MATERIALS REPORT
For the
LATROBE ROAD IMPROVEMENT PROJECT
Latrobe Road
El Dorado Hills, CA 95762

Project No. E07057.003
September 2007

YOUNGDAHL CONSULTING GROUP, INC.
Geotechnical • Geoscience • Materials Testing • Storm Water Compliance

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Project No. E07057.003
27 September 2007

El Dorado County
Department of Transportation – Foothills Division
4505 Golden Foothills Parkway
El Dorado Hills, CA 95762

Attention: Mr. Rick Carter, Senior Civil Engineer

Subject: **LATROBE ROAD IMPROVEMENT PROJECT**
El Dorado Hills, California
MATERIALS REPORT

Reference: 1. Latrobe Road Improvement Plans, Prepared by El Dorado County Department of Transportation.

Dear Mr. Carter:

In accordance with your authorization, Youngdahl Consulting Group, Inc. has performed a materials study and report for the proposed Latrobe Road improvements in El Dorado Hills, California.

Our study included a visual site reconnaissance, followed by a stereonet analysis of the existing road cut between STA 0+25 and STA 17+00 along Latrobe Road at 25 to 50 foot intervals. A soil sample was collected at STA 1+50 to conduct an R-Value for pavement design and a three-part composite sample was collected and tested for the presence of naturally occurring asbestos.

Based on the results of our field study and laboratory testing, the site is suitable, from an engineering geology and geotechnical standpoint, to receive the proposed improvements, provided the recommendations presented in this report are incorporated into the project plans and specifications, and are adhered to during development.

Should you have any questions or require additional information, please contact our office at your convenience.

Very truly yours,
Youngdahl Consulting Group, Inc.

Andrea R. Mitchell
Staff Geologist

Reviewed By:

Roy C. Kroll, P.G., C.E.G
Associate Engineering Geologist

CERTIFIED ENGINEERING GEOLOGIST
ROY C. KROLL
No. 1328
EXPIRATION DATE 12/31/08
STATE OF CALIFORNIA

Victor P. Dumlao, P.E.
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
VICTOR P. DUMLAO
No. C70027
Exp. 09-30-08
CIVIL
STATE OF CALIFORNIA

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MATERIALS REPORT
For the
LATROBE ROAD IMPROVEMENT PROJECT
Latrobe Road
El Dorado Hills, California

INTRODUCTION

In accordance with the agreement between El Dorado County Department of Transportation (EDC D.O.T.) and Youngdahl Consulting Group, Inc. (YCG), this report presents a limited study of earth materials, rock cut slope analysis, and naturally occurring asbestos assessment performed for the Latrobe Road Improvement Project. The purpose of this limited study is to provide earth materials criteria for use in design and construction of the proposed road improvements. Limitations of this study are discussed in the attached "Limitations and Uniformity of Conditions".

PROJECT DESCRIPTION

We understand that, according to the EDC D.O.T., the Latrobe Road improvement project proposes to increase sight distance by realigning and widening about 0.3 miles of the road between the limits of Mile Post 6.9 and 7.6 along Latrobe Road. The project will vertically realign approximately 800 linear feet and 1700 horizontal feet to improve the sight distance and widen the road from its existing 26 feet to approximately 28 feet to match the existing roadway width from the previously improved southern end of the project.

EXPLORATION AND TESTING

On 31 August 2007, a YCG staff geologist and a California Registered Engineering Geologist, performed a rock cut slope analysis of the road cut in the existing road alignment. Geologic attitudes of the rock structure were taken in 25 to 50 foot intervals along the 0.3 miles of road that is going to be realigned during the course of the project. In addition, a soil sample was collected within the project area and was tested for naturally occurring asbestos (NOA). A more detailed report on the results of the NOA sampling can be found as an attachment to this report.

At the time of the rock cut slope analysis, YCG also collected a soil sample from STA 1+50 to conduct an R-Value test (California Test Method 301-F) to characterize the soils for roadway pavement design. The results of the R-Value test are discussed in the Structural Section/Subgrade section of this report.

GEOLOGIC SETTING

The project site is situated in the western foothills of the Sierra Nevada Range. The California Division of Mines and Geology "Mineral Land Classification of the Folsom 15-Minute Quadrangle, Sacramento, El Dorado, Placer, and Amador Counties, California" (1:48,000; 1984) maps surface materials within the project limits as Mesozoic age metavolcanic rocks of the Copper Hill Formation, with metasedimentary rocks of the Salt Springs Slate Formation along the western edge. The U.S.D.A. Soil Conservation Service "Soil Survey of El Dorado Area, California" (1974) depicts the site as covered by Auburn Series soils (AxE and AxD), which typically are comprised of 14 to 27 inches of surficial clayey silt or sandy silt, underlain by hard metamorphic rocks.

