FINAL MATERIALS REPORT
PROPOSED REYES ADOBE ROAD BRIDGE
WIDENING OVER U.S. HIGHWAY 101
BRIDGE NO. 53-1726
AGOURA HILLS, CALIFORNIA

Kleinfelder Project No. 75010

September 26, 2007

KLEINFELDER
An employee owned company

September 26, 2007
Project No. 75010

STV Incorporated
100 Pacifica, Suite 140
Irvine, CA 92618

Attention: Mr. Tim McGrady, P.E.
Project Manager

Subject: Final Materials Report
Proposed Reyes Adobe Road Bridge Widening
Over U.S. Highway 101
Bridge No. 53-1726
Agoura Hills, California

Dear Mr. McGrady:

Kleinfelder West, Inc. (Kleinfelder) is pleased to submit this Final Materials Report for the proposed Reyes Adobe Road Bridge Widening over U.S. Highway 101, Bridge Number 53-1726, Agoura Hills, California. Our services have been performed in accordance with our agreed-upon scope of work. The authorized scope of work included field exploration, laboratory testing, geotechnical engineering analyses, and report preparation. This report provides geotechnical design and construction recommendations for proposed pavement structural sections, corrosion potential, and materials. Review comments by Caltrans dated July 19, 2007 have been incorporated into this Final Materials Report. Geotechnical recommendations for the bridge structure, embankments, and other elements of the project are included in separate Final Foundation and Geotechnical Design Reports.

We appreciate the opportunity to provide geotechnical and environmental services to you on this project and trust the information in this report meets the current project needs. If there are any questions, please contact the undersigned.

Respectfully submitted,

KLEINFELDER WEST, INC.

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1 INTRODUCTION

1.1 GENERAL

The City of Agoura Hills proposes to widen the existing two-lane Reyes Adobe Road Bridge over the U.S. Highway 101 (Bridge No. 53-1726) located in the City of Agoura Hills, California. The location of the site is shown in Figure 1, Site Location Map and the proposed layout is shown in Figure 2, General Plan. The proposed widening will be designed generally in accordance with current Caltrans standards.

Our services have been performed in accordance with our agreed-upon scope of work. The authorized scope of work included field exploration, laboratory testing, geotechnical engineering analyses, and report preparation. This report provides geotechnical evaluation and recommendations regarding the pavement structural sections and corrosion potential in accordance with current Caltrans Standard Plans and Specifications. Concurrent with this investigation, we performed a geotechnical investigation for the proposed bridge widening; the results of that investigation are provided in a separate Final Foundation Report. Recommendations for the proposed roadway embankments and earthwork are addressed in a separate Final Geotechnical Design Report (GDR). A limited Aerially Deposited Lead (ADL) study is also included in our scope and a stand-alone technical memo for this study is provided in Appendix D of our Final Foundations Report.

Review comments by Caltrans dated July 19, 2007 have been incorporated into this Final Report. Our Response Letter to Caltrans Comments is included in Appendix C.

1.2 PURPOSE AND SCOPE OF WORK

The purpose of this report is to document subsurface conditions, provide analyses of anticipated site conditions as they pertain to the project and to recommend geotechnical design and construction criteria for the proposed pavements. This report establishes a geotechnical baseline to be used by the project roadway design team in developing the project plans and specifications. The scope of work included the following tasks:

- Review of existing geotechnical and geologic data within and adjacent to the project site.

- Drilling, sampling and logging of three (3) hollow stem auger borings. Two of the borings (B-1 and B-2) were drilled at the location of the proposed bridge widening and one boring (B-3) was drilled at the locations of the northbound on-ramp and planned fill for the widening.
- Laboratory testing of selected samples to characterize the subsurface conditions.
- Engineering analyses to develop geotechnical recommendations for pavement design and corrosion assessment.
- Preparation of this report.

1.3 LIMITATIONS

This report has been prepared for STV and The City of Agoura Hills. It is intended solely for their use in the design and construction of the project as described herein. It may not contain sufficient information for other uses or purposes of other parties.

The findings, conclusions and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No other warranty, direct or implied, is made. Field exploration program was based on the project plans provided to us by STV at the time of our investigation.

The scope of our geotechnical services did not include any environmental site assessment for the presence or absence of hazardous/toxic materials in the soil, surface water, ground water or atmosphere, or the presence of wetlands.

Our evaluation of subsurface conditions at the site has considered subgrade soil and groundwater conditions present at the time of our investigation. The influence(s) of post-construction changes to these conditions such as introduction of water into the subsurface will likely influence future performance of the proposed project.

The client has the responsibility to see that all parties to the project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. This report contains information, which may be useful in the preparation of contract specifications. However, the report is not designed as a specification document and may not contain sufficient information for this use without proper modification.

This report may be used only by the client and only for the purposes stated within a reasonable time from its issuance, but in no event later than three years from the date of the report. Land or facility use, on and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold Kleinfelder harmless from any claim or liability associated with such unauthorized use or non-compliance.

2 EXISTING FACILITIES AND PROPOSED IMPROVEMENTS

2.1 EXISTING FACILITIES

Existing Reyes Adobe Road within the project limits is a north-south four lane arterial street that narrows to two lanes at the bridge structure. Existing topographic relief generally descends from North to South. The existing grade elevations at Abutment 1 and Abutment 5 are 940 feet and 930 feet respectively. Bents 2, 3 and 4 are within the depressed portion of U.S. Highway 101 and the ground surface elevations at these locations are approximately 918, feet, 916 feet, and 916 feet (above mean sea level), respectively. The existing embankment fill slopes beneath the existing bridge are moderately steep with average inclinations of approximately 1.5H:1V. The existing slopes have a flatter gradient further away from the existing bridge.

2.2 PROPOSED IMPROVEMENTS

The existing Reyes Adobe Road Bridge over the U.S. Highway 101 (Bridge No. 53-1726) was constructed in 1950 between Canwood Drive and Agoura Road in Agoura Hills, California. The existing Reyes Adobe Road Overcrossing (OC) supports one northbound lane and one southbound lane across US 101 Freeway. Currently, the Reyes Adobe Road OC is a four-span, with precast prestressed girders in spans 2 and 3, and cast-in-place / precast girders in spans 1 and 4. The length and width are 221 feet and 37.8 feet, respectively. The proposed widening will be on the west side and will consist of four-span, precast prestressed girder with intermediate and end diaphragms. The width for the widening portion will be 58.8 feet.

Based on the general plan and topographic information, the approach embankments beneath the widening near abutments 1 and 5 will require up to approximately 12 feet of fill from the existing grade, with embankment slope gradients that will match the existing gradients of approximately 1.5H:1V slope in the longitudinal direction (beneath the structure). Earthwork at the bent locations is anticipated to be nominal and limited to excavation and backfill associated with pile cap construction.

The proposed improvements require construction of new roadway widening lanes on the north side of the bridge (north of Abutment 1) and widening the existing northbound access ramps mainly on a fill embankment. Extension of existing drainage culverts on the north

side of the bridge at the base of the embankment fill is also planned. No new retaining walls are planned.

3 PREVIOUS STUDIES

The following previous data were reviewed:

- Preliminary Foundation Report, Proposed West Side Widening, Reyes Adobe Overcrossing (Bridge No. 53-1726), Agoura Hills, California, by Kleinfelder, Inc., Kleinfelder Project No. 75010, dated August 8, 2006.
- Preliminary Foundation Report (PRF), Reyes Adobe Overcrossing at US 101, Bridge No. 53-1726, Agoura Hills, California, by Group Delta Consultants (GDC), GDC Project No. I-430, dated April 2, 2004.
- As-built drawings (Including Log of Test Borings), by Caltrans, Approved April 13, 1964.

Other available maps and reports reviewed include United States Geological Survey (USGS) Quad maps and geologic data from in-house files.

4 PHYSICAL SETTING

4.1 TOPOGRAPHY AND DRAINAGE

Existing topographic relief generally descends from North to South. The existing grade elevations at Abutment 1 and Abutment 5 are 940 feet and 930 feet respectively. Bents 2, 3 and 4 are within the depressed portion of U.S Highway 101 and the ground surface elevations at these locations are approximately 918, feet, 916 feet, and 916 feet (above mean sea level), respectively. The existing embankment fill slopes beneath the existing bridge are moderately steep with average inclinations of approximately 1.5H:1V. The existing slopes have a flatter gradient further away from the existing bridge.

In general, the natural regional drainage is to the south and to the east. Locally, drainage is affected by man-made fill, ditches, storm drains and improvements.

4.2 MAN-MADE AND NATURAL FEATURES OF ENGINEERING AND CONSTRUCTION SIGNIFICANCE

Placement of new embankment fill for the roadways and bridge approach widenings may impact the existing buried utility lines and other improvements by causing settlements due to weight of the fill. The design engineers should evaluate the impacts of embankment loading and resulting settlements on the buried utilities and other existing improvements. Plans for protection or relocation of these facilities may be required.

4.3 REGIONAL GEOLOGY

The project site is located in the city of Agoura Hills in the western portion of Los Angeles County and within the southwestern portion of the Transverse Ranges Geomorphic province of California. The Transverse Ranges consist of generally east-west trending mountains and valleys, which contrast with the overall north-northwest structural trend elsewhere in the state. The anomalous structure of the Transverse Ranges is attributed to the effects of compressive deformation (crustal shortening), generated by north-south convergence along the big bend of the San Andreas fault (Yerkes, 1987) north of the San Gabriel Mountains and the motion of the Pacific Plate. The valleys and mountains of the Transverse Ranges are typically bounded by a series of east-west trending, generally north dipping reverse faults with left-lateral, oblique movement.

5 GEOTECHNICAL INVESTIGATION PROGRAM

The geotechnical investigation program consisted of field exploration and laboratory testing as discussed below.

5.1 FIELD EXPLORATION

The subsurface conditions at the location of the proposed widening were investigated by Kleinfelder on January 3, 2007 by drilling three hollow stem auger borings (B-1, B-2, and B-3). Borings B-1 and B-2 were drilled near the locations of Bents 2 and 4, respectively. One boring (B-3) was also drilled on the northbound ramp paving area. Borings B-1 through B-3 were drilled using a 8-inch diameter hollow- stem auger drilling system by Jet Drilling to depths of approximately 31 to 46.5 feet. The approximate boring locations are shown in Figure 3, Plot Plan. The boring logs are presented in Appendix A.

In the borings, soil samples were taken at approximately 5-foot intervals, to the maximum depth explored, with either a Standard Penetration Test (SPT) sampler or a California Modified split spoon sampler. All samples were stored and transported to our laboratory for testing. The soils from the test borings were visually classified in the field by a Kleinfelder staff engineer in general accordance with the Unified Soil Classification System per ASTM D-2488. Field classifications and boring logs were revised as necessary based on laboratory test results and the review of a registered Geotechnical Engineer. At the conclusion of drilling, the borings were abandoned by backfilling with cement-bentonite grout.

Three shallow hand auger borings (Borings HB-1 through HB-3) were also excavated to obtain samples for analytical testing which is included in Appendix D of our Final Foundation Report.

5.2 LABORATORY TESTING

Laboratory tests were performed on selected samples to characterize the soils and to develop index and engineering properties of the soils. The tests performed are indicated on the Logs of Borings, which are presented in Appendix A. A detailed description of the laboratory testing program and test results are presented in Appendix B. Laboratory tests performed consisted of:

- In situ moisture content and dry density, ASTM D-2937
- Atterberg limits (liquid limit and plastic limit), ASTM D-4318
- Grain size distribution test, ASTM D-422-63/CT-202/203
- Wash analysis (fines content or % passing #200 sieve), ASTM D-1140
- Direct shear test, ASTM D-3080
- Consolidation test, ASTM D-2435/CT-219
- Corrosivity tests (pH, sulfates, chlorides and electrical resistivity), CT-532/643/417/422
- R-Value

6 GEOTECHNICAL CONDITIONS

6.1 SITE GEOLOGY

The Reyes Adobe Road OC over US Highway 101 is located in a pass within Lindero Canyon. The site is located in the Santa Monica Mountains of the Transverse Range Geomorphic Province of California. At the interchange of the Reyes Adobe Road with US 101 Freeway, the surficial materials consist of younger alluvium (silts and clays). An outcrop of basalt that correlates to the Conejo Volcanics of the Santa Monica Mountains is observed on the southern side of the Reyes Adobe Road OC. Outcrops of shaley claystones and siltstones, of the Topanga Formation, are exposed on the north side of the bridge. At depth, basalt and/or sedimentary units of the Conejo Volcanics or the Topanga Formation may be encountered.

6.2 SUBSURFACE CONDITIONS

Generally, the subsurface materials encountered consisted of compacted fill underlain by alluvium and bedrock. Bedrock was encountered in borings B-1 through B-3 at depths of approximately 19, 22, and 29 feet, respectively (corresponding to elevations 897, 894 and 895 feet). The top of bedrock appears to descend steeply from Abutment 1 location towards the Bent 2 location and then gradually between the Bent 2 location to Abutment 5 location. Past grading at this location appeared to involve excavations, fills and cut slopes to achieve existing grades.

The materials encountered across the site generally consist of previously placed compacted fill material (Qf), underlain by alluvium, and by bedrock. The compacted fill consists generally of silty sand and silty clay. The Alluvium (Qa) generally consists of stiff to very stiff sandy clay and dense silty sand with some gravel. The bedrock consists of claystone and siltstone of the Upper Topanga Formation Bedrock. The bedrock is thinly bedded. The alluvium/bedrock contact appears to deepen abruptly between Abutment 1 and Bent 2. Near and between Bents 2 through 4 and Abutment 5, alluvium/bedrock contact deepens gently.

Generalized cross sections A-A' and B-B' are presented in Figure 4.

6.3 GROUNDWATER CONDITIONS

Groundwater was encountered in Boring B-2 at a depth of approximately 19 feet below grade (or approximate elevation 897). Groundwater was not encountered within borings B-1 and B-3 to a maximum depth of approximately 36.5 and 46.5 below the ground surface, respectively. The groundwater was encountered approximately 3 feet above bedrock within the silty sand alluvium material. The as-built LOTBs with borings from June 1962 reported groundwater approximately at elevations 891 feet to 894 feet. For our design, we used a groundwater level at an elevation of 897 feet at each support location.

Groundwater may fluctuate due to seasonal variation, nearby construction, irrigation, and numerous other man-made and natural influences.

6.4 PROJECT SITE SEISMICITY

6.4.1 Ground Motion

The project site is located in a seismically active region. Based on the Caltrans latest Seismic Hazard Map (1996), the controlling fault for the Reyes Adobe Road OC is the Malibu Coast-Santa Monica-Hollywood-Raymond (MMR) fault, with a closest distance of approximately 11 km. The MMR is a reverse/oblique (RO) fault and could generate a moment magnitude of 7.5 for the maximum credible earthquake (MCE). The Chatworth/S (CWS) and Chatworth/N (CWN) Faults, with a MCE magnitude of 6.25 and 6.5, are located with a closest distance of about 8 and 10 km, respectively; their type of faulting is unknown as defined in the technical report to accompany the Caltrans 1996 Seismic Hazard Map. According to the latest Caltrans Seismic Hazard Map (1996), the peak bedrock acceleration (PBA) at the site is within the contour zone of 0.4g and 0.5g. According to Caltrans Practice, a PBA value of 0.5g should be used. Based on the Caltrans Guidelines for Structures Foundations (2006), the PBA value ascertained from the Seismic Hazard Map shall be verified with Sadigh et al. (1997) attenuation relationship. Calculations using the Sadigh et al. (1997) attenuation relationship for the controlling fault MMR indicated a PBA of 0.49g.

6.4.2 Ground Surface Rupture

The project site is not located within one of the Fault-Rupture Hazard Zones in California designated by the California Geological Survey. No faults are mapped as crossing the site or projecting towards the site in the geologic literature reviewed. Therefore, the potential for ground surface fault rupture at the site is considered low.

7 CORROSION INVESTIGATION

Caltrans Corrosion Guidelines state that the Department considers a site to be corrosive to foundation elements, at bridge structures, if one or more of the following conditions exist for the soil and/or water samples taken at the site (Caltrans, 2003):

- Chloride concentration is greater than or equal to 500 ppm
- Sulfate concentration is greater than or equal to 2000 ppm
- pH is 5.5 or less

A representative sample of the site soils was tested to evaluate the corrosion potential of the subsurface soils. Testing included pH, sulfate content, chloride content, and minimum resistivity. The results of these tests are presented in Table 1 below.

Based on the results of the corrosion analyses, the tested material is considered non-corrosive based on above criteria. However, due to low resistivity, on-site soil may have corrosion potential for buried metal. This should be considered in the design of buried metal structures.

Table 1
Summary of Corrosion Laboratory Tests

Boring	Sample Depth (ft, bgs)	USCS Soil Type	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
B-3	2.5-5	Silty Clay (CL)	1100	7.8	14	63

Notes:
ohm-cm = ohm-centimeter; ppm = parts per million; USCS = Unified Soil Classification System

8 PAVEMENT DESIGN

Subgrade soil testing and our structural section recommendations for pavements are presented below for the widening of the Reyes Adobe Road and for the widening of the access ramps to the US 101.

8.1 SUBGRADE CAPACITY

Kleinfelder performed R-value soil subgrade testing on a representative near-surface bulk sample from the borings drilled for this project. The test results indicated an R-value of 20 for the near surface Silty Clay materials. The test results are included in Appendix B.

For structural sections to be built on imported fill, the district 7 of Caltrans specified an R-value of 15. In the embankment areas, the import material in the upper 4 feet (below the top of subgrade) should have a minimum R-value of 15 or greater.

