Appendix E.1 Final Geologic and Soils Engineering Report Part 2

Appendix E.1.1 Prior Geologic Work (1965 through 1999)

JB17866

FOUNDATION ENGINEERING COMPANY
CIVIL ENGINEERS
219 WEST 7TH STREET
LOS ANGELES, CALIFORNIA, 90014
873-5032 (AREA CODE 213)

VALLEY OFFICE
5521 RESEDA BLVD.
TARZANA, CALIF. 91356
342-8711

LABORATORY
11104 VENTURA BLVD.
STUDIO CITY, CALIF.

SOILS ENGINEERING INVESTIGATION

Hillside Building Site

General

A foundation investigation has been conducted for a proposed retaining wall at Harvard School, 3700 Coldwater Canyon Road, Studio City, in Los Angeles, California. The work included drilling 2 test holes and conducting field and laboratory tests to classify the soil. Field inspection and testing indicate the wall can be designed in conformity with the provisions of the Building Code, and therefore design values were selected from the Code. This report was prepared after reviewing the preliminary plans and making foundation recommendations to the designers.

Surface Conditions

The property is located at the base of a west slope in the foothills of the Santa Monica Mountains. The wall excavation had been made at the time of this investigation.

The soil on the surface consists of a sandy clay. Tributary drainage to the site is intercepted by an existing private road. There were no signs of slope instability or excessive moisture.

A map is attached showing the approximate topography of the site and adjoining property.

Foundation Conditions

The soil consists of a medium dense sand-clay mixture which contains some gravel. The soil becomes more coarse with depth. The temporary vertical cut exposed no bedrock.

A map is attached showing the locations of test holes. Also included are the boring logs.

Conclusions and Recommendations

It is concluded that the site will be suitable for the proposed wall. Our recommendations are based on inspection of the site, exploration, and experience with similar sites. The wall will not be supporting bedding plane loads.

The slopes should be planted to reduce erosion in accordance with Section 91.3007 of the Los Angeles City Building Code.

Footings placed 12 inches into the ground may be designed for an allowable bearing pressure of 1000 pounds per square foot. This value may be increased 200 pounds per square foot for each additional foot of penetration to a maximum value of 4000 pounds per square foot.

A sliding coefficient of 0.4 may be assumed and an equivalent fluid pressure of 200 pounds per cubic foot may be used for lateral passive resistance to a maximum value of 4000 pounds per square foot.

Retaining walls with level backfill should be designed for an equivalent fluid pressure of 30 pounds per cubic foot.

Walls to retain a natural or compacted fill slope of 2 horizontal to 1 vertical may be designed for an equivalent fluid pressure of 43 pounds per cubic foot.

The wall backfill should be drained. A continuous layer of gravel 12 inches in height should be placed against the back of the wall. Weepholes should consist of unmortared joints in block walls or 1/2 inch diameter round holes in poured concrete walls. The openings should be at least 6 inches above finished grade to prevent surface water from flowing back into the holes. The temporary wall excavation has been made and will stand without shoring to a vertical height of 9 feet.

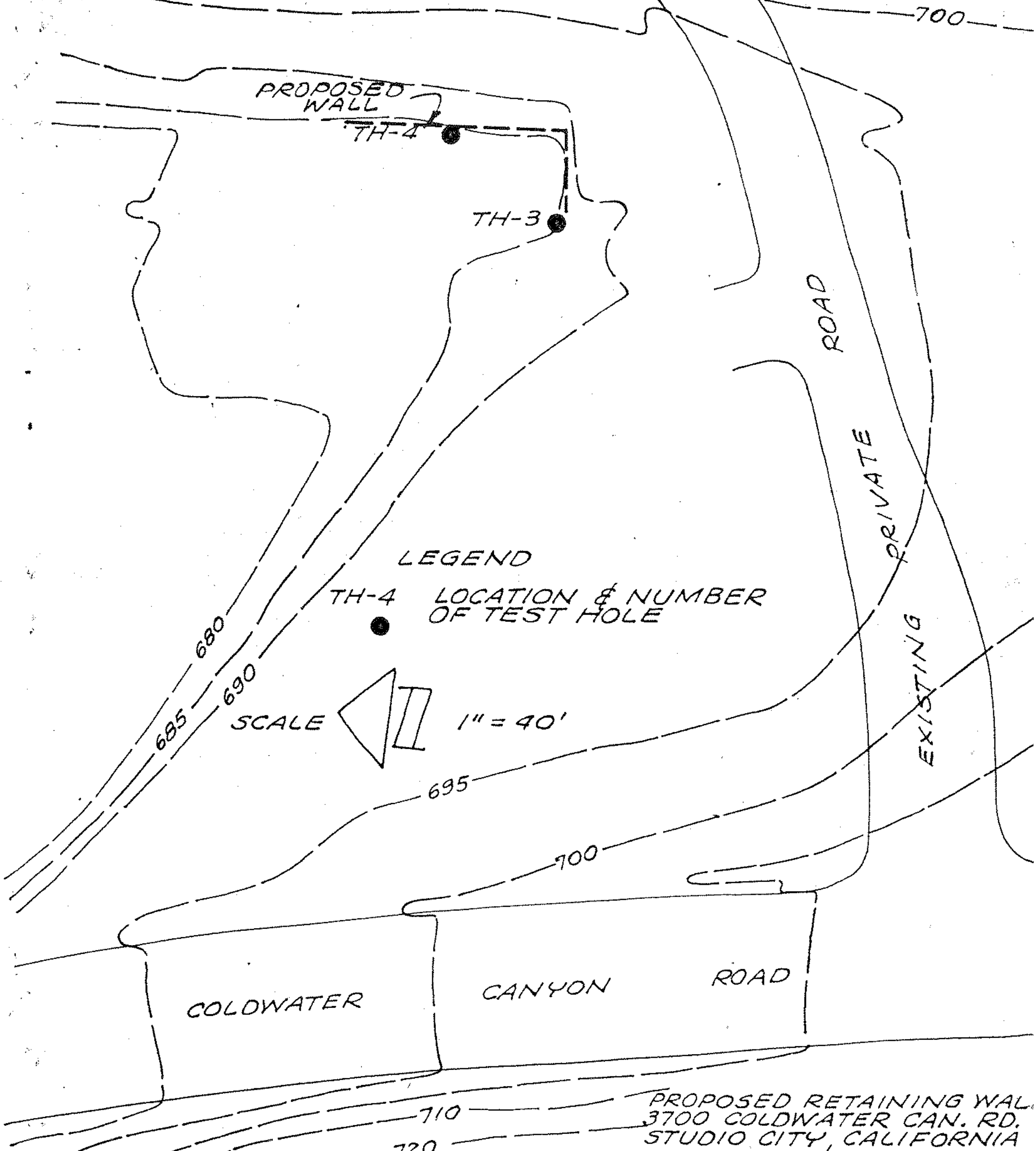
FOUNDATION ENGINEERING COMPANY

Jack W. Rolston

JACK W. ROLSTON
Civil Engineer

August 23, 1965

LOCATION OF TEST HOLES



PROPOSED RETAINING WAL
3700 COLDWATER CAN. RD.
STUDIO CITY, CALIFORNIA

FOUNDATION ENGINEERING COMPANY

LOG OF TEST HOLES

Continuous disturbed samples were taken for classification tests to identify the various soils, and 2-1/2 Inch diameter undisturbed samples were taken at frequent intervals for detailed laboratory tests. Also a 2-inch sampler was driven in a prescribed manner (see N below) to obtain relative density and consistency of the soil. There are various sizes of samplers and driving hammers in existence, but as this combination of sampler and hammer has been used the most, it has been adopted by the profession as the "standard" and is designated in texts as the Standard Penetration Test. Reference: Soil Mechanics in Engineering Practice, Terzaghi & Peck, Wiley 1948, Page 265.

An explanation of the symbols and values shown on the logs is as follows:

N — The number of blows of a 140 lb. hammer, having a fall of 30" needed to drive a 2" o.d. sampler one foot after seating the sampler 6 inches. An estimate of the relative density of sands, silty sands and gravelly sands can be obtained from Table I, and of the consistency of clays and silts from Table II.

M. C. — Moisture content in percent of dry weight.

D. D. — Dry Density in pounds per cubic foot.

4. — The percent of the material that will pass a no. 4 sieve (3/16"); the materials larger than the no. 4 sieve and smaller than 3 inches would be designated as a gravel, and the material smaller than the no. 4 and larger than the no. 200 would be termed as a sand.

200 — The percent of the material that will pass a no. 200 sieve (the largest particle that will pass a no. 200 sieve is about the smallest that can be seen with the unaided eye). If more than one-half of the sample passes this sieve, it would be classed as a clay or silt.

L. L — Liquid Limit, an arbitrary test that determines the moisture content at which the soil changes from a plastic to a viscous liquid condition.

P. I. — Plastic Index, the difference between Liquid Limit and Plastic Limit. The P. L. is the moisture content at which the soil changes from a plastic to a semi-solid consistency. The Plastic Index is a measure of plasticity, which is used to differentiate between clays and silts. A material having a relative high plasticity with respect to the Liquid Limit would be classed as a clay.

TABLE I

Relative Density of Sands

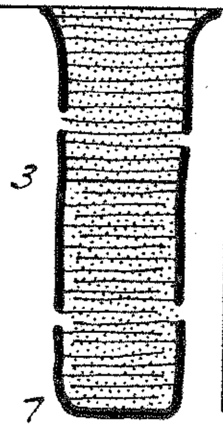
N	
0-4	Very loose
4-10	Loose
10-30	Medium
30-50	Dense
Above 50	Very Dense

TABLE II

Consistency of Clays & Silts

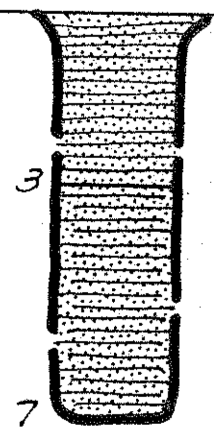
N	
2-4	Soft
4-8	Medium
8-15	Stiff
15-30	Very Stiff
Above 30	Hard

LOG OF TEST HOLE 3



N	MC	DD	4	200	LL	PI	DESCRIPTION
							SANDY CLAY
16	18	87	95	52	31	7	MEDIUM DENSE
	19		90	48			CLAYEY SAND
		92					MEDIUM DENSE
20	17		90	33			

LOG OF TEST HOLE 4



N	MC	DD	4	200	LL	PI	DESCRIPTION
							SANDY CLAY
14	27	76	98	66	51	14	MEDIUM DENSE
	31		96	47			CLAYEY SAND
							MEDIUM DENSE
12	29	78	98	48			

DRILLED AUG. 18, 1965
NO GROUND WATER

3700 COLDWATER CANYON
STUDIO CITY, CALIFORNIA
FOUNDATION ENGINEERING COMPANY

B&S Form G-10—20M—3-65 (R-66)

REPORT ON APPEAL FOR MODIFICATION
City of Los Angeles
Board of Building and Safety Commissioners

File

JOB ADDRESS: 3700 Coldwater Canyon Blvd.
Tract 1000, Lot 1111
OWNER: Harvard School
STATUS: Proposed

VN
BOARD FILE: #650734
OCCUPANCY:
TYPE:
STORIES:
FIRE DIST.:
ZONE:
JOB ORDER:
PERMIT:

READ BY

Harvard School
3700 Coldwater Canyon
Studio City, California

REQUEST:

Permission to place compacted fill on existing loose fill.

STAFF RECOMMENDATION:

Approval, provided:

1. A grading permit is secured.
2. The new fill is compacted to 90 percent density and is tested by an approved soil testing agency.
3. All recommendations of the soil report by Foundation Engineering Company dated July 30, 1965, are incorporated into the plans.
4. An affidavit stating that the fill will not be used for the support of structures is recorded with the County Recorder and filed with the Department.

COPY

CODE AND COMMENTS:

Section 91.3006 (d) states in part, "All man-made fills shall be compacted to a minimum of 90 percent relative compaction as determined by A.S.T.M. method D 1557-58T."

The subject site is located at the Harvard School on Coldwater Canyon Boulevard in Studio City.

A proposed road and parking area will require a maximum depth of ten feet of new fill to be placed over an old fill which is contained in a canyon bottom. A soil engineering report by Foundation Engineering Company, Inc., indicates the loose fill is approximately 20 feet deep and is believed to have been in place at least 25 years.

Superintendent of Building

Recommended by:

August 4, 1965 W.E.M.

Report and recommendations adopted by the BOARD OF BUILDING AND SAFETY COMMISSIONERS on AUG 4 1965

Approvals on proposed construction are void unless required permit is obtained within six months.

3700 Coldwater Canyon Blvd. Board File No. 650734

Harvard School Page 2 of 2

CODE AND COMMENTS: CONT'D

Under the above conditions, the request constitutes a slight modification of the ordinance in that the fill will not be used for structural support. The modification is in conformity with the spirit and purpose of the ordinance involved.

J. C. HONNING
Superintendent of Building

Recommended by:

W. E. MILBURN
Chief of Grading Division

WEM:PGB:sl

FOUNDATION ENGINEERING COMPANY
CIVIL ENGINEERS
219 WEST 7TH STREET
LOS ANGELES, CALIFORNIA, 90014
873-5032 (AREA CODE 213)

VALLEY OFFICE
5521 RESEDA BLVD.
TARZANA, CALIF. 91356
342-8711

LABORATORY
11104 VENTURA BLVD.
STUDIO CITY, CALIF.

July 30, 1965

Mr. Robert G. Johnson A.I.A.
13135 Ventura Boulevard
Sherman Oaks, California

Re: Lot 1111, Tract 1000

Dear Sir:

The location of the proposed driveway for Harvard School at 3700 Coldwater Canyon, Studio City, has been inspected. The proposed road will cross the canyon just north of the existing tennis courts and join a private road on the east side of the canyon.

Bedrock is exposed in the sides of the canyon. It is our opinion that fill existing on the bottom of the canyon to a depth of approximately 20 feet. Judging by the age of the existing buildings, it is believed that the fill has been in place for at least 25 years. The area has been planted and has been well irrigated.

The road and parking area will require a maximum depth of 10 feet of new fill. It is our opinion that the new fill can be placed directly on the old fill since the existing material has been in place for a long period of time, has been thoroughly watered, and the site will not be used for buildings.

Prior to placement of the new fill the vegetation should be removed, the upper layer of old fill should be excavated to firm material, and the subgrade should be moistened and compacted. New fill should be placed in layers and compacted under the direction of a soils engineer. On the side of the canyon all loose soil should be removed and the fill placed directly on the bedrock.

Very truly yours,

FOUNDATION ENGINEERING CO.

Jack W. Rolston
JACK W. ROLSTON
Civil Engineer

JWR:jh

FOUNDATION ENGINEERING COMPANY
CIVIL ENGINEERS
219 WEST 7TH STREET
LOS ANGELES, CALIFORNIA, 90014
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VALLEY OFFICE
5521 REBEDA BLVD.
TARZANA, CALIF. 91356
342-8711

LABORATORY
11104 VENTURA BLVD.
STUDIO CITY, CALIF.

RECEIVED
JUL 30 1965
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE

July 30, 1965

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JACK W. ROLSTON
Civil Engineer

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B&S Form G-10 -20M—3-65 (R-66)

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City of Los Angeles
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4. An affidavit stating that the fill will not be used for the support of structures is recorded with the County Recorder and filed with the Department.

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Superintendent of Building

Recommended by:

August 4, 1965 W.E.M.

Report and recommendations adopted by the BOARD OF BUILDING AND SAFETY COMMISSIONERS on AUG 4 1965

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3700 Coldwater Canyon Blvd. Board File No. 650734

Harvard School Page 2 of 2

CODE AND COMMENTS: CONT'D

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J. C. MONNING
Superintendent of Building

Recommended by:

W. E. MILBURN
Chief of Grading Division

WEM:PGB:sl

FOUNDATION ENGINEERING COMPANY

CIVIL ENGINEERS
219 WEST 7TH STREET
LOS ANGELES, CALIFORNIA, 90014

873-5032 (AREA CODE 213)

VALLEY OFFICE
5521 RESEDA BLVD.
TARZANA, CALIF. 91356
342-8711

LABORATORY
11104 VENTURA BLVD.
STUDIO CITY, CALIF.

July 30, 1965

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Lot 1111
3700 Coldwater Cyn

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13135 Ventura Boulevard
Sherman Oaks, California

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The road and parking area will require a maximum depth of 10 feet of new fill. It is our opinion that the new fill can be placed directly on the old fill since the existing material has been in place for a long period of time, has been thoroughly watered, and the site will not be used for buildings.

Prior to placement of the new fill the vegetation should be removed, the upper layer of old fill should be excavated to firm material, and the subgrade should be moistened and compacted. New fill should be placed in layers and compacted under the direction of a soils engineer. On the side of the canyon all loose soil should be removed and the fill placed directly on the bedrock.

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FOUNDATION ENGINEERING CO.

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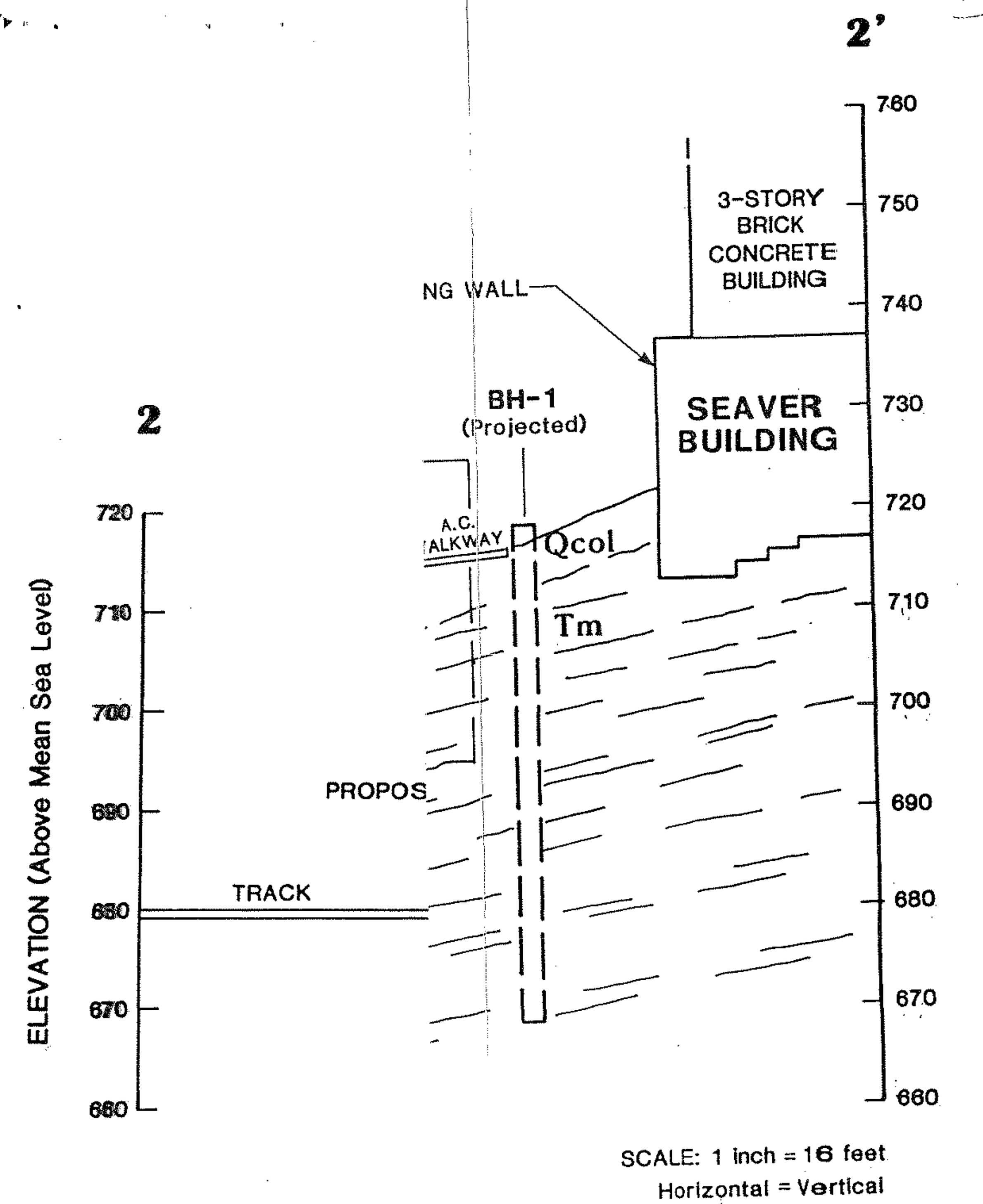


SEE DRAWING 1 FOR DE

SECTION 2-2'

Project No.	Drawing No.
93-31-141-01	3

ENGINEER'S CERTIFICATE OF COMPLIANCE

FOR

CONSOLIDATED EARTH FILLS

RECEIVED
NOV 22 1965
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING NOV 1? 1965

TRACT: 1000 LOT: 1111

Job Address:	3700 Coldwater Canyon Road, Studio City
Soil Testing Agency:	FOUNDATION ENGINEERING COMPANY 873-5032 219 W. 7th St., Los Angeles, Calif. 90014
Owner's Name:	HARVARD SCHOOL 984-1830 3700 Coldwater Canyon, Studio City
Topography by:	Harmon Rasnow & Associates 21318 Dumetz Rd., Woodland Hills, Calif. DI 8-1084
Grading Plan by:	Johnson-Silvestri 13135 Ventura Blvd., Sherman Oaks, Calif.
Grading Contractor:	Kirby- & Wood 14941 Raymer Street, Van Nuys, Calif. ST 6-1142
Date work started:	August 4, 1965
Date fill completed:	November 3, 1965
Permit No.:	LA 97122 Date: 1965

Note: See attached report for description of the grading, classification of the soil and tabulation of the test results. A Foundation Report describing the conditions at the site was prepared on July 30, 1965, August 23, 1965 and September 20, 1965

Date of Certificate: November 5, 1965

TO THE SUPERINTENDENT OF BUILDING

I hereby certify that I have personally supervised* the placing of consolidated earth fill on the above described property and that the same was placed in conformity with the requirements of the Los Angeles City Building Code.

Jack W. Rolston
JACK W. ROLSTON
Civil Engineer

*For the purpose of this certificate, to have "personally supervised" shall include supervision performed by any person or persons employed by, and responsible to, the licensed engineer signing this certificate. Where the supervision of all or part of the work above is delegated, full responsibility shall be assumed by the licensed engineer whose signature is affixed hereon. Supervision does not include location, elevation, grades or dimensions of fill.

File

August 27, 1965

Harvard School
3700 Coldwater Canyon Road
Studio City, California

RE: Tract 1000
Lot 1111
Location 3700 Coldwater Canyon Road

SUBJECT: Engineering Report, dated August 23, 1965, prepared by Foundation Engineering Company.

The above report has been reviewed by the Grading Division of the Department of Building and Safety. It is recommended that the conditions listed below are followed:

1. All of the recommendations of the report are incorporated into the plans.
2. The soils engineer shall inspect the footing excavations to determine that they are founded in the recommended strata before calling the Department for footing inspection.
3. A field inspection reveals an undetermined amount of uncontrolled fill in the area of the proposed wall. All the footings shall extend through the fill into the natural undistrubed soils.
4. Temporary shoring may be omitted for excavations to a maximum vertical height of nine feet.

J. C. MONNING
Superintendent of Building

W. E. MILBURN
Chief of Grading Division

WEM:JC:sl

JB178666

FOUNDATION ENGINEERING COMPANY

CIVIL ENGINEERS

219 WEST 7TH STREET

LOS ANGELES, CALIFORNIA, 90014

873-5032 (AREA CODE 213)

VALLEY OFFICE
5521 RESEDA BLVD.
TARZANA, CALIF. 91356
342-8711

LABORATORY
11104 VENTURA BLVD.
STUDIO CITY, CALIF.

REPORT ON CONTROLLED COMPACTED FILL

3700 Coldwater Canyon Road, Studio City, California

General

Compacted fill was placed in the bottom of a canyon to create a private roadway and parking area. Compacted sand backfill was placed behind retaining walls., and behind a basement wall near the chapel. The maximum depth of fill is 13 feet.

Description of the Fill

Prior to placement of the fill, the area was cleared of all weeds and debris. A 15-foot leveled area was provided at the toe of the fill to provide a bench to begin the fill. The existing ground was scarified to a depth of 6 inches, moistened and compacted. After the ground surface was prepared it was inspected and found to be firm and suitable for support of the fill. The material used for the fill was obtained from the site and from 5000 Coldwater Canyon Road and consisted of sandy clay and silty sand, and sand.

Fill was placed in level loose layers not exceeding 6 inches in thickness, moistened to near optimum moisture and compacted with a tamping roller (sheepsfoot). Water was placed on the completed portion of the fill before placement of additional fill. The fill slopes are 2 horizontal to 1 vertical. During placement of the fill the tamping roller was backed over the slope to compact the fill slope.

The extent of the grading is shown on the attached drawing.

Testing

Field density tests were made at frequent intervals at a depth of about 8 inches below the fill surface to determine the degree of compaction. These tests were made by the sand volume method in accordance with the American Association of State Highway Officials (AASHO) Test Method T 147-49, Method A. The density was determined by obtaining the dry weight of the soil from a hole approximately 8 inches deep and determining the volume of the hole with calibrated sand.

The maximum density and otpimum moisture content were determined in the laboratory in accordance with the American Society for Testing Materials (ASTM) Test Method D 1557-58T. The compaction test was made on the minus no. 4 fraction of the sample in a 4-inch diameter mold having a 1/30 cubic foot volume with 25 blows of a 10 pound hammer falling 18 inches on each of five layers. A new batch of soil was used for each point on the compaction curve.

The degree of compaction is the ratio between the field density and the maximum density obtained in the laboratory.

The locations of the density tests are given on the attached plan showing the extent of the fill. The results of the tests are shown on the attached table "Summary of Tests".

Conclusions and Recommendations

It is concluded that the fill was placed in an orderly and efficient manner, that the field density tests are representative of the density of the entire fill, and that all portions of the fill are compacted to at least 90% of the maximum density as determined in the laboratory in accordance with the requirements of the City of Los Angeles.

It is recommended that provisions given in the report dated July 30, August 23, and September 20, 1965 be used as a basis for design. Conditions at the site were similar to those anticipated in the original foundation report. The fill is non-structural and is intended as a driveway fill, wall backfill only. Only pavement, curbs and drainage devices may be placed on the fill.

On completion of the grading, the leveled areas were sloped to drain toward the street and berms were provided at the top of the fill slope to prevent water from flowing over the slope. The drainage provisions and berms must be maintained during and after construction to prevent scour of the slopes. Although fill is compacted, scour can occur readily if water is allowed to flow over the slopes in a concentrated manner. All slopes should be planted to reduce erosion in accordance with Section 91.3007 of the Building Code. Sloughing of the slopes should be expected until a dense ground cover is established.

FIELD DENSITY TESTS - 3700 Coldwater Canyon Road, Studio City

Test #	Date	Field Density pcf	Percent Moisture	Maximum Density, pcf	Degree of Compaction %
1	8/4/65	75	24	81	93
2	8/5/65	75	33	81	93
3	8/5/65	77	33	81	95
4	8/6/65	76	31	81	94
5	8/6/65	77	29	81	95
6	8/9/65	76	30	81	94
7	8/9/65	78	27	81	96
8	8/10/65	77	27	81	94
9	8/10/65	75	32	81	92
10	8/11/65	76	31	81	94
11	8/11/65	75	26	81	93
12	8/11/65	79	23	81	98
13	8/17/65	106	14	113	94
14	8/17/65	102	17	113	90
15	8/18/65	104	16	113	92
16	8/19/65	111	11	113	98
17	8/19/65	107	10	113	95
18	8/25/65	108	12	113	96
19	8/26/65	106	13	113	94
20	8/26/65	104	15	113	92
21	8/27/65	107	13	113	95
22	8/27/65	107	13	113	95
23	8/31/65	107	15	113	95
24	9/1/65	106	12	113	94
25	10/21/65	105	10	113	93
26	11/1/65	108	8	116	93
27	11/1/65	107	10	116	92
28	11/1/65	109	9	116	94
29	11/2/65	108	10	116	93
30	11/2/65	109	9	116	94

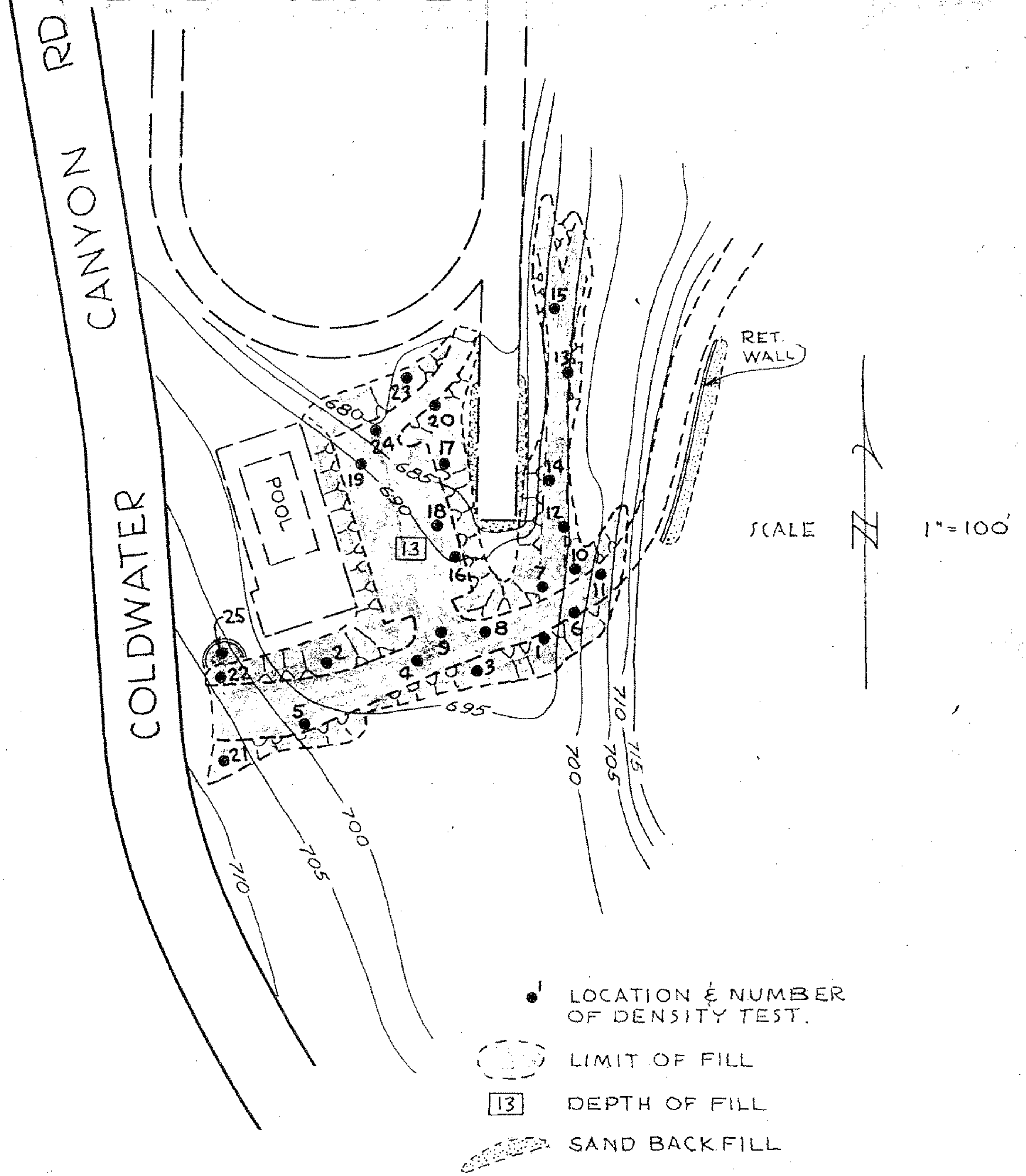
COMPACTION TEST

Maximum Dry Density, lbs. per cu. ft.	81	113	116
Maximum Size Tested	1/4	1/4	1/4
Optimum Moisture, Percent:	32	15	10
Field Density Test Nos.:	1-12	13-25	26-30

CLASSIFICATION TESTS

Soil Type	Sandy Clay	Silty Sand	Sand
Percent Passing No. 3/4 Sieve	98	99	100
Percent Passing No. 4 Sieve	95	95	100
Percent Passing No. 200 Sieve	51	24	6
Liquid Limit	30	-	-
Plastic Index:	8	--	-
Expansion:	Expansive	Non-Expan.	Non-Expan.

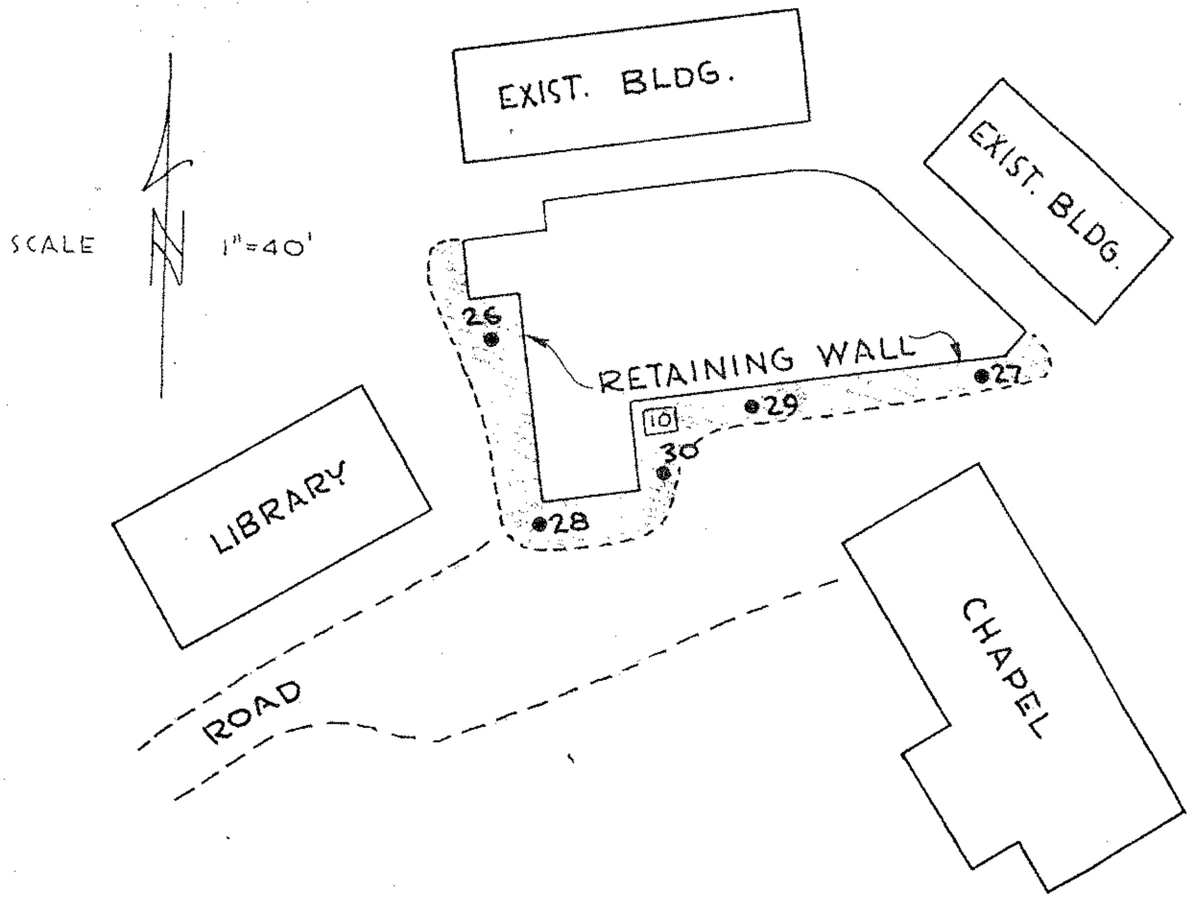
LOCATION OF DENSITY TESTS

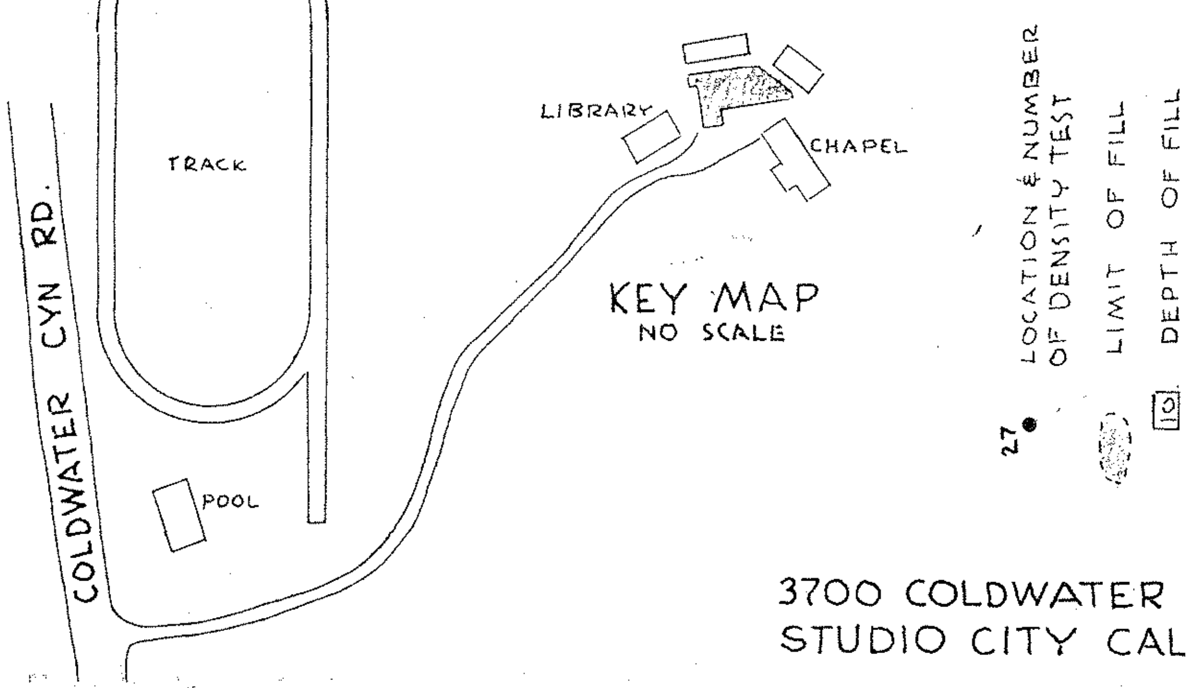


3700 COLDWATER CYN
STUDIO CITY, CALIF.

FOUNDATION ENGINEERING COMPANY

LOCATION OF DENSITY TESTS





3700 COLDWATER CYN. RD.
STUDIO CITY CALIF.

FOUNDATION ENGINEERING COMPANY

I 1000 V.N. FILE

HARVARD SCHOOL

November 24, 1965

Foundation Engineering Co.,
219 West 7th Street
Los Angeles, Californăa 90014

Subject: Tract 1000
Lot Por. 1111
Location 3700 Coldwater Cyn., (VN65/83502)

Lots having compacted fill same

Final approval is granted for compacted fill constructed on above lots of subgect property as described in your report dated 11-5-65.

The approval is limited exclusively to the area shown in the report and subject to the following requirements:

A. The compacted fill is approved only as a non-structural fill. This fill is not to be used for support of structural footiggs.

B. Slope erosion control, planting, and irrigating of fill slopes, and runoff control are required.

J. C. MONNING
Superintendent of Building

F. R. BAUER
Grading Engineer

D.M. 7325

FRB/eg

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET ☐ LOS ANGELES, CALIFORNIA 90026 ☐ TELEPHONE 386-3920

LeROY CRANDALL
AND ASSOCIATES

Board File 670179

November 17, 1967

Johnson and Silvestri & Associates
13135 Ventura Boulevard
North Hollywood, California 91604 (Our Job No. B-67150)

Gentlemen:

Inspection of Caisson Excavations,
Proposed Subsurface Drainage System;
Inspection of Foundation Excavations, and
Inspection and Testing of Compacted Fill
Proposed Lower School Building - Harvard School
3700 Coldwater Canyon Drive.
Los Angeles, California
for the Harvard School

This report confirms our inspection and approval of the excavations for drilled-and-belled caissons installed as components of the sub-surface drainage system at the subject site, and of the excavations for spread footings installed to support the proposed Lower School Building; included are the results of our inspection and testing of the compacted fill placed in the northeasterly corner of the building area to provide support for the floor slab, and of the compacted soils placed as backfill adjacent to footings. The locations of the sub-surface drainage lines and the proposed Lower School Building are shown, with relation to adjacent existing buildings, on the attached Plate 1, Plot Plan. The inspection work was performed during the period of July, 1967 through October,

1967. We previously performed a foundation investigation of the site, and submitted our recommendations in a report dated August 26, 1966 (our Job No. A-66131). We also performed field percolation studies at the subject site, and presented the results, as well as our recommendations for sub-surface drainage, in a report dated December 2, 1966 (our Job No. A-66131-B).

In our initial investigation, it was discovered that an ancient slide existed at the site of the proposed development; the approximate boundary of the ancient slide mass is shown on Plate 1, Plot Plan. From the tests and analyses presented in our report of August 26, 1966, it was found that the slide mass is stable under the conditions existing at the time of our investigation, and that the site could be developed for the proposed building if hydrostatic pressures are not allowed to develop within the slide mass. Accordingly, we recommended that a suitable drainage system be devised to assure that future seepage would not jeopardize the stability of the site.

It was concluded that two rows of vertical sand drains would be the most suitable method of intercepting any future seepage. A preliminary plan of a sub-surface drainage system was presented in our report of December 2, 1966. We recommended that two rows of vertical drains be installed, with the drains extending at least six feet below the slide plane. The drains were to be interconnected at the bottoms to provide drainage to a common sump. In our preliminary plan, the vertical drains were shown at a spacing of seven feet on centers, based on the assumption that the drains would be connected by either belling or slot-cutting. The seven-foot spacing was not final, however, and could be modified in accordance with the contractor's method of installation. If the contractor chose to connect the drains by boring or tunneling, a larger spacing up to a maximum of 15 feet on centers could be used. An adequate slope was to be provided along the drain connections to allow the water to flow to a sump located in each of the two drain lines. After the required excavation, the drains were to be filled with washed concrete sand, except for the top six feet which was to be plugged with impermeable soils compacted into place.

In accordance with our recommendations, two rows of drilled caissons with interconnecting bells were constructed for the sub-surface drainage system. The shaft and bell dimensions of the drilled-and-belled caissons, as well as the spacing on centers, were generally pre-determined according to the data provided in our report of December 2, 1966, but modified at the contractor's option in accordance with field conditions encountered. The depths of the caissons varied, depending on the elevation of the slide plane at each caisson location. Based on our reports, the approved plans and specifications required that the base or flow line of the proposed drain system extend a minimum of six feet below the slide plane. However, preliminary data obtained as the caisson installation was initiated along Line $B-B_1$ indicated that the actual surface of the slide plane is very irregular, thus rendering it impossible to achieve a uniform gradient as well as a six-foot penetration below the slide mass. At the request of Mr. Johnson, we then reviewed the requirements for the penetration of the proposed sub-surface drainage system below the ancient landslide mass. In a letter dated August 3, 1967, we stated that to achieve a practical installation and still provide a drain system which will properly function, we believed that the penetration below the slide plane could be slightly modified. We suggested that the drainage system be installed so as to have an average penetration of six feet below the slide plane, with no drain penetrating less than two feet below the slide plane, and preferably with a minimum penetration of four feet.

Our field representative checked the construction of each caisson excavation to verify that the soils were consistent with those encountered during our investigation of the site. He also entered all the excavations to determine the elevation of the slide plane and to assure minimum penetration was achieved and that the bells were properly interconnected and cleaned of loose soils. Initial inspection of Caisson Nos. 27 and 43 indicated that the minimum required penetration was not obtained. The subject excavations were subsequently deepened and re-belled, thus resulting in caissons with double bells. At the option of the contractor, Caisson No. 31x was drilled, backfilled with sand and a soil cap, and abandoned, to facilitate construction procedures. The slide plane observed in the excavation for Caisson No. 77 indicated a sharp upward trend toward the east, and no evidence of the slide plane could be observed in the excavation for the adjacent Caisson No. 78. Definite fractures, however, indicated a possible fault zone within the area of Caisson No. 78. Neither the slide plane nor the fault zone was observed in the excavation for Caisson No. 79. To confirm that the easterly end of the drainage line was apparently beyond the slide mass, Excavation No. 80, a straight shaft 18 inches in diameter, was constructed to a depth of approximately 11 feet below the existing grade; again, no evidence of the slide plane was observed. Excavation P-1, for the proposed piezometer on Line $B-B_1$ was drilled to a depth of 41 feet, at which depth caving was encountered with sand entering the excavation from the adjacent Caisson No. 19. Excavation P-1 was therefore backfilled and abandoned. The proposed piezometer was then re-located at P-2. During drilling of P-2, however, a rock obstruction was encountered at a depth of approximately 26 feet below the existing grade. As with P-1, P-2, was backfilled and abandoned. The proposed piezometer was successfully installed at Location P-3. In some excavations where hard layers of material were encountered, an air hammer was utilized to facilitate the construction of bells and interconnections.

The actual shaft diameters, base elevations, and bell diameters of the caisson, sump, and piezometer excavations are given in the attached Table of Caisson Data; the locations and profiles of the excavations for Line $B-B_1$ are shown on the attached Plate 2-A, Caisson Layout Plan and Profile Section, and for Line $A-A_1$ on the attached Plate 2-B, Caisson Layout plan and Profile Section.

Based on the results of our inspection, the drilled-and-belled caisson excavations were constructed, the bells interconnected, and the excavations backfilled to within six feet of the ground surface with washed concrete sand in accordance with the plans for the project and to our satisfaction. Also the piezometers (P-3 and P-4) and the sumps (Excavations 17 and 62) were properly installed. The pilot holes of the two sumps were filled with sand, over which a concrete slab was poured. Sections of concrete pipe, 60 inches in diameter, were then placed as lining for each excavation, with the pipes perforated at the depth of the adjoining bells to allow the proper flow of water into the sump. To permit normal vehicular traffic at the site, the upper six feet of the caisson excavations were backfilled with uncompacted soils. It was our understanding that the contractor planned to remove and replace the soils with properly compacted backfill at a later date. As of this date, however, we have not been requested to inspect and test any compaction of soil backfill in the caisson excavations.

After completion of the sub-surface drainage system, excavations were constructed for the conventional spread footings installed to support the proposed Lower School Building. Our field representative checked the excavations to verify that the soils were firm natural soils capable of supporting at least the design pressure. All excavations were cleaned of any loose materials prior to approval, and a few were deepened to obtain the required minimum penetration of one foot into firm natural soils.

Based on the results of our inspection, the soil conditions for the footing excavations were satisfactory. The firm natural soils are capable of providing adequate foundation support for the proposed Lower School Building.

During excavation for footings in the northwesterly portion of the proposed building, existing fill was encountered. The fill ranged from 0 to 8 feet in depth, with the maximum thickness at the northwest corner. In our report of August 26, 1966, we stated that in excavated areas the natural soils would offer adequate support to slabs on grade. However, any existing fill deposits or disturbed natural soils were to be excavated and replaced as properly compacted fill. All required fill materials were to be placed in loose lifts not exceeding eight inches in thickness, brought to optimum moisture content, and compacted to at least 90% of the maximum dry density obtainable by the ASTM Designation D1557-64T method of compaction.

The on-site soils, consisting primarily of shale, diatomaceous shale, and silty clay, were used for the required filling. Compaction tests were performed on the on-site soils thus used for filling, to establish the maximum dry densities. The tests were performed in accordance with the specified method of compaction, which utilizes a 1/30-cubic-foot mold in which each of five layers of soil is compacted by 25 blows of a ten-pound hammer falling 18 inches. The results of the compaction tests were utilized in establishing the degree of compaction achieved during the placing of the fill.

After the existing fill in the northwesterly portion of the building area for the proposed Lower School Building was removed, the resultant exposed natural shale soils were scarified to a depth of six inches, brought to optimum moisture content, and rolled with heavy compaction equipment. The required fill materials were then placed in loose lifts not exceeding eight inches in thickness, brought to approximately optimum moisture content, and compacted. To establish the degree of compaction achieved, a total of eight field density tests were taken as the filling progressed. Where the tests indicated less than 90% compaction, the soils were either reworked in place and retested, or removed and replaced with properly compacted fill. In addition to testing the controlled fill placed for floor slab support in the northwesterly portion of the building area, our field representative tested the compacted soils placed as backfill adjacent to footings, at the times and locations indicated by the contractor's superintendent. In accordance with instructions from the Architect, compaction to at least 85% of the maximum dry density was deemed acceptable for the subject backfilling. The results of the backfill tests (Nos. 9 through 18) were provided the contractor's superintendent as the data became available. The results of all field density tests are presented in the attached Table of Test Results; the locations of the tests are shown on Plate 1, Plot Plan.

Based on our observations of the methods employed and the test results, the old fill deposit in the northwesterly portion of the building area was removed, the underlying natural soils reworked, and the new fill placed to rough grade in accordance with the specifications and to our satisfaction. The resulting fill, provided that the upper soils are kept adequately moistened and any disturbed soils are properly re-rolled prior to placing base material or pouring concrete, will provide adequate support for the planned floor slab. Also, the backfills placed adjacent to footings were compacted to at least 85% of the maximum dry density, in accordance with the modified compaction standard issued by the Architect.

Yours very truly,

LeROY CRANDALL AND ASSOCIATES

by Russell C Weber
Russell C. Weber

RW-JA/lg
Attachments (5)
(4 copies submitted)

cc: (1) King, Benioff, Steinmann, King
(3) L. A. Dept. of Bldg. & Safety

T A B L E O F C A I S S O N D A T A

LINE B-B1

CAISSON NUMBER	ACTUAL SHAFT DIAMETER (INCHES)	ACTUAL BASE ELEVATION (FEET)	BELL DIAMETER (FEET-INCHES) ACTUAL
1	30	665.7	6-2
2	30	665.6	6-8
3	30	664.7	6-6
4	30	664.3	6-8
5	30	663.9	6-6
6	30	662.9	4-2
7	30	662.5	6-4
8	24	662.0	7-1
9	24	661.5	7-1
10	24	661.0	7-2
11	24	661.1	7-2
12	30	659.9	7-0
13	30	659.5	7-2
14	30	659.1	7-0
15	30	658.3	7-1
16	30	657.8	7-1
17	72	651.6	6-0
18	31	658.5	6-10
19	30	659.1	6-3
20	30	660.1	6-4
21	30	661.2	6-3
22	30	661.7	5-11
23	24	661.9	6-5
24	30	663.2	6-5
25	30	663.5	5-0
26	30	665.7	6-10
27	30	666.4	6-8
28	30	674.1	6-4
29	30	675.5	8-5
30	30	675.9	9-0
31x	30	680.8	Abandoned
31	30	676.0	6-6
32	30	676.2	6-6
33	30	676.6	5-9
34	30	676.8	6-8
35	30	680.0	7-4
36	30	680.3	8-4
37	30	681.0	7-10
38	30	681.4	7-10
39	31	683.4	8-9
40	30	684.4	8-8

CAISSON NUMBER	ACTUAL SHAFT DIAMETER (INCHES)	ACTUAL BASE ELEVATION (FEET)	BELL DIAMETER (FEET-INCHES) ACTUAL
41	30	684.4	8-1
42	30	684.4	8-10
43	30	684.0	8-11
44	26	688.9	8-2
45	26	690.7	8-0
	PIEZOMETERS		
P-1	Abandoned		
P-2	Abandoned		
P-3	24	656.7	2-0
	LINE $A-A_1$		
46	24	719.5	6-10
47	24	719.1	7-1
48	24	719.0	7-0
49	24	718.8	7-0
50	24	718.9	7-1
51	24	718.5	7-0
52	30	718.5	6-9
53	30	718.0	6-9
54	24	717.5	7-1
55	24	717.2	7-1
56	24	717.0	7-1
57	30	716.5	6-4
58	30	716.4	6-10
59	30	716.1	6-4
60	30	716.0	6-6
61	30	715.4	6-9
62	72	706.8	6-0
63	30	712.4	6-9
64	30	712.1	6-7
65	30	713.0	6-7
66	30	714.4	6-10
67	30	715.3	6-4
68	30	715.8	6-6
69	30	716.6	5-6
70	30	717.7	6-8
71	30	717.8	6-10
72	30	717.8	6-11
73	30	718.2	6-6
74	30	718.3	6-9
75	30	718.3	6-6

CAISSON NUMBER	ACTUAL SHAFT DIAMETER (INCHES)	ACTUAL BASE ELEVATION (FEET)	BELL DIAMETER (FEET-INCHES) ACTUAL
76	30	718.3	6-6
77	30	719.0	6-1
78	30	720.4	6-6
79	30	719.7	6-6
80	30	729.4	2-6
	PIEZOMETER		
P-4	18	711.4	1-6

NOTE: Elevations refer to job datum.

T A B L E   O F   T E S T   R E S U L T S

TEST NO.	ELEVATION (FEET)	MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS./CU.FT.)	MAXIMUM DENSITY (LBS./CU.FT.)	PERCENT COMPACTION
1	676½	41.8	72	91	79*
2	676½	31.3	85	91	93
3	678½	35.5	80	91	88**
4	678½	33.8	87	91	96
5	680	32.4	82	91	90
6	681	30.1	86	91	95
7	681½	41.9	78	88	89
8	681½	37.6	84	91	92
9	682	22.8	80	91	88*
10	682	44.0	67	88	76*
11	682	34.8	68	78	87*
12	682	33.8	77	88	88
13	682	23.4	91	91	100
14	682	35.5	75	88	85
15	682	30.8	76	88	86
16	682	31.7	77	88	88
17	682½	28.0	76	86	88
18	682½	32.4	73	86	85

NOTES: Elevations refer to job datum.
* Indicates area reworked and retested.
** Indicates soils removed and replaced with properly compacted backfill.

JOB NO. B-67150

CITY OF LOS ANGELES

DEPARTMENT OF BUILDING AND SAFETY

ENGINEER'S CERTIFICATE OF COMPLIANCE FOR COMPACTED EARTH FILLS

LOCATION OF FILL: TRACT NO.________ LOT NOS. ________

JOB ADDRESS: 3700 Coldwater Canyon Drive, Los Angeles, California

SOIL TESTING AGENCY: LeRoy Crandall and Associates

PROPERTY OWNER'S NAME: Harvard School

OWNER'S ADDRESS:

PER REPORT ON OUR PROJECT NO.

DATE WORK STARTED ON PROJECT: August 24, 1967

DATE FILL WAS COMPLETED: October 26, 1967

DATE OF THIS CERTIFICATE: December 4, 1967

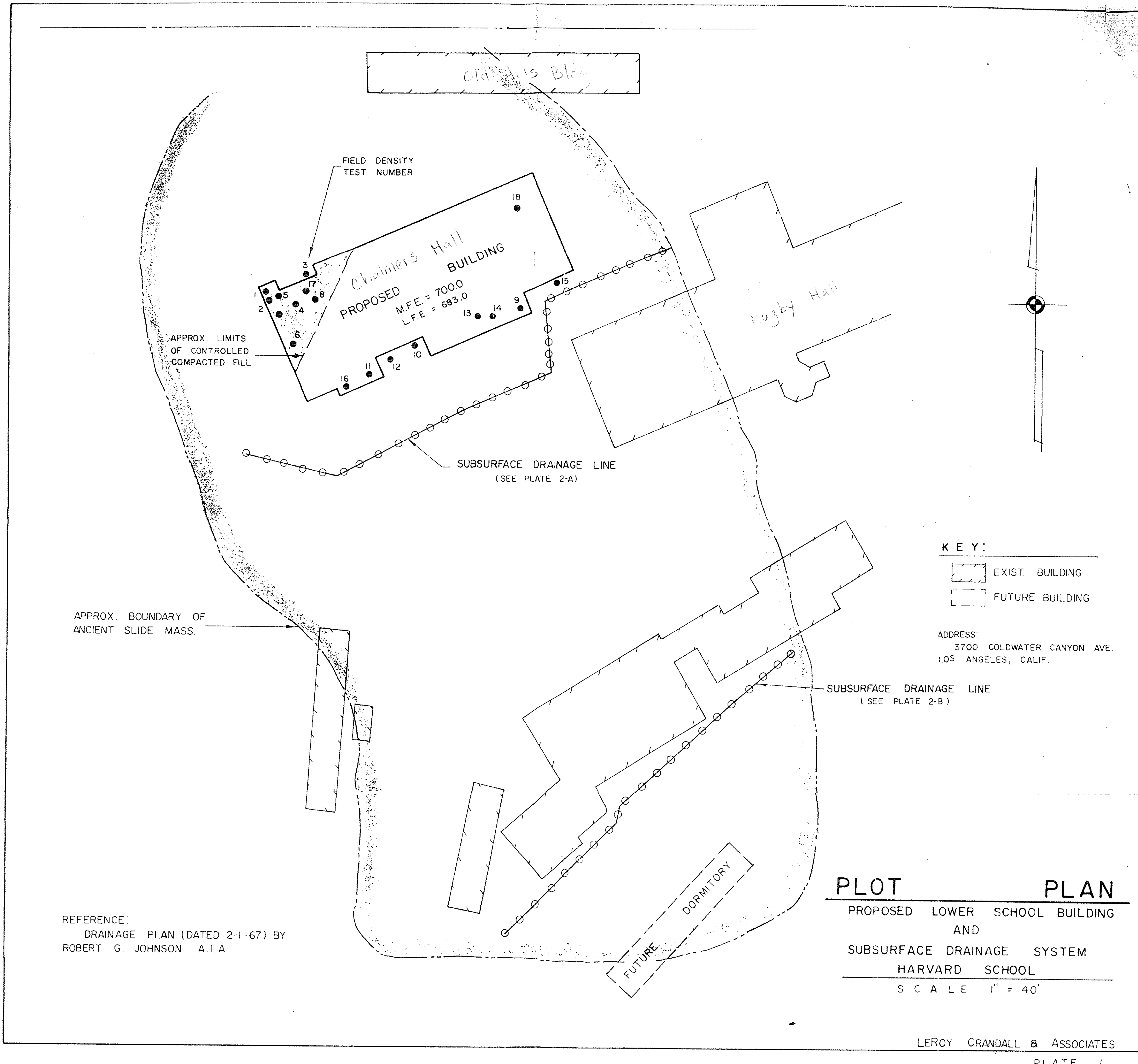
TO THE SUPERINTENDENT OF BUILDING:

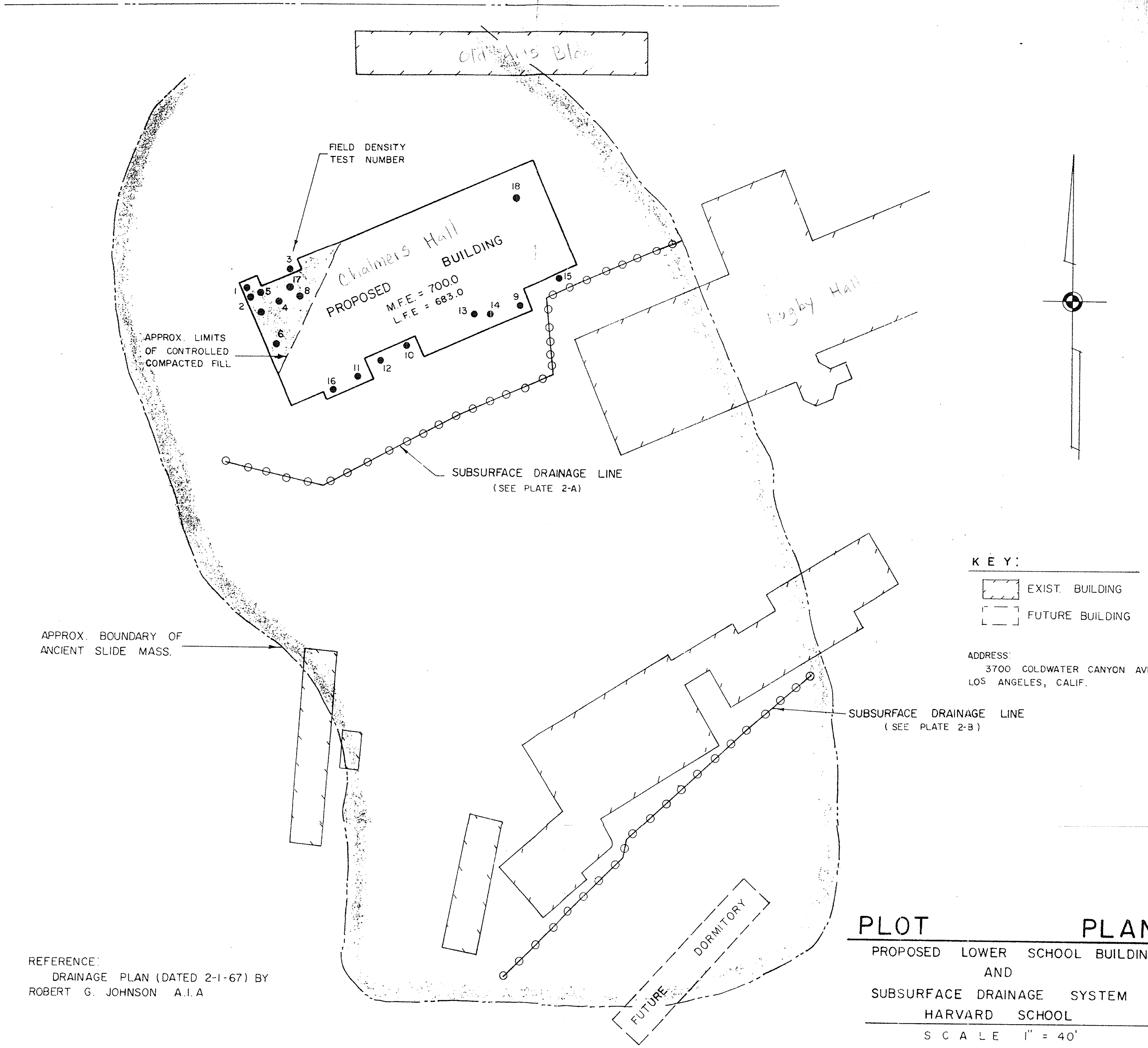
*I hereby certify that I have personally inspected and tested the placing of compacted earth fill on the above described property, and on the basis of these inspections and tests it is my opinion that the same was placed in conformity with the requirements of the Los Angeles City Building Code.

Russell C. Weber

Civil Engineer Russell C. Weber
California Certificate No. 8954

*For the purpose of this Certificate, to "have personally inspected and tested" shall include inspection and testing performed by any person or persons responsible to, the licensed engineer signing this certificate. Where the inspection and testing of all or part of the work above is delegated, full responsibility shall be assumed by the licensed engineer whose signature is affixed thereon.


Old Arts Bldg
FIELD DENSITY TEST NUMBER
Chalmers Hall
PROPOSED BUILDING
M.F.E. = 700.0
L.F.E. = 683.0
1 2 3 4 5 6 8 9 10 11 12 13 14 15 16 17 18
APPROX. LIMITS OF CONTROLLED COMPACTED FILL
Rugby Hall
SUBSURFACE DRAINAGE LINE
(SEE PLATE 2-A)
APPROX. BOUNDARY OF ANCIENT SLIDE MASS.
KEY:
EXIST. BUILDING
FUTURE BUILDING
ADDRESS:
3700 COLDWATER CANYON AVE.
LOS ANGELES, CALIF.
SUBSURFACE DRAINAGE LINE
(SEE PLATE 2-B)
FUTURE DORMITORY
REFERENCE:
DRAINAGE PLAN (DATED 2-1-67) BY
ROBERT G. JOHNSON A.I.A
PLOT PLAN
PROPOSED LOWER SCHOOL BUILDING
AND
SUBSURFACE DRAINAGE SYSTEM
HARVARD SCHOOL
SCALE 1" = 40'
LEROY CRANDALL & ASSOCIATES
PLATE 1



ADDRESS:
3700 COLDWATER CANYON AVE.
LOS ANGELES, CALIF.

REFERENCE:
DRAINAGE PLAN (DATED 2-1-67) BY
ROBERT G. JOHNSON A.I.A

PLOT PLAN

PROPOSED LOWER SCHOOL BUILDING
AND
SUBSURFACE DRAINAGE SYSTEM
HARVARD SCHOOL

SCALE 1" = 40'

LEROY CRANDALL & ASSOCIATES

PLATE 1

UN FILE

December 19, 1967

Johnson & Silvestri & Associates
13135 Ventura Boulevard
North Hollywood, California 91604

TRACT: 1000
LOT: Portion of 1111
LOCATION: 3700 Coldwater Canyon Boulevard
(HARVARD SCHOOL)

Fill soil classification per Table 28-A: Silty-clay.

Lots having compacted fill: Same as above.

Final approval is granted for the nonstructural compacted fill placed on the above lots as described in the compaction report prepared by LeRoy Crandall and Associates, Report No. B-67150, dated November 17, 1967.

This approval is limited exclusively to the area shown in the report and subject to the following conditions:

1. This fill may be used for the support of floor slabs and pavement. However, the fill is not approved for the support of structural footings.

2. Planting and irrigation of cut and fill slopes in hillside areas is required per Code Section 91.3007.

For compacted fill to be classified as structural fill, the soil testing laboratory responsible for controlling the placement of the fill must first certify its placement and secondly provide the allowable vertical and lateral bearing values which the fill can safely support. Where such values exceed those permitted in Table 28-A and 28-B of the Los Angeles Municipal Code, test data and calculations are required for each such increased value. The calculations shall include settlement calculations.

R. J. WILLIAMS
Superintendent of Building

A. J. JOHNSON
Grading Engineer

AJJ:mm
Ext. 3435

cc: LeRoy Crandall and Associates
Geotechnical Consultants, Inc.
King, Benioff, Steinman & King

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET □ LOS ANGELES, CALIFORNIA 90026 □ TELEPHONE 386-3920

GRADING AUG - 1 1968

LEROY CRANDALL
AND ASSOCIATES

July 30, 1968

RECEIVED
AUG 5 1968
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

Johnson and Silvestri & Associates
13135 Ventura Boulevard
North Hollywood, California 91604

(Our Job No. B-67150-B)

Gentlemen:

Inspection and Testing of Compacted Backfill
Proposed Planter and Retaining Walls
3700 Coldwater Canyon Drive
Studio City District, Los Angeles, California
for the Harvard School

SCOPE

This report presents the results of our inspection and testing of the compacted backfills placed around the planter and retaining walls at the subject site. The inspection work was performed intermittently during the period from December, 1967 through July, 1968. We have performed previous inspections at the site, and presented the results as each phase was completed.

PLANTER WALL BACKFILL

PROCEDURES:

We were initially requested to inspect and test the compacted

L. LeROY CRANDALL, C. E.
FREDRICK A. BARNES
LEOPOLD HIRSCHFELDT
RUSSELL C. WEBER, C. E.
J. D. KIRKGARD, C. E.
JAMES M. McWEE, C. E.
SEYMOUR S. CHIU, C. E.
P. A. MALJIAN, C. E.
ROBERT CHIERUZZI, C. E.
JAMES L. VAN BEVEREN, C. E.

backfill around the planter walls outside the south wall of the lower classroom building. Stockpiled, on-site soils were placed in loose lifts adjacent to the walls and compacted. Approximately two feet of compacted backfill had been placed prior to our inspection.

Our field representative performed a maximum density check of the on-site soils to confirm the maximum dry density established during our previous inspection work. He also performed three field density tests and compared the results to the maximum density to determine the degree of compaction obtained. The comparison indicated inadequate compaction due primarily to excessive moisture content and lack of sufficient compactive effort.

The stockpiled soils were allowed to dry for approximately one week and then backfilling continued. At the request of the contractor, our representative visited the site and performed two additional tests (Nos. 4 and 5). These tests indicated that the moisture content had been reduced and that adequate compaction had been obtained.

During that visit, we were notified that backfilling would not continue until waterproofing was completed. There was approximately eight feet of backfill to be placed.

When we were next requested to visit the site, it was noted that backfilling had been completed. Since foundation support of the planters was involved, it was decided to excavate beneath the footing level to test the backfill.

A backhoe was utilized to excavate two pits adjacent to the planters, and field density tests were performed at the various levels. Also, an additional compaction test was performed and established a maximum dry density of 91 pounds per cubic foot for the on-site shale soils. The compaction test, as well as the maximum density check, was performed in accordance with the ASTM Designation D1557-58T method of compaction.

The results of the field density tests are presented in the attached Table of Test Results; the locations are shown on the attached Plot Plan.

CONCLUSIONS:

Based on the results of our tests and our observations of the sides of the pit, we are satisfied that, although we can not certify the backfill to be compacted to at least 90% of the maximum dry density, the backfill will provide adequate support for the proposed planter walls.

RETAINING WALL BACKFILL

PROCEDURES:

After the retaining wall was constructed, we were requested to inspect the area of planned backfill to assure removal of construction debris and loose soils, prior to placement of the required backfill. The area of backfill was the retaining wall extending southward from the southwest corner of the lower classroom building. After the area was inspected and approved, placement of the soil for backfilling began.

Initial backfilling operations were difficult due to the confined area and the nature of the backfill soils. The thickness of each lift was kept to a minimum to facilitate specified compaction. Due to the difficulty in obtaining the specified 90% compaction, the Architect, in a letter dated June 28, 1968, relaxed the required degree of compaction from 90% to 85% compaction, for the lower portions of the backfill.

As the backfill area became less confined, larger equipment was used and adequate compaction was more readily obtained. Field density tests were performed and the results were compared to the maximum density to confirm the degree of compaction obtained. The test data are included in the Table of Test Results; the locations are shown on the Plot Plan.

CONCLUSIONS:

Based on our observations of the backfilling operations and the results of our tests, we are satisfied that the backfill on the west and east side of the retaining wall have been compacted in accordance with the project specifications as revised.

LIMITED INSPECTION OF FOOTING EXCAVATIONS

During the period of our inspection, we were requested to inspect various footing excavations to assure adequate soil conditions. The excavations were constructed for the planters and for stairways appurtenant to the classroom building. Our field representative inspected the excavations as requested. Based on his inspection, we are satisfied that the excavations inspected were founded in firm foundation soils and cleaned of loose soils. The footings constructed therein, will provide adequate support for the proposed walls.

Yours very truly,

LeROY CRANDALL AND ASSOCIATES

by Russell C. Weber
Russell C. Weber

RW-FS/lg
Attachments (2)
(4 copies submitted)

cc: (3) L. A. Dept. of Bldg. & Safety

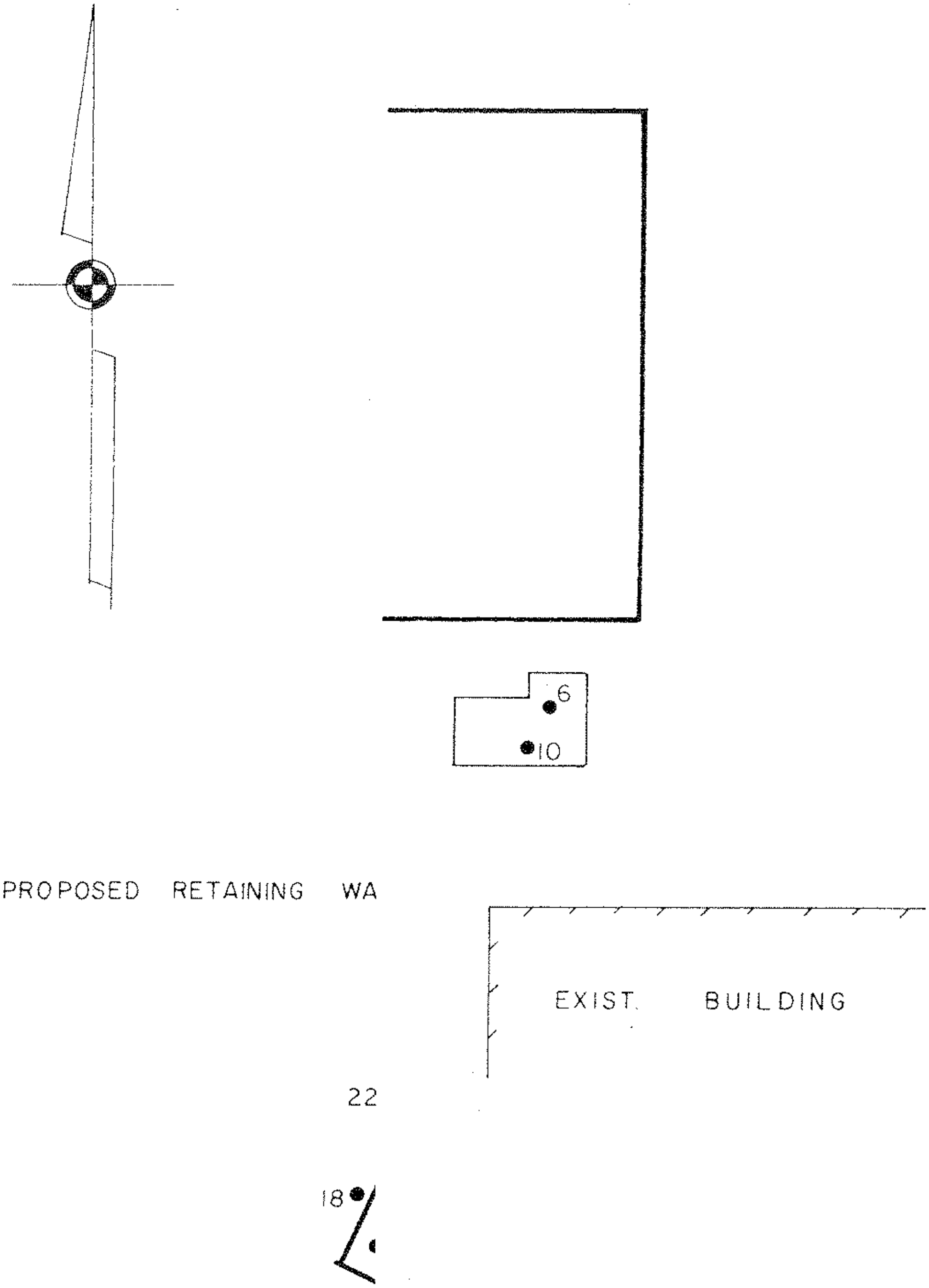
T A B L E O F T E S T R E S U L T S

TEST NO.	ELEVATION (FEET)	MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS./CU.FT.)	MAXIMUM DENSITY (LBS./CU.FT.)	PERCENT COMPACTION
1	684½	48.5	71	89	80*
2	685	42.0	73	89	82*
3	684	49.0	67	89	75*
4	688½	39.3	82	89	92
5	690	31.8	80	89	90
6	700	33.8	85	91	93
7	697½	32.5	83	91	91
8	695½	36.8	83	91	91
9	693	40.6	73	84	85**
10	697	33.6	84	91	92
11	681	33.0	84	91	92
12	683	28.0	83	91	91
13	685	30.1	84	91	92
14	687	25.5	80	89	90
15	688	32.2	77	89	87**
16	690½	29.1	75	89	84**
17	684	35.1	87	91	96
18	689	23.1	84	91	92
19	686½	30.2	84	91	92
20	690½	32.0	88	91	97
21	689½	33.4	81	89	91
22	692½	31.0	85	91	93
23	693	30.6	83	89	93
24	694½	29.7	85	89	95
25	693	31.5	86	91	95
26	692	32.4	86	91	95
27	694	30.4	86	91	95
28	695½	32.6	86	91	95
29	696½	31.1	85	91	93
30	698	29.8	85	91	93
31	699	31.8	83	91	91

NOTES: Elevations refer to job datum.
* Indicates area reworked and retested.
** Indicates area reworked and approved without further testing.

B-67150-B 7-23-68 lg

JOB R-67150-B DATE 7-24-68 DR J.M O.E. CHKD



PLAN

L BUILDING

1" = 20'

REFERENCE:

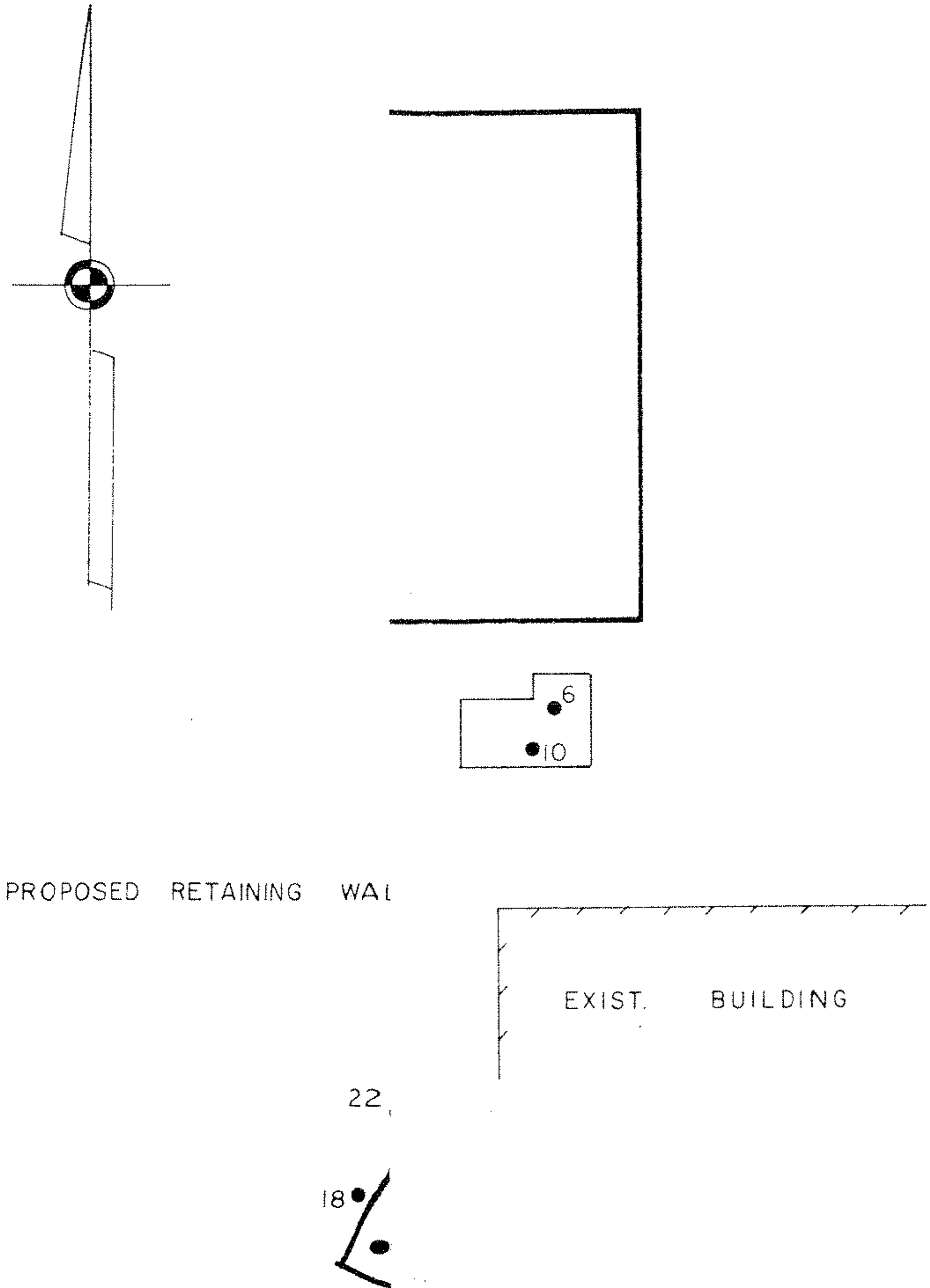
PLOT PLAN (UNDATED)

ROBERT G. JOHNSON A.I.A

HENRY N. SILVESTRI A.I.A

LEROY CRANDALL AND ASSOCIATES

JOB B-67150-B DATE 7-24-68 DR. J.M. O.E. CHKD.



PLAN

L BUILDING

1" = 20'

REFERENCE:
PLOT PLAN (UNDATED) E
ROBERT G. JOHNSON A.I.A
HENRY N. SILVESTRI A.I.A

LEROY CRANDALL AND ASSOCIATES

CITY OF LOS ANGELES
Department of Building and Safety
GRADING INSPECTOR'S COMPACTION RECORD

L.A. 48862 Permit Number Dist. Map 7325

Tract 1000 Lots 1111

Street Location 3700 Coldwater Canyon--

Hillside ✓ Flat Hillside ______ Flatland ______

1. Field Compaction Approved ok

2. Field Compaction Not Approved ______

Fill Lot No.'s 1111
All lots not listed above are considered to be cut or natural.

Buttress Fill Lot No.'s —

Required retaining wall on lot No.'s —

Lot No.'s having fill over 100 ft. deep —

—, to be held until ______

Sub-drain termination lot No.'s —

Additional Remarks: this Report covers Back fill of combination Bldg & Ret. walls--ftgs into natural

Inspector Johnson Dist. 7

Date 8-5-68

B&S B-163 R11.63

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET □ LOS ANGELES, CALIFORNIA 90026 □ TELEPHONE 386-3920

Allen

GRADING AUG 12 1968

LEROY CRANDALL
AND ASSOCIATES

August 12, 1968

Johnson & Silvestri & Associates
7700 Sunset Boulevard
Los Angeles, California 90046

(Our Job No. A-66131)

Gentlemen:

Review of Foundation Recommendations
Proposed Academic Center
3700 Coldwater Canyon Drive
Los Angeles, California
for the Harvard School

This letter confirms our discussions with personnel of your firm and with King·Benioff·Steinmann·King, concerning foundation design recommendations for the subject Academic Center. We previously performed a foundation investigation for certain school additions which included the subject Academic Center and other buildings; our report covering the investigation was dated August 26, 1966. Field percolation studies were performed at the site to develop more complete recommendations for subsurface drainage; the results of the field percolation studies were submitted in our report dated December 2, 1966 (our Job No. A-66131-B). Although not directly pertinent to the Academic Center, we recently performed a supplementary foundation investigation for the proposed facultyresidence buildings and submitted that report on August 2, 1968 (our Job No. A-66131-C). Additional exploration borings and laboratory tests have not been performed for the Academic Center, as this building was covered by our initial report of foundation investigation dated August 26, 1966.

During the course of the original investigation it was determined that the Lower School and the Academic Center would be located on an ancient landslide. Therefore, the investigation of the site was much more extensive and thorough than would normally have been performed.

At the time our initial report was submitted, the structural features of the Academic Center had not been established. We now understand that the Academic Center will be three stories in height with the lower floor extending partly below grade to be used for parking. The building will be of reinforced concrete construction. Column loads will range from 22,000 to 240,000 pounds. Wall loads will range from 4,000 to 8,000 pounds per lineal foot. As stated previously, the lower floor will extend partly below grade, and some of the exterior building walls will function as retaining walls. There will also be other retaining walls around the building because of the planned grades.

L. LeROY CRANDALL, C. E. FREDRICK A. BARNES LEOPOLD HIRSCHFELDT
RUSSELL C. WEBER, C. E. J. D. KIRKGARD, C. E. JAMES M. McWEE, C. E.
SEYMOUR S. CHIU, C. E. P. A. MALJIAN, C. E.
ROBERT CHIERUZZI, C. E. JAMES L. VAN BEVEREN, C. E.

The structural features of the proposed building are not different than anticipated at the time of our initial investigation. Accordingly, the foundation design recommendations in our initial report (dated August 26, 1966) may be used for the Academic Center. As stated in our report, analyses were made to confirm the stability of the existing landslide mass. The analyses indicated that the mass is presently stable against movement with a factory of safety of 1.6. Since the planned grading for the Academic Center will consist essentially of excavation, which was also the case for the Lower School, the proposed construction of the Academic Center will not decrease the stability of the mass.

One of our recommendations for construction on the landslide mass was that a preventive subdrain system be installed so that hydrostatic pressures would not develop within the slide mass. This subdrain system was installed prior to construction of the Lower School. Two rows of vertical drains were installed, one of which was located above the currently planned Academic Center. Accordingly, the subdrain system was installed to control possible seepage in the area of the Academic Center as well as the area of the Lower School.

We trust that this letter satisfactorily answers any questions concerning the applicability of our initial report of August 26, 1966 to the Academic Center. If there are any further questions, please do not hesitate to call.

Yours very truly,

LeROY CRANDALL AND ASSOCIATES

by LeRoy Crandall
LeRoy Crandall

JK-PM:mu
(4 copies submitted)

cc: (2) King·Benioff·Steinmann·King
(3) L.A. Department of Building & Safety
Attn: Mr. Thomas A. Allen, Jr.

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET □ LOS ANGELES, CALIFORNIA 90026 □ TELEPHONE 386-3920

allen

GRADING AUG 12 1968

LeROY CRANDALL
AND ASSOCIATES

August 12, 1968

Johnson & Silvestri & Associates
7700 Sunset Boulevard
Los Angeles, California 90046

(Our Job No. A-66131)

Gentlemen:

Review of Foundation Recommendations
Proposed Academic Center
3700 Coldwater Canyon Drive
Los Angeles, California
for the Harvard School

This letter confirms our discussions with personnel of your firm and with King·Benioff·Steinmann·King, concerning foundation design recommendations for the subject Academic Center. We previously performed a foundation investigation for certain school additions which included the subject Academic Center and other buildings; our report covering the investigation was dated August 26, 1966. Field percolation studies were performed at the site to develop more complete recommendations for subsurface drainage; the results of the field percolation studies were submitted in our report dated December 2, 1966 (our Job No. A-66131-B). Although not directly pertinent to the Academic Center, we recently performed a supplementary foundation investigation for the proposed facultyresidence buildings and submitted that report on August 2, 1968 (our Job No. A-66131-C). Additional exploration borings and laboratory tests have not been performed for the Academic Center, as this building was covered by our initial report of foundation investigation dated August 26, 1966.

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At the time our initial report was submitted, the structural features of the Academic Center had not been established. We now understand that the Academic Center will be three stories in height with the lower floor extending partly below grade to be used for parking. The building will be of reinforced concrete construction. Column loads will range from 22,000 to 240,000 pounds. Wall loads will range from 4,000 to 8,000 pounds per lineal foot. As stated previously, the lower floor will extend partly below grade, and some of the exterior building walls will function as retaining walls. There will also be other retaining walls around the building because of the planned grades.

August 12, 1968
(Our Job No. A-66131)

The structural features of the proposed building are not different than anticipated at the time of our initial investigation. Accordingly, the foundation design recommendations in our initial report (dated August 26, 1966) may be used for the Academic Center. As stated in our report, analyses were made to confirm the stability of the existing landslide mass. The analyses indicated that the mass is presently stable against movement with a factory of safety of 1.6. Since the planned grading for the Academic Center will consist essentially of excavation, which was also the case for the Lower School, the proposed construction of the Academic Center will not decrease the stability of the mass.

One of our recommendations for construction on the landslide mass was that a preventive subdrain system be installed so that hydrostatic pressures would not develop within the slide mass. This subdrain system was installed prior to construction of the Lower School. Two rows of vertical drains were installed, one of which was located above the currently planned Academic Center. Accordingly, the subdrain system was installed to control possible seepage in the area of the Academic Center as well as the area of the Lower School.

We trust that this letter satisfactorily answers any questions concerning the applicability of our initial report of August 26, 1966 to the Academic Center. If there are any further questions, please do not hesitate to call.

Yours very truly,

LeROY CRANDALL AND ASSOCIATES

by LeRoy Crandall
LeRoy Crandall

JK-PM:mu
(4 copies submitted)

cc: (2) King·Benioff·Steinmann·King
(3) L.A. Department of Building & Safety
Attn: Mr. Thomas A. Allen, Jr.

C00 V.N. Fil

CITY OF LOS ANGELES

CALIFORNIA

SAM YORTY
MAYOR

DEPARTMENT OF
BUILDING AND SAFET
402, CITY HALL
LOS ANGELES, CALIF. 9001
TELEPHONE 624-5211

R. J. WILLIAMS
GENERAL MANAGER AND
SUPERINTENDENT OF BUILDING

August 14, 1968

Johnson & Silvestri & Associates
7700 Sunset Boulevard
Los Angeles, California 90046

TRACT: 1000
LOT: 1111
LOCATION: 3700 Coldwater Canyon Drive

Engineering Report No. A-66131, dated August 12, 1968, prepared by LeRoy Crandall and Associates.

The above report regarding the proposed construction of the Academic Center within an ancient landslide mass has been reviewed by the Grading Division of the Department of Building and Safety. The report is satisfactory and a permit may be issued provided the additional conditions listed below are followed:

1. Prior to the issuance of a permit, the owner shall file a notarized letter with the Grading Division indicating a clear understanding that, inasmuch as the building is on a landslide area which may at some future time move, damage may occur after construction.

2. The consulting soil engineer shall inspect the footing excavations to determine that they are founded in the recommended strata before calling the Department for footing inspection.

3. The allowable single pile load shall be reduced by the pile efficiency equation for friction piles driven in groups.

4. Grading plans shall be submitted to the Department for review prior to obtaining a grading permit.

5. The consultant soil engineer shall review and approve the detailed grading plans prior to obtaining a grading permit.

The approval of the above report and the conditions listed above are consistent with the recommendations of the Grading Consultants and the approval granted by the Board of Building and Safety Commissioners under B.F. No. 670179 for the construction of the adjacent lower school building on the same ancient landslide.

R. M. Oberlies
R. M. OBERLIES
Chief of Grading Division

BWH:sm
Ext. 3435

cc: LeRoy Crandall and Associates

1040 V.N. File

CITY OF LOS ANGELES

CALIFORNIA

SAM YORTY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
402, CITY HALL
LOS ANGELES, CALIF. 90012
TELEPHONE 624-5211

R. J. WILLIAMS
GENERAL MANAGER AND
SUPERINTENDENT OF BUILDING

August 19, 1968

LeRoy Crandall & Associates
711 North Alvarado Street
Los Angeles, California

Tract 1000
Lot 1111
Location 3700 Coldwater Cyn. LA 48862

Lots having compacted fill 1111

COPY

Final approval is granted for comapcted fill constructed on above lots of subject property as described in your report dated 7-30-68, B-67150-B.

The approval is limited exclusively to the area shown in the report and subject to the following requirements:

A. The compacted fill is approved only as a non-structural fill. This fill is not to be used for support of structural footings.

B. Slope erosion control, planting, and irrigating of fill slopes, and runoff control are required.

R.J. WILLIAMS
Superintendent of Building

F.R. BAUER
Grading Engineer

DM 7325/7

smc
Ext. 211

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET □ LOS ANGELES, CALIFORNIA 90026 □ TELEPHONE 386-3920

GRADING SEP 20 1968

LEROY CRANDALL
AND ASSOCIATES

September 19, 1968

RECEIVED
SEP 24 1968
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

Johnson and Silvestri
Architects and Associates
7700 Sunset Boulevard
Los Angeles, California 90046

(Our Job No. B-68174)

Gentlemen:

Inspection and Testing of Compacted Backfill, and
Inspection of Footing Excavations
Proposed Telephone and Electrical Equipment Building
3700 Coldwater Canyon Drive
Studio City District, Los Angeles, California
for the Harvard School

This report presents the results of our inspection and testing of the compacted soils placed as backfill to raise the grade and provide floor slab support for the proposed building; confirmation of our inspection and approval of the excavations for the footings is included. The subject building is located near the southwest corner of the Academic Center. The inspection work was performed during the month of August, 1968. We previously performed a foundation investigation for the various additions at the school, and submitted our recommendations in a report dated August 26, 1966 (our Job No. A-66131), supplemented by letters dated August 28, 1967 and August 12, 1968. We also performed previous inspection at the site, and submitted the results as the work was completed.

Prior to the construction of the Academic Center, certain buildings had to be re-located. In conjunction with the re-location, a new equipment building was to be constructed. During excavating for the proposed equipment building, an underground storage tank was uncovered. The storage tank and the old backfill around the tank were excavated. The approximate location of the resulting excavation is shown on the attached Plot Plan, with relation to the outline of the equipment building.

After the base of the excavation was inspected to assure removal of loose soils, the excavated soils were spread in thin loose layers and mixed and compacted. A compaction test performed on a sample of the soils utilized in the filling established a maximum dry density of 88 pounds per cubic foot at an optimum moisture content of 28% of the dry weight. The test was performed in accordance with the ASTM Designation D1557-66T method of compaction. The method utilizes a 1/30-cubic-foot mold in which each of five layers of soil is compacted by 25 blows of a ten-pound hammer falling 18 inches.

Field density tests were performed as the backfilling progressed, and the results were compared with the maximum density to determine the degree of compaction obtained. The approximate locations of the tests are shown on the Plot Plan; the results of the tests are as follows:

September 19, 1968
(Our Job No. B-68174)

TEST NO.	ELEVATION (FEET)	MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS./CU.FT.)	MAXIMUM DENSITY (LBS./CU.FT.)	PERCENT COMPACTION
1	704	23.2	82	88	93
2	706	24.0	83	88	94
3	707½	25.2	82	88	93
4	709	28.1	84	88	95
5	710	27.4	81	88	92
6	711	26.9	83	88	94

NOTE: Elevations refer to job datum.

Based on our observations of the backfilling and the results of our tests, we are satisfied tha t the excavation resulting from the removal of the storage tank was cleaned and then backfilled with on-site soils compacted to at least 90% of the maximum dry density. The resulting backfill will provide adequate floor slab support.

We were later requested to inspect the wall footing excavations. The area of the above mentioned backfill required deep footing excavations. Our field representative inspected the excavations to assure penetration into the natural soils and removal of any loose soils. Based on his inspection, we are satisfied that the excavations penetrated into natural soils; the footings constructed therein will provide adequate support for the proposed telephone and electrical equipment building. Written notification of our approval of the excavations was posted at the site.

Yours very truly,

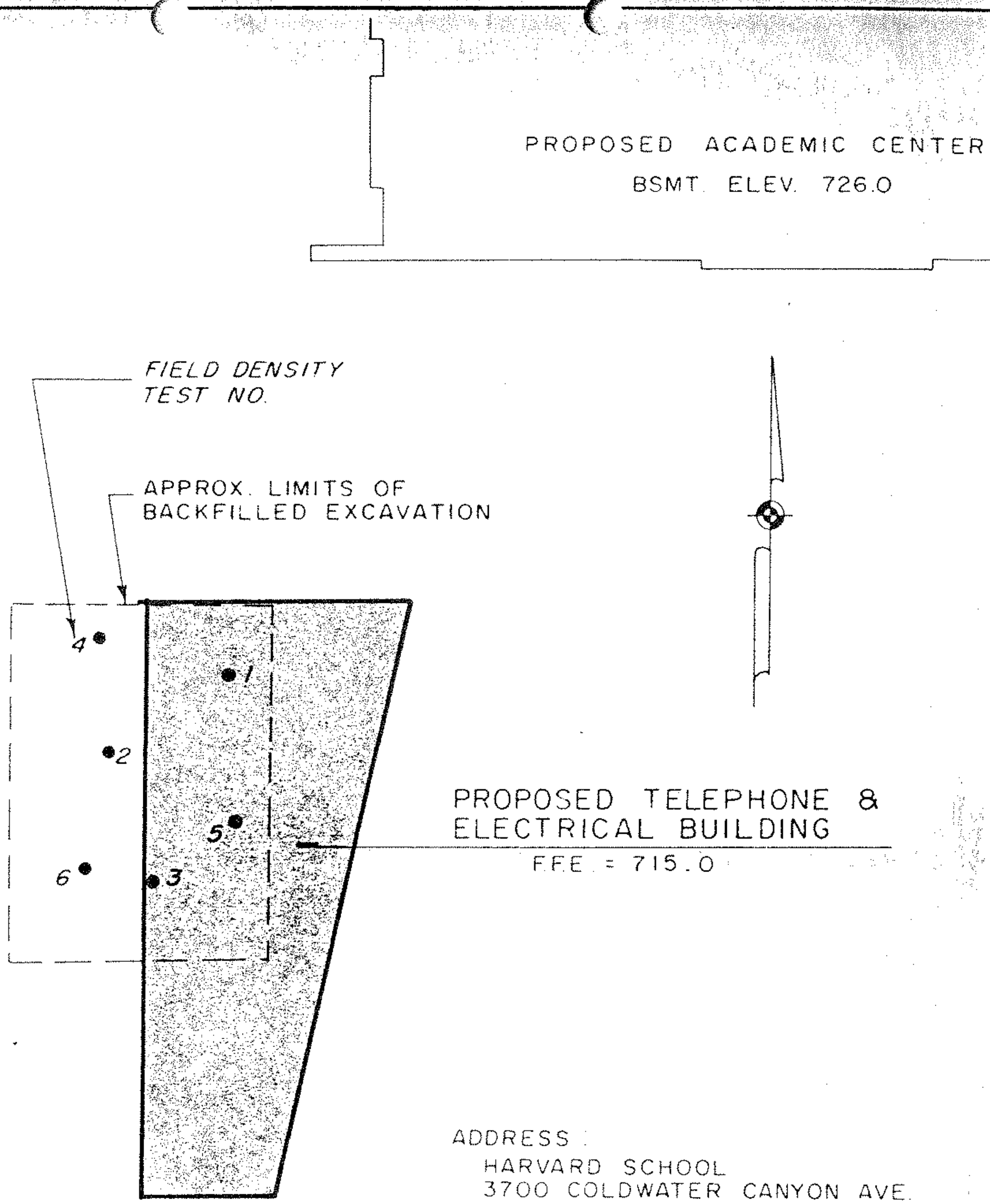
LeROY CRANDALL AND ASSOCIATES

by Russell C. Weber
Russell C. Weber

RW-FS/lg
Attachment
(6 copies submitted)

cc: (3) L. A. Dept. of Bldg. & Safety

JOB 13 88174 DATE 9-18-88 DR. cmc O.E. CHKD



ADDRESS:
HARVARD SCHOOL
3700 COLDWATER CANYON AVE.
LOS ANGELES, CALIFORNIA

REFERENCE:
SITE PLAN (UNDATED) BY ROBERT G. JOHNSON A.I.A., HENRY N. SILVESTRI A.I.A., ARCHITECTS AND ASSOCIATES.

PLOT PLAN

SCALE 1" = 8'

LEROY CRANDALL AND ASSOCIATES

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET □ LOS ANGELES, CALIFORNIA 90026 □ TELEPHONE 386-3920

GRADING DEC 20 1968

LeROY CRANDALL
AND ASSOCIATES

December 19, 1968

Johnson and Silvestri
Architects and Associates
7700 Sunset Boulevard
Los Angeles, California 90046

(Our Job No. B-68174-B)

Gentlemen:

Inspection and Testing of Compacted Backfill, and
Inspection of Footing Excavations
Proposed Retaining Wall
3700 Coldwater Canyon Drive
Studio City District, Los Angeles, California
for the Harvard School

SCOPE

This report presents the results of our inspection and testing of the compacted backfill placed to raise the grade and provide foundation support for the proposed retaining wall; confirmation of our inspection and approval of the retaining wall foundation is included. The proposed retaining wall is located adjacent to and north of the existing Telephone and Electrical Equipment Building, which is included on the attached Plot Plan. The inspection work was performed during the months of November and December, 1968. We previously performed a foundation investigation of the site for the proposed additions at the school, and submitted our recommendations in a report dated August 26, 1966 (our Job No. A-66131), supplemented by letters dated August 28, 1967 and August 12,

L. LeROY CRANDALL, C. E.
FREDRICK A. BARNES
LEOPOLD HIRSCHFELDT
RUSSELL C. WEBER, C. E.
J. D. KIRKGARD, C. E.
JAMES M. McWEE, C. E.
SEYMOUR S. CHIU, C. E.
P. A. MALJIAN, C. E.
ROBERT CHIERUZZI, C. E.
JAMES L. VAN BEVEREN, C. E.

1968. We have performed previous inspections at the site, and submitted the results as the work was completed.

INSPECTION AND TESTING OF COMPACTED FILL

Upon completion of construction for the Telephone and Electrical Equipment Building, compacted fill soils were placed on the north and east sides of the subject structure. The old existing fill and debris soils were excavated from the area to receive compacted backfill.

After the area was excavated, the resultant exposed soils were inspected to assure removal of all unsuitable materials. Next, the required fill materials were placed in loose lifts not exceeding eight inches in thickness, brought to optimum moisture content, and compacted. The required fill materials were to be compacted to at least 90% of the maximum dry density obtainable by the ASTM Designation D1557-66T method of compaction. Compaction tests were performed on the soils encountered during the filling, to establish the maximum dry densities. The tests were performed in accordance with the specified method of compaction, which utilizes a 1/30-cubic-foot mold in which each of five layers of soil is compacted by 25 blows of a ten-pound hammer falling 18 inches. The results of the field density tests were used in establishing the degree of compaction achieved during the placing of the fill.

Field density tests were performed as the backfilling progressed, to establish the degree of compaction achieved. Compacted fill soils in the area of Test Nos. 1, 2, and 3 were removed to permit the excavation of previously existing fill soils. The area of Test No. 5, which indicated less than the required degree of compaction, was reworked until the specified degree of compaction resulted. The locations of the tests are shown on the Plot Plan; the tests resulted in the following data:

TEST NO.	ELEVATION (FEET)	MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS./CU.FT.)	MAXIMUM DENSITY (LBS./CU.FT.)	PERCENT COMPACTION
1	716	19.3	92	102	90
2	717½	19.8	94	102	92
3	719	20.4	93	102	91
4	716	24.2	89	94	95
5	718	32.0	75	94	80*
6	718	35.2	77	83	93
7	719½	34.2	75	83	90

NOTES: Elevations refer to job datum.
* Indicates area reworked and retested.

Based on our observations of the methods employed and the test results, the old fill was removed and the new fill compacted to at least 90% of the maximum dry density to Elevation 719½. The resulting backfill will provide adequate foundation support for the new retaining wall.

INSPECTION OF FOUNDATION EXCAVATIONS

After the completion of the backfilling, excavations were constructed for footings installed to support the proposed retaining wall. Our field representative inspected the excavations to verify that the soils were firm compacted fill soils capable of supporting at least the design pressure. All excavations were cleaned of any loose materials prior to final approval. Based on the results of our inspection, the soil conditions for the footing excavations were satisfactory. The firm compacted fill soils are capable of providing adequate foundation support for the proposed retaining wall.

Yours very truly,

LeROY CRANDALL AND ASSOCIATES

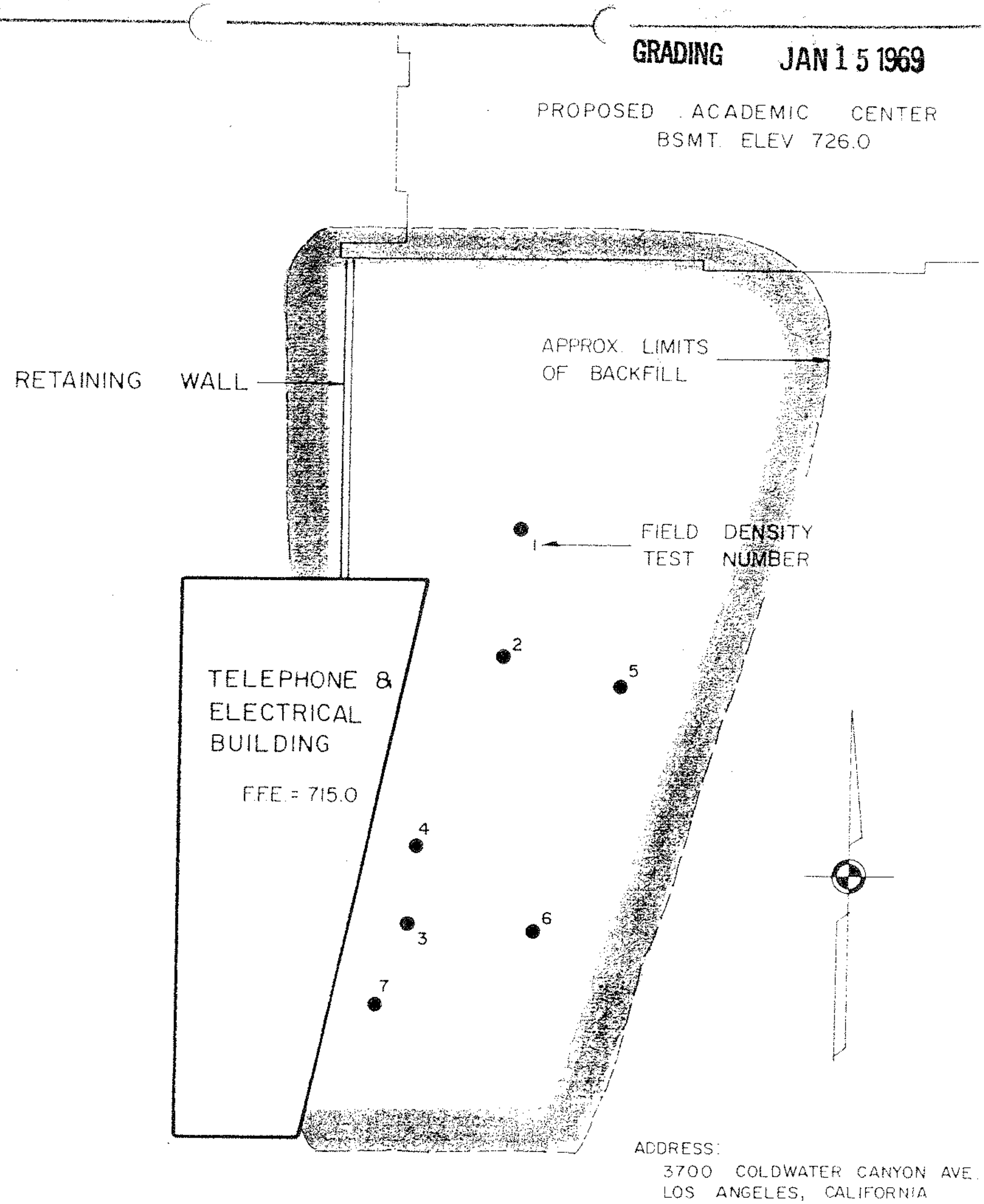
by Russell C. Weber

Russell C. Weber

RW-RQ/lg
Attachment
(6 copies submitted)

cc: (3) L.A. Dept. of Bldg. & Safety

JOB R-6111/4-B DATE 12-12-68 DR U.M. OE ____ CHKD ____



PLOT PLAN

PROPOSED RETAINING WALL

SCALE 1" = 8'

REFERENCE:
SITE PLAN (UNDATED) BY ROBERT G. JOHNSON A.I.A., HENRY N. SILVESTRI A.I.A. ARCHITECTS AND ASSOC.

LEROY CRANDALL AND ASSOCIATES

JOB NO. B-68174-B

CITY OF LOS ANGELES

DEPARTMENT OF BUILDING AND SAFETY

ENGINEER'S CERTIFICATE OF COMPLIANCE FOR COMPACTED EARTH FILLS

LOCATION OF FILL: TRACT NO.__________ LOT NOS. __________

JOB ADDRESS: 3700 Coldwater Canyon Drive, Studio City District, Los Angeles

SOIL TESTING AGENCY: LeRoy Crandall and Associates

PROPERTY OWNER'S NAME: Harvard School

OWNER'S ADDRESS: 3700 Coldwater Canyon Drive, Studio City District, Los Angeles

PER REPORT ON OUR PROJECT NO. A-66131

DATE WORK STARTED ON PROJECT: November 25, 1968

DATE FILL WAS COMPLETED: December 30, 1968

DATE OF THIS CERTIFICATE: January 24, 1969

TO THE SUPERINTENDENT OF BUILDING:

*I hereby certify that I have personally inspected and tested the placing of compacted earth fill on the above described property, and on the basis of these inspections and tests it is my opinion that the same was placed in conformity with the requirements of the Los Angeles City Building Code.

Russell C. Weber

Civil Engineer Russell C. Weber
California Certificate No. 8954

*For the purpose of this Certificate, to "have personally inspected and tested" shall include inspection and testing performed by any person or persons responsible to, the licensed engineer signing this certificate. Where the inspection and testing of all or part of the work above is delegated, full responsibility shall be assumed by the licensed engineer whose signature is affixed thereon.

LeROY CRANDALL & ASSOCIATES
Consulting Foundation Engineers

To: Field Inspector, Department of Building and Safety
Los Angeles, California.

Project: Inspection and Testing of Compacted Backfill
Proposed Retaining Wall (Job No. B-68174-B)
3700 Coldwater Canyon Drive
Studio City District, Los Angeles, California
for the Harvard School

The compacted fill placed for foundation ~~and floor slab~~ support of the retaining wall ~~building~~ is approved as of December 19 1968. The grading was performed in accordance with the project specifications and the recommendations in our foundation investigation report dated August 26, 1966. (our Job No. A-66131).