Rock and soil consistent with the above description was exposed along the proposed alignment for the road extension. A geologic investigation to evaluate the presence of asbestos in the proposed extension was completed concurrently with the subsurface investigation. The

investigation report did not document any naturally occurring asbestos in the samples collected (see attached letter report). Exposed rock was observed to be highly to moderately weathered and highly to moderately fractured/jointed.

Prominent structural discontinuities observed within the metavolcanic rock, exposed in the existing road cut between STA 9+00 and 12+00, consist of fractures and joint sets that strike to the northwest and predominantly dip between 50 and 90 degrees to the southwest (Figure 2). From STA 12+00 to 14+00 the prominent orientation of the strike of the discontinuities is to the northeast and dipping between 35 and 85 degrees. From STA 14+00 to 16+00 the strike of the discontinuities is to the northeast and dipping between 40 and 85 degrees to the southeast. A shear zone between STA 13+00 and 13+20 was observed and has a strike of N35°W and dip of 45° to the northeast.

EARTH MATERIALS AND CONDITIONS

Materials encountered along Latrobe Road are consistent with the published mapping and site observations. They include silty SAND with some clay and metavolcanic bedrock.

The silty SAND with some clay was observed between STA 0+25 and 8+50 where there was little to no bedrock exposed. There was also a section between STA 13+00 and 13+20 where the bedrock had been sheared, and allowed for the development of soil in this area.

The metavolcanic bedrock exposed in the road cut was weathered to highly weathered. In some places, where existing tree roots have significantly broken up the bedrock, there is the potential for the slope to ravel and slough off.

CONCLUSIONS AND RECOMMENDATIONS

Road Segments

Cut Slopes and Excavation

Based on our geologic mapping data, the maximum allowable slope for the proposed road cuts have been included in the table below. Due to the variability of the geology in this area, different sections of the road cut were determined to be stable at different slope ratios.

Station Number	Maximum Allowable Slope Ratio
STA 0+25 – STA 8+50	2H:1V
STA 8+50 – STA 11+00	1H:1V
STA 11+00 – STA 12+50	1.5H:1V
STA 12+50 – STA 13+00	1H:1V
STA 13+00 – STA 14+25	1.5H:1V
STA 14+25 – STA 17+00	1H:1V

This information is based upon potential planes of weakness (fractures, joints, foliations) daylighting out-of-slope that were evaluated during the rock cut slope analysis. To reduce the potential of surficial slope runoff, erosion, raveling, and sloughing of material on the cut slope, the construction of a brow ditch is recommended for the cut slopes. YCG recommends that the brow ditch be lined with an impermeable geocomposite geotextile, such as Huesker Canal[3] 8208 or Strata Systems VBC-350 DL or approved equivalent, overlain by cobbles to keep it in place. The product specifications have been included as an attachment to this report. The additional installation of a curb at the base of the slope could act as a crumb wall to prevent intermittent small scale material that sloughs off the slope from entering into the roadway.

Seepage should be expected seasonally from within the proposed cut slopes, but is not expected to be significant. Such areas should be reviewed during construction by the engineering geologist for supplemental drainage or subdrainage treatment, as necessary. The potential for naturally occurring asbestos rock to be exposed during road construction is not anticipated, based on our NOA assessment completed at the time of the cut slope investigation. There was no visible indication of NOA and the sample collected was non-detect for NOA. Please refer to the NOA assessment report that is an attachment to this report.

Basement/Subgrade Soils

Materials encountered along the proposed road alignment consist of silty sand, with a varying amount of gravel from disaggregated metavolcanic rock. An R-Value of 68 was determined for the silty SANDS tested. However, due to expansion encountered during laboratory testing and the redistribution of soils typical during grading, we used an R-value of 19 for design purposes.

Structural Section/Subgrade Preparation

Design Values: Table 1 provides recommended pavement sections based on the "R" - Value test (California Test Method 301-F) performed on a bulk sample representative of the silty SAND materials expected to be exposed at subgrade as well as our experience with similar materials in the area. *If clay soils are encountered, we should review pavement subgrades to determine the appropriateness of the provided sections, and provide additional pavement design recommendations as field conditions dictate. Even minor clay constituents will greatly reduce the design R-Value.* The recommended design thicknesses presented in Table 1 were calculated in accordance with the methods presented in the latest update of the Fifth Edition of the California Department of Transportation Highway Design Manual. A varying range of traffic indices are provided for use by the project Civil Engineer for roadway design.