8.2 RECOMMENDED PAVEMENT SECTIONS

8.2.1 Flexible Pavement

We evaluated the minimum flexible pavement sections for the proposed roadway widening using a design R-values of 15 and 20, and traffic index (TI) values of 12 provided by STV.

The Caltrans Highway Design Manual (September 2006) was used in developing the following recommended pavement sections. Design calculations were performed using the CalFP computer program by Caltrans (version 1.0, 2007). The recommended minimum flexible pavement sections are summarized in Table 2. The pavement sections provided in Table 2 were developed for a design life of 20 years.

The minimum width of new HMA-B for widening shall be 5 feet for achieving compaction in accordance Section 39 of the Standard Specifications. In areas where the proposed pavement approaching to curb and gutter, causing difficulties in achieving the required compaction, we recommend replacing with cub and a full gutter be placed on lean concrete treated base with the gutter having a thickness similar to a PCC pavement of 8 to 10 inches.

We understand overlay of existing asphalt pavement on Reyes Adobe Road is planned. Based on our discussions with a Caltrans representative, it is our opinion that the existing pavement may be milled 2 inches and replaced with 2 inches or more of HMA for improvement of ride quality, aesthetics, or safety provided that the remaining asphalt section after milling has a minimum thickness of 2 inches. STV should verify the existing pavement thickness and assure the above requirements are met.

Table 2
Summary of Minimum Flexible Pavement Section Thicknesses
(for embankment areas where imported fill will be in the upper 4 feet)

Location	Design R-value *	Design Traffic Index (TI)	Minimum Pavement Section (feet)
Widening on Reyes Adobe Road	15	12	**Alternative-1:** 0.60 HMA, Type B 1.00 AB, Class 2 1.20 AS, Class 4 **Alternative-2:** 1.50 Full-Depth HMA, Type B 0.35 AB, Class 3
Ramp	15	12	0.60 HMA, Type B 0.60 LCB 1.15 AB, Class 3

Notes:
HMA = Hot Mixed Asphalt
LCB = Lean Concrete Base
AB = Aggregate Base
AS = Aggregate Subbase

8.2.2 Rigid Pavement

A review of the pavement issues at the ramp terminus indicates that there will be some small areas of existing PCC pavement which need to rebuild / replace based on an R-value of 15 and a TI value of 12. The following pavement sections are recommended:

Rigid Pavement
0.85' PCC
0.40' LCB
0.60' AB

Legend: PCC = Portland Cement Concrete
LCB = Lean Concrete Base
AB = Class 3 Aggregate Base

9 MATERIAL SOURCES

Fill will be required for the proposed embankments at the abutments and on the west side of Reyes Adobe Road, North of the existing OC. Since grading is anticipated to occur before foundations and bridge widening construction, it will be necessary to import borrow material for the fill embankment. Other construction materials such as aggregates, asphalt, Portland cement, and fly ash should also be imported from local commercial sources. No potential import fill material sources have been pre-tested for this project. Prior to import, materials testing should be performed and approved by the Geotechnical Engineer and the District Materials Engineer prior to being brought to the site.

Suppliers for the construction materials can be found on the internet at: http://www.thebluebook.com.

A current listing of mining operations eligible to sell materials to the State of California can also be found on the internet at:
http://www.consrv.ca.gov/omr/index.htm.

10 CONSTRUCTION CONSIDERATIONS

10.1 CONSTRUCTION ADVISORIES

The anticipated settlement waiting periods after the completion of embankment fill should be taken into consideration. Construction of pavements and other permanent structures should not start until the required settlement criteria are met. For pavement areas, the residual (remaining) differential settlement should not exceed 2 inches over a distance of 200 feet, provided that final grade after settlement meets drainage requirements.

During excavations, erosion and surficial sloughing may occur. Excavations during wet seasons will require erosion protection. The contractor should be aware of water pollution control work as defined in by Caltrans Standard Specifications.

10.2 PRECONSTRUCTION SURVEY AND CONSTRUCTION MONITORING

Prior to any site work, excavations and fill placement, conditions of existing structures and improvements should be surveyed and photo/video documented. A survey of all structures and improvements that are to be left in place which are within a distance equal to the height of embankments or two times the height of the excavations (or shoring) should be prepared prior to start of construction and monitored during construction.

Final Project Plans and Specifications should be reviewed by a geotechnical engineer prior to construction to confirm that the full intent of the recommendations presented in the Materials Report have been applied to the design and that the recommendations presented are applicable to the final scope of the project.

Following review of Plans and Specifications, sufficient and timely observation during construction should be performed to correlate findings of the investigation with actual subsurface conditions exposed during the construction.

10.3 CONTAMINATED SOIL AND GROUNDWATER CONSIDERATIONS

Evaluation of potentially contaminated soils or groundwater was not part of this scope of work.

10.4 DIFFERING SITE CONDITIONS

Soil and groundwater conditions were observed and interpreted at the exploration locations only. This information was used as the basis of analyses and recommendations provided herein. Conditions may vary between the exploration locations and seasonal fluctuations in the groundwater level may occur due to variations in rainfall and local groundwater management practices. If conditions encountered during construction differ from those described herein, our recommendations may be subject to modification.

11 RECOMMENDATIONS AND SPECIFICATIONS

11.1 GRADING AND EARTHWORK

All grading and earthwork activities should be performed in accordance with the applicable portions of Section 19 of Caltrans Standard Specifications and recommendations contained in this report.

11.1.1 Clearing and Grubbing

Debris, organic material or other unsuitable material should be removed and disposed of in accordance with Sections 16 and 19-2.02 of Caltrans Standard Specifications, or the material can be removed and delivered to an approved sanitary landfill.

11.1.2 Remedial Grading

After clearing and stripping, undocumented fills, concrete and rubble piles, and loose/soft or wet soils along the alignment should be removed. The thickness of unsuitable subgrade soils is generally expected to range from 12 inches to 2 feet; however, locally, deeper removals may be required. The exposed surface should be proof-rolled with loaded heavy equipment. Areas of loose or yielding soils should be overexcavated and recompacted. Soils that cannot be compacted, or are otherwise unsuitable for the planned use, should be excavated and disposed of. Soft and wet subgrade conditions will most likely be encountered during removal operations, requiring soil stabilization.

11.2 MATERIAL SPECIFICATIONS

All engineered fill to be used in general embankment areas should be free of organic and other deleterious debris, a well-graded soil with maximum dimension of 4 inches, essentially non-plastic (liquid limit less than 30, plasticity index less than 12), with less than 50 percent passing the No. 200 sieve, and an Expansion Index (EI) of less than 50. In general, well-graded mixtures of gravel, sand, and non-plastic silt and clay meeting the above requirements are acceptable for use as engineered fill in general embankment areas. It should be noted that as the percentage of fines (% passing No. 200 sieve) increases, the magnitude of in-fill settlement and the settlement duration (waiting period) will increase.

Structure backfill should conform to Section 19-3.06 of Caltrans Standard Specifications. All structure backfill (including fill placed behind walls) should be placed in thin, loose lifts; moisture-conditioned, and compacted to Caltrans Standard Specifications (Section 19-5.03). Ponding and jetting should not be allowed.

In the proposed pavement areas, the upper 4 feet of embankment fill (below top of subgrade) should consist of soils exhibiting a minimum R-value of 15 or greater.

Recommended structural pavement materials should conform to the specified provisions in the Caltrans Standard Specifications including grading and quality requirements, shown below:

- Aggregate Base (AB) should be either Class 2 or Class 3 whichever is recommended and should conform to Sections 26-1.02A and 26-1.02B, respectively, of the Standard Specifications.

- Hot Mixed Asphalt (HMA) for pavement should be Type B and conform to Section 39 of the Standard Specifications. Asphalt concrete specimens should be tested for surface abrasion in accordance with California Test Method 360.

11.3 PAVEMENT AREAS

11.3.1 Subgrade Compaction

Structural pavement sections within the State right-of-way should be compacted to a minimum of 95 percent in accordance with Section 19-5.03 "Relative Compaction (95 Percent)" of Caltrans Standard Specifications and Section 614.6 of the Caltrans Highway Design Manual. This compaction criteria applies in the upper 32 inches of materials below finished grade for the width of the traveled way or widening plus 3 feet on each side within the State right-of-way, or to a depth of 1 foot below top of subgrade for pavement sections outside of the State right-of-way. All materials and placement should conform to Caltrans Standard Specifications and the Caltrans Highway Design Manual.

12 REFERENCES

American Society for Testing Materials (ASTM). Annual Book of Standards. Soil and Rock. Vol. 04.08. 1997.

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Caltrans Standard Specifications. 2006.

Caltrans Guidelines for Structures Foundation Reports, March 2006.

Caltrans Seismic Design Criteria, Version 1.4. June 2006.

Caltrans, As-built drawings (Including Log of Test Borings), by Caltrans, Approved April 13, 1964.

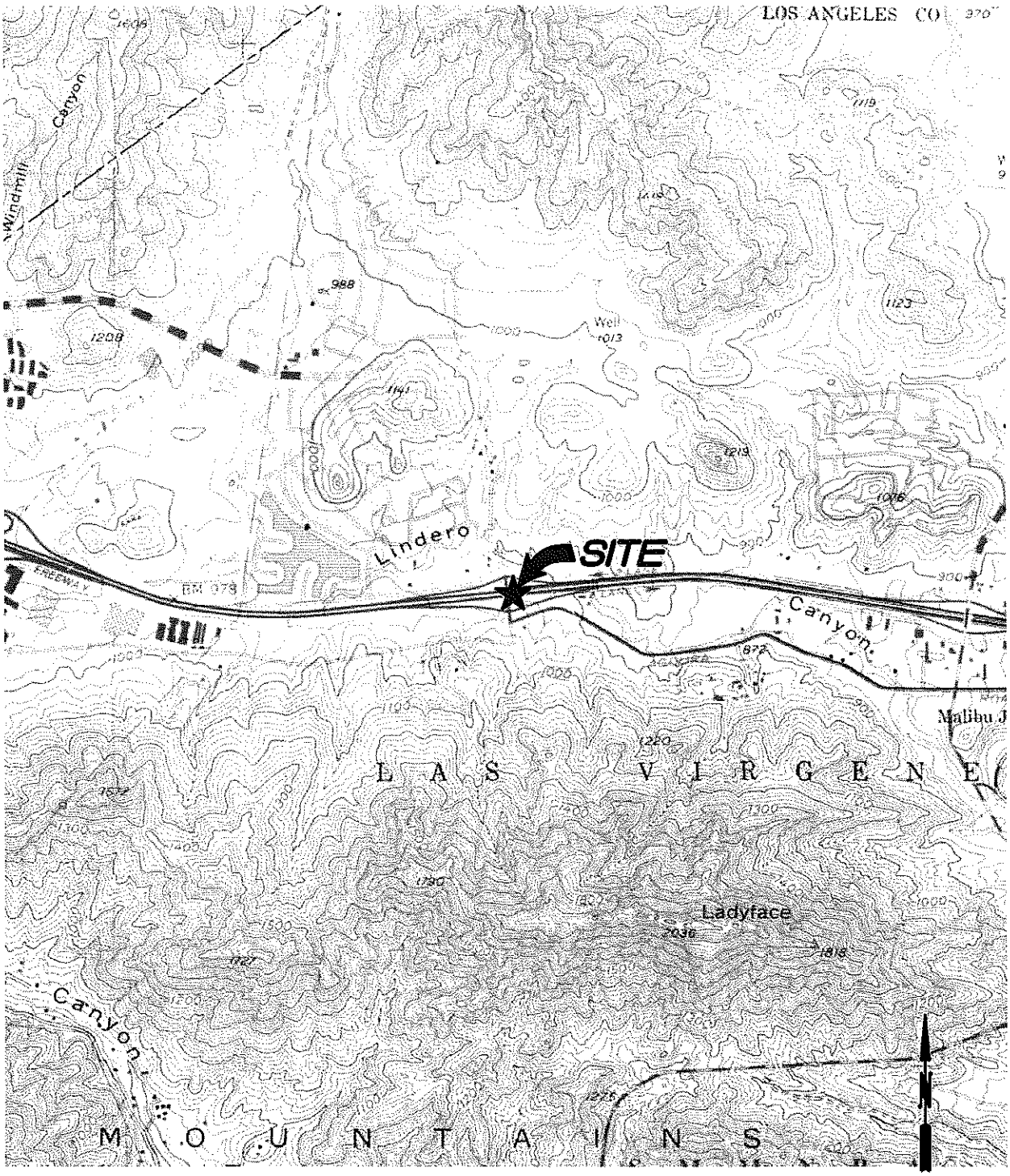
Preliminary Foundation Report, Proposed West Side Widening, Reyes Adobe Overcrossing (Bridge No. 53-1726), Agoura Hills, California, by Kleinfelder, Inc., Kleinfelder Project No. 75010, dated August 8, 2006.

Preliminary Foundation Report, (PRF), Reyes Adobe Overcrossing at US 101, Bridge No. 53-1726, Agoura Hills, California, by Group Delta Consultants (GDC), GDC Project No. 1-430, dated April 2, 2004.

Sadigh, et al. Attenuation relationships for Shallow Crustal Earthquakes Based on California Strong Motion Data, Seismological Research Letters, Vol. 68, No. 1, pp. 180-189. 1997.

State of California Department of Conservation Division of Mines and Geology (CDMG). Fault Rupture Hazard Zones, Special Publication 42. 1997b.

FIGURES



SOURCE: U.S.G.S. 7.5' topographic series, Agoura Hills, California quadrangle dated 1950, photorevised 1981.

ATTACHED IMAGES: Images: 75010p1.jpg
ATTACHED XREFS:
DB-L:\2007\CADD CAD FILE: L:\2007\CADD\75010\ LAYOUT: Layout2

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SITE LOCATION MAP

REYES ADOBE ROAD
101 FREEWAY AND REYES ADOBE INTERCHANGE
AGOURA HILLS, CALIFORNIA

DRAWN BY:	D. FAHRNEY
REVISED BY:	D. FAHRNEY
CHECKED BY:	J. KEMPTON
FIGURE	1

DRAWN: 05/29/07	APPROVED BY:_____	PROJECT NO. 70510	FILE NAME: 75010p1.dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
07	LA	101	36.1/36.3		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

Timothy J. McGrady No. 45968 Exp. 12-31-08 CIVIL — REGISTERED PROFESSIONAL ENGINEER — 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.

CITY OF AGOURA HILLS
30001 LADYFACE COURT
AGOURA HILLS, CALIFORNIA 91301

STV INCORPORATED
1055 WEST 7TH STREET, SUITE 3150
LOS ANGELES, CALIFORNIA 90017

Sta. 8+49.67± PVC
-0.376% Elev. 939.13±

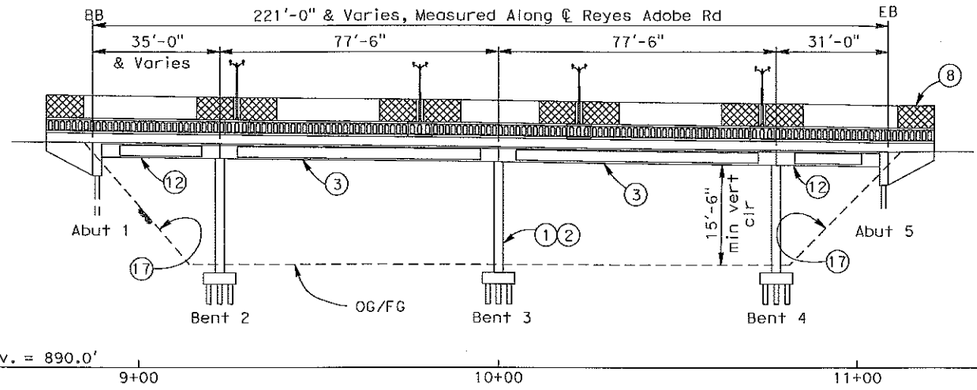
350' VC R/C = -1.230% ± per Sta.