The fill was compacted to at least 90 % of the maximum dry density obtainable by the ASTM Designation D1557-66T method of compaction. An allowable bearing pressure of 1,500 pounds per square foot may be imposed on the fill under the following conditions: Maximum toe pressure imposed by wall should not ex ceed 1,700 pounds per square foot.

This certification is limited to: retaining wall area
Minimum footing depth of two feet.

~~Upon completion of the grading, our final report will be submitted, giving the locations and results of the tests and observations.~~

Comments: Maximum depth of fill approximately ten feet near wall location, sloping to zero rapidly, to the east.

LeRoy Crandall & Associates

by Russell C Weber
Russell C. Weber

(3 copies submitted)

cc: (1) Johnson Silvestri & Associates

CITY OF LOS ANGELES
Department of Building and Safety
GRADING INSPECTOR'S COMPACTION RECORD

L.A. 72427 Dist. Map 7325
Permit Number

Tract 1000 Lots Portion of 1111

Street Location 3700 Coldwater Cyn

Hillside ✓ Flat Hillside ____ Flatland ____

1. Field Compaction Approved ✓

2. Field Compaction Not Approved ____

Fill Lot No.'s ____
All lots not listed above are considered to be cut or natural.

Buttress Fill Lot No.'s ____

Required retaining wall on lot No.'s ____

Lot No.'s having fill over 100 ft. deep ____

____, to be held until ____

Sub-drain termination lot No.'s ____

Additional Remarks:

This report covers the fill adjacent to a bldg.

Inspector Mezzio Dist. 8
Date 12-31-68

B&S B-163 R11.63

CITY OF LOS ANGELES
Department of Building and Safety
GRADING INSPECTOR'S COMPACTION RECORD

LA 72427
Permit Number

Dist. Map 7325

Tract 1000 Lots Part - 1111

Street Location 3700 Coldwater Cyn -

Hillside ✓ Flat Hillside ____ Flatland ____

1. Field Compaction Approved ok -
2. Field Compaction Not Approved ____

Fill Lot No.'s ____
All lots not listed above are considered to be cut or natural.

Buttress Fill Lot No.'s ____

Required retaining wall on lot No.'s —

Lot No.'s having fill over 100 ft. deep —

—, to be held until ____

Sub-drain termination lot No.'s —

Additional Remarks: this Report covers fill in isolated area of Elect. Eqpt Bldg only -

no certification sheet & no bearing value assigned -- this is classified as a primary fill --

Inspector J Johnson Dist. 8

Date 9-25-68

B&S B-163 R11.63

1000 V.N. Fer

CITY OF LOS ANGELES

CALIFORNIA

R. J. WILLIAMS
GENERAL MANAGER AND
SUPERINTENDENT OF BUILDING

CITY OF LOS ANGELES FOUNDED 1781

SAM YORTY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
402, CITY HALL
LOS ANGELES, CALIF. 90012
TELEPHONE 624-5211

LeRoy Crandall & Associates
711 North Alvarado Street
Los Angeles, California 90026

DATE: February 20, 1969

TRACT: 1000
LOT: Portion 1111
LOCATION: 3700 Coldwater Canyon

PERMIT: LA 72427

Fill soil classification, per Table 28-A: See Report

Lots having compacted fill: Portion 1111

Approval is granted for compacted fill constructed on the above lots as described in the compaction report dated 12-19-68, prepared by LeRoy Crandall & Associates, Report No. B68174-B.

Approval is limited to the area shown in the report and by the following requirements:

A. Footings for one-story wood frame structures may be dimensioned from Table 17-B without use of the soil bearing value.
B. Footing bearing pressure for all other structures shall not exceed a value of 1500 lbs. per sq. ft. at 24 inches minimum, below approved compacted surface.
C. Continuous footings per Code Section 91.3012 are required.
D. All footings supported partly or wholly on compacted fill shall be reinforced continuously with at least one number 4 bar at the top and bottom of the footing.
E. Slope erosion control, planting, and irrigating of fill slopes, and runoff control are required as per Code Section 91.3007.
F. Building or structure footings shall be set back 5 feet from the face of slopes 20 feet or less in vertical height where the angle of slope is between 1½ horizontal to 1 vertical and two horizontal to 1 vertical. Where the vertical height of slope exceeds 20 feet and the angle of slope is as described above the set back shall be increased 1 foot for each additional 5 feet in vertical height over 20 feet to a maximum set back of 10 feet. For slopes exceeding 100 feet in vertical height, the set back shall be 40 feet except as permitted in Code Section 91.3009 (c).

Superintendent of Building

By ______________________
F.R. BAUER, Grading Engineer

DM# 7325
8

B&S B-142 R1.68

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET ☐ LOS ANGELES, CALIFORNIA 90026 ☐ TELEPHONE 386-3920

V.N. TRACT FILE

JB17866

LEROY CRANDALL
AND ASSOCIATES

RECEIVED
MAY 16 1969
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

May 12, 1969

OK. FOR ADDITION
5-20-69

Johnson & Silvestri & Associates
7700 Sunset Boulevard
Los Angeles, California 90046

(Our Job No. A-69121)

Tr 1000

Attention: Mr. Robert G. Johnson

Por. of lot 1111

Gentlemen:

Report of Soil Investigation
Proposed Additions to Headmaster's Residence
3700 Coldwater Canyon Drive
Los Angeles, California
for the Harvard School

This letter presents the results of a limited investigation of the soil conditions beneath the proposed additions to the headmaster's residence at the subject site. We have previously made investigations of the soil conditions on the Harvard School property. The headmaster's residence is located close to the Residence Halls covered in our report dated August 2, 1968 (our Job No. A-66131-C). The additions will consist of a bedroom at the west end of the existing residence and a utility room at the east end of the existing residence. The additions will be of light wood-frame construction.

The soil conditions were explored by digging two pits. The exploration pit in the area of the bedroom addition encountered firm clay soils beneath approximately one foot of existing fill or cultivated natural soils. The exploration pit in the utility room area encountered firm shale beneath eight inches of existing fill or cultivated natural soils.

Based on the exploration pits and our previous work at the School site, the subject additions may be supported on spread footings established in the natural soils. Footings may be designed using values from the City of Los Angeles Building Code.

Although conservative for the shale, it may be assumed that the classification of the natural soils would be a "stiff lean clay". According to the Code, footings carried at least one foot into undisturbed natural soils and established on "stiff lean clay" may be designed to impose a dead plus live load pressure of 2,000 pounds per square foot. We would recommend that footings extend at least $1\frac{1}{2}$ feet below the lowest adjacent final grade. Footing excavations should be inspected to verify penetration into undisturbed natural soils.

Yours very truly,

LeROY CRANDALL AND ASSOCIATES

by LeRoy Crandall
LeRoy Crandall

JK-PM:mu
(6 copies submitted)

V.N. file

V.N.

July 29, 1969

Johnson & Silvestri & Associates
7700 Sunset Boulevard
Los Angeles, California 90046

TRACT: 1000
LOT: 1111
LOCATION: 3700 Coldwater Canyon

Engineering Report No. A-69121, dated May 12, 1969, prepared by LeRoy Crandall and Associates.

The above report regarding a proposed addition to an existing dwelling has been reviewed by the Grading Division of the Department of Building and Safety. The report is satisfactory and a permit may be issued provided the additional conditions listed below are followed:

1. The consulting soil engineer shall inspect the footing excavations to determine that they are founded in the recommended strata before calling the Department for footing inspection.

2. The plans shall comply with all the recommendations of the soil engineer and a copy of this soil report and approval letter must be attached to the job set of plans.

R. M. OBERLIES
Chief of Grading Division

SYN:ep
cc: LeRoy Crandall & Associates

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET □ LOS ANGELES, CALIFORNIA 90026 □ TELEPHONE 386-3920

LEROY CRANDALL
AND ASSOCIATES

JB17866.

December 29, 1969

Robert G. Johnson, A.I.A.
Henry N. Silvestri, A.I.A.
Architects and Associates
7700 Sunset Boulevard
Los Angeles, California 90046

(Our Job No. B-68174-B)

Gentlemen:

Placement of Rock Backfill
Academic Center
Harvard School
3700 Coldwater Canyon Avenue
Los Angeles, California
for the Harvard School

This letter supplements our previous report of inspection and testing at the subject site, dated December 1, 1969. In addition to confirming our inspection and approval of the excavations for footings, that report presented the results of testing of the compacted backfill for the project. A review of the Table of Test Results of the backfill testing indicates that the first three tests revealed compaction less than specified; in addition, the last four field density tests taken indicated failing conditions. The Grading Division, Los Angeles Department of Building and Safety has questioned whether the backfill was actually placed and completed in accordance with the Building Code.

A review of the records of our inspection show that the first backfill placed was not properly compacted, and was therefore removed and recompacted properly. Test Nos. 4, 5, 6, 7, and 8 were taken during the recompaction of the backfill. Test Nos. 9 through 12 were taken in roughly the top two feet of the backfill; tests of these backfill materials indicated less than the specified degree of compaction. Rather than re-compacting, the contractor elected to remove these upper backfill soils down to that which had been previously approved, and replaced them with compacted rock base course. This was done to expedite the job, and permit the completion of the project. Our representative observed the placement of the rock, and its compaction; field density tests could not be taken, but based on the compaction performed and probing of the backfill, the backfill was completed in accordance with the requirements and to our satisfaction.

Yours very truly,

LeROY CRANDALL AND ASSOCIATES

by Russell C. Weber
Russell C. Weber

RW/lg
(6 copies submitted)

cc: (3) L.A. Dept. of Bldg. & Safety
Attn: Mr. Bauer

JOB NO. B-68174-B

CITY OF LOS ANGELES

DEPARTMENT OF BUILDING AND SAFETY

ENGINEER'S CERTIFICATE OF COMPLIANCE FOR COMPACTED EARTH FILLS

LOCATION OF FILL: TRACT NO. ______ LOT NOS. ______

JOB ADDRESS: 3700 Coldwater Canyon Avenue, Los Angeles, California

SOIL TESTING AGENCY: LeRoy Crandall and Associates

PROPERTY OWNER'S NAME: Harvard School

OWNER'S ADDRESS:

PER REPORT ON OUR PROJECT NO. A-66131-A

DATE WORK STARTED ON PROJECT: May 10, 1969

DATE FILL WAS COMPLETED: July 31, 1969

DATE OF THIS CERTIFICATE: December 29, 1969

TO THE SUPERINTENDENT OF BUILDING:

*I hereby certify that I have personally inspected and tested the placing of compacted earth fill on the above described property, and on the basis of these inspections and tests it is my opinion that the same was placed in conformity with the requirements of the Los Angeles City Building Code.

Russell C. Weber

Civil Engineer Russell C. Weber
California Certificate No. 8954

*For the purpose of this Certificate, to "have personally inspected and tested" shall include inspection and testing performed by any person or persons responsible to, the licensed engineer signing this certificate. Where the inspection and testing of all or part of the work above is delegated, full responsibility shall be assumed by the licensed engineer whose signature is affixed thereon.

CONSULTING FOUNDATION ENGINEERS 711 NORTH ALVARADO STREET □ LOS ANGELES, CALIFORNIA 90026 □ TELEPHONE 386-3920

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LEROY CRANDALL
AND ASSOCIATES

RECEIVED
DEC 4 1969
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

December 1, 1969

Robert G. Johnson, A.I.A.
Henry N. Silvestri, A.I.A.
Architects and Associates
7700 Sunset Boulevard
Los Angeles, California 90046

(Our Job No. B-68174-B)

Gentlemen:

Inspection of Foundation Excavations, and
Testing of Compacted Backfill
Proposed Academic Center
Harvard School
3700 Coldwater Canyon Avenue
Los Angeles, California
for the Harvard School

This report confirms our inspection and approval of the excavations for spread footings installed to support the proposed Academic Center building at the subject site; included are the results of our testing of the compacted soils placed as backfill for the project. The location of the planned structure is shown, with relation to adjacent existing buildings on the attached Plot Plan. The inspection work was performed during the month of November, 1968 through July, 1969. We previously performed a foundation investigation of the site, and submitted our recommendations in a report dated August 26, 1966 (our Job No. A-66131), supplemented by letters dated August 28, 1967 and August 12, 1968. Our reports of other investigation and inspection services at the general site have been submitted from time to time as the work was completed.

L. LeROY CRANDALL, C. E.
FREDRICK A. BARNES
LEOPOLD HIRSCHFELDT
RUSSELL C. WEBER, C. E.
J. D. KIRKGARD, C. E.
JAMES M. McWEE, C. E.
SEYMOUR S. CHIU, C. E.
P. A. MALJIAN, C. E.
ROBERT CHIERUZZI, C. E.
JAMES L. VAN BEVEREN, C. E.

Based on the planned floor grades and the existing topography, it was anticipated that excavation would be required beneath the majority of the Academic Center area . At the time of our investigation, the site was occupied by numerous buildings and appurtenant paved and planted areas. Construction of the Academic Center, therefore, required the removal of some existing buildings. It was expected that excavation for the Academic Center would extend to shale, permitting the use of conventional spread footings. We stated that conventional spread footings carried at least one foot into the shale and at least three feet below the lowest adjacent grade or floor level, could be designed to impose a dead plus live load pressure of 4,000 pounds per square foot.

After the building area for the Academic Center was cut to grade, excavations were constructed for conventional spread footings installed to support the proposed building. In addition, excavations were constructed for footings to support the stairway and retaining wall north of the building and the south wall of the driveway. Our field representative checked the excavations to verify that the soils were firm natural materials capable of supporting at least the design pressure. The excavations were cleaned of any loose materials prior to final approval.

Based on the results of our inspection, the soil conditions for the footing excavations were satisfactory. The firm natural soils are capable of providing adequate foundation support for the proposed Academic Center, and appurtenant facilities.

After installation of the foundations and construction of walls below grade, compacted materials were placed as backfill against walls and in a trench for a drain line. Between footings at the southwesterly portion of the Academic Center, at the stairway area northwest of the building, beneath the slab area northeast of the structure, and for the lower four feet along the east side, crushed rock was used for backfilling. The rock was placed in thin loose lifts and consolidated with hand-tamping equipment. Our field representative probed the rock backfill during placement to confirm the adequacy and uniformity of the compaction. Based on the results of the probing, the crushed rock backfill was adequately and uniformly compacted.

Above the four feet of rock backfill against the north and east building walls, and in the trench for the drain line, on-site shale and diatomaceous soils were placed and compacted. The maximum dry densities of the on-site soils were determined by compaction tests performed in accordance with the ASTM Designation D1557-66T method of compaction, which utilizes a 1/30-cubic-foot mold in which each of five layers of soil is compacted by 25 blows of a ten-pound hammer falling 18 inches. The results of the compaction tests were used in establishing the degree of compaction achieved during the placing of the backfill.

As the backfilling progressed, our field representative performed periodic field density tests to determine the degree of compaction achieved. The results of the field density tests are presented in the attached Table of Test Results; the locations of the tests are shown on the Plot Plan.

Yours very truly,

LeROY CRANDALL AND ASSOCIATES

by Russell C. Weber

Russell C. Weber

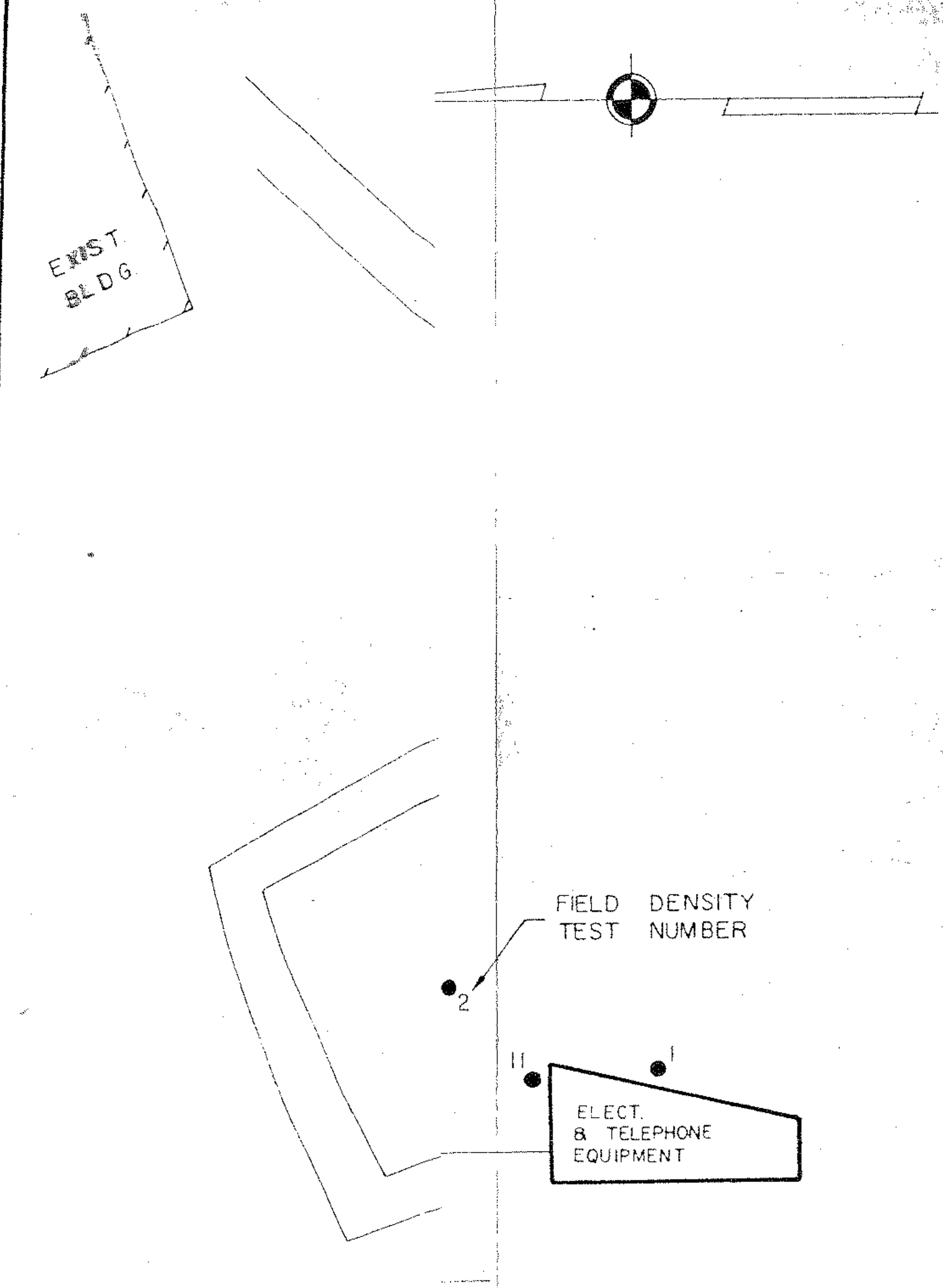
RW-JA/lg
Attachments (2)
(6 copies submitted)

cc: (3) L. A. Dept. of Bldg. & Safety

TABLE OF TEST RESULTS

TEST NO.	ELEVATION (FEET)	MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS./CU.FT.)	MAXIMUM DENSITY (LBS./CU.FT.)	PERCENT COMPACTION
1	719	52.0	60	83	72
2	724	42.0	59	83	71
3	723	40.1	63	94	67
4	731½	33.6	78	88	89
5	732	31.7	79	88	90
6	732½	33.2	79	88	90
7	733	30.6	80	88	91
8	732	29.4	83	88	94
9	734	37.2	69	83	83
10	734	35.4	70	83	84
11	723½	25.7	77	88	87
12	736½	39.2	67	88	76

NOTE: Elevations refer to job datum.



REFERENCE:
SITE PLAN (UNDATED) BY
ROBERT G. JOHNSON A.I.

PLAN

ACADEMIC CENTER

SCALE 1" = 20'

LEROY CRANDALL AND ASSOCIATES

Geology & Soils Consultants Inc.

JB17866

GEOLOGIC ENGINEERING INVESTIGATION

Proposed Library and Field House
3700 Coldwater Canyon Avenue
Los Angeles, California

for

HARVARD SCHOOL

GSC 614 January 29, 1973

G.S. Kovacs
Civil Engineering
John W. Byer
Engineering Geology

ENGINEERING GEOLOGY ▪ SOILS & FOUNDATION ENGINEERING
12526 VENTURA BLVD. STUDIO CITY CALIFORNIA 91604 (213)980-0825 (L.A.)877-2757

January 29, 1973
GSC 614

GEOLOGIC ENGINEERING INVESTIGATION
PROPOSED LIBRARY AND FIELD HOUSE
3700 COLDWATER CANYON AVENUE
LOS ANGELES, CALIFORNIA

INTRODUCTION

This report presents the results of our foundation investigation performed on the subject property. The purpose of this investigation was to determine the nature of the soils underlying the site, to ascertain their engineering properties, and to provide recommendations for foundations, lateral design, and slabs on grade.

This investigation included reviewing pertinent engineering geology and soils reports (see Reference List), drilling exploratory test borings and pits, obtaining representative soil samples, and the preparation of this report. The exploratory boring locations are shown on the enclosed Plot Plan and Geologic Map. Also attached are the laboratory results, a geologic section and stability analysis.

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STRUCTURAL CONSIDERATIONS

Information concerning the proposed development was furnished by Mr. Robert Johnson of Johnson & Silvestri, Architects. The proposed structures are a two-story concrete, tilt-up panel Field House and a two-story, woodframe Library. The Field House is a heavy masonry structure with column loads in the range of 550 kips. The Library will be a conventional frame structure with a wall load not expected to exceed three kips per lineal foot. The column loads are not expected to exceed 50 kips. The Library site will require some grading as it will be on a cut and fill area. The Field House will require extensive grading since its location will require excavation.

SITE CONDITIONS

The property is located at 3700 Coldwater Canyon Avenue in the City of Los Angeles, California. For the Library structure: the surface at present is covered by several trees, shrubs, lawn and the existing Library. The site slopes from the south to the north and drainage is by sheetflow down the slopes to the north and down the street to the west.

The adjacent structures are the Academic Center to the west, a plaza to the east, a roadway to the south, and a rose garden to the north. There is a buried foundation to the west of the existing Library in the parking lot. There are also several underground utilities in and about the existing Library structure (see Plot Plan and Geologic Map).

For the Field House: the surface at present has a parking lot on approximately 15 feet of fill, several trees, shrubs, and a retaining wall down at the track level. The parking area is approximately 15 feet above the track level and all drainage from the parking area is by sheetflow to the storm drains which pipe the water down to the storm drains at the track level. There are also several electrical conduits, sewer lines, and storm drains running through the site (see Plot Plan and Geologic Map).

The site was explored on the 11th, 12, and 15th of January, 1973, by digging two test pits and by drilling seven exploratory test borings with a truck-mounted, rotary drilling machine. The borings varied in depth from 20 to 51 feet, and the test pits were six to eight feet deep. The boring and test pit locations are shown on the Plot Plan and Geologic Map and the soils encountered are logged on Plates A-1 through A-19.

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The soils encountered will be broken into those found at the Field House site and those found at the Library.

Library Building

The soil profile for the Library was consistent throughout the site. The profile is a sloping profile going from a cut to a fill condition across the site in a south to north direction. In Borings 6, 7, and 9-A, Modelo Formation was encountered below the asphalt and crusher run base to the completed depth of these borings (46 feet for Boring 6, 35 feet for Boring 7, and 30 feet in Boring 9-A). Down the slope in Test Pits A, B, and GA, a typical fill soil, natural soils, then Modelo Formation profile was encountered with the Modelo continuing to completion of these test pits (6 feet for Test Pit A, 8 feet for Test Pit B, and 4 feet for Test Pit GA).

Field House

The soil profile for the Field House was consistent once the 15 feet of fill for the parking lot was penetrated. The Field House, from the data collected in the borings, appears to be situated across an alluviated canyon. The soils in Borings 1 through 4, below the parking lot fill, were alternating layers of sands, silts, and clayey sands which are indicative of alluvium.

Bedrock was encountered in all borings. The depth of bedrock ranged from 10 feet in Boring 5, and 15 feet in Boring 6A, which were on a flank of a south-trending ridge; 24 to 28 feet in Borings 1 and 2, down on the track; and 36 to 37 feet in Borings 3 and 4, up on the parking lot fill.

GROUND WATER

Library

Ground water was not encountered in any of the borings or test pits dug for the Library Building. As such, no problems are to be anticipated during the construction of the structure.

Field House

Ground water was encountered in Borings 1 through 4. The water was flowing in at the bedrock-alluvium contact. The water had filled each hole to this elevation by the time the hole was ten feet into the bedrock. Ground water concentrates on the bedrock due to its impermeable nature.

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GEOLOGIC STRUCTURE

Geologic conditions affecting the proposed Library were ascertained from downhole inspection in Borings 6 and 7. Geologic data presented in the Crandall reports were reviewed and incorporated into the regional geologic picture.

As described in the referenced geologic reports, a pre-historic landslide mass was found to underlie a majority of the existing Harvard School. The slide debris ranges in thickness from 25 to 40 feet. The slide can be classified as a block glide which failed along northwest-dipping bedding planes within the Miocene Modelo Formation. Subsequent to the failure, the surrounding terrain has been modified by erosion, grading, and more significantly, alluvial deposition along the toe of the slide.

Geologic data gathered from Borings 6 and 7 were incorporated with the existing data which were used to draw Geologic Section A. This section indicates the slide to be larger than originally mapped. Section A was then used for a stability analysis. The analysis indicates that the pre-historic landslide has reached equilibrium and possesses a safety factor in excess of 1.5.

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Downhole inspection indicated the slide debris to consist of diatomaceous and silty shale of the Modelo Formation. The slide debris was found to be mostly tight with localized areas containing open fractures and soil filled fractures. The slide plane in Boring 6 was found at a depth of 24.5 feet. The attitude of the slide plane in this area is strike N40E, with a 14 degree dip to the northwest. The slide plane consists of wet silty clay that is firm and no active seepage was occurring at the slide plane.

Immediately below the slide plane, the bedrock encountered consisted of diatomaceous and silty shale with interbedded, fine-grained sandstone. The bedrock is very firm, tight, with no open fractures or joints. Bedding within the Modelo Formation was found to strike N50E and dip 12 to 15 degrees to the northwest.

In Boring 7, two slide planes were recognized. The first plane was found at a depth of four feet in which the rock above was very weathered, crushed, and broken. The slide debris below four feet was tight and resembled in-place bedrock except for the presence of open fractures. The fractures were open as much as 1/4 inch to a depth of approximately 20 feet. At this depth, a second slide plane was recognized striking N55E and dipping 14 degrees to the northwest. Below the slide plane, the bedrock was found to be very firm, tight, and closed, similar to the rock found in Boring 6.

Based upon the geologic data submitted to date and the additional information gained from Borings 6 and 7, the school site is underlain by a pre-historic landslide that is now grossly stable and should not affect future construction. Reconnaissance visual inspection of buildings currently constructed on the slide area reveals the presence of no adverse cracking or separations which would indicate that the slide is creeping.

RECOMMENDATIONS - LIBRARY STRUCTURE

Foundations

Conventional spread footings may be used to support the structure provided they are founded on the Modelo Formation (within the pre-historic landslide) which is found nine inches below existing grade on the south side and eight feet below existing grade on the north side. Wall footings may be designed for a bearing value of 3,000 pounds per square foot and should be a minimum of 12 inches in width and two feet into the Modelo Formation. Column footings may be designed for a bearing value of 5,000 pounds per square foot and should be a minimum of two feet in width and two feet into the Modelo Formation. The structure should not be supported on isolated piers. The wall footings and column piers should all be tied together.

Lateral Design

The bearing values indicated above are for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. Resistance to lateral loading may be provided by friction acting at the base of foundations and by passive earth pressure. An allowable coefficient of friction of 0.4 may be used with the dead load forces. Passive earth pressure may be computed as an equivalent fluid having a density of 400 pounds per cubic foot with a maximum earth pressure of 5,000 pounds per square foot for the Modelo Formation. When combining passive and friction for lateral resistance, the passive component should be reduced by one third. For design of isolated poles, the allowable passive earth pressure may be increased by 100 percent.

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Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. The maximum settlement is expected to be 0.5 inches and occur below the columns. Differential settlement is not expected to exceed 1/4 inch.

RECOMMENDATIONS - FIELD HOUSE

Foundations

The most economical foundation system which can satisfy the structural consideration is drilled, cast-in-place friction piles. While some difficulty is expected due to the ground water condition, the cost should prove less when considering driven displacement piles of either timber or concrete. The latter cause considerable noise and ground motion which is objectionable in this area.

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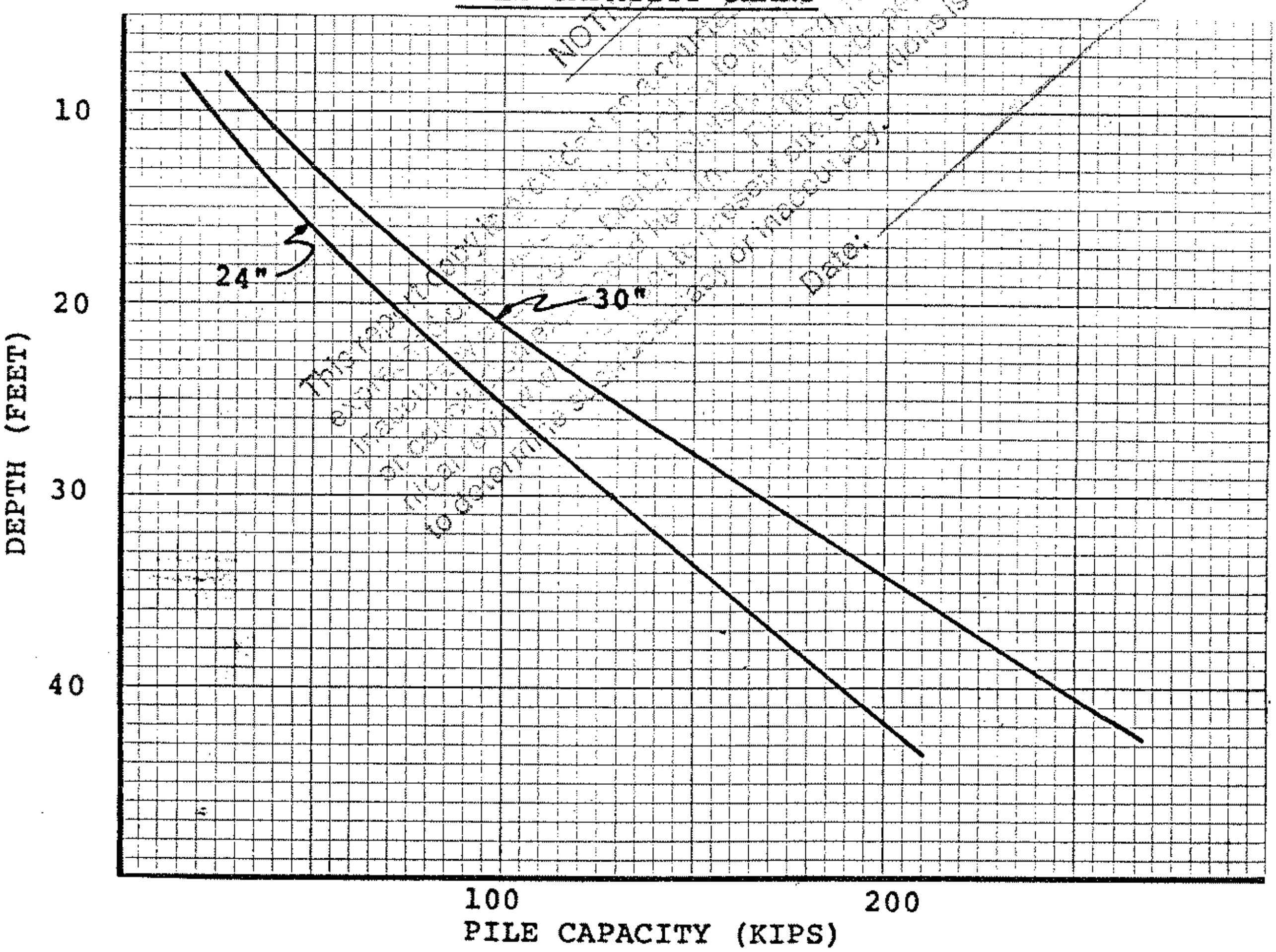
The piles may be sized per the following Pile Capacity Chart.

PILE CAPACITY CHART



NOTES:
1. Capacity for Drilled, Cast-in-Place, Pile of Diameter Shown. Other Diameter Piles Have Capacity in Direct Proportion to Diameter.
2. For Uplift Capacity, Multiply by One-Half.
3. All Piles to be Placed in "Dry" Holes.
4. No Pile Excavation to Remain Open Overnight.
5. Space Piles at 2-1/2 Pile Diameters, Center to Center.
6. Place No More Than One Pile Per Group Per Day.
7. For Lateral Capacity, See Text.
8. Minimum Recommended Depth, Ten Feet Into Bedrock.

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Placement

Placement of the concrete will require a coordinated effort by the foundation contractor. Using 24-inch piles as an example, the following steps should be taken: Piles should be excavated using a 30-inch bucket down to the bedrock. Once in the bedrock, a 28-inch steel casing should be placed in the hole and driven into the bedrock so as to effect a seal to keep the perched ground water from entering the excavation. A 24-inch bucket should then be used to excavate the pile to the required depth. Any water that has collected in the excavated shaft should be removed prior to placing any concrete. The concrete should be placed in the shaft keeping the concrete level five feet above the tip of the steel casing as it is being extracted.

Inspection by the foundation engineer will be required to determine the required penetration and allow continuous placement of concrete. <u>No pile excavation should be allowed to stand open overnight</u>. Only one pile per cluster may be placed in any one day.

Group Action

Where multiple piles are required and they can be placed at 2-1/2 pile diameter spacing center to center, no reduction in capacity is necessary.

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Settlement

Foundation settlement is expected during the course of construction. Differential settlement is not expected to occur and the maximum settlement of the piles is not expected to exceed 3/4 inch.

Lateral Design

Resistance to lateral loads may be calculated from the following table for fixed and free head piles 24 inches in diameter.

	Fixed Head	Free Head
Lateral Capacity (kips)	32	13
Max. Neg. Moment (kip-in)	66P*	--
Inflection Point (feet)	7	--
Depth to Max. Moment (feet)	13	8
Max. Pos. Moment (kip-in)	19P*	58P*
Depth to Zero Moment (feet)	28	24

*P is in kips

Retaining Walls

The Field House is going to be cut into the existing parking lot fill on the west and south sides. Also, it is going to be cut into the side of the south-trending ridge on the east side. These cuts will most likely cause the walls of the building to act as retaining walls. Retaining walls can be designed for an equivalent fluid pressure of 30 pounds per square foot per foot of depth. The retaining walls shall have a sufficient number of weepholes and these weepholes shall be covered with a sufficient amount of gravel to allow the weepholes to function properly. Footings may be designed for 3,000 pounds per square foot and lateral resistance may be provided by friction and passive earth pressure as indicated in the "Lateral Design" section of the recommendations for the Field House.

Excavations

There will be excavations required for the Field House ranging in depth from 12 feet to 16 feet. These excavations should be stabilized within 30 days of initial excavating. Water should not be allowed to pond on top of the excavation nor to flow towards it.

Temporary excavations can be made if the upper five feet is cut at a slope of 1:1. The remaining 11 feet may be cut vertically.

Floor Slabs and Paving

Prior to placing slabs-on-grade or paving, the existing grade should be scarified to a depth of six inches, moistened as required to obtain optimum moisture content and recompacted to 90 percent of the maximum dry density, as determined by ASTM D 1557-70. The following pavement sections are recommended:

Service	Pavement Thickness (Inches)	Base Course (Inches)
Light Passenger Cars	2	
Trucks, Moderate Truck Driveways (Storage, etc.)	3	4

Base course should be crusher run base (CRB) or decomposed granite.

Floor slabs should be reinforced with a minimum of 6x6-10x10 welded wire fabric. Slabs which will be provided with a floor covering should be protected by a polyethelene plastic vapor barrier. The barrier should be covered with a thin layer of sand, about one inch, to prevent punctures and aid in the concrete cure.

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<u>Inspection</u>

It is recommended that all footings be inspected by our representative prior to placing concrete or steel. Any fill which is placed should be inspected, tested, and certified.

Respectfully submitted,

GARY C. MASTERMAN

G. S. KOVACS
R.C.E. 13503

JOHN W. BYER
E.G. 883

GCM:GSK:JWB:mm

Enc: Plot Plan and Geologic Map
Section A-A
Plates A-1 thru A-19
Plates B-1 thru B-4
Plates C-1 thru C-7
Plate D
Reference List

xc: (2) Addressee
(1) King, Benioff, Steinmann, & King
(4) Johnson & Silvestri, AIA

BORING LOG NUMBER 1

Drilling Date 1/12/73 **Elevation** 680.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						Surface: Dirt Track
				2		FILL, Clayey Sand, brown, moist, dense, with diatomaceous Shale 1/2"
5.0	3	23.0	90.0			
				6	ML ML	Clayey Silt, tan, moist, firm, with Shale fragments 1/2"
					—	— — grades to red-brown
10.0	4	21.0	88.0	10		
					SM	Silty Sand, red-brown, slightly moist, dense, medium with Slate fragments 1/2"
				14		
15.0	1	35.6	80.3			Clayey Silt, tan, very moist, soft
				18		grades to red-brown
20.0	2	29.0	93.0		ML	
23.0	** 17/6"	75.0	54.5	22		water in hole at 22'
						BEDROCK, Modelo Shale, dark brown, dense
				26		
				30		
31.0	** 46/10	54.7	65.5			
				34		End boring at 33.0 feet; No Caving; Water level at 23.0 feet.
						1500# Kelly **750# Inner Kelly 12" Drop

BORING LOG NUMBER 2

Drilling Date 1/12/73 **Elevation** 680.3

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Misture Content %	Dry Unit Weight p.c.f.	Depth in feet.	Graphic Log	Surface: Dirt Track **Description**
						FILL, Clayey Sand, red-brown, moist, dense
				2		Clayey Silt, tan, moist, stiff with Shale fragments 1/2",
5.0	6	22.7	98.0	6	ML	grades drier
10.0	3	16.7	90.6	10	SM	Silty Sand, brown, moist, dense, medium with some Clay binder
						grades clayier
				14		
15.0	5	19.0	98.7			Sandy Clay, tan, moist, dense, medium
				18	CL	
20.0	3	15.9	102.5			1/2" angular Shale fragments red-brown Sand stringer
				22		
25.0	** 5	30.8	92.3			Clayey Silt, tan, moist, stiff
				26	ML	
						caving at 28.5 feet water running in at 29 feet
30.0	** 6	46.0	75.9	30		BEDROCK, Modelo Shale, tan
35.0	** 12	55.0	68.4	35		
40.0	** 20	47.0	70.0	40		grades denser and has a green color
				45		
				50		
						End at 51 feet; Water at 29 feet; Caving at 30 feet

BORING LOG NUMBER 3

Drilling Date 1/12/73 **Elevation** 693.7

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Surface: AC Parking Lot, 4" AC — **Description**
				2		FILL, Sandy Gravel, brown, moist, dense with subrounded boulders, Gravel 1½" maximum, bricks and concrete present
5.0	5	14.1	115.0			Silt, tan, slightly moist, loose, with Shale fragments to 1½"
				6		Clayey Sand, dark brown, moist, dense, medium, with Shale fragments plaster and bricks present
10.0	3	24.2	84.5	10		Silty Sand, yellow-brown, moist, dense, medium with Shale fragments and Clay binder
				14		
15.0	2	13.7	89.2			
				18		grades clayier
20.0	2	16.4	88.0			Clayey Gravel, brown, moist, dense, 2" maximum cobble-size Shale fragments present
				22		grades sandy
25.0	**6	20.3	92.5		GC	
				26		
30.0	**7	24.1	97.0	30		
				34	CL	Clayey Silt, tan, moist, soft, has some Gravel present, hard to drill; cemented limestone boulders, grades very moist, rapid caving
35.0	**4	34.4	86.3			
				38		BEDROCK, highly weathered
40.0	**4	58.4	64.3			
				42		End boring at 41.5 feet; Water and Caving at 39 feet; unable to advance

BORING LOG NUMBER 4

Drilling Date 1/12/73 **Elevation** 694.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						Surface: Dirt Area Just Off Parking Area
						FILL, Clayey Sand, red-brown, moist, dense, medium
				2		Clayey Silt, dark brown, moist, soft with Shale fragments 1½" maximum
5.0	2	22.5	87.0			
				6		
						Clayey Sand, red-brown, moist, dense, medium to coarse with Shale fragments 1½"
10.0	2	14.7	92.0	10		
				14		
						Clayey Sand, dark brown, moist, dense, medium
17.5	4	14.6	104.5			
				18		
						Gravel present, Shale fragments 1½" maximum
				22		
24.0	** 6	21.4	91.5			grades sandier
				26		
					CL	Clayey Silt, dark brown, moist, stiff, with angular Shale fragments 1½"
				30		
31.5	** 5	27.9	90.0		GC	Clayey Sand, tan, moist, dense, medium with some angular Shale fragments 1½" -grades very sandy & to a dark red brown
					SM	Silty Sand, red-brown, moist, dense, medium, with some Clay binder
				34		
36.0	** 4	33.2	84.8		CL	Clayey Silt, gray, very moist, soft Water at 36 feet
				38		BEDROCK, Modelo Formation, weathered
				40		good, hard, Shale
				45		End at 45.0 feet; Water at 38.0 feet at Conclusion of Drilling; no Caving

BORING LOG NUMBER 5

Drilling Date 1/15/73 **Elevation** 702.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						Surface: Dirt Road
				2		FILL, Clayey Silt, brown, moist, firm, with Sand, concrete, bricks, Shale, cobble-sized subrounded fragments cobbles of very hard Shale present
5.0	2	24.6	66.5	6	ML	Silt, Tan, slightly moist, loose
10.0	4	38.8	70.0	10		BEDROCK, Modelo Formation, tan, dense
				14		
15.0	7	60.0	62.8	18		
20.0	8	60.6	59.8	22		
						End at 21.0 feet; no Water; no Caving

BORING LOG NUMBER 6

Drilling Date 1/15/73 **Elevation** 740.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						Surface: AC 4", CRB 6"
				2		FILL, Clayey Silt, tan, moist, firm, with bits of Clay and concrete, and Shale
						BEDROCK, Modelo Formation, weathered
5.0	4	35.2	85.4	6		well bedded
				10		
13.0	7	65.0	57.0	14		
				18		
				22		
24.0	** 18					slide plane at 25 feet
				26		
30.0	16	45.0	77.3	30		
				34		
35.0	** 16	47.0	73.5			fine Sand lense
				38		
40.0	23	78.0	54.5	40		grades moist

(continues)

BORING LOG NUMBER 6 (continued)

Drilling Date 1/15/73 **Elevation** 740.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet.	Graphic Log	Description
				42		Modelo Formation continues
				46		End at 46.0 feet; no Water; no Caving

ATTITUDES

Bedding In Slide:

N40E; 38NW @ 8'
N60E; 25N @ 9'
N65E; 30N @ 9.5'
N60E; 26N @ 11'
N60E; 27N @ 15'
N25E; 46W @ 20'
N50E; 17N @ 25'

Slide Plane 24.5 Feet:

N40E; 14NW

Bedding Below Slide:

N50E; 14N @ 30'
N45E; 12N @ 35'
N50E; 15N @ 40'

BORING LOG NUMBER 7

Drilling Date 1/15/73 **Elevation** 745.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						Surface: AC 4", CRB 4"
				2		BEDROCK at surface
						thinly bedded **Slide Plane at 4 feet**
5.0	8	87.0	48.4			
				6		
10.0	6	46.3	72.5	10		grades moist
				14		
15.0	8	46.6	71.0			
				18		limestone layer
20.0	4	76.0	56.6			slide plane at 19 feet grades drier
				22		
25.0	** 22	43.8	75.5			
				26		
30.0	** 16	42.0	78.5	30		
				34		Siliceous layer, very hard
				38		End at 35.0 feet; no Water; no Caving See Plate A-9 for Attitudes.

BORING LOG NUMBER 7 (continued)

Drilling Date 1/15/73 **Elevation** 745.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet.	Graphic Log	Description
						ATTITUDES **In Slide Plane:** N55E; 14N @ 4' Bedding: N50E; 12N @ 5' N75W; 19N @ 10' N55E; 12N @ 15' N45E; 16N @ 18' Slide Plane (?): N55E; 14N @ 20' Bedding: N60E; 15N; @ 22' N60E; 18N @ 31'

BORING LOG NUMBER A, B

Drilling Date 1/11/73 **Elevation** 742.2, 736.2

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						A (742.2)
				0		SOIL, Clayey Sand, brown, moist, dense
				1		BEDROCK, Modelo Formation, weathered
2.0	-	40.6	71.0	2		
				3		
				4		
				5		
6.0	-	53.0	67.0	6		End pit at 6.0 feet; no Water; no Caving
						B (736.2)
				0		FILL, Clayey Sand, brown, moist, dense
				1		Clayey Silt, dark brown, moist, stiff, with Diatomaceous Shale fragments
2.0	-	23.4	86.0	2		Silty Clay, dark brown, moist, hard
				3		
				4		
				5		BEDROCK, Modelo Formation, weathered
				6		
				7		
				8		End pit at 8.0 feet; no Water; no Caving

BORING LOG NUMBER 2A

(See Ref. List No. 2)

Drilling Date 5/10/66 **Elevation** 677.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet.	Graphic Log	Description
				0	SM	Silty Sand, well graded, oiled
					CL	Silty Clay, dark gray
						some Shale Gravel
5.0	-	33.6	71.0	5		Shale, weathered, fractured, mottled light brown and light grayish brown
10.0	-	31.2	87.0	10		diatomaceous
						mottled grayish white
15.0	-	75.1	53.0	15		
						End at 15 feet; no Water; no Caving

BORING LOG NUMBER 4A

(See Ref. List No. 2)

Drilling Date 5/11/66 **Elevation** 700.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						3" Asphaltic Paving
				0	CL	FILL, Silty Clay, lumps of Shale, pieces of wood and concrete, mottled brown
						Shale, weathered, fractured, mottled light brown and light grayish brown
5.0	-	30.5	82.0	5		
						diatomaceous
10.0	-	42.2	61.0	10		
						mottled grayish-white
15.0	-	36.0	71.0	15		
						(Slide Plane) lenses of Sandstone seams of Silty Clay, dark gray
20.0	-	57.0	59.0	20		
25.0	-	49.0	70.0	25		
30.0	-	83.5	50.0	30		layer of limestone
35.0	-	60.3	59.0	35		
						massive, dark brownish gray
40.0	-	36.1	80.0	40		
				45		End at 45 feet; no Water; no Caving

BORING LOG NUMBER 6A
(See Ref. List No. 2)

Drilling Date 5/11/66 **Elevation** 690.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
				0		FILL, Silty Sand, fine, brown
					CL	FILL, Silty Clay, lumps of Shale, few pieces of wood, dark grayish brown, about 20% of diatomaceous Shale
5.0	-	23.2	85.0	5	CL	Silty Clay, brown
10.0	-	28.0	79.0	10	ML	Clayey Silt, brown roots
15.0	-	44.6	68.0	15	CL	Silty Clay, dark brown mottled brown
20.0	-	50.4	68.0	20		Shale, weathered, diatomaceous, mottled light brown and light grayish brown
25.0	-	61.2	60.0	25		
						End at 25 feet; no Water; no Caving

BORING LOG NUMBER 9A

(See Ref. List No. 2)

Drilling Date 5/12/66 **Elevation** 739.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet.	Graphic Log	Description
						4"Asphaltic Paving and 5" Base Course
				0		Shale, weathered, fractured, mottled light brown and light grayish brown
5.0	-	57.5	50.0	5		diatomaceous
10.0	-	53.5	64.0	10		roots
						grayish brown
15.0	-	47.4	69.0	15		lenses of Sandstone
						(Slide Plane)
20.0	-	45.9	75.0	20		
25.0	-	45.2	75.0	25		
30.0	-	42.7	71.0	30		
						End at 30 feet; no Water; no Caving

BORING LOG NUMBER 10A

(See Ref. List No. 2)

Drilling Date 7/15/66 **Elevation** 737.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
						3" Asphaltic Paving
				0		FILL, Silty Clay, mottled brown
						Shale, weathered, fractured, diatomaceous, mottled light brown and grayish white
5.0	-	42.1	75.0	5		
						layer of limestone
10.0				10		
						(Slide Plane)
15.0	-	55.3	63.0	15		
						lenses of Sandstone
20.0	-	41.0	76.0	20		
25.0	-	42.0	73.0	25		
30.0	-	52.7	66.0	30		
35.0	-	32.1	81.0	35		
						End at 35 feet; no Water; no Caving

BORING LOG NUMBER AA, EA, GA

(See Ref. List No. 2)

Drilling Date 5/12/66 **Elevation** 802.0, 823.0, 729.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet.	Graphic Log	Description
						AA (802.0)
				0	CL	Silty Clay, roots, brown
2.0	-	37.7	64.0			Shale, weathered, highly fractured, mottled brown
				5		End at 2.5 feet; no Water
						EA (823.0)
				0	CL	Silty Clay, brown
4.0	-	25.7	82.0			Shale, weathered, highly fractured, mottled brown
				5		End at 4.0 feet; no Water
						GA (729.0)
				0	CL	Silty Clay, roots (to 10"), dark grayish brown
4.0	-	40.7	73.0			Shale, weathered, fractured, mottled brown
				5		End at 4.0 feet; no Water

BORING LOG NUMBER 16A'

(See Ref. List No. 3)

Drilling Date 7/8/68 **Elevation** 800.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet	Graphic Log	Description
				0	CL	Silty Clay, lumps of Shale, roots, mottled gray and brown
						Shale, weathered, fractured, mottled light brown and light grayish brown Bedded
5.0	-	34.8	58.0	5		
10.0	-	24.0	82.0	10		
15.0	-	38.4	50.0	15		seams of Clay, roots
20.0	-	38.4	50.0	20		
25.0	-	44.1	55.0	25		
30.0	-	36.1	65.0	30		
35.0	-	42.3	56.0	35		
40.0	-	41.0	64.0	40		
45.0	-	38.5	77.0	45		grayish brown
50.0	-	32.8	83.0	50		
						End at 50 feet; no Water; no Caving

BORING LOG NUMBER 17A'

(See Ref. List No. 3)

Drilling Date 7/9/68 **Elevation** 825.0

Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet.	Graphic Log	Description
				0	CL	Silty Clay, lumps of Shale, few Gravel, roots, mottled brown and dary gray Few cobbles
5.0	-	21.9	82.0	5		Shale, weathered, fractured, mottled, light brown and light grayish brown Bedded
10.0	-	27.1	70.0	10		roots
15.0	-	28.5	65.0	15		
20.0	-	27.0	54.0	20		
25.0	-	28.0	80.0	25		
						End at 25 feet; no Water; Raveling from 0'-3' (to 30" in diameter)

BORING LOG NUMBER 18A'

(See Ref. List No. 3)

Drilling Date 7/9/68 **Elevation** 850.0

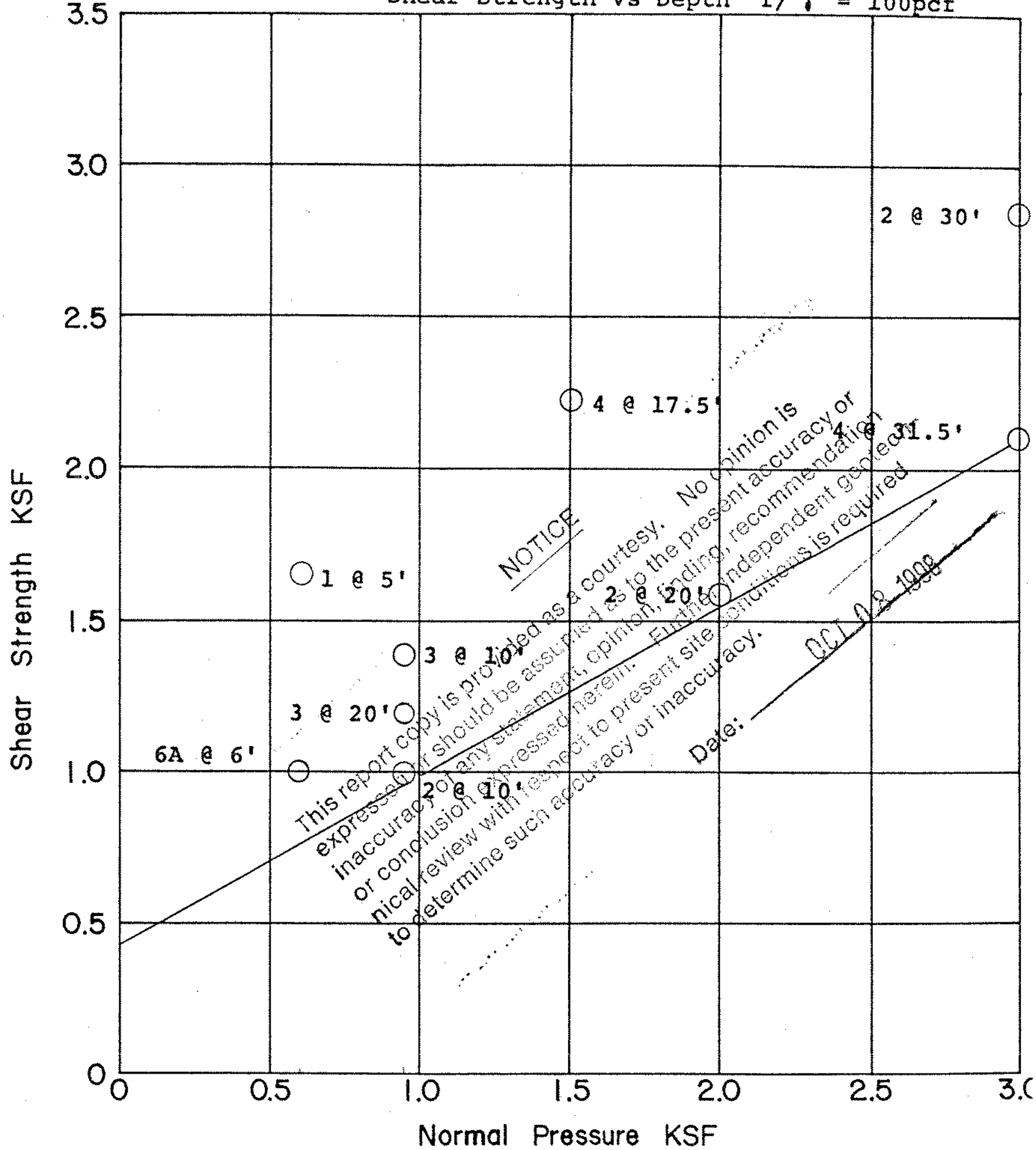
Project Harvard - GSC 614

Sample Depth ft.	Blows per ft.	Moisture Content %	Dry Unit Weight p.c.f.	Depth in feet.	Graphic Log	Description
				0	CL	FILL, Silty Clay, lumps of **Shale**, mottled brown and gray Decomposed wood
5.0	-	24.6	59.0	5		Shale, weathered, fractured, roots, mottled light brown and light grayish brown Bedded
10.0	-	31.3	71.0	10		
15.0	-	34.6	68.0	15		
20.0	-	33.9	57.0	20		
				25		End at 25 feet; no Water; Raveling from 0'-5' (to 30" in diameter)

SHEAR TEST DIAGRAM

Project Harvard - GSC 614

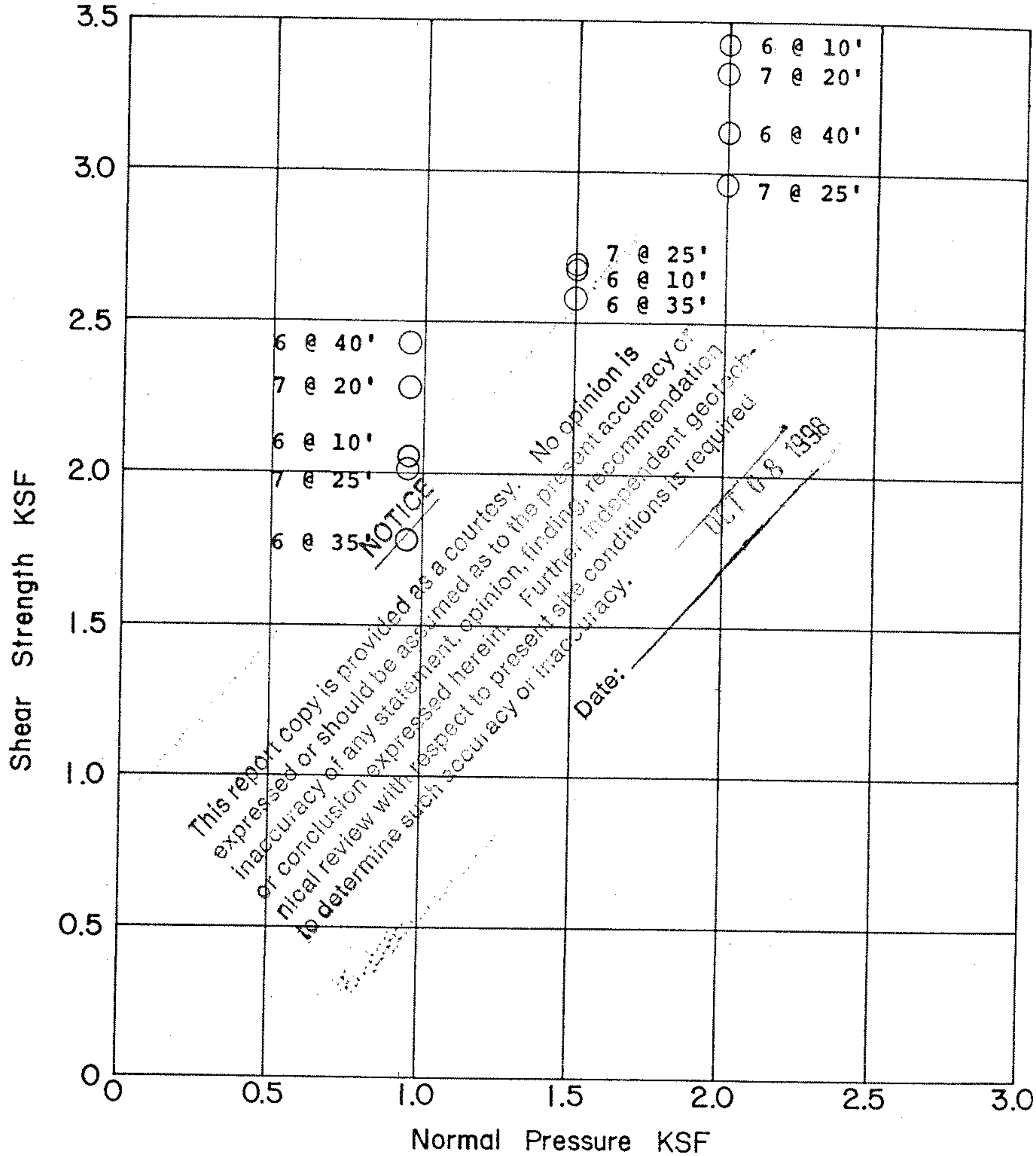
Shear Strength vs Depth f/γ = 100pcf



- ○ Direct Shear at Field Moisture
- ● Direct Shear, Saturated
- ◡ Unconfined Compression Test
- ⊕ Vane Shear Test
- ⊙ Penetrometer

SHEAR TEST DIAGRAM

Project Harvard - GSC 614 (Library)

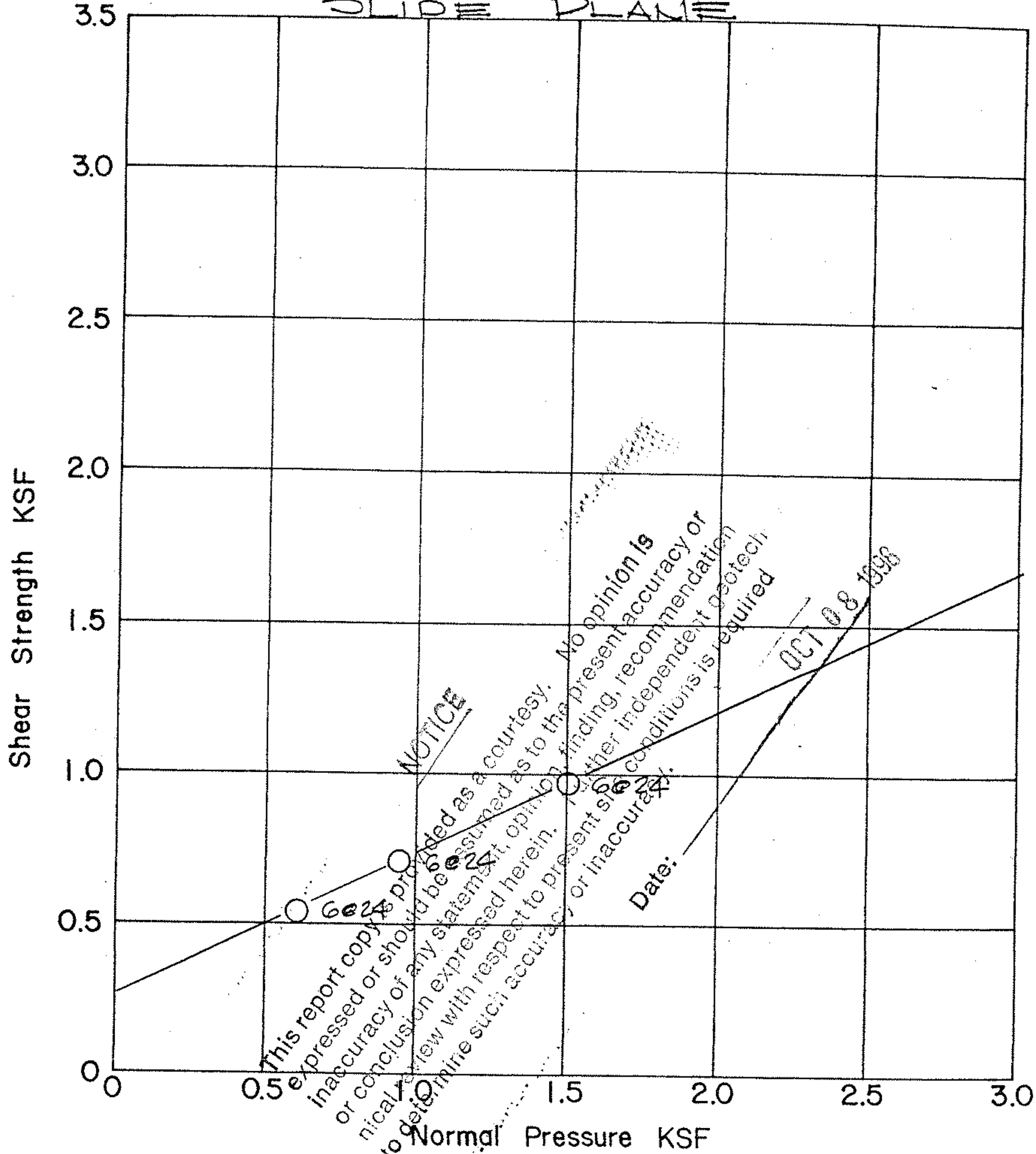


○ Direct Shear at Field Moisture
● Direct Shear, Saturated
◡ Unconfined Compression Test
⊕ Vane Shear Test
⊙ Penetrometer

SHEAR TEST DIAGRAM

Project HARVARD SCHOOL GSC 614

SLIDE PLANE

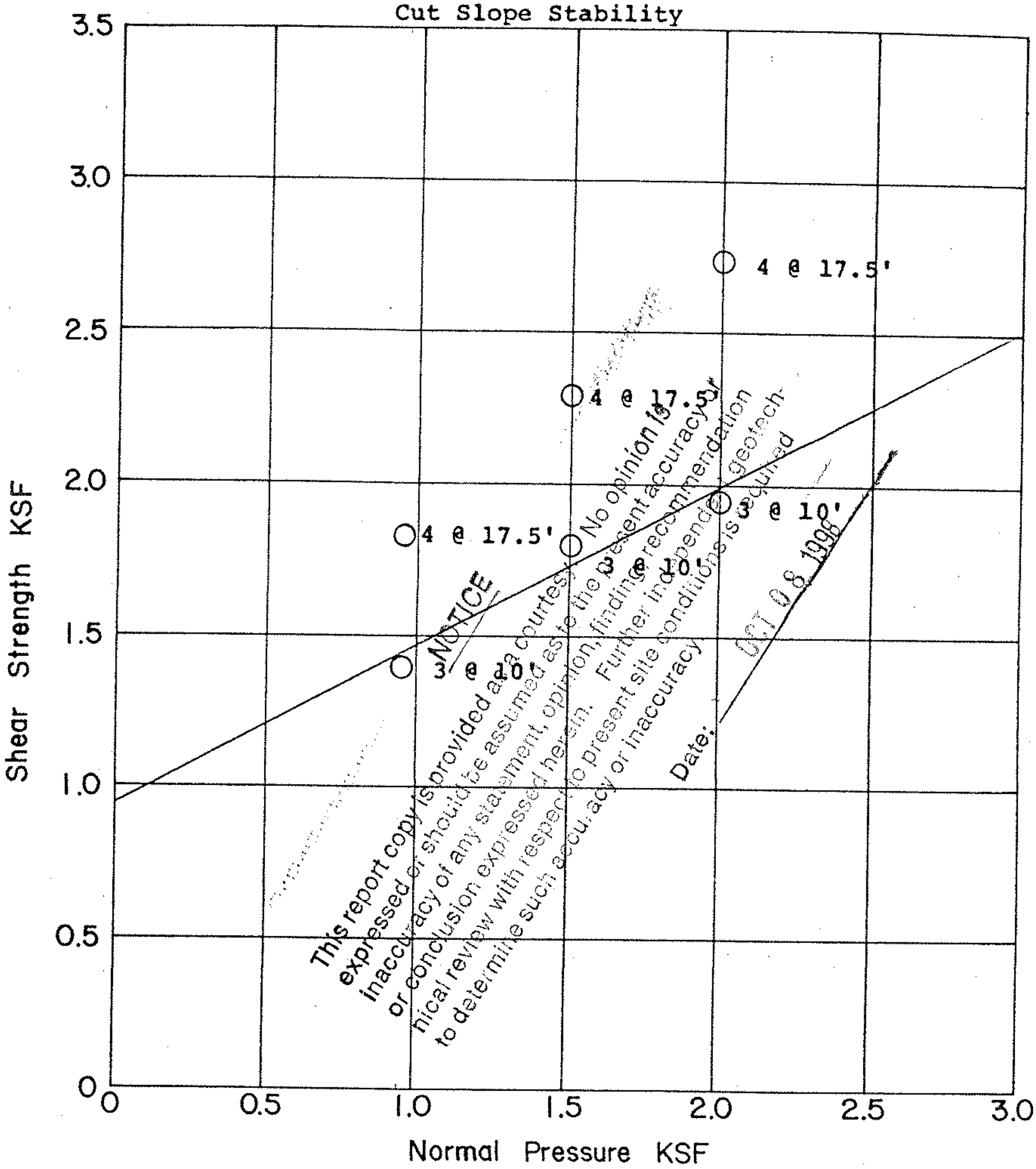


- ○ Direct Shear at Field Moisture
- ● Direct Shear, Saturated
- ◡ Unconfined Compression Test
- ⊕ Vane Shear Test
- ⊙ Penetrometer

SHEAR TEST DIAGRAM

Project Harvard - GSC 614

Cut Slope Stability

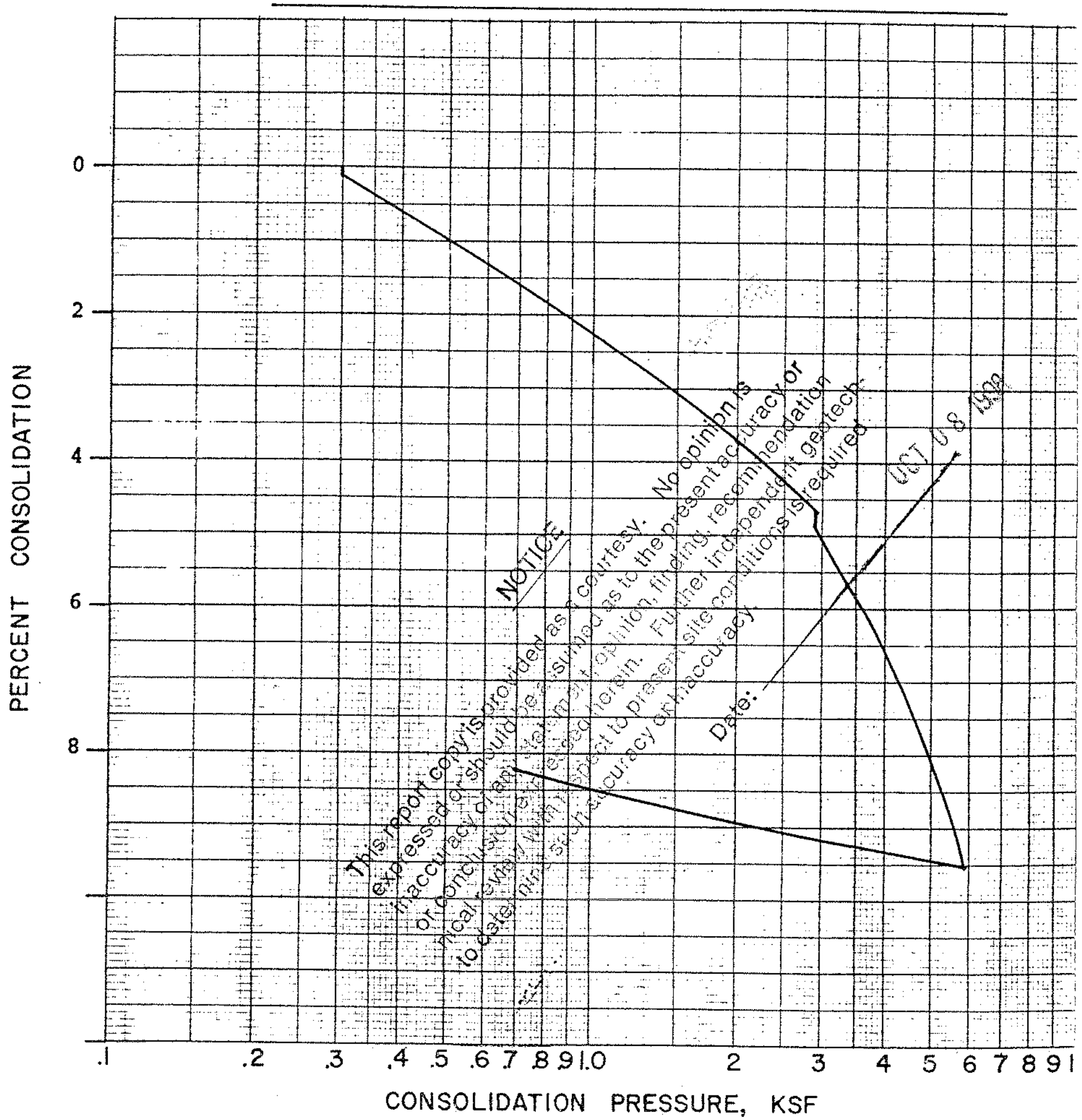


○ Direct Shear at Field Moisture
● Direct Shear, Saturated
◡ Unconfined Compression Test
⊕ Vane Shear Test
⊙ Penetrometer

CONSOLIDATION TEST

Project Harvard - GSC 614

Sample 1 @ 15' Water added at 3ksf

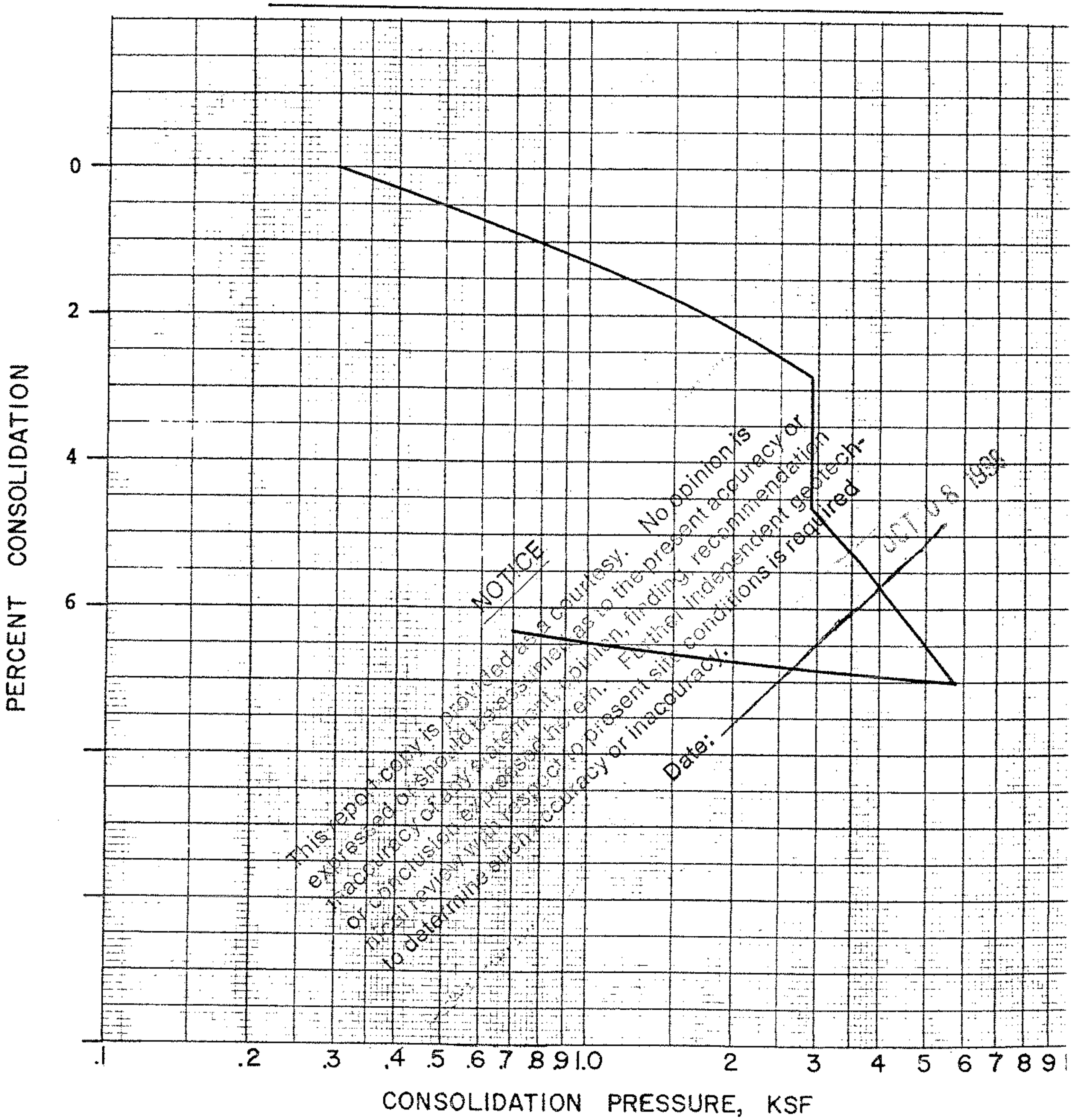


GEOLOGY and SOILS CONSULTANTS, Inc. PLATE C-1

CONSOLIDATION TEST

Project Harvard - GSC 614

Sample 2 @ 10' Water added at 3ksf

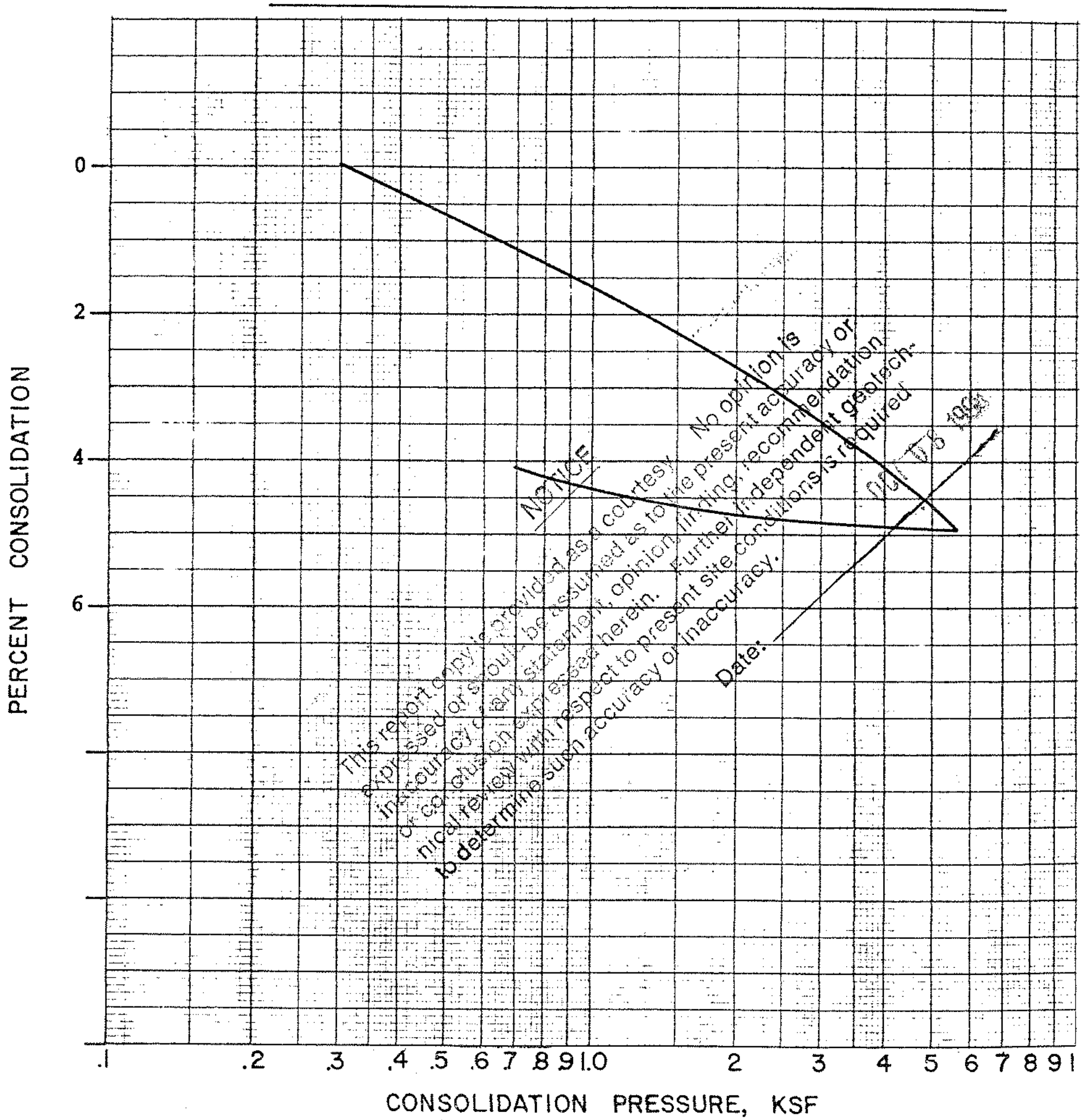


GEOLOGY and SOILS CONSULTANTS, Inc. PLATE C-2

CONSOLIDATION TEST

Project Harvard - GSC 614

Sample 2 @ 20' Water added at 3ksf

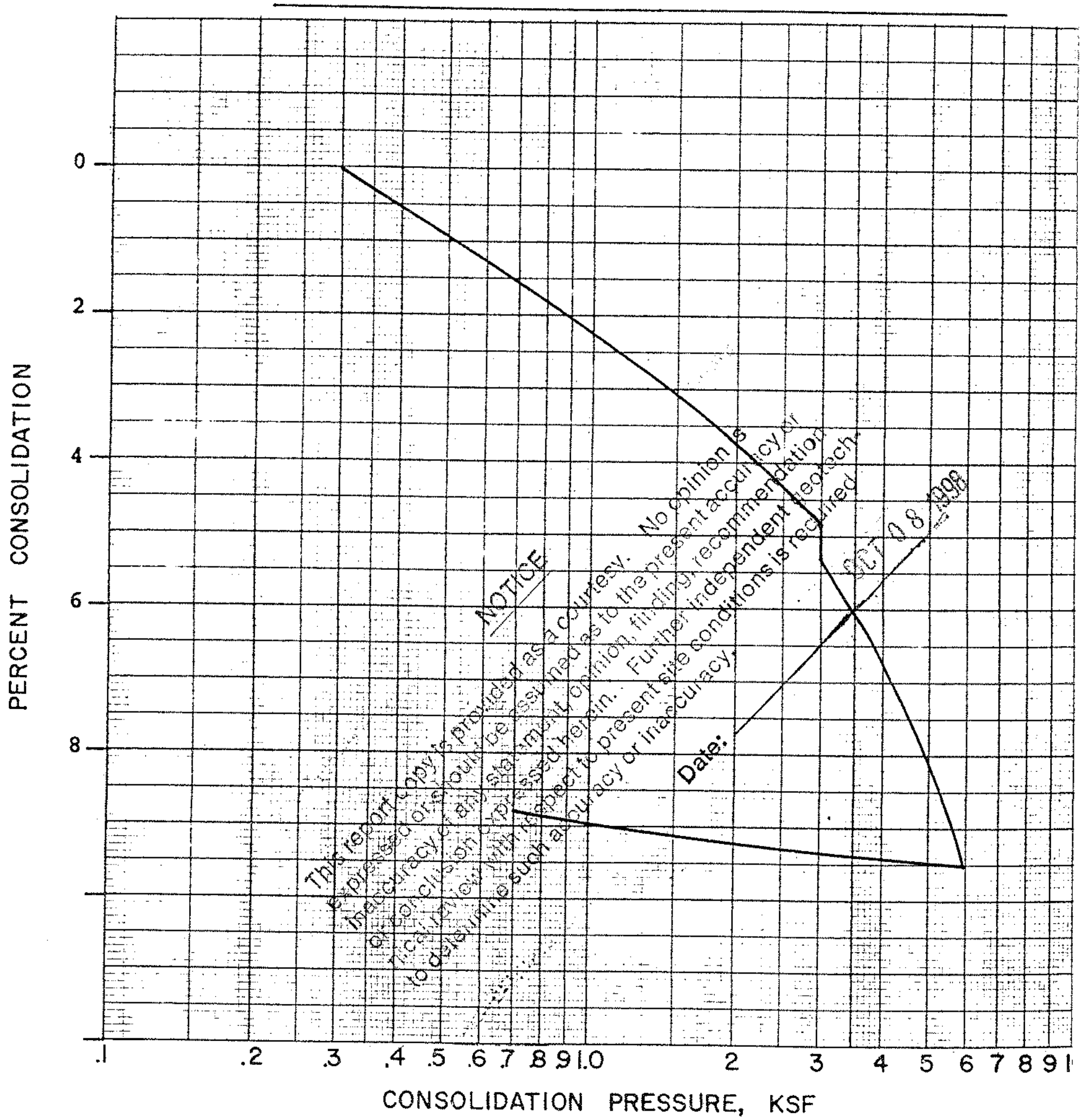


GEOLOGY and SOILS CONSULTANTS, Inc. PLATE C-3

CONSOLIDATION TEST

Project Harvard - GSC 614

Sample 3 @ 20' Water added at 3ksf

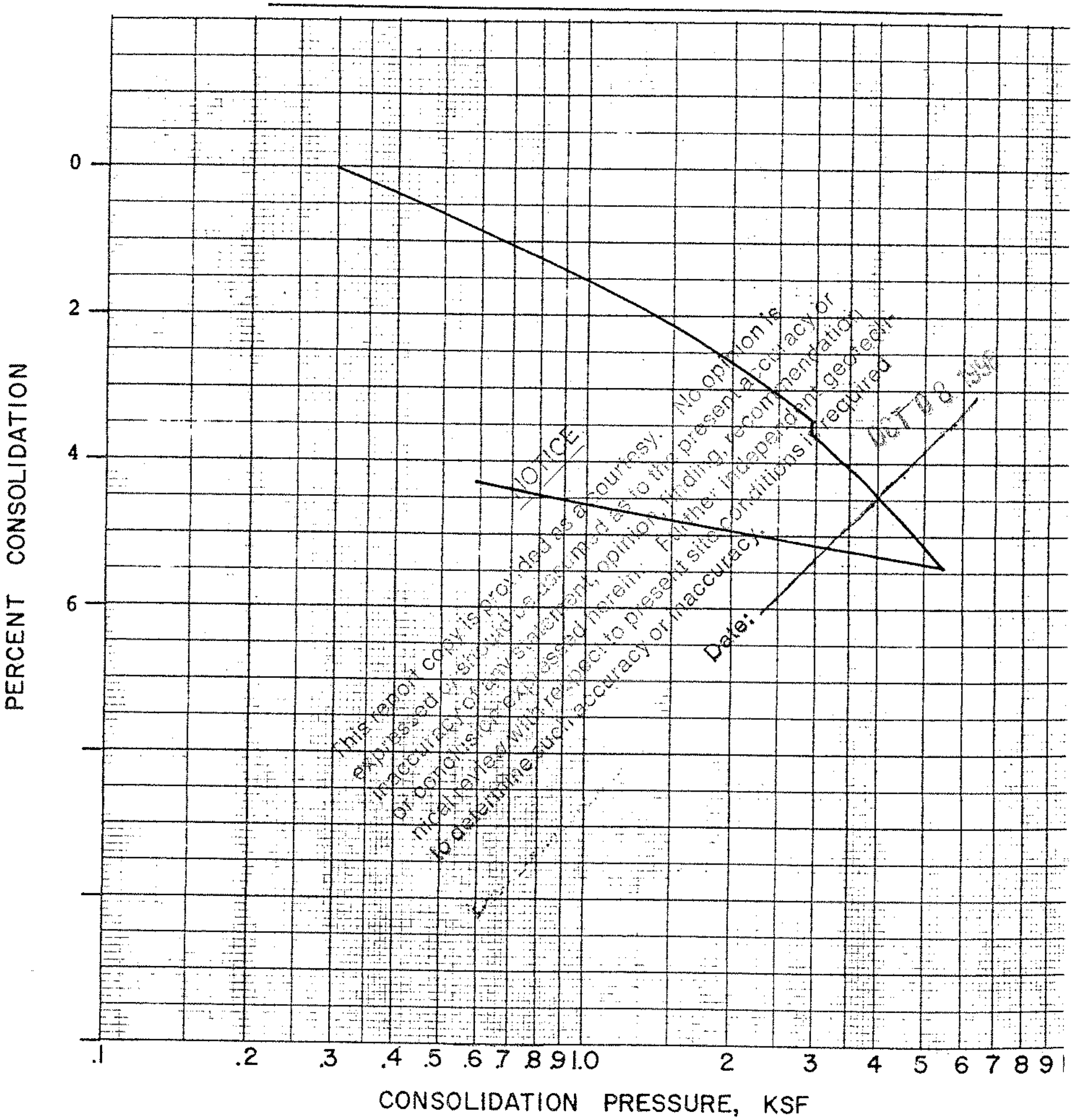


GEOLOGY and SOILS CONSULTANTS, Inc. PLATE C-4

CONSOLIDATION TEST

Project Harvard - GSC 614

Sample 2 @ 30' Water added at 3ksf

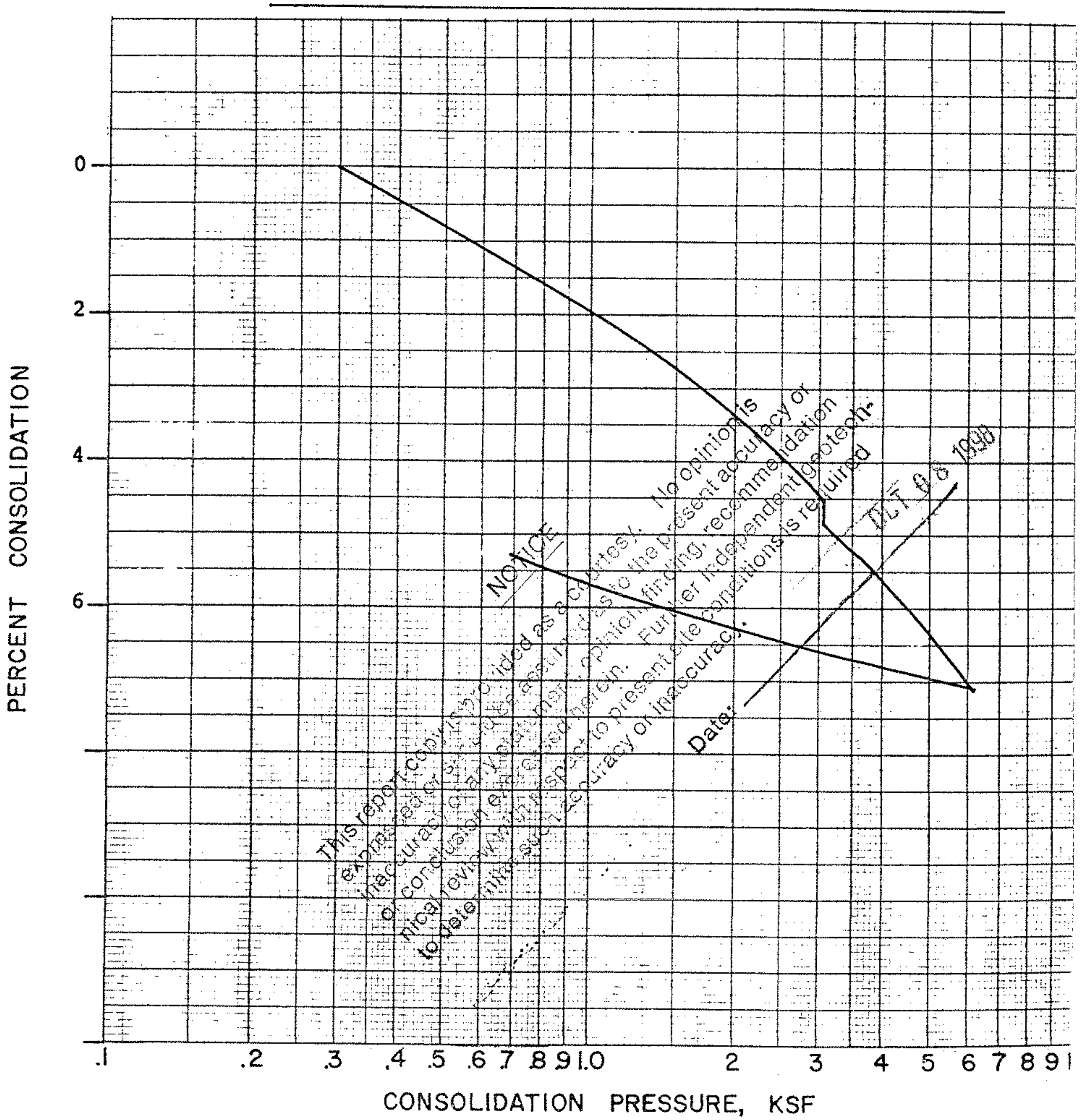


GEOLOGY and SOILS CONSULTANTS, Inc. PLATE C-5

CONSOLIDATION TEST

Project Harvard - GSC 614

Sample 4 @ 31.5' Water added at 3ksf

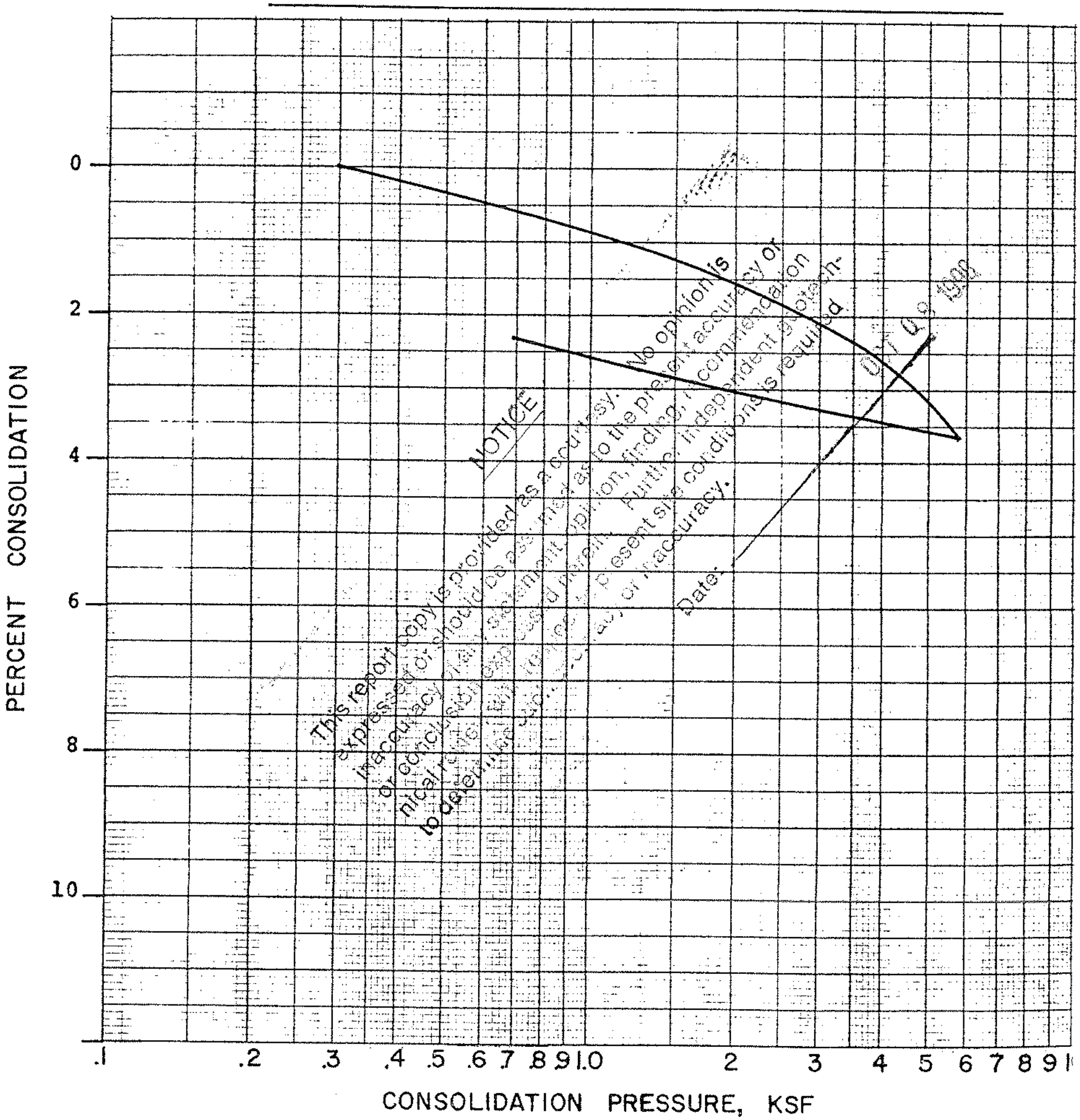


GEOLOGY and SOILS CONSULTANTS, Inc. PLATE C-6

CONSOLIDATION TEST

Project Harvard - GSC 614

Sample 2 @ 35.0' Water added at 3 ksf



GEOLOGY and SOILS CONSULTANTS, Inc. PLATE C-7

SLIDE STABILITY CALCULATIONS

SEGMENT	$\gamma = 110$ W (K)	N W Cos θ	D W Sin θ	c = 260 cL	N tan ϕ	R
1	$\frac{(9+6)}{2}(125) = 940$ 103	θ = 17.5° 98	31.0	30.	45.7	75.7
2	$(10+5)/2\,(130) = 975$ 107	θ = 14° 104	25.9	33.8	48.6	82.4
3	$(10+12)/2\,(120) = 1320$ 145	θ = 12.5° 142	31.4	31.2	66.4	97.6
4	$(12+7)/2\,(120) = 1140$ 125	θ = 10° 123	21.6	31.2	57.5	887
5	$\frac{1}{2}(7)(105) = 370$ 40.7	θ = 11° 40.	-7.8	-28.6	-18.7	-47.3
			102.1			297.1

$$F.S. = \frac{297.1}{102.1} = \underline{\underline{2.9}}$$

Geology & Soils Consultants Inc.

BY G.C.M DATE 24 JAN SUBJECT HARVARD SCHOOL
CHKD ____ DATE ____
GSC 614
PLATE D

January 29, 1973
GSC 614

REFERENCE LIST

1. Converse Foundation Engineers, Foundation Report, dated April 10, 1961. Job #61-169-A

2. LeRoy Crandall and Associates and Hood & Schmidt, Foundation Investigation, report dated August 26, 1966, Job #A-66131; City of Los Angeles Approval Letter, Board File No. 670179

3. LeRoy Crandall and Associates and Hood & Schmidt, Supplemental Geologic Report and Supplemental Foundation Report, dated July 26, 1968. Job #A-66131-C; City of Los Angeles Approval Letter, Board File No. 670179

4. LeRoy Crandall and Associates, Foundation Investigation and Subsurface Drainage System, dated November 17, 1967. Job #B67150; City of Los Angeles Approval Letter, dated December 19, 1967.

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Geology & Soils Consultants Inc.

March 6, 1973

King, Benioff, Steinmann & King
13701 Riverside Drive
Sherman Oaks, California 91403

Attention: Robert White

<u>Subject</u>

Free Standing Retaining Wall Design,
Proposed Library-Harvard School,
Studio City, California.

Reference: Geologic Engineering Investigation, Geology and Soils Consultants, Inc., Dated: January 29, 1973.

Gentlemen:

Persuant to our conversation, the following information confirms our verbal recommendations. Free standing walls may be designed to bear on the residual soil. Walls which are supported on the stiff soil may be designed for a bearing value of 1,000 pounds per square foot. The footings should penetrate all local fill deposits and be at least 12 inches in the native, black stiff clay.

Active pressures acting against the walls of 30 pounds per cubic foot, may be used where a free draining, granular backfill is employed. Ample weepholes or drain lines are recommended. Isolated walls need not be laterally tied as previously recommended for other structural elements. Those elements may consist of either ties or a reinforced floor slab.

Resistance to lateral loads may be provided by friction acting at the base of the foundations. The allowable coefficient of friction is 0.3. Passive earth pressure of 1,000 pounds per square foot may be used. The passive earth pressure should be reduced by one third when combining with friction.

Should you have any additional questions, please call.

Very truly yours,

G. S. KOVACS
R.C.E. 13503

xc: (2) Addressee
(4) Johnson & Silvestre
(2) Harvard School

GSK:km

G.S. Kovacs
Civil Engineering
John W. Byer
Engineering Geology

ENGINEERING GEOLOGY • SOILS & FOUNDATION ENGINEERING
12526 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604 (213)980-0825 (L.A.)877-2757

CITY OF LOS ANGELES
CALIFORNIA

SAM YORTY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
402, CITY HALL
LOS ANGELES, CALIF. 90012
R. J. WILLIAMS
GENERAL MANAGER

March 7, 1973

Harvard School
3700 Coldwater Boulevard
North Hollywood, California

3700 COLDWATER BOULEVARD

The Department of Building and Safety approves the foundation investigation and engineering geologic report dated January 29, 1973, prepared by Geology and Soils Consultants, Incorporated (No. GSC 614), concerning the development of a proposed library and field house. The library will be a two story wood frame structure and the field house a two story concrete tilt-up structure.

COPY

The following are conditions of this approval:

1. The plans shall comply with all of the recommendations of the Foundation Engineer and a copy of this foundation report, any supplements, and this approval letter shall be attached to the District Office and field set of plans. Submit two copies of the report dated January 29, 1973 to the Building Department Plan Checker prior to issuance of a permit.

2. A grading permit shall be obtained for all grading and shall be performed under the periodic inspection and approval of the Foundation Engineer.

3. If the actual foundation design loads do not conform to the foundation loads assumed in the report, the Foundation Engineer shall submit a supplementary report containing specific design recommendations for the heavier loads to the Department for review and approval prior to issuance of a permit.

4. If import soils are used, no footings shall be poured until the Foundation Engineer has submitted a compaction report and in-place shear test data to the Department and obtained approval.

5. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety.

6. All friction pile drilling and installation shall be performed under the continuous inspection and approval of the Foundation Engineer.

7. All fill or backfill shall be compacted to a minimum of 90% relative compaction as determined by A.S.T.M. method D-1557.

8. Prior to the pouring of concrete, a representative of Geology and Soils Consultants, Incorporated shall inspect and approve the footing and pile excavations. He shall post a notice on the job site for the City Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing and pile excavations. A written certification to this effect shall be filed with the Department upon completion of the work.

R. M. OBERLIES
Chief of Grading Division

RH:JWC:dr
485-3435

cc: Geology and Soils Consultants, Inc.
Johnson & Silvestri
VN Inspection
LA Plan Check

Kovacs-Byer and Associates Inc.

JB17866

March 28, 1979
GSC 614

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Recommendations for Retaining Walls, Vicinity of New Field House, Harvard School, 3700 Coldwater Canyon Avenue, Los Angeles, California.

Reference: Geologic Engineering Investigation, Geology and Soils Consultants, Inc. (Kovacs-Byer and Associates, Inc.), GSC 614, dated January 29, 1973.

Gentlemen:

This letter provides additional information for design and construction of retaining walls which are isolated and not laterally joined to the main buildings.

Retaining walls for this condition may be designed to be founded on the medium dense alluvium. The recommended bearing value is 1,000 pounds per square foot, the allowable coefficient of friction is 0.4, and the passive earth pressure may be assumed as an equivalent fluid having a density of 300 pounds per cubic foot.

Respectfully submitted,

G. S. KOVACS
R.C.E. 18503

GSK:mm

xc: (2) Addressee
(1) Johnson and Silvestri
(1) King-Benioff-Steinmann-King

Kovacs-Byer and Associates Inc.

RECEIVED
JAN 2 [illegible] 1974
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

January 22, 1974
KB 1115

Mr. John Bruchman
5205 Hollywood Blvd., Room 210
Hollywood, California 90028

GRADING JAN 29 197[illegible]

Subject

Site Examination, Storage Building
Harvard School
3700 Coldwater Canyon Avenue
Studio City, California

Dear Mr. Bruchman:

As you requested, an examination has been made of the subject building. The purpose of the examination was to determine the nature of the damage and what conditions prevail in the foundation area. It is proposed to repair the cracks in the masonry walls as indicated on the plans of John B. Ferguson & Associates.

The building was formerly used as a rifle range and consists of concrete walls on two sides and concrete block masonry on the west or downslope side. The building was constructed on a small shelf created by cutting and filling the natural terrain. As a result, the east wall was constructed on the fill. The fill has subsequently settled and the wall has developed several vertical cracks.

It is proposed to seal the cracks with dry-pack concrete and return the building to service as a storage building.

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING
12526 VENTURA BLVD, STUDIO CITY, CALIFORNIA 91604 (213) 980-0825 (LA) 877-2757

CONCLUSIONS

The outside wall of the building is supported by fill. The fill is about four feet in thickness based on the visual examination. Since there is no indication of mass failure and the structure is not to be occupied, the proposed repair is considered satisfactory.

Very truly yours,

G S Kovacs

G. S. KOVACS
Chief Engineer

GSK:mjc

xc: (4) Addressee
(1) John B. Ferguson & Associates

JB17866

Kovacs-Byer and Associates Inc.

February 22, 1974
GSC 614

Harvard School
7217 Melrose Avenue
Los Angeles, California 90046

Attention: Robert F. Boyd

Subject

Interim Compaction Report, Proposed Seeley G. Mudd Library, 3700 Coldwater Canyon Avenue, Los Angeles, California.

Reference: Geologic Engineering Investigation, Geology and Soils Consultants, Inc., dated January 29, 1973.

Gentlemen:

This interim report presents the results of our compaction tests and inspection on the subject property. The purpose of the testing was to determine that the specifications required by the Los Angeles City Building Code were met. The results of the density tests are shown on the attached Table I and plotted on the attached Plot Plan. This work was requested by Mr. Bill Pollard of Western Alta Construction. The fill will be used to support a concrete floor slab.

The following soil type was used in the compacted fill:

Soil Type	Soil Description	Maximum Dry Density Lbs./Cu.Ft.	Optimum Moisture Content (%)	Expansion Index *
A	Gray Diatomaceous Clay	80.5	38.5	6.5

*Based on air dry to saturated under 60 pounds per square foot surcharge.

GRADING

Prior to placing any fill, the existing surface soils were scarified to a depth of six inches, moistened as required to achieve optimum moisture content, and recompacted to 90 percent of the maximum density.

Onsite soils were placed by means of a small loader in loose lifts of about six inches, moistened as required to achieve optimum moisture content by means of a 3/4-inch water hose, and thoroughly compacted with a mechanical hand compactor. Compacted fill was placed to 90 percent of the maximum dry density, or better, as indicated by the test results. Where tests indicate failing results, the soils were either removed or reworked until 90 percent compaction was obtained. Reworked tests are indicated on Table I by the suffix "A".

The maximum vertical depth of fill is eight feet located along the southwest edge of the building (see Plot Plan, location of Field Tests 3, 4, and 5).

CONCLUSIONS AND RECOMMENDATIONS

The fill was placed in a satisfactory manner and is suitable for support of the proposed concrete floor slab.

The soils exposed at the subgrade elevation are expansive and may be used to support the floor slab. The slab should be reinforced with a minimum of 6x6-10x10 welded wire fabric. Floor slabs which will receive a floor covering should be further protected by a plastic vapor barrier. The vapor barrier should be covered with a thin layer of clean sand to aid in the concrete cure and to protect the barrier from punctures.

Fill which is placed beyond the limits shown on the Plot Plan should be compacted with suitable equipment and inspected by our representative.

Should you have any questions, please call.

Respectfully submitted,

G. S. KOVACS
R.C.E. 13503

GSK:mm

Enc: Table I
Plot Plan
Certificate

xc: (1) Addressee
(1) Johnson & Silvestri
(2) Los Angeles City Department of Building and Safety, Van Nuys Grading Division
(1) King, Benioff, Steinmann and King

ENGINEERING GEOLOGY ■ SOILS & FOUNDATION ENGINEERING
12526 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604 (213)980-0825 (L.A.)877-2757

February 22, 1974
GSC 614

TABLE I

Test	Date	Location	Depth*	Moisture Content (%)	Dry Unit Weight (pcf)	Soil Type	Max. Dens.	% Comp.
1	10/11/73	See Plot Plan	1.5	38.0	71.0	A	80.5	88.0
1A	10/11/73	" "	1.5	45.0	73.6	A	80.5	91.5
2	10/12/73	" "	0.5	43.0	73.0	A	80.5	90.7
3	11/15/73	" "	7.0	34.5	72.2	A	80.5	90.0
4	11/15/73	" "	4.0	33.0	72.4	A	80.5	90.1
5	11/15/73	" "	1.5	34.0	73.3	A	80.5	90.8

*Below Finish Floor (Feet)

February 22, 1974
GSC 614

ENGINEER'S CERTIFICATE OF COMPLIANCE
FOR
CONSOLIDATED EARTH FILLS

Description: Harvard School, 3700 Coldwater Canyon Avenue
Los Angeles, California

Property Owner's Name: Harvard School

Address: 3700 Coldwater Canyon Avenue
Los Angeles, California 90046

Date Work Started on Project: 10/11/73

Date Work Was Completed: 11/15/73

Date of This Certificate: 2/22/74

To The Superintendent of Building:

*I hereby certify that I have personally supervised the placing of consolidated earth fill on the above referenced property and that same was placed in conformity with the requirements of the Building Code of the City of Los Angeles.

G. S. Kovacs
R.C.E. 13503

*For the purpose of this Certificate, to "have personally supervised" shall include supervision performed by any person or persons employed by, and responsible to, the licensed engineer signing this Certificate. Where the supervision of all or part of the work above is delegated, full responsibility shall be assumed by the licensed engineer whose signature is affixed hereon.

V. J. PICK

February 14, 1974

Mr. John Bruchman
5205 Hollywood Boulevard, Room 210
Hollywood, CA 90028

TRACT: 1000
LOT: 1111
LOCATION: 3700 Cold Water Canyon Avenue

Engineering Report No. KB 1115, dated January 22, 1974, prepared by Kovacs-Byer and Associates, Inc.

The above report concerning the repair of an existing concrete masonry storage building has been reviewed by the Grading Division of the Department of Building and Safety. The report is satisfactory and a permit may be issued provided the additional conditions listed below are followed:

1. A building permit shall be obtained for the repair of the existing building.

2. All of the recommendations of the report are incorporated into the plans.

R. M. OBERLIES
Chief of Grading Division

RKH:mn
485-3435

cc: Kovacs-Byer and Assoc.
VN Inspection

Kovacs-Byer and Associates Inc.

November 1, 1978
GSC 614

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Update of Geologic Engineering Investigation, 3700 Coldwater Canyon Avenue, Los Angeles, California.