Design values provided are based upon properly drained subgrade conditions. Although the R-Value design to some degree accounts for wet soil conditions, proper surface and landscape drainage design is integral in performance of adjacent street sections with respect to stability and degradation of the asphalt. Proper drainage design is particularly important for pavements constructed on relatively flat sites with subgrades consisting of finer grained, low permeability materials (i.e. silts and clays) and/or shallow bedrock horizons.

Table 1: Recommended Pavement Design Thickness

Design Traffic Indices	Alternative Pavement Sections (inches)	
	Asphalt Concrete*	Aggregate Base**
7.0	4.0 4.5	12.0 11.5
8.0	4.5 5.0	14.5 13.5
9.0	5.5 6.0	16.0 15.5
10.0	6.0	19.0 18.0

NOTES:
* Asphaltic Concrete: must meet specifications for CAL TRANS Type B Asphaltic Concrete
** Aggregate Base: must meet specifications for CAL TRANS Class II Aggregate Base ("R"-Value = minimum 78)

Due to the redistribution of materials that occurs during mass grading operations, we should review pavement subgrades to determine the appropriateness of the provided sections. Deep cut areas may have better support characteristics than those used in determining the above sections.

Drainage/Subdrainage/Erosion

No difficulty is anticipated with excluding free groundwater from the roadway structural section; therefore, no specific subdrainage requirements are foreseen at this time for this project. However, the potential for isolated areas of seepage along the soil/bedrock interface may require edge drains or local relief. Such areas should be evaluated by the engineering geologist at the time of excavation, and be treated as necessary. Surface flow should be directed away from the roadbed and ponding avoided within 0.8 meters of finish grade. Surficial soils throughout the project alignment are generally considered erodible where subjected to concentrated flow. New roadway runoff should be controlled accordingly. Erosion protection along inner-gutter areas where the gradient exceeds 5 percent is recommended.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. This report has been prepared for the exclusive use of El Dorado County Department of Transportation for specific application to the Latrobe Road Improvement Project. Youngdahl Consulting Group, Inc. has endeavored to comply with generally accepted geotechnical engineering practice common to the local area. Youngdahl Consulting Group, Inc. makes no other warranty, express or implied.

2. As of the present date, the findings of this report are valid for the property studied. With the passage of time, changes in the conditions of a property can occur whether they be due to natural processes or to the works of man on this or adjacent properties. Legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may cause this report to be invalid, wholly or partially. Therefore, this report should not be relied upon after a period of three years without our review nor should it be used or is it applicable for any properties other than those studied.

3. Section 3317.8 in Appendix Chapter 33 of the latest edition of the California Building Code is applicable to this report. This section states that, in regard to the transfer of responsibility, if the Geotechnical Engineer of Record for the project site is not maintained into and through the grading phase of the project, the work shall be stopped until the replacement has agreed in writing to accept their responsibility within the area of technical competence for approval upon completion of the work.