Sta. 11+99.67± PVT
Elev. 930.28±

-4.68%

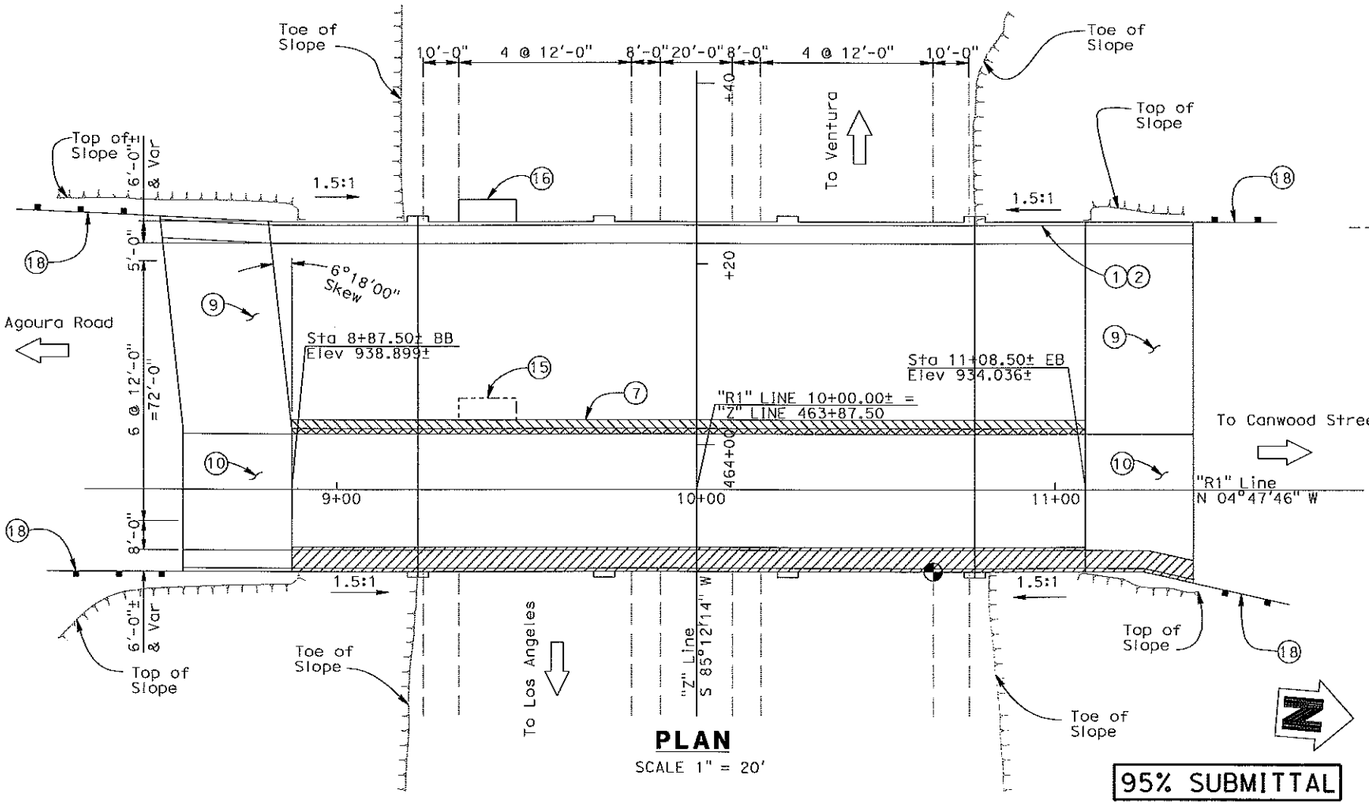
EXISTING PROFILE GRADE

No Scale



MIRRORED ELEVATION

SCALE 1" = 20'



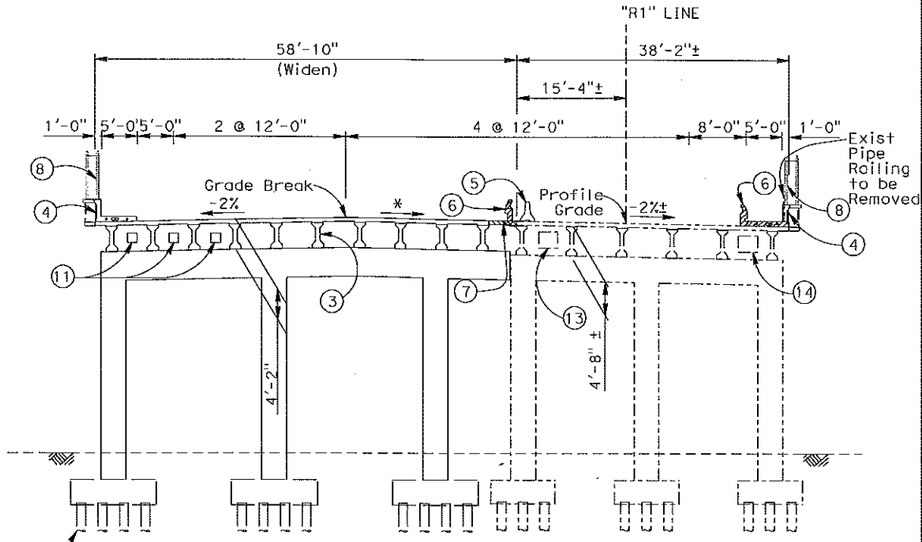
PLAN

SCALE 1" = 20'

95% SUBMITTAL

LEGEND:

- INDICATES LIMITS OF CONCRETE & RAILING REMOVAL
- INDICATES CLOSURE POUR
- INDICATES EXISTING STRUCTURE
- INDICATES NEW STRUCTURE



TYPICAL SECTION

SCALE 1" = 10'
(Typical for Span 2 & 3, See Note 3)
(For Spans 1 & 4, See Note 12)

NOTES

1. PAINT "REYES ADOBE RD. OC (Widen)"
2. PAINT "BRIDGE NO. 53-1726"
3. PC/PS GIRDER WITH INTERMEDIATE AND END DIAPHRAGMS. TYPICAL FOR SPANS 2 AND 3. SEE "TYPICAL SECTION No. 2" FOR DETAILS
4. CONCRETE BARRIER TYPE 26 MOD
5. TEMPORARY RAILING TYPE K. FOR LOCATIONS, SEE "STAGE CONSTRUCTION DETAILS" SHEET AND "ROAD PLANS"
6. EXISTING TYPE 1 BARRIER RAILING TO BE REMOVED
7. CLOSURE POUR (3'-11")
8. CHAIN LINK RAILING TYPE 7 MOD
9. STRUCTURE APPROACH SLAB TYPE N (30D)
10. STRUCTURE APPROACH SLAB TYPE R (30D)
11. FUTURE UTILITY OPENING
12. CAST-IN-PLACE CONCRETE RECTANGULAR T-BEAM. TYPICAL FOR SPAN 1 AND 4. SEE "TYPICAL SECTION No. 1" SHEET FOR DETAILS.
13. EXISTING RECLAIMED WATERLINE
14. EXISTING PACIFIC TELEPHONE AND TELEGRAPH CO. UTILITY
15. REMOVE EXISTING BRIDGE MOUNTED SIGN
16. BRIDGE MOUNTED SIGN
17. SLOPE PAVING (FULL SLOPE)
18. METAL BEAM GUARD RAIL, SEE "ROAD PLANS"

◒ INDICATES POINT OF MINIMUM VERTICAL CLEARANCE

* MATCH EXISTING GRADE

Figure 2

Lily Sun	DESIGN	BY Susan Michalski	CHECKED Wellington Chu	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 53-1726
DESIGN OVERSIGHT	DETAILS	BY Wellington Chu	CHECKED Susan Michalski	LAYOUT	BY Susan Michalski / CHECKED Wellington Chu	Wellington H. Chu PROJECT ENGINEER	POST MILES 36.1/36.3
X SIGN OFF DATE	QUANTITIES	BY Susan Michalski	CHECKED Wellington Chu	SPECIFICATIONS	BY Susan Michalski / PLANS AND SPECS COMPARED W. Chu		REYES ADOBE ROAD OC (WIDENING) GENERAL PLAN

DESIGN GENERAL PLAN SHEET (ENGLISH) (REV. 2/25/05)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 07-274
EA 240201

FILE => $REQUEST

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) 05/31/07 09/05/07

SHEET 1 OF 25

DATE PLOTTED => $DATE TIME PLOTTED => $TIME USERNAME => &USER

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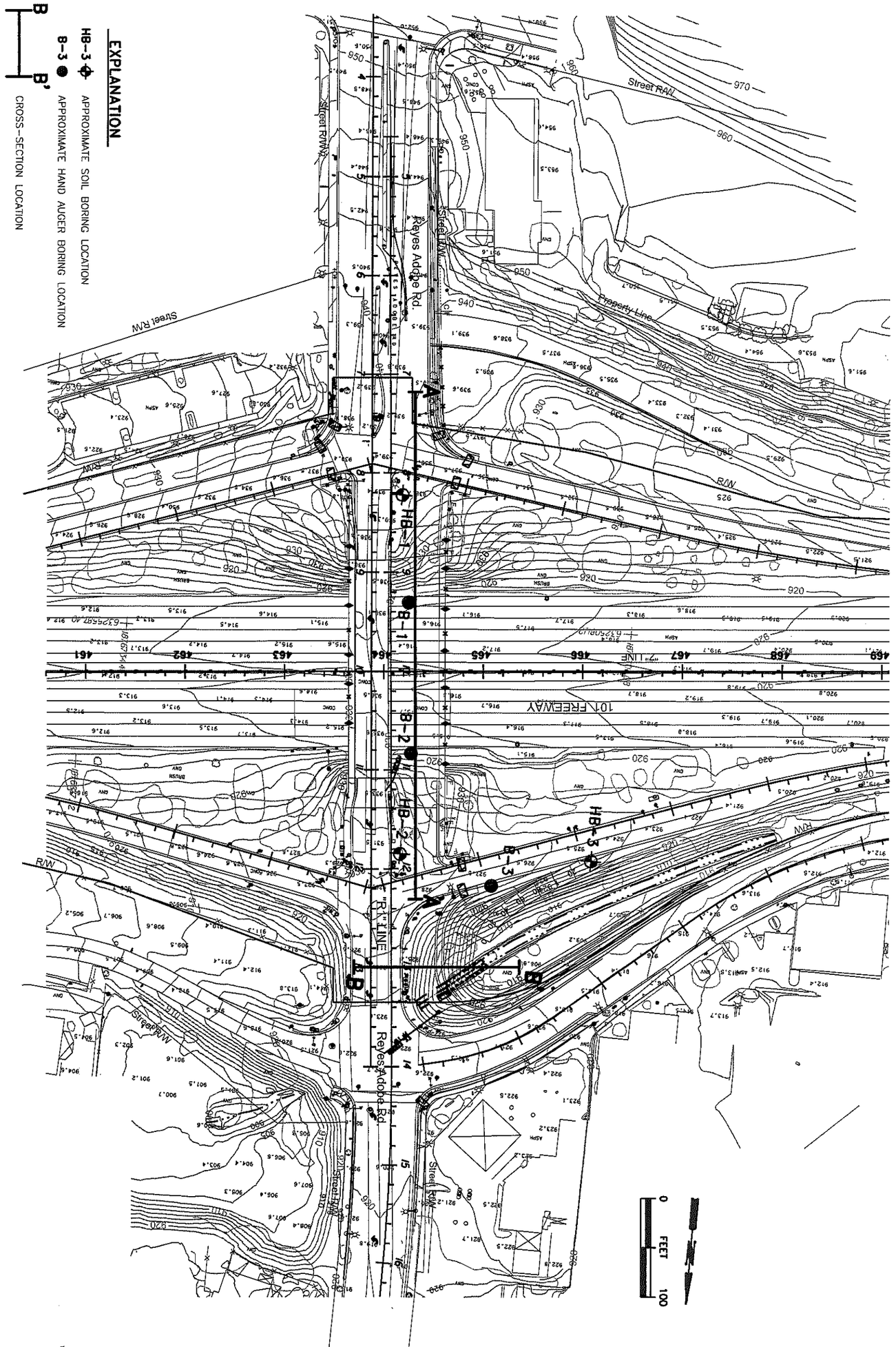
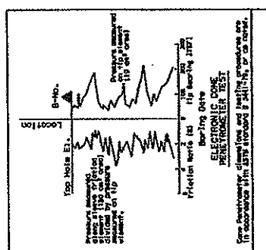
ATTACHED XREFS:
DB-L:\2007\CADD

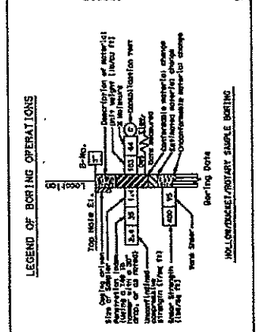
CAD FILE: L:\2007\CADD\75010\Reyes_Adobe_Civil_Sheets\ LAYOUT: Layout1



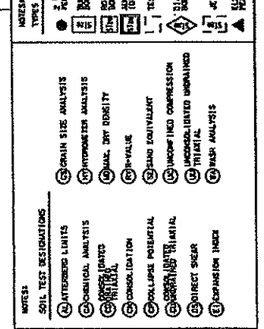
DRAWN BY: D. FAHRNEY	**PLOT PLAN**	KLEINFELDER	FIGURE
REVISED BY: D. FAHRNEY			
CHECKED BY: J. KEMPTON	REYES ADOBE ROAD 101 FREEWAY AND REYES ADOBE INTERCHANGE AGOURA HILLS, CALIFORNIA	6430 Variel Avenue, Suite 103 Woodland Hills, CA 91367 PH. (818) 226-6900 FAX. (818) 226-6910 www.kleinfelder.com	3
DATE: 05/10/07 APPROVED BY:	PROJECT NO. 75010 FILE NAME: 75010p3.dwg		

PLOTTED: 29 May 2007, 1:34pm, dfahrney





LEGEND OF BORING OPERATIONS



NOTES:

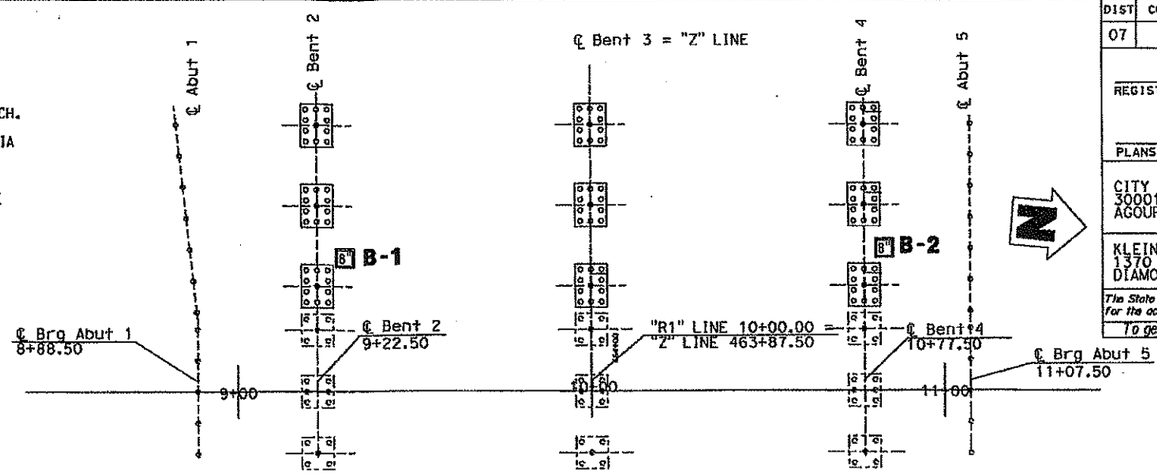
1. 1.4 INCH DIAMETER SAMPLES WERE TAKEN USING A STANDARD PENETRATION TEST (SPT) SPLIT BARREL SAMPLER WITH AN INSIDE DIAMETER (ID) OF 1.4 INCH AND AN OUTSIDE DIAMETER (OD) OF 2 INCH.

2. 2.4 INCH DIAMETER RING SAMPLES WERE TAKEN USING A CALIFORNIA (MODIFIED) SPLIT BARREL SAMPLER WITH AN ID OF 2.4 INCH AND AN OD OF 3.27 INCH.

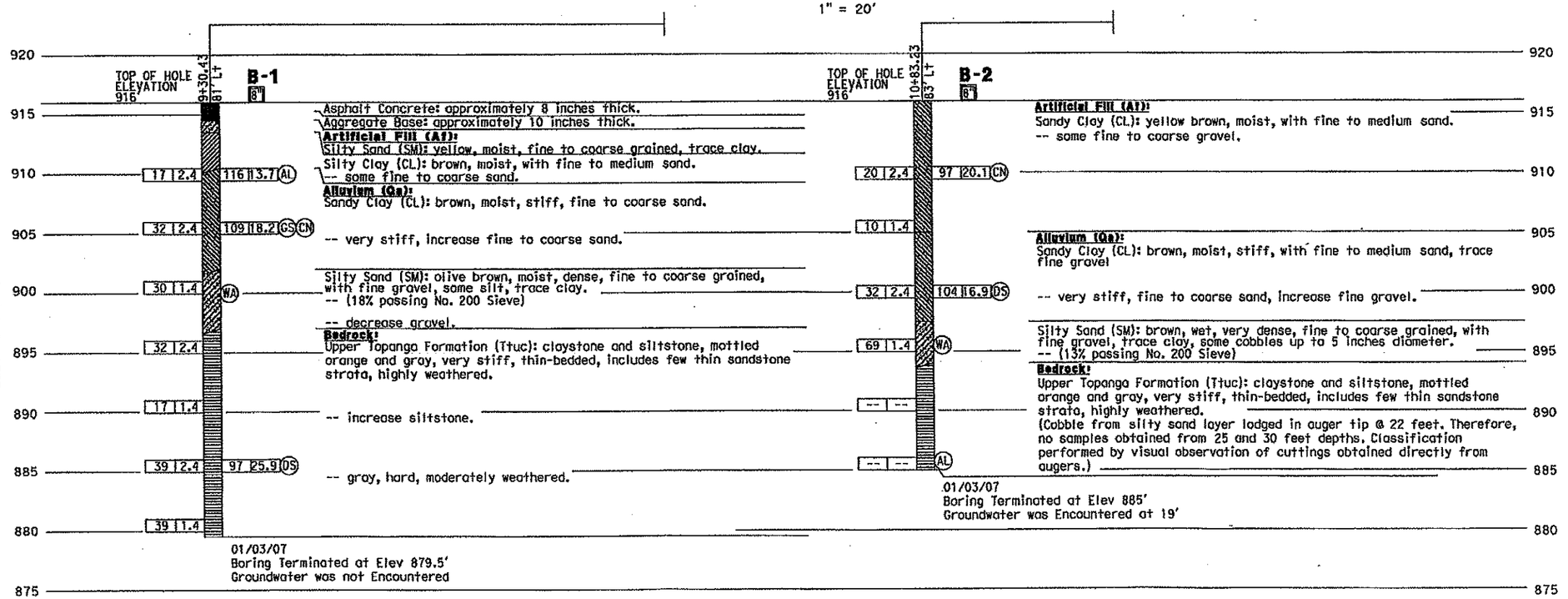
3. AN ABOVE-HOLE AUTOMATIC HAMMER SYSTEM WAS USED TO ADVANCE THE DRIVE SAMPLERS. (140 LB HAMMER, 30-INCH DROP)

