MATERIALS REPORT

US 50, Silva Valley Parkway Interchange, Phase 1

El Dorado County, California

03-ED-50
PM 1.07/R2.40
EA 03-1E2901

Prepared by:

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March 2012

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File No. 556.2
March 15, 2012

Mr. Derek Minnema
Mark Thomas & Co, Inc.
7300 Folsom Boulevard
Sacramento, CA 95826-2622

Subject: **MATERIALS REPORT**
US 50, Silva Valley Parkway Interchange, Phase 1
03-ED-50, PM 1.07/R2.40, EA 03-1E2901
El Dorado County, California

Dear Mr. Minnema:

Blackburn Consulting (BCI) is pleased to submit this Materials Report for the US 50, Silva Valley Parkway Interchange Project in El Dorado County, California. BCI prepared this report in accordance with the April 7, 2010 agreement between BCI and Mark Thomas Company (MTCo) and Amendment No. 3 for Deflection Testing. We submitted a draft Materials Report in October 2010. This report includes modifications in response to comments on the draft report and additional deflection testing results for incorporation of existing project shoulder pavement. Draft report comment and our response are attached in Appendix C.

INTRODUCTION

Purpose

Blackburn Consulting (BCI) prepared this Materials Report for the proposed, Phase 1, Silva Valley Parkway Interchange improvements at US 50 in El Dorado County, California. This report is for use by MTCo and the design team in Phase 1 roadway design and as preliminary information for Phase 2 components. Do not use or rely upon this report for different locations or improvements without the written consent of BCI.

Scope of Services

To prepare this and related project reports, BCI:

- Discussed the project with MTCo
- Reviewed the Geometric Approval Drawings, preliminary Drainage Plan, and 65% submittal layout provided by MTCo

- Reviewed published maps and literature related to site soil, rock, and geologic conditions
- Prepared a Geotechnical Design Report and Foundation Reports for the Silva Valley Parkway Interchange Project
- Drilled, logged, and sampled 70 exploratory test borings and pits in the project area and material borrow area
- Performed laboratory tests on samples obtained from the test borings and test pits
- Performed engineering analysis
- Completed deflection testing at shoulder areas

The interchange project consists of two design/construction phases, as described further below. This report addresses the Phase 1 improvements and provides preliminary information for Phase 2 design.

Below we present a Project Description, General Soil and Rock Conditions, Laboratory Test Results, Structural Pavement Recommendations, Culvert Corrosion Assessment, Borrow Material Evaluation and Limitations.

PROJECT DESCRIPTION

General Description

El Dorado County proposes to construct a new Silva Valley Parkway Interchange on US 50 between El Dorado Hills Blvd/Latrobe Road Interchange and Bass Lake Road Interchange near the existing Clarksville undercrossing. We include a Site Vicinity Map as Figure 1.

According to plans and documents provided by MTCo, the overall project (Phase 1 and 2) includes the following roadway improvements:

- Partial cloverleaf interchange with loop on-ramps in the northeast and southwest quadrants and diagonal on- and off-ramps in each direction of travel on the freeway
- Continuous auxiliary lanes between El Dorado Hills Boulevard and the Silva Valley Parkway Interchange connecting the on-ramps with off-ramps
- Auxiliary lane for the eastbound diagonal on-ramp
- Auxiliary lane for the westbound diagonal off-ramp
- An overcrossing with four lanes for through traffic on the new Silva Valley Parkway in addition to deceleration lanes for the loop on-ramps and turn pockets at the intersections
- Embankment fills and culverts (new and extended) for the auxiliary lanes, ramps, and new roadway
- Retaining walls at several locations for ramp and auxiliary lane construction
- Bike and pedestrian access beneath the freeway using the existing Silva Valley Parkway
- Tong Road, north of the freeway, will be relocated to the north to provide access to the parcels in the northeast quadrant

The project will be constructed in two phases. Phase 1 will include the majority of interchange improvements with the exception of the eastbound diagonal on-ramp and the westbound loop on-ramp (and associated retaining structures). These ramps will be constructed in Phase 2, which is anticipated to begin construction sometime after 2020. BCI prepared separate Foundation Reports for the project bridges and a Geotechnical Design Report that discusses site conditions, grading, and retaining walls for the project.

Figures 2A through 2K (attached) show the general interchange improvements, stationing and reference lines, and BCI's exploration/test locations. Following is a brief description of the main Phase 1 components.

US 50 Auxiliary Lanes (Line "A2, A3L, and A3R")

The auxiliary lane improvements will extend along the mainline A2 Line (eastbound and westbound) from approximately Station 68+00 to 92+00 (MTCo, 2010 Layout), along the A3L Line from approximately Station 120+00 to 138+00, and along the A3R Line from approximately Station 112+00 to 128+00. In general, east and westbound auxiliary lane improvements will include a 12-ft wide lane, a 10-ft wide paved shoulder.

Both cut and embankment fill are necessary for auxiliary lane widening. Cuts will be primarily into existing cut slopes that expose hard rock and will have a final slope gradient of 1:1 (horizontal to vertical) or flatter. New embankment fill will be up to 15 feet in depth and will have a final slope gradient of 2:1 or flatter. Native materials derived from the project cuts, local borrow, and imported borrow will be used for construction of embankment fills. The project will require a significant quantity of import fill.

Silva Valley Parkway (Line "SVP")

The Silva Valley Parkway realignment will include a new overcrossing at US 50 that will have a total width of approximately105-ft with four lanes for through traffic, deceleration lanes for the on-ramps, and turn pockets at the intersections. Beyond the overcrossing, this will taper down to four through lanes with 4 to10–ft wide paved shoulders and a 16-ft wide median until the transition to existing roadway. Most of Silva Valley Parkway will require embankment fill with some excavation required near the intersection with realigned Tong Road (on the north side of US 50). Fill slopes will have a final gradient of 2:1 (horizontal to vertical) or flatter, and cuts into rock will be at a gradient of 1:1 or flatter.

Ramp Alignments (Lines "W1, W3, E1 and E2")

The new on/off ramps will vary in width from approximately 24 to 36-ft with an 8-ft and 4-ft wide paved shoulder and 3-ft wide unpaved shoulders. Ramps will generally require embankment fill with depths up to 15-ft. The westbound off-ramp ("W1") and eastbound loop on-ramp ("E2") will also require some excavation into the underlying rock. Fill slopes will have final gradient of 2:1 (horizontal to vertical) or flatter, and cuts into rock will be at a gradient of 1.5:1 or flatter.

Old Silva Valley Parkway Tie-in (Line "C1")

Old Silva Valley Parkway lies outside of Caltrans right-of-way (ROW) and will tie-in to the new Silva Valley Parkway with two through lanes on the north and south ends. Embankment fill will be required for the tie-in with depth of fill on the order of 3 to 5 feet. Fill slopes will be at a gradient of 2:1 (horizontal to vertical) or flatter.

Old White Rock Road Tie-in (Line "C2")

Old White Rock Road lies outside of Caltrans ROW and will tie-in to the new White Rock Road with two through lanes and a right turn pocket. The existing White Rock Road at the tie-in is a narrow, concrete roadway. Excavation into the underlying rock, up to 7 feet deep, will be required for this portion of roadway. Cut slopes will be at a gradient of 1.5:1 (horizontal to vertical) or flatter.

Tong Road (Line "TR")

Tong Road lies outside of Caltrans ROW and will be realigned to the north of its current location. The new road will consist of two through lanes and shoulders (approximately 2 to 4-ft wide). Plans show a concrete arch culvert at the crossing of Carson Creek. The road will require several feet of embankment fill for most of the length except at the west end where excavation into the underlying rock, up to 10-ft deep, will be required. Fill slopes will be at a gradient of 2:1 (horizontal to vertical) or flatter and cut slopes at a gradient of 1.5:1 or flatter.

Culverts

The project includes 13 new culverts (3 culvert extensions). We expect each culvert to be either corrugated steel pipe (CSP), aluminum or aluminized-steel pipe, or reinforced concrete pipe, box, or arch. We expect culverts will be constructed within shallow native soils and weathered rock and/or within engineered embankment fill. We list the culvert locations in Table 1 below.

Table 1
Planned Culvert Locations

General Location	Culvert Station Location*	Culvert Size/Type
Eastbound Diagonal Off-Ramp	E1 Line, 93+40	6ft x 7ft Concrete Box (extension)
Eastbound Loop On-Ramp	E2 Line, 102+00	18-inch APC
Westbound Diagonal On-Ramp	W3 Line, 100+30	24-inch APC
Westbound Mainline	A3L Line, 122+80	24-inch CSP (extension)
White Rock Road (realign)	C2 Line, 18+94	18-inch APC
White Rock Road	SVP Line, 141+10	24-inch APC
White Rock Road	SVP Line, 145+40	Quadruple 6ft x 6ft Concrete box
White Rock Road	SVP Line, 148+80	24-inch APC
Silva Valley Parkway	SVP Line, 165+00	24-inch APC
Silva Valley Parkway	SVP Line, 176+80	36-inch APC
Silva Valley Parkway	SVP Line, 181+35	48-inch CSP
Tong Road	TR Line, 14+50	18-inch APC
Tong Road	TR Line, 11+50	Concrete Arch

* Approximate Line and Station from preliminary plans by MTCo
APC = Alternative Pipe Culvert, CSP = Corrugated Steel Pipe

Existing Facilities

US 50 crosses through El Dorado County from west to east and is a divided freeway, constructed in 1965 and widened in 2000/02. During our investigation (2010), HOV lanes were under construction in the median in both directions. When complete, there will be four lanes in the eastbound direction (2 mixed-flow, 1 HOV lane, and 1 truck-climbing lane) and three lanes in the westbound direction (2 mixed-flow and 1 HOV lane) through the project area.

Two existing interchanges bound the project area, El Dorado Hills Boulevard/Latrobe Road to the west at PM 0.86, and Bass Lake Road to the east at PM R3.23. The proposed Silva Valley Interchange is located at PM R1.79.

Existing US 50 through the project site has standard 12-ft wide lanes, 10-ft outside shoulders and a minimum of 10-ft wide inside shoulders (with HOV project completed, the shoulders range from 10 to 25-ft). There is an eastbound truck-climbing lane on “Bass Lake Grade” through the project site to accommodate slow trucks on the mainline grade east of the interchange. This truck-climbing lane terminates at the top of the grade just before the Bass Lake Road Interchange.

The existing Silva Valley Parkway (old) is a north-south arterial that serves the El Dorado Hills Community. Silva Valley Parkway currently crosses under US 50 and is a 2-lane facility.

GENERAL SOIL AND ROCK CONDITIONS

The project site is located within the foothills of the Sierra Nevada Geomorphic Province and underlain by Mesozoic-age metavolcanic rock. Northwest trending and steeply dipping foliation and faulting dominate rock structure in this portion of the foothills.

In general, hard rock occurs at relatively shallow depths throughout the project area. Our subsurface data shows that native, subsurface materials encountered at this site generally consist of 3 to 6 feet of clayey silt/sand and silty sand (residual soils) with gravel underlain by moderately hard to hard metavolcanic rock. Rock structure in the area has a predominant foliation (and fracture) with a typical strike of north, 35º to 45º west, and a steep dip of 70º-90º to the north.

Embankment fill is present along portions of US 50 but most of the highway is within cut (into native soils/rock) or is at/near original grade. Within the project area, the most significant fill depths occur at the crossing of Carson Creek near A3L and A3R Line Station 110+50, the existing Silva Valley Parkway (Clarksville, Br. No. 25-0072) undercrossing near A2 Line 98+00, and at the double box culvert for the drainage (Bucks Ravine Creek) near A2 Line Station 93+00.

We did not observe groundwater seepage at the surface in the project area, out of existing cut slopes, or within our test pits or augered borings, with the exception of perched groundwater at a depth of 8 to 9 feet located above weathered rock at Test Pits T-10-147 & 153 (near the drainage in the northwest quadrant). In general, we expect that shallow groundwater and seepage can occur at isolated locations near the soil/rock interface (typical depths of approximately 3 to 6 feet below existing, natural grade), particularly during the winter months or extended periods of rainfall.

Locally, seepage can also occur along zones of fractured or less weathered rock and daylight at the ground surface or within excavations.

LABORATORY TEST RESULTS

R-Value

We completed nine R-Value tests on soil and weathered rock samples, obtained from borings and test pits completed during our field investigations for the project. Figures 2A through 2K (attached) show the boring and test pit locations. The sampled materials represent anticipated pavement subgrade soils for new roadway segments.

We summarize the R-Value test results in Table 2, below, and include complete laboratory test reports in Appendix A.

Table 2
R-Value Test Results (CTM 301)

Exploration ID	Sample No.	Approximate Sample Depth (feet)	USCS Soil Classification	R-value
A-10-129	D2	0.5 – 5.0	ML with sand	19
A-10-137	D1	2.25 – 5.0	ML with gravel	29
A-10-144	D1	0 – 5.0	CL with gravel	28
A-10-145	D1	0.5 – 5.0	CL with gravel	29
A-10-156	D2	0.5 – 8.0	ML	25
T-10-103	D1	0 – 2.0	GM	51
T-10-108	D1	0 – 2.5	SM with gravel	41
T-10-119	D1	0 – 2.5	SM with gravel	57
T-10-122	D1	0 – 3.5	GM	68

MTCo indicates that the area located to the north of the interchange (northeast of the new Silva Valley Parkway/Tong Road intersection) may be used for a borrow source. Additional borrow material will be required and sources are not known at this time. The sample from location T-10-122 is from the noted borrow area and consists of a mixture of weathered rock and soil (as anticipated for use in new embankment). All proposed borrow sources will need to be tested for acceptable R-value and corrosion characteristics, where applicable, prior to approval for site use. We provide a minimum R-value for import materials in the "Structural Pavement Sections" of this report.

Corrosivity

We completed 8 corrosivity tests on representative soil/rock samples from our borings and test pits, and conducted 4 field resistivity tests. We summarize the test results in Table 3, below, and include the laboratory test reports in Appendix A.

Table 3
Corrosion Test Results (CTM 417, 422, 643)

Exploration/ Test Location ID	Sample No.	Sample Depth (feet)	pH	Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
R-10-004	S2	5-6.5	7.1	1,420	17	68
R-10-005	S1	0-1.5	5.6	3,220	14	36
R-10-006	S1	0-1.5	5.3	6,970	14	0.2
A-10-136	D1	2.0-5.0	7.4	2,060	24	65
T-10-107	D1	0-1.5	5.7	5,630	15	0.4
T-10-109	D1	0-2.5	6.1	3,220	14	0.8
T-10-112	D1	0-2.0	5.8	4,290	11	<0.1
T-10-120	D1	4.0-5.0	7.6	2,250	13	8
RS1*	D1	1.0-2.0	6.2	10,724	---	---
RS2*	D1	1.0-2.0	6.3	6,128	---	---
RS3*	D1	0 – 1.0	5.3	4,979	---	---
RS4*	D1	0.5-1.5	5.4	7,277	---	---

*Field resistivity (4-pin) test location and location of soil sample obtained for pH testing

STRUCTURAL PAVEMENT SECTIONS

For pavement design purposes, we separate expected pavement subgrade conditions into four material types:

1. **Rock:** areas where excavation for pavement subgrade is expected to expose moderately weathered, moderately hard to hard, in-place rock
2. **Weathered Rock:** areas where excavation for pavement subgrade is expected to expose intensely to moderately weathered, soft to moderately hard, in-place rock
3. **Native Silty Soils:** areas where excavation for pavement subgrade is expected to expose stiff to hard, medium dense to dense, in-place silt and silty soil
4. **Embankment Fill:** areas that will be underlain by new embankment fill expected to come from on-site cuts, the borrow area on the north side of the project, and from off-site borrow locations.

Our R-Value tests resulted in values ranging from 19 (silty soil) to 68 (gravelly/rocky soil). Based on the planned improvements, our subsurface investigation, sampling and testing, and our experience with similar materials, we recommend the following R-Values for design based on the anticipated subgrade material type (as described above):

Subgrade Material Type	Design R-Value
Rock	50
Weathered Rock	40
Native Silty Soils	25
Embankment Fill (Import)	25

Embankment fill sourced from within project site or the identified borrow area is expected to consist of a mixture of soil and weathered rock resulting in a silty gravel (GM) or sandy silt (ML)/silty sand (SM) with gravel soil type, which has an R-Value of 40 or greater. Since import from an unknown source will be required, we assume an R-Value of 25 for embankment fill (to a minimum depth of 4 feet below subgrade elevation). Table 4 below lists the locations of new pavement, the expected subgrade material, and the R-Value we assign for design of new pavement.

Table 4

Subgrade Summary and R-Value For Pavement Design

Location	Approximate Station	Anticipated Finish Subgrade Material	Design R-Value
Eastbound Aux. Lane, El Dorado Hills Blvd to eastbound off-ramp	A2 Line, 70+00 to 76+00	Native silty soils overlying weathered rock	25
	A2 Line, 76+00 to 89+00	Hard rock	50
Westbound Aux. Lane, westbound on-ramp to El Dorado Hills Blvd	A2 Line, 68+00 to 85+00	Native silty soils overlying weathered rock	25
	A2 Line, 85+00 to 89+00	Hard rock	50
Eastbound Diagonal Off-Ramp	E1 Line, 0+00 to 105+50	Embankment fill	25
Eastbound Loop On-Ramp	E2 Line, 80+00 to 112+00	Embankment fill and rock	25
Eastbound Loop On-Ramp Aux. Lane and Lane Drop	A3R Line, 112+00 to 126+75	Embankment fill	25
Westbound Aux. Lane	A3L Line, 120+00 to 126+00	Native silty soils and new embankment fill	25
	A3L Line, 126+00 to 136+00	Hard rock	50
Westbound Diagonal Off-Ramp	W1 Line, 105+25 to 120+00	New and existing embankment fill	25
Westbound Diagonal On-Ramp	W3 Line, 89+00 to 106+50	New and existing embankment fill	25
Silva Valley Parkway	SVP Line, 139+10 to 178+00	New Embankment fill and minor cut to rock	25
	SVP Line, 178+00 to 186+77	Native silty soils and new embankment fill	25
Old White Rock Road and Old Silva Valley Parkway	C1 and C2 Line, 12+40 to 25+45	Weathered rock and new embankment fill	25
Tong Road	TR Line, 2+40 to 19+70	New embankment fill and minor cut to weathered rock	25

We calculated new pavement structural sections using Caltrans Flexible Pavement Design Methods (Highway Design Manual, Chapter 600) the computer program CalFP (Caltrans pavement design software, V1.1). Table 5 lists structural sections for new pavement based on several different Traffic Indices (as requested by MTCo).

Table 5
New Pavement Structural Sections

<table>
<tr><th>Location</th><th>Approximate Station</th><th>Design R-Value</th><th>Traffic Index</th><th>Dense Graded HMA (ft)</th><th>Class 2 Aggregate Baserock (ft)</th></tr>
<tr><td>Eastbound Aux. Lane, to El Dorado Hills Blvd</td><td>A2 Line, 70+00 to 76+00</td><td rowspan="3">25</td><td>12</td><td>0.60</td><td>1.70</td></tr>
<tr><td>Westbound Aux. Lane to El Dorado Hills Blvd</td><td>A2 Line, 68+00 to 85+00</td><td>13</td><td>0.65</td><td>1.85</td></tr>
<tr><td>Westbound Aux. Lane</td><td>A3L Line, 120+00 to 126+00</td><td>13.5</td><td>0.70</td><td>1.90</td></tr>
<tr><td>Eastbound Aux. Lane, to El Dorado Hills Blvd</td><td>A2 Line, 76+00 to 89+00</td><td rowspan="3">50</td><td>12</td><td>0.60</td><td>0.80</td></tr>
<tr><td>Westbound Aux. Lane to El Dorado Hills Blvd</td><td>A2 Line, 85+00 to 89+00</td><td>13</td><td>0.65</td><td>0.90</td></tr>
<tr><td>Westbound Aux. Lane</td><td>A3L Line, 126+00 to 136+00</td><td>13.5</td><td>0.70</td><td>0.90</td></tr>
<tr><td>Eastbound Diagonal Off-Ramp</td><td>E1 Line, 0+00 to 105+50</td><td rowspan="8">25</td><td rowspan="2">10</td><td rowspan="2">0.50</td><td rowspan="2">1.35</td></tr>
<tr><td>Eastbound Loop On-Ramp</td><td>E2 Line, 80+00 to 112+00</td></tr>
<tr><td>Eastbound On-Ramp Aux. Lane and Lane Drop</td><td>A3R Line, 112+00 to 126+75</td><td rowspan="2">11</td><td rowspan="2">0.55</td><td rowspan="2">1.55</td></tr>
<tr><td>Westbound Diagonal Off-Ramp</td><td>W1 Line, 105+25 to 120+00</td></tr>
<tr><td>Westbound Diagonal On-Ramp</td><td>W3 Line, 89+00 to 106+50</td><td rowspan="4">12</td><td rowspan="4">0.60</td><td rowspan="4">1.70</td></tr>
<tr><td>White Rock Rd/Silva Valley Parkway</td><td>SVP Line, 139+10 to 186+77</td></tr>
<tr><td>Old White Rock Road and Old Silva Valley Pkwy</td><td>C1 and C2 Line, 12+40 to 25+45</td></tr>
<tr><td>Tong Road</td><td>TR Line, 2+40 to 19+70</td></tr>
</table>

The project Geotechnical Design Report provides recommendations for project grading, including subgrade preparation, embankment construction, and compaction recommendations.

EXISTING SHOULDER PAVEMENT USE

Existing shoulder pavement will be within new ramp and climbing lanes at the following approximate locations:

- "A2" Line (Left, westbound): Station 69+10 to 97+10
- "A2" Line (Right, eastbound): Station 68+75 to 94+75
- "A3R" Line (eastbound): Station 103+60 to 128+25
- "A3L" Line (westbound): Station 116+60 to 137+40

To determine the adequacy of the existing shoulder pavement for mainline use and necessary removal/overlay, BCI had Associated Engineering Consultants, Inc. (AEC) complete deflection testing. AEC tested the shoulder areas, including the segments listed above, using a DYNAFLECT deflection device. AEC obtained deflection measurements at intervals of 100 feet and collected over 20 asphalt cores (to record asphalt thickness and condition). AEC's report is attached in Appendix B.

AEC found the shoulder areas they evaluated to be adequate for mainline use with no overlay requirement (considering a Traffic Index of 13.5). The existing shoulder pavement within the area evaluated is, therefore, adequate for mainline traffic use and can be incorporated into the project.

MTCo expects some cold plane and overlay of the existing shoulder to be necessary for modification (flattening) of the current shoulder slope. MTCo's design includes a grind of 0.30 feet with 0.20 to 0.30 feet of HMA overlay and 0.10 feet of Rubberized Hot Mix Asphalt (Open Graded) to tie-in to the existing pavement. Caltrans Materials (District 3, Marysville) confirmed that this is an acceptable design.

CULVERT CORROSION

For structural elements, Caltrans[1] considers a site corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at a site:

- Chloride concentration is 500 parts per million (ppm) or greater,
- Sulfate concentration is 2000 ppm or greater,
- pH is 5.5 or less.

In addition, Caltrans states that the minimum resistivity of soil and/or water indicates the relative quantity of soluble salts present in the soil or water. Soil and water need not be tested for chlorides and sulfates if the minimum resistivity is greater than 1,000 ohm-cm, because a minimum resistivity greater than 1,000 ohm-cm indicates that the chloride and sulfate contents are low (i.e., low corrosion potential).

[1] Caltrans Corrosion Guidelines, Version 1.0, Sept 2003

We completed a review of visible culverts within the project area and they appear to be in good condition. We did not observe significant corrosion of metal culverts or degradation of concrete culverts.

Based on our testing and observations, consider the site soils as generally non-corrosive. The maximum chloride and sulfate concentrations we obtained are 24 and 68 part per million (ppm), respectively. The soil pH ranged from 5.3 to 7.6 and the minimum resistivity ranged from 1,420 to 10,724 ohm-cm (most greater than 2,000 ohm-cm). In general, our tests indicate that the surface soils have a relatively low pH ranging from 5.3 to 6.1 and the underlying, weathered rock has a relatively neutral pH ranging from 7.1 to 7.6.

In accordance with the Caltrans Corrosion Guidelines (2003), we provide the approximate life of 18 gage corrugated steel pipe (CSP), in years, for each sample location in Table 6.

Table 6
Life of 18 Gage CSP (CTM 643)

Exploration ID	Sample No.	Sample Depth (feet)	pH	Resistivity (ohm-cm)	Approx. Years to Perforation
R-10-004	S2	5-6.5	7.1	1,420	21
R-10-005	S1	0-1.5	5.6	3,220	15
R-10-006	S1	0-1.5	5.3	6,970	18
A-10-136	D1	2.0-5.0	7.4	2,060	34
T-10-107	D1	0-1.5	5.7	5,630	19
T-10-109	D1	0-2.5	6.1	3,220	17
T-10-112	D1	0-2.0	5.8	4,290	17
T-10-120	D1	4.0-5.0	7.6	2,250	35
RS1	D1	1.0-2.0	6.2	10,724	24
RS2	D1	1.0-2.0	6.3	6,128	22
RS3	D1	0 – 1.0	5.3	4,979	17
RS4	D1	0.5-1.5	5.4	7,277	18

For a 50-year service life, with respect to soil corrosivity, we recommend 10 gage Galvanized Steel-Metal for CSP on this project. Exceptions to this are at the following locations:

- W3 Line, 100+50, use a protective coating or 16 gage Aluminum/Aluminized Steel
- A3L Line, 122+80, use a minimum of 8 gage Galvanized Steel-Metal
- SVP Line, 148+80, use a minimum of 8 gage Galvanized Steel-Metal
- C2 Line, 18+94, use a minimum of 8 gage Galvanized Steel-Metal

Aluminum or Aluminized Steel pipes with a minimum thickness of 16 gage are acceptable alternative culvert materials with the following exceptions (where a low pH in the area makes Aluminum or Aluminized Steel pipe unsuitable):

- SVP Line, 165+00
- A3L Line, 122+80

We expect that concrete structures (such as the box culvert extension and culverts at Tong Road and White Rock Road) will be founded on weathered/hard rock and backfilled with local borrow material. Based on anticipated site conditions, our pH, sulfate and chloride testing, and Table 855.4 of the Caltrans Highway Design Manual (CHDM), cementious materials must comply with Section 90-2.01C of the Standard Specifications. However, pH values can be in the range of 5.6 to 7.0; therefore, water content restriction does apply and a maximum water-to-cementious material ratio of 0.45 is applicable.

The above minimum thicknesses do not take pipe abrasion resistance and overfill height into consideration. We provide culvert foundation and backfill recommendations in our Geotechnical Design Report for the project.

BORROW MATERIALS

At this time the only site identified for possible use as a source of borrow material is located north of Tong Road and east of Silva Valley Parkway (centered approximately 300 feet right of SVP line, Sta. 170+00 to 175+00). Our test pits excavated in this area show approximately 1 to 2 feet of silty soil over intensely weathered and fractured rock, which we expect to become slightly weathered and hard at depths of 10 to 15 feet below the ground surface.

We completed a grain size analysis of material excavated from the upper 5 feet in this area (T-10-121-D2) and the results show a classification of silty gravel (GM) with sand. An R-Value test on the soil from this area (T-10-122-D1) resulted in a value of 68.

Our review of materials and testing indicate that the soil and weathered rock excavated from this area will be suitable for use as embankment fill on the project site. Provisions for use/disposal of oversize material generated during excavation will be necessary. Use of import material is addressed further in the Geotechnical Design Report.

LIMITATIONS

BCI performed services in accordance with generally accepted geotechnical engineering principles and practices currently used in this area. Where referenced, we used ASTM or Caltrans standards as a general *guideline* only. We do not warranty our services.

BCI based this report on the current site conditions. We assume the soil and groundwater conditions encountered in our borings and test pits are representative of the subsurface conditions across the site. Actual conditions between our subsurface explorations can be different.

Modern design and construction is complex, with many regulatory sources/restrictions, involved parties, construction alternatives, etc. It is common to experience changes and delays. The owner should set aside a reasonable contingency fund based on complexities and cost estimates to cover changes and delays.

Thank you for selecting BCI to be on your design team. Please call if you have questions or require additional information.

Sincerely,

BLACKBURN CONSULTING

Patrick Fischer, P.G., C.E.G.
Engineering Geologist, Principal

Rick Sowers, P.E., C.E.G.
Engineer, Principal

Attachments: Figure 1, Vicinity Map
Figures 2A through 2K, Location Map

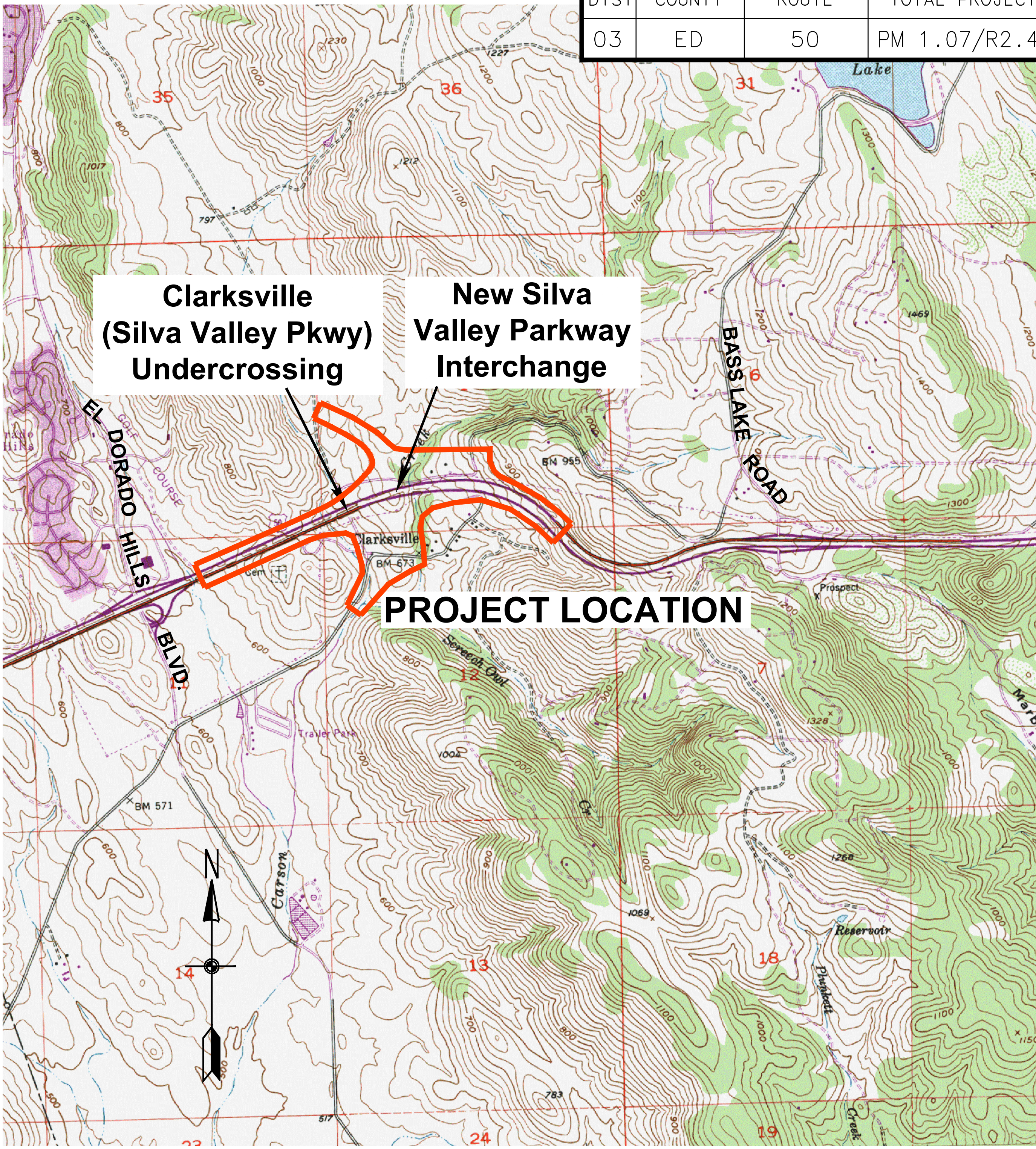
Appendix A:	R-Value Test Results (9)
	Corrosion Test Results
	Borrow Material Gradation
Appendix B:	Deflection Testing and Analysis (AEC, 2011)
Appendix C:	Draft Report Comments and BCI Response

Figures

Figure 1 – Vicinity Map

Figure 2A through 2K, Location Map

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



Source: MAPTECH Terrain Navigator Pro, v. 7.01, USGS topographic map, 7.5 minute quadrangle, 1:24000, Clarksville 1953 (revised 1980).

SCALE: 1"=0.5 Miles

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 1.dwg

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VICINITY MAP

Silva Valley Parkway Interchange
EA 03-1E2901
El Dorado County, California

File No. 556.2

March 2012

Figure 1

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40

SCALE: 1"=800'

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

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PROJECT MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901

El Dorado County, California

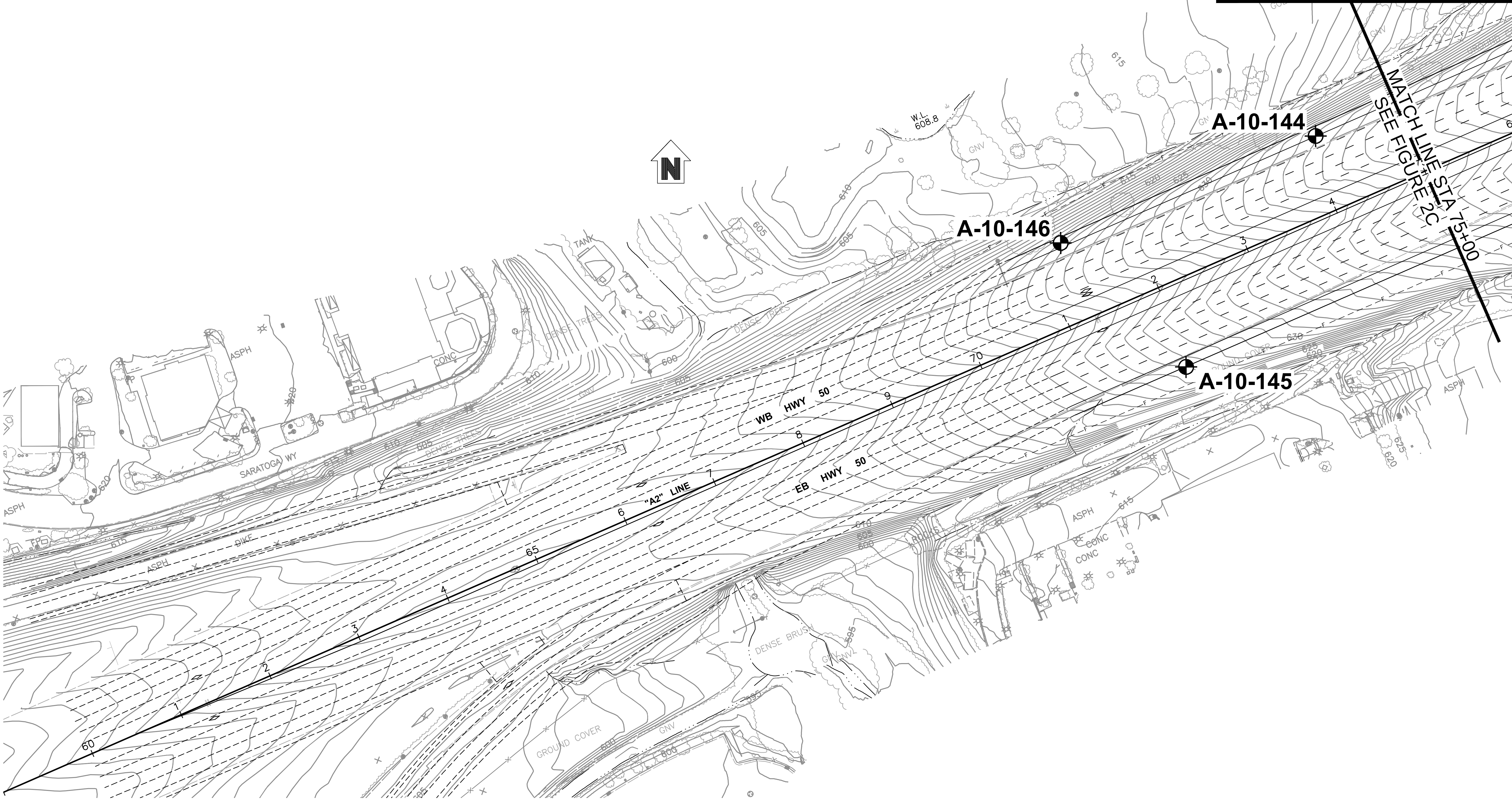
File No. 556.2

March 2012

Figure 2A

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"A2" LINE, STA 59+00 to 75+00
El Dorado County, California

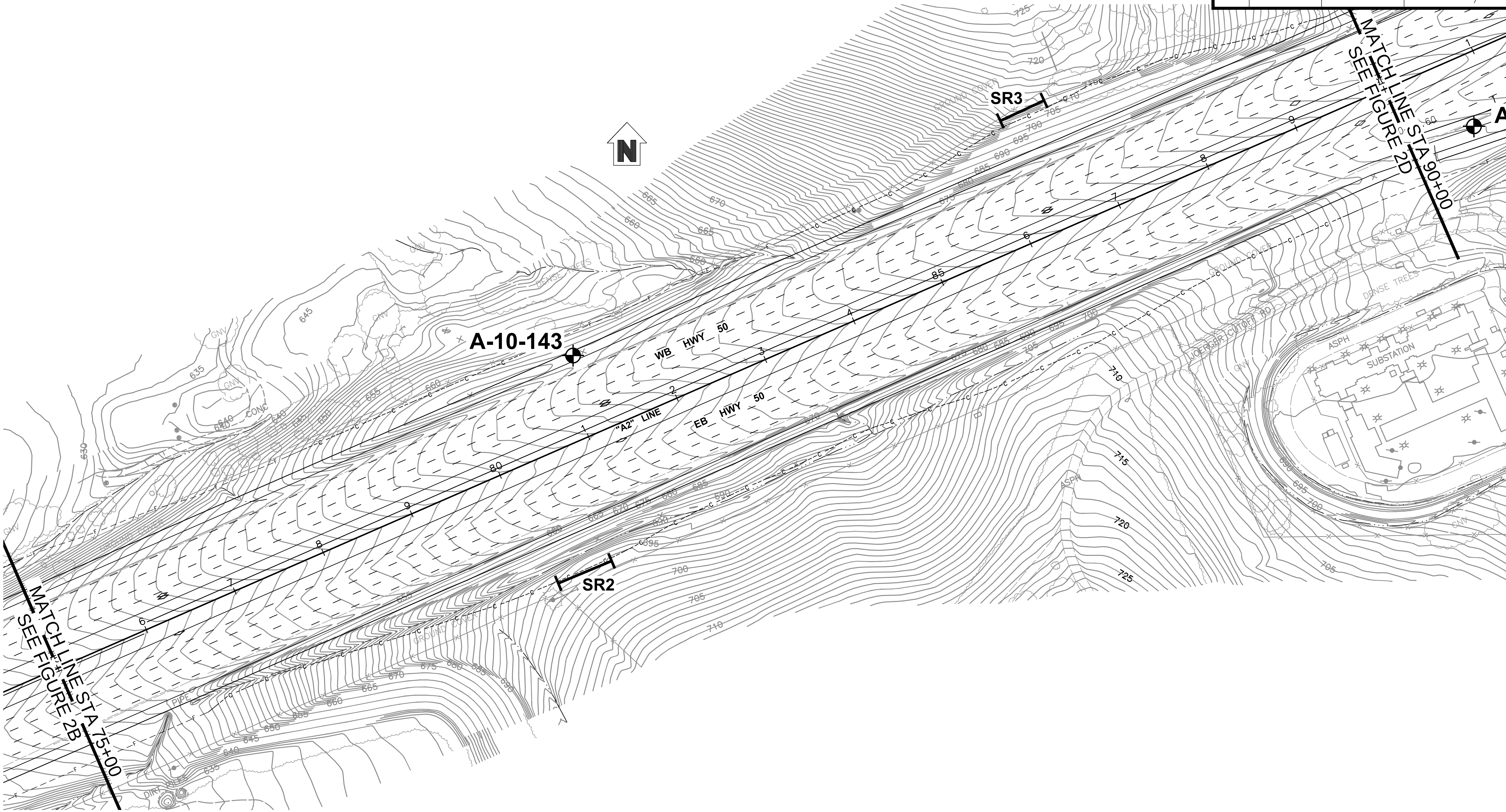
File No. 556.2

March 2012

Figure 2B

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"A2" LINE, STA 75+00 to 90+00
El Dorado County, California

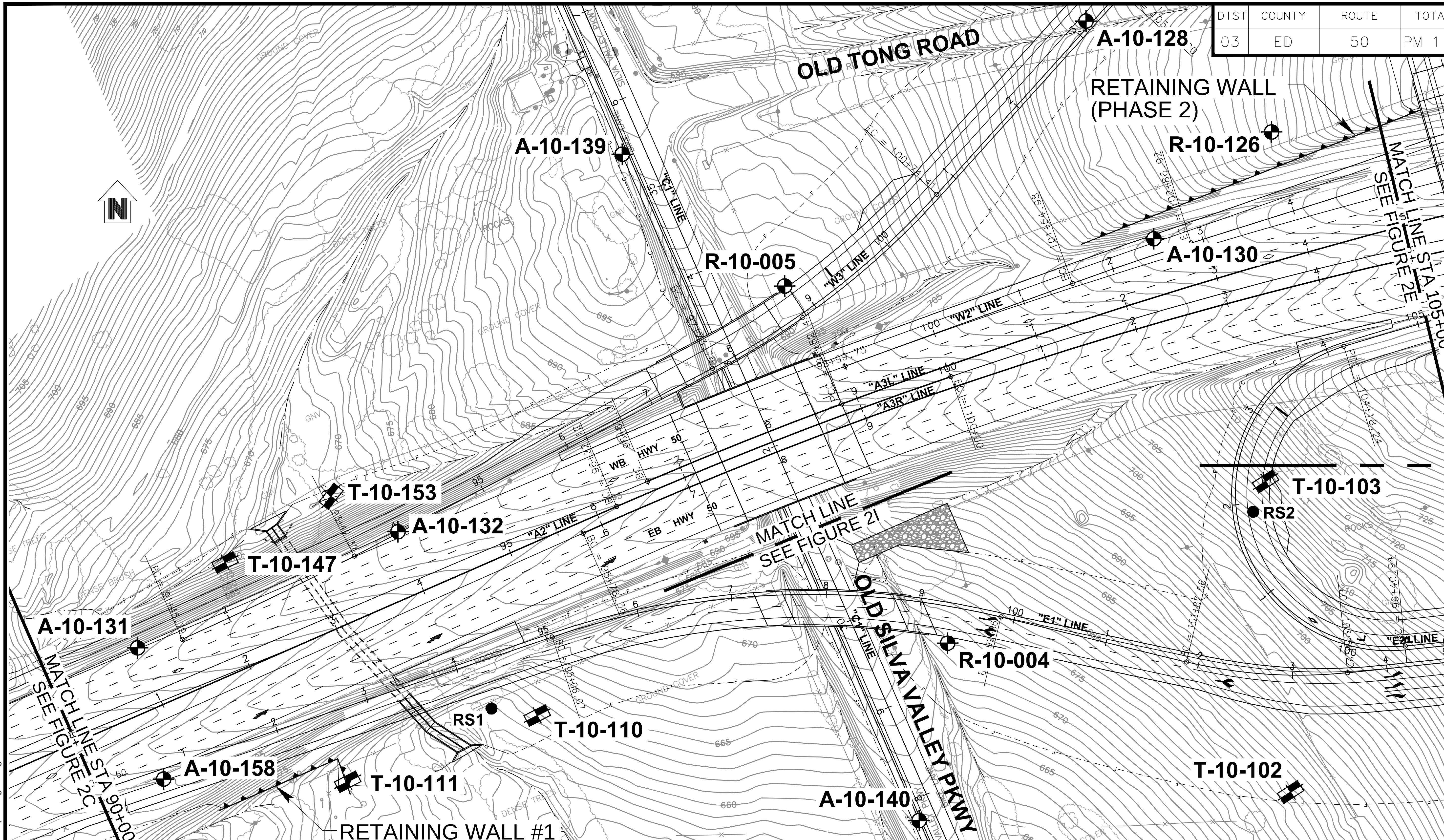
File No. 556.2

March 2012

Figure 2C

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"A2", "A3L", "A3R" LINES, STA 90+00 to 105+00
El Dorado County, California

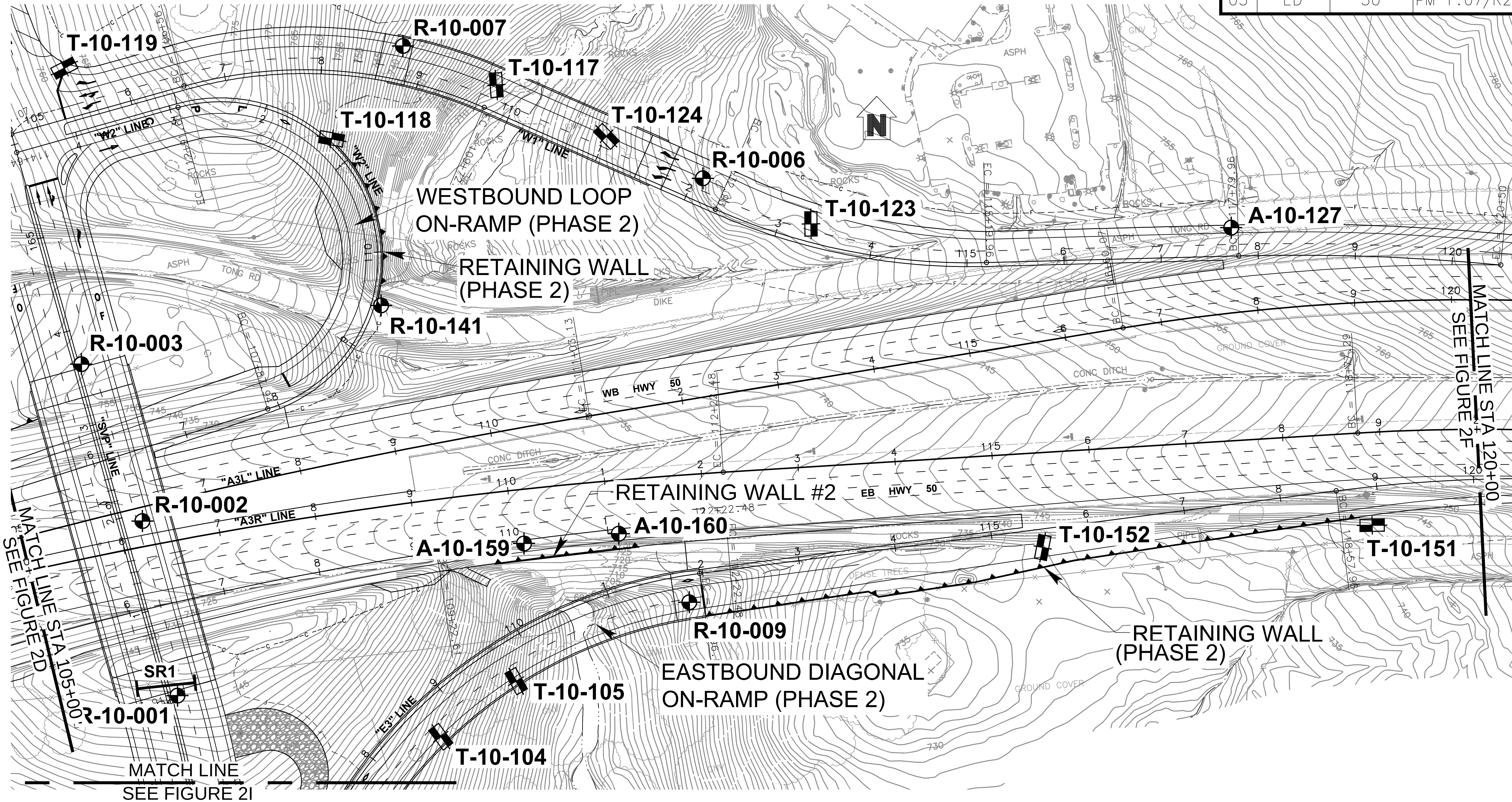
File No. 556.2

March 2012

Figure 2D

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"A3L", "A3R" LINES, STA 105+00 to 120+00
El Dorado County, California

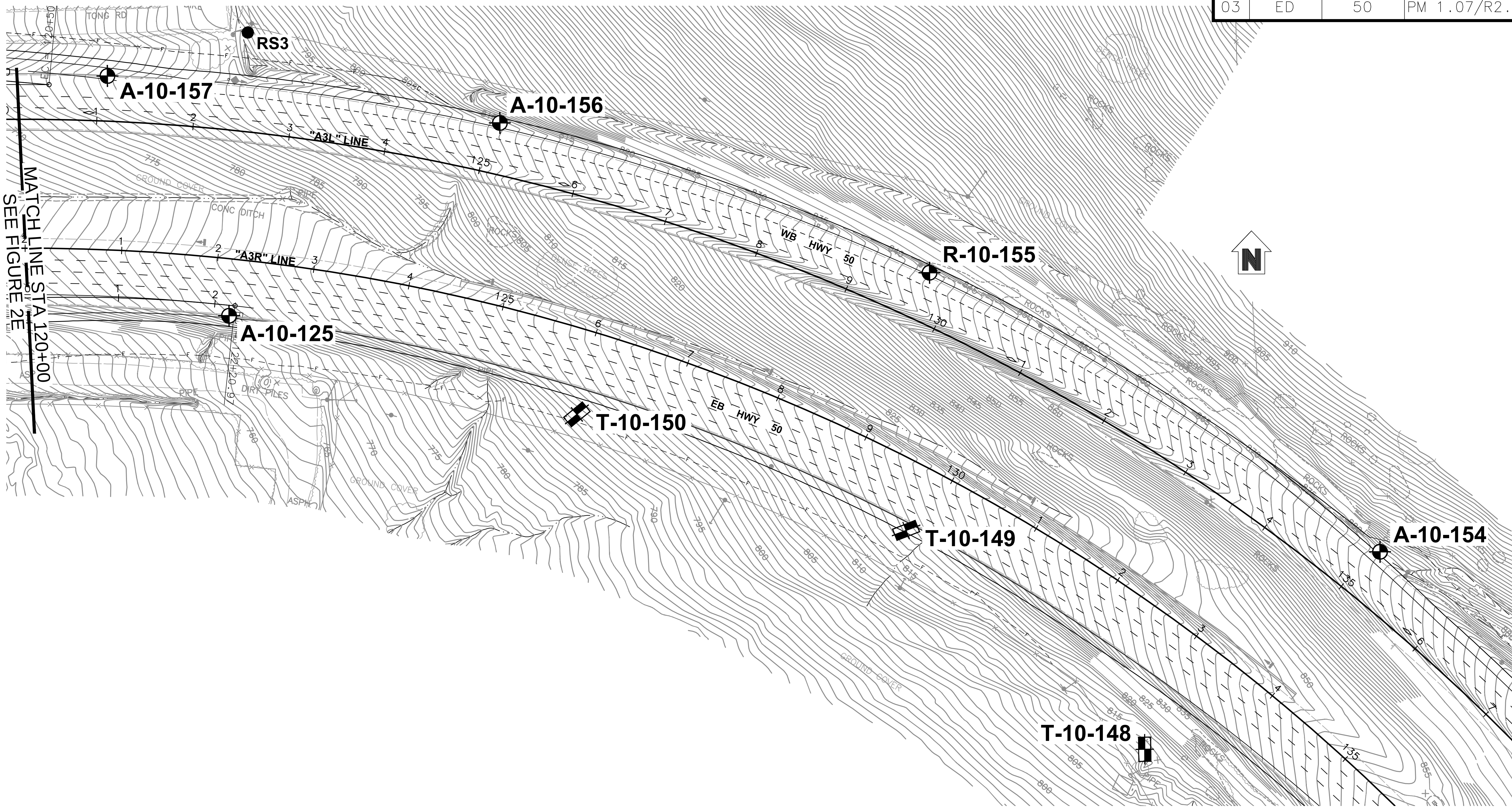
File No. 556.2

March 2012

Figure 2E

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

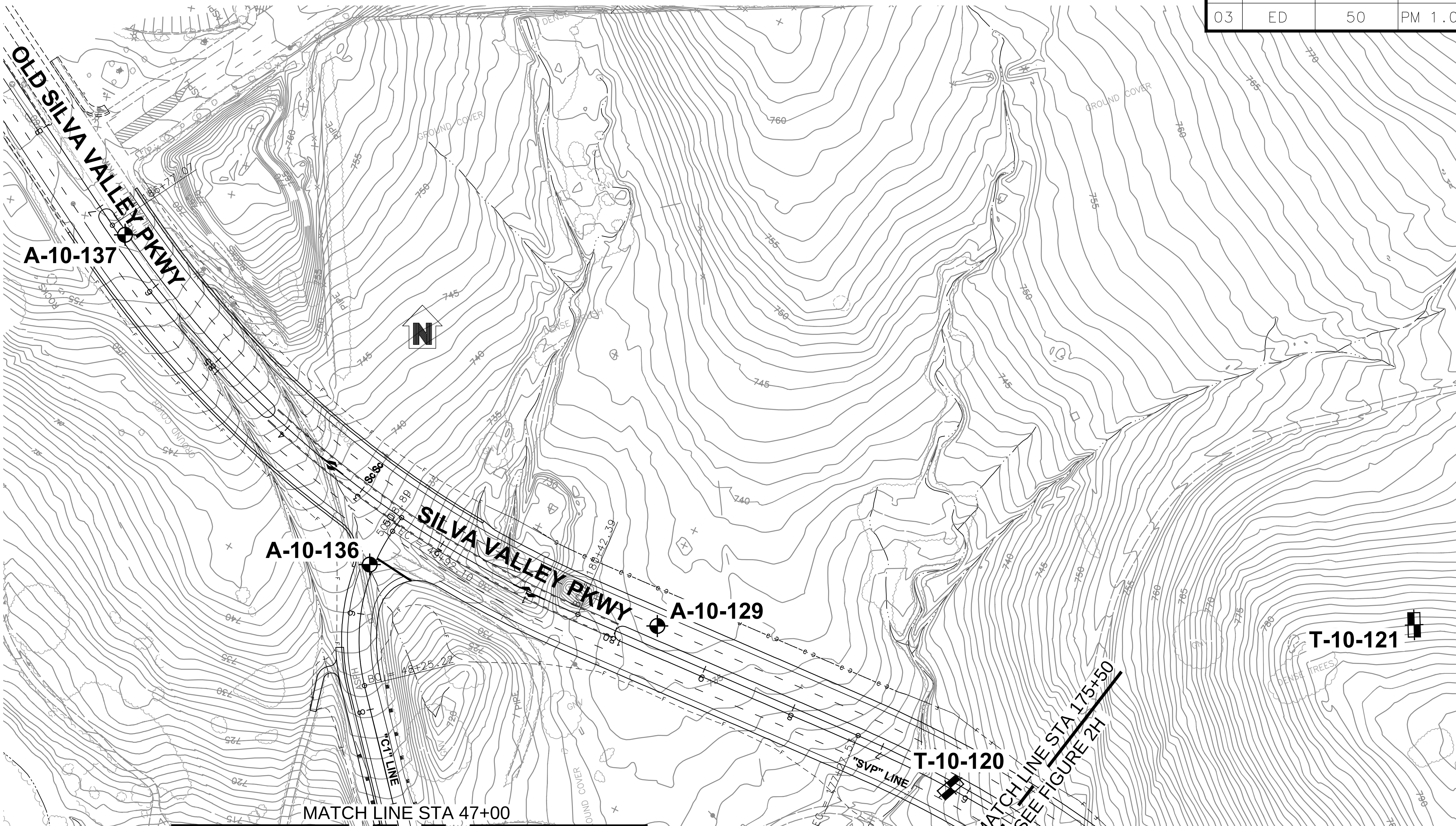
SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"A3R", "A3L" LINE, STA 120+00 to 137+00
El Dorado County, California

File No. 556.2

March 2012

Figure 2F

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"C1", STA 47+00 to 50+32.54/"SVP" 175+50 to 187+50
El Dorado County, California

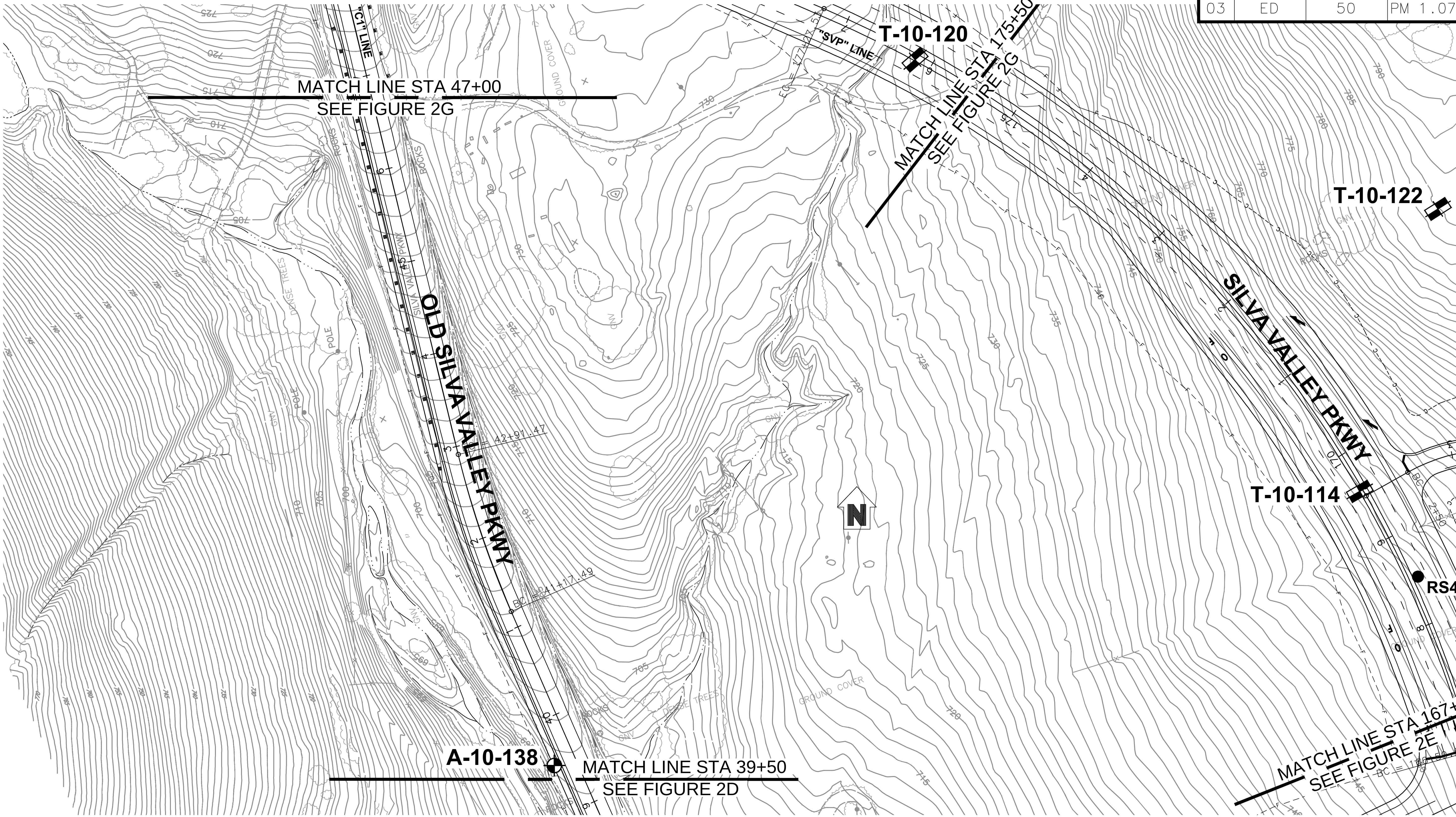
File No. 556.2

March 2012

Figure 2G

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"C1", STA 39+50 to 47+00/"SVP" 167+00 to 175+50
El Dorado County, California

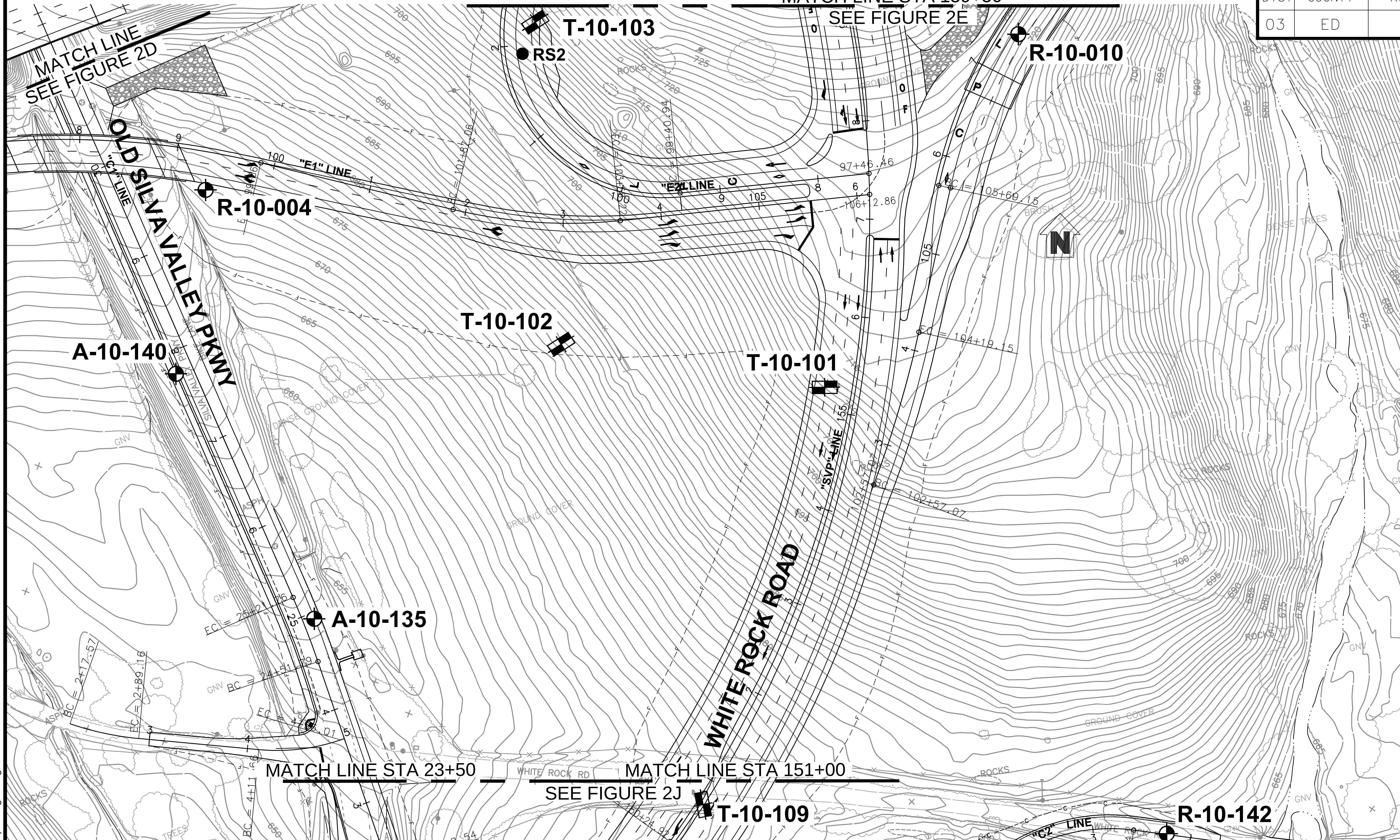
File No. 556.2

March 2012

Figure 2H

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

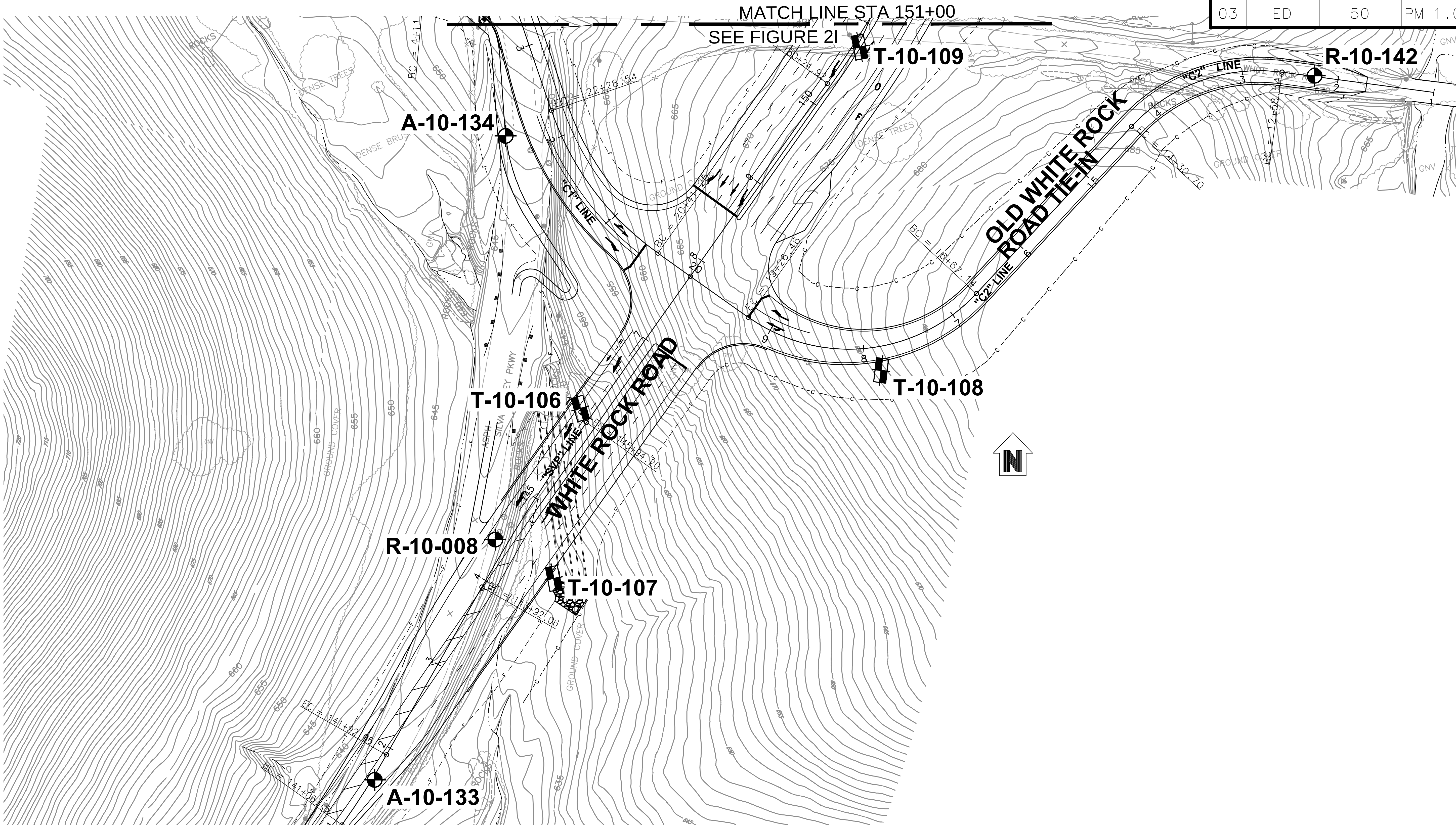
SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"C1", STA 23+50 to 31+25/"SVP" 151+00 to 159+50
El Dorado County, California

File No. 556.2

March 2012

Figure 2I

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg



DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40

LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901
"C1", STA 20+00 to 23+50/"SVP" 141+00 to 151+00
El Dorado County, California

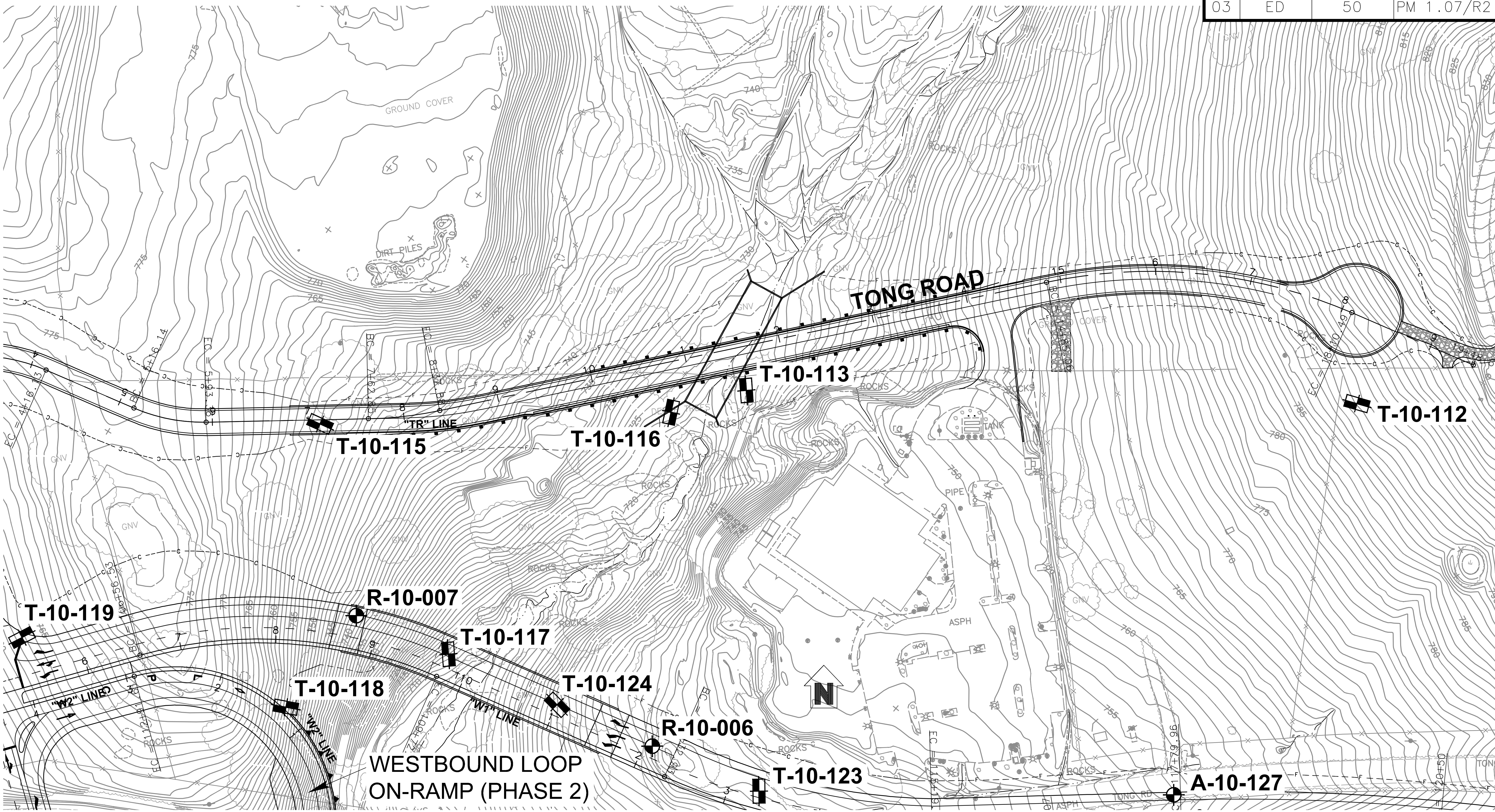
File No. 556.2

March 2012

Figure 2J

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

DIST	COUNTY	ROUTE	TOTAL PROJECT
03	ED	50	PM 1.07/R2.40



LEGEND

A-10-001 Approximate Boring Location

T-10-005 Approximate Test Pit Location

SR3 Seismic Refraction Line Location

RS4 Field Resistivity Test Location

Source: US 50/Silva Valley Pkwy Interchange Geometric Approval Drawing, dated May 2010 and February 2012 by Mark Thomas & Company, Inc.

SCALE: 1"=100'

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LOCATION MAP

SILVA VALLEY PARKWAY INTERCHANGE - EA 03-1E2901

TONG ROAD

El Dorado County, California

File No. 556.2

March 2012

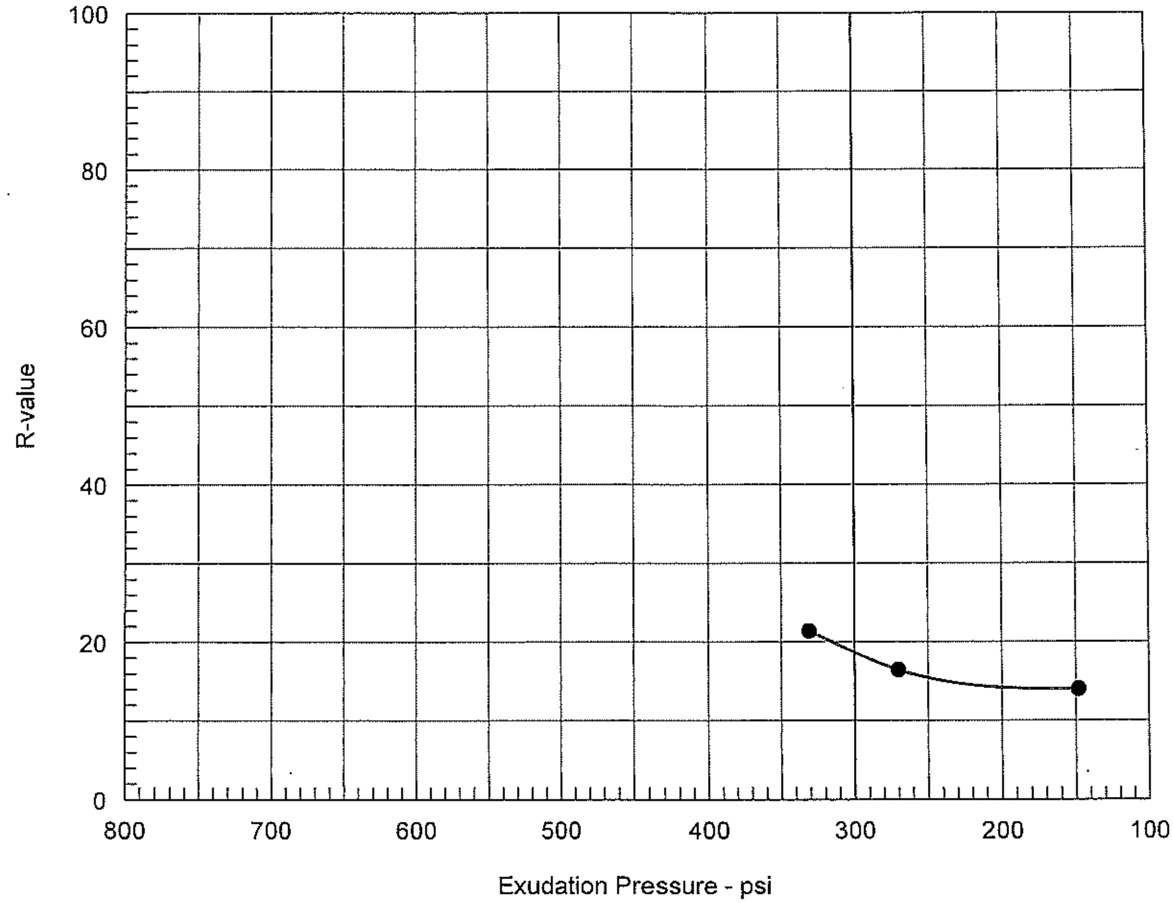
Figure 2K

3/12/2012 556.2 SV Pkwy Mtrl Report Fig 2.dwg

APPENDIX A

R-Value Test Results (9)
Corrosion Test Results
Borrow Material Gradation

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	173	119.6	14.9	0.42	108	2.60	331	20	21
2	142	119.0	15.5	0.36	109	2.44	270	17	16
3	112	116.3	16.6	0.06	117	2.64	148	13	14

Test Results	Material Description
R-value at 300 psi exudation pressure = 19	CLAYEY SILT with SAND, dark yellowish brown (decomposed metavolcanic rock)

Project No.: 556.2
Project: Silva Valley Parkway Interchange Project
Source of Sample: A-10-129 **Depth:** 0.5-5.0'
Sample Number: D2
Date: 9/24/2010

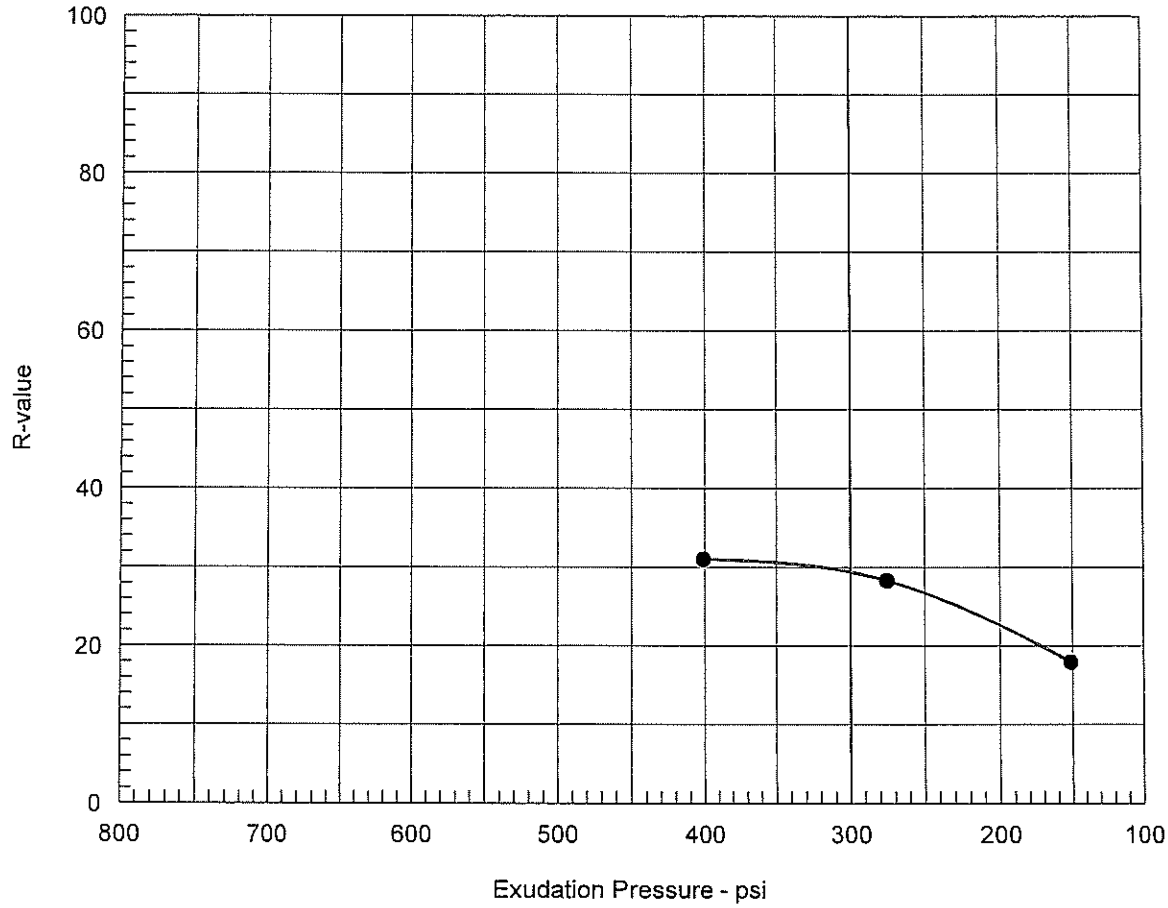
Tested by: MDR
Checked by: RBL

Remarks:
8.9% retained on No. 4 sieve.

R-VALUE TEST REPORT

Blackburn Consulting

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	320	121.6	14.1	0.82	96	2.61	401	29	31
2	263	119.3	15.2	0.55	97	2.56	275	27	28
3	163	116.5	16.1	0.36	111	2.52	151	18	18

Test Results	Material Description
R-value at 300 psi exudation pressure = 29	SILT with SAND and some GRAVEL, yellowish brown (decomposed metavolcanic rock)

Project No.: 556.2

Project: Silva Valley Parkway Interchange Project

Source of Sample: A-10-137 **Depth:** 2.25-5.0'

Sample Number: D1

Date: 9/24/2010

Tested by: MDR

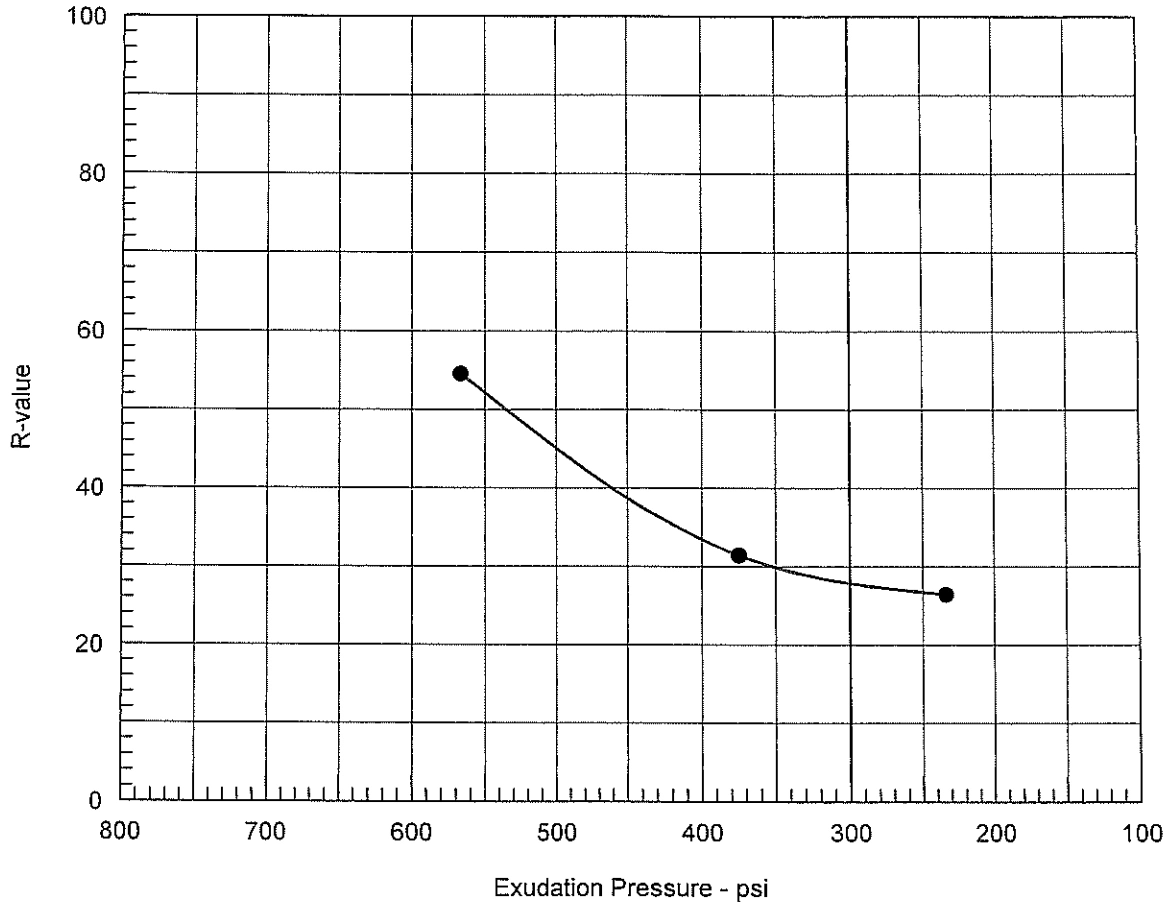
Checked by: RBL

Remarks:
12.8% retained on No. 4 sieve.

R-VALUE TEST REPORT

Blackburn Consulting

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	350	138.3	9.4	0.00	53	2.31	567	59	55
2	224	136.0	10.2	0.00	91	2.47	375	31	31
3	81	133.0	11.1	0.00	98	2.52	234	26	26

Test Results	Material Description
R-value at 300 psi exudation pressure = 28	SANDY, SILTY CLAY with GRAVEL, yellowish brown, (decomposed metavolcanic rock)

Project No.: 556.2

Project: Silva Valley Parkway Interchange Project

Source of Sample: A-10-144 **Depth:** 0.5-5.0'

Sample Number: D1

Date: 9/10/2010

Tested by: BKR

Checked by: MDR

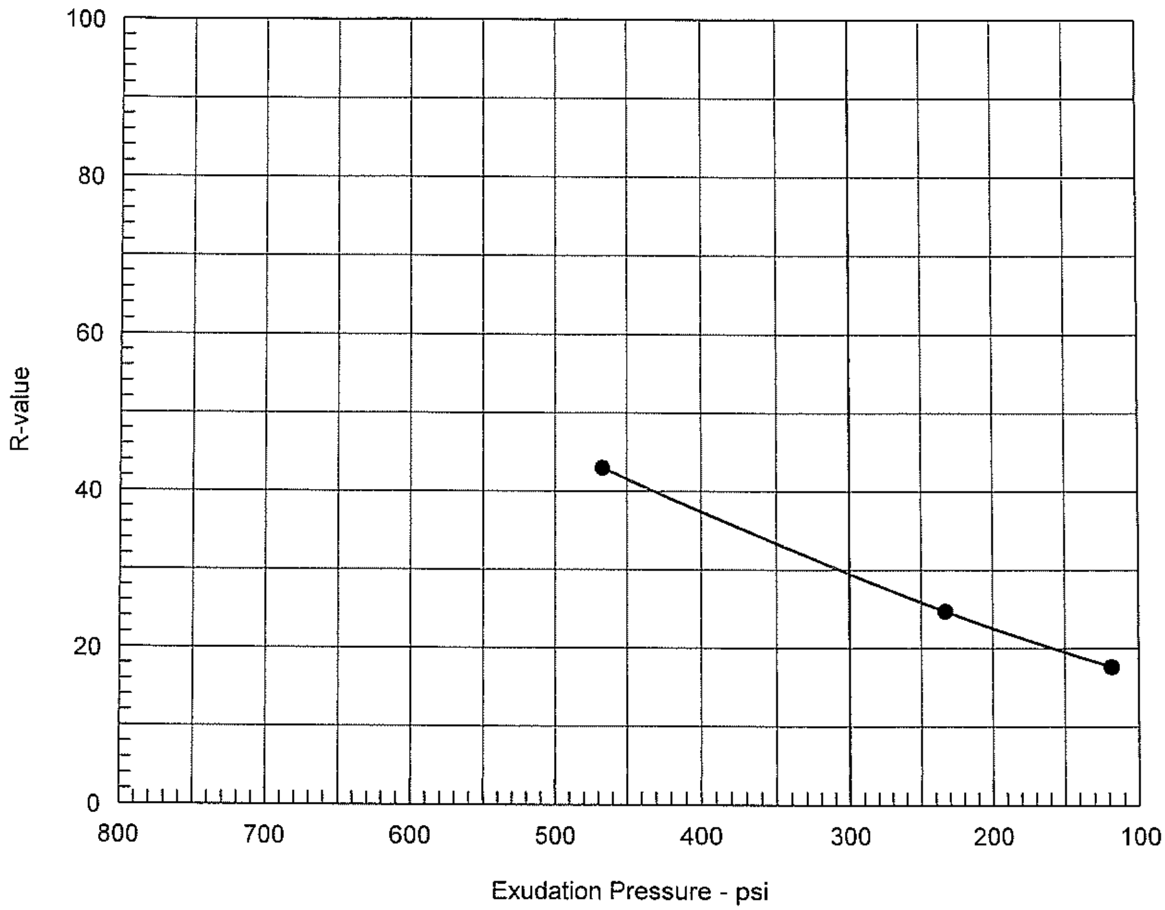
Remarks:
25.3% retained on No. 4 sieve.

R-VALUE TEST REPORT

Blackburn Consulting

Figure ______

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	244	136.1	9.6	0.00	70	2.42	467	45	43
2	102	129.6	11.3	0.00	101	2.53	233	25	25
3	61	126.0	13.1	0.00	111	2.46	118	18	18

Test Results	Material Description
R-value at 300 psi exudation pressure = 29	SANDY, SILTY CLAY with GRAVEL, yellowish brown, (decomposed metavolcanic rock)

Project No.: 556.2
Project: Silva Valley Parkway Interchange Project
Source of Sample: A-10-145 **Depth:** 0.5-5.0'
Sample Number: D1
Date: 9/10/2010

Tested by: BKR
Checked by: MDR
Remarks:

R-VALUE TEST REPORT

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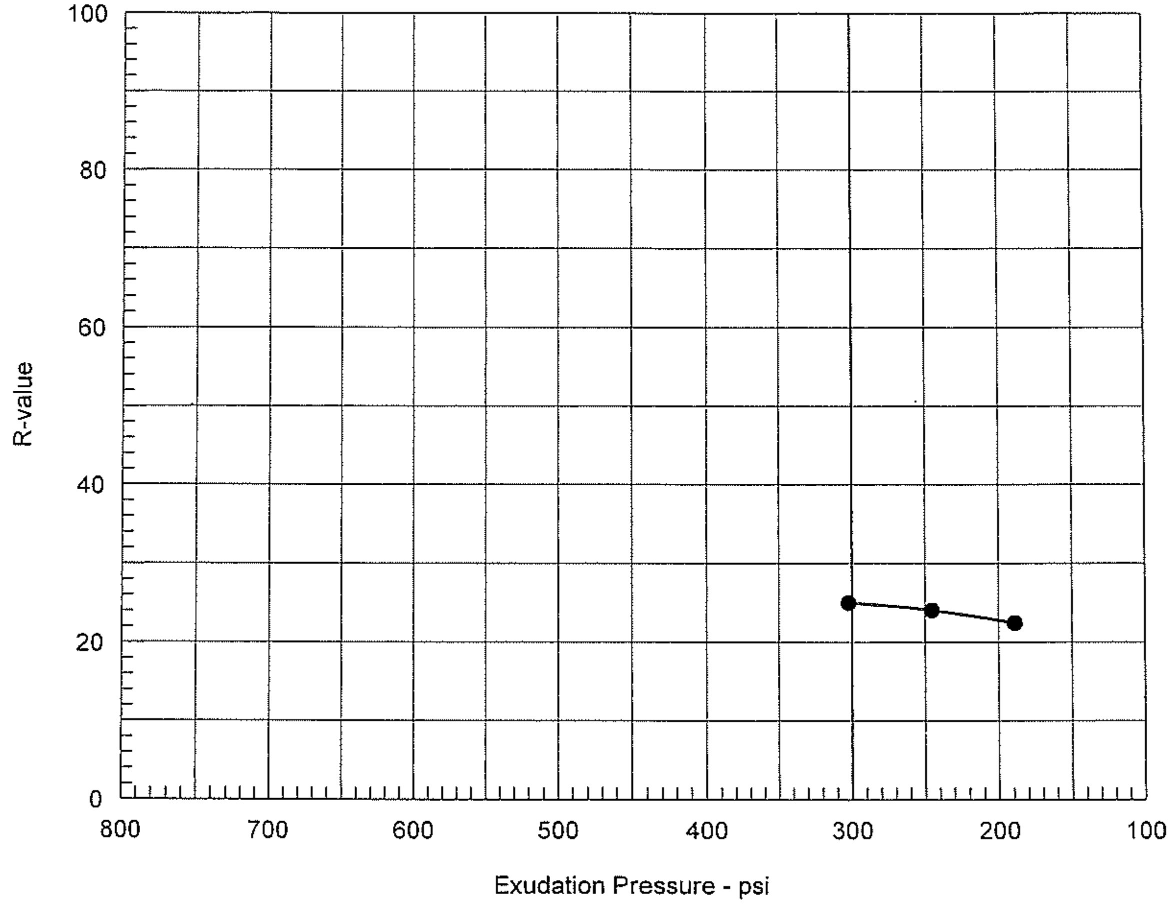
Figure ______

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	350	123.7	13.2	0.24	99	2.55	302	25	25
2	263	119.5	13.9	0.12	103	2.67	245	22	24
3	234	120.1	14.6	0.09	106	2.67	189	20	22

Test Results	Material Description
R-value at 300 psi exudation pressure = 25	SANDY SILT, olive brown (decomposed metavolcanic rock)

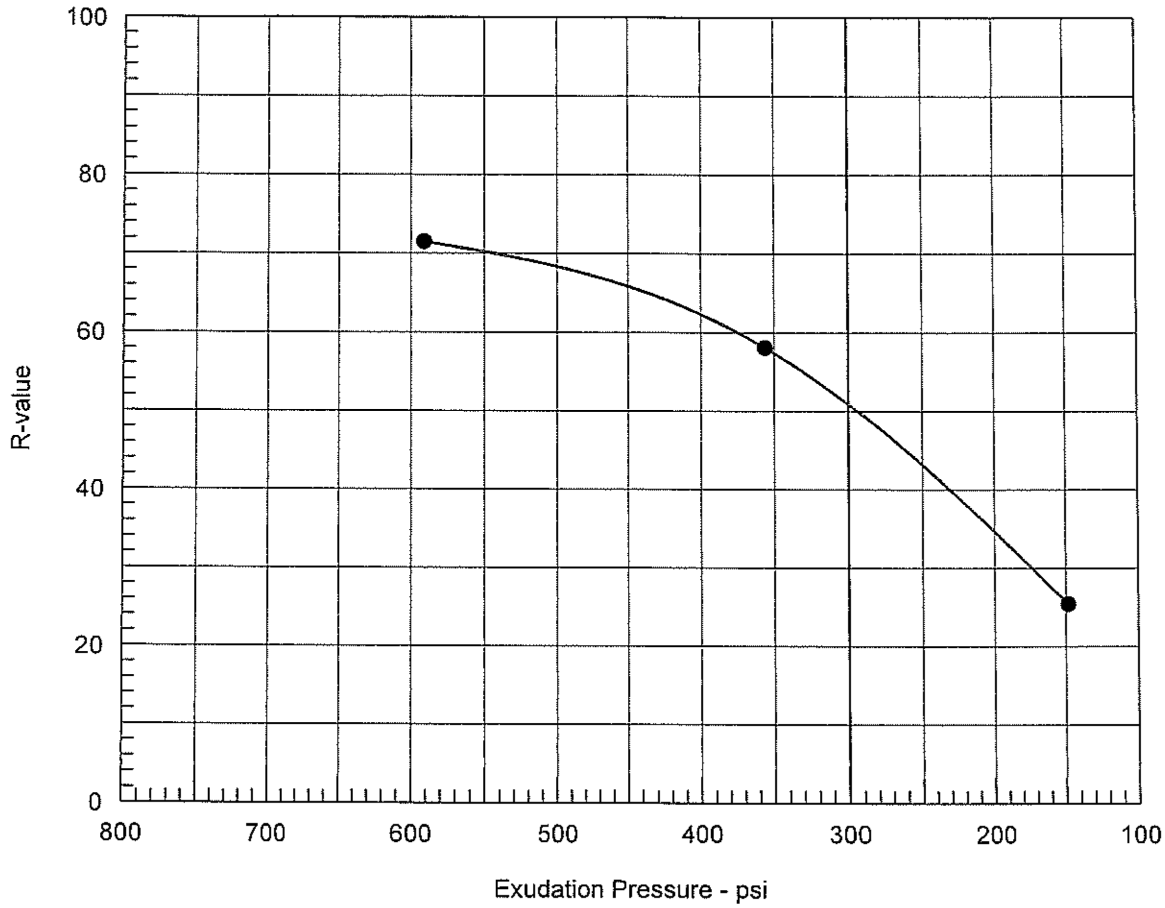
Project No.: 556.2
Project: Silva Valley Parkway Interchange Project
Source of Sample: A-10-156 **Depth:** 0.5-8.0'
Sample Number: D2
Date: 9/24/2010

Tested by: MDR
Checked by: RBL
Remarks:

R-VALUE TEST REPORT

Blackburn Consulting

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	350	127.8	11.3	0.00	30	2.55	591	71	71
2	224	126.8	12.1	0.00	47	2.53	356	58	58
3	102	123.3	13.8	0.00	94	2.51	148	25	25

Test Results	Material Description
R-value at 300 psi exudation pressure = 51	SILTY, CLAYEY GRAVEL with SAND, dusky red, (decomposed metavolcanic rock)

Project No.: 556.2

Project: Silva Valley Parkway Interchange Project

Source of Sample: T-103 **Depth:** 0-2.0'

Sample Number: D1

Date: 9/10/2010

Tested by: BKR

Checked by: MDR

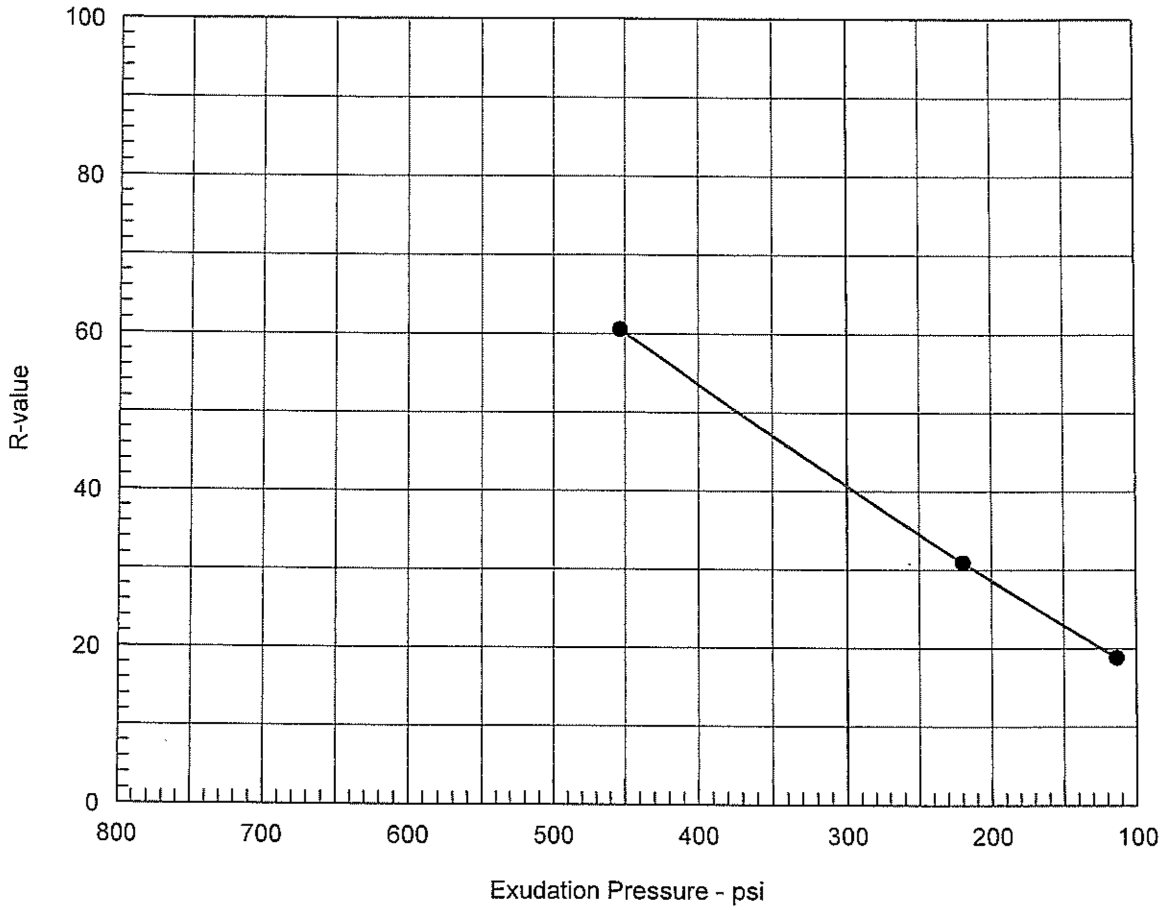
Remarks:
70.3% retained on No. 4 sieve.

R-VALUE TEST REPORT

Blackburn Consulting

Figure ______

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	350	189.5	10.7	0.00	43	2.45	453	61	61
2	203	129.6	12.4	0.00	87	2.50	220	31	31
3	61	126.3	13.7	0.00	108	2.54	113	19	19

Test Results	Material Description
R-value at 300 psi exudation pressure = 41	SILTY, CLAYEY SAND with GRAVEL, red, (decomposed metavolcanic rock)

Project No.: 556.2
Project: Silva Valley Parkway Interchange Project
Source of Sample: T-108 **Depth:** 0-2.5'
Sample Number: D1
Date: 9/10/2010

Tested by: BKR
Checked by: MDR

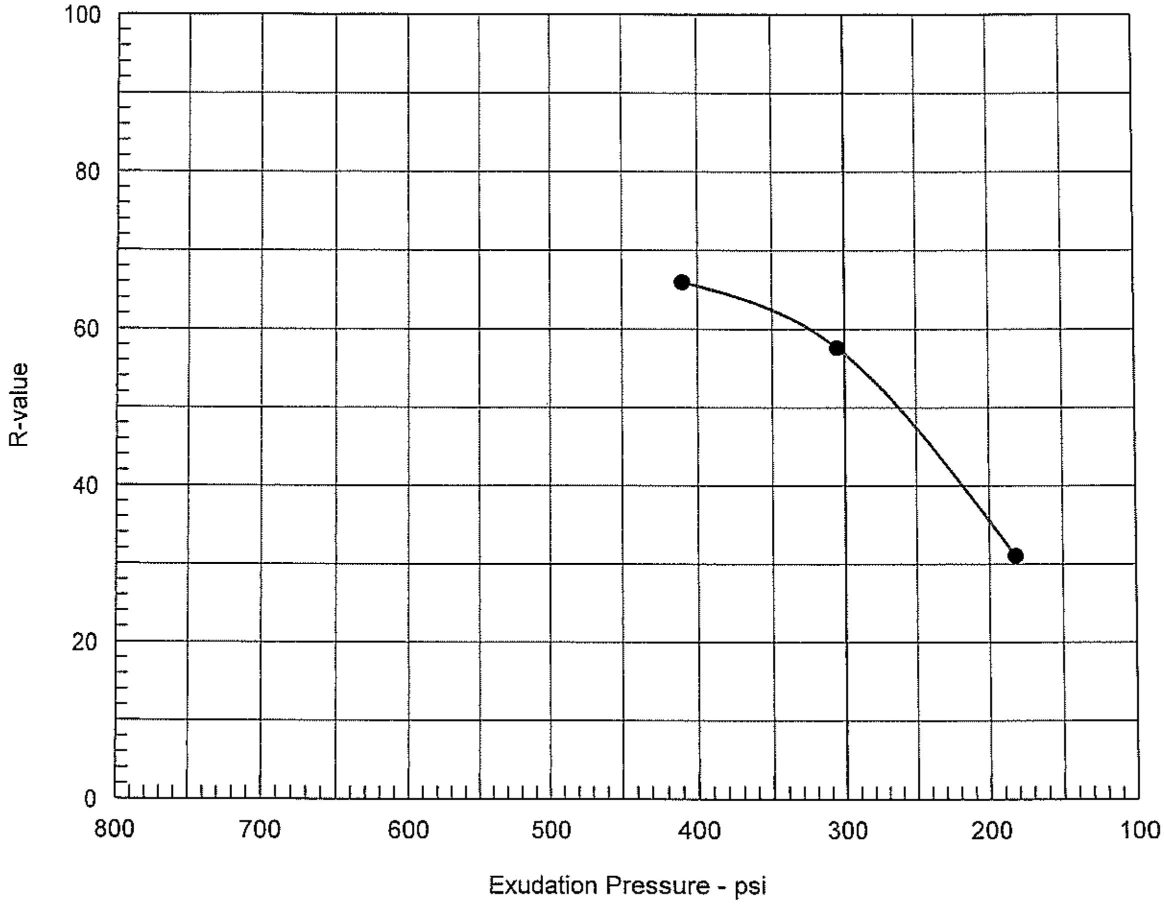
Remarks:
49.8% retained on No. 4 sieve.

R-VALUE TEST REPORT

Blackburn Consulting

Figure ______

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	350	129.2	11.1	0.00	35	2.53	410	66	66
2	350	127.9	12.0	0.00	50	2.65	305	54	58
3	142	124.7	13.3	0.00	87	2.60	182	29	31

Test Results	Material Description
R-value at 300 psi exudation pressure = 57	SILTY, CLAYEY SAND with GRAVEL, red, (decomposed metavolcanic rock)

Project No.: 556.2
Project: Silva Valley Parkway Interchange Project
Source of Sample: T-119 **Depth:** 0-2.5'
Sample Number: D1
Date: 9/10/2010

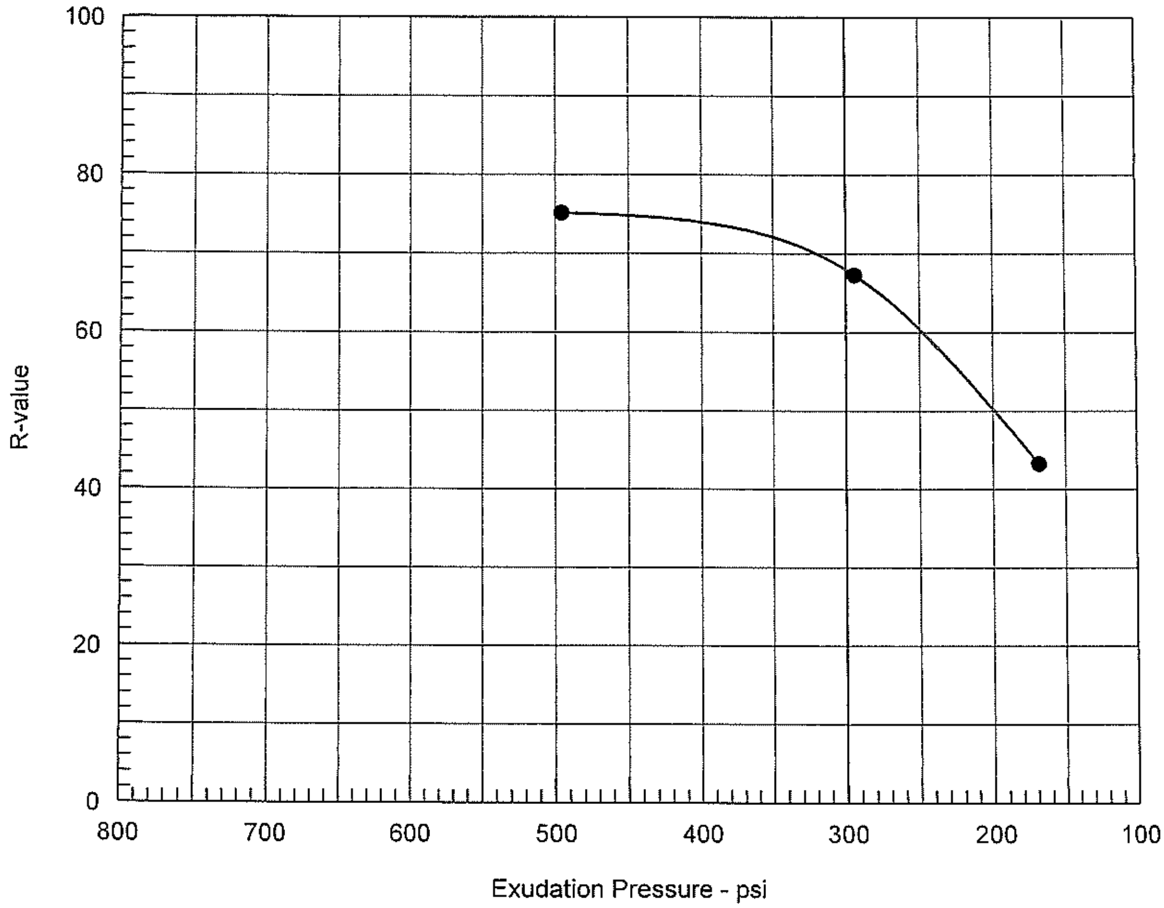
Tested by: BKR
Checked by: MDR
Remarks:
28.6% retained on No. 4 sieve.

R-VALUE TEST REPORT

Blackburn Consulting

Figure ______

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	350	118.5	14.5	0.00	25	2.50	496	75	75
2	282	117.2	15.4	0.00	34	2.50	294	67	67
3	224	115.9	16.2	0.00	64	2.60	169	41	43

Test Results	Material Description
R-value at 300 psi exudation pressure = 68	SILTY, CLAYEY SAND with GRAVEL, dusky red (decomposed metavolcanic rock)

Project No.: 556.2

Project: Silva Valley Parkway Interchange Project

Source of Sample: T-122 **Depth:** 0-3.5'

Sample Number: D1

Date: 9/10/2010

Tested by: BKR

Checked by: MDR

Remarks:
42.9% retained on No. 4 sieve.

R-VALUE TEST REPORT

Blackburn Consulting

Figure ______

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 09/17/2010
Date Submitted 09/14/2010

To: Ken Colburn
Blackburn Consulting
11521 Blocker Dr. Ste. 110
Auburn, CA 95603

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : SILVA VLY PKWY INTER Site ID : R-10-004-S2B.
Thank you for your business.

* For future reference to this analysis please use SUN # 58852-119538.

EVALUATION FOR SOIL CORROSION

Soil pH	7.08	
Minimum Resistivity	1.42 ohm-cm (x1000)	
Chloride	17.0 ppm	00.00170 %
Sulfate	67.5 ppm	00.00675 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 09/17/2010
Date Submitted 09/14/2010

To: Ken Colburn
Blackburn Consulting
11521 Blocker Dr. Ste. 110
Auburn, CA 95603

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : SILVA VLY PKWY INTER Site ID : R-10-005-S1B.
Thank you for your business.

* For future reference to this analysis please use SUN # 58852-119539.

EVALUATION FOR SOIL CORROSION

Soil pH	5.63		
Minimum Resistivity	3.22 ohm-cm (x1000)		
Chloride	13.6 ppm	00.00136	%
Sulfate	35.5 ppm	00.00355	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 09/17/2010
Date Submitted 09/14/2010

To: Ken Colburn
Blackburn Consulting
11521 Blocker Dr. Ste. 110
Auburn, CA 95603

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : SILVA VLY PKWY INTER Site ID : R10-006-S1B.
Thank you for your business.

* For future reference to this analysis please use SUN # 58852-119540.

EVALUATION FOR SOIL CORROSION

Soil pH	5.30	
Minimum Resistivity	6.97 ohm-cm (x1000)	
Chloride	14.0 ppm	00.00140 %
Sulfate	0.2 ppm	00.00002 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 09/17/2010
Date Submitted 09/14/2010

To: Ken Colburn
Blackburn Consulting
11521 Blocker Dr. Ste. 110
Auburn, CA 95603

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : SILVA VLY PKWY INTER Site ID : A-10-136-D1.
Thank you for your business.

* For future reference to this analysis please use SUN # 58852-119541.

EVALUATION FOR SOIL CORROSION

Soil pH	7.37	
Minimum Resistivity	2.06 ohm-cm (x1000)	
Chloride	24.3 ppm	00.00243 %
Sulfate	65.2 ppm	00.00652 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 09/17/2010
Date Submitted 09/14/2010

To: Ken Colburn
Blackburn Consulting
11521 Blocker Dr. Ste. 110
Auburn, CA 95603

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : SILVA VLY PKWY INTER Site ID : T-10-107-D1.
Thank you for your business.

* For future reference to this analysis please use SUN # 58852-119542.

EVALUATION FOR SOIL CORROSION

Soil pH	5.71		
Minimum Resistivity	5.63 ohm-cm (x1000)		
Chloride	15.0 ppm	00.00150	%
Sulfate	0.4 ppm	00.00004	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 09/17/2010
Date Submitted 09/14/2010

To: Ken Colburn
Blackburn Consulting
11521 Blocker Dr. Ste. 110
Auburn, CA 95603

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : SILVA VLY PKWY INTER Site ID : T-10-109-D1.
Thank you for your business.

* For future reference to this analysis please use SUN # 58852-119543.

EVALUATION FOR SOIL CORROSION

Soil pH	6.11		
Minimum Resistivity	3.22	ohm-cm (x1000)	
Chloride	13.8 ppm	00.00138 %	
Sulfate	0.8 ppm	00.00008 %	

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 09/17/2010
Date Submitted 09/14/2010

To: Ken Colburn
Blackburn Consulting
11521 Blocker Dr. Ste. 110
Auburn, CA 95603

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : SILVA VLY PKWY INTER Site ID : T-10-112-D1.
Thank you for your business.

* For future reference to this analysis please use SUN # 58852-119544.

EVALUATION FOR SOIL CORROSION

Soil pH	5.80		
Minimum Resistivity	4.29	ohm-cm (x1000)	
Chloride	10.5 ppm	00.00105	%
Sulfate	< .1		

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

BSK Associates
Engineers & Laboratories

567 West Shaw Avenue Suite B
Fresno CA 93704
P 559.497.2880
F 559.497.2886
www.bskassociates.com

VIA US MAIL

September 15, 2010

BSK Job G1008510F
BSK SAMPLE ID: F10-498

Mr. Ken Colburn
Blackburn Consulting
11521 Blocker Drive, Suite 110
Auburn, CA 95603

SUBJECT: Laboratory Testing Results
PO 10050 – Silva Parkway Interchange
Sample Date: 7/2/2010

Dear Mr. Colburn:

BSK has performed testing on a soil sample shipped to our laboratory identified as follows:

T-120 / D2 @ 4' - 5'

Testing was performed in accordance with Caltrans Test Methods and consisted of Minimum Resistivity and pH (Caltrans Test Method 643), Sulfate Content (Caltrans Test Method 417), and Chloride Content (Caltrans Test Method 422). The results are tabulated below and the test reports are enclosed.

Sample ID	Minimum Resistivity, Ohm-cm @ 15.5°C	pH	Sulfate, mg/kg	Chloride, mg/kg
T-120 / D2 @ 4' – 5'	2,250	7.6 @ 21.2°C	7.8	13

BSK appreciates the opportunity to be of service to Blackburn Consulting and looks forward to being of service to you in the future. Please call with any questions you may have @ 559-497-2870.

Respectfully,
BSK Associates

Nathan M. Shwiyhat, P.E.
Project Engineer

Enclosures: Minimum Resistivity Test Report
Analytical Report

Distribution: Client (1 original, 1 E-Copy)
BSK File

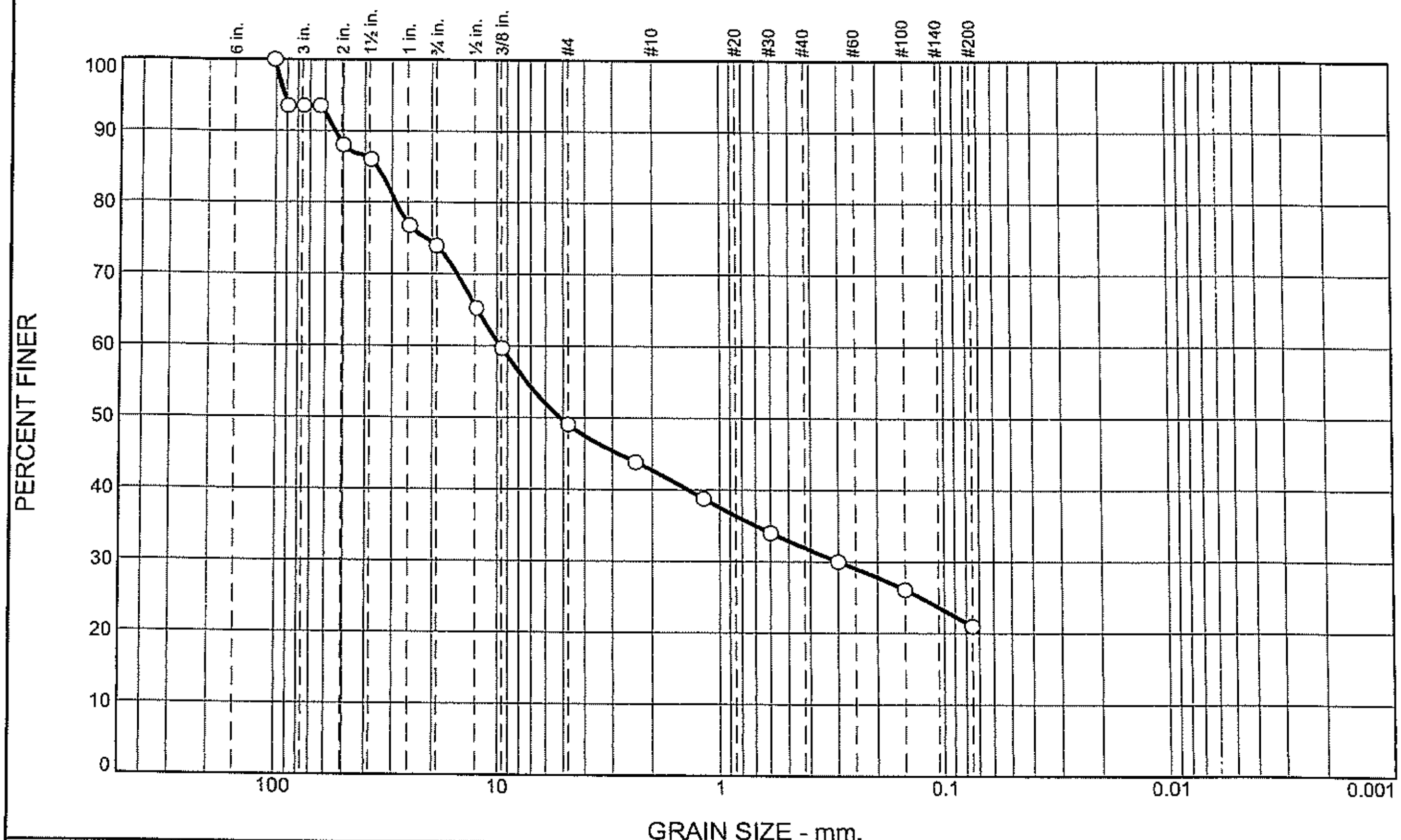
Project Name: Silva Valley Parkway IC
BCI File No: 556.2
Field Resistivity Test Locations

blackburn consulting

pH Measurement of Soil
CTM 643

Sample No:	1	2	3	4		
Sample Location:	RS-1	RS-2	RS-3	RS-4		
Soil Type:	ML	ML	ML/SM	SM		
Date:	9/27	9/27	9/27	9/27		
Temperature (°F) 77 ± 2 (25°C ±1)	25.0	24.2	24.5	24.5		
Required Amount of Dry Soil (g)	30.0	30.0	30.0	30.0		
Measured Amount of Dry Soil (g)	30.0	30.0	30.0	30.0		
Distilled Water (mL)	30.0	30.0	30.0	30.0		
Stand Time (start) minimum 1 hr.	8:30 AM	8:30 AM	8:30 AM	8:30 AM		
Stand Time (finish)	10:12 AM	10:15 AM	10:18 AM	10:20 AM		
pH Reading (0.00)	6.15	6.30	5.26	5.35		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
6.5	19.5	24.9	6.4	10.8	10.9	21.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4.0"	100.0		
3.5"	93.5		
3.0"	93.5		
2.5"	93.5		
2.0"	88.1		
1.5"	86.0		
1.0"	76.8		
3/4"	74.0		
1/2"	65.3		
3/8"	59.7		
#4	49.1		
#8	43.8		
#16	38.7		
#30	34.0		
#50	30.0		
#100	26.1		
#200	21.0		

* (no specification provided)

Soil Description

Metavolcanic Rock, yellowish brown, decomposed (SILTY GRAVEL with SAND)

Atterberg Limits

PL= LL= PI= NP

Coefficients

D_{90}= 54.3331 D_{85}= 35.1133 D_{60}= 9.6739
D_{50}= 5.1541 D_{30}= 0.3002 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO=

Remarks

1 Piece retained on 3.5" sieve. Sample was hand shaken for entire sieve analysis.

Source of Sample: T-121 **Depth:** N/A
Sample Number: D2

Date: 9-14-10

Blackburn Consulting

W. Sacramento, CA

Client: Mark Thomas & Company, Inc.
Project: Silva Valley Parkway Interchange Project

Project No: 556.2 **Figure**

Tested By: MAR **Checked By:** MDR

Appendix B

Deflection Testing and Analysis (AEC, 2011)

Associated Engineering Consultants, Inc.

DEFLECTION TESTING & ANALYSIS
HIGHWAY 50 & SILVA VALLEY PARKWAY
EL DORADO COUNTY, CALIFORNIA

Prepared for:

BLACKBURN CONSULTING

In Conjunction With:

Materials Report, US 50 – Silva Valley Parkway Interchange, Phase I

EA 03-1E2901

El Dorado County, California

By

Associated Engineering Consultants, Inc.

October 2011

Job No. 11200

20179 Charlanne Dr. • Redding, CA 96002 • (530) 226-1616 • Fax (530) 226-1617

Associated Engineering Consultants, Inc.

Revised October 25, 2011 Job No. 11200

Mr. Pat Fischer, P.G., C.E.G.
Blackburn Consulting
11521 Blocker Drive, Suite 110
Auburn, California 95603

Re: Deflection Testing of Highway 50
& Silva Valley Parkway Interchange, Phase I
EA 03-1E2901, El Dorado County, CA

Mr. Fischer:

As you are aware, our firm conducted deflection testing activities and material sampling activities on various dates throughout September 2011. While testing and sampling activities took place, various photographs were taken. In addition, we walked a significant portion of the subject test sections of Highway 50 to better understand the conditions, general trends and refine our overall recommendations. We did this during daylight hours as it is sometimes difficult to evaluate visual clues and conditions during nighttime hours, wherein a majority of the testing and sampling took place.

As directed by Blackburn Consulting, Associated Engineering Consultants, Inc. (AEC) tested various sections of Highway 50, in both the eastbound and westbound direction between Latrobe Road and the Bass Lake Road using a DYNAFLECT deflection device. Within the subject sections, we focused on the common shoulder areas approximately 3 to 5 five lateral of the fog line. The subject sections of Highway 50 typically were determined to be in good condition. Deflection measurements were taken at 100 foot intervals which exceeds the minimum requirement of data points by over a factor of two. While twenty (20) asphalt-concrete (AC) cores are listed in the core log, there were a total of 22 cores extracted at distinct locations. (Two core locations were aborted due to excessive fracturing of the core.) Cores of an atypical length were suspected to be "plug" type repairs, where during a previous period of construction and/or rehabilitation, a soft section of sub-grade may have been replaced by full-depth AC pavements. The AC cores extracted revealed that there were only two shoulder locations where a pavement fabric interlayer had been used. Six distinct soil samples were also collected at several locations and have been inventoried for future use if required by BCI.

Normally, all structural requirements and recommendations for the overlay designs are based on the 10-year design traffic indexes. However, the deflection levels are such there is no overlay requirement.

In addition to the recommendations and dialogue found within this report, you will find hard copies of our deflection data presented in a scatter plot format, as well as material sampling data and various photographs. These were included as a matter of record and to better understand the data and conclusions we have reached.

The recommendations are based on the deflection data collected by Associated Engineering Consultants, Inc., the materials sampled, tested and inventoried by Associated Engineering Consultants, Inc., and the information supplied by Caltrans, Blackburn Consulting, etc. Our recommendations are based on the testing methodologies as outlined by the California Department of Transportation, sound engineering practices, historical data, experience as practicing engineers, etc. Should Blackburn Consulting or any other party with a vested interest wish to supply further information which may influence the ways by which we can analyze and make recommendations for the subject sections of Highway 50, we would encourage the respective parties to present said information.

Furthermore, should you or any other parties associated with this project have any questions or comments, please contact us at your earliest convenience.

Respectfully yours,
ASSOCIATED ENGINEERING CONSULTANTS, INC.

A Jones

Andrew Jones
Project Engineer

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
BRUCE G. HOWARD
No. 054216
Exp. 12-31-11
CIVIL
STATE OF CALIFORNIA

Bruce Howard, P.E.
President

Recommendations

The following is a set of recommendations based on the deflection data, physical conditions as visually noted in the field, twenty distinct core samples (as inventoried) of the AC pavements at various locations and an evaluation and sampling of the base materials while on site. Stationing is approximate, and moves from east to west and west to east. Station 66+00 is at the western limits of the subject section of Highway 50 and is near the Latrobe Road under-crossing. Station 137+50 corresponds with the eastern limits that lie within the westbound lanes of Highway 50 and as depicted on the corresponding plan set.

A Traffic Index of 13.5 was supplied to AEC, and hence used in our various calculations. Furthermore, the DYNAFLECT deflection device used was calibrated at the annual Caltrans calibration event held in Marysville, California.

Associated Engineering Consultants, Inc., reserves the right to amend the findings and recommendations contained herein pending additional information supplied to our firm.

Eastbound Highway 50; Lane – East Bound Shoulder
Station 68+77 to Station 128+25 (Latrobe UC to "Bass Lake Grade")

Using a Traffic Index of 13.5, this section of Highway 50 commands an AC overlay requirement of 0.00'.

Considering the newly refurbished condition of the subject section of road, there are no recommendations for an AC overlay at this time.

Westbound Highway 50; Lane – West Bound Shoulder
Station 137+42 to Station 69+11 ("Bass Lake Grade" to East of Latrobe)

Using a Traffic Index of 13.5, this section of Highway 50 commands an AC overlay requirement of 0.00'.

Considering the newly refurbished condition of the subject section of road, there are no recommendations for an AC overlay at this time.

General Discussion

Normally, a report of this nature generally dedicates a page or more to each subject section of road. Typically, there is a dialogue giving direction pertaining to the treatments necessary prior to the placement of an AC overlay. Alternatives are also cited as appropriate.

With regard to these two subject sections of road, the lack of AC overlay requirement suggests that the shoulder areas are performing in a manner similar to a new or nearly new road. Deflection levels were lower in comparison to the data collected in 2007 within the number 1 and 2 lanes of common traffic. But, considering the fact that the shoulder sections have essentially no traffic, this condition is to be expected. Further note that it is conceivable that the freshly placed AC (open gap graded top lift) is masking the true levels of deflection to some extent. However, considering the lack of traffic, and our ability to compare the recently collected data with data collected several years ago on a surface consisting of dense graded AC, we are of the opinion that such a masking effect would be minimal.

Assuming an R-value of 25 or greater and a Traffic Index of 13.5, one would expect a section of 7.5 inches of AC over 22 inches of aggregate base for a new design. All coring locations revealed this to be the case, with the exception of core location twelve. This is even taking into account the fact that the top 1.0" to 1.2" of open gap graded AC has no structural value. Location twelve has an ample base section. It is the AC section that is slightly "lean" in terms of thickness for a new section.

If no improvements were being taken into consideration, our recommendations would be limited to doing nothing until the next maintenance cycle or existing conditions command maintenance and/or rehabilitation.

It is conceivable that due to changing geometrics, cold milling will be required to essentially mate the prescribed Silva Valley Parkway improvements with Highway 50. It would be typical for the open gap graded material to be milled away as it typically does not have a structural value (in terms of design value) and cannot receive an AC overlay. An additional 0.17 to 0.25 feet might be milled away such that a sufficient lift of dense grade AC might be placed. Thereafter, the new pavements can receive the placement of an open gap graded material to assist drainage.

Rubberized AC materials should be considered, if feasible. Feasibility is typically driven by cost, the availability of subsides, etc. However, one advantage to a rubberized product is that it lowers noise levels resulting from traffic.

Conclusion

In summary, the pavements that are in place are performing as intended and for all practical purposes, have been designed properly in terms of the structural section one would anticipate and/or prescribe.

Should Blackburn Consulting or any other parties having a vested interest have questions or comments, or require any additional information, we would invite them to contact us at their earliest convenience.

DYNAFLECT DEFLECTION DATA

ASSOCIATED ENGINEERING CONSULTANTS, INC.

DYNAFLECT ANALYSIS SOFTWARE

STREET INFORMATION

CLIENT NAME	BC	STREET	HWY 50	ROAD #	0
PROJECT NO.	11200	FROM	Highway 50	STATION	70+00
TEST DATE	9/16/2011	TO	Highway 50	STATION	100+00
ANALYSIS DATE	9/23/2011	DIR/LANE	E-S	TOTAL LANES	1
AMBIENT TEMP	60	INTERVAL	100	TESTED BY	AJ/WS

STRUCTURAL DATA

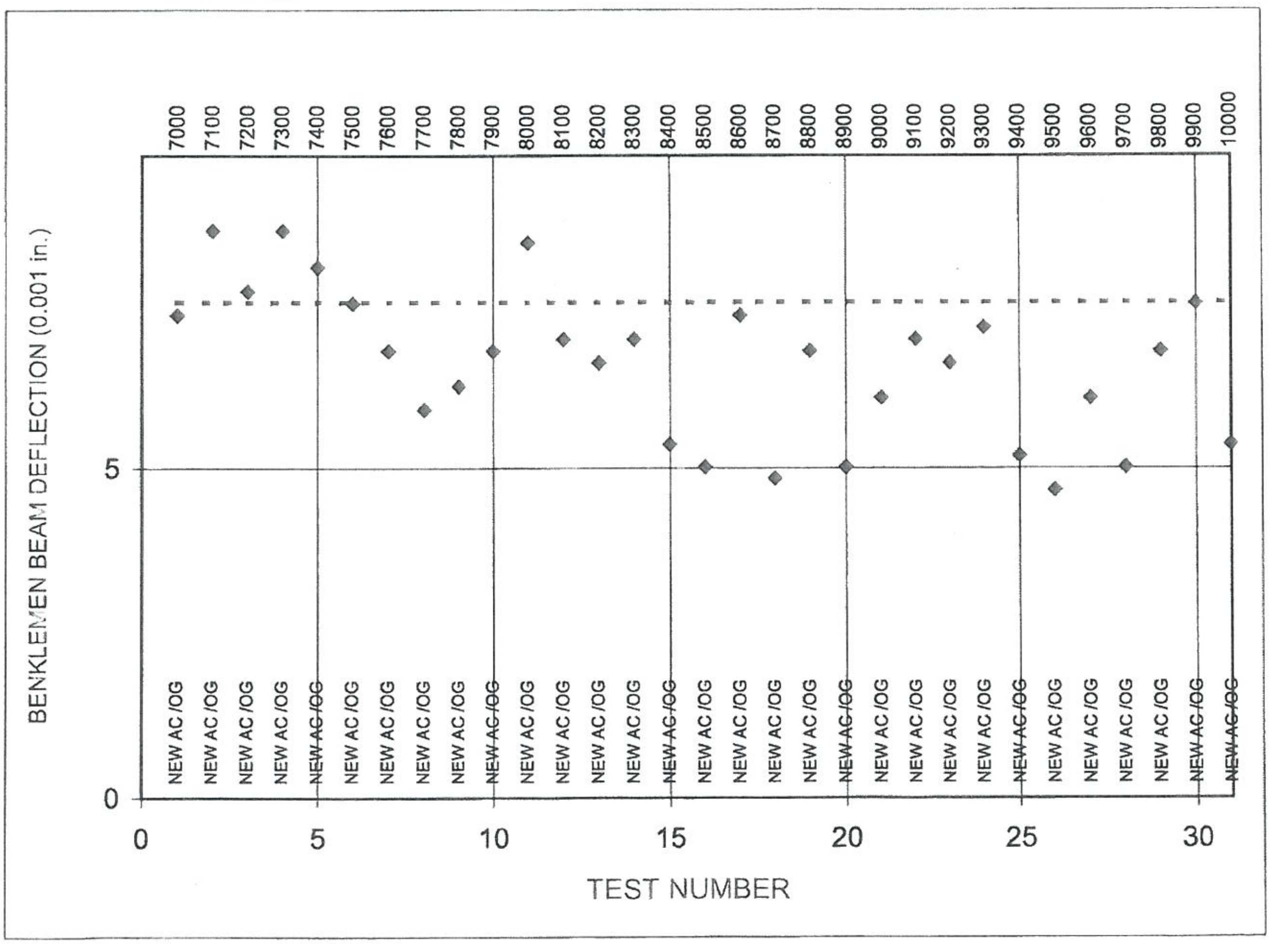
AC THICKNESS	10.6	BASE TYPE	AB	TRAFFIC INDEX	13.5	TOLERABLE DEFL.	8E-03

STRUCTURAL ANALYSIS

70% PERCENTILE	7E-03	MEAN	7E-03	MIN	5E-03	MAX	9E-03	SD	1.1E-03
80% PERCENTILE	8E-03								
90% PERCENTILE	8E-03								

OVERLAY DESIGN

DEFLECTION	8E-03	TOLERABLE	8E-03	% REDUCTION	0%	AC OVERLAY	0.00'



ASSOCIATED ENGINEERING CONSULTANTS, INC.

DYNAFLECT ANALYSIS SOFTWARE

STREET INFORMATION

CLIENT NAME	BC	STREET	HWY 50	ROAD #	0
PROJECT NO.	11200	FROM	Highway 50	STATION	101+00
TEST DATE	9/16/2011	TO	Highway 50	STATION	128+00
ANALYSIS DATE	9/23/2011	DIR/LANE	E-S	TOTAL LANES	1
AMBIENT TEMP	60	INTERVAL	100	TESTED BY	AJ/WS

STRUCTURAL DATA

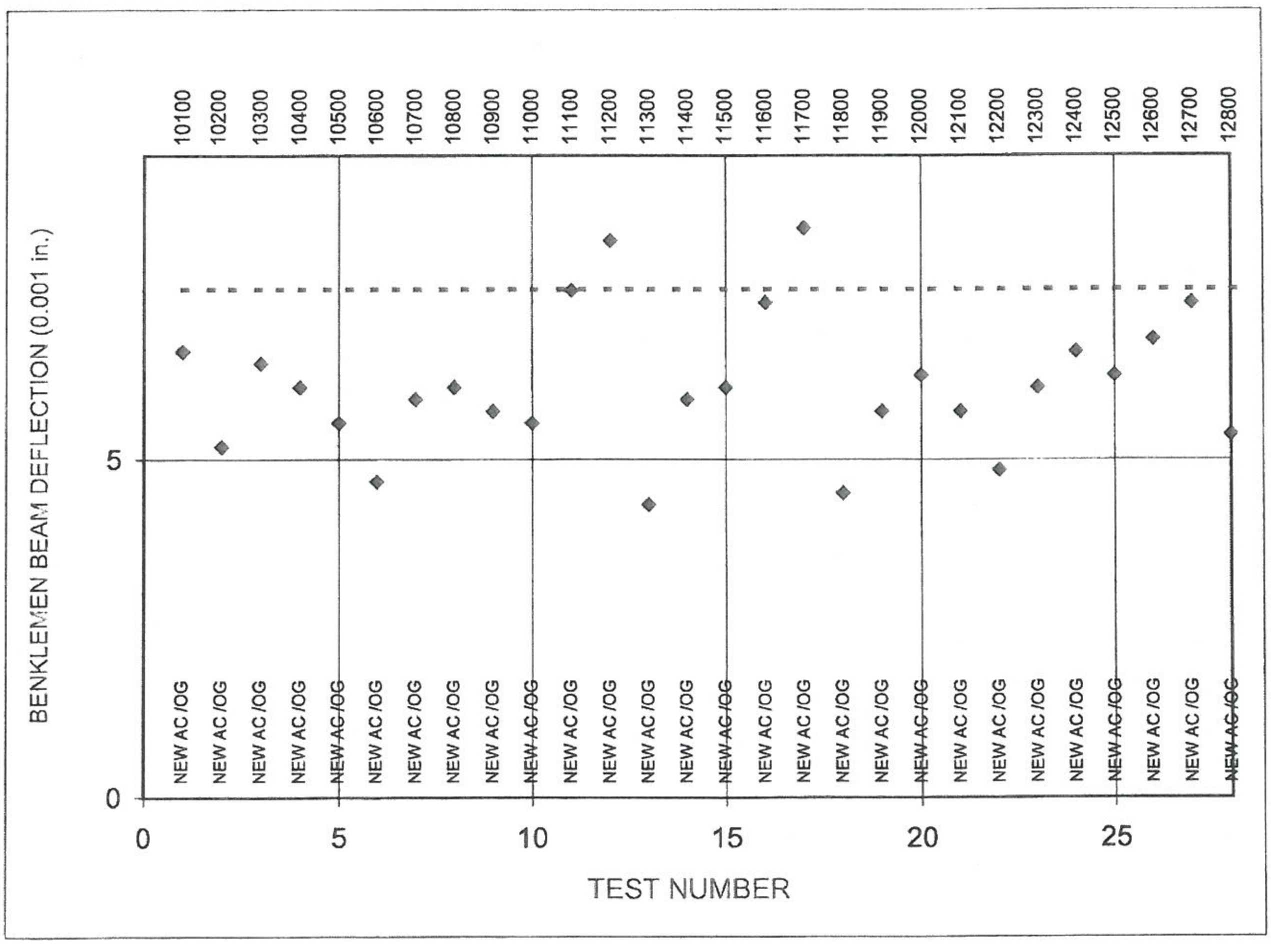
AC THICKNESS	10.6	BASE TYPE	AB	TRAFFIC INDEX	13.5	TOLERABLE DEFL.	8E-03

STRUCTURAL ANALYSIS

70% PERCENTILE	7E-03								
80% PERCENTILE	7E-03	MEAN	6E-03	MIN	4E-03	MAX	8E-03	SD	1.0E-03
90% PERCENTILE	7E-03								

OVERLAY DESIGN

DEFLECTION	7E-03	TOLERABLE	8E-03	% REDUCTION	0%	AC OVERLAY	0.00'



ASSOCIATED ENGINEERING CONSULTANTS, INC.

DYNAFLECT ANALYSIS SOFTWARE

STREET INFORMATION

CLIENT NAME	BC	STREET	HWY 50	ROAD #	0
PROJECT NO.	11200	FROM	Highway 50	STATION	137+00
TEST DATE	9/16/2011	TO	Highway 50	STATION	110+00
ANALYSIS DATE	9/23/2011	DIR/LANE	W-S	TOTAL LANES	1
AMBIENT TEMP	60	INTERVAL	100	TESTED BY	AJ/WS

STRUCTURAL DATA

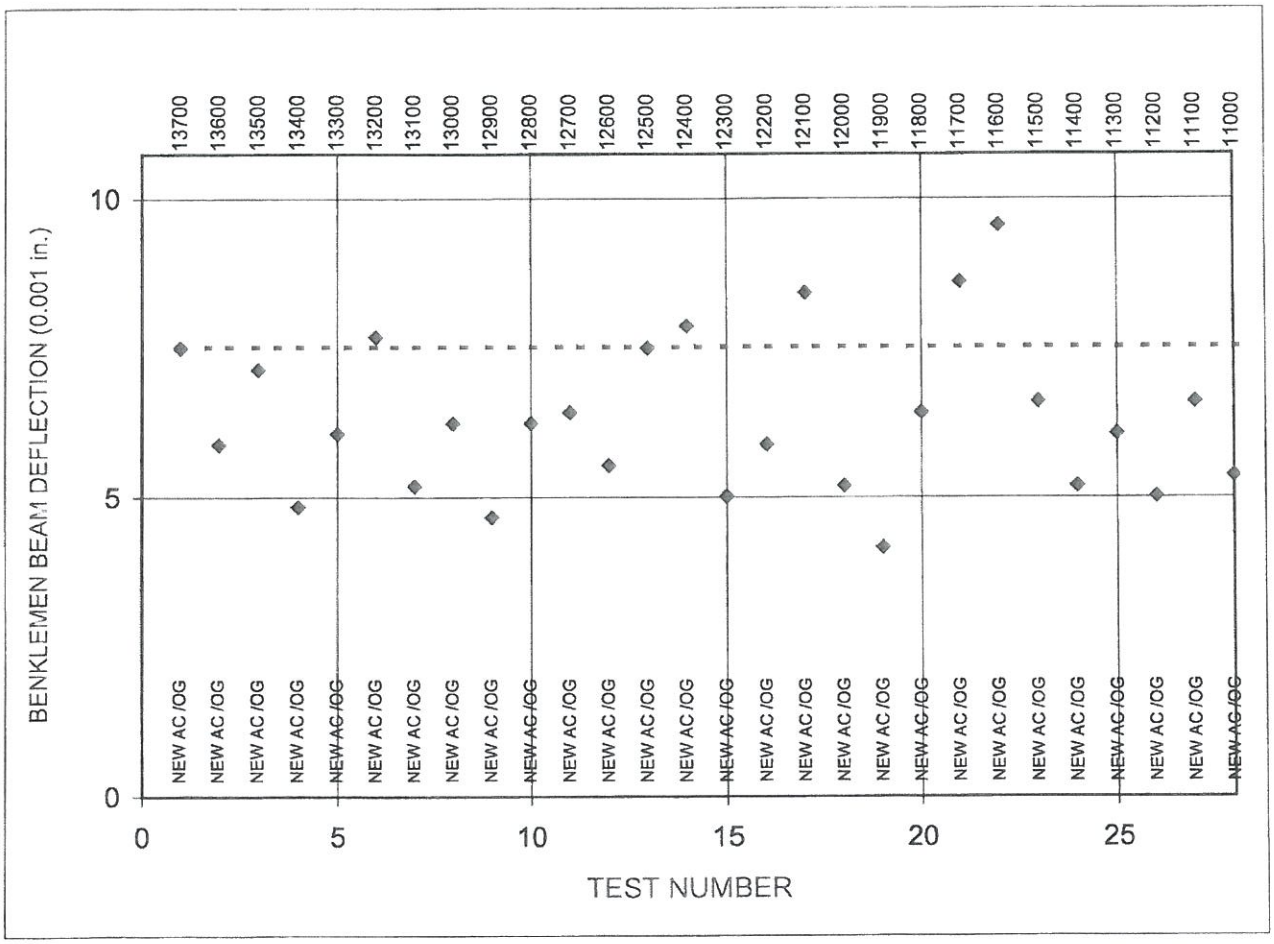
AC THICKNESS	10.6	BASE TYPE	AB	TRAFFIC INDEX	13.5	TOLERABLE DEFL.	8E-03

STRUCTURAL ANALYSIS

70% PERCENTILE	7E-03								
80% PERCENTILE	8E-03	MEAN	6E-03	MIN	4E-03	MAX	10E-03	SD	1.3E-03
90% PERCENTILE	8E-03								

OVERLAY DESIGN

DEFLECTION	8E-03	TOLERABLE	8E-03	% REDUCTION	0%	AC OVERLAY	0.00'



ASSOCIATED ENGINEERING CONSULTANTS, INC.

DYNAFLECT ANALYSIS SOFTWARE

STREET INFORMATION

CLIENT NAME	BC	STREET	HWY 50	ROAD #	0
PROJECT NO.	11200	FROM	Highway 50	STATION	109+00
TEST DATE	9/16/2011	TO	Highway 50	STATION	70+00
ANALYSIS DATE	9/23/2011	DIR/LANE	W-S	TOTAL LANES	1
AMBIENT TEMP	60	INTERVAL	100	TESTED BY	AJ/WS

STRUCTURAL DATA

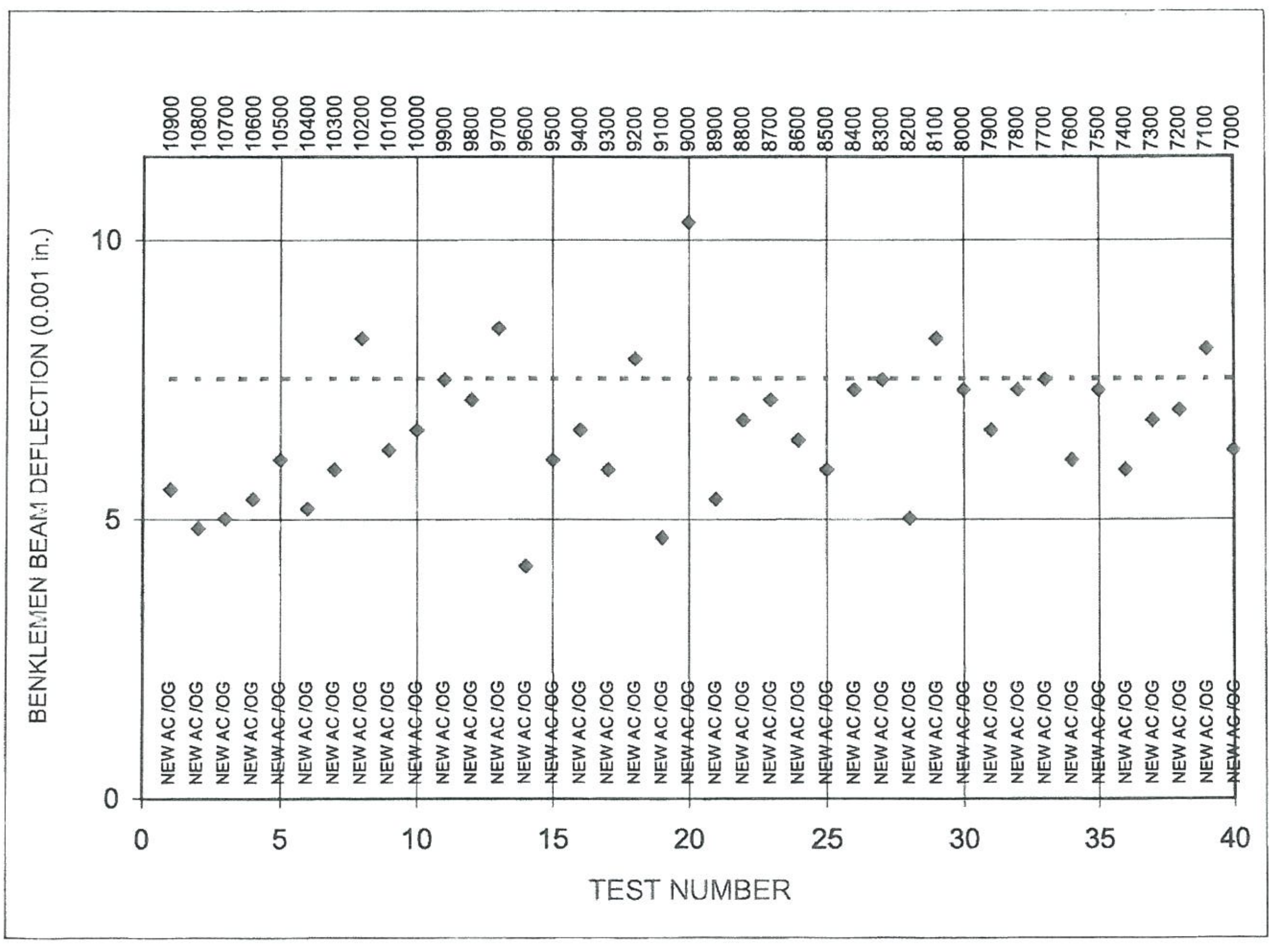
AC THICKNESS	10.6	BASE TYPE	AB	TRAFFIC INDEX	13.5	TOLERABLE DEFL.	8E-03

STRUCTURAL ANALYSIS

70% PERCENTILE	7E-03								
80% PERCENTILE	8E-03	MEAN	7E-03	MIN	4E-03	MAX	10E-03	SD	1.2E-03
90% PERCENTILE	8E-03								

OVERLAY DESIGN

DEFLECTION	8E-03	TOLERABLE	8E-03	% REDUCTION	0%	AC OVERLAY	0.00'



AC CORING LOG

AC Core Log

Materials Report, US 50 - Silva Valley Parkway Interchange, Phase I, EA 03-1E290, El Dorado County, CA

Job No. 11200

Core No.	Street	Lane	Approx. Station	Thickness (In.)	Lifts	Top Lift OG	Fabric	Base	Notes
1	Highway 50	E-SHOULDER	7100	19.5	4+	Yes (New)	No	1.0" + AB (Round)/Deep AC Plug	Deep AC Plug / Core Fractured
2	Highway 50	E-SHOULDER	7600	9.4	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
3	Highway 50	E-SHOULDER	8100	11.6	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	Fractured
4	Highway 50	E-SHOULDER	8500	13.4	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
5	Highway 50	E-SHOULDER	9100	13.8	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	Fractured
6	Highway 50	E-SHOULDER	9800	9.6	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
7	Highway 50	E-SHOULDER	10600	9.1	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
8	Highway 50	E-SHOULDER	11100	9.3	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
9	Highway 50	E-SHOULDER	11700	9.4	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	Fractured - Top Lift
10	Highway 50	E-SHOULDER	12200	11.3	4+	Yes (New)	Yes	1.0" + AB (Round/Crushed)	Fractured - Top Lift / Fabric at 3.8 inches from "Top"
11	Highway 50	W-SHOULDER	13500	9.9	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	Fractured - Top Lift
12	Highway 50	W-SHOULDER	13000	7.0	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	Fractured - Top Lift
13	Highway 50	W-SHOULDER	12500	8.7	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
14	Highway 50	W-SHOULDER	12000	10.2	4+	Yes (New)	Yes	1.0" + AB (Round/Crushed)	Fabric at 3.5 Inches from "Top" of Core
15	Highway 50	W-SHOULDER	11500	10.6	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
16	Highway 50	W-SHOULDER	11000	8.8	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
17	Highway 50	W-SHOULDER	10500	8.9	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	Fractured
18	Highway 50	W-SHOULDER	10000	10.6	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
19	Highway 50	W-SHOULDER	9500	8.7	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	
20	Highway 50	W-SHOULDER	8000	13.1	4+	Yes (New)	No	1.0" + AB (Round/Crushed)	Fractured

PHOTOGRAPHS

PHOTO 1
Pictured above is DYNAFLECT deflection device, in action, in the E2 lane of Highway 50. (Circa 2007.) Notice the surface is comprised of DGAC. (Included for historical reference.)

PHOTO 2
Pictured above is the "Control Box" for the DYNAFLECT deflection device as oriented in the tow vehicle. This pictures was taken along the same subject section of Highway 50 in 2007.

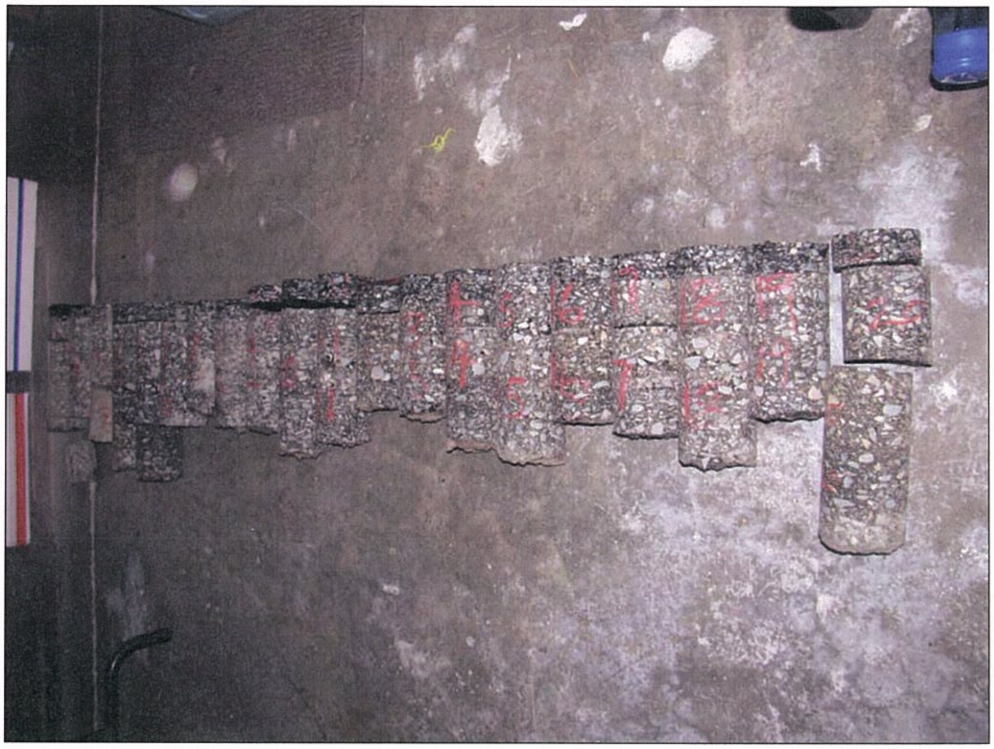


PHOTO 3

A total of 20 cores were extracted. All cores had an open gap graded AC for the top lift. Said lift was recently placed. Cores were taken at approximately 500 foot intervals.

PHOTO 4

Core 12 (circled above) had the thinnest AC section. See core log for more details.

PHOTO 5

Due to its recent placement, the top lift of AC materials had a tendency to separate from the lower lifts during coring activities.

PHOTO 6

Extracted cores revealed up to seven distinct lifts of AC pavements.

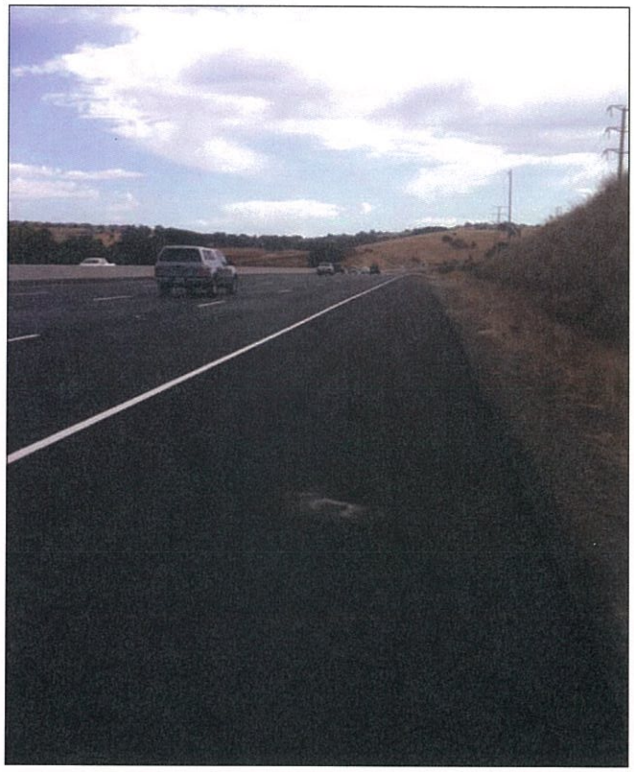


PHOTO 7
Facing eastward, the freshly rehabilitated highway makes for a good photo.

PHOTO 8
An up close shot reveals the nature of the open gap graded material.

PHOTO 9
Facing westward, the tapered of a prior overlay are visible.

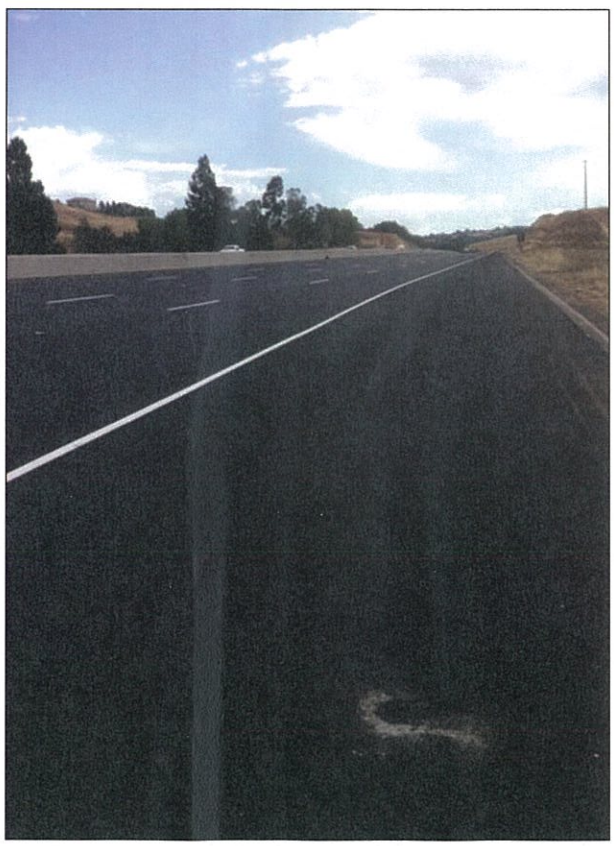


PHOTO 10
Note the core in the foreground. Coring was general done along the centerline of the existing shoulders.

Appendix C

Draft Report Comments and BCI Response

Silva Valley Parkway Interchange
65% Comment Matrix (Julia Rockenstein)
Materials

#	Sheet Name	Description	Response/Action
	Draft Materials Report		
1	Pg 9	Table 5 Westbound Aux Lane A3L line 120+00 to 126+00:Proposed Structural Section (specifically the AB thickness) is not adequate.	The AB thickness shown is 1.85 ft but should be 1.90 ft. This is corrected in the report.
2	Pg 10	Table 6 Westbound 89+00 to 96+00: Proposed new section is not adequate	This Table 6 "Existing Shoulder Pavement Summary" is removed from text. Deflection testing was completed to evaluate shoulder pavement.
	Plans		
1	Typicals	Saw cut needs to be 1' inside ETW since no deflection study has been done	Applies to Plans only. Deflection study has been completed for shoulder area
2		Per Highway Design Manual (HDM) the first 2' of shoulders greater than 5' MUST be built to mainline structural section. For constructability and future uses, Caltrans prefers the entire shoulder be built to mainline structural section. Typicals currently show a taper of structural section from ETW.	Applies to Plans only.