 4

ISSUED FOR CONSTRUCTION DRAWINGS
APPROVED BY:
DATE:

IP 050154 MS 4051

© 2003 WEBB ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRAND NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070

PREPARED BY: DATE: 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	REVISIONS DESCRIPTION	APPR.	DATE
P8/248680			

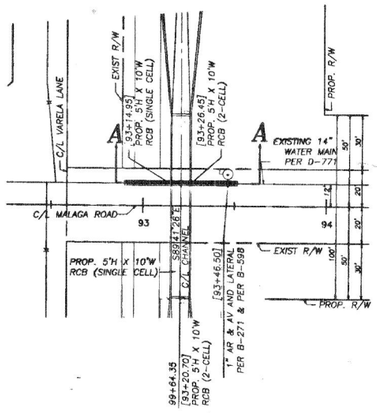
DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

ROMOLAND MDP
LINE A-3 STAGE 1
HWY. 74 12" & 16" WATER CROSSING

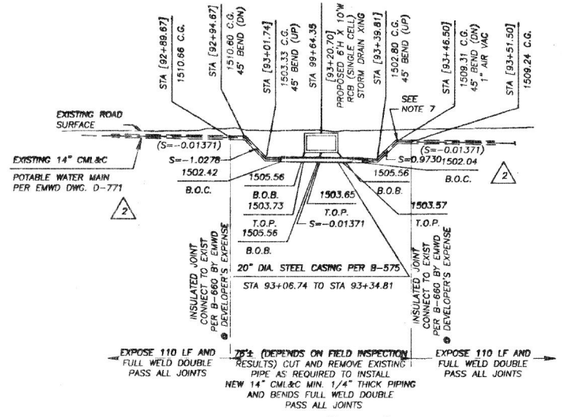
PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 24 OF 25

C:\2003\03-0388\DWG\PRO\03388_TNE_A3.prt 12/10/2007



PLAN

1"=40'



SECTION "A-A"

NOT TO SCALE

STA= STREET STATIONING
BOB= BOTTOM OF BOX
BOC= BOTTOM OF CASING
INV= INVERT
NTS= NOT TO SCALE
TOP= TOP OF PIPE
99+00 STATION PER MALAGA ROAD STORM DRAIN
[93+00] STATION PER EMWD DWG. D-771

1"=40'

NOTES:

1. 14" CML&C OFFSET TO BE FULLY WELDED DOUBLE PASS EACH JOINT
2. FABRICATION TO CONFORM TO AWWA C-200 AND EMWD SPECIFICATIONS
3. SHOP DRAWINGS MUST BE SUBMITTED PRIOR TO FABRICATION FOR EMWD APPROVAL
4. 48 HOURS NOTICE IS REQUIRED BEFORE FABRICATION FOR INSPECTION
5. C.G. = CENTER GRADE OF WATER LINE
6. TIE-IN LOCATIONS AND PIPE O.D. TO BE POT-HOLED AND VERIFIED PRIOR TO FABRICATION
7. INSTALL 1" OUTLET PER STANDARD PLAN B-271 FOR 1" AIR VAC PER B-598
8. CONNECTIONS TO EXISTING WATER LINE TO BE DONE BY EMWD @ DEVELOPERS EXPENSE CONTRACTOR TO SUPPLY ALL MATERIAL.

2 RELOCATE WTR AT STA. 92+82.72 TO 93+53.42 (D-771)

W.O. 11-579 C.O.

REVISIONS DESCRIPTION			APPROVALS		
NO.	DATE		APP'D	DATE	
					DESIGN
					CONSTRUCTION
					INSPECTION
					OPERATIONS
					SUBMITTED

REFERENCES: DWGS. D-771

SCALE: 1" = 40'
DRAWN BY: AWA

INITIAL: 3/P
DATE: 10/19/06

REGISTERED PROFESSIONAL ENGINEER — SCOTT R. HILDEBRANDT — NO. C44762 EXP. 3-31-08 CIVIL — STATE OF CALIFORNIA

10/19/06

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

14" CML & C MODIFICATION
MALAGA ROAD
STA. 92+82.72 TO 93+53.42

APPROVED: [signature] SUPT. 10/19/06 SK-1117

MALAGA RD. 14" WATER CROSSING
E.M.W.D. REFERENCE DWG. D-771
SEE SHEET NO. 13

IP 050154 MS 4051

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: [signature] DATE 12-13-07
R.C.E. NO. 44762 EXP. DATE 3-31-08

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



TWO WORKING DAYS BEFORE YOU DIG

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY; AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND, 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
P8/248660	REVISIONS		

DESIGNED BY: J.C.C.
DRAWN BY: R.R.
DATE DRAWN: Dec 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: DATE:

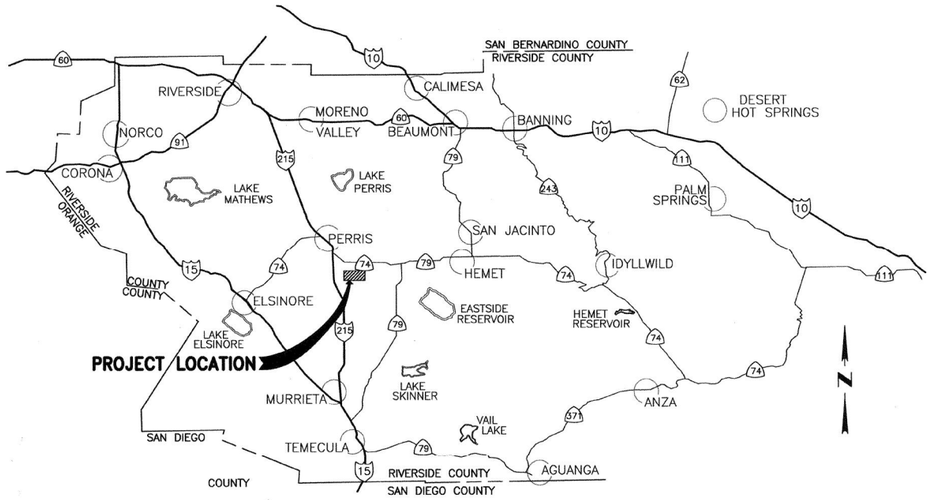
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ROMOLAND MDP
LINE A-3 STAGE 1
MALAGA RD. 14" WATER CROSSING

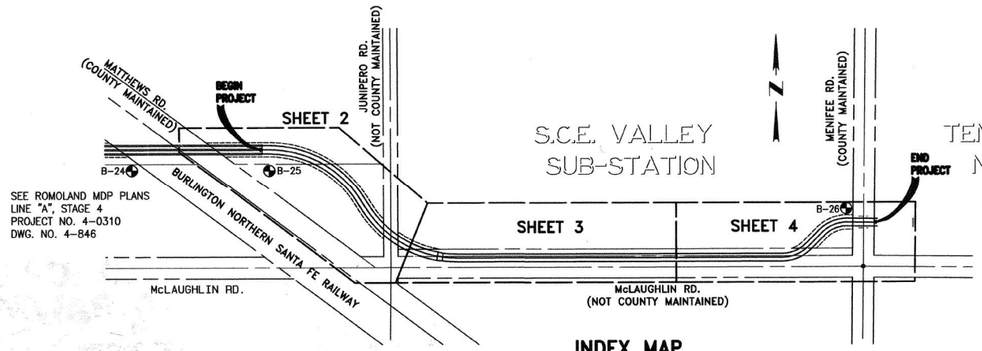
PROJECT NO. 4-0-00431
DRAWING NO. 4-871
SHEET NO. 25 OF 25

©2003 03-08-03 DWG 3838_INC_A3.dgn 10/19/2007

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
ROMOLAND MDP-LINE A, STAGE 5



VICINITY MAP
N.T.S.



INDEX MAP
SCALE:1"=200'
SEC 14 T5S R3W

GENERAL NOTES

1. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION.
2. ALL CHANNEL/STORM DRAIN REFERENCES AND CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
3. TOPOGRAPHY BY AERIAL PHOTOGRAPHS TAKEN AT AN ALTITUDE NOT TO EXCEED A FLYING HEIGHT TO CONTOUR INTERVAL RATIO OF 1800. PHOTOGRAPHY DATED 11-15-03.
4. THE VERTICAL DATUM IS DERIVED FROM (NGVD 29 OR NAVD 88). THE HORIZONTAL DATUM IS DERIVED FROM (NAD 27 OR NAD 83).
5. STANDARD DRAWINGS CALLED FOR ON THE PLAN & PROFILE SHALL CONFORM TO R.C.F.C. & W.C.D. STD. DRAWINGS, OR CALTRANS STANDARD PLANS. OR R.C.T.D.
6. ELEVATIONS AND LOCATIONS OF UTILITIES WERE OBTAINED FROM AVAILABLE INFORMATION AND ARE SHOWN APPROXIMATELY ON THESE PLANS. 48 HOURS BEFORE EXCAVATION CALL UNDERGROUND SERVICE ALERT AT 1-800-227-2600. ALL UTILITIES SHALL BE PROTECTED IN PLACE EXCEPT AS NOTED ON PLANS AND SPECIFICATIONS.
7. THE CONTRACTOR IS REQUIRED TO CONTACT ALL UTILITY AGENCIES REGARDING TEMPORARY SUPPORT AND SHORING REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
8. ALL OPENINGS RESULTING FROM CUTTING OR PARTIAL REMOVAL OF EXIST. CULVERTS, PIPES, OR SIMILAR STRUCTURES TO BE ABANDONED, SHALL BE SEALED AT BOTH ENDS WITH 6" MIN. CLASS "B" CONCRETE. OR REMOVED AS DIRECTED
9. ALL RECONSTRUCTION, RESURFACING AND PAVEMENT DELINATION, CURBS, SIDEWALKS AND OTHER IMPROVEMENTS ARE TO BE RECONSTRUCTED IN KIND USING THE SAME STRUCTURAL SECTION, LOCATIONS AND ELEVATIONS AS THE EXISTING IMPROVEMENTS, UNLESS OTHERWISE NOTED.
10. ⊕ INDICATES APPROX. SOIL BORING LOCATION PER SOILS REPORT BY CHJ, INC. DATED APRIL 27, 2004.
11. ~~THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S MEMORANDUM OF UNDERSTANDINC STANDARD SPECIFICATIONS DATED SEPTEMBER 1984, AND DESIGN MANUAL STANDARD DRAWINGS DATED APRIL 2004~~
12. AN ENCROACHMENT PERMIT IS REQUIRED FROM R.C.T.D. PLEASE CONTACT MOJAHED SALAMA AT (951) 955-6790. ~~IF AN ENCROACHMENT PERMIT IS REQUIRED FROM RIVERSIDE COUNTY FLOOD CONTROL, THEN CONTACT ED LOTZ AT (951)955-1266. AFTER THE PERMIT IS ISSUED THE DISTRICT MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.~~
13. UNLESS OTHERWISE SPECIFIED, MINIMUM STREET RECONSTRUCTION SHALL BE 0.25' TYPE "A" HOT MIX ASPHALT OVER 6" CLASS 2 AGGREGATE BASE OR AS SPECIFIED BY THE ENGINEER. ⚠
14. ALL PIPE LENGTHS ARE HORIZONTAL PROJECTIONS (NOT TRUE LENGTHS OF PIPE) AND ARE THE BASIS OF THE ESTIMATES OF QUANTITIES. THE CONTRACTOR SHALL DETERMINE THE TRUE QUANTITY OF PIPE REQUIRED FOR THIS PROJECT PRIOR TO PLACING THE ORDER.

INDEX

	SHEET NO.:
TITLE SHEET	1
PLAN & PROFILE	2-4
CONNECTOR PIPE PROFILES	5

R.C.F.C. & W.C.D. STANDARD DRAWINGS

MH253	MANHOLE NO. 3
TS302	TRANSITION STRUCTURE NO. 2
M814	ABBREVIATIONS AND SYMBOLS
M815	BEDDING AND PAY LINES
M816	CONCRETE BULKHEAD
JS226	JUNCTION STRUCTURE NO.1

CALTRANS STANDARDS

D81	REINFORCED CONCRETE DOUBLE BOX CULVERT

APWA STANDARDS

382	WINDOW DETAILS FOR MULTIPLE RCB STRUCTURES

MAINTENANCE RESPONSIBILITIES:

R.C.F.C. & W.C.D. MAINTAINS:
STORM DRAIN SYSTEMS IN OR OUT OF ROAD RIGHT-OF-WAY.
LINE "A" STAGE 5, (2) CELL RCB, TRANSITION AND MANHOLES
FROM STA. 213+00.00 (BEGINNING OF PROJECT)
TO STA. 231+62.24 (END OF PROJECT)INCLUDES CLEANING OF DEBRIS FOR ENTIRE PROJECT & INCLUDES STRUCTURAL INTEGRITY EXCEPT IN AREAS THAT RCTD MAINTAINS

BASIS OF BEARINGS:

THE CENTERLINE OF SAN JACINTO AVENUE TAKEN AS NORTH 89°36'00" EAST PER MAP OF FIGADOTA FARMS NO. 5, AS SHOWN BY MAP ON FILE IN BOOK 16, PAGE 78 OF MAPS, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

NOTICE TO CONTRACTOR:

THE EXISTENCE AND LOCATIONS OF ALL UNDERGROUND UTILITIES (UTILITY PIPES, STRUCTURES, ETC.) SHOWN ON THESE PLANS WERE ASCERTAINED BY A REVIEW OF RECORDS PROVIDED BY THESE MEMBER AGANCIES AND ARE APROXIMATE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. LOCATIONS OF UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION.

CALL UNDERGROUND SERVICE ALERT (U.S.A.) 1-800-227-2600 AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION.

RECO... DRAWI... RECORD ... 2/9/17 ... APPROVED BY: ...

IP 050154 MS 4051

SEAL-COUNTY
REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH No. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY:
RECOMMENDED ... DATE 12/18/07
ALAN D. FRENCH, P.E. DATE 12-18-07
R.C.E. 45702 EXP. 12-31-08

REGISTERED PROFESSIONAL ENGINEER SCOTT R. WILDERMUTH No. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
FAX (951) 788-1256
PREPARED BY: ... DATE 12/3/07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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


TWO WORKING DAYS BEFORE YOU DIG

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND. 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/235837 REVISIONS		
⚠	ADDED NOTES	[illegible]	2/9/17

DESIGNED BY: V.S.
DRAWN BY: J.P.
DATE DRAWN: DEC, 2007
CHECKED BY:

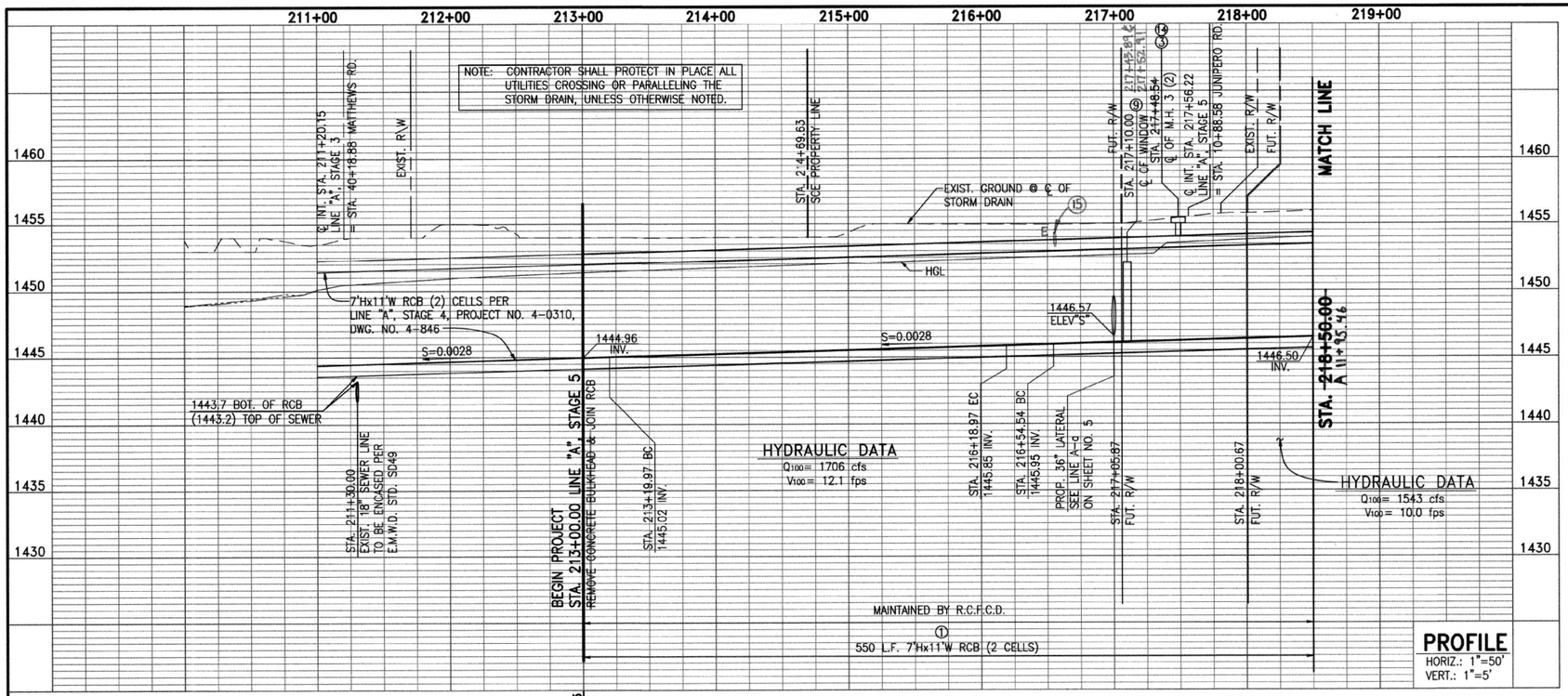
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL: ... PLANNING ENGINEER DATE: 12-21-2007
APPROVED BY: ... CHIEF ENGINEER DATE: 12/21/07

ROMOLAND MDP
LINE A - STAGE 5
TITLE SHEET

PROJECT NO. 4-0310
DRAWING NO. 4-861
SHEET NO. 1 OF 5

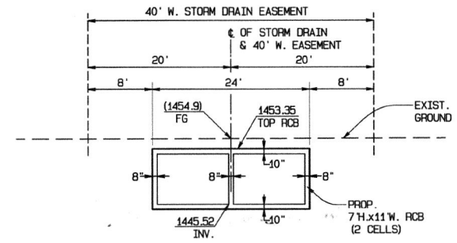
50

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PROFILE

HORIZ.: 1"=50'
VERT.: 1"=5'

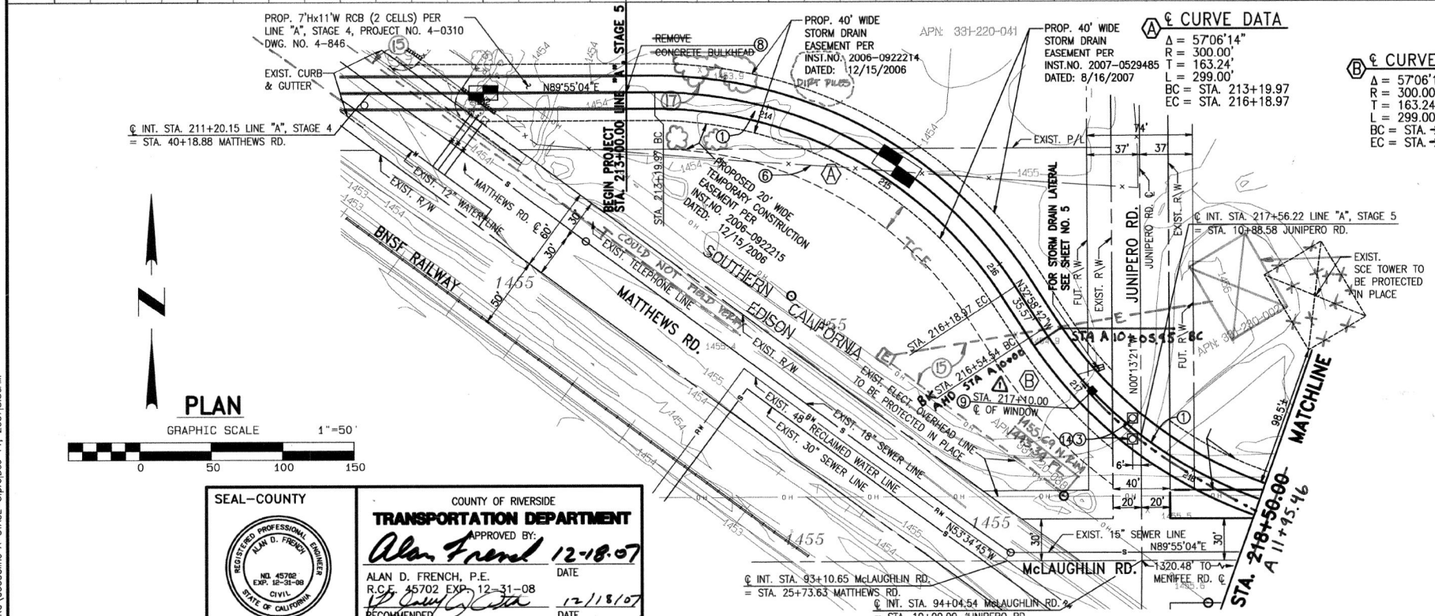


SECTION AT STA. 215+00.00

TYPICAL FROM STA. 213+00.00 TO STA. 218+50.00

GRAPHIC SCALE 1"=10'

0 10 20 30



PLAN

GRAPHIC SCALE 1"=50'

0 50 100 150

℄ CURVE DATA (A)

Δ = 57°06'14"
R = 300.00'
T = 163.24'
L = 299.00'
BC = STA. 213+19.97
EC = STA. 216+18.97

℄ CURVE DATA (B)

Δ = 57°06'14"
R = 300.00'
T = 163.24'
L = 299.00'
BC = STA. ~~216+54.54~~ A 10+05.95
EC = STA. ~~219+53.54~~ A 13+04.95 ⚠

NOTE

72 HOURS PRIOR TO WORKING IN SCE R/W, PLEASE CONTACT JAY GLASSER OF SCE AT PHONE NO. (909) 944-4429

CONSTRUCTION NOTES

① CONSTRUCT 7.0'Hx11.0'W RCB (2 CELLS) PER CALTRANS STD. D81
③ CONSTRUCT M.H. NO. 3 PER R.C.F.C.D. STD. DWG. NO. MH253
⑥ REMOVE & REPLACE EXISTING FENCE AS NECESSARY
~~⑧ REMOVE CONCRETE BULKHEAD~~
⑨ CONSTRUCT WINDOW PER A.P.W.A STD. PLAN NO. 382
⑭ CONSTRUCT 7' X 7' X 6" CONCRETE PAD WITH # 4 BARS @ 18" O.C. BOTH WAYS
⑮ COULD NOT FIELD VERIFY, CONTRACTOR TO POTHOLE PRIOR TO EXCAVATION.
⑰ REMOVE INTERFERRING PORTIONS OF TREES AS NECESSARY.

RECORD DRAWINGS
APPROVED: RECORD DRAWINGS
APPROVED BY: Stuart E. McKelvey
DATE: 2/9/17

IP 050154 MS 4051

SEAL—COUNTY
REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. R.C.E. 45702 EXP. 12-31-08 DATE
RECOMMENDED 12/18/07 DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRAND NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE: 12/13/07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 M. NW FROM WINCHESTER
3.9 M. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND. 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
P8/235837	REVISIONS		
⚠	REVISED ALIGNMENT AND NOTES	~~MPA~~	2/9/17

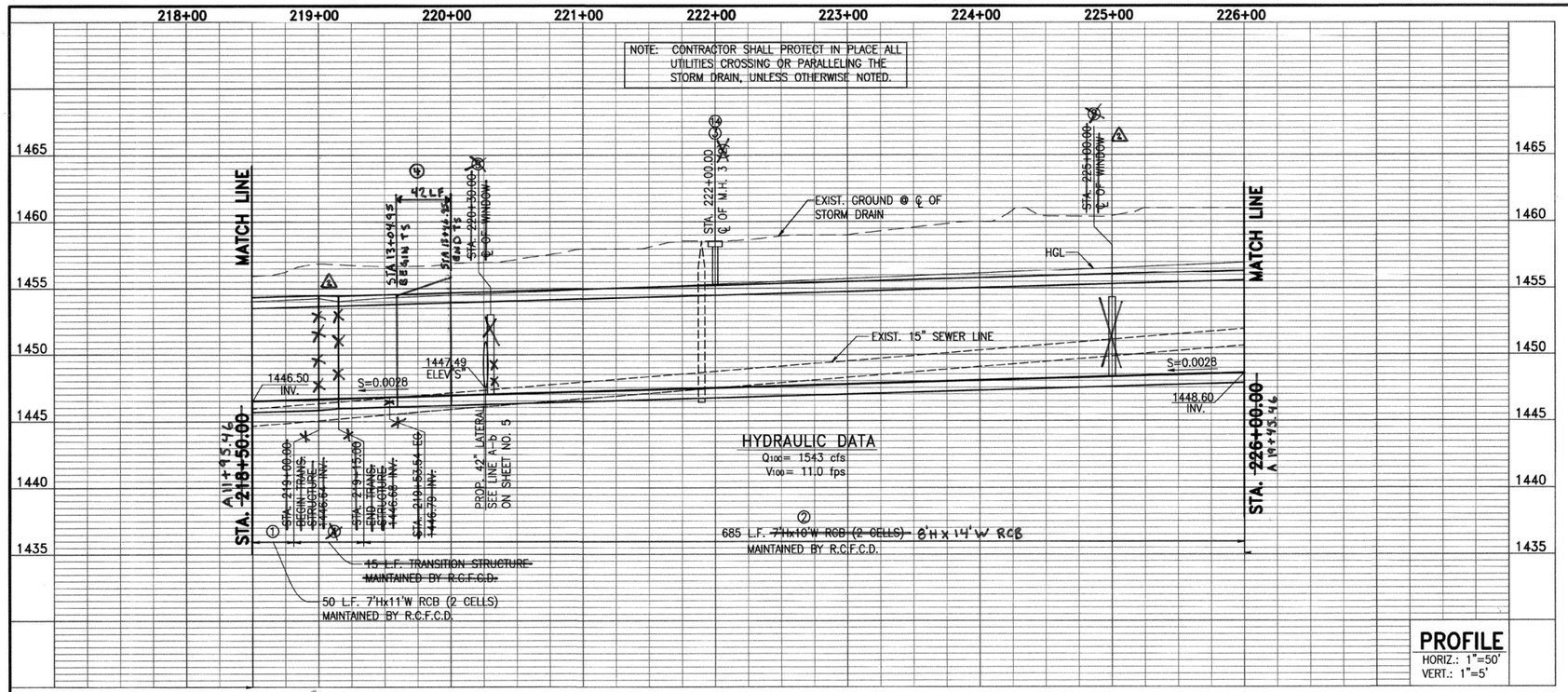
DESIGNED BY: V.S.
DRAWN BY: J.P.
DATE DRAWN: DEC. 2007
CHECKED BY:

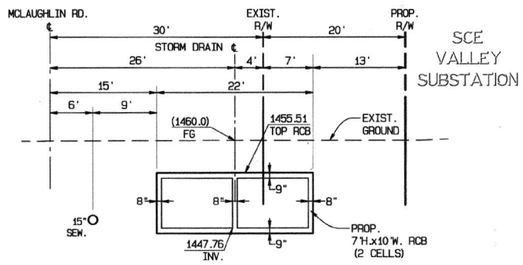
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 12/21/07
APPROVED BY: Stuart E. McKelvey DATE: 12-21-2007

ROMOLAND MDP
LINE A - STAGE 5
STA.213+00.00 TO STA. 218+50.00

PROJECT NO. 4-0310
DRAWING NO. 4-861
SHEET NO. 2 OF 5

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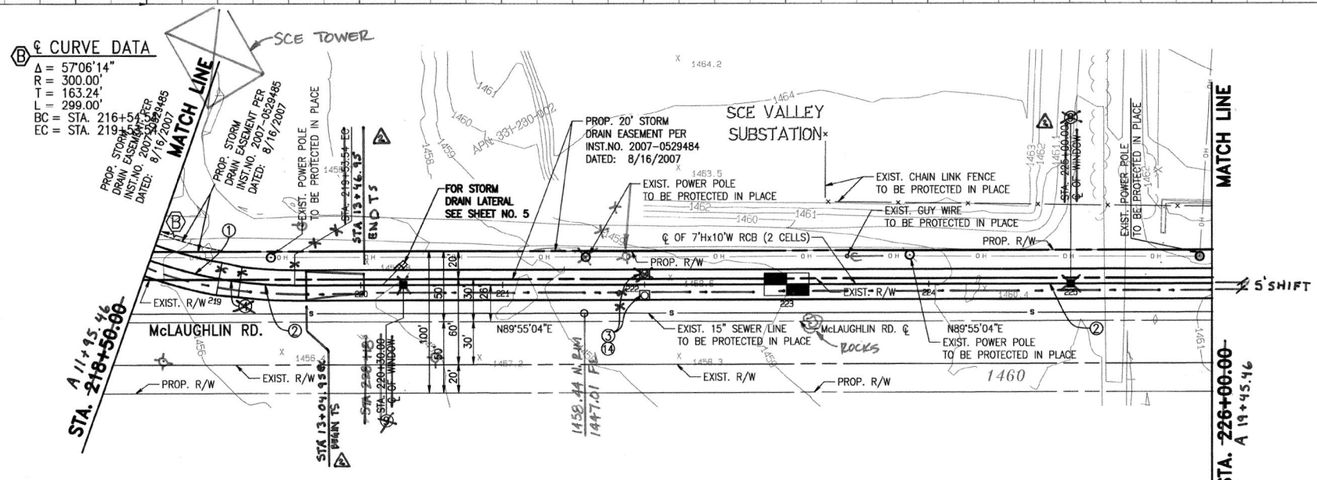


SECTION AT STA. 223+00.00

TYPICAL FROM STA. 219+53.54 TO STA. 226+00.00

GRAPHIC SCALE 1"=10'

0 10 20 30



PLAN

GRAPHIC SCALE 1"=50'

0 50 100 150

NOTE

72 HOURS PRIOR TO WORKING IN SCE R/W, PLEASE CONTACT JAY GLASSER OF SCE AT PHONE NO. (909) 944-4429.

RECORD DRAWINGS
APPROVED BY:
DATE: 2/9/17

CONSTRUCTION NOTES

① CONSTRUCT 7.0'Hx11.0'W RCB (2 CELLS) PER CALTRANS STD. D81
⚠ ② ~~CONSTRUCT 7.0Hx10.0'W RCB (2 CELLS) PER CALTRANS STD. D81~~ CONSTRUCT 8'H x 14'W RCB PER CALTRANS STD D80.
③ CONSTRUCT M.H. NO. 3 PER R.C.F.C.D. STD. DWG. NO. MH253
④ CONSTRUCT TRANSITION STRUCTURE NO. 2 PER R.C.F.C.D. STD. DWG. NO. TS302
⑨ CONSTRUCT WINDOW PER A.P.W.A STD. PLAN NO. 382
⑭ CONSTRUCT 7' X 7' X 6" CONCRETE PAD WITH # 4 BARS @ 18" O.C. BOTH WAYS

RECORD DRAWINGS
APPROVED BY:
DATE:

SEAL-COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH No. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: Alan French 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED 12/18/07 DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. WILDERMUTH No. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: DATE 12-13-07
R.C.E. NO. C44762 EXP. DATE 3-31-08

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
BURIED CABLE
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PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 195 YRDS. NW OF THE SE SWITCH STAND. 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	P8/235837 REVISIONS	APPR.	DATE
⚠	ADDED NOTES		2/9/17
⚠	REVISED ALIGNMENT AND DELETED RCB WINDOWS		2/9/17

DESIGNED BY: V.S.
DRAWN BY: J.P.
DATE DRAWN: DEC. 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL: DATE: 12/21/07
APPROVED BY: DATE: 12-21-2007

IP 050154 MS 4051

ROMOLAND MDP
LINE A - STAGE 5
STA. 218+50.00 TO STA. 226+00.00

PROJECT NO. 4-0310
DRAWING NO. 4-861
SHEET NO. 3 OF 5

52

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

WARNING!!!

THE G16, G24, AND G30 ARE HIGH PRESSURE GAS LINES: EXTREME CAUTION SHALL BE EXERCISED WHEN WORKING IN THIS AREA. THE CONTRACTOR IS REQUIRED TO USE MANUAL EXCAVATION METHODS WHEN EXCAVATING WITHIN 3' OF THE EXISTING GAS LINES. NOTIFY MR. TIM PEARCE OF THE GAS COMPANY 48 HOURS IN ADVANCE OF EXCAVATION AT (951) 845-0709.

MATCH LINE STA. 226+00.00 Δ 19°45'46"

STA. 227+00.00 ℄ OF M.H. NO. 3 (2)

STA. 228+18.00 ℄ OF WINDOW

EXIST. GROUND @ ℄ OF STORM DRAIN

HGL

1461.73 ELEV. 12" WTR.

1461.64 ELEV. 30"G

16"G

1462.67 ELEV.

42.97' TRANSITION STRUCTURE

8' H X 12' W RCB PER LINE "A" STAGE 6, PROJECT NO. 4-0310

S=0.005

EXIST. 15" SEWER LINE

1449.40 ELEV.

S=0.0028

HYDRAULIC JUMP

S=0.0005

1448.80 INV.

HYDRAULIC DATA
Q100= 1543 cfs
V100= 11.0 fps

PROP. 36" LATERAL SEE LINE A-6 ON SHEET NO. 5

STA. 228+66.36 BC 1449.35 INV.

STA. 229+44.90 EC 1449.57 INV.

STA. 229+98.96 BC 1449.72 INV.

STA. 230+47.10 FUT. R/W

STA. 230+78.55 EC 1449.94 INV.

STA. 231+03.65 GB 1450.00 INV.

STA. 231+62.24 GB 1453.55 INV.

FUT. R/W

STA. 230+58.00 ℄ OF M.H. NO. 3 (2)

EXIST. R/W

FUTURE FINISHED SURFACE @ MENIFEE RD.

℄ INT. STA. 231+23.62 LINE "A", STAGE 5 = STA. 11+22.34 MENIFEE RD.

EXIST. R/W

FUT. R/W

END PROJECT STA. 231+62.24 LINE "A", STAGE 5 = STA. 231+62.24 LINE "A", STAGE 6

HYDRAULIC DATA
Q 100= 1277.5 cfs
V100= 16.0 fps

6'Hx14'W RCB

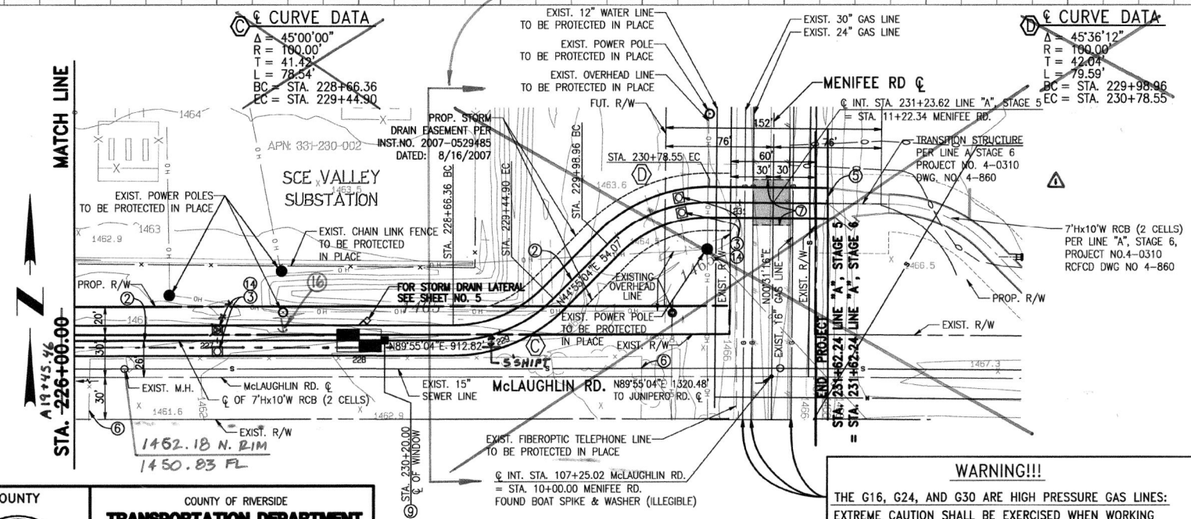
~~250 L.F. 7'Hx10'W RCB (2 CELLS)~~ 562.24 L.F. 7'Hx10'W RCB (2 CELLS)

MAINTAINED BY R.C.F.C.D.

MAINTAINED BY R.C.F.C.D.

PROFILE
HORIZ.: 1"=50'
VERT.: 1"=5'

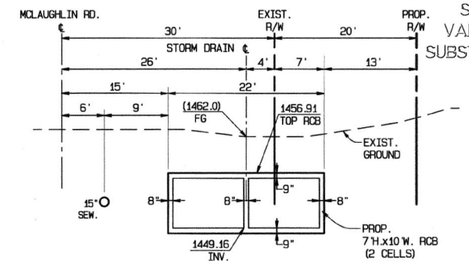
SEE SHEET 4A FOR MODIFIED ALIGNMENT DETAILS



PLAN
GRAPHIC SCALE 1"=50'
0 50 100 150

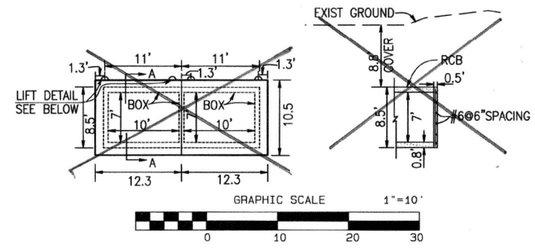
WARNING!!!

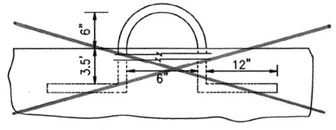
THE G16, G24, AND G30 ARE HIGH PRESSURE GAS LINES: EXTREME CAUTION SHALL BE EXERCISED WHEN WORKING IN THIS AREA. THE CONTRACTOR IS REQUIRED TO USE MANUAL EXCAVATION METHODS WHEN EXCAVATING WITHIN 3' OF THE EXISTING GAS LINES. NOTIFY MR. TIM PEARCE OF THE GAS COMPANY 48 HOURS IN ADVANCE OF EXCAVATION AT (951) 845-0709.



SECTION AT STA. 228+00.00
TYPICAL FROM STA. 226+00.00 TO STA. 228+66.36

GRAPHIC SCALE 1"=10'
0 10 20 30





LIFT DETAIL
SCALE 1"=1'

BULKHEAD DETAIL ⑤

NOTE

72 HOURS PRIOR TO WORKING IN SCE R/W, PLEASE CONTACT JAY GLASSER OF SCE AT PHONE NO. (909) 944-4429.

CONSTRUCTION NOTES

Δ ② ~~CONSTRUCT 8'Hx14'W RCB PER CALTRANS STD D80.~~ ~~CONSTRUCT 7.0'Hx10.0'W RCB (2 CELLS) PER CALTRANS STD. D81~~
③ CONSTRUCT M.H. NO. 3 PER R.C.F.C.D. STD. DWG. NO. MH253
~~⑤ CONCRETE BULKHEAD PER DETAIL SHOWN HERE & R.C.F.C.D. STD. DWG. NO. M816~~
⑥ REMOVE & REPLACE EXISTING CHAIN LINK FENCE AS NECESSARY
~~⑦ REMOVE & REPLACE EXISTING PAVEMENT AS NECESSARY~~
⑨ CONSTRUCT WINDOW PER A.P.W.A STD. PLAN NO. 382
⑭ CONSTRUCT 7' X 7' X 6" CONCRETE PAD WITH # 4 BARS @ 18" O.C. BOTH WAYS
⑯ EXISTING GUY WIRE TO BE RELOCATED BY SCE.

RECORD DRAWINGS
APPROVED BY: [signature] DATE: 2/9/17

IP 050154 MS 4051

SEAL–COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45782 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: [signature] 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED [signature] 12/18/07 DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070
PREPARED BY: [signature] DATE: 12/3/07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
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3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND. 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/235837 REVISIONS		
Δ	MODIFIED ALIGNMENT SEE SHEET 4A	[illegible]	2/9/17
Δ	REVISED ALIGNMENT AND NOTES	[illegible]	2/9/17

DESIGNED BY: V.S.
DRAWN BY: J.P.
DATE DRAWN: DEC. 2007
CHECKED BY:

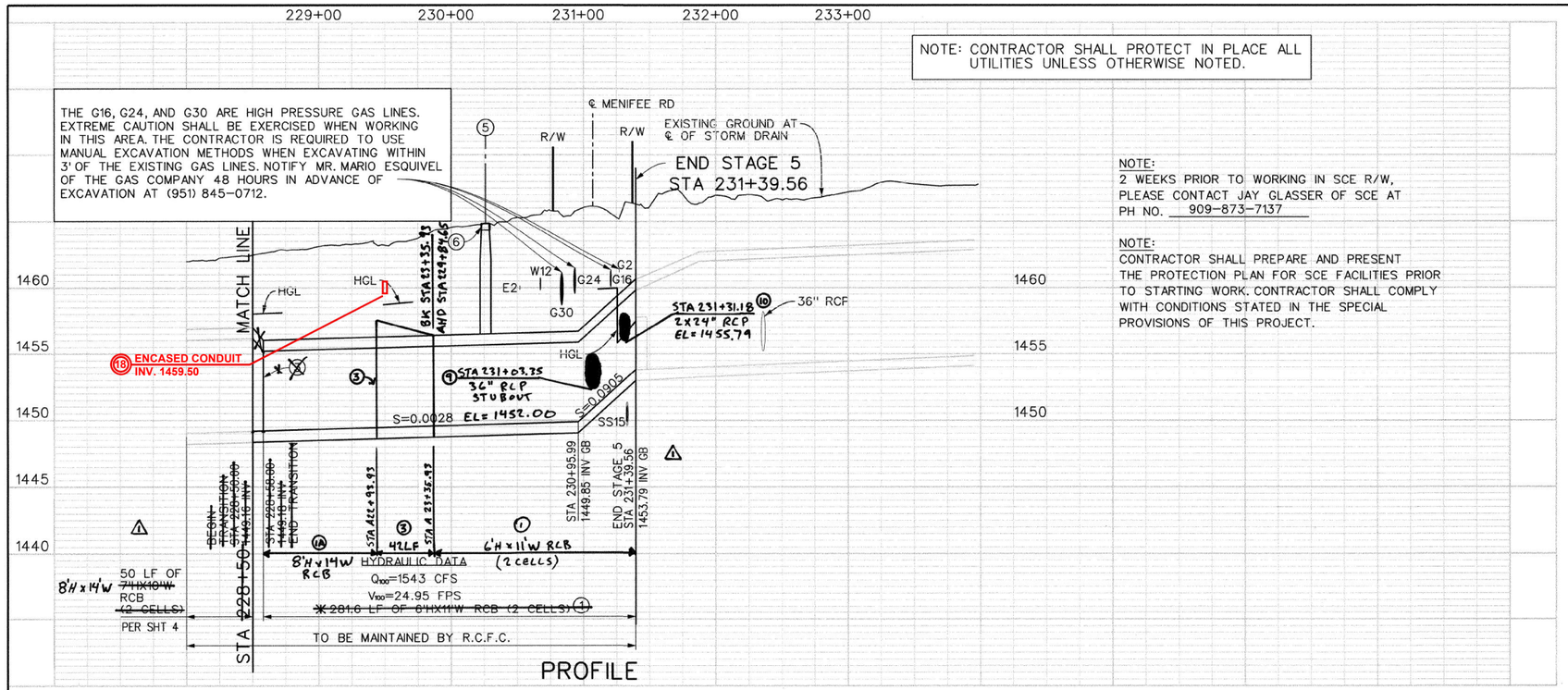
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 12/26/07
APPROVED BY: [signature] DATE: 12-21-2007

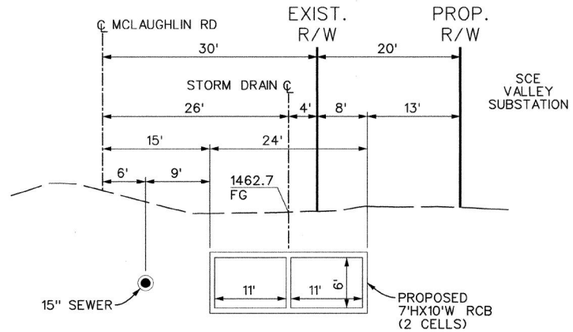
ROMOLAND MDP
LINE A – STAGE 5
STA. 226+00.00 TO STA. 231+92.62

PROJECT NO. 4-0310
DRAWING NO. 4-861
SHEET NO. 4 OF 5

53

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SECTION AT STA 228+65

TYPICAL FROM STA 228+50 TO 231+39.56

10' 0 10'

✱ SPECIAL PIPES

THE CONCRETE COVER ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1 1/2" OVER THE REINFORCING WHEN THE DESIGN VELOCITIES EXCEED 20FT PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE f'c=5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND f'c=6,000 FOR VELOCITIES EXCEEDING 30 FEET PER SECOND

Ⓐ ℄ CURVE DATA

- Δ = ~~39°06'59.66"~~ L 39°07'00.88" L
- R = ~~400.00'~~ 50'
- ⚠ L = ~~68.27'~~ 34.14'
- T = ~~35.53'~~ 17.76'
- BC = STA ~~229+00.06~~ A 22+39.79
- EC = STA ~~229+68.33~~ A 22+93.93
- N = ~~2212603.30~~ 2212598.29
- E = ~~6286650.54~~ 6286644.38

Ⓑ ℄ CURVE DATA

- Δ = 39°06'59.45"R
- R = 100.00'
- L = 68.27'
- T = 35.53'
- BC = STA 229+90.44
- EC = STA 230+58.71
- N = 2212662.18
- E = 6286722.71

⚠ (11) INSTALL CONCRETE BULKHEAD PER RCFC STD M816.

(1A) CONSTRUCT 8'HX14'W RCB PER CALTRANS STD D80.

(12) CONSTRUCT CONCRETE DROP INLET PER STD CB11D.

NOTES

1. CONSTRUCT 6'HX11'W RCB (2 CELLS) PER CALTRANS STD D81.
2. REMOVE AND REPLACE FENCE APPROX. 70 LF PER RCFC STD M801. SECURE YARD EACH NIGHT.
3. CONSTRUCT TRANSITION STRUCTURE PER RCFC STD DWG TS302.
5. CONSTRUCT MANHOLE NO.3 PER RCFC STD MH253.
6. CONSTRUCT 6" THICK CONCRETE PAD (7'X7') WITH 6"X6" 10 GA W.W.M. AROUND MANHOLE LID.
7. PROTECT POWER POLES IN PLACE.
8. CONSTRUCT MANHOLE NO.3 ADJACENT TO NORTH WALL OF RCB AND INSTALL MODIFIED TYPE 36R GRATE PER CALTRANS STD D77B WITH 2' NOMINAL DIAMETER.

⚠ (9) CONSTRUCT JUNCTION STRUCTURE NO.1 PER RCFC STD JS22G. A=45°, C=14.47', EL."R"=1452.83' EL."S"=1452.00 8LF-36" CLASS IV RCP. S=0.20.

(10) CONSTRUCT JUNCTION STRUCTURE NO.3 PER RCFC STD JS22B. A=90°, EL"S"=1455.79. SEE PROFILE ON SHEET 4B.

(18) EP 3714, 7/24/2019, ELECTRICAL CONDUIT IN ENCASEMENT

RECORD DRAWINGS

APPROVED BY: _____

DATE: 2/9/17

REGISTERED PROFESSIONAL ENGINEER MEKBTB DEGARGA No. 52203 C/V IL. STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ROBERT J. CULLEN No. 44684 C/V IL. STATE OF CALIFORNIA

CITY OF MENIFEE
APPROVED BY: _____
CITY ENGINEER
DATE: 9/22/14

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

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EL. 1478.07

REF.	DESCRIPTION	APPR.	DATE
	P8/235837 REVISIONS		
⚠	REVISED ALIGNMENT AND NOTES AND ADDED INLETS	dtm	2/9/17

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

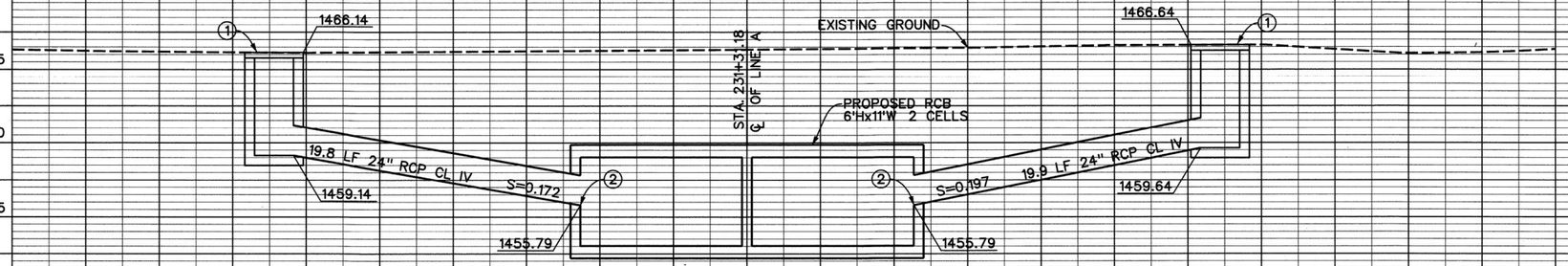
DESIGNED BY: ROHINI MUSTAFA
DRAWN BY: MICHAEL ARMENTA
DATE DRAWN: AUGUST 2014
RECOMMENDED FOR APPROVAL BY: _____ DATE: 9/22/2014
APPROVED BY: _____ DATE: 22 Sept 2014

ROMOLAND MDP LINE A STAGE 5

PLAN AND PROFILE

PROJECT NO. 5 4-00310-0⅔
DRAWING NO. 4-861
SHEET NO. 4A OF 5

NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES UNLESS OTHERWISE NOTED.



MENIFEE ROAD

NE AND SE SIDE OF RCB TO BE MAINTAINED BY COUNTY OF RIVERSIDE TRANSPORTATION

SEVERAL HIGH PRESSURE GAS LINES ARE LOCATED IN THIS AREA. EXTREME CAUTION SHALL BE EXERCISED WHEN WORKING IN THIS AREA. THE CONTRACTOR IS REQUIRED TO USE MANUAL EXCAVATION METHODS WHEN EXCAVATING WITHIN 3' OF THE EXISTING GAS LINES. NOTIFY MR. MARIO ESQUIVEL OF THE GAS COMPANY 48 HOURS IN ADVANCE OF EXCAVATION AT (951) 845-0712.

NOTES

(1) CONSTRUCT CONCRETE DROP INLET PER STD CB110: V=7, 3 SIDES OPEN (N, W AND E), GRADE TO DRAIN.

(2) CONSTRUCT JUNCTION STRUCTURE 3 PER STD JS228, A=90°

RECORD DRAWINGS

APPROVED BY: Scott Kyle

DATE: 2/9/17

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

TWO WORKING DAYS BEFORE YOU DIG

REF.	REVISIONS	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

DESIGNED BY: A. DONOHOO
DRAWN BY: A. DONOHOO
DATE DRAWN: JAN. 2017

RECOMMENDED FOR APPROVAL BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

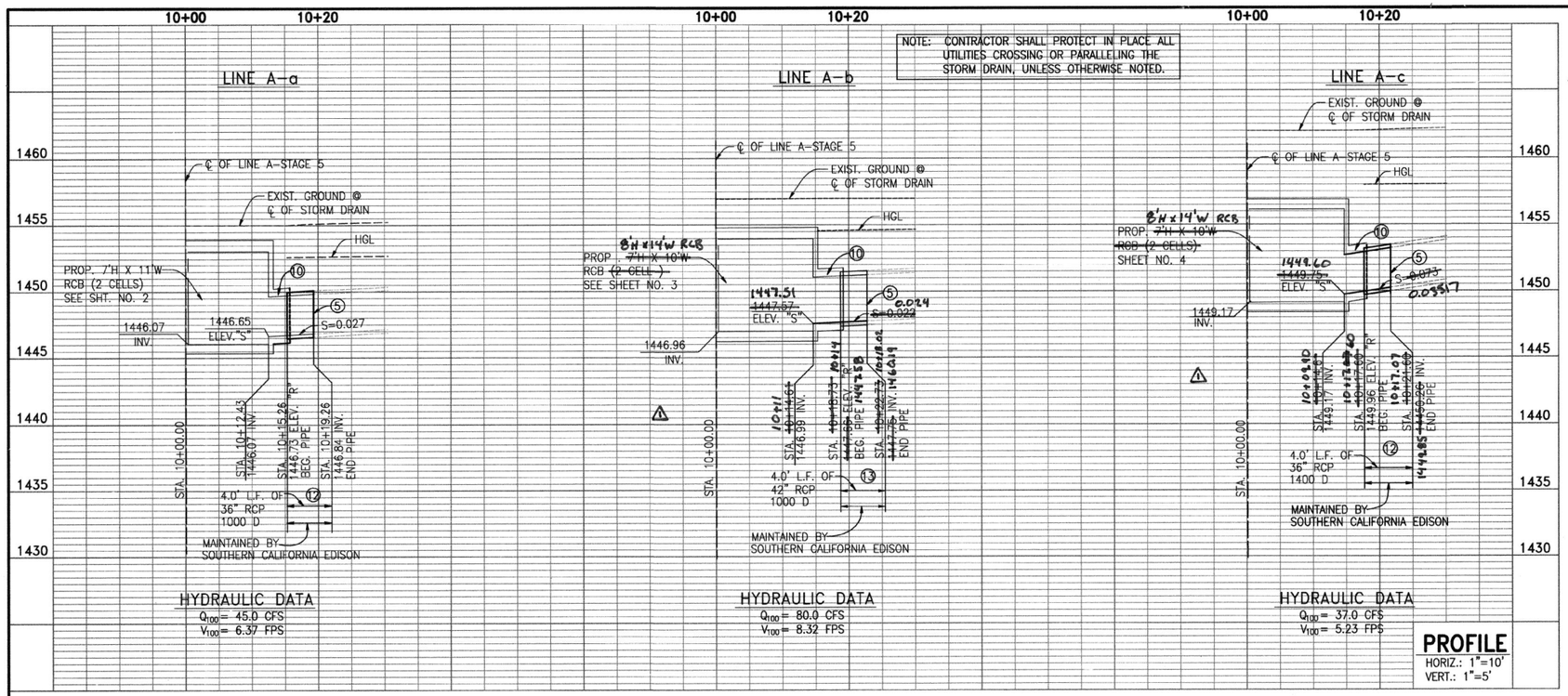
ROMOLAND MDP LINE A STAGE 5

CONNECTOR PIPE PROFILES

PROJECT NO. 4-0-310-05

DRAWING NO. 4-861

SHEET NO. 4B OF 5



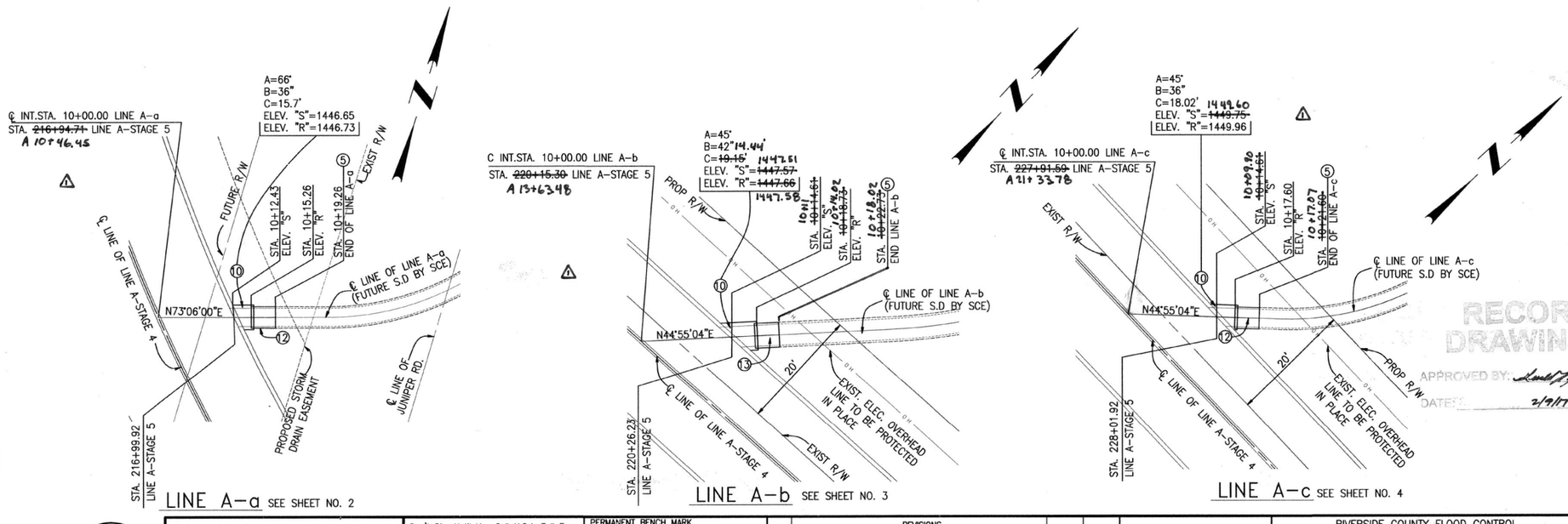
CONSTRUCTION NOTES

⑤ CONCRETE BULKHEAD PER R.C.F.C.D. STD. DWG. NO. M816

⑩ CONSTRUCT JUNCTION STRUCTURE NO.1 PER R.C.F.C.D. STD J226, FOR A,B,C ELEV. R & ELEV. "S" VALUES SEE PLAN

⑫ INSTALL 36" RCP,BEDDING PER R.C.F.C.D. STD.M815

⑬ INSTALL 42" RCP,BEDDING PER R.C.F.C.D. STD. M815



RECORD DRAWINGS

APPROVED BY: [signature]

DATE: 2/9/07

PLAN

GRAPHIC SCALE 1"=10'

0 10 20 30

IP 050154 MS 4051

SEAL-COUNTY

REGISTERED PROFESSIONAL ENGINEER ALAN D. FRENCH NO. 45702 EXP. 12-31-08 CIVIL STATE OF CALIFORNIA

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT
APPROVED BY: [signature] 12-18-07
ALAN D. FRENCH, P.E. DATE
R.C.E. 45702 EXP. 12-31-08
RECOMMENDED [signature] 12/18/07
DATE

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
3788 McCRAY ST.
RIVERSIDE, CA. 92506
PH. (951) 686-1070

PREPARED BY: [signature] DATE 12/13/07
R.C.E. NO. C44762 EXP. DATE 3-31-08

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

PERMANENT BENCH MARK
B.M. NO. S 327-1935
3.9 MI. NW FROM WINCHESTER
3.9 MI. NW ALONG THE ATCHISON,TOPEKA AND SANTA FE RAILWAY FROM THE STATION AT WINCHESTER, RIVERSIDE COUNTY, AT MENIFEE SIDING, 198 YRDS. NW OF THE SE SWITCH STAND. 72 FT. E OF MILEPOST 6, 16.5 FT. NE OF THE CENTERLINE OF THE TRACK, AND 4.5 FT. NE OF THE STATION SIGN. A STANDARD DISK, STAMPED R 327 1935 AND SET IN THE TOP OF A CONCRETE POST.
ELEVATION: 1478.07

REF.	REVISIONS	APPR.	DATE
P8/235837			
1	REVISED STATION AND ELEV.	[signature]	2/9/07

DESIGNED BY: V.S.
DRAWN BY: J.P.
DATE DRAWN: DEC. 2007
CHECKED BY:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 12/21/07
APPROVED BY: [signature] DATE: 12-21-2007

ROMOLAND MDP
LINE A - STAGE 5
LINES A-a, A-b, A-c

PROJECT NO. 4-0310
DRAWING NO. 4-861
SHEET NO. 5 OF 5

55

G:\2003\03-0338\DWG&PRO\03338line A-STAGE-5.prj|Dec 11, 2007|8:35AM