BENCHMARK:

LA County BM ID#11278 Cal-Trans Disc in SE Corner Bridge over 101 Freeway 24 inches E/O CF 23 feet E/O Reyes Adobe MKD (101-005 1994)
Elev. 939.056



PLAN
1" = 20'



PROFILE
Horiz 1:20
Vert 1:5

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
07	LA	101	36.1		

5/24/07
REGISTERED CIVIL ENGINEER DATE

REGISTERED GEOTECHNICAL ENGINEER
JUSTIN J. KEMPTON
No. GE2385
exp. 09/30/07
STATE OF CALIFORNIA

PLANS APPROVAL DATE

CITY OF AGOURA HILLS
30001 LADYFACE COURT
AGOURA HILLS, CALIFORNIA 91301

KLEINFELDER INC.
1370 VALLEY VISTA DRIVE, SUITE 150
DIAMOND BAR, CALIFORNIA 91765

FIGURE 4A

LILY SUN DESIGN OVERSIGHT X SIGN OFF DATE	DRAWN BY D. FAHRNEY	M. JANOUSEK STAFF ENGINEER FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	THOMAS E. SARDO PROJECT ENGINEER	BRIDGE NO. 53-1726 POST MILE 36.1
	CHECKED BY J. KEMPTON	DATE: 01/03/07			REYES ADOBE ROAD OC (WIDENING)
					LOG OF TEST BORINGS

OSF GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 2/28/05)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 07
EA 240204
FILE => &REQUEST

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET 19 | OF 20

USERNAME => &USER
DATE PLOTTED => &DATE
TIME PLOTTED => &TIME

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
07	LA	101	36.1		

5/24/07
REGISTERED CIVIL ENGINEER DATE

REGISTERED GEOTECHNICAL ENGINEER — JUSTIN J. KEMPTON — No. GE2385 — Exp. 09/30/07 — STATE OF CALIFORNIA

PLANS APPROVAL DATE

CITY OF AGOURA HILLS
30001 LADYFACE COURT
AGOURA HILLS, CALIFORNIA 91301

KLEINFELDER INC.
1370 VALLEY VISTA DRIVE, SUITE 150
DIAMOND BAR, CALIFORNIA 91765

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NOTES:

1. 1.4 INCH DIAMETER SAMPLES WERE TAKEN USING A STANDARD PENETRATION TEST (SPT) SPLIT BARREL SAMPLER WITH AN INSIDE DIAMETER (ID) OF 1.4 INCH AND AN OUTSIDE DIAMETER (OD) OF 2 INCH.
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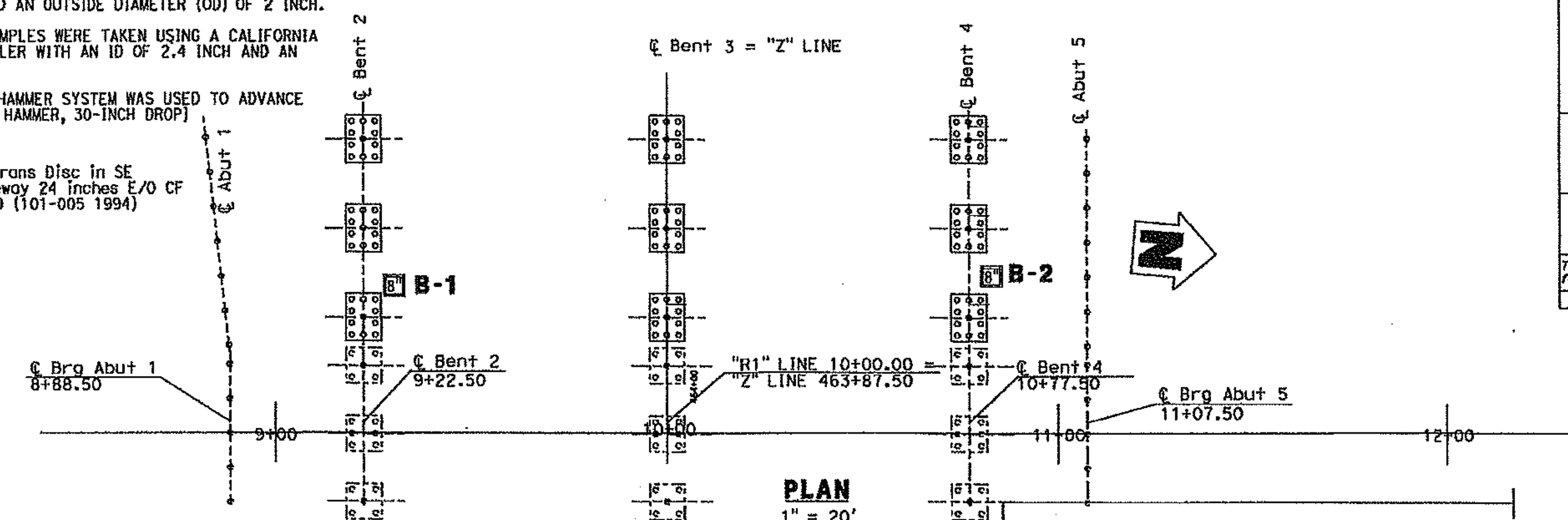
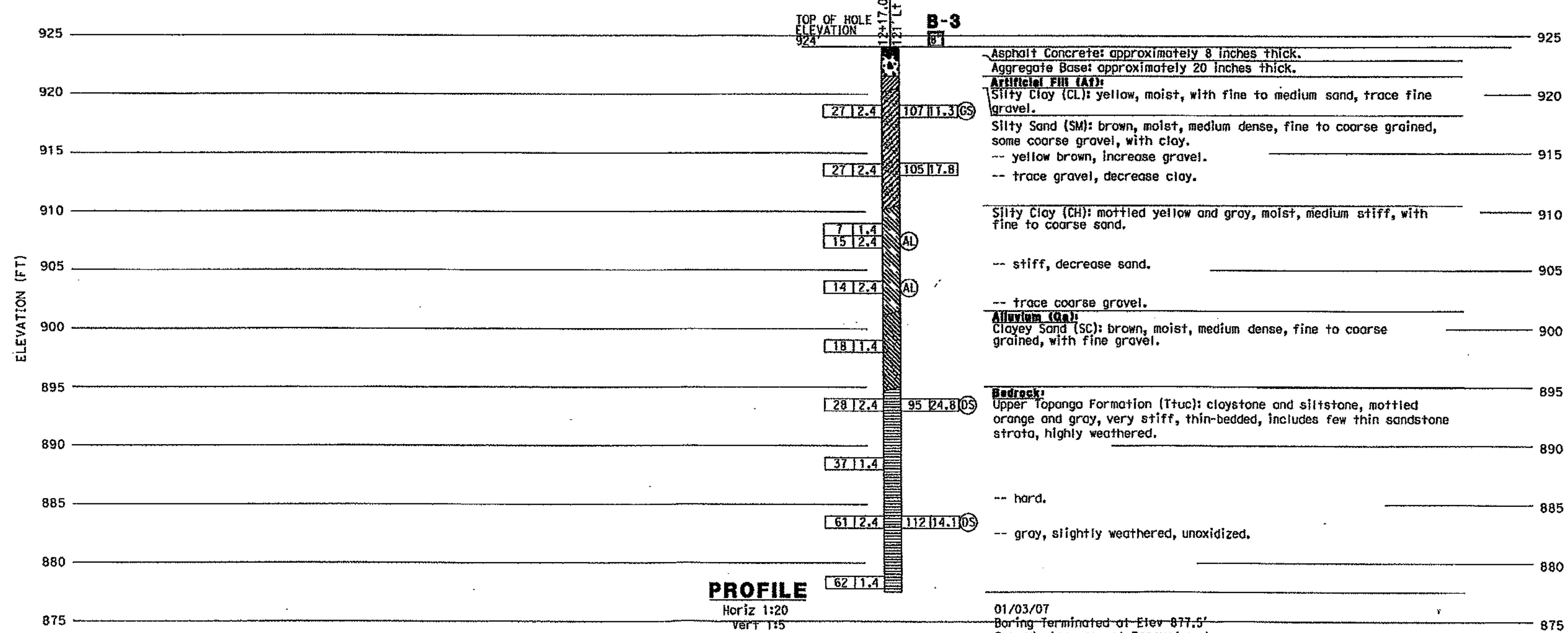
BENCHMARK:

LA County BM ID#11278 Cal-Trans Disc in SE Corner Bridge over 101 Freeway 24 inches E/O CF 23 feet E/O Reyes Adobe MKD (101-005 1994)
Elev. 939.056

B-3



PLAN
1" = 20'



PROFILE
Horiz 1:20
Vert 1:5

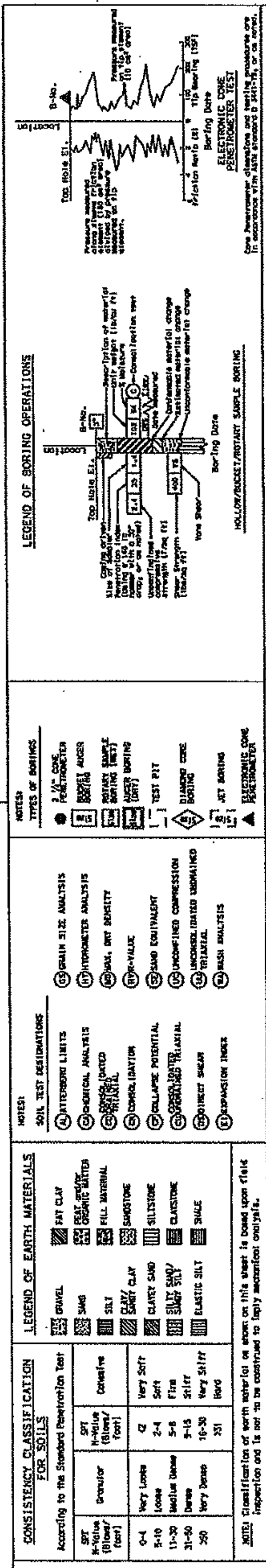


FIGURE 4B

LILY SUN DESIGN OVERSIGHT	DRAWN BY: D. FAHRNEY	M. JANOUSEK STAFF ENGINEER FIELD INVESTIGATION BY: DATE: 01/03/07	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
X SIGN OFF DATE	CHECKED BY: J. KEMPTON		THOMAS E. SARDO PROJECT ENGINEER

BRIDGE NO. 53-1726
POST MILE 36.1

REYES ADOBE ROAD OC (WIDENING)

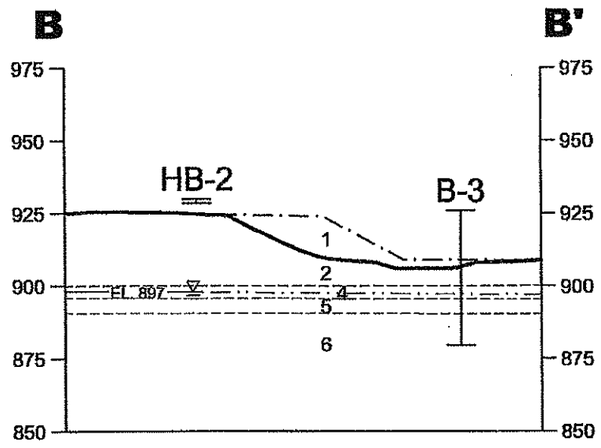
LOG OF TEST BORINGS

CU 07
EA 240204

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

SHEET 19 OF 20



LAYER NO.	MATERIAL NAME
1	NEW FILL
2	OLD FILL
3	ALLUVIUM (CL)
4	ALLUVIUM (SM/SC)
5	BEDROCK (HIGHLY WEATHERED)
6	BEDROCK

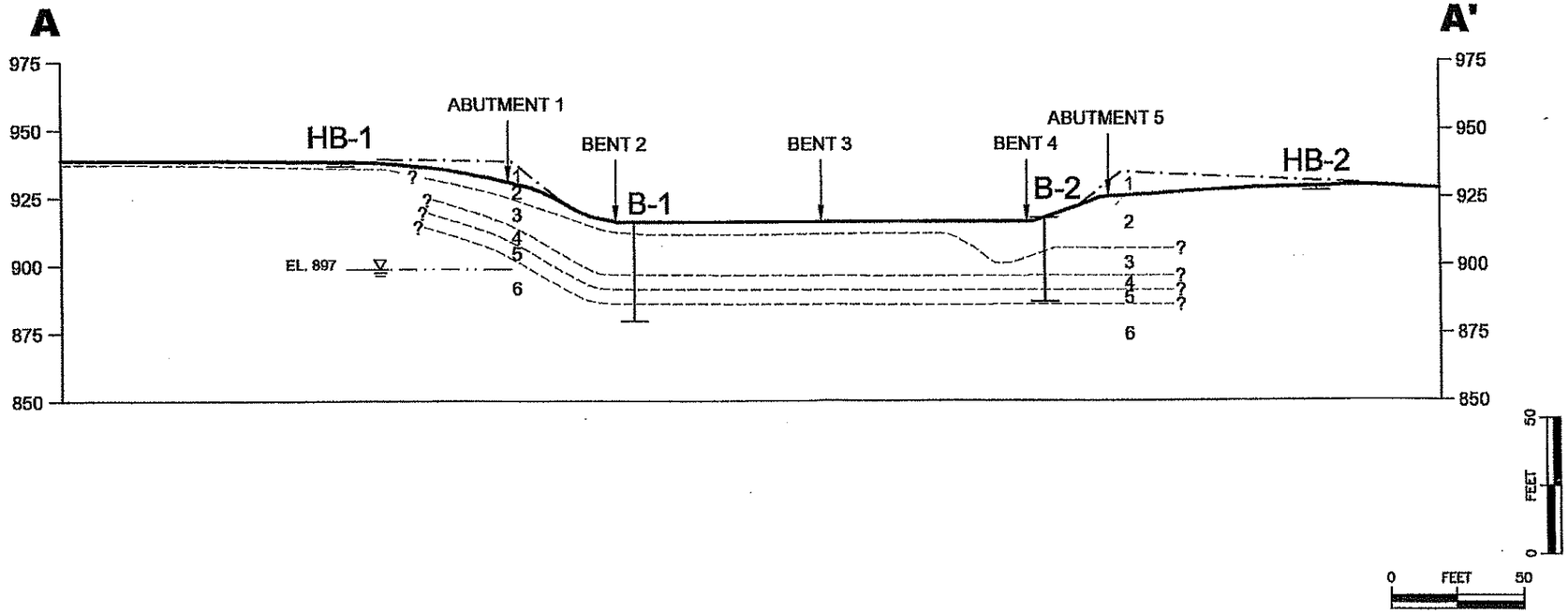


FIGURE 5

KLEINFELDER
6430 Variel Avenue, Suite 103
Woodland Hills, CA 91367
PH. (818) 226-6900 FAX. (818) 226-6910
www.kleinfelder.com

PLOTTED: 01 Jun 2007, 12:47pm, dfahrney

CAD FILE: L:\2007\CADD\75010\Reyes_Adobe_Civil_Sheets\ LAYOUT: SECTION

ATTACHED IMAGES:
ATTACHED XREFS:
DB-L:\2007\CADD

CROSS-SECTIONS A-A' AND B-B'

REYES ADOBE ROAD
101 FREEWAY AND REYES ADOBE INTERCHANGE
AGOURA HILLS, CALIFORNIA

DRAWN BY:	D. FAHRNEY	PROJECT NO.	75010
REVISED BY:	D. FAHRNEY	FILE NAME:	75010p3.dwg
CHECKED BY:	J. KEMPTON		
DATE:	05/10/07	APPROVED BY:	

ATTACHED IMAGES: Images: gdc20.bmp
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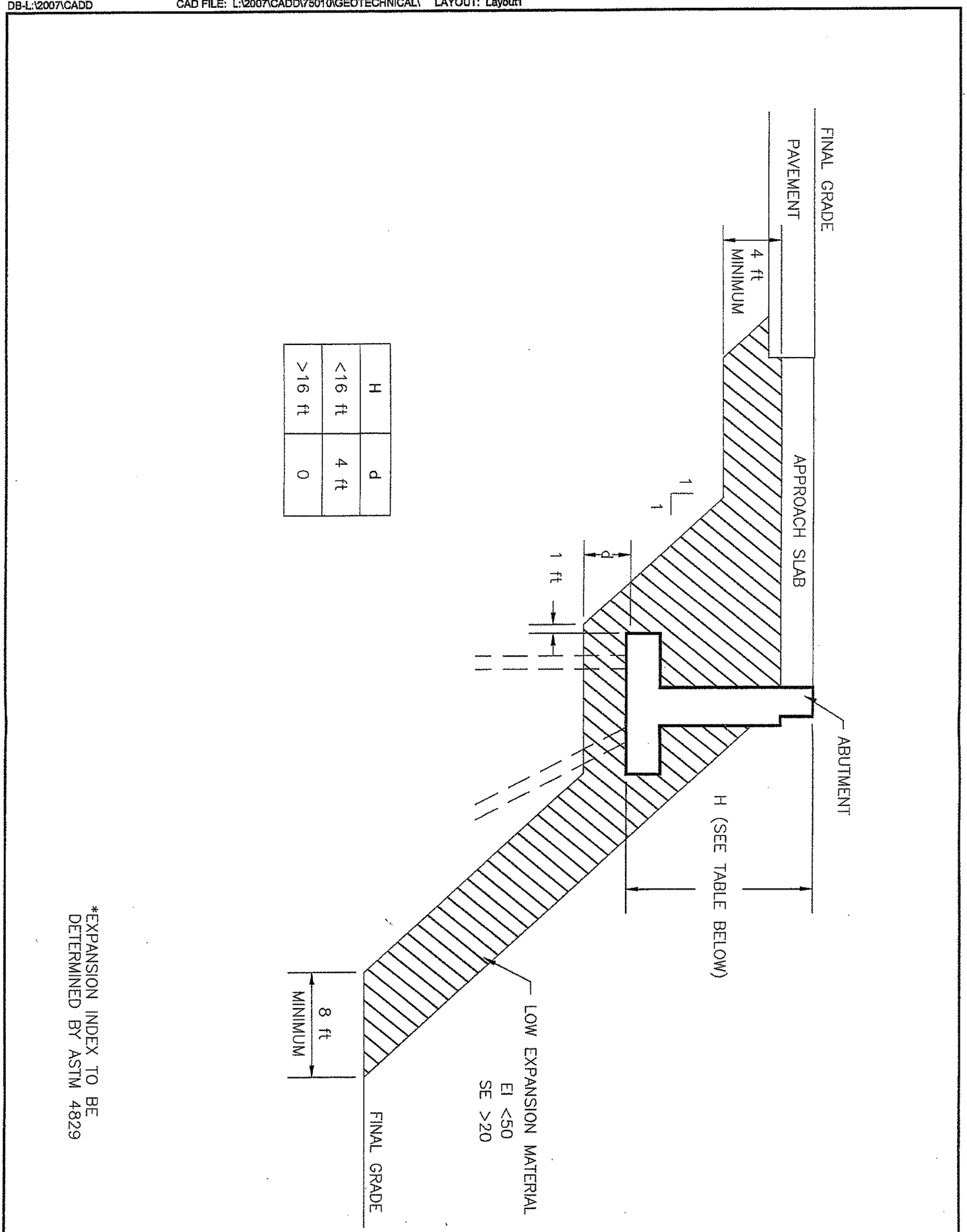


DRAWN BY: D. FAHRNEY	**EXPANSIVE SOIL EXCLUSION ZONE**	KLEINFELDER	FIGURE
REVISED BY: D. FAHRNEY			
CHECKED BY: J. KEMPTON	REYES ADOBE ROAD 101 FREEWAY AND REYES ADOBE INTERCHANGE AGOURA HILLS, CALIFORNIA	6430 Variel Avenue, Suite 103 Woodland Hills, CA 91367 PH. (818) 226-6900 FAX. (818) 226-6910 www.kleinfelder.com	6
DATE: 05/10/07 APPROVED BY:	PROJECT NO. 75010 FILE NAME: 75010p6.dwg		

PLOTTED: 01 Jun 2007, 12:40pm, dfahmey

APPENDIX A
FIELD EXPLORATION

APPENDIX A
FIELD EXPLORATION

The subsurface exploration program for the proposed bridge consisted of drilling and logging a total of 3 hollow-stem auger borings and 3 hand-auger borings. The hollow-stem borings were drilled with a CME-75, truck-mounted drill rig furnished by Jet Drilling of Signal Hill, California. Borings B-1 to B-3 were advanced to depths ranging from approximately 31 feet to 46.5 feet below existing grade on January 3, 2007. The borings were drilled through asphalt; rapid-set concrete was used to patch the holes. Borings HB-1 to HB-3 were advanced to depths ranging from approximately 1.5 to 3 feet below existing grade on January 4, 2007. All borings were backfilled with the soil cuttings when the drilling and excavating was completed. The approximate locations of the borings are shown on Plate 2.

The Logs of Borings are presented as Figures A-2 through A-7. An explanation to the logs is presented as Figure A-1. The Logs of Borings describe the earth materials encountered, samples obtained, and show field and laboratory tests performed. The logs also show the boring number, drilling date and the name of the logger and drilling subcontractor. The borings were logged by a Kleinfelder staff engineer using the Unified Soil Classification System. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual. Bulk and intact samples of representative earth materials were obtained from the borings.

A Modified California Sampler was used to obtain relatively undisturbed samples of the soil encountered. This sampler consists of a 3-inch O.D., 2.4-inch I.D. split barrel shaft that is driven a total of 18-inches into the soil at the bottom of the boring. The soil was retained in one inch brass rings for laboratory testing. An additional two inches of soil from each drive remained in the cutting shoe and was usually discarded after visually classifying the soil. The number of blows required to drive the sampler the final 12 inches is presented on the boring logs. The California sampler was driven by a 140-pound hammer with a drop height of 30 inches.

Disturbed samples were obtained using a Standard Penetration Sampler (SPT). This sampler consists of a 2-inch O.D., 1.4-inch I.D. split barrel shaft that is advanced into the soils at the bottom of the drill hole a total of 18-inches. The number of blows required to drive the sampler for final 12 inches is presented on the Logs of Borings. The SPT

sampler was driven by a 140-pound hammer with a drop height of 30 inches. Soil samples obtained by the SPT were stored in plastic ziplock bags. Bulk samples of the sub-surface soils were retrieved directly from the soil cuttings.

Date Drilled:	Water Depth:
Drilled By:	Date Measured:
Drilling Method:	Reference Elevation:
Logged By:	Datum:

Elevation (feet) Depth	Sample	Sample No.	Blow Count (Blows/ft.)	Graphic Log	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
		1	6			108	10	DS, SE
		2	12					GS
5								
	(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)
10								

NOTES ON FIELD INVESTIGATION

1. SAMPLE – Graphical representation of sample type as shown below.
   - Split Spoon – Standard Penetration Test Sample (SPT)
   - Drive Sample – California Sample (Cal)
   - Bulk Sample – Obtained by collecting cuttings in a plastic bag
   - Tube Sample – Shelby/Pitcher Tube Sample

2. SAMPLE NO. – Sample Number

3. BLOWS/FT – Number of blows required to advance sampler 1 foot (unless a lesser distance is specified). Samplers in general were driven into the soil at the bottom of the hole with a standard (140 lb) hammer dropping a standard 30 inches. Drive samples collected in bucket auger borings may be obtained by dropping non-standard weight from variable heights. When a SPT sampler is used the blow count conforms to ASTM D-1586.

   SCR/RQD – Sample Core Recovery, (SCR) in percent (%) and Rock Quality Designation (RQD) in percent (%). RQD is defined as the percentage of core in each run which the spacing between natural fractures is greater than 4 inches. Mechanical breaks of the core are not considered.

4. GRAPHIC LOG – Standard symbols for soil and rock types, as shown on plate B-1b.

5. GEOTECHNICAL DESCRIPTION

   Soil – Soil classifications are based on the Unified Soil Classification System per ASTM D-2487, and designations include consistency, moisture, color and other modifiers. Field descriptions have been modified to reflect results of laboratory analyses where deemed appropriate.

   Rock – Rock classifications generally include a rock type, color, moisture, mineral constituents, degree of weathering, alteration, and the mechanical properties of the rock. Fabric, lineations, bedding spacing, foliations, and degree of cementation are also presented where appropriate.

   Description of soil origin or rock formation is placed in brackets at the beginning of the description where applicable, for example, Residual Soil.

6. DRY DENSITY, MOISTURE CONTENT: As estimated by laboratory or field testing.

7. ADDITIONAL TESTS – (Indicates sample tested for properties other than the above):

MAX – Maximum Dry Density	SG – Specific Gravity	PP – Pocket Penetrometer
GS – Grain Size Distribution	HA – Hydrometer Analysis	WA – Wash Analysis
SE – Sand Equivalent	AL – Atterberg Limits	DS – Direct Shear
EI – Expansion Index	RV – R-Value	CP – Collapse Potential
CHEM – Sulfate and Chloride Content, pH, Resistivity	CN – Consolidation	UC – Unconfined Compression
PM – Permeability	CU – Consolidation Undrained Triaxial	T – Torvane
UU – Unconsolidated Undrained Triaxial	CD – Consolidated Drained Triaxial	

8. ATTITUDES – Orientation of rock discontinuity observed in bucket auger boring or rock core, expressed in strike/dip and dip angle, respectively, preceeded by a one-letter symbol denoting nature of discontinuity as shown below.

   B: Bedding Plane J: Jointing C: Contact F: Fault S: Shear

KLEINFELDER

EXPLANATION OF LOGS

PLATE A-1a

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

PRIMARY DIVISIONS			GROUP SYMBOLS	SECONDARY DIVISIONS
COARSE-GRAINED SOILS — MORE THAN HALF OF MATERIALS IS LARGER THAN #200 SIEVE SIZE	GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN #4 SIEVE	CLEAN GRAVELS (LESS THAN) 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVEL WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN #4 SIEVE	CLEAN SANDS (LESS THAN) 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS — MORE THAN HALF OF MATERIALS IS SMALLER THAN #200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
	HIGHLY ORGANIC SOILS		PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS
TYPICAL FORMATIONAL MATERIALS	SANDSTONES		SS	
	SILTSTONES		SH	
	CLAYSTONES		CS	
	LIMESTONES		LS	
	SHALE		SL	

CONSISTENCY CRITERIA BASED ON FIELD TESTS

RELATIVE DENSITY: COARSE-GRAINED SOIL

RELATIVE DENSITY	SPT * (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	0 - 15
Loose	4 - 10	15 - 35
Medium Dense	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very Dense	>50	85 - 100

CONSISTENCY: FINE-GRAINED SOIL

CONSISTENCY	SPT (# blows/ft)	TORVANE UNDRAINED SHEAR STRENGTH (tsf)	POCKET ** PENETROMETER UNCONFINED COMPRESSIVE STRENGTH (tsf)
Very Soft	<2	<0.13	<0.25
Soft	2 - 4	0.13 - 0.25	0.25 - 0.5
Medium Stiff	4 - 8	0.25 - 0.5	0.5 - 1.0
Stiff	8 - 15	0.5 - 1.0	1.0 - 2.0
Very Stiff	15 - 30	1.0 - 2.0	2.0 - 4.0
Hard	>30	>2.0	>4.0

* NUMBER OF BLOWS OF 140 POUND HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1 3/8 INCH I.D.) SPLIT BARREL SAMPLER (ASTM-1586 STANDARD PENETRATION TEST)

** UNCONFINED COMPRESSIVE STRENGTH IN TONS/SQ.FT. READ FROM POCKET PENETROMETER

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

KLEINFELDER

EXPLANATION OF LOGS

PLATE A-1b

Date Drilled:	1/3/07	Water Depth:	>36.5 feet
Drilled By:	Jet Drilling	Date Measured:	1/3/2007
Drilling Method:	8" Hollow Stem Auger	Elevation:	916 feet (approx.)
Logged By:	M. Janousek	Datum:	MSL

Elevation (feet) / Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
915 / 0		1			**Asphalt Concrete:** approximately 8 inches thick.			Analytical
		2			**Aggregate Base:** approximately 10 inches thick.			Analytical
		3			**Artificial Fill (Af):**			Analytical
		4			**Silty Sand (SM):** yellow, moist, fine to coarse grained, trace clay.			Analytical
					Silty Clay (CL): brown, moist, with fine to medium sand.			
5		5			-- some fine to coarse sand.			Analytical
910		6	17		**Alluvium (Qa):** **Sandy Clay (CL):** brown, moist, stiff, fine to coarse sand.	116	13.7	AL
10								
905		7	32		-- very stiff, increase fine to coarse sand.	109	18.2	GS, CN
15					**Silty Sand (SM):** olive brown, moist, dense, fine to coarse grained, with fine gravel, some silt, trace clay.			
900		8	30		-- (18% passing No. 200 Sieve)			WA
					-- decrease gravel.			
20					**Bedrock:**			
895		9	32		**Upper Topanga Formation (Ttuc):** claystone and siltstone, mottled orange and gray, very stiff, thin-bedded, includes few thin sandstone strata, highly weathered.			
25								
890		10	17		-- increase siltstone.			
30								
885		11	39		-- gray, hard, moderately weathered.	97	25.9	DS

KLEINFELDER

PROJECT NO. 75010-2

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

LOG OF BORING B-1

PLATE A-2a

Drafted By: Reviewed By:

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH DB 75010-2 REYES ADOBE INTERCHANGE UPDATED 5-07.GPJ KA RDLND.GDT 5/29/07

Elevation (feet) Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION *(Continued From Previous Page)*	Dry Density (pcf)	Moisture Content (%)	Additional Tests
880		12	39					

Total Depth: 36.5 feet.
Groundwater not encountered.
Boring backfilled with soil cuttings and capped with Quickset Cement.

KLEINFELDER

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

PLATE
A-2b

PROJECT NO. 75010-2

LOG OF BORING B-1

GEOTECH DB 75010-2 REYES ADOBE INTERCHANGE UPDATED 5-07.GPJ KA RDLND.GDT 5/29/07

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled:	1/3/07	Water Depth:	19 feet
Drilled By:	Jet Drilling	Date Measured:	1/3/2007
Drilling Method:	8" Hollow Stem Auger	Elevation:	916 feet (approx.)
Logged By:	M. Janousek	Datum:	MSL

Elevation (feet) / Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
915		1			**Artificial Fill (Af):** **Sandy Clay (CL):** yellow brown, moist, with fine to medium sand.			Analytical
		2						Analytical
		3			-- some fine to coarse gravel.			Analytical
		4						Analytical
5		5						
910		6	20			97	20.1	Analytical CN
10								
905		7	10		**Alluvium (Qa):** **Sandy Clay (CL):** brown, moist, stiff, with fine to medium sand, trace fine gravel.			
15								
900		8	32		-- very stiff, fine to coarse sand, increase fine gravel.	104	16.9	DS
▽								
20					**Silty Sand (SM):** brown, wet, very dense, fine to coarse grained, with fine gravel, trace clay, some cobbles up to 5 inches diameter.			
895		9	69		-- (13% passing No. 200 Sieve)			WA
25		10	N/A		**Bedrock:** **Upper Topanga Formation (Ttuc):** claystone and siltstone, mottled orange and gray, very stiff, thin-bedded, includes few thin sandstone strata, highly weathered. (Cobble from silty sand layer lodged in auger tip @ 22 feet. Therefore, no samples obtained from 25 and 30 feet depths. Classification performed by visual observation of cuttings obtained directly from augers.)			
890								
30		11	N/A					AL
885					Practical refusal @ 31 feet. Groundwater encountered @ 19 feet. Boring backfilled with soil cuttings and capped with Quickset Cement.			

GEOTECH DB 75010-2 REYES ADOBE INTERCHANGE UPDATED 5-07.GPJ KA RDLND.GDT 5/29/07

KLEINFELDER

PROJECT NO. 75010-2

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

LOG OF BORING B-2

PLATE A-3

Drafted By: Reviewed By:

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled:	1/3/07	Water Depth:	>46.5 feet
Drilled By:	Jet Drilling	Date Measured:	1/3/2007
Drilling Method:	8" Hollow Stem Auger	Elevation:	924 feet (approx.)
Logged By:	M. Janousek	Datum:	MSL

Elevation (feet) Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
		1			**Asphalt Concrete:** approximately 8 inches thick.			Analytical
		2			**Aggregate Base:** approximately 20 inches thick.			Analytical
		3						Analytical
		4			**Artificial Fill (Af):**			Analytical, RV,
920		4B			**Silty Clay (CL):** yellow, moist, with fine to medium sand, trace fine gravel.			SE, CHEM
5		5	27		**Silty Sand (SM):** brown, moist, medium dense, fine to coarse grained, some coarse gravel, with clay.	107	11.3	GS
					-- yellow brown, increase gravel.			
915								
10		6	27		-- trace gravel, decrease clay.	105	17.8	
910					**Silty Clay (CH):** mottled yellow and gray, moist, medium stiff, with fine to coarse sand.			
15		7	7					
		8	15		-- stiff, decrease sand.			AL
905								
20		9	14		-- trace coarse gravel.			AL
					Alluvium (Qa):			
900					**Clayey Sand (SC):** brown, moist, medium dense, fine to coarse grained, with fine gravel.			
25		10	18					
895					**Bedrock:**			
30		11	28		**Upper Topanga Formation (Ttuc):** claystone and siltstone, mottled orange and gray, very stiff, thin-bedded, includes few thin sandstone strata, highly weathered.	95	24.8	DS
890								

KLEINFELDER

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

PLATE A-4a

PROJECT NO. 75010-2

LOG OF BORING B-3

Drafted By: Reviewed By:

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH.DB 75010-2 REYES ADOBE INTERCHANGE UPDATED 5-07.GPJ KA_RDLND.GDT 5/29/07

Elevation (feet) Depth	Sample Type	Sample Number	Blows per Foot	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION *(Continued From Previous Page)*	Dry Density (pcf)	Moisture Content (%)	Additional Tests
		12	37		**Bedrock:** **Upper Topanga Formation (Ttuc):** claystone and siltstone, mottled orange and gray, very stiff, thin-bedded, includes few thin sandstone strata, highly weathered. *(continued)* -- hard.			
885 40		13	61		-- gray, slightly weathered, unoxidized.	112	14.1	DS
880 45		14	62					
					Total Depth: 46.5 feet. Groundwater not encountered. Boring backfilled with soil cuttings and capped with Quickset Cement.			

KLEINFELDER

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

PLATE
A-4b

PROJECT NO. 75010-2

LOG OF BORING B-3

GEOTECH DB 75010-2 REYES ADOBE INTERCHANGE UPDATED 5-07.GPJ KA RDLND.GDT 5/29/07

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled:	1/4/07	Water Depth:	> 1.5 feet
Drilled By:		Date Measured:	1/4/2007
Drilling Method:	Hand-Auger Boring	Elevation:	938 feet (approx.)
Logged By:	M. Janousek	Datum:	MSL

Elevation (feet) Depth	Sample Type	Sample Number	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
		1		**Artificial Fill (Af):** **Silty Sand (SM):** brown, moist, fine to coarse grained, trace clay, with roots and leaves.			Analytical
		2		-- increase clay, with cobbles up to 8 inches diameter.			Analytical
935				Hand-Auger Boring terminated at 1.5 feet. Refusal encountered due to presence of oversize cobbles.			

GEOTECH DB 75010-2 REYES ADOBE INTERCHANGE UPDATED 5-07.GPJ KA RDLND.GDT 5/29/07

KLEINFELDER

PROJECT NO. 75010-2

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

LOG OF BORING HB-1

PLATE

A-5

Drafted By: Reviewed By:

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

Date Drilled:	1/4/07	Water Depth:	> 1.5 feet
Drilled By:		Date Measured:	1/4/2007
Drilling Method:	Hand-Auger Boring	Elevation:	926 feet (approx.)
Logged By:	M. Janousek	Datum:	MSL

Elevation (feet) Depth	Sample Type	Sample Number	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
925		1		**Artificial Fill (Af):** **Silty Sand (SM):** brown, moist, fine to coarse grained, with fine gravel, with roots.			Analytical
		2		**Clayey Sand (SC):** yellow brown, moist, fine to coarse grained, with cobbles up to 6 inches diameter. Hand-Auger Boring terminated at 1.5 feet. Refusal encountred due to presence of oversize cobbles.			Analytical

KLEINFELDER

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

PLATE A-6

PROJECT NO. 75010-2

LOG OF BORING HB-2

Drafted By: Reviewed By:

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH DB 75010-2 REYES ADOBE INTERCHANGE UPDATED 5-07.GPJ KA RDLND.GDT 5/29/07

Date Drilled:	1/4/07	Water Depth:	> 3 feet
Drilled By:		Date Measured:	1/4/2007
Drilling Method:	Hand-Auger Boring	Elevation:	924 feet (approx.)
Logged By:	M. Janousek	Datum:	MSL

Elevation (feet) Depth	Sample Type	Sample Number	Graphic Log	SOIL DESCRIPTION AND CLASSIFICATION	Dry Density (pcf)	Moisture Content (%)	Additional Tests
		1		**Artificial Fill (Af):** **Silty Sand (SM):** brown, moist, fine to medium grained.			Analytical
		2		-- gray brown. -- yellow brown, with fine gravel.			Analytical
		3		**Sandy Clay (CL):** yellow brown, moist, fine to medium sand, some fine gravel.			Analytical
		4					Analytical
920				Total Depth: 3.0 feet. Boring backfilled with soil cuttings.			

KLEINFELDER

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

PLATE A-7

PROJECT NO. 75010-2

LOG OF BORING HB-3

Drafted By: Reviewed By:

Note: The boundaries between soil types shown on the logs are approximate as the transition between different soil layers may be gradual.

GEOTECH DB 75010-2 REYES ADOBE INTERCHANGE UPDATED 5-07.GPJ KA RDLND.GDT 5/29/07

APPENDIX B
LABORATORY TESTING

APPENDIX B
LABORATORY TESTING

Laboratory tests were performed on representative intact and bulk soil samples to estimate engineering characteristics of the various earth materials encountered. Testing was performed in accordance with one of the following references:

1) ASTM Standards for Soil Testing, latest revisions
2) Caltrans California Testing Methods (CTM), latest revisions

LABORATORY MOISTURE AND UNIT WEIGHT DETERMINATIONS

Natural moisture content and dry unit weight tests were performed on soil samples collected from the borings in accordance with ASTM D2216-92 and D2937-94, respectively. The results are presented on the Logs of Borings and are summarized in Table B-1, Moisture and Unit Weight.

SIEVE ANALYSES

Sieve analyses were performed on two samples of the materials encountered at the site to evaluate the grain size distribution characteristics of the soils and to aid in their classification. Tests were performed in general accordance with ASTM Test Method D 422. Results of these tests are presented as Plate B-1, Grain Size Distribution.

WASH SIEVE

The percent passing #200 sieve of two selected soil samples were performed by wash sieving in accordance with ASTM Standard Test Method D 1140-92. The test results are summarized in Table B-2, Wash Sieve Test Results.

PLASTICITY INDEX

Plasticity index testing was performed on two soil samples to evaluate the plasticity characteristics and to aid in the classification of the soils. The tests were performed in accordance with ASTM Standard Test Method D 4318. The results are presented as Plate B-2, Plasticity Chart.

DIRECT SHEAR

Direct shear tests were conducted on four relatively undisturbed soil samples in accordance with ASTM Standard Test Method D 3080-90 to evaluate the shear strength parameters of the materials. Prior to shearing, the samples were soaked with water to saturation or near saturation moisture contents. The in-situ dry density and moisture content of the sample is presented in Table B-1 and on the boring logs. The test results are presented as Plates B-3 through B-6, Direct Shear Test.

CONSOLIDATION

Consolidation testing was performed on two select, relatively undisturbed samples. The tests were performed in general accordance with ASTM Standard Test Method D 2435. The test results are presented as Plates B-7 and B-8, Consolidation Test. The specimen was inundated at 2.14 ksf which corresponds to approximately 15 to 20 feet of overburden for a finished grade condition.

R-VALUE TEST

R-value testing was performed on one sample of the near-surface soils encountered at the site. The test was performed in general accordance with Caltrans Standard Test Method 301. The test result is presented in Table B-3, R-Value Test Result.

CORROSIVITY TESTS

A series of chemical tests were performed on one selected sample collected from a depth between approximately 2.5 to 5.0 feet below the existing grade to estimate pH, resistivity, and sulfate and chloride contents. The test results may be used by a qualified corrosion engineer to evaluate the general corrosion potential with respect to the construction materials. The results of the tests are presented in Table B-4, Corrosion Test Results.

Table B-1
Moisture and Unit Weight

Boring	Depth (ft)	Dry Unit Weight (pcf)	Moisture Content (%)
B-1	5	116	13.7
B-1	10	109	18.2
B-1	30	97	25.9
B-2	15	104	16.9
B-3	5	107	11.3
B-3	10	105	17.8
B-3	30	95	24.8

Table B-2
Wash Sieve Test Results

Boring	Depth (ft)	Percent Passing No. 200 Sieve
B-1	16	10
B-2	20	13

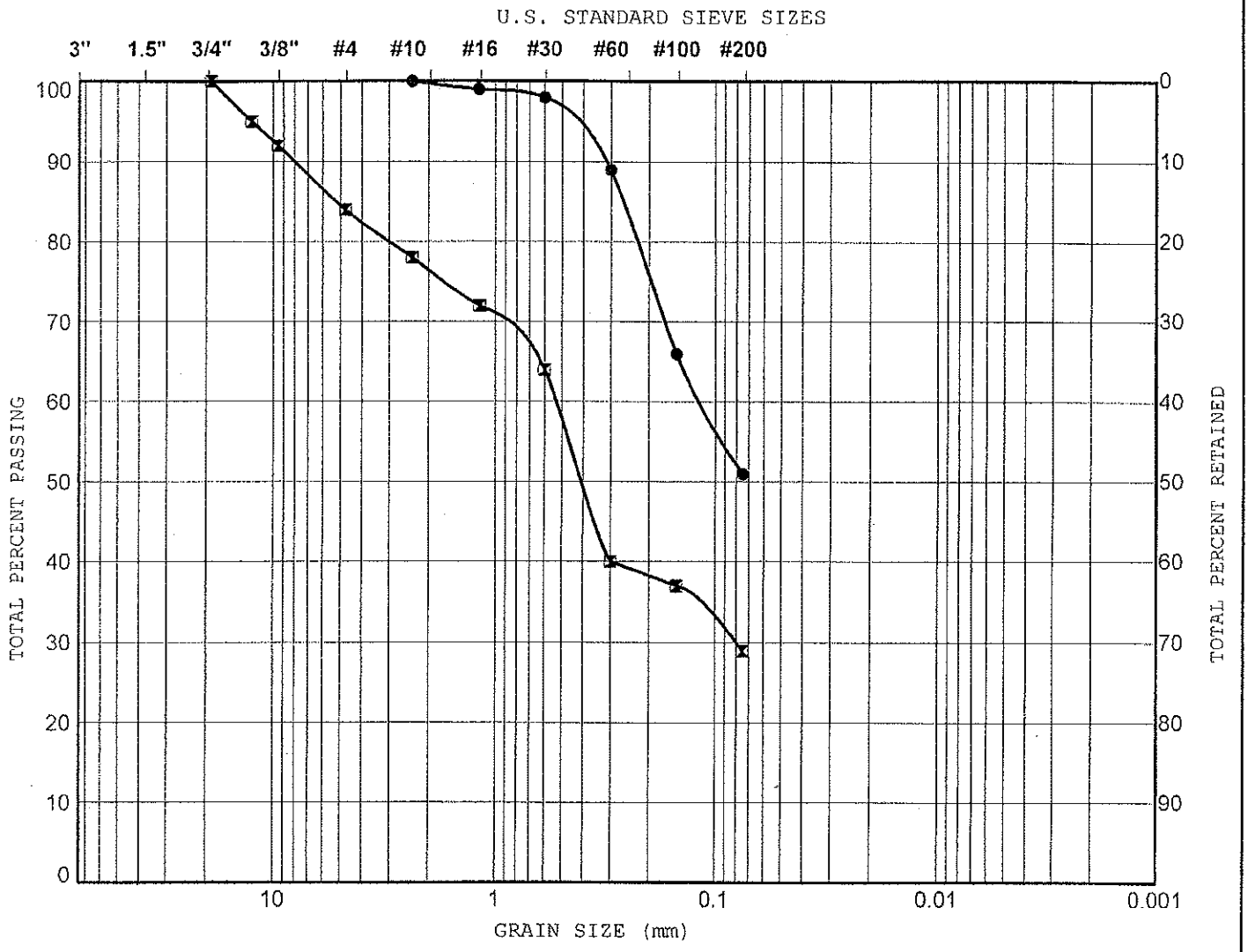
Table B-3
R-Value Test Result

Boring	Depth (ft)	R-Value
B-3	2.5 – 5	20

Table B-4
Corrosion Test Results

Boring	Depth (ft)	PH	Sulfate (ppm)	Chloride (ppm)	Resistivity (Ω-cm)
B-3	2.5 – 5	7.8	14	63	1100

SIEVE ANALYSIS	HYDROMETER



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (ft)	Description	Classification
●	B-1	10.0	Sandy Clay	CL
⊠	B-3	5.0	Silty Sand	SM

KLEINFELDER

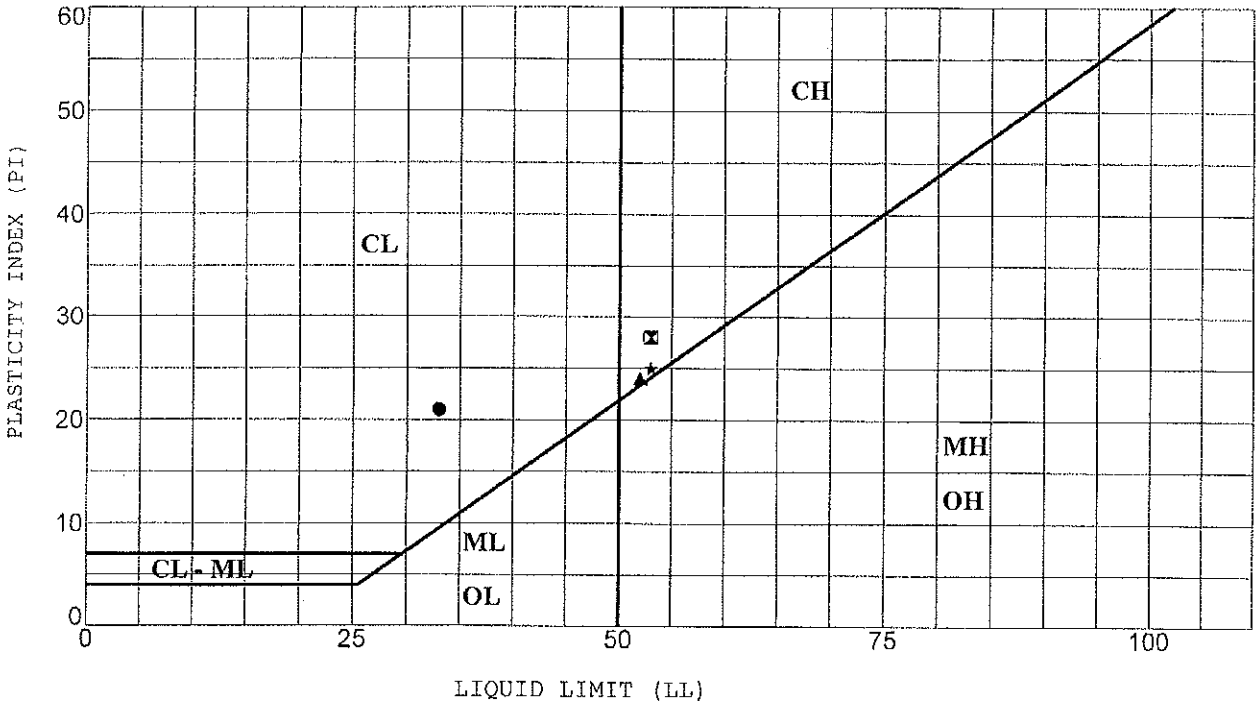
PROJECT NO. 75010-2

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

GRAIN SIZE DISTRIBUTION

PLATE

B-1



	Sample	Depth (ft)	LL (%)	PL (%)	PI (%)	LI (-)	Description
●	B-1	6.0	33	12	21		Sandy Clay (CL)
⊠	B-2	30.0	53	25	28		Weathered Bedrock (CH)
▲	B-3	16.5	52	28	24		Silty Clay (CH)
★	B-3	20.0	53	28	25		Silty Clay (CH)

LL - Liquid Limit

PL - Plasticity Limit

PI - Plasticity Index

LI - Liquidity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of slight plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL > 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity, organic silts

KLEINFELDER

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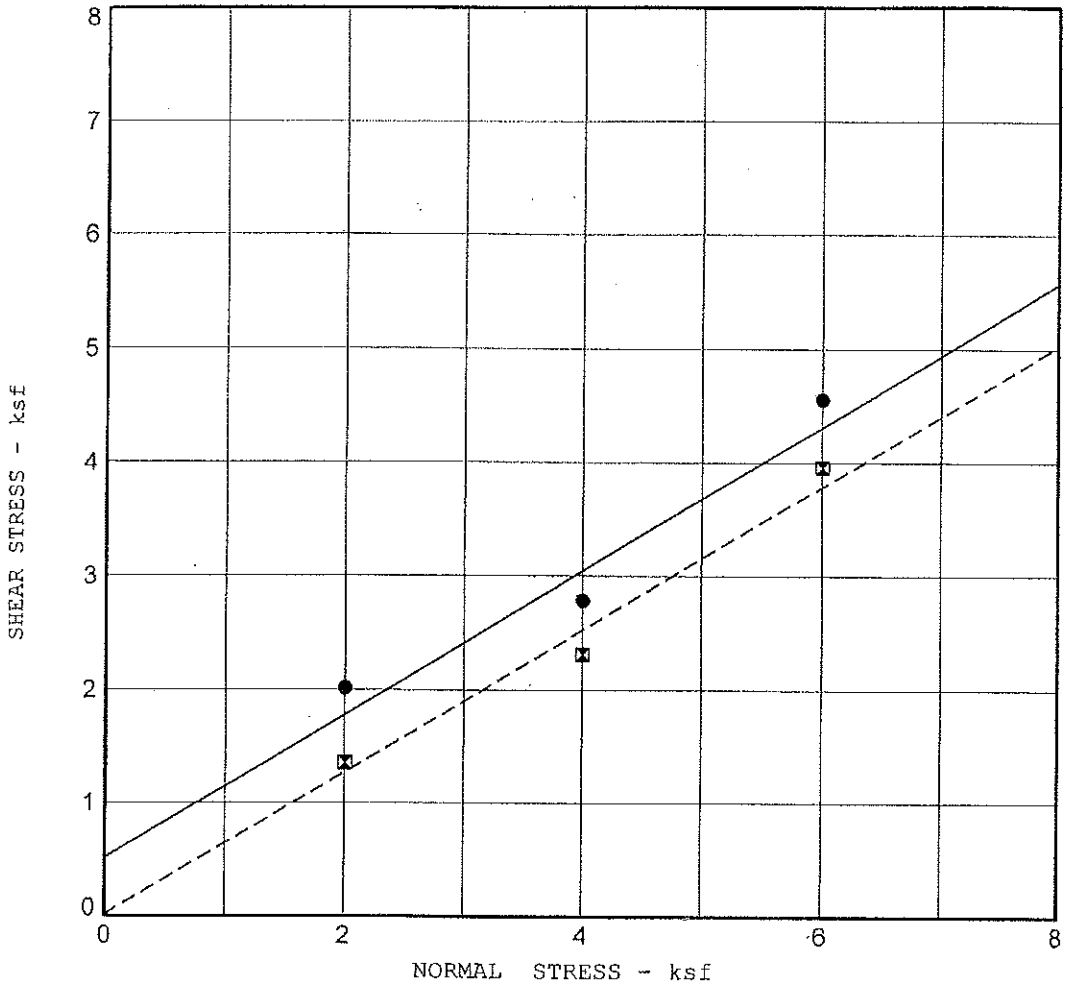
Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

PLASTICITY CHART

PLATE

B-2



Test type	controlled - strain test		
Rate of shear - in/min	0.004		
Normal Stress - psf	2000	4000	6000
Peak Shear - psf	2016	2348	4560
Ultimate Shear - psf	1356	2316	3960

Initial Moisture Content : 25.9%

Initial Dry Density : 97 pcf

Final Moisture Content : 28.1 %

Boring	B-1
Depth - ft	30.0
Description	Weathered Bedrock
Classification	Upper Topanga Formation

	● Peak	⊠ Ultimate
Friction Angle - deg	32	33
Cohesion - ksf	0.500	0.000

KLEINFELDER

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Proposed West Side Widening
Reyes Adobe Road OC
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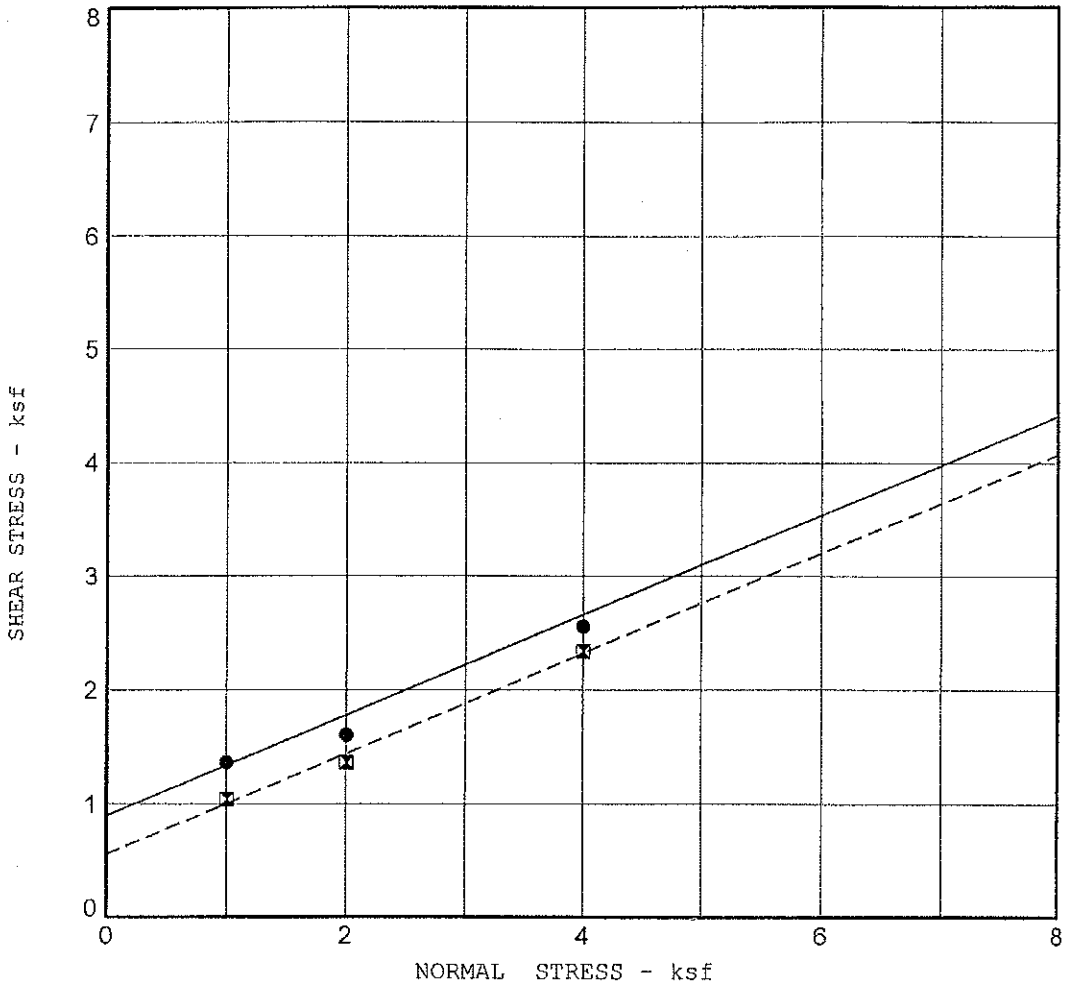
DIRECT SHEAR TEST

PLATE

B-3



Test type	controlled - strain test		
Rate of shear - in/min	0.004		
Normal Stress - psf	1000	2000	4000
Peak Shear - psf	1368	1608	2556
Ultimate Shear - psf	1044	1368	2340

Initial Moisture Content : 16.9%

Initial Dry Density : 107 pcf

Final Moisture Content : 26.6%

Boring	B-2
Depth - ft	15.0
Description	Sandy Clay
Classification	CL

	● Peak	⊠ Ultimate
Friction Angle - deg	24	24
Cohesion - ksf	0.900	0.600

KLEINFELDER

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Proposed West Side Widening
Reyes Adobe Road OC
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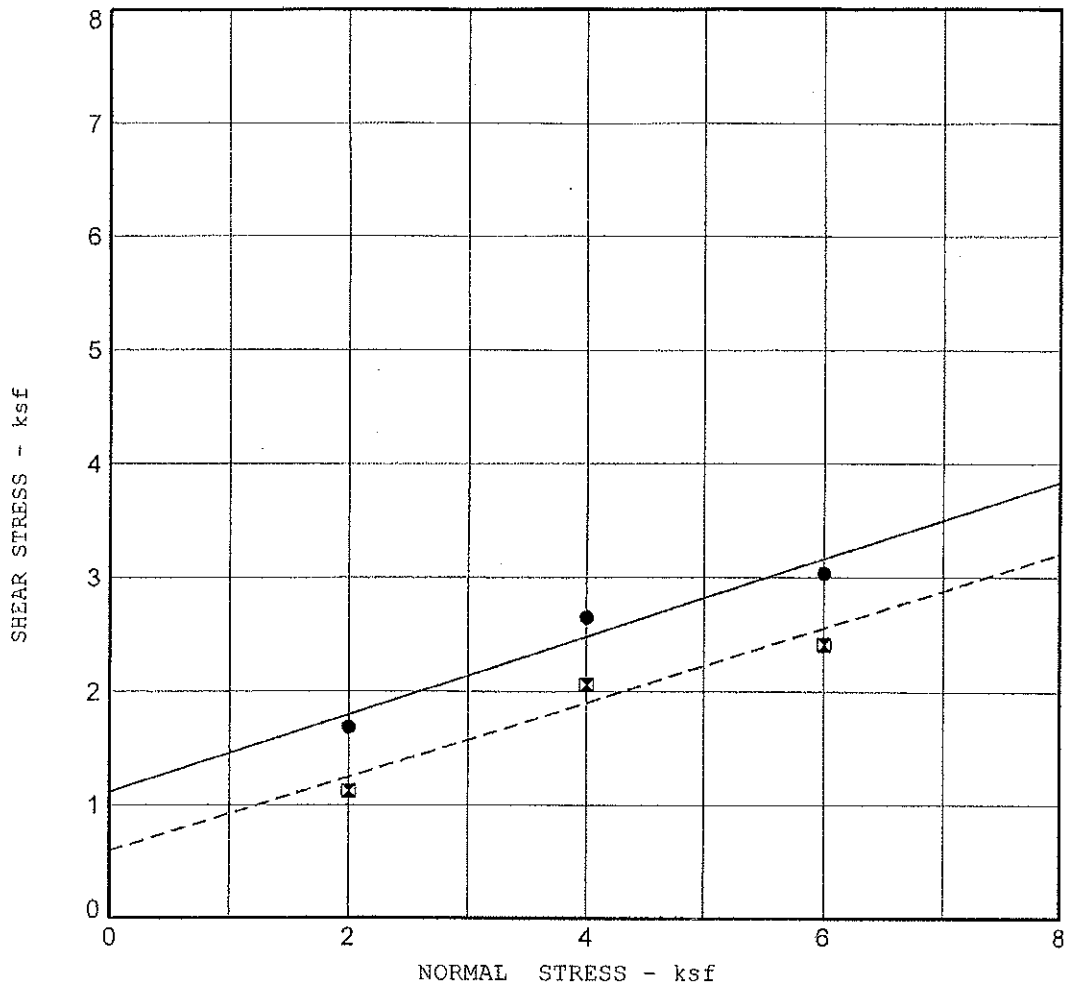
DIRECT SHEAR TEST

PLATE

B-4



Test type	controlled - strain test		
Rate of shear - in/min	0.004		
Normal Stress - psf	2000	4000	6000
Peak Shear - psf	1692	2652	3036
Ultimate Shear - psf	1128	2064	2412

Initial Moisture Content : 24.8%

Initial Dry Density : 95 pcf

Final Moisture Content : 28.5 %

Boring	B-3
Depth - ft	30.0
Description	Weathered Bedrock
Classification	Upper Topanga Formation

	● Peak	⧈ Ultimate
Friction Angle - deg	19	18
Cohesion - ksf	1.120	0.600

KLEINFELDER

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Proposed West Side Widening
Reyes Adobe Road OC
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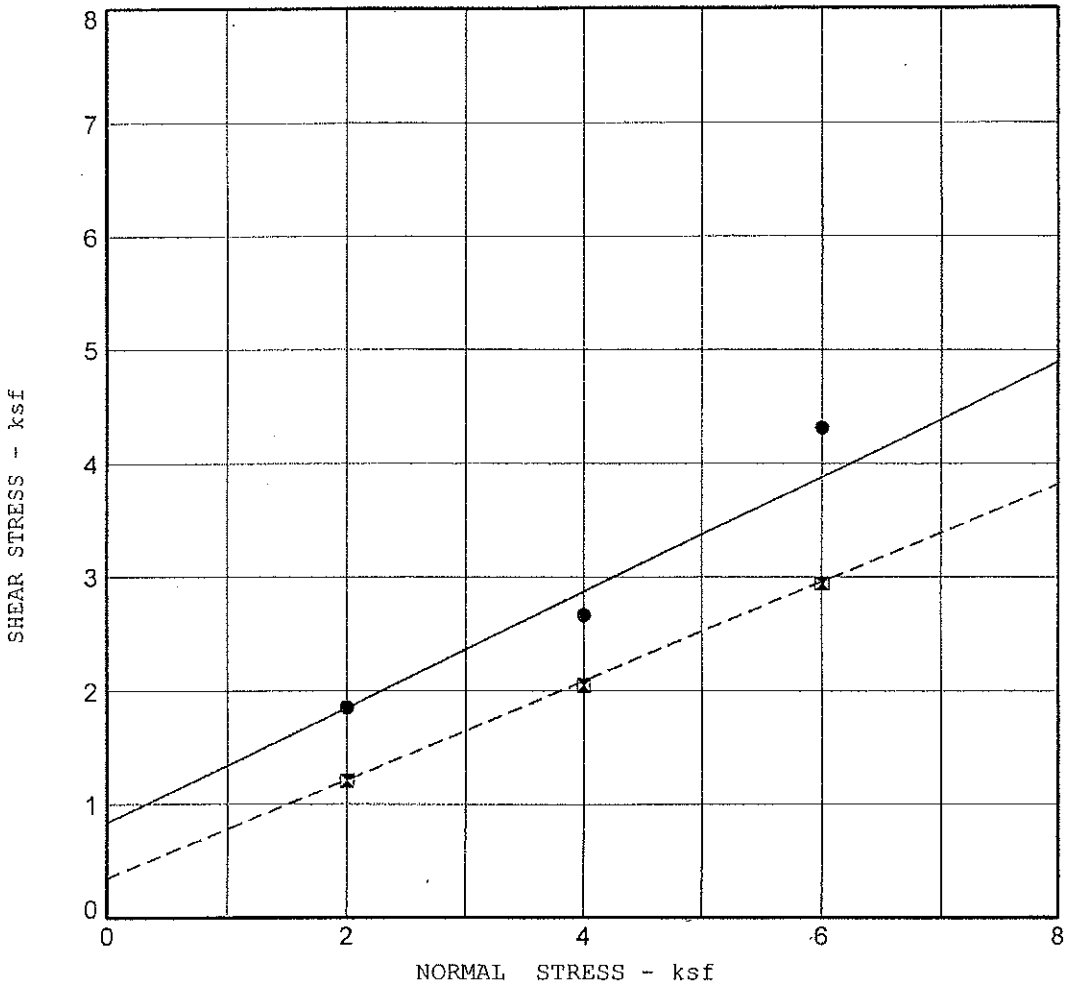
DIRECT SHEAR TEST

PLATE

B-5



Test type	controlled - strain test		
Rate of shear - in/min	0.004		
Normal Stress - psf	2000	4000	6000
Peak Shear - psf	1860	2664	4320
Ultimate Shear - psf	1212	2052	2940

Boring	B-3
Depth - ft	40.0
Description	Weathered Bedrock
Classification	Upper Topanga Formation

	● Peak	⊠ Ultimate
Friction Angle - deg	25	23
Cohesion - ksf	0.840	0.350

Initial Moisture Content : 14.0%

Initial Dry Density : 112 pcf

Final Moisture Content : 29.1 %

KLEINFELDER

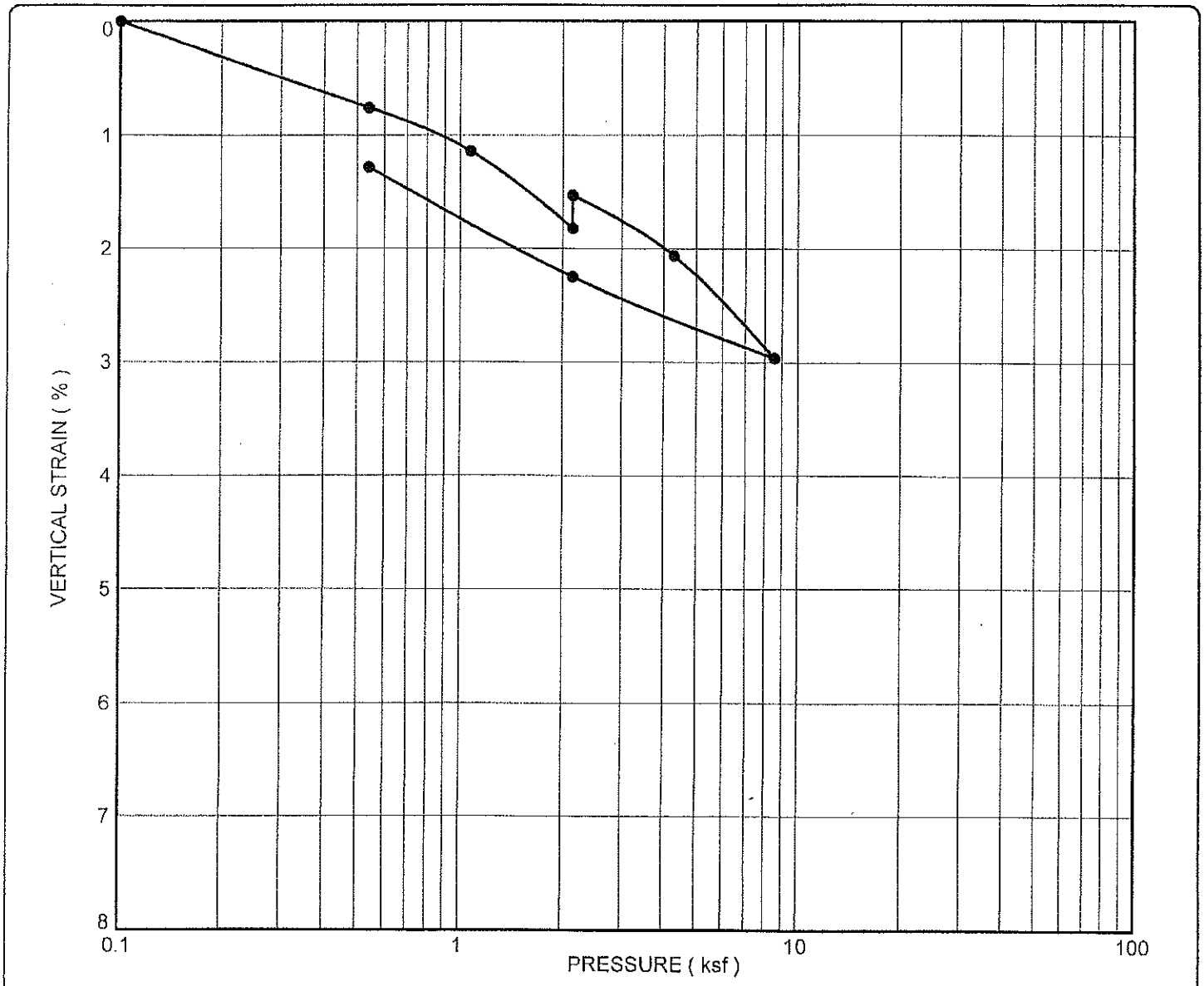
PROJECT NO. 75010-2

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

DIRECT SHEAR TEST

PLATE

B-6



*Note: Sample was Inudated at 2.14 ksf

Sample	B-1
Depth	10.0
Description	Sandy Clay
Classification	CL

Initial Moisture Content : 18.2 %
Initial Dry Density : 109 pcf
Final Moisture Content : 19.4 %

KLEINFELDER

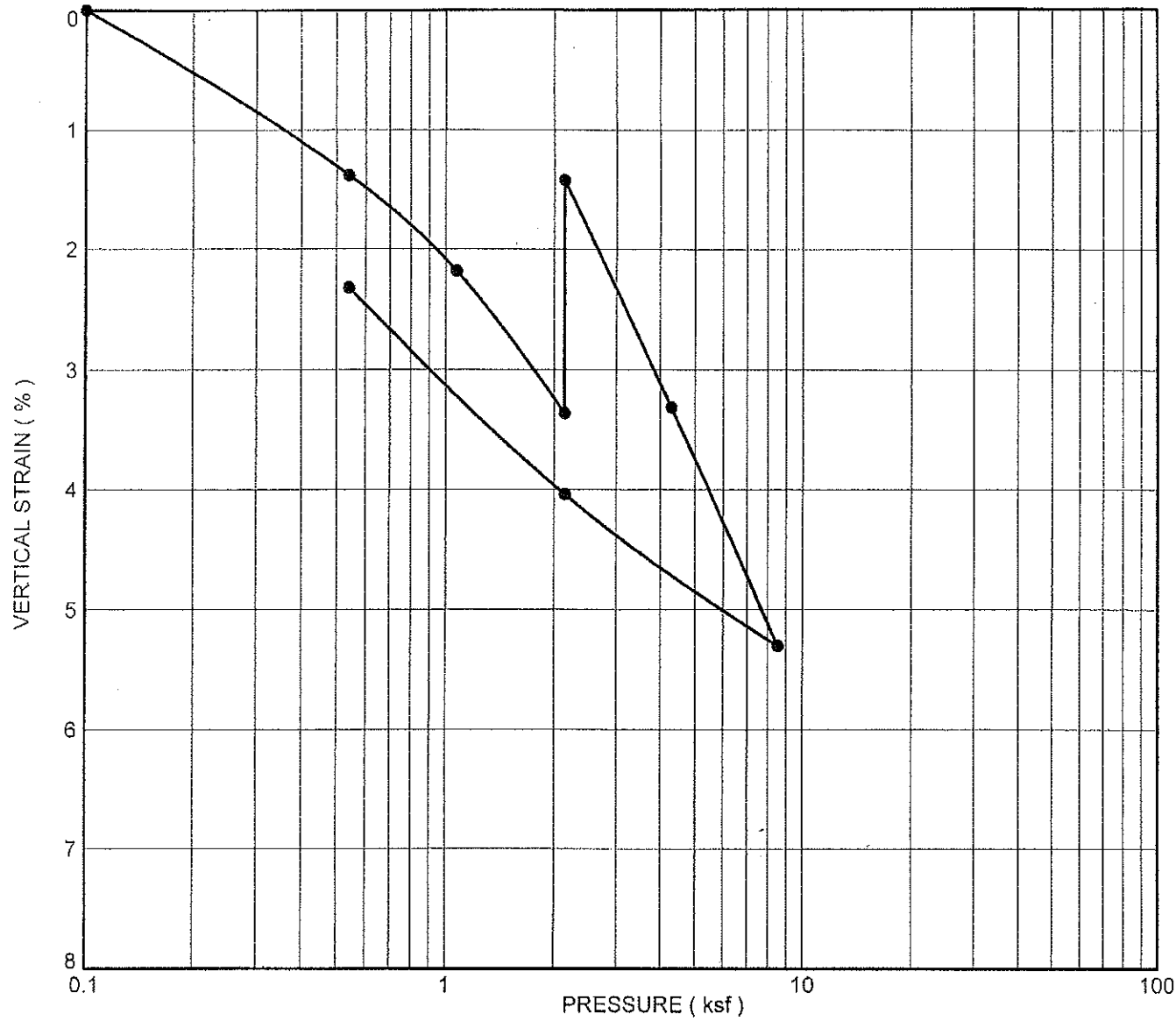
PROJECT NO. 75010-2

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

CONSOLIDATION TEST

PLATE

B-7



*Note: Sample was inudated at 2.14 ksf

Sample	B-2
Depth	5.0
Description	Sandy Clay
Classification	CL

Initial Moisture Content : 20.1 %
Initial Dry Density : 97 pcf
Final Moisture Content : 19.0 %

KLEINFELDER

PROJECT NO. 75010-2

Proposed West Side Widening
Reyes Adobe Road OC
Agoura Hills, CA

CONSOLIDATION TEST

PLATE

B-8

KLEINFELDER

MOISTURE - DENSITY TEST DATA

PROJECT NAME: Reyes Adobe Road **PROJECT #:** 75010 **TESTER:** ELF **DATE:** 01/17/07

	Sample Location	B-1	B-1	B-1	B-2	B-2	B-3	B-3	B-3	B-3	
	Sample Number	6	7	11	6	8	5	6	11	13	
	Sample Depth	5	10	30	5	15	5	10	30	40	
	Visual Soil Classification										
	Torvane Shear(TSF)										
	Pocket Pen(TSF)										
WEIGHTS	Weight of Moist Soil + Rings	1017.58	802.8	960.5		960.4	1131.4	387.5	1127.4	995.9	
	Number of Rings	5	4.0	5.0		5.0	6.0	2.0	6.0	5.0	
	Weight of Rings	225	180	225	#VALUE!	225	270	90	270	225	#VALUE!
	Wt. Moist Soil	792.58	622.75	735.5	#VALUE!	735.38	861.44	297.46	857.4	770.86	#VALUE!
	Dish Number	1	2	3	4	5	6	7	8	9	10
	Wt. Moist Soil+Tare	206.2	582.0	234.8	190.4	258.4	772.2	284.2	210.3	207.1	
	Wt. Dry Soil+Tare	187.5	535.6	205.5	166.9	235.5	722.2	256.4	182.4	187.7	
	Weight of Tare	51.2	280.2	92.4	50.1	100.1	279.1	100.4	70.0	49.3	
RESULTS	Wet Density(pcf)	131.3	128.9	121.8	#VALUE!	121.8	118.9	123.2	118.4	127.7	#VALUE!
	Moisture Content(%)	13.7	18.2	25.9	20.1	16.9	11.3	17.8	24.8	14.1	#VALUE!
	Dry Density(pcf)	115.5	109.1	96.8	#VALUE!	104.2	106.8	104.6	94.8	111.9	#VALUE!
	Degree of Saturation(%)	84.1	93.3	96.8	#VALUE!	76.3	54.6	81.3	88.4	78.0	#VALUE!
	Remarks										

AP Engineering and Testing, Inc.

Geotechnical Testing Laboratory

CORROSION TEST RESULTS

Client Name: Kleinfelder
Project Name: Reyes Adobe
Project No.: 75010

AP Job No.: 27-0190
Date 02/07/07

Boring No.	Sample No.	Depth (ft)	Soil Type	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (%)	Chloride Content (%)
B-3	4	2.5-5	ML	1100	7.8	0.0014	0.0063

NOTES:
Resistivity Test and pH: California Test Methods 532 and 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

2607 Pomona Boulevard, Pomona, CA 91768
Tel. (909) 869-6316 Fax. (909)869-6318

KLEIN-ELDER

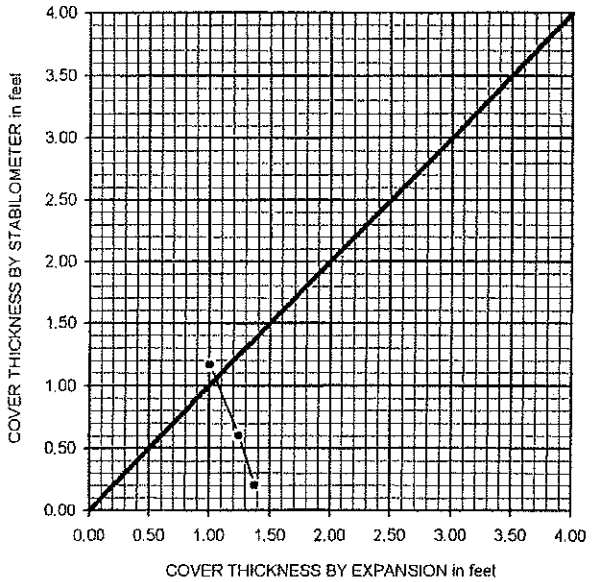
R-VALUE TEST RESULTS

PROJECT NAME:	REYES ADOBE ROAD	PROJECT NUMBER:	75010
SAMPLE NUMBER:	07-9-0053	SAMPLE LOCATION:	B-3 @
SAMPLE DESCRIPTION:	s(CL)	TECHNICIAN:	0
		DATE SAMPLED	8/25/2006

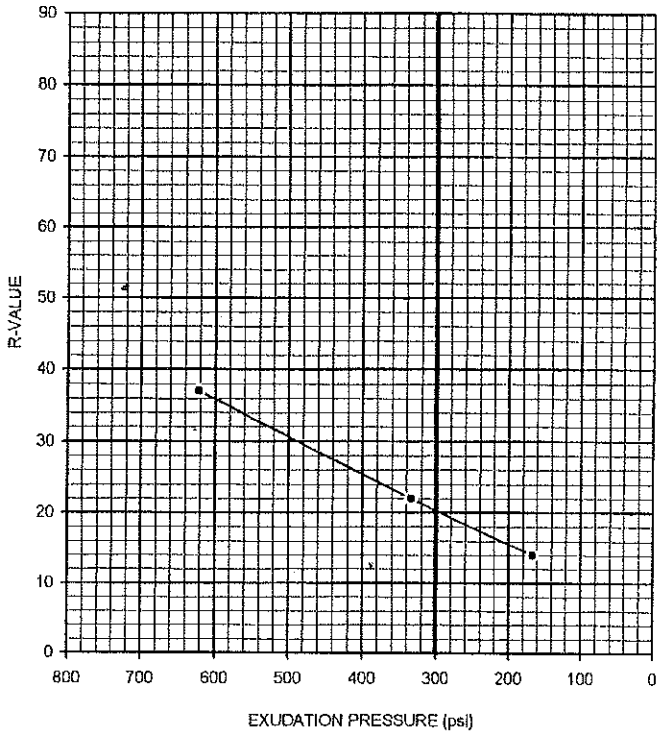
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	10.0	12.0	13.5
HEIGHT OF SAMPLE, Inches	2.46	2.71	2.47
DRY DENSITY, pcf	119.5	118.3	116.5
COMPACTOR AIR PRESSURE, psf	150	120	100
EXUDATION PRESSURE, psf	622	334	167
EXPANSION, Inches x 10exp-4	35	18	6
STABILITY Ph 2,000 lbs (160 psi)	97	121	129
TURNS DISPLACEMENT	2.81	3.53	3.57
R-VALUE UNCORRECTED	37	19	14
R-VALUE CORRECTED	37	22	14

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	1.01	1.25	1.38
EXPANSION PRESSURE THICKNESS, ft.	1.17	0.60	0.20

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	34
R-VALUE BY EXUDATION:	20
EQUILIBRIUM R-VALUE:	20

APPENDIX C
RESPONSE TO CALTRANS REVIEW COMMENTS

KLEINFELDER

September 7, 2007

STV, Inc.
100 Pacifica, Suite 140
Irvine, California 92618

Attention: Mr. Tim J. McGrady
Project Manager

Subject: Response to Caltrans and STV Review Comments
Proposed Reyes Adobe Road Bridge Widening
Over U.S. Highway 101
Bridge No. 53-1726
Agoura Hills, California

References: 1) Draft Materials Report, Proposed Reyes Adobe Road Bridge Widening, by Kleinfelder West, Inc. dated June 1, 2007

Dear Mr. McGrady:

Kleinfelder West, Inc. (Kleinfelder) is pleased to submit our response to Caltrans comments dated July 19, 2007 and STV comments provided in an email by you dated August 16, 2007. A copy of the comments is included as Appendix A. Our responses to the Caltrans and STV comments are provided as follows.

CALTRANS COMMENTS AND OUR RESPONSE

Pavement Design, Page 14 and 15 of 21

Comment No. 1:
(Caltrans) Materials (Group) recommends the following structural sections for the proposed widening:

WB On-Ramp

T.I.=12 *R-Value=15*

Alternative 1: *0.60' Hot Mix Asphalt, Type B* (HMA-B)*
0.60' Lean Concrete Base
1.15' Aggregate Base, Class 3
2.35' Total

**Current Standards refer to Asphalt Concrete (AC) as Hot Mix Asphalt (HMA).*

Reyes Adobe Road

T.I.=12 R-Value=15

Alternative 1: *0.60' Hot Mix Asphalt, Type B* (HMA-B)*
1.00' Aggregate Base, Class 2
1.20' Aggregate Subbase, Class 4
2.8' Total

Alternative 2: *1.50' Full-Depth HMA-B*
0.35' Aggregate Base, Class 3
1.85' Total

Response:
T.I. values used in our Draft Materials Report were provided by STV. We understand that a new T.I. value of 12 should be used for pavement design for both the freeway on- and off-ramps and Reyes Adobe road. We will revise Table 2 of our Materials Report using the above values recommended by Caltrans. In addition, the imported borrow R-value shall be 15 or greater based on SSP 19-040. The minimum width of new HMA-B for widening shall be 5 feet for achieving compaction in accordance Section 39 of the Standard Specifications. In areas where the proposed pavement approaching to curb and gutter, causing difficulties in achieving the required compaction, we recommend replacing with cub and a full gutter be placed on lean concrete treated base with the gutter having a thickness similar to a PCC pavement of 8 to 10 inches.

STV COMMENTS AND OUR RESPONSE

STV Comment No. 1 (see email from Tim McGrady in Appendix A): Further review of the pavement issues at the ramp terminus indicates that we will have some small areas of existing PCC pavement to rebuild / replace. Please provide recommendations for the new PCC pavement sections in your report. Of course, use the TI=12 criteria. Please call Satish (213-236-0176) if you need further details regarding location, etc. Thanks.

Response: Acknowledged. The recommendations for the new PCC are provided below based on a T.I. value of 12 and an R-value of 15, and will be included in Table 2 of our Materials Report.

Rigid Pavement
0.85' PCC
0.40' LCB
0.60' AB

Legend: PCC = Portland Cement Concrete
LCB = Lean Concrete Base

AB = Class 3 Aggregate Base

STV Comment No. 2 (phone conversations and meetings): provide recommendations for overlay of existing asphalt pavement.

Response: We understand overlay of existing asphalt pavement on Reyes Adobe Road is planned. Based on our discussions with a Caltrans representative, it is our opinion that the existing pavement may be milled 2 inches and replaced with 2 inches or more of HMA for improvement of ride quality, aesthetics, or safety provided that the remaining asphalt section after milling has a minimum thickness of 2 inches. STV should verify the existing pavement thickness and assure the above requirements are met.

CLOSURE

The following is attached and complete this letter.

Appendix A Caltrans and STV Review Comments

We appreciate the opportunity to be of service to you on this project. If you have any questions or comments regarding this letter, please contact the undersigned.

Sincerely,

KLEINFELDER, INC.

REGISTERED PROFESSIONAL ENGINEER
ENDI ZAHI
No. GE 2676
Exp. 9-30-08
GEOTECHNICAL
STATE OF CALIFORNIA

Justin Kempton, PE, GE
Area Manager

Endi Zhai, PhD, GE
Principal Geotechnical Engineer

Distribution: (PDF) Addressee

APPENDIX A
CALTRANS REVIEW COMMENTS

STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION
FACSIMILE COVER

FAX

CALTRANS

Attention: BELIA CARDENA Attn: Tim McGrady	From: California State Department of Transportation, Office of Design "D", 100 South Main Street, Suite 100, Los Angeles, CA 90012
To: Unit/Company STV INC.	Name of Sender: SAID JALEO / Location:
	Date 7-20-07 / Total Pages (including cover sheet) 3
	FAX # / ATSS FAX #
District/City	Phone # 213 897-1234 / ATSS #
Phone # / Fax # 909 484-1360	ORIGINAL DISPOSITION: DESTROY RETURN CALL FOR PICK-UP

MESSAGE:

Tim;

The are the commets for the Material Report prepared by Kleinfelder dated June 1, 2007 for the Reseda Adobe Overcrossing Project in the City of Agoura Hills, Ca.

Said

State of California Business, Housing and Transportation Agency

Memorandum

To: Khan Hossain, STE
Office of Design D

Date: July 19, 2007

07-LA-101, PM 36.1/36.3
Bridge Widening
07- 240200

From: **Kirsten Stahl, P.E.**
Office of Engineering Services, Materials Investigations
DEPARTMENT OF TRANSPORTATION

Subject: **Draft Materials Report Review**

Materials Investigations has reviewed this Draft Materials Report and has the following comments:

Pavement Design, Page 14 and 15 of 21

Materials recommends the following structural sections for the proposed widening:

WB On-Ramp

T.I. = 12 **R-Value = 15**

Alternative 1:
0.60' Hot Mix Asphalt, Type B* (HMA-B)
0.60' Lean Concrete Base
1.15' Aggregate Base, Class 3
2.35' Total

* Current Standards refer to Asphalt Concrete (AC) as Hot Mix Asphalt (HMA).

Reyes Adobe Road

T.I. = 12 **R-Value = 15**

Alternative 1:
0.60' Hot Mix Asphalt, Type B
1.00' Aggregate Base, Class 2
1.20' Aggregate Subbase, Class 4
2.80' Total

Alternative 2:
1.50' Full-Depth HMA-B
0.35' Aggregate Base, Class 3
1.85' Total

July 19, 2007
07-LA-101, PM 36.1/36.3
07 – 240200

R-Value of 15 is specified for structural sections built on fill.

The imported borrow R-Value shall be 15 or greater, refer to SSP 19-040.

The minimum width of new HMA-B for widening shall be 5 feet for achieving compaction in accordance with section 39 of the Standard Specifications.

If you have any questions, please call me at extension 7-0470 or Min Deng of my staff at extension 7-0452.

Kirsten Stuhl, P.E.
Civil Engineering License No. C46857 - Exp. 06/30/09
District Materials Engineer