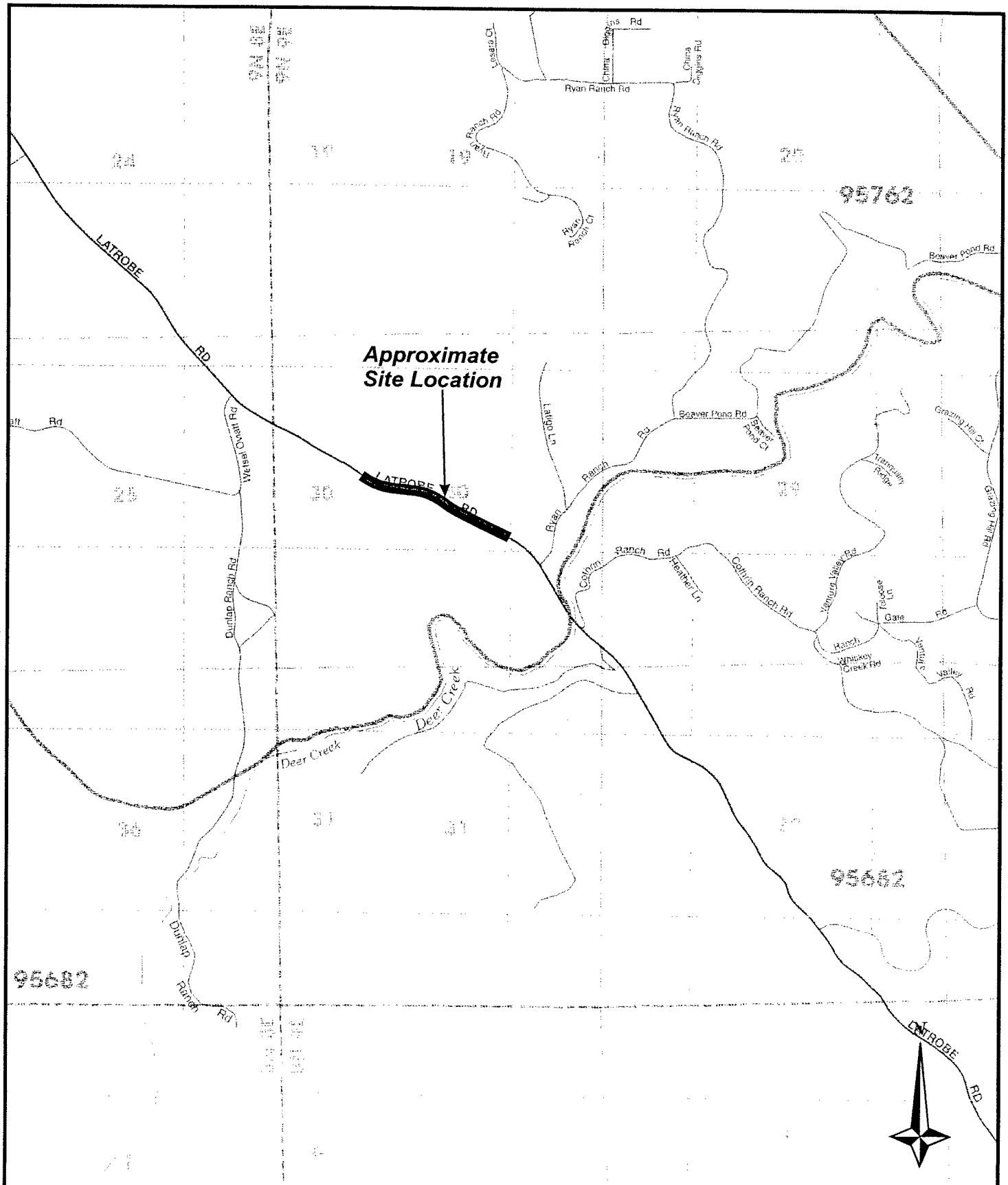
WARNING: Do not apply any of this report's conclusions or recommendations if the nature, design, or location of the facilities is changed. If changes are contemplated, Youngdahl Consulting Group, Inc. must review them to assess their impact on this report's applicability. Also note that Youngdahl Consulting Group, Inc. is not responsible for any claims, damages, or liability associated with any other party's interpretation of this report's subsurface data or reuse of this report's subsurface data or engineering analyses without the express written authorization of Youngdahl Consulting Group, Inc.

4. The analyses and recommendations contained in this report are based on limited windows into the subsurface conditions and data obtained from subsurface exploration. The methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Samples cannot be relied on to accurately reflect the strata variations that usually exist between sampling

locations. Should any variations or undesirable conditions be encountered during the development of the site, Youngdahl Consulting Group, Inc., will provide supplemental recommendations as dictated by the field conditions.

5. The recommendations included in this report have been based in part on assumptions about strata variations that may be tested only during earthwork. Accordingly, these recommendations should not be applied in the field unless Youngdahl Consulting Group, Inc. is retained to perform construction observation and thereby provide a complete professional geotechnical engineering service through the observational method. Youngdahl Consulting Group, Inc. cannot assume responsibility or liability for the adequacy of its recommendations when they are used in the field without Youngdahl Consulting Group, Inc. being retained to observe construction. Unforeseen subsurface conditions containing soft native soils, loose or previously placed non-engineered fills should be a consideration while preparing for the grading of the property. It should be noted that it is the responsibility of the owner or his/her representative to notify Youngdahl Consulting Group, Inc., in writing, a minimum of 48 hours before any excavations commence at the site.

FIGURES



BASE MAP REFERENCE: *El Dorado County Street And Road Atlas, Page 233 & 234, 2006*

YOUNGDAHL CONSULTING GROUP, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING	Project No.: E07057.003 **September 2007**	**VICINITY MAP** **Latrobe Road Safety Improvements** El Dorado Hills, California	**FIGURE** **1**

END CULVERT
LTR-XCL-STA. 0+60.26
OFFSET=-26.00'
N=1983286.8514
E=6839820.0254

RYAN RANCH RD.
(MP 6.88)

UTILITY POLE

EXISTING EP

UTILITY POLE

PROP. CL

UTILITY POLE

END CULVERT
LTR-XCL-STA. 8+16.86
OFFSET=-13.02'
N=1983633.6684
E=6839146.4528

2H:1V

0+25
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00

BEGIN CULVERT
LTR-XCL-STA. 0+50.16
OFFSET=34.59'
N=1983338.1712
E=6839853.7856

UTILITY POLE

BEGIN PROJECT
LTR-XCL-STA. 1+00.00
OFFSET=0.00'

EXISTING CL

FENCE LINE

BEGIN CULVERT
LTR-XCL-STA. 8+15.78
OFFSET=15.92'
N=1983659.1906
E=6839160.1435

MATCH LINE STA. 8+00
(SEE BELOW)

MATCH LINE STA. 8+50
(SEE ABOVE)

UTILITY POLE

EXISTING EP

1H:1V

UTILITY POLE

1.5H:1V

1H:1V

PROP. CL

1.5H:1V

1H:1V

END PROJECT
LTR-XCL-STA. 17+99.58
OFFSET=0.00'

UTILITY POLE

DRIVEWAY

11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00

FENCE LINE

TO HIGHWAY 50

EXISTING CL

EXCERPT FROM: *Latrobe Road Realignment, El Dorado County DOT, Sheet L-1, Dated 8/6/07*

PRELIMINARY

YOUNGDAHL CONSULTING GROUP, INC.
GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Project No.: E07057.003

September 2007

SITE PLAN

Latrobe Road Safety Improvements
El Dorado Hills, California

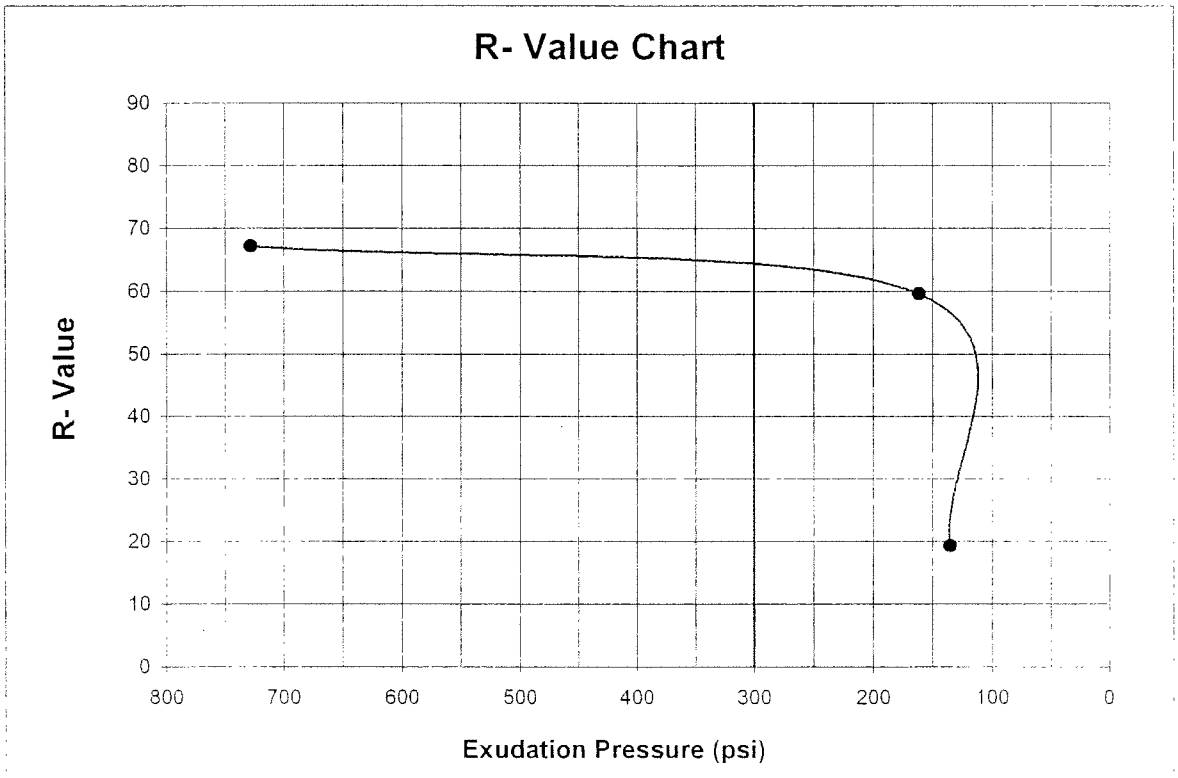
FIGURE 2

RESISTANCE VALUE TEST (Cal Test 301, ASTM D2844)

Sample I.D.: BK 1 Depth:

Description: Brown Silty SAND w/ trace clay and little gravel

Test Specimen	E	G	H
Moisture Content (%)	19.3	17.0	15.9
Dry Density (pcf)	107.2	110.8	111.6
Expansion Dial (0.0001")	34	114	171
Expansion Pressure (psf)	147.2	493.6	740.4
Exudation Pressure (psi)	135.3	161.5	728.0
Resistance Value "R"	19	60	67
R Value at 300 psi Exudation Pressure:			**68**



YOUNGDAHL CONSULTING GROUP, INC.
GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Latrobe Road Improvements

PROJECT NO	DATE
E07057.003	September 2007

FIGURE NO
3

ATTACHMENTS

YOUNGDAHL CONSULTING GROUP, INC.
Geotechnical • Geoscience • Materials Testing • Storm Water Compliance

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Project No. E07057.003
27 September 2007

El Dorado County
Department of Transportation – Foothills Division
4505 Golden Foothills Boulevard
El Dorado Hills, CA 95762

Attention: Mr. Rick Carter, Senior in Civil Engineer

Subject: **Latrobe Road Improvement Project**
El Dorado Hills, California
RESULTS OF NATURALLY OCCURRING ASBESTOS ASSESSMENT

References: See Reference Section Below

Dear Mr. Carter:

At your request, Youngdahl Consulting Group, Inc. (YCG) completed an assessment for naturally occurring asbestos (NOA) for the Latrobe Road Improvement Project in El Dorado Hills, El Dorado County, California. One (1) 3-part composite soil/rock sample was collected from 0 to 6 inches below the surface along the proposed new alignment for Latrobe Road. This sample was analyzed for asbestos by the California Air Resources Board Test Method 435 (ARB TM 435).

Regulatory Issues

When NOA is present, additional regulatory requirements may be triggered. The purpose of this evaluation was to determine if NOA is present in a form that would trigger these additional regulatory requirements. These requirements include the California Air Resources Board ATCM, Title 17, Section 93105 and the El Dorado County Environmental Management Department Air Quality Management District (AQMD) – Rule 223-2 "Fugitive Dust – Asbestos Hazard Mitigation" (Adopted 19 July 2005) (Rule 223-2).

Environmental Setting

The primary exposure pathway for asbestos is through inhalation of dust containing asbestos fibers. The direct ingestion of soil containing asbestos is not considered to be a significant exposure pathway for asbestos.

There are numerous ways in which dust can be generated. In general, dust suppression methods outlined by the California Environmental Protection Agency (Cal-EPA) have varying degrees of effectiveness in reducing the risks from exposure to dust containing asbestos. At this time, it is very difficult to directly quantify health risks based on asbestos concentrations in soil and rock because asbestos must become airborne to become a hazard and the potential amount of airborne dust cannot easily be estimated from a given soil concentration.

Sampling Activity and Test Results

On 31 August 2007, a representative of YCG, working under the supervision of a California Professional Geologist, collected one (1) 3-part composite soil/rock sample from 0 to 6 inches along proposed Latrobe Road alignment as a part of a rock cut slope analysis to test for NOA by the ARB TM 435 to a quantification limit of 0.25%. The laboratory tests were performed by an independent certified analytical laboratory working under a subcontract to YCG. Visible indications of NOA were not observed during the field investigation.

The sample was collected from the test pits with a stainless steel trowel. Each sample was placed into a 1-gallon plastic bag. The sample was then homogenized by kneading or mixing for approximately five minutes. Approximately 16 ounces of material was then placed into an 18-ounce sterilized sample bag. Approximately 16 ounces of material was also placed into a new 18-ounce plastic bag to be archived as a duplicate sample.

Results of Laboratory Analysis

The NOA samples were sent by overnight delivery, under chain of custody rules, to EMSL Laboratory of San Leandro, California (ELAP No. 1620). NOA was not detected in the samples.

Table 1 – Sample Collection Information for NOA Sampling

Sample Identification	Asbestos ARB TM 435	Description
LR-1	ND	Brown, non-fibrous, homogeneous

ARB TM 435, Limit of Quantification = 0.25%
ND = non-detect

QA/QC Procedures for NOA Samples

Archive duplicates of the NOA soil samples were obtained. The archive duplicate samples will be retained for further additional analysis if necessary and will be stored for a period of one year.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. This report has been prepared for the exclusive use of El Dorado County Department of Transportation and their consultants, for specific application to the Latrobe Road Improvement Project, located in El Dorado Hills. California. Youngdahl Consulting Group, Inc. has endeavored to comply with generally accepted environmental geology practice common to the local area. Youngdahl Consulting Group, Inc. makes no other warranty, express or implied.

2. As of the present date, the findings of this report are valid for the property studied. With the passage of time, changes in the conditions of a property can occur whether they are due to natural processes or to the works of man on this or adjacent properties. Legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may cause this report to be invalid, wholly or partially. Therefore, this report should not be relied upon after a period of three years without our review nor should it be used or is it applicable for any properties other than those studied.

3. The analyses and recommendations contained in this report are based on limited windows into the subsurface conditions and data obtained from subsurface exploration. The methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Samples cannot be relied on to accurately reflect the strata variations that usually exist between sampling locations. Should any variations or undesirable conditions be encountered during the development of the site, Youngdahl Consulting Group, Inc. will provide supplemental recommendations as dictated by the field conditions.

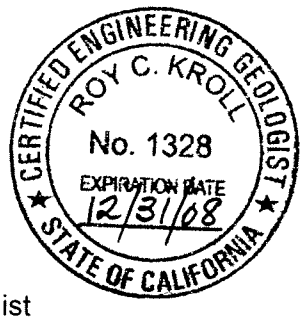
If you have any questions regarding this assessment, please do not hesitate to contact us at (916) 933-0633.

Very truly yours,
Youngdahl Consulting Group, Inc.

Andrea R. Mitchell
Staff Geologist

Reviewed by:

Roy C. Kroll, P.G., C.E.G.
Associate Engineering Geologist



Distribution: (4) Client

Attachment: Appendix I – EMSL Laboratory Analytical Reports

REFERENCES

1. CDMG, (2001), "Mineral Land Classification of El Dorado County, California", compiled by L.L. Busch, Open-File Report 2000.03.

2. Churchill, R.K. and others, (2000): "Areas More Likely To Contain Natural Occurrences of Asbestos in Western El Dorado County, California", California Department of Conservation, Division of Mines and Geology, Open File Report 2000-002.

3. El Dorado County, Environmental Management Department, Air Quality Management District (AQMD) – Rule 223-2 "Fugitive Dust – Asbestos Hazard Mitigation" (Adopted 7/19/2005).

APPENDIX I

EMSL LABORATORY ANALYTICAL REPORTS

EMSL Analytical, Inc
2235 Polvorosa Ave, Suite 230, San Leandro, CA 94577
Phone: (510) 895-3675 Fax: (510) 895-3680 Email: milpitaslab@emsl.com

Attn: **Andrea Mitchell**
Youngdahl Consulting Group
1234 Glenhaven Court
El Dorado Hills, CA 95762

Fax: (916) 933-6482 Phone: (916) 933-0633
Project: **E07057.003 / Latrobe Road Improvement, El Dorado Hills**

Customer ID:	YOUN22
Customer PO:	E07057.003
Received:	09/04/07 7:30 AM
EMSL Order:	090704982
EMSL Proj:	
Analysis Date:	9/12/2007
Report Date:	9/12/2007

PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	Location	Appearance	% Fibrous	% Non-Fibrous	% Type
LR-1		Brown		100.00% Non-fibrous (other)	None Detected
090704982-0001		Non-Fibrous Homogeneous			

Analyst(s)

Nonette Patron (1)

Baojia Ke, Laboratory Manager
or other approved signatory

THIS IS THE LAST PAGE OF THE REPORT.

YOUNGDAHL CONSULTING GROUP, INC.
GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

1234 Glenhaven Court
El Dorado Hills, CA 95762
Telephone: (916) 933-0633 Fax: (916) 933-6482

Lab Number 907049 & 2

Report Due Date:

CHAIN OF CUSTODY

Client:	Youngdahl Consulting Group, Inc.		
Address:	1234 Glenhaven Court		
City, State & Zip:	El Dorado Hills, CA 95762	Project Name:	Latrobe Road Improvement
Contact:	Andrea Mitchell	Project Number:	E07057.003
Telephone:	(916) 933-0633	Collection Point:	Latrobe Road
Fax Number:	(916) 933-6482	Collector's Name:	ARM
Fax Results:	(Y) N Page 1 of 1	Location (City):	El Dorado Hills

SAMPLE TYPE CODES

*Matrix: Soil = (S); Rock = R; Mineral Fragments = MF

*Container Type: (P) = Plastic; G = Glass; O = Other

TURNAROUND TIME REQUESTED

(Standard) *144+ hours*; RUSH; Special — Lab Manager Approval

CLIENT'S SAMPLE ID/LOCATION	Date	Time	SAMPLE TYPE	CONTAINERS	ANALYSES REQUESTED: ARB-TM-435	EPA Method 600/R-93-116 PLM	EPA Method 600/R-93-116 TEM
LR-1	8/31/07	1000	S	P	X		
LR-2	8/31/07	1030	S	P	HOLD		

Instructions/Comments/Special Requirements: *ARB TM 435 preparation

CARB 435 Prep Level A SL

SAMPLE RECEIPT			Date	Time	Samples Relinquished By	Samples Received By
Received Cold	Y	N	8/31/07	1145		
Custody Seals	Y	N				
Seals Intact	Y	N				
No. of Containers:						

CANAL[3]
HGC 8208-PET

HUESKER'S HGC 8208-PET IS A COMPOSITE GEOTEXTILE THAT CONSISTS O TWO (TOP AND BOTTOM) 8 OZ/YD^2 POLYESTER NONWOVENS BONDED TO 20 MILS C OLEFINIC COPOLYMER GEOMEMBRANE. THE HGC 8208-PET GEOCOMPOSITE IS NERT TO BIOLOGICAL DEGRADATION AND NATURALLY ENCOUNTERED CHEMICALS ALKALIES, AND ACIDS. HGC 8208-PET COMPOSITE CONFORMS TO THE NOMINAL VALUI S LISTED IN THE FOLLOWING TABLE.

PHYSICAL PROPERTIES OF CANAL[3] HGC 8208-PET COM OSITE

PROPERTY	TEST METHOD	VA IES
Mass Per Unit Area	ASTM D-5261	32 /yd^2
Membrane Thickness	ASTM D-5199	20 mils
Grab Tensile Strength (MD)	ASTM D-4632	3(lbs
Grab Elongation (MD)	ASTM D-4632	>1 %
Trapezoid Tear Strength (MD)	ASTM D-4533	1( ) lbs
Puncture Strength, (5/16)	ASTM D-4833	2 lbs

Roll Size –

- Width – up to 25 feet
- Length – up to 400 feet

Each roll of HGC 8208-PET composite delivered to the project site is labeled by HUESKER® with roll label that indicates manufacturer's name, product identification, lot number, roll number and roll dimensions. All rolls of HGC 8208-PET are encased in a sturdy polyethylene wrap to shield the product from rain, dirt, dust and ultraviolet light. Contact HUESKER for information on our material warranty.

8-03

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HIGH STRENGTH GEOTEXTILES, GEOGRIDS & GEOCOMPOSITES

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Strata Systems, Inc.
Barrier-Bac Division

VBC- 350 DL

Physical Properties and Typical Values

Film ID			**350 gsr ı film w/ Fiber**
Thickness (gsm)	**Internal**		**33 mils**
Tensile @ ULT	**ASTMD**	**MDTD**	**136.8**
(lbs / in)	**D882**	**TD**	**103.2**
Elongations @ ULT	**ASTM**	**MD**	**789.1**
(%)	**D882**	**TD**	**857.1**
Dart Impart	**ASTM**	**Method A**	**3809**
(grams)	**D1709**	**Method B**	**3912**
Elmendorf Tear	**ASTM**	**MD**	**>13,000**
(grams)	**D1922**	**TD**	**>13,000**
Puncture-Prop. Tear	**ASTM**	**MD**	**>230,882**
(grams) Sled: 1 – lb	**D2582**	**TS**	**>230,882**
Beach Puncture Tear	**ASTM**	**MD**	**170.8**
(in – lbs)	**D781**	**TD**	**168.2**
Maximum use temperature			**180° F**
Minimum use temperature			**-50°F**

PERMEABILITY

Baseline Water Vapor Permeance (Perms)	**ASTM E96**	**Method B**	**0.009**
Permeance After Wetting, Drying & Soaking (Perms)	**ASTM 154-93**	**Section 8**	**0.009**
Effect of Low Temperature on Bending (Perms)	**ASTM 154-93**	**Section 12**	**0.011**
Resistance to Organisms and Substrates in Contact w/Soil (Perms)	**ASTM 154-93**	**Section 13**	**0.013**
Resistance to Petroleum and Soil Poison (Perms)	**ASTM 154-93**	**Section 14**	**0.014**

Note: Information herein, to the best of our knowledge, are typical property values and intended as guides only. Strata S ıtems, Inc. makes no warranties as to the suitability for specific use or merchantability of products referred to, no guarantee, express or imp ıd, is made as to product application for a particular use.

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