Reference: Geologic Engineering Investigation, Proposed Library and Field House, 3700 Coldwater Canyon Avenue, Los Los Angeles, California, by Geology and Soils Consultants (Kovacs-Byer and Associates), GSC 614, dated January 29, 1973.

Gentlemen:

As requested by the architects and structural engineers, we have reviewed our referenced report with respect to construction of the Field House at Harvard School. A visit to the site reveals that site conditions are similar to those in 1973.

The structure is also similar to the previously proposed building; however, the loads are somewhat lighter. We are of the opinion that heavy concentrated loads, as high as 220 kips, may produce total and differential settlement which would be undesirable.

Drilled piles are recommended for the structure. The allowable loads are indicated in the report. In lieu of lateral ties, it may prove desirable to provide sufficient thickness of floor slab to resist the lateral load. The allowable coefficient of friction between the concrete slab and the ground is 0.4.

If further questions arise, please feel free to call.

Respectfully submitted,

G. S. KOVACS
R.C.E. 13503

GSK:mm

xc: (2) Addressee
(4) Johnson and Silvestri
(1) King, Benioff, Steinmann, King

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING

JBI7866

Kovacs-Byer and Associates Inc.

June 14, 1979
GSC 614

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Retaining Wall Design Parameters, Harvard School, 3700 Coldwater Canyon Avenue, North Hollywood, California.

Gentlemen:

As requested by Mr. Robert Johnson, Architect for the proposed field house construction, a study was made of the foundation design for the retaining wall. This wall is to be constructed adjacent to the existing tennis court. The wall will be on the order of six to eight feet in height.

The constructor excavated test pits along the wall to determine the fill depth and type of bearing material. Three feet of older fill was encountered in the test pit overlying the natural soil. The latter material is a dark brown, clay alluvium. The clay is very stiff and currently moist.

A sample of the clay was collected using a hand-operated steel soil sampler. The sample at a depth of three feet was returned to our laboratory and testing for strength using the direct shear test. The results of this test are enclosed as Plate B.

The wall footing may be placed 12 inches into the clay and should penetrate the fill. In lieu of deepening the footing and increasing the wall height, the footing may be filled with a lean-mix concrete to within 12 inches of the finish surface. The retaining wall footing may then be placed upon the lean-mix surface.

The following design parameters are recommended and were furnished to Robert White of King, Benioff, Steinmann and King on June 14, 1979.

Vertical Bearing	Passive Earth Pressure	Maximum Passive Earth Pressure	Coefficient of Friction
2000 psf	400 pcf	2000 psf	0.4

Please advise when the footing will be ready for observation by our representative to see that the proper bearing stratum has been reached.

Respectfully submitted,

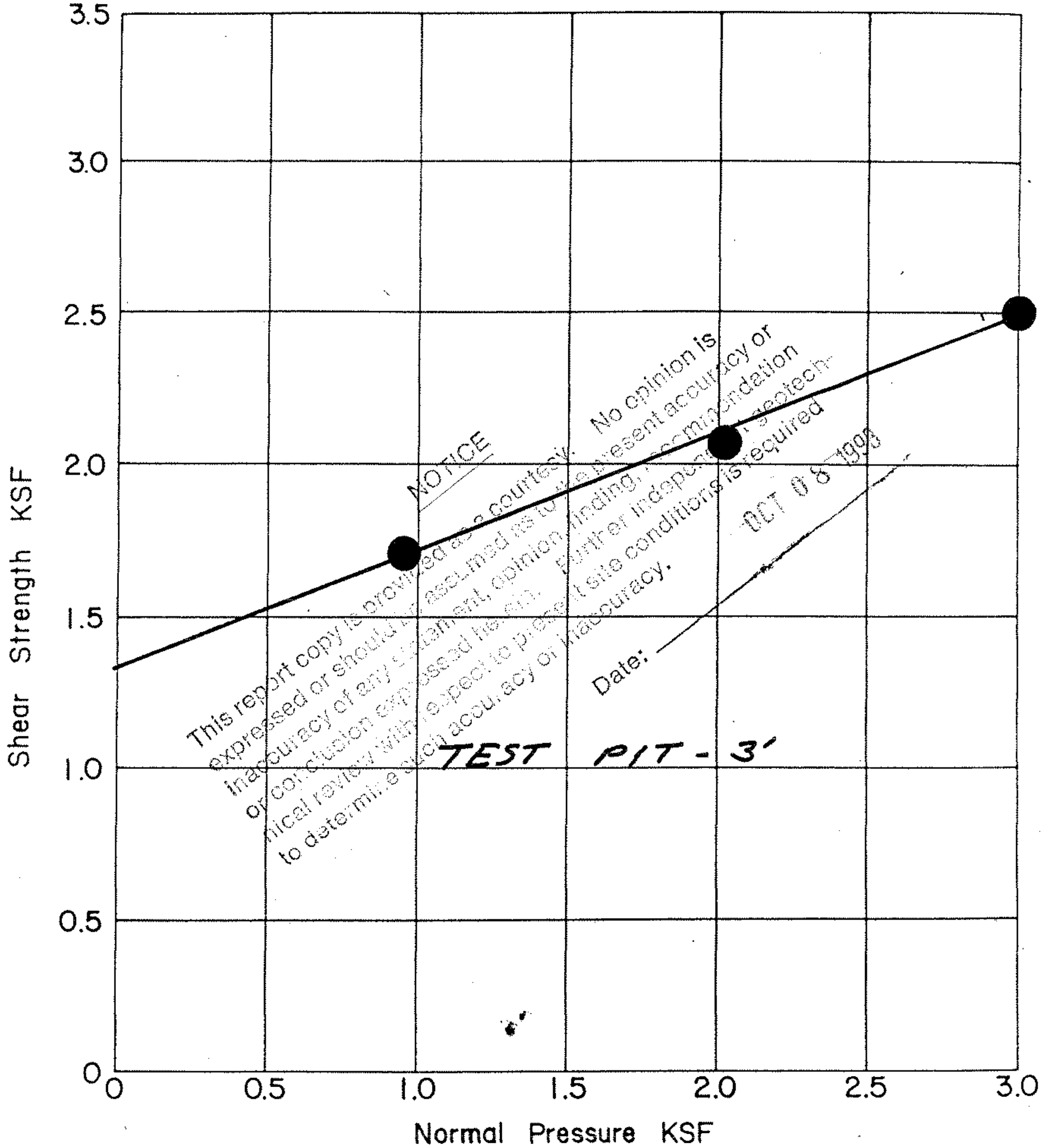
G. S. KOVACS
R.C.E. 13503

GSK:mm

Enc: Plate B
xc: (1) Addressee
(1) King, Benioff, Steinmann, King
(4) Johnson and Silvestri

SHEAR TEST DIAGRAM

Project *HARVARD SCHOOL*



○ Direct Shear at Field Moisture
● Direct Shear, Saturated
◡ Unconfined Compression Test
⊕ Vane Shear Test
⊙ Penetrometer

Kovacs-Byer and Associates Inc.

June 27, 1979
GSC 614

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Supplemental Recommendations for Field House Entry Columns, Harvard School, 3700 Coldwater Canyon Avenue, Los Angeles, California

Reference: Geologic Engineering Investigation, Geology and Soils Consultants, Inc. (Kovacs-Byer and Associates, Inc.), GSC 614, dated January 29, 1973.

Gentlemen:

We have reviewed the referenced report and are pleased to offer the recommendations enclosed. At the south end of the field house there will be an entry way the full width of the building. Columns supporting the entry way roof carry loads on the order of 20 kips according to information furnished by Mr. Robert White of King, Benioff, Steinman & King.

It is recommended that these columns be supported by drilled cast-in-place friction piles a minimum of 10 feet into stiff, sand clay alluvium. Allowable skin friction value is 350 pounds per square foot for each foot of pile shaft in contact with undisturbed natural ground. Resistance to lateral loading may be provided by passive pressure of 800 pounds per square foot with a maximum of 4,000 pounds per square foot.

Piles should be inspected by our representative to see that local fill is penetrated and the piles are founded in the recommended bearing strata as indicated above and by the structural engineer.

Respectfully submitted,

G. S. KOVACS
R.G.E. 13503

GSK:sk

xc: (1) Addressee
(1) Jones Brothers Construction
(4) King, Benioff, Steinman & King
(1) Stegman & Scott, Attn: Fritz Kastner
(1) Johnson & Silvestri, AIA

JB17866

Kovacs-Byer and Associates Inc.

KB 614
September 18, 1979

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

<u>Subject</u>

Pile Inspection
Proposed Fieldhouse and Gymnasium
3700 Coldwater Canyon Avenue
North Hollywood, California

Reference: Geologic and Soils Engineering Investigation, Geology and Soils Consultants, Inc. (Kovacs-Byer and Associates, Inc.) GSC 614, January 29, 1973

Supplemental Recommendations for Field House Entry Columns, Kovacs-Byer and Associates, June 27, 1979.

Gentlemen:

This report presents the final compilation of data on the cast-in-place friction piles drilled on the subject property on September 4, 1979. A total of 6 piles were placed in accordance with the plans prepared by King-Benioff-Steinmann-King, Structural Engineers, the specifications of the City of Los Angeles Building Code, and the recommendations of the referenced reports.

The piles ranged in depth from 17 to 25 feet as the depth of fill varied. Casing was not required as no groundwater was encountered.

All of the cast-in-place friction piles are approved by this office.

Respectfully submitted,

KOVACS-BYER AND ASSOCIATES, INC.

Edward F. Hill

EDWARD F. HILL

G. S. KOVACS
R. E. 13503

Enc: Pile Plot Plan
Table I

xc: (1) Addressee
(1) King-Benioff-Steinmann-King
(2) City of Los Angeles, Dept. of Building and Safety
(1) Johnson & Silvestri, Architects
(1) Jones Brothers Construction
(1) P.D. & E. Post Driving Equipment

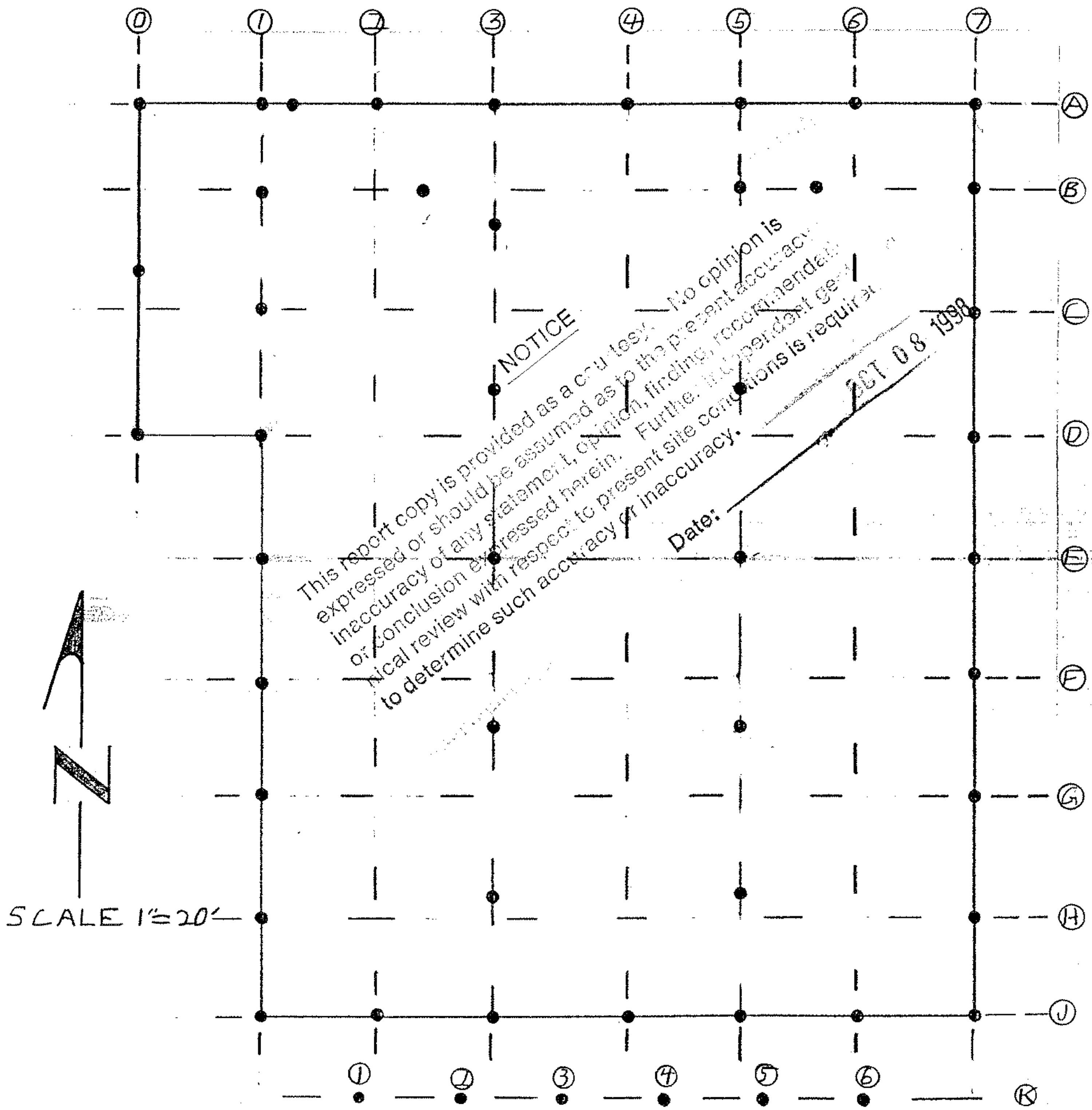
Kovacs-Byer and Associates Inc.

CONSULTING ENGINEERS and GEOLOGISTS

BY EH DATE 7/13/79
UPDATED 9/17/79
CHECKED BY ______ DATE ______

SUBJECT PILE PLOT PLAN

KB 614-G



KB 614
September 18, 1979

TABLE I

Pile No.	Diameter (Inches)	Total Depth (Feet)	Required Depth Into Bearing Soil (Feet)	Actual Depth Into Bearing Soil (Feet)	Comments
1K	36	17	10	11	
2K	"	18	"	11	Storm drain at 3 feet
3K	"	20	"	11	
4K	"	21½	"	10½	
5K	"	25	"	11	
6K	"	22	"	11	Bedrock at 18 feet

JB17866

Kovacs - Byer and Associates Inc.

January 10, 1980
GSC 614-F

Harvard High School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Compaction Report
Foundation Wall Backfill
3700 Coldwater Canyon Avenue
Los Angeles, California

Reference: Interim Compaction Report
Kovacs-Byer and Associates, Inc.
February 22, 1974

Gentlemen:

This report presents the results of our compaction tests and inspection on the subject property. The purpose of the testing was to determine that the specifications required by the City of Los Angeles Building Code were met. The results of the density tests are shown on the attached Table I and plotted on the enclosed Plot Plan. This work was requested by Jones Brothers Construction. The fill will be used to support exterior stairways and building entrance ramps and for backfill.

The following soil type was used in the compacted fill:

Soil Type	Soil Description	Maximum Dry Density Lbs./Cu.Ft.	Optimum Moisture Content (%)	Expansion Index*
A	Gray, Diatomaceous Clay	80.5	38.5	40
B	Brown, Poorly Graded Sand (Import)	132.0	9.0	5

*Expansion Index as Determined by Expansion Index Method (UBC Standard 29-2 or ASTM Equivalent)

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The compaction tests were performed in accordance with ASTM D 1557-70. The field density tests were performed in accordance with ASTM D 1556.

GRADING

Onsite soils and imported fill were placed by means of a loader and/or hand labor, in loose lifts of about 4 inches, moistened as required to achieve optimum moisture content by means of a water hose, and thoroughly compacted with whackers. Compacted fill was placed to 90 percent of the maximum dry density or better, as indicated by the test results. Where tests indicate failing results, the soils were either removed or reworked until 90 percent compaction was obtained.

The maximum vertical depth of fill is 12 feet, located at the west side of the building.

CONCLUSIONS AND RECOMMENDATIONS

The fill was placed in a satisfactory manner and is suitable for support of the proposed exterior concrete fixtures. The soils exposed at the subgrade elevation are expansive and may be used to support the floor slab. The slab should be reinforced with a minimum of 6x6-10x10 or 12-W2.8 welded wire fabric. Floor slabs which will receive a floor covering should be further protected by a plastic vapor barrier. The vapor barrier should be covered with a thin layer of clean sand to aid in the concrete cure and to protect the barrier from punctures.

Fill which is placed beyond the limits shown on the Plot Plan, should be compacted with suitable equipment and inspected by our representative. Kovacs-Byer and Associates, Inc., assumes no responsibility for compacted fill or earth materials placed beyond the limits shown by test elevations or the Plot Plan. Fill placed below slabs in parkways, driveways, as wall backfill, in parking lots, around footings, and in utility trenches are the responsibility of the contractor to place in accordance with the approved plans and specifications. Prior to placing concrete or steel in the footing excavations, a site visit should be made by our representative to see that the footings are free of loose and disturbed material and are supported on the properly compacted fill.

Should you have any questions, please call.

Respectfully submitted,

PETER M. EXPOSITO

G. S. KOVACS
R.C.E. 13503

NPP:PME:GSK:mjc

Enc: Plot Plan
Table I
Approval

xc: (1) Addressee
(2) City of Los Angeles Dept. of Building and Safety
Grading Division, Van Nuys Office
(1) King-Benioff-Steinmann-King, Consulting Engineers
(1) Johnson and Silvestri, Architects; Attn: Bob Johnson
(1) Jones Brothers Construction

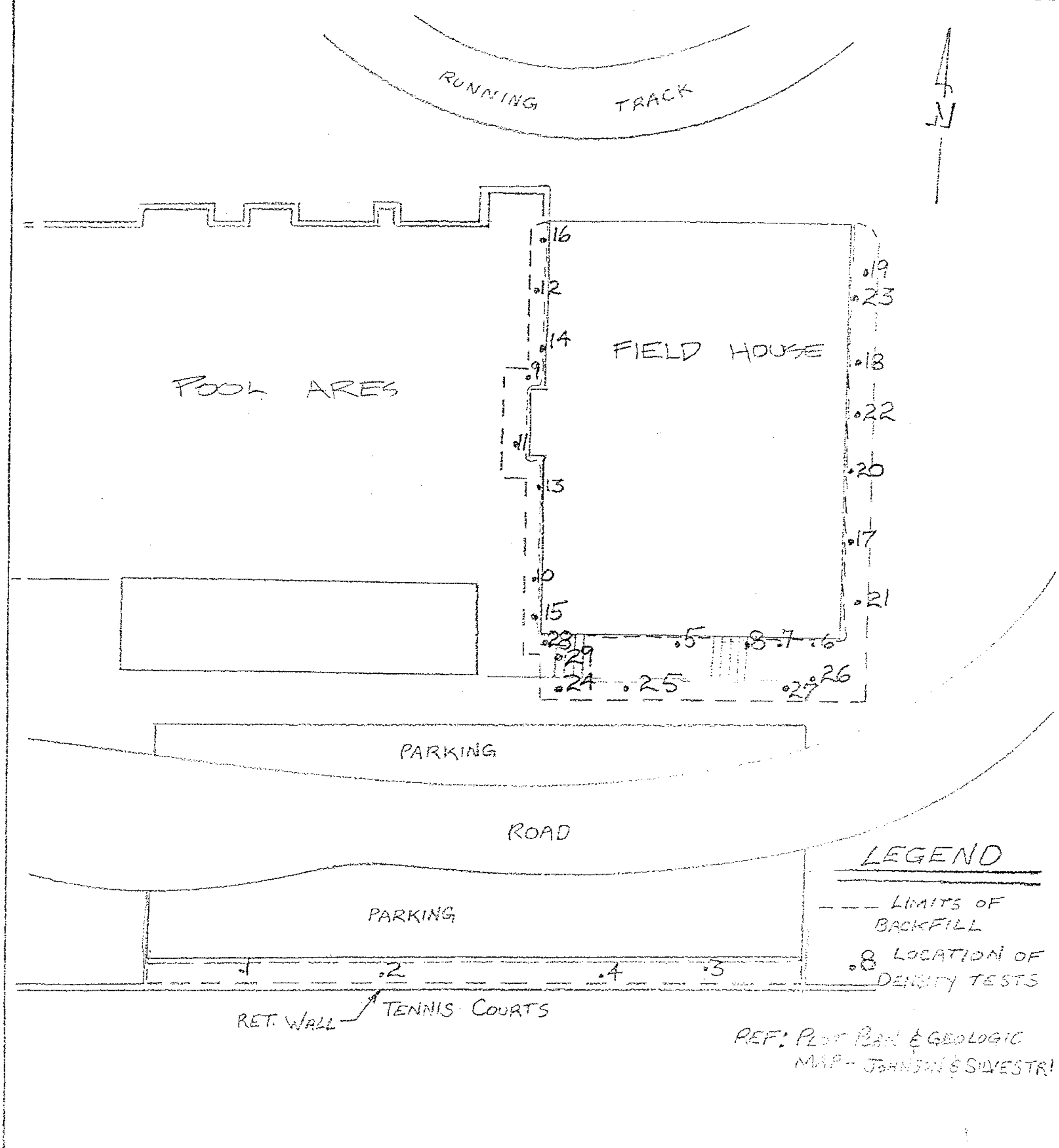
Kovacs-Byer and Associates Inc.

CONSULTING ENGINEERS and GEOLOGISTS

BY NP DATE 1-8-80 SUBJECT PLOT PLAN

CHECKED BY ________ DATE ________

KB 614-F



January 10, 1980
GSC 614-F

TABLE I

FIELD DENSITY TESTS

Test	Date	Location	Elev.* (Feet)	Moisture Content (%)	Dry Unit Weight (pcf)	Soil Type	Max. Dens.	Perce Comp.
1	8/ 8/79	Parking Area	+ 2	31.5	76.7	A	80.5	95.3
2	8/ 8/79	"	+ 4	33.6	77.3	A	80.5	96.0
3	8/ 9/79	"	+ 4	33.0	72.7	A	80.5	90.4
4	8/ 9/79	"	+ 6	33.9	73.1	A	80.5	90.8
5	8/27/79	South Side	+ 2	31.8	74.7	A	80.5	92.8
6	8/27/79	"	+ 4	31.1	74.9	A	80.5	93.1
7	8/30/79	"	+ 6	33.5	74.4	A	80.5	92.5
8	8/30/79	"	+ 8	32.7	72.7	A	80.5	90.4
9	8/30/79	West Side	+ 2	38.0	76.2	A	80.5	94.7
10	8/30/79	"	+ 4	34.2	75.9	A	80.5	94.4
11	8/30/79	"	+ 2	36.0	76.5	A	80.5	95.0
12	8/30/79	"	+ 4	37.0	74.3	A	80.5	92.4
13	9/ 4/79	"	+ 6	36.4	75.4	A	80.5	93.7
14	9/ 4/79	"	+ 8	33.6	74.0	A	80.5	92.0
15	9/ 4/79	"	+10	37.3	72.7	A	80.5	90.3
16	9/ 6/79	"	+12	38.3	74.4	A	80.5	92.4
17	9/ 6/79	East Side	+ 2	38.0	73.7	A	80.5	91.5
18	9/ 6/79	"	+ 2	36.2	74.8	A	80.5	92.9
19	9/ 6/79	"	+ 4	36.9	74.1	A	80.5	92.0
20	9/13/79	"	+ 4	35.4	73.0	A	80.5	90.7
21	9/13/79	"	+ 6	34.5	74.2	A	80.5	92.2
22	9/13/79	"	+ 6	34.9	72.9	A	80.5	90.6
23	9/13/79	"	+10	37.2	73.5	A	80.5	91.4
24	12/ 6/79	South Side	+ 2	7.9	123.9	B	132.0	93.8
25	12/12/79	"	+ 4	10.1	122.5	B	132.0	92.8
26	12/14/79	"	+ 2	9.5	122.3	B	132.0	92.7
27	12/18/79	"	+ 4	10.6	127.0	B	132.0	96.2
28	12/18/79	"	+ 2	10.5	120.7	B	132.0	91.4
29	12/20/79	"	+ 3	13.9	120.8	B	132.0	91.6

Kovacs-Byer and Associates Inc.

ENGINEER'S VERIFICATION OF COMPLIANCE FOR COMPACTED EARTH FILLS

DESCRIPTION: Foundation Wall Backfill
3700 Coldwater Canyon Avenue
Los Angeles, California

PROPERTY OWNER'S NAME: Harvard High School

ADDRESS: 3700 Coldwater Canyon Avenue
North Hollywood, California 91607

DATE WORK STARTED ON PROJECT: August 8, 1979

DATE WORK WAS COMPLETED: December 20, 1979

DATE OF THIS VERIFICATION: January 10, 1980

TO THE SUPERINTENDENT OF BUILDING:

I hereby verify that I have personally supervised the testing and approval during placement and compaction of fill on the above-described property, and on the bases of these inspections and tests, it is my opinion that the work was done in conformity with requirements of the Building Code of the City of Los Angeles, California

G. S. KOVACS
R.C.E. 13503

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING

11430 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604 (213) 980-0825 (LA) 877-2757

Kovacs-Byer and Associates Inc.

May 2, 1980
GSC 614

Harvard High School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Final Approval on Compaction and
Footing Observations
3700 Coldwater Canyon Avenue
Los Angeles, California

Gentlemen:

Please be advised that the excavation of foundations and all compaction work on the subject property has been observed and approved by a representative of this office. Foundations were approved to the required depths and compaction testing to specifications (see Compaction Reports by Kovacs-Byer and Associates, Inc. dated February 22, 1974 and January 10, 1980.), as recommended in the preliminary Geologic and Foundation Investigation report, and as required on the approved set of plans.

Should you have any questions, please call.

Respectfully submitted,

PETER M. EXPOSITO

JEFFREY S. GORDON
R.C.E. 30446

ECW13503

PME:JSG:mjc

xc: (1) Addressee
(2) Johnson & Sylvestri, Architects
Attn: Bob Johnson

CITY OF LOS ANGELES

CALIFORNIA

TOM BRADLEY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
402 CITY HALL
LOS ANGELES, CALIF. 90012

FRANK V. KROEGER
GENERAL MANAGER

December 14, 1984

KOVACS-BYER & ASSOCIATES, INC.
RECEIVED
DEC 20 1984

Harvard School
3700 Coldwater Canyon
Studio City, CA 91604

TRACT: 1000
LOT: Portion of 1111
LOCATION: 3700 COLDWATER CANYON AVENUE

13 ___ PR ___

Geological and Soil Engineering Report No. GSC-614-G, dated October 29, 1984, prepared by Kovacs Byer and Associates.

The above report concerning construction of a new swimming pool and pool house has been reviewed by the Grading Division of the Department of Building and Safety. According to the report, the existing pool is to be removed and a larger one is to be constructed in its place. The slopes ascend above and descend below the pad at up to 2:1 in gradient.

The report is acceptable provided the following conditions are complied with during site development:

1. The proposed excavations shall not remove support from under the existing structures. The proposed excavation is interpreted to remove the lateral support from under the existing structure, if the depth of the excavation is equal to or greater than the horizontal distance to the structure.

2. The geologist and soils engineer shall review and approve the detailed plans, prior to issuance of any permits.

3. All graded slopes shall be no steeper than 2:1.

4. All recommendations of the report which are in addition to or more restrictive than those contained herein shall be incorporated into the plans.

5. The soils engineer shall inspect all excavations to determine that conditions are as anticipated and provide recommendations for hazard found during excavation.

6. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety.

7. Suitable arrangements shall be made with the Department of Public Works for the proposed removal of support and/or retaining of slopes adjoining the public way.

8. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

JOHN D. COLVIN
Chief of Grading Division

Ivan O. Tkatch
Ivan O. Tkatch
Engineering Geologist

David T. Hsu
Soils Engineer

IOT/DTH:jfd
485-2160

GR71214A:94

cc: Kovacs-Byer and Assoc.
Robert C. Johnson
VN District Office

Kovacs-Byer and Associates Inc.

JB17866

January 3, 1985
GSC 614-G

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Basement Wall Recommendations
Proposed Pool House
Part of Lot 1111, Tract 1000
3700 Coldwater Canyon Avenue
North Hollywood, California

Reference: Report by Kovacs-Byer and Associates, Inc.: Addendum Geologic and Soils Engineering Exploration, October 29, 1984.

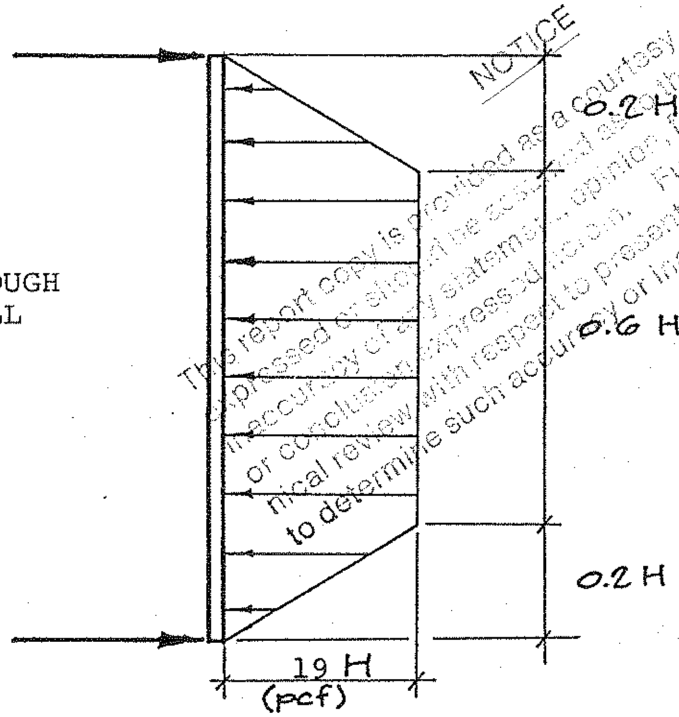
Gentlemen:

As requested by Gordon of John A. Martin and Associates, we have prepared this letter concerning the proposed pool house basement retaining walls.

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING
11430 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604-3182 (818) 980-0825 (213) 877-2757

Basement walls may be designed for an active pressure as indicated in the diagram below. The conditions for this loading diagram include a restraint at the top of the wall, use of free draining backfill, and a groundwater condition at least ten feet below the footing.

SECTION THROUGH
BASEMENT WALL



All walls should be backfilled with a free draining soil or rock. Where the void to be filled is confined, the use of crushed rock base or pea gravel is recommended. The surface of the backfill should be sealed by pavement or the top 18 inches compacted with native soil.

Should you have any questions, please call.

Respectfully submitted,

ROBERT I. ZWEIGLER
R.C.E. 33744

RIZ:mjc

xc: (1) Addressee
(1) John A. Martin & Associates, Inc.
(4) Johnson & Silvestri, Architects

Kovacs-Byer and Associates Inc.

V N

4967

February 1, 1985
GSC 614-G

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

<u>Subject</u>

Additional Comments
Proposed Pool House
Part of Lot 1111, Tract 1000
3700 Coldwater Canyon Avenue
North Hollywood, California

References: Reports by Kovacs-Byer and Associates, Inc.:
Addendum Geologic and Soils Engineering Exploration, October 29, 1984;
Basement Wall Recommendations, Proposed Pool House, January 3, 1985.

Gentlemen:

As requested by Gordon of John A. Martin and Associates, we have prepared this letter concerning the proposed pool house. As an alternative to using a deepened continuous foundation for the southern portion of the proposed pool house to penetrate the existing fill, the fill may be removed and recompacted and then used for foundation support.

The following guidelines may be used in preparation of the grading plan and job specifications for the removal and recompaction. We would appreciate the opportunity of reviewing the contract documents prior to solicitation of bids to insure that the intent of our recommendations is conveyed to the contractor.

A. The areas to receive compacted fill shall be stripped of all vegetation, debris, existing fill, and soft or disturbed earth materials. The excavated areas shall be observed by the soils engineer prior to placing compacted fill.

B. The proposed building area shall be excavated to a minimum depth of 2 feet below the bottom of the footings. The excavation shall extend at least five feet beyond the edge of footings or for a distance equal to the depth of fill below the footings, whichever is greater. The excavated areas shall be observed by the soils engineer prior to placing compacted fill.

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING

11430 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604-3182 (818) 980-0825 (213) 877-2757

C. The exposed grade shall then be scarified to a depth of six inches, moistened to optimum moisture content, and recompacted to 90 percent of the maximum density.

D. Fill, consisting of soil approved by the soils engineer, shall be placed in compacted layers with suitable compaction equipment. The excavated onsite materials are considered satisfactory for reuse in the controlled fills. Any imported fill shall be observed by the soils engineer prior to use in fill areas. Rocks larger than six inches in diameter shall not be used in the fill.

E. The fill shall be compacted to at least 90 percent of the maximum laboratory density for the material used. The maximum density shall be determined by ASTM D 1557-78 or equivalent.

F. Field observation and testing shall be performed by the soils engineer during grading to assist the contractor in obtaining the required degree of compaction and the proper moisture content. Where compaction is less than required, additional compactive effort shall be made with adjustment of the moisture content, as necessary, until 90 percent compaction is obtained.

Fill slopes may be constructed at a 2:1 gradient and shall be keyed and benched into firm alluvium. Keyways should be a minimum of 12 feet wide and 2 feet into alluvium as measured on the downhill side.

Continuous footings may be used to support the proposed pool house provided they are founded in alluvium or approved compacted fill. Continuous footings should be a minimum of 12 inches in width. Design parameters are outlined in the following chart.

Bearing Material	Minimum Depth of Footing (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Alluvium or Approved Compacted Fill	18	1,000	0.4	200	1,000

The bearing value indicated above is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. When combining passive and friction for lateral resistance, the passive component should be reduced by one third.

All continuous footings should be reinforced with four #4 steel bars; two placed near the top and two near the bottom of the footing. Footings should be cleaned of all loose soil, moistened, and free of shrinkage cracks prior to placing concrete.

Footings encountered both alluvium and approved compacted fill should be reinforced with an additional two #4 steel bars for a distance of five feet on each side of the contact.

All footings should be founded to a depth which is a minimum of 5 horizontal feet from the face of any descending slope.

Should you have any questions, please call.

Respectfully submitted,

ROBERT I. ZWEIGLER
R.C.E. 33744

JOHN W. BYER
E.G. 883

xc: (1) Addressee
(1) John A. Martin & Associates, Inc.
Attn: Gordon
(4) Johnson & Silvestri, Architects

Kovacs-Byer
and Associates
Inc.

V N

4967

January 3, 1985
GSC 614-G

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Basement Wall Recommendations
Proposed Pool House
Part of Lot 1111, Tract 1000
3700 Coldwater Canyon Avenue
North Hollywood, California

Reference: Report by Kovacs-Byer and Associates, Inc.: Addendum Geologic and Soils Engineering Exploration, October 29, 1984.

Gentlemen:

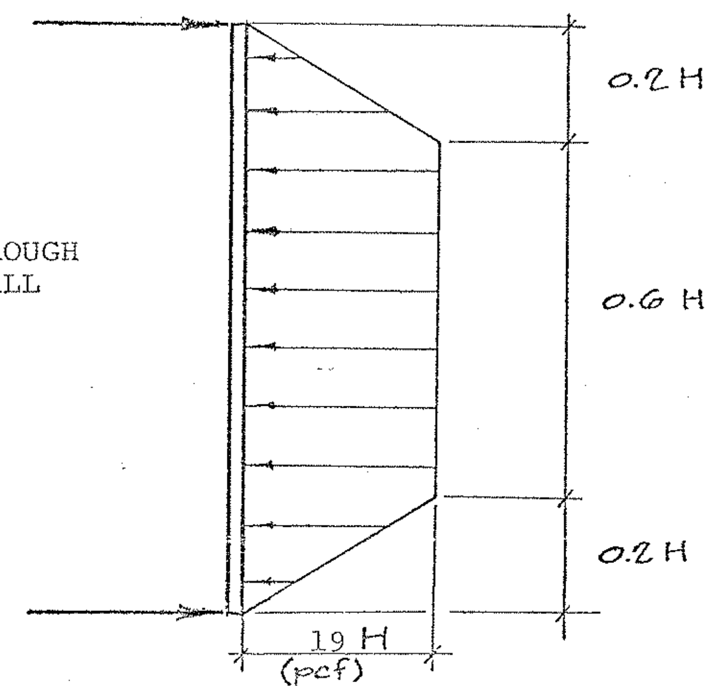
As requested by Gordon of John A. Martin and Associates, we have prepared this letter concerning the proposed pool house basement retaining walls.

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING

11430 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604-3182 (818) 980-0825 (213) 877-2757

Basement walls may be designed for an active pressure as indicated in the diagram below. The conditions for this loading diagram include a restraint at the top of the wall, use of free draining backfill, and a groundwater condition at least ten feet below the footing.

SECTION THROUGH
BASEMENT WALL



All walls should be backfilled with a free draining soil or rock. Where the void to be filled is confined, the use of crushed rock base or pea gravel is recommended. The surface of the backfill should be sealed by pavement or the top 18 inches compacted with native soil.

Should you have any questions, please call.

Respectfully submitted,

ROBERT I. ZWEIGLER
R.C.E. 33744

RIZ:mjc

xc: (1) Addressee
(1) John A. Martin & Associates, Inc.
(4) Johnson & Silvestri, Architects

JB17866

CITY OF LOS ANGELES

CALIFORNIA

TOM BRADLEY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
402, CITY HALL
LOS ANGELES, CA 90012-4869

FRANK V. KROEGER
GENERAL MANAGER

KOVACS-BYER & ASSOCIATES, INC.
RECEIVED

JUN 11 1985

KB 614-G PR

June 7, 1985

HARVARD ~~Howard~~ School
3700 Coldwater Canyon
Studio City, CA 91604

TRACT: 1000
LOT: 1111
LOCATION: 3700 COLDWATER CANYON AVENUE

Geological and Soil Engineering Reports No. GSC-614-G, dated Janurary 3, 1985 and February 1, 1985, prepared by Kovacs-Byer and associates.

REFERENCE: Department letter dated December 14, 1984

The above reports concerning construction of basement walls and pool house have been reviewed by the Grading Division of the Department of Building and Safety.

The reports are accetable provided the following conditions are complied with during site development:

1. All conditions of the above referenced department letter shall remain in effect.

2. A grading permit shall be obtained.

3. Existing fill shall not be used for support of footings, floor slabs or proposed fill.

4. All man-made fill shall be compacted to a minimum of 90 percent relative compaction ar required by Code Section 91.7006(d).

5. Temporary vertical cuts shall not exceed 8 feet in height. Cuts higher than 8 feet shall be trimmed back to 1:1, as recommended by the soils engineer.

JOHN D. COLVIN
Chief of Grading Division

Ivan O. Tkatch

IVAN O. TKATCH
Engineering Geologist

Vernon Gong

VERNON GONG
Engineering Assistant

IOT/VG:kf
485-2160

cc: Kovacs-Byer
Robert C. Johnson
VN District Office

Kovacs-Byer
and Associates
Inc.

June 17, 1985
GSC 614-G

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Additional Comments, Proposed Retaining Wall Design, Part of Lot 1111, Tract 1000, 3700 Coldwater Canyon Avenue North Hollywood, California

References: Reports by Kovacs-Byer and Associates, Inc.:
Addendum Geologic and Soils Engineering Exploration, October 29, 1984;
Basement Wall Recommendations, Proposed Pool House, January 3, 1985;
Additional Comments, Proposed Pool House, February 1, 1985.

City of Los Angeles Department of Building and Safety Review Letter, June 7, 1985.

Gentlemen:

As requested by Gordon Kelsen of John A. Martin and Associates, we have prepared this letter concerning the proposed retaining walls for the pool house as an alternative to using an expansive soils design. Retaining walls backfilled with a minimum of 2 feet of non-expansive, free-draining soil may be designed per the City of Los Angeles Building Code Table 23-E. The imported, non-expansive fill shall be observed and approved by the soils engineer prior to use in fill areas. Retaining wall backfill shall be compacted to a minimum of 90 percent of the maximum density as determined by ASTM D 1557-78 or equivalent. Any fill which is placed should be approved, tested, and verified if used for engineered purposes.

Should you have any questions, please call.

Respectfully submitted,

ROBERT I. ZWEIGLER
R.C.E. 33744

JOHN W. BYER
E.G. 883

RIZ:JWB:mjc
xc: (1) Addressee (2) Johnson & Silvestri, Architects
(2) John A. Martin & Associates, Attn: Gordon Kelsen

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING

11430 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604-3182 (818) 980-0825 (213) 877-2757

JB17864

CITY OF LOS ANGELES
CALIFORNIA

TOM BRADLEY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
402, CITY HALL
LOS ANGELES, CA 90012-4869

FRANK V. KROEGER
GENERAL MANAGER

KOVACS-BYER & ASSOCIATES, INC.
RECEIVED
JUL 11 1985
KB 614-G PR

July 9, 1985

HARVARD
~~Howard~~ School
3700 Coldwater Canyon Avenue
Studio City, CA 91604

TRACT: 1000
LOT: 1111
LOCATION: 3700 COLDWATER CANYON AVENUE

Engineering Report No. GSC-G, dated June 17, 1985, prepared by Kovacs-Byer and Associates, Incorporated.

References: Department letters dated December 14, 1984 and June 7, 1985.

The above report concerning proposed retaining wall backfill has been reviewed by the Grading Division of the Department of Building and Safety.

The report is acceptable provided the following conditions are complied with during site development:

1. All recommendations of the report which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

2. All conditions of the above referenced Department letters shall apply, except for more restrictive conditions contained herein.

3. All retaining wall backfill shall consist of non-expansive, free-draining soil approved by the soils engineer prior to use.

4. The design of the drainage system required to prevent possible hydrostatic pressure on retaining walls shall be approved by the soils engineer prior to the issuance of the building permit.

5. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted to the street in an acceptable manner and in a non-erosive device.

JOHN D. COLVIN
Chief of Grading Division

Vernon Gong

VERNON GONG
Engineering Assistant

VG:gae
485-2160

cc: Kovacs-Byer
Robert C. Johnson
VN District Office

Kovacs - Byer and Associates Inc.

July 10, 1985
GSC 614-G

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Additional Recommendations,
Proposed Pool Design, Part of
Lot 1111, Tract 1000,
3700 Coldwater Canyon Avenue
North Hollywood, California

References: Reports by Kovacs-Byer and Associates, Inc.
Addendum Geologic and Soils Engineering Exploration, October 29, 1984;
Basement Wall Recommendations, Proposed Pool House, January 3, 1985;
Additional Comments, Proposed Pool House, February 1, 1985;
Additional Comments, Proposed Retaining Wall Design, June 17, 1985;

City of Los Angeles Department of Building and Safety Review Letter, June 7, 1985.

Gentlemen:

As requested by Mr. Bob Johnson of Johnson and Silvestri, Architects, and following a conversation with the structural engineer, we have prepared this letter concerning the proposed pool shell design.

The northern pool wall should be designed as free-standing, as recommended in the referenced reports. The remainder of the pool walls may be designed for an expansive soils design provided these walls support natural alluvium. Portions of any pool walls to support fill should be designed as free-standing. Also, it should be noted that the pool bottom is to be founded on natural alluvium entirely.

Should you have any questions, please call.

Respectfully submitted,

ROBERT I. ZWEIGLER
R.C.E. 33744 E.G. 1210

RIZ:emb

xc: (1) Addressee
(4) Johnson & Silversti

NOTICE

Date:

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING

11430 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604-3182 (818) 980-0825 (213) 877-2757

CITY OF LOS ANGELES

CALIFORNIA

TOM BRADLEY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
402, CITY HALL
LOS ANGELES, CA 90012-4869

FRANK V. KROEGER
GENERAL MANAGER

July 24, 1985

Harvard School
2700 Coldwater Canyon Avenue
Studio City, California 91604

TRACT: 1000
LOT: 1111
LOCATION: 3700 COLDWATER CANYON AVENUE

Engineering Report No. GSC 614-G, dated July 10, 1985 prepared by Kovacs-Byer and Associates, Inc.

REFERENCE: Department letters dated June 7, 1985 and December 14, 1984

The above report concerning the design of pool walls has been reviewed by the Grading Division of the Department of Building and Safety.

The report is acceptable provided the following conditions are complied with during site development:

1. All conditions of the above referenced Department letters shall apply.

2. All recommendations of the report which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

3. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans.

4. The soils engineer shall review and approve the detailed plans, prior to issuance of any permit.

5. The soils engineer shall inspect the excavations for the footings to determine that they are founded in the recommended strata before calling the Department for footing inspection.

JOHN D. COLVIN
Chief of Grading Division

Vernon Gong

VERNON GONG
Engineering Assistant

VG:pet
485-3435

cc: Kovacs-Byer and Associates, Inc.
Robert C. Johnson
VN District Office

Kovacs-Byer
and Associates
Inc.

5423

July 10, 1985
GSC 614-G

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

Subject

Additional Recommendations,
Proposed Pool Design, Part of
Lot 1111, Tract 1000,
3700 Coldwater Canyon Avenue
North Hollywood, California

References: Reports by Kovacs-Byer and Associates, Inc.
Addendum Geologic and Soils Engineering Exploration, October 29, 1984;
Basement Wall Recommendations, Proposed Pool House, January 3, 1985;
Additional Comments, Proposed Pool House, February 1, 1985;
Additional Comments, Proposed Retaining Wall Design, June 17, 1985;

City of Los Angeles Department of Building and Safety Review Letter, June 7, 1985.

Gentlemen:

As requested by Mr. Bob Johnson of Johnson and Silvestri, Architects, and following a conversation with the structural engineer, we have prepared this letter concerning the proposed pool shell design.

The northern pool wall should be designed as free-standing, as recommended in the referenced reports. The remainder of the pool walls may be designed for an expansive soils design provided these walls support natural alluvium. Portions of any pool walls to support fill should be designed as free-standing. Also, it should be noted that the pool bottom is to be founded on natural alluvium entirely.

Should you have any questions, please call.

Respectfully submitted,

ROBERT I. ZWEIGLER
R.C.E. 33744 E.G. 1210 RIZ:emb

xc: (1) Addressee
(4) Johnson & Silversti

JB178666

Kovacs-Byer and Associates Inc.

August 19, 1985
GSC 614-G

Harvard School
3700 Coldwater Canyon Avenue
North Hollywood, California 91607

<u>Subject</u>

Compaction Report
Retaining Wall South of New Pool
and Parking Area, 3700 Coldwater Canyon
Avenue, North Hollywood, California

References: Reports by Kovacs-Byer and Associates, Inc.
Addendum Geologic and Soils Engineering Exploration, October 29, 1984;
Basement Wall Recommendations, Proposed Pool House, January 3, 1985;
Additional Comments, Proposed Pool House, February 1, 1985;
Additional Commendts, Proposed Retaining Wall Design, June 17, 1985.

City of Los Angeles Department of Building and Safety Review Letters, June 7, 1985; July 9, 1985; and July 24, 1985.

Gentlemen:

This report presents the results of our compaction testing and observations on the subject property. The purpose of the testing was to determine that the specifications required by the City of Los Angeles Building Code were met. The results of the compaction tests are shown on the attached Table I and plotted on the enclosed Plot Plan. The fill will be used to support a retaining wall and parking area.

The following soil type was used in the compacted fill:

Soil Type	Soil Description	Max. Dry Density Lbs./Cu.Ft.	Optimum M/C Percent	Expansion Index*
A	Dark Brown Sandy Clay	108.0	19.0	65 - High

*Expansion Index as Determined by Expansion Index Method (UBC Standard 29-2 or ASTM Equivalent)

The compaction tests were performed in accordance with ASTM D 1557-78. The field density tests were performed in accordance with ASTM D 1556.

GRADING

Grading consisted of removing fill soil beneath a proposed retaining wall and placing compacted fill in the area beneath the proposed footing and in the future backfill area. Prior to placing any fill, the existing surface soil and loose fill were removed to firm natural material and stockpiled for later placement in the compacted fill.

The exposed ground was scarified to a depth of six inches, moistened as required to achieve optimum moisture content, and recompacted to 90 percent of the maximum density.

Onsite soil was placed by means of a crawler loader in loose lifts of about six inches, moistened as required to achieve optimum moisture content by means of a one inch hose, and compacted by track-rolling with the loader.

Field density tests indicate that compacted fill was placed to 90 percent of the maximum dry density or better.

Fill placed on surfaces having a slope gradient steeper than 5:1 was keyed and benched into firm material in accordance with recommendations of the geologist or soils engineer.

The maximum vertical depth of fill is seven feet, located in the west backfill area.

CONCLUSIONS AND RECOMMENDATIONS

Field density tests indicate that compacted fill was placed in a satisfactory manner and is suitable for support of the proposed retaining wall and parking area. Retaining wall footings supported on the compacted fill may utilize an allowable bearing value of 1,000 pounds per square foot and should be a minimum of 18 inches in depth below the lowest adjacent finished grade.

The northwest fooring labeled "B" on the Plot Plan will extend 12 inches into natural because of adjoining utility trench. In the area labeled "A", the footing will pass under the 12-inch pipe overhead.

The soil exposed at the subgrade elevation is highly expansive. Due to the highly expansive soil at subgrade elevation, the parking area should be topped with a minimum of 6 inches of non-expansive base grade material prior to placing asphalt.

Fill which is placed beyond the limits shown on the Plot Plan, should be compacted with suitable equipment and observed by our representative. Kovacs-Byer and Associates, Inc., assumes no responsibility for compacted fill or earth material placed beyond the limits shown by test elevations or the Plot Plan. Fill placed below slabs in parkways, driveways, in parking lots, around footings and in utility trenches are the responsibility of the contractor to placing in accordance with the approved plans and specifications.

Prior to placing concrete or steel in the footing excavations, a site visit should be made by our representative to see that the footings are free of loose and disturbed material and are supported on the properly compacted fill. A 24-hour notice is requested for a site visit.

Should you have any questions, please call.

Respectfully submitted,

PETER M. EXPOSITO

G. S. KOVACS
R.C.E. 13503

RNB:PME:GSK:mjc

Enc: Plot Plan
Table I
Approval

xc: (2) Addressee
(1) Johnson & Silvestri, Architects
(2) City of Los Angeles Department of Building and Safety
Grading Division, Van Nuys Office

ENGINEERING GEOLOGY / SOILS & FOUNDATION ENGINEERING

11430 VENTURA BLVD., STUDIO CITY, CALIFORNIA 91604-3182 (818) 980-0825 (213) 877-2757

Kovacs-Byer and Associates Inc.
CONSULTING ENGINEERS and GEOLOGISTS

BY HB DATE

CHECKED BY DATE

SUBJECT PLOT PLAN
HARVARD SCHOOL

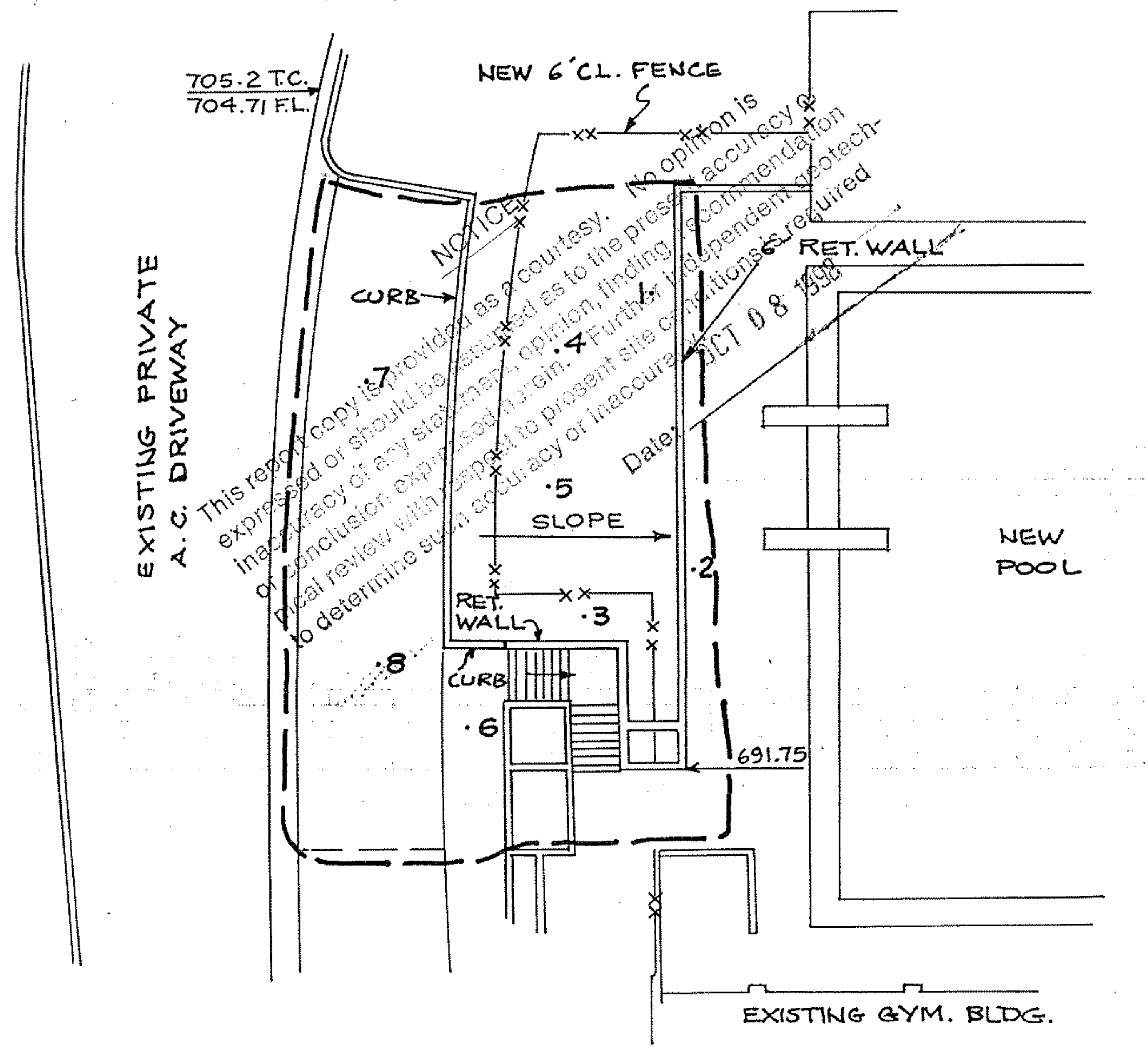
KB 614-G

SCALE. 1"=20'

LEGEND

·8 LOCATION AND NUMBER OF FIELD DENSITY TEST.

— — LIMITS OF COMPACTED FILL.



REF. SITE PLAN BY. JOHNSON & SILVESTRI A.I.A. DATED 6-85.

August 19, 1985
GSC 614-G

TABLE I

FIELD DENSITY TESTS

Test	Date	Location *	Elev.*	Moisture Content (%)	Dry Unit Weight (pcf)	Soil Type	Max. Dens.	Percent Comp.
1	8/ 6/85	See Plot Plan	690	19.8	103.6	A	108.0	95
2	8/ 6/85	"	692	17.6	99.7	"	"	92
3	8/ 7/85	"	694	20.5	100.4	"	"	93
4	8/ 8/85	"	697	18.5	99.8	"	"	92
5	8/ 9/85	"	699	19.2	100.8	"	"	93
6	8/ 9/85	"	701	18.4	102.1	"	"	94
7	8/12/85	"	703	21.2	103.4	"	"	95
8	8/14/85	"	704	18.6	100.6	"	"	93

*Elevations and locations are approximate only and do not indicate an accurate survey.

Kovacs-Byer and Associates Inc.

ENGINEER'S CERTIFICATE OF COMPLIANCE FOR COMPACTED EARTH FILLS

GSC 614-G

DESCRIPTION: Compaction Report, Retaining Wall South of New Pool and Parking Area, 3700 Coldwater Canyon Avenue, North Hollywood, California

PROPERTY OWNER'S NAME: Harvard School

ADDRESS: 3700 Coldwater Canyon Avenue
North Hollywood, California 91607

DATE WORK STARTED ON PROJECT: August 5, 1985

DATE WORK WAS COMPLETED: August 15, 1985

DATE OF THIS CERTIFICATION: August 19, 1985

TO THE SUPERINTENDENT OF BUILDING:

*I hereby certify that I have personally supervised the testing and approval during placement and compaction of fill on the above-described property, and on the bases of these inspections and tests, it is my opinion that the work was done in conformity with requirements of the Building Code of the City of Los Angeles, California.

G. S. KOVACS
R.C.E. 13503

*For the purpose of this certificate, to "have personally inspected and tested" shall include inspection and testing performed by any person responsible to the licensed engineer signing this certificate. Where the inspection and testing of all or part of the work above is delegated, full responsibility shall be assumed by the licensed engineer whose signature is affixed thereon.

JB 17866

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099

VN 5534

RECEIVED
MAR 0 8 1991
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

Epsilon Engineering
report of preliminary soil investigation - upper level
1/10/91

REPORT OF

PRELIMINARY SOIL INVESTIGATION

for

Harvard School
Lower Level
3700 Coldwater Canyon
North Hollywood, California 91604

Job No. 1290-494
January 10, 1991

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099

January 10, 1991
Job No. 1290-494

Weinstein Construction
16153 Leadwell Street
Van Nuys, CA 91406

Re: Harvard School
Lower Level
3700 Coldwater Canyon
North Hollywood, CA 91604

Dear Mr. Weinstein:

At your request, a preliminary soils investigation has been performed at the above-mentioned property.

The purpose of the investigation was to determine the adequacy of the subsurface soils for future construction.

Site Description

The subject site is located on the west side of the building. The site is presently paved with concrete. The site slopes from east to west at the rate of two percent (2%) ±.

Soil Investigation

Four (4) test borings were excavated at the site. The soil was visually classified at the time of excavation. Bulk samples were obtained and taken to the laboratory for further testing. The laboratory testing was performed by Norcal Engineering, 10571 Calle Lee, Suite 155, Los Alamitos, California 90720. For location of test pits, see Plate No. 1 attached. Also attached are logs of test pits. No seepage or ground water was encountered during the excavation.

Conclusions and Recommendations

It is concluded that the site is suitable for construction from a soil engineering standpoint provided the following recommendations are incorporated into the design and construction.

1. Since bedrock is near the surface, we recommend that all footings be placed at least two feet into undisturbed bedrock.

2. For footings founded on the slope, they should be at a depth equal to one-third (1/3) the height of the slope, for the steeper portion of the slope. At the bottom portion, where the slope flattens to four to one (4:1), this will not be necessary.

Bearing Values

For footings founded in unweathered bedrock, a bearing value of 2,000 pounds per square foot (psf) is assigned to footings having a minimum width and depth of one foot. An additional 200 psf may be added to the above values for each additional foot of depth below designed grade.

An additional one-third of the above values may be added for live and transient loading such as wind and seismic loading.

Slabs on Grade

Since the structure is not on level ground, slabs on grade was not considered.

Drainage

All drainage should be directed away from the newly constructed structure.

Utility Trenches

All utility trenches should be compacted to at least 90% of maximum density as determined in the laboratory.

This report is based upon observation of excavations plotted on Plate No. 1. No representation is made for quality or extent of materials not observed.

If during construction conditions are found other than those covered in this report, the soil engineer should be notified before proceeding further.

All footings should be inspected by the soil engineer prior to placing steel.

This report is subject to review by local governing authorities.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston
Engineering Vice President
GEO 829

BORING LOG

DATE: DEC. 28, 1992 DRILLING EQUIPMENT | No. 1
DRIVING WEIGHT

3700 Cold Canyon (Lower Level) | SURFACE EL. BORING

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	% MOISTURE	γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	C PSF
			SANDY CLAY, DRY GRAY BROWN (FILL)		11.1	94		
4'								
4.5			SANDY CLAY, MOIST MODERATELY DENSE		13.3	102		
5.5'			DARK BROWN					
			WEATHERED TO FIRM BED ROCK					
7'			BOTTOM OF BORING 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 · (213) 483-1779

BORING LOG

DATE: DEC. 28, 1990 DRILLING EQUIPMENT No. 2

DRIVING WEIGHT SURFACE EL. BORING

3700 COLDWATER CAN. (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
2½'			SANDY CLAY, DRY LOOSE GRAY BROWN FILL					
3' 4'			CLAYEY SAND MOIST MODERATLY DENSE DARK BROWN		7.1	95		
4½' 6'			WEATHERED BED ROCK GETTING DENSER BOTTOM OF BORING 2		NA	100		

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 • (213) 483-1779

BORING LOG

DATE: DEC. 28, 1990 DRILLING EQUIPMENT | No. 3

DRIVING WEIGHT

3700 COLDWATER CAN (LOWER LEVEL) | SURFACE EL. BORING

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
1'			CLAYEY SAND LOOSE DISTURBED					
3'			SANDY CLAY, LOOSE DRY DARK BROWN		8.3	98	15	525
4.5'			WEATHERED BED ROCK GRAY BROWN MODERATLY DENSE BOTTOM OF BORING 3					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3280 · (213) 483-1779

BORING LOG

DATE: DEC. 28, 1990 DRILLING EQUIPMENT No. 4

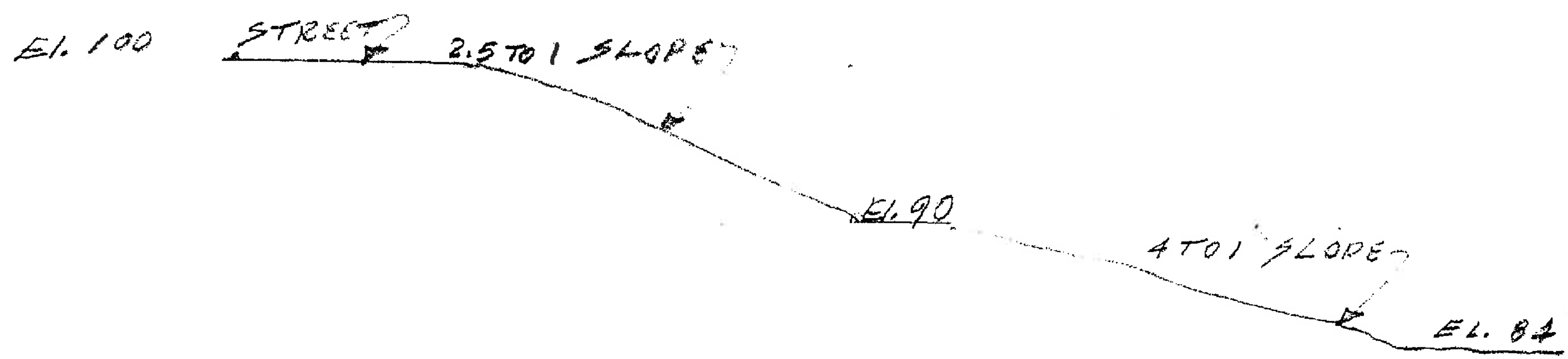
DRIVING WEIGHT SURFACE EL. BORING

3700 COLD WATER CANYON (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	% MOISTURE	Y PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	C PSF
2.5			SANDY CLAY, DRY LOOSE GRAY BROWN					
3'			WEATHERED BED ROCK TO DENSE BED ROCK @ 3.5'		8.3	99		
4'			BOTTOM OF BORING 7					

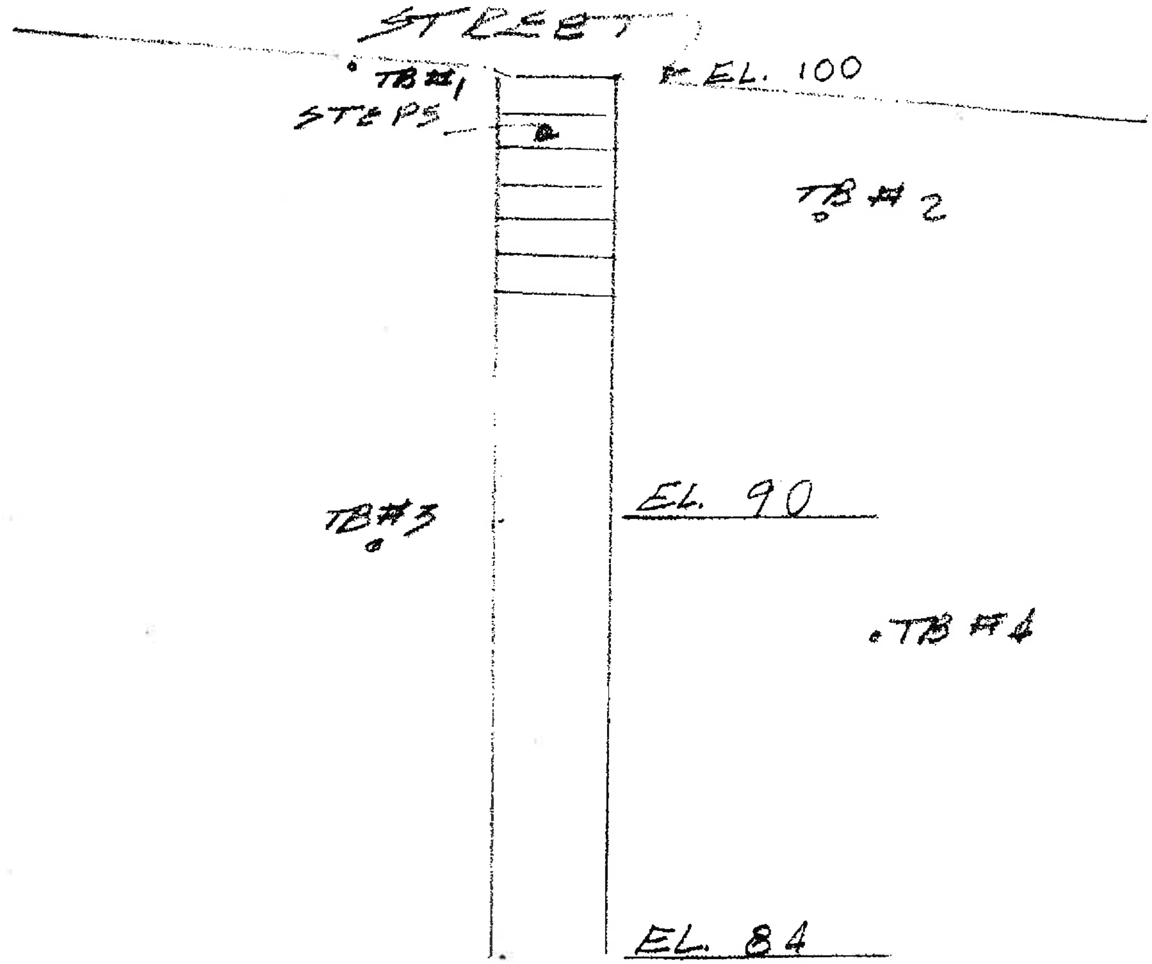
EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 (213) 883-1779

HARVARD SCHOOL
7300 COLD WATER CAN.
NORTH HOLLY WOOD CA.



EPSILON ENG. & INSP. INC.
19933 LABRADOR ST
CHATSWORTH CA. 91311
JOB NO. 1290-495 JAN. 28, 1991

HARVARD SCOOL
LOWER LEVEL
3700 COLD WATER CANYON
NORTH HOLLYWOOD CA. 91604



JOB NO. 129-495

EPSILON ENG. & INSP. INC.
19955 LABRADOR ST.
CHATSWORTH CA. 91311

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
10571 CALLE LEE SUITE 155 LOS ALAMITOS, CA 90720
(714) 826-4231 (213) 267-0125
FAX (714) 826-2514

January 7, 1991 Project Number 3125-90

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

Re: Laboratory Tests - Proposed Development - Located at 3700 Coldwater Canyon, Van Nuys, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on a sample of the soils which were transported to this firm.

LABORATORY TESTS

A. Direct shear tests (ASTM: 3080) were performed on undisturbed samples of the soils. These tests are performed under saturated conditions at loads of 518 lbs./sq.ft., 1,036 lbs./sq.ft., 2,072 lbs./sq.ft. with results shown on Plate A.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

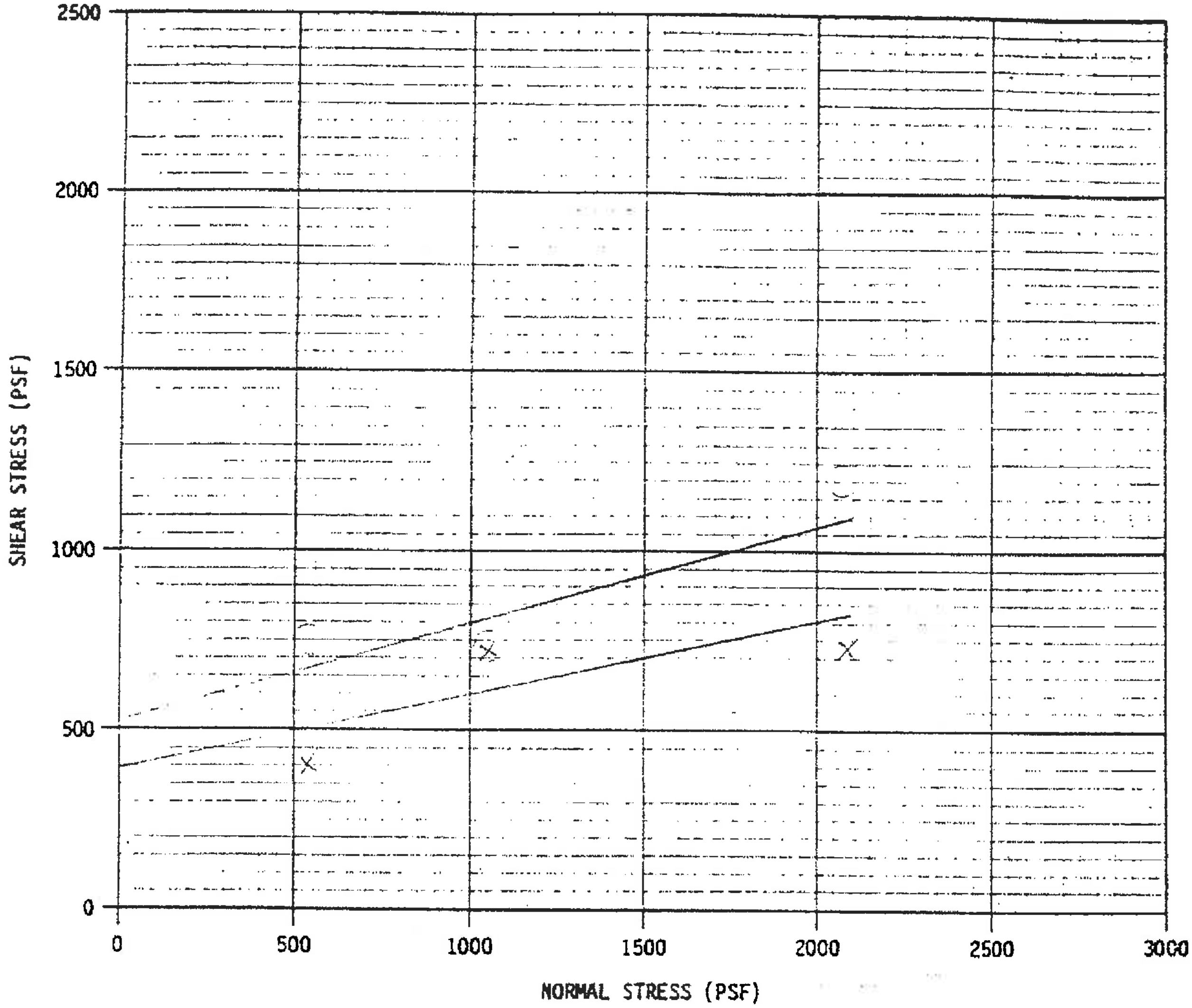
Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12-31-92
GEOTECHNICAL
STATE OF CALIFORNIA

Keith D. Tucker
Project Engineer
R.G.E. 841

Troy D. Norrell
President



	SYMBOL	BORING NUMBER	DEPTH (FEET)	Ø (DEGREES)	C (PSF)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)
upper level	X	3	2	11	400		
lower level	O	2	3	15	525		
	△						
	□						

NOTE: TESTS PERFORMED ON SATURATED SAMPLES UNLESS SHOWN BELOW.
(FM) = FIELD MOISTURE
SAMPLES REMOLDED AT 90% OF MAXIMUM DRY DENSITY PER ASTM D 1557-78 STANDARDS.
(R) = REMOLDED

Plate A

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

DIRECT SHEAR TEST RESULTS

PROJECT 3125-90 DATE

JB17866

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099

April 24, 1991
Job No. 1290-494

Weinstein Construction
16153 Leadwell Street
Van Nuys, CA 91406

TB 614
1115

Re: Harvard School
Lower Level
3700 Coldwater Canyon
North Hollywood, CA 91604

Dear Mr. Weinstein:

The following is an addendum to the above-mentioned project.

The structure's original design called for footing to be founded in bedrock. This has been redesigned to allow all footings to be founded in compacted fill. This is due to a change in the bleacher structure. By the use of compacted fill the bleachers can be constructed at a steeper angle, allowing greater vision. This may be accomplished as follows

Site Description

The subject site is located on a slope, sloping upward at a rate of four plus to one (4+:1). By the use of compacted fill the slope will remain at four to one (4:1) except for a small section which will be on the order of three and one-half to one (3-1/2:1). The structure may be founded on compacted fill provided it is accomplished as follows:

1. Prior to placing fill the area to receive fill shall be cleared of all vegetation, debris and other organic materials.

2. Once this has been accomplished, the slope shall be benched to a minimum of one and one-half (1-1/2) equipment widths into the slope, and shall slope slightly downward into the slope 3%±.

Conclusions and Recommendations

It is concluded that the site is suitable for construction from a soil engineering standpoint provided the following recommendations are incorporated into the design and construction.

The structure is to be a canopy type outdoor arena (pergola). The site is presently paved--a concrete slab in fair to good condition.

1. The footings shall be pier type, founded a minimum of two feet into unweathered bedrock.

2. The footing shall be at such depths as to measure one-third (1/3) the height of the slope, but need not exceed forty feet (40') from the outer edge of the footing to the face of the slope.

Bearing Values

For footings founded in unweathered bedrock, a bearing value of 2,000 pounds per square foot (psf) is assigned to footings having a minimum width and depth of one foot. An additional 200 psf may be added to the above values for each additional foot of depth below designed grade.

An additional one-third of the above values may be added for live and transient loading such as wind and seismic loading.

Drainage

All drainage should be directed away from the newly constructed structure.

Utility Trenches

All utility trenches should be compacted to at least 90% of maximum density as determined in the laboratory.

This report is based upon observation of excavations plotted on Plate No. 1. No representation is made for quality or extent of materials not observed.

If during construction conditions are found other than those covered in this report, the soil engineer should be notified before proceeding further.

All footings should be inspected by the soil engineer prior to placing steel.

This report is subject to review by local governing authorities.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston
Engineering Vice President
GEO 829

REGISTERED PROFESSIONAL ENGINEER
No. GE000829
Exp. 12/31/92
GEOTECHNICAL
STATE OF CALIFORNIA

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
10571 CALLE LEE SUITE 155 LOS ALAMITOS, CA 90720
(714) 826-4231 (213) 267-0125
FAX (714) 826-2514

January 7, 1991 Project Number 3125-90

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

Re: Laboratory Tests - Proposed Development - Located at 3700 Coldwater Canyon, Van Nuys, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on a sample of the soils which were transported to this firm.

LABORATORY TESTS

A. Direct shear tests (ASTM: 3080) were performed on undisturbed samples of the soils. These tests are performed under saturated conditions at loads of 518 lbs./sq.ft., 1,036 lbs./sq.ft., 2,072 lbs./sq.ft. with results shown on Plate A.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D Tucker

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12-31-92
GEOTECHNICAL
STATE OF CALIFORNIA

Troy D. Norrell
President

LOG# 24671

JB17866

VN 5-9/2

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099

RECEIVED
JUL 02 1991
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

May 23, 1991
Job No. 1290-494

Weinstein Construction
16153 Leadwell Street
Van Nuys, CA 91406

Re: Harvard School
3700 Coldwater Canyon
North Hollywood, CA 91604

Dear Mr. Weinstein:

The following answers pertain to questions asked in correction sheet prepared by the City of Los Angeles regarding the above-mentioned project.

1. See new combined report.

2. This shall be answered by the architect and/or the structural engineer.

3. The anticipated loads shall be furnished by the structural engineer.

4. See topographic map attached.

5. Adequate and non-erosive drainage will be provided. See grading plan attached.

6. Footing design and recomendations are in accordance with Los Angeles Building Code Figure 29-1.

7. Upper level soils are natural. Lower level, the loose soils are fill soils..

8. Slabs on grade shall be as follows:

   Since the soil falls in the high expansive range, we recommend the following: A minimum of four inches (4") of coarse sand with a moisture barrier membrane. Shall be reinforced with No. 3 bars at a minimum of 24" on center. The soil shall be saturated below the sand barrier a minimum of 18".

9. See attached logs.

10. See plan attached.

11. The only temporary excavation will be the preparation of the new fill. The vertical cut shall not exceed five feet.

Thank you for this opportunity to be of service to you.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston
Engineering Vice President
GEO 829

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. THURSTON
No. GE000829
Exp. 12/31/92
GEOTECHNICAL
STATE OF CALIFORNIA

ROBERT G. JOHNSON
ARCHITECT A.I.A.
3918 FAIRWAY AVE. • STUDIO CITY, CA 91604 • (818) 766-3617

June 25, 1991

Response to questions from Epsilon Engineering & Inspection:

1. Pergola design at upper level "flag court area" is with 5"x 5" TS Cols with "flagpole" t yp e footings 1000 psf bearing and 100 psf/f t. of depth (1500 psf max)
2. Soil report indicated a value of 2000 psf footings fou nded into unweatherd bedrock.

3. Open air seating (stadium type) on reinforced conc. resting on compacted fill placed on slope benched and prepared as directed by the so i ls engineer. Paving at levelarea above seating and at roadway shall be over 4" base material and reinforced.

4. Footings for Announcers Booth shall be on compacted soil with a bearing value of 1,500 psf. for the concrete block walls/ conc. floor and roof deck structure.

5. All drainage shall be sloped to catch basins and storm drain lines connecting to existing storm drain system.

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099

January 10, 1991
Job No. 1290-494

Weinstein Construction
16153 Leadwell Street
Van Nuys, CA 91406

Re: Harvard School
3700 Coldwater Canyon
North Hollywood, CA 91604

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The purpose of the investigation was to determine the adequacy of the subsurface soils for future construction.

Site Description

The subject site is located on the west side of the building. The site is presently paved with concrete. The site slopes from east to west at the rate of two percent (2%) ±.

Soil Investigation

Four (4) test borings were excavated at the site. The soil was visually classified at the time of excavation. Bulk samples were obtained and taken to the laboratory for further testing. The laboratory testing was performed by Norcal Engineering, 10571 Calle Lee, Suite 155, Los Alamitos, California 90720. For location of test pits, see Plate No. 1 attached. Also attached are logs of test pits. No seepage or ground water was encountered during the excavation.

Conclusions and Recommendations

It is concluded that the site is suitable for construction from a soil engineering standpoint provided the following recommendations are incorporated into the design and construction.

Upper Level

The structure is to be a canopy type outdoor arena (pergola). The site is presently paved--a concrete slab in fair to good condition.

1. The footings shall be pier type, founded a minimum of two feet into unweathered bedrock.

2. The footing shall be at such depths as to measure one-third (1/3) the height of the slope, but need not exceed forty feet (40') from the outer edge of the footing to the face of the slope.

Lower Level

1. Since bedrock is near the surface, we recommend that all footings be placed at least two feet into undisturbed bedrock.

2. For footings founded on the slope, they should be at a depth equal to one-third (1/3) the height of the slope, for the steeper portion of the slope. At the bottom portion, where the slope flattens to four to one (4:1), this will not be necessary.

Bearing Values

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All drainage should be directed away from the newly constructed structure.

Utility Trenches

All utility trenches should be compacted to at least 90% of maximum density as determined in the laboratory.

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This report is subject to review by local governing authorities.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston
Engineering Vice President
GEO 829

BORING LOG

DATE: JAN. 3, 1991 DRILLING EQUIPMENT | No. 1

DRIVING WEIGHT | SURFACE EL. BORING

3700 COLD WATER CANYON UPPER LEVEL

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
4"			CONCRETE					
3'			SANDY CLAY MOIST MODERATLY DENSE GRAY BROWN					
3½'			WEATHERD BED ROCK GRAY DENSE @ 4'		11.1	97		
4½'			BOTTOM OF BORING 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 · (213) 483-1779

BORING LOG

DATE: JAN. 3, 1990 DRILLING EQUIPMENT | No. 2

DRIVING WEIGHT | SURFACE EL. BORING

3700 COLD WATER CANYON UPPER LEVEL

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: Y PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
4"			CONCRETE					
			SANDY CLAY A ROCK COULD NOT GET THROUGH BOTTOM of BORING 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3250 • (213) 463-1779

BORING LOG

DATE: JAN. 3, 1991 DRILLING EQUIPMENT No. 2-[illegible]

DRIVING WEIGHT SURFACE EL. BORING

3700 COLDWATER CANYON UPPER LEVEL

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
1'			DARK BROWN LOOSE TOP SOIL					
3'			SANDY CLAY, MOIST MODERATLY DENSE GRAY BROWN					
3.5'			WEATHERED BED ROCK GRAY DENSE VERY DENSE @ 4'		11.9	97		
4.5'			BOTTOM OF BORING 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3250 . (213) [illegible]

BORING LOG

DATE: JAN. 3, 1991 DRILLING EQUIPMENT No. 3

DRIVING WEIGHT SURFACE EL. BORING

3700 COLD WATER CANYON UPPER LEVEL

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: γ PCF	ENGINEERING PROPERTIES (SHEAR STRENGTH): θ	ENGINEERING PROPERTIES (SHEAR STRENGTH): C PSF
4"			CONCRETE					
1.5'			SANDY CLAY MOIST MODERATLY DENSE					
2'			WEATHERED BED ROCK DENSE @ 2'		11.1	95	11	400
4'			BOTTOM OF BORING					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 (213) 283-1779

BORING LOG

DATE: JAN. 3, 1991 DRILLING EQUIPMENT | No. 2

DRIVING WEIGHT | SURFACE EL. BORING

3700 COLD WATER CANYON UPPER LEVEL

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	% MOISTURE	γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	C PSF
4"			CONCRETE					
2'			SANDY CLAY moist moderatly Dense					
3.5'			WEATHERED Bed ROCK DENSE @ 3' Bottom of Boring 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 • (213) 483-1779

BORING LOG

DATE: DEC. 28, 1990 DRILLING EQUIPMENT | No. 1

DRIVING WEIGHT | SURFACE EL. BORING

3700 COLD CANYON (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	% MOISTURE	Y PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	C PSF
4'			SANDY CLAY, DRY GRAY BROWN (FILL)		11.1	94		
4.5 5.5'			SANDY CLAY, MOIST MODERATLY DENSE DARK BROWN		13.3	102		
7'			WEATHERED TO FIRM BED ROCK BOTTOM OF BORING 1					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 · (213) 483-1779

BORING LOG

DATE: DEC. 28, 1990 DRILLING EQUIPMENT | No. 2

DRIVING WEIGHT

SURFACE EL. BORING

3700 COLD WATER CAN. (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	% MOISTURE	Y PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	C PSF
2½'			SANDY CLAY, DRY LOOSE GRAY BROWN FILL					
3' 4'			CLAYEY SAND MOIST MODERATLY DENSE DARK BROWN		7.1	95		
4½' 6'			WEATHERED BED ROCK GETTING DENSER		11.1	100		
			BOTTOM OF BORING 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3286 • (213) 463-1779

BORING LOG

DATE: DEC. 28, 1990 DRILLING EQUIPMENT No. 3

DRIVING WEIGHT

SURFACE EL. BORING

3700 COLDWATER CAN (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: Y PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
1'			CLAYEY SAND LOOSE DISTURBED					
3'			SANDY CLAY, LOOSE DRY DARK BROWN		8.3	98	15	525
4½'			WEATHERED BED ROCK GRAY BROWN MODERATLY DENSE BOTTOM OF BORING Z					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 · (213) 283-1779

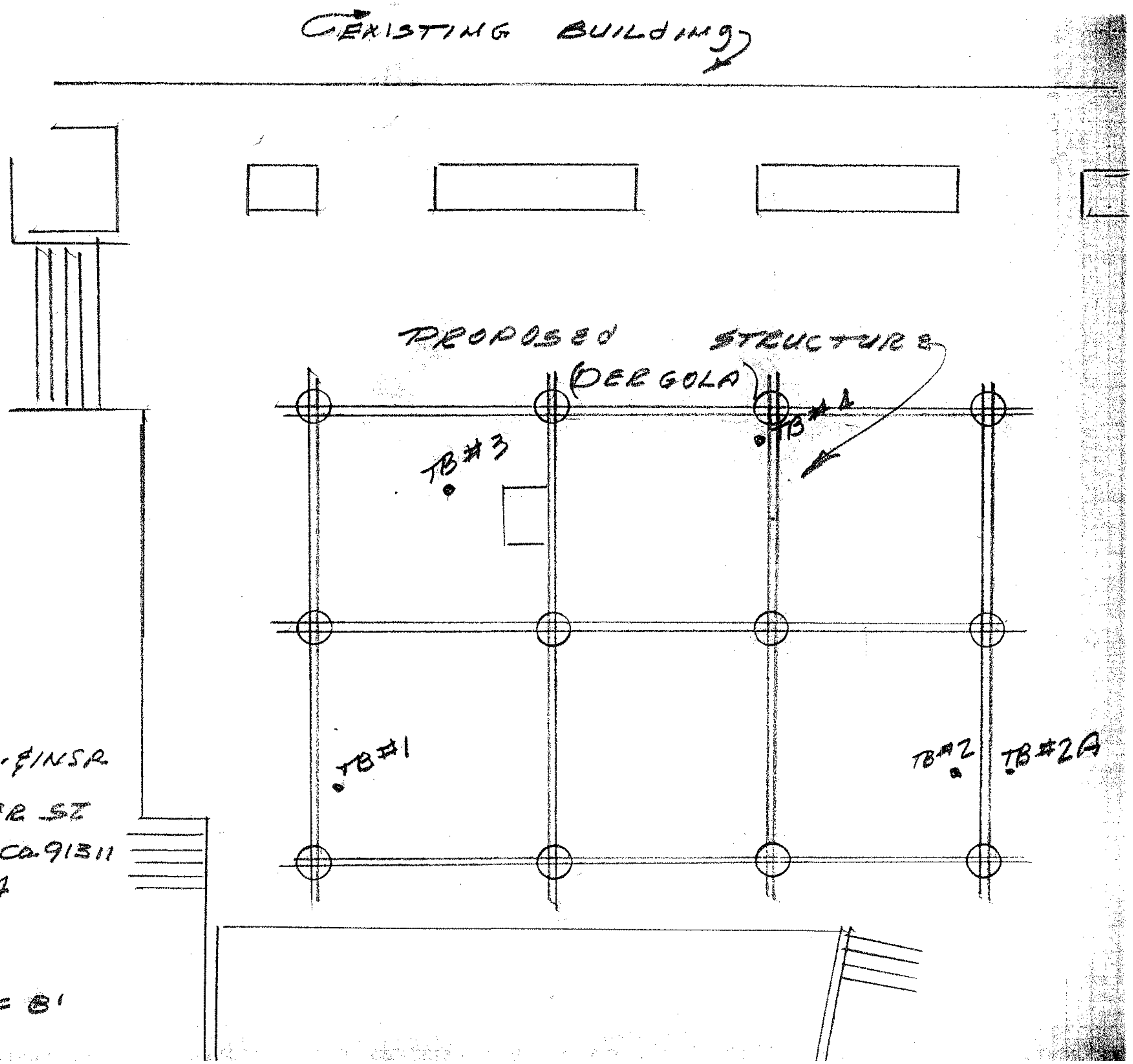
DATE: DEC. 28, 1990 DRILLING EQUIPMENT | No. 4

DRIVING WEIGHT | SURFACE EL. BORING

3700 COLD WATER CANYON (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
			SANDY CLAY, DRY LOOSE GRAY BROWN					
2.5								
3'			WEATHERED BED ROCK TO DENSE BED ROCK @ 3.5'		8.3	99		
4'			BOTTOM OF BORING 2					

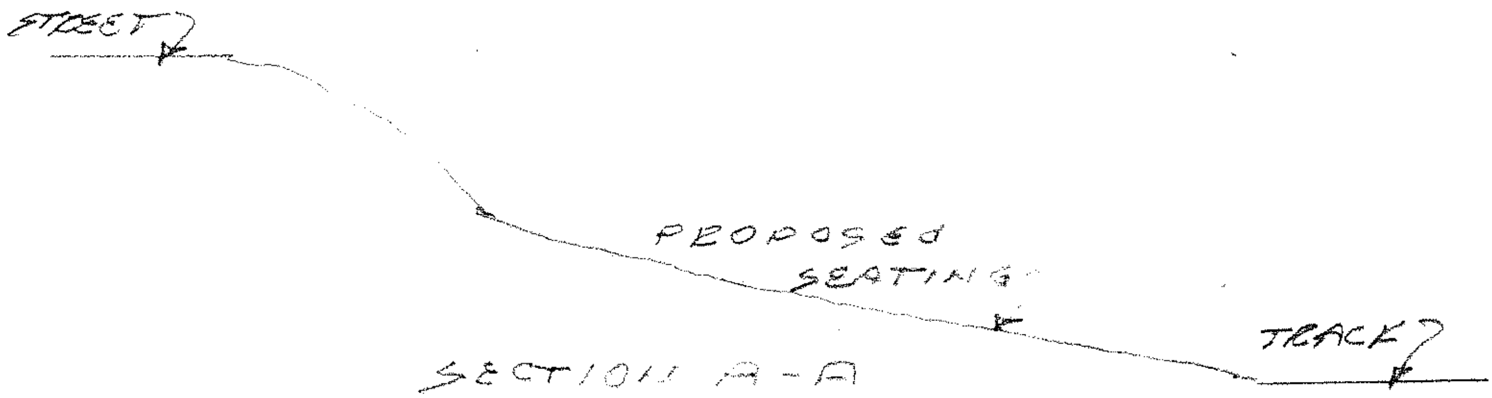
EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 (213) 283-1779



EPSILON ENG. & INSR.
19935 LABRADOR ST
CHATSWORTH CA. 91311
JOB NO. 1290-494
JAN. 28, 1991

SCALE 1" = 8'

HARVARD SCHOOL
3700 COLDWATER CANYON
LOWER [illegible]



SECTION A-A

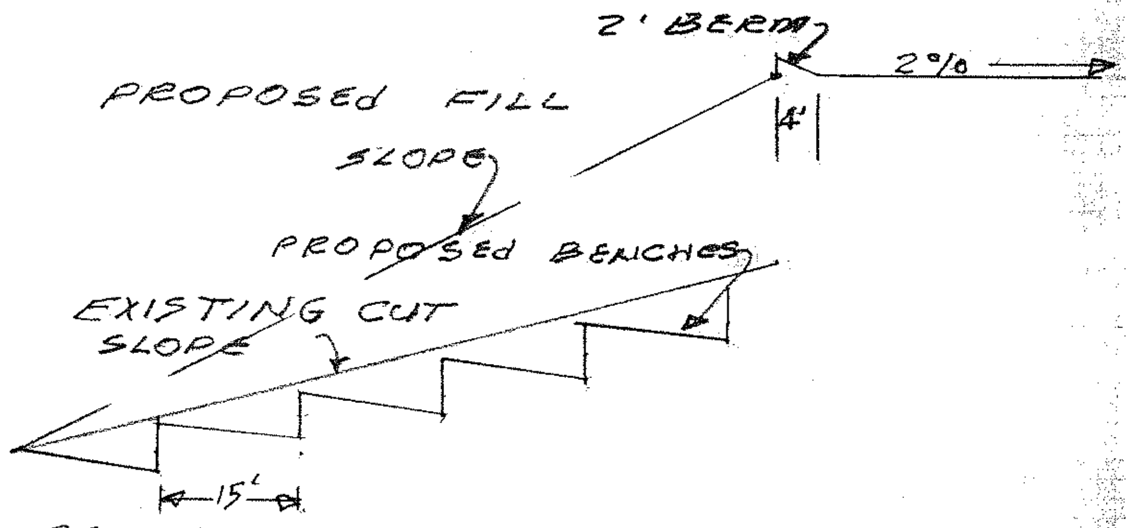
EPSILON ENG[illegible]
19933 LABRADOR ST.
CHATSWORTH CA. [illegible]

SCALE 1" = 10'

HARVARD SCHOLL

PROPOSED BLEACHERS
3700 COLD WATER CANYON
STUDIO CITY 91604

PROPOSED FILL



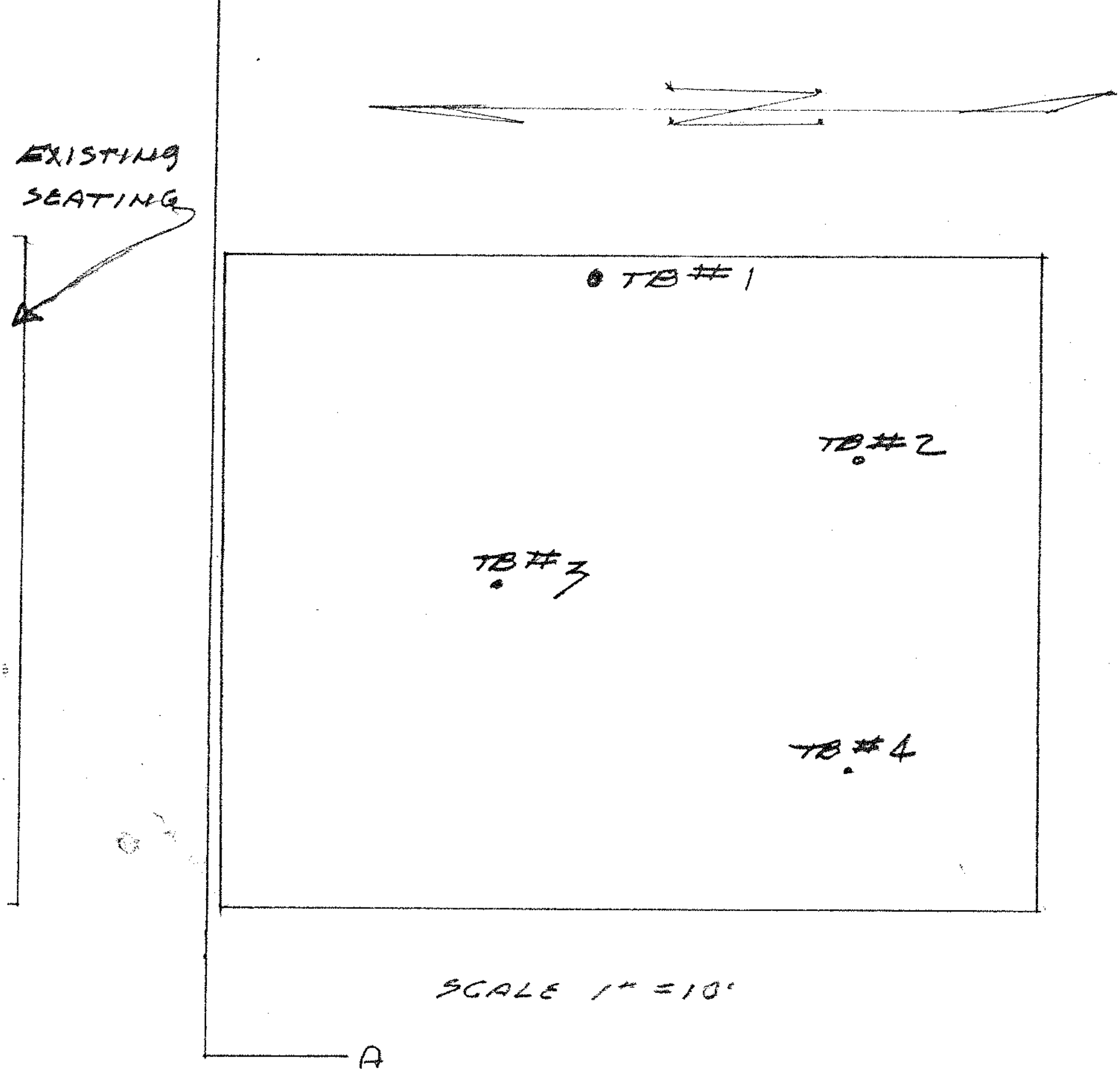
BENCHES 15' MINIMUM

BENCH SLOPE INTO CUT 3% MINIMUM

SCALE 1" = 20'

EPSILON ENGINEERING & INSP. INC
19933 LABRADOR ST
CHATSWORTH CA. 91311

HARVARD SCHOOL
LOWER LEVEL
3700 COLDWATER CANYON
NORTH HOLLYWOOD CA. 91604



SCALE 1" = 10'

EPSILON ENG & INSP. INC.
19933 LABRADOR ST.
CHATSWORTH CA. 91311

B & S B-17 (R 6/86)

City of Los Angeles
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District VN | Log No. 24683 | 27611 4

ADDRESS APPROVED

Signature/Date

APPLICATION FOR REVIEW OF TECHNICAL REPORTS AND IMPORT-EXPORT ROUTES

INSTRUCTIONS

A. Address all communications to the Grading Division, Department of Building and Safety, Room 460A, City Hall, Los Angeles, California 90012-4869. Phone (Area Code 213) 485-3435.
B. Obtain address approval from the Department of Public Works prior to submittal.
C. Submit 2 copies (4 for fault study zone) of reports and 3 copies of application with items (1) through (10) completed.
D. Check should be made to the Department of Building and Safety.

Note: Please Pr

(1) LEGAL DESCRIPTION
Tract 1000
Blk ______ Lots POR 1111

(2) PROJECT ADDRESS 3700 Coldwater Cyn A

(3) OWNER FRANK HEDGES
Address 3700 COLDWATER CYN AVE.
City North Hollywood Zip 91604
Phone (Daytime) ______

(4) APPLICANT WEINSTEIN CONSTRUCTI
Address 16153 LEADWELL St.
City VAN NUYS CA
Phone (Daytime) 818-988-5404 Zip 9140

(5) Report(s) Prepared by EPSILON ENGINEERING

(6) Report Date(s) JAN 10, 1991 1-10-91

(7) Status of project: ☒ Proposed ☐ Under Construction ☐ Storm Damage

(8) Previous site reports? NO If yes, give date(s) of report(s) and name of company(s) who prepared report(s).

(9) Previous Department actions? Yes If yes, please give dates and attach a copy to expedite processing.
Dates 5-9-91 (Denied)

(10) Signature of applicant Thomas Stoll Position Employee - Weinst

(DEPARTMENT USE ONLY)

REVIEW REQUESTED & PROCESSING	FEES	REVIEW REQUESTED & PROCESSING	FE
☑ Foundation Investigation	Ø	☐ Seismology report per 91.2305(d)	
☐ Soils Engineering		☐ Environmental Assessment	
☐ Geology		☐ Import-Export Route	
☐ Combined Soils Engr. & Geol.		☐ Division of Land	
☑ Supplemental	Ø	Sub-total	Ø
☐ Combined Supplemental		One-Stop Surcharge	

THE REPORT IS ☒ APPROVED WITH CONDITIONS ☐ NOT APPROVED TOTAL FEE Ø

DEPARTMENT ACTION BY: ______ For Geology ______ Date | Grant Edwards For Soils & Foundation 7/10/91 Date

☒ Conditions of Approval ☐ Reasons for Non-Approval ☐ See Attached letter ☐ Supplemental Sheet ____ Attach

(1) THIS APPROVAL IS FOR CONSTRUCTION ON OR NEAR SLOPES NOT EXCEEDING 2:1. A DETAILED SUPPLEMENTAL REPORT CONTAINING STABILITY ANALYSIS SHALL BE PROVIDED FOR ANY SLOPE STEEPER THAN 2:1.

(2) ALL FOOTINGS SHALL BE FOUNDED A MINIMUM OF

(Continued Over)

(Cashier Use Only)

DEPARTMENT USE ONLY
Fee Due Ø
Fee Verified [signature]
Date 7-5-91

DISTRIBUTION
☒ Owner
☒ Applicant
☐ ______

☒ Soil Engineer
☐ Geologist
☐ Board files
☒ Tract file

Plan Check
☐ LA
☒ VN
☐ WLA
☐ SP/WLA

Inspection
☐ LA
☒ VN
☐ WLA
☐ SP/WLA

☐ Bl
☒ Bl

NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS
10571 CALLE LEE SUITE 155 LOS ALAMITOS, CA 90720
(714) 826-4231 (213) 267-0125
FAX (714) 826-2514

November 14, 1991 Project Number 3594-91

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

Re: Laboratory Tests - Proposed Development - Located at 3700 Harvard School, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on a sample of the soils which were transported to this firm.

LABORATORY TESTS

A. Gradation analysis were performed on 1 sample and results are shown on Plate B.

We appreciate this opportunity to be of service to you. If you have any further questions please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12-31-92
GEOTECHNICAL
STATE OF CALIFORNIA

Keith D. Tucker
Project Engineer
R.G.E. 841

Troy D. Norrell
President

SIEVE ANALYSIS *
DATA AND COMPUTATION SHEET

SIEVE MESH	WEIGHT RETAINED IN GRAMS	PERCENT RETAINED	CUMULATIVE PERCENT FINER	SPECS
2"				
1 1/2"				
1"				
3/4"	0	0	100	
1/2"				
3/8"				
4	26	7	93	
8				
10				
12				
14				
16				
30				
40	68	18	82	
50				
60				
100	86	24	76	
200	99	27	73	
PAN	358			

* Wet Sieve Analysis

PROJECT NO. 3594-91 DATE 11-14-91 WEIGHT OF SAMPLE 358 GM.

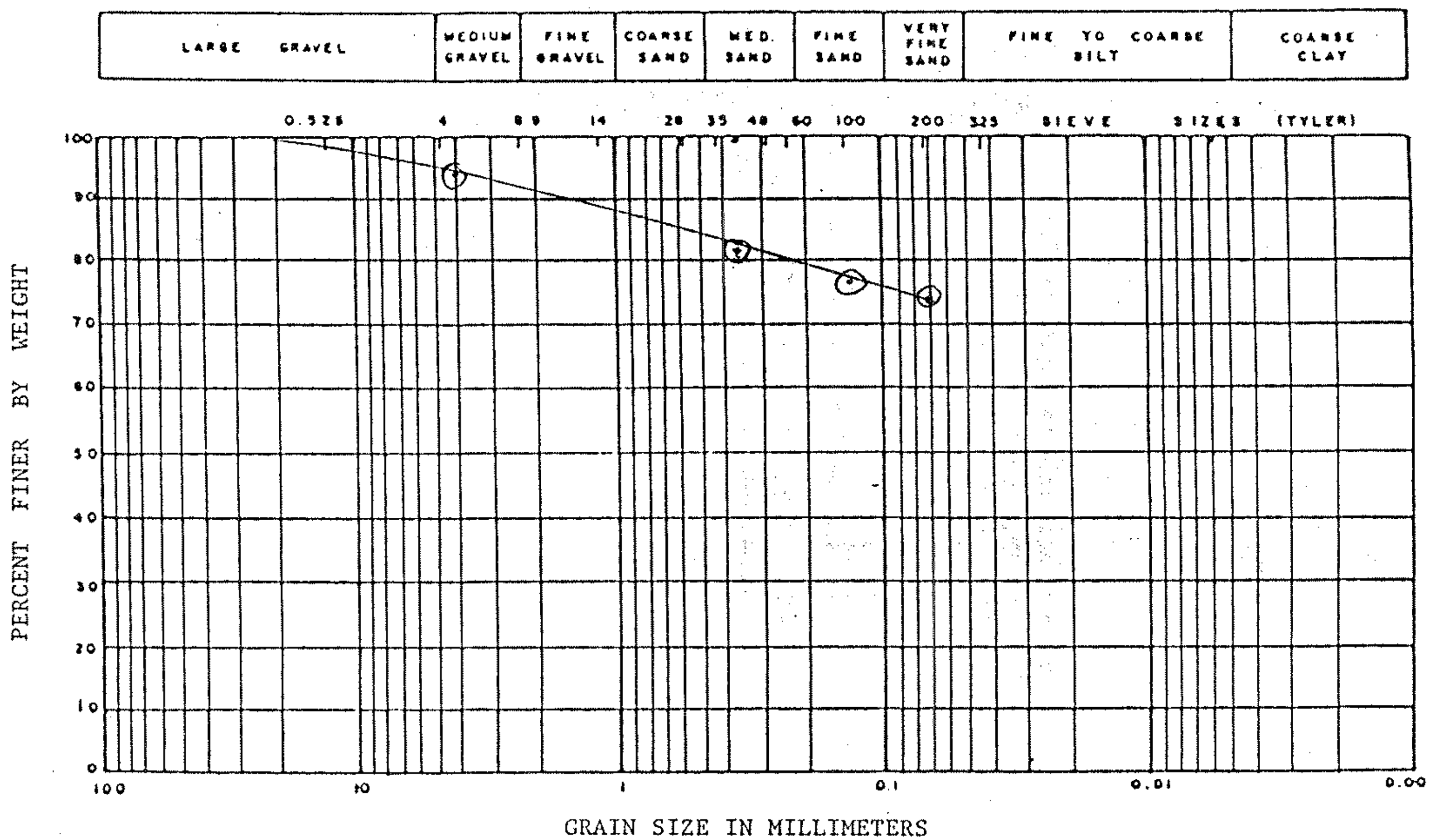
SAMPLE NO. 1 TESTED BY: S.V.

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT NO. 3594-91

DATE: November 14, 1991

MECHANICAL ANALYSIS CURVE



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS
10571 CALLE LEE SUITE 155 LOS ALAMITOS, CA 90720
(714) 826-4231 (213) 267-0125
FAX (714) 826-2514

November 7, 1991

Project Number 3594-91

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

Re: Laboratory Tests - Proposed Development - Located at 3700 Harvard School, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on a sample of the soils which were transported to this firm.

LABORATORY TESTS

A. Direct shear tests (ASTM:3080) were performed on undisturbed samples of the soils. These tests are performed under saturated conditions at loads of 518 lbs./sq.ft., 1,036 lbs./sq.ft., 2,072 lbs./sq.ft. with results shown on Plate A.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12-31-92
GEOTECHNICAL
STATE OF CALIFORNIA

Troy D. Norrell
President

26755

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099

November 6, 1991
Job No. 1091-560

Weinstein Construction Co.
16153 Leadwell Street
Van Nuys, CA 91406

Re: Harvard School
3700 Coldwater Canyon
North Hollywood, CA 91604

Dear Mr. Weinstein:

The following report pertains to the correction sheet prepared by the City of Los Angeles dated April 24, 1991 and signed by Mr. Bobby D. Addams. Corrections are as follows:

1. The three signed copies of the geology report have been mailed.

2. The logs, gradation, shear strength, density test, and moisture content are attached, taken from north test pit No. 2.

<u>RGA-1-84</u>

The existing slope angle is 4-14 to 1 ± (12°), while the bedding plane of the rock lies at 10° +. However, both the deep-seated stability and the surficial slope stability are grossly stable. In addition to the stability of the slope, there shall be a fill placed over the slope to raise the elevation of the slope to support the new bleachers.

<u>Fill Preparations</u>

1. Prior to placing the fill, the area to receive fill shall be stripped of all vegetation.

2. A key shall then be cut to a depth of five feet (5') and a width of at least fifteen feet (15'), or at least one and one-half equipment width.

3. This shall be sloped downward into the slope at the rate of 6% ±.

4. Once this has been accomplished the bottom shall be scarified to a depth of six inches (6"), brought to near-optimum moisture, and compacted to the specified degree of 90% of laboratory maximum density.

5. Fill may then be placed in loose level layers not exceeding eight inches (8") in depth and compacted to 90% of maximum density.

6. Benches shall be cut as per sketch attached (Plate No. 1).

Proposed Fill

At this time the proposed fill and its source is unknown. However, we will test and approve the source of import prior to its acceptance.

Testing - RGA-5-67

Due to the adverse bedding plane of the existing bedrock, it appears the slope is unstable, although all tests indicate a grossly stable slope based on test performance. All were in excess of 1.5. The tests were performed as follows:

Testing

For gross stability, shear tests were obtained by testing paralled to the bedding plane and sheared in accordance with ASTM 3080. The results of these tests, along with the computer results, are attached.

For surficial stability tests, a shear test was performed on soil from test boring No. 2 at a depth of three feet (3'). The results of this test are also attached.

Buttress Fill

A buttress fill was not intended. However, the fill to raise the area for the bleachers will act as a buttress. This is also keyed into the slope (see Plate No. 1).

Conclusions

In our opinion we feel the site is grossly stable and meets at least the minimum requirements of all City codes, including RGA-5-67 and RGA-1-84.

All laboratory tests were performed by Norcal Engineering at 10571 Calle Lee, Suite 155, Los Alamitos, CA 90720, a Los Angeles licensed laboratory. We accept the results of these tests.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston
Engineering Vice President
GEO 829

REGISTERED PROFESSIONAL
STEVEN R. THURSTON
No. GE000829
Exp. 12/31/92

BORING LOG

DATE: DEC. 28, 1998 DRILLING EQUIPMENT | No. 1

DRIVING WEIGHT

3700 COLD CANYON (LOWER LEVEL) | SURFACE EL. BORING

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	% MOISTURE	Y PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	C PSF
4'			SANDY CLAY, DRY GRAY BROWN (FILL)		11.1	94		
4.5 / 5.5'			SANDY CLAY, MOIST MODERATLY DENSE DARK BROWN		13.3	102		
7'			WEATHERED TO FIRM BED ROCK					
			BOTTOM OF BORING 7					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3280 (213) 883-1779

BORING LOG

DATE: DEC. 28, 1990 DRILLING EQUIPMENT No. 2

DRIVING WEIGHT

SURFACE EL. BORING

3700 COLD WATER CAN. (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: Y PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
2.5'			SANDY CLAY, DRY LOOSE GRAY BROWN FILL					
3' – 4'			CLAYEY SAND MOIST MODERATLY DENSE DARK BROWN		7.1	95		
4.5'			WEATHERED BED ROCK GETTING DENSER		11.1	100		
6'			BOTTOM OF BORING 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 (213) 483-1779

BORING LOG

DATE: DEC 28, 1990 DRILLING EQUIPMENT | No. 3

DRIVING WEIGHT

SURFACE EL. BORING

3700 COLDWATER CAN (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION			ENGINEERING PROPERTIES	
				CONSISTENCY	% MOISTURE	γ PCF	SHEAR STRENGTH θ	C PSF
1'			CLAYEY SAND LOOSE DISTURBED					
3'			SANDY CLAY, LOOSE DRY DARK BROWN		8.3	98	15	525
4½'			WEATHERED BED ROCK GRAY BROWN MODERATLY DENSE BOTTOM OF BORING 3					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-[illegible] (818) [illegible]

DATE: DEC 20, 1990 DRILLING EQUIPMENT
DRIVING WEIGHT

SURFACE EL. BORING

3700 COLD WATER CANYON (LOWER LEVEL)

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CONSISTENCY	% MOISTURE	γ PCF	SHEAR STRENGTH θ	C PSF
2.5			SANDY CLAY, DRY LOOSE GRAY BROWN					
3'			WEATHERED BED ROCK TO DENSE BED ROCK @ 3.5'		8.3	99		
4'			BOTTOM OF BORING 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3200 (213) 483-1779

BORING LOG NORTH TEST PIT | No TP#2

DATE: NOV. 1, 1991 DRILLING EQUIPMENT

DRIVING WEIGHT | SURFACE EL. BORING

3700 COLD WATER CANYON

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	% MOISTURE	γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	C PSF
0.5'			TOP SOIL DARK BROWN HARD (SANDY CLAY)					
4.0'			SANDY CLAY) BROWN TO DARK BROWN MOIST MODERATLY DENSE					
5.0'			BED ROCK DENSE. GRAY BROWN. MOIST DENSE BOTTOM OF PIT Z					
5.5'					11.1	97		

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3256 (818) 883-1779

BORING LOG SOUTH PIT No. TP 3

DATE: NOV. 1, 1991 DRILLING EQUIPMENT

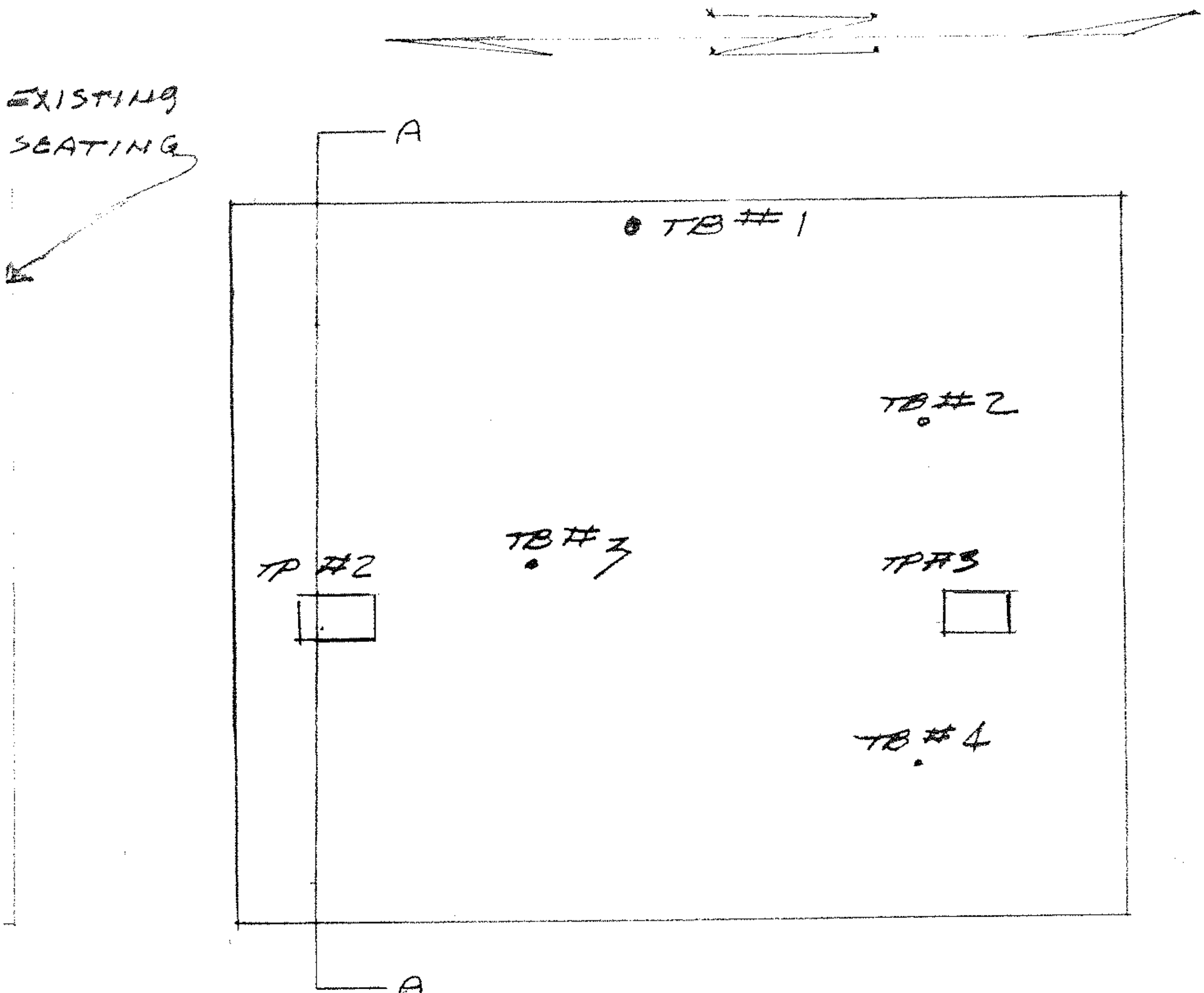
DRIVING WEIGHT SURFACE EL. BORING

3700 COLD WATER CANYON

DEPTH IN FEET	SAMPLE NO.	BLOWS PER FOOT	VISUAL CLASSIFICATION	CLASSIFICATION: CONSISTENCY	CLASSIFICATION: % MOISTURE	CLASSIFICATION: γ PCF	ENGINEERING PROPERTIES: SHEAR STRENGTH θ	ENGINEERING PROPERTIES: C PSF
0.5'			TOP SOIL DARK BROWN SANDY CLAY					
7.0'			SANDY CLAY, BROWN TO DARK BROWN MOIST MODERATLY DENSE					
8.0'			BED ROCK HARD MOIST DENSE BOTTOM OF BORING 2					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 9.311
(818) 886-32[illegible] (213) [illegible]

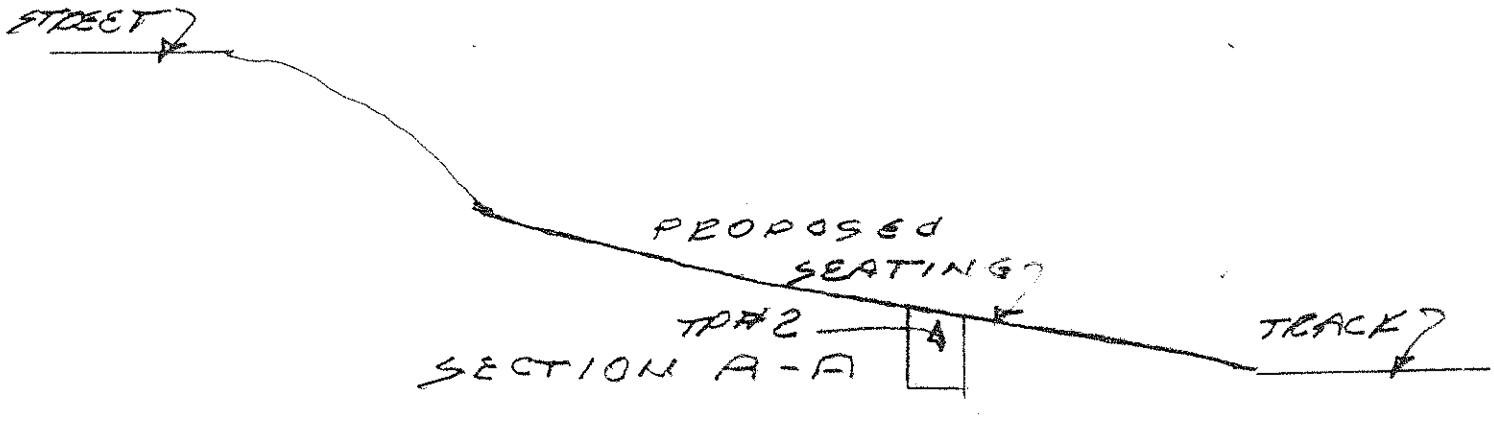
HARVARD SCHOOL
LOWER LEVEL
3700 COLDWATER CANYON
NORTH HOLLYWOOD CA. 91604



SCALE 1" = 10'

EPSILON ENG & INSP. INC.
19933 LABRADOR ST.
CHATSWORTH CA. 91311

HARVARD SCHOOL
3700 COLDWATER CANYON
LOWER LEVEL



SECTION A-A

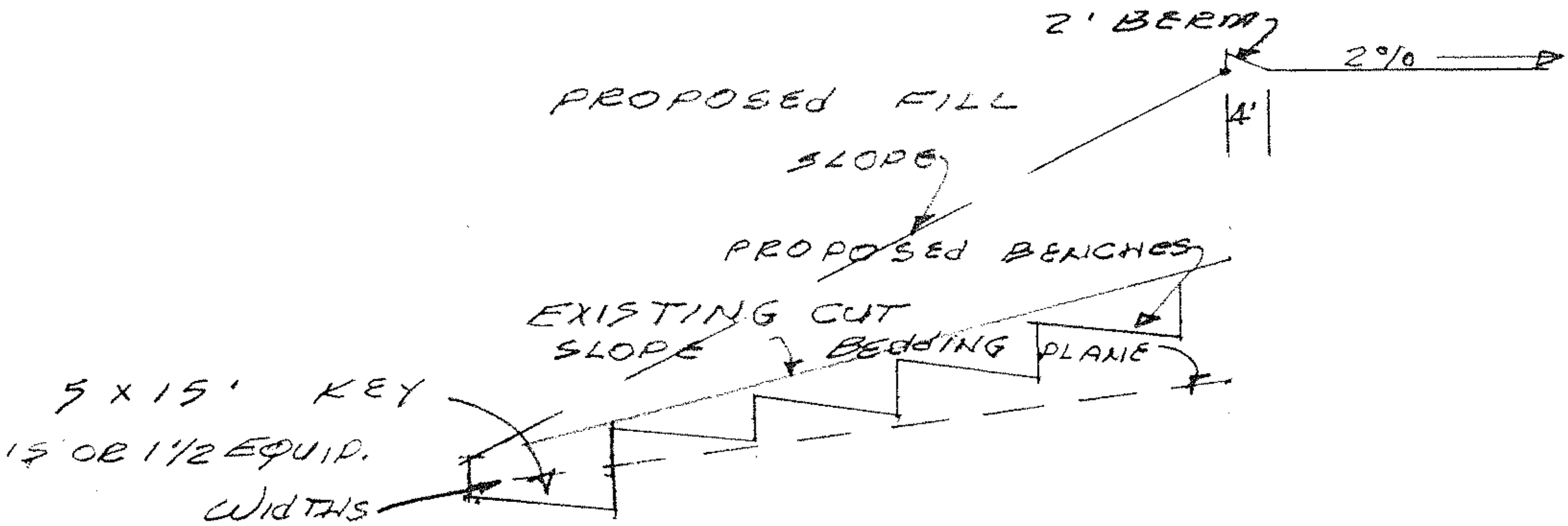
EPSILON ENG & INSP. INC.
19933 LABRADOR ST.
CHATSWORTH CA. 91311

SCALE 1" = 10'

HARVARD SCHOOL

PROPOSED BLEACHERS
3700 COLD WATER CANYON
STUDIO CITY 91604

PROPOSED FILL



BENCHES 15' MINIMUM

BENCH SLOPE INTO CUT 3% MINIMUM

SCALE 1" = 20'

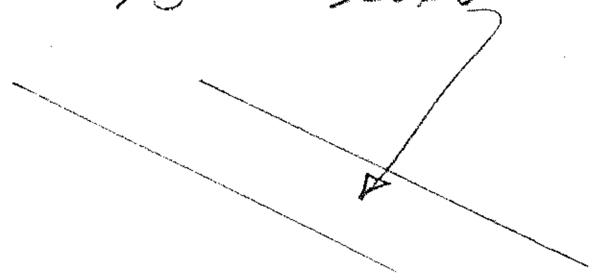
EPSILON ENGINEERING & INSP. INC
19933 LABRADOR ST
CHATSWORTH CA. 91311

NOV-13, 1991 - JOB NO. 1290-495

PLATE NO. 1

HARVARD SCHOOL
3700 COLD WATER CANYON
NORTH HOLLYWOOD

SEEPAGE PARALLEL
TO SLOPE



Z	DEPTH OF SATURATION	= 3'
i	SLOPE ANGLE	= 26°
γ_T	UNIT WEIGHT	= 100
γ_W	UNIT WEIGHT OF WATER	= 62.4
C	COHESION	= 525
ϕ	ANGLE OF SHEARING RESISTANCE	= 15°
FS	MINIMUM ACCEPTABLE FACTOR OF SAFETY	= 1.5

$$F.S. = \frac{C + (\gamma_T - \gamma_W)\, z \cos^2 \tan\phi}{\gamma \quad z \quad \sin i \quad \cos i}$$

$$= \frac{525 + 100 - 62.4 \;\; 3 \;\; .945 \;\; .24}{100 \;\; 3 \;\; .39 \;\; .917} = \frac{562.6}{107.2}$$

F.S. = 5.25

EPSILON ENG. & INSP. INC
19933 LABRADOR ST.
CHATSWORTH CA. 91311
JOB NO. 1290-494 NOV. 13, 1991

SLOPE STABILITY CALCULATION

Type of Calculation: Circular Arc File No: NOV12 .DAT
11-12-1991

Soil Data:	Soil Type	Density	Friction Angle	Cohesion
	1	100 pcf	19 deg	575 psf

N	Soil	Area	Ang	Wt	Fr	CL	Df
1	1	80	-33	8.0	2.3	9.2	-4.3
2	1	246	-20	24.6	8.0	9.2	-8.4
3	1	376	-7	37.6	12.8	9.2	-4.6
4	1	439	6	43.9	15.0	9.2	4.6
5	1	421	19	42.1	13.7	9.2	13.6
6	1	331	32	33.1	9.7	9.2	17.5
7	1	197	45	19.7	4.8	9.2	13.9
8	1	44	58	4.4	0.8	7.5	3.7
					67.2	71.9	36.0

Center of Circle (X & Y): 45 55
Radius: 71.1

Safety Factor: 3.86

DESCRIPTION OF FAILURE SURFACE

Slice Number	Beginning X	Beginning Y	Ending X	Ending Y	Inclination
1	0.0	0.0	13.4	-8.7	-33
2	13.4	-8.7	28.5	-14.1	-20
3	28.5	-14.1	44.4	-16.1	-7
4	44.4	-16.1	60.3	-14.4	6
5	60.3	-14.4	75.4	-9.2	19
6	75.4	-9.2	89.0	-0.8	32
7	89.0	-0.8	100.4	10.5	45
8	100.4	10.5	108.9	24.0	58

Plate 1

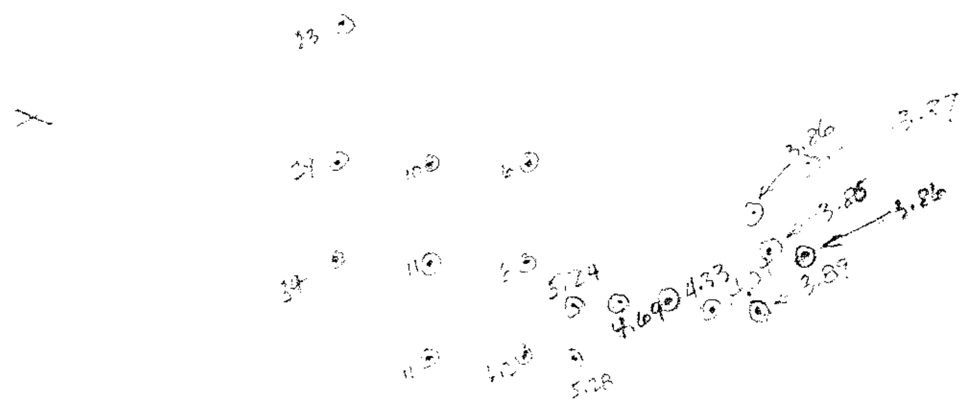
HARVARD SCHOOL
Lower Level
3700 Cold Water Canyon
North Hollywood, CA 91604

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. THURSTON
No. GE000829
Exp. 12/31/92
GEOTECHNICAL
STATE OF CALIFORNIA

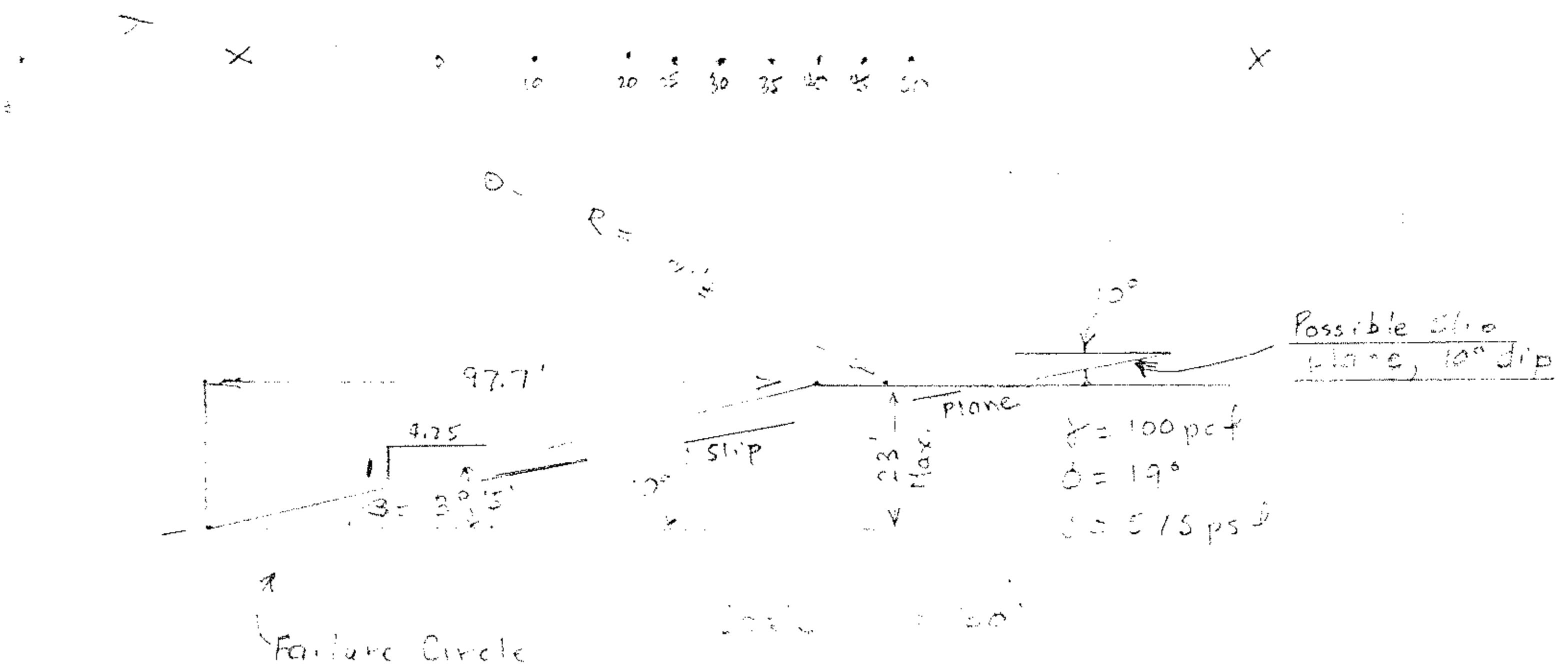
Stability Calculations — TRIALS

Nov 12, 1991

Location:



Scale: 1" = 20'



HARVARD SCHOOL
Lower Level
3700 Cold Water Canyon
North Hollywood, CA 91604

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. THURSTON
No. GE000829
Exp. 12-31-92
GEOTECHNICAL
STATE OF CALIFORNIA

SLOPE STABILITY CALCULATION

Type of Calculation: Buttress Width Design

File No: NOVA14A .DAT
11-14-1991

Soil Data:

Soil Type	Density	Friction Angle	Cohesion
1	100 pcf	19 deg	575 psf

N	Soil	Area	Ang	Wt	Fr	CL	Df
1	2	414	10	49.6	30.5	43.1	8.6
					30.5	42.4	8.6

Buttress Width = 0

Safety Factor: 8.44

Plate 1

No buttress required.

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. THURSTON
No. GE000829
Exp. 12/31/92
GEOTECHNICAL
STATE OF CALIFORNIA

HARVARD SCHOOL
Lower Level
3700 Cold Water Canyon
North Hollywood, CA 91604

RYLAND ASSOCIATES, INC.
GEOSCIENCE CONSULTANTS

Geophysical and Geological Exploration
Engineering Seismology
Mining Consultant

2569 East Colorado Boulevard
Pasadena, California 91107
(818) 792-6163
FAX (818) 792-1226

Project 91-128-29
October 10, 1991

Epsilon Engineering and Inspection, Inc.
19933 Labrador St.
Chatsworth, CA 91311

Geologic Investigation
Proposed Bleacher Construction
Harvard School
North Hollywood, California

This letter presents the results of my geologic investigation of the subject site. The scope of work included: a site visit, a review of general regional geology, observation of three test pits, and preparation of this report. Details of the proposed construction are presented in the foundation engineering report but it generally consists of increasing the size of the bleacher section and providing an upper deck behind them.

The site consists of a gentle west facing slope. Existing bleachers are in the northern half of the proposed construction area. A topographic map of the slope was not available and the attached cross section is estimated only.

No soils or geology reports for adjacent structures were available from the school.

Geologic Setting

The site is located on the northern flank of the Santa Monica mountains. The Santa Monica Mountains are a large mass of rocks ranging in age from Jurassic to Quaternary; they have been uplifted and faulted throughout their extent.

The site is located about 3.5 miles north of the trace of the Santa Monica/Hollywood Fault System; this system is considered active. Smaller, inactive faults have been mapped near the site (City, c. 1965), including a fault less than 100 feet south of the site. The site is 0.9 mile north of the "conditionally active" Benedict Canyon Fault Zone (County, 1990).

As with all of Southern California the site is subject to the effects of major earthquakes, particularly those generated relatively nearby on the fault system mentioned above, as well as on more distant faults such as the Sierra Madre, Sylmar, Newport-Inglewood, and San Andreas.

Site Geology

The geologic unit at the site consists of shale of the upper Modelo fm (City, c. 1965); this is called Tud, unnamed shale, by Dibblee (1991). The difference is academic, based on regional data. The rock, as observed in OC1 and two test pits, is composed of whitish, fresh to weathered, thinly bedded (1/8" or less) diatomaceous shale. The shale is relatively lightweight and porous, at least in the weathered outcrop, but ranged into a more siliceous facies in a portion of TP-2.

Dibblee (1991) shows an attitude of N60E, 35NW a few hundred feet east of the site. In this study there appears to be a slight difference in the attitude between Dibblee's regional trends and the outcrop measurements. The City data tend to agree with my measurements with the nearest attitudes showing a northwest dip ranging from 10 to 25 degrees. Test Pit-1 was not able to reach rock through increasingly dense residual soil; rock depth is estimated to exceed four feet. Test Pits 2 and 3 utilized additional labor are were excavated to greater depths and into rock. There was considerable variation in bedding attitudes although all indicated an apparent westerly component, ranging from 10-30 degrees for the test pits to 4-14 degrees from the outcrop.

The overburden in the proposed bleacher area is composed of a thin layer of topsoil, fill and slopewash, generally thinning to the west. This is underlain by dark brown, dense, residual soil (clayey silt). The soil/bedrock interface is rather irregular and there is differential weathering and soil formation along vertical fractures. In the three test pits excavated for this investigation, the depth of rock ranged from 4-5 feet. Previous test pits excavated by Epsilon (1991) showed depths ranging from 3.5-5.5 feet.

The fault mapped by the City, but not by Dibblee, apparently separates very steep dips (greater than 60 degrees) from much more shallow dips. Since TP-3 was adjacent to the southern end of the proposed bleachers, the fault, if it does exist, must be south of the proposed site; from the map this may be only a few tens of feet.

No landslides were observed directly at the site. Surficial failures of nearby, steep slopes would be possible. The County (1991) shows a landslide more than a hundred feet (it is difficult to determine from the map scale available) north of the site, probably on a north-facing slope; it is not known whether this was on, or adjacent to, the school grounds. This landslide is not shown on the City map.

Conclusions and Recommendations

The site is underlain by soft to moderately dense sedimentary rock. The somewhat lightweight nature of some of the underlying beds of diatomaceous shale may indicate somewhat lower bearing capacities than typical dense shales. The rock underlying the proposed foundation area should be specifically tested for bearing capacity, shear and compressional strength, unless these data are already available from nearby studies.

The shale and residual soil should be tested for expansive characteristics if it to be used for compacted fill or support for any of the proposed structure. The existing bleachers, whose age may exceed 25 years, show no signs of major distress.

According to the Epsilon addendum (1991), the current construction plan calls for the construction of a large fill slope with the bleachers to be placed directly atop the fill. The fill is to be emplaced into fifteen foot wide benches separated by vertical cuts of approximately five feet. If these cuts are made into the existing slopes it is probable that they will intersect bedrock in some of the uphill portions and dense residual soils at the downhill portions. Thus, there will be differential support from the residual soil layers and the bedrock. The effect of differential compaction and settlement (and possible differential expansive effects) should be considered in design.

Secondly, there will be some out-of-slope, daylighted bedding in the uphill, vertical, portions of the proposed bench cuts. With the rather gentle slopes (around 15 degrees) and dips (4-30 degrees) involved, it is likely that the proposed fill will buttress these adversely dipping beds. Adequacy of this buttressing should be confirmed by computer analysis as for standard buttresses. The depth of rock at the western end of the bleachers is not known; it may be partly underlain by alluvium (more likely at the northwestern corner). Additional design may be required.

Thirdly, due to the rather complex nature of this system, a slope stability analysis should be made for the site. Based on the measurements made on the outcrop and test pits, there is a westerly component of apparent dip ranging from 4 to 30 degrees, as shown on the attached cross sections. Assuming that the bedrock surface slopes similarly to the topographic surface, bedrock dips of less than 15 degrees could be partly unsupported. An analysis using a range of values should be conducted, although 10 degrees would be typical. A revised geologic section, using actual topography and the proposed lines of slope stability analysis, should be prepared when these data become available. The mass of the proposed overlying fill should also be included in any calculations. Due to the variation in the attitudes, modelling the entire system at a single, adverse dip could be very conservative.

The slope should be modelled for the possibility for surficial failure of loose material (fill and soil) over the underlying bedrock; this relatively shallow slope (estimated at 4:1) would be expected to be stable.

An alternate recommendation, which would reduce the confirmatory design calculations and uncertainties, would be to found the entire fill into bedrock cuts, a more standard procedure.

The final design of the proposed fill system, with confirmatory calculations utilizing the known geologic data, should be reviewed by an engineering geologist.

The bench cuts must be monitored by an engineering geologist prior to final emplacement of the fill. Bedding attitudes should be measured to confirm slope stability and foundation depth calculations.

Diversion of local slope runoff off-site should be assured according to standard code provisions. No seepage was noted but near-surface water may flow on or near the bedrock/soil interface. The clayey residual soil could have minimal permeability although there are roots and other sources of secondary porosity. If subsurface water is encountered in the excavation, provision must be made for its drainage.

Seismic design procedures and other features of the latest Uniform Building Code and City of Los Angeles Building Code should be observed.

This report is based on brief visits to the site with minimum subsurface data. A geologist should visit the site after initial excavation and exposure of the underlying bedrock. Any unusual conditions encountered or exceptions to the observations of this report should be reported immediately to a geologist for additional analysis prior to proceeding with construction. If any deviant and/or adverse conditions are uncovered in this inspection they must be mitigated before construction may continue.

Submitted:

Stephen Ryland
CEG 988

Attachments: Fault and Epicenter Map
Areal Geology-Dibblee, 1991
Areal Geology-City of Los Angeles, c. 1965
Site Plan and Geologic Cross Section

REFERENCES

City of Los Angeles, c. 1965, Preliminary Geologic Maps of the Santa Monica Mountains, Map Sheet 70.

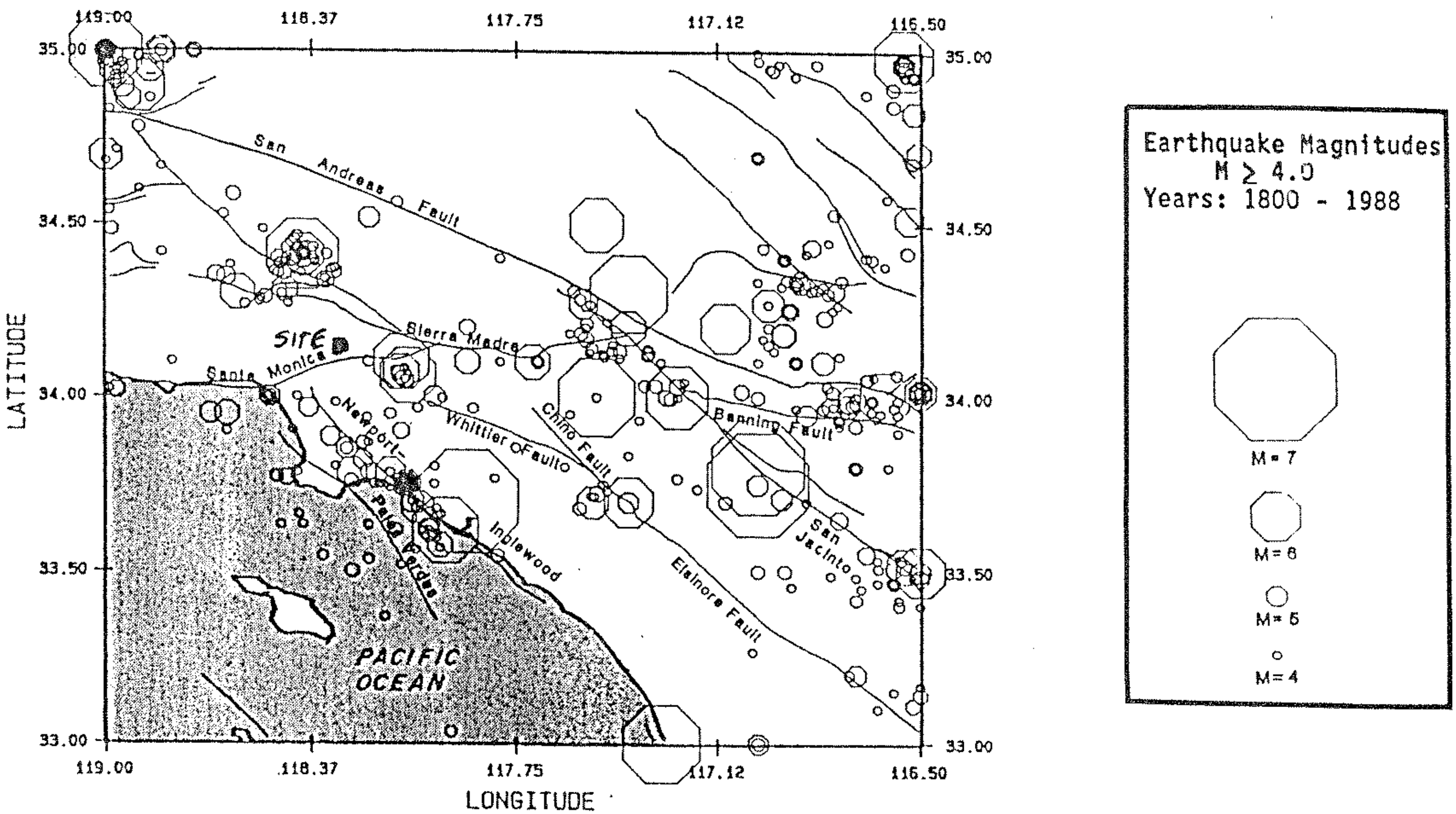
County of Los Angeles, 1990, Draft Seismic Safety Element, General Plan.

Dibblee, T.W., 1991, Geologic Map of the Beverly Hills and Van Nuys (South 1/2) Quadrangles, Los Angeles County, California, Dibblee Geological Foundation, Map DF-31.

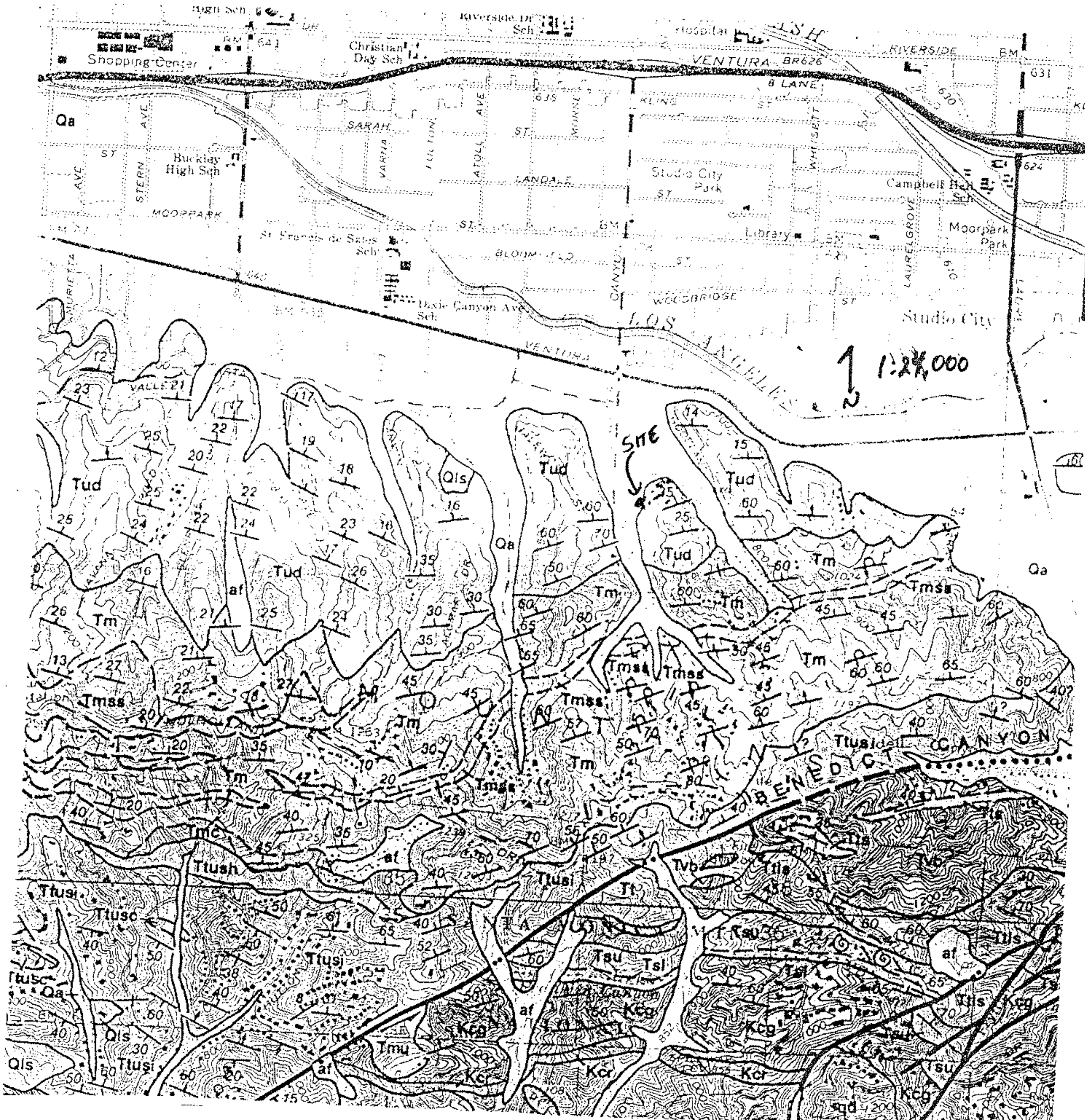
Epsilon Engineering, 1991, Report of Preliminary Soil Investigation for Harvard School, Lower Level, North Hollywood, California, 1/10/91, plus addendum dated 4/24/91.

APPENDIX-GEOLOGIC DATA

TP-1	0-1'	Fill, also slopewash and topsoil, loose, light brown, silt, with rock frags
	1-3'	Residual soil, dark brown clayey silt, rock fragments, much denser at 2', Bedrock depth estimated at 4+'.
TP-2	0-6"	Topsoil
	6"--3.5-4'	Residual Soil, Dark brown, increasingly dense with depth, "sticky" when wet, rock fragments increasing with depth.
	3.5-4--5'	Bedrock, Whitish shale ranging from somewhat soft, diatomaceous to harder siliceous material. Bedding Attitudes: N28E, 12NW N37E, 35NW N60E, 23NW N35E, 19NW
TP-3	0-6"	Topsoil
	6"-5'	Residual Soil, as above, bedrock surface somewhat irregular
	5-7'	Bedrock, mostly softer and powdery facies Bedding Attitudes: N2E, 24W N29E, 15NW N20E, 25NW
OC-1		Diatomaceous siltstone, lightweight, grayish to whitish, Bedding Attitudes: N30E, 13NW N40E, 11NW N-S, 14W Strike?, 4W



Major faults and selected historical earthquakes: ground shaking sources for the County of Los Angeles.



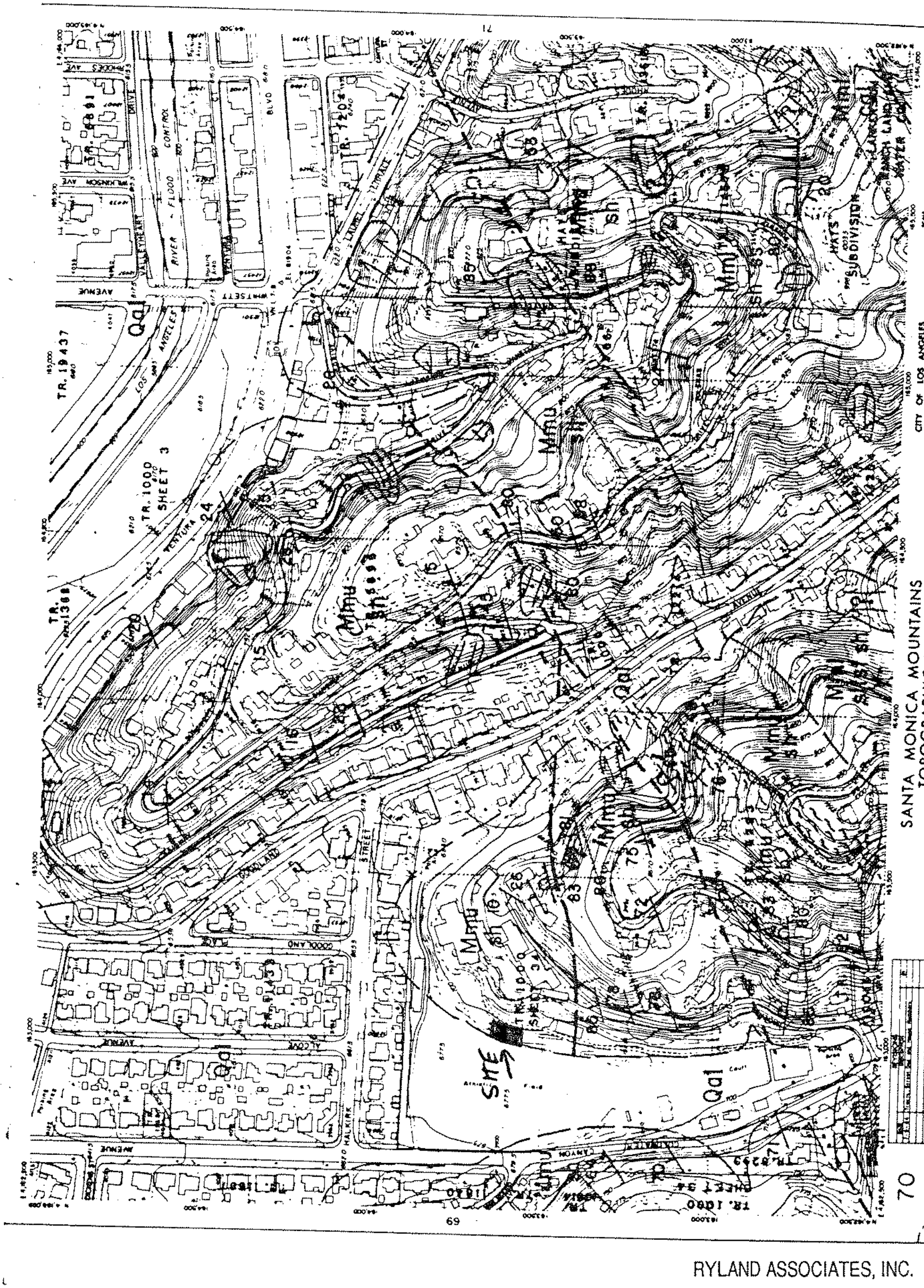
Tud

UNNAMED SHALE
(upper member of Modelo Formation of Hoots 1931; Upper Modelo Formation of Durrell 1954; equivalent to Sisquoc Formation of Dibblee 1959, in Ventura Basin)
marine clastic and biogenic; late Miocene age
("Delmontian" and late Mohnian Stages)

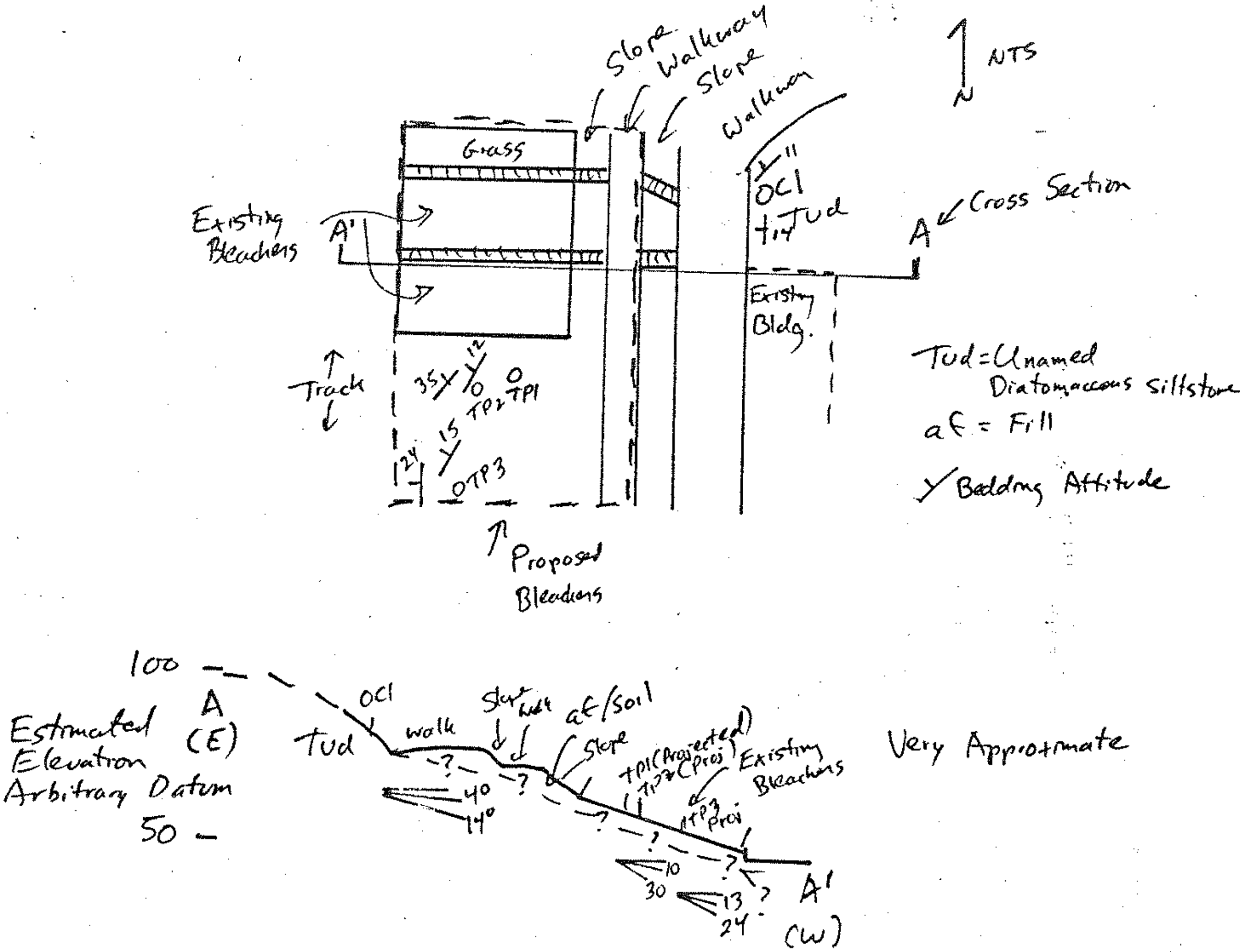
Tud *soft, white-weathering diatomaceous shale to diatomite, bedded, soft, semi-punky, porous; grades laterally westward into* Tush

AREA GEOLOGY
Dibblee, 1991

RYLAND ASSOCIATES, INC.



RYLAND ASSOCIATES, INC.



SITE PLAN AND GEOLOGIC SECTION

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
10571 CALLE LEE SUITE 155 LOS ALAMITOS, CA 90720
(714) 826-4231 (213) 267-0125
FAX (714) 826-2514

January 7, 1991

Project Number 3125-90

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

Re: Laboratory Tests - Proposed Development - Located at 3700 Coldwater Canyon, Van Nuys, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on a sample of the soils which were transported to this firm.

LABORATORY TESTS

A. Direct shear tests (ASTM: 3080) were performed on undisturbed samples of the soils. These tests are performed under saturated conditions at loads of 518 lbs./sq.ft., 1,036 lbs./sq.ft., 2,072 lbs./sq.ft. with results shown on Plate A.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

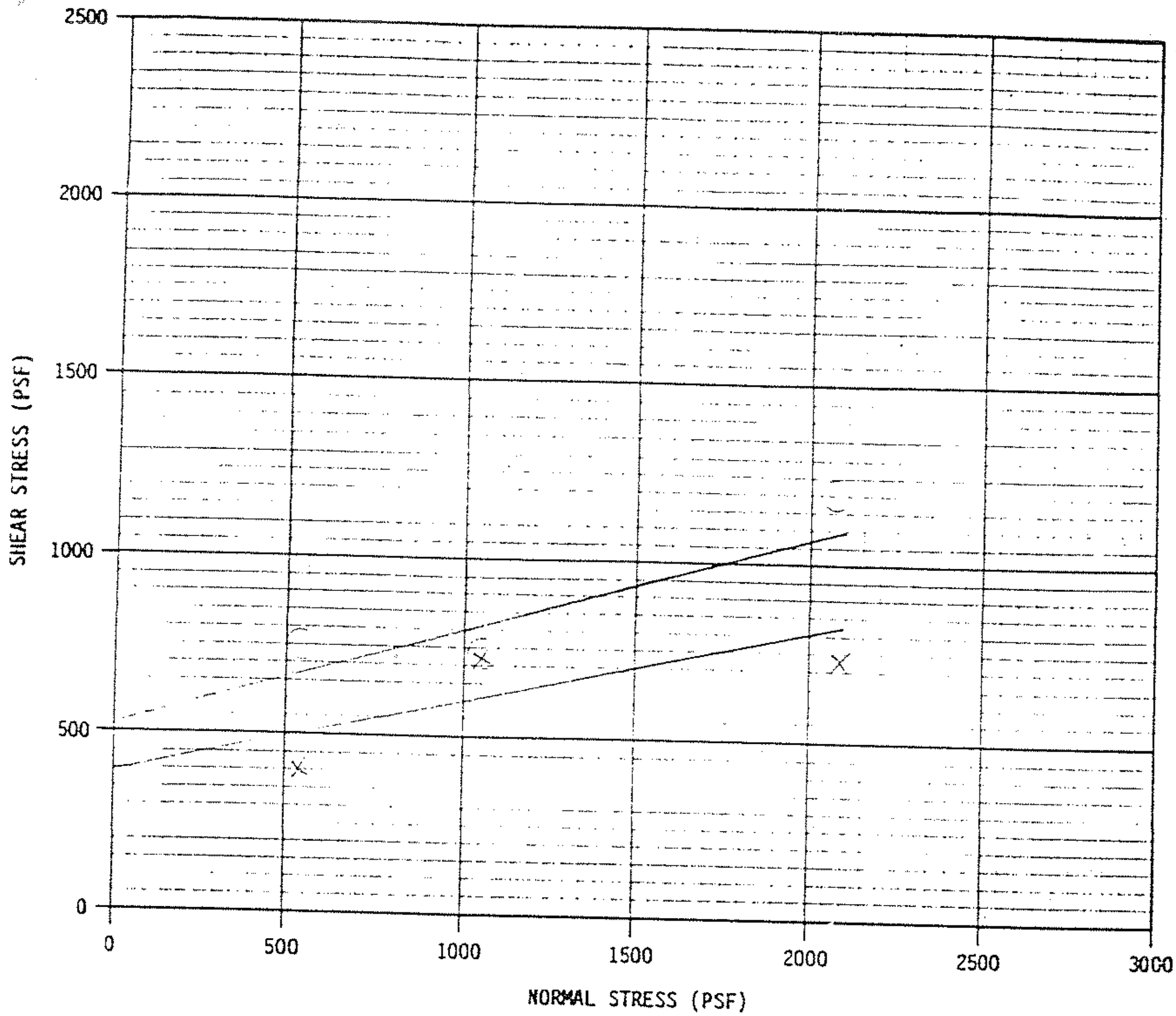
Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12-31-92
GEOTECHNICAL
STATE OF CALIFORNIA

Troy D. Norrell
President



SYMBOL	BORING NUMBER	DEPTH (FEET)	Ø (DEGREES)	C (PSF)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)
X (upper level)	3	2	11	400		
O (lower level)	2	3	15	525		
△						
□						

NOTE: TESTS PERFORMED ON SATURATED SAMPLES UNLESS SHOWN BELOW.
(FM) = FIELD MOISTURE
SAMPLES REMOLDED AT 90% OF MAXIMUM DRY DENSITY PER ASTM D 1557-78 STANDARDS.
(R) = REMOLDED

Plate A

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

DIRECT SHEAR TEST RESULTS

PROJECT 3125-90 DATE

City of Los Angeles
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District VN | Log No. 2583
ADDRESS APPROVED
Signature/Date

APPLICATION FOR REVIEW OF TECHNICAL REPORTS AND IMPORT-EXPORT ROUTES

INSTRUCTIONS

1. Address all communications to the Grading Division, Department of Building and Safety, Room 460A, City Hall, Los Angeles, California 90012-4869. Phone (Area Code 213) 485-3435.
2. Obtain address approval from the Department of Public Works prior to submittal.
3. Submit 2 copies (4 for fault study zone) of reports and 3 copies of application with items (1) through (10) completed.
4. Check should be made to the Department of Building and Safety.

Note: Please

(1) LEGAL DESCRIPTION
Tract 1000
Blk ______ Lots POR 1111

(2) PROJECT ADDRESS 3700 COLDWATER CTN

(3) OWNER HARVARD WESTLAKE SCH.
Address 3700 COLDWATER CTN
City No. HOLLYWD
Zip 91604
Phone (Daytime) 980-6692

(4) APPLICANT ROBERT JOHNSON HARVARD WESTLAKE S
Address 3700 COLDWATER CTN
City No. HOLLYWD
Phone (Daytime) 980-6692 Zip 916

(5) Report(s) Prepared by EPSILON ENGR.

(6) Report Date(s) APRIL 24, 1991

(7) Status of project: ☒ Proposed ☐ Under Construction ☐ Storm Damage

(8) Previous site reports? YES If yes, give date(s) of report(s) and name of company(s) who prepared report(s).

(9) Previous Department actions? YES If yes, please give dates and attach a copy to expedite processing.
Dates 6-9-91

(10) Signature of applicant [signature]
Position ARCHITECT

(DEPARTMENT USE ONLY)

REVIEW REQUESTED & PROCESSING	FEES	REVIEW REQUESTED & PROCESSING	FEES
☐ Foundation Investigation		☐ Seismology report per 91.2305(d)	
☐ Soils Engineering		☐ Environmental Assessment	
☐ Geology		☐ Import-Export Route	
☐ Combined Soils Engr. & Geol.		☐ Division of Land	
☒ Supplemental			
☐ Combined Supplemental	50	Sub-total	50
		One-Stop Surcharge	1
		TOTAL FEE	51

THE REPORT IS ☐ APPROVED WITH CONDITIONS ☒ NOT APPROVED

DEPARTMENT ACTION BY: ______ For Geology ______ Date   Bobby D. Adams 10/18/91 For Soils & Foundation Date

Conditions of Approval ☒ Reasons for Non-Approval ☐ See Attached letter ☐ Supplemental Sheet ____ Attached

1) Provide 3 signed copies of Geologic Report and pay Department Review Fee. 2) Provide additional site subsurface exploration to define soil profiles. 3) Provide analyses and recommendation in accordance with RGA #1-84. 4) Subsurface exploration shall comply with RGA # 5-67.

(Continued Over)

GRADING REPORT 50.00
ONE STOP 1.00
TOTAL 51.00
CHECK 51.00
(Cashier Use Only)

DEPARTMENT USE ONLY
Due 85
Verified [initials]
9/19/91

DISTRIBUTION
☒ Owner
☒ Applicant
☐ ______
☒ Soil Engineer
☒ Geologist
☐ Board files
☐ Tract file

Plan Check: ☐ LA ☒ VN ☐ WLA ☐ SP/WLA

Inspection: ☐ LA ☒ VN ☐ WLA ☐ SP/WLA ☐ BMI ☐ BI

B & S B-17 (R 6/86)

City of Los Angeles
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District VN | Log No. 24683

476114

ADDRESS APPROVED

Signature/Date

APPLICATION FOR REVIEW OF TECHNICAL REPORTS AND IMPORT-EXPORT ROUTES

INSTRUCTIONS

A. Address all communications to the Grading Division, Department of Building and Safety, Room 460A, City Hall, Los Angeles, California 90012-4869. Phone (Area Code 213) 485-3435.
B. Obtain address approval from the Department of Public Works prior to submittal.
C. Submit 2 copies (4 for fault study zone) of reports and 3 copies of application with items (1) through (10) completed.
D. Check should be made to the Department of Building and Safety.

Note: Please Pr

(1) LEGAL DESCRIPTION
Tract 1000
Blk ______ Lots POR 1111

(2) PROJECT ADDRESS 3700 Coldwater Cyn

(3) OWNER FRANK HEDGES
Address 3700 COLDWATER CYN AVE.
City North Hollywood Zip 91604
Phone (Daytime) ______

(4) APPLICANT WEINSTEIN CONSTRUCTI
Address 16153 LEADWELL St.
City VAN NUYS CA
Phone (Daytime) 818-988-5404 Zip 9140

(5) Report(s) Prepared by EPSILON ENGINEERING

(6) Report Date(s) JAN 10, 1991 1-10-9

(7) Status of project: ☒ Proposed ☐ Under Construction ☐ Storm Damage

(8) Previous site reports? NO If yes, give date(s) of report(s) and name of company(s) who prepared report(s).

(9) Previous Department actions? Yes If yes, please give dates and attach a copy to expedite processing.
Dates 5-9-91 (Denied)

(10) Signature of applicant Thomas Stoll Position Employee Weinst

(DEPARTMENT USE ONLY)

REVIEW REQUESTED & PROCESSING	FEES	REVIEW REQUESTED & PROCESSING	FE
☒ Foundation Investigation	Ø	☐ Seismology report per 91.2305(d)	
☐ Soils Engineering		☐ Environmental Assessment	
☐ Geology		☐ Import-Export Route	
☐ Combined Soils Engr. & Geol.		☐ Division of Land	
☒ Supplemental	Ø	Sub-total	Ø
☐ Combined Supplemental		One-Stop Surcharge	

THE REPORT IS ☒ APPROVED WITH CONDITIONS ☐ NOT APPROVED TOTAL FEE Ø

DEPARTMENT ACTION BY: ______ For Geology ______ Date Grant Edwards For Soils & Foundation 7/10/91 Date

☒ Conditions of Approval ☐ Reasons for Non-Approval ☐ See Attached letter ☐ Supplemental Sheet ____ Attach

(1) THIS APPROVAL IS FOR CONSTRUCTION ON OR NEAR SLOPES NOT EXCEEDING 2:1. A DETAILED SUPPLEMENTAL REPORT CONTAINING STABILITY ANALYSIS SHALL BE PROVIDED FOR ANY SLOPE STEEPER THAN 2:1.

(2) ALL FOOTINGS SHALL BE FOUNDED A MINIMUM OF

(Continued Over)

(Cashier Use Only)

DEPARTMENT USE ONLY
Fee Due Ø
Fee Verified [signature]
Date 7-5-91

DISTRIBUTION
☒ Owner
☒ Applicant
☐ ______
☒ Soil Engineer
☐ Geologist
☐ Board files
☒ Tract file

Plan Check: ☐ LA ☒ VN ☐ WLA ☐ SP/WLA

Inspection: ☐ LA ☒ VN ☐ WLA ☐ SP/WLA ☐ BM ☒ BI

TWO FEET INTO UNWEATHERED BEDROCK, AND SHALL BE SETBACK IN ACCORDANCE WITH CODE SECTION 91. 2907(d).

(3) TEMPORARY EXCAVATIONS SHALL NOT EXCEED FIVE FEET.

(4) FILL PLACED IN EXCESS OF 12" SHALL BE COMPACTED A MINIMUM OF 90% R.C. WITH A GRADING PERMIT.

(5) CONDITIONS NO. 2, 3, 4, 9, 10, 12, 13, 19, 20, 21, 22, 25 AND 30 OF THE ATTACHED SUPPLEMENTAL SHEET SHALL APPLY.

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY

SUPPLEMENTAL CONDITIONS FOR FOUNDATION INVESTIGATION REPORTS

1. A grading permit shall be obtained.

2. Existing uncertified fill shall not be used for support of footings, floor slab, or proposed fill.

3. No fill shall be placed until the City Grading Inspector has inspected and approved the bottom excavations.

4. The fill shall be placed under the inspection and approval of the responsible Engineer. A compaction report shall be submitted to the Department upon completion of the compaction.

5. If import soils are used, no footings shall be poured until the responsible Engineer has submitted a compaction report and in place shear test data and settlement data to the Department and obtained approval.

6. Compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the footings.

7. Prior to the issuance of any permit, the owner shall file a notarized Covenant and Agreement with the Office of the Los Angeles County Recorder acknowledging the proposed pavement will be constructed on uncertified fill and future settlement may occur.

8. The building design shall incorporate provision for anticipated differential settlements in excess of one-fourth inch.

9. The responsible Engineer shall review and approve the foundation plan and/or the Excavation/Shoring plan prior to the issuance of any permits.

10. A supplemental report shall be submitted to the Grading Division containing recommendations for shoring, underpinning and sequence of construction if any excavation would remove the lateral support of the public way or adjacent structures.

11. Prior to issuance of any permit, the owner of the subject site shall record a notarized affidavit with the office of the Los Angeles County Recorder which will inform future owners of the subject site that the lateral support of a portion of the building footings on the adjoining property is provided by the subterranean walls of the building on the subject site.

12. Approval from the Department of Public Works shall be obtained for any excavation that would remove the lateral support of the public way.

13. All roof and pad drainage shall be conducted to the street by gravity.

14. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted to the street in an acceptable manner and in a non-erosive device.

15. The design of the subdrainage system required to prevent possible hydrostatic pressure behind retaining/basement walls shall be approved by the responsible Engineer prior to issuance of the building permit. Installation of the subdrainage system shall be inspected and approved by the Soil Engineer.

16. Basement excavations shall be performed under the continuous inspection and approval of the responsible Engineer.

17. Installation of shoring, underpinning, and/or slot cutting excavations shall be performed under the continuous inspection and approval of the responsible Engineer.

September 1989

18. Basement walls and slab shall be waterproofed with an L.A. City approved "Below-grade waterproofing" material with a research report number.

19. If the actual foundation design loads do not conform to the foundation loads assumed in the report, the responsible Engineer shall submit a supplementary report containing specific design recommendations for the heavier loads to the Department for review and approval prior to issuance of a permit.

20. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety.

21. Prior to the issuance of any permit which authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation.

22. A copy of the foundation report and/or supplements and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above foundation report and/or supplements to the Building Department Plan Checker prior to issuance of the permit.

23. All pile driving shall be performed under continuous inspection and approval of the responsible Engineer. A log of pile driving shall be kept and a copy submitted to the Department along with written certification that the work supervised meets the conditions of the report. Such supervision does not waive the required inspection by the City Building Inspector.

24. All friction pile drilling and installation shall be performed under the continuous inspection and approval of the responsible Engineer.

25. Spread footings and slab-on-grade shall be designed for expansive soil conditions.

26. Pile and/or caisson foundation ties are required by Code Section, 91.2312(j)3B. Exceptions and modification to this requirement are provided in Rule of General Application 662.

27. When water over 3 inches in depth is present in drilled pile holes, a concrete mix with a strength p.s.i. of 1000 over the design p.s.i. shall be tremied from the bottom up; an admixture that reduces the problem of segregation of paste/aggregates and dilution of paste shall be included.

28. The installation and testing of tie-back anchors shall comply with the attached sheets titled "Requirements for Tie-back Earth Anchors".

29. Provide a notarized letter from adjoining property owners allowing tie-back anchors on their property.

30. Prior to the pouring of concrete, a representative of the consulting Foundation Engineer shall inspect and approve the footing excavations. He shall post a notice on the job site for the City Building Inspector and the contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Department upon completion of the work.

31. Prior to excavation, an initial inspection shall be called at where time sequence of shoring, protection fences and dust and traffic control will be scheduled.

CITY OF LOS ANGELES

CALIFORNIA

TOM BRADLEY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
411, CITY HALL
LOS ANGELES, CA 90012-48
WARREN V. O'BRIEN
GENERAL MANAGER
EARL SCHWARTZ
EXECUTIVE OFFICER

VN

December 13, 1991

Log # 26755
(SOILS/GEO FILE - 2)

Harvard Westlake School
3700 Coldwater Canyon Avenue
North Hollywood, CA 91604

TRACT: 1000
LOT: a portion of 1111
LOCATION: 3700 COLDWATER CANYON AVENUE

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Soils/Geo Reports	1290-495	01/10/91	Epsilon
	1290-494	04/24/91	Epsilon
	1091-560	11/06/91	Epsilon
	91-128-29	10/01/91	Ryland
	91-128-29	10/10/91	Ryland

The above reports concerning recommendations for construction of bleachers have been reviewed by the Grading Division of the Department of Building and Safety. According to the reports, the site has unsupported bedding planes which have been calculated stable. A fill designed to raise the grade and provide a sloping surface for the bleachers will act as a buttress to support the bedding planes.

The reports are acceptable, provided the following conditions are complied with during site development:

1. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

2. All fill slopes shall be no steeper than 2:1.

3. All proposed cut slopes shall be no steeper than 2 : 1 or the angle of exposed bedding planes, whichever is flatter.

4. A minimum one and one-half equipment width, but not less than 15 feet, buttress shall be provided to support the bedding planes, as recommended.

4A. The buttress keyway shall be founded at least 5 feet into competent bedrock.

5. All recommendations of the report which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

6. A grading permit shall be obtained.

7. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

8. The geologist and soil engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading.

9. Any unsupported shale planes, either existing or exposed by grading, shall be supported by a designed retaining wall or buttress fill.

10. All fill, soil and slope wash shall be removed, and the bedrock properly benched prior to placement of fill, as recommended.

11. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM 1557.

12. Both the geologist and the soils engineer shall inspect and approve all fill and subdrain placement areas prior to placing fill. Both consultants shall include in their final reports a certification of the adequacy of the foundation material to support the fill without undue settlement and/or consolidation.

13. All graded, brushed or bare slopes shall be planted with low-water consumption, native-type plant varieties recommended by a landscape architect. Suitable arrangements shall be made with the Department with respect to continued maintenance of the recommended plant varieties until they are established as an effective ground cover.

14. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety.

15. A structure shall be considered surcharging an excavation if the structure is located within a horizontal distance from the top of the excavation equal to the depth of the excavation as specified in Code Section 91.2903.

16. A supplemental report shall be submitted to the Grading Division containing recommendations for shoring, underpinning, and sequence of construction in the event that any excavation would remove lateral support to adjacent structures. A plot plan showing the type, number of stories, and location or absence of any structures adjacent to the excavation shall be part of the excavation plans.

17. Prior to the placing of compacted fill, a representative of the consulting Soils Engineer shall inspect and approve the bottom excavations. He shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the City Grading Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be filed with the Department upon completion of the work. The fill shall be placed under the inspection and approval of the Foundation Engineer. A compaction report shall be submitted to the Department upon completion of the compaction.

18. Prior to the pouring of concrete, a representative of the consulting Soil Engineer shall inspect and approve the footing excavations. He shall post a notice on the job site for the City Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Department upon completion of the work.

19. Existing fill shall not be used for support of footings, floor slabs or proposed fill.

LARRY WESTPHAL
Chief of Grading Division

THEODORE D. NICKERSON
Engineering Geologist II

BOBBY D. ADAMS
Geotechnical Engineer I

TDN/BDA:lr
TGRSG121391A/4WP
(213) 485-2160

cc: Epsilon Engineering & Inspection, Inc.
Ryland Associates, Inc.
VN District Office
Robert Johnson

CITY OF LOS ANGELES

CALIFORNIA

SAM YORTY
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
402, CITY HALL
LOS ANGELES, CALIF. 90012

R. J. WILLIAMS
GENERAL MANAGER

March 7, 1973

Harvard School
3700 Coldwater Boulevard
North Hollywood, California

3700 COLDWATER BOULEVARD

The Department of Building and Safety approves the foundation investigation and engineering geologic report dated January 29, 1973, prepared by Geology and Soils Consultants, Incorporated (No. GSC 614), concerning the development of a proposed library and field house. The library will be a two story wood frame structure and the field house a two story concrete tilt-up structure.

The following are conditions of this approval:

1. The plans shall comply with all of the recommendations of the Foundation Engineer and a copy of this foundation report, any supplements, and this approval letter shall be attached to the District Office and field set of plans. Submit two copies of the report dated January 29, 1973 to the Building Department Plan Checker prior to issuance of a permit.

2. A grading permit shall be obtained for all grading and shall be performed under the periodic inspection and approval of the Foundation Engineer.

3. If the actual foundation design loads do not conform to the foundation loads assumed in the report, the Foundation Engineer shall submit a supplementary report containing specific design recommendations for the heavier loads to the Department for review and approval prior to issuance of a permit.

4. If import soils are used, no footings shall be poured until the Foundation Engineer has submitted a compaction report and in-place shear test data to the Department and obtained approval.

5. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety.

6. All friction pile drilling and installation shall be performed under the continuous inspection and approval of the Foundation Engineer.

7. All fill or backfill shall be compacted to a minimum of 90% relative compaction as determined by A.S.T.M. method D-1557.

8. Prior to the pouring of concrete, a representative of Geology and Soils Consultants, Incorporated shall inspect and approve the footing and pile excavations. He shall post a notice on the job site for the City Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing and pile excavations. A written certification to this effect shall be filed with the Department upon completion of the work.

R. M. OBERLIES
Chief of Grading Division

RH:JWC:dr
485-3435

cc: Geology and Soils Consultants, Inc.
Johnson & Silvestri
VN Inspection
LA Plan Check

3633/

CONVERSE CONSULTANTS WEST

Consulting Engineering and Applied Sciences

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Telephone (818) 440-0800
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GEOTECHNICAL INVESTIGATION

Proposed Science Building
Harvard Westlake School
3700 Coldwater Canyon Avenue
Studio City, California

PREPARED FOR

Harvard Westlake School
3700 Coldwater Canyon Avenue
Studio City, California

CCW Project No. 93-31-141-01

April 22, 1994

CC-1

CONVERSE CONSULTANTS WEST

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April 22, 1994

Harvard Westlake School
3700 Coldwater Canyon Avenue
Studio City, California 91604

Attention: Mr. Robert Levin
Chief Financial Officer

Subject: GEOTECHNICAL INVESTIGATION
Proposed Science Building
Harvard Westlake School
3700 Coldwater Canyon Avenue
Studio City, California
CCW Project No. 93-31-141-01

Gentlemen:

This report presents the results of our geotechnical investigation of the site of a proposed two-story classroom building at the Harvard Westlake School.

Results of this investigation indicate the site is suitable for support of the proposed structure. Subsurface materials encountered in the borings generally consisted of diatomaceous shale and siltstone bedrock. Clayey soils were encountered above the rock. Minor amounts of fill were also encountered. No groundwater was observed in the borings.

Properly designed foundations consisting of spread footings and end bearing caissons are recommended for support of the building. Because of lateral load considerations, drilled cast-in-place friction piles may be used as an alternate.

Thank you for this opportunity to be of service. If you have any questions, please contact the undersigned.

Very truly yours,

CONVERSE CONSULTANTS WEST

Leonard T. Evans, Jr., Ph.D., GE 302
Vice President/Chief Engineer

Howard A. Spellman, Jr., CEG 154
Sr. Vice President/Geology Manager

Dist: 1/Addressee
15/Gruen Associates
Attn: Mr. Kurt Franzen
(3 copies unbound for City of Los Angeles)

REGISTERED PROFESSIONAL ENGINEER
LEONARD T. EVANS, JR.
No. 302
Exp. 3/31/97
GEOTECHNICAL
STATE OF CALIFORNIA

TABLE OF CONTENTS

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation at the site of the proposed Science Building. The purpose of this investigation was to evaluate existing site and subsurface conditions and to provide recommendations for design of foundations and retaining walls.

The site is located on the west side of the campus, immediately east of the running track and soccer field as shown on Drawing 1. Two existing buildings are to be demolished to make room for the new Science Building. The local topography slopes down to the west-northwest, and the existing facilities are terraced into the natural slopes. The southeastern boundary of the site is the main campus roadway, and the northwestern boundary of the site is a secondary maintenance roadway. This northwestern roadway is to be realigned further to the west; requiring a fill berm atop the existing west-facing slope. It is currently envisioned to construct a retaining wall to support this new roadway. In plan view, the site has overall dimensions of approximately 300 feet north-south by 120 feet east-west. There is approximately 30 feet of elevation drop across the site from the southeast to the northwest.

The proposed Science Building structure will provide 31,000 ± square feet of classroom space, and will be a two-story structure cut into the west-facing slope. For the purposes of this report, it is assumed that bearing wall/retaining wall loads will not exceed 11 kips per foot of wall, and column loads will not exceed 225 kips in the interior of the building. Exterior column loads will be about 75 kips.

2.0 SCOPE OF WORK

The scope of work for the investigation included the following:

- A field exploration program which consisted of drilling, logging and sampling of five borings to depths ranging from 15 to 50 feet. The boring locations are shown on Drawing 1.

- Continuous logs of subsurface conditions encountered were recorded in the field by our personnel. All borings except BH-5 were down-hold logged by an experienced engineering geologist. Descriptions of the field equipment and procedures, and the boring logs are presented in Appendix A. Samples of the subsurface materials were recovered at the site and returned to our laboratory for testing.

- Prepare two geologic cross-sections across the site indicating the orientation of the bedding of the rock. The approximate bottom of foundation level (elevation 695 feet) has been indicated on the sections to illustrate the extent of excavation or filling required.

- A laboratory testing program which included moisture and density determinations, direct shear, consolidation and chemical analysis tests.

- Review of previous Converse reports for nearby projects and review of foundation drawings for a previous project affecting the site.

- Engineering analyses to evaluate the results of the field exploration and laboratory testing, and to develop recommendations for foundations, floor slabs, retaining walls and site grading.

- Preparation of this report which summarizes the results of our investigation and presents geotechnical recommendations for the development of the site.

3.0 SUBSURFACE CONDITIONS

The subsurface materials encountered on this site consisted primarily of Modelo siltstone and diatomaceous shale, with 3 to 17 feet of clay soils overlying the bedrock. Minor amounts of fill were observed to depths of 1 to 2 feet in the borings. Bedding planes strike northeasterly and incline northwesterly 10° to 81°. At these attitudes, bedding planes do not incline unsupported out of descending slopes and are deemed grossly stable from an engineering geologic standpoint (see Drawings 1, 2 and 3).

At the lower floor level of 695 feet the majority of the building area should be in siltstone or shale bedrock. The bedrock is very stiff (by soils definitions) and relatively incompressible. This is in spite of having low densities and high moisture contents due to the diatomaceous shale content. The presence of the diatomaceous material also increased the shearing strength of the rock above that normally associated with Modelo siltstone.

On the southwestern side of the site the surface of the bedrock drops rapidly. The clays encountered in this area are relatively stiff and incompressible. The clay topsoil is potentially expansive as is some of the bedrock. Moisture conditioning and/or replacement of the upper soils will be necessary beneath ground slabs.

No groundwater was encountered in the borings.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 General

At the planned finished grade of 695 feet, the majority of the building footprint will bottom in rock. Conventional continuous and isolated footings may be used in this area. In order to maintain small differential settlements, the remainder of the building may be supported on end-bearing piers or caissons. As an alternate, drilled cast-in-place piles may be used for the entire building in order to develop the lateral resistance of piles in bending.

Shoring will be required east of the proposed building. ~~Conventional soldier piles with tied-back anchors may be used.~~ There has also been discussion about using permanent tied-back anchors with the retaining wall on the east side of the site.

4.2 End Bearing Foundations

On Drawing 1 we have plotted our estimate of the daylight line for rock at elevation 693 feet. We have also estimated the rock contours for the western portion of the building. East of the daylight line rock is expected and shallow footings are recommended in the area. Shallow footings or piers with a minimum embedment of 2 feet below finished grade and bottoming 2 feet into rock may be designed for a dead plus live load bearing of 4,000 psf. When considering temporary forces such as wind or seismic, the above bearing may be increased 50%

West of the daylight line circular end-bearing piers or caissons may be used. Caissons or piers should bottom at least 2 feet into the rock formation as the upper several feet of rock are weathered. The same bearing value may be used for the deep foundations. Caissons will require hand cleaning to insure proper bearing areas.

Settlements of footings supporting column loads of 75 and 225 kips should be about ¼ inch and 0.4 inches, respectively. Continuous footings supporting loads of 11 kips per foot should settle about ¼ inch. These values are based upon a design bearing of 4,000 psf and an actual bearing of 90% of the design value.

4.3 Drilled Piles

The southwestern portion of the building will require deep foundations because of the depth to rock. The northern portion of the building will have to resist large lateral loads due to the high retaining wall and the surcharge from the Seaver Building. The lateral resistance available by using piles may be needed in this area. Thus, there may be deep foundations throughout much of the building.

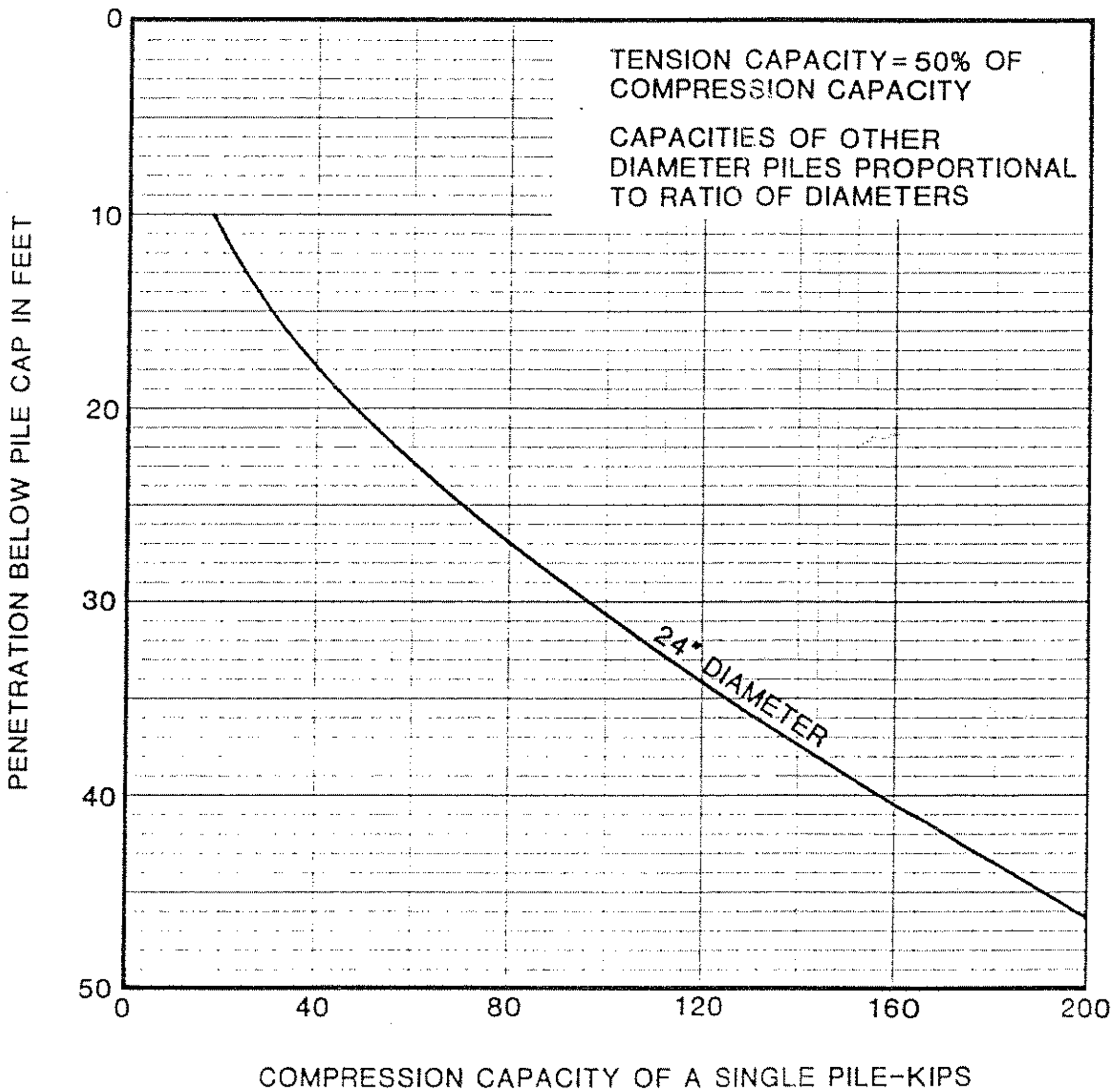
Drilled friction piles will be considerably less expensive than end bearing caissons of the same diameter and length due to the necessity of casing the excavation to hand clean the end bearing caisson. Thus, it may be prudent to use drilled piles throughout the building.

Drilled pile capacities for 24-inch diameter cast-in-place concrete friction piles are given on Figure 1. The capacities are valid for piles embedded in diatomaceous shale, siltstone and the stiff clay alluvium. Other pile diameters may be used. The capacities may be proportional on the ratio of the pile diameters.

Compression capacities presented refer to dead plus live load forces and may be increased 50% when considering temporary forces. Minimum pile spacing should be 2½ diameters on centers. No group efficiency factor is considered necessary.

If piles are properly designed and installed, we estimate pile settlements should be ¼ inch or less.

We encountered hard drilling in Boring BH-2 below a depth of 40 feet. We note in both deep borings we had high (more than 15 blows) driving resistance below 35 feet. There may be hard sandstone layers and heavy-duty drilling equipment with hardened drilling teeth may be required.



Approved for publication 4/2 by [signature]

DRILLED PILE CAPACITIES

CONVERSE CONSULTANTS WEST

Project No. 93-31-141-01

Figure No. 1

4.4 Lateral Resistance

Lateral forces may be resisted by friction between the lower floor slab and supporting soils, passive resistance against sides of footings shear keys or pile caps and by lateral resistance of caissons or piles in bending.

A coefficient of friction of 0.43 may be applied to dead load forces. Passive resistance of the native clays and siltstone undisturbed or properly compacted may be assumed to be 300 psf plus an equivalent fluid pressure of 230 psf per foot of depth. This is valid up to a maximum of 3,000 psf. Where sandy soils are used as backfill, a passive resistance of 240 psf per foot of depth should be used.

Where piles or caissons are used, it may be possible to utilize the lateral capacity of the shaft in bending to resist lateral loads. Table 4-1 presents lateral pile capacity for various diameters of piles embedded in soil. Table 4-2 presents lateral capacities where the piles are in rock. Where rock is within two pile diameters below the bottom of pile cap, Table 4-2 values may be used. Where rock is deeper, use the values in Table 4-1. For the values given in the tables to be applicable, the length of the piles should be at least the minimum length indicated in the table. If shorter piles are used, the top of pile deflection will be greater for the same lateral load.

TABLE 4-1

LATERAL PILE CAPACITIES - SOIL

FREE HEAD	24" Drilled	30" Drilled	36" Drilled	42" Drilled
Lateral Capacity, kips[a]	14.3	19.8	26.0	32.0
Maximum Moment[b]	4.3P	5.2P	6.1P	7.0P
Depth to Zero Moment, ft	20	24	27	32
Depth to Maximum Moment, ft	7.3	8.8	10.2	11.8
Minimum Pile Length (ft)	22	27	30	36
FIXED HEAD				
Lateral Capacity, kips[a]	28.3	39.0	50.5	63.1
Maximum Positive Moment[b]	1.5P	1.9P	2.2P	2.6P
Maximum Negative Moment[b]	5.4P	6.7P	7.9P	8.9P
Depth to Maximum Positive Moment, ft	13.0	16.0	18.8	21.5
Depth to Maximum Negative Moment, ft	0	0	0	0
Depth to Zero Moment, ft	25	31	36	41
Depth to Inflection Point, ft	7.0	8.4	10.0	11.0
Minimum Pile Length (ft)	25	31	36	41

a Lateral capacity is based on ¼ inch deflection and may be increased by ⅓ for short durations of loading which include the effect of wind or seismic forces.

b Moment is for the horizontal load, P, applied to the bottom of pile cap; if the horizontal load is in pounds, the moment will be in foot-pounds.

TABLE 4-2

LATERAL PILE CAPACITIES - ROCK

FREE HEAD	24" Drilled	30" Drilled	36" Drilled	42" Drilled
Lateral Capacity, kips[a]	24.0	33.0	43.5	54.1
Maximum Moment[b]	3.9P	4.7P	5.5P	6.2P
Depth to Zero Moment, ft	18	22	26	29
Depth to Maximum Moment, ft	6.5	7.9	9.2	10.6
Minimum Pile Length (ft)	20	24	28	32
FIXED HEAD				
Lateral Capacity, kips[a]	47.1	65.0	84.0	105.0
Maximum Positive Moment[b]	1.4P	1.7P	2.0P	2.3P
Maximum Negative Moment[b]	5.0P	6.1P	7.0P	8.0P
Depth to Maximum Positive Moment, ft	12.0	14.5	17.0	19.2
Depth to Maximum Negative Moment, ft	0	0	0	0
Depth to Zero Moment, ft	23	27	32	37
Depth to Inflection Point, ft	6.2	7.6	8.7	10.0
Minimum Pile Length (ft)	23	27	32	37

a Lateral capacity is based on ¼ inch deflection and may be increased by ⅓ for short durations of loading which include the effect of wind or seismic forces.

b Moment is for the horizontal load, P, applied to the bottom of pile cap; if the horizontal load is in pounds, the moment will be in foot-pounds.

The Structural Engineer also requested we consider the use of multiple shear keys on the sides of grade beams to increase the lateral resistance. To be effective, the keys need to be spaced far enough apart so that the failure mode is a passive wedge failure of a soil block on the face of the shear key and not a general shear failure in the soil along a line parallel to the grade beam but located at the ends of the shear keys. We recommend that if the shear key projects outward a distance *m* from the face of the grade beam, the spacing between shear keys be at least 5m apart. The values presented above for passive resistance may be used on the faces of shear keys which are normal to the axis of the grade beam. All of the recommendations regarding shear keys assume the grade beams are poured neat.

The lateral resistances presented above may be combined and used simultaneously without reduction.

4.5 Seismic Design

This site is not within a currently designated Alquist-Priolo Special Studies Zone. However, strong groundshaking due to seismic activity is anticipated at this site. This site is within the Uniform Building Code (UBC) Seismic Zone 4, as is most of Southern California. A site factor of 1.0 (S_1) can be used, as shown in Table No. 23-J of the 1991 UBC, for seismic design as rock is at or close to the surface.

4.6 Slabs-on-Grade

Some of the floor slabs or exterior ground slabs will be in rock cut while the remainder will be in areas of clay soils or new compacted fill. It is presumed the compacted fills will be the material from the cut zones. The soils, including rock, are moderately expansive if allowed to dry back. Conventional 4-inch thick slabs-on-grade may be used for support of nominal ground floor loads. A minimum of 6" x 6" - 6/6 welded wire fabric or #3 bars on 24-inch centers, each way, should be used as reinforcement. Prior to reinforcement, the upper foot of soil or rock should be scarified, moisture conditioned to at least 3% above optimum and compacted to 90% relative compaction. The moisture content of the subgrade should be maintained or adjusted to 3-4% above optimum for a depth of 2 feet below lowest adjacent grade until slabs are poured. As an alternative, the upper 2 feet of soil could be replaced with non-expansive soils with no moisture content restrictions.

If a moisture-sensitive floor covering, such as vinyl tile is used, slabs should be underlain by a 6-mil thick polyethylene plastic vapor barrier. If the barrier is used, it should be underlain and covered with 2 inches of sand to prevent punctures and to aid in the concrete cure. Joints should be lapped a minimum of 6 inches and taped.

4.7 Retaining Walls

There will be several conventional retaining or subterranean walls on the project. The design earth pressures presented in Table 4-3 are based on the following assumptions:

1. The backfill will be drained earth.
2. The backfill will be non-expansive soil.
3. Cantilevered walls are those that are free to deflect during and after backfilling.

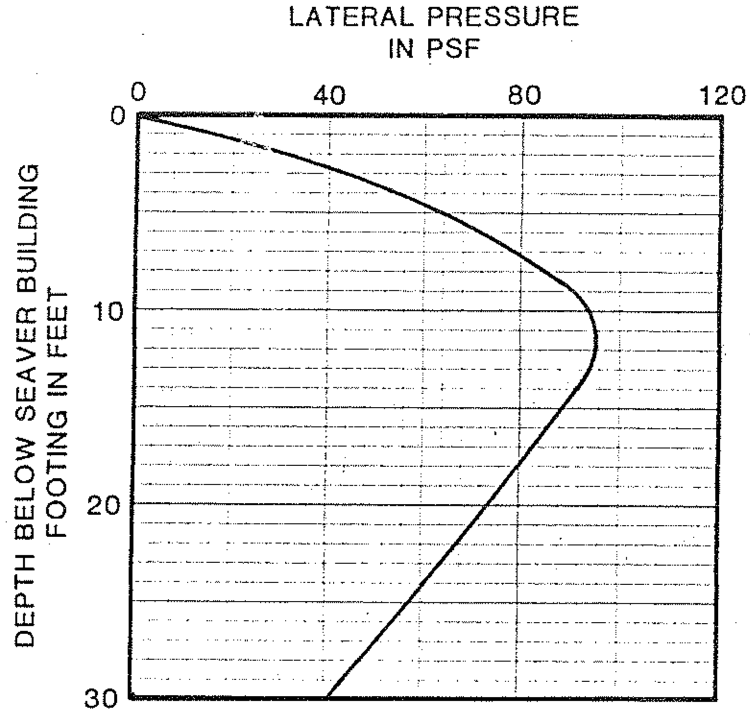
TABLE 4-3

RETAINING WALLS - EARTH PRESSURE

SLOPE RATIO (horizontal:vertical)	DESIGN EARTH PRESSURES (Equivalent fluid - pcf)	
	Cantilevered Wall	Restrained Wall
Level	30	35
4:1	34	39
2.3:1	39	44
2:1	43	48
5:3	49	54
1½:1	53	58

All walls should be provided with a drainage system on the rear face of the walls and a french drain system or weep holes to promote drainage. Non-expansive soils should be used as backfill behind retaining walls to promote drainage and to eliminate swelling pressures. The granular backfill should be used within a zone extending upward at 45° from the base of the wall stem and over to the wall stem.

Where walls will support nearby roads, a traffic surcharge should be used. If the roadway is less than 5 feet from the wall, a surcharge of 150 psf acting in the top 10 feet should be added. If the road traffic is between 5 to 10 feet from the wall, use 100 psf surcharge in the top 10 feet.



NOTES:

1. Assumes buildings are about 19 feet apart.
2. Assumes actual bearing on Seaver Building footings is about 3,000 psf.

Approved for publication 1/22, by JE

LATERAL SURCHARGE FROM SEAVER BUILDING

CONVERSE CONSULTANTS WEST

Project No. 93-31-141-01

Figure No. 2

This wall will be located in an area where the foundation will bottom in the stiff clay alluvium. For design purposes, the bearing value should be limited to 2500 pst for dead plus live loads. The wall is shown on sections provided by the Architect as being built on the side of a slope that varies from about 3:1 to 1½:1. The embedment of the toe of the wall will have to be deep enough so that the toe will be at least 5 feet horizontally from the surface of the slope. In addition, the passive resistance in front of the toe of the wall will be considerably less because of the negative slope in front of the wall. For a negative 1½:1 slope in front of the wall, the passive resistance will reduce to an equivalent fluid pressure with a density of about 125 pcf. If a shear key is used beneath the rear face of the footing, full passive resistance may be used.

4.8 Temporary and Permanent Slopes

Temporary excavations during construction should be designed in accordance with the following recommendations. Please note that safety during construction is the contractor's responsibility. The use of sloped excavations may be applicable where plan dimensions for excavation are not limited by existing buildings, streets or utilities. Where constraints exist, temporary shoring will be required.

Based upon soil encountered in the test borings, it is our opinion that sloped temporary excavations in the clay may be according to the slope ratios presented in Table 4-4. These slopes ratios are valid where no structures are involved at the top of slope. Below nearby structures shoring should be used.

TABLE 4-4
TEMPORARY EXCAVATION SLOPES

MAXIMUM DEPTH OF CUT (ft)	MAXIMUM SLOPE RATIO* (horizontal to vertical)
0-5	vertical
5 - 15	3/4 to 1

* Slope gradient assumed to be uniform from toe to top of slope.

1:1

Slope ratios of temporary slopes excavated in rock will be dependent upon the orientation of the bedding with respect to the slope. In general, south- and east-facing temporary slopes should be stable if cut at 3/4 horizontal to 1 vertical. North- and west-facing cut slopes will probably daylight bedrock bedding and may require shoring or the slopes cut back to the angle of the bedding planes. On the east side of the proposed building we recommend the temporary slope be shored.

No surcharge load should be permitted within 10 feet of the top of the temporary slope.

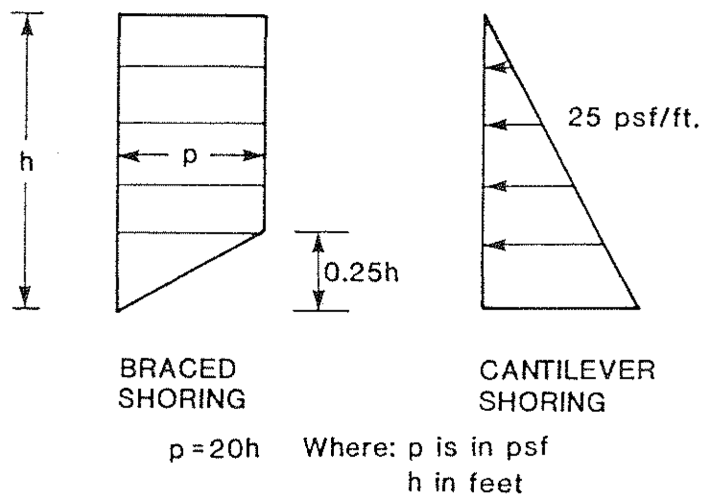
Permanent slopes should be no steeper than 2 horizontal to 1 vertical.

4.9 Shored Excavations

Temporary shoring consisting of steel soldier piles set in concrete may be used. Cantilevered shoring could be used for shallow excavations up to 15 feet deep and where lateral movement and/or settlement behind the wall is not a critical factor.

To limit local sloughing, we recommend that exposed soils between soldier piles be supported by lagging or guniting. All lumber to be left in the ground should be pressure-treated in accordance with Specification C-2 of the American Wood Preservers Association (AWPA).

Temporary shoring supporting a horizontal surface should be designed to resist earth pressures, excluding surcharge loads, as indicated in the following sketch. Surcharge effects may be computed using a pressure coefficient of 0.3 times the uniform surcharge pressure.



For sloping surfaces use the values in Table 4-5.

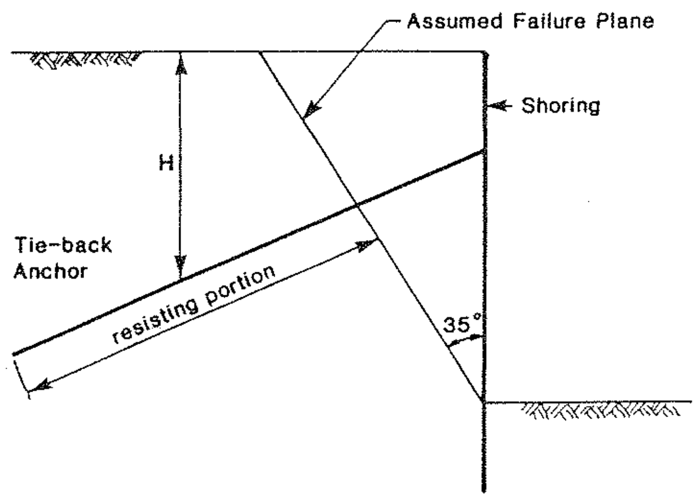
TABLE 4-5

TEMPORARY SHORING PRESSURES

SLOPE RATIO (horizontal:vertical)	SHORING PRESSURES	
	Cantilevered	Tied-Back
Level	25	20H
4:1	28	22H
2.3:1	33	25H
2:1	36	27H
5:3	41	31H
1.5:1	44	33H

Lateral resistance for soldier piles may be assumed to be provided by passive resistance below the bottom of excavation. The allowable passive pressure for soldier piles may be taken as 500 pounds per square foot of depth, measured below the bottom of the excavation. The allowable passive resistance is for soldier piles spaced not less than two diameters center-to-center. Tie-back soil anchors may be required to provide additional resistance to lateral soil pressures. Recommendations for design of soil anchor tie-backs are presented below.

Soil Anchor Tie-back: For design purposes, it may be assumed that the potential wedge of failure as determined by a plane drawn at 35° with the vertical through the bottom of the excavation as shown in the sketch below.



For estimating the allowable capacity of drilled friction anchors, frictional values may be computed using the following equation:

$$q = 25H \text{ pounds per square foot}$$

where:

H = average depth of resisting portion of anchor measured vertically below the ground surface, feet.

The above equation is valid up to a maximum of 550 psf. Only the frictional resistance developed beyond the assumed failure plane should be assumed effective in resisting lateral loads.

The anchors may be installed at angles between 15° to 40° below the horizontal. If caving occurs in the drilled shafts, casing can be used prior to concrete pour; but casing must be pulled as the shaft is poured. Structural concrete should be placed in the lower portion of the drilled shaft up to the assumed failure plane. Pouring of the anchors should be done by pumping the concrete through a tremie or pipe extending to the bottom of the shaft. The anchor shaft between the failure plane and the face of the shoring may be backfilled with sand after concrete placement.

All temporary anchors should be preloaded to 150% of design load for at least 15 minutes. If acceptable, the anchors should be locked off at 100% of design load. At least 5% of the anchors should be tested to 200% of maximum design load. The 200% of design load should be maintained and monitored for at least 24 hours. If there is any creep or load reduction during the testing period, it may be necessary to run anchor load tests for a week at about 125% of design load. If there is creep or load reduction at 125% of design load, it will be necessary to modify the anchor design.

We understand a soldier pile wall with gunite facing and permanent tied-back anchors is being considered for the east wall. If such a retaining wall is used independent of the building, then the lateral loads from the retained earth and Seaver Building surcharge will not have to be transferred by the building frame to the ground.

A permanently tied-back wall can be used provided that approval is obtained from the City. The anchors will have to be protected against corrosion. From a geotechnical standpoint we have the following additional recommendations:

1. Anchor friction capacities should be reduced to a maximum of 500 psf.
2. Trapezoidal shoring pressures presented in Table 4-5 should be increased 4H psf.
3. Pressures for permanent cantilevered walls should be taken from Table 4-3, not Table 4-5.
4. All permanent anchors should be tested to 200% of design load. At least 5% of the anchors should be tested for at least 24 hours.

It is recommended that CCW review the plans and specifications for the proposed shoring system and that a CCW representative observe and monitor the installation of the shoring.

4.10 Slope Stability

The slope between the Seaver Building and the northern end of the proposed building was analyzed and discussed in Section 4.7. The factor of safety was in excess of 1.5 and is acceptable.

The slope uphill of the southern end of the building and the main campus roadway is shown in Section 1-1'. Bedding is not uniform in the area. We chose to analyze a wedge between the proposed building and the roadway as shown on Sheet C-2 in Appendix C. The sliding wedge had a factor of safety of 1.74 and is acceptable.

4.11 Earthwork

Site development is expected to consist of demolishing two buildings, clearing of the site, excavation on the east side of the site and filling on the west side, slab subgrade preparation, and backfilling for retaining walls, footings and utility trenches. Recommended specifications for compaction of fill are presented in Appendix D. Suggested guidelines for structural backfill and utility trench backfill and drainage are presented below.

- Structural Fill: Where the building pad and/or footings require filling, excavated onsite soils are suitable for use as backfill, provided they are moisture-conditioned to above optimum and properly compacted. Granular backfill is recommended behind subterranean walls. Loose soil, formwork and debris should be removed prior to backfilling the walls. Backfill should be placed and compacted in accordance with the recommended specification of Appendix D. Where space limitations do not allow for conventional backfill compaction operations, special backfill materials and procedures may be required. Pea gravel or other select backfill can be used in limited space areas. Recommendations for placement and densification of pea gravel or other special backfill can be provided during construction.

- Site Drainage: Adequate positive drainage should be provided away from the structure to prevent water from ponding and to reduce percolation of water into the backfill. A desirable slope for surface drainage is 2% in landscaped areas and 1% in paved areas. Planters and landscaped areas adjacent to the building perimeter should be designed to minimize water infiltration into the subsoils behind any basement walls.

- Utility Trenches: Buried utility conduits should be bedded and backfilled around the conduit in accordance with the project specifications. Where conduit underlies concrete slabs-on-grade and pavement, the remaining trench backfill above the pipe should be placed and compacted in accordance with recommendations given in Appendix D.

4.12 Corrosivity

A sample of the near surface soils was tested for corrosivity. Results of the tests indicate no detectable soluble sulfate concentration, chloride concentrations of 71 ppm, pH of 7.7 and minimum resistivity of 1,850 ohm-cm.

Type I or II Portland cement should be used for concrete in contact with soils. The results of the resistivity test indicate that stray currents in the soils may induce moderate to severe corrosion to metallic pipes. If such piping is planned, we recommend that a corrosion consultant be retained to further evaluate the potential corrosivity and provide specific recommendations for buried metal pipes.

4.13 Plan Review

This report has been prepared to aid in evaluating the site and to assist the structural engineer in the design of foundations for the proposed structure. It is recommended that this office be provided the opportunity to review the final design drawings and specifications to determine if the recommendations of this report have been properly implemented.

4.14 Observations and Testing During Construction

All structural fill and backfill should be placed and compacted under observation and testing by this office. All footings, caissons or pile excavations should be observed prior to placement of steel and concrete to ascertain that they are founded on satisfactory soils and that excavations are free of loose and disturbed materials.

5.0 CLOSURE

The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering principles and practice. We make no other warranty, either express or implied. The findings and recommendations are based on the results of field and laboratory investigations, combined with an extrapolation of soil conditions beyond the boring locations. If conditions encountered during construction appear to be different from those shown in the borings, this office should be notified immediately.

APPENDIX A
FIELD EXPLORATION

APPENDIX A
FIELD EXPLORATION

The field exploration included a site reconnaissance and subsurface drilling program. During the site reconnaissance, the surface conditions were noted and the boring locations were determined.

Test borings were advanced using a truck-mounted bucket auger drill rig equipped for sampling. Soils and bedrock were continuously logged by an experienced geologist and soils were visually classified in the field in accordance with the Unified Soil Classification system. Four borings were down-hole logged to obtain attitudes of geologic structure (bedding planes). The field descriptions have been modified, where appropriate, to reflect laboratory test results.

Relatively undisturbed drive samples of the subsurface materials were obtained at frequent intervals in the borings using a drive sampler (2.4-inch inside diameter, 3-inch outside diameter) lined with sample rings. The thin-walled steel sampler was driven into the bottom of the borehole with successive drops of a driving weight. The blow counts and drop hammer weights are shown on the boring logs. The samples were retained in brass rings (2.4 inches in diameter, 1.00 inch in height). The central portion of the sample was normally retained and carefully sealed in waterproof plastic containers for shipment to the laboratory.

Logs of the borings are presented in the following boring summary sheets which also include descriptions of the earth materials, pertinent field data and supplementary laboratory data.

Log of Boring No. BH-1

Date Drilled: 3/9/94 Logged by: GAL Checked by: LTE

Equipment: 24" Bucket Auger Driving Weight and Drop: see Drawing A-1b

Ground Surface Elevation: 719 feet Depth to Water: none encountered

SUMMARY OF SUBSURFACE CONDITIONS

This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

DEPTH (ft)	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER*
	3 inches of ASPHALT						
	FILL: SANDY SILT (ML); with rock fragments, bricks and other debris						
5	**COLLUVIUM: SILT (ML);** clayey, contains angular rock fragments to 3 inches diameter, brown	■		4	50	57	
	WEATHERED BEDROCK: CLAYEY SILTSTONE; brown						
10	**BEDROCK: CLAYEY SILTSTONE;** easily excavated with hand pick, laminated to thinly bedded, maximum bed thickness 3 inches	■		5	43	78	ds
	6.5' Bedding: N55E,19NW 10' Bedding: N52E, 25NW						
	SANDY SILTSTONE interbedded with CLAYEY SILTSTONE, moist		▨				
15	15' Bedding: N44E, 17NW	■		5			
20	20.5' Bedding: N52E, 23NW CLAYSTONE layer 1 to 3 inches thick, dark red brown						
25	Interbedded SILTSTONE, silty fine grained SANDSTONE and Diatomaceous Shale, bedding 1/4 to 3 inches	■		5	44	75	
30	30' Bedding: N48E, 17NW						
35	35' Bedding: N52E, 17NW						

Converse Consultants West

Project No. 93-31-141-01 Drawing No. A-1a

Log of Boring No. BH-1

Date Drilled: 3/9/94 Logged by: GAL Checked by: LTE

Equipment: 24" Bucket Auger Driving Weight and Drop: see below

Ground Surface Elevation: 719 feet Depth to Water: none encountered

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER*
		Laminated SILTY CLAYSTONE and SILTSTONE, light brown to brown	■		17	27	94	
40		CLAYEY SILTSTONE bed about 1 foot thick SILTY CLAYSTONE, thinly laminated with SILTSTONE 41' Bedding: N56E, 15NW						
45		SILTSTONE, poorly bedded, bedding thickness to 4 feet, dark brown 45' Bedding: N39E, 14NW		▨				
50		49' Bedding: N46E, 17NW	■		50	30	90	
		End of boring at 51 feet No groundwater encountered Boring backfilled and tamped 3/9/94 DRIVING WEIGHT and DROP 0-28.5 feet: 3930 pounds/24 inches 28.5-51 feet: 2391 pounds/24 inches						

Converse Consultants West

Project No. 93-31-141-01

Drawing No. A-1b

Log of Boring No. BH-2

Date Drilled: 3/9/94 Logged by: GAL Checked by: LTE

Equipment: 24" Bucket Auger Driving Weight and Drop: see Drawing A-2b

Ground Surface Elevation: 710 feet Depth to Water: none encountered

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER*
		3 inches of ASPHALT						
		FILL: SILT (ML)						
5		COLLUVIUM: SILT (ML); clayey, rock fragments to 3 inches, abundant roots and rootlets, krotovina, light brown to dark brown, minor clay illuviations			4	33	81	
		WEATHERED BEDROCK: SILT (ML); clayey						
10		BEDROCK: CLAYEY SILTSTONE; with interbeds of SANDY SILTSTONE and silty fine SANDSTONE, SANDSTONE beds <1 inch thick, CLAYEY SILTSTONE beds up to 3.5 inches thick, light brown to brown 7' Bedding: N70E, 81NW			6	35	82	
15		15' Bedding: N70E, 74NW						
20		20' Bedding: N67E, 76NW Increase in fine grained SANDSTONE content, beds to 2.5 inches, light brown						
25		25' Bedding: N66E, 74NW			9	18	98	
30		30' Bedding: N78E, 73NW						

Converse Consultants West

Project No. 93-31-141-01

Drawing No. A-2a

Log of Boring No. BH-2

Date Drilled: 3/9/94 Logged by: GAL Checked by: LTE

Equipment: 24" Bucket Auger Driving Weight and Drop: see below

Ground Surface Elevation: 710 feet Depth to Water: none encountered

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER*
		35' Bedding: N70E, 58NW Increased clay content-predominantly clayey siltstone			20	54	68	
40		40' Bedding: N75E, 71NW Hard drilling-used crowders-localized concretions						
45		45' Bedding: N72E, 72NW			21	35	87	
50					24	25	99	
		End of boring at 51 feet No groundwater encountered Boring backfilled and tamped 3/9/94 <u>DRIVING WEIGHT and DROP</u> 0-28.5 feet: 3930 pounds/24 inches 28.5-51 feet: 2391 pounds/24 inches						

Converse Consultants West

Project No. 93-31-141-01

Drawing No. A-2b

Log of Boring No. BH-3

Date Drilled: 3/9/94 Logged by: GAL Checked by: LTE

Equipment: 24" Bucket Auger Driving Weight and Drop: 3930 pounds/24 inches

Ground Surface Elevation: 700 feet Depth to Water: none encountered

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER*
		3 inches of ASPHALT						
		FILL: SILT (ML); clayey, brown						
		BEDROCK: DIATOMACEOUS SHALE 4' Bedding: N66E, 16NW						
5					7	33	84	c
		8' Bedding: N63E, 10NW SILTY CLAYSTONE, brown						
10		DIATOMACEOUS SHALE			9	31	63	
		13' Bedding: N62E, 12NW						
15						43	78	
		End of boring at 16 feet No groundwater encountered Boring backfilled and tamped 3/9/94						

Converse Consultants West

Project No. 93-31-141-01

Drawing No. A-3

Log of Boring No. BH-4

Date Drilled: 3/10/94 Logged by: GAL Checked by: LTE

Equipment: 24" Bucket Auger Driving Weight and Drop: 3930 pounds/24 inches

Ground Surface Elevation: 694 feet Depth to Water: none encountered

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER*
		4 inch thick ASPHALT						
		COLLUVIUM: CLAY (CL); silty, angular rock fragments to 1.5 inches, minor clay illuviation 4 to 6 feet, dark brown		X				
5			X		13			c ds
		WEATHERED BEDROCK: SILTY DIATOMACEOUS SHALE; contact between Colluvium and Weathered Bedrock had filled paleo ground cracks, 1 to 2 inches wide to a maximum of 2.5 feet below the contact		X				
10		6' Bedding: N66E, 12NW 9' Bedding: N59E, 16NW	X		7	43	76	
		13' Bedding: N63E, 17NW						
15			X		10	39	78	
		End of boring at 16 feet No groundwater encountered Boring backfilled and tamped 3/10/94						

Log of Boring No. BH-5

Date Drilled: 3/9/94 3/10/94 | Logged by: GAL | Checked by: LTE

Equipment: 24" Bucket Auger | Driving Weight and Drop: 3930 pounds/24 inches

Ground Surface Elevation: 689 feet | Depth to Water: none encountered

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER*
		4 inches of ASPHALT						
		FILL: SANDY SILT (ML); light brown						
		ALLUVIUM: CLAY (CL); silty, dark brown to black						
5		abundant roots and rootlets			6	23	103	ds
10					7	21	103	c
15					8	25	99	
		PALEOSOL - moderately well developed argellic B horizon, good to moderate ped faces						
20		WEATHERED BEDROCK: filled paleo ground cracks, 1 inch wide maximum, 1.5 feet deep maximum, Bedrock-laminated, diatomaceous shale and fine grained sandy siltstone, light brown			7	44	76	
		End of boring at 23 feet No groundwater encountered Boring backfilled and tamped 3/10/94						

Converse Consultants West

Project No. 93-31-141-01

Drawing No. A-5

MAJOR DIVISIONS			SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS More than half is larger than No. 200 sieve	GRAVELS More than half coarse fraction is larger than No. 4 sieve	Clean gravels with little or no fines	GW	Well graded gravels, gravel-sand mixtures
			GP	Poorly graded gravels, gravel-sand mixtures
		Gravels with over 12% fines	GM	Silty gravels, poorly graded gravel-sand silt mixtures
			GC	Clayey gravels, poorly graded gravel-sand-clay mixtures
	SANDS More than half coarse fraction is smaller than No. 4 sieve	Clean sands with little or no fines	SW	Well graded sands, gravelly sands
			SP	Poorly graded sands, gravelly sands
		Sands with over 12% fines	SM	Silty sands, poorly graded sand-silt mixtures
			SC	Clayey sands, poorly graded sand-clay mixtures
FINE GRAINED SOILS half is smaller than No. 200 sieve	SILTS AND CLAYS Liquid limit less than 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic clays and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous fine, sandy or silty soils, 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 and other highly organic soils

SAMPLE TYPE

STANDARD PENETRATION TEST, Split barrel sampler in accordance with ASTM D1586-84 Standard Test Method

DRIVE SAMPLE, 2.42-inch inside diameter driven with 140-pound weight, 30-inch drop (ASTM D 3550-84)

BULK SAMPLE, loose cuttings from exploration

TEST TYPE

(Results shown in Appendix B)

	OTHER
CLASSIFICATION	
Plasticity	pi
Grain Size Analysis	ma
Sand Equivalent	SE
Specific Gravity	sg
Expansion Index	EI
Compaction Curve	max
STRENGTH	
Pocket Penetrometer	p
Direct Shear	ds
Unconfined Compression	uc
Triaxial Compression	tx
R-value	R
CONSOLIDATION	c
Collapse	col

EXPLORATION LOG KEY

APPENDIX B

LABORATORY TEST PROGRAM

APPENDIX B
LABORATORY TEST PROGRAM

Laboratory tests were conducted on representative samples for the purpose of classification, and determination of their physical properties and engineering characteristics. The amount and selection of the types of testing for a given study are based on the geotechnical conditions of the project. Test results are presented on the boring logs and in this appendix. A summary of the various laboratory tests conducted by our office for engineering purposes is presented below.

Moisture-Density Relationships

The in-situ moisture content in percent of dry weight and in-situ dry density in pounds per cubic foot were determined on selected drive samples obtained during the field exploration. Data obtained from theses tests were used to aid in the classification and correlation of the materials and to provide qualitative information regarding strength and compressibility. Test results are presented on the boring logs in Appendix A.

Maximum Density

Compaction curves were run on two samples of the upper soils in order to determine the maximum dry density and optimum moisture content. The tests were run using the ASTM D 1557-91 test procedure. The results are:

BORING	DEPTH (feet)	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)
4	3 - 5	81.2	32.0
5	2 - 4	107.5	18.0

Expansion Index

An expansion index test was fun on a bulk soil sample from Boring 4 at a depth of 3 to 5 feet. The test was run in accordance with the ASTM D 4829-88 test procedure. The corrected expansion index was 61%.

Consolidation

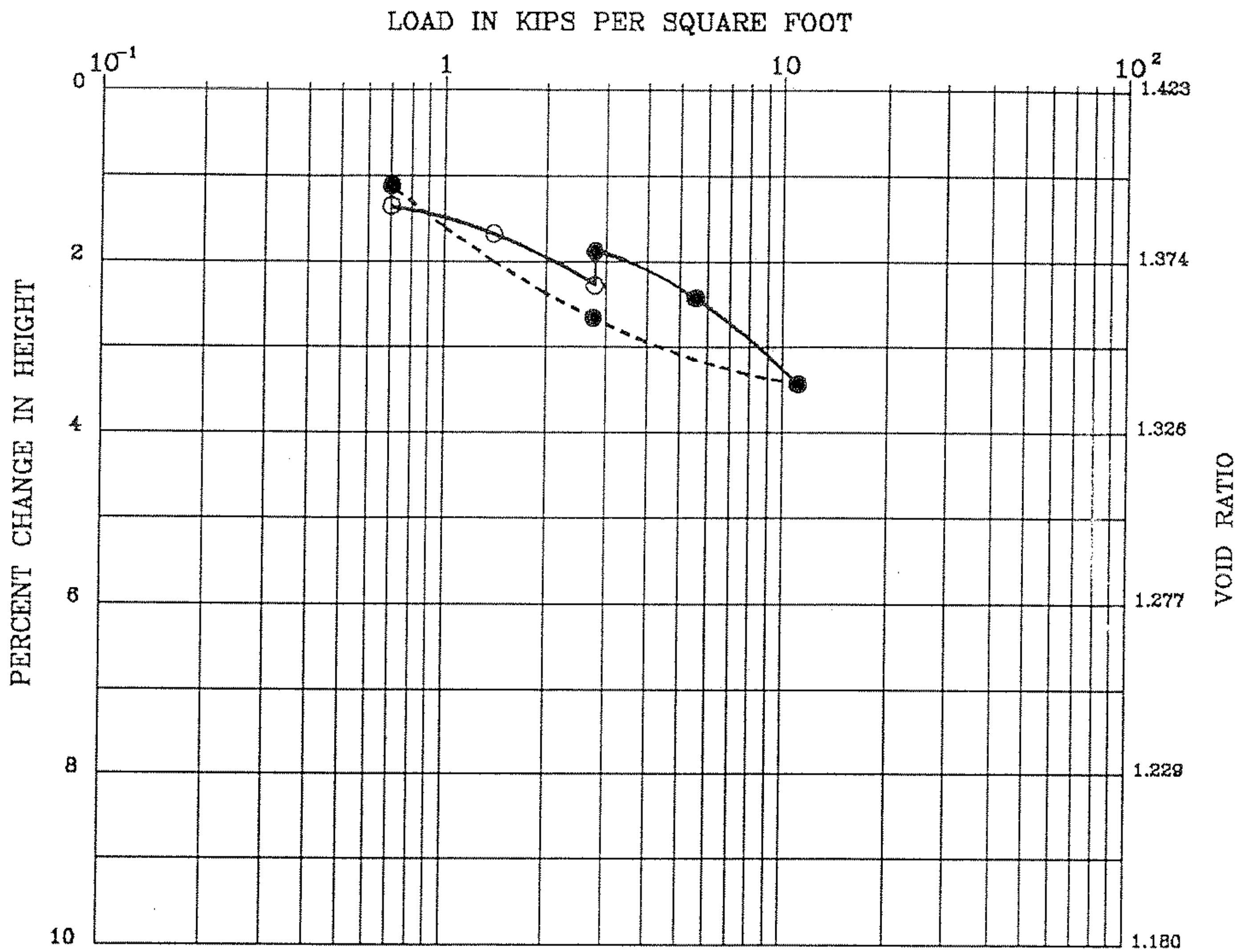
Two consolidation tests were performed on drive samples of the soil and rock to determine the compressibility and moisture sensitivity of the material. In addition, one consolidation test was run on a sample of compacted fill. Test results are presented on Drawings B-1 through B-3.

Direct Shear

The shear strength characteristics of the rock and soil were obtained from direct shear test results. Samples were soaked under surcharge prior to shearing. Samples were sheared to at least 50% shear strain. Load and deformation readings were continuously taken and stored on floppy disk. Printouts of the readings were made and the peak and residual shear stresses were calculated from the load readings. Test results are presented on Drawings B-4 through B-6.

Soil Corrosivity

Resistivity, pH, soluble sulfate and chloride concentrations were determined on one sample to evaluate the corrosion potential of common construction materials in contact with site soil. These tests were performed by M.J. Schiff & Associates, Inc. and the test results are enclosed at the end of this appendix.



BORING : BH-3
DEPTH (ft) : 5 - 6

DESCRIPTION : BEDROCK: DIATOMACEOUS SHALE

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	31.5	70.0	60	1.423
FINAL	51.2	70.8	100	1.394

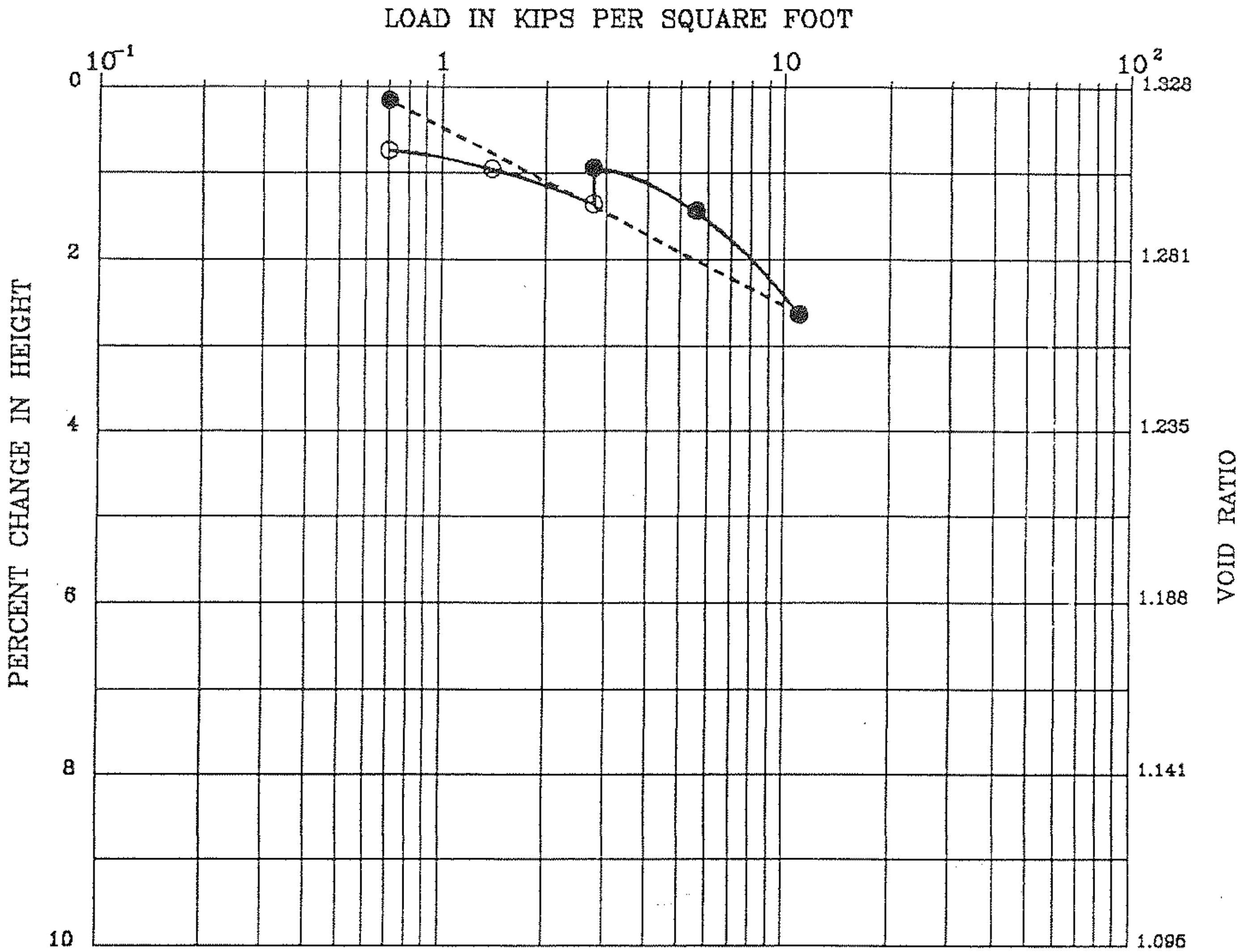
Note: Solid circles indicate readings after addition of water

CONSOLIDATION TEST

Converse Consultants West

Project No. 93-31-141-01

Drawing No. B-1



BORING : BH-4

DEPTH (ft) : 3 - 5

DESCRIPTION : *REMOLD: CLAY (CL), silty

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	31.9	72.5	65	1.328
FINAL	47.7	72.6	97	1.323

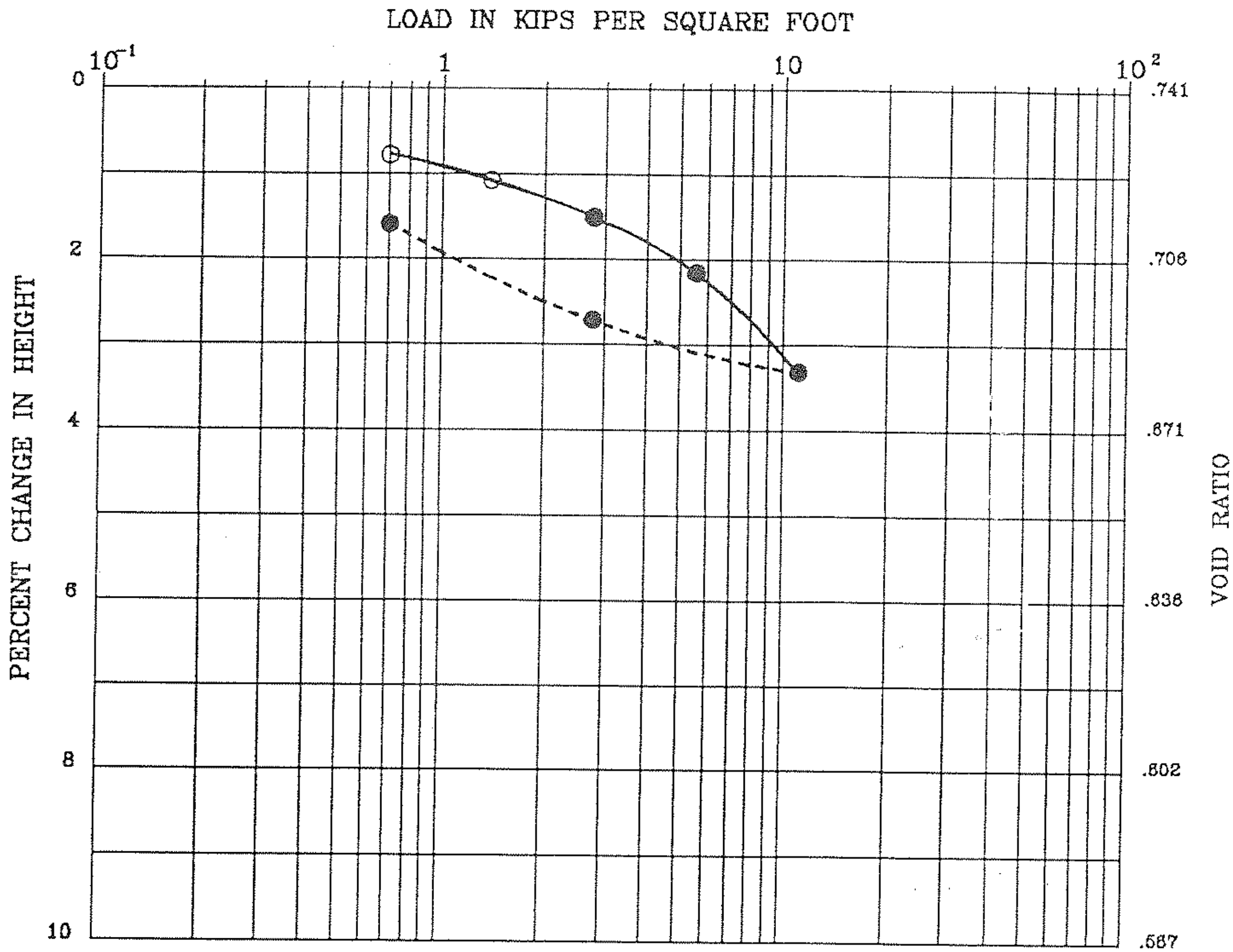
Note: Solid circles indicate readings after addition of water

CONSOLIDATION TEST

Converse Consultants West

Project No. 93-31-141-01

Drawing No. B-2



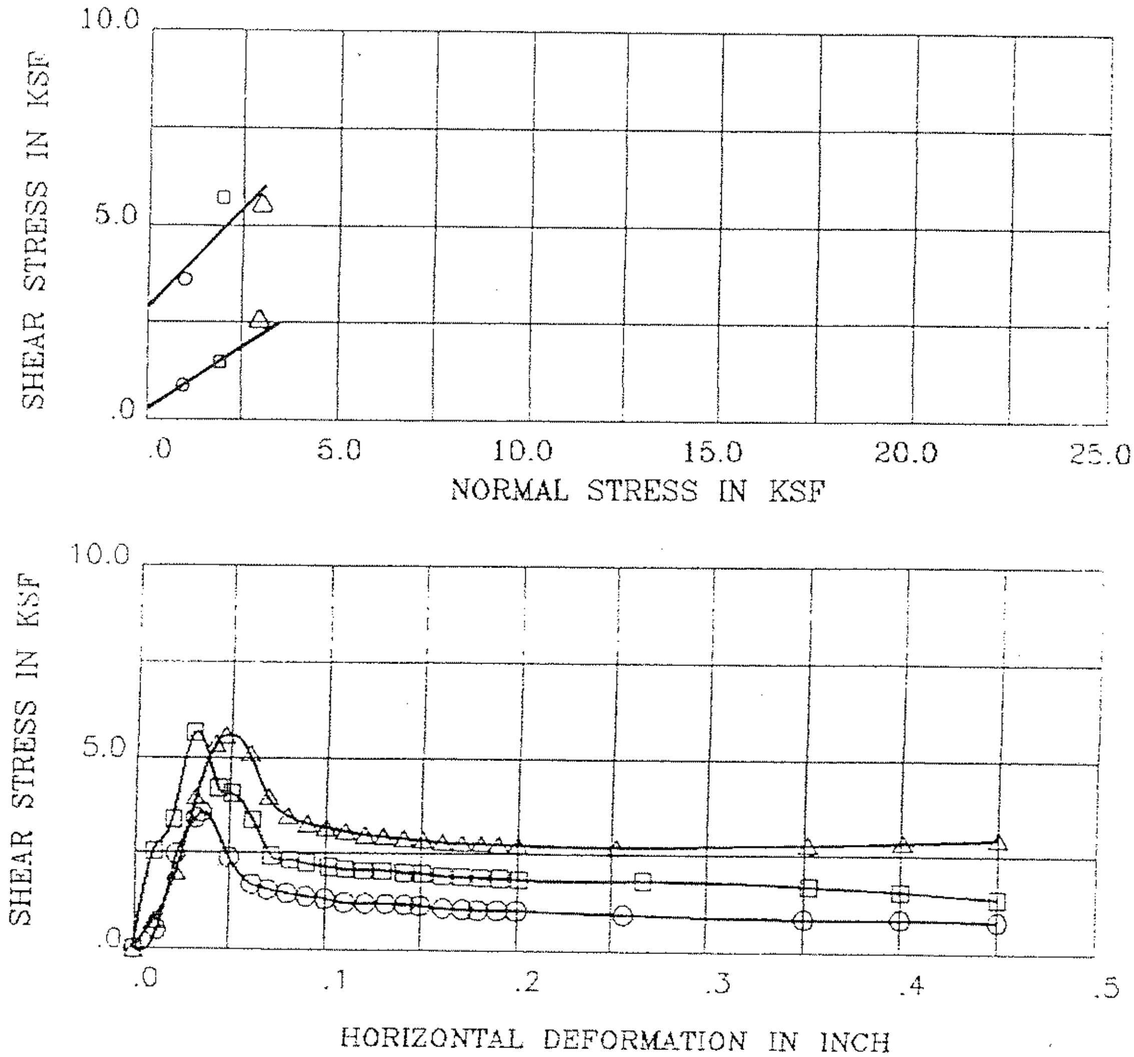
BORING	: BH-5	DESCRIPTION	: COLLUVIUM:	CLAY (CL), silty
DEPTH (ft)	: 10 - 11			

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	20.8	102.9	81	.741
FINAL	23.6	106.8	100	.678

Note: Solid circles indicate readings after addition of water

CONSOLIDATION TEST

Converse Consultants West	Project No. 93-31-141-01	Drawing No. B-3



BORING/SAMPLE : BH-1/R-2 DEPTH (ft) : 10-11
DESCRIPTION : Bedrock
STRENGTH INTERCEPT (ksf) : 2.911 PEAK 0.15 RESIDUAL
FRICTION ANGLE (degree) : 45.4 PEAK 33.5 RESIDUAL

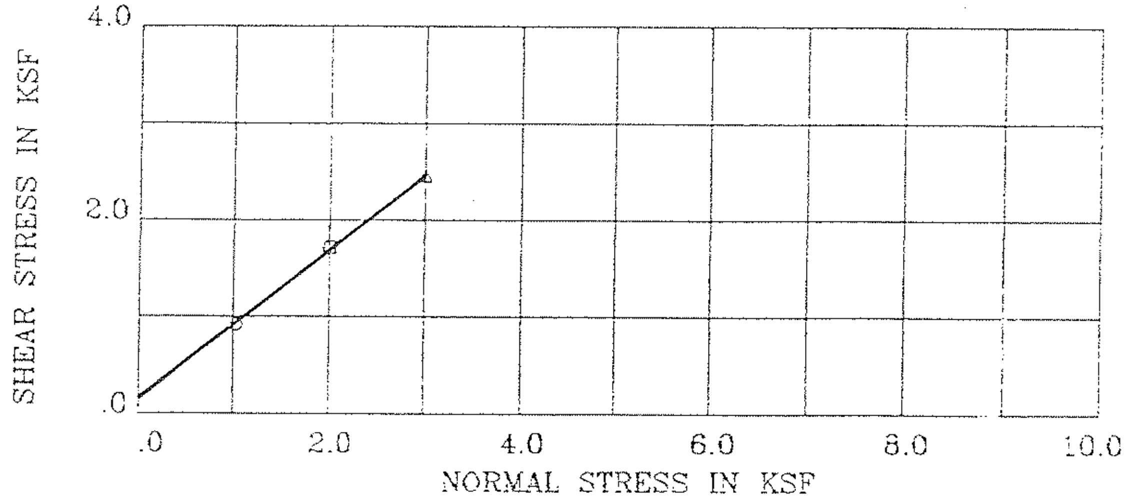
SYMBOL	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	VOID RATIO	NORMAL STRESS (ksf)	PEAK SHEAR (ksf)	RESIDUAL SHEAR (ksf)
○	44.5	79.0	1.133	1.00	3.56	.83
□	43.9	80.3	1.098	2.00	5.67	1.42
△	45.2	78.9	1.134	3.00	5.59	2.70

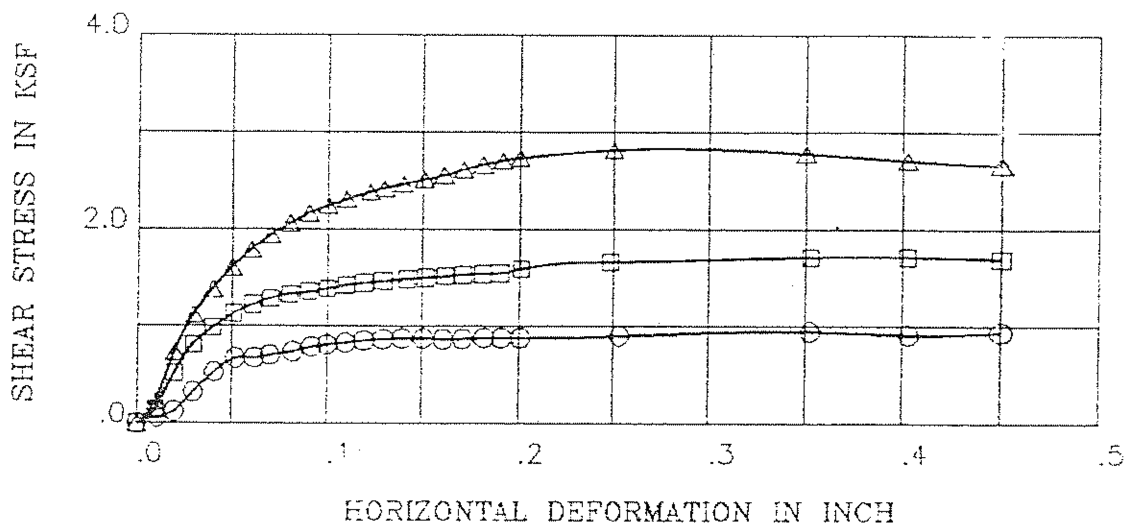
DIRECT SHEAR TEST

Converse Consultants West

Project No. 93-31-141-01

Drawing No. B-4





BORING/SAMPLE : BH-4 DEPTH (ft) : 3-5

DESCRIPTION : Clay(CL), Silty

STRENGTH INTERCEPT (ksf) : 0.15

FRICTION ANGLE (degree) : 37.2

RESIDUAL

Remolded to 90% of maximum density

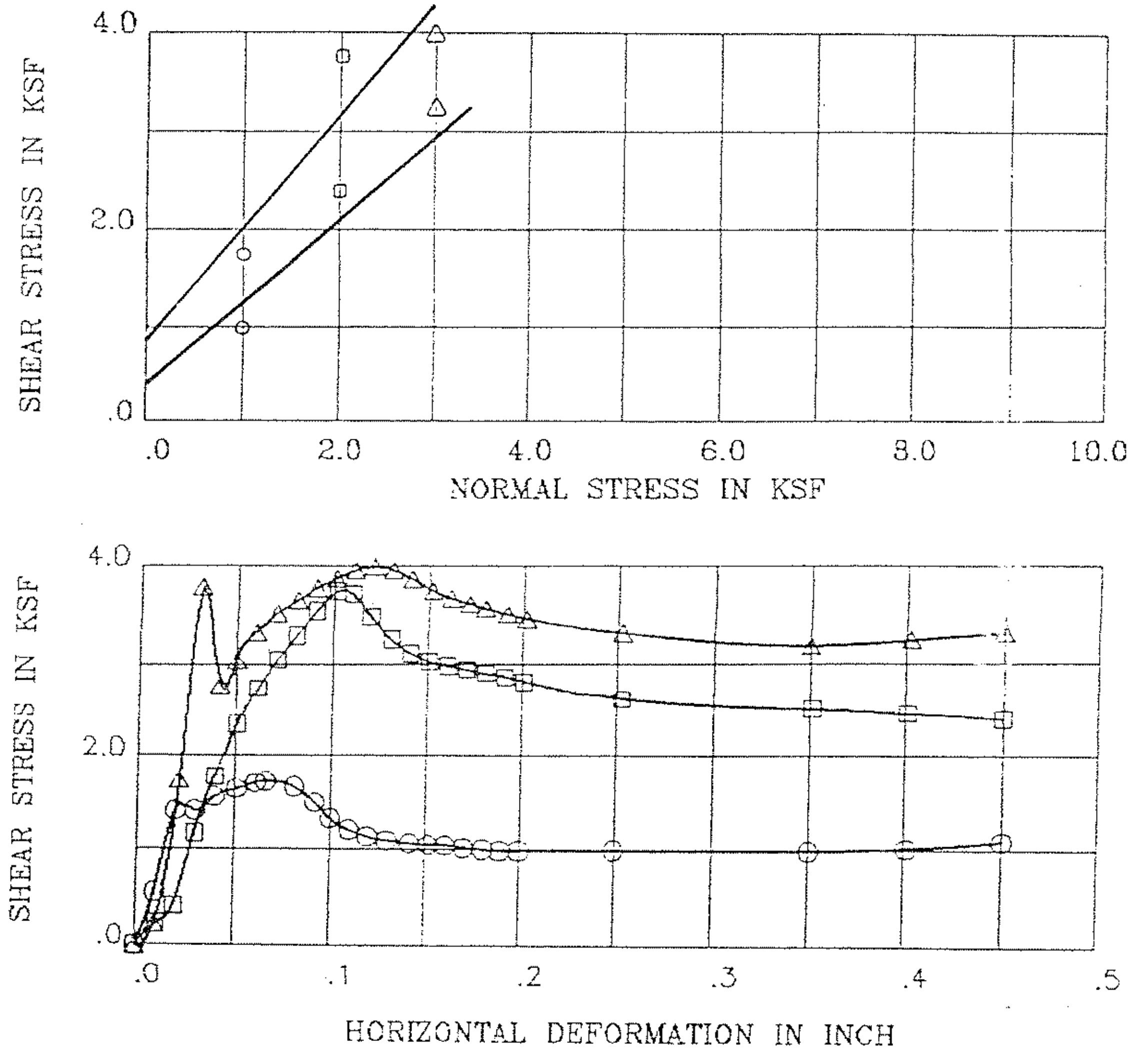
SYMBOL	SOAKED MOISTURE CONTENT (%)	DRY DENSITY (pcf)	VOID RATIO	NORMAL STRESS (ksf)	PEAK SHEAR (ksf)	RESIDUAL SHEAR (ksf)
○	53.4	73.8	1.282	1.00	.95	.91
□	48.7	72.4	1.327	2.00	1.71	1.69
△	48.6	73.3	1.300	3.00	2.82	2.43

DIRECT SHEAR TEST

Converse Consultants West

Project No. 93-31-141-01

Drawing No. B-5



BORING/SAMPLE	: B.H.5/R-1.	DEPTH (ft)	:	5-6
DESCRIPTION	: Clay (CL), Silty			

STRENGTH INTERCEPT (ksf)	:	.883	PEAK	0.4	RESIDUAL
FRICTION ANGLE (degree)	:	48.6	PEAK	40	RESIDUAL

SYMBOL	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	VOID RATIO	NORMAL STRESS (ksf)	PEAK SHEAR (ksf)	RESIDUAL SHEAR (ksf)
○	26.4	100.8	.672	1.00	1.72	.99
□	25.1	107.7	.564	2.00	3.75	2.40
△	25.0	105.1	.603	3.00	3.99	3.18

DIRECT SHEAR TEST

LETTER OF TRANSMITTAL

M.J. SCHIFF & ASSOCIATES, INC.
1291 North Indian Hill Boulevard
Claremont, California 91711

Tel: (909) 626-0967
Fax: (909) 621-1419

DATE: March 24, 1994

TO: CONVERSE CONSULTANTS WEST
3393 E. Foothill Boulevard
Pasadena, California 91107

ATTN: Mr. Tom Benson

SUBJECT: Gruen Hervard Data Sheet
Your Project #93-31-141-01

WE ARE SENDING YOU [X] Attached

COPIES	DATE	REF. NO.	DESCRIPTION
1	3/24/94	MJS&A#94057	Table 1 Soil Analysis for Gruen Hervard
1			MJS&A's Chain of Custody Record
1			Converse Envirolab's Chain of Custody Record

REMARKS: Enclosed is the data sheet for Gruen Hervard, Your P.O. #21-01979, along with Chain of Custody Records from both MJS&A and Converse Envirolab.

SIGNED: Paul R Smith for

Robert A. Pannell

TABLE 1

RESULTS OF LABORATORY ANALYSIS ON SOIL SAMPLES

Sample ID	Soil Type	Soil Resistivity		Saturated Soil pH	EC* (mS/cm)	Chemical Analysis in mg/kg (ppm) of dry soil										Redox (mv)
		As–received (ohm–cm)	Saturated (ohm–cm)			Ca	Mg	Na	NH_4	CO_3	HCO_3	Cl	SO_4	NO_3	S^{--}	
BH2 @ 2–4'	silty sand	4,000	1,850	7.7	0.16	156	nd	5	NA	nd	366	71	nd	NA	NA	NA

*Electrical Conductivity measured on a 1:5 soil to distilled water extract.
nd = not detected
NA = Not Analyzed

Gruen Hervard
Your #93-31-141-01, MJS&A #94057
F1

M. J. Schiff & Associates, Inc.
Consulting Corrosion Engineers
1291 North Indian Hill Boulevard
Claremont, California 91711-3897
(909) 626-0967

CHAIN OF CUSTODY RECORD

Sample # ___________ Job # GRUEN HERVARD CCW JobName: ___________

Description of Sample (Photo, if Available):

SOIL SAMPLE FROM CONVERSE CONSULTANTS WEST
DELIVERED BY HANNA KAKISH 3/14/94
CCW PROJECT: GRUEN HERVARD
93-31-141-01
PROJECT MANAGER: TOM BENSEN (sp)
P.O. # 31-01979
DATA ONLY

DATE/TIME	RELINQUISHED BY	RECEIVED BY
3/14/94: 17¹⁵	SEE ATTACHED	GRAHAM BELL
3/15/94: 08³⁰	MJS&A RECBell	BGI RECB
3/22/94 0900	BGI JTK	MJS&A RAP

D:\WP51\CHAINCST.REC

CHAIN OF CUSTODY RECORD

Envirolab Log Number ______

Project Name: Gruen Harvard

Project Number: 93-31-141-01

Project Location: Gruen Harvard

Phone Number: (818) 440.0800

Project Manager: TCB

Sample Collector:

Turn Around:

- Normal - 10 working days: X
- 1 week RUSH
- 24-48 hour RUSH
- < 24 hour RUSH

Lab sample number	Date sampled	Time sampled	Matrix	Sample identification	Comp. Instr.	PH	Resistivity	Sol. Salt	Sol. Chlor				Remarks
1			soil	BH2 Bulk 1 2-4'		✓	✓	✓	✓				

	Signature	Print Name	Company	Date	Time
Relinquished by	Hanna Kakis	Hanna Kakish	CCW	3/14/94	
Received by	G. EcBell	GrecBell	MJS&A	3/14/94	17:15
Relinquished by	Robert Pannell	ROBERT PANNELL	MJS&A	3/24/94	1300
Received by					
Relinquished by					
Received by					

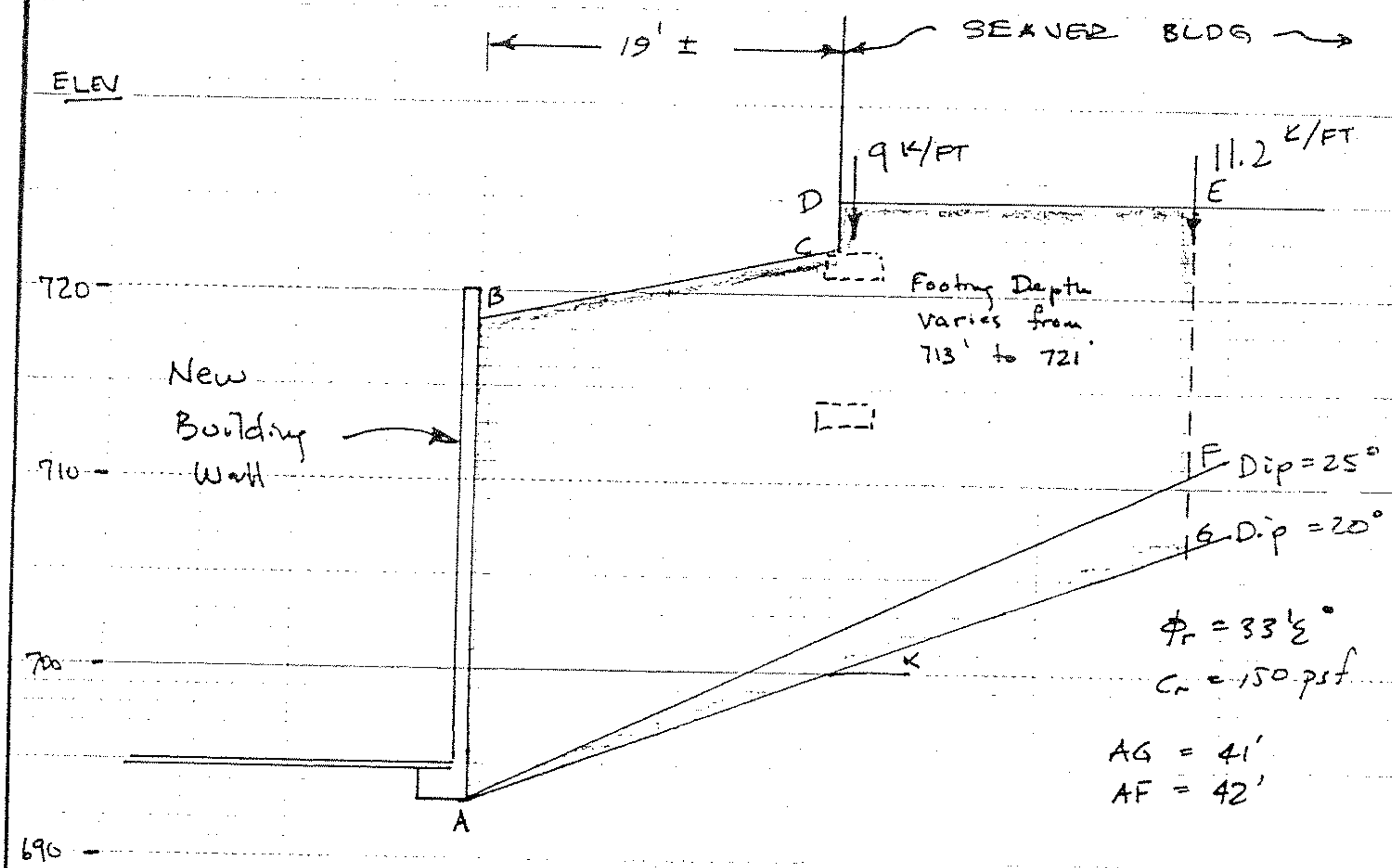
APPENDIX C

SLOPE STABILITY CALCULATIONS

BY LTE DATE 4/94 CLIENT HARVARD WESTLAKE SCHOOL SHEET NO. C-1 OF

CHKD. BY DATE SCIENCE BUILDING PROJECT NO. 93-31-141-01

PROJECT 'STABILITY OF ROCK WEDGE WITH SEAVER BLDG ON TOP



Area ABCDEFA $= \frac{25\frac{1}{2}+22\frac{1}{2}}{2} \times 19 + \frac{25+18}{2} \times 19 = 456 + 408.5 = 864.5$

$W = 865 \times 100 = 86.5^K$ + 2 FTG SURCHARGES $= 86.5 + 9 + 11.2 = 106.7^K$

Driving Force $= 106.7 \sin 20 = 36.5$

Resisting Force $= 106.7 \cos 20 \tan 33\frac{1}{2} + 41 \times 0.15 = 72.5$

$FS = \frac{72.5}{36.5} = 1.98$

Subtract area AFG to use $\alpha = 25°$

$A = 864.5 - 38 \times 4 \times \frac{1}{2} = 788.5$ $W = 78.85$ W + Surcharge $= 99.1^{K}/FT$

$DF = 99.1 \sin 25 = 41.9$

$RF = 99.1 \cos 25 \tan 33\frac{1}{2} + 42 \times 0.15 = 65.7$

$FS = 1.57$ OK

Converse Consultants

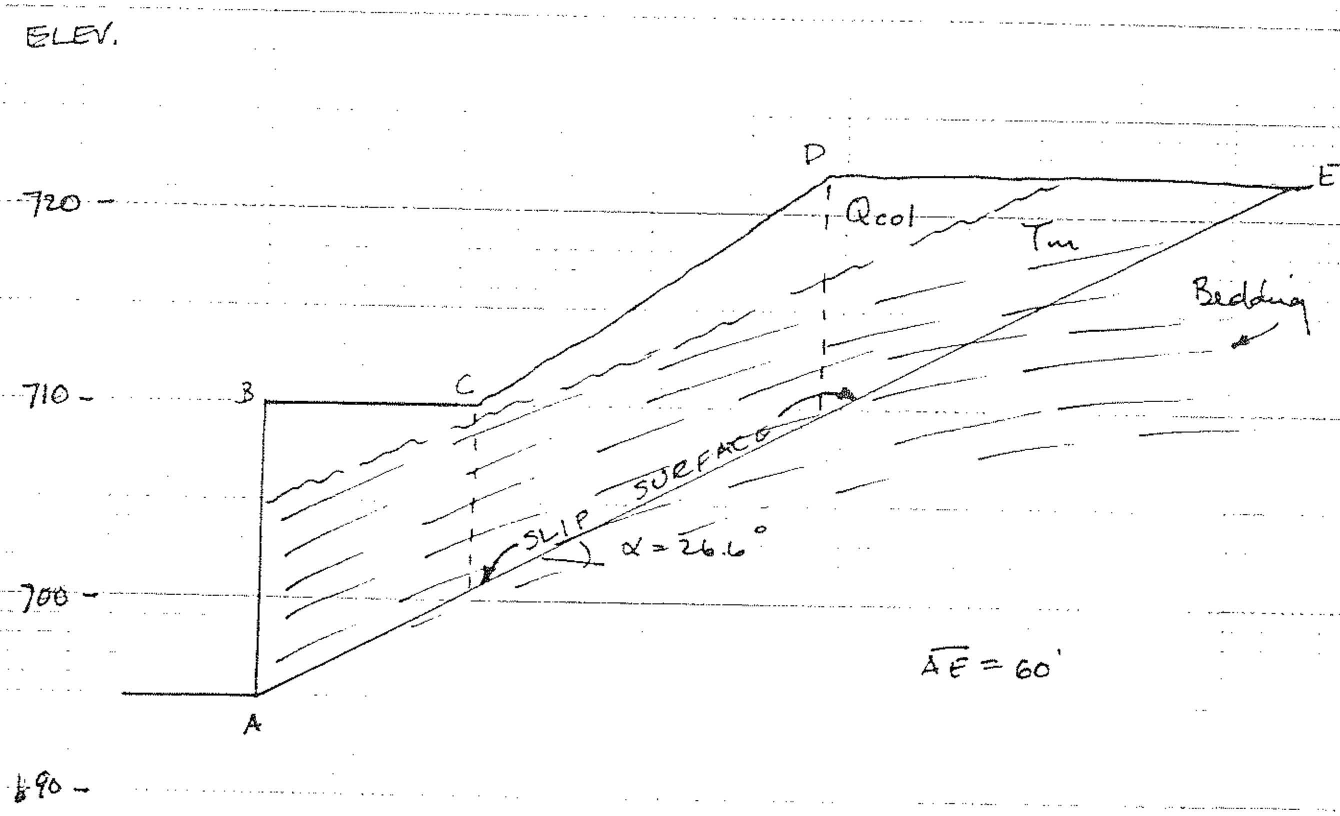
SIGNED

REG. NO.

SHEET NO. C-1

BY LTE DATE 4/94 CLIENT Harvard Westlake Sch SHEET NO. C-2 OF
CHKD. BY DATE Science Bldg PROJECT NO. 93-31-141-01
PROJECT Slope Stability

SECTION 1-1'



$$\text{Area ABCDEA} = \frac{15 + 9\tfrac{1}{2}}{2} \times 11 + \frac{9\tfrac{1}{2} + 12\tfrac{1}{2}}{2} \times 18 + 12\tfrac{1}{2} \times 24 \times \tfrac{1}{2}$$

$$= 134.8 + 198 + 150 = 482.8 \ \square'$$

$W = 48.3^{K}$

Driving Force $= W \sin 26.6° = 21.6^{K}$

Resisting Force $= W \cos 26.6 \tan 33\tfrac{1}{2} + 60 \times 0.15 = 37.6^{K}$

$F.S. = \frac{37.6}{21.6} = 1.74$ OK

Converse Consultants

SIGNED

REG. NO.

SHEET NO. C-2

APPENDIX D

RECOMMENDED EARTHWORK SPECIFICATIONS

APPENDIX D
RECOMMENDED EARTHWORK SPECIFICATIONS

The following specifications are recommended to provide a basis for quality control during the placement of compacted backfill.

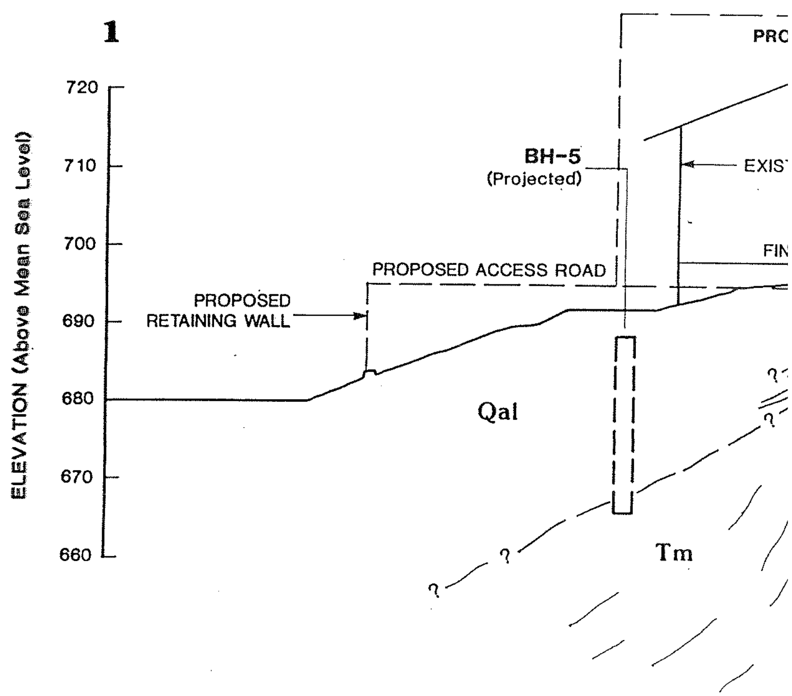
Areas that are to receive compacted fill shall be observed by Converse Consultants West (CCW) prior to the placement of fill.

The exposed surface shall be scarified to a depth of 6 inches, moisture conditioned to optimum and mechanically compacted to at least 90% of the ASTM D 1557-91 laboratory maximum density.

Fill shall be placed in controlled layers (lifts), the thickness of which is compactible with the type of compaction equipment used. The thickness of the compacted fill layer shall be adjusted to obtain proper compaction with the equipment used, and should not exceed the maximum allowable thickness of 8 inches. Each layer shall be compacted to a minimum relative compaction of 90% of the ASTM D 1557-91 laboratory maximum density. Soils native to the site should be compacted 1% to 2% above optimum if placed more than 4 feet below finished grade. Within the upper 4 feet native soils should be compacted at least 3% above optimum to reduce expansion potential. Density testing shall be performed by CCW to verify compaction. The contractor shall provide proper access and level areas for testing.

Fill soils shall consist of either onsite clayey soils or imported soils essentially cleaned of contaminants, organics, cobbles, boulders, and deleterious material; and shall be approved by CCW. Rocks larger than 3 inches in diameter shall not be used unless they are sufficiently broken down. All imported soil shall be granular and non-expansive, with an Expansion Index (EI) less than 30. CCW shall evaluate and/or test questionable import material for conformance with the specifications prior to delivery to the site. The contractor shall notify CCW 72 hours prior to importing the material to the site.

CCW shall observe the placement of compacted fill and conduct in-place field density tests on the compacted fill to check for adequate moisture content and the required relative compaction. Where less than the specified relative compaction is indicated, additional compactive effort shall be applied and the soil moisture-conditioned as necessary until adequate relative compaction is attained.



SEE DRAWING 1 FOR DESCRIPTION OF EARTH MATERIALS

CITY OF LOS ANGELES
CALIFORNIA

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
400, CITY HALL
LOS ANGELES, CA 90012-4869
WARREN V. O'BRIEN
GENERAL MANAGER
ARTHUR J. JOHNSON, JR.
EXECUTIVE OFFICER

June 29, 1994

Log # 36331
C.D. 2

(SOILS/GEOLOGY FILE-2)

Harvard-Westlake School
3700 Coldwater Cyn Ave
N. Hollywood, CA 91604

TRACT: 1000
LOT: 1111
LOCATION: 3700 COLDWATER CANYON AVENUE

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Soils/Geo Report	93-31-141-01	04/22/94	Converse West Consultant
Grading Ovrszd Doc	93-31-141-01	04/15/94	--

The above referenced report concerning the proposed science building has been reviewed by the Grading Division of the Department of Building and Safety. According to the report, a roadway is also proposed for this project. The site construction is planned on a slope ranging from 1 1 1/2:1 to 3:1 with a 30' elevation drop.

The report is acceptable, provided the following conditions are complied with during site development:

1. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

COMMISSIONERS
SCOTT Z. ADLER
PRESIDENT
JAMESINA E. HENDERSON
VICE-PRESIDENT
JEANETTE APPLEGATE
MABEL CHANG
JOYCE L. FOSTER

CITY OF LOS ANGELES
CALIFORNIA

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
400, CITY HALL
LOS ANGELES, CA 90012-4869
WARREN V. O'BRIEN
GENERAL MANAGER
ARTHUR J. JOHNSON, JR.
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June 29, 1994

Log # 36331
C.D. 2

(SOILS/GEOLOGY FILE-2)

Harvard-Westlake School
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1. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

2. All recommendations of the report which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

3. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety.

4. A grading permit shall be obtained.

5. All existing fill, soils, exploratory trench backfill, seismically unstable alluvium and earth materials shall be removed and recompacted under the direct supervision of the soils engineer.

6. All existing uncertified fill and/or creep prone soils shall be removed and recompacted under the geotechnical supervision of the soils engineer.

7. All the proposed building foundations shall be embeded into bedrock, as recommended. The roadway-support retaining wall may be founded into the stiff clay alluvium.

8. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted to the street in an acceptable manner and in a non-erosive device.

9. Prior to issuance of the building permit, the design of the subdrainage system required to prevent possible hydrostatic pressure behind the retaining walls shall be approved by the Soil Engineer and accepted by the Department. Installation of the subdrainage system shall be inspected and approved by the Soil Engineer.

10. The geologist and soil engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading.

11. The geologist shall inspect the excavations for the footings to determine that they are founded in the recommended strata before calling the Department for footing inspection.

12. All friction pile, caisson drilling and shoring installation shall be performed under the continuous inspection and approval of the Foundation Engineer.

13. A registered grading deputy inspector approved by and responsible to the project geotechnical engineer shall be required to provide continuous inspection for the proposed slot cutting, underpinning, shoring, tie-back, buttress, and the drilling and installation of all deep foundations.

14. The installation and testing of tie-back anchors shall comply with the recommendations included in the report or the standard sheets titled "Requirement for Tie-back Earth Anchors", whatever is more restrictive.

15. Tie-back anchors shall not be used as a permanent measure.

16. Pile and/or caisson foundation ties are required by Code Section 91.2908(b). Exceptions and modification to this requirement are provided in Rule of General Application 662.

17. Cantilevered unrestrained retaining walls shall be designed as per T-29.E of the Los Angeles Building Code.

18. The retaining wall supporting the roadway shall be designed for an additional vehicular surcharge.

19. Temporary vertical unsurcharged excavations shall be no higher than 5 feet. Higher cuts shall be sloped at 1:1.

20. All graded slopes shall be no steeper than 2:1.

21. North and west facing temporary excavations may need to be shored in the event the excavation daylights bedrock bedding planes, as recommended.

22. If the actual foundation design loads do not conform to the foundation loads assumed in the report, the Soils Engineer shall submit a supplementary report containing specific design recommendations for the heavier loads to the Department for review and approval prior to issuance of a permit.

23. The building design shall incorporate provisions for anticipated differential settlements in excess of one-fourth inch.

24. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill.

25. Prior to the placing of compacted fill, a representative of the consulting Soils Engineer shall inspect and approve the bottom excavations. He shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the City Grading Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be filed with the Department upon completion of the work. The fill shall be placed under the inspection and approval of the Foundation Engineer. A compaction report shall be submitted to the Department upon completion of the compaction.

26. Prior to the pouring of concrete, a representative of the consulting Soil Engineer shall inspect and approve the footing excavations. He shall post a notice on the job site for the City Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Department upon completion of the work.

LARRY WESTPHAL
Chief of Grading Division

Dana V. Prevost
DANA V. PREVOST
Engineering Geologist I

Salem Garawi
SALEM GARAWI
Structural Engineer Assoc. I

SG/DVP:rlm
A:\JUN36331
(213) 485-2160

cc: Converse Consultants
Gruen Assoc
VN District Office

JB17866 /8509

EPSILON ENGINEERING & INSPECTION INC.
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FAX (818) 886-6045

Epsilon Engineering addenda 5/20/96 & 5/9/96

RECEIVED MAY 21 1996 KING - DEHOFF - STEINMANN - KING

RECEIVED JUN 20 1996 DEPARTMENT OF BUILDING & SAFETY VAN NUYS DISTRICT OFFICE GRADING DIVISION

May 20, 1996
Job No. 196-786

Weinstein Construction Co. Inc.
Attn: Mr. I. Weinstein
15425 Ventura Blvd.
Sherman Oaks, CA

Re: Harvard School Deck Addition
3700 Cold Water Canyon
North Hollywood, CA

Dear Mr. Weinstein:

The following are additional notes to be added to the soil report prepared by Epsilon Engineering, dated May 7, 1996. Notes are as follows:

1. The minimum depth of embedment is seven feet (7'). Piles are subject to daylight, but all piles are well within the L. A. Building Code 29-1.

2. Creep applies to two piles in line.

3. Pile diameter has no effect on creep value.

4. The minimum pile spacing is three (3) diameters.

5. A deputy soil inspector may be required to inspect during the excavation of the piles.

Sincerely,

L W Jones

L. W. Jones

Approved by:

Steven Thurston

Steven Thurston
Engineering Vice President
GEO 829

REGISTERED PROFESSIONAL ENGINEER STEVEN R. THURSTON No. GE000829 Exp. 12/31/96 GEOTECHNICAL STATE OF CALIFORNIA

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099
FAX (818) 886-6045

May 9, 1996
Job No. 196-786

Harvard School
3700 Cold Water Canyon
N. Hollywood, CA

Dear Sir"

Lateral Resistance

The competent bedrock materials underlying the descending slope area provide lateral resistance to the creep forces and seismic loads. The following values may be used in resisting these lateral loads imposed on the pile foundations.

Coefficient of Friction = 0.40
Equiv.passive fluid pressure = 400 pcf
Maximum passive pressure= 4000 psf

These values are for deepened foundations embedded into competent bedrock materials only. The point of fixity for pile foundations may be assumed at the colluvium/bedrock contact depth.

Settlement Analysis

The structural loads resisted by deepened foundations extending down to competent bedrock materials should incur settlements of one-half inch or less with differential settlements of one-quarter inch, typically.

Recommendations

The proposed deck structure should be supported on deepened foundations which extend below the fill soils and colluvium into competent sedimentary bedrock materials. No vertical or lateral support should be assigned to the overlying fill soils and colluvium along the descending slope area.

Friction Pile Foundations

Friction piles may be constructed below the proposed deck to provide vertical and lateral support for the lightly loaded structure. An allowable skin friction value of 750 psf may be utilized for piles embedded into competent bedrock materials. A one-third increase may be applied to this value due to short-term wind or seismic loading conditions.

Lateral Soil Loads

The existing fill soils encountered in our borings along the descending slope were found to be subject to downslope creep, as described in the geologic report by Ray Eastman dated May 4, 1996. A lateral creep force of 1000 lbs. per lineal foot should be assumed for the upper fill soils, acting on the pile foundations.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston
Engineering Vice President
GEO 829

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. THURSTON
No. GE000829
Exp. 12/31/95
GEOTECHNICAL
STATE OF CALIFORNIA

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REPORT

OF

PRELIMINARY SOIL INVESTIGATION

HARVARD SCHOOL DECK ADDITION
3700 COLD WATER CANYON
NORTH HOLLYWOOD, CA

Job No. 196-786
May 7, 1996

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099
FAX (818) 886-6045

May 7, 1996
Job No. 196-786

Weinstein Construction Inc.
Attn: I. Weinstein
13425 Ventura Blvd.
Sherman Oaks, CA

Re: Harvard School Deck Addition
4700 Cold Water Canyon
North Hollywood, CA

Dear Mr. Weinstein:

Pursuant to your request, we have conducted a preliminary soil investigation at the above mentioned property.

The purpose of the investigation was to determine the adequacy of sub-surface soil for the support of the proposed structure.

<u>Site Description</u>

The proposed site is located on the east side of Coldwater Canyon in the City of North Hollywood. The new structure under consideration consists of a deck over a one and one-half to one (1-1/2 to 1) fill slope. The fill measure up to twenty feet (20'), and is in a very loose state. An existing retaining wall is located at the west end of the project. Bed rock is near the surface in this area creating a stable condition.

<u>Soil Investigation</u>

Twelve (12) test borings and one (1) test pit were excavated at the site. The soil was visually classified at the time of excavation. Bulk and undisturbed samples were obtained and taken to the laboratory for further testing. The laboratory testing was performed by Norcal Engineering Co., 10641 Humbolt

St., Los Alamitos, CA 90720. For location of test borings and test pit, see plot plan attached. Also attached are logs of test borings and test pit. No seepage or ground water was encountered during the excavation. We have reviewed the laboratory tests by Norcal and we accept the their test results.

Five cross sections were run on the slope. See plot plan attached for locations. The east side bed rock is found to be minus twenty feet ± (-20'±). The material above the bed rock is very loose and unstable. This portion of the project shall be founded on caissons. For further information, see recommendations for caissons attached.

For the west side of the project, we recommend conventional footings.

Foundation Conditions

To reduce the potential of subsidence and to provide uniform support for the structure, we recommend that deck footings be founded on conventional footings, starting or near test bore No. 4 and all to be founded in conventional footings, in accordance with the Los Angeles Building Code 29-1, and all footings shall be founded in unweathered bed rock.

Bearing Values

For footings founded in unweathered bed rock, a bearing value of 2,000 pounds per square foot (psf) may be assigned to footings having a minimum width and depth of one foot. An additional 200 lbs. per square foot may be added to the above values for each additional foot of depth below designed grade.

An additional one third of the above value may be added for live and transient loading such as wind and seismic loading.

All disturbed soil shall be recompacted to at least 90% of maximum laboratory density as determined in accordance with ASTM Test Method D-1557-78.

Utility Trenches

All utility trenches should be compacted to at least 90% of maximum density as determined in the laboratory.

This report is based upon observation of excavations plotted on Plate No. 1. No representation is made for quality or extent of materials not observed.

If during construction, conditions are found other than those covered in this report, the soil engineer should be notified before proceeding further.

All footings should be inspected by the soil engineer prior to placing steel.

This report is subject to review and approval by local governing authorities.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston
Engineering Vice President
GEO 829

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. THURSTON
No. GE000829
Exp. 12/31/96
GEOTECHNICAL
STATE OF CALIFORNIA

BORING LOG: | No. 1

DATE: JAN. 19, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: SURFACE EL. BORING:

ADDRESS: 4700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
3'			SILTY CLAY W/TRACE OF CLAY & ROCK FRAGMENTS					
5			SANDY CLAY W/ ROCK		4.9	69	12	275
4'			FRAGMENTS					
5 5'			BED ROCK SHALE GRAY BROWN BOTTOM OF BORING		4.9	69	12	275

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FAX (818) 886-6045

BORING LOG: No. 2

DATE: JAN. 19, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: SURFACE EL. BORING:

ADDRESS: 4700 COLD WATER CANYON

VISUAL CLASSIFICATION

				CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	ø SHEAR STRENGTH	C PSF
14'			SILTY CLAY LIGHT BROWN TO GRAY BROWN SOME ROCK FRAGMENTS FILL					
15'			BED ROCK (SHALE) GRAY BOTTOM OF BORING		26.6	67	19	300

EPSILON ENGINEERING & INSPECTION INC.
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BORING LOG: No. 3

DRILLING EQUIPMENT

DATE: JAN. 1996

DRIVING WEIGHT:

SURFACE EL. BORING:

ADDRESS: 4700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
7'			SILTY CLAY W/ROCK FRAGMENTS @ 7' & TRACE OF SAND FILL		25.3	84	16	475
16'			BED ROCK ?					
17'			BOTTOM OF BORING ?					

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BORING LOG: No. 4

DATE: JAN. 26, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: SURFACE EL. BORING:

ADDRESS: 4700 COLDWATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
4'			SILTY CLAY W/ROCK FRAGMENTS GRAY BROWN FILL					
5 1/2'			BED ROCK (SHALE) VERY HARD, COULD NOT GET SAMPLE GRAY BOTTOM OF BORING					

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(818) 886-3208 (805) 259-8099
FAX (818) 886-6045

BORING LOG:					No. 5			
DATE: JAN. 26, 1996			DRILLING EQUIPMENT					
DRIVING WEIGHT:				SURFACE EL. BORING:				
ADDRESS: 4700 COLD WATER CANYON								

			VISUAL CLASSIFICATION	CLASSIFICATION			ENGINEERING PROPERTIES	
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
15'			SILTY CLAY MOIST LOOSE GRAY BROWN FILL					
25'			BED ROCK (SHALE) GRAY DENSE BOTTOM of BORING ?		24	80	12	550

EPSILON ENGINEERING & INSPECTION INC.
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CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 • (805) 259-8099
FAX (818) 886-6045

BORING LOG:	No. 2 A

DATE: FEB 23, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: SURFACE EL. BORING:

ADDRESS: 4700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
12'			SILTY CLAY LIGHT BROWN MOIST TO WET LOOSE DARK BROWN DRY @ 3' STILL LOOSE		32	83	11	525
16'			SOME ROCK BED ROCK @ 16' BOTTOM of BORING					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 • (805) 259-8099
FAX (818) 886-6045

BORING LOG: No. 6

DATE: APRIL 4, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: SURFACE EL. BORING:

ADDRESS: 4700 COLDWATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
4"			CONCRETE					
3 5/			SANDY CLAY BROWN LOOSE W/ROCK FRAGMENTS					
5'			BED ROCK GRAY BROWN DRY HARD AT 4' BOTTOM of BORING					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 • (805) 259-8099
FAX (818) 886-6045

BORING LOG: | **No.** 7

DATE: APRIL 4, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT:

SURFACE EL. BORING:

ADDRESS: 4700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
4"			CONCRETE					
2.5'			SANDY CLAY, DRY LOOSE GRAY					
4'			BED ROCK, LIGHT GRAY SOFT, HARD @ 3' BOTTOM OF BORING					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 • (805) 259-8099
FAX (818) 886-6045

BORING LOG:									No. 8
DATE: APRIL 13, 1996			DRILLING EQUIPMENT						
DRIVING WEIGHT:				SURFACE EL. BORING:					
ADDRESS: 4700 COLD WATER CANYON									
			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES			
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF	
4'			SANDY CLAY, W/SILT LOOSE WET						
8'			ROCK GRAY SOFT						
14'			SANDY CLAY, MOIST DARK BROWN WET @ 12' LOOSE						
15.5'			BED ROCK SOFT GRAY BOTTOM OF BORING						

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19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 (805) 259-8099
FAX (818) 886-6045

BORING LOG: | No. 9

DATE: APRIL 4, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT:

SURFACE EL. BORING:

ADDRESS: 4700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
2'			SILTY CLAY, DARK BROWN MOIST LOOSE					
5'			BED ROCK, SOFT. HARD @ 4' LOST SAMPLE @ 5' BOTTOM OF BORING ?					

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BORING LOG:				No. 10					
DATE: APRIL 22, 1996 DRILLING EQUIPMENT									
DRIVING WEIGHT:				SURFACE EL. BORING:					
ADDRESS: 4700 COLDWATER CANYON									
			VISUAL CLASSIFICATION	CLASSIFICATION				ENGINEERING PROPERTIES	
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF	
16.5'			SANDY CLAY W/SILT AND ROCK FRAGMENTS FILL SOME LARGE ROCK VERY LOOSE						
19'			SANDY CLAY LOOSE DARK BROWN (TOP SOIL)						
21'	15/25		BED ROCK SOFT GRAY						
23'	9/21		SAMPLES BROKE UP						
26'	15/39		BOTTOM OF BORING						

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FAX (818) 886-6045

BORING LOG:	No. 11

DATE: APRIL 23, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: | SURFACE EL. BORING:

ADDRESS: 4900 COLDWATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION			ENGINEERING PROPERTIES	
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
10'			SILTY CLAY W/ROCK FRAGMENTS SOME LARGE VERY LOOSE GRAY BROWN					
12'			SANDY CLAY DARK BROWN LOOSE (TOP SOIL)					
18'			BED ROCK SOFT AT 12' HARD @ 14' BOTTOM of BORING?					
19'	17/4½							

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FAX (818) 886-6045

BORING LOG: | No. 12

DATE: APRIL 25, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: | SURFACE EL. BORING:

ADDRESS: 4700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
6"			LOOSE SOIL FILL					
10"			CONCRETE SWALE					
4 5'			SILTY CLAY W/HIGH % OF ROCK FRAGMENTS W/ ROOTS AND LARGE ROCK					
7 5'			SILTY CLAY W/SOME ROCK LOOSE TOP SOIL DARK BROWN					
16 5'			BED ROCK LIGHT GRAY SOFT GETTING HARDER W/ DEPTH BOTTOM OF BORING?					
17 5	24/ 46							

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19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 • (805) 259-8099
FAX (818) 886-6045

BORING LOG: No. TP No. 1

DATE: MAY 3 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: SURFACE EL. BORING:

ADDRESS: 4700 COLDWATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION			ENGINEERING PROPERTIES	
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
1'			SANDY CLAY DARK BROWN (TOP SOIL)					
4'			BED ROCK DENSE GETS HARDER W/DEPTH BOTTOM OF PIT					

EPSILON ENGINEERING & INSPECTION INC.
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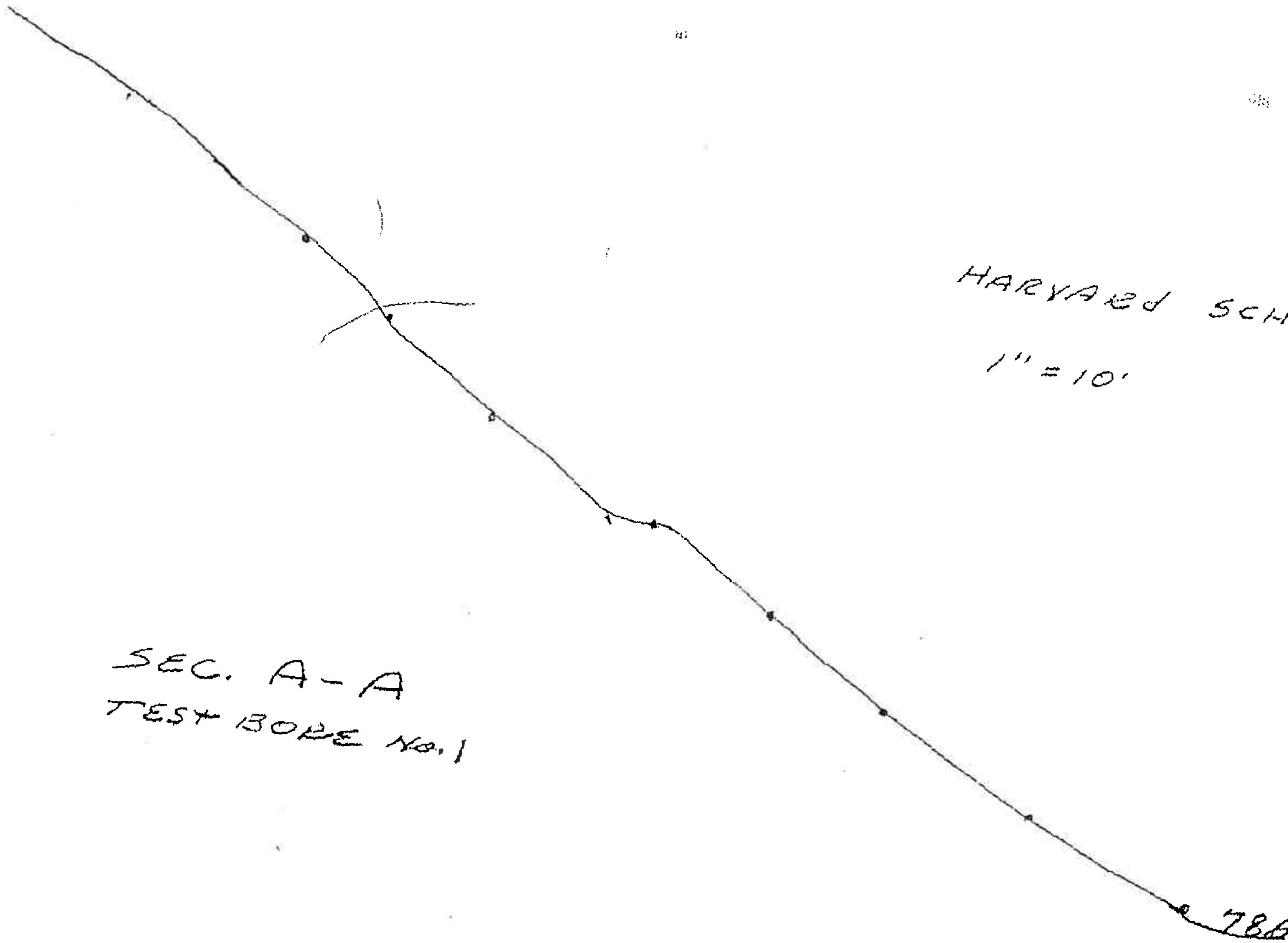
FAX (818) 886-6045

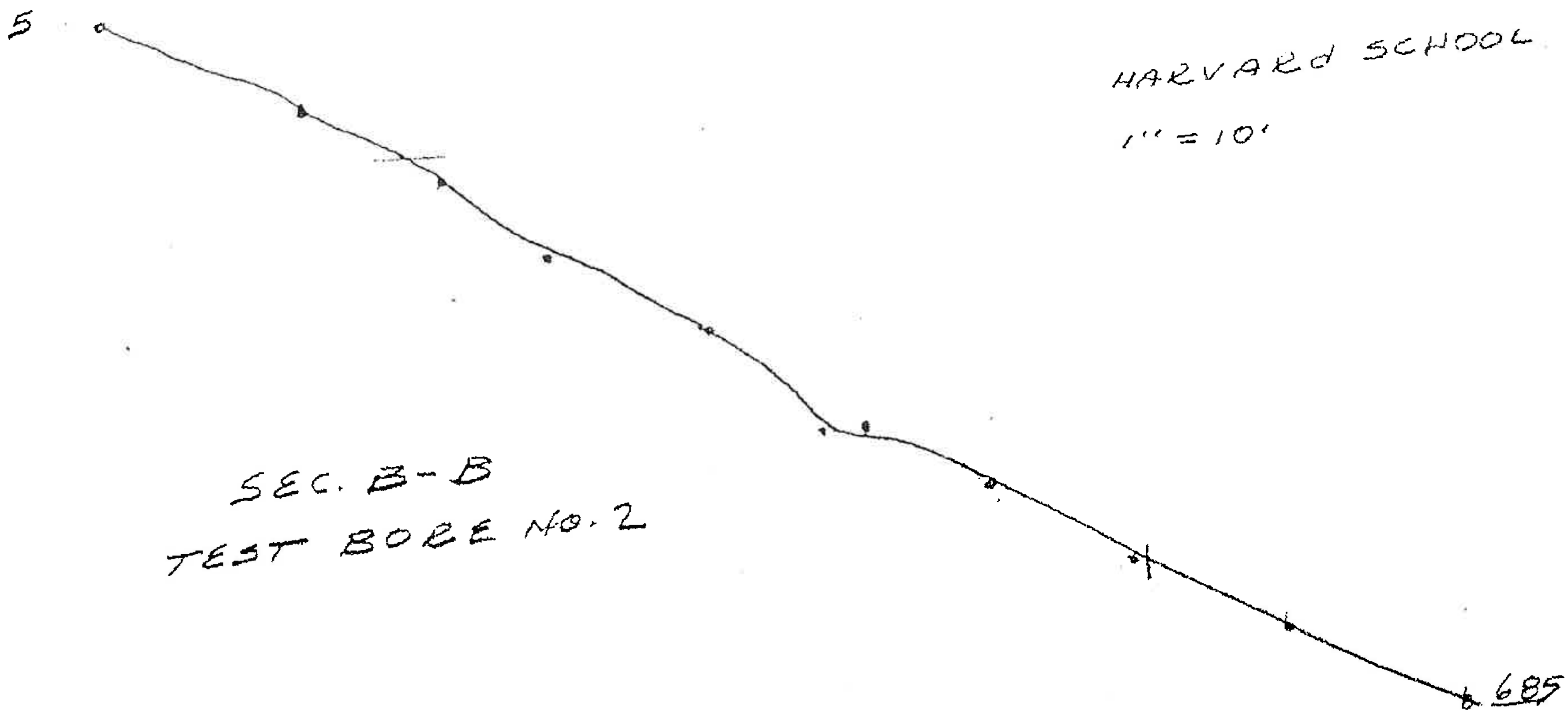
HARVARD SCHOOL

1" = 10'



SEC. A-A

TEST BORE No. 1



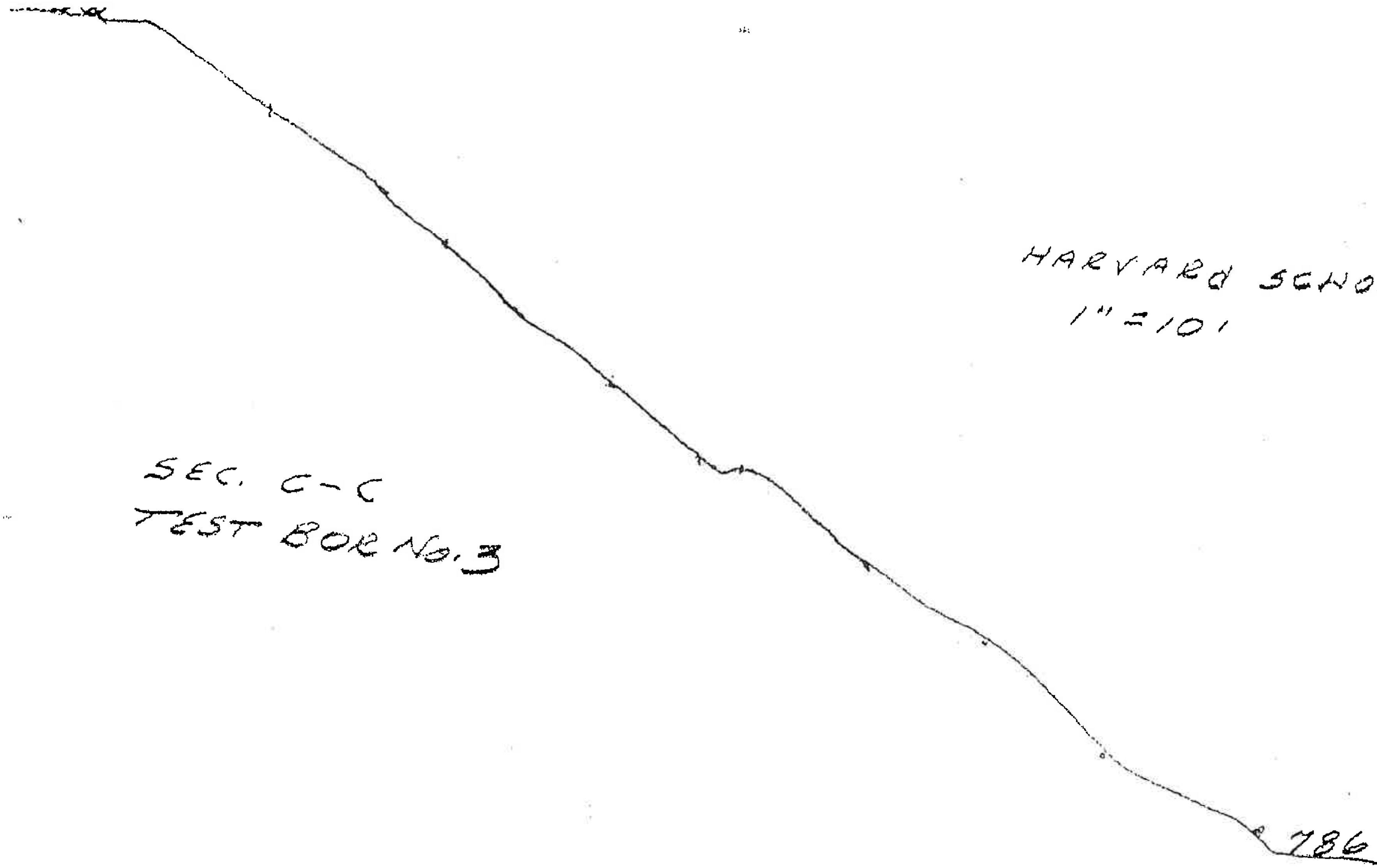
HARVARD SCHOOL

1" = 10'

SEC. B-B

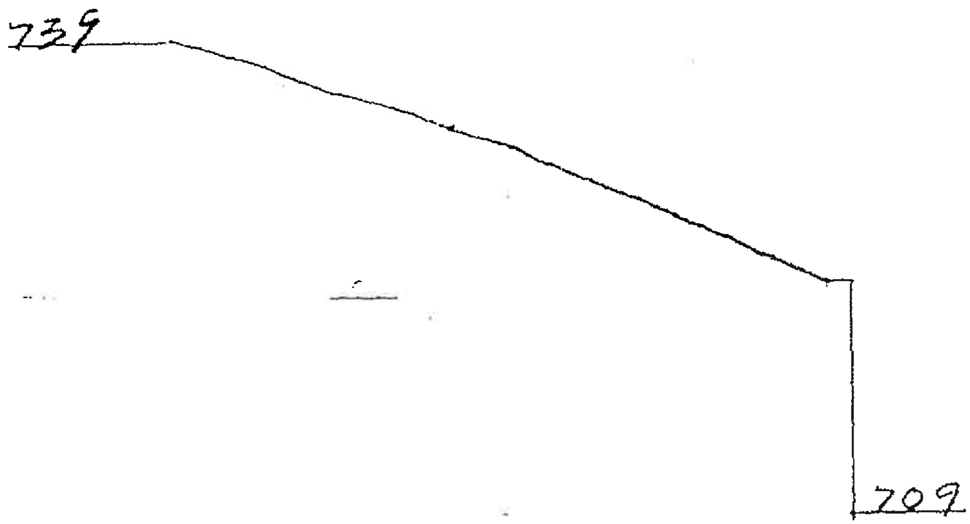
TEST BORE NO. 2

HARVARD SCHOOL
1" = 10'

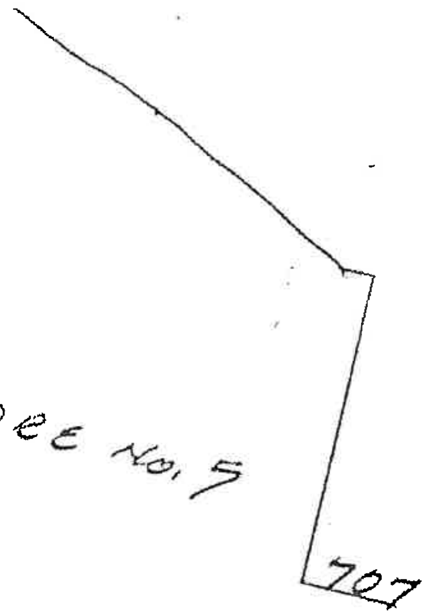


HARVARD SCHOOL

1" = 10'



SEC D-D
TEST BORE No. 4



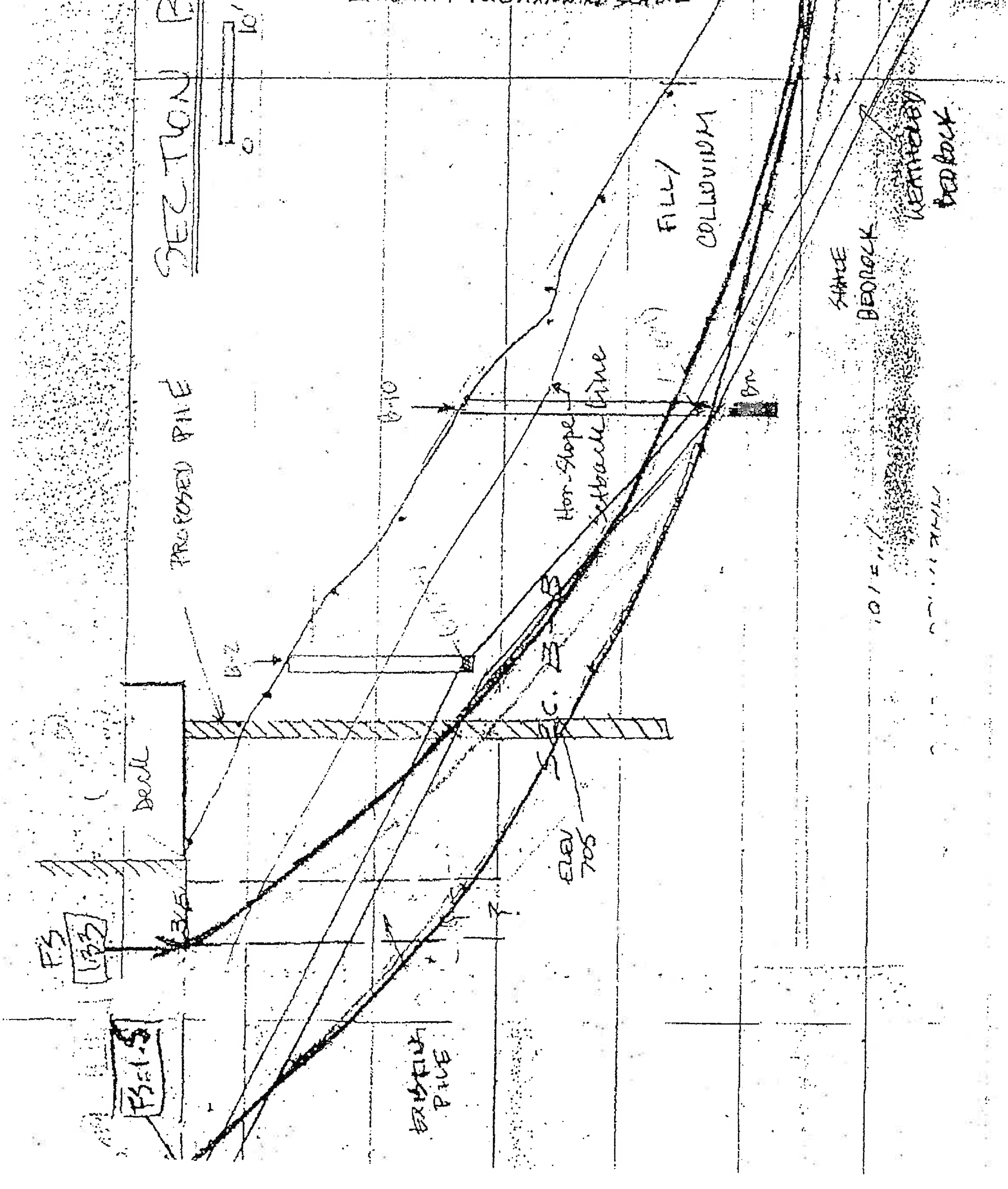
HARVARD SCHOOL

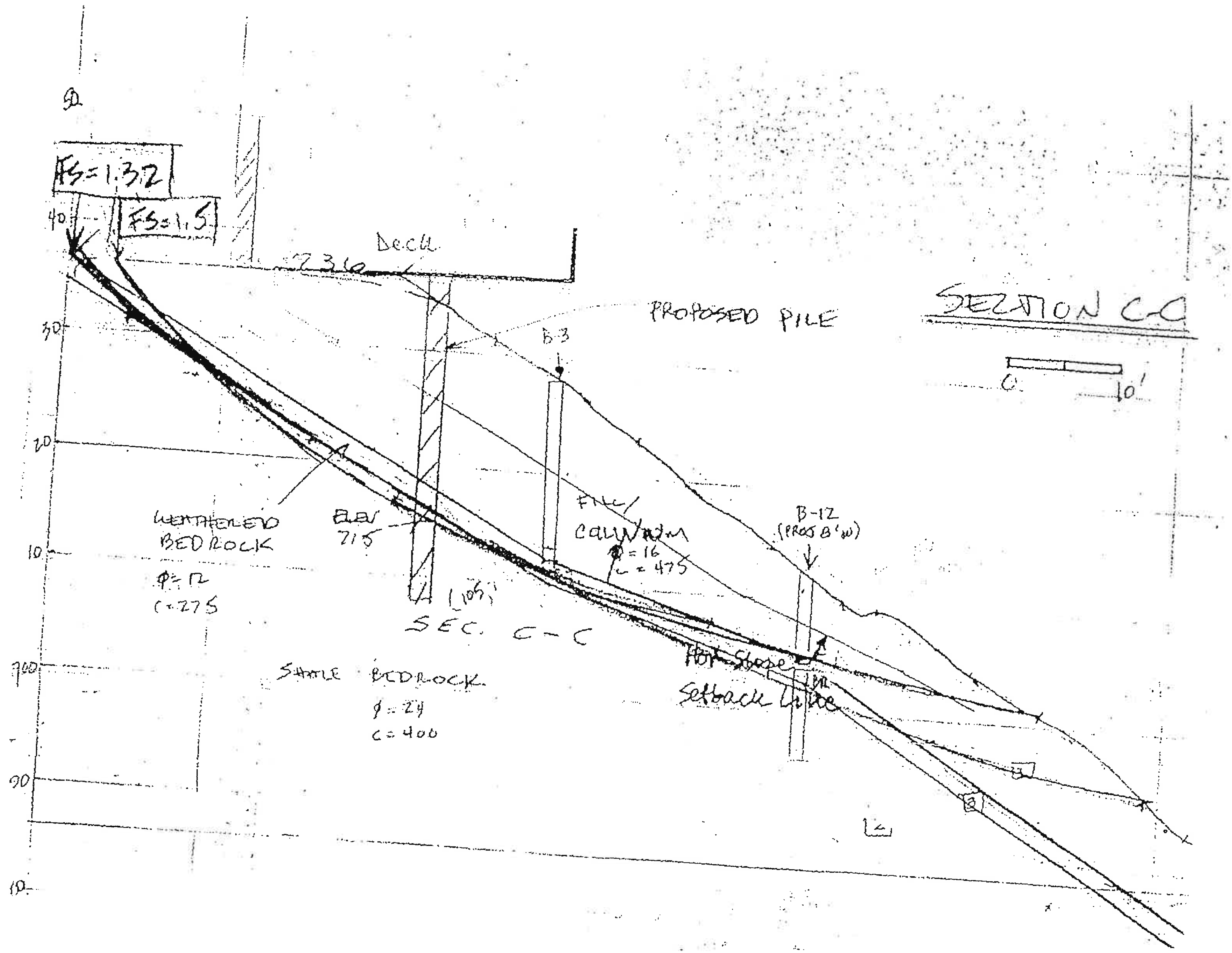
1'' = 10'

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 2

To LEONARD	From KEITH TUCKER
Co. EPSILON	Co. c/o CAKES AMES
Dept.	Phone # (714) 260-0236
Fax # (818) 886-6CH5	Fax #

STABILITY FOR HARVARD SCHOOL





SECTION C-C
FS=1.32
FS=1.5
Deck
PROPOSED PILE
B-3
B-12
(PROP B'W)
FILL/
COLLUVIUM
φ=16
c=475
WEATHERED
BEDROCK
φ=12
c=275
ELEV
715
SEC. C-C
SHALE BEDROCK
φ=24
c=400
Setback Line
0
10'

"The Geologic Outfit"

RAY A. EASTMAN
ENGINEERING GEOLOGIST

(714) 871-9468

2461 E. Orangethorpe Avenue
Suite 229
Fullerton, California
92631

May 4, 1996

Epsilon Engineering Inc.
19933 Labrador Street
Chatsworth, Calif. 91311

Subject: Engineering Geologic Investigation
Proposed Deck at Remodeled Arts Complex Building
Harvard/Westlake School
3700 Coldwater Canyon Boulevard
N. Hollywood, Calif.
Project No. 1577

Gentlemen:

Per your request, we have conducted an engineering geologic investigation in order to identify pertinent geologic factors with respect to the proposed development. The main factors, in turn, included evaluation of the geologic setting with particular interest directed towards the stratigraphy, structure, seismicity, gross stability and foundation conditions.

The development plan is preliminary and the discussions and recommendations provided herein must be considered as general. We understand, however, that proposed construction will consist of a cantilever type deck of ± 14-24 feet in width by ± 145 feet in length at the northerly side of the remodeled arts complex building; the proposed foundations will consist of continuous footing and/or drilled pile systems. Lastly, of course, see the accompanying plot plan for an overview.

SCOPE OF WORK

The geologic work was based upon preliminary planning information and was conducted in accordance with generally accepted practice for the particular circumstances. In turn, the investigation included the following:

o) review of selected geologic maps;
o) field geologic examination of the site;
o) subsurface geologic exploration by one test pit and three test borings; and
o) visual classification and evaluation of the units encountered with respect to proposed construction.

The field geologic work was conducted on April 23rd-25th and May 3rd, 1996.

SITE CONDITIONS

The proposed deck site occupies ± 0.1 acre situated at the lower, northern flank of the Santa Monica Mountains. It is bounded to the west by Coldwater Canyon Boulevard and in general by the School Campus.

Topography consists of two main aspects: namely, a narrow level pad adjacent to the existing building and a ± 1.5:1 descending slope towards the north thereof with a relief of ± 55 feet.

An overview of the site and topography is also shown by the accompanying base maps.

GEOLOGIC CONDITIONS

Geology consists of three basic units: namely, sedimentary bed-rock, colluvium and fill. Also, of course, see the accompanying geologic maps, sections and logs for an overview.

The bedrock is assigned to the Modelo formation. It consists mainly of firm, gray diatomaceous shale; the associated strata are moderately folded/faulted and the general dips of strata are at ± 16 degrees towards the northwest.

The colluvium overlies the bedrock and is, in part, sandwiched between the bedrock and fill. It is ± 2-4 feet in thickness and consists mainly of moderately soft, dk brown f sandy clay with shale fragments and rootlets.

The fill overlies the hillside and ranges in thickness to ± 16 feet. It consists mainly of poorly compact, gray and brown silt and clay with numerous shale fragments, boulders and rootlets.

Finally, we may note that groundwater seepage was not encountered during the exploratory work.

SEISMIC CONDITIONS

The nearest active faults of significance to the site include the following:

Fault Zone	Approximate Location			Earthquake Magnitude*
Hollywood	3.5	miles	SE	6.5
Inglewood	6	"	SW	6.7
Verdugo	6	"	NE	6.4
Santa Monica	7	"	SW	6.6
San Fernando	10	"	N	6.4
Raymond	10	"	E	6.2
Sierra Madre	11	"	NE	6.6
Santa Susana	13	"	NW	6.6
San Gabriel	15	"	N	6.7
Malibu	16	"	SW	6.6
Palos Verdes	17	"	SW	6.6
Anacapa	22	"	SW	6.7
Simi	22	"	NW	6.6
Whittier	22	"	SE	6.7

San Pedro Basin	25 "	SW	6.6
San Andreas	33 "	NE	8.1.

(*) Maximum probable magnitude, USGS 1985.

In turn, the associated ground motion parameters may be bracketed by the following:

Fault Zone	Anticipated Horizontal Acceleration* Peak (g)	65% Peak (g)
Hollywood	0.49	0.32
Inglewood	0.42	0.27
Verdugo	0.39	0.25
San Fernando	0.29	0.19
Malibu	0.23	0.15
Whittier	0.17	0.11
San Andreas	0.20	0.13.

(*) Seed 1983.

Also, of course, see the accompanying fault and earthquake epicenter maps for an overview.

CONCLUSIONS/RECOMMENDATIONS

The proposed deck development is considered to be feasible from an engineering geologic standpoint, subject to the more specific discussions presented below:

o) Geologic Stability - The site topography, and firm and essentially neutral to slope dip characteristics of the bedrock are favorable for gross stability over the easterly ± 60 percent of the proposed deck area, but, as may be surmised, the westerly portion of same turns such as to have an adverse dip component. Moreover, the fill and colluvium, as generally expected, are subject to sloughing and downslope creep.

o) Seismicity - Nearby fault lines include the Hollywood, Inglewood, Verdugo and Santa Monica; these have associated, postulated maximum probable earthquake magnitudes of 6.4-6.7. In turn, the related, repeatable ground motion accelerations range upwards to ± 0.32g.

o) Site Grading - Site grading, if required, is anticipated to be amenable to the use of conventional earth moving equipment with moderate to heavy ripping. The bulk of excavated materials is also anticipated to be suitable for use in compacted fills. Naturally, stripping of unsuitable soils and fills to expose underlying competent bedrock will be required prior to placement of newly compacted fill.

o) Proposed Cut and Fill Slopes - Cut slopes, if required, are typically encompassed by three factors: namely, 1) those less than 5 feet in height are anticipated to be stable; 2) those that are at 2:1 with favorable soil conditions and/or bedrock with into slope bedding, jointing or faulting are anticipated to be stable to heights on the order of 50 feet; and 3) those that expose unfavorable soil conditions and/or out of slope bedding, jointing or faulting are anticipated to require buttress fills or retaining walls. In turn, fill slopes, if required, of compacted soils at 2:1 are anticipated to be stable to heights on the order of 50 feet.

o) Expansive Soils - Major portions of the fill, colluvium and bedrock are anticipated to be expansive and precautions are required relative thereto.

o) Foundation Criteria - Two basic considerations must be fulfilled with respect to the engineering geologic aspects of the foundation criteria: namely, 1) the foundations must be safe against shear failure of the soils or rock, and 2) the post-construction settlement must be within permissive limits.

Adequate support for compacted fills and/or building foundations is anticipated to be provided by the bedrock subject, of course, to the earlier discussions. Naturally, we recommend that all fills and building foundations be established in competent bedrock and such will, in part, be determined by the depth of critical bedding planes. As may be surmised, the existing fill and colluvium are not suitable in general for the support of additional fill or building loads. Also, the foundations should be established such as to have a minimal setback of ten feet from any adjacent descending slope faces of bedrock and/or a 1:1 projection from the base of any adjacent slopes of bedrock and/or excavations. Lastly, the footing excavations may require heavy ripping work due to localized zones of hard rock and boulders.

o) Engineering Geologic Inspection - We recommend a review of the finalized grading and construction plan by our geologist in order to verify our findings. Further, we recommend that site inspections be made by our geologist during grading and construction in order to verify the geologic conditions encountered and, of course, additional recommendations may be required if conditions other than anticipated are found.

SELECTED REFERENCES

Dibblee, T.W., 1991, Geologic Map of the Beverly Hills and Van Nuys Quadrangles, Dibblee Geological Foundation; City of Los Angeles, 1982, Geologic Map Sheets of the Santa Monica Mountains; Seed, H.B., 1983, Ground Motions and Soil Liquefaction During Earthquakes, Earthquake Engineering Research Institute; U.S.

Geological Survey, 1989, Map Showing Late Quaternary Faults of the Los Angeles Region, MF-1964; U.S. Geological Survey, 1985, Evaluating Earthquake Hazards in the Los Angeles Region, Professional Paper 1360.

REMARKS

Several of the aforementioned items, of course, also fall under the purview of your office as the soils engineer and these may require further evaluation; these items include the site grading, slope stability, expansive soils, retaining walls, shoring and foundation design criteria.

The conclusions and recommendations express our best evaluation of the project requirements as based upon the planning information provided and information obtained at the geologic exposures and exploratory boring locations. The client must recognize, however, that evaluation of subsurface deposits is subject to the influence of undisclosed and unforeseen variations in conditions that may occur and the client has a related responsibility to bring to our attention any unusual condition that may be encountered.

We trust that this engineering geologic report will meet with your needs at this time. However, please contact us if you have any questions.

Sincerely,

Ray A. Eastman
CEG 423

RAE/se
attachments

GEOLOGIC LOG - TEST PIT

Project No.: 1577 Date: 5-3-96 Pit No.: 1

Equipment: Hand Dimensions: W 2' L 4' D 4'

Elevation: 736

Depth, ft.	Description	Unit
0-1	Loose damp dk brn f-m sdy silt w/ shale fgs and rootlets	Colluvium
1-4	Mod firm mod fractured damp gr and tan diatomaceous shale - N50E18N; joint set at N65W85N	Modelo fm

GEOLOGIC LOG - TEST BORING

Project No.: 1577 Date: 4-23-96 Boring No.: 1

Equipment: Hillsiderig Boring Dimensions: Dia 2' D 26'

Elevation: 729'

Depth, ft.	Description	Unit
0-8	Poorly comp damp brn w/gr f sdy clay w/ numerous shale fgs and rootlets	Fill
8-16½	Poorly comp damp gr brn f sdy clay w/numerous shale fgs and boulders (Contact at 30° N)	
16½-20	Mod soft damp dk brn f sdy clay w/ shale fgs and rootlets	Colluvium
20-26	Firm damp gr diatomaceous shale - N50E15N	Modelo fm
	Seepage nil Backfilled	

GEOLOGIC LOG - TEST BORING

Project No.: 1577 Date: 4-24-96 Boring No.: 2

Equipment: Hillsiderig Boring Dimensions: Dia 2' D 19'

Elevation: 735'

Depth,ft.	Description	Unit
0-10	Poorly comp damp gr and brn si clay w/numerous shale fgs, boulders and rootlets (Contact at 38°N)	Fill
10-12	Mod soft damp dk brn f sdy clay w/rootlets	Colluvium
12-19	Firm damp gr diatomaceous shale - N50E16N	Modelo fm

Seepage nil Backfilled

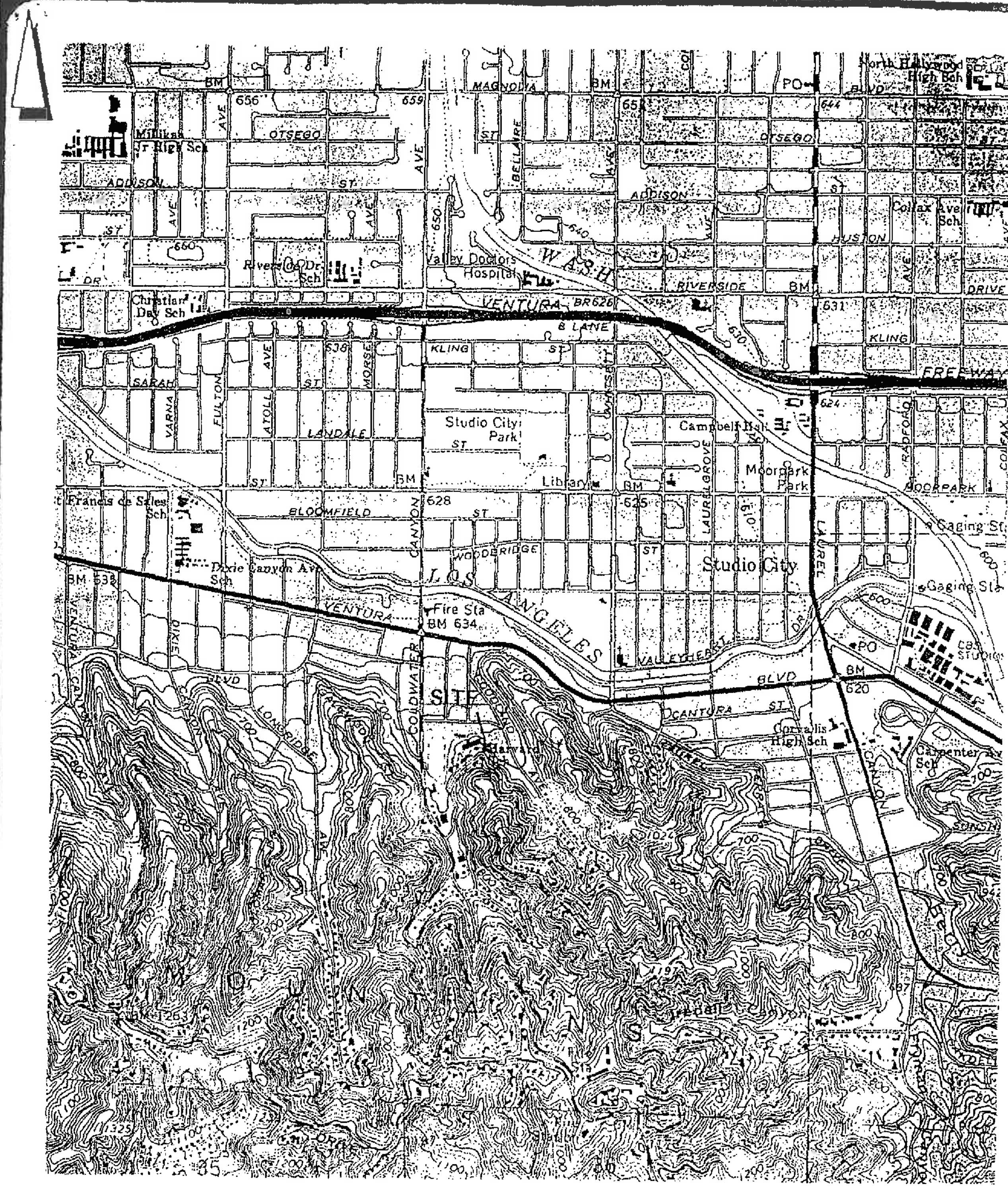
GEOLOGIC LOG - TEST BORING

Project No.: 1577 Date: 4-25-96 Boring No.: 3

Equipment: Hillsiderig Boring Dimensions: Dia 2' D 16½'

Elevation: 709'

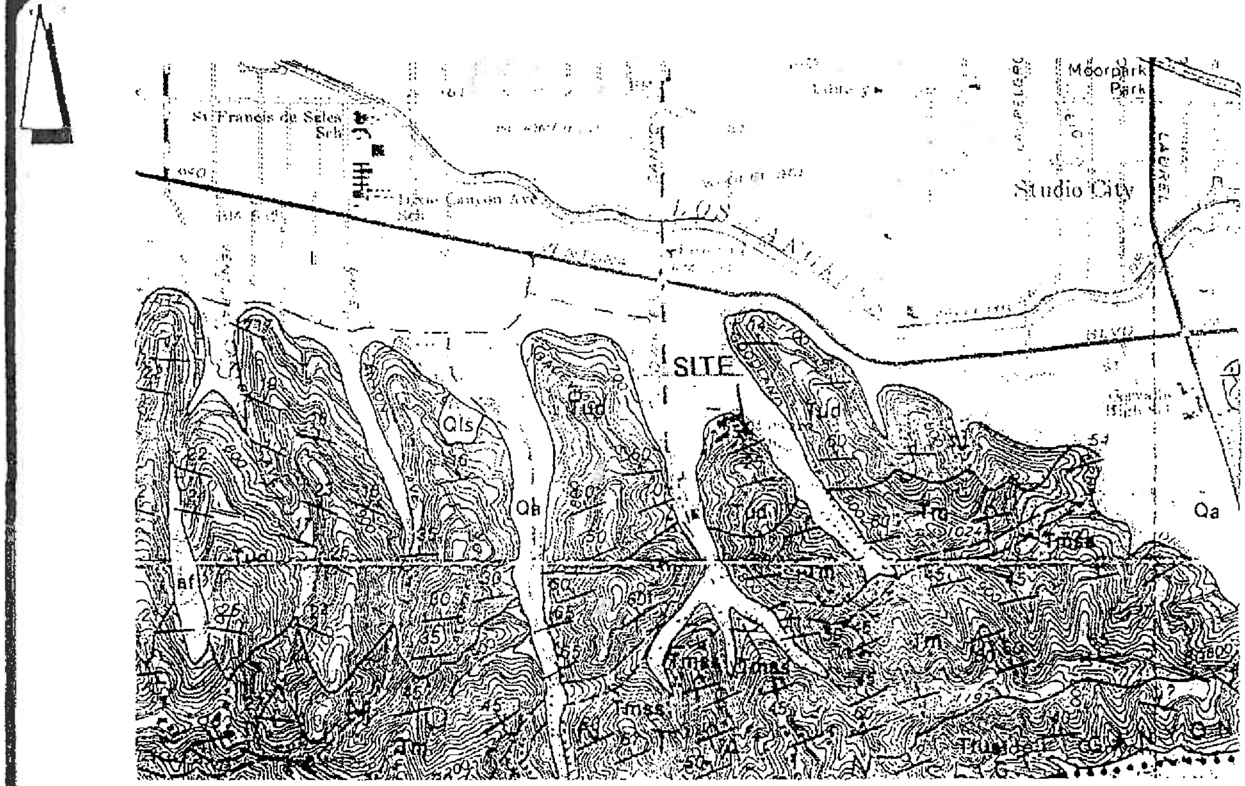
Depth, ft.	Description	Unit
0-½	Loose damp gr brn f sdy silt w/shale fgs	Fill
	4" concrete per swale	
½-4½	Poorly comp damp gr brn si clay w/numerous shale fgs and rootlets (Contact at 30°N)	
4½-7½	Mod soft damp dk brn si clay w/shale fgs and rootlets	Colluvium
7½-16½	Firm damp gr diatomaceous shale - N50E16N	Modelo fm
	Seepage nil Backfilled	



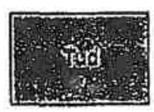
VICINITY MAP 1"- 2000'

"The Geologic Outfit"

RAY A. EASTMAN
ENGINEERING GEOLOGIST



Dibblee 1991

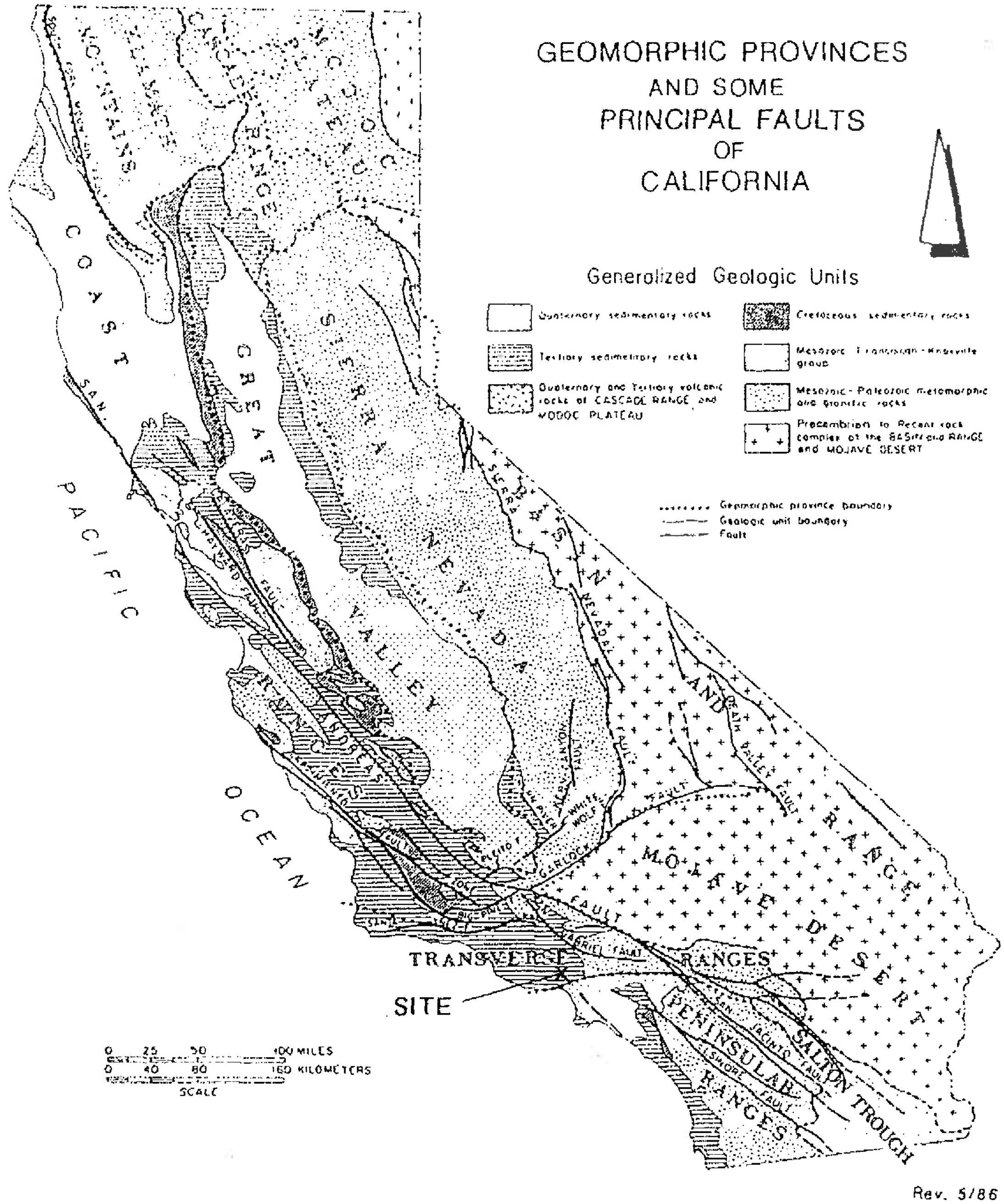


UNNAMED SHALE
(upper member of Modelo Formation of Hoots 1931; Upper Modelo Formation of Durrell 1954; equivalent to Sisquoc Formation of Dibblee 1989, in Ventura Basin)
marine clastic and biogenic; late Miocene age
("Delmontian" and late Mohnian Stages)
Tud *soft, white-weathering diatomaceous shale to diatomite, bedded, soft, semi-punky, porous; grades laterally westward into* Tush

AREA GEOLOGY MAP 1"- 2000'

" The Geologic Outfit "

RAY A. EASTMAN
ENGINEERING GEOLOGIST

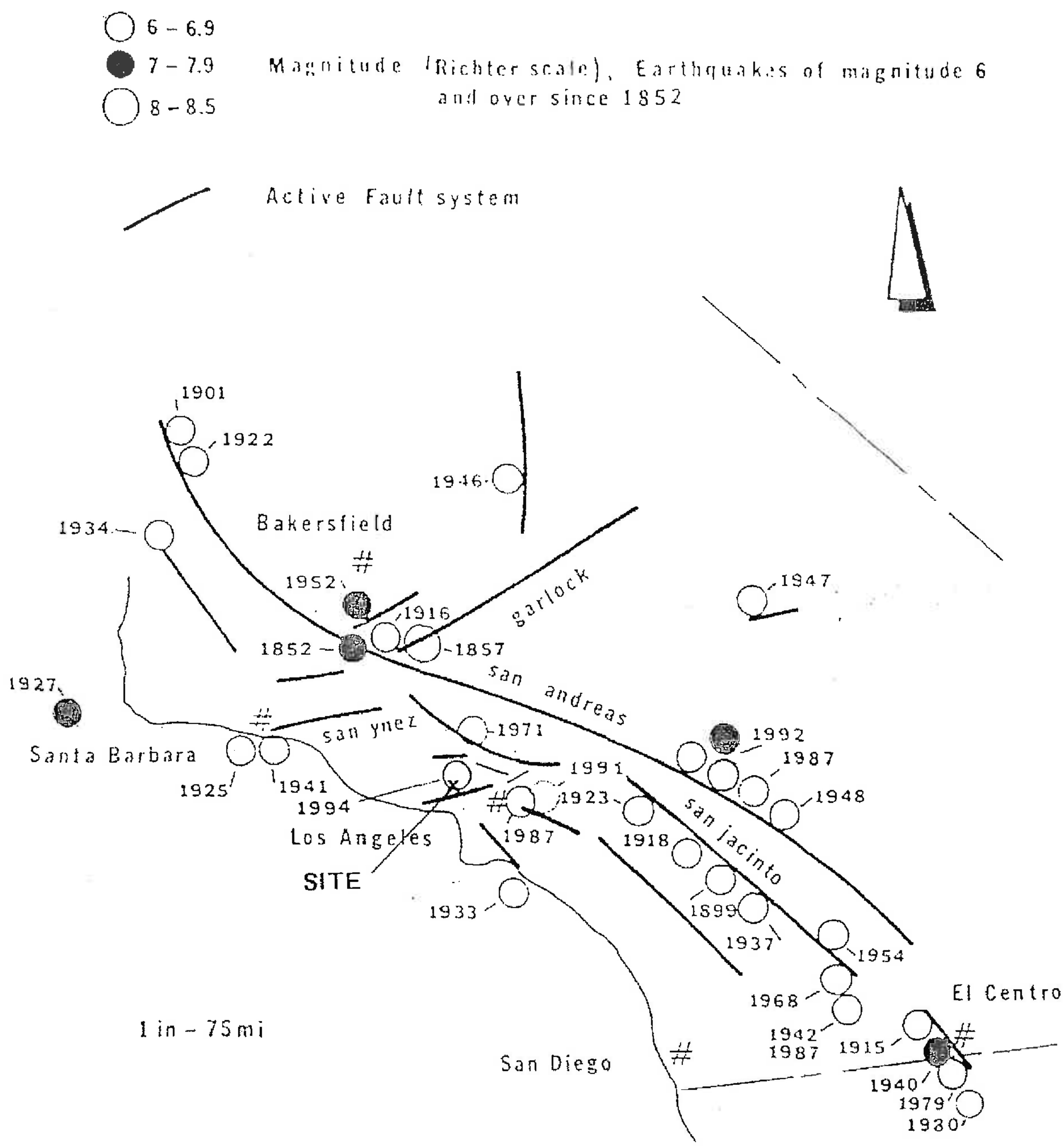


CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY

REGIONAL GEOLOGY MAP

" The Geologic Outfit "

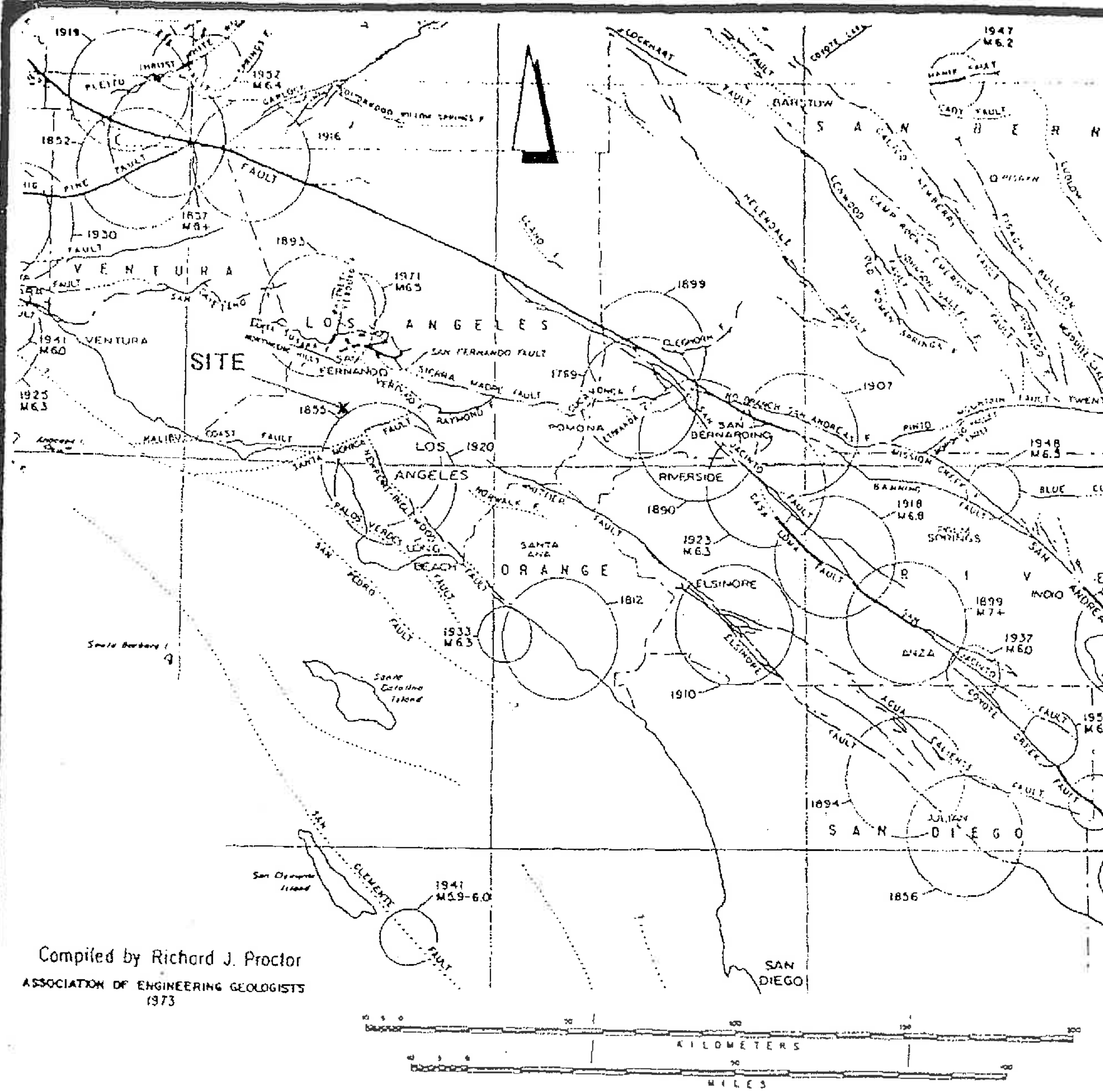
RAY A. EASTMAN
ENGINEERING GEOLOGIST



EPICENTER MAP

"The Geologic Outfit"

RAY A. EASTMAN
ENGINEERING GEOLOGIST



MAJOR EARTHQUAKES AND RECENTLY ACTIVE FAULTS IN THE SOUTHERN CALIFORNIA REGION

EXPLANATION

ACTIVE FAULTS

Total length of fault zone that breaks Holocene deposits or that has had seismic activity

Fault segment with surface rupture during an historic earthquake, or with aseismic fault creep

o Holocene volcanic activity (Amboy, Pisgah, Cerro Prieto and Salton Buttes)

EARTHQUAKE LOCATIONS

1899 M7+

Approximate epicentral area of earthquakes that occurred 1769-1933. Magnitudes not recorded by instruments prior to 1906 were estimated from damage reports assigned an Intensity VII (Modified Mercali scale) or greater; this is roughly equivalent to Richter M 6.0. 31 moderate** earthquakes, 7 major and one great earthquake (1857) were reported in the 164-year period 1769-1933

1952 M7.7

Earthquake epicenters since 1933, plotted from improved instruments. 29 moderate** and three major earthquakes were recorded in the 40-year period 1933-1973

FAULT MAP

RAY A. EASTMAN
ENGINEERING GEOLOGIST

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
10641 HUMBOLT STREET LOS ALAMITOS, CA 90720
(310) 799-9469 FAX (310) 799-9459

February 2, 1996 Project Number 5914-96

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

Re: Laboratory Tests - Proposed Development - 4700 Coldwater Canyon, West Hills, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on samples of soils transported to this firm.

LABORATORY TESTS

A. Direct shear tests (ASTM:3080) were performed on undisturbed samples of the soils. These tests are performed under saturated conditions at loads of 500 lbs./sq.ft., 1,000 lbs./sq.ft. and 2,000 lbs./sq.ft. with results shown on Plate A.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

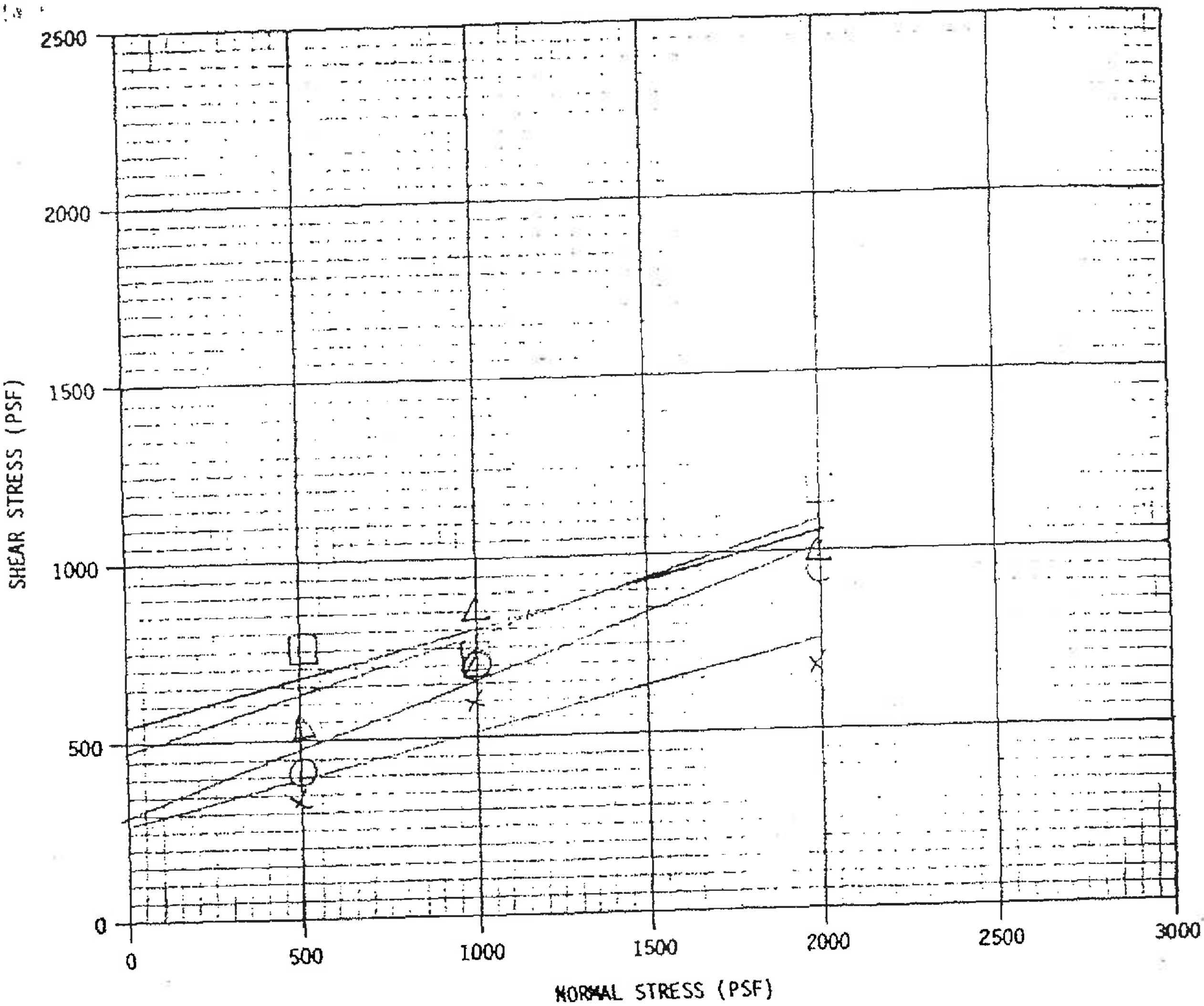
Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12-31-96
GEOTECHNICAL
STATE OF CALIFORNIA

Troy D. Norrell
President



SYMBOL	BORING NUMBER	DEPTH (FEET)	ø (DEGREES)	C (PSF)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)
X	1	5	12	275	68.9	4.9
O	2	15	19	300	67.4	26.6
Δ	3	7	16	475	83.9	25.3
□	~~X~~ 5	5	12	550	80.1	23.8

NOTE: TESTS PERFORMED ON SATURATED SAMPLES UNLESS SHOWN BELOW.
(FM) FIELD MOISTURE
TESTS PERFORMED ON UNDISTURBED SAMPLES UNLESS SHOWN BELOW.
(R) SAMPLES REMOLDED AT 90% OF MAXIMUM DRY DENSITY

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

DIRECT SHEAR TEST RESULTS
PLATE A

PROJECT 5914-96 | DATE 2/2/96

NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS
10641 HUMBOLT STREET LOS ALAMITOS, CA 90720
(310) 799-9469 FAX (310) 799-9459

February 28, 1996 | Project Number 5914-96

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

Re: Laboratory Tests - Proposed Development - 4700 Coldwater Canyon, West Hills, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on samples of soils transported to this firm.

LABORATORY TESTS

A. In-Place moisture density tests were performed on in-place samples. Results are shown on Table I.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL GEOTECHNICAL
KEITH D. TUCKER
No. 841
Exp. 12-31-96
STATE OF CALIFORNIA

Troy D. Norrell
President

TABLE I
IN-PLACE MOISTURE/DENSITY TESTS

Test Boring	Depth	Percent Moisture	Dry Density (lbs./cu.ft.)
2A	16"	22.8	69.6
2A	12'	32.1	83.4
2A	16.5'	23.9	74.6

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(310)799-9469 FAX (310)799-9459

April 17, 1996 Project Number 5914-96

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

RE: **Laboratory Tests** - Proposed Development - Located at 4700 Coldwater Canyon, West Hills, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on samples of soils transported to this firm.

LABORATORY TESTS

A. Direct shear tests (ASTM:3080) were performed on undisturbed samples of the soils. These tests are performed under saturated conditions at loads of 500 lbs./sq.ft., 1,000 lbs./sq.ft. and 2,000 lbs./sq.ft. with results shown on Plate A.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

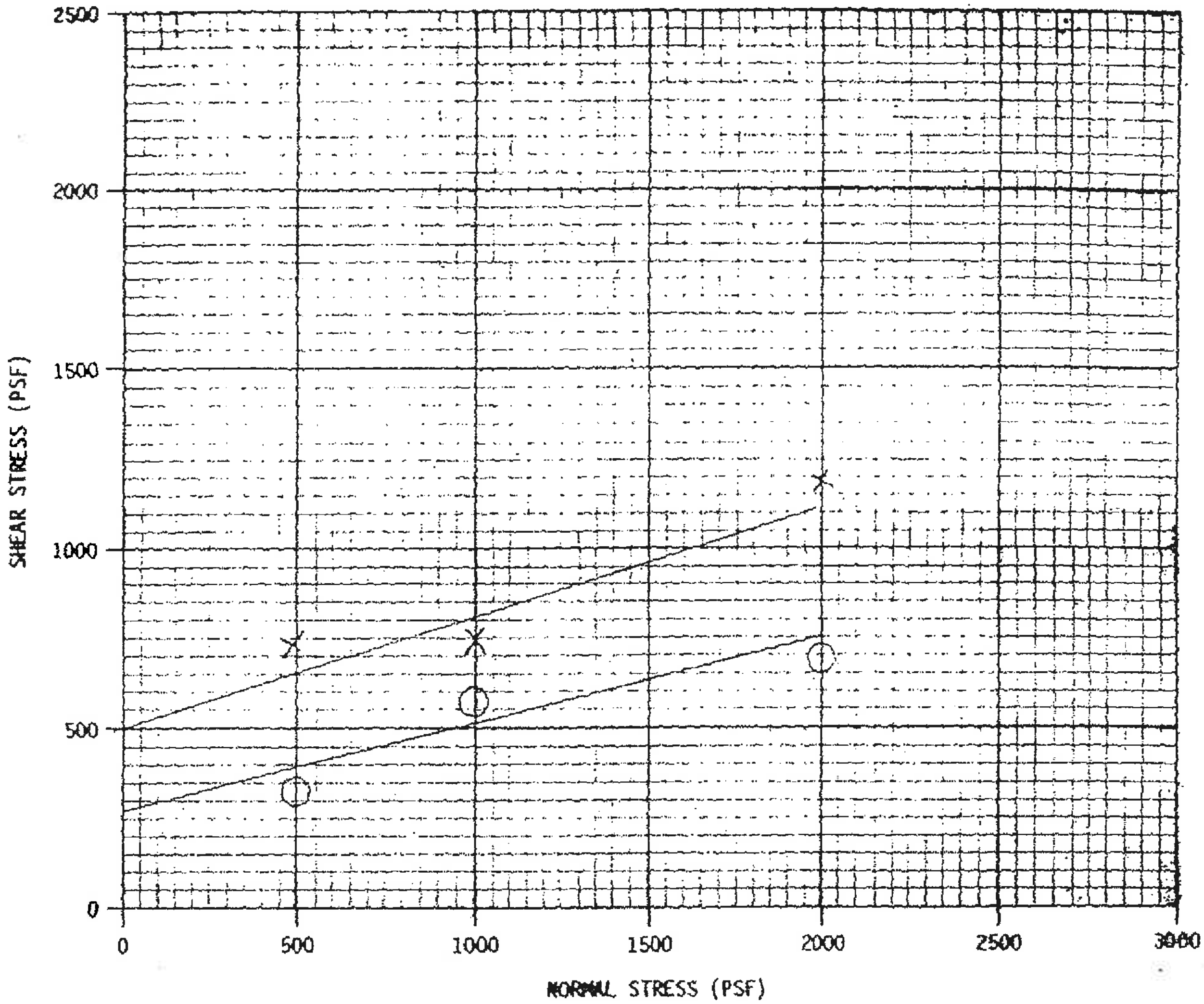
Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12-31-96
GEOTECHNICAL
STATE OF CALIFORNIA

Troy D. Norrell
President



SYMBOL	BORING NUMBER	DEPTH (FEET)	∅ (DEGREES)	C (PSF)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)
X	6	2.5	17	500	84.5	19.9
O	7	3.0	13	275	76.1	31.2
△						
□						

NOTE: TESTS PERFORMED ON SATURATED SAMPLES UNLESS SHOWN BELOW.
(FM) FIELD MOISTURE
TESTS PERFORMED ON UNDISTURBED SAMPLES UNLESS SHOWN BELOW.
(R) SAMPLES REMOLDED AT 90% OF MAXIMUM DRY DENSITY

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

DIRECT SHEAR TEST RESULTS
PLATE A

PROJECT 5914-96 | DATE 4-17-96

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
10641 HUMBOLT STREET LOS ALAMITOS, CA 90720
(310) 799-9469 FAX (310) 799-9459

March 15, 1996

Project Number 5914-96

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

Re: Laboratory Tests - Proposed Development - 4700 Coldwater Canyon, West Hills, in the City of Los Angeles, California

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GEOTECHNICAL
STATE OF CALIFORNIA

Keith D. Tucker
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Troy D. Norrell
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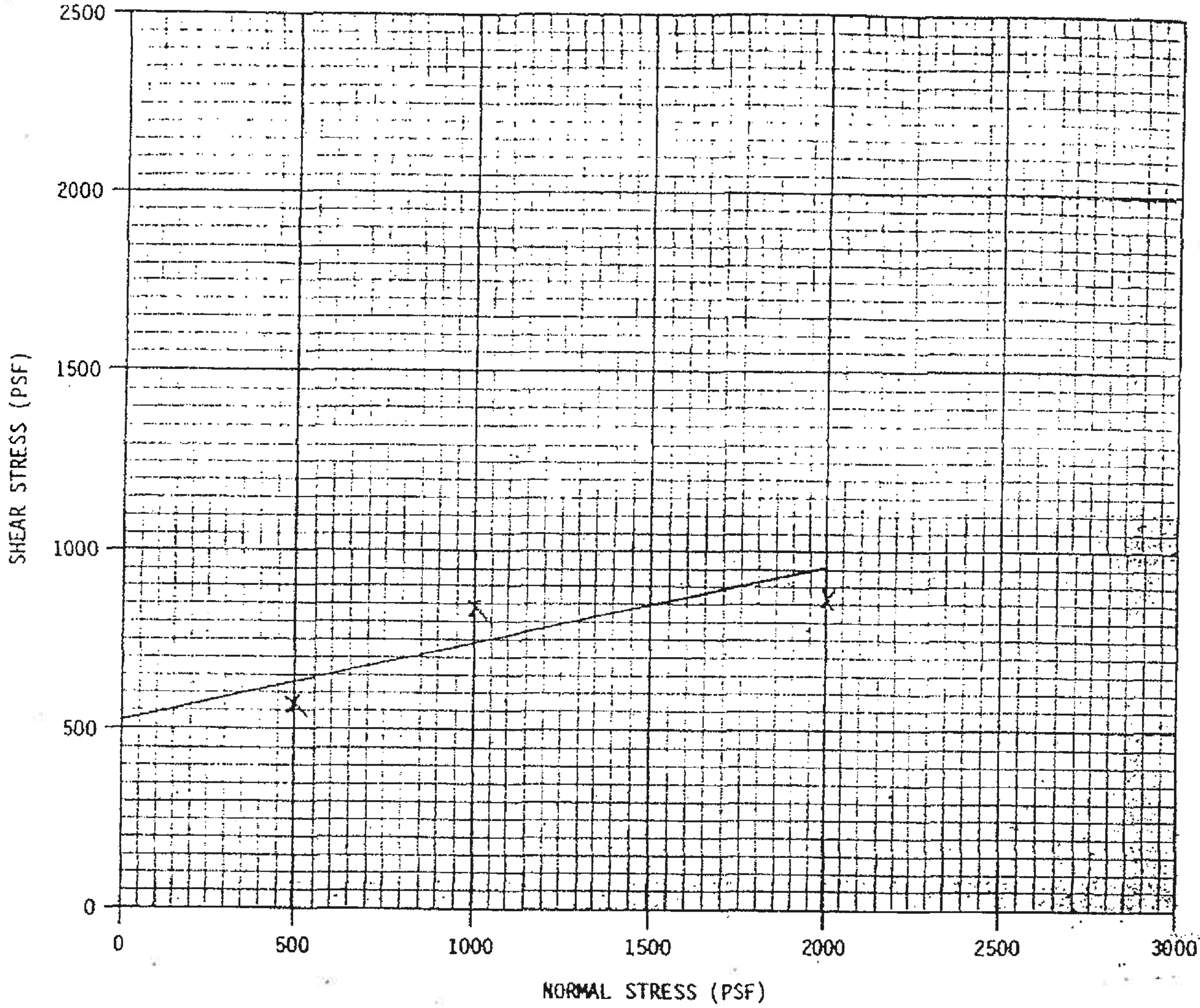

SYMBOL	BORING NUMBER	DEPTH (FEET)	ø (DEGREES)	C (PSF)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)
X	2A	12.0	11	525	83.4	32.1
○						
△						
□						

NOTE: TESTS PERFORMED ON SATURATED SAMPLES UNLESS SHOWN BELOW.
(FM) FIELD MOISTURE
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NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5914-96 DATE 3-15-96

DIRECT SHEAR TEST RESULTS
Plate A

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(310)799-9469 FAX (310)799-9459

May 1, 1996

Project Number 5914-96

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

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NORCAL ENGINEERING

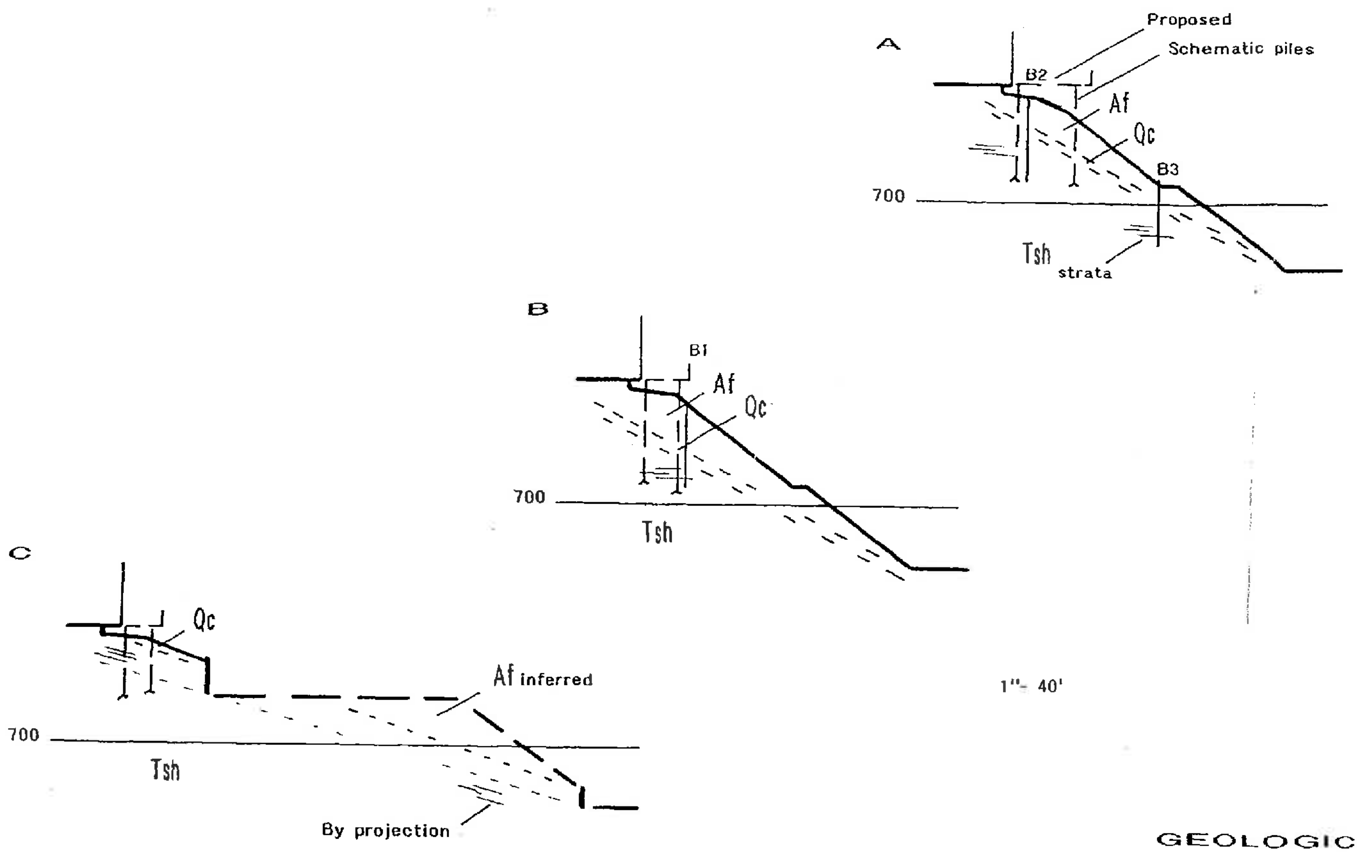
Keith D. Tucker

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL KEITH D. TUCKER No. 841 Exp. 12-31-96 GEOTECHNICAL STATE OF CALIFORNIA

Troy D. Norrell
President

PROJECT No / DATE



1"- 40'

GEOLOGIC SECTIONS

"The Geologic Outfit"

RAY A. EASTMAN
ENGINEERING GEOLOGIST

CITY OF LOS ANGELES
CALIFORNIA

JB17866

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
400, CITY HALL
LOS ANGELES, CA 90012-4869

ARTHUR J. JOHNSON, JR.
GENERAL MANAGER

ARTHUR C. DEVINE
EXECUTIVE OFFICER

July 26, 1996

Log # 18509
C.D. --

(SOILS/GEOLOGY FILE - 2)

Harvard-Westlake School
3700 Coldwater Cyn Avenue
Studio City, CA 91604

TRACT: 1000
LOT: 1111 (Arb 1)
LOCATION: 3700 COLDWATER CANYON AVENUE

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Soils Reports	196-786	05/07/96	Epsilon Eng
	196-786	05/09/96	
	196-786	05/20/96	
Laboratory Test Reports	5914-96	02/02/96	Norcal Eng
	5914-96	02/28/96	
	5914-96	03/15/96	
	5914-96	04/17/96	
	5914-96	05/01/96	
Geologic Report	--	05/04/96	Ray A. Eastman

The subject reports and laboratory tests concerning a proposed 145 foot long deck of undisclosed design and location have been reviewed by the Grading Section of the Department of Building and Safety. It is noted that the proposed cantilevered deck to be located at the rear of the old Science Building, extends over a 1 1/2:1 fill slope. The deck is located on the geologic sections, but not shown on the plans accompanying the report. it is presumed the deck will be concrete and of solid decking.

The reports are acceptable, provided the following conditions are complied with during site development:

1. Graded slopes are not proposed.

2. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

3. All recommendations of the report which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

4. Footings shall be located from the face of the slope a minimum horizontal distance of H/3.

5. The consultants shall inspect the excavations for the footings to determine that they are founded in the recommended strata before calling the Department for footing inspection.

6. All friction pile or caisson drilling and installation shall be performed under the periodic inspection and approval of the Foundation Engineer.

7. Pile and/or caisson foundation ties are required by Code Section 91.1807.2. Exceptions and modification to this requirement are provided in Rule of General Application 662.

8. Pile and/or caisson shafts shall be designed for a lateral load of 1000 pounds per linear foot of shaft exposed to fill, soil and weathered bedrock.

9. The deck shall have no roof or enclosing walls.

10. All deck drainage shall be collected and conducted to an approved location in a non-erosive device.

11. All existing uncertified fill and/or creep prone soils shall be removed and recompacted under the geotechnical supervision of the soils engineer.

12. All graded, brushed or bare slopes shall be planted with low-water consumption, native-type plant varieties recommended by a landscape architect. Suitable arrangements shall be made with the Department with

respect to continued maintenance of the recommended plant varieties until they are established as an effective ground cover.

13. Prior to the placing of compacted fill, a representative of the consulting Soils Engineer shall inspect and approve the bottom excavations. He shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the City Grading Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be filed with the Department upon completion of the work. The fill shall be placed under the inspection and approval of the Foundation Engineer. A compaction report shall be submitted to the Department upon completion of the compaction.

14. Prior to the pouring of concrete, a representative of the consulting Soil Engineer shall inspect and approve the footing excavations. He shall post a notice on the job site for the City Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Department upon completion of the work.

JDV/for

J. W. COBARRUBIAS
Engineering Geologist III

DAVID T. HSU
Geotechnical Engineer II

JWC/DTH:rlm
A:\JUL18509
(213) 485-2160

cc: Epsilon Eng./Norcal Eng
Ray Eastman
VN District Office

CITY OF LOS ANGELES
CALIFORNIA

JB17866

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
400, CITY HALL
LOS ANGELES, CA 90012-4869

ARTHUR J. JOHNSON, JR.
GENERAL MANAGER

ARTHUR C. DEVINE
EXECUTIVE OFFICER

July 26, 1996

Log # 18509
C.D. --

(SOILS/GEOLOGY FILE - 2)

Harvard-Westlake School
3700 Coldwater Cyn Avenue
Studio City, CA 91604

TRACT: 1000
LOT: 1111 (Arb 1)
LOCATION: 3700 COLDWATER CANYON AVENUE

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Engineering Geologist III

DAVID T. HSU
Geotechnical Engineer II

JWC/DTH:rlm
A:\JUL18509
(213) 485-2160

cc: Epsilon Eng./Norcal Eng
Ray Eastman
VN District Office

"The Geologic Outfit"

VN/2107

RAY A. EASTMAN
ENGINEERING GEOLOGIST

2461 East Orangethorpe Avenue, Suite 200
Fullerton, California 92831
(909) 606-9938

November 26, 1996

Epsilon Engineering Inc.
19933 Labrador Street
Chatsworth, Ca. 91311

Subject: Geologic Information Per Proposed " Gallery "
Harvard/Westlake School
3700 Coldwater Canyon Boulevard
N. Hollywood, Ca.
Project No. 1577

Reference: Engineering Geologic Investigation Report dated May 4, 1996

Gentlemen:

Per your request, we have reviewed our earlier report in regards to the proposed " Gallery " which will be located at the northeasterly side of the Mudd Library. We find that the geologic conditions described therein may be applied to the " Gallery " site.

We trust that this geologic information will meet with your needs at this time.

Sincerely,

Ray A. Eastman
CEG423

"The Geologic Outfit"

2063

RAY A. EASTMAN
ENGINEERING GEOLOGIST

2461 E. Orangethorpe Avenue
Suite 229
Fullerton, California
92631

February 17, 1997

VN 2186

RECEIVED
FEB 20 1997
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

Epsilon Engineering Inc.
19933 Labrador Street
Chatsworth, Calif. 91311

Subject: Proposed Gallery
Remodeled Arts Complex Building
Harvard/Westlake School
3700 Coldwater Canyon Boulevard
N. Hollywood, Calif.
Project No. 1577

Reference: Engineering Geologic Investigation Report for a Proposed Deck at the Remodeled Arts Complex Building dated May 4, 1996.

Gentlemen:

Per your request, we have revised our geologic map to show the proposed gallery site and two associated section lines have been drawn to reflect the subsurface conditions.. The supplemental map and sections are appended.

We trust that this geologic information will meet with your needs at this time.

Sincerely,

Ray A. Eastman
CEG 423

20634

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099
FAX (818) 886-6045

February 13, 1997
Job No. 196-786

VN 2186

RECEIVED
FEB 20 1997
DEPARTMENT OF BUILDING & SAFE
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

City of Los Angeles
Department of Building & Safety
480 City Hall Room 460A
Los Angeles, CA

Re: Harvard Westlake School
Proposed Art Gallery

Dear Sirs:

The following report is in response to the recent geotechnical review sheet, dated January 21, 1997 for the proposed gallery.

This report includes information from previous reports dated May 7, May 9, and May 20, 1996. Also a report pertaining to an elevator structure dated January 29, 1997, as well as geology reports by Ray Eastman dated May 4, 1996 and January 7, 1997.

Update Field Investigation

Two test bores were excavated--no. 6 and 7, dated April 4, 1996. Laboratory results and log borings are attached. Our findings were similar to those found in test borings on the slope. Below, the bed rock was much closer to the surface.

Conclusions and Recommendations

Lateral Resistance

The competent bed rock in this area lies approximately three feet (3') below the surface. Due to existing walls and surcharges, we recommend that the building be founded on poured-in-place piles and into competent bed rock. Material underlying the descending slope area provides lateral resistance to creep forces and seismic loads. The following values may be used in resisting these lateral loads imposed on the pile foundations:

Coefficient of friction = 0.40
Equivalent passive fluid pressure = 400 pcf
Maximum passive pressure - 4,000 pcf

These values are for deepened foundations embedded into competent bed rock material, only. The point of fixity for pile foundation may be assumed at the colluvium bed rock contact depth.

Friction Pile Foundation

Friction pile may be constructed below the proposed structure to provide vertical and lateral support for structure. An allowable skin friction value of 500 psf may be utilized for piles embedded into competent bed rock material. An additional one-third increase may be applied to this value due to short-term wind or seismic loading conditions.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston

Steven Thurston
Engineering Vice President
GEO 829

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. THURSTON
No. GEO. 0829
Exp. 12/31/00
GEOTECHNICAL
STATE OF CALIFORNIA

BORING LOG: No. 6

DATE: APRIL 4, 1996 DRILLING EQUIPMENT

DRIVING WEIGHT: SURFACE EL. BORING:

ADDRESS: 700 COLDWATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
4"			CONCRETE					
2 5			SANDY CLAY BROWN LOOSE W/ROCK FRAG-		19.9	85	17	500
3 5			MENTS					
			BED ROCK GRAY BROWN DRY HARD AT 4'					
5'			BOTTOM OF BORING					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 · (805) 259-8099
FAX (818) 886-6045

BORING LOG: | **No.** 7

DATE: APRIL 4, 1996 **DRILLING EQUIPMENT**

DRIVING WEIGHT:

SURFACE EL. BORING:

ADDRESS: 700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
4"			CONCRETE					
2.5'			SANDY CLAY, DRY LOOSE GRAY					
			BED ROCK, LIGHT GRAY SOFT, HARD		31.2	76.1	13	275
4'			@ 3' BOTTOM OF BORING 7					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 • (805) 259-8099
FAX (818) 886-6045

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(310)799-9469 FAX (310)799-9459

April 17, 1996

Project Number 5914-96

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

RE: **Laboratory Tests** - Proposed Development - Located at 3700 Coldwater Canyon, North Hollywood, in the City of Los Angeles, California

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NORCAL ENGINEERING

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R.G.E. 841

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No. 841
Exp. 12-31-96
GEOTECHNICAL
STATE OF CALIFORNIA

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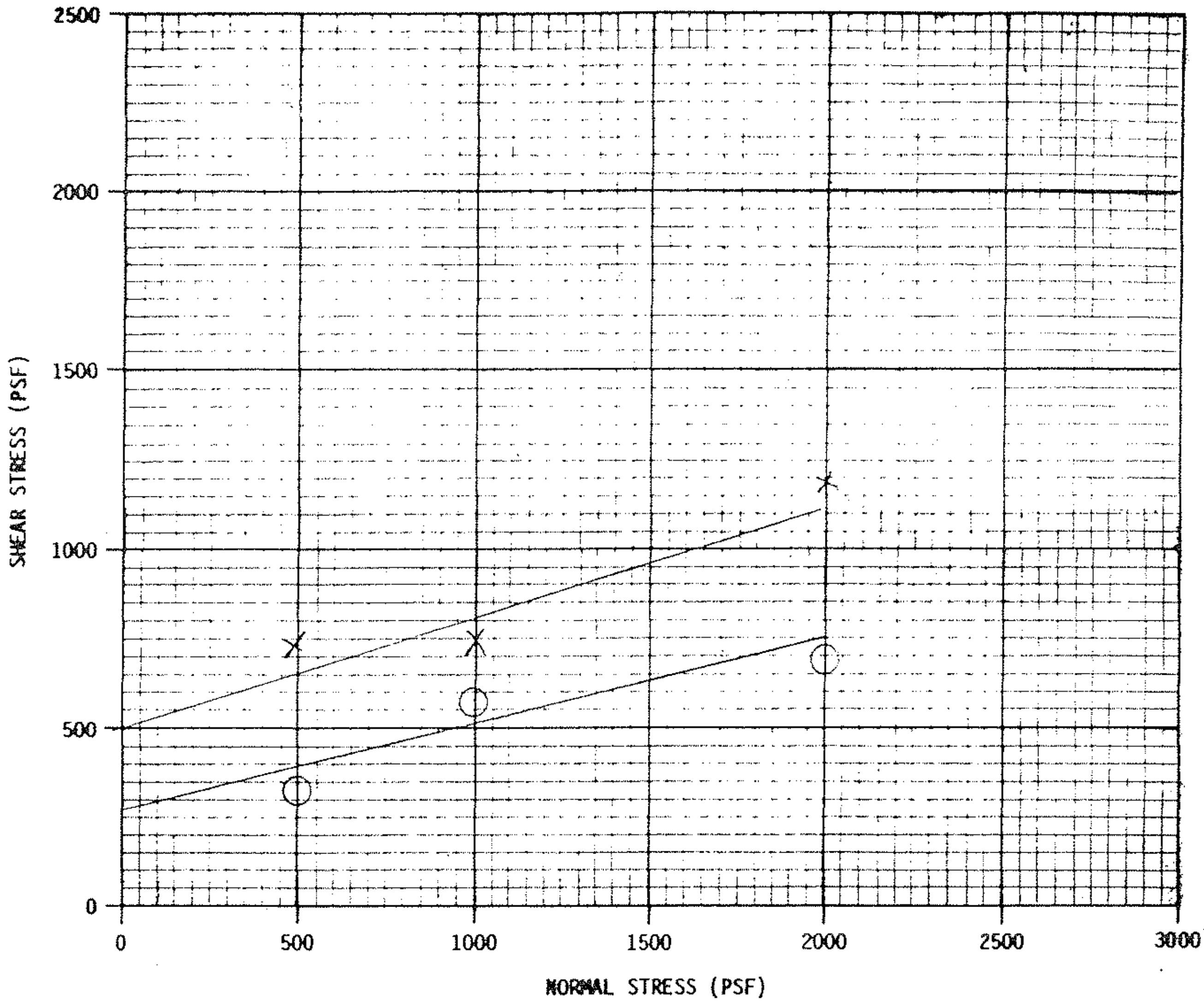

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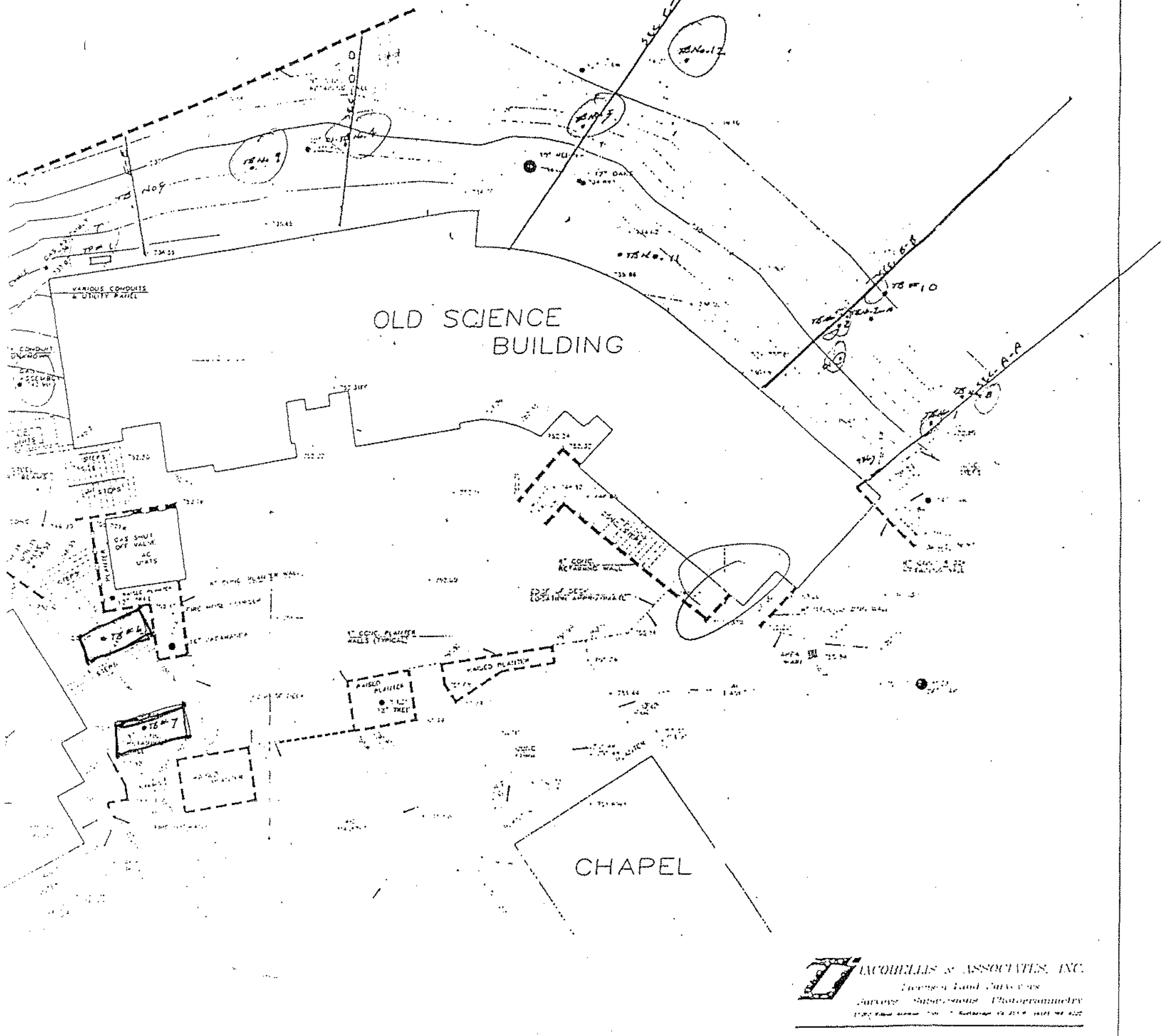
NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 5914-96 | DATE 4/17/96

DIRECT SHEAR TEST RESULTS
PLATE A

SURVEY
KE CAMPUS



REDUCED TO FIT THE FAX

JB17866

CITY OF LOS ANGELES
CALIFORNIA

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY

400 CITY HALL
LOS ANGELES, CA 90012-4869

ARTHUR J. JOHNSON, JR.
GENERAL MANAGER

ARTHUR C. DEFINE
EXECUTIVE OFFICER

January 21, 1997

Log # 20286
Soils/Geo File-2

Harvard Westlake School
3700 Coldwater Cyn. Av.
N. Hollywood, Ca. 91604

TRACT:	1000
LOT:	1111 (arb-1)
LOCATION:	3700 Coldwater Cyn. Av.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Geo Report	1577	Nov. 26, 1996	Ray A. Eastman

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Letter	18509	July 26, 1996	Bldg.&Sfty.
Geo Report	1577	May 4,1996	Ray A. Eastman
Soil Report	196-786	May 7, 1996	Epsilon Eng.
" "	" "	May 9, 1996	" "
	" "	May 20, 1996	" "

The above report concerning a proposed gallery has been reviewed by the Grading Section of the Department of Building and Safety.

The report cannot be approved as it lacks sufficient information to determine the stability or safety of the proposed development. An addendum to the report shall be submitted which contains the following information:

1. Provide a revised geologic map and cross section showing the proposed gallery.

2. Provide recommendations from the soil engineer for the proposed gallery.

Theodore Nickerson
THEODORE NICKERSON
Engineering Geologist II

EDWARD CASTELLANOS
Geotechnical Engineer I

TDN:DTH:tdn
a/20286
(213) 485-3435

cc: Epsilon Engineering
Ray A. Eastman
VN District Office

JB17866

CITY OF LOS ANGELES

CALIFORNIA

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY

400 CITY HALL
LOS ANGELES, CA 90012-4869

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GENERAL MANAGER

ARTHUR C. DEFINE
EXECUTIVE OFFICER

January 21, 1997

Log # 20286
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TDN:DTH:tdn
a/20286
(213) 485-3435

cc: Epsilon Engineering
Ray A. Eastman
VN District Office

21056

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19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099
FAX (818) 886-6045

VN 2299

RECEIVED
APR 09 1997
DEPARTMENT OF BUILDING & SAFETY
VAN NUYS DISTRICT OFFICE
GRADING DIVISION

REPORT

OF

PRELIMINARY SOIL INVESTIGATION

HARVARD SCHOOL
GALLERY BASEMENT
3700 COLD WATER CANYON
NORTH HOLLYWOOD, CA

MARCH 14, 1997
Job No. 397-834

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR ST.
CHATSWORTH, CA 91311
(818) 886-3208 (805) 259-8099
FAX (818) 886-6045

March 14, 1997
Job No. 397-834

Harvard School
Attn: Mr. James Shelton
3700 Cold Water Canyon
North Hollywood, CA

Re: Harvard School
Gallery Basement
3700 Cold Water Canyon
North Hollywood, CA

Dear Mr. Shelton:

Pursuant to your request, we have conducted a preliminary soil investigation at the above mentioned project.

The purpose of the investigation was to determine the adequacy of sub-surface soil for the support of the proposed structure, addition and basement.

Site Description

The subject site is located in the Gallery Building, and is to be an addition to the existing structure with a basement. The site is relatively level, sloping very slightly to the north. There are buildings on both the east and west sides with basements.

Soil Investigation

Two (2) test borings were excavated at the site. The soil was visually classified at the time of excavation. Bulk and undisturbed samples were obtained and taken to the laboratory for further testing. The laboratory testing was performed by Norcal Engineering Co., 10641 Humbolt St., Los Alamitos, CA 90720. For location of test borings, see plot plan attached. Also attached are logs of test borings. No seepage or ground water was encountered during the excavation.

We accept the laboratory test results from Norcal Engineering.

Foundation Conditions

To reduce the potential of subsidence and to provde uniform support for the structure, we recommend that the existing soils be excavated to basement floor level. The excavation may be laid back to one-half to one (1/2 to 1) with an extra three feet at the footing elevation. This will be the north and south walls. The east and west walls are already in place.

Bearing Values

For footings founded in natural grade, a bearing value of 2100 pounds per square foot (psf) may be assigned to footings having a minimum width and depth of one foot. An additional 200 lbs. Per square foot may be added to the above values for each additional foot of depth below designed grade.

An additional one third of the above value may be added for live and transient loading such as wind and seismic loading and an equivalent fluid weight of thirty pounds per foot.

Slabs on Grade

For soils falling in the medium expansive range, we recommend reinforcing with No. 4 bars at eighteen inches (18") on center, with a moisture barrier, such as a plastic membrane of at least 6 mils in thickness. The membrane should be overlain by a minimum of two inches (2") of clean sand to provide a working surface. The top twelve inches (12") shall be saturated to 140% of optimum moisture.

All disturbed soil shall be recompacted to at least 90% of maximum laboratory density as determined in accordance with ASTM Test Method D-1557-78.

Utility Trenches

All utility trenches should be compacted to at least 90% of maximum density as determined in the laboratory.

This report is based upon observation of excavations plotted on Plate No. 1. No representation is made for quality or extent of materials not observed.

Harvard School
Attn: Mr. James [illegible]

[illegible]
[illegible]

If during construction, conditions are found other than those covered in this report, the soil engineer should be notified before proceeding further.

All footings should be inspected by the soil engineer prior to placing steel.

This report is subject to review and approval by local governing authorities.

Sincerely,

L. W. Jones

Approved by:

Steven Thurston,
Engineering Vice President

REGISTERED PROFESSIONAL ENGINEER
STEVEN R. THURSTON
No. GEO. 0829
Exp. 12/31/00
GEOTECHNICAL
STATE OF CALIFORNIA

BORING LOG: No. 1

DATE: FEB. 28, 1997 DRILLING EQUIPMENT

DRIVING WEIGHT: SURFACE EL. BORING:

ADDRESS: 3700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	Y PCF	θ SHEAR STRENGTH	C PSF
6'			CLAYEY SAND W/ ROCK FRAGMENTS FILL LOOSE GRAY BROWN MOIST					
13'			BED ROCK, SOFT SHALE GRAY BROWN MOIST		33	79	11	32
27'								
28'			VERY HARD ROCK GRAY BOTTOM OF BORING?					

EPSILON ENGINEERING & INSPECTION INC.
19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
(818) 886-3208 • (805) 259-8099
FAX (818) 886-6045

BORING LOG: No. 2

DATE: Feb. 28, 1997

DRILLING EQUIPMENT

DRIVING WEIGHT:

SURFACE EL. BORING:

ADDRESS: 3700 COLD WATER CANYON

			VISUAL CLASSIFICATION	CLASSIFICATION		ENGINEERING PROPERTIES		
				EXPANSIVE INDEX	% MOISTURE	γ PCF	ϕ SHEAR STRENGTH	C PSF
8			CLAYEY SAND, W/ROCK FRAGMENTS GRAY BROWN MOIST LOOSE					
11			BED ROCK, SHALE SOFT GRAY BROWN MOIST.		37	81	14	400
27'			BOTTOM OF BORING					

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19933 LABRADOR STREET
CHATSWORTH, CALIFORNIA 91311
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FAX (818) 886-6045

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(310)799-9469 FAX (310)799-9459

March 12, 1997 | Project Number 6615-97

Epsilon Engineering
19933 Labrador Street
Chatsworth, California 91311

RE: **Laboratory Tests** - Proposed Development - Located at 3700 Coldwater Canyon Boulevard, in the City of Los Angeles, California

Dear Sirs:

Pursuant to the request of Mr. Leonard Jones, the following laboratory tests were performed on samples of soils transported to this firm.

LABORATORY TESTS

A. Direct shear tests (ASTM:3080) were performed on undisturbed samples of the soils. These tests are performed under saturated conditions at loads of 500 lbs./sq.ft., 1,000 lbs./sq.ft. and 2,000 lbs./sq.ft. with results shown on Plate A.

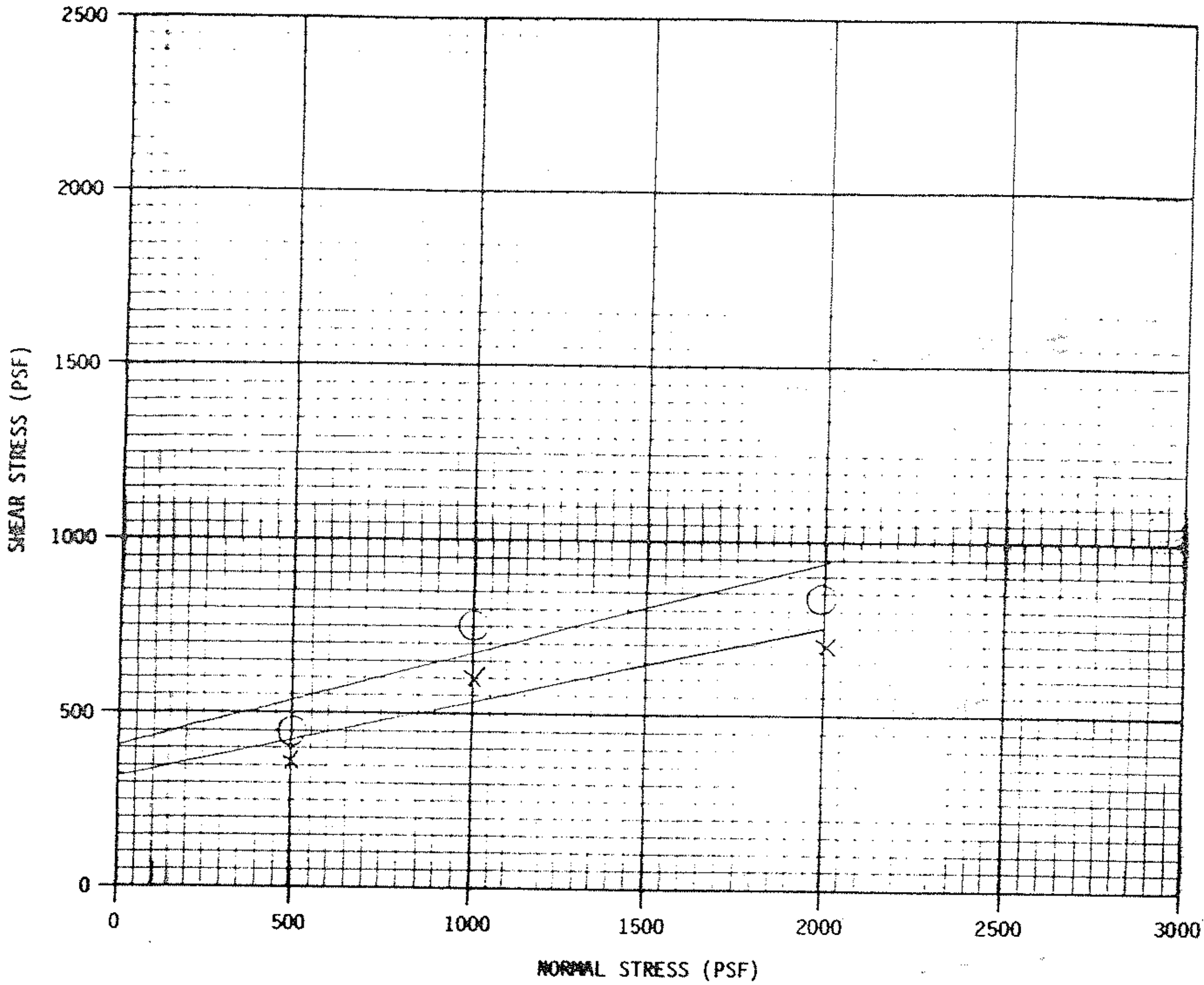
We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12/31/00
GEOTECHNICAL
STATE OF CALIFORNIA

Troy D. Norrell
President



SYMBOL	BORING NUMBER	DEPTH (FEET)	Ø (DEGREES)	C (PSF)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)
X	1	13.0	11	325	78.9	33.4
O	2	11.0	14	400	81.1	37.4
Δ						
□						

NOTE: TESTS PERFORMED ON SATURATED SAMPLES UNLESS SHOWN BELOW.
(FM) FIELD MOISTURE
TESTS PERFORMED ON UNDISTURBED SAMPLES UNLESS SHOWN BELOW.
(R) SAMPLES REMOLDED AT 90% OF MAXIMUM DRY DENSITY

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 6615-97 | DATE

DIRECT SHEAR TEST RESULTS
Plate A

"The Geologic Outfit"

RAY A. EASTMAN
ENGINEERING GEOLOGIST

2461 East Orangethorpe Avenue, Suite 200
Fullerton, California 92831
(909) 606-9938

March 5, 1997

Epsilon Engineering Inc.
19933 Labrador Street
Chatsworth, Calif. 91311

Subject: Supplemental Geologic Information
Proposed Gallery
Remodel Arts Complex Building
Harvard/ Westlake School
3700 Coldwater Canyon Boulevard
N. Hollywood, Calif.
Project No. 1577A.

Reference: Engineering Geologic Investigation Report for a Proposed Deck at the Remodeled Arts Complex Building dated May 4, 1996.

Gentlemen:

Per your request, we have made geologic inspections of two test borings at the gallery site. The said inspections were made on February 28th and same consisted of down hole logging of the test borings.

The geology consists of shale bedrock and fill as anticipated in our earlier report and memorandum of February 17th.

We have added the test boring information to our earlier drawings and same as well as the logs are appended.

We trust that this supplemental geologic information will meet with your needs at this time.

Sincerely,

Ray A. Eastman
CEG 423

GEOLOGIC LOG - TEST BORING

Project No.: 1577A
Equipment: Auger rig
Elevation: 750

Date: 2-28-97
Boring Dimensions: Dia. 2'

Boring No.: 1
D. 30'

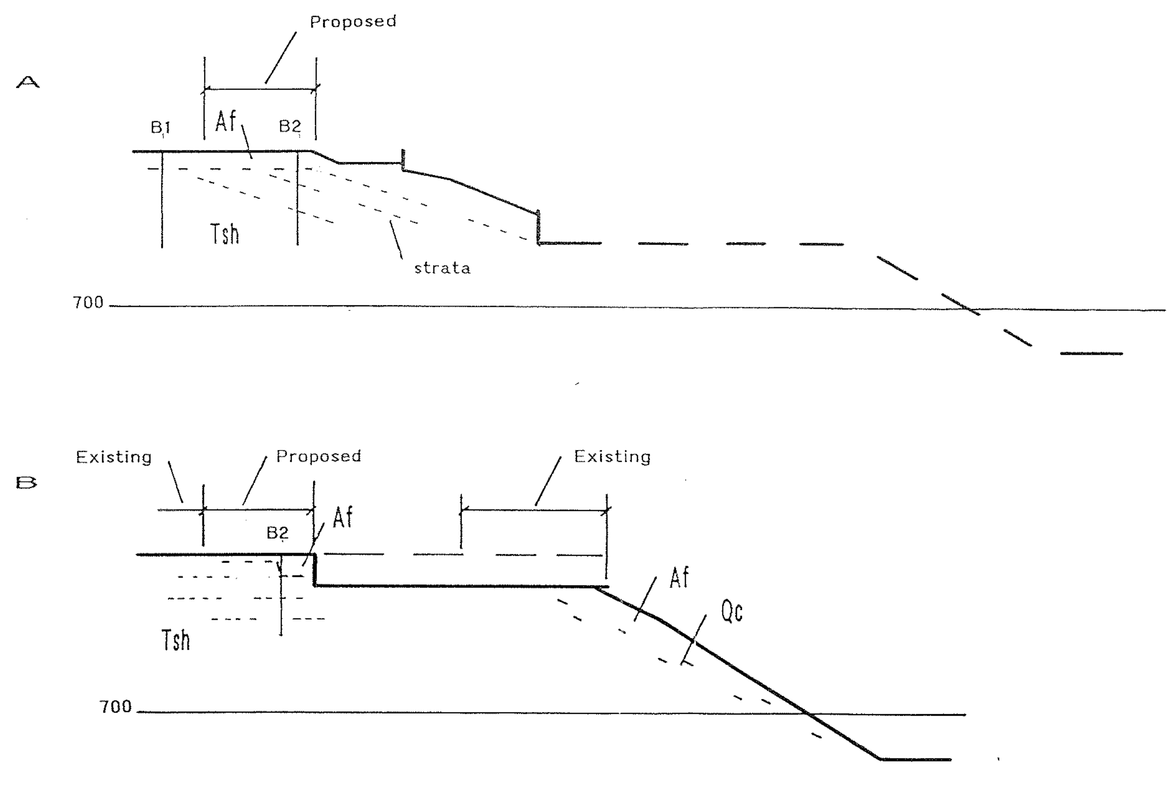
Depth '	Description	Unit
0-6.5	Mod comp moist brn si f-m sand	Fill
6.5 -30	Firm damp gr and brn diatomaceous shale - N40E12N	Modelo fm.
	Seepage nil	

GEOLOGIC LOG - TEST BORING

Project No.: 1577A | Date: 2-28-97 | Boring No.: 2
Equipment: Auger rig | Boring Dimensions: Dia. 2' | D. 27'
Elevation: 749

Depth '	Description	Unit
	East Side	
0-2	Mod comp moist cly f-m sand w/gravel	Fill
2-4	Mod comp moist brn si f-m sand	
4-6	Mod comp moist lt brn si f sand w/numerous shale fgs	
6-27	Firm damp gr and brn diatomaceous shale - N30W18N; local fold at 16' at N30W18N	Modelo fm.
	West Side	
0-2	Fill	
2-27	Shale	
	Seepage nil	

PROJECT No 1577 DATE 2-97

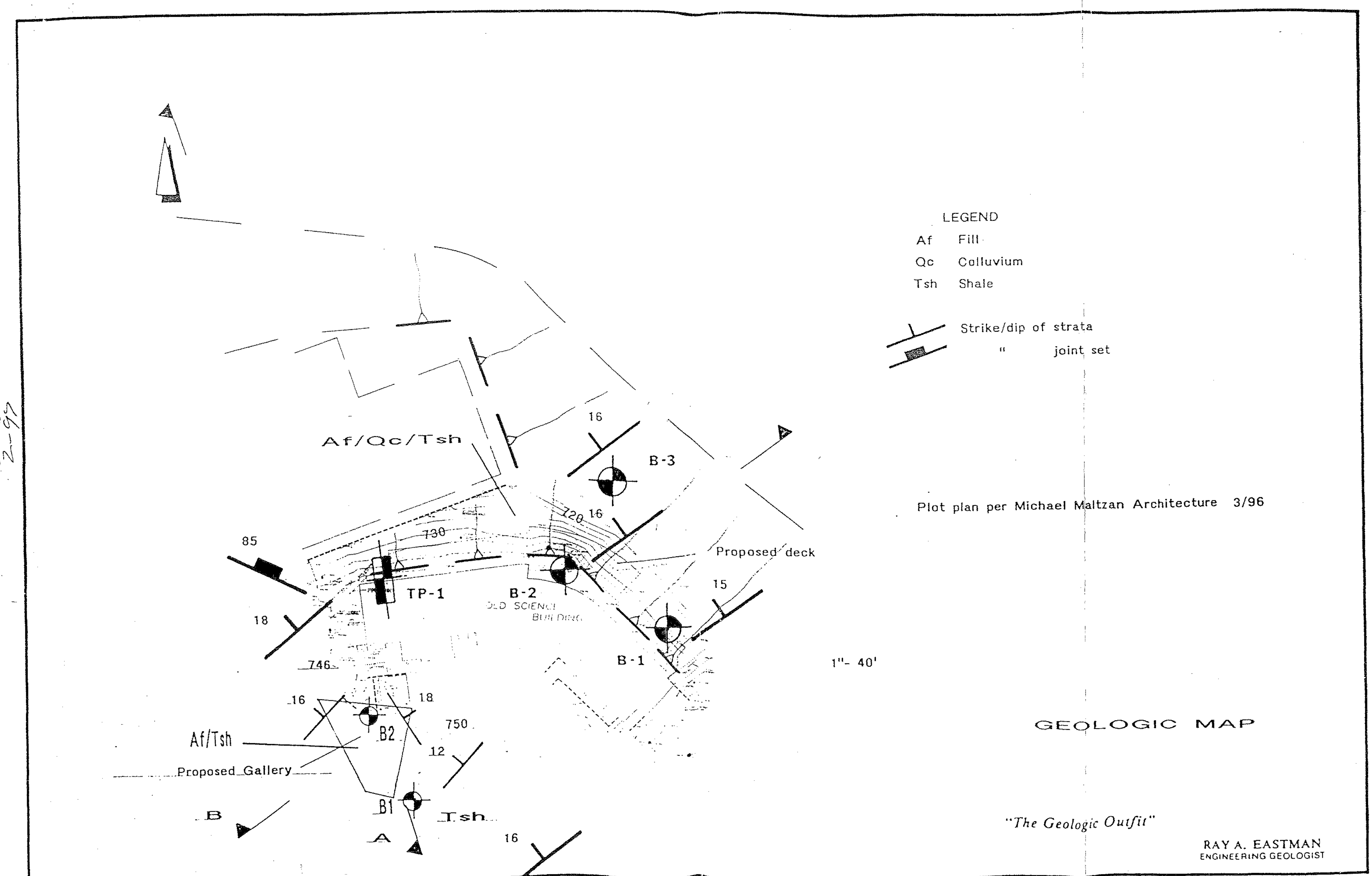


1"- 40'

GEOLOGIC SECTIONS

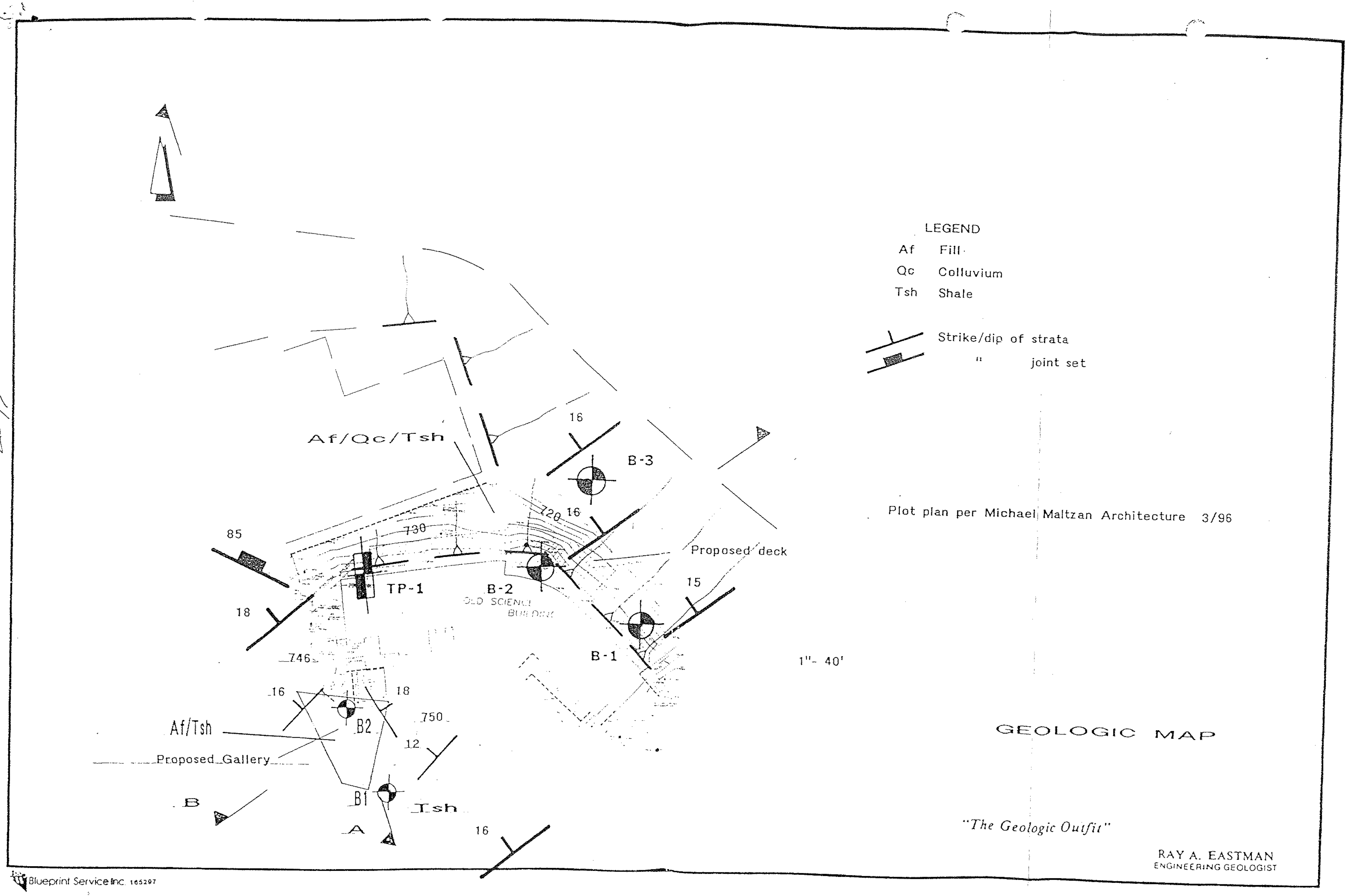
"The Geologic Outfit"

RAY A. EASTMAN
ENGINEERING GEOLOGIST



LEGEND
Af Fill
Qc Colluvium
Tsh Shale
Strike/dip of strata
" joint set
Af/Qc/Tsh
Af/Tsh
Tsh
Proposed Gallery
Proposed deck
OLD SCIENCE BUILDING
TP-1
B-1
B-2
B-3
B1
B2
A
B
85
18
16
16
16
18
12
15
16
730
720
746
750
1"- 40'
Plot plan per Michael Maltzan Architecture 3/96
GEOLOGIC MAP
"The Geologic Outfit"
RAY A. EASTMAN
ENGINEERING GEOLOGIST

5-96
2-97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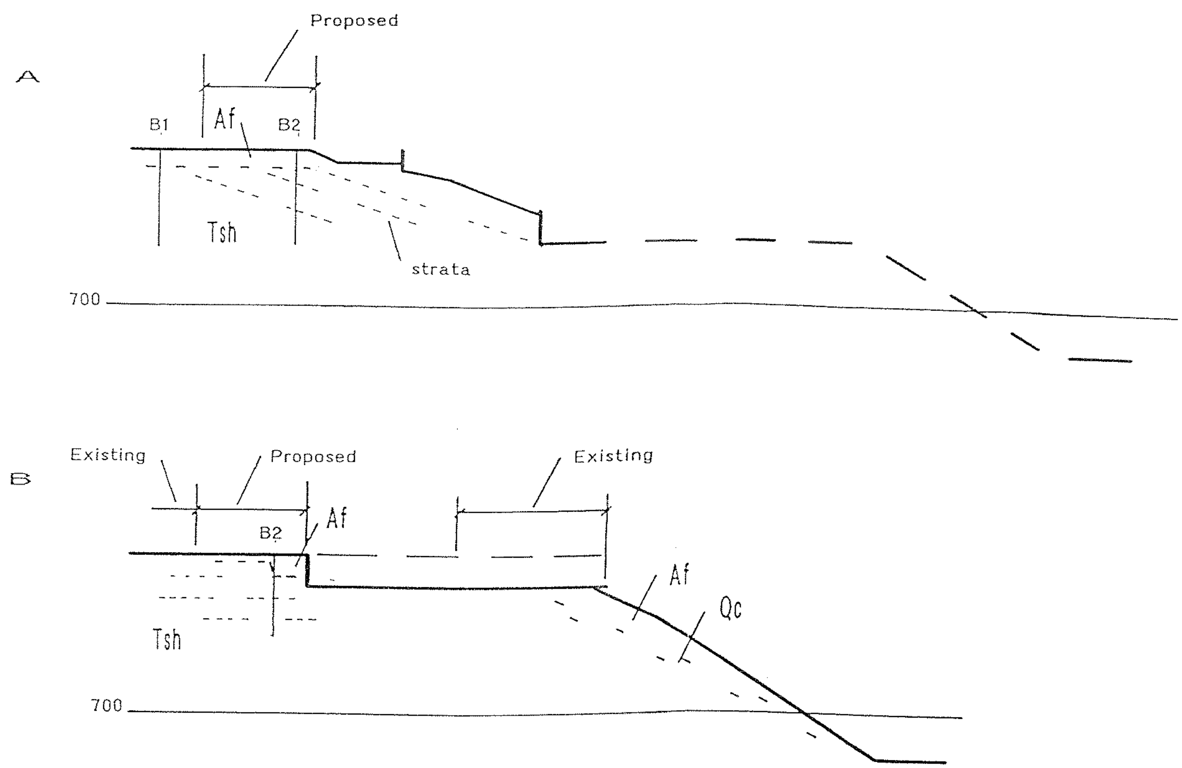
Af Fill
Qc Colluvium
Tsh Shale
Strike/dip of strata
" joint set
Plot plan per Michael Maltzan Architecture 3/96
Af/Qc/Tsh
B-3
16
85
730
720
Proposed deck
15
TP-1
B-2
OLD SCIENCE BUILDING
18
B-1
746
1"- 40'
16
18
750
Af/Tsh
B2
12
Proposed Gallery
B
B1
Tsh
A
16
GEOLOGIC MAP
"The Geologic Outfit"
RAY A. EASTMAN
ENGINEERING GEOLOGIST
Blueprint Service Inc. 165297

PROJECT No 1577 DATE 2-97



1"- 40'

GEOLOGIC SECTIONS

"The Geologic Outfit"

RAY A. EASTMAN
ENGINEERING GEOLOGIST

CITY OF LOS ANGELES
CALIFORNIA

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
400 CITY HALL
LOS ANGELES, CA 90012-4869
ARTHUR J. JOHNSON, JR.
GENERAL MANAGER
ARTHUR C. DEFINE
EXECUTIVE OFFICER

VN

March 21, 1997

Log # 20634
Soils/Geo File-2

Harvard Westlake School
3700 Coldwater Cyn. Av.
N. Hollywood, Ca. 91604

TRACT: 1000
LOT: 1111 (arb-1)
LOCATION: 3700 Coldwater Cyn. Av.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Soil Report	196-786	Feb. 13, 1997	Epsilon Engrg.
Geo Report	1577	Feb. 17, 1997	Ray A. Eastman

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Letter	20286	Jan. 21, 1997	Bldg.&Sfty.
" "	18509	July 26, 1996	" "
Soil Report	196-786	May 20, 1996	Epsilon Engrg.
" "	" "	May 9, 1996	" "
" "	" "	May 7, 1996	" "
Geo Report	1577	Nov. 26, 1996	Ray A. Eastman
" "	" "	" "	" "

The above reports concerning recommendations for a proposed gallery have been reviewed by the Grading Section of the Department of Building and Safety.

The reports are acceptable, provided the following conditions are complied with during site development:

1. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly

indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

2. All new fill slopes shall be no steeper than 2:1.

3. All proposed new cut slopes shall be no steeper than 2:1 or the angle of exposed bedding planes, whichever is flatter.

4. All recommendations of the reports which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

5. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

6. The geologist and soil engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading.

7. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557.

8. Both the geologist and the soils engineer shall inspect and approve all fill and subdrain placement areas prior to placing fill. Both consultants shall include in their final reports a certification of the adequacy of the foundation material to support the fill without undue settlement and/or consolidation.

9. All graded, brushed or bare slopes shall be planted with low-water consumption, native-type plant varieties recommended by a landscape architect.

10. All roof and pad drainage shall be conducted to the street in an acceptable manner.

11. The building shall be supported on cast-in-place friction piles or caissons founded in competent bedrock. Pile design parameters shall be as recommended in the 2/13/97 report.

12. Footings adjacent to a descending slope steeper than 3:1 in gradient shall be located a distance of one-third the vertical height of the slope but need not exceed 40 feet measured horizontally from the lowest unsupported bedding plane.

13. The geologist and soil engineer shall inspect the excavations for the footings to determine that they are founded in the recommended strata before calling the Department for footing inspection.

14. Foundation ties are required for individual piles and/or caissons per Code Section 91.1807.2. Exceptions and modification to this requirement are provided in Rule of General Application 662.

15. Pile and/or caisson shafts shall be designed for a lateral load of 1000 pounds per linear foot of shaft exposed to fill, soil and weathered bedrock.

16. Existing upper soils shall not be used for vertical and/or lateral support of footings, concrete slabs, new fill or deep foundations.

Theodore Nickerson

THEODORE NICKERSON
Engineering Geologist II

EDWARD CASTELLANOS
Geotechnical Engineer I

TDN:EC:tdn:ec
a/20634
(213) 485-3435

cc: Epsilon Engineering & Inspection Inc.
Ray A. Eastman
U. B. S. K.
VN District Office

CITY OF LOS ANGELES
CALIFORNIA

COMMISSIONERS

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March 21, 1997

Log # 20634
Soils/Geo File-2

Harvard Westlake School
3700 Coldwater Cyn. Av.
N. Hollywood, Ca. 91604

TRACT: 1000
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15. Pile and/or caisson shafts shall be designed for a lateral load of 1000 pounds per linear foot of shaft exposed to fill, soil and weathered bedrock.

16. Existing upper soils shall not be used for vertical and/or lateral support of footings, concrete slabs, new fill or deep foundations.

Theodore Nickerson
THEODORE NICKERSON
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EDWARD CASTELLANOS
Geotechnical Engineer I

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cc: Epsilon Engineering & Inspection Inc.
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V N

CITY OF LOS ANGELES

CALIFORNIA

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400 CITY HALL
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TIM TAYLOR
GENERAL MANAGER

RICHARD E. HOLGUIN
EXECUTIVE OFFICER

August 11, 1997

Log # 22010
Soils/Geo File-2

Harvard Westlake School
3700 Coldwater Canyon Av.
N. Hollywood, Ca. 91604

TRACT: 1000
LOT: 1111 (arb-1)
LOCATION: 3700 Coldwater Canyon Av.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Addendum Report	196-786	July 31, 1997	Epsilon Engrg.

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Soil Report	397-834	June 18, 1997	Epsilon Engrg.
Geo Report	1577A	April 28, 1997	Ray A. Eastman
Soil Report	397-834	March 14, 1997	Epsilon Engrg.
Geo Report	1557A	March 5, 1997	Ray A. Eastman
Dept. Letter	21684	July 25, 1997	Bldg. & Sfty
Dept. Letter	21056	Mar. 14, 1997	Bldg. & Sfty
Dept. Letter	20634	Mar. 21, 1997	Bldg. & Sfty

The above reports concerning recommendations for a proposed addition to the gallery building have been reviewed by the Grading Section of the Department of Building and Safety. The March 21, 1997 Department letter approved the addition which was to be supported on friction piles founded in bedrock (condition-11). Condition 16 of the letter restricted the upper soils from any support use. The March 14, 1997 soil report recommends support of the addition on footings founded in natural grade. The April 28, 1997 geology report shows a basement under the addition so that the bearing material would now be bedrock, probably with continuous footings instead of friction piles.

The reports are acceptable, provided the following conditions are complied with during site development:

1. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

2. All conditions of the above referenced Department letter shall apply, except condition 11 which shall be modified to allow continuous footings founded in bedrock.

3. All recommendations of the report which are in addition to or more restrictive than the conditions contained herein shall also be incorporated into the plans for the project.

4. Temporary excavations exposing bedding planes shall be trimmed along bedding.

5. Temporary excavations in fill or soil shall be no steeper than 1:1.

6. A grading permit shall be obtained for all structural fill and retaining wall backfill.

7. Prior to issuance of the building permit, the design of the subdrainage system required to prevent possible hydrostatic pressure behind the retaining wall shall be approved by the soils engineer and accepted by the Department. Installation of the subdrainage system shall be inspected and approved by the soils engineer and by the City grading inspector.

8. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. He shall post a notice on the job site for the City grading inspector and the contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the City grading inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be filed with the Department upon completion of the work. The fill shall be placed under the inspection and approval of the soils engineer. A compaction report shall be submitted to the Department upon completion of the compaction.

9. Basement walls and slab shall be waterproofed with an L.A. City approved "Below-grade waterproofing" material with a research report number.

10. Basement excavations shall be performed under the continuous inspection and approval of the soils engineer and deputy grading inspector.

11. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557.

12. In-place density tests shall be performed in accordance with the latest version of A.S.T.M.

Standard. Density tests utilizing nuclear devices shall conform to Memorandum of General Distribution #61.

Theodore Nickerson
THEODORE NICKERSON
Engineering Geologist II

ANDRZEJ T. SZPIKOWSKI
Geotechnical Engineer I

TDN:ATS:tdn:ats
a/22010
(213) 485-3435

cc: Epsilon Engineering
Ray A. Eastman
VN District Office

V N

CITY OF LOS ANGELES

CALIFORNIA

RICHARD J. RIORDAN
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August 11, 1997

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3700 Coldwater Canyon Av.
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3. All recommendations of the report which are in addition to or more restrictive than the conditions contained herein shall also be incorporated into the plans for the project.

4. Temporary excavations exposing bedding planes shall be trimmed along bedding.

5. Temporary excavations in fill or soil shall be no steeper than 1:1.

6. A grading permit shall be obtained for all structural fill and retaining wall backfill.

7. Prior to issuance of the building permit, the design of the subdrainage system required to prevent possible hydrostatic pressure behind the retaining wall shall be approved by the soils engineer and accepted by the Department. Installation of the subdrainage system shall be inspected and approved by the soils engineer and by the City grading inspector.

8. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. He shall post a notice on the job site for the City grading inspector and the contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the City grading inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be filed with the Department upon completion of the work. The fill shall be placed under the inspection and approval of the soils engineer. A compaction report shall be submitted to the Department upon completion of the compaction.

9. Basement walls and slab shall be waterproofed with an L.A. City approved "Below-grade waterproofing" material with a research report number.

10. Basement excavations shall be performed under the continuous inspection and approval of the soils engineer and deputy grading inspector.

11. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557.

12. In-place density tests shall be performed in accordance with the latest version of A.S.T.M.

Standard. Density tests utilizing nuclear devices shall conform to Memorandum of General Distribution #61.

Theodore Nickerson
THEODORE NICKERSON
Engineering Geologist II

ANDRZEJ T. SZPIKOWSKI
Geotechnical Engineer I

TDN:ATS:tdn:ats
a/22010
(213) 485-3435

cc: Epsilon Engineering
Ray A. Eastman
VN District Office

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVE. # 201, GLENDALE, CA 91206
818•549•9959 TEL 818•543•3747 FAX

October 16, 1998
JB 17866-B

Harvard-Westlake School
% Jeffrey M. Kalban & Associates
10780 Santa Monica Boulevard, Suite 120
Los Angeles, California 90025-4749

Attention: Susan Oakley

Subject

Geologic and Soils Engineering Exploration
Proposed Parking Lot Expansion and Gymnasium Addition
Harvard-Westlake School
3700 Coldwater Canyon Avenue
North Hollywood, California

Gentlepersons:

The J. Byer Group is transmitting its geologic and soils engineering exploration report for the proposed work to be performed at Harvard-Westlake School. This is the report requested by you with respect to construction of a parking lot expansion and addition to the gymnasium. The reviewing agency for this document is the City of Los Angeles Department Building and Safety, Grading Section. The reviewing agency requires that three copies be filed along with an application form and a filing fee. Eight copies of the report are enclosed.

It is our understanding that Jeffrey M. Kalban & Associates will file the report with the Grading Section. It is suggested that you read the report carefully prior to submittal to any governmental agency. Any questions concerning the report should directed to the undersigned. The J. Byer Group appreciates the opportunity to offer our consultation and advice on this project.

Very Truly Yours,
THE J. BYER GROUP, INC.

John W. Byer
President

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GEOLOGIC AND SOILS ENGINEERING EXPLORATION
PROPOSED PARKING LOT EXTENSION AND GYMNASIUM ADDITION
PORTION OF LOT 1111, TRACT 1000
3700 COLDWATER CANYON AVENUE
NORTH HOLLYWOOD, CALIFORNIA
FOR HARVARD-WESTLAKE SCHOOL
THE J. BYER GROUP, INC. PROJECT NUMBER JB 17866-B
OCTOBER 16, 1998

GEOLOGIC AND SOILS ENGINEERING EXPLORATION
PROPOSED PARKING LOT EXTENSION AND GYMNASIUM ADDITION
PORTION OF LOT 1111, TRACT 1000
3700 COLDWATER CANYON AVENUE
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THE J. BYER GROUP, INC. PROJECT NUMBER JB 17866-B
OCTOBER 16, 1998

INTRODUCTION

This report has been prepared per our signed agreement dated September 16, 1998 and summarizes findings of The J. Byer Group, Inc. geologic and soils engineering exploration performed on the site. The purpose of this study is to evaluate the nature, distribution, engineering properties, and geologic structure of the earth materials underlying the site with respect to expanding the south parking lot and constructing an addition to the existing gymnasium.

INTENT

It is the intent of this report to assist in the design and completion of the proposed project. The recommendations are intended to reduce geotechnical risks affecting the project. The professional opinions and advice presented in this report are based upon commonly accepted standards and are subject to the general conditions described in the NOTICE section of this report.

EXPLORATION

The scope of the field exploration was determined from our initial site visit, consultation with your architect, and review of the preliminary plans. Exploration was conducted using techniques normally applied to this type of project in this setting. This report is limited to the area of the exploration and the proposed project as shown on the enclosed Geologic Map and Cross Section.

Exploration was conducted on September 30, 1998 with the aid of a hollow stem auger drill rig, and hand labor. It included excavating five test pits and drilling five borings to a maximum depth of 50 feet. Samples of the earth materials were obtained at frequent intervals and were delivered to the soils engineering laboratory for testing and analysis.

Office tasks included laboratory testing of selected soil samples, review of the City of Los Angeles grading records, preparation of one geologic cross section, preparation of the Geologic Map, and the preparation of this report. The earth materials exposed in the test pits and borings are described on the enclosed Log of Test Pits and Log of Borings. Appendix I contains a discussion of the laboratory testing procedures and results.

The proposed project, surface geologic conditions, and the location of the test pits and borings are shown on the Geologic Map. Subsurface distribution of the earth materials, projected geologic structure, and the proposed project are shown on Section A.

PROPOSED DEVELOPMENT

The preliminary plans prepared by Jeffrey M. Kalban & Associates Architecture, were a guide for the field exploration and the preparation of this report. It is proposed to regrade and expand the existing south parking lot. Retaining walls may be necessary to support the upslope bank along the east side of the existing lot. It is proposed to remove an existing building south of the gymnasium and replace it with a new gymnasium addition. The existing gymnasium will remain. Formal plans have not been prepared and await the conclusions and recommendations of this report.

SITE DESCRIPTION

The subject property is located south of Ventura Boulevard and just east of Coldwater Canyon Avenue within the alluviated north draining Coldwater Canyon. The area explored consists of the southernmost portion of the school south of the main entrance and north of Hacienda Drive. The area consists of mostly a parking lot, and a gymnasium and small utility building. The western portion of the property is somewhat elevated above the central portion and is near the elevation of Coldwater Canyon Avenue. Along the eastern side of the project, natural slopes ascend up to Hacienda Drive and residential properties above. These slopes are generally 2:1 or flatter. Drainage on the property is controlled by catch basins which carry the drainage to a storm drain system to the north. A drainage easement runs along the western portion of the project area below the southwest corner of the existing gymnasium. This easement contains a 30 inch steel pipe which has been converted from a water line to a storm drain. The top of the pipe was exposed in Test Pit 2 and is approximately three feet below the existing grade.

GROUNDWATER

Groundwater was encountered in our borings and is at a consistent level of approximately 18 feet below the parking lot surface, north of the gymnasium. The groundwater is at 23 feet below the parking lot surface in Boring 5. The groundwater is flowing in the alluvium and across the top of the bedrock below the alluvium and colluvium. The groundwater table is assumed to be relatively permanent at this elevation and will be encountered during construction of the proposed gymnasium addition. Fluctuations in groundwater levels may occur across the site. Rising groundwater can cause saturation of the earth materials, and additional subsidence.

EARTH MATERIALS

Fill

The subject property is located within an old canyon area and has been filled to create level area. The depth of fill is shown at the boring locations on the enclosed Geologic Map. The fill ranges from 4 to 14 feet thick and consists of interlayered sandy clay, silty clay, silty sand, and clayey sand. The fill was found to be only moderately dense.

Colluvium

Natural colluvium blankets the bedrock along the east side of the canyon area. The colluvium was exposed in test pits excavated here and consists of clayey silt that is dark gray brown, moist, firm, and contains fragments of diatomaceous shale bedrock. Colluvium was also encountered in Boring 4 where the offsite canyon to the west of Coldwater Canyon Avenue drains east toward the proposed project site. The colluvium was found to be 17 feet thick in Boring 4 and is resting on the underlying alluvium.

Alluvium

Natural alluvium underlies the central portion of Coldwater Canyon and was encountered in borings across the project area. The alluvium consists of alternating layers of clayey sand, clayey silt, and silty sand which contain various amounts of gravel. In Boring 3 some cobble sized fragments of shale were encountered. The alluvium is generally soft to medium dense and saturated below the water table.

Bedrock

Bedrock underlying the property was exposed in the test pits and was encountered in the borings. The bedrock consists of diatomaceous shale, siltstone, and sandstone, typical for this area of the Santa Monica Mountains. The bedrock is well bedded, moderately hard and somewhat fractured. The borings indicated that the upper three to six feet of the bedrock is deeply weathered and soft and has the consistency of a firm clay.

GEOLOGIC STRUCTURE

Bedding in this area is folded with an east-west strike and a north dip between 87 degrees to vertical. The geologic structure of the bedrock is not expected to affect the proposed project.

GENERAL SEISMIC CONSIDERATIONS

Southern California is located in an active seismic region. Moderate to strong earthquakes can occur on numerous local faults. The United States Geological Survey, California Division of Mines and Geology, private consultants, and universities have been studying earthquakes in southern California for several decades. Early studies were directed toward earthquake prediction and estimation of the effects of strong ground shaking. Studies indicate that earthquake prediction is not practical and not sufficiently accurate to benefit the general public. Governmental agencies are shifting their focus to earthquake resistant structures as opposed to prediction. The purpose of the code seismic design parameters is to prevent collapse during strong ground shaking. Cosmetic damage should be expected.

Within the past 25 years, southern California and vicinity have experienced an increase in seismic activity beginning with the San Fernando earthquake in 1971. In 1987, a moderate earthquake struck the Whittier area and was located on a previously unknown fault. Ground shaking from this event caused substantial damage to the City of Whittier, and surrounding cities.

The January 17, 1994, Northridge earthquake was initiated along a previously unrecognized fault below the San Fernando Valley. The energy released by the earthquake propagated to the southeast, northwest, and northeast in the form of shear and compression waves, which caused the strong ground shaking in portions of the San Fernando Valley, Simi Valley, City of Santa Clarita, and City of Santa Monica.

Southern California faults are classified as: active, potentially active, or inactive. Faults from past geologic periods of mountain building, but do not display any evidence of recent offset, are considered "potentially active". Faults that have historically produced earthquakes or show evidence of movement within the past 11,000 years are known as "active faults". There are no known active faults within close vicinity of the subject property.

The principal seismic hazard to the subject property and proposed project is strong ground shaking from earthquakes produced by local faults. Modern, well-constructed buildings are designed to resist ground shaking through the use of shear panels and reinforcement. Additional precautions may be taken to protect personal property and reduce the chance of injury, including strapping water heaters and securing furniture. It is likely that the subject property will be shaken by future earthquakes produced in southern California. However, secondary effects such as surface rupture, lurching, liquefaction, consolidation, ridge shattering, and landsliding should not occur at the subject property.

Liquefaction

The subject property is mapped by the California Division of Mines and Geology as within a Liquefaction Seismic Hazard Zone as shown on the Van Nuys Quadrangle Official Map, released February 1, 1998. Liquefaction Seismic Hazard Zones are areas where historic occurrence of liquefaction, or local geological, geotechnical, and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resource Code Section 2693(C) would be required.

Liquefaction is a condition where a soil experiences a deformation at a constant low residual stress or with low residual resistance, due to the build up and maintenance of high pore water pressures, which reduce the effective confining pressure to a very low value. Pore pressure build up leading to liquefaction may be due either to static or cyclic stress applications and the possibility of its occurrence will depend on the void ratio or relative density of a sand and the confining pressure. Liquefaction may also be caused by a critical hydraulic gradient during an upward flow of water in a sand deposit.

There are four general conditions necessary for liquefaction to occur. A high groundwater table; fine grained, cohensionless soils, generally fine to medium grained sands with less than 15 percent passing the #200 sieve; a low relative density so that the soil tends to become more compact upon shaking which aids development of pore pressures; and strong ground shaking.

The earth materials underlying the area of the proposed project consist of saturated alluvial soils below a depth of approximately 18 feet. The soils are generally fine grained and soft to medium dense. No fine grained sand layers within a confined water zone were encountered in the borings. The majority of the soils display a wide range of grain sizes from cobble and gravel down to silt. Based upon the moisture and density test results, as well as the blow counts from the sampling procedure, it is the opinion of The J. Byer Group that the liquefaction potential at the property is low. The proposed structures are to be founded into bedrock.

CONCLUSIONS AND RECOMMENDATIONS

General Findings

The conclusions and recommendations of this exploration are based upon five borings, five test pits, research of available records, consultation, years of experience observing similar properties in similar settings and review of the development plans. It is the finding of The J. Byer Group, Inc. that construction of the proposed project is feasible from a geologic and soils engineering standpoint provided the advice and recommendations contained in this report are included in the plans and are implemented during construction.

The recommended bearing material for the proposed gymnasium addition and possible retaining wall along the east side of the parking lot is the bedrock. The proposed retaining wall may use conventional footings. The proposed addition to the gymnasium should be founded on deepened footings consisting of drilled, cast-in-place concrete friction piles.

EXISTING GYMNASIUM

The existing gymnasium is supported on a conventional spread footing 18 inches into colluvium along the eastern side. The footing along the western side could not be exposed as the storm drain pipe runs along the west wall and below the corner of the gymnasium. It is the opinion of The J. Byer Group that the concrete wall exposed in Test Pit 2 is a grade beam, which is probably supported by deepened pad footings into the alluvium. It is likely that the majority of the existing gymnasium is supported on spread footings, which derive support from the natural alluvium.

EXISTING PARKING LOT

The existing parking lot, north of the gymnasium, is underlain by four to five inches of concrete reinforced with welded wire mesh. This area is shown as a tennis court on the City of Los Angeles Topographic Map series produced in 1960. The parking lot is supported on the old fill which rests on the underlying alluvium. It is recommended that the existing concrete slab be left in place as part of the expansion of the parking lot.

FOUNDATION DESIGN

General Conditions

The following foundation recommendations are minimum requirements. The structural engineer may require footings that are deeper, wider, or larger in diameter, depending on the final loads.

Spread Footings

Continuous footings may be used to support the proposed retaining wall along the eastern side of the proposed parking lot provided they are founded in the bedrock. Continuous footings should be a minimum of 12 inches in width. The following chart contains the recommended design parameters.

Bearing Material	Minimum Embedment Depth of Footing (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Bedrock	12	4,000	0.4	400	4,000

The bearing value shown above is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. When combining passive and friction for lateral resistance, the passive component should be reduced by one third.

All continuous footings should be reinforced with a minimum of two #4 steel bars; one placed near the top and one near the bottom of the footings. Footings should be cleaned of all loose soil, moistened, free of shrinkage cracks and approved by the geologist prior to placing forms, steel or concrete.

Deepened Foundations - Friction Piles

The proposed gymnasium addition is located in an area underlain by fill over saturated alluvium. Drilled, cast-in-place concrete friction piles are recommended to support the proposed addition. Piles should be a minimum of 24 inches in diameter and a minimum of eight feet into the firm shale bedrock. Piles may be assumed fixed at four feet into bedrock. The piles may be designed for a skin friction of 600 pounds per square foot for that portion of pile in contact with the bedrock. For design purposes, the upper four feet of the bedrock should be considered to be weathered and ignored for support of vertical loads.

Lateral Design

The friction value is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. Resistance to lateral loading may be provided by passive earth pressure within the alluvium and bedrock.

Passive earth pressure, within the alluvium, may be computed as an equivalent fluid having a density of 140 pounds per cubic foot. The maximum allowable passive earth pressure within the alluvium is 2,000 pounds per square foot. Passive earth pressure within the bedrock may be computed as an equivalent fluid having a density of 800 pounds per cubic foot. The maximum allowable earth pressure is 4,000 pounds per square foot. For design of isolated piles, the allowable passive and maximum earth pressures may be increased by 100 percent. Piles spaced more than 2½ pile diameters on center may be considered isolated.

Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. A settlement of ¼ to ½ inch may be anticipated. Differential settlement should not exceed ¼ inch.

Toe of Slope Clearance

The proposed addition, as shown on the plans, will be located adjacent to a small ascending slope between the existing parking lot and building and Hacienda Drive to the east. The Building Department requires a setback of one half of the slope height to a maximum of 15 feet. For retained slopes, the face of the retaining wall is considered the toe of the slope.

RETAINING WALLS

General Design

Retaining walls up to 10 feet high, may be necessary as part of the parking lot expansion. For general design, retaining walls up to 10 feet high with a 2:1 backslope and supporting colluvium and bedrock may be designed for an equivalent fluid pressure of 43 pounds per cubic foot.

Retaining walls should be provided with a subdrain or weepholes covered with a minimum of 12 inches of ¾ inch crushed gravel.

Backfill

Retaining wall backfill should be compacted to a minimum of 90 percent of the maximum density as determined by ASTM D 1557. Where access between the retaining wall and the temporary excavation prevents the use of compaction equipment, retaining walls should be backfilled with ¾ inch crushed gravel to within two feet of the ground surface. Where the area between the wall and the excavation exceeds 18 inches, the gravel must be vibrated or wheel-rolled, and tested for compaction. The upper two feet of backfill above the gravel should consist of a compacted fill blanket to the surface. Retaining wall backfill should be capped with a paved surface drain.

Foundation Design

Retaining wall footings may be sized per the"Spread Footings" section of this report.

Freeboard

Retaining walls surcharged by a sloping condition should be provided with a minimum of 12 inches of freeboard for slough protection. An open "V" drain should be placed behind the wall so that all upslope flows are directed around the structure to an approved location.

Temporary Excavations

Temporary excavations will be required to construct the proposed retaining walls. The excavations will be up to 10 feet in height and will expose colluvium over bedrock. The colluvium should be trimmed to 1:1 for wall excavations. The bedrock is capable of maintaining vertical excavations up to five feet. Where vertical excavations in the bedrock exceed five feet in height, the upper portion should be trimmed to 1:1 (45 degrees).

The geologist should be present during grading to see temporary slopes. All excavations should be stabilized within 30 days of initial excavation. Water should not be allowed to pond on top of the excavations nor to flow toward them. No vehicular surcharge should be allowed within three feet of the top of the cut.

PAVING

For areas to receive new paving the exposed grade should be scarified to a depth of six inches, moistened as required to achieve optimum moisture content, and compacted to 95 percent of the maximum dry density. Any trench backfill below paving, should be compacted to at least 90 percent of the maximum dry density. Irrigation water should be prevented from migrating under paving. The following table shows the recommended pavement sections:

Service	Pavement Thickness (Inches)	Base Course (Inches)
Light Passenger Cars	3	4
Moderate Trucks (Storage, etc.)	4	6

DRAINAGE

Control of site drainage is important for the performance of the proposed project. Roof gutters are recommended for the proposed addition. Pad and roof drainage should be collected and transferred to the existing storm drain system in non-erosive drainage devices. Drainage should not be allowed to pond on the pad or against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope. Planters located within retaining wall backfill should be sealed to prevent moisture intrusion into the backfill. Planters located next to raised floor type construction also should be sealed to the depth of the footings or grade beams. Drainage control devices require periodic cleaning, testing and maintenance to remain effective.

WATERPROOFING

Interior and exterior retaining walls are subject to moisture intrusion, seepage, and leakage and should be waterproofed. Waterproofing paints, compounds, or sheeting can be effective if properly installed. Equally important is the use of a subdrain that daylights to the atmosphere. The subdrain should be covered with ¾ inch crushed gravel to help the collection of water. Yard areas above the wall should be sealed or properly drained to prevent moisture contact with the wall or saturation of wall backfill.

Construction of raised floor buildings where the grade under the floor has been lowered for joist clearance can also lead to moisture problems. Surface moisture can seep through the footing and pond in the underfloor area. Positive drainage away from the footings, waterproofing the footings, compaction of trench backfill and subdrains can help to reduce moisture intrusion.

PLAN REVIEW

Formal plans ready for submittal to the Building Department should be reviewed by The J. Byer Group. Any change in scope of the project may require additional work.

SITE OBSERVATIONS DURING CONSTRUCTION

The Building Department requires that the geotechnical company provide site observations during construction. The observations include foundation excavations. All fill that is placed should be tested for compaction and approved by the soils engineer prior to use for support of engineered structures. The City of Los Angeles requires that all retaining wall subdrains be observed by a representative of the geotechnical company and the City Inspector.

Please advise The J. Byer Group, Inc. at least 24 hours prior to any required site visit. The agency approved plans and permits should be at the jobsite and available to our representative. The project consultant will perform the observation and post a notice at the jobsite of his visit and findings. This notice should be given to the agency inspector.

CONSTRUCTION SITE MAINTENANCE

It is the responsibility of the contractor to maintain a safe construction site. When excavations exist on a site, the area should be fenced and warning signs posted. All pile excavations must be properly covered and secured. Soil generated by foundation and subgrade excavations should be either removed from the site or properly placed as a certified compacted fill. Soil must not be spilled over any descending slope. Workers should not be allowed to enter any unshored trench excavations over five feet deep.

GENERAL CONDITIONS

This report and the exploration are subject to the following NOTICE. Please read the NOTICE carefully, it limits our liability.

NOTICE

In the event of any changes in the design or location of any structure, as outlined in this report, the conclusions and recommendations contained herein may not be considered valid unless the changes are reviewed by us and the conclusions and recommendations are modified or reaffirmed after such review.

The subsurface conditions, excavation characteristics, and geologic structure described herein and shown on the enclosed cross section have been projected from excavations on the site as indicated and should in no way be construed to reflect any variations that may occur between these excavations or that may result from changes in subsurface conditions.

Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, irrigation, and other factors not evident at the time of the measurements reported herein. Fluctuations also may occur across the site. High groundwater levels can be extremely hazardous. Saturation of earth materials can cause subsidence or slippage of the site.

If conditions encountered during construction appear to differ from those disclosed herein, notify us immediately so we may consider the need for modifications. Compliance with the design concepts, specifications or recommendations during construction requires the review of the engineering geologist and geotechnical engineer during the course of construction.

THE EXPLORATION WAS PERFORMED ONLY ON A PORTION OF THE SITE, AND CANNOT BE CONSIDERED AS INDICATIVE OF THE PORTIONS OF THE SITE NOT EXPLORED.

This report is issued and made for the sole use and benefit of the client, is not transferable and is as of the exploration date. Any liability in connection herewith shall not exceed the fee for the exploration. No warranty, expressed or implied, is made or intended in connection with the above exploration or by the furnishing of this report or by any other oral or written statement.

THIS REPORT WAS PREPARED ON THE BASIS OF THE PRELIMINARY DEVELOPMENT PLAN FURNISHED. FINAL PLANS SHOULD BE REVIEWED BY THIS OFFICE AS ADDITIONAL GEOTECHNICAL WORK MAY BE REQUIRED.

The J. Byer Group appreciates the opportunity to provide our service on this project. Any questions concerning the data or interpretation of this report should be directed to the undersigned.

Respectfully submitted,
THE J. BYER GROUP, INC.

John W. Byer
E.G. 883

Robert I. Zweigler
E.G. 1210/G.E. 2120

REGISTERED PROFESSIONAL ENGINEER
ROBERT I. ZWEIGLER
No. 2120
Exp. 6-30-02
GEOTECHNICAL
STATE OF CALIFORNIA

JWB:RIZ:flh
G:\FINAL\REPORTS\17866-B.RPT

Enc: Appendix I - Laboratory Testing
Shear Test Diagrams (2)
Consolidation Curves (3)
Topographic Map
Regional Geologic Map
Log of Test Pits (2 Pages)
Log of Borings (11 Pages)

In Pocket: Geologic Map
Section A

xc: (8) Addressee

APPENDIX I

LABORATORY TESTING

Undisturbed and bulk samples of the fill, colluvium, alluvium, and bedrock were obtained from the test pits and borings and transported to the laboratory for testing and analysis. The samples were obtained by driving a ring lined barrel sampler conforming to ASTM D-3550 with successive drops of the sample hammer. Experience has shown that sampling causes some disturbance of the sample, however the test results remain within a reasonable range. The samples were retained in brass rings of 2.50 inches outside diameter and 1.00 inches in height. The central portions of the samples were stored in close fitting, waterproof containers for transportation to the laboratory.

Moisture-Density

The dry density of the samples was determined using the procedures outlined in ASTM D-2937. The moisture content of the samples was determined using the procedures outlined in ASTM D-2216. The results are shown on the Log of Borings.

Shear-Tests

Shear tests were performed on samples of alluvium and bedrock using the procedures outlined in ASTM D-3080 and a strain controlled, direct shear machine manufactured by Soil Test, Inc. The rate of deformation was 0.025 inches per minute. The samples were tested in an artificially saturated condition. Following the shear test, the moisture content of the samples was determined to verify saturation. The results are plotted on the "Shear Test Diagrams".

Consolidation

Consolidation tests were performed on insitu samples of the alluvium. Results are graphed on the "Consolidation Curves".

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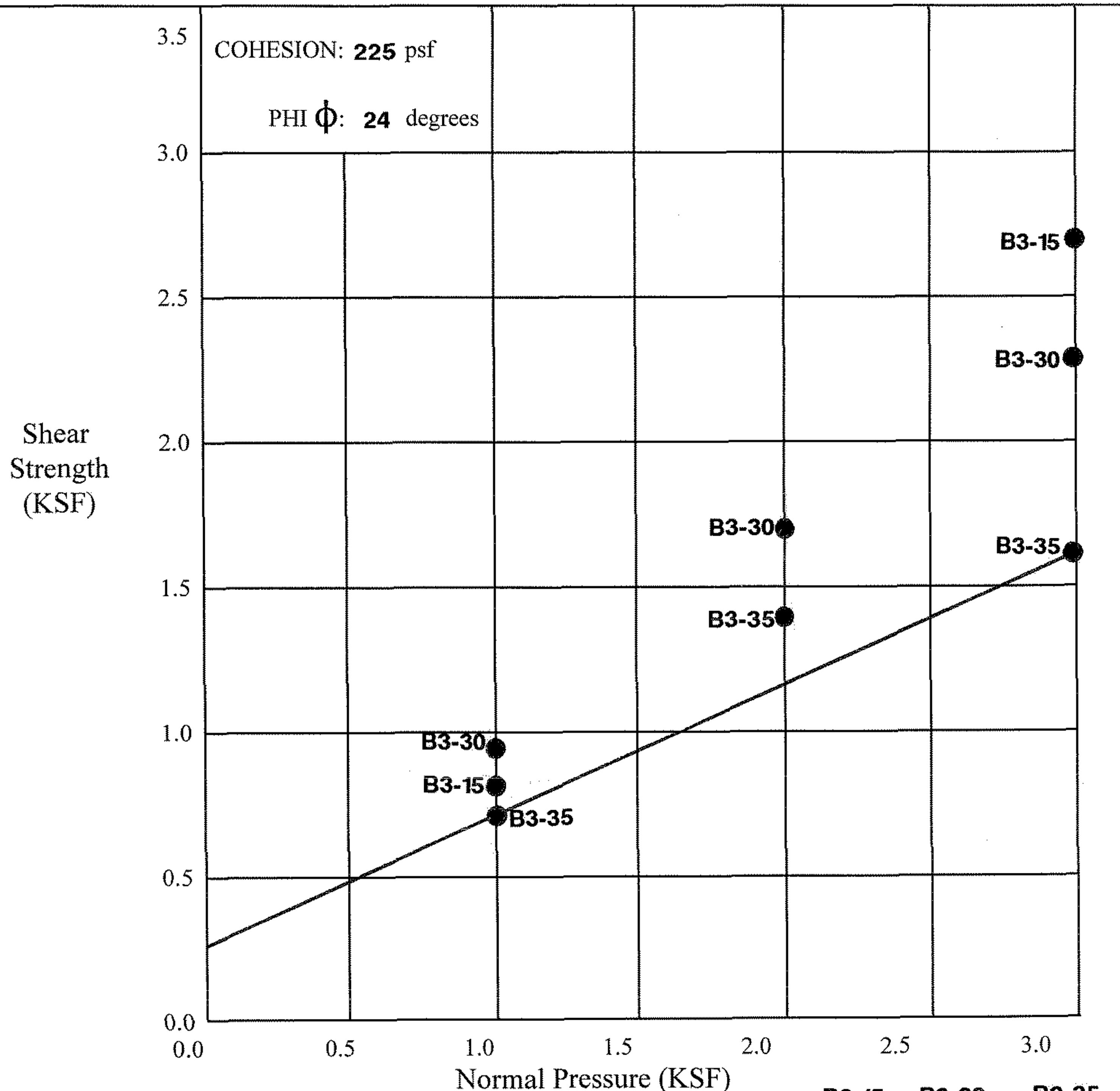
SHEAR TEST DIAGRAM #1

JB 17866-B HARVARD-WESTLAKE

SAMPLE: ALLUVIUM



		B3-15	B3-30	B3-35
○ Direct Shear (Field Moisture)	Dry Density (pcf) =	94.6	93.0	90.3
● Direct Shear (Saturated)	Water Content (%) =	28.7	24.2	31.5

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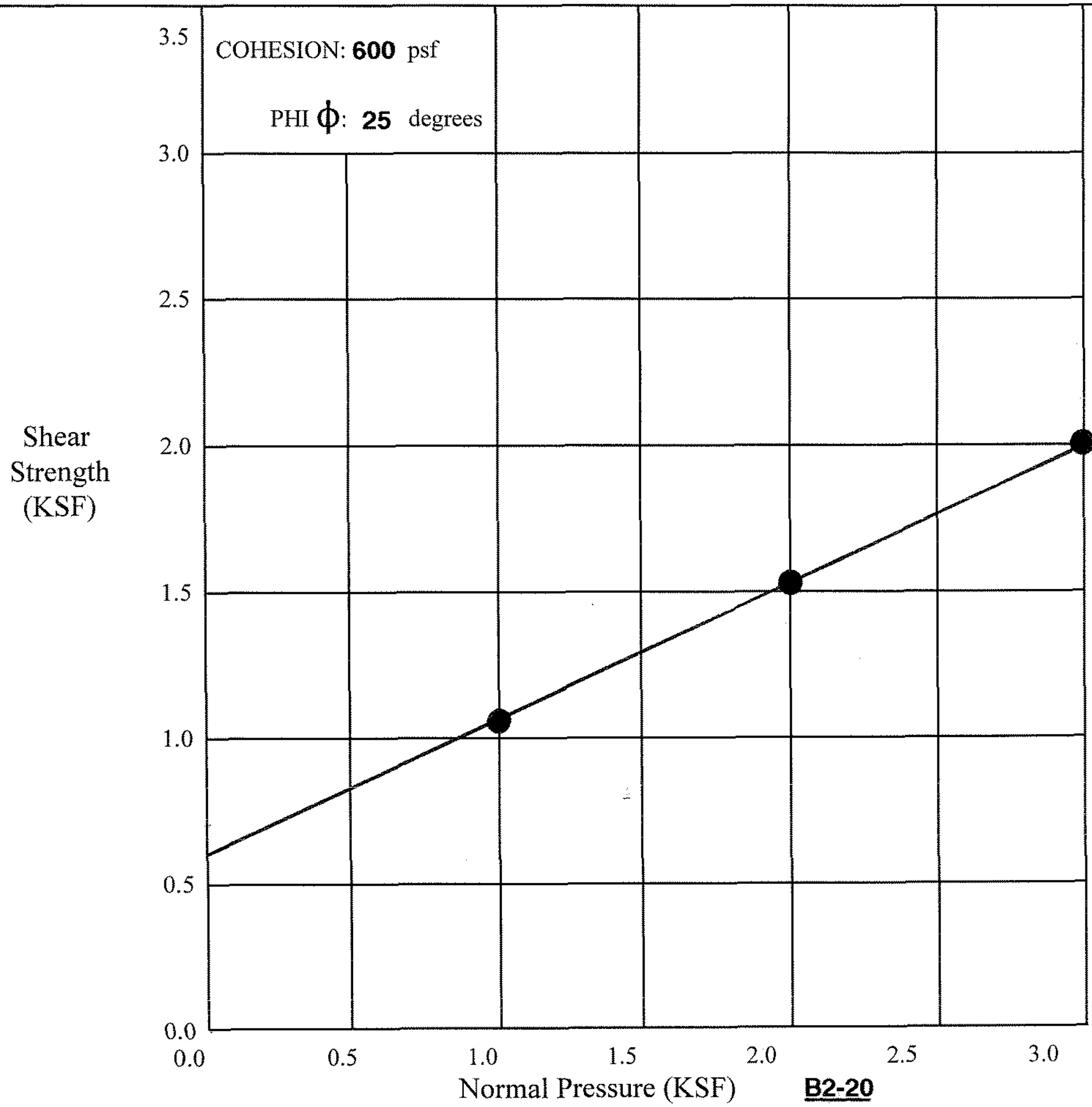
SHEAR TEST DIAGRAM #2

JB 17866-B HARVARD-WESTLAKE

SAMPLE: BEDROCK



B2-20

○ Direct Shear (Field Moisture)

● Direct Shear (Saturated)

Dry Density (pcf) = 109.7

Water Content (%) = 19.1

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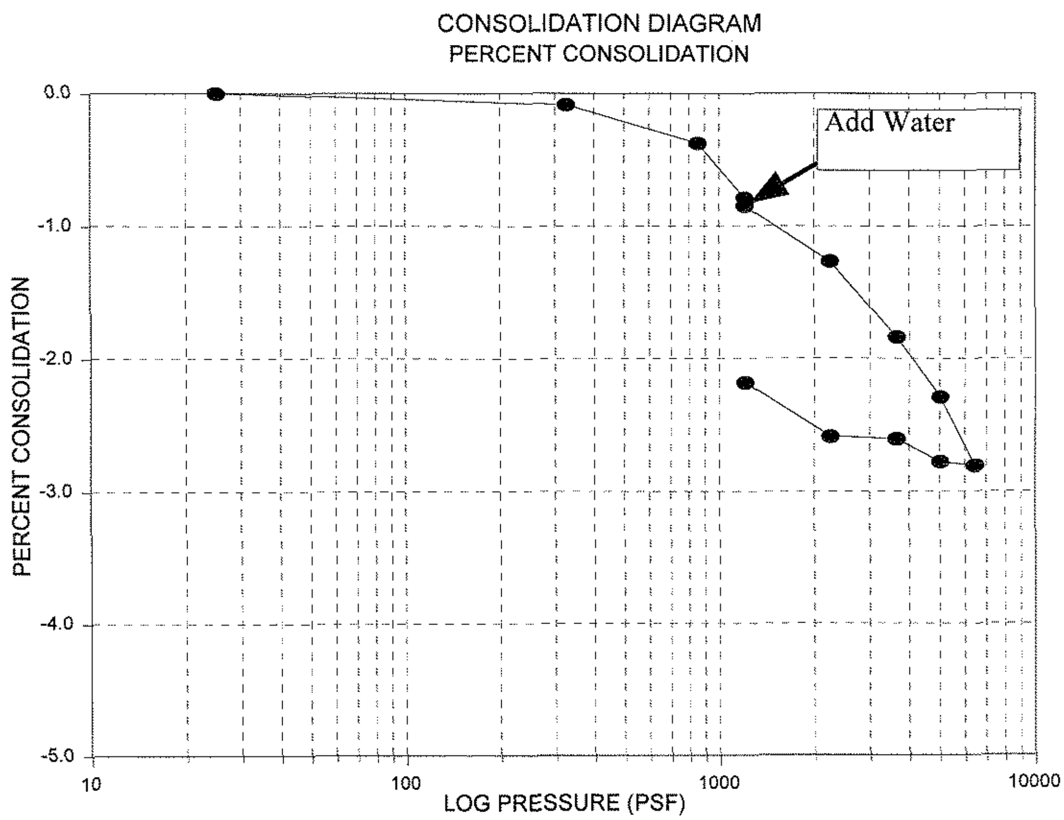
CONSOLIDATION DIAGRAM #1

JB: 17866-B HARVARD

CONSULTANT: JWB

EARTH MATERIAL: ALLUVIUM

LOCATION: B5-10'



Dry Density	99.7 pcf	Specific Gravity	2.65
Initial Moisture	20.7%	Initial Void Ratio	0.66
Initial % Saturation	83.3%	C'c	0.03

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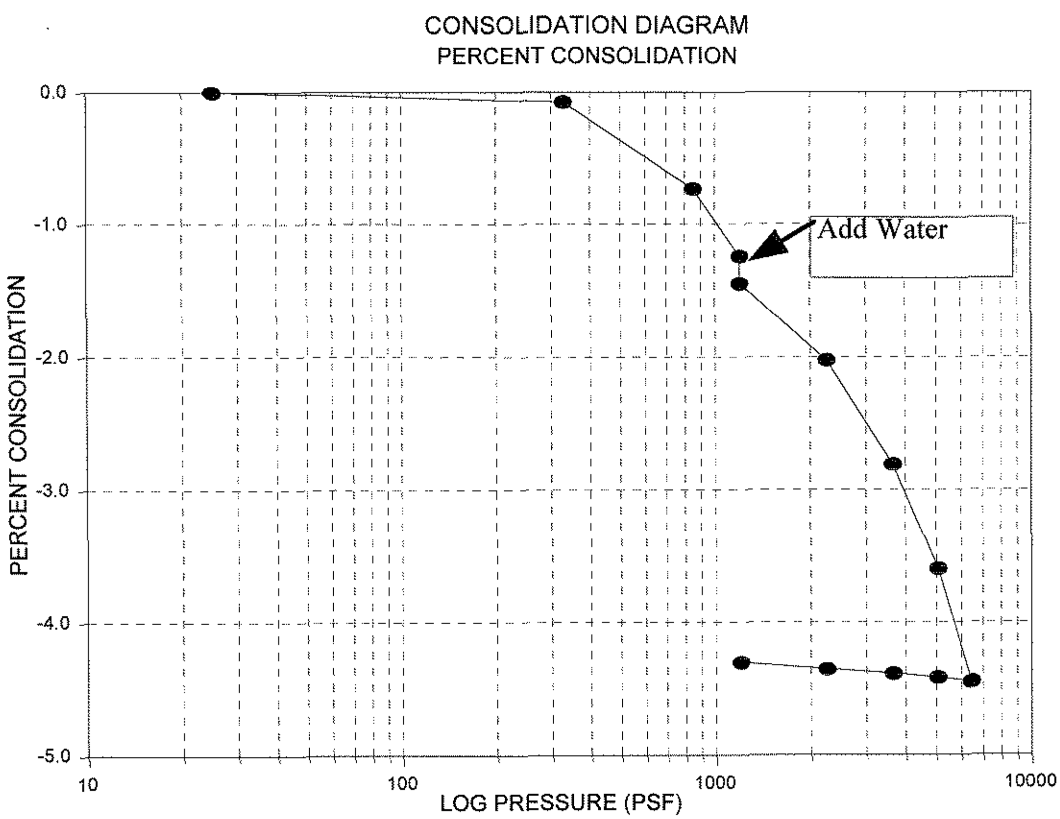
CONSOLIDATION DIAGRAM #2

JB: 17866-B HARVARD

CONSULTANT: JWB

EARTH MATERIAL: ALLUVIUM

LOCATION: B5-15'



Dry Density	97.0 pcf	Specific Gravity	2.65
Initial Moisture	19.6%	Initial Void Ratio	0.70
Initial % Saturation	73.7%	C'c	0.05

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512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
(818) 549-9959 FAX: (818) 543-3747

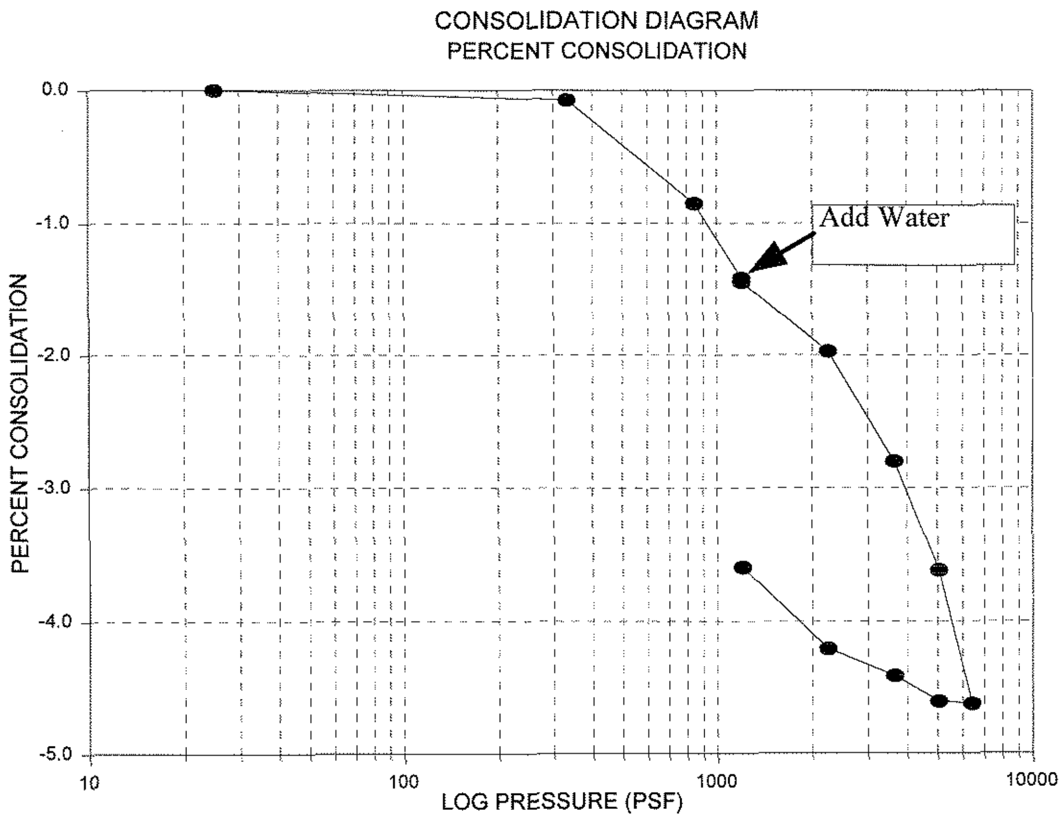
CONSOLIDATION DIAGRAM #3

JB: 17866-B HARVARD

CONSULTANT: JWB

EARTH MATERIAL: ALLUVIUM

LOCATION: B5-20



Dry Density	94.9 pcf	Specific Gravity	2.65
Initial Moisture	27.1%	Initial Void Ratio	0.74
Initial % Saturation	96.7%	C'c	0.05

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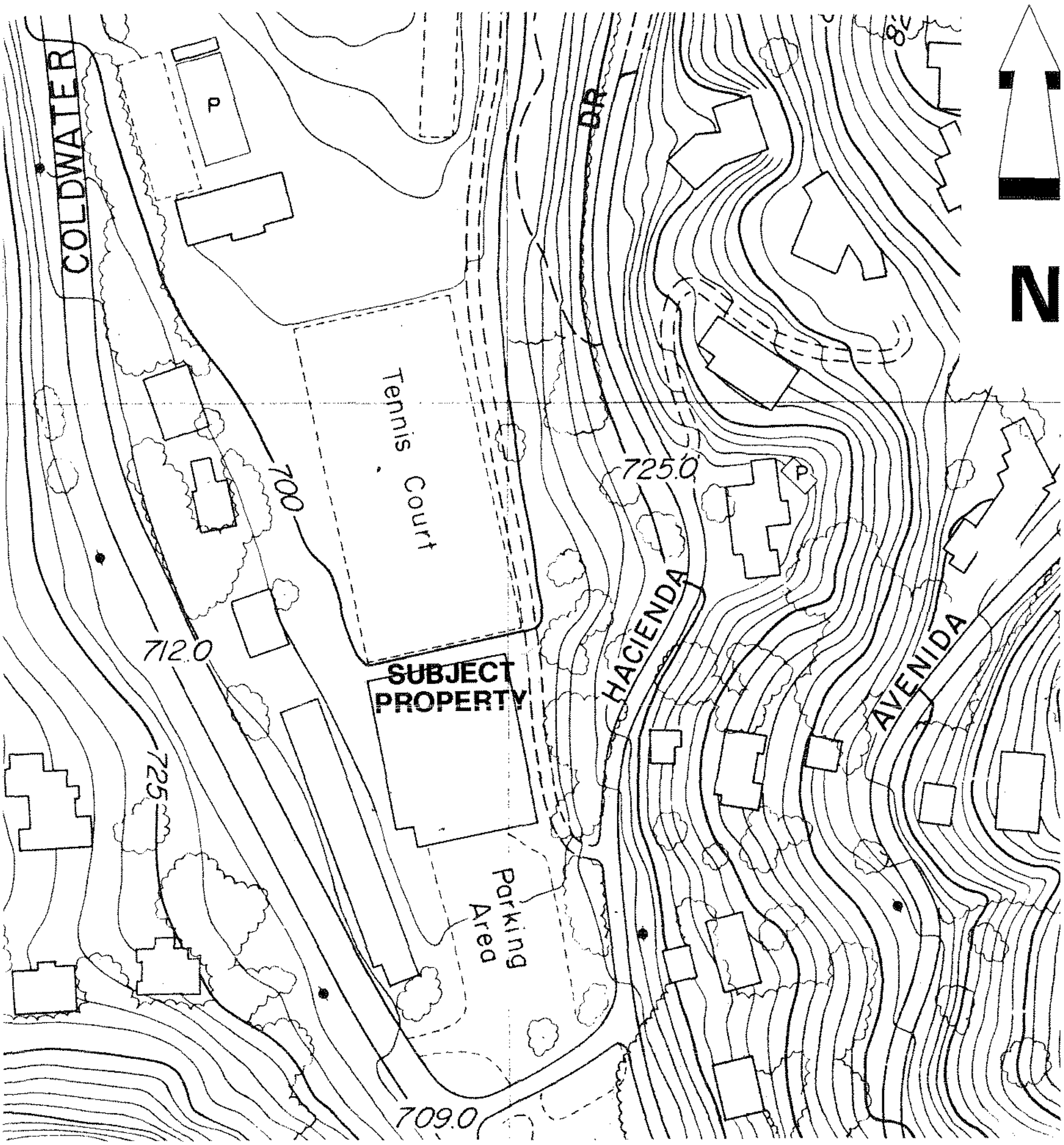
TOPOGRAPHIC MAP

JB 17866-b HARVARD-WESTLAKE

CONSULTANT: JWB SCALE: 1"=100'

*REFERENCE: SANTA MONICA MOUNTAINS TOPOGRAPHIC MAPS, SHEET #***70** (JANUARY 1960)



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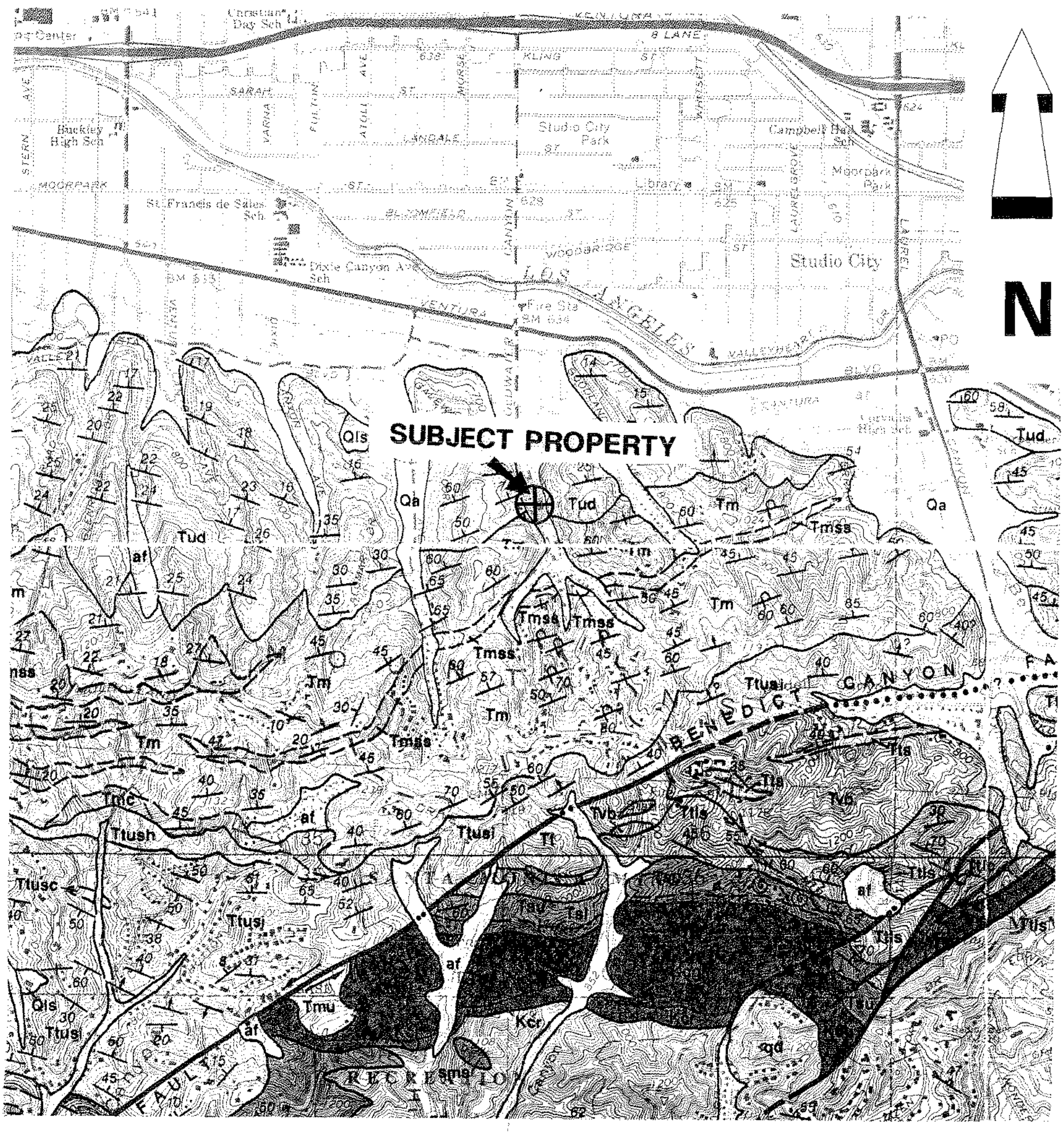
REGIONAL GEOLOGIC MAP

JB 17866-B HARVARD-WESTLAKE

CONSULTANT: JWB SCALE: 1"=2000'

REFERENCE: GEOLOGIC MAPS OF THE BEVERLY HILLS AND VAN NUYS (SOUTH ½) QUADRANGLE BY T.W. DIBBLEE, 1991.



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LOG OF TEST PITS

JB: 17866-B CLIENT: HARVARD-WESTLAKE

GEOLOGIST: JWB DATE LOGGED: 9/30/98

REPORT DATE: 10/16/98

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
TEST PIT #1					
			0 - 2	**COLLUVIUM:**	Silty Clay, dark gray, moist, firm, rock fragments to 1 inch
			2 - 3		rock fragments up to 4 inches
			3 - 6	**BEDROCK:**	Diatomaceous Shale, light brown, slightly moist, moderately hard, Bedding: N80E; 88N
End at 6 Feet; No Water; No Caving; No Fill.					
TEST PIT #2					
			0 - 2	**FILL:**	Clayey Silt, dark brown, moist, slightly dense, contains rock fragments, concrete, steel and brick
			2 - 3		1 inch diameter pipe
			3 - 4		2½ inch diameter pipe
			4 - 4½		bottom of footing, top of metal pipe - 30 inches diameter
End at 4½ Feet; No Water; No Caving; Fill to Total Depth.					
TEST PIT #3					
			0 - 3	**FILL:**	Silty Sand, brown, moist, dense, contains fragments of concrete and brick
			3 - 4½	**COLLUVIUM:**	Silty Clay, dark brown, moist, firm, roots up to 1 inch, rock fragments to ½ inch
			4½ - 6		bottom of footing at 4½ feet
			6 - 7		rock fragments up to 4 inches
			7 - 8	**BEDROCK:**	Diatomaceous Shale, tan, hard, Bedding: E-W: 90
End at 8 Feet; No Water; No Caving; Fill to 3 Feet.					

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

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LOG OF TEST PITS

JB: 17866-B CLIENT: HARVARD-WESTLAKE

GEOLOGIST: JWB DATE LOGGED: 9/30/98

REPORT DATE: 10/16/98

TEST PIT #4

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 4	**COLLUVIUM:**	Clayey Silt, brown, moist, firm, contains diatomaceous rock fragments to 3 inches
			4 - 6	**BEDROCK:**	Diatomaceous Shale, tan, hard, Bedding: N87E; 87N

End at 6 Feet; No Water; No Caving; No Fill.

TEST PIT #5

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - ½	**COLLUVIUM:**	Sandy Silt, brown, moist, soft, roots to 2 inches
			½ - 3	**BEDROCK:**	Diatomaceious Shale, white, dry, moderately hard, well bedded, Bedding: N84E; 90

End at 3 Feet; No Water; No Caving; No Fill.

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

Project No: JB 17866-B

Log of Boring 1

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue

By: JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE				SAMPLE			Lab Data				
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
697	0	Ground Surface **FILL** Silty Sand and Silty Clay, light brown, moist, slightly dense, soft									
696	1										
695	2			---	R	10	12.8	93.5			
694	3										
693	4			---	R	9	39.3	70.9			
692	5	**COLLUVIUM** Silty Clay, dark brown, very moist, firm									
691	6										
690	7	Sandy Clay, dark brown, moist, soft, rock fragments to ¼ inch		---	R	9	25.4	87.9			
689	8										
688	9	Clayey Silt, medium brown, moist, firm		---	R	9	38.1	76.5			
687	10										
686	11										
685	12			---	R	12	34.8	79.7			
684	13										
683	14	Silty Clay, light brown, moist to very moist, soft porous		---	R	9	42.1	73.8			
682	15										
681	16										
680	17	Clayey Silt, brown, wet, soft, contains rock fragments up to 2 inches		---	R	10	72.4	57.8			
679	18	water at 18 feet									
678	19						64.8	58.1			
677	20										

Surface: 5 Inch Concrete Parking Lot

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 697

Sheet: 1 of 3

Project No: JB 17866-B

Log of Boring 1

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue **By:** JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
		WEATHERED BEDROCK Diatomaceous Shale, light brown, moist, soft		---	R	10					
676	21										
675	22			---	R	15	84.9	49.2			
		BEDROCK Diatomaceous Siltstone and Shale, gray, moist, moderately hard, well bedded, saturated									
674	23										
673	24			---	R	20	75.4	52.0			
		End at 25 Feet; Water at 18 Feet; Fill to 5 Feet									
672	25										
671	26										
670	27										
669	28										
668	29										
667	30										
666	31										
665	32										
664	33										
663	34										
662	35										
661	36										
660	37										
659	38										
658	39										
657	40										

Surface: 5 Inch Concrete Parking Lot
Drill Method: Hollow-Stem Auger
Drill Date: 9/30/98

Size: 8 Inch
Elevation: 697
Sheet: 2 of 3

Project No: JB 17866-B

Log of Boring 2

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue **By:** JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE				SAMPLE			Lab Data				
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
698	0	Ground Surface									
697	1	**FILL** Silty Clay, dark brown, moist, slightly firm, rock fragments up to 1 inch									
696	2										
695	3										
694	4										
693	5			---	R	10	35.3	78.9			
692	6										
691	7	**COLLUVIUM** Sandy Silt, brown, moist, soft, porous, rock fragments to 1 inch									
690	8										
689	9										
688	10			---	R	16	26.1	87.8			
687	11										
686	12										
685	13										
684	14										
683	15	**WEATHERED BEDROCK** Diatomaceious Siltstone and Sandstone, light brown, moist, moderately hard, very fractured, well bedded		---	R	50 11"	N/R	N/R			N/R = No Recovery
682	16										
681	17										
680	18	water at 18 feet									
679	19	**BEDROCK** Diatomaceous Siltstone and Sandstone, light brown, very wet, moderately hard									
678	20			---	R	50 11"	17.1	109.7			

Surface: 4 Inches Concrete/2 Inches Base

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 698

Sheet: 1 of 2

Project No: JB 17866-B

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue

Log of Boring 2

By: JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE				SAMPLE			Lab Data				
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
		End at 20 Feet; Water at 18 Feet; Fill to 6 Feet									
677	21										
676	22										
675	23										
674	24										
673	25										
672	26										
671	27										
670	28										
669	29										
668	30										
667	31										
666	32										
665	33										
664	34										
663	35										
662	36										
661	37										
660	38										
659	39										
658	40										

Surface: 4 Inches Concrete/2 Inches Base

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 698

Project No: JB 17866-B

Log of Boring 3

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue

By: JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE				SAMPLE			Lab Data				
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
698	0	Ground Surface									
		FILL Silty Clay, dark brown, moist, soft, rock fragments to ½ inch									
697	1										
696	2										
695	3										
694	4										
693	5			---	R	12	23.3	97.6			
692	6	Silty Sand, reddish brown, moist, slightly dense, rock fragments to ½ inch									
691	7										
690	8										
689	9										
688	10			---	R	20	20.3	95.2			
687	11										
686	12										
685	13										
684	14	**ALLUVIUM** Clayey Sand, medium brown, wet, slightly dense									
683	15			---	R	9	27.5	94.6			
682	16										
681	17										
680	18	water at 18 feet									
679	19										
				---	R	7	36.1	89.2			
678	20										

Surface: 4 Inches Concrete w/Wire Mesh

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 698

Sheet: 1 of 3

Project No: JB 17866-B

Log of Boring 3

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue **By:** JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE				SAMPLE			Lab Data				
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
		Clayey Sand, brown, wet, slightly dense, shale fragments to 1 inch									
677	21										
676	22										
675	23	Clayey Silt, dark brown, wet, soft, shale fragments to ½ inch									
674	24										
673	25			---	R	6	33.8	87.6			
672	26										
671	27										
670	28										
669	29										
668	30	sample disturbed, rock in tip of sampler		---	R	17	30.4	93.0			
667	31										
666	32										
665	33	Clayey Sand, brown, wet, slightly dense, some gravel									
664	34										
663	35			---	R	9	28.5	90.3			
662	36										
661	37										
660	38										
659	39			---	R	14	36.5	81.8			
658	40										

Surface: 4 Inches Concrete w/Wire Mesh

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 698

Project No: JB 17866-B

Log of Boring 3

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue **By:** JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE				SAMPLE			Lab Data				
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
657	41	more gravel and cobbles									
656	42										
655	43										
654	44										
653	45	BEDROCK Diatomaceous Shale, gray, moderately hard, well bedded, bedding near vertical in sample		---	R	50 8"	50.6	69.8			
652	46										
651	47										
650	48										
649	49										
648	50	End at 50 Feet; Water at 18 Feet; Fill to 14 Feet.		---	R	50 11"	50.7	71.2			
647	51										
646	52										
645	53										
644	54										
643	55										
642	56										
641	57										
640	58										
639	59										
638	60										

Surface: 4 Inches Concrete w/Wire Mesh

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 698

Project No: JB 17866-B

Log of Boring 4

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue **By:** JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description (SUBSURFACE PROFILE)	Symbol	USCS (SAMPLE)	Type	Blow Count Per Foot	Moisture Content (%) (Lab Data)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
708	0	Ground Surface									
		FILL Silty Clay, dark brown, moist, firm, contains rock fragments, brick									
704	4	**COLLUVIUM:** Clayey Silt, dark brown, moist, very firm, rock fragments									
703	5			---	R	11	26.9	89.7			
699	9	grades lighter brown, more rock fragments									
698	10			---	R	12	29.6	87.1			
695	13	Clayey Silt, medium brown, moist, firm, very porous, rock fragments to ¼ inch									
693	15			---	R	17	24.0	82.5			
688	20			---	R	26	28.9	94.0			

Surface: 3 Inches Asphalt/4 Inches Base

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 708

Project No: JB 17866-B

Log of Boring 4

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue **By:** JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
		Clayey Silt, dark brown, moist, firm, shale fragments to ¼ inch, porous									
687	21										
686	22										
685	23	**ALLUVIUM** Silty Sand, brown, moist, medium dense									
684	24										
683	25			---	R	27	18.7	95.5			
682	26										
681	27										
680	28										
679	29										
678	30										
677	31										
676	32	**WEATHERED BEDROCK** Diatomaceous Shale, tan, moist, soft									
675	33										
674	34										
673	35	End at 35 Feet; No Water; Fill to 4 Feet.		---	R	39	43.9	97.4			
672	36										
671	37										
670	38										
669	39										
668	40										

Surface: 3 Inches Asphalt/4 Inches Base

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 708

Project No: JB 17866-B

Log of Boring 5

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue **By:** JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
706	0	Ground Surface								
		FILL Silty Clay, dark brown, moist, slightly firm, rock fragments to 2 inches								
705	1									
704	2									
703	3									
702	4	**COLLUVIUM** Clayey Silt, dark gray brown, moist, firm, small rock fragment, porous								
701	5		---	R	10	33.7	78.7			
700	6									
699	7									
698	8	**ALLUVIUM** Silty Sand, brown, moist, medium dense, shale fragments to 1 inch								
697	9									
696	10		---	R	13	20.7	99.7			
695	11									
694	12									
693	13									
692	14									
691	15	more Silt, less gravel	---	R	22	19.6	97.0			
690	16									
689	17									
688	18									
687	19		---	R	15	27.1	94.9			
686	20									

Surface: 5 Inches Asphalt

Drill Method: Hollow-Stem Auger

Drill Date: 9/30/98

Size: 8 Inch

Elevation: 706

Project No: JB 17866-B

Log of Boring 5

Client: HARVARD-WESTLAKE SCHOOL

Location: 3700 Coldwater Canyon Avenue

By: JWB

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE				SAMPLE			Lab Data				
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	PHI Angle (degrees)	Cohesion (psf)	Remarks
		rock fragments to 2 inches									
685	21										
684	22										
683	23	BEDROCK Diatomaceous Shale, light brown, saturated, soft Water at 23 Feet									
682	24										
681	25			---	R	15	50.4	70.5			
680	26	grades to moderately hard, bedded									
679	27										
678	28										
677	29										
676	30			---	R	18	59.6	64.0			
675	31										
674	32	grades to very dark gray, moderately hard, tight									
673	33										
672	34										
671	35	End at 35 Feet; Water at 23 Feet; Fill to 4 Feet		---	R	50 7"	39.3	77.7			
670	36										
669	37										
668	38										
667	39										
666	40										

Surface: 5 Inches Asphalt

Drill Method: Hollow-Stem Auger

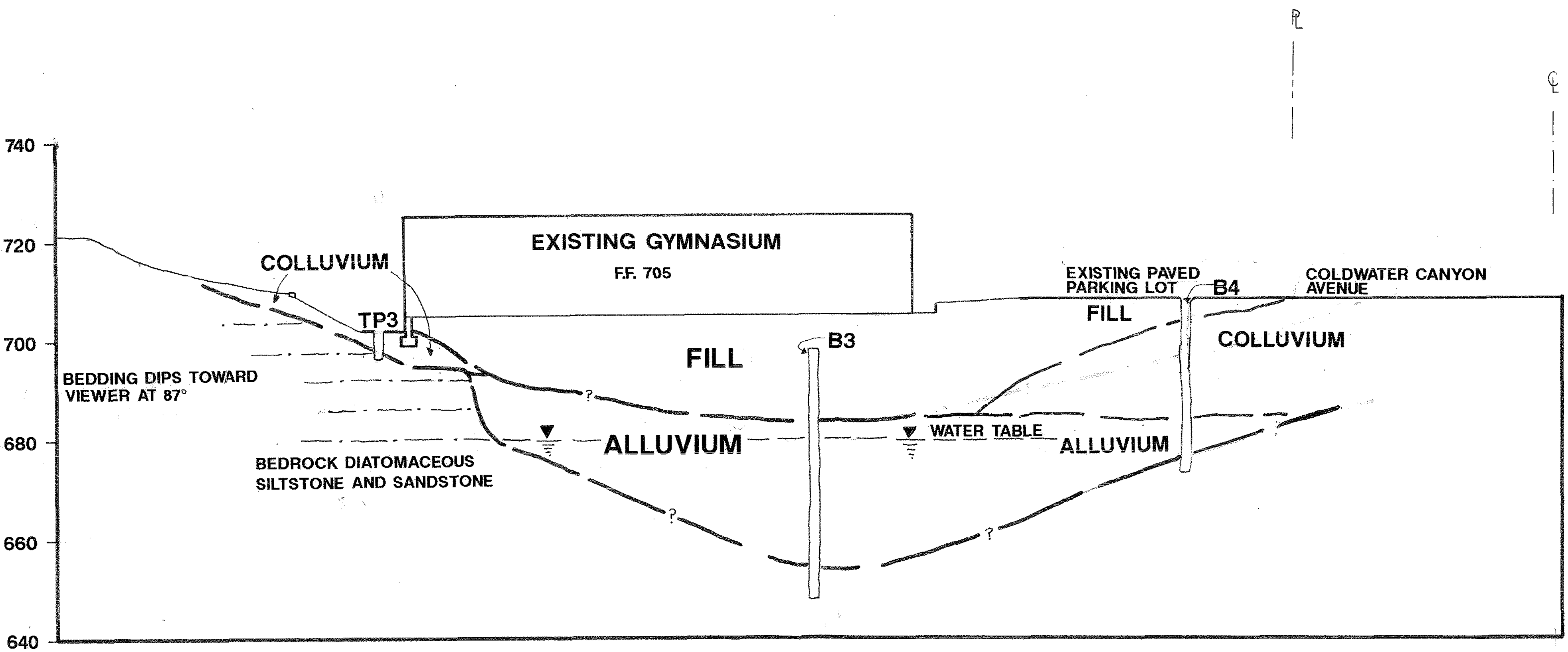
Drill Date: 9/30/98

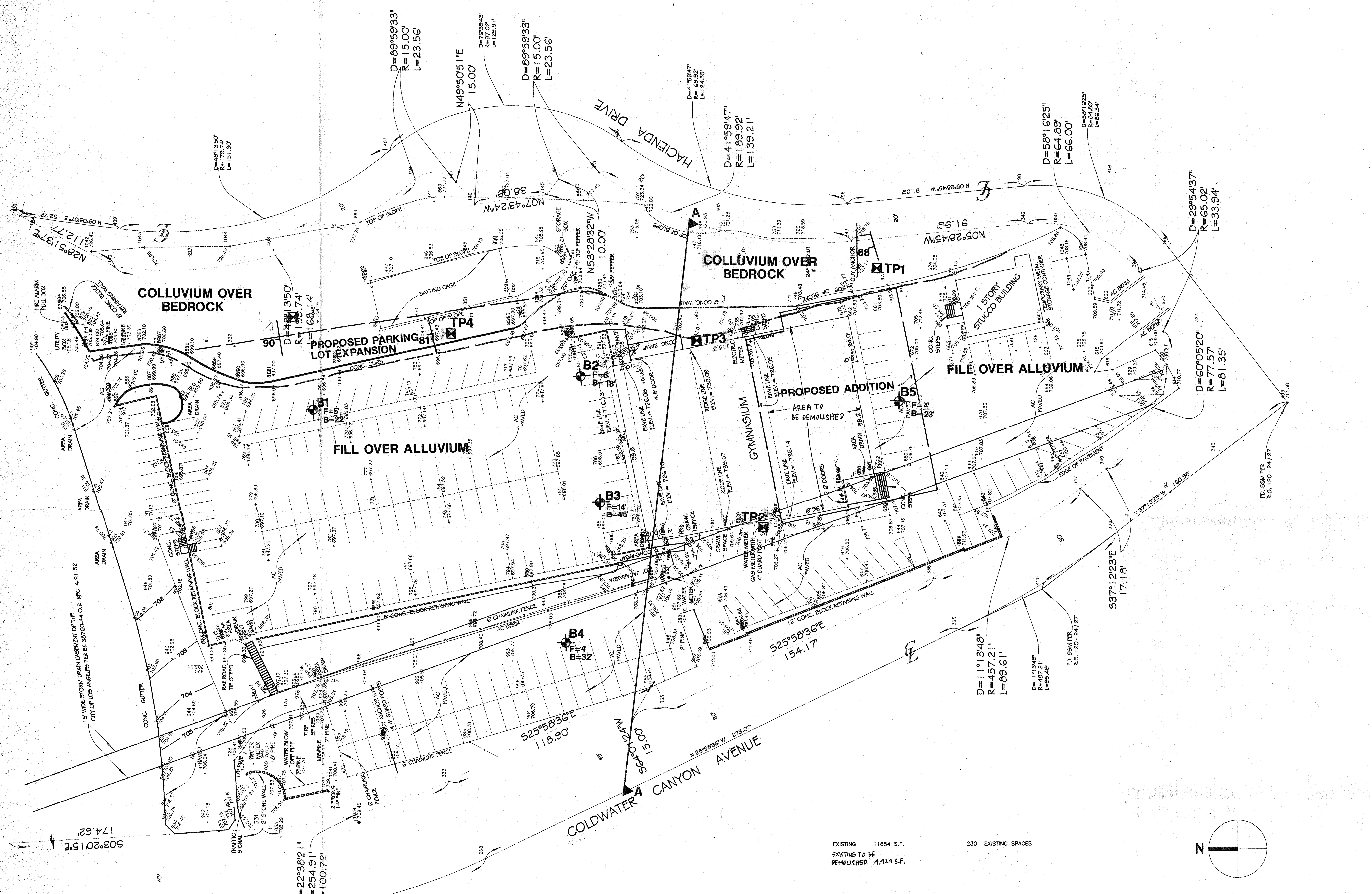
Size: 8 Inch

Elevation: 706

THE J. BYER GROUP, INC. A GEOTECHNICAL CONSULTING FIRM 512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206 (818) 549-9959 Tel • (818) 543-3747 Fax	SECTION A	
	JB: 17866-B HARVARD-WESTLAKE SCHOOL	
	CONSULTANT: JWB	SCALE: 1"=20'

OCTOBER 16, 1998





LEGEND

B5	LOCATION AND NUMBER OF 8" HOLLOW STEM BORING
TP5	LOCATION AND NUMBER OF HAND DUG TEST PIT
	GEOLOGIC CONTACT
F=14'	DEPTH OF FILL AT BORING
B=45'	DEPTH OF TOP OF BEDROCK AT BORING
87	STRIKE AND DIP OF BEDDING

OCTOBER 16, 1998

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
(818) 549-9959 Tel • (818) 543-3747 Fax

GEOLOGIC MAP

JB: 17866-B HARVARD WESTLAKE HIGH SCHOOL

CONSULTANT: JWB SCALE: 1"=20'

JEFFREY M. KALBAN AND ASSOCIATES
ARCHITECTURE

10780 Santa Monica Boulevard, Suite 120, Los Angeles, CA 90025

HARVARD WESTLAKE HIGH SCHOOL
HAMILTON GYM ADDITION AND REMODEL

3700 COLDWATER CANYON AVE.
NORTH HOLLYWOOD, CALIFORNIA 91604

REVISIONS

DATE	DESCRIPTION
09/14/98	

SHEET TITLE

EXISTING

PROJECT NO.: 980800

DRAWN / DATE / CHECK / DATE / APPRV. / DATE

SHEET NO. A1

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVE. # 201, GLENDALE, CA 91206
818•549•9959 TEL 818•543•3747 FAX

October 23, 1998
JB 17866-B

Harvard-Westlake School
Jeffrey M. Kalban & Associates
10780 Santa Monica Boulevard, Suite 120
Los Angeles, California 90025-4749

Attention: Susan Oakley

Subject

Addendum Report
Proposed Gymnasium Addition
Portion of Lot 1111, Tract 1000
3700 Coldwater Canyon Avenue
North Hollywood, California

Reference: Report by The J. Byer Group, Inc.:

Geologic and Soils Engineering Exploration, Proposed Parking Lot Extension and Gymnasium Addition, dated October 16, 1998.

Gentlepersons:

At the request of Susan Oakley, The J. Byer Group is providing additional information with respect to construction of the gymnasium addition. The referenced report did not contain recommendations for slab-on-grade floors. The area of the proposed addition is underlain by uncompacted fill and soft alluvium. Slab-on-grade construction is not recommended. The proposed addition should use raised floor construction or slabs should be structural, designed to bridge from the pile and grade beam foundation system.

Respectfully submitted,
THE J. BYER GROUP, INC.

John W. Byer
E. G. 883

Robert I. Zweigler
G. E. 2120

REGISTERED PROFESSIONAL ENGINEER
ROBERT I. ZWEIGLER
No. 2120
Exp. 6-30-02
GEOTECHNICAL
STATE OF CALIFORNIA

JWB:RIZ:flh
G:\FINAL\ADDENDUM\17866-B.ADD

xc: (1) Addressee (Fax and Mail)
(1) William Koh, Structural Engineer (Fax and Mail)

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVE. # 201, GLENDALE, CA 91206
818•549•9959 TEL 818•543•3747 FAX

January 26, 1999
JB 17866-B

Harvard-Westlake School
3700 Coldwater Canyon Avenue
North Hollywood, California 91604

Attention: Mr. Frank Hedge

Subject

Addendum Report
Proposed Placement of New Fill Over Existing Fill
Portion of Lot 1111, Tract 1000
3700 Coldwater Canyon Avenue
North Hollywood, California

Reference: Report by The J. Byer Group, Inc.:

Geologic and Soils Engineering Exploration, Proposed Parking Lot Extension and Gymnasium Addition, dated October 16, 1998.

City of Los Angeles Department of Building and Safety, Grading Section, Application for Review of Technical Reports and Import-Export Routes, dated January 19, 1999.

Gentlepersons:

This letter has been prepared in response to the referenced letter by the City of Los Angeles. The reason for non-approval is as follows:

1) The Department does not allow new fill on existing uncertified fill. Provide alternative recommendations.

It is proposed to place up to 8½ feet of new fill over existing uncertified fill in the area of the existing parking lot. The enclosed Site Plan shows the area of the proposed new fill with existing and proposed grades. The new fill will support paving for the proposed parking lot. The relatively thick proposed depth of additional fill is necessary so the parking lot will drain to the driveway ramp at the northeast corner.

It is the opinion of The J. Byer Group that new fill may be placed over the existing fill provided it is used only for support of paving. Less than one inch of settlement of the existing fill and alluvium should be anticipated upon placement of new fill.

In order to obtain Grading Section approveal to place compacted fill over the existing fill, a Request for Modification of Building Ordinances must be approved. Also, the city will require that the owner sign an affidavit attesting to knowledge of the area of uncertified fill. The new parking area will be a "restricted use area" suitable for a parking lot only.

Respectfully submitted,
THE J. BYER GROUP, INC.

John W. Byer
E. G. 883

Robert I. Zweigler
G. E. 2120

REGISTERED PROFESSIONAL ENGINEER
ROBERT I. ZWEIGLER
No. 2120
Exp. 6-30-02
GEOTECHNICAL
STATE OF CALIFORNIA

JET:JWB:RIZ:flh
G:\FINAL\ADDENDUM\17866-B1.ADD

Enc: Application for Review of Technical Reports and Import-Export Routes, dated January 19, 1999
Request for Modification of Building Ordinances
Site Plan

xc: (1) Addressee (Fax and Mail)
(1) Jeffrey M. Kalban & Associates (Fax and Mail)
(3) City of Los Angeles Department of Building and Safety, Grading Section,
(The J. Byer Group to file)

City of Los Angeles — Department of Building and Safety

☒ REQUEST FOR MODIFICATION OF BUILDING ORDINANCES (98.0403 L.A.M.C.)

☐ REQUEST FOR ALTERNATE MATERIAL OR METHOD OF CONSTRUCTION (17951d H. & S.C.)

☐ REQUEST FOR HARDSHIP EXEMPTION OR EQUIVALENT FACILITATION (19957 H. & S.C.)

For above requests, complete sections 1, 2, & 3 in duplicate by printing in ink or typing.

READ BY

FILE NO.

DISTRIBUTION

☐ Owner ☐ .... Pl Ck.
☐ Petitioner ☐ .... Insp.
☐ Fire ☐ .... Bur.
☐ Health ☐ ....

JOB ADDRESS 3700 COLDWATER CYN AVE

LOT(S) POR LOT 1111 BLK

TRACT 1000

1

Owner HARVARD-WESTLAKE SCHOOL
Address 3700 COLDWATER CYN AVE
NO. HOLLYWOOD, CA Zip 91604
Daytime Phone (800) 879-0447

Petitioner THE J. BYER GROUP
Address 512 E. WILSON AVE #201
GLENDALE Zip 91206
Daytime Phone (818) 549 9959

District Office .... Type ....
Plan Ck No. .... Stories ....
Zone .... Occ. ....
Permit No. .... No. Units ....
Job Order No. .... F. D. ....
Bureau/Division .... D. M. ....
Use of Bldg. .... C. D. ....
Job Status ....

☐ YARD NOTICE (COM-784) RECEIVED FROM PETITIONER
☐ POSTCARD (COM-3) NAME/ADDRESS COMPLETED BY PETITIONER
☐ SIGN NOTICE RECEIVED FROM PETITIONER

2 REQUEST: Submit plans if necessary to illustrate request. Additional sheets or data may be attached.

PLACE NEW FILL OVER EXISTING UNCERTIFIED FILL

Dept. Comment

Code Sections: L.A.M.C. —

3 JUSTIFICATION/FINDINGS OF EQUIVALENCY:

Title 24 —

SEE REPORTS BY THE J. BYER GROUP DATED OCTOBER 16, 1998 AND JANUARY 26, 1999.

Petitioner's Signature [signature] Position GEOLOGIST Date 1/27/99

Reviewed By .... Date ....

DEPARTMENT ACTION: In accordance with ☐ Sect. 98.0403 L.A.M.C. ☐ Sect. 17951d H. & S.C. ☐ Sect. 19957 H. & S.C.

The Request is ☐ Granted (See attached letter). ☐ Denied (See reverse for appeal information.)

☐ Written concurrence from the (Fire) (Transportation) (Health) (.........................) Dept. is required.

☐ Request (IS) (IS NOT) in conformity with the spirit and purpose of Code Section involved.

☐ Condition (DOES) (DOES NOT) provide ....
(EQUIVALENCY) (EQUIVALENT FACILITATION)

Department Action By

Date

Conditions Of Approval: (Reasons For Appeal in Case of Denial)

(Cashier Use Only)

No. of Items ....
Fee due ....
Fee verified ....

APPEAL OF DEPARTMENT ACTION TO BOARD OF BUILDING AND SAFETY COMMISSIONERS/HANDICAPPED ACCESS APPEALS COMMISSION

(Signature, statement of reasons for appeal and filing fees are required.)

Signature of Owner or Applicant submitting notarized declaration (B & S COMM-832) — Bd. Res. No. 832

X .... Position .... Date ....

Print Name ....

B & S COM-31 (R 1/88)

S B-17 (R 6/86)

City of Los Angeles
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District LA | Log No. 26[illegible]4[illegible]6

ADDRESS APPROVED

Signature/Date

APPLICATION FOR REVIEW OF TECHNICAL REPORTS AND IMPORT-EXPORT ROUTES

INSTRUCTIONS

Address all communications to the Grading Division, Department of Building and Safety, 201 N. Figueroa St., 3rd Fl. CTR 1, Los Angeles, California 90012-4869. Phone (Area Code 213) 677-6329.
Obtain address approval from the Department of Public Works prior to submittal.
Submit 2 copies (4 for fault study zone) of reports and 3 copies of application with items (1) through (10) completed.
Check should be made to the Department of Building and Safety.

Note: Please Print

(1) LEGAL DESCRIPTION
Tract 1000
Blk ______ Lots POR LOT 1111

(3) OWNER HARVARD WESTLAKE SCHOOL
Address 3700 COLDWATER CYN AV
City NORTH HOLLYWOOD, CA Zip 91604
Phone (Daytime) ______

(2) PROJECT ADDRESS 3700 COLDWATER CYN AV

(4) APPLICANT BRUCE A. MILLER & ASSOC
Address 1024 S. GRAND AV 29TH FL
City LOS ANGELES, CA
Phone (Daytime) 213/426 6571 Zip 90017

(5) Report(s) Prepared by THE J. BYER GROUP

(6) Report Date(s) 10/16/98

(7) Status of project: ☒ Proposed ☐ Under Construction ☐ Storm Damage

(8) Previous site reports? ____ If yes, give date(s) of report(s) and name of company(s) who prepared report(s).

(9) Previous Department actions? ____ If yes, please give dates and attach a copy to expedite processing.
Dates ______

(10) Signature of applicant C. O'Brien Position Agent

(DEPARTMENT USE ONLY)

REVIEW REQUESTED & PROCESSING	FEES	REVIEW REQUESTED & PROCESSING	FEES
☐ Foundation Investigation		☐ Seismology report per 91.2305(d)	
☐ Soils Engineering		☐ Environmental Assessment	
☐ Geology		☐ Import-Export Route	
☒ Combined Soils Engr. & Geol.	410 00	☐ Division of Land	
☐ Supplemental		Sub-total	
☐ Combined Supplemental		One-Stop Surcharge	
		TOTAL FEE	$460.10

THE REPORT IS ☐ APPROVED WITH CONDITIONS ☒ NOT APPROVED

DEPARTMENT ACTION BY: Jeffrey O'Keefe For Geology Date 1-19-99 — [illegible] For Soils & Foundation Date 1/15/99

Conditions of Approval ☒ Reasons for Non-Approval ☐ See Attached letter ☐ Supplemental Sheet ____ Attached

1) The Department does not allow new fill on existing uncertified fill. Provide alternative recommendations.

12/21/98 03:14:55PM LA04 I-5910 0 06
GRADING REPORT 410.00
SYS DEV 24.60
ONE STOP 8.20
MISCELLANEOUS 5.00
CITY PLAN SURC 12.30
TOTAL 460.10
D066 01093006
CRCARD
460.10

(Continued Over) (Cashier Use Only)

DEPARTMENT USE ONLY
Fee Due #460 10
Fee Verified K S Jain

DISTRIBUTION
☐ Owner
☐ Applicant
☐ Soil Engineer
☐ Geologist
☐ Board files
☐ LA ☐ VN ☐ WLA ☐ SP/WLA
☐ LA ☐ VN ☐ WLA ☐ SP/WLA
Inspection ☐ BMI ☐ BI

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
(818) 549-9959 Tel • (818) 543-3747 Fax

SITE PLAN

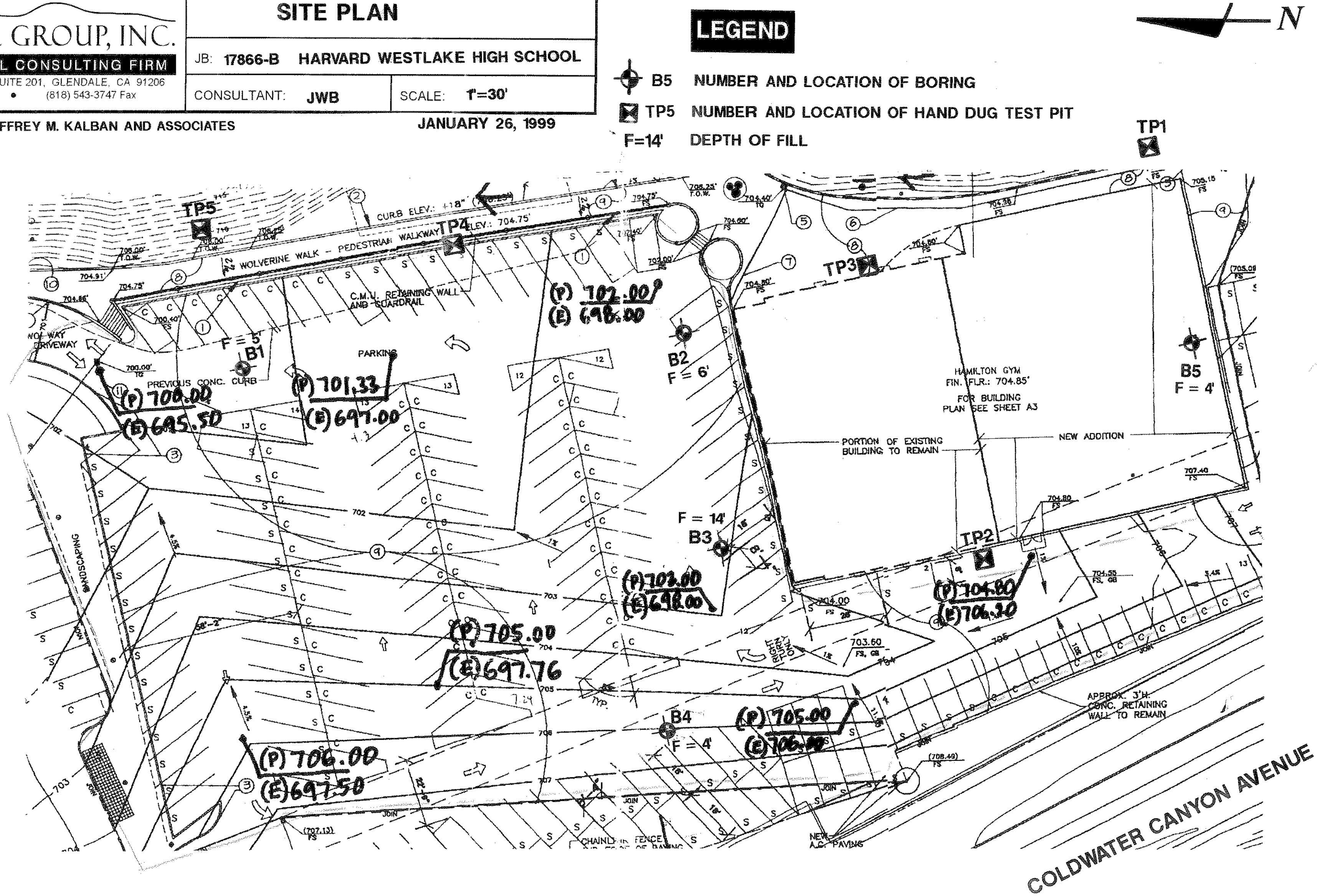
JB: 17866-B	HARVARD WESTLAKE HIGH SCHOOL	
CONSULTANT: JWB	SCALE: 1"=30'	

PLAN PROVIDED BY JEFFREY M. KALBAN AND ASSOCIATES

JANUARY 26, 1999

LEGEND

B5 NUMBER AND LOCATION OF BORING
TP5 NUMBER AND LOCATION OF HAND DUG TEST PIT
F=14' DEPTH OF FILL



CITY OF LOS ANGELES

CALIFORNIA

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

ANDREW A. ADELMAN
GENERAL MANAGER

RICHARD E. HOLGUIN
EXECUTIVE OFFICER

February 12. 1999

Log # 26646-01
C.D. --

SOILS/GEOLOGY FILE - 2

Mr. Bruce A. Miller
624 S. Grand Ave 29th Floor
Los Angeles, CA 90017

TRACT: 1000
LOT: PORTION 111
LOCATION: 3700 Coldwater Canyon Av

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soils Report	JB 17866-B	01-26-99	J. Byer Group
Modification	6919	2-12-99	Building & Safety

PREVIOUS REFERENCE REPORT/LETTERS(S(	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soils Report	JB 17866-B	10-16-98	J. Byer Group
Department Letter	26646	01-19-99	Building & Safety

The report has been reviewed by the Grading Section of the Department of Building and Safety. According to the report, it is planned to demolish an existing addition attached to the southern wall of the gymnasium, and construct a new addition in its place. It is also planned to enlarge the parking lot north of the gymnasium, by excavating the toe of the ascending slope to the east, and supporting in with a retaining wall.

The site is underlain by uncertified fill up to 14 feet in depth. The fill was placed over natural alluvium and, in part, colluvium. Bedrock will be exposed in the excavation for the retaining wall on the east side of the parking lot. The existing parking lot was apparently placed over a former tennis court slab. It is planned to place up to 8 feet of new fill over the existing uncertified fill. The recent J. Byer report indicates that the new fill and pavement thereon will settle less than one inch due to consolidation of the underlying fill and alluvium. The placement of a non-structural fill over an existing uncertified is granted in Modification #6919.

The site is within a State Seismic Hazard Zone, in which liquefaction is a potential hazard. The report indicates that the occurrence of a liquefaction event is low, but will be mitigated by supporting the structures on foundations extending in bedrock. A deepened foundation will be required for the addition.

The report is acceptable, provided the following conditions are complied with during site development:

1. Prior to the issuance of any permit, the owner shall file a notarized Covenant and Agreement with the Office of the Los Angeles County Recorder and the Department, regarding the proposed parking lot to be constructed on uncertified fill, stating that they are aware that there is a potential for settlement and cracking of the parking lot and agree to assume the responsibility for any necessary maintenance or repair. (Note: The Agreement must be approved by the Grading Section prior to being recorded.)

2. Certified fill placed over uncertified fill, as granted in Modification #6919 shall be non-structural.

3. The addition and retaining wall foundations shall be supported on bedrock, as recommended.

4. The addition shall utilize a friction pile and grade beam foundation. The upper four feet of bedrock is considered weathered and not suitable for the support of vertical loads, as recommended.

5. The addition slab shall be designed as a structural slab, due to uncertified fill beneath the slab area.

6. All new graded slopes shall be no steeper than 2:1.

7. The bedrock may excavated vertically up to a height of 5 feet. Any portion above 5 feet and all the colluvium shall be sloped at a gradient of 1:1.

8. All recommendations of the reports which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

9. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

10. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State

Division of Industrial Safety.

11. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

12. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesion-less soil having less than 15 percent of finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent of the maximum dry density.

13. All roof and pad drainage shall be conducted to the street in an acceptable manner.

14. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted to the street in an acceptable manner and in a non-erosive device.

15. The retaining walls shall be provided with a minimum freeboard of 12 inches.

16. Prior to issuance of the building permit, the design of the subdrainage system required to prevent possible hydrostatic pressure behind retaining walls shall be approved by the soils engineer and accepted by the Department. Installation of the subdrainage system shall be inspected and approved by the soils engineer and by the City grading inspector.

17. The geologist and soils engineer shall inspect the excavations for the footings to determine that they are founded in the recommended strata before calling the Department for footing inspection.

18. Buildings adjacent to ascending slopes shall be set back from the toe of the slope a level distance equal to one half the vertical height of the slope, but needs not to exceed 15 feet in accordance with Code Section 91.1806.4.2.

19. All friction pile or caisson drilling and installation shall be performed under the continuous inspection and approval of the geologist and soils engineer.

20. Pile caisson and/or isolated foundation ties are required by Code Section 91.1807.2. Exceptions and modification to this requirement are provided in Rule of General Application 662.

21. Prior to the placing of compacted fill, a representative of the consulting Soils Engineer shall inspect and approve the bottom excavations. He shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the City Grading Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be filed with the Department upon completion of the work. The fill shall be

placed under the inspection and approval of the Soils Engineer. A compaction report shall be submitted to the Department upon completion of the compaction.

22. Prior to the pouring of concrete, a representative of the consulting Geologist and Soil Engineer shall inspect and approve the footing excavations. He shall post a notice on the job site for the City Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Department upon completion of the work.

DAVID HSU
Chief of Grading Section

JEFFREY C. KOFOED
Engineering Geologist II

BANWARI BISHNOI
Geotechnical Engineer I

JK/BB:jk
26646-01
(213) 977-6329

cc: J. Byer Group
Harvard Westlake School
VN District Office

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVE. # 201, GLENDALE, CA 91206
818•549•9959 TEL 818•543•3747 FAX

February 24, 1999
JB 17973-B

Harvard-Westlake School
3700 Coldwater Canyon Avenue
North Hollywood, California 91604

Attention: Frank Hedge

Subject

Review of Borrow Site Grading Plan
Harvard-Westlake School - West Campus
Portion of Lot 1112, Tract 1000 and Portion of Lot 135, Tract 6293
3801 Coldwater Canyon Avenue
North Hollywood, California

References: Reports by The J. Byer Group Inc,:

Proposed Export of Soils, Harvard-Westlake School, West Campus, dated January 18, 1999; and

Borrow Site Grading Plan, prepared by J. E. Vigil Company, dated January 1999.

Gentlepersons:

The J. Byer Group has reviewed the referenced Borrow Site Grading Plan. It is proposed to create a 2:1 cut slope in the southwest portion of the site. A test pit (Test Pit 11) and boring (Boring 1) have been excavated in the area of the proposed cut as part of the geologic and soils engineering exploration being prepared for the site. The location of the test pit and boring are shown on the enclosed Preliminary Geologic Map, which is based upon the referenced Borrow Site Grading Plan. Samples of the bedrock exposed in the test pit and boring were taken to the soils laboratory for testing and analysis.

The dry density of the samples was determined using the procedures outlined in ASTM D-2937. The moisture content of the samples was determined using the procedures outlined in ASTM D-2216. The results are shown on the Log of Test Pit and Log of Boring. Shear tests were performed on samples of bedrock using the procedures outlined in ASTM D-3080 and a strain controlled, direct shear machine manufactured by Soil Test, Inc. The rate of deformation was 0.025 inches per minute. The samples were tested in an artificially saturated condition. Following the shear test, the moisture content of the samples was determined to verify saturation. The results are plotted on the "Shear Test Diagram".

A 75 foot high 2:1 cut slope is proposed. The plan shows two diverter terraces on the proposed cut slope. The diverter terraces will be six feet wide, and will conduct drainage to the pad. The gross stability of the slope was analyzed using Taylor's method. To simplify the analysis, a 75 foot high 2:1 slope consisting of bedrock was assumed in the calculations.

The analysis shows that the proposed slope will be grossly stable with a factor of safety in excess of 1.5. The calculations use the shear tests of samples believed to represent the weakest bedrock encountered during exploration. The slope angle used is the most critical for the slopes analyzed.

The Borrow Site Grading Plan and proposed 2:1 cut slope up to 75 feet high are acceptable to The J. Byer Group. The J. Byer Group should observe the cut slope during grading.

It is the responsibility of the contractor to maintain a safe construction site. When excavations exist on a site, the area should be fenced and warning signs posted. Soil generated by grading should be either removed from the site or properly placed as a certified compacted fill. Soil must not be spilled over any descending slope.

February 3, 1999
JB 17866-B
Page 3

The J. Byer Group appreciates the opportunity to provide our service on this project. Should you have any questions concerning this letter please contact the undersigned.

Respectfully submitted,
THE J. BYER GROUP, INC.

James E. Tucker
Project Geologist

John W. Byer for
E. G. 883 EG 1691

Robert I. Zweigler
G. E. 2120

REGISTERED PROFESSIONAL ENGINEER
JON A. IRVINE
RCE 55005
Exp. 6/2000
CIVIL
STATE OF CALIFORNIA

JET:JWB:RIZ:flh
G:\FINAL\LETTERS\17973-B.LTR

Encl: Shear Test Diagram
Log of Test Pits
Log of Borings
Stability Analysis

In Pocket: Preliminary Geologic Map

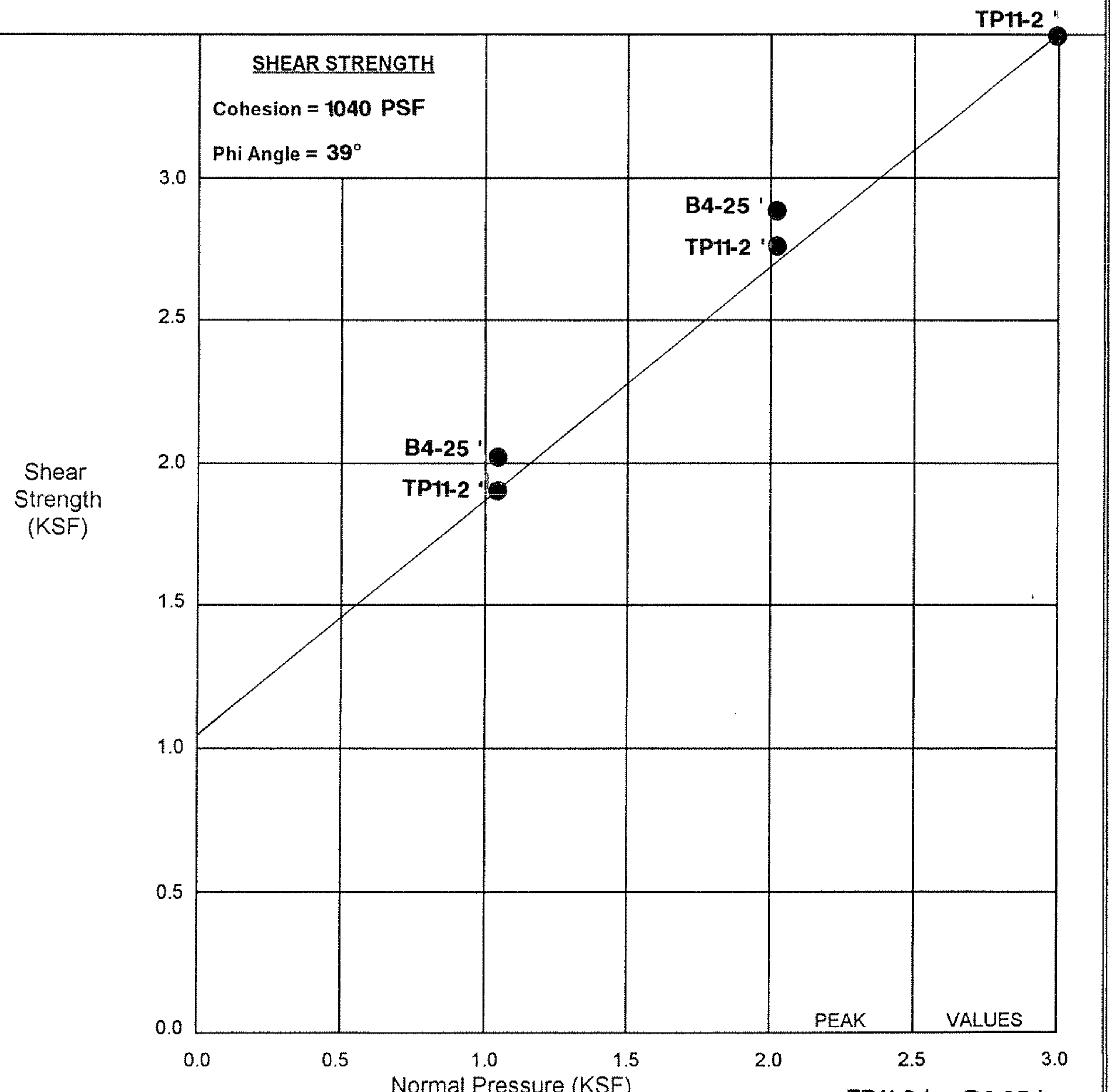
xc: (1) Addressee
(1) J. E. Vigil Company
(4) Jeffrey M. Kalban and Associates

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
818•549•9959 Tel 818•543•3747 Fax

SHEAR TEST DIAGRAM

JB: 17973-B Harvard - West Campus

SAMPLE: Bedrock



○ Direct Shear (Field Moisture)

● Direct Shear (Saturated)

	TP11-2 '	B4-25 '
Moisture Content (%) =	85.9	44.5
Dry Density (pcf) =	42.1	74.6

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
818•549•9959 Tel 818•543•3747 Fax

LOG OF TEST PITS

JB: 17973-B CLIENT: HARVARD-WEST CAMPUS

GEOLOGIST: JET DATE LOGGED: 12/22/98

EXCAVATION METHOD: Back Hoe

REPORT DATE: 2/24/99

TEST PIT #1 Surface Conditions: Toe of Slope Elevation: 760

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 2	**SOIL:**	Sandy Silt, medium to dark brown, slightly moist, soft, porous, rock fragments up to 4 inches
			2 - 3		Gravelly Silt, gray brown, slightly moist, firm, porous
			3 - 5½	**BEDROCK:**	Diatomaceous, Siltstone, white, light gray, light tan, moderately hard, bedding near vertical, thinly bedded, diatomaceous Bedding at 4½ feet: N62E; 71N.

End at 5½ Feet; No Water; No Caving; No Fill.

TEST PIT #2 Surface Conditions: Toe of Slope Elevation: 780

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 6	**ALLUVIUM:**	Sandy Silt, Silty Sand, brown to dark brown, slightly moist, slightly firm, porous, siltstone fragments up to 1 foot, roots up to 2 inches
			6 - 8	**BEDROCK:**	Diatomaceous, Siltstone, orange, white, gray, tan, moderately hard, fractured, very weathered
			8 - 10		white, gray, tan, moderately hard, thinly bedded Bedding at 9 Feet; N73E; 74N

End at 10 Feet; No Water; No Caving; No Fill.

TEST PIT #3 Surface Conditions: Toe of Slope Elevation: 760

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - ½	**SOIL:**	Sandy Silt, brown, gray, slightly moist, medium firm, porous, rootlets
			½ - 3	**BEDROCK:**	Diatomaceous, Siltstone, gray to brown, gray to light tan, moderately hard, slightly fractured, rootlets along fractured, thinly bedded
			3 - 6		hard, no fractures N69E; 64N N72E; 69N at 5 Feet

End at 6 Feet; No Water; No Caving; No Fill.

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
818•549•9959 Tel 818•543•3747 Fax

LOG OF TEST PITS

JB: 17973-B CLIENT: HARVARD-WEST CAMPUS

GEOLOGIST: JET DATE LOGGED: 12/22/98

EXCAVATION METHOD: Back Hoe

REPORT DATE: 2/24/99

TEST PIT #4 Surface Conditions: Toe of Slope Elevation: 760

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1½	**COMPACTED FILL:**	Sandy Silt, dark gray brown, slightly moist, firm, rock fragments up to 8 inches
			1½ - 11	**ALLUVIUM:**	Sandy Silt, gray brown, slightly moist to moist, firm, porous, rock fragments to 6 inches
			11 - 12½	**BEDROCK:**	Diatomaceous, Siltstone, white, buff to light brownish gray, moderately hard, fractured, weathered
			12½ - 14		Hard, slightly fractured, thinly bedded. Bedding at 3 Feet: N80E; 65N

End at 14 Feet; No Water; No Caving; Fill to 1½ Feet.

TEST PIT #5 Surface Conditions: Slope Elevation: 765

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 2	**SOIL:**	Sandy Silt, brownish gray, slightly moist, firm, porous, some gravel roots to ½
			2 - 4		rock fragments to 12 inches
			4 - 5½	**BEDROCK:**	Diatomaceous Siltstone, gray to brownish gray, moderately hard, fractured, roots up to ⅛ inch along fractures
			5½ - 7		hard, not fractured, thinly bedded Bedding at 6 Feet: N74E; 61N

End at 7 Feet; No Water; No Caving; No Fill.

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
818•549•9959 Tel 818•543•3747 Fax

LOG OF TEST PITS

JB: 17973-B CLIENT: HARVARD-WEST CAMPUS

GEOLOGIST: JET DATE LOGGED: 12/29/98

EXCAVATION METHOD: Hand Dug

REPORT DATE: 2/24/99

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
TEST PIT #6					Surface Conditions: Slope Elevation: 750
			0 - 1½	**SOIL:**	Sandy Silt, gray brown, dry, slightly firm, very porous, roots to 1 inch, burrows
			1½ - 4½		slightly moist, firm, porous, some gravel
			4½ - 6½	**BEDROCK:**	Diatomaceous Siltstone, buff to light gray brown, moderately hard to hard, well bedded Bedding at 5 Feet: N64E; 71N
End at 6½ Feet; No Water; No Caving; No Fill.					
TEST PIT #7					Surface Conditions: Slope Elevation: 725
			0 - ½	**SOIL:**	
			½ - 2½	**BEDROCK:**	Diatomaceous Siltstone, buff to light gray brown, hard Bedding at 1½ Feet: N72E; 64N
End at 2½ Feet; No Water; No Caving; No Fill.					
TEST PIT #8					Surface Conditions: Slope Elevation: 735
			0 - 1½	**FILL:**	Sandy Silt, light brownish gray, dry, soft, rootlets, some gravel, burrows
8	18.4	58.1	1½ - 6	**SOIL:**	Sandy Silt, brownish gray to dark brownish gray, slightly moist, slightly firm to firm, slightly porous, roots to 1 inch
			6 - 7½	**BEDROCK:**	Diatomaceous Siltstone, light gray to light greenish gray, moderately hard to hard, thinly bedded, Bedding at 7 Feet: N66E; 68N
End at 7½ Feet; No Water; No Caving; Fill to 1½ Feet.					

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

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LOG OF TEST PITS

JB: 17973-B CLIENT: HARVARD-WEST CAMPUS

GEOLOGIST: JET DATE LOGGED: 12/29/98

EXCAVATION METHOD: Hand Dug

REPORT DATE: 2/24/99

TEST PIT #9 Surface Conditions: Toe of Slope Elevation: 720

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1½	**SOIL:**	Sandy Silt, brownish gray, dry, soft to slightly firm, porous, burrows
2½	21.9	63.2	1½ - 5		dark brownish gray to black, slightly moist to moist, slightly firm to firm, slightly porous to porous, rock fragments up to 6 inches, some clay, roots to 1 inch
			5 - 6	**BEDROCK:**	Siltstone, buff, soft, very weathered, fractured
			6 - 7		brown to greenish gray, moderartely hard to hard, slightly weathered, fractured, gypsum along fractures Bedding at 6½ Feet: N67E; 88S

End at 7 Feet; No Water; No Caving; No Fill.

TEST PIT #10 Surface Conditions: Level Elevation: 760

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1	**FILL:**	Sandy Silt, dark brownish gray, dry, soft, rootlets, some gravel
2	21.7	57.9	1 - 4	**SOIL:**	Sandy Silt, brownish gray, dry, firm to very firm, porous, burrows
			4 - 5½	**BEDROCK:**	Diatomaceous Siltstone, gray brown to brown to tan, soft, very weathered, fractured gypsum along fractures
6½	76.4	38.8	5½ - 6½		buff to light brown, moderately hard, bedded, slightly weathered, slightly fractured Bedding at 5½ Feet: N74E; 64S

End at 6½ Feet; No Water; No Caving; Fill to 1 Foot.

TEST PIT #11 Surface Conditions: Slope Elevation: 825

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1	**SOIL:**	Sandy Silt, light brownish gray, dry to slightly moist, slightly firm, slightly porous, rootlets
2	58.9	42.1	1 - 3	**BEDROCK:**	Diatomaceous Siltstone, white to buff to light brownish gray, moderately hard to hard Bedding at 2 Feet: N62E; 64NW Bedding at 2½ Feet: N65E; 62NW

End at 3 Feet; No Water; No Caving; No Fill.

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 1

By: JET

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Elevation	Depth	Description (SUBSURFACE PROFILE)	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
760		Ground Surface								
	0	**COMPACTED FILL** Sandy Silt, light brownish gray, dry to slightly moist, firm								
759	1									
758	2									
757	3	**BEDROCK** Diatomaceous Siltstone, brownish gray to gray, moderately hard, slightly fractured, thinly bedded, rootlets along freactures								
756	4	hard, no fractures Bedding at 4½ feet: N70E; 67NW								
755	5									
754	6									
753	7									
752	8									
751	9	Jointing at 9 Feet: N13W; 55NE								
750	10	Bedding at 10 Feet: N66E; 69NW		---	R	4	74.1	51.8		
749	11									
748	12									
747	13	4 Inch diameter concretion, dark brown, very hard								
746	14									
745	15	Bedding at 15 Feet: N67E; 71NW								
744	16	light brown to gray brown								
743	17									
742	18									
741	19									
740	20									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 760

Project No: JB 17973-B

Log of Boring 1

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

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SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
				----	R	7	81.6	54.6		
739	21									
738	22	Jointing at 22 Feet: N16W; 62NE								
737	23	Bedding at 23 Feet: N73E; 69NW								
736	24									
735	25	dark gray brown to dark gray								
734	26	Bedding at 26 Feet: N70E; 67NW								
733	27			----	R	7	29.9	87.2		
732	28									
731	29	End at 30 Feet; No Water; No Caving; Fill to 2½ Feet.								
730	30									
729	31									
728	32									
727	33									
726	34									
725	35									
724	36									
723	37									
722	38									
721	39									
720	40									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 760

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 2

By: JET

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SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
765		Ground Surface								
	0	**ALLUVIUM** Silt, dark gray brown, slightly moist, slightly soft, very porous, roots to 1½ inches and rock fragments to 4 inches								
764	1									
763	2									
762	3									
761	4	firm, some gravel, roots to ¼ inch, slightly porous to porous								
760	5			----	R	3	26.8	85.5		
759	6									
758	7									
757	8									
756	9									
755	10									
754	11									
753	12	Gravelly Silt, gray to dark gray brown, firm, rock fragments to 6 inches								
752	13									
751	14	Silt, dark grayish brown, slightly firm, porous								
750	15			----	R	6	25.5	83.4		
749	16	firm, light grayish brown to dark grayish brown porous								
748	17									
747	18									
746	19	light gray brown, firm to very firm, rock fragments to 6 inches								
745	20									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 765

Sheet: 1 of 2

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 2

By: JET

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Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
				----	R	4	32.5	76.3		
744	21	BEDROCK Diatomaceous Siltstone, light brown, soft, ver weathered, soil filled fractured up to 1 inch, some gypsum along fractures								
743	22									
742	23									
741	24	light brown and gray, moderately hard to hard, slightly fractured, some gypsum veins along bedding and fractures Jointing at 24½ Feet: N10W; 32NE								
740	25									
739	26	Bedding at 26 Feet: N73E; 76NW								
738	27									
737	28	Bedding at 27½ Feet: N75E; 78NW								
736	29									
735	30	End at 30 Feet; No Water; No Caving; No Fill.		----	R	12	50.0	67.9		
734	31									
733	32									
732	33									
731	34									
730	35									
729	36									
728	37									
727	38									
726	39									
725	40									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 765

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 3

By: JET

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Elevation	Depth	Description (SUBSURFACE PROFILE)	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
755	0	Ground Surface								
		COMPACTED FILL Sandy Silt, light brownish gray to dark grayish brown, slightly moist, firm, rock fragments to 4 inches, rootlets								
754	1									
753	2									
752	3									
751	4									
750	5			----	R	4	40.5	64.8		
749	6									
748	7	very firm, moist, some gravel								
747	8									
746	9									
745	10			----	R	3	26.4	86.7		
744	11									
743	12									
742	13									
741	14									
740	15			----	R	4	29.9	86.9		
739	16									
738	17									
737	18									
736	19	dark brownish gray								
735	20									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 755

Sheet: 1 of 3

Project No: JB 17973-B

Log of Boring 3

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

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SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		ALLUVIUM: Sandy Silt, dark gray brown, moist, firm, some gravel, porous		----	R	3	27.2	92.9		
734	21									
733	22			----	R	4	25.2	95.1		
732	23									
731	24									
730	25			----	R	3	27.3	89.1		
729	26									
728	27			----	R	7	27.4	86.9		
727	28	Gravelly Silt, light brownish gray to tan, moist, firm, rock fragments to 6 inches, slightly porous								
726	29									
725	30	dark grayish brown, very firm, some clay		----	R	8	28.8	82.0		
724	31									
723	32									
722	33	gray brown to tan								
721	34									
720	35	dark gray brown, porous		----	R	5	46.1	77.1		
719	36									
718	37	**BEDROCK** Diatomaceous Siltstone, tan to light gray brown, moderately hard to hard, thinly bedded								
717	38	Bedding at 38½ Feet: N70E; 67NW								
716	39	Jointing at 39 Feet: N23W; 65NE								
715	40									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 755

Project No: JB 17973-B

Log of Boring 3

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

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Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
				----	R	11	94.1	45.1		
714	41	End at 41 Feet; No Water; No Caving; Fill to 20 Feet								
713	42									
712	43									
711	44									
710	45									
709	46									
708	47									
707	48									
706	49									
705	50									
704	51									
703	52									
702	53									
701	54									
700	55									
699	56									
698	57									
697	58									
696	59									
695	60									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 755

Sheet: 3 of 3

Log of Boring 4

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

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SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
756		Ground Surface								
	0	**COMPACTED FILL** Sandy Silt, dark brown, moist, firm, some gravel, some clay								
755	1									
754	2									
753	3									
752	4									
751	5	Gravelly Silt, light grayish brown to tan, moist, firm, rock fragments to 6 inches								
750	6	Sandy Silt, dark gray brown, moist, firm								
749	7									
748	8	**ALLUVIUM** Sandy Silt, light gray brown, moist to very moist, very firm, some clay, slightly porous								
747	9									
746	10			-----	R	3	28.7	89.6		
745	11									
744	12									
743	13									
742	14	Gravelly Silt, tan to dark grayish brown, moist, slightly firm to firm, rock fragments to 8 inches								
741	15									
740	16	**BEDROCK** Siltstone, gray to light gray brown, loose, very weathered, very fractured, soil along fractures								
739	17									
738	18	light gray brown, moderately hard, thinly bedded, slightly fractured								
737	19	Bedding at 19 Feet: N65E; 58NW								
736	20									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 756

Project No: JB 17973-B

Log of Boring 4

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

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Elevation	Depth	Description (Subsurface Profile)	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		hard								
735	21	Bedding at 21 Feet: N70E; 68NW								
734	22									
733	23	Bedding at 22½ Feet: N66E; 66NW								
732	24									
731	25	End at 25 Feet; No Water; No Caving; Fill to 8½ Feet.		----	R	6	42.9	74.6		
730	26									
729	27									
728	28									
727	29									
726	30									
725	31									
724	32									
723	33									
722	34									
721	35									
720	36									
719	37									
718	38									
717	39									
716	40									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 756

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 5

By: JET

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Elevation	Depth	Description (SUBSURFACE PROFILE)	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
740	0	Ground Surface								
739	1	FILL Sandy Silt, dark gray brown, slightly moist, medium firm, brick and concrete fragments								
738	2	ALLUVIUM Sandy Silt, dark gray brown, moist, firm to slightly firm, porous to very porous to porous, some gravel								
737	3									
736	4									
735	5			----	R	2	26.6	58.0		
734	6									
733	7									
732	8	firm, slightly porous to porous								
731	9									
730	10	slightly firm, with rock fragments to 6 inches		----	R	1	28.2	57.9		
729	11									
728	12									
727	13									
726	14									
725	15			----	R	3	21.4	68.0		
724	16									
723	17									
722	18	firm to very firm								
721	19									
720	20									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 740

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 5

By: JET

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SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		Gravelly Silt, whitish gray to grayish brown, slight moist to moist, firm, with rock fragments to 6 inches		----	R	4	28.6	61.8		
719	21									
718	22									
717	23	BEDROCK Diatomaceous Siltstone, tan to light grayish brown, moderately hard, moderately weathered								
716	24									
715	25	moderately hard to hard, slightly fractured, wel bedded Bedding at 25½ Feet: N65E; 70NW		----	R	7	34.6	78.8		
714	26									
713	27	hard, grayish brown to greenish brown Jointing at 27 Feet; N24W vertical								
712	28	Bedding at 28 Feet: N66E; 66NW								
711	29	End at 30 Feet; No Water; No Caving; Fill to 2 Feet.								
710	30									
709	31									
708	32									
707	33									
706	34									
705	35									
704	36									
703	37									
702	38									
701	39									
700	40									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 740

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 6

By: JET

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SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
731		Ground Surface								
	0	**FILL** Silty Sand, brown, moist, slightly dense								
730	1	Sandy Silt, dark gray brown, moist, firm, roots to ¼ inch, some gravey								
729	2									
728	3	**ALLUVIUM** Sandy Silt, dark gray, brown, moist, firm, slightly porous, roots to 1 inch								
727	4									
726	5			----	R	2	23.1	65.6		
725	6	light gray brown to dark gray brown, slightly moist, slightly firm, roots to ¼ inch, porous								
724	7									
723	8									
722	9									
721	10			----	R	2	21.5	59.6		
720	11									
719	12									
718	13									
717	14									
716	15	rock fragments to 6 inches		----	R	2	23.3	65.2		
715	16									
714	17									
713	18									
712	19									
711	20									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 731

Project No: JB 17973-B

Log of Boring 6

Client: HARVARD-WESTLAKE

Location: West Campus **By:** JET

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SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		Gravelly Silt, light gray brown to gray brown to tan, slightly moist, firm, porous to very porous		----	R	2	26.5	100.1		
710	21									
709	22									
708	23	very firm, rock fragments to 6 inches								
707	24									
706	25			----	R	5	27.0	59.9		
705	26									
704	27									
703	28									
702	29									
701	30			----	R	5	37.0	77.3		
700	31									
699	32	light brown, tan to light gray brown, moist, ver firm, rock fragments to 8 inches								
698	33									
697	34	dark gray brown								
696	35	BEDROCK Diatomaceous Siltstone, grayish brown to greenish gray, moderately hard, fractured and weathered		----	R	8	43.4	77.0		
695	36									
694	37	Bedding at 37 Feet: N74E; 85NW hard, slightly fractured Jointing at 37½ Feet: N20W; 53NE								
693	38	Bedding at 38 Feet: N76E; 88NW								
692	39									
691	40									

Surface: Level **Size:** 24 Inch

Drill Method: Bucket Auger **Elevation:** 731

Drill Date: 12/28/98 **Sheet:** 2 of 3

Project No: JB 17973-B

Log of Boring 6

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

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SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		Bedding at 40 Feet: N74E; 87NW								
690	41									
689	42									
		End at 43 Feet; No Water; No Caving; Fill to 3 Feet								
688	43									
687	44									
686	45									
685	46									
684	47									
683	48									
682	49									
681	50									
680	51									
679	52									
678	53									
677	54									
676	55									
675	56									
674	57									
673	58									
672	59									
671	60									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 731

Sheet: 3 of 3

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GROSS STABILITY ANALYSIS - TAYLOR'S METHOD
JB 17973-B HARVARD-WEST CAMPUS

CALCULATE THE MAXIMUM SLOPE HEIGHT TO WHICH 27 DEGREE SLOPES CONSISTING OF BEDROCK HAVE A FACTOR OF SAFETY GREATER THAN 1.5 UTILIZING TAYLOR'S METHOD *(FUNDAMENTALS OF SOIL MECHANICS)*.

BEDROCK PROPERTIES (Saturated) REFERENCE: SHEAR DIAGRAM 2

Cohesion (C)	Density (W)	Phi Angle
1040 psf	**110 pcf**	**39 degrees**

SLOPE ANGLE ANALYZED = 27 DEGREES.

For Factor of Safety (FS) = 1.5 : Cd = C / Fs = 693.33 psf
Phid = atan(tan(Phi)/Fs)= 25 degrees
(for FAd > 25 degrees, use FAd = 25 degrees)

Interpolate Stability Number (sn) from Taylor's charts:

	Slope Angles							
degrees	20	30	40	50	60	70	80	90
P 5	.090	.110	.130	.145	.160	.185	.210	.260
h 10	.045	.075	.100	.120	.140	.160	.188	.220
i 15	.020	.045	.070	.095	.115	.140	.168	.200
d 20	000	.025	.050	.075	.098	.120	.150	.180
25	000	.010	.033	.055	.080	.105	.130	.170

FROM CHART sn = .007

$$\text{SAFE SLOPE HEIGHT} = \frac{Cd}{Wt \times (sn)} = \frac{693}{110 \times .007} = 900.43 \text{ feet.}$$

CONCLUSIONS:

THE CALCULATIONS INDICATE THAT 27 DEGREE SLOPES IN BEDROCK ARE GROSSLY STABLE WITH A FACTOR OF SAFETY GREATER THAN 1.5 UP TO 900 FEET HIGH. THEREFORE, THE FUTURE SLOPES UP TO 75 FEET HIGH CONSISTING OF BEDROCK WILL BE GROSSLY STABLE.

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PRELIMINARY GEOLOGIC MAP

JB: 17973-B HARVARD - WEST CAMPUS
CONSULTANT: JET | SCALE: 1" = 40'

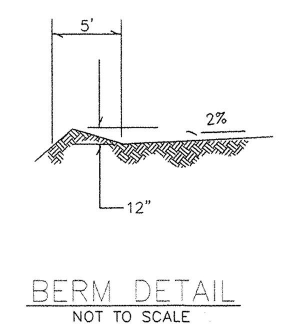
FEBRUARY 24, 1999

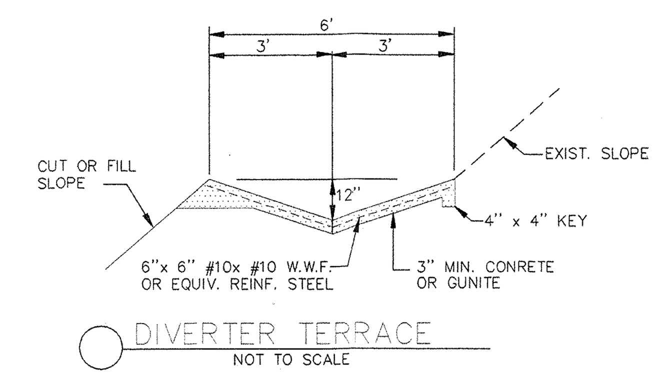
N
W E
S

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

LEGEND

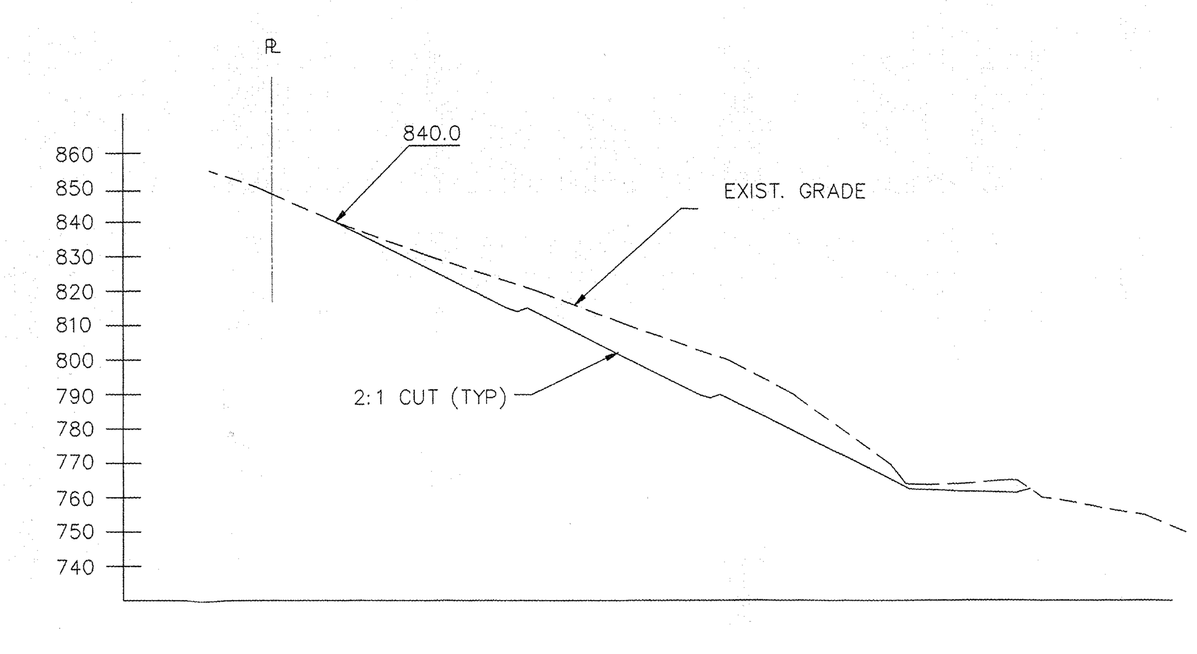
B6 LOCATION AND NUMBER OF BORING
TP5 LOCATION AND NUMBER OF BACK HOE PIT
TP11 LOCATION AND NUMBER OF HAND DUG TEST PIT
GEOLOGIC CONTACT





CONSTRUCTION NOTES

1. CONST. 6 FOOT WIDE TERRACE DRAIN PER DETAIL HEREON
2. CONST. BERM AT TOP OF SLOPE PER DETAIL HEREON
3. CUT SLOPE AT 2:1 MAX, AND PAD AS SHOWN, TO GENERATE 5830+ CY AS REQUIRED TO BALANCE FILL AREA FOR THE PARKING LOT ACROSS THE STREET, SHOWN ON SHEET 2.



SECTION A-A
SCALES
HORIZ. = VERT.
1" = 40'

LEGEND:

AC	ASPHALTIC CONCRETE
CONC	CONCRETE
FH	FIRE HYDRANT
GM	GAS METER
PP	POWER POLE
WV	WATER VALVE

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
515 E. WILSON AVE. # 201, GLENDALE, CA
818•549•9959 TEL 818•543•3747 FAX

March 4, 1999
JB 17973-B

Harvard-Westlake School
3700 Coldwater Canyon Avenue
North Hollywood, CA 91604

Attention: Frank Hedge

Subject

Geologic and Soils Engineering Exploration
Proposed Athletic Field
Harvard-Westlake School - West Campus
Portion of Lot 1112, Tract 1000; Portion of Lot 135, Tract 6293
3801 Coldwater Canyon Avenue
Studio City, California

Gentlepersons:

The J. Byer Group has completed our preliminary report dated March 4, 1999, which describes the geologic and soils engineering conditions with respect to construction of the proposed athletic field. One copy of the report is included with this letter, one copy has been sent to Jeffrey M. Kalban and Associates and one copy has been sent to the J. E. Vigil Company. The final report will be completed when a grading plan for the project has been completed. Any questions concerning the report should directed to the project geologist and engineer. The J. Byer Group appreciates the opportunity to offer our consultation and advice on this project.

Very Truly Yours,
THE J. BYER GROUP, INC.

John W. Byer
President

THE J. BYER GROUP, INC.
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PRELIMINARY GEOLOGIC AND SOILS ENGINEERING EXPLORATION

PROPOSED ATHLETIC FIELD

LOT 1112, TRACT 1000; PORTION OF LOT 135, TRACT 6293

3801 COLDWATER CANYON AVENUE

STUDIO CITY, CALIFORNIA

FOR HARVARD-WESTLAKE SCHOOL

THE J. BYER GROUP, INC. PROJECT NUMBER JB 17973-B

MARCH 4, 1999

PRELIMINARY GEOLOGIC AND SOILS ENGINEERING EXPLORATION
PROPOSED ATHLETIC FIELD
LOT 1112, TRACT 1000; PORTION OF LOT 135, TRACT 6293
3801 COLDWATER CANYON AVENUE
STUDIO CITY, CALIFORNIA
FOR HARVARD-WESTLAKE SCHOOL
THE J. BYER GROUP, INC. PROJECT NUMBER JB 17973-B
MARCH 4, 1999

INTRODUCTION

This report has been prepared per our signed agreement dated December 18, 1998 and summarizes findings of The J. Byer Group, Inc. geologic and soils engineering exploration performed on the site. The purpose of this study is to evaluate the nature, distribution, engineering properties, relative stability, and geologic structure of the earth materials underlying the site with respect to construction of the proposed athletic field.

INTENT

It is the intent of this report to assist in the design and completion of the proposed project. The recommendations are intended to reduce geotechnical risks affecting the project. The professional opinions and advice presented in this report are based upon commonly accepted standards and are subject to the general conditions described in the NOTICE section of this report.

EXPLORATION

The scope of the field exploration was determined from our initial site visit and consultation with Jeffrey M. Kalban and Associates. The preliminary grading plan prepared by Jeffrey M. Kalban and Associates, dated December 1998, was considered prior to beginning work on this project. Exploration was conducted using techniques normally applied to this type of project in this setting. This report is limited to the area of the exploration and the proposed project as shown on the enclosed Geologic Map and Cross Sections. Conditions affecting portions of the property outside the area explored, are beyond the scope of this report.

Exploration was conducted on December 22, 23, 28, and 29, 1998 with the aid of a tractor-mounted backhoe, truck mounted bucket auger drill rig, and hand labor. It included excavating 11 test pits and drilling six borings to a maximum depth of 43 feet. Samples of the earth materials were obtained at frequent intervals and were delivered to the soils engineering laboratory for testing and analysis. Downhole observation of the earth materials was performed by the project geologist. Exposures of earth materials were geologically mapped by the engineering geologist.

Office tasks included laboratory testing of selected soil samples, review of the United States Department of Agriculture 1952 series air photos, review of the City of Los Angeles grading records, preparation of three geologic Cross Sections, preparation of the Geologic Map, and slope stability calculations. The earth materials exposed in the test pits and borings are described on the enclosed Log of Test Pits and Log of Borings. Appendix I contains a discussion of the laboratory testing procedures and results.

The proposed project, surface geologic conditions, and the location of the test pits and borings are shown on the Geologic Map. Subsurface distribution of the earth materials, projected geologic structure, and the proposed project are shown on Sections A, B, and C. Section B forms the basis for the enclosed stability calculations.

RESEARCH - PRIOR WORK

Research at the City of Los Angeles Department of Building and Safety was performed prior to the preparation of this report. No geology and soils engineering reports or compaction reports were located for the site.

A portion of the site has been graded as part a previously proposed development. The grading consisted of cut and fill operations to create two level building pads and an access driveway. Compacted fill slopes were created at a gradient of 2:1. The slope above the driveway is supported by a retaining wall. Development of the site was stopped prior to completion of the grading and a compaction report was apparently not prepared for the site.

PROPOSED DEVELOPMENT

Information concerning the proposed project was provided by Jeffrey M. Kalban and Associates. The preliminary grading plan prepared by Jeffrey M. Kalban and Associates, dated December, 1998, was a guide for the field exploration and the preparation of this report. It is proposed to create a level athletic field. Retaining walls up to 30 feet high are planned to support future compacted fill and cut slopes. Grading will consist of cut and fill operations.

Formal plans have not been prepared and await the conclusions and recommendations of this report.

SITE DESCRIPTION

The subject property consists of a partially graded hillside parcel on the north flank of the Santa Monica Mountains, in the Studio City section of the City of Los Angeles, California. It is located on the west side of Coldwater Canyon Avenue, approximately ¼ mile south of Ventura Boulevard. The site is developed with two single family residences. The surrounding area has been developed with scattered hillside residences.

Past grading on the site has consisted of cut and fill operations to create level building pads. The north and west-central portions of the site were graded in the 1980's as part of a proposed development of the site. Two level building pads were graded. The pads are accessed via a concrete paved driveway which ascends from Coldwater Canyon Avenue. The north pad was created by placing compacting fill in a secondary canyon. A 2:1 compacted fill slope descends to the east below the building pad to a retaining wall above the paved driveway. The slope to the west of the building pad ascends offsite at gradients ranging from 2:1 to 3:1. The south pad was created by cutting into an existing secondary ridge and placing compacted fill in the southeast portion of the pad. A six to eight foot high vertical cut was created on the west portion of the pad. The cut slope ascends above the vertical portion approximately 30 feet at a 2:1 gradient. The natural slope continues to ascend offsite to the west an additional 150 feet at gradients ranging from 2:1 to 3:1. Grading was ceased prior to completion of the development.

The south and east central portions of the site were graded to create level building pads for three residences (one which has been demolished). Grading consisted of minor cut and fill operations.

Vegetation on the west portion of the site consists of a moderately thick assemblage of native chaparral. Vegetation around the existing residences consists of domesticated grasses, shrubs and trees. Vegetation on the level building pads and slope in the north and west-central portion of the site consists of scattered weeds and shrubs. Surface drainage is by sheetflow runoff down the contours of the land to the east. Drainage on the slopes above the level building pads in the north and west-central portion of the site are intercepted by concrete paved drainage swales which conduct the drainage to the existing concrete driveway and Coldwater Canyon Avenue.

GROUNDWATER

Groundwater was not encountered during exploration. Seasonal fluctuations in groundwater levels may occur due to variations in climate, irrigation, and other factors not evident at the time of the exploration. Fluctuations in groundwater levels may also occur across the site. Rising groundwater can saturate earth materials, causing subsidence of the site or instability of slopes.

EARTH MATERIALS

Compacted Fill

Compacted fill, associated with previous site grading in the north and west-central portion of the site, was observed to be up to 20 feet deep in Boring 3. The compacted fill consists of sandy silt which is light brownish gray to dark grayish brown, slightly moist to moist, firm to very firm, with rock fragments up to six inches.

Fill

Fill, associated with grading in the south-west portion of the site consists of sandy silt which is dark gray brown, slightly moist, medium firm, with brick and concrete fragments.

Soil

Natural residual soil blankets the slopes in north, west and south portions of the site. The soil consists of sandy silt and gravelly silt which is medium to dark brown to gray brown, slightly moist, soft to firm, porous with rock fragments up to four inches. The soil layer observed is on the order of three feet thick.

Alluvium

Natural alluvium underlies the north and south portions of the site. The alluvium was observed to be 6 to 33 feet thick and is anticipated to thicken toward the east. The alluvium consists of sandy silt, silt and gravelly silt, which is brown, dark brown, and gray to dark gray brown, soft to firm, slightly moist to moist, porous to very porous, with roots up to 1½ inches and rock fragments up to six inches.

Bedrock

Bedrock underlying the site and encountered in the test pits consists of diatomaceous siltstone and shale mapped as part of the Modelo Formation by H. W. Hoots in the United States Geological Survey Professional Paper 165, "Geology of the Eastern Part of the Santa Monica Mountains, Los Angeles County, California", 1931. The bedrock is also exposed in cut slopes on the central and west portion of the site. The bedrock is tan to brown and white to gray, moderately hard to hard, thinly bedded.

GEOLOGIC STRUCTURE

The bedrock described is common to this area of the Santa Monica Mountains and the geologic structure is consistent with regional trends. Bedding planes mapped generally strike east-west and dip steeply to the north. Bedding is overturned in the extreme south portion of the site, dipping steeply to the south. Joint planes mapped are randomly oriented and steeply dipping. The geologic structure of the bedrock is favorably oriented for stability of the site and proposed project.

GENERAL SEISMIC CONSIDERATIONS

Southern California is located in an active seismic region. Moderate to strong earthquakes can occur on numerous local faults. The United States Geological Survey, California Division of Mines and Geology, private consultants, and universities have been studying earthquakes in southern California for several decades. Early studies were directed toward earthquake prediction and estimation of the effects of strong ground shaking. Studies indicate that earthquake prediction is not practical and not sufficiently accurate to benefit the general public. Governmental agencies are shifting their focus to earthquake resistant structures as opposed to prediction. The purpose of the code seismic design parameters is to prevent collapse during strong groundshaking. Cosmetic damage should be expected.

Within the past 25 years, southern California and vicinity have experienced an increase in seismic activity beginning with the San Fernando earthquake in 1971. In 1987, a moderate earthquake struck the Whittier area and was located on a previously unknown fault. Ground shaking from this event caused substantial damage to the City of Whittier, and surrounding cities.

The January 17, 1994, Northridge earthquake was initiated along a previously unrecognized fault below the San Fernando Valley. The energy released by the earthquake propagated to the southeast, northwest, and northeast in the form of shear and compression waves, which caused the strong ground shaking in portions of the San Fernando Valley, Simi Valley, City of Santa Clarita, and City of Santa Monica.

Southern California faults are classified as: active, potentially active, or inactive. Faults from past geologic periods of mountain building, but do not display any evidence of recent offset, are considered "inactive" or "potentially active". Faults that have historically produced earthquakes or show evidence of movement within the past 11,000 years are known as "active faults". There are no known active faults within close vicinity of the subject property.

The principal seismic hazard to the subject property and proposed project is strong ground shaking from earthquakes produced by local faults. Modern, well-constructed buildings are designed to resist ground shaking through the use of shear panels and reinforcement. Additional precautions may be taken to protect personal property and reduce the chance of injury, including strapping water heaters and securing furniture. It is likely that the subject property will be shaken by future earthquakes produced in southern California. However, secondary effects such as surface rupture, lurching, liquefaction, ridge shattering, and landsliding should not occur at the subject property.

Liquefaction

The site is not located within a liquefaction zone per the "Seismic Hazards Zones, Van Nuys Quadrangle, Official Map," dated February 1, 1998, by the California Division of Mines and Geology.

SLOPE STABILITY

Gross Stability

Slopes on and adjacent to the subject property include an existing 180 foot high 2:1 to 3:1 cut and natural slope. The gross stability of the slope was analyzed using Taylor's method. To simplify the analysis, a 180 foot high 2:1 slope consisting of bedrock was assumed in the calculations. Also, the global stability of the proposed stepped retaining walls shown on Section B was checked using simplified Bishop's method and a software program by TAGA.

The analysis shows that the subject property, existing and proposed slopes will be grossly stable with a factor of safety in excess of 1.5. The calculations use the shear tests of samples believed to represent the weakest bedrock encountered during exploration. The slope angle and cross section used are the most critical for the slopes analyzed.

Surficial Stability

Based upon the enclosed calculations, it is reasonable to assume that the natural residual soil is surficially stable. The method of analysis used is the "parallel seepage model" recommended by the American Society of Civil Engineers and the Building and Safety Advisory Committee (8/16/78). The assumptions of this method are: a uniform planar slope; uniform soil density and shear strength; and uniform seepage parallel to the slope. The validity of the analysis depends, in part, by how closely the assumptions model the field conditions.

For surficial deposits overlying natural slopes, it is the opinion of The J. Byer Group, Inc. that the assumptions of the "parallel seepage model" are not completely satisfied. Thus, though the calculation shows that the surficial materials on the site are stable with a factor of safety in excess of 1.5, the mitigating measures recommended in the "Conclusions and Recommendations" of this report should be implemented during development of the site.

CONCLUSIONS AND RECOMMENDATIONS

General Findings

The conclusions and recommendations of this exploration are based upon six borings, 11 test pits, field geologic mapping, research of available records, consultation, years of experience observing similar properties in similar settings and review of the development plans. It is the finding of The J. Byer Group, Inc. that construction of the proposed project is feasible from a geologic and soils engineering standpoint provided the advice and recommendations contained in this report are included in the plans and are implemented during construction.

Geotechnical issues affecting the site include thick sections of compacted fill and alluvium underlying the north portion of the site and thick alluvium under the south portion. Although compacted, the existing fill was not certified as a structural or secondary engineered fill. The compacted fill and alluvium observed in Borings 3 and 4 was firm to very firm. Consolidation tests performed on samples of the alluvium encountered in Borings 3 and 4 indicate that it is not subject to excessive consolidation upon saturation and loading. It is the opinion of The J. Byer Group that the existing compacted fill may be utilized as secondary structural fill for the proposed project and may support additional fill. The alluvium in the south portion of the site and encountered in Borings 2, 5 and 6 is soft to very firm and porous. Consolidation tests performed on the alluvium encountered in Borings 2, 5, and 6 indicate the alluvium is subject to moderate to high consolidation upon saturation and loading. Future compacted fill placed over the alluvium in the south portion of the site will experience differential settlement due to consolidation of the underlying alluvium. The differential settlement may be in excess of two feet.

It is proposed to place future compacted fill in the south and east portions of the site to create a level pad for the proposed athletic field. It is the opinion of the J. Byer Group that future compacted fill may be placed over the existing compacted fill and alluvium. The future compacted fill will be secondary structural fill, not to be used for foundation support.

SITE PREPARATION

It is proposed to place compacted fill in the south and east portions of the site to create a level surface for the proposed athletic field. Surficial materials consisting of uncompacted fill and soil are present on the site. Remedial grading is recommended to improve site conditions.

General Grading Specifications

The following guidelines may be used in preparation of the grading plan and job specifications. The J. Byer Group would appreciate the opportunity of reviewing the plans to insure that these recommendations are included. The grading contractor should be provided with a copy of this report.

A. The site should be prepared to receive compacted fill by removing all vegetation, debris, existing uncompacted fill, and soil. The exposed excavated area should be observed by the soils engineer or geologist prior to placing compacted fill. The exposed grade should be scarified to a depth of six inches, moistened to optimum moisture content, and recompacted to 90 percent of the maximum density.

B. Fill, consisting of soil approved by the soils engineer, shall be placed in horizontal lifts and compacted in six inch layers with suitable compaction equipment. The excavated onsite materials are considered satisfactory for reuse in the controlled fills. Any imported fill shall be observed by the soils engineer prior to use in fill areas. Rocks larger than six inches in diameter shall not be used in the fill.

C. The fill shall be compacted to at least 90 percent of the maximum laboratory density for the material used. The maximum density shall be determined by ASTM D 1557-91 or equivalent.

D. Field observation and testing shall be performed by the soils engineer during grading to assist the contractor in obtaining the required degree of compaction and the proper moisture content. Where compaction is less than required, additional compactive effort shall be made with adjustment of the moisture content, as necessary, until 90 percent compaction is obtained. One compaction test is required for each 500 cubic yards or two vertical feet of fill placed.

Fill Slopes

Fill slopes may be constructed at a 2:1 gradient. Compacted fill should be keyed and benched into bedrock or alluvium. Keyways should be a minimum of 12 feet wide and three feet into bedrock or alluvium as measured on the downhill side. The base of all fills and the axis of drainage courses require subdrains.

Excavation Characteristics

The test pits and borings did encounter hard, cemented bedrock. Excavation difficulty is a function of the degree of weathering and amount of fracturing within the bedrock. The bedrock generally becomes harder and more difficult to excavate with increasing depth. Hard cemented layers are also known to occur at random locations and depths and may be encountered during foundation excavation. Should a hard cemented layer be encountered, coring or the use of jackhammers may be necessary.

FOUNDATION DESIGN

General Conditions

The following foundation recommendations are minimum requirements. The structural engineer may require footings that are deeper, wider, or larger in diameter, depending on the final loads.

Spread Footings

Continuous and/or pad footings may be used to support the proposed retaining walls and pedestrian bridge provided they are founded in bedrock. Continuous footings should be a minimum of 12 inches in width. Pad footings should be a minimum of 24 inches square. The following chart contains the recommended design parameters.

Bearing Material	Minimum Embedment Depth of Footing (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Bedrock	12	3,000	0.5	400	6,000

Increases in the bearing value are allowable at a rate of 600 pounds per square foot for each additional foot of footing width or depth to a maximum of 6,000 pounds per square foot. For bearing calculations, the weight of the concrete in the footing may be neglected.

The bearing value shown above is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. When combining passive and friction for lateral resistance, the passive component should be reduced by one third.

All continuous footings should be reinforced with a minimum of two #4 steel bars; one placed near the top and one near the bottom of the footings. Footings should be cleaned of all loose soil, moistened, free of shrinkage cracks and approved by the geologist prior to placing forms, steel or concrete.

Deepened Foundations - Friction Piles

Drilled, cast in place concrete friction piles are recommended to support the proposed retaining walls adjacent to Coldwater Canyon Avenue, where deep alluvium was encountered. Piles should be a minimum of 24 inches in diameter and a minimum of eight feet into bedrock. Piles may be assumed fixed at three feet into bedrock. The piles may be designed for a skin friction of 700 pounds per square foot for that portion of pile in contact with the bedrock. Piles for retaining walls need only be tied in one horizontal direction with grade beams.

Soldier Piles

Soldier piles may be utilized to support the temporary excavations for the proposed retaining walls in the southwest portion of the site. Soldier piles should be a minimum of 24 inches in diameter and a minimum of eight feet into bedrock. Piles may be assumed fixed at three feet into bedrock. The piles may be designed for a skin friction of 700 pounds per square foot for that portion of pile in contact with the bedrock. Soldier piles should be spaced a maximum of eight feet on center. Based upon the enclosed calculations, the soldier piles up to 30 feet retaining may be designed for an equivalent fluid pressure of 43 pounds per square foot. The soldier piles may be incorporated onto the final design of the retaining walls.

Lateral Design

The friction value is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. Resistance to lateral loading may be provided by passive earth pressure within the bedrock.

Passive earth pressure may be computed as an equivalent fluid having a density of 500 pounds per cubic foot for the bedrock. The maximum allowable earth pressure is 6,000 pounds per square foot for the bedrock. For design of isolated piles, the allowable passive and maximum earth pressures may be increased by 100 percent. Piles spaced more than 2½ pile diameters on center may be considered isolated.

Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. A settlement of ¼ to ½ inch may be anticipated. Differential settlement should not exceed ¼ inch.

RETAINING WALLS

General Design

Retaining walls up to 30 feet high, and with a 2:1 backslope may be designed for an equivalent fluid pressure of 43 pounds per cubic foot per the enclosed calculations. Retaining walls should be provided with a subdrain or weepholes covered with a minimum of 12 inches of ¾ inch crushed gravel.

Backfill

Retaining wall backfill should be compacted to a minimum of 90 percent of the maximum density as determined by ASTM D 1557-91 or equivalent. Where access between the retaining wall and the temporary excavation prevents the use of compaction equipment, retaining walls should be backfilled with ¾ inch crushed gravel to within two feet of the ground surface. Where the area between the wall and the excavation exceeds 18 inches, the gravel must be vibrated or wheel-rolled, and tested for compaction. The upper two feet of backfill above the gravel should consist of a compacted fill blanket to the surface. Retaining wall backfill should be capped with a paved surface drain.

Freeboard

Retaining walls surcharged by a sloping condition should be provided with a minimum of two feet of freeboard for slough protection. An open "V" drain should be placed behind the wall so that all upslope flows are directed around the structure to the street.

Temporary Excavations

Temporary excavations will be required to construct the proposed retaining walls in the south and southwest portion of the site. The excavations will be up to 30 feet in height and will expose soil over bedrock. The soil should be trimmed to 1:1 for wall excavations. The bedrock is capable of maintaining vertical excavations up to 15 feet per the enclosed calculations. Where vertical excavations in the bedrock exceed 15 feet in height, the upper portion should be trimmed to 1:1 (45 degrees).

Vertical excavations in excess of 15 feet will require the use of temporary shoring. Temporary shoring should be designed for an equivalent fluid pressure of 43 pounds per cubic foot per the enclosed calculations.

The geologist should be present during grading to see temporary slopes. All excavations should be stabilized within 30 days of initial excavation. Water should not be allowed to pond on top of the excavations nor to flow toward them. No vehicular surcharge should be allowed within three feet of the top of the cut.

Paving

Prior to placing paving, the existing grade should be scarified to a depth of 12 inches, moistened as required to obtain optimum moisture content, and recompacted to 90 percent of the maximum dry density, as determined by ASTM D 1557-91. Trench backfill below paving, should be compacted to 90 percent of the maximum dry density. Irrigation water should be prevented from migrating under paving. The following table shows the recommended pavement sections:

Service	Pavement Thickness (Inches)	Base Course (Inches)
Light Passenger Cars	3	4
Moderate Trucks (Storage, etc.)	3	12

Base course should be crusher-run base (CRB) or decomposed granite.

DRAINAGE

Control of site drainage is important for the performance of the proposed project. Pad drainage should be collected and transferred to the street in non-erosive drainage devices. Drainage should not be allowed to pond on the pad or against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope. Planters located within retaining wall backfill should be sealed to prevent moisture intrusion into the backfill. Drainage control devices require periodic cleaning, testing and maintenance to remain effective.

WATERPROOFING

Retaining walls are subject to moisture intrusion, seepage, and leakage and should be waterproofed. Waterproofing paints, compounds, or sheeting can be effective if properly installed. Equally important is the use of a subdrain that daylights to the atmosphere. The subdrain should be covered with ¾ inch crushed gravel to help the collection of water. Yard areas above the wall should be sealed or properly drained to prevent moisture contact with the wall or saturation of wall backfill.

PLAN REVIEW

Formal plans ready for submittal to the Building Department should be reviewed by The J. Byer Group. Any change in scope of the project may require additional work.

SITE OBSERVATIONS DURING CONSTRUCTION

The Building Department requires that the geotechnical company provide site observations during construction. The observations include foundation excavations, keyways for fill, benching, pool excavations, temporary slopes and permanent cut slopes. All fill that is placed should be tested for compaction and approved by the soils engineer prior to use for support of engineered structures. The City of Los Angeles requires that all retaining wall subdrains be observed by a representative of the geotechnical company as well as the City Inspector.

Please advise The J. Byer Group, Inc. at least 24 hours prior to any required site visit. The agency approved plans and permits should be at the jobsite and available to our representative. The project consultant will perform the observation and post a notice at the jobsite of his visit and findings. This notice should be given to the agency inspector.

CONSTRUCTION SITE MAINTENANCE

It is the responsibility of the contractor to maintain a safe construction site. When excavations exist on a site, the area should be fenced and warning signs posted. All pile excavations must be properly covered and secured. Soil generated by foundation and subgrade excavations should be either removed from the site or properly placed as a certified compacted fill. Soil must not be spilled over any descending slope. Workers should not be allowed to enter any unshored trench excavations over five feet deep.

GENERAL CONDITIONS

This report and the exploration are subject to the following NOTICE. Please read the NOTICE carefully, it limits our liability.

NOTICE

In the event of any changes in the design or location of any structure, as outlined in this report, the conclusions and recommendations contained herein may not be considered valid unless the changes are reviewed by us and the conclusions and recommendations are modified or reaffirmed after such review.

The subsurface conditions, excavation characteristics, and geologic structure described herein and shown on the enclosed cross sections have been projected from excavations on the site as indicated and should in no way be construed to reflect any variations that may occur between these excavations or that may result from changes in subsurface conditions.

Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, irrigation, and other factors not evident at the time of the measurements reported herein. Fluctuations also may occur across the site. High groundwater levels can be extremely hazardous. Saturation of earth materials can cause subsidence or slippage of the site.

If conditions encountered during construction appear to differ from those disclosed herein, notify us immediately so we may consider the need for modifications. Compliance with the design concepts, specifications or recommendations during construction requires the review of the engineering geologist and geotechnical engineer during the course of construction.

THE EXPLORATION WAS PERFORMED ONLY ON A PORTION OF THE SITE, AND CANNOT BE CONSIDERED AS INDICATIVE OF THE PORTIONS OF THE SITE NOT EXPLORED.

This report is issued and made for the sole use and benefit of the client, is not transferable and is as of the exploration date. Any liability in connection herewith shall not exceed the fee for the exploration. No warranty, expressed or implied, is made or intended in connection with the above exploration or by the furnishing of this report or by any other oral or written statement.

THIS REPORT WAS PREPARED ON THE BASIS OF THE PRELIMINARY DEVELOPMENT PLAN FURNISHED. FINAL PLANS SHOULD BE REVIEWED BY THIS OFFICE AS ADDITIONAL GEOTECHNICAL WORK MAY BE REQUIRED.

The J. Byer Group appreciates the opportunity to provide our service on this project. Any questions concerning the data or interpretation of this report should be directed to the undersigned.

Respectfully submitted,
THE J. BYER GROUP, INC.

James E. Tucker
Project Geologist

This report was prepared under the direction and supervision of:

John W. Byer
E.G. 883

Robert I. Zweigler
G.E. 2120

REGISTERED PROFESSIONAL ENGINEER
JON A. IRVINE
RCE 55005
Exp. 6/2000
CIVIL
STATE OF CALIFORNIA

JET:JWB:RIZ:flh
G:\FINAL\REPORTS\17973-B.RPT

Enc: Appendix I - Laboratory Testing
Shear Test Diagrams (3 pages)
Consolidation Curves (10)
Vicinity Map
Regional Geologic Map
Log of Test Pits (4 Pages)
Log of Borings (14 Pages)
Calculation Sheets (11 Pages)

In Pocket: Geologic Map
Sections A, B, and C

xc: (1) Addressee
(1) J. E. Vigil Company
(1) Jeffrey M. Kalban and Associates

APPENDIX I

LABORATORY TESTING

Undisturbed and bulk samples of the compacted fill, fill, soil, alluvium and bedrock were obtained from the test pits and borings and transported to the laboratory for testing and analysis. The samples were obtained by driving a ring lined barrel sampler conforming to ASTM D-3550 with successive drops of the Kelly bar and hand sampler weight. Experience has shown that sampling causes some disturbance of the sample, however the test results remain within a reasonable range. The samples were retained in brass rings of 2.50 inches outside diameter and 1.00 inches in height. The samples were stored in close fitting, waterproof containers for transportation to the laboratory.

Moisture-Density

The dry density of the samples was determined using the procedures outlined in ASTM D-2937. The moisture content of the samples was determined using the procedures outlined in ASTM D-2216. The results are shown on the Log of Test Pits and Log of Borings.

Shear-Tests

Shear tests were performed on samples of future compacted fill, soil, and bedrock using the procedures outlined in ASTM D-3080 and a strain controlled, direct shear machine manufactured by Soil Test, Inc. The rate of deformation was 0.025 for the bedrock and future compacted fill samples and 0.010 inches per minute for the soil samples. The samples were tested in an artificially saturated condition. Following the shear test, the moisture content of the samples was determined to verify saturation. The results are plotted on the "Shear Test Diagrams".

Consolidation

Consolidation tests were performed on insitu samples of the alluvium. Results are graphed on the "Consolidation Curves".

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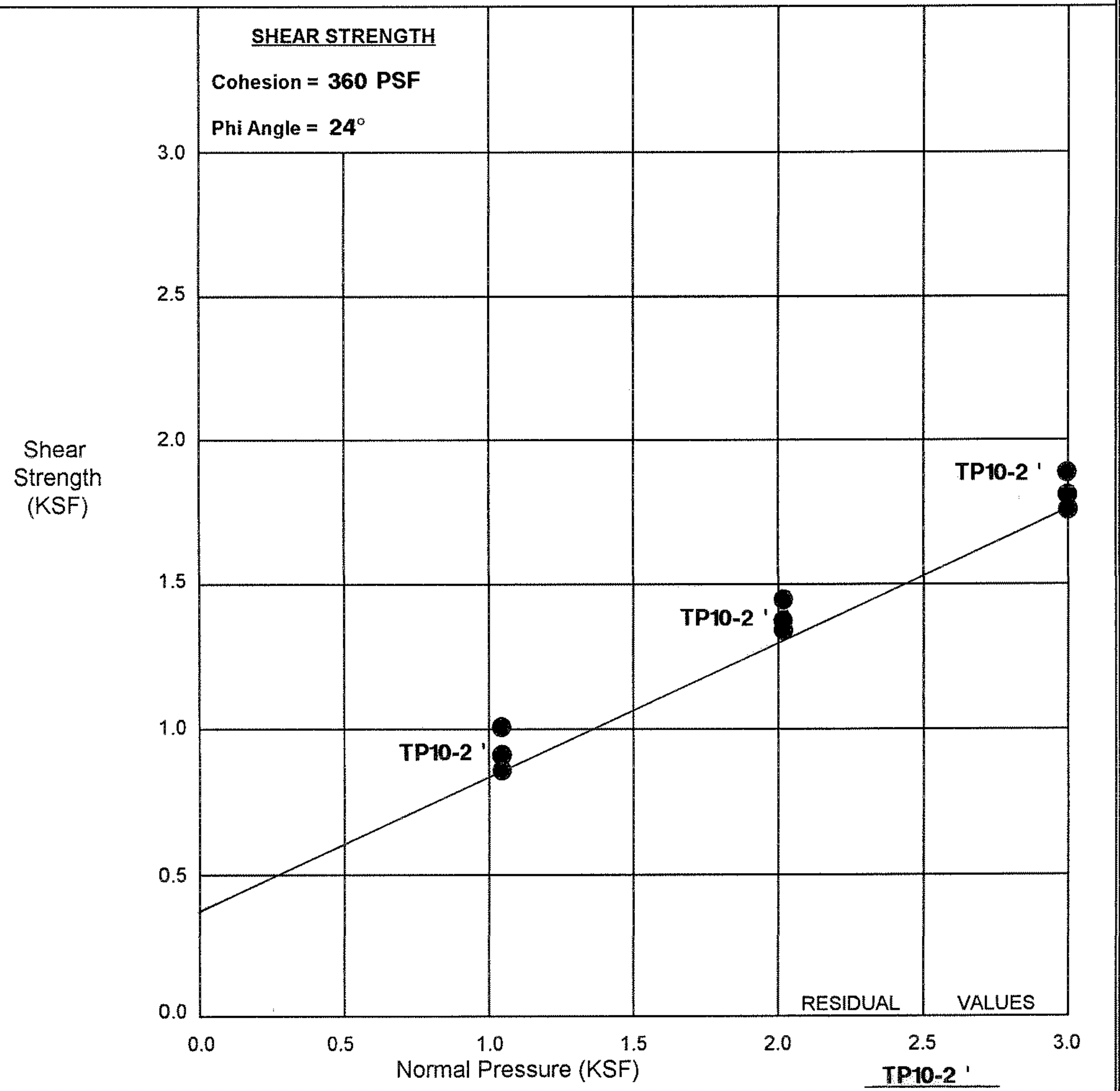
SHEAR TEST DIAGRAM

JB: 17973-B Harvard - West Campus

SAMPLE: Soil



○ Direct Shear (Field Moisture)

● Direct Shear (Saturated)

	TP10-2 '
Moisture Content (%) =	77.6
Dry Density (pcf) =	57.9

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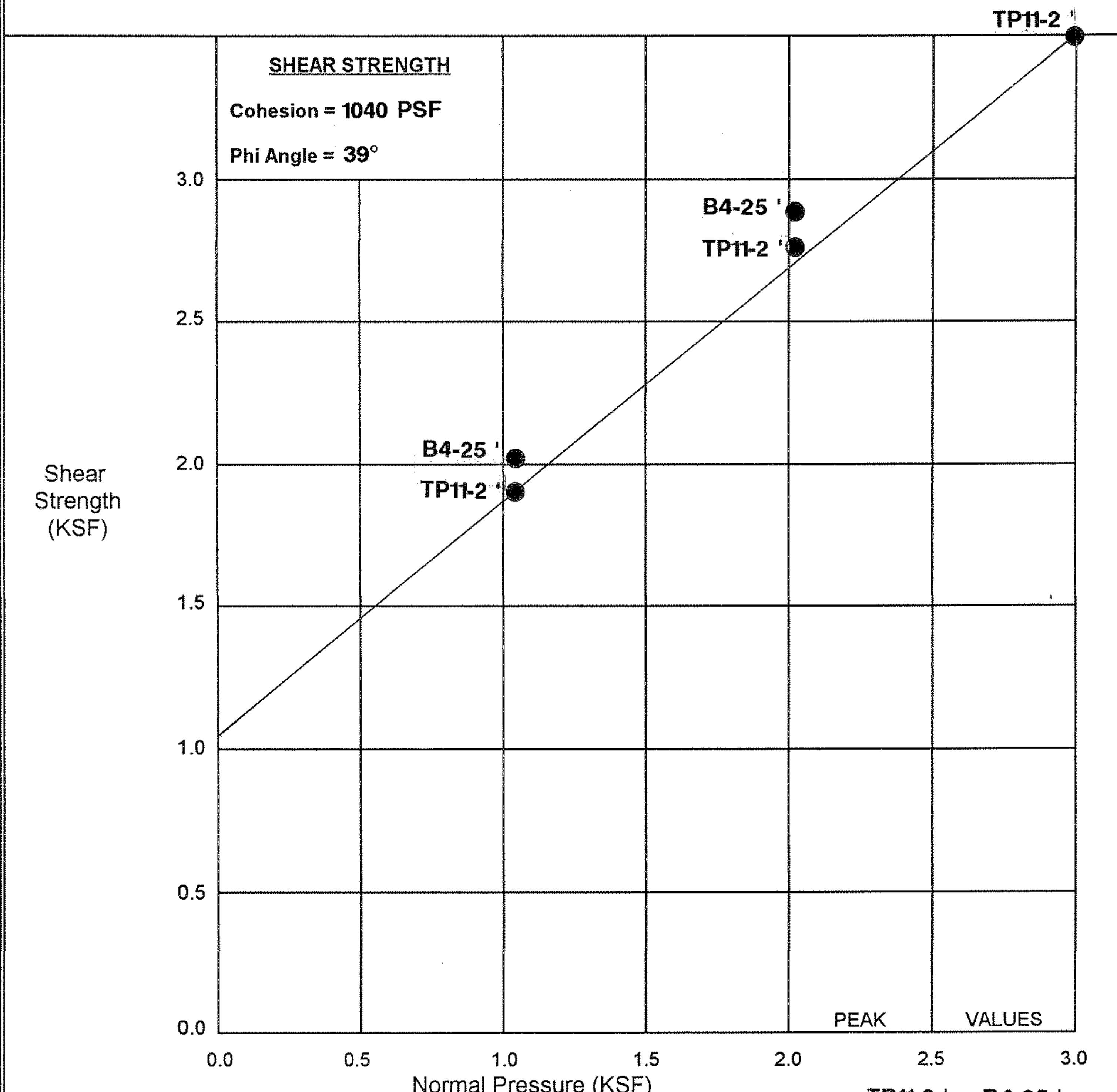
SHEAR TEST DIAGRAM

JB: **17973-B** Harvard - West Campus

SAMPLE: Bedrock



○ Direct Shear (Field Moisture)

● Direct Shear (Saturated)

	TP11-2 '	B4-25 '
Moisture Content (%) =	85.9	44.5
Dry Density (pcf) =	42.1	74.6

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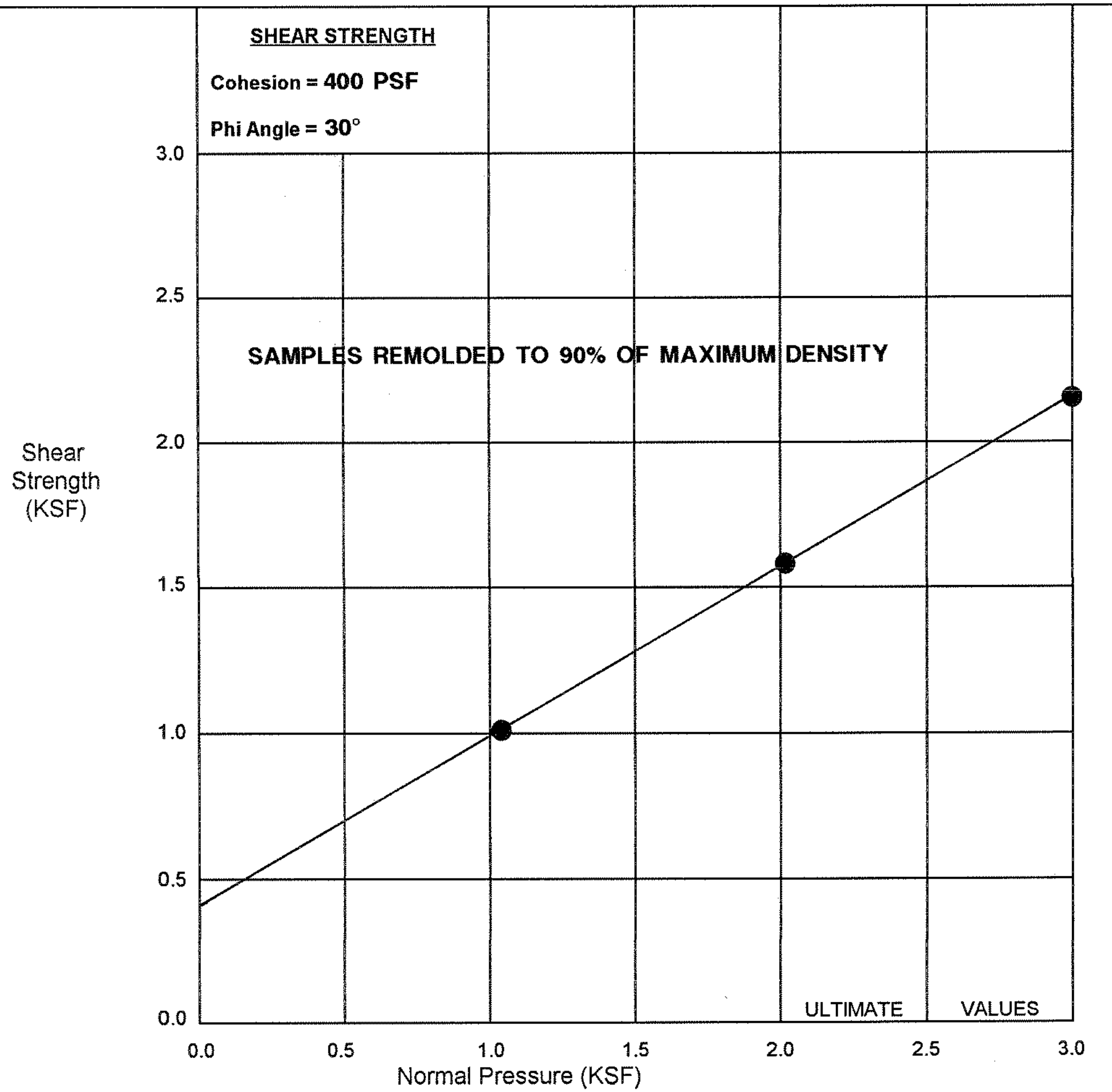
SHEAR TEST DIAGRAM

JB: 17973-B Harvard - West Campus

SAMPLE: Future Fill



○ Direct Shear (Field Moisture)

● Direct Shear (Saturated)

Moisture Content (%) = 42

Dry Density (pcf) = 76.5

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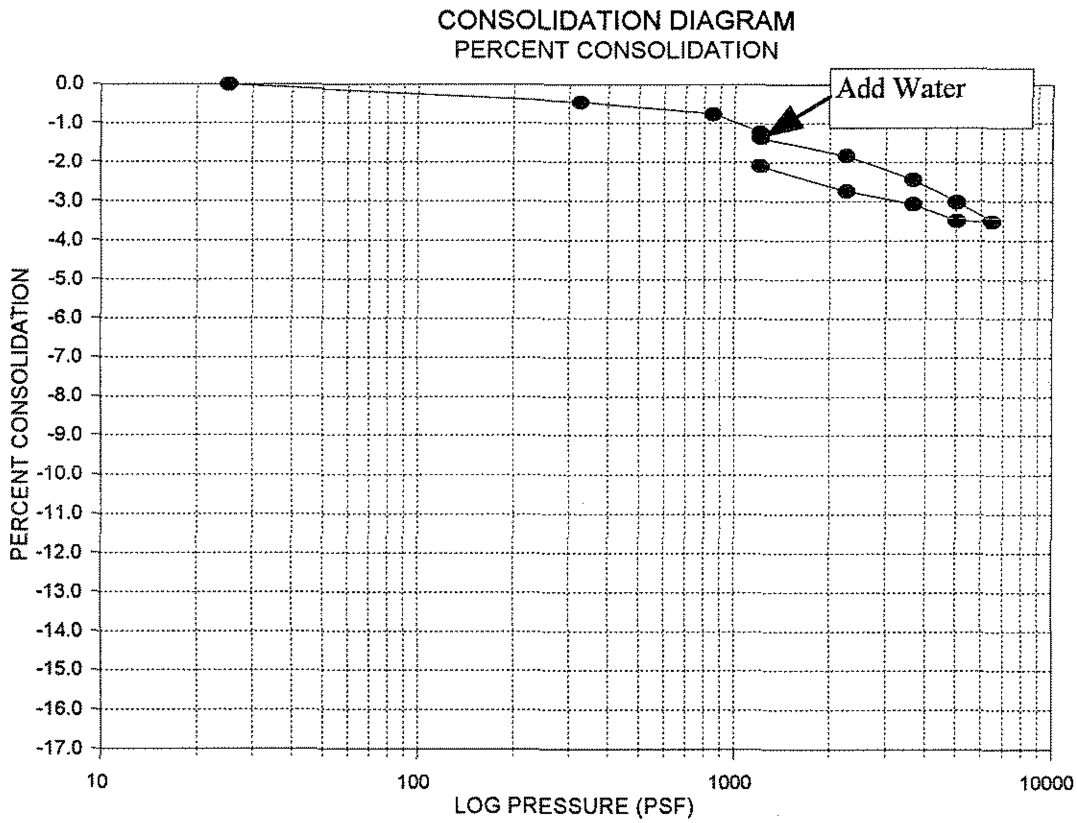
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium LOCATION: B2-20'



Dry Density	76.3 pcf	Specific Gravity	2.60
Initial Moisture	32.5%	Initial Void Ratio	1.13
Initial % Saturation	75.0%	C'c	0.03

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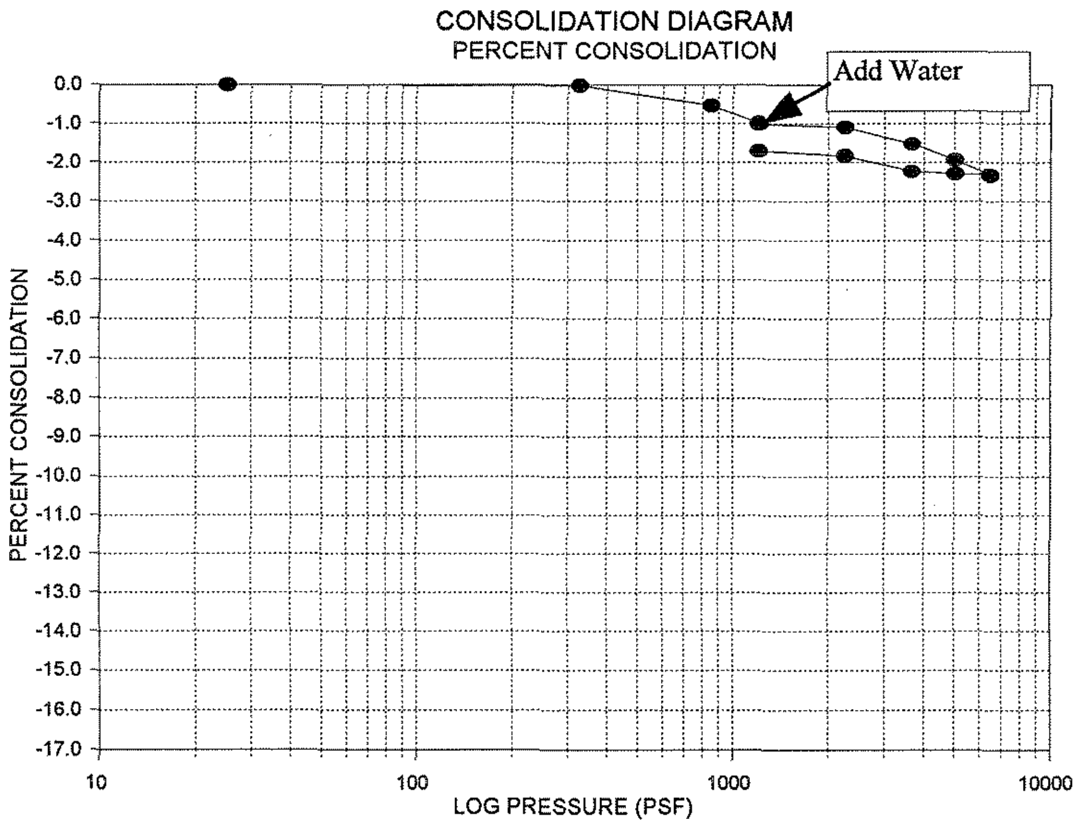
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium

LOCATION: B3-22'



Dry Density	95.1 pcf	Specific Gravity	2.60
Initial Moisture	25.2%	Initial Void Ratio	0.71
Initial % Saturation	92.8%	C'c	0.02

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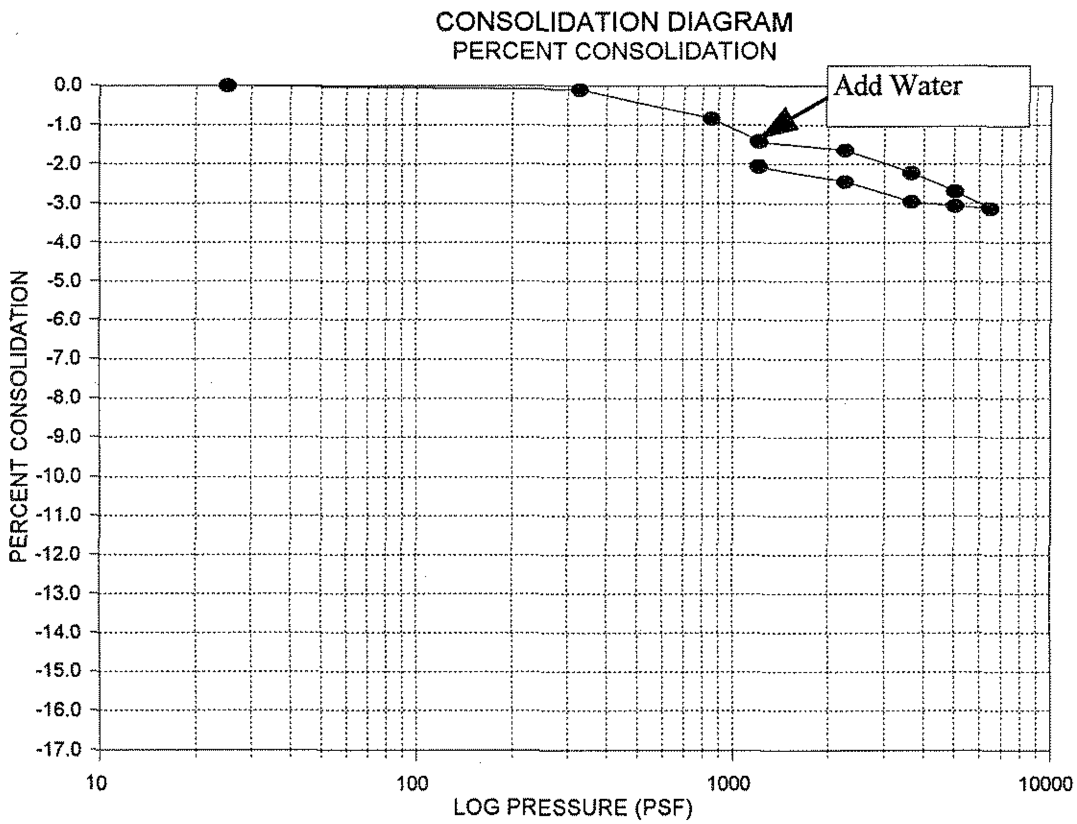
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium

LOCATION: B3-25'



Dry Density	89.1 pcf	Specific Gravity	2.60
Initial Moisture	27.3%	Initial Void Ratio	0.82
Initial % Saturation	86.5%	C'c	0.03

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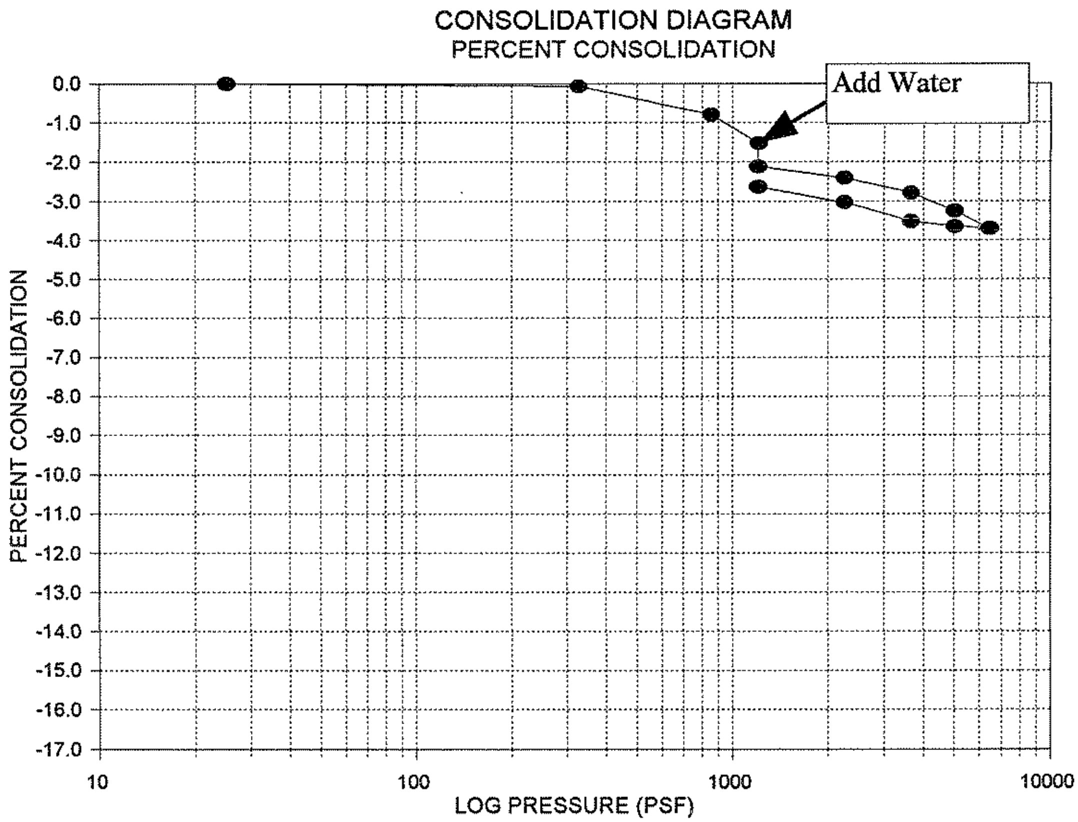
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium LOCATION: B3-27'



Dry Density	86.9 pcf	Specific Gravity	2.60
Initial Moisture	27.4%	Initial Void Ratio	0.87
Initial % Saturation	82.2%	C'c	0.03

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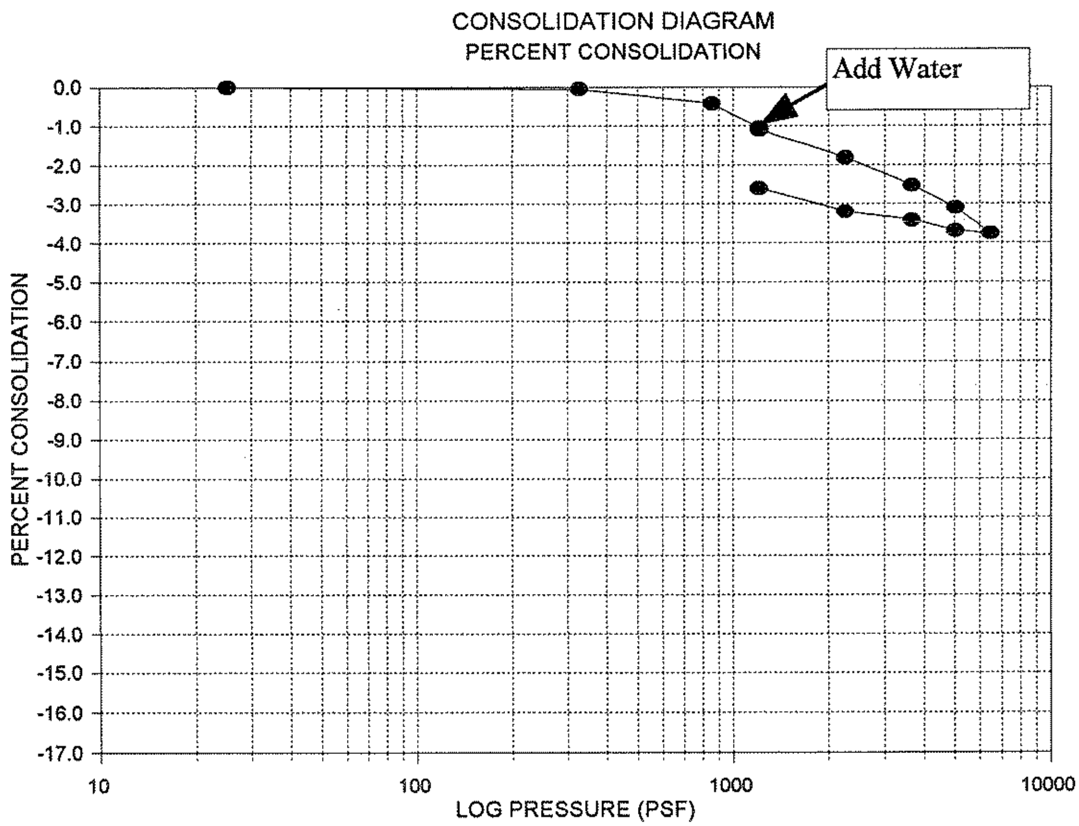
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium

LOCATION: B3-30'



Dry Density	82.0 pcf	Specific Gravity	2.60
Initial Moisture	28.8%	Initial Void Ratio	0.98
Initial % Saturation	76.5%	C'c	0.04

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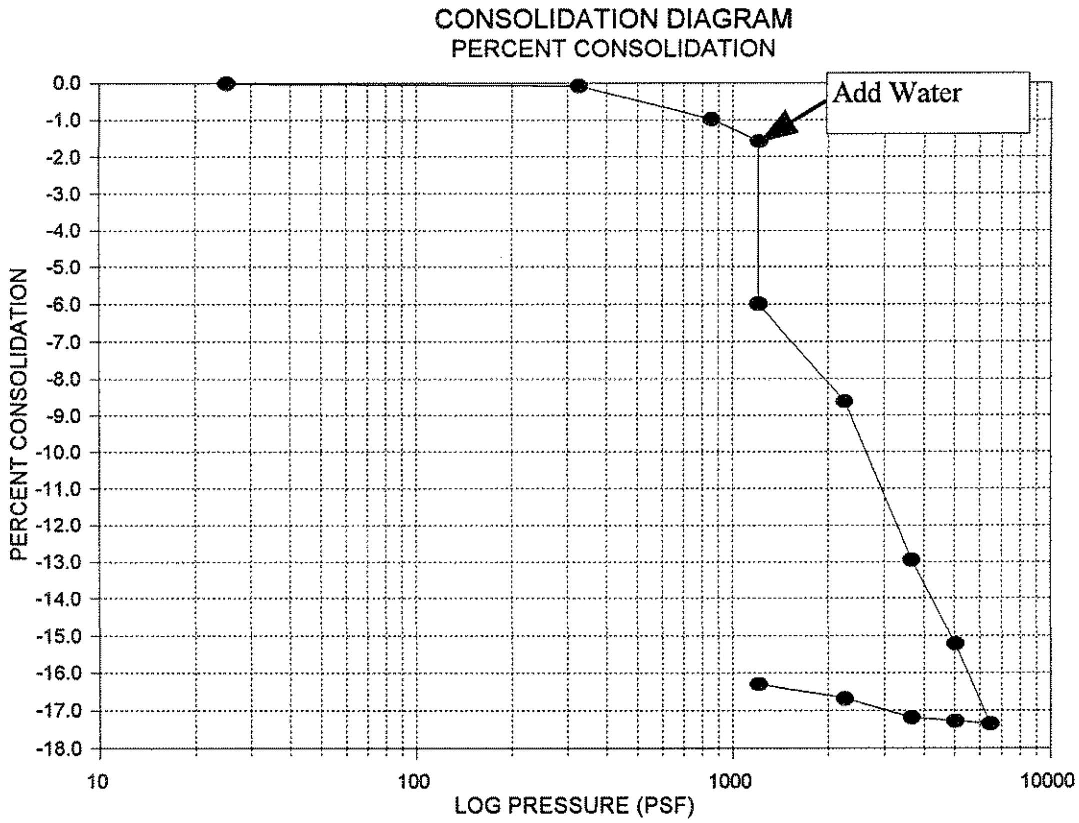
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium

LOCATION: B5-5'



Dry Density	58.0 pcf	Specific Gravity	2.60
Initial Moisture	26.6%	Initial Void Ratio	1.80
Initial % Saturation	38.5%	C'c	0.17

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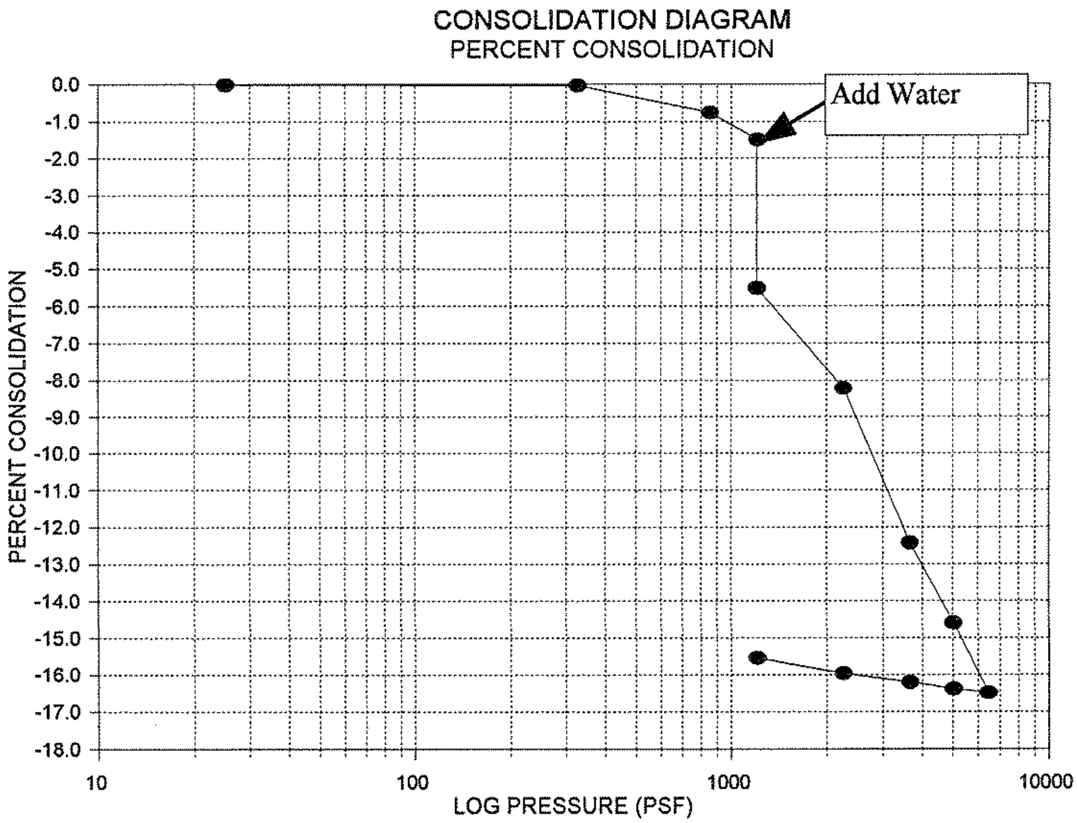
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium

LOCATION: B5-10



Dry Density	57.9 pcf	Specific Gravity	2.60
Initial Moisture	28.2%	Initial Void Ratio	1.80
Initial % Saturation	40.7%	C'c	0.16

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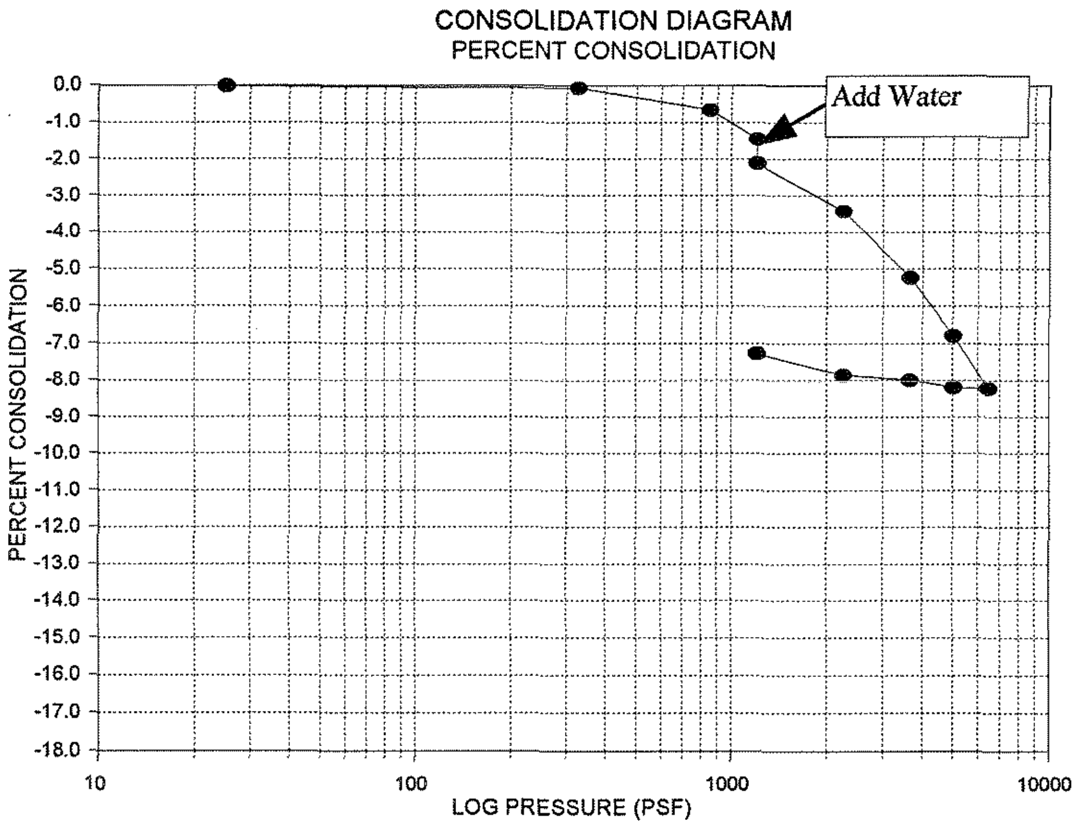
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium

LOCATION: B5-15'



Dry Density	68.0 pcf	Specific Gravity	2.60
Initial Moisture	21.4%	Initial Void Ratio	1.39
Initial % Saturation	40.1%	C'c	0.09

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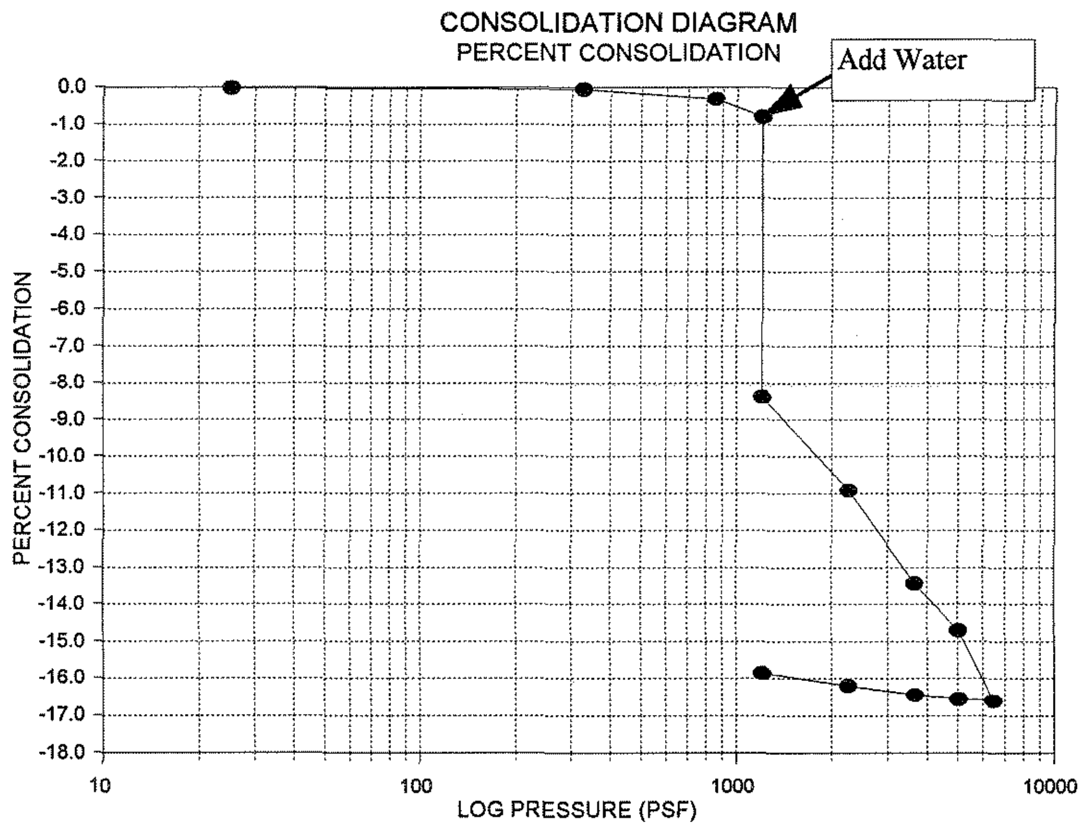
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium

LOCATION: B6-25'



Dry Density	59.9 pcf	Specific Gravity	2.60
Initial Moisture	27.0%	Initial Void Ratio	1.71
Initial % Saturation	41.1%	C'c	0.12

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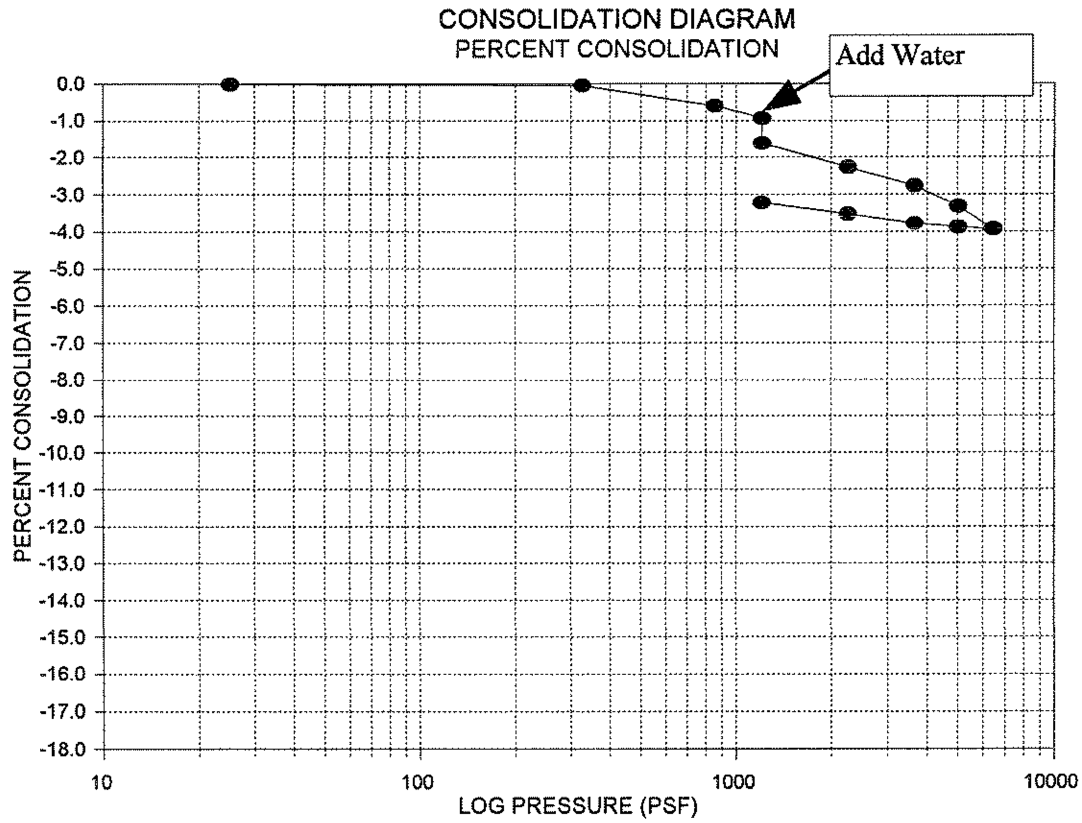
CONSOLIDATION DIAGRAM

JB: 17866-B Harvard - West Campus

CONSULTANT: JET

EARTH MATERIAL: Alluvium LOCATION: B6-30'



Dry Density	77.0 pcf	Specific Gravity	2.60
Initial Moisture	43.4%	Initial Void Ratio	1.11
Initial % Saturation	101.9%	C'c	0.04

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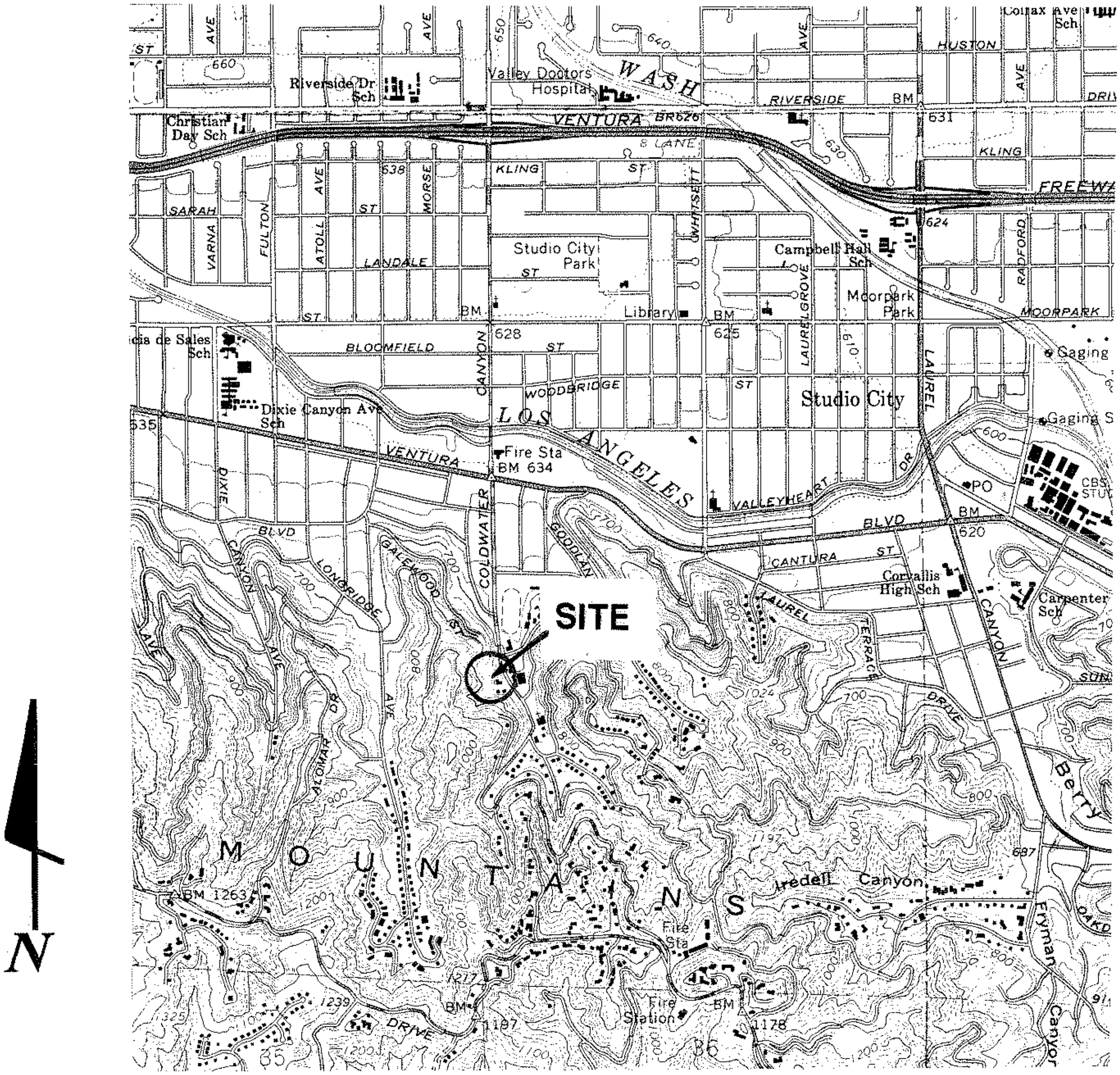
VICINITY MAP

JB 17973-B CLIENT: Harvard-West Campus

CONSULTANT: JET SCALE: 1" = 2000'

REFERENCE: *U.S.G.S. 7½ Minute Quadrangle, Van Nuys Sheet, Photorevised 1972.*



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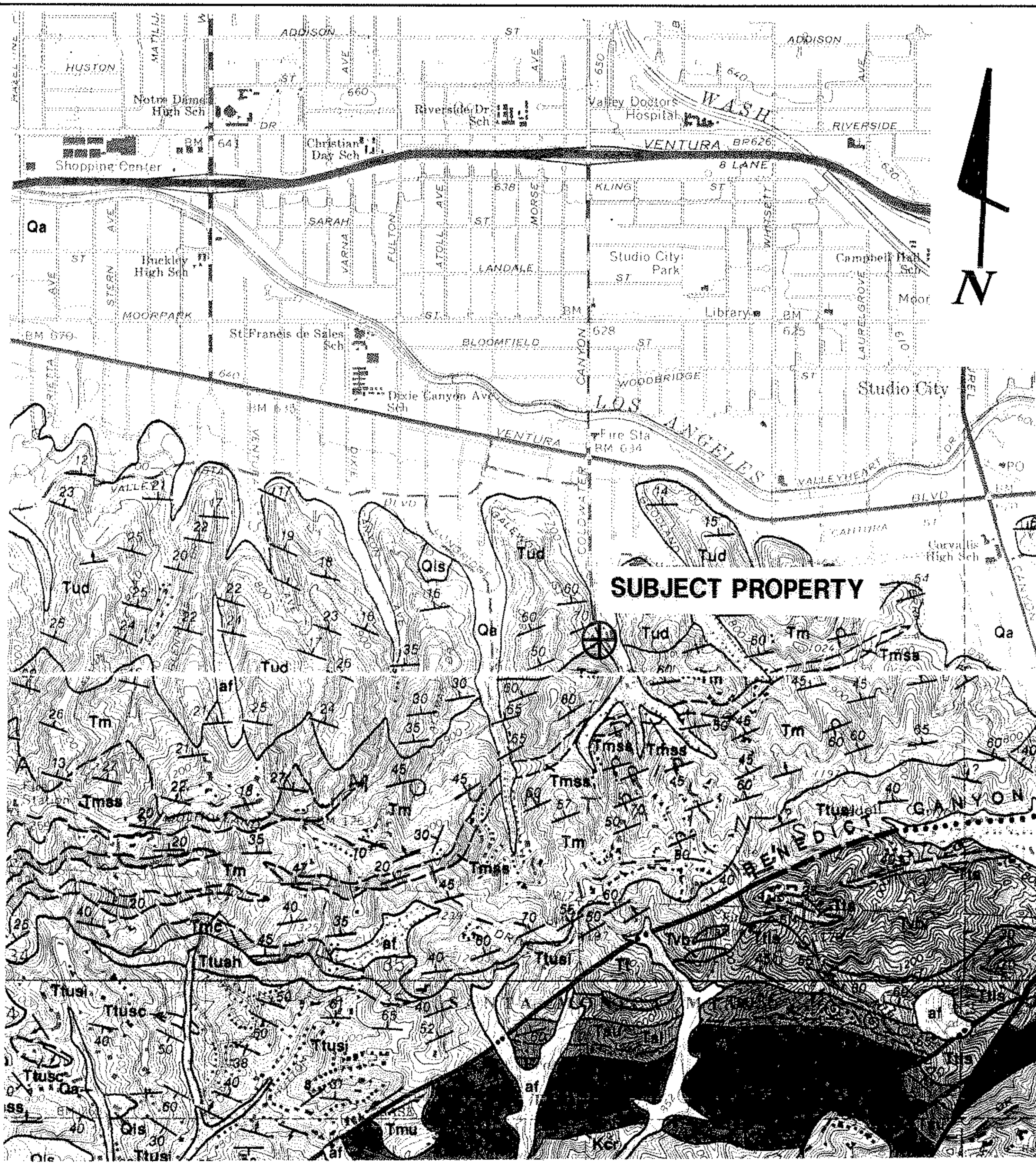
REGIONAL GEOLOGIC MAP

JB 17973-B CLIENT: Harvard-West Campus

CONSULTANT: JET SCALE: 1" = 2000'

REFERENCE: *Geologic Map of the Beverly Hills and Van Nuys (South ½) Quadrangles, Dibblee, 1991.*



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LOG OF TEST PITS

JB: 17973-B CLIENT: HARVARD-WEST CAMPUS

GEOLOGIST: JET DATE LOGGED: 12/22/98

EXCAVATION METHOD: Back Hoe

REPORT DATE: 2/24/99

TEST PIT #1 Surface Conditions: Toe of Slope Elevation: 760

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 2	**SOIL:**	Sandy Silt, medium to dark brown, slightly moist, soft, porous, rock fragments up to 4 inches
			2 - 3		Gravelly Silt, gray brown, slightly moist, firm, porous
			3 - 5½	**BEDROCK:**	Diatomaceous, Siltstone, white, light gray, light tan, moderately hard, bedding near vertical, thinly bedded, diatomaceous Bedding at 4½ feet: N62E; 71N.

End at 5½ Feet; No Water; No Caving; No Fill.

TEST PIT #2 Surface Conditions: Toe of Slope Elevation: 780

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 6	**ALLUVIUM:**	Sandy Silt, Silty Sand, brown to dark brown, slightly moist, slightly firm, porous, siltstone fragments up to 1 foot, roots up to 2 inches
			6 - 8	**BEDROCK:**	Diatomaceous, Siltstone, orange, white, gray, tan, moderately hard, fractured, very weathered
			8 - 10		white, gray, tan, moderately hard, thinly bedded Bedding at 9 Feet; N73E; 74N

End at 10 Feet; No Water; No Caving; No Fill.

TEST PIT #3 Surface Conditions: Toe of Slope Elevation: 760

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - ½	**SOIL:**	Sandy Silt, brown, gray, slightly moist, medium firm, porous, rootlets
			½ - 3	**BEDROCK:**	Diatomaceous, Siltstone, gray to brown, gray to light tan, moderately hard, slightly fractured, rootlets along fractured, thinly bedded
			3 - 6		hard, no fractures N69E; 64N N72E; 69N at 5 Feet

End at 6 Feet; No Water; No Caving; No Fill.

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

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LOG OF TEST PITS

JB: 17973-B CLIENT: HARVARD-WEST CAMPUS

GEOLOGIST: JET DATE LOGGED: 12/22/98

EXCAVATION METHOD: Back Hoe

REPORT DATE: 2/24/99

TEST PIT #4 Surface Conditions: Toe of Slope Elevation: 760

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1½	COMPACTED FILL:	Sandy Silt, dark gray brown, slightly moist, firm, rock fragments up to 8 inches
			1½ - 11	ALLUVIUM:	Sandy Silt, gray brown, slightly moist to moist, firm, porous, rock fragments to 6 inches
			11 - 12½	BEDROCK:	Diatomaceous, Siltstone, white, buff to light brownish gray, moderately hard, fractured, weathered
			12½ - 14		Hard, slightly fractured, thinly bedded. Bedding at 3 Feet: N80E; 65N

End at 14 Feet; No Water; No Caving; Fill to 1½ Feet.

TEST PIT #5 Surface Conditions: Slope Elevation: 765

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 2	SOIL:	Sandy Silt, brownish gray, slightly moist, firm, porous, some gravel roots to ½
			2 - 4		rock fragments to 12 inches
			4 - 5½	BEDROCK:	Diatomaceous Siltstone, gray to brownish gray, moderately hard, fractured, roots up to ⅛ inch along fractures
			5½ - 7		hard, not fractured, thinly bedded Bedding at 6 Feet: N74E; 61N

End at 7 Feet; No Water; No Caving; No Fill.

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

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LOG OF TEST PITS

JB: 17973-B CLIENT: HARVARD-WEST CAMPUS

GEOLOGIST: JET DATE LOGGED: 12/29/98

EXCAVATION METHOD: Hand Dug

REPORT DATE: 2/24/99

TEST PIT #6 Surface Conditions: Slope Elevation: 750

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1½	**SOIL:**	Sandy Silt, gray brown, dry, slightly firm, very porous, roots to 1 inch, burrows
			1½ - 4½		slightly moist, firm, porous, some gravel
			4½ - 6½	**BEDROCK:**	*Diatomaceous Siltstone*, buff to light gray brown, moderately hard to hard, well bedded Bedding at 5 Feet: N64E; 71N

End at 6½ Feet; No Water; No Caving; No Fill.

TEST PIT #7 Surface Conditions: Slope Elevation: 725

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - ½	**SOIL:**	
			½ - 2½	**BEDROCK:**	Diatomaceous Siltstone, buff to light gray brown, hard Bedding at 1½ Feet: N72E; 64N

End at 2½ Feet; No Water; No Caving; No Fill.

TEST PIT #8 Surface Conditions: Slope Elevation: 735

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1½	**FILL:**	Sandy Silt, light brownish gray, dry, soft, rootlets, some gravel, burrows
8	18.4	58.1	1½ - 6	**SOIL:**	Sandy Silt, brownish gray to dark brownish gray, slightly moist, slightly firm to firm, slightly porous, roots to 1 inch
			6 - 7½	**BEDROCK:**	*Diatomaceous Siltstone*, light gray to light greenish gray, moderately hard to hard, thinly bedded, Bedding at 7 Feet: N66E; 68N

End at 7½ Feet; No Water; No Caving; Fill to 1½ Feet.

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

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LOG OF TEST PITS

JB: 17973-B CLIENT: HARVARD-WEST CAMPUS

GEOLOGIST: JET DATE LOGGED: 12/29/98

EXCAVATION METHOD: Hand Dug

REPORT DATE: 2/24/99

TEST PIT #9 Surface Conditions: Toe of Slope Elevation: 720

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1½	**SOIL:**	Sandy Silt, brownish gray, dry, soft to slightly firm, porous, burrows
2½	21.9	63.2	1½ - 5		dark brownish gray to black, slightly moist to moist, slightly firm to firm, slightly porous to porous, rock fragments up to 6 inches, some clay, roots to 1 inch
			5 - 6	**BEDROCK:**	Siltstone, buff, soft, very weathered, fractured
			6 - 7		brown to greenish gray, moderartely hard to hard, slightly weathered, fractured, gypsum along fractures Bedding at 6½ Feet: N67E; 88S

End at 7 Feet; No Water; No Caving; No Fill.

TEST PIT #10 Surface Conditions: Level Elevation: 760

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1	**FILL:**	Sandy Silt, dark brownish gray, dry, soft, rootlets, some gravel
2	21.7	57.9	1 - 4	**SOIL:**	Sandy Silt, brownish gray, dry, firm to very firm, porous, burrows
			4 - 5½	**BEDROCK:**	Diatomaceous Siltstone, gray brown to brown to tan, soft, very weathered, fractured gypsum along fractures
6½	76.4	38.8	5½ - 6½		buff to light brown, moderately hard, bedded, slightly weathered, slightly fractured Bedding at 5½ Feet: N74E; 64S

End at 6½ Feet; No Water; No Caving; Fill to 1 Foot.

TEST PIT #11 Surface Conditions: Slope Elevation: 825

SAMPLE DEPTH (feet)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	DEPTH INTERVAL (feet)	EARTH MATERIAL	LITHOLOGIC DESCRIPTION
			0 - 1	**SOIL:**	Sandy Silt, light brownish gray, dry to slightly moist, slightly firm, slightly porous, rootlets
2	58.9	42.1	1 - 3	**BEDROCK:**	Diatomaceous Siltstone, white to buff to light brownish gray, moderately hard to hard Bedding at 2 Feet: N62E; 64NW Bedding at 2½ Feet: N65E; 62NW

End at 3 Feet; No Water; No Caving; No Fill.

NOTE: The stratification depths shown on the Log of Test Pits are approximate and are based upon visual classification of samples and cuttings. The actual depths may vary. Variations between test pits may also occur.

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 1

By: JET

The J. Byer Group, Inc.
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Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description (Subsurface Profile)	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
760	0	Ground Surface							
		COMPACTED FILL Sandy Silt, light brownish gray, dry to slightly moist, firm							
759	1								
758	2								
757	3	**BEDROCK** Diatomaceous Siltstone, brownish gray to gray, moderately hard, slightly fractured, thinly bedded, rootlets along freactures							
756	4	hard, no fractures Bedding at 4½ feet: N70E; 67NW							
755	5								
754	6								
753	7								
752	8								
751	9	Jointing at 9 Feet: N13W; 55NE							
750	10	Bedding at 10 Feet: N66E; 69NW	----	R	4	74.1	51.8		
749	11								
748	12								
747	13	4 Inch diameter concretion, dark brown, very hard							
746	14								
745	15	Bedding at 15 Feet: N67E; 71NW							
744	16	light brown to gray brown							
743	17								
742	18								
741	19								
740	20								

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 760

Sheet: 1 of 2

Project No: JB 17973-B

Log of Boring 1

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
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Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE											
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
				----	R	7	81.6	54.6		
739	21									
738	22	Jointing at 22 Feet: N16W; 62NE								
737	23	Bedding at 23 Feet: N73E; 69NW								
736	24									
735	25	dark gray brown to dark gray								
734	26	Bedding at 26 Feet: N70E; 67NW								
733	27			----	R	7	29.9	87.2		
732	28									
731	29	End at 30 Feet; No Water; No Caving; Fill to 2½ Feet.								
730	30									
729	31									
728	32									
727	33									
726	34									
725	35									
724	36									
723	37									
722	38									
721	39									
720	40									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 760

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: *West Campus*

Log of Boring 2

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
765	0	Ground Surface **ALLUVIUM** Silt, dark gray brown, slightly moist, slightly soft, very porous, roots to 1½ inches and rock fragments to 4 inches								
764	1									
763	2									
762	3									
761	4	firm, some gravel, roots to ¼ inch, slightly porous to porous								
760	5			----	R	3	26.8	85.5		
759	6									
758	7									
757	8									
756	9									
755	10									
754	11									
753	12	Gravelly Silt, gray to dark gray brown, firm, rock fragments to 6 inches								
752	13									
751	14	Silt, dark grayish brown, slightly firm, porous								
750	15			----	R	6	25.5	83.4		
749	16	firm, light grayish brown to dark grayish brown porous								
748	17									
747	18									
746	19	light gray brown, firm to very firm, rock fragments to 6 inches								
745	20									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 765

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 2

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description (Subsurface Profile)	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
				----	R	4	32.5	76.3		
744	21	BEDROCK Diatomaceous Siltstone, light brown, soft, ver weathered, soil filled fractured up to 1 inch, some gypsum along fractures								
743	22									
742	23									
741	24	light brown and gray, moderately hard to hard, slightly fractured, some gypsum veins along bedding and fractures Jointing at 24½ Feet: N10W; 32NE								
740	25									
739	26	Bedding at 26 Feet: N73E; 76NW								
738	27									
737	28	Bedding at 27½ Feet: N75E; 78NW								
736	29									
735	30	End at 30 Feet; No Water; No Caving; No Fill.		----	R	12	50.0	67.9		
734	31									
733	32									
732	33									
731	34									
730	35									
729	36									
728	37									
727	38									
726	39									
725	40									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 765

Project No: JB 17973-B

Log of Boring 3

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
755	0	Ground Surface								
		COMPACTED FILL Sandy Silt, light brownish gray to dark grayish brown, slightly moist, firm, rock fragments to 4 inches, rootlets								
754	1									
753	2									
752	3									
751	4									
750	5			----	R	4	40.5	64.8		
749	6									
748	7	very firm, moist, some gravel								
747	8									
746	9									
745	10			----	R	3	26.4	86.7		
744	11									
743	12									
742	13									
741	14									
740	15			----	R	4	29.9	86.9		
739	16									
738	17									
737	18									
736	19	dark brownish gray								
735	20									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 755

Project No: JB 17973-B

Log of Boring 3

Client: HARVARD-WESTLAKE

Location: West Campus **By:** JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description (Subsurface Profile)	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		ALLUVIUM: Sandy Silt, dark gray brown, moist, firm, some gravel, porous		----	R	3	27.2	92.9		
734	21									
733	22			----	R	4	25.2	95.1		
732	23									
731	24									
730	25			----	R	3	27.3	89.1		
729	26									
728	27			----	R	7	27.4	86.9		
727	28									
726	29	Gravelly Silt, light brownish gray to tan, moist, firm, rock fragments to 6 inches, slightly porous								
725	30	dark grayish brown, very firm, some clay		----	R	8	28.8	82.0		
724	31									
723	32									
722	33	gray brown to tan								
721	34									
720	35	dark gray brown, porous		----	R	5	46.1	77.1		
719	36									
718	37	**BEDROCK** Diatomaceous Siltstone, tan to light gray brown, moderately hard to hard, thinly bedded								
717	38	Bedding at 38½ Feet: N70E; 67NW								
716	39	Jointing at 39 Feet: N23W; 65NE								
715	40									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 755

Project No: JB 17973-B

Log of Boring 3

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
				----	R	11	94.1	45.1		
714	41	End at 41 Feet; No Water; No Caving; Fill to 20 Feet								
713	42									
712	43									
711	44									
710	45									
709	46									
708	47									
707	48									
706	49									
705	50									
704	51									
703	52									
702	53									
701	54									
700	55									
699	56									
698	57									
697	58									
696	59									
695	60									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 755

Sheet: 3 of 3

Project No: JB 17973-B

Log of Boring 4

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
756	0	Ground Surface								
		COMPACTED FILL Sandy Silt, dark brown, moist, firm, some gravel, some clay								
755	1									
754	2									
753	3									
752	4									
751	5	Gravelly Silt, light grayish brown to tan, moist, firm, rock fragments to 6 inches								
750	6									
749	7	Sandy Silt, dark gray brown, moist, firm								
748	8									
747	9	**ALLUVIUM** Sandy Silt, light gray brown, moist to very moist, very firm, some clay, slightly porous								
746	10			----	R	3	28.7	89.6		
745	11									
744	12									
743	13									
742	14									
741	15	Gravelly Silt, tan to dark grayish brown, moist, slightly firm to firm, rock fragments to 8 inches								
740	16									
739	17	**BEDROCK** Siltstone, gray to light gray brown, loose, very weathered, very fractured, soil along fractures								
738	18	light gray brown, moderately hard, thinly bedded, slightly fractured								
737	19	Bedding at 19 Feet: N65E; 58NW								
736	20									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 756

Project No: JB 17973-B

Log of Boring 4

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE											
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		hard								
735	21	Bedding at 21 Feet: N70E; 68NW								
734	22									
733	23	Bedding at 22½ Feet: N66E; 66NW								
732	24									
731	25	End at 25 Feet; No Water; No Caving; Fill to 8½ Feet.		----	R	6	42.9	74.6		
730	26									
729	27									
728	28									
727	29									
726	30									
725	31									
724	32									
723	33									
722	34									
721	35									
720	36									
719	37									
718	38									
717	39									
716	40									

Surface: Level Pad

Drill Method: Bucket Auger

Drill Date: 12/23/98

Size: 24 Inch

Elevation: 756

Sheet: 2 of 2

Project No: JB 17973-B

Log of Boring 5

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE										
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
740	0	Ground Surface								
739	1	**FILL** Sandy Silt, dark gray brown, slightly moist, medium firm, brick and concrete fragments								
738	2	**ALLUVIUM** Sandy Silt, dark gray brown, moist, firm to slightly firm, porous to very porous to porous, some gravel								
737	3									
736	4									
735	5			----	R	2	26.6	58.0		
734	6									
733	7									
732	8	firm, slightly porous to porous								
731	9									
730	10	slightly firm, with rock fragments to 6 inches		----	R	1	28.2	57.9		
729	11									
728	12									
727	13									
726	14									
725	15			----	R	3	21.4	68.0		
724	16									
723	17									
722	18	firm to very firm								
721	19									
720	20									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 740

Sheet: 1 of 2

Project No: JB 17973-B

Log of Boring 5

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		Gravelly Silt, whitish gray to grayish brown, slight moist to moist, firm, with rock fragments to 6 inches		----	R	4	28.6	61.8		
719	21									
718	22									
717	23	**BEDROCK** Diatomaceous Siltstone, tan to light grayish brown, moderately hard, moderately weathered								
716	24									
715	25	moderately hard to hard, slightly fractured, wel bedded Bedding at 25½ Feet: N65E; 70NW		----	R	7	34.6	78.8		
714	26									
713	27	hard, grayish brown to greenish brown Jointing at 27 Feet; N24W vertical								
712	28	Bedding at 28 Feet: N66E; 66NW								
711	29	End at 30 Feet; No Water; No Caving; Fill to 2 Feet.								
710	30									
709	31									
708	32									
707	33									
706	34									
705	35									
704	36									
703	37									
702	38									
701	39									
700	40									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 740

Sheet: 2 of 2

Project No: JB 17973-B

Client: HARVARD-WESTLAKE

Location: West Campus

Log of Boring 6

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
731		Ground Surface								
	0	**FILL** Silty Sand, brown, moist, slightly dense								
730	1	Sandy Silt, dark gray brown, moist, firm, roots to ¼ inch, some gravey								
729	2									
728	3	**ALLUVIUM** Sandy Silt, dark gray, brown, moist, firm, slightly porous, roots to 1 inch								
727	4									
726	5			----	R	2	23.1	65.6		
725	6	light gray brown to dark gray brown, slightly moist, slightly firm, roots to ¼ inch, porous								
724	7									
723	8									
722	9									
721	10			----	R	2	21.5	59.6		
720	11									
719	12									
718	13									
717	14									
716	15	rock fragments to 6 inches		----	R	2	23.3	65.2		
715	16									
714	17									
713	18									
712	19									
711	20									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 731

Sheet: 1 of 3

Project No: JB 17973-B

Log of Boring 6

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		Gravelly Silt, light gray brown to gray brown to tan, slightly moist, firm, porous to very porous		----	R	2	26.5	100.1		
710	21									
709	22									
708	23	very firm, rock fragments to 6 inches								
707	24									
706	25			----	R	5	27.0	59.9		
705	26									
704	27									
703	28									
702	29									
701	30			----	R	5	37.0	77.3		
700	31									
699	32	light brown, tan to light gray brown, moist, ver firm, rock fragments to 8 inches								
698	33									
697	34	dark gray brown								
696	35	**BEDROCK** Diatomaceous Siltstone, grayish brown to greenish gray, moderately hard, fractured and weathered		----	R	8	43.4	77.0		
695	36									
694	37	Bedding at 37 Feet: N74E; 85NW hard, slightly fractured Jointing at 37½ Feet: N20W; 53NE								
693	38	Bedding at 38 Feet: N76E; 88NW								
692	39									
691	40									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 731

Sheet: 2 of 3

Project No: JB 17973-B

Log of Boring 6

Client: HARVARD-WESTLAKE

Location: West Campus

By: JET

The J. Byer Group, Inc.
512 East Wilson Ave., Suite 201
Glendale, CA 91206
(818) 549-9959

SUBSURFACE PROFILE										
Elevation	Depth	Description	Symbol	USCS	Type	Blow Count Per Foot	Moisture Content (%)	Dry Density (pcf)	% Saturation	Remarks
		Bedding at 40 Feet: N74E; 87NW								
690	41									
689	42									
		End at 43 Feet; No Water; No Caving; Fill to 3 Feet								
688	43									
687	44									
686	45									
685	46									
684	47									
683	48									
682	49									
681	50									
680	51									
679	52									
678	53									
677	54									
676	55									
675	56									
674	57									
673	58									
672	59									
671	60									

Surface: Level

Drill Method: Bucket Auger

Drill Date: 12/28/98

Size: 24 Inch

Elevation: 731

Sheet: 3 of 3

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**********************************************
* ****************************************** *
* *                                        * *
* *    --------------------------------    * *
* *     TSTAB  slope stability analysis    * *
* *        Revision 2.52 - 01/06/86        * *
* *    --------------------------------    * *
* *                                        * *
* *    TAGA Engineering Software Services  * *
* *         Berkeley, California USA       * *
* *                                        * *
* *   IBM PC & 8086/8088 MS-DOS Version by * *
* *                                        * *
* * Design Professionals Management Systems * *
* *         Kirkland, Washington USA       * *
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* *                                        * *
* ****************************************** *
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SLOPE STABILITY ANALYSIS, HARVARD WESTLAKE- SECTION B - JB 17973-B

ANALYSIS BY BISHOP'S SIMPLIFIED METHOD

INPUT DATA

```
CONTROL DATA,
     AUTOMATIC SEARCH FOR CRITICAL CIRCLE
     NUMBER OF DEPTH LIMITING TANGENTS                 0
     NUMBER OF VERTICAL SECTIONS                      11
     NUMBER OF SOIL LAYER BOUNDARIES                   2
     NUMBER OF POINTS DEFINING COHESION PROFILE        0
     NUMBER OF CURVES DEFINING COHESION ANISOTROPY     0
     NUMBER OF BOUNDARY LINE LOADS                     0
     NUMBER OF BOUNDARY PRESSURE LOADS                 0

     SEISMIC COEFFICIENT                    =        .000
     ATMOSPHERIC PRESSURE                   =    2116.000
     UNIT WEIGHT OF WATER                   =      62.400
     UNIT WEIGHT OF WATER IN TENSION CRACK  =      62.400

SEARCH STARTS AT CENTER ( 240.0, -10.0),WITH FINAL GRID OF 10.0

ALL CIRCLES PASS THROUGH THE POINT ( 220.0, 162.0)
```

GEOMETRY

SECTIONS	-80.00	35.00	160.00	165.00	175.00	185.00	195.00
	205.00	219.00	220.00	500.00			
T. CRACKS	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
W IN CRACK	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
BOUNDARY 1	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
BOUNDARY 2	400.00	400.00	400.00	400.00	400.00	400.00	400.00
	400.00	400.00	400.00	400.00			

SOIL PROPERTIES

LAYER	DENSITY	COHESION	FRICTION ANGLE	DELTA PHI
1	122.00	1040.00	39.00	.00

RESULTS

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	F.S.
1	163.2	173.2	240.0	-10.0	2.082
2	162.0	172.0	220.0	-10.0	2.085
3	163.0	193.0	240.0	-30.0	2.098
4	166.6	176.6	260.0	-10.0	2.321
5	163.3	153.3	240.0	10.0	2.076
6	162.3	152.3	230.0	10.0	2.037
7	163.2	163.2	240.0	.0	2.077
8	164.9	154.9	250.0	10.0	2.193
9	163.4	143.4	240.0	20.0	2.079
10	162.0	152.0	220.0	10.0	2.058
11	162.3	162.3	230.0	.0	2.049
12	162.4	142.4	230.0	20.0	2.027
13	162.0	142.0	220.0	20.0	2.044
14	163.4	143.4	240.0	20.0	2.079
15	162.4	132.4	230.0	30.0	2.021
16	162.0	132.0	220.0	30.0	2.032
17	163.5	133.5	240.0	30.0	2.091
18	162.4	122.4	230.0	40.0	2.019
19	162.0	122.0	220.0	40.0	2.021
20	163.6	123.6	240.0	40.0	2.115
21	162.4	112.4	230.0	50.0	2.026
22	162.0	132.0	220.0	30.0	2.032
23	163.5	133.5	240.0	30.0	2.091
24	163.8	113.8	240.0	50.0	2.159
25	162.0	112.0	220.0	50.0	2.015
26	162.4	112.4	210.0	50.0	2.088
27	162.0	102.0	220.0	60.0	2.014
28	162.5	102.5	230.0	60.0	2.047
29	162.4	112.4	210.0	50.0	2.088
30	162.4	112.4	230.0	50.0	2.026
31	162.5	92.5	230.0	70.0	2.091

F.S. MINIMUM= 2.014 FOR THE CIRCLE OF CENTER (220.0, 60.0)

INPUT DATA

CONTROL DATA,

AUTOMATIC SEARCH FOR CRITICAL CIRCLE	
NUMBER OF DEPTH LIMITING TANGENTS	0
NUMBER OF VERTICAL SECTIONS	11
NUMBER OF SOIL LAYER BOUNDARIES	2
NUMBER OF POINTS DEFINING COHESION PROFILE	0
NUMBER OF CURVES DEFINING COHESION ANISOTROPY	0
NUMBER OF BOUNDARY LINE LOADS	0
NUMBER OF BOUNDARY PRESSURE LOADS	0

SEISMIC COEFFICIENT	=	.000
ATMOSPHERIC PRESSURE	=	2116.000
UNIT WEIGHT OF WATER	=	62.400
UNIT WEIGHT OF WATER IN TENSION CRACK	=	62.400

SEARCH STARTS AT CENTER (240.0, -10.0),WITH FINAL GRID OF 10.0

ALL CIRCLES PASS THROUGH THE POINT (220.0, 165.0)

GEOMETRY

SECTIONS	-80.00	35.00	160.00	165.00	175.00	185.00	195.00
	205.00	219.00	220.00	500.00			
T. CRACKS	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
W IN CRACK	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
BOUNDARY 1	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
BOUNDARY 2	400.00	400.00	400.00	400.00	400.00	400.00	400.00
	400.00	400.00	400.00	400.00			

SOIL PROPERTIES

LAYER	DENSITY	COHESION	FRICTION ANGLE	DELTA PHI
1	122.00	1040.00	39.00	.00

RESULTS

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	F.S.
1	166.1	176.1	240.0	-10.0	2.152
2	165.0	175.0	220.0	-10.0	2.141
3	166.0	196.0	240.0	-30.0	2.162
4	169.5	179.5	260.0	-10.0	2.391
5	166.3	156.3	240.0	10.0	2.151
6	165.3	175.3	210.0	-10.0	2.189
7	165.0	185.0	220.0	-20.0	2.152
8	165.3	175.3	230.0	-10.0	2.125
9	165.0	165.0	220.0	.0	2.130
10	165.3	185.3	230.0	-20.0	2.135
11	166.1	176.1	240.0	-10.0	2.152
12	165.3	165.3	230.0	.0	2.115
13	165.0	165.0	220.0	.0	2.130
14	166.2	166.2	240.0	.0	2.150
15	165.3	155.3	230.0	10.0	2.107
16	165.0	155.0	220.0	10.0	2.119
17	166.3	156.3	240.0	10.0	2.151
18	165.3	145.3	230.0	20.0	2.101
19	165.0	145.0	220.0	20.0	2.109
20	166.4	146.4	240.0	20.0	2.158
21	165.4	135.4	230.0	30.0	2.098
22	165.0	135.0	220.0	30.0	2.100
23	166.5	136.5	240.0	30.0	2.171
24	165.4	125.4	230.0	40.0	2.100
25	165.0	145.0	220.0	20.0	2.109
26	166.4	146.4	240.0	20.0	2.158
27	166.6	126.6	240.0	40.0	2.197
28	165.0	125.0	220.0	40.0	2.094
29	165.4	125.4	210.0	40.0	2.152
30	165.0	115.0	220.0	50.0	2.091
31	165.4	115.4	210.0	50.0	2.149
32	165.4	115.4	230.0	50.0	2.110
33	165.0	105.0	220.0	60.0	2.094
34	165.4	125.4	210.0	40.0	2.152
35	165.4	125.4	230.0	40.0	2.100
36	165.5	105.5	230.0	60.0	2.133

F.S. MINIMUM= 2.091 FOR THE CIRCLE OF CENTER (220.0, 50.0)

INPUT DATA

CONTROL DATA,

AUTOMATIC SEARCH FOR CRITICAL CIRCLE	
NUMBER OF DEPTH LIMITING TANGENTS	0
NUMBER OF VERTICAL SECTIONS	11
NUMBER OF SOIL LAYER BOUNDARIES	2
NUMBER OF POINTS DEFINING COHESION PROFILE	0
NUMBER OF CURVES DEFINING COHESION ANISOTROPY	0
NUMBER OF BOUNDARY LINE LOADS	0
NUMBER OF BOUNDARY PRESSURE LOADS	0

SEISMIC COEFFICIENT	=	.000
ATMOSPHERIC PRESSURE	=	2116.000
UNIT WEIGHT OF WATER	=	62.400
UNIT WEIGHT OF WATER IN TENSION CRACK	=	62.400

SEARCH STARTS AT CENTER (240.0, -10.0),WITH FINAL GRID OF 10.0

ALL CIRCLES PASS THROUGH THE POINT (220.0, 170.0)

GEOMETRY

SECTIONS	-80.00	35.00	160.00	165.00	175.00	185.00	195.00
	205.00	219.00	220.00	500.00			
T. CRACKS	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
W IN CRACK	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
BOUNDARY 1	-20.00	30.00	80.00	100.00	100.00	120.00	120.00
	140.00	140.00	160.00	160.00			
BOUNDARY 2	400.00	400.00	400.00	400.00	400.00	400.00	400.00
	400.00	400.00	400.00	400.00			

SOIL PROPERTIES

LAYER	DENSITY	COHESION	FRICTION ANGLE	DELTA PHI
1	122.00	1040.00	39.00	.00

RESULTS

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	F.S.
1	171.1	181.1	240.0	-10.0	2.261
2	170.0	180.0	220.0	-10.0	2.228
3	171.0	201.0	240.0	-30.0	2.263
4	174.4	184.4	260.0	-10.0	2.505
5	171.2	161.2	240.0	10.0	2.270
6	170.3	180.3	210.0	-10.0	2.264
7	170.0	190.0	220.0	-20.0	2.235
8	170.3	180.3	230.0	-10.0	2.224
9	170.0	170.0	220.0	.0	2.221
10	170.3	170.3	210.0	.0	2.259
11	170.3	170.3	230.0	.0	2.219
12	170.0	160.0	220.0	10.0	2.215
13	170.3	160.3	210.0	10.0	2.254
14	170.3	160.3	230.0	10.0	2.216
15	170.0	150.0	220.0	20.0	2.210
16	170.3	150.3	210.0	20.0	2.251
17	170.3	150.3	230.0	20.0	2.215
18	170.0	140.0	220.0	30.0	2.207
19	170.4	140.4	210.0	30.0	2.248
20	170.4	140.4	230.0	30.0	2.218
21	170.0	130.0	220.0	40.0	2.206
22	170.4	130.4	210.0	40.0	2.248
23	170.4	130.4	230.0	40.0	2.226
24	170.0	120.0	220.0	50.0	2.210
25	170.4	140.4	210.0	30.0	2.248
26	170.4	140.4	230.0	30.0	2.218
27	170.4	120.4	230.0	50.0	2.241
28	170.4	120.4	210.0	50.0	2.251

F.S. MINIMUM= 2.206 FOR THE CIRCLE OF CENTER (220.0, 40.0)

THE J. BYER GROUP, Inc.
A Geotechnical Consulting Firm

SURFICIAL STABILITY ANALYSIS
JB 17973-B HARVARD-WEST CAMPUS

CALCULATE THE SURFICIAL STABILITY OF THE SOIL USING THE INFINITE SLOPE ANALYSIS WITH PARALLEL SEEPAGE. THIS METHOD WAS RECOMMENDED BY THE A.S.C.E. AND THE BUILDING AND SAFETY ADVISORY COMMITTEE (8/16/78).

SOIL PROPERTIES (All Saturated) REFERENCE: SHEAR DIAGRAM 1

COHESION	360	psf
PHI ANGLE	24	degrees
SATURATED DENSITY	122.5	pcf
SLOPE ANGLE	27	degrees
WATER DENSITY	62.4	pcf
DEPTH OF SATURATION	3	feet

$$\text{FACTOR OF SAFETY} = \frac{360 + ((122.5 - 62.4)\ 3\ ((\text{COS } 27)\hat{\ }2)\text{TAN}(24))}{122.5 \times 3 \text{ COS } 27 \text{ SIN } 27}$$

THE CALCULATED FACTOR OF SAFETY IS 2.85
======

CONCLUSIONS:
CALCULATIONS INDICATE THE SOIL HAS A FACTOR OF SAFETY OF 2.85 AND IS CONSIDERED SURFICIALLY STABLE.

THE J. BYER GROUP, Inc.
A Geotechnical Consulting Firm

RETAINING WALL ANALYSIS
JB 17973-B HARVARD-WEST CAMPUS

CALCULATE THE DESIGN MINIMUM EQUIVALENT FLUID PRESSURE (EFP) FOR PROPOSED RETAINING WALLS SUPPORTING BEDROCK UP TO 30 FEET HIGH, WITH A 27 DEGREE BACKSLOPE. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE.

BEDROCK PROPERTIES (Saturated)

COHESION	1040 psf	RETAINING WALL HEIGHT	30 feet
PHI ANGLE	39 degrees	BACKSLOPE ANGLE	27 degrees
DENSITY	112 pcf	UNIFORM SURCHARGE	0 pounds/foot
REF. SHEAR DIAGRAM 2		FACTOR OF SAFETY	1.5

For Factor of Safety (FS) = 1.5 : Cd = C/FS = 693.33 psf
Phid = atan(tan(Phi)/FS) = 28.36 degrees

FOR THIS CALCULATION THE ANGLE OF FRICTION BETWEEN THE WALL AND THE BACKFILL IS 0 DEGREES.

1230 TRIALS WERE ANALYZED USING ASSUMED FAILURE ANGLES VARYING FROM 30 TO 70 DEGREES AT AN INTERVAL OF 1 DEGREES, AND UPSLOPE DISTANCES TO THE TENSION CRACK FROM 1 TO 30 FEET AT AN INTERVAL OF 1 FEET.

THE HORIZONTAL UPSLOPE DISTANCE TO THE TENSION CRACK WHICH RESULTS IN THE HIGHEST HORIZONTAL THRUST ON THE RETAINING WALL IS 9 FEET. THE TOTAL EXTERNAL SURCHARGE ON THE FAILURE WEDGE IS 0 POUNDS.

DESIGN THE RETAINING WALL AS FOLLOWS:

CRITICAL FAILURE ANGLE (degrees)	AREA OF FAILURE WEDGE (sq. ft.)	TENSION CRACK DEPTH (feet)	MAXIMUM HORIZONTAL THRUST (pounds)	EQUIVALENT FLUID PRESSURE (pcf)
57.00	228.27	20.73	2473.88	5.50

CONCLUSIONS:
THE CALCULATION INDICATES THAT THE PROPOSED RETAINING WALL UP TO 30 FEET HIGH SUPPORTING BEDROCK WITH A 27 DEGREE BACKSLOPE MAY BE DESIGNED FOR A MINIMUM EFP OF 43 PCF.

THE J. BYER GROUP, Inc.
A Geotechnical Consulting Firm

TEMPORARY STABILITY ANALYSIS
JB 17973-B   HARVARD-WEST CAMPUS

CALCULATE THE MAXIMUM ALLOWABLE HEIGHT OF TEMPORARY VERTICAL EXCAVATIONS IN BEDROCK WITH A 27 DEGREE BACKSLOPE. ASSUME THE BEDROCK IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE.

BEDROCK PROPERTIES (Saturated)

COHESION	1040 psf	STABLE EXCAVATION HT.	15 feet
PHI ANGLE	39 degrees	BACKSLOPE ANGLE	27 degrees
DENSITY	112 pcf	UNIFORM SURCHARGE	0 pounds/foot
REF. SHEAR DIAGRAM 2		FACTOR OF SAFETY	1.5

For Factor of Safety (FS) = 1.5 : Cd = C/FS = 693.33 psf
Phid = atan(tan(Phi)/FS) = 28.36 degrees

1230 TRIALS WERE ANALYZED USING ASSUMED FAILURE ANGLES VARYING FROM 30 TO 70 DEGREES AT AN INTERVAL OF 1 DEGREES, AND UPSLOPE DISTANCES TO THE TENSION CRACK FROM 1 TO 30 FEET AT AN INTERVAL OF 1 FEET.

THE HORIZONTAL UPSLOPE DISTANCE TO THE TENSION CRACK WHICH RESULTS IN HIGHEST HORIZONTAL THRUST ON THE TEMPORARY VERTICAL EXCAVATION IS 1 FEET. THE TOTAL EXTERNAL SURCHARGE ON THE FAILURE WEDGE IS 0 POUNDS.

CRITICAL FAILURE ANGLE (degrees)	AREA OF FAILURE WEDGE (sq. ft.)	TENSION CRACK DEPTH (feet)	MAXIMUM HORIZONTAL THRUST (pounds)	EQUIVALENT FLUID PRESSURE (pcf)
52.00	14.61	14.23	-365.33	-3.25

CONCLUSIONS:

THE CALCULATION INDICATES THAT TEMPORARY VERTICAL EXCAVATIONS UP TO 15 FEET HIGH EXPOSING BEDROCK WITH A 27 DEGREE BACKSLOPE WILL HAVE A NEGATIVE THRUST AND ARE, THEREFORE, TEMPORARILY STABLE.

THE J. BYER GROUP, Inc.
A Geotechnical Consulting Firm

SOLDIER PILE ANALYSIS
JB 17973-B   HARVARD-WEST CAMPUS

CALCULATE THE DESIGN MINIMUM EQUIVALENT FLUID PRESSURE (EFP) FOR PROPOSED SOLDIER PILES SUPPORTING BEDROCK UP TO 30 FEET HIGH, WITH A 27 DEGREE BACKSLOPE. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE.

BEDROCK PROPERTIES (Saturated)

COHESION	1040 psf	RETAINED HEIGHT	30 feet
PHI ANGLE	39 degrees	BACKSLOPE ANGLE	27 degrees
DENSITY	112 pcf	UNIFORM SURCHARGE	0 pounds/foot
REF. SHEAR DIAGRAM 2		FACTOR OF SAFETY	1.5

For Factor of Safety (FS) = 1.5 : Cd = C/FS = 693.33 psf
Phid = atan(tan(Phi)/FS) = 28.36 degrees

FOR THIS CALCULATION THE ANGLE OF FRICTION BETWEEN SOLDIER PILES AND THE RETAINED EARTH MATERIAL IS 0 DEGREES.

1230 TRIALS WERE ANALYZED USING ASSUMED FAILURE ANGLES VARYING FROM 30 TO 70 DEGREES AT AN INTERVAL OF 1 DEGREES, AND UPSLOPE DISTANCES TO THE TENSION CRACK FROM 1 TO 30 FEET AT AN INTERVAL OF 1 FEET.

THE HORIZONTAL UPSLOPE DISTANCE TO THE TENSION CRACK WHICH RESULTS IN THE HIGHEST HORIZONTAL THRUST ON THE SOLDIER PILES IS 9 FEET. THE TOTAL EXTERNAL SURCHARGE ON THE FAILURE WEDGE IS 0 POUNDS.

DESIGN THE SOLDIER PILES AS FOLLOWS:

CRITICAL FAILURE ANGLE (degrees)	AREA OF FAILURE WEDGE (sq. ft.)	TENSION CRACK DEPTH (feet)	MAXIMUM HORIZONTAL THRUST (pounds)*	EQUIVALENT FLUID PRESSURE (pcf)*
57.00	228.27	20.73	2473.88	5.50

*** VALUES PER LINEAR FOOT OF RETAINED EARTH**

CONCLUSIONS:
THE CALCULATION INDICATES THAT PROPOSED SOLDIER PILES SUPPORTING UP TO 30 FEET OF BEDROCK MAY BE DESIGNED TO RETAIN A MINIMUM EFP OF 43 pcf (PER LINEAR FOOT OF RETAINED EARTH). THE EFP AND THRUST MUST BE MULTIPLIED BY THE PILE SPACING.

THE J. BYER GROUP, Inc.
A Geotechnical Consulting Firm

RETAINING WALL ANALYSIS
JB 17973-B HARVARD-WEST CAMPUS

CALCULATE THE DESIGN MINIMUM EQUIVALENT FLUID PRESSURE (EFP) FOR PROPOSED RETAINING WALLS SUPPORTING FUTURE FILL UP TO 22 FEET HIGH, WITH A 0 DEGREE BACKSLOPE. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE.

FUTURE FILL PROPERTIES (Saturated)

COHESION	400 psf	RETAINING WALL HEIGHT	22 feet
PHI ANGLE	30 degrees	BACKSLOPE ANGLE	0 degrees
DENSITY	103.2 pcf	UNIFORM SURCHARGE	0 pounds/foot
REF. SHEAR DIAGRAM 3		FACTOR OF SAFETY	1.5

For Factor of Safety (FS) = 1.5 : Cd = C/FS = 266.66 psf
Phid = atan(tan(Phi)/FS) = 21.05 degrees

FOR THIS CALCULATION THE ANGLE OF FRICTION BETWEEN THE WALL AND THE BACKFILL IS 0 DEGREES.

1230 TRIALS WERE ANALYZED USING ASSUMED FAILURE ