I-80/SR 65 Interchange Project
Placer County, California

Drainage Impact Summary Report

03-Pla-80-1.9/6.1
03-Pla-65-R4.8/R7.3

Prepared for:

PLACER COUNTY TRANSPORTATION PLANNING AGENCY

Prepared by:

CH2MHILL

WRECO

January 2015

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Submitted to:
Placer County Transportation Planning Agency

This report has been prepared by or under the supervision of the following Registered Engineer. The Registered Civil Engineer attests to the technical information contained herein and has judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

Analette Ochoa, P.E.
Registered Civil Engineer

1/12/15
Date

January 2015

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Executive Summary

The Interstate 80/State Route 65 (I-80/SR 65) Interchange (Project) is within Placer County, in and near the cities of Roseville and Rocklin. The Project proposes to construct up to 4.2 miles of improvements along the I-80 corridor and 2.5 miles of improvements along the SR 65 corridor.

Three build alternatives are proposed to add capacity, a bi-directional HOV system, and high-speed connections. Local and regional circulation and access would be improved, as would weaving conditions along I-80 between Eureka Road/Atlantic Street and Taylor Road and along SR 65 between the I-80/SR 65 Interchange and Galleria Boulevard/Stanford Ranch Road. Other improvements would include widening the East Roseville Viaduct, replacing the Taylor Road Overcrossing, and realigning the existing eastbound I-80 to northbound SR 65 loop connector.

Alternative 1 would improve spacing and vehicle lane-weaving movements between interchanges on I-80. The two existing Taylor Road interchange ramps would be relocated to the east and reconstructed in a Type L-11/L-12 interchange configuration, providing two additional ramp connections and improving access between the local streets and freeway system. The interchange would be positioned within the I-80/SR 65 interchange footprint and utilize portions of the existing eastbound I-80 to northbound SR 65 loop connector as well as the existing southbound SR 65 to eastbound I-80 connector. The existing Taylor Road interchange ramps would be removed, and the area would be regraded.

Alternative 2 would improve spacing and vehicle lane-weaving movements between interchanges on I-80 by collecting and redirecting eastbound ramp traffic onto a collector-distributor ramp system. The collector-distributor system would provide eastbound access to Taylor Road and from Eureka Road at the Atlantic Street/Eureka Road interchange and would restrict local traffic from leaving or entering I-80 mainline until after the critical weave area between Eureka Road and the I-80/SR 65 interchange. The two existing Taylor Road interchange ramps would remain in their current location but would be reconfigured to accommodate the surrounding improvements.

Similar to Alternative 2, Alternative 3 would improve spacing and vehicle lane-weaving movements between interchanges on I-80 by collecting eastbound Eureka Road on-ramp traffic. Weaving on I-80 would be significantly improved because ramp traffic would be redirected to a collector-distributor system and restricted from entering and exiting I-80 mainline until after the critical weave area between Eureka Road and the I-80/SR 65 interchange. Unique to Alternative 3, the two existing Taylor Road interchange ramps would be eliminated, and access to the Taylor Road area would be accommodated by the adjacent local interchanges at the Atlantic Street/Eureka Road, Rocklin Road, and Galleria Boulevard/Stanford Ranch Road interchanges. The connector ramps serving I-80 and SR 65 are the same between Alternatives 2 and 3.

The analysis in this technical study assumes the currently proposed design alternatives, which include standard piers spaced evenly apart, to support the Eastbound I-80 to Northbound SR 65 connector (Alternative 1) and Collector-Distributor ramp (Alternatives 2 and 3). The initial geometry and spacing assumptions required that piers be placed in the wetted portions of the channel.

Concurrent with the development of this technical study, the Project team has consulted with Caltrans and relevant resource agencies to identify design options to minimize and/or avoid impacts to listed species and riverine habitat within Secret Ravine. Based on these meetings, the Project team has designed an outrigger concept and/or shifted the bent spacing, which enables the placement of the bridge foundation outside of the channel.

Although not specifically analyzed in this study, the revised design constitutes either an A) improved condition over that analyzed, or B) a condition similar to that analyzed. Therefore, a separate analysis of the revised design is not included in this study.

This report intends to document the drainage impacts, assess proposed drainage designs, and any necessary improvements for the Project.

The drainage design will be based on Caltrans criteria found in the Highway Design Manual (HDM; 2010, with updates). The Rational Method, TR-55 method, and United States Geological Survey (USGS) regression equations will be used to estimate the design discharge, depending on watershed characteristics. The water spread will be designed for the shoulder width. The hydraulic gradient for culverts will designed to be at least 0.75 feet below the top of inlet grate or manhole cover. The allowable freeboard height for ditches will equal 0.2 times the energy head for trapezoidal ditch cross sections under subcritical flow.

The majority of the Project area is outside of any Federal Emergency Management Agency (FEMA) floodplains. FEMA floodplains, including regulatory floodways, are located at the major creek crossings within the Project limits. The Project crossings at Antelope Creek, Secret Ravine, and Miners Ravine are located within a designated Zone AE region. Zone AE is a 100-year floodplain designation with base flood elevations (BFEs) determined. The Flood Insurance Rate Maps (FIRMs) also show a regulatory floodway designation at these locations. The remaining Project area is located within a Zone X region, which is a designation pertaining to areas of flood with a recurrence interval of 500 years or more or with depths of less than 1 foot during the 100-year occurrence event.

There are six waterways that flow through or along the Project's vicinity that may be impacted by the Project. Impervious area would be added within the Project limits, which would result in 32, 29, and 27 acres of added impervious area for Alternatives 1, 2, and 3, respectively. The added impervious area will increase flows and impact existing drainage patterns to the local drainage systems. Therefore, the Project would improve, replace, or add storm drain systems to mitigate changes to existing drainage patterns due to the

Project. Roadside ditches would be modified as well. The existing floodplains and discharge flows would match the existing condition to the extent possible.

Acronyms

APC	Alternative Pipe Culvert
BMP	Best Management Practice
Caltrans	California Department of Transportation
CSP	Corrugated Steel Pipe
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
HDM	Highway Design Manual
HOV	High-occupancy Vehicle
HSG	Hydrologic Soil Group
I-	Interstate
IDF	Intensity Duration Frequency
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
PCFCWCD	Placer County Flood Control and Water Conservation District
PCTPA	Placer County Transportation Planning Agency
PM	Post Miles
Project	I-80/SR 65 Interchange Project
RCP	Reinforced Concrete Pipe
RSP	Rock Slope Protection
SR	State Route
TSM	Traffic System Management
USDA	United States Department of Agriculture
USGS	United States Geological Survey

1 INTRODUCTION

1.1 Project Description

The California Department of Transportation (Caltrans), in cooperation with the Placer County Transportation Planning Agency (PCTPA), Placer County, and the cities of Roseville, Rocklin, and Lincoln, proposes to improve the Interstate 80/State Route 65 (I-80/SR 65) Interchange in Placer County, California.

The I-80/SR 65 Interchange Project (Project) is located in Placer County in the cities of Roseville and Rocklin at the I-80/SR 65 Interchange. The Project limits include I-80 from the Douglas Boulevard Interchange to the Rocklin Road Interchange (post miles [PM] 1.9 to 6.1) and SR 65 from the I-80 junction to the Pleasant Grove Boulevard Interchange (PM R4.8 to R7.3). The existing I-80/SR 65 Interchange is a type F-6 freeway-to-freeway interchange. See Figure 1 and Figure 2 for Project location and vicinity maps, respectively.

The purpose of the Project is to reduce future traffic congestion, improve operations and safety, and comply with current Caltrans and local agency design standards.

Three build alternatives are under consideration and were designed to satisfy the purpose and need, while avoiding or minimizing environmental impacts.

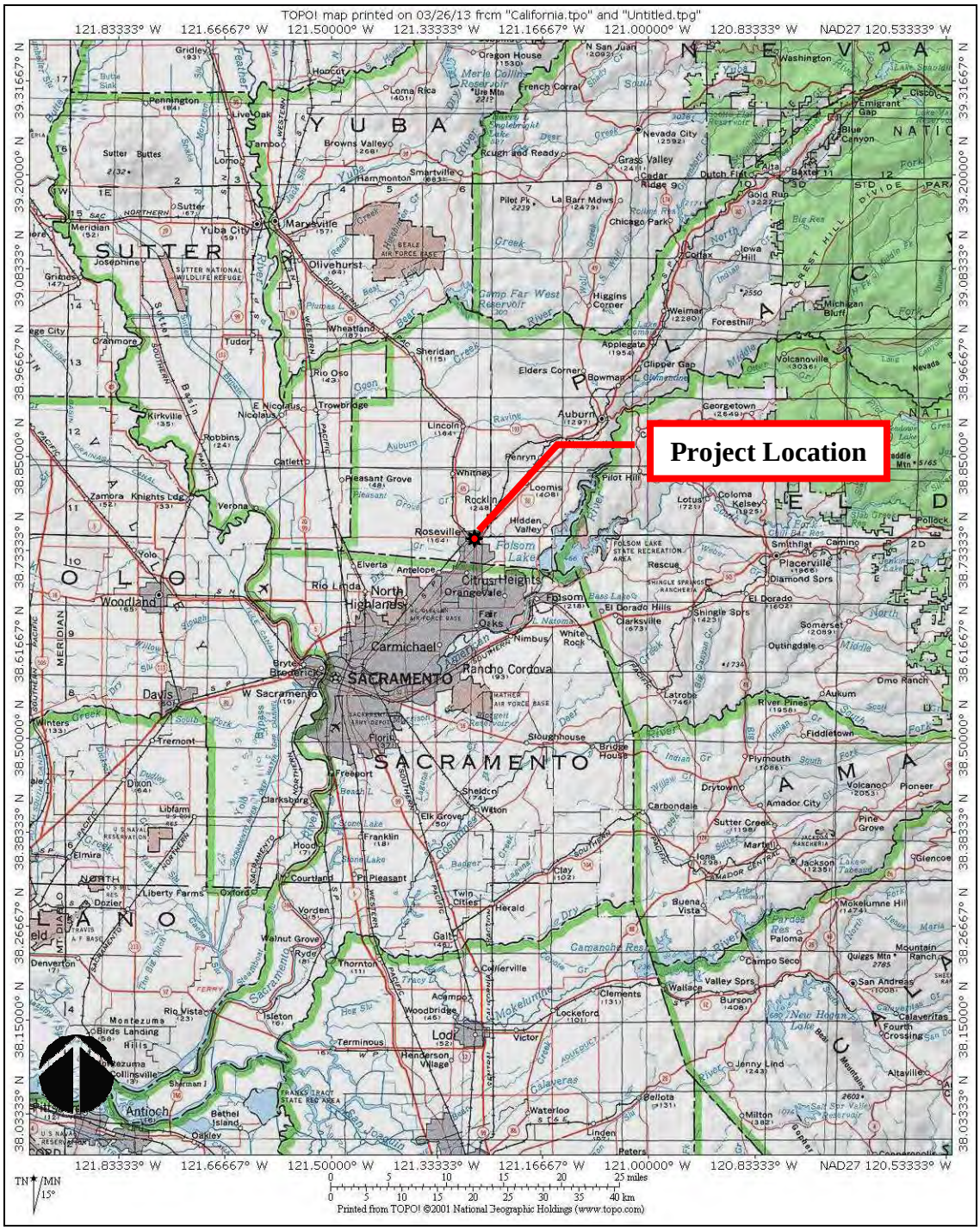

Figure 1. Location Map

Source: United States Geological Survey (USGS)

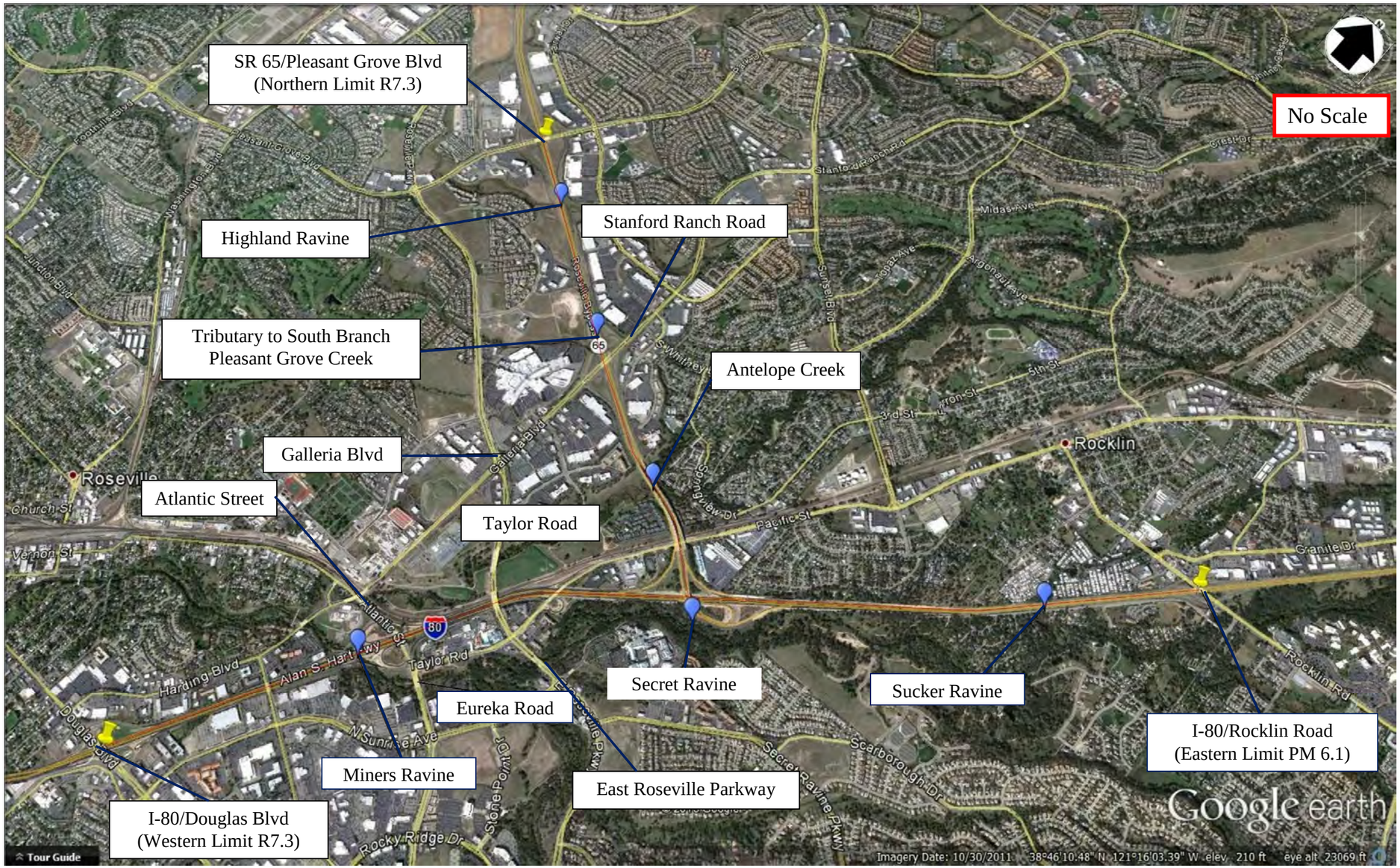

Figure 2. Vicinity Map

Source: Google

1.1.1 Build Alternatives

All of the build alternatives propose to add capacity, a bidirectional high-occupancy vehicle (HOV) system, and high-speed connector ramps. Local and regional circulation and access would be improved, as would vehicle lane-weaving conditions along I-80 between Eureka Road/Atlantic Street and Taylor Road and along SR 65 between the I-80/SR 65 interchange and Galleria Boulevard/Stanford Ranch Road. Other improvements would include widening the East Roseville Viaduct, replacing the Taylor Road overcrossing, and realigning the existing eastbound (EB) I-80 to northbound (NB) SR 65 loop connector.

The alternatives under consideration are:

- Build Alternative 1—Taylor Road Full Access Interchange
- Build Alternative 2—Collector–Distributor System Ramps
- Build Alternative 3—Taylor Road Interchange Eliminated

Alternative 1 would improve spacing and vehicle lane-weaving movements between interchanges on I-80. The two existing Taylor Road interchange ramps would be relocated to the east and reconstructed in a Type L-11/L-12 interchange configuration, providing two additional ramp connections and improving access between the local streets and freeway system. The interchange would be positioned within the I-80/SR 65 interchange footprint and utilize portions of the existing EB I-80 to NB SR 65 loop connector as well as the existing southbound (SB) SR 65 to EB I-80 connector. The existing Taylor Road interchange ramps would be removed, and the area would be regraded (See Figure 3).

Alternative 2 would improve spacing and vehicle lane-weaving movements between interchanges on I-80 by collecting and redirecting EB ramp traffic onto a collector-distributor ramp system. The collector-distributor system would provide EB access to Taylor Road and from Eureka Road at the Atlantic Street/Eureka Road interchange and would restrict local traffic from leaving or entering I-80 mainline until after the critical weave area between Eureka Road and the I-80/SR 65 interchange. The two existing Taylor Road interchange ramps would remain in their current location but would be reconfigured to accommodate the surrounding improvements (See Figure 4).

Similar to Alternative 2, Alternative 3 would improve spacing and vehicle lane-weaving movements between interchanges on I-80 by collecting EB Eureka Road on-ramp traffic. Weaving on I-80 would be significantly improved because ramp traffic would be redirected to a ramp braid system and restricted from entering and exiting I-80 mainline until after the critical weave area between Eureka Road and the I-80/SR 65 interchange. Unique to Alternative 3, the two existing Taylor Road interchange ramps would be eliminated, and access to the Taylor Road area would be accommodated by the adjacent local interchanges at the Atlantic Street/Eureka Road, Rocklin Road, and Galleria Boulevard/Stanford Ranch Road interchanges. The connector ramps serving I-80 and SR

65 (SW, EN, SE, WN, and HOV) are the same between Alternatives 2 and 3. (See Figure 5).

1.1.2 Transportation System Management

This alternative includes ramp metering, HOV bypass lanes, traffic signal coordination, transit options, and bicycle and pedestrian facilities in order to improve the transportation system at the I-80/SR 65 interchange. However, the transportation system management (TSM) measures alone could not satisfy the purpose and need of the project. This alternative has been eliminated, but the TSM features have been incorporated into the build alternatives for this project.

1.1.3 No-Build Alternative

This alternative would not make any improvements to the I-80/SR 65 interchange or adjacent transportation facilities to satisfy the purpose and need. HOV and auxiliary lanes proposed on SR 65 north of Galleria Boulevard/Stanford Ranch Road, and other local improvements separately proposed and identified in the Metropolitan Transportation Plan, would be implemented according to their proposed schedules.

1.1.4 Outrigger Concept/Shifted Bent Spacing

The analysis in this technical study assumes the currently proposed design alternatives, which include standard piers spaced evenly apart, to support the Eastbound I-80 to Northbound SR 65 connector (Alternative 1) and Collector-Distributor ramp (Alternatives 2 and 3). The initial geometry and spacing assumptions required that piers be placed in the wetted portions of the channel.

Concurrent with the development of this technical study, the Project team has consulted with Caltrans and relevant resource agencies to identify design options to minimize and/or avoid impacts to listed species and riverine habitat within Secret Ravine. Based on these meetings, the Project team has designed an outrigger concept and/or shifted the bent spacing, which enables the placement of the bridge foundation outside of the channel.

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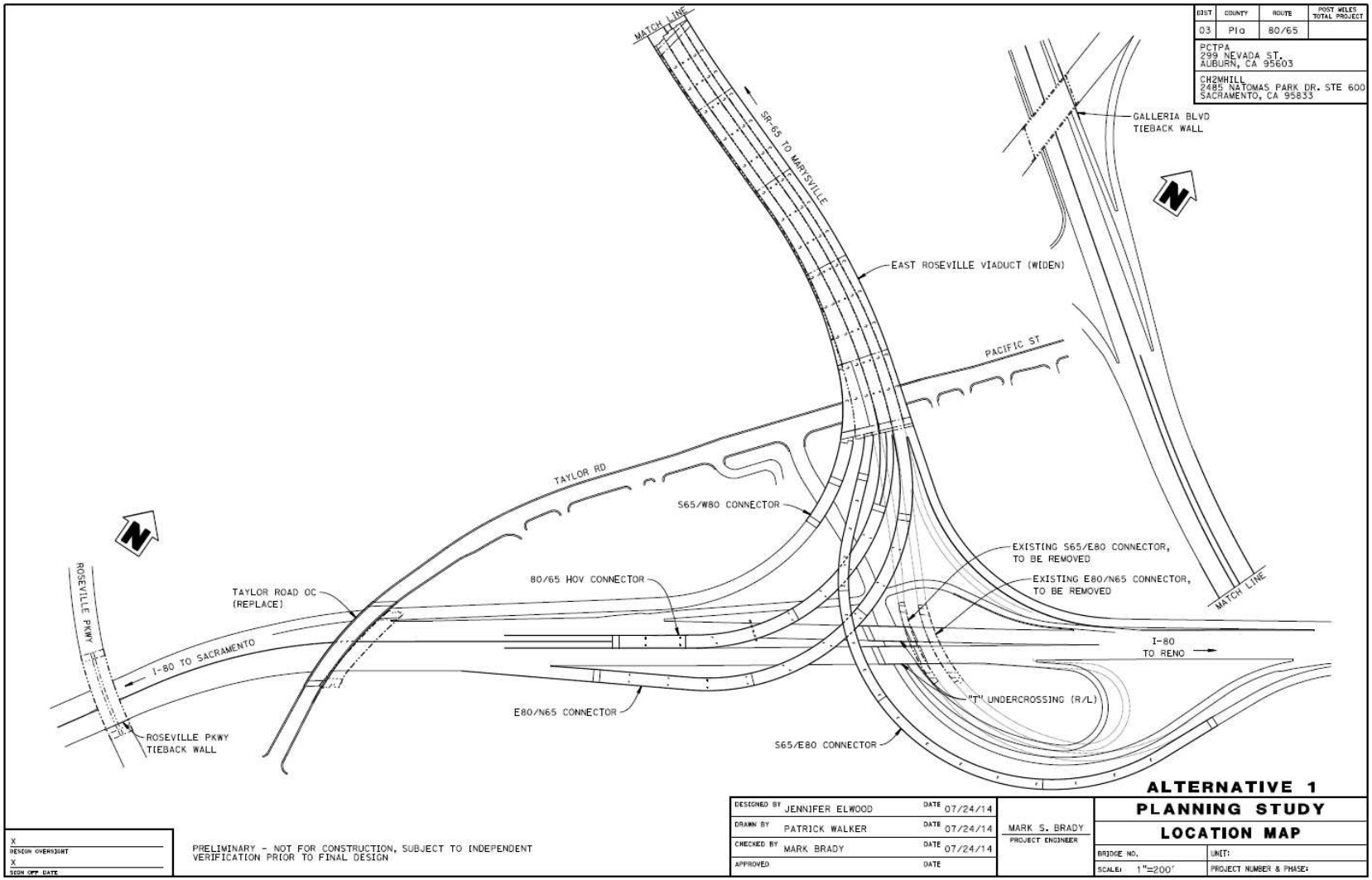

Figure 3. Alternative 1 Layout

Source: CH2M Hill

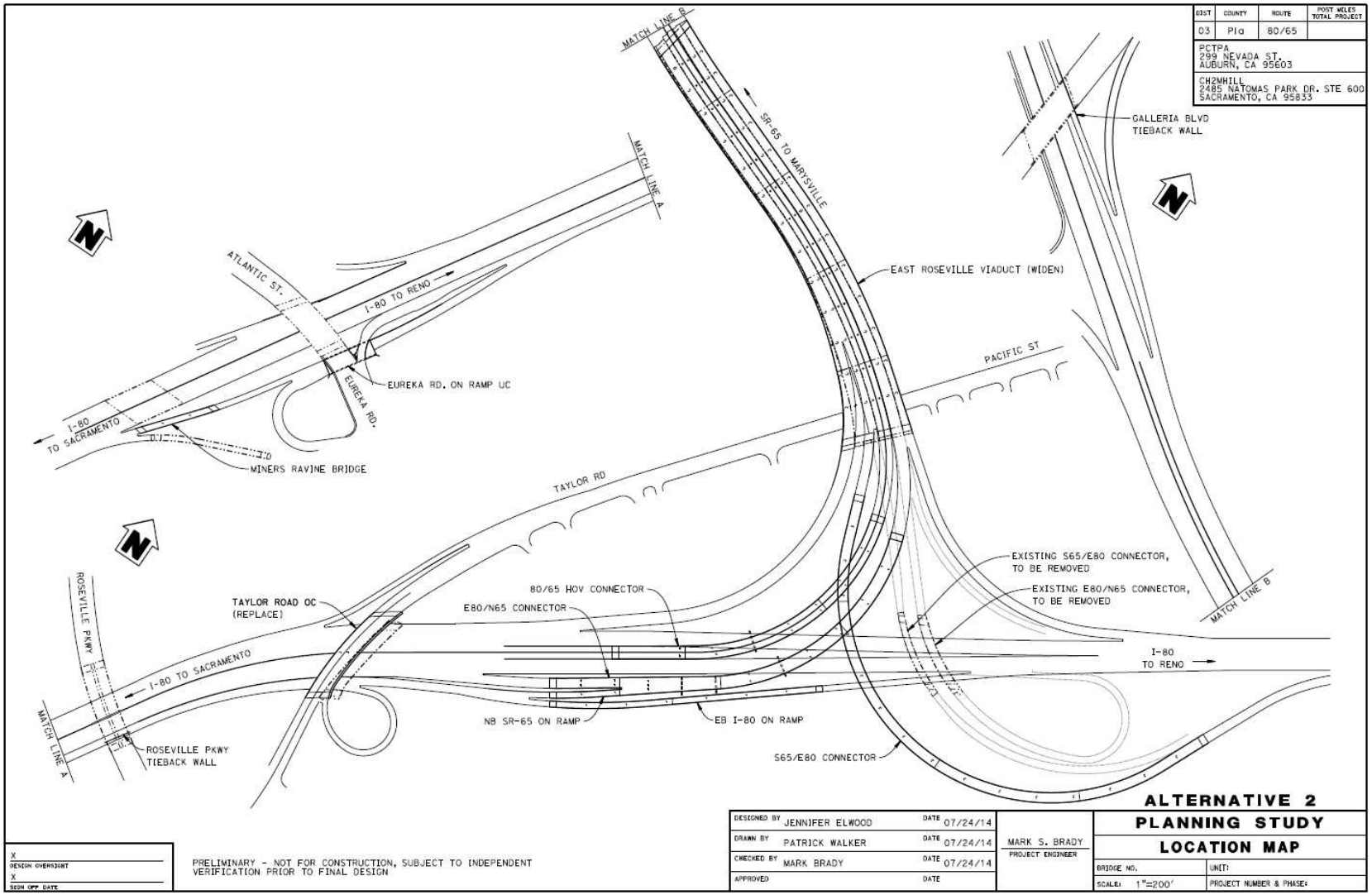

Figure 4. Alternative 2 Layout

Source: CH2M Hill

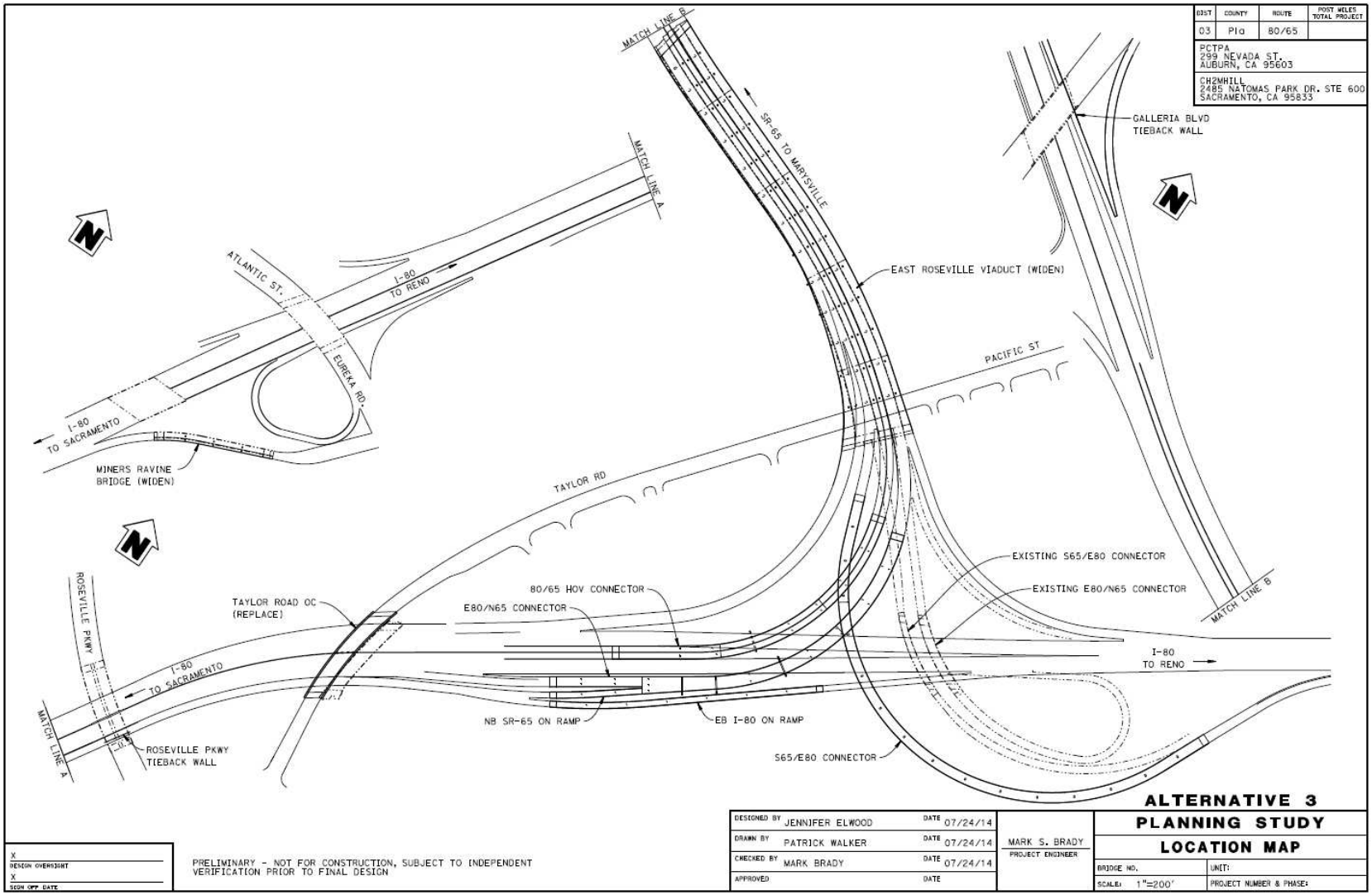

Figure 5. Alternative 3 Layout

Source: CH2M Hill

1.2 Key Tasks

The purpose of this report is to document the drainage impacts due to the proposed Project changes and to analyze or recommend drainage improvements necessary to maintain existing drainage patterns and discharge flows to the extent possible.

1.3 Existing Facilities

Within Placer County, I-80 begins at the Sacramento County/Placer County line in Roseville as a 10-lane freeway—including two carpool HOV lanes, one in each direction. It extends east through the Riverside Avenue interchange where it changes to nine lanes (five eastbound and four westbound). At the Douglas Boulevard interchange, I-80 returns to a 10-lane freeway and remains this size through the Rocky Ridge Drive/Lead Hill Boulevard overcrossing, Atlantic Street/Eureka Road interchange, Roseville Parkway overcrossing, Taylor Road interchange, and the SR 65 interchange. East of the SR 65 junction, I-80 changes to six lanes, the HOV lanes end, and the highway extends into the City of Rocklin past the Rocklin Road interchange.

SR 65 begins at the I-80 junction and is an important interregional route that serves both local and regional traffic. The route serves as a major connector for both automobile and truck traffic originating from the I-80 corridor in the Roseville/Rocklin area to the SR 70/99 corridor in the Marysville/Yuba City area. SR 65 is a vital economic link from residential areas to shopping and employment centers in southern Placer County. It is also an important route for transporting aggregate, lumber, and other commodities.

The existing I-80/SR 65 interchange is a type F-6 freeway-to-freeway interchange that was constructed in 1985.

1.4 Existing Drainage and Drainage Design Issues

The existing drainage system within the Project limits is composed of cross culverts, bridge crossings over major creeks, concrete ditches, urban vegetation, storm drains along the roads, unlined ditches, and roadside asphalt concrete gutters. For all proposed alternatives, the principal features that would impact existing drainage facilities are the widening of the roadway and the construction of new retaining walls. Portions of the East Roseville Viaduct, I-80, and SR 65 would be widened as part of the proposed actions for the Project. Culverts in serviceable condition would be extended to address the proposed widening and to maintain existing drainage patterns, and undersized culverts would be replaced with larger sizes.

Based on as-built plans (see Appendix A), several of the existing cross culverts were constructed around 1985. Therefore, they may still be in fair condition, assuming they have a 50-year design life. Culvert inspections could be performed during the PS&E phase of the Project to determine their condition.

Additional inlets and new longitudinal systems may be designed to meet the current drainage design requirements and to capture the increased runoff due to added impervious areas. Existing drainage systems at the edge of shoulders or in the median may need to be relocated, and new systems would be proposed to address new retaining walls and sound walls.

There are no proposed drainage improvements outside of Caltrans' right-of-way. The flow pattern of upstream, off-site drainage areas flowing through cross culverts would be maintained, and downstream drainage systems would need to be evaluated for any impacts.

1.5 Drainage Design Criteria

The drainage design for the Project will comply with Chapter 800 of the sixth edition of the *Caltrans Highway Design Manual* (HDM), with updates (2006).

- Hydrology calculations will be performed based on Table 819.5A of the HDM. The Rational Method and TR-55 Graphical Method will be used unless the watershed area is greater than 320 acres or the time of concentration is greater than one hour. If the watershed area is too large or the time of concentration is too long, the USGS Regression Equations will be used instead of the Rational Method.
    - Longitudinal storm drain systems and ditches will be designed for the 25-year storm event.
    - Cross culverts will be designed for the 100-year storm event.
- The runoff spread width for the Project will be designed to be contained within the shoulder.
- Culverts will be designed with a minimum slope resulting in a self-cleaning velocity of 3 ft/sec when flowing half full.
- Manning's n values of 0.013 and 0.024 will be used during hydraulic calculations for existing concrete pipes and corrugated steel pipes, respectively. Alternative pipe culvert (APC) will be designed using a Manning's n value of 0.024.
- Minimum time of concentration for pavement areas used for calculations is 5 minutes.
- Cross culverts will be a minimum of 18 inches in diameter under the roadway unless they exceed 100 feet in length, in which case, the minimum diameter of a pipe is 24 inches. Downdrains will have a minimum diameter of 12 inches.
- Hydraulic grade lines within the storm drain system will be designed to be at least 0.75 feet below the top of inlet grates and manhole rims.
- Ditches will be designed with a freeboard height equaling at least 0.2 times the energy head, assuming trapezoidal shaped ditches with subcritical flow.
- Table 864.3A of the HDM will be referred to for the Manning's n value for ditches.
- Table 862.2 of the HDM will be referred to for the maximum velocity criteria for ditches.

The *California Bank and Shore Rock Slope Protection Design Manual* (Caltrans 2000) will be used to design the rock slope protection (RSP).

1.6 Design and As-built Plans

WRECO reviewed the following as-built record drawings for the I-80/SR 65 interchange (see Appendix A):

- From 0.4 miles east of Douglas Boulevard Overcrossing to 0.3 miles west of Route 65, Contract Number: 03-242924, 08/15/1990.

- From 2.4 km east of South Roseville Overcrossing to 0.6 km west of Atlantic Street Overcrossing, Contract Number: 03-375604, 03/29/2006.

- On Route 80 from Taylor Road Overcrossing to 1.1 miles east of Taylor Road Overcrossing and On Route 65 from Route 80 to 1.2 miles north of Taylor Road, Contract Number: 03-242914, 06/24/1985.

- From 1.3km to 0.3 km west of Rocklin Road Undercrossing, Contract Number: 03-390004, 12/31/1999.

2 WATERSHED CHARACTERISTICS

2.1 Watershed Area

The offsite watersheds of the waterways crossing the Project were preliminarily delineated based on USGS topographic maps and USGS StreamStats. The crossings have drainage areas of up to 41.6 square miles, as listed in Table 1. Antelope Creek, Miners Ravine, and Secret Ravine have the largest watersheds. Secret Ravine runs longitudinally along I-80, but the Project may impact it due to the proposed widening of the E80/N65 connector and/or the S65/E80 connectors, which are in close vicinity of Secret Ravine. The offsite watershed delineations are included in Figure 6. See Appendix B for delineations of individual watersheds.

Table 1. Preliminary Offsite Watershed Drainage Areas

Waterway	Approximate Drainage Area (mi^2)
Antelope Creek	14.1
Highland Ravine	1.3
Miners Ravine	20.0 (41.6 including Secret Ravine)
Secret Ravine	21.6
Sucker Ravine	2.9
Tributary to South Branch Pleasant Grove	0.1

Source: USGS

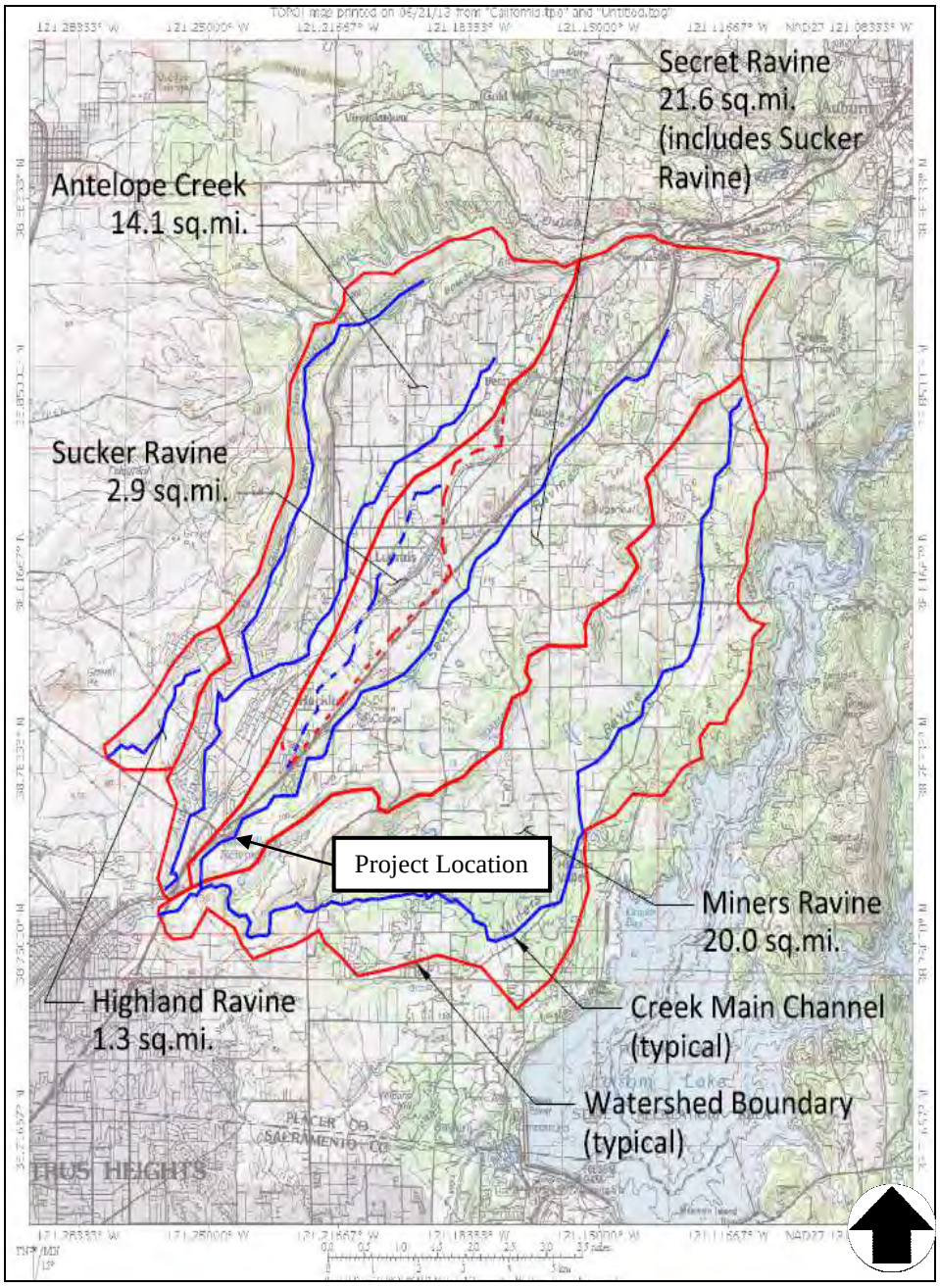

Figure 6. Major Offsite Watersheds

Source: USGS

2.2 Land Use

The City of Rocklin *General Plan* (November 2012) identifies the land use along I-80 and SR 65 within the city limits as medium density residential and recreation/conservation with some low density residential, retail commercial, medium-high density residential, high-density residential, and business professional. The City of Rocklin website states that the city has a current population of 58,295.

The City of Roseville *General Plan* 2025 (April 2013) identifies the land use along I-80 and SR 65 within the city limits as community commercial, regional commercial, and business professional, with some general industrial, open space, parks and recreation, and high-density residential. The 2010 United States Census reported that Roseville had a population of 118,800.

2.3 Soil Type and Vegetation

Soil data were obtained from the United States Department of Agriculture (USDA) Natural Resources Conservation Service's (NRCS) *Web Soil Survey* application. Based on the evaluated soil list in Table 2, the majority of the soils are classified as being within hydrologic soil group (HSG) D, which have very low infiltration rates when wet. The soils are HSG C near the major waterways. HSG C soils are characterized as having low infiltration rates when wet. Just south of Rocklin Road is the only location where the soil is classified as HSG B, which has moderate infiltration rates when wet. Refer to Appendix C for soil information.

Table 2. Soil Units, Permeability, and Drainage

Soil Unit	Map Unit Name	Surface Texture	Permeability	Drainage	Hydrologic Soil Group
106	Andregg coarse sandy loam	Coarse sandy loam	Moderate	Well drained	B
130	Caperton-Andregg coarse sandy loam	Coarse sandy loam	Very slow	Somewhat excessively drained	D
140	Cometa sandy loam	Sandy loam	Very slow	Well drained	D
141	Cometa-Fiddyment Complex	Loam	Very slow	Well drained	D
142	Cometa-Ramona sandy loam	Sandy loam	Very slow	Well drained	D
144	Exchequer very stony loam	Very stony loam	Very slow	Somewhat excessively drained	D
145	Exchequer-Rock outcrop complex	Very stony loam	Very slow	Somewhat excessively drained	D
146	Fiddyment loam	Loam	Very slow	Well drained	D
152	Inks cobbly loam	Cobbly loam	Very slow	Well drained	D
154	Inks-Exchequer Complex	Cobbly loam	Very slow	Well drained	D
175	Ramona sandy loam	Sandy loam	Slow	Well drained	C
180	Rubble land	Fragmental material	-	Excessively drained	-
184	Sierra sandy loam	Sandy loam	Slow	Well drained	C
194	Xerofluvents	Stratified loamy sand to fine sandy loam	Slow	Somewhat poorly drained	C
196	Xerorthents, cut and fill areas	Variable	-	Well drained	-
197	Xerorthents, placer areas	Variable	Very slow	Well drained	D

Source: USDA

2.4 Precipitation

Roseville has a Mediterranean climate that is characterized by cool, wet winters and hot, dry summers. Average daily high temperatures range from 54°F in January to 95°F in July and 94°F in August. Daily low temperatures range from 39°F in winter to 60°F in summer. The rainy season for the Project is from October 15 through April 15, as indicated in the “Northern and Central California Areas, Figure 1-1, Designation of Rainy

Season" in the *Caltrans Storm Water Quality Handbooks, Construction Site Best Management Practices Manual* (Caltrans 2009).

Precipitation data were collected using the National Oceanic and Atmospheric Administration (NOAA) Atlas Precipitation Frequency Data Server (PFDS) web application. The location chosen was in Roseville, California, with latitude: 38.7716 and longitude -121.2479. The 24-hour rainfall depths are summarized in Table 3, and the Intensity-Duration-Frequency (IDF) curve is shown in Figure 7. For more information, see Appendix D.

Table 3. 24-hour Rainfall Depth Summary

Recurrence Interval (yr)	2	10	25	50	100
Depth (in.)	2.23	3.21	3.84	4.34	4.86

Source: NOAA

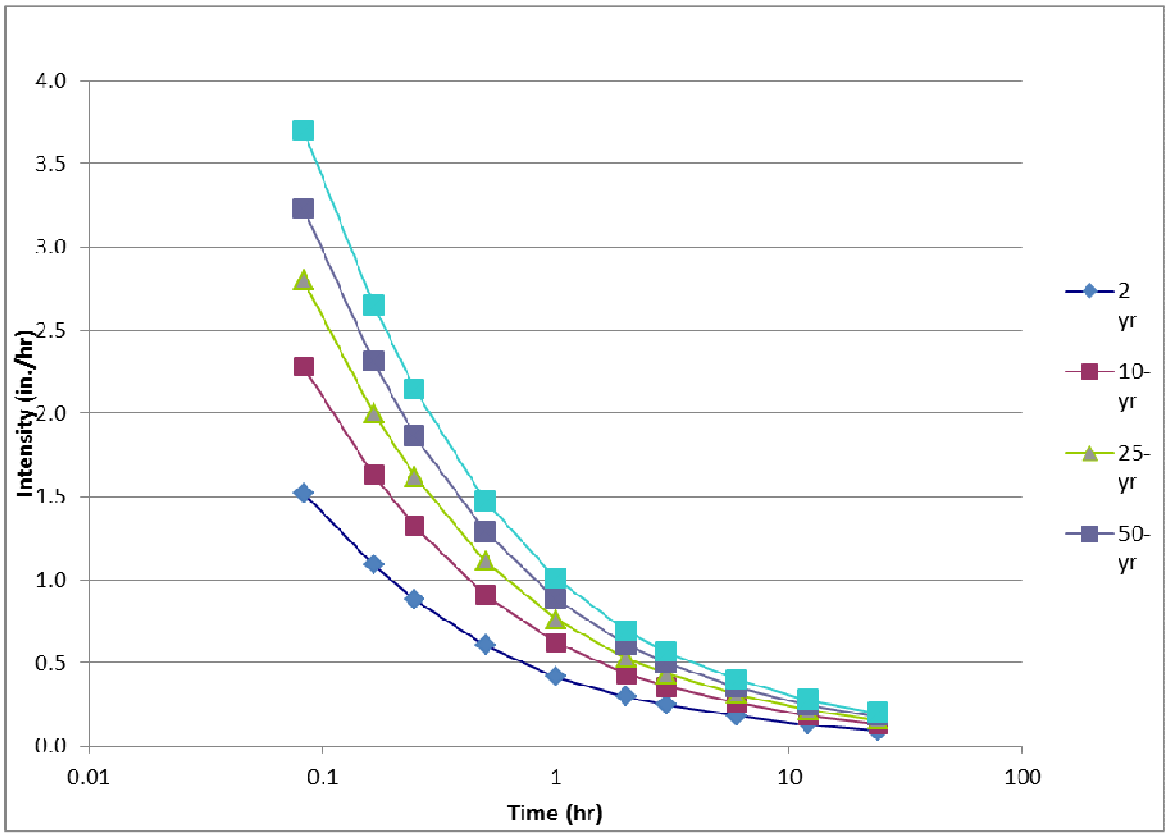

Figure 7. Intensity-Duration-Frequency (IDF) Curve

Source: NOAA

2.5 Creek Crossings

A list of creek and stream crossings within the Project limits was created using Federal Emergency Management Agency (FEMA) maps, USGS topographic maps, Oakland Museum of California watershed maps, and aerial photographs. The six creek crossings within the Project limits are Miners Ravine, Secret Ravine, Sucker Ravine, Antelope Creek, a tributary to South Branch Pleasant Grove Creek, and Highland Ravine

Highland Ravine crosses SR 65 approximately 0.4 miles southeast (toward the I-80/SR 65 Interchange) of Pleasant Grove Boulevard. The stream crosses SR 65 twice but only once within the Project limits. The South Branch of Pleasant Grove Creek crosses SR 65 farther southeast of Highland Ravine just before the Galleria Boulevard overcrossing (see Figure 8 for the stream crossing locations). The Highland Ravine crossing, a double 72-inch culvert, is shown in Photo 1.

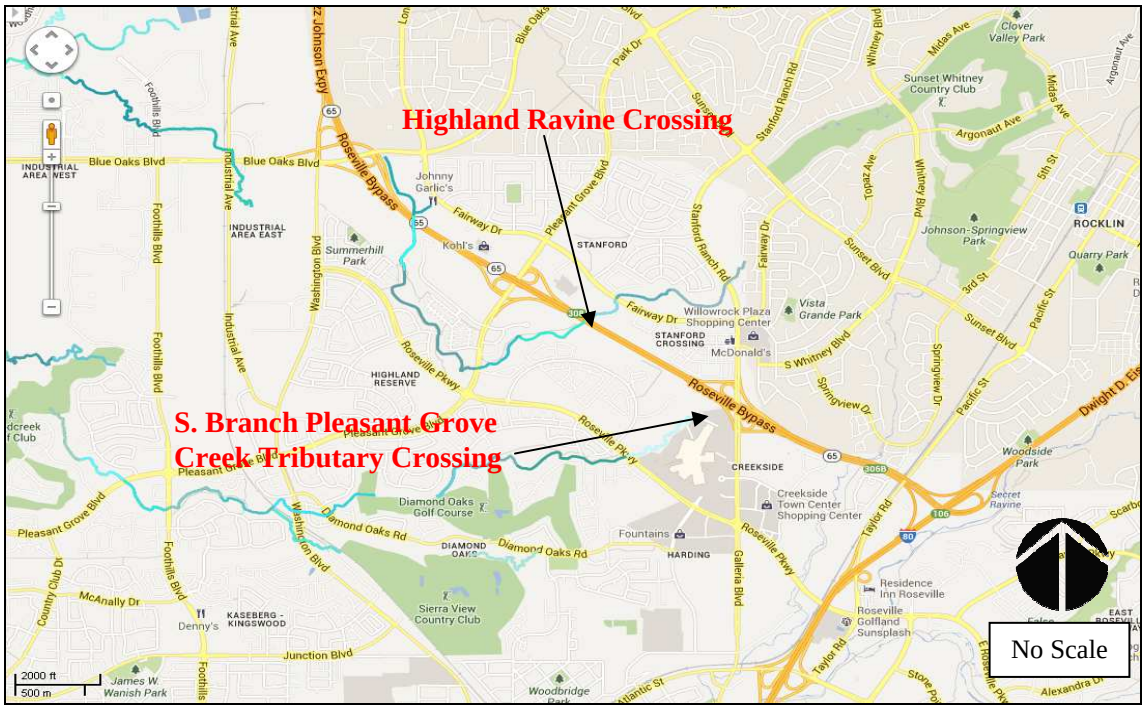

Figure 8. Highland Ravine and the Tributary to South Branch Pleasant Grove Creek Crossings

Source: Google

Photo 1. Eastbound SR 65 Highland Ravine

Antelope Creek crosses SR 65 at the East Roseville Viaduct bridge immediately west of Taylor Road and the I-80/SR 65 Interchange. Secret Ravine generally flows parallel to I-80 within the Project limits, from the Taylor Road Overcrossing, which is located 0.2 miles north of Roseville Parkway on I-80, to the Project's northern limits at Rocklin Road. Miners Ravine crosses I-80 immediately south of Atlantic Street approximately at the Taylor Road off-ramp (see Figure 9 for the Antelope Creek, Secret Ravine and Miners Ravine crossings and locations). The Antelope Creek and Miners Ravine crossings are shown in Photo 2 and Photo 3, respectively.

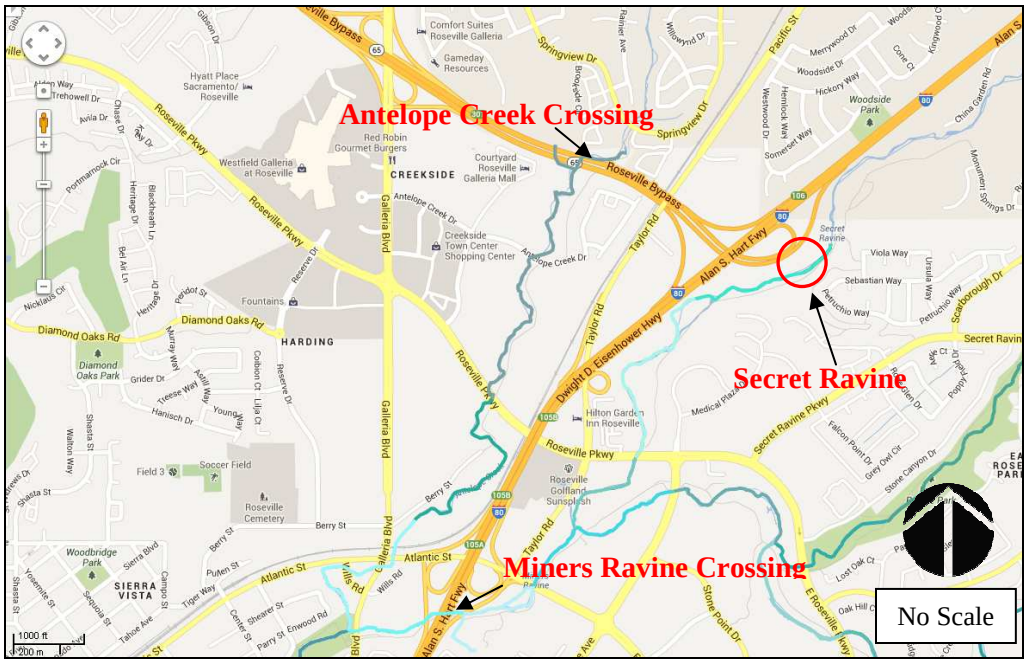

Figure 9. Antelope Creek Crossing, Miners Ravine Crossing, and Secret Ravine
Source: Google

Photo 2. Eastbound SR 65 over Antelope Creek

Photo 3. Eastbound I-80 at Miners Ravine

The Sucker Ravine crossing is located near the northern limits of the Project at Rocklin Road. Sucker Ravine crosses I-80 to flow into Secret Ravine immediately east of the I-80 roadway (see Figure 10 for the Sucker Ravine crossing location). The Sucker Ravine crossing is shown in Photo 4.

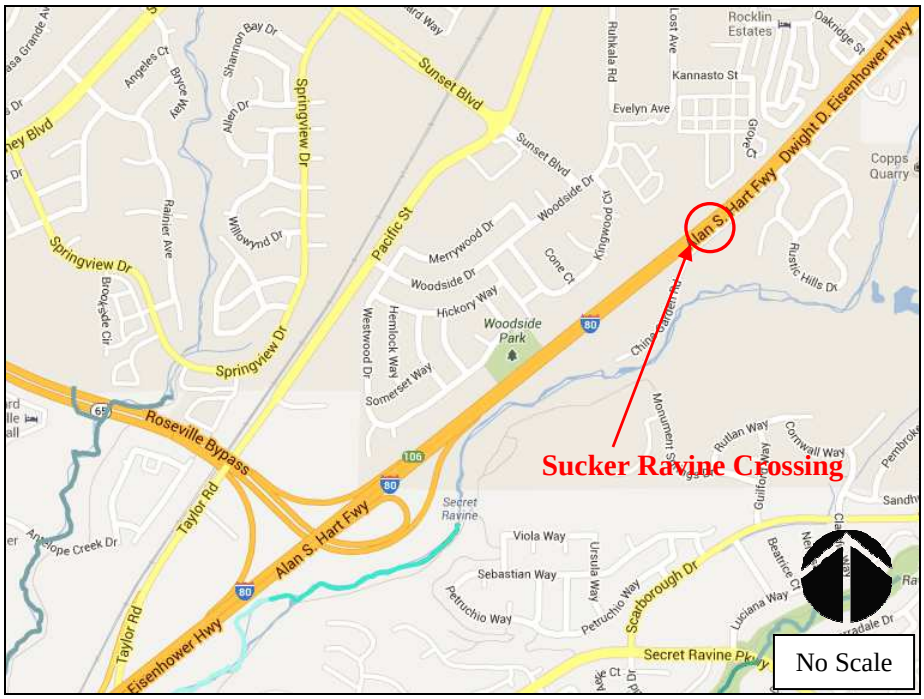

Figure 10. Sucker Ravine Crossing

Source: Google

Photo 4. Eastbound I-80 at Sucker Ravine

2.6 Large Tributaries to Creeks Crossings

There are 15 stormwater crossings greater than 24 inches in diameter within the Project limits that drain to the six direct receiving waterways. The sizes and types of these crossings are listed in Table 4. The crossings were located by reviewing as-built record drawings.

Table 4. Drainage Facilities at Major Crossings

Receiving Waterway	Control Line	Approximate Station(s)	Drainage Facility	Culvert Construction
Miners Ravine	I-80	58+90	Bridge	-
	I-80	60+75	Bridge	-
	I-80	62+00	Bridge	-
Secret Ravine	I-80	113+30	36" RCP	Before 1985
	Line SE	137+80	30" APC	1985
	I-80	145+90	30" RCP	Before 1985
	I-80	164+50	36" RCP	Before 1985
	SR-65	109+05 - 111+05	36" APC	1985
Tributary to South Branch Pleasant Grove Creek	SR-65	156+35 skew 121°	48" APC	1985
	SR-65	162+72 skew 78°	48" APC	1985
	SR-65	168+25 skew 64°	36" APC	1985
	SR-65	174+00	30" APC	1985
Sucker Ravine	I-80	195+40	96" CSP	Before 1999
Antelope Creek	SR-65	126+00	Bridge	-
Highland Ravine	SR-65	191+00	72” Double RCP	Unknown

Note:
RCP = Reinforced Concrete Pipe
APC = Alternative Pipe Culvert
CSP = Corrugated Steel Pipe

3 HYDROLOGY

Supporting hydrology and hydraulics calculations for drainage design will be provided in a future submittal.

3.1 Regional Hydrology

I-80 and SR 65 within the Project limits cross two hydrologic sub-areas (HSA), Lower American (HSA #519.21) and Pleasant Grove (HSA #519.22), within one hydrologic unit: see Table 5. Lower American includes Antelope Creek, Miners Ravine, Secret Ravine, and Sucker Ravine. Pleasant Grove includes Highland Ravine and the tributary to South Branch Pleasant Grove Creek. The Water Quality Planning Tool (Caltrans 2013) shows that there are three HSAs; this is hydrologically incorrect because Secret Ravine is a tributary to Miners Ravine, which in turn is a tributary to Dry Creek.

Table 5. Hydrologic Units within the Project Limits

PM Limits	Hydrologic Unit	Hydrologic Area	HSA Number
I-80 PM 1.9-6.1 and SR 65 PM R4.8-R5.58	Valley-American	Lower American	519.21
SR 65 PM R5.58-R7.3	Valley-American	Pleasant Grove	519.22

The disturbed soil area, existing paved area, and added impervious areas within Caltrans R/W are shown in Table 6.

Table 6. Estimated Disturbed Soil and Impervious Areas within Caltrans R/W

Hydrologic Unit Code – Hydrologic Sub-Area (Receiving Waterbodies)	Build Alternative 1		
	Disturbed Soil Area (acre)	Impervious Area (acre)	
		Existing	Added
180201110101 – Lower American (Antelope Creek, Miners Ravine, Secret Ravine, and Sucker Ravine)	117	76	26
180201610302 – Pleasant Grove (Highland Ravine and Tributary to South Branch Pleasant Grove)	30	13	4
Total	147	89	30

Hydrologic Unit Code – Hydrologic Sub-Area (Receiving Waterbodies)	Build Alternative 2		
	Disturbed Soil Area (acre)	Impervious Area (acre)	
		Existing	Added
180201110101 – Lower American (Antelope Creek, Miners Ravine, Secret Ravine, and Sucker Ravine)	120	76	24
180201610302 – Pleasant Grove (Highland Ravine and Tributary to South Branch Pleasant Grove)	31	13	4
Total	151	89	28

Hydrologic Unit Code – Hydrologic Sub-Area (Receiving Waterbodies)	Build Alternative 3		
	Disturbed Soil Area (acre)	Impervious Area (acre)	
		Existing	Added
180201110101 – Lower American (Antelope Creek, Miners Ravine, Secret Ravine, and Sucker Ravine)	123	75	22
180201610302 – Pleasant Grove (Highland Ravine and Tributary to South Branch Pleasant Grove)	33	13	4
Total	156	88	26

The disturbed soil area, existing paved area, and added impervious areas within the City of Roseville R/w are shown in Table 7.

Table 7. Estimated Disturbed Soil and Impervious Areas within City of Roseville R/W

Hydrologic Unit Code – Hydrologic Sub-Area (Receiving Waterbodies)	Build Alternative 1		
	Disturbed Soil Area (acre)	Impervious Area (acre)	
		Existing	Added
180201110101 – Lower American (Antelope Creek, Miners Ravine, Secret Ravine, and Sucker Ravine)	13	6	1

Hydrologic Unit Code – Hydrologic Sub-Area (Receiving Waterbodies)	Build Alternative 2		
	Disturbed Soil Area (acre)	Impervious Area (acre)	
		Existing	Added
180201110101 – Lower American (Antelope Creek, Miners Ravine, Secret Ravine, and Sucker Ravine)	13	6	1

Hydrologic Unit Code – Hydrologic Sub-Area (Receiving Waterbodies)	Build Alternative 3		
	Disturbed Soil Area (acre)	Impervious Area (acre)	
		Existing	Added
180201110101 – Lower American (Antelope Creek, Miners Ravine, Secret Ravine, and Sucker Ravine)	21	6	1

3.2 Federal Emergency Management Agency Data

Discharge values for Antelope Creek, Secret Ravine, and Miners Ravine were obtained from FEMA's Flood Insurance Study (FIS) for Placer County and Incorporated Areas, 06061CV001 (November 21, 2001). Placer County and Incorporated Areas FEMA Flood Insurance Rate Maps (FIRMs) 06061C0477F, 06061C0477G, and 06061C0479G were used to determine floodplain and floodway designations in the Project area (see Figure 11 for the Project flood zone delineation map). The FIRM shows that the Project sites at Antelope Creek, Secret Ravine, and Miners Ravine are located within a designated Zone AE region. Zone AE is a 100-year floodplain designation with base flood elevations (BFEs) determined. The FIRMs also show a floodway designation at these locations. The Sucker Ravine crossing I-80 is designated as a Zone AO, which represents areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 ft. The remaining Project area is located within a Zone X region which is a designation pertaining to areas of flood with a recurrence interval of 500 years or more.

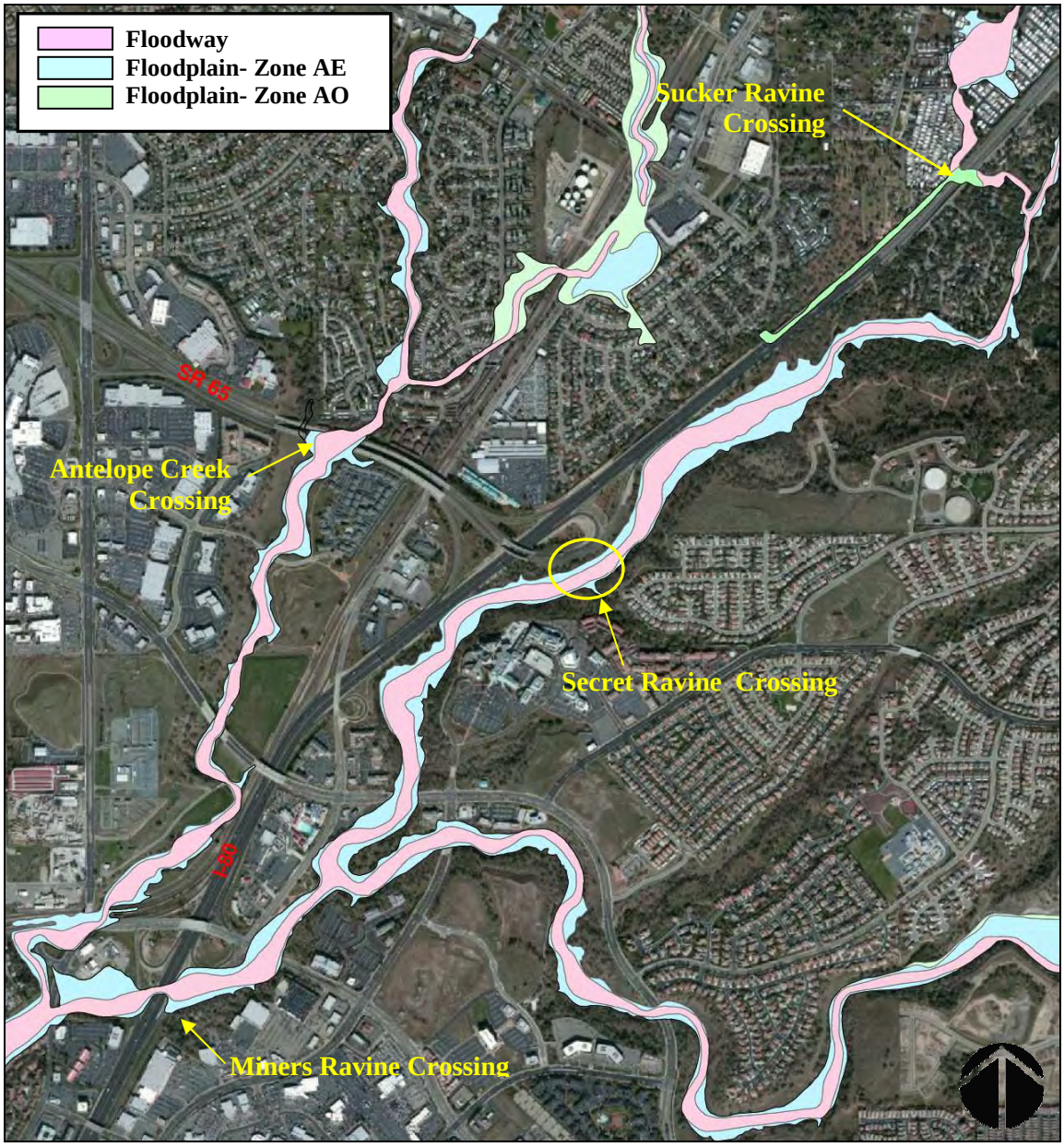

Figure 11. FEMA Floodplain and Floodway Map

Source: Bing, FEMA

3.3 Previous Studies

Placer County Flood Control and Water Conservation District's (PCFCWCD) report, *Update to the Dry Creek Watershed Flood Control Plan* (2011), was used to determine updated flood discharge values of the pertinent streams. The discharge values were obtained for locations closest to the site: SR 65 for Antelope Creek, the SE Connector for Secret Ravine, and I-80 for Miners Ravine. Placer County's hydrologic models consider land use factors for the years 1992 and 2007 and the General Plan build-out for the Dry Creek watershed area.

3.4 Design Discharge Summary

Discharge values for Antelope Creek, Secret Ravine, and Miners Ravine obtained from FEMA and the PCFCWCD are summarized in Table 8 and Table 9. The discharge values were obtained from locations listed on the FIS and PCFCWCD's report closest to the streams crossings: SR 65 for Antelope Creek, the SE Connector for Secret Ravine, and I-80 for Miners Ravine. The highest 100- and 50-year discharge values were reported in the FIS and the values in the updated PCFCWCD report were used for the hydraulic modeling to be conservative. Antelope Creek and Secret Ravine HEC-RAS models use the PCFCWCD Report's discharge values. Miners Ravine HEC-RAS model uses FEMA FIS' discharge values.

Table 8. Summary of 50-year Discharge Values

Stream	50-year Discharge Value (cfs)	
	FEMA (2001)	PCFCWCD Report (2011)
Antelope Creek	2,380	3,418
Secret Ravine	3,800	4,415
Miners Ravine	7,000	6,402

Note: cfs = cubic foot per second

Table 9. Summary of 100-year Discharge Values

Stream	100-year Discharge Value (cfs)	
	FEMA (2001)	PCFCWCD Report (2011)
Antelope Creek	3,080	4,095
Secret Ravine	4,200	4,697
Miners Ravine	7,840	7,322

3.5 Hydrologic Stability

The PCFCWCD presented multiple projected land use scenarios to determine discharge values. The discharge values selected for the hydraulic analysis of this report are from the most conservative scenario (scenario 7), which uses a future unmitigated model to determine discharge values of various recurrence intervals. Therefore, the hydrologic findings based on this scenario are considered to be stable.

4 IMPACTED DRAINAGE SYSTEMS

Supporting calculations for impacted drainage systems will be provided in a future submittal. As mentioned in Table 6 and Table 7, there will be additional impervious areas of 32, 29, and 27 acres from the proposed changes in Alternatives 1, 2, and 3, respectively. The increase in impervious area can result in the modification of existing receiving water body hydrographs by increasing the flow volumes, rates, and peak durations from the loss of unpaved overland flow and native infiltration (hydromodification). Further details are included in the *Water Quality Assessment Report* (WRECO 2014).

4.1 Impacted Offsite Drainage Systems

The existing offsite drainage systems and facilities impacted by the Project include major creek crossings such as bridges and culverts. Mitigation measures will be proposed to maintain pre-construction runoff flows. The increase in impervious areas from the Project alternatives will result in additional runoff to downstream drainages. Alternative 3 will have less of an increase in impervious area compared to Alternatives 1 and 2.

The potential increases to the existing floodplain elevations should have small impacts to Secret Ravine and Miners Ravine because they are at a low point along their waterways, and their surrounding neighborhoods are built up to a much higher elevation.

Additional piers along the East Roseville Viaduct are proposed, which would increase the water surface elevation upstream. The surrounding houses are built at a similar elevation to the creek upstream of the viaduct.

4.2 Impacted Onsite Drainage Systems

The majority of the Project consists of widening existing roadways and constructing new connecting roads at the I-80/SR 65 Interchange. Therefore, there will be new onsite drainage systems. The drainage systems will be designed to route flows to and from the permanent stormwater treatment best management practices (BMPs). For more information, see the Project's *Water Quality Assessment Report* (WRECO 2014).

Existing systems will be evaluated to determine compliance with current design standards. Existing drainage systems impacted by the Project will be redesigned, if needed, to limit the design water surface elevations and velocities to no greater than the existing conditions and to maintain the existing drainage patterns. Due to the proposed widenings, the culverts shown in Table 4 will require lengthening to extend past the proposed side slopes. Any other systems that are impacted by the widening will also be extended. For locations of additional preliminary drainage improvements not included in Table 4, see Appendix E.

4.2.1 Roadside Ditches

Some of the existing ditches within the Project right-of-way have been proposed to be converted into stormwater treatment BMPs designed to carry and treat stormwater runoff

from the Project. The ditch dimensions may change based on the designs of the BMPs. Existing ditches may also be modified due to the proposed widening and retaining walls.

5 REFERENCES

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Appendix A As-built Drawings

Appendix A.1 EA 03-242914 As-built Drawing (1985)

STATE OF CALIFORNIA

2429

DEPARTMENT OF TRANSPORTATION

IR-080-3(187)108
F-FMA-065(20)

DIST.	COUNTY	ROUTE	POST MILE—TOTAL PROJECT	EXHIBIT NO.	TOTAL SHEETS
03	Pla	80,65	3.7/4.8, R4.8/R6.3	1	175

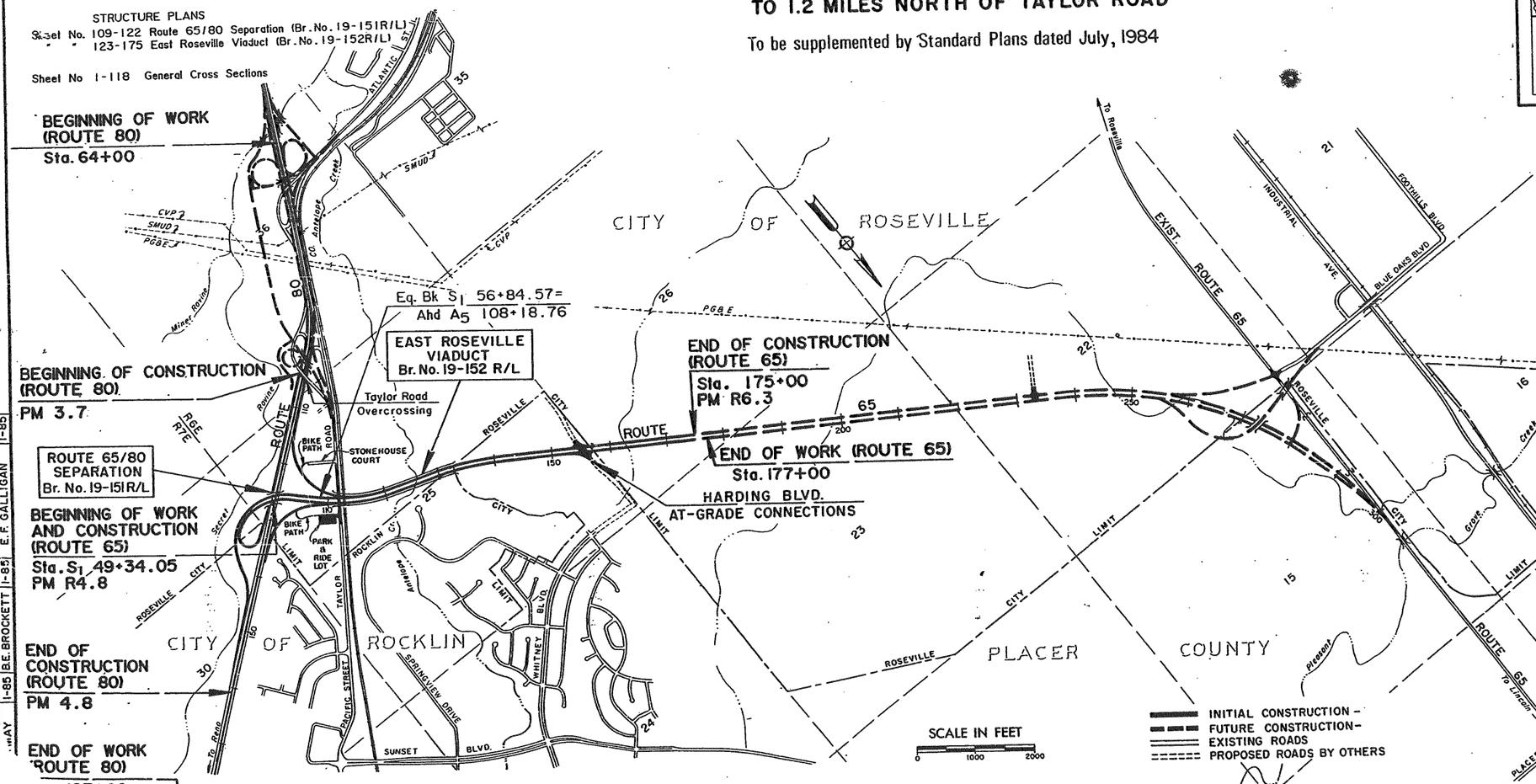
PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN PLACER COUNTY IN ROSEVILLE AND ROCKLIN
ON ROUTE 80 FROM TAYLOR ROAD OVERCROSSING TO 1.1 MILES EAST
OF TAYLOR ROAD OVERCROSSING AND ON ROUTE 65 FROM ROUTE 80
TO 1.2 MILES NORTH OF TAYLOR ROAD

To be supplemented by Standard Plans dated July, 1984

INDEX OF SHEETS

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN



Date	Approval Recommended By
1-85	E. F. GALLIGAN
Date	Design Engineer
1-85	B.E. BROCKETT
Date	
1-85	
AY	

District Director of Transportation
Registered Civil Engineer No 8872

Approved June 24, 1985

Chief, Office of Office Engineers
Registered Civil Engineer No 8854

Length of Work = 2.5 miles (Route 80)
Length of Construction = 1.1 miles (Route 80)

Length of Work = 1.5 miles (Route 65)
Length of Construction = 1.5 miles (Route 65)

Contract No. 03-242914

03210-242911

Dist	County	Route	Post Miles Total Project	Sheet No	Total Sheets
03	Pla	80,85	3.7/R8,R48/R65	6	175

B. E. Brockett
DESIGN ENGINEER — REGISTERED CIVIL ENGINEER NO. 18066

DATE APPROVED June 24, 1985

CONSTRUCTION SYMBOLS

- R/W Angle Point
- Controlled Access Line
- Pipe Culvert with Flared End Section
- Top of Cut
- Toe of Fill
- Gutter or Ditch
- Metal Beam Guard Rail
- 0.20' AC Overlay
- Rock Slope Protection
- (No.) Drainage Structure Number
- 8" Conduit (See DL-2).

NOTE:
For additional Symbols & Abbreviations See Standard Plans (A-10)

ABBREVIATIONS

Drainage Abbreviations (See first Sheet of Culvert List)

WM-f	Wire Mesh Freeway Fence
CL-6f	Chain Link 6' Fence
HGP-F	Headlight Glare Protection Fence
MB-GR	Metal Beam Guard Rail
Shldr	Shoulder
Exist.	Existing
R/W	Right of Way
w/	with
APC	Alternative Pipe Culvert
AC	Asphalt Concrete
CSP-DD	Corugated Steel Pipe-Downdrain
PSP-UD	Perforated Steel Pipe-Underdrain
SCSP	Sacked Concrete Slope Protection

T11N-R6E-MDB&M
Sec. 36

CITY OF ROSEVILLE

BEGINNING OF WORK
STA. B 64+00

BEGINNING OF CONSTRUCTION
STA. B 105+00
PM 3.7

(B) TAYLOR ROAD O.C.
Br. No. 19-23
PM 3.73

Note: EQUATION: B 26+92.14 POT = A 1120+00.00 POT (1965 As Built Plans)

Exist. Type 50 Concrete Barrier with Headlight Glare Screen

To Sacramento

AC PCC

R=2400'

8"PSP-UD

B 100+94.96 EC

To Rocklin

CATTLEMENS RESTAURANT

PARKING PETER C. & I.A. GILLHAM, et al

CONFORM +00

+75 Overside Drain w/25' AC Flare
Begin AC Dike

Exist. CL-6f

Exist. R/W

6" AC Gutter

AC Dike (Type A)

Exist. MB-GR

Grade to Drain

Exist. Shldr

EXIST. RTE. 80 - WB

4.74'

N51°00'18"E 7799.16'

PM 3.83

EXIST RTE. 80 - EB

8" Water, R/W to R/W

+50 Type I Flare 4' offset

+95 AC Overside Drain w/25' AC Flare
Begin AC Dike

CONFORM +00

Exist. R/W

Exist. CL-6f

18" RCP

12" Water

City of Roseville

ANGELO TSAKOPOULOUS

SHEET REFERENCES — NO.
Profile B ..... P-3 & P-4

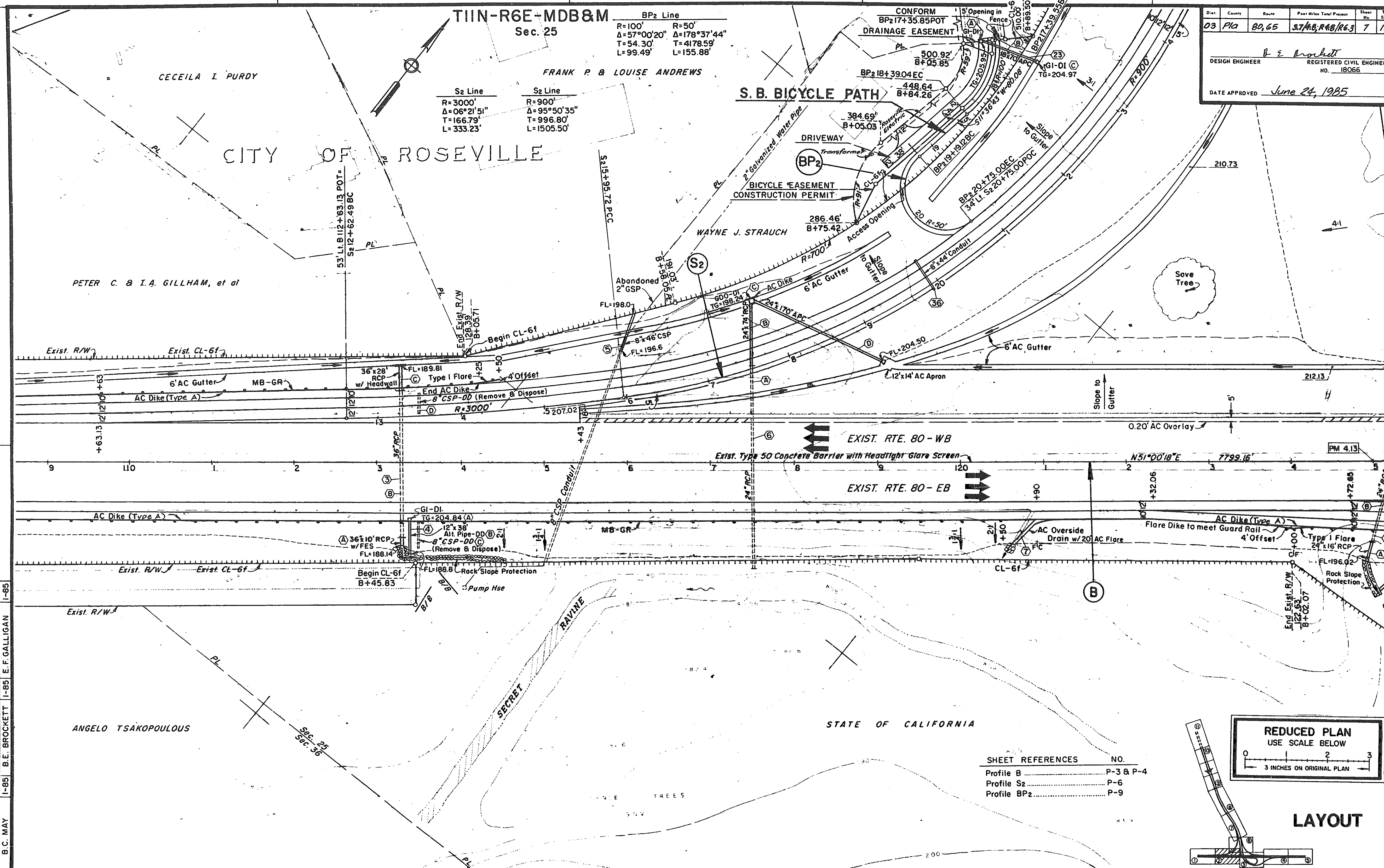
Horizontal Control for this Project
California Coordinate System Zone II.
Ground Distances and Grid Bearings shown.
To obtain Grid Distance, multiply by 0.99992

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

LAYOUT

Project Engineer	B.C. MAY	Date	1-85		
Design Engineer	B.E. BROCKETT	Date	1-85	Approved Recommended By	E.F. GALLIGAN
				Date	1-85

SHEET NO	TOTAL SHEET
L-1	



T11N-R6E-MDB&M
Sec. 25
BP2 Line
R=100' Δ=57°00'20" T=54.30' L=99.49'
R=50' Δ=178°37'44" T=4178.59' L=155.88'
S2 Line
R=3000' Δ=06°21'51" T=166.79' L=333.23'
S2 Line
R=900' Δ=95°50'35" T=996.80' L=1505.50'
CECEILA I. PURDY
FRANK P. & LOUISE ANDREWS
CITY OF ROSEVILLE
PETER C. & I.A. GILLHAM, et al
WAYNE J. STRAUCH
S.B. BICYCLE PATH
CONFORM BP2 17+35.85 POT
DRAINAGE EASEMENT
DRIVEWAY
Transformer
BICYCLE EASEMENT CONSTRUCTION PERMIT
Access Opening
Abandoned 2" GSP
2" Galvanized Water Pipe
Save Tree
EXIST. RTE. 80 - WB
EXIST. RTE. 80 - EB
Exist. Type 50 Concrete Barrier with Headlight Glare Screen
N51°00'18"E 7799.16'
PM 4.13
0.20' AC Overlay
Begin CL-6f
End Exist. R/W
Exist. R/W
Exist. CL-6f
6' AC Gutter
MB-GR
AC Dike (Type A)
Type 1 Flare
4' Offset
End AC Dike
8" CSP-DD (Remove & Dispose)
R=3000'
8" CSP Conduit
24" RCP
24"x170' APC
12'x14' AC Apron
Rock Slope Protection
Pump Hse
AC Overside Drain w/ 20' AC Flare
Flare Dike to meet Guard Rail
SECRET RAVINE
ANGELO TSAKOPOULOUS
STATE OF CALIFORNIA
Sec. 25
Sec. 36

Dist.	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
03	Pla	80,65	3.7/4.8; R4.8/R6.3	7	175

B. E. Brockett
DESIGN ENGINEER — REGISTERED CIVIL ENGINEER NO. 18066

DATE APPROVED June 24, 1985

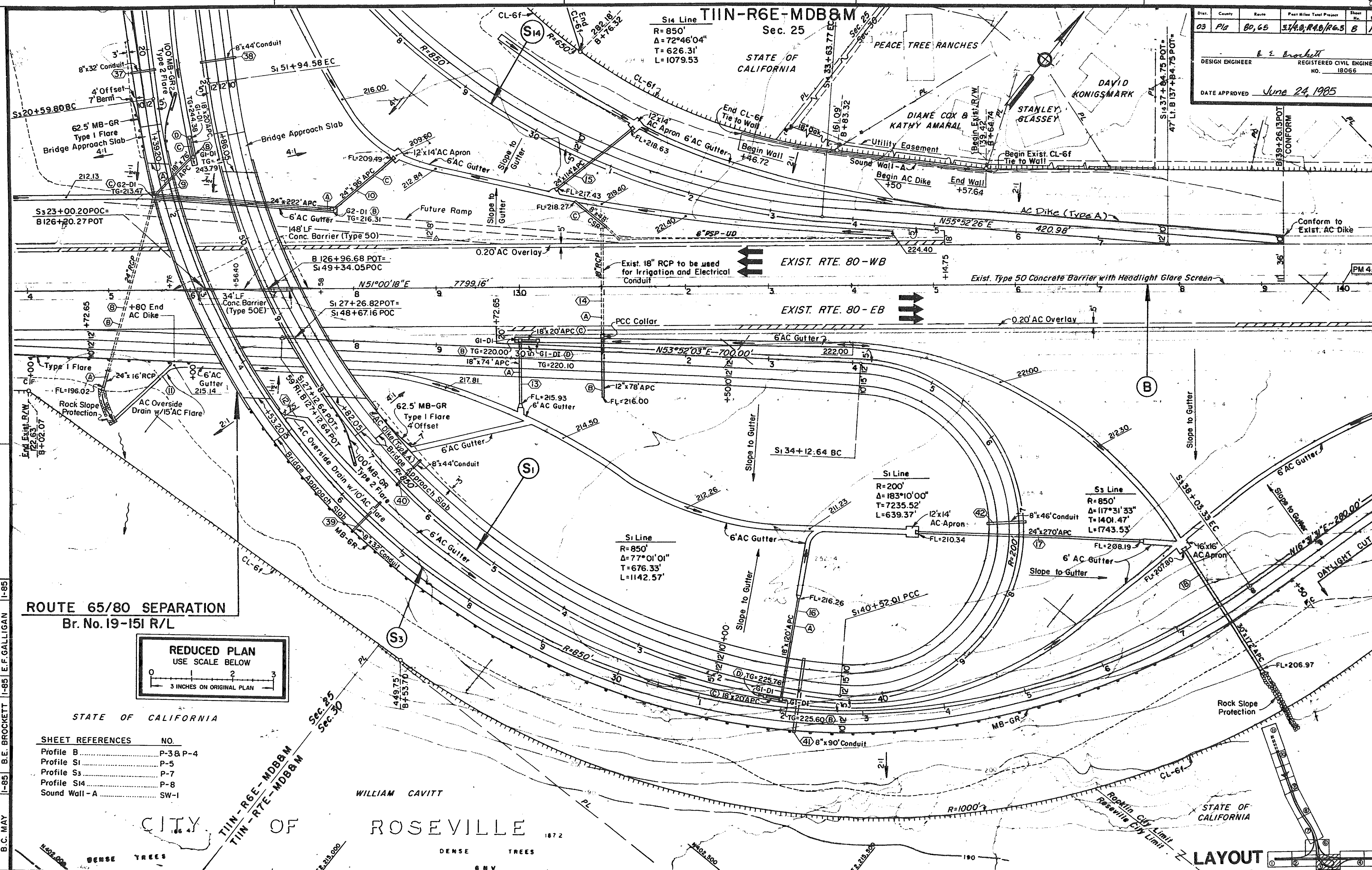
SHEET REFERENCES	NO.
Profile B	P-3 & P-4
Profile S2	P-6
Profile BP2	P-9

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

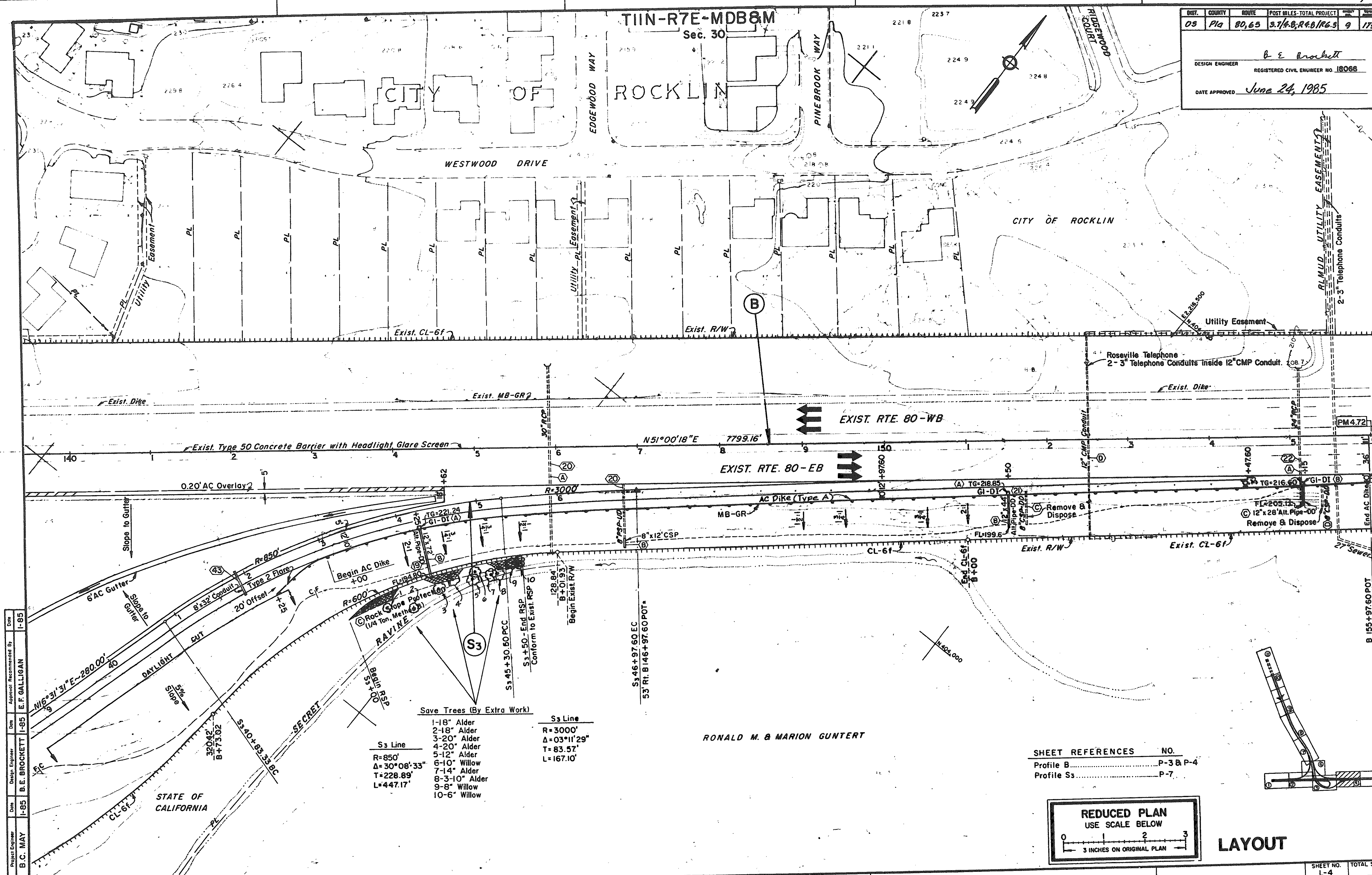
LAYOUT

Project Engineer	Date	Design Engineer	Date	Approval Recommended By	Date
B.C. MAY	1-85	B.E. BROCKETT	1-85	E.F. GALLIGAN	1-85

SHEET NO. L-2 | TOTAL SHEETS



T11N-R6E-MDB&M
Sec. 25
03 Pla 80,65 33/4.0;R4.8/R6.5 8 175
DESIGN ENGINEER
REGISTERED CIVIL ENGINEER NO. 18066
DATE APPROVED June 24, 1985
STATE OF CALIFORNIA
PEACE TREE RANCHES
DAVID KONIGSMARK
STANLEY GLASSEY
DIANE COX & KATHY AMARAL
S14 Line
R=850'
Δ=72°46'04"
T=626.31'
L=1079.53
S1 Line
R=200'
Δ=183°10'00"
T=7235.52'
L=639.37'
S1 Line
R=850'
Δ=77°01'01"
T=676.33'
L=1142.57'
S3 Line
R=850'
Δ=117°31'33"
T=1401.47'
L=1743.53'
EXIST. RTE. 80-WB
EXIST. RTE. 80-EB
N51°00'18"E 7799.16'
N53°52'03"E-700.00'
N55°52'26"E 420.98'
Future Ramp
Sound Wall-A
Utility Easement
Exist. Type 50 Concrete Barrier with Headlight Glare Screen
Exist. 18" RCP to be used for Irrigation and Electrical Conduit
Conform to Exist. AC Dike
Rock Slope Protection
DAYLIGHT CUT
Rocklin City Limit
Roseville City Limit
ROUTE 65/80 SEPARATION
Br. No. 19-151 R/L
REDUCED PLAN
USE SCALE BELOW
3 INCHES ON ORIGINAL PLAN
STATE OF CALIFORNIA
SHEET REFERENCES NO.
Profile B P-3 & P-4
Profile S1 P-5
Profile S3 P-7
Profile S14 P-8
Sound Wall-A SW-1
WILLIAM CAVITT
T11N-R6E-MDB&M
T11N-R7E-MDB&M
Sec. 25
Sec. 30
CITY OF ROSEVILLE
DENSE TREES
Project Engineer B.C. MAY 1-85
Design Engineer B.E. BROCKETT 1-85
Approval Recommended By E.F. GALLIGAN 1-85
LAYOUT
SHEET NO. L-3
TOTAL SHEETS


T11N-R7E-MDB&M
Sec. 30
CITY OF ROCKLIN
EDGEWOOD WAY
PINEBROOK WAY
RIDGEWOOD COURT
WESTWOOD DRIVE
CITY OF ROCKLIN
RLMUD UTILITY EASEMENT
2-3" Telephone Conduits
Utility Easement
Utility Easement
Exist. CL-6f
Exist. R/W
Roseville Telephone
2-3" Telephone Conduits inside 12" CMP Conduit.
Exist. Dike
Exist. MB-GR
EXIST. RTE. 80-WB
N51°00'18"E 7799.16'
Exist. Type 50 Concrete Barrier with Headlight Glare Screen
EXIST. RTE. 80-EB
0.20' AC Overlay
R=3000'
R=850'
R=600'
AC Dike (Type A)
MB-GR
TG=221.24
GI-DI (A)
TG=218.85
GI-DI
TG=216.60
GI-DI (B)
FL=205.13
12"x28' Alt. Pipe-DD
Remove & Dispose
Remove & Dispose
FL=199.6
FL=194.80
8"x12' CSP
CL-6f
Exist. R/W
Exist. CL-6f
27" Sewer
End AC Dike
PM 4.72
Slope to Gutter
6' AC Gutter
Slope to Gutter
8'x32' Conduit
Type 2 Flare
20' Offset
Begin AC Dike +00
Rock Slope Protection (1/4 Ton, Method B)
RAVINE
DAYLIGHT CUT
N16°31'31"E-280.00'
5% Slope
S3 40+83.33 BC
32042' B+73.02
SECRET RAVINE
Begin RSP S3 +00
S3 45+30.50 PCC
S3 +50 - End RSP Conform to Exist. RSP
128.84' B+01.93 Begin Exist. R/W
S3 46+97.60 EC
53' Rt. B 146+97.60 POT=
End CL-6f B+00
B 155+97.60 POT CONFORM
STATE OF CALIFORNIA
RONALD M. & MARION GUNTERT
Save Trees (By Extra Work)
1-18" Alder
2-18" Alder
3-20" Alder
4-20" Alder
5-12" Alder
6-10" Willow
7-14" Alder
8-3-10" Alder
9-8" Willow
10-6" Willow
S3 Line
R=850'
Δ=30°08'33"
T=228.89'
L=447.17'
S3 Line
R=3000'
Δ=03°11'29"
T=83.57'
L=167.10'
SHEET REFERENCES NO.
Profile B ... P-3 & P-4
Profile S3 ... P-7
REDUCED PLAN
USE SCALE BELOW
3 INCHES ON ORIGINAL PLAN
LAYOUT

DIST.	COUNTY	ROUTE	POST MILES-TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Pla	80,65	3.7/4.8;R4.8/R6.3	9	175

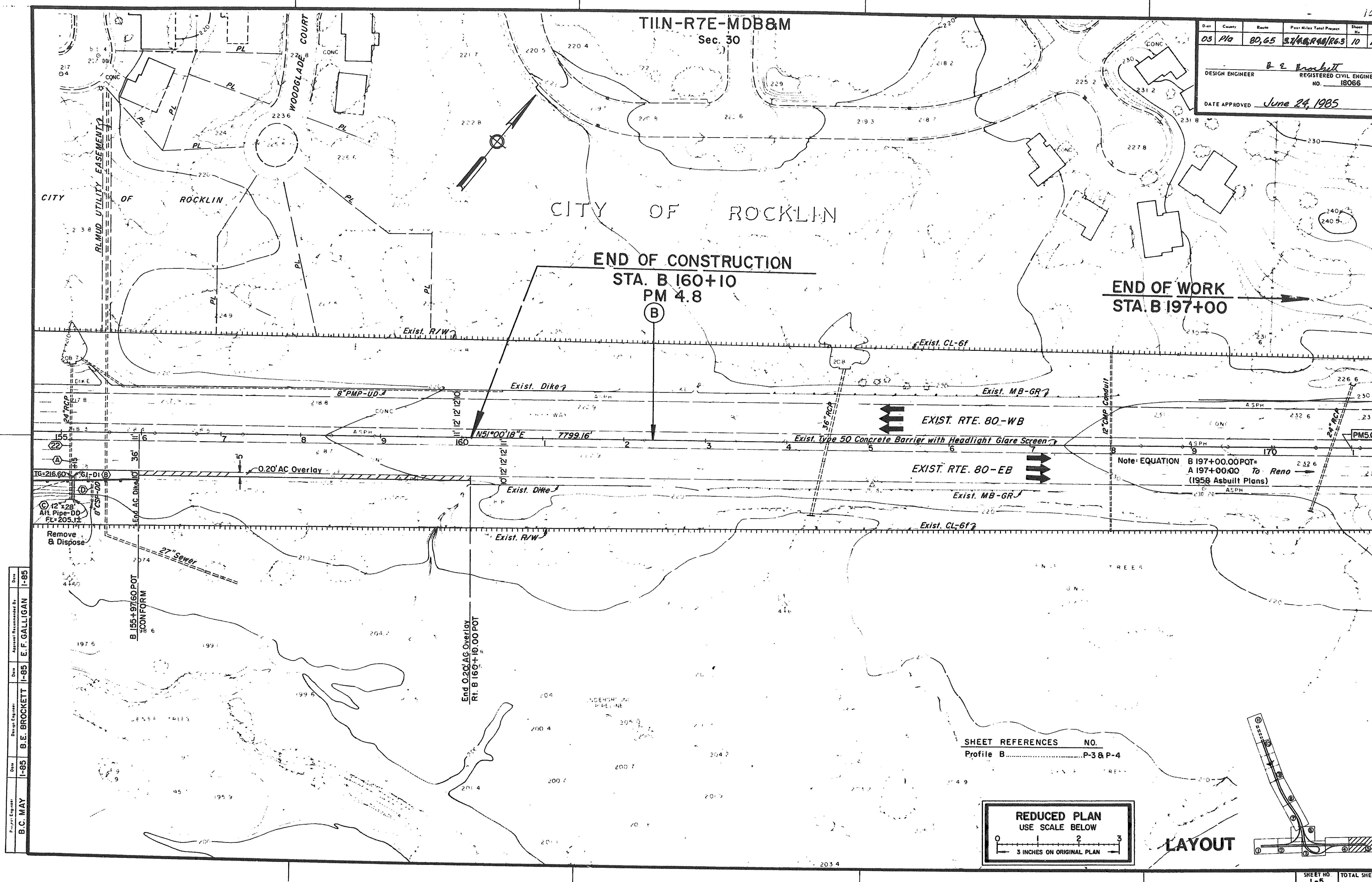
DESIGN ENGINEER — REGISTERED CIVIL ENGINEER NO. 18066

DATE APPROVED June 24, 1985

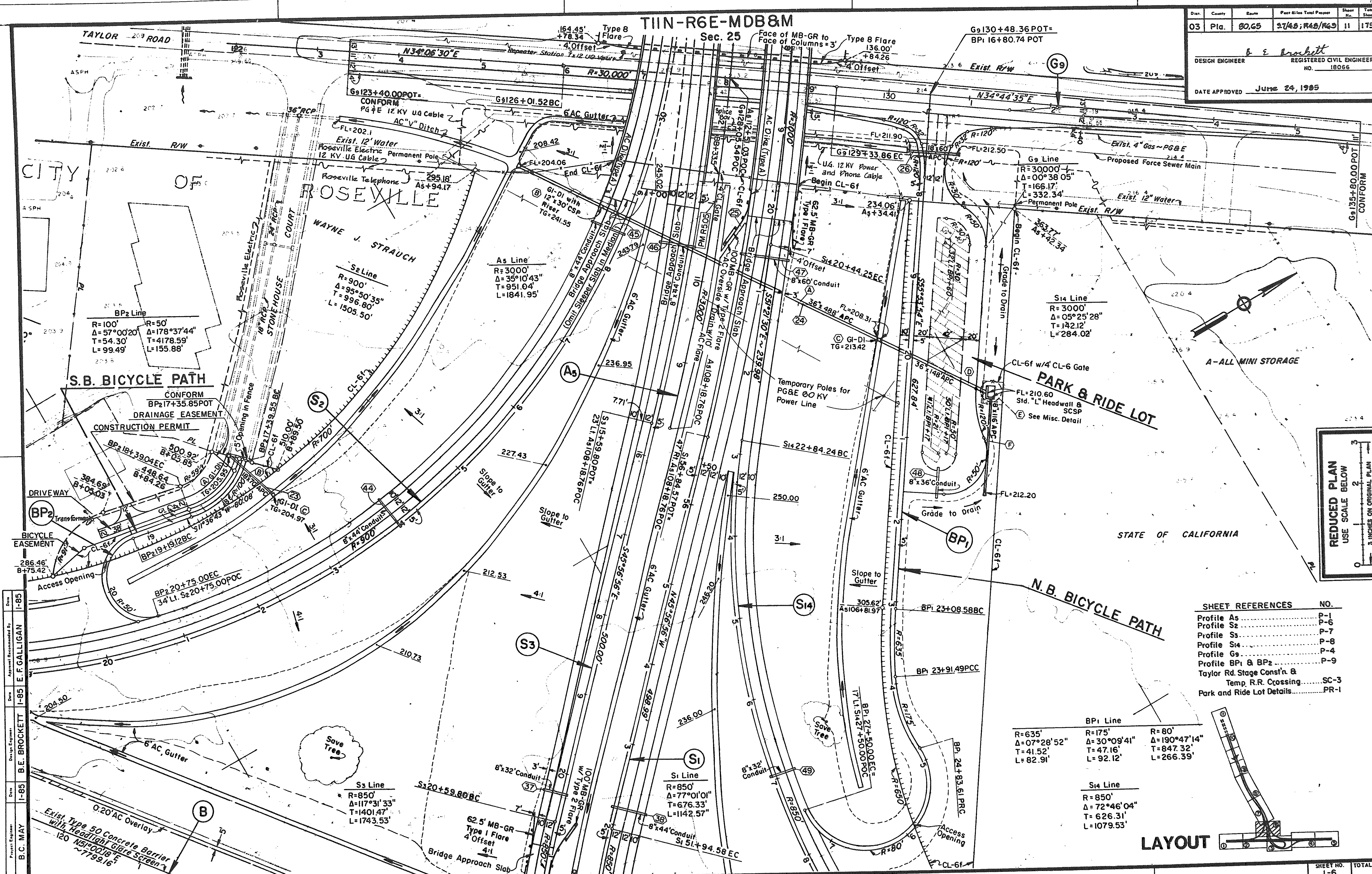
Project Engineer	Date	Design Engineer	Date	Approval Recommended By	Date
B.C. MAY	1-85	B.E. BROCKETT	1-85	E.F. GALLIGAN	1-85

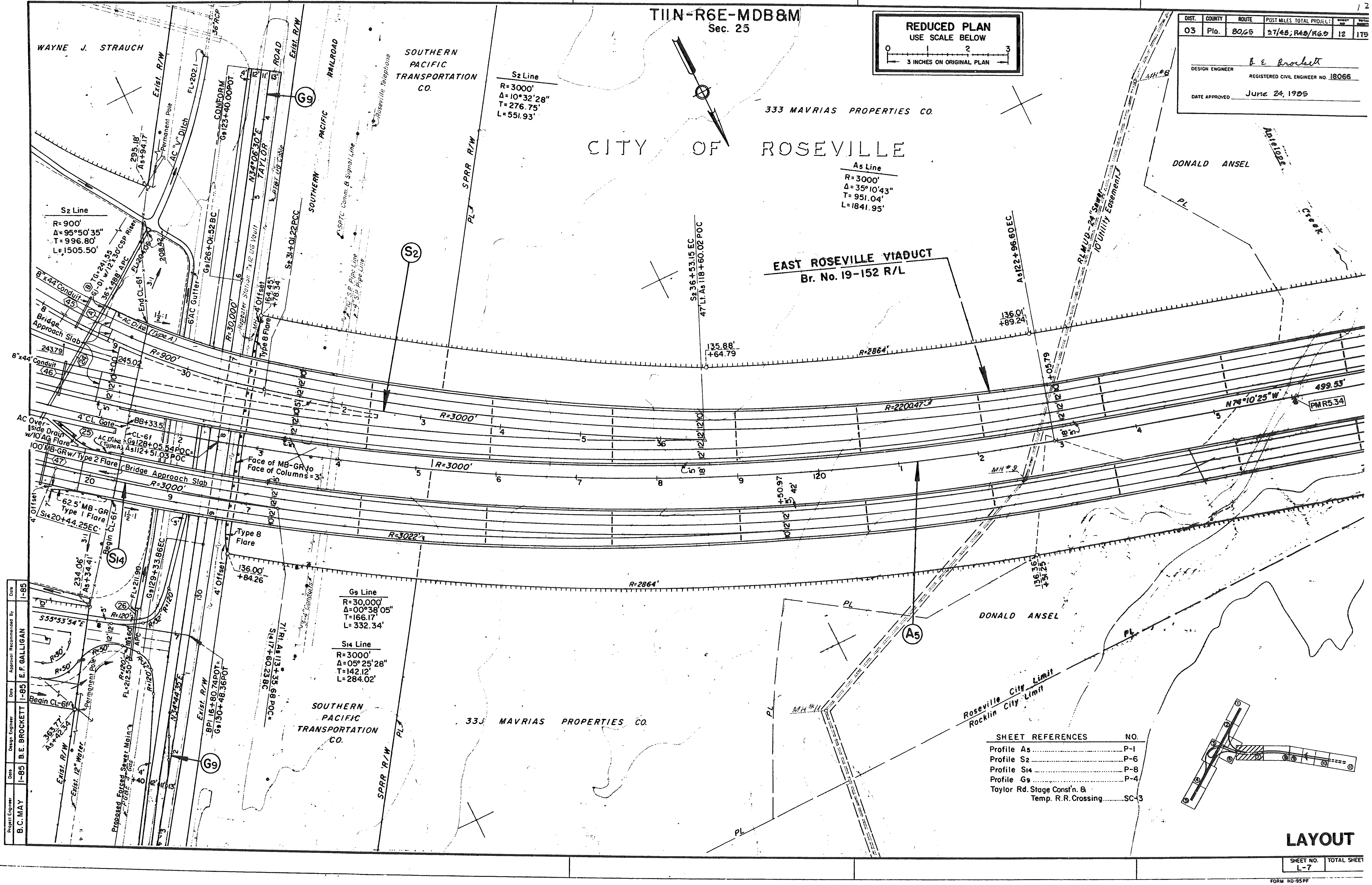
SHEET NO. L-4 | TOTAL SHEETS

FORM HD-95PF

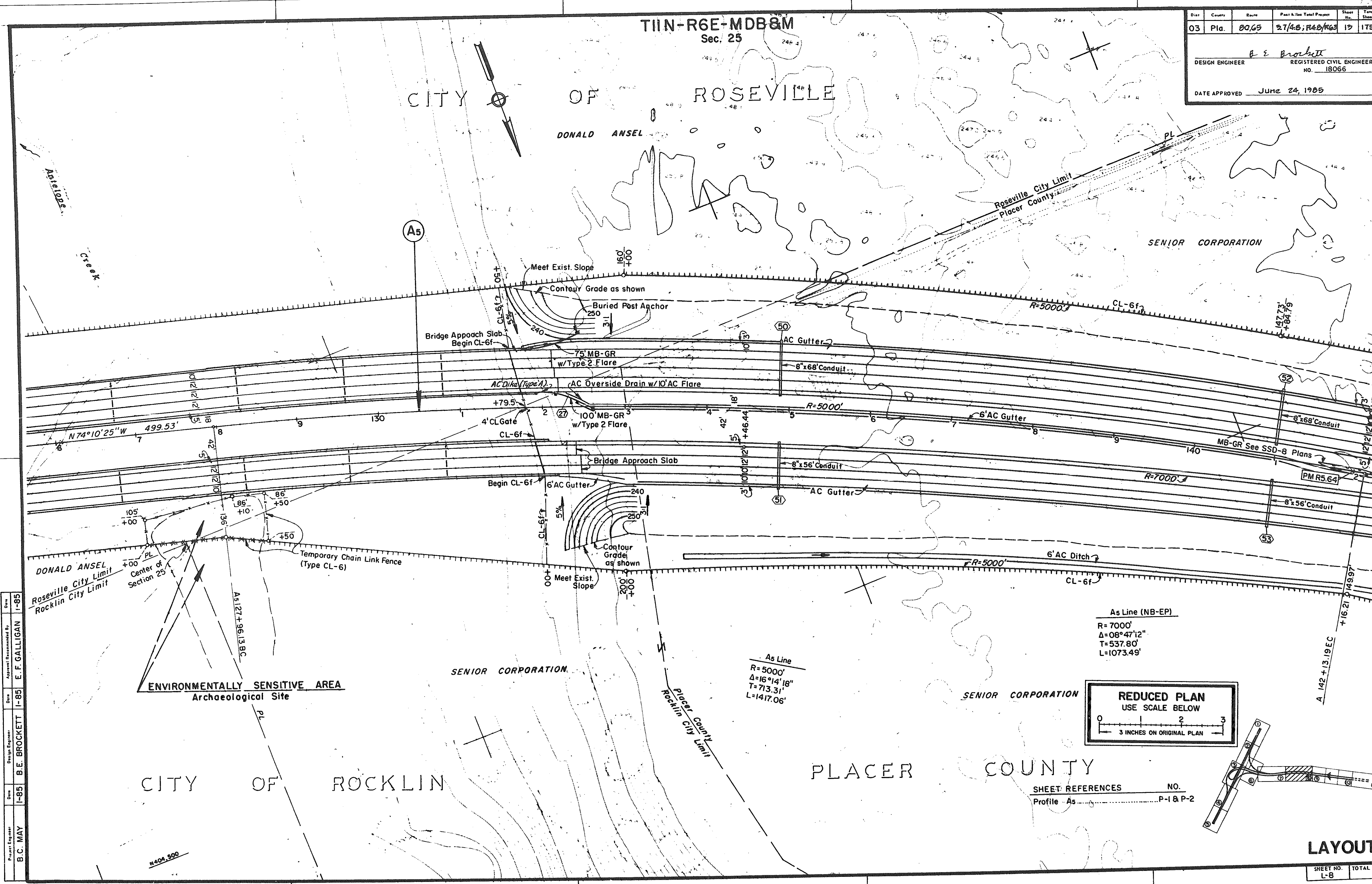


10
Dist | County | Route | Post Miles Total Project | Sheet No. | Total Sheets
03 | Pla | 80,65 | 3.7/4.8,R4.8/R6.3 | 10 | 175
DESIGN ENGINEER
REGISTERED CIVIL ENGINEER NO. 18066
DATE APPROVED June 24, 1985
T11N-R7E-MDB&M
Sec. 30
CITY OF ROCKLIN
WOODGLADE COURT
PLMUD UTILITY EASEMENT
CITY OF ROCKLIN
END OF CONSTRUCTION
STA. B 160+10
PM 4.8
B
END OF WORK
STA. B 197+00
Exist. R/W
Exist. CL-6f
Exist. Dike
Exist. MB-GR
8" PMP-UD
EXIST. RTE. 80-WB
EXIST. RTE. 80-EB
N51°00'18"E 7799.16'
Exist. Type 50 Concrete Barrier with Headlight Glare Screen
0.20' AC Overlay
36" RCP
24" RCP
12" CMP Conduit
PM5.00
Note: EQUATION B 197+00.00 POT= A 197+00.00 To Reno
(1958 Asbuilt Plans)
TG=216.60
GI-D1
12"x28" Alt. Pipe-DD
FL=205.1±
Remove & Dispose
27" Sewer
End AC Dike
8" CSP-DD
B 155+97.60 POT CONFORM
End 0.20' AC Overlay Rt. B 160+10.00 POT
Exist. CL-6f
Exist. R/W
SHEET REFERENCES NO.
Profile B P-3 & P-4
REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN
LAYOUT
Project Engineer B.C. MAY 1-85
Design Engineer B.E. BROCKETT 1-85
Approval Recommended By E.F. GALLIGAN 1-85
SHEET NO. L-5
TOTAL SHEETS

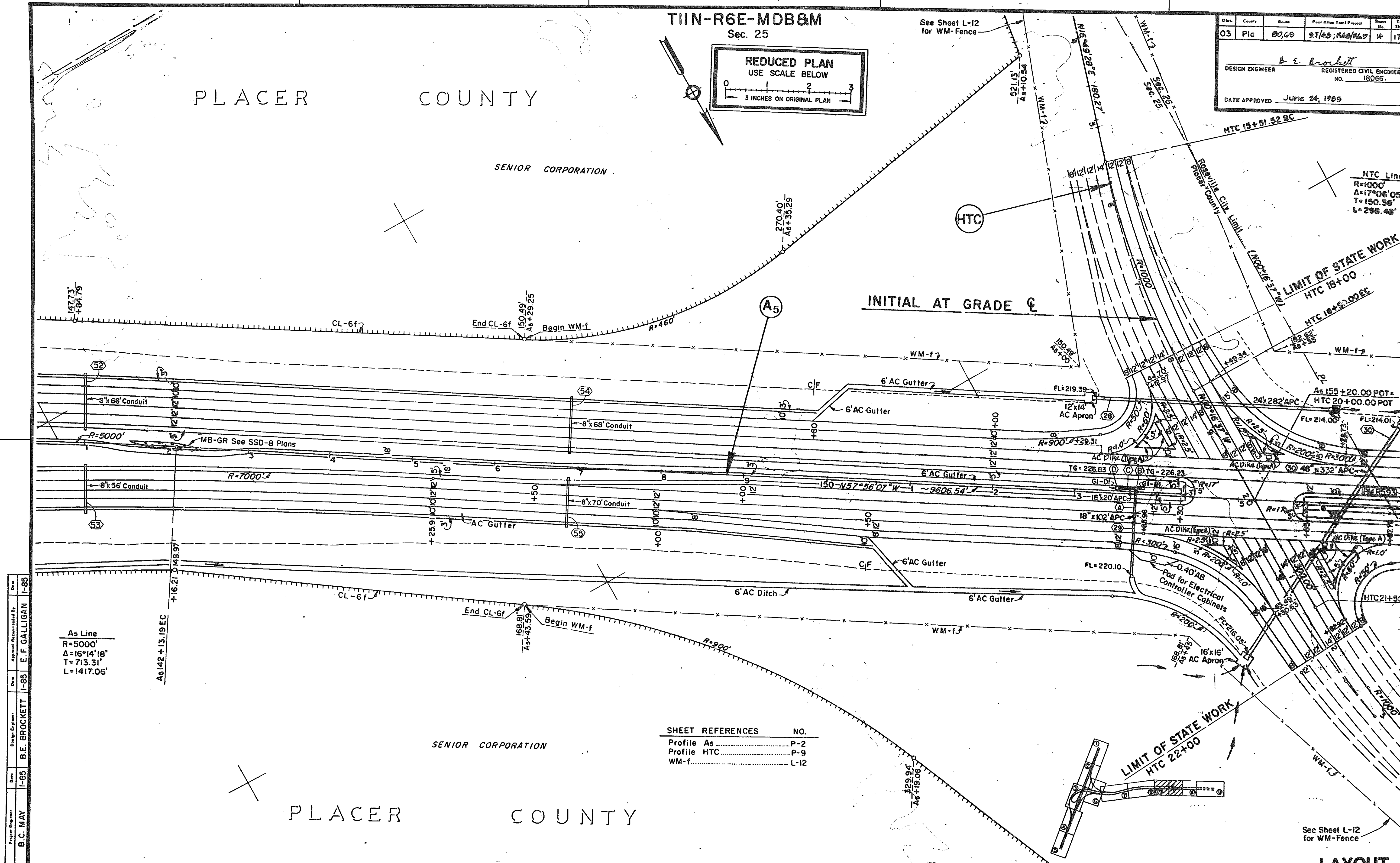

T11N-R6E-MDB&M
Sec. 25
Dist. | County | Route | Post Miles Total Project | Sheet No. | Total Sheets
03 | Pla. | 80,65 | 27/48; R48/R63 | 11 | 175
B. E. Brockett
DESIGN ENGINEER
REGISTERED CIVIL ENGINEER NO. 18066
DATE APPROVED June 24, 1985
TAYLOR ROAD
CITY OF ROSEVILLE
WAYNE J. STRAUCH
STONEHOUSE COURT
Exist. R/W
Exist. 12' Water
Roseville Electric 12 KV UG Cable
Roseville Telephone
PG&E 12 KV UG Cable
AC "V" Ditch
6' AC Gutter
Repeater Station 7x12 UG Vault
N34°06'30"E
R=30,000'
G9 123+40.00 POT= CONFORM
G9 126+01.52 BC
G9 129+33.86 EC
G9 130+48.36 POT= BP1 16+80.74 POT
N34°44'35"E
Exist. 4" Gas ~ PG&E
Proposed Force Sewer Main
Exist. 12" Water
G9 135+80.00 POT CONFORM
G9 Line
R=30,000'
Δ=00°38'05"
T=166.17'
L=332.34'
Type 8 Flare
Face of MB-GR to Face of Columns = 3'
Begin CL-6f
End CL-6f
PM R5.05
Bridge Approach Slab
(Omit Sleeper Slab in Median)
AC Dike (Type A)
100' MB-GR w/ Type 2 Flare
AC Overside Drain w/10' AC Flare
S51°21'30"E ~ 239.98'
Temporary Poles for PG&E 60 KV Power Line
A5 Line
R=3000'
Δ=35°10'43"
T=951.04'
L=1841.95'
S2 Line
R=900'
Δ=95°50'35"
T=996.80'
L=1505.50'
S14 Line
R=3000'
Δ=05°25'28"
T=142.12'
L=284.02'
BP2 Line
R=100'
Δ=57°00'20"
T=54.30'
L=99.49'
R=50'
Δ=178°37'44"
T=4178.59'
L=155.88'
S.B. BICYCLE PATH
CONFORM BP2 17+35.85 POT
DRAINAGE EASEMENT
CONSTRUCTION PERMIT
DRIVEWAY
BICYCLE EASEMENT
Access Opening
BP2 20+75.00 EC
34' Lt. S2 20+75.00 POC
PARK & RIDE LOT
CL-6f w/4' CL-6 Gate
FL=210.60
Std. "L" Headwall & SCSP
See Misc. Detail
Grade to Drain
A-ALL MINI STORAGE
STATE OF CALIFORNIA
N.B. BICYCLE PATH
S3 Line
R=850'
Δ=117°31'33"
T=1401.47'
L=1743.53'
S1 Line
R=850'
Δ=77°01'01"
T=676.33'
L=1142.57"
S45°56'56"E 500.00'
N45°56'56"W 498.99'
S3 20+59.80 BC
S1 51+94.58 EC
S14 22+84.24 BC
S14 20+44.25 EC
BP1 23+08.58 BC
BP1 23+91.49 PCC
BP1 24+83.61 PRC
BP1 27+50.00 EC= 17' Lt. S14 27+50.00 POC
Save Tree
0.20' AC Overlay
Exist. Type 50 Concrete Barrier with Headlight Glare Screen
120 N51°00'18"E ~7799.16'
BP1 Line
R=635'
Δ=07°28'52"
T=41.52'
L=82.91'
R=175'
Δ=30°09'41"
T=47.16'
L=92.12'
R=80'
Δ=190°47'14"
T=847.32'
L=266.39'
S14 Line
R=850'
Δ=72°46'04"
T=626.31'
L=1079.53'
SHEET REFERENCES NO.
Profile A5 P-1
Profile S2 P-6
Profile S3 P-7
Profile S14 P-8
Profile G9 P-4
Profile BP1 & BP2 P-9
Taylor Rd. Stage Const'n. & Temp. R.R. Crossing SC-3
Park and Ride Lot Details PR-1
REDUCED PLAN
USE SCALE BELOW
3 INCHES ON ORIGINAL PLAN
LAYOUT
Project Engineer B.C. MAY 1-85
Design Engineer B.E. BROCKETT 1-85
Approval Recommended By E. F. GALLIGAN 1-85
SHEET NO. L-6
TOTAL SHEETS



T11N-R6E-MDB&M
Sec. 25
REDUCED PLAN
USE SCALE BELOW
3 INCHES ON ORIGINAL PLAN
DIST. 03 COUNTY Pla. ROUTE 80,65 POST MILES TOTAL PROJECT 27/48; R48/R6.5 12 175
DESIGN ENGINEER
REGISTERED CIVIL ENGINEER NO. 18066
DATE APPROVED June 24, 1985
WAYNE J. STRAUCH
SOUTHERN PACIFIC TRANSPORTATION CO.
333 MAVRIAS PROPERTIES CO.
CITY OF ROSEVILLE
DONALD ANSEL
S2 Line
R=3000'
Δ=10°32'28"
T=276.75'
L=551.93'
A5 Line
R=3000'
Δ=35°10'43"
T=951.04'
L=1841.95'
S2 Line
R=900'
Δ=95°50'35"
T=996.80'
L=1505.50'
EAST ROSEVILLE VIADUCT
Br. No. 19-152 R/L
TAYLOR ROAD
N34°06'30"E
CONFORM G9 123+40.00POT
G9 126+01.52 BC
S2 31+01.22 PCC
S2 36+53.15 EC
47' Lt. A5 118+60.02 POC
A5 122+96.60 EC
R=2864'
R=2200.47'
R=3000'
R=3022'
N78°10'25"W 499.53'
PM R5.34
RLMUD 24" Sewer 10' Utility Easement
Antelope Creek
G9 Line
R=30,000'
Δ=00°38'05"
T=166.17'
L=332.34'
S14 Line
R=3000'
Δ=05°25'28"
T=142.12'
L=284.02'
SPRR R/W
Exist. R/W
Roseville City Limit
Rocklin City Limit
SHEET REFERENCES NO.
Profile A5 P-1
Profile S2 P-6
Profile S14 P-8
Profile G9 P-4
Taylor Rd. Stage Const'n. & Temp. R.R. Crossing SC-3
Project Engineer B.C. MAY 1-85
Design Engineer B.E. BROCKETT 1-85
Approval Recommended By E.F. GALLIGAN 1-85
LAYOUT
SHEET NO. L-7
FORM HD-95PF



Dist | County | Route | Post Miles Total Project | Sheet No. | Total Sheets
03 | Pla. | 80,65 | 27/4.8; R4.8/R63 | 13 | 175
B. E. Brockett
DESIGN ENGINEER
REGISTERED CIVIL ENGINEER NO. 18066
DATE APPROVED June 24, 1985
T11N-R6E-MDB&M
Sec. 25
CITY OF ROSEVILLE
DONALD ANSEL
Antelope Creek
Roseville City Limit
Placer County
SENIOR CORPORATION
Meet Exist. Slope
Contour Grade as shown
Buried Post Anchor
Bridge Appoach Slab
Begin CL-6f
75' MB-GR w/Type 2 Flare
AC Dike (Type A)
AC Overside Drain w/10' AC Flare
100' MB-GR w/Type 2 Flare
4' CL Gate
CL-6f
AC Gutter
8"x68' Conduit
R=5000'
6' AC Gutter
MB-GR See SSD-8 Plans
PM R5.64
Bridge Approach Slab
8"x56' Conduit
R=7000'
6' AC Ditch
N74°10'25"W 499.53'
Temporary Chain Link Fence (Type CL-6)
Center of Section 25
Roseville City Limit
Rocklin City Limit
A5 127+96.13 BC
A 142+13.19 EC
ENVIRONMENTALLY SENSITIVE AREA
Archaeological Site
SENIOR CORPORATION
A5 Line
R=5000'
Δ=16°14'18"
T=713.31'
L=1417.06'
A5 Line (NB-EP)
R=7000'
Δ=08°47'12"
T=537.80'
L=1073.49'
Placer County
Rocklin City Limit
REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN
CITY OF ROCKLIN
PLACER COUNTY
SHEET REFERENCES NO.
Profile A5 .... P-1 & P-2
LAYOUT
SHEET NO. L-8
TOTAL SHEETS
Project Engineer B.C. MAY 1-85
Design Engineer B.E. BROCKETT 1-85
Approval Recommended By E.F. GALLIGAN 1-85



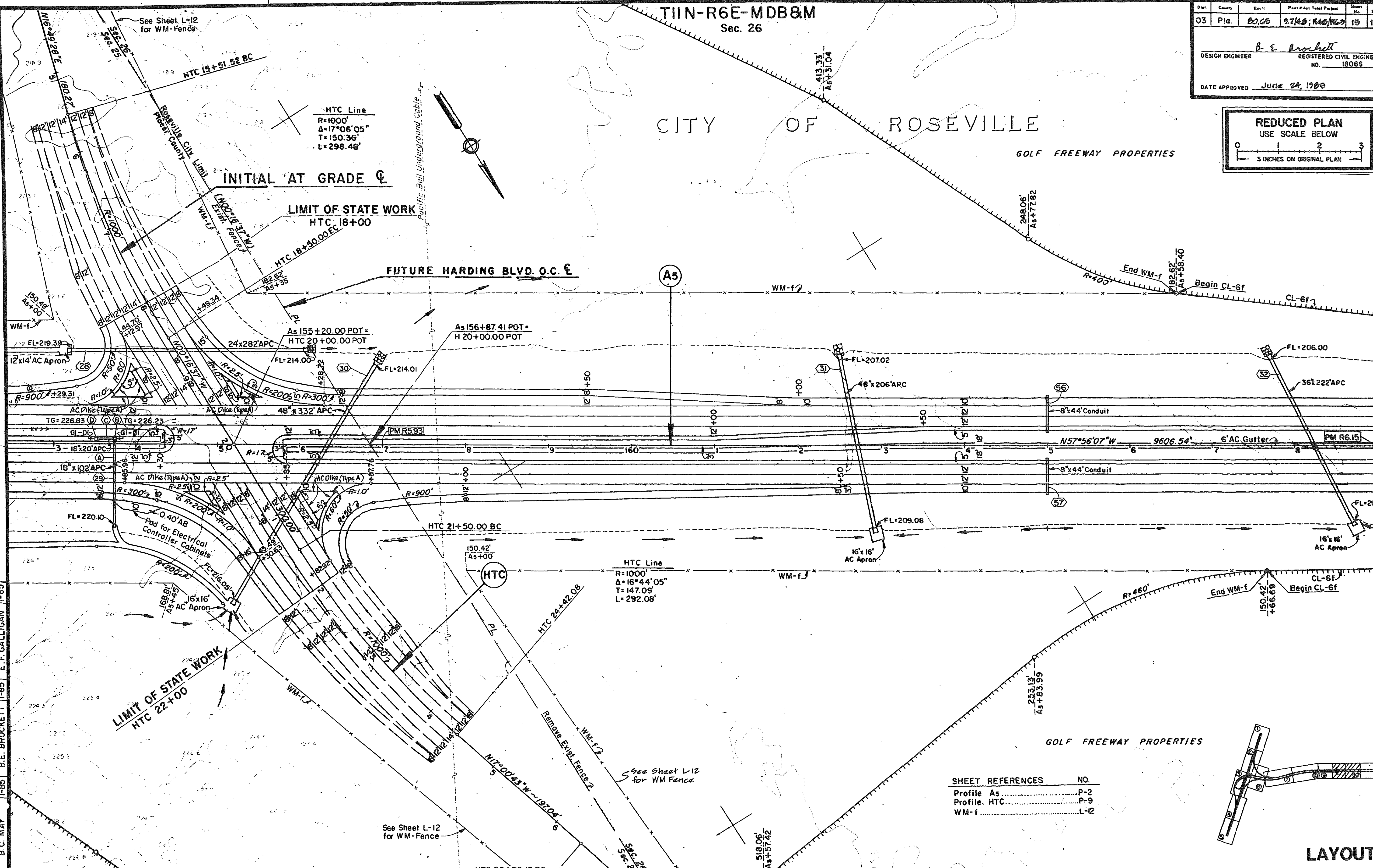
Dist.	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
03	Pla	80,65	9.7/4.5; R4.8/R4.9	14	175

B. E. Brockett
DESIGN ENGINEER
REGISTERED CIVIL ENGINEER NO. 18066.
DATE APPROVED June 24, 1985
T11N-R6E-MDB&M
Sec. 25
REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN
PLACER COUNTY
SENIOR CORPORATION
See Sheet L-12 for WM-Fence
INITIAL AT GRADE ℄
HTC
A5
HTC 15+51.52 BC
HTC Line
R=1000'
Δ=17°06'05"
T=150.36'
L=298.48'
LIMIT OF STATE WORK HTC 18+00
HTC 18+50.00 EC
Roseville City Limit
Placer County
N16°49'28"E 180.27'
Sec. 25
Sec. 26
As 155+20.00 POT= HTC 20+00.00 POT
150 - N57°56'07"W - 1 ~ 9606.54'
CL-6f
End CL-6f
Begin WM-f
WM-f
R=460'
R=900'
R=5000'
R=7000'
MB-GR See SSD-8 Plans
8"x68' Conduit
8"x56' Conduit
8"x70' Conduit
6' AC Gutter
6' AC Ditch
AC Gutter
12'x14' AC Apron
16'x16' AC Apron
0.40' AB Pad for Electrical Controller Cabinets
18"x102' APC
3 - 18"x20' APC
24"x282' APC
48"x332' APC
AC Dike (Type A)
FL=219.39
FL=214.00
FL=214.01
FL=220.10
FL=216.05'
TG=226.83
TG=226.23
LIMIT OF STATE WORK HTC 22+00
HTC 21+50.00
As Line
R=5000'
Δ=16°14'18"
T=713.31'
L=1417.06'
As 142+13.19 EC
SHEET REFERENCES NO.
Profile As P-2
Profile HTC P-9
WM-f L-12
PLACER COUNTY
SENIOR CORPORATION
See Sheet L-12 for WM-Fence
LAYOUT
SHEET NO. L-9
TOTAL SHEETS
Project Engineer B.C. MAY 1-85
Design Engineer B.E. BROCKETT 1-85
Approval Recommended By E.F. GALLIGAN 1-85
14

Dist.	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
03	Pla.	80,65	9.7/48; R46/R69	15	175

B. E. Brockett
DESIGN ENGINEER
REGISTERED CIVIL ENGINEER NO. 18066
DATE APPROVED June 24, 1985

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN



T11N-R6E-MDB&M
Sec. 26
CITY OF ROSEVILLE
GOLF FREEWAY PROPERTIES
See Sheet L-12 for WM-Fence
HTC 15+51.52 BC
Roseville City Limit
Placer County
HTC Line
R=1000'
Δ=17°06'05"
T=150.36'
L=298.48'
Pacific Bell Underground Cable
INITIAL AT GRADE ℄
LIMIT OF STATE WORK
HTC 18+00
HTC 18+50.00 EC
FUTURE HARDING BLVD. O.C. ℄
A5
WM-f
As 155+20.00 POT= HTC 20+00.00 POT
As 156+87.41 POT= H 20+00.00 POT
24'x282'APC
48"x332' APC
48"x206'APC
36"x222'APC
8"x44'Conduit
N57°56'07"W 9606.54'
6' AC Gutter
PM R5.93
PM R6.15
End WM-f
Begin CL-6f
CL-6f
12'x14' AC Apron
16'x16' AC Apron
18"x102'APC
3 - 18"x20'APC
AC Dike (Type A)
TG = 226.83
TG = 226.23
FL=219.39
FL=214.00
FL=214.01
FL=207.02
FL=206.00
FL=209.08
FL=220.10
FL=216.05
FL=210.12
0.40' AB Pad for Electrical Controller Cabinets
HTC 21+50.00 BC
HTC
HTC Line
R=1000'
Δ=16°44'05"
T=147.09'
L=292.08'
HTC 24+42.08
LIMIT OF STATE WORK
HTC 22+00
Remove Exist. Fence
N17°00'43"W~197.04'
See Sheet L-12 for WM Fence
See Sheet L-12 for WM-Fence
HTC 26+39.12 BC
Sec. 26
Sec. 25

SHEET REFERENCES NO.
Profile As.......P-2
Profile HTC.......P-9
WM-f.......L-12

Project Engineer	Date	Design Engineer	Date	Approval Recommended By	Date
B.C. MAY	1-85	B.E. BROCKETT	1-85	E.F. GALLIGAN	1-85

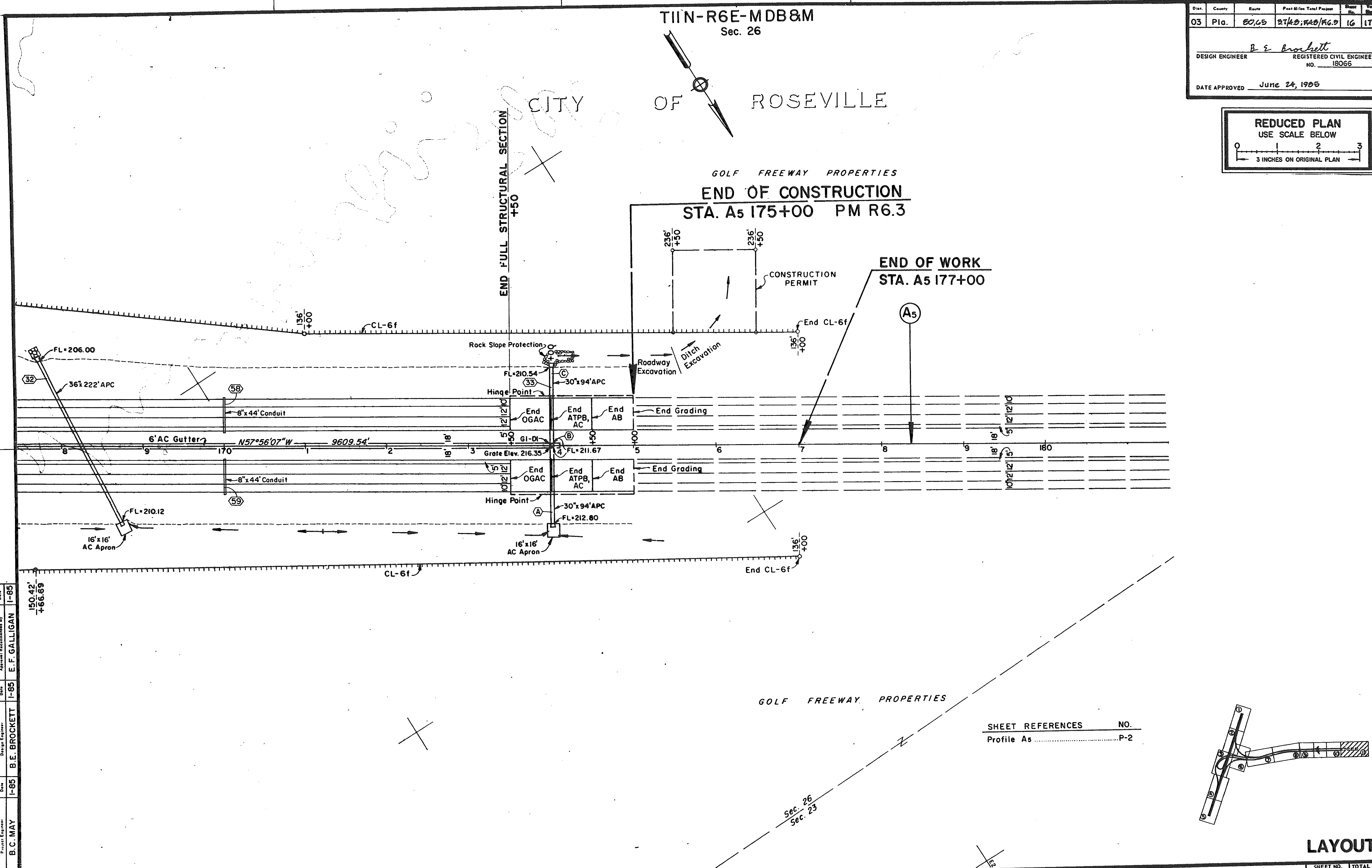
LAYOUT

SHEET NO. L-10 TOTAL SHEETS

Dist.	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
03	Pla.	80,65	27/40;F48/R6.3	16	178

B E Brockett
DESIGN ENGINEER
REGISTERED CIVIL ENGINEER NO. 18066
DATE APPROVED June 24, 1985

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN



Project Engineer	Date	Design Engineer	Date	Approval Recommended By	Date
B.C. MAY	1-85	B.E. BROCKETT	1-85	E.F. GALLIGAN	1-85

SHEET REFERENCES	NO.
Profile A5	P-2

LAYOUT

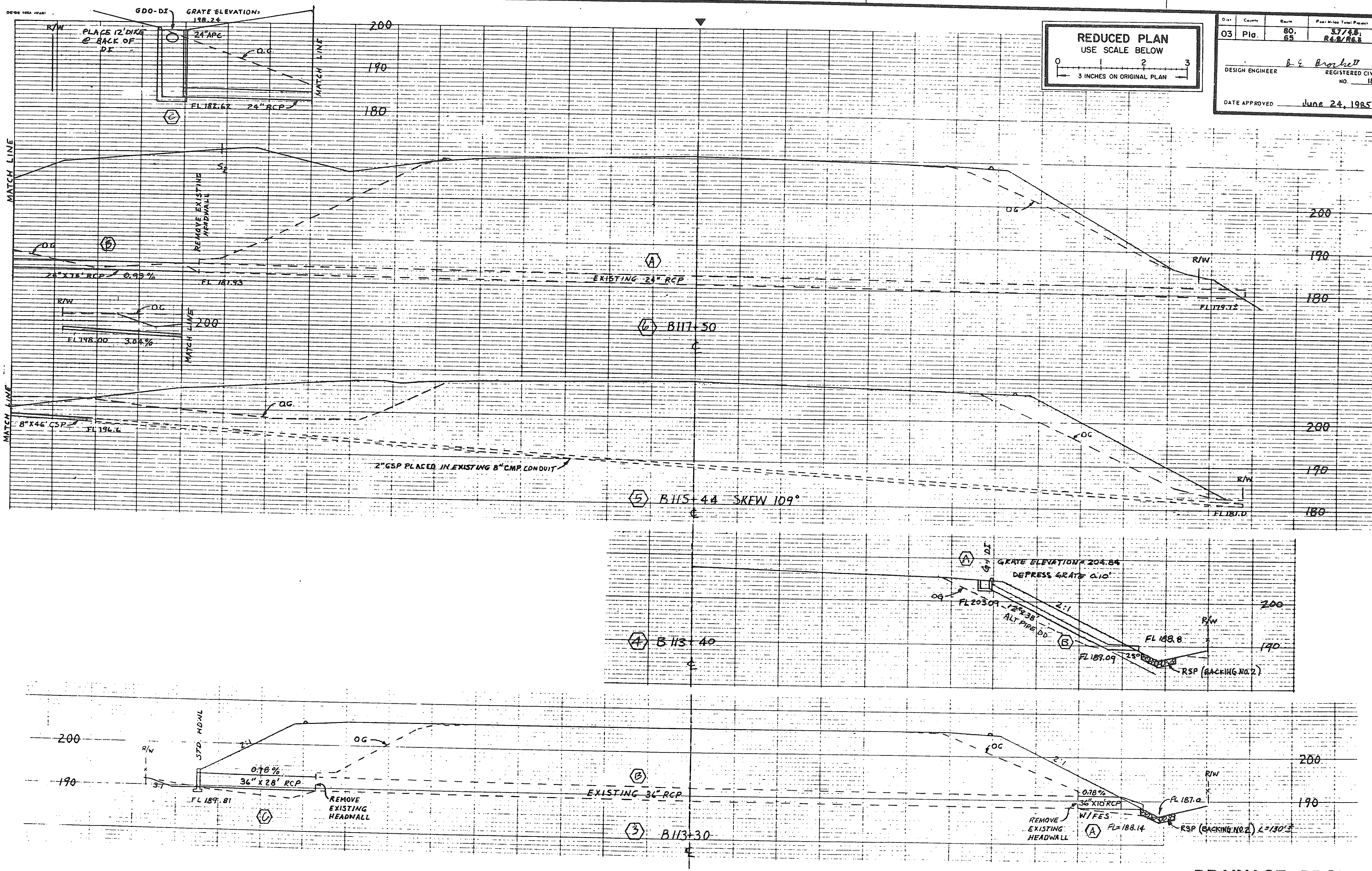
SHEET NO. L-11 TOTAL SHEETS

Dist	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
03	Pla.	80, 65	5.7/4.8; R4.8/R6.8	27	175

DESIGN ENGINEER — REGISTERED CIVIL ENGINEER NO. 18066

DATE APPROVED June 24, 1985

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN



DRAINAGE PROFILES

Scale: 1" = 10'

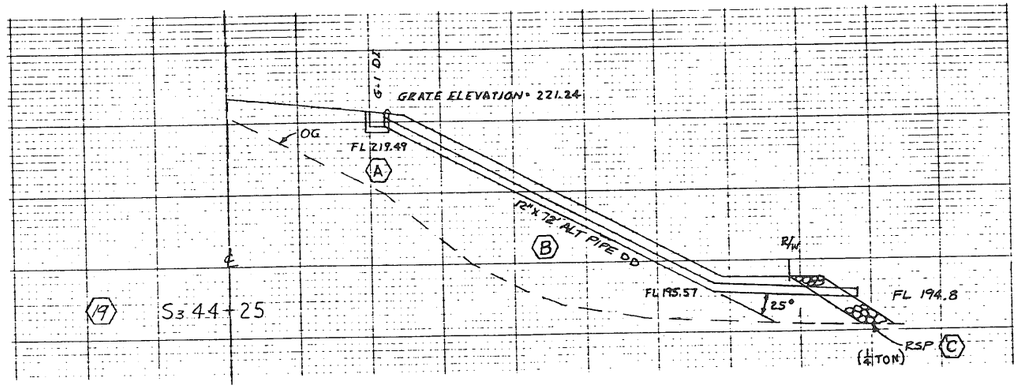
SHEET NO.	TOTAL SHEETS
DR-1	8

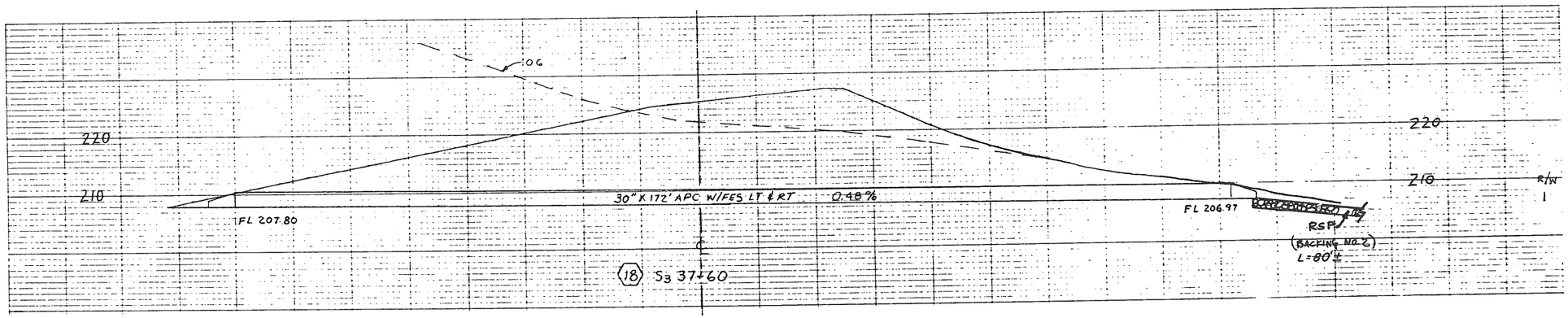
Dist	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
03	Pla.	80, 65	3.7/4.8; R4.8/R6.3	30	175

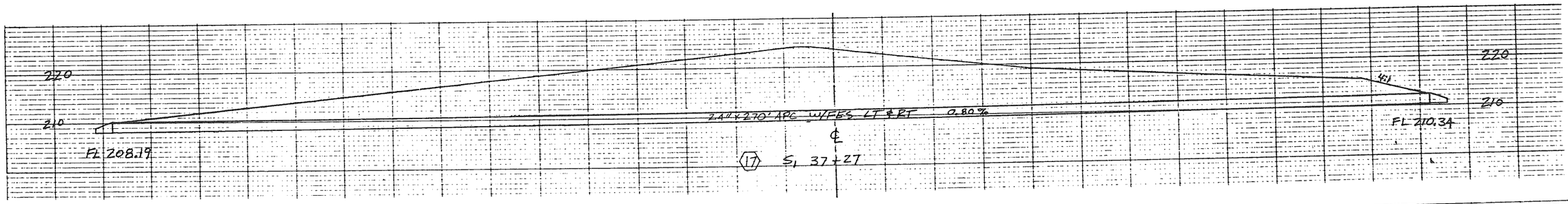
B. E. Brockett
DESIGN ENGINEER — REGISTERED CIVIL ENGINEER NO 18066

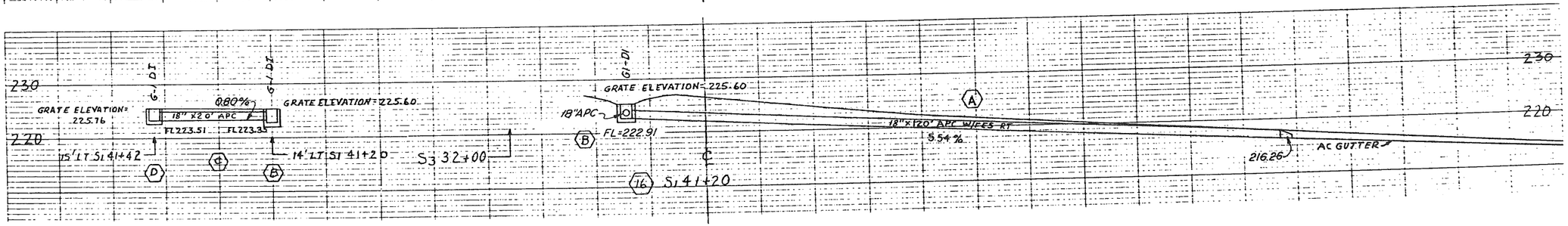
DATE APPROVED June 24, 1985

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN









DRAINAGE PROFILES

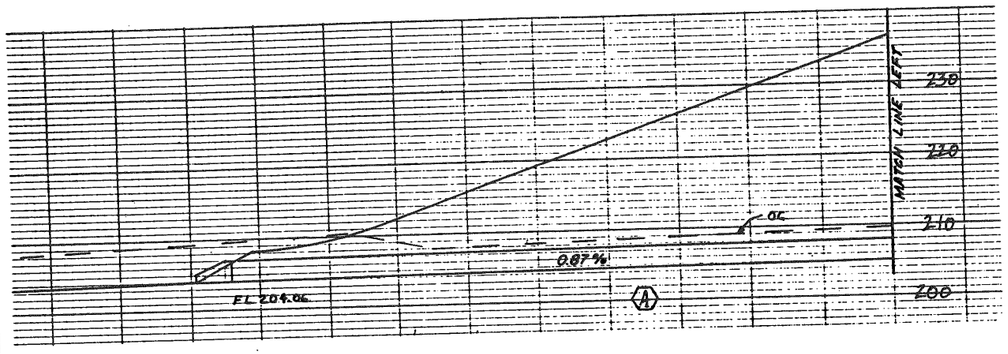
Scale: 1" = 10'

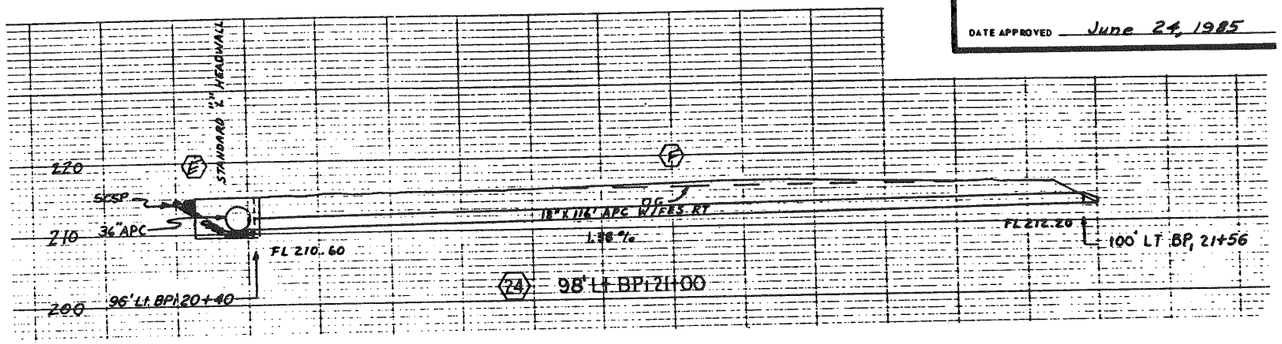
SHEET NO. DR-4 | TOTAL SHEETS 8

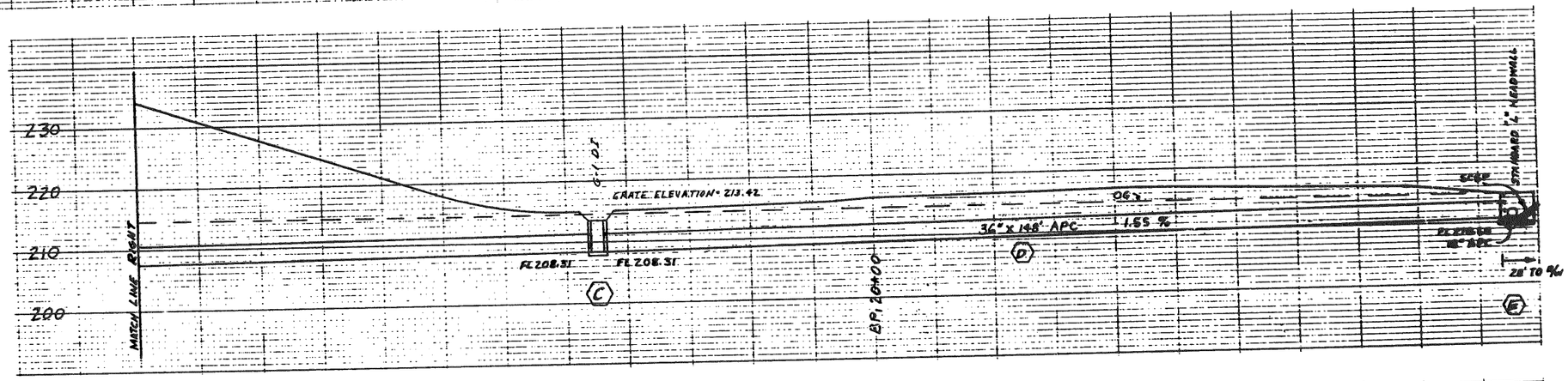
Dist	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
03	Pla.	80, 65	37/48; R4.8/R6.3	32	12

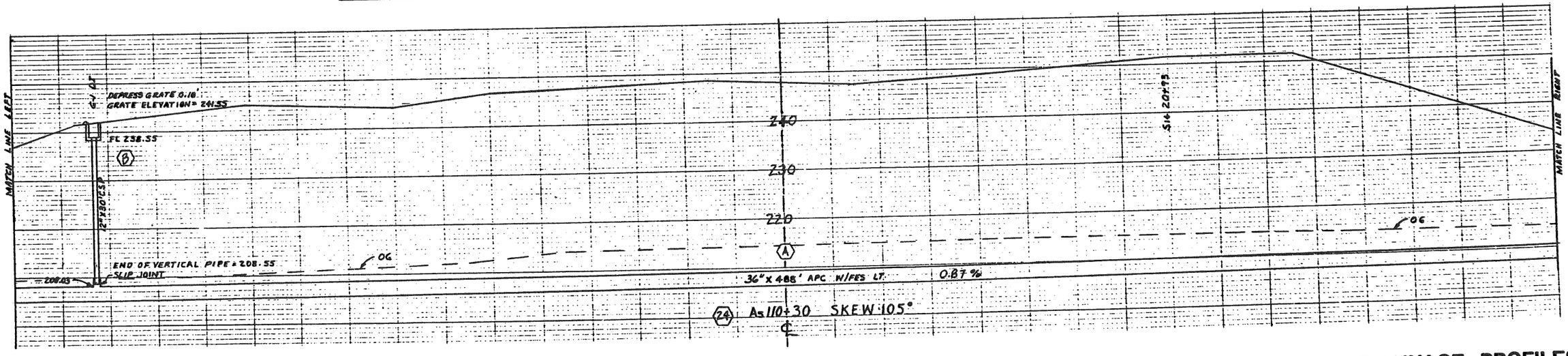
DESIGN ENGINEER — REGISTERED CIVIL ENGINEER NO. 18066

DATE APPROVED June 24, 1985









REDUCED PLAN
USE SCALE BELOW
0 — 2 — 3
3 INCHES ON ORIGINAL PLAN

Project Engineer | Date | Design Engineer | Date | Approval Recommended By | Date

DRAINAGE PROFILES

Scale: 1" = 10'

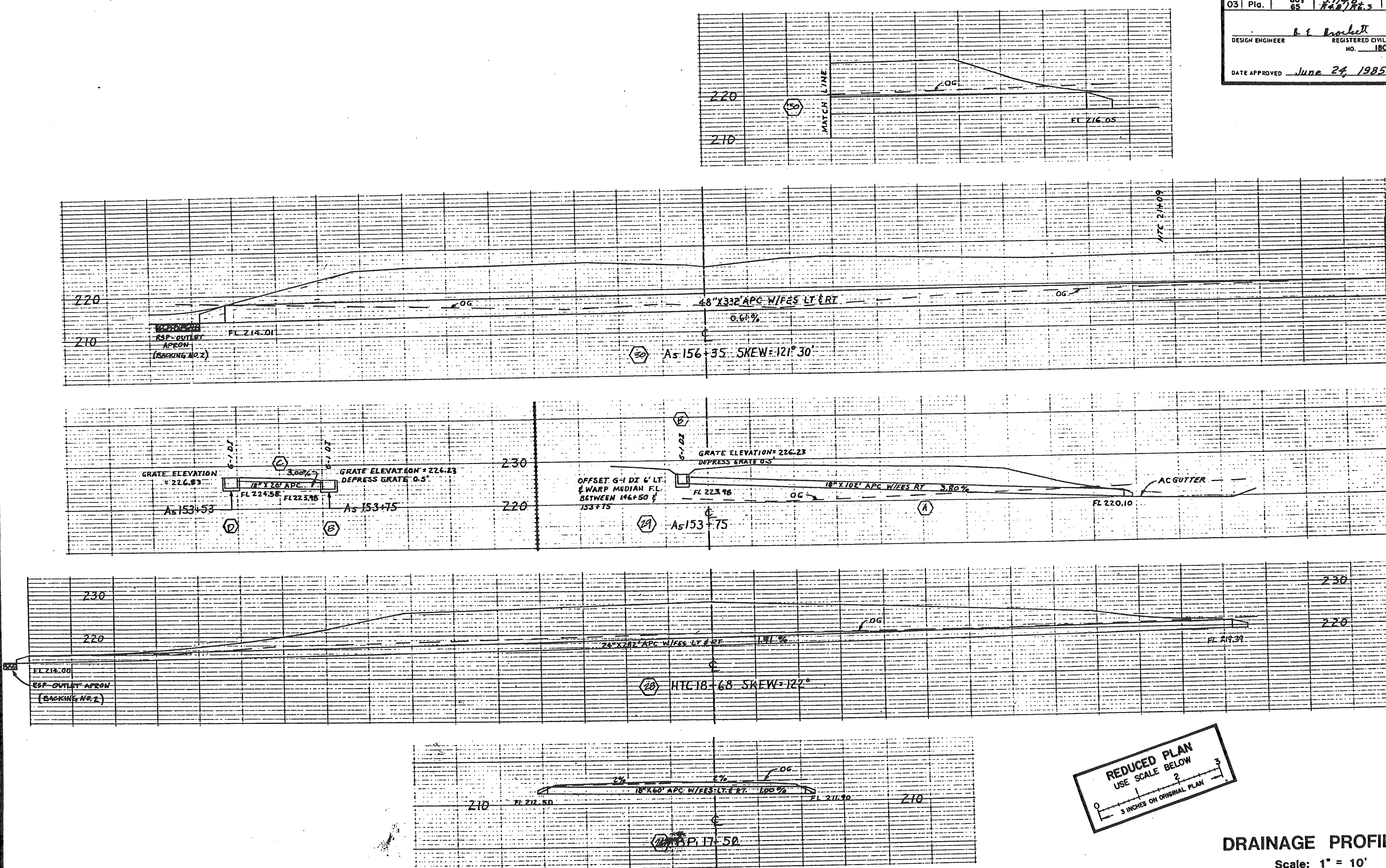
SHEET NO.	TOTAL SHEETS
DR-6	8

Dist	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
03	Pla.	80, 65	3.7/4.8; [illegible]	33	175

DESIGN ENGINEER

REGISTERED CIVIL ENGINEER NO. 18066

DATE APPROVED June 24, 1985



REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DRAINAGE PROFILES

Scale: 1" = 10'

SHEET NO.	TOTAL SHEETS
DR-7	8

33

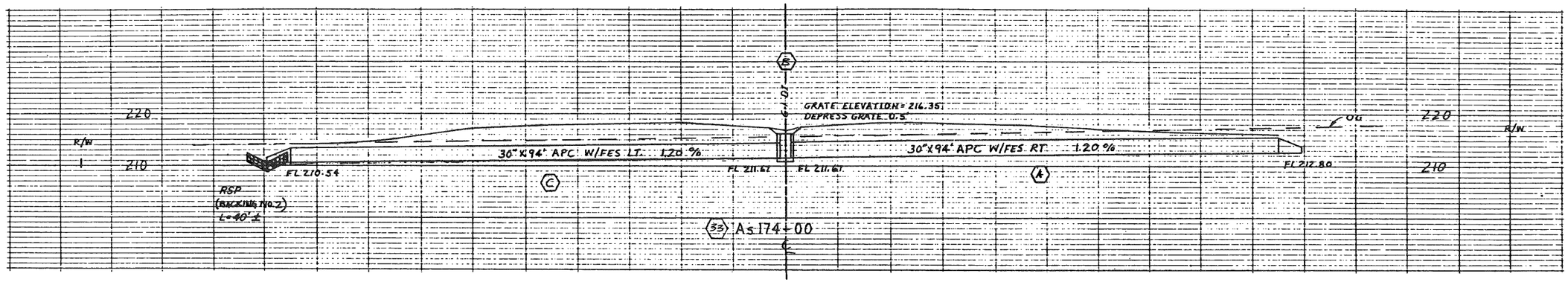
Dist	County	Route	Post Mile Total Project	Sheet No.	Total Sheets
03	Pla.	80 65	37/48.3 R48/R6.3	34	175

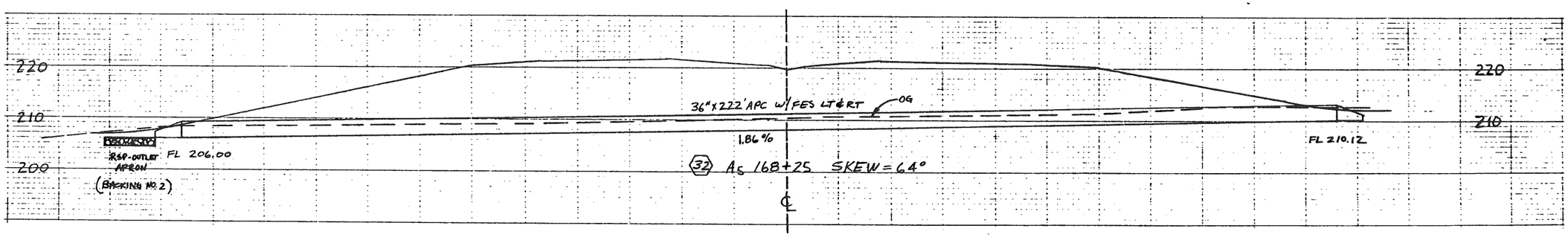
DESIGN ENGINEER B. E. Brockett

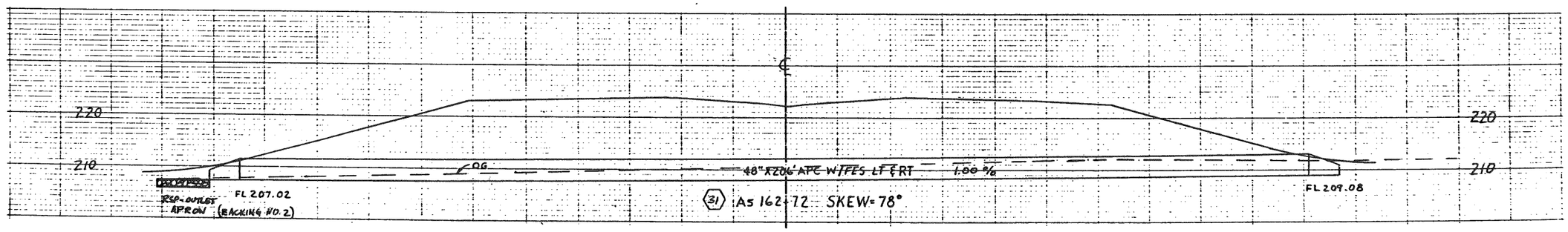
REGISTERED CIVIL ENGINEER NO. 18066

DATE APPROVED June 24, 1985

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN







DRAINAGE PROFILES

Scale: 1" = 10'

SHEET NO.	TOTAL SHEETS
DR-8	8

34

Appendix A.2 EA 03-390004 As-built Drawing (1999)

INDEX OF SHEETS

Sheet No.	Description
1	Title and Location Map
2	Typical Cross Sections
3-5	Layouts
6-7	Construction Details
8	Drainage Details
9	Stage Construction and Traffic Handling Plan
10	Construction Area Signs
11-12	Summary of Quantities
13-42	Sound Wall Plans
43-48	Revised Standard Plans
49-51	New Standard Plans

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO CONTRACTORS AND SPECIAL PROVISIONS BOOK.

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

ACIM-080-3(221)E

PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY
IN PLACER COUNTY
IN ROCKLIN
FROM 1.3 km TO 0.3 km
WEST OF ROCKLIN ROAD UNDERCROSSING

To be supplemented by Standard Plans dated July, 1997

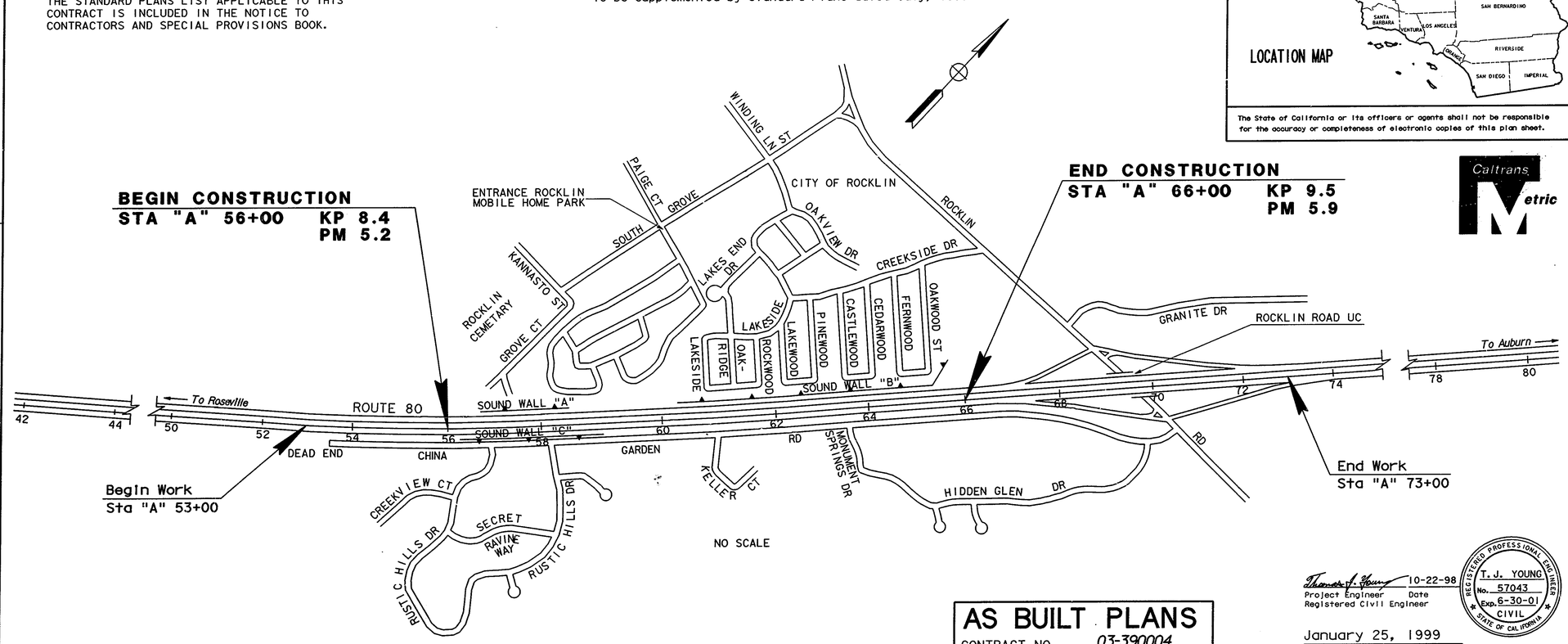
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	Pla	80	8.4/9.5	1	51

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

BEGIN CONSTRUCTION
STA "A" 56+00 KP 8.4
PM 5.2

END CONSTRUCTION
STA "A" 66+00 KP 9.5
PM 5.9

Caltrans Metric



AS BUILT PLANS	
CONTRACT NO.	03-390004
DATE COMPLETED	12/31/99
RESIDENT ENGINEER	Salah Bouzid

Thomas J. Young 10-22-98
Project Engineer Date
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER
T. J. YOUNG
No. 57043
Exp. 6-30-01
CIVIL
STATE OF CALIFORNIA

January 25, 1999
Plans Approval Date

PROJECT ENGINEER	DATE	PROJECT MANAGER	DATE
T.J. YOUNG		P. BURDICK	

The Contractor shall possess the Class (or classes) of license as specified in the ''Notice to Contractors''.

LAST REVISION 00-00-00
DATE PLOTTED => 26-SEP-2001
TIME PLOTTED => 12:52

Contract No. 03-390004

FORM DC-OE-93-PF (REV. 3/88)

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => t3bell
DGN FILE => 339000a01

CU 03228

EA 390001

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	Pla	80	8.4/9.5	3	51

Thomas J. Young 10-22-98
REGISTERED CIVIL ENGINEER

1-25-99
PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER — T. J. YOUNG No. 57043 Exp. 6-30-01 CIVIL — STATE OF CALIFORNIA

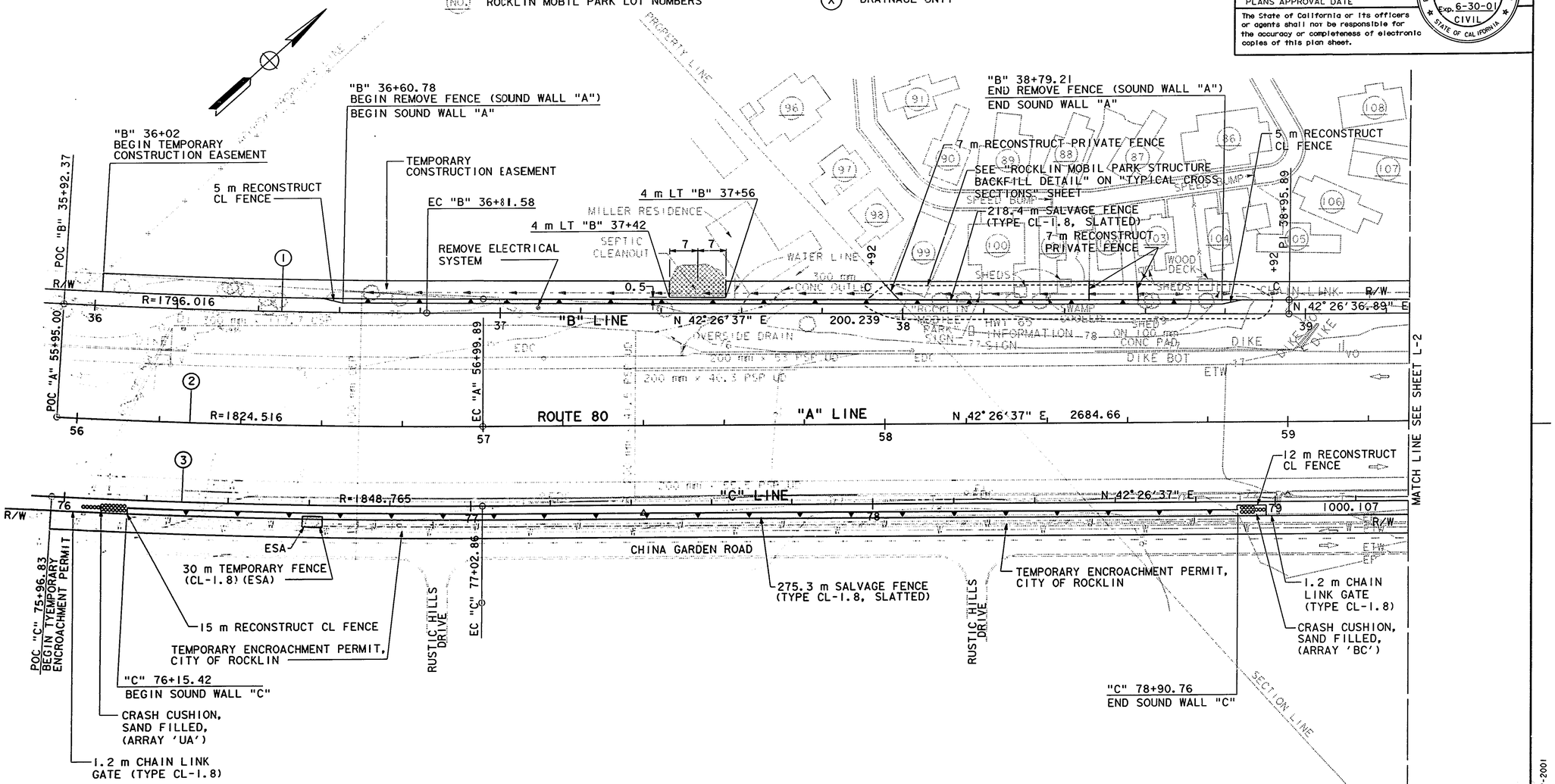
Caltrans Metric

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR SLOPE ROUNDING DETAIL, SEE "TYPICAL CROSS SECTIONS" SHEET.

LEGEND

- ENVIRONMENTALLY SENSITIVE AREA (ESA)
- SEPTIC TANK LEACH FIELD
- (NO.) ROCKLIN MOBIL PARK LOT NUMBERS
- DIRECTION OF TRAFFIC
- (NO.) DRAINAGE SYSTEM
- (X) DRAINAGE UNIT



CURVE DATA				
No.	R	Δ	T	L
①	1796.016	3°17'10.480"	51.643	103.258
②	1824.516	3°17'38.380"	52.461	104.893
③	1848.765	3°17'10.390"	53.033	106.037
④	8.557	42°44'58.560"	3.349	6.385

AS BUILT PLANS
CONTRACT NO. 03-390004
DATE COMPLETED 12/31/99
RESIDENT ENGINEER Salah Bouzid

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT L-1

SCALE: 1:500

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE => 339000e01

CU 03250 EA 390001

LAST REVISION 00-00-00 DATE PLOTTED => 26-SEP-2001 TIME PLOTTED => 12:58

	CALCULATED/ DESIGNED BY	CHECKED BY	DATE	REVISED BY	DATE REVISED
	TEH	TJY	02/98		

PROJECT ENGINEER T. J. YOUNG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
NORTH REGION
DIVISION OF DESIGN, SOUTH
DESIGN BRANCH '81
Caltrans

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	Pla	80	8.4/9.5	4	51

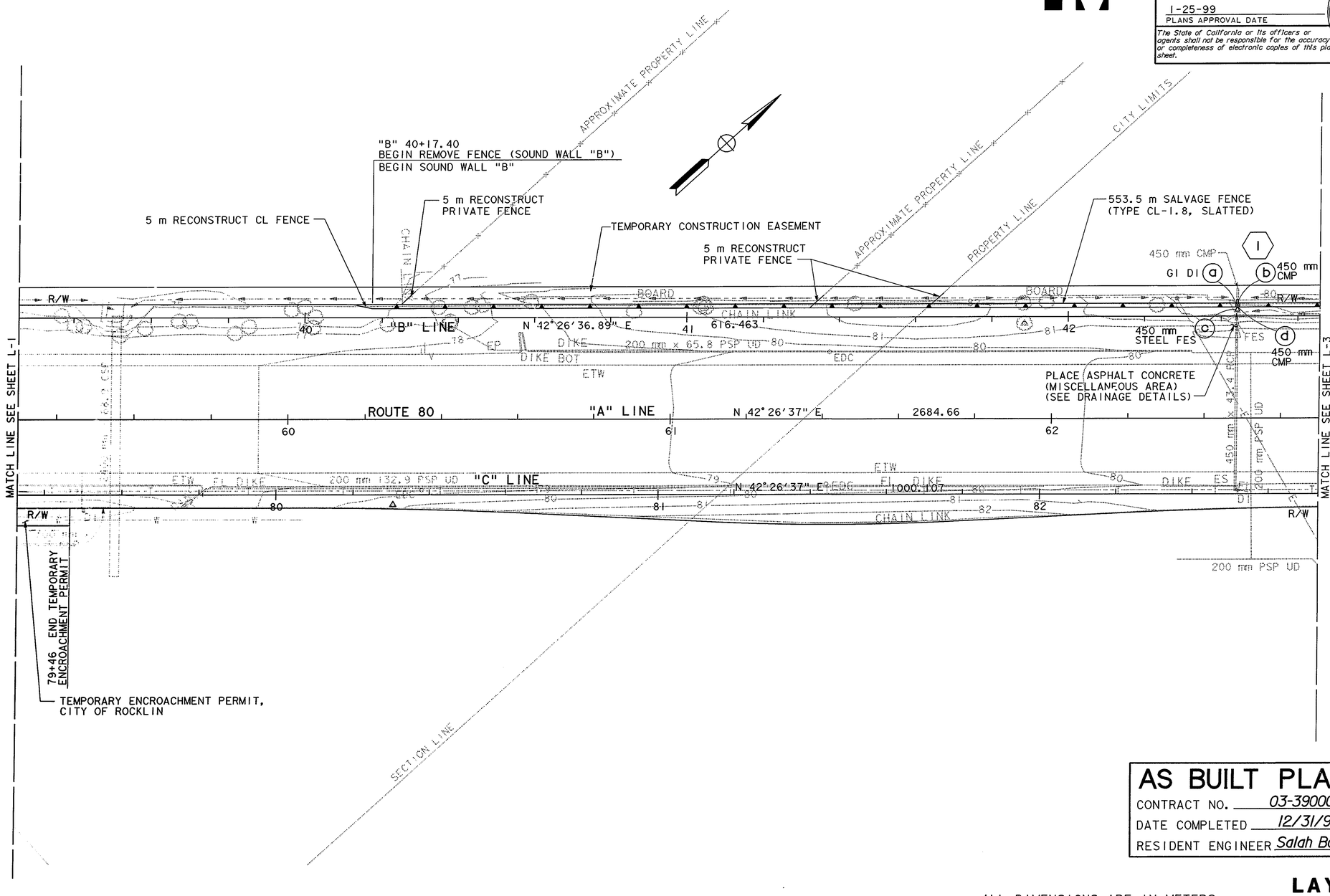
Caltrans Metric

Thomas J. Young 10-22-98
REGISTERED CIVIL ENGINEER

1-25-99
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — T. J. YOUNG No. 57043 Exp. 6-30-01 CIVIL — STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



AS BUILT PLANS
CONTRACT NO. 03-390004
DATE COMPLETED 12/31/99
RESIDENT ENGINEER Salah Bouzid

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT
SCALE: 1:500
L-2

CALCULATED/ DESIGNED BY	CHECKED BY
TEH 02/98	TJY 02/98

DATE REVISED BY — DATE REVISED

PROJECT ENGINEER
T. J. YOUNG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
NORTH REGION
DIVISION OF DESIGN, SOUTH
DESIGN BRANCH 81

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE => $$$$$$$$$$DGNSPEC$$$$$$$$$$

CU 03250

EA 390001

LAST REVISION 00-00-00 TIME PLOTTED => $$$$$$$SYSTIME$$$$$$

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	Pla	80	8.4/9.5	5	51

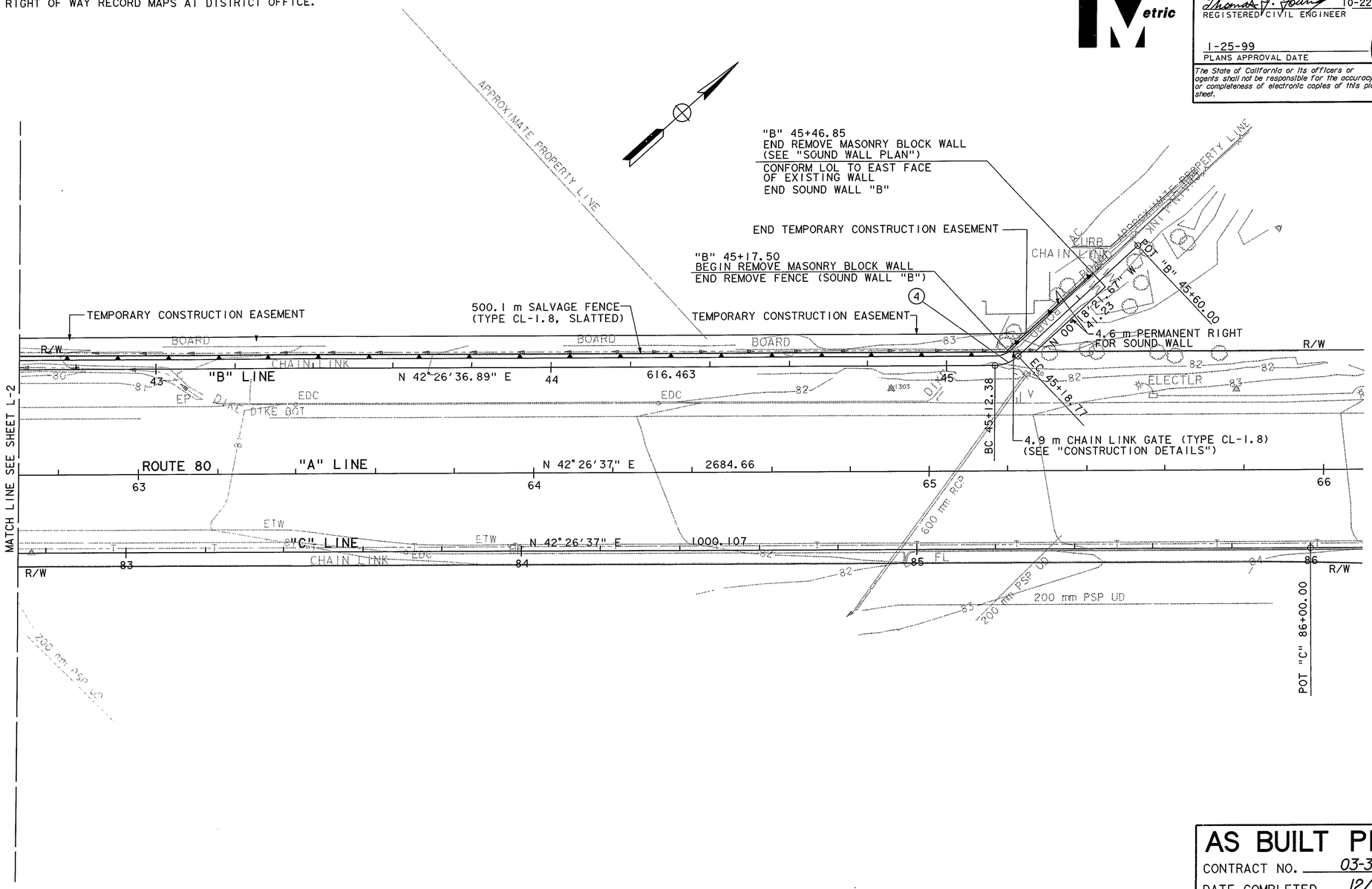
Caltrans Metric

Thomas J. Young 10-22-98
REGISTERED CIVIL ENGINEER

1-25-99
PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER — T. J. YOUNG No. 57043 Exp. 6-30-01 CIVIL — STATE OF CALIFORNIA



AS BUILT PLANS

CONTRACT NO. 03-390004
DATE COMPLETED 12/31/99
RESIDENT ENGINEER Salah Bouzid

ALL DIMENSIONS ARE IN METERS
UNLESS OTHERWISE SHOWN

LAYOUT
SCALE: 1:500 **L-3**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER
NORTH REGION DIVISION OF DESIGN, SOUTH DESIGN BRANCH 51	T. J. YOUNG

	CALCULATED/ DESIGNED BY	TEH	DATE 02/98	REVISED BY
	CHECKED BY	TJY	02/98	DATE REVISED

LAST REVISION 00-00-00 TIME PLOTTED => $$$$$$$SYTIME$$$$$$$

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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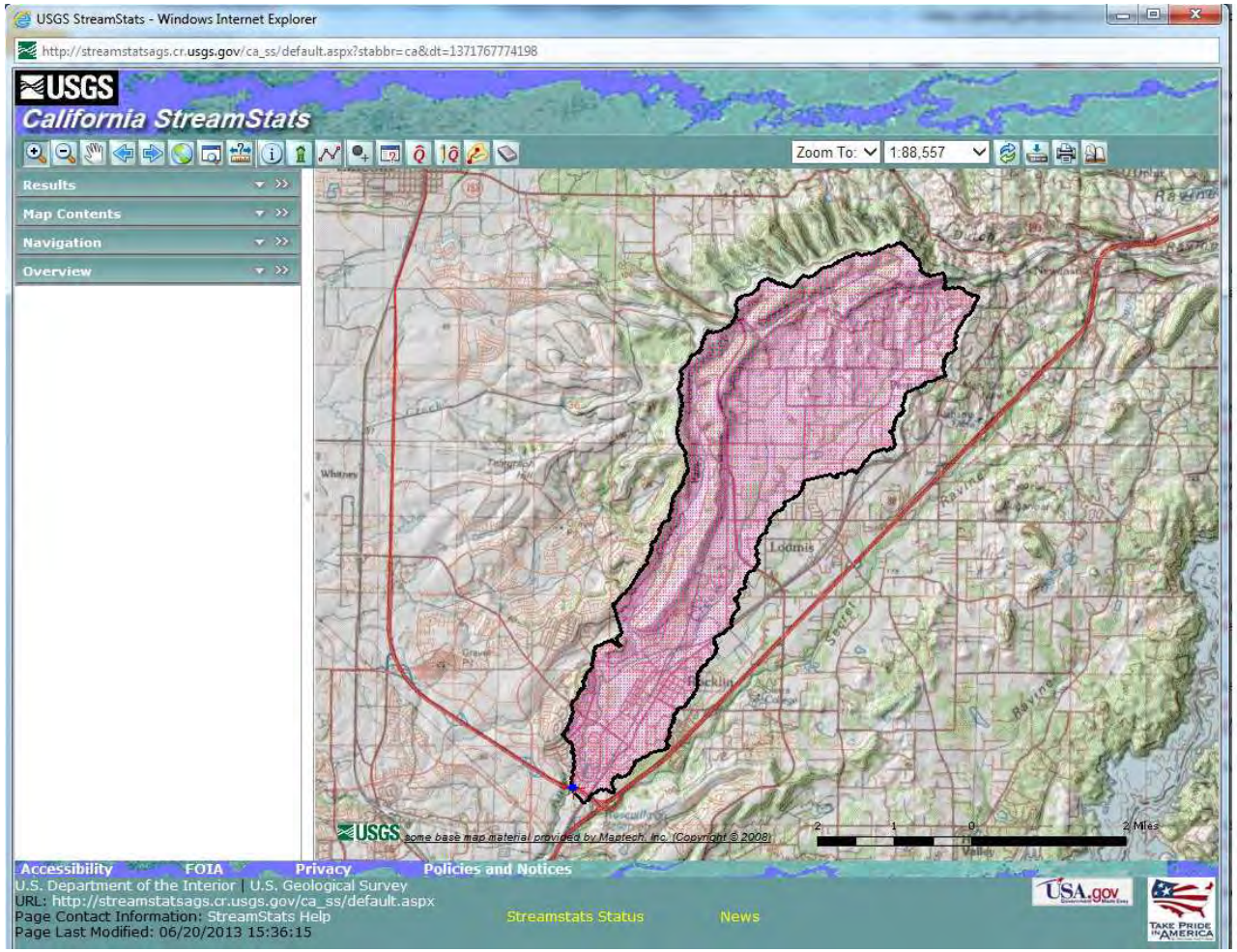
DGN FILE => $$$$$$$$$$DGNSPEC$$$$$$$$$$

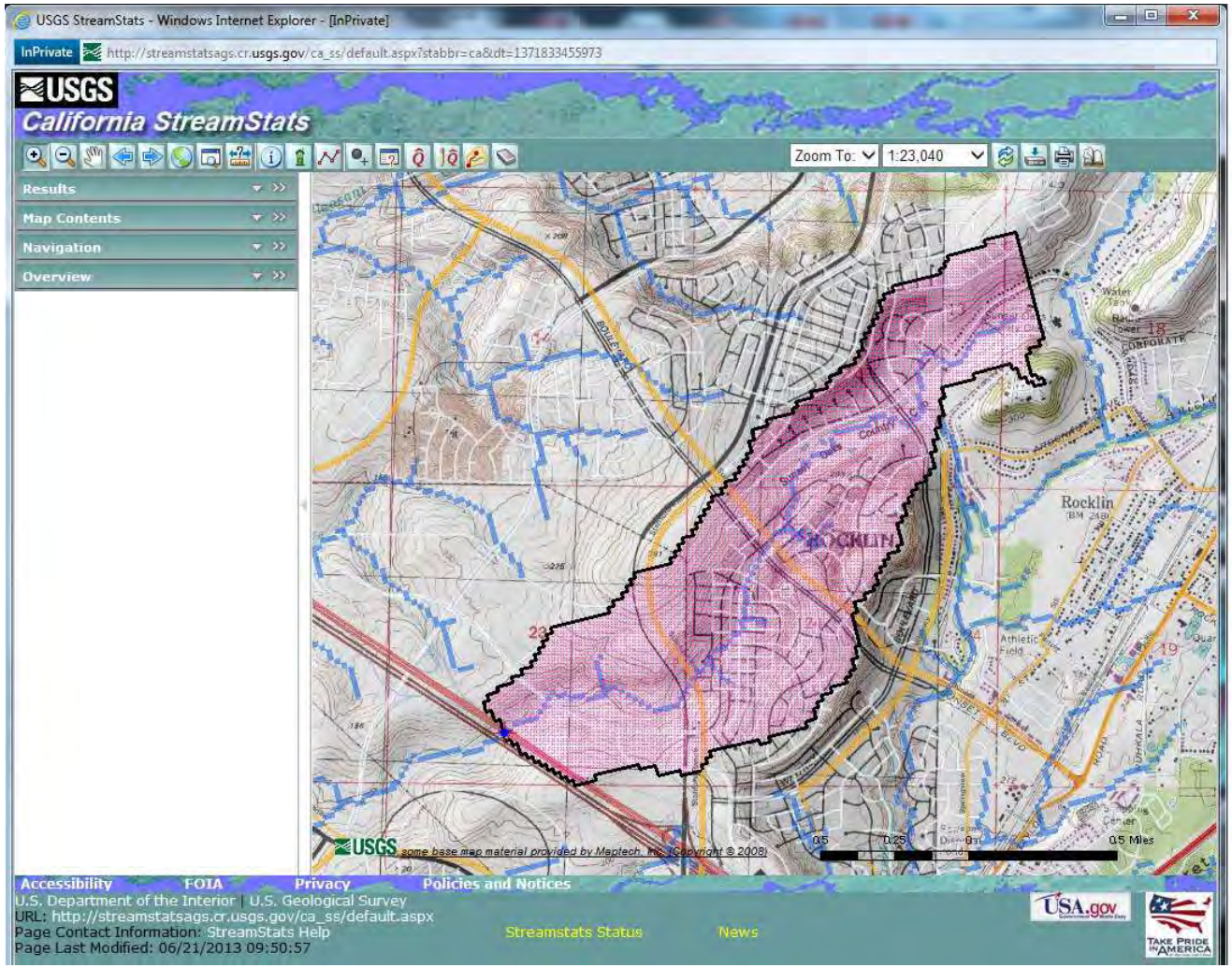
CU 03250 EA 390001

Appendix B StreamStats Watershed Delineations



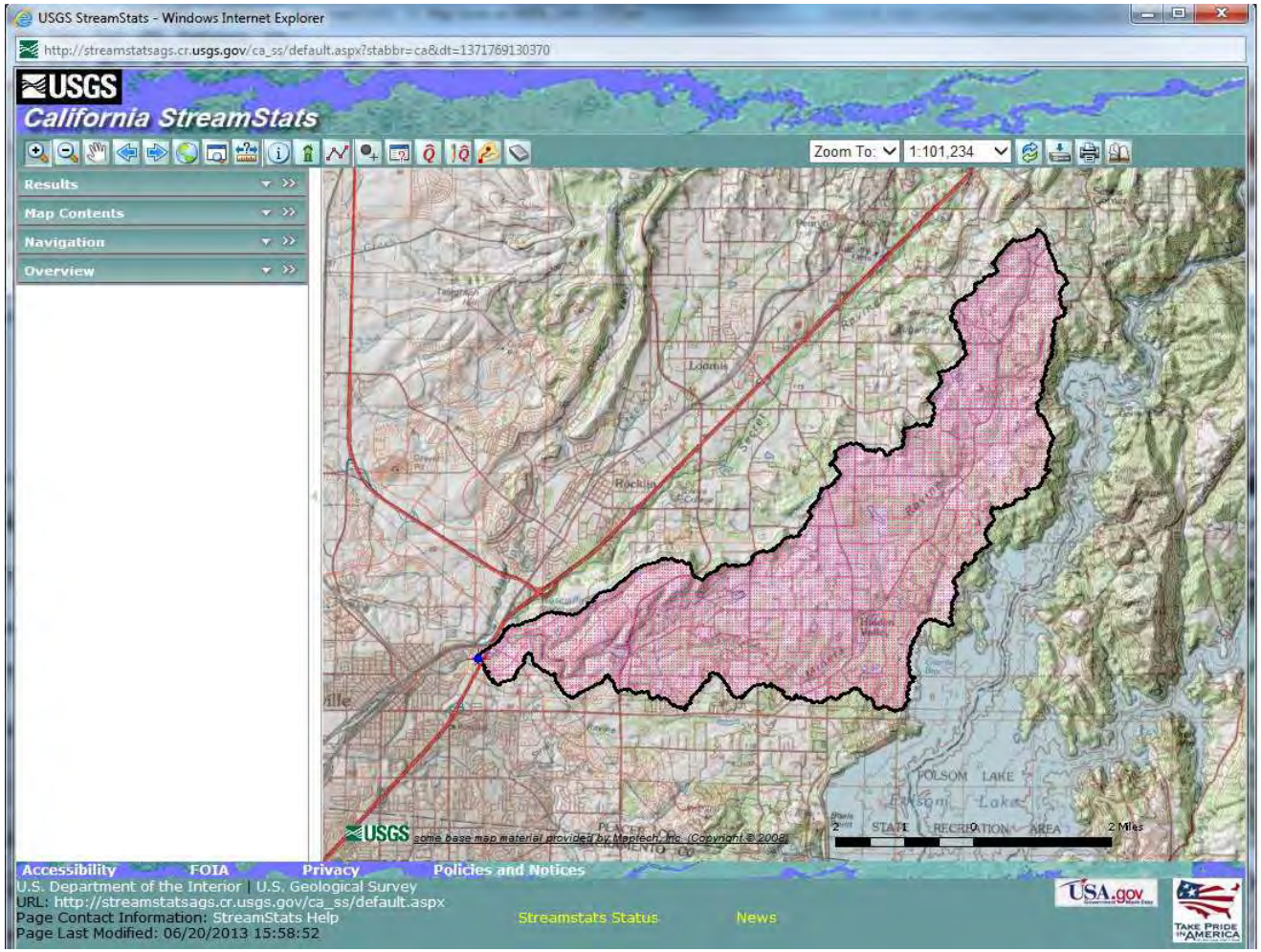
Antelope Creek Watershed

Source: StreamStats



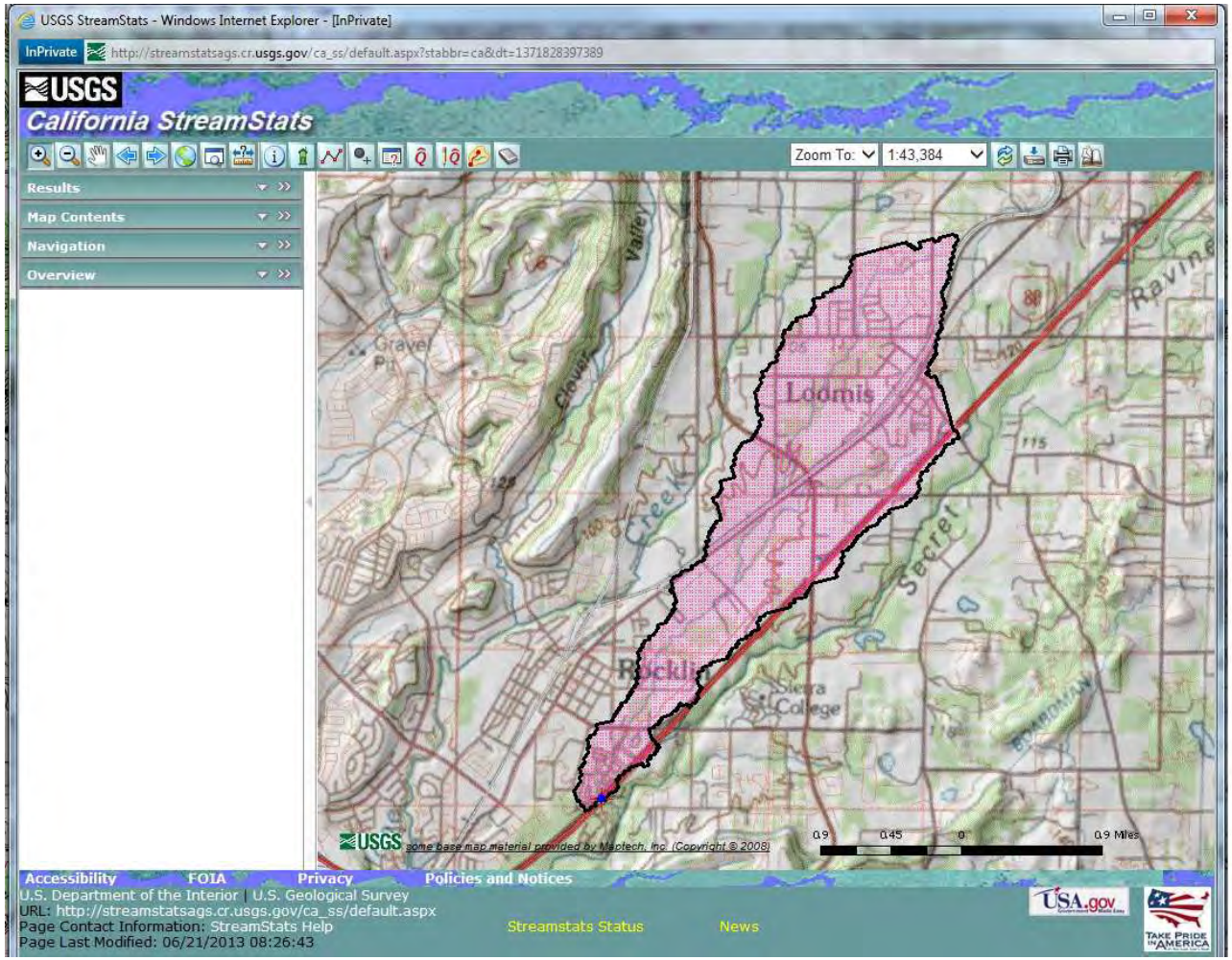
Highland Ravine Watershed

Source: StreamStats



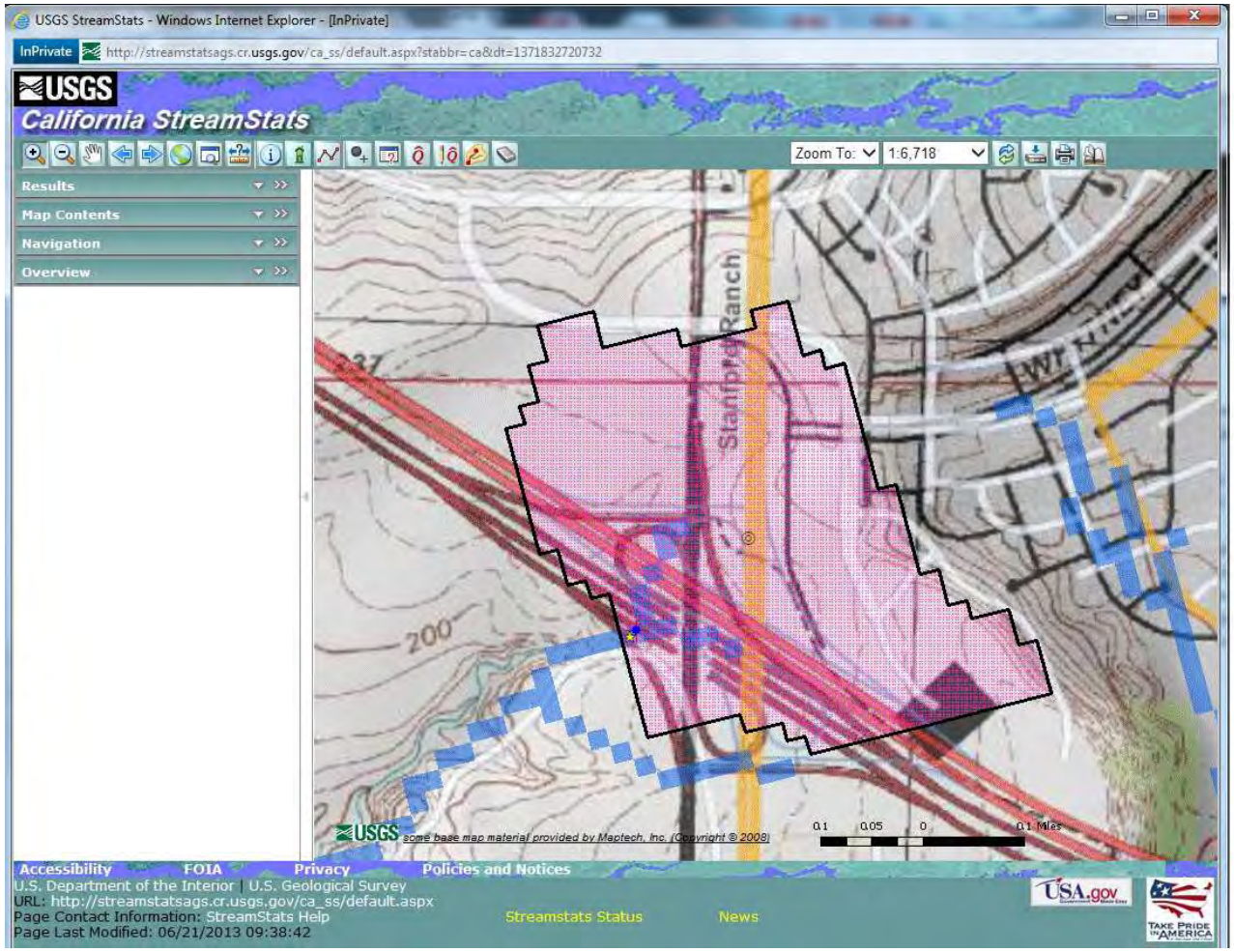
Miners Ravine Watershed

Source: StreamStats



Sucker Ravine Watershed

Source: StreamStats

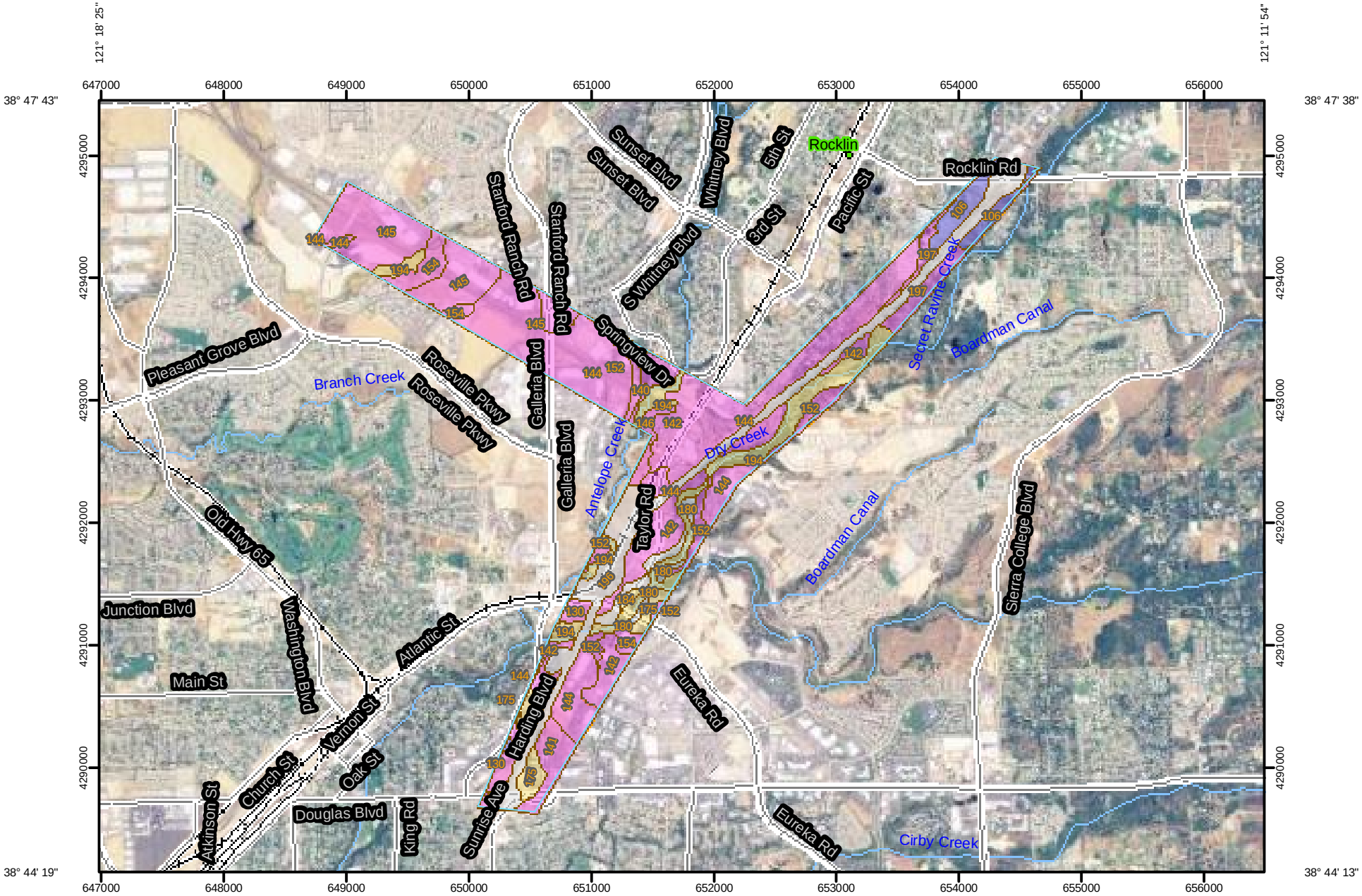


Tributary to South Branch Pleasant Grove Watershed

Source: StreamStats

Appendix C Soil Data

Appendix C.1 Hydrologic Soil Group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121° 11' 54"
38° 47' 43"
38° 47' 38"
38° 44' 19"
38° 44' 13"
121° 18' 30"
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647000
648000
649000
650000
651000
652000
653000
654000
655000
656000
4295000
4294000
4293000
4292000
4291000
4290000
Rocklin
Rocklin Rd
Sunset Blvd
Whitney Blvd
5th St
3rd St
Pacific St
Stanford Ranch Rd
S Whitney Blvd
Springview Dr
Secret Ravine Creek
Boardman Canal
Pleasant Grove Blvd
Branch Creek
Roseville Pkwy
Galleria Blvd
Antelope Creek
Dry Creek
Taylor Rd
Old Hwy 65
Junction Blvd
Washington Blvd
Atlantic St
Main St
Vernon St
Oak St
Church St
Atkinson St
Douglas Blvd
King Rd
Harding Blvd
Sunrise Ave
Eureka Rd
Sierra College Blvd
Cirby Creek
Map Scale: 1:45,100 if printed on A size (8.5" x 11") sheet.
N
Meters
0
500
1,000
2,000
3,000
Feet
0
2,500
5,000
10,000
15,000

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

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

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:45,100 if printed on A size (8.5" × 11") sheet.

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

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

Soil Survey Area: Placer County, California, Western Part
Survey Area Data: Version 5, Dec 14, 2007

Date(s) aerial images were photographed: 6/29/2005

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Placer County, California, Western Part (CA620)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
106	Andregg coarse sandy loam, 2 to 9 percent slopes	B	47.5	3.4%
130	Caperton-Andregg coarse sandy loams, 2 to 15 percent slopes	D	21.3	1.5%
140	Cometa sandy loam, 1 to 5 percent slopes	D	19.2	1.4%
141	Cometa-Fiddyment complex, 1 to 5 percent slopes	D	42.1	3.0%
142	Cometa-Ramona sandy loams, 1 to 5 percent slopes	D	273.2	19.5%
144	Exchequer very stony loam, 2 to 15 percent slopes	D	287.1	20.5%
145	Exchequer-Rock outcrop complex, 2 to 30 percent slopes	D	166.9	11.9%
146	Fiddyment loam, 1 to 8 percent slopes	D	14.4	1.0%
152	Inks cobbly loam, 2 to 30 percent slopes	D	63.0	4.5%
154	Inks-Exchequer complex, 2 to 25 percent slopes	D	40.4	2.9%
175	Ramona sandy loam, 2 to 9 percent slopes	C	36.4	2.6%
180	Rubble land		30.1	2.2%
184	Sierra sandy loam, 9 to 15 percent slopes	C	3.6	0.3%
194	Xerofluvents, frequently flooded	C	128.1	9.2%
196	Xerorthents, cut and fill areas		186.1	13.3%
197	Xerorthents, placer areas	D	40.1	2.9%
Totals for Area of Interest			**1,399.4**	**100.0%**

Description

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

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

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

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

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

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

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

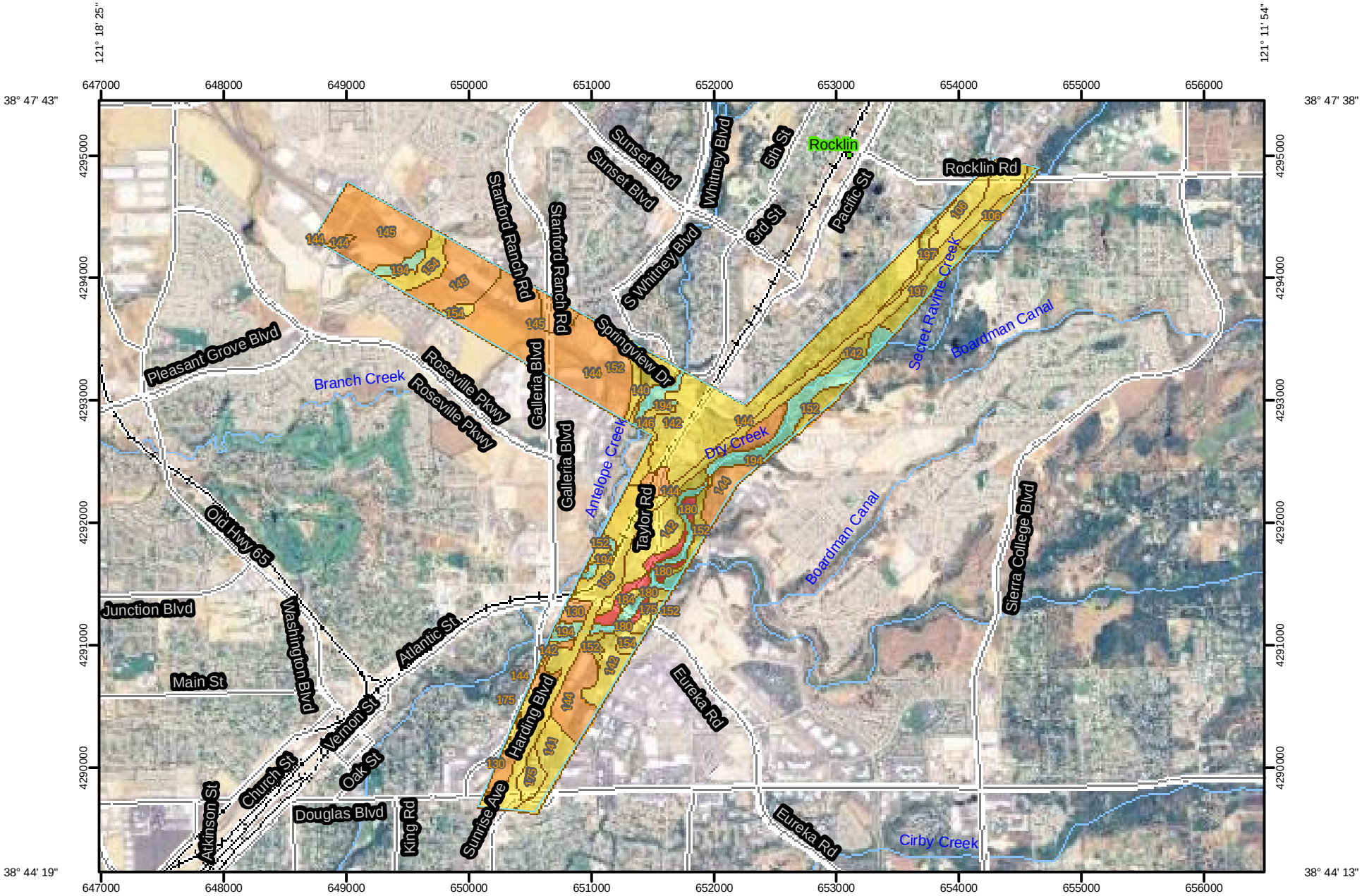
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix C.2 Soil Drainage Class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121° 11' 54"
38° 47' 43"
38° 47' 38"
38° 44' 19"
38° 44' 13"
121° 18' 30"
121° 11' 59"
647000
648000
649000
650000
651000
652000
653000
654000
655000
656000
4295000
4294000
4293000
4292000
4291000
4290000
Rocklin
Rocklin Rd
Sunset Blvd
Whitney Blvd
5th St
3rd St
Pacific St
Stanford Ranch Rd
S Whitney Blvd
Springview Dr
Secret Ravine Creek
Boardman Canal
Pleasant Grove Blvd
Roseville Pkwy
Branch Creek
Galleria Blvd
Antelope Creek
Dry Creek
Taylor Rd
Old Hwy 65
Junction Blvd
Washington Blvd
Atlantic St
Main St
Vernon St
Oak St
Church St
Atkinson St
Douglas Blvd
King Rd
Sunrise Ave
Harding Blvd
Eureka Rd
Sierra College Blvd
Cirby Creek
Map Scale: 1:45,100 if printed on A size (8.5" x 11") sheet.
N
Meters
0 500 1,000 2,000 3,000
Feet
0 2,500 5,000 10,000 15,000

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:45,100 if printed on A size (8.5" × 11") sheet.

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

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

Soil Survey Area: Placer County, California, Western Part
Survey Area Data: Version 5, Dec 14, 2007

Date(s) aerial images were photographed: 6/29/2005

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

Drainage Class

Drainage Class— Summary by Map Unit — Placer County, California, Western Part (CA620)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
106	Andregg coarse sandy loam, 2 to 9 percent slopes	Well drained	47.5	3.4%
130	Caperton-Andregg coarse sandy loams, 2 to 15 percent slopes	Somewhat excessively drained	21.3	1.5%
140	Cometa sandy loam, 1 to 5 percent slopes	Well drained	19.2	1.4%
141	Cometa-Fiddyment complex, 1 to 5 percent slopes	Well drained	42.1	3.0%
142	Cometa-Ramona sandy loams, 1 to 5 percent slopes	Well drained	273.2	19.5%
144	Exchequer very stony loam, 2 to 15 percent slopes	Somewhat excessively drained	287.1	20.5%
145	Exchequer-Rock outcrop complex, 2 to 30 percent slopes	Somewhat excessively drained	166.9	11.9%
146	Fiddyment loam, 1 to 8 percent slopes	Well drained	14.4	1.0%
152	Inks cobbly loam, 2 to 30 percent slopes	Well drained	63.0	4.5%
154	Inks-Exchequer complex, 2 to 25 percent slopes	Well drained	40.4	2.9%
175	Ramona sandy loam, 2 to 9 percent slopes	Well drained	36.4	2.6%
180	Rubble land	Excessively drained	30.1	2.2%
184	Sierra sandy loam, 9 to 15 percent slopes	Well drained	3.6	0.3%
194	Xerofluvents, frequently flooded	Somewhat poorly drained	128.1	9.2%
196	Xerorthents, cut and fill areas	Well drained	186.1	13.3%
197	Xerorthents, placer areas	Well drained	40.1	2.9%
Totals for Area of Interest			**1,399.4**	**100.0%**

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

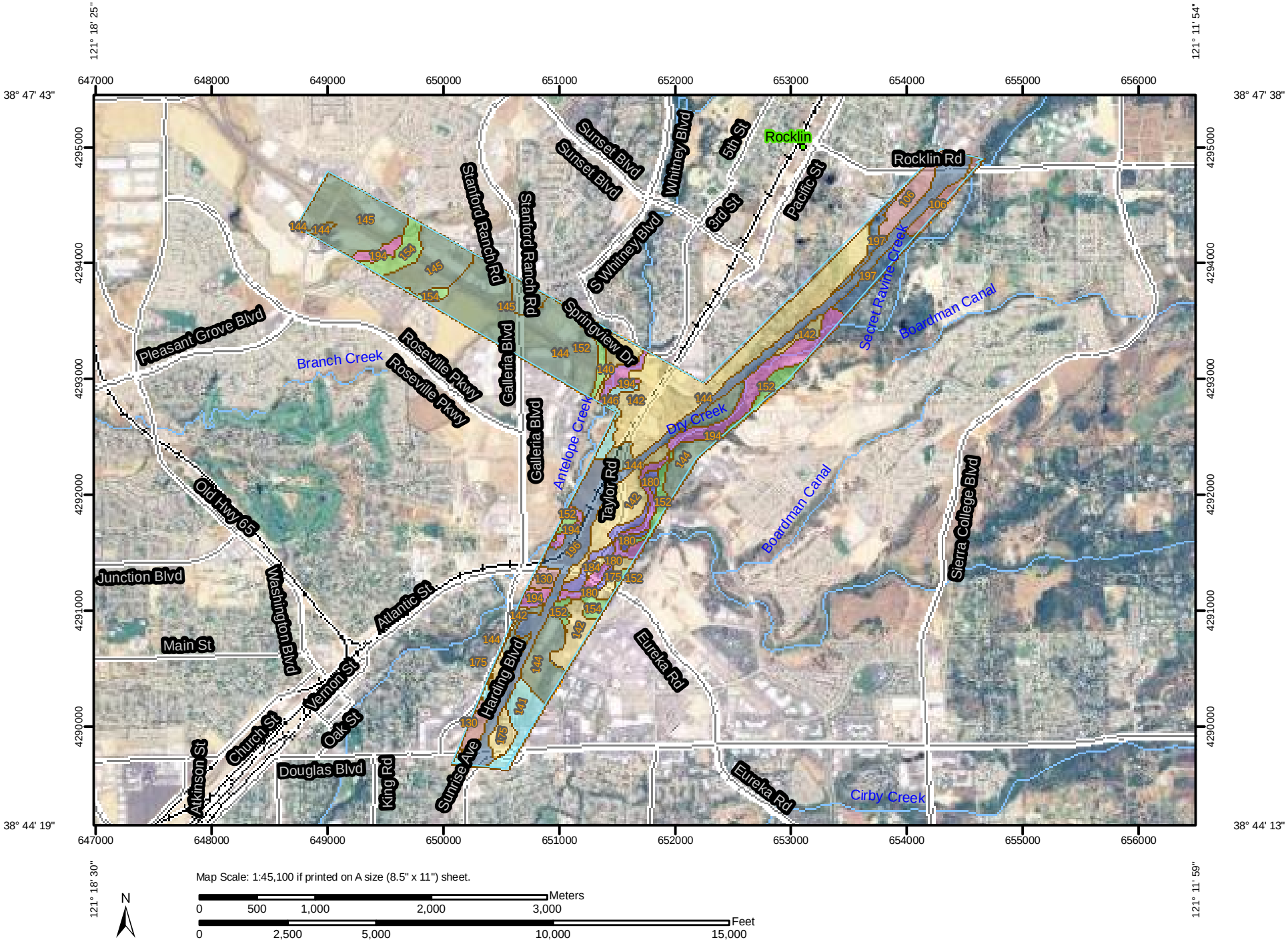
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Appendix C.3 Soil Surface Texture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121° 11' 54"
38° 47' 43"
38° 47' 38"
38° 44' 19"
38° 44' 13"
121° 18' 30"
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647000
648000
649000
650000
651000
652000
653000
654000
655000
656000
4295000
4294000
4293000
4292000
4291000
4290000
Rocklin
Rocklin Rd
Sunset Blvd
Whitney Blvd
5th St
3rd St
Pacific St
Stanford Ranch Rd
S Whitney Blvd
Springview Dr
Pleasant Grove Blvd
Roseville Pkwy
Galleria Blvd
Branch Creek
Antelope Creek
Dry Creek
Secret Ravine Creek
Boardman Canal
Taylor Rd
Old Hwy 65
Junction Blvd
Washington Blvd
Atlantic St
Main St
Vernon St
Oak St
Church St
Atkinson St
Douglas Blvd
King Rd
Harding Blvd
Sunrise Ave
Eureka Rd
Sierra College Blvd
Cirby Creek
Map Scale: 1:45,100 if printed on A size (8.5" x 11") sheet.
N
Meters
0 500 1,000 2,000 3,000
Feet
0 2,500 5,000 10,000 15,000

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- coarse sandy loam
- cobbly loam
- fragmental material
- loam
- sandy loam
- stratified loamy sand to fine sandy loam
- variable
- very stony loam
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:45,100 if printed on A size (8.5" × 11") sheet.

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

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

Soil Survey Area: Placer County, California, Western Part
Survey Area Data: Version 5, Dec 14, 2007

Date(s) aerial images were photographed: 6/29/2005

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

Surface Texture

Surface Texture— Summary by Map Unit — Placer County, California, Western Part (CA620)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
106	Andregg coarse sandy loam, 2 to 9 percent slopes	coarse sandy loam	47.5	3.4%
130	Caperton-Andregg coarse sandy loams, 2 to 15 percent slopes	coarse sandy loam	21.3	1.5%
140	Cometa sandy loam, 1 to 5 percent slopes	sandy loam	19.2	1.4%
141	Cometa-Fiddyment complex, 1 to 5 percent slopes	loam	42.1	3.0%
142	Cometa-Ramona sandy loams, 1 to 5 percent slopes	sandy loam	273.2	19.5%
144	Exchequer very stony loam, 2 to 15 percent slopes	very stony loam	287.1	20.5%
145	Exchequer-Rock outcrop complex, 2 to 30 percent slopes	very stony loam	166.9	11.9%
146	Fiddyment loam, 1 to 8 percent slopes	loam	14.4	1.0%
152	Inks cobbly loam, 2 to 30 percent slopes	cobbly loam	63.0	4.5%
154	Inks-Exchequer complex, 2 to 25 percent slopes	cobbly loam	40.4	2.9%
175	Ramona sandy loam, 2 to 9 percent slopes	sandy loam	36.4	2.6%
180	Rubble land	fragmental material	30.1	2.2%
184	Sierra sandy loam, 9 to 15 percent slopes	sandy loam	3.6	0.3%
194	Xerofluvents, frequently flooded	stratified loamy sand to fine sandy loam	128.1	9.2%
196	Xerorthents, cut and fill areas	variable	186.1	13.3%
197	Xerorthents, placer areas	variable	40.1	2.9%
Totals for Area of Interest			**1,399.4**	**100.0%**

Description

This displays the representative texture class and modifier of the surface horizon.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Layer Options: Surface Layer

Appendix D NOAA Atlas 14 Rainfall Data

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Publications
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NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

DATA DESCRIPTION

Data type: precipitation intensity **Units:** english **Time series type:** partial duration

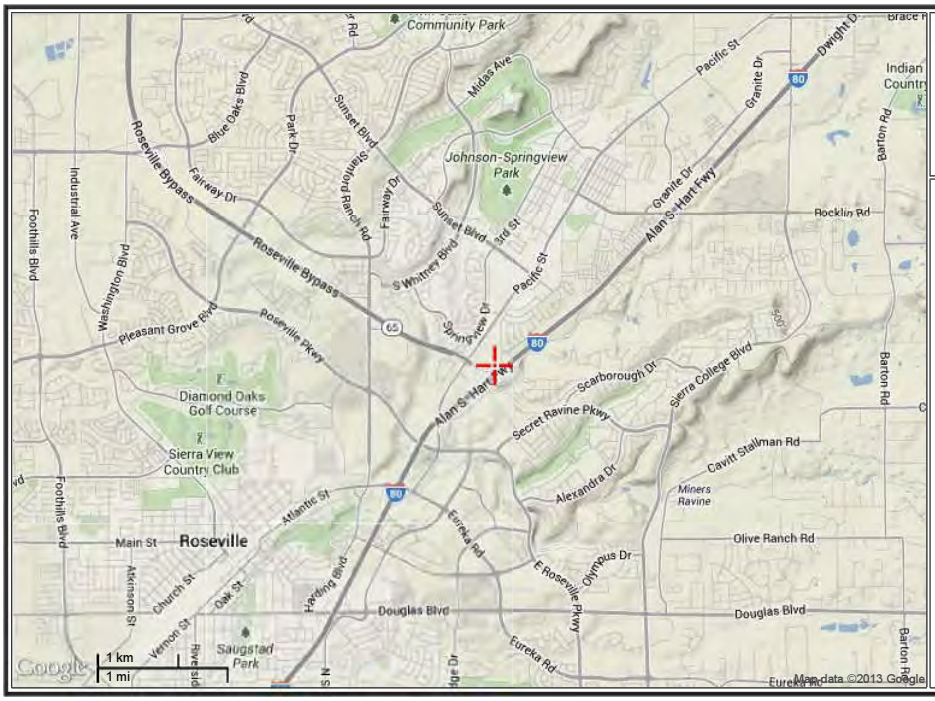
SELECT LOCATION

1. Manually:

a) Enter location (decimal degrees, use "-" for S and W): latitude: [ ] longitude: [ ] submit

b) Select station (click here for a list of stations used in frequency analysis for CA): select station

2. Use map:



a) Select location
(move crosshair or double click)
b) Click on station icon
([ ] show stations on map)

LOCATION INFORMATION:
Name: Roseville, California, US*
Latitude: 38.7716
Longitude: -121.2479
Elevation: 235 ft*

* source: Google Maps

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
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PDS-based precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.24 (1.09-1.43)	1.52 (1.33-1.75)	1.92 (1.68-2.22)	2.28 (1.97-2.66)	2.80 (2.32-3.41)	3.23 (2.60-4.04)	3.70 (2.89-4.78)	4.21 (3.18-5.64)	4.98 (3.58-7.02)	5.63 (3.86-8.27)
10-min	0.888 (0.780-1.02)	1.09 (0.954-1.25)	1.38 (1.21-1.60)	1.63 (1.41-1.91)	2.00 (1.66-2.44)	2.31 (1.87-2.90)	2.65 (2.07-3.42)	3.02 (2.28-4.04)	3.57 (2.56-5.03)	4.03 (2.77-5.92)
15-min	0.716 (0.628-0.824)	0.880 (0.768-1.01)	1.11 (0.972-1.28)	1.32 (1.14-1.54)	1.62 (1.34-1.97)	1.86 (1.50-2.34)	2.14 (1.67-2.76)	2.44 (1.84-3.26)	2.88 (2.06-4.05)	3.25 (2.24-4.78)
30-min	0.494 (0.432-0.568)	0.606 (0.532-0.698)	0.766 (0.670-0.886)	0.906 (0.784-1.06)	1.11 (0.922-1.36)	1.29 (1.04-1.61)	1.47 (1.15-1.90)	1.68 (1.27-2.25)	1.99 (1.42-2.80)	2.24 (1.54-3.29)
60-min	0.338 (0.297-0.389)	0.416 (0.364-0.479)	0.526 (0.459-0.608)	0.622 (0.537-0.727)	0.764 (0.632-0.931)	0.882 (0.711-1.11)	1.01 (0.791-1.31)	1.15 (0.871-1.54)	1.36 (0.977-1.92)	1.54 (1.06-2.26)
2-hr	0.246 (0.216-0.284)	0.297 (0.260-0.342)	0.370 (0.323-0.428)	0.434 (0.375-0.507)	0.528 (0.438-0.644)	0.608 (0.490-0.761)	0.694 (0.543-0.896)	0.790 (0.596-1.06)	0.931 (0.668-1.31)	1.05 (0.722-1.54)
3-hr	0.206 (0.181-0.237)	0.247 (0.216-0.285)	0.305 (0.267-0.353)	0.357 (0.308-0.417)	0.433 (0.358-0.527)	0.496 (0.400-0.621)	0.565 (0.442-0.730)	0.641 (0.485-0.858)	0.754 (0.541-1.06)	0.849 (0.584-1.25)
6-hr	0.152 (0.133-0.175)	0.181 (0.158-0.208)	0.222 (0.194-0.257)	0.258 (0.223-0.301)	0.310 (0.257-0.378)	0.353 (0.285-0.443)	0.400 (0.313-0.517)	0.452 (0.342-0.605)	0.528 (0.379-0.743)	0.591 (0.406-0.868)
12-hr	0.107 (0.094-0.123)	0.128 (0.112-0.147)	0.156 (0.137-0.181)	0.181 (0.157-0.212)	0.217 (0.180-0.265)	0.246 (0.198-0.308)	0.277 (0.217-0.358)	0.311 (0.235-0.416)	0.359 (0.257-0.505)	0.399 (0.274-0.585)
24-hr	0.076 (0.069-0.086)	0.092 (0.083-0.105)	0.114 (0.103-0.130)	0.133 (0.118-0.152)	0.158 (0.136-0.187)	0.179 (0.151-0.216)	0.200 (0.165-0.248)	0.223 (0.178-0.285)	0.255 (0.195-0.339)	0.280 (0.207-0.387)
2-day	0.050 (0.045-0.057)	0.062 (0.056-0.071)	0.078 (0.071-0.089)	0.091 (0.082-0.105)	0.109 (0.094-0.130)	0.123 (0.104-0.149)	0.137 (0.113-0.170)	0.152 (0.121-0.194)	0.172 (0.132-0.229)	0.187 (0.139-0.258)

3-day	**0.039** (0.036–0.045)	**0.050** (0.045–0.056)	**0.063** (0.057–0.072)	**0.074** (0.066–0.085)	**0.089** (0.076–0.105)	**0.100** (0.084–0.121)	**0.111** (0.091–0.138)	**0.122** (0.098–0.156)	**0.138** (0.105–0.183)	**0.149** (0.110–0.206)
4-day	**0.033** (0.030–0.037)	**0.042** (0.038–0.048)	**0.054** (0.048–0.061)	**0.063** (0.056–0.072)	**0.075** (0.065–0.089)	**0.085** (0.072–0.103)	**0.094** (0.077–0.117)	**0.103** (0.083–0.132)	**0.116** (0.089–0.154)	**0.125** (0.093–0.173)
7-day	**0.023** (0.021–0.026)	**0.030** (0.027–0.034)	**0.039** (0.035–0.044)	**0.045** (0.040–0.052)	**0.054** (0.046–0.064)	**0.060** (0.051–0.073)	**0.067** (0.055–0.083)	**0.073** (0.058–0.093)	**0.081** (0.062–0.107)	**0.086** (0.064–0.119)
10-day	**0.018** (0.017–0.021)	**0.024** (0.022–0.027)	**0.031** (0.028–0.035)	**0.036** (0.032–0.042)	**0.043** (0.037–0.051)	**0.048** (0.041–0.058)	**0.053** (0.043–0.066)	**0.058** (0.046–0.073)	**0.064** (0.049–0.085)	**0.068** (0.050–0.094)
20-day	**0.012** (0.011–0.014)	**0.016** (0.014–0.018)	**0.020** (0.018–0.023)	**0.024** (0.021–0.027)	**0.028** (0.024–0.033)	**0.031** (0.026–0.038)	**0.034** (0.028–0.043)	**0.037** (0.030–0.048)	**0.041** (0.031–0.055)	**0.044** (0.032–0.060)
30-day	**0.010** (0.009–0.011)	**0.013** (0.011–0.014)	**0.016** (0.015–0.018)	**0.019** (0.017–0.022)	**0.022** (0.019–0.026)	**0.025** (0.021–0.030)	**0.027** (0.022–0.034)	**0.029** (0.023–0.037)	**0.032** (0.025–0.043)	**0.034** (0.025–0.047)
45-day	**0.008** (0.007–0.009)	**0.010** (0.009–0.012)	**0.013** (0.012–0.015)	**0.015** (0.013–0.017)	**0.018** (0.015–0.021)	**0.019** (0.016–0.024)	**0.021** (0.017–0.026)	**0.023** (0.018–0.029)	**0.025** (0.019–0.033)	**0.027** (0.020–0.037)
60-day	**0.007** (0.007–0.008)	**0.009** (0.008–0.010)	**0.011** (0.010–0.013)	**0.013** (0.012–0.015)	**0.015** (0.013–0.018)	**0.017** (0.014–0.020)	**0.018** (0.015–0.023)	**0.020** (0.016–0.025)	**0.022** (0.017–0.029)	**0.023** (0.017–0.032)

[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.

Estimates from the table in csv format: precipitation frequency estimates Submit

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Page last modified: April 23, 2013

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Record Precipitation

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NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

DATA DESCRIPTION

Data type: precipitation depth Units: english Time series type: partial duration

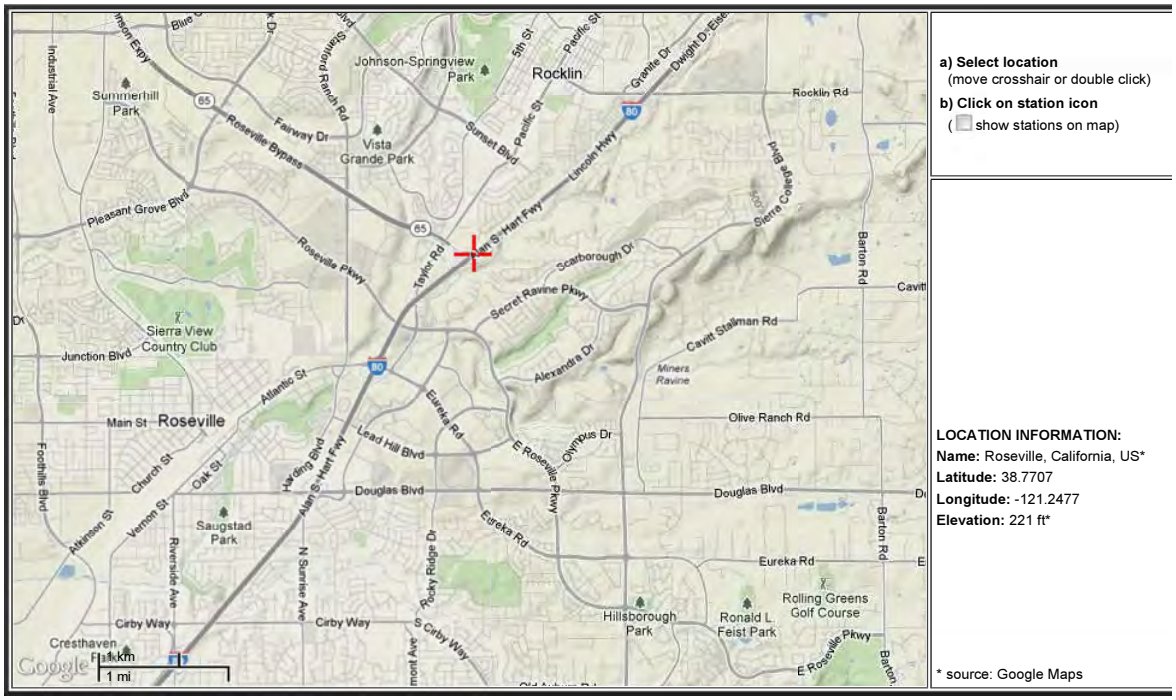
SELECT LOCATION

1. Manually:

a) Enter location (decimal degrees, use "-" for S and W): latitude: longitude: submit

b) Select station (click here for a list of stations used in frequency analysis for CA): select station

2. Use map:



a) Select location
(move crosshair or double click)
b) Click on station icon
(show stations on map)

LOCATION INFORMATION:
Name: Roseville, California, US*
Latitude: 38.7707
Longitude: -121.2477
Elevation: 221 ft*

* source: Google Maps

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
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PDS-based 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	0.104 (0.091–0.120)	0.128 (0.112–0.147)	0.161 (0.140–0.187)	0.191 (0.164–0.223)	0.234 (0.194–0.286)	0.271 (0.218–0.340)	0.311 (0.243–0.402)	0.356 (0.269–0.476)	0.422 (0.303–0.593)	0.478 (0.329–0.701)
10-min	0.149 (0.131–0.172)	0.183 (0.160–0.211)	0.231 (0.201–0.268)	0.273 (0.236–0.320)	0.336 (0.278–0.410)	0.388 (0.313–0.487)	0.446 (0.349–0.576)	0.510 (0.385–0.682)	0.604 (0.434–0.850)	0.685 (0.471–1.00)
15-min	0.181 (0.158–0.208)	0.221 (0.194–0.256)	0.279 (0.243–0.324)	0.330 (0.285–0.387)	0.406 (0.336–0.496)	0.470 (0.379–0.589)	0.539 (0.422–0.697)	0.616 (0.466–0.824)	0.731 (0.525–1.03)	0.828 (0.570–1.21)
30-min	0.249 (0.218–0.287)	0.305 (0.267–0.353)	0.385 (0.336–0.447)	0.456 (0.393–0.534)	0.561 (0.464–0.685)	0.648 (0.522–0.813)	0.744 (0.582–0.961)	0.851 (0.643–1.14)	1.01 (0.724–1.42)	1.14 (0.787–1.68)
60-min	0.342 (0.299–0.394)	0.419 (0.366–0.484)	0.529 (0.461–0.613)	0.626 (0.540–0.733)	0.769 (0.636–0.939)	0.889 (0.717–1.12)	1.02 (0.798–1.32)	1.17 (0.882–1.56)	1.38 (0.994–1.95)	1.57 (1.08–2.30)
2-hr	0.498 (0.436–0.574)	0.600 (0.524–0.693)	0.745 (0.649–0.863)	0.873 (0.753–1.02)	1.06 (0.879–1.30)	1.22 (0.985–1.53)	1.40 (1.09–1.80)	1.59 (1.20–2.13)	1.88 (1.35–2.64)	2.12 (1.46–3.11)
3-hr	0.626 (0.548–0.722)	0.749 (0.655–0.865)	0.924 (0.805–1.07)	1.08 (0.930–1.26)	1.31 (1.08–1.59)	1.50 (1.21–1.88)	1.70 (1.33–2.20)	1.94 (1.46–2.59)	2.28 (1.63–3.20)	2.56 (1.77–3.76)
6-hr	0.917 (0.803–1.06)	1.09 (0.954–1.26)	1.34 (1.17–1.55)	1.55 (1.34–1.82)	1.87 (1.54–2.28)	2.13 (1.71–2.66)	2.41 (1.88–3.11)	2.72 (2.05–3.63)	3.17 (2.28–4.46)	3.55 (2.44–5.20)
12-hr	1.30 (1.13–1.49)	1.55 (1.35–1.79)	1.90 (1.66–2.20)	2.20 (1.90–2.58)	2.64 (2.18–3.22)	2.99 (2.41–3.75)	3.37 (2.63–4.35)	3.77 (2.85–5.05)	4.36 (3.13–6.14)	4.84 (3.34–7.10)
24-hr	1.84 (1.66–2.08)	2.23 (2.01–2.53)	2.76 (2.48–3.14)	3.21 (2.86–3.67)	3.84 (3.31–4.54)	4.34 (3.66–5.24)	4.86 (4.00–6.03)	5.42 (4.33–6.91)	6.20 (4.75–8.25)	6.83 (5.05–9.41)
2-day	2.43	3.01	3.78	4.41	5.28	5.95	6.63	7.35	8.32	9.09

	(2.19–2.74)	(2.71–3.41)	(3.40–4.29)	(3.93–5.05)	(4.55–6.25)	(5.02–7.19)	(5.46–8.23)	(5.88–9.38)	(6.38–11.1)	(6.73–12.5)
3-day	**2.85** (2.57–3.22)	**3.60** (3.24–4.07)	**4.57** (4.10–5.18)	**5.35** (4.77–6.12)	**6.40** (5.52–7.58)	**7.20** (6.08–8.72)	**8.02** (6.60–9.94)	**8.84** (7.07–11.3)	**9.96** (7.64–13.3)	**10.8** (8.01–14.9)
4-day	**3.17** (2.86–3.58)	**4.04** (3.64–4.57)	**5.16** (4.64–5.86)	**6.05** (5.40–6.93)	**7.24** (6.24–8.58)	**8.14** (6.87–9.84)	**9.03** (7.43–11.2)	**9.94** (7.95–12.7)	**11.1** (8.54–14.8)	**12.1** (8.93–16.6)
7-day	**3.89** (3.51–4.40)	**5.03** (4.54–5.69)	**6.46** (5.81–7.33)	**7.58** (6.76–8.67)	**9.03** (7.78–10.7)	**10.1** (8.52–12.2)	**11.1** (9.17–13.8)	**12.2** (9.74–15.5)	**13.5** (10.4–18.0)	**14.5** (10.8–20.0)
10-day	**4.42** (3.99–5.00)	**5.75** (5.18–6.50)	**7.39** (6.64–8.39)	**8.66** (7.72–9.91)	**10.3** (8.87–12.2)	**11.5** (9.69–13.9)	**12.6** (10.4–15.7)	**13.8** (11.0–17.6)	**15.2** (11.7–20.3)	**16.3** (12.1–22.5)
20-day	**5.83** (5.26–6.59)	**7.59** (6.84–8.59)	**9.75** (8.76–11.1)	**11.4** (10.2–13.0)	**13.5** (11.6–16.0)	**15.0** (12.6–18.1)	**16.4** (13.5–20.4)	**17.8** (14.3–22.8)	**19.6** (15.0–26.1)	**20.9** (15.5–28.8)
30-day	**7.06** (6.37–7.98)	**9.13** (8.23–10.3)	**11.7** (10.5–13.2)	**13.6** (12.1–15.5)	**16.0** (13.8–19.0)	**17.8** (15.0–21.5)	**19.4** (16.0–24.1)	**21.0** (16.8–26.8)	**23.1** (17.7–30.7)	**24.5** (18.2–33.8)
45-day	**8.68** (7.83–9.81)	**11.1** (9.97–12.5)	**14.0** (12.6–15.9)	**16.2** (14.4–18.5)	**19.0** (16.4–22.5)	**21.0** (17.7–25.4)	**22.9** (18.9–28.4)	**24.8** (19.8–31.6)	**27.1** (20.8–36.1)	**28.8** (21.3–39.7)
60-day	**10.4** (9.42–11.8)	**13.1** (11.8–14.8)	**16.4** (14.7–18.6)	**18.9** (16.8–21.6)	**22.0** (19.0–26.1)	**24.3** (20.5–29.4)	**26.5** (21.8–32.8)	**28.6** (22.9–36.5)	**31.2** (23.9–41.6)	**33.1** (24.5–45.7)

[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.

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National Weather Service
Office of Hydrologic Development
1325 East West Highway
Silver Spring, MD 20910
Page Author: HDSC webmaster
Page last modified: April 23, 2013

Appendix E Conceptual Drainage Improvement Locations

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	PLA	80/65	80 1.9-6.1 65 R4.8-R7.3		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

WRECO
1243 ALPINE ROAD
SUITE 108
WALNUT CREEK, CA 94596

NOTE:

POTENTIAL DRAINAGE IMPROVEMENT LOCATIONS BASED ON PRELIMINARY AVAILABLE EXISTING INFORMATION TO DATE. OTHER DRAINAGE IMPROVEMENTS WILL BE PROPOSED IN FUTURE PHASES OF THE PROJECT.

FUTURE DRAINAGE IMPROVEMENTS MAY INCLUDE: CULVERT REPLACEMENT, CULVERT REHABILIATION, CULVERT EXTENSION, AND NEW DRAINAGE SYSTEMS.

I-80/ SR 65 INTERCHANGE PROJECT
CONCEPTUAL DRAINAGE IMPROVEMENT LOCATIONS

SCALE: 1"= 2000'

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION | DATE PLOTTED => 9/5/2014
03-27-12 | TIME PLOTTED => 12:02:19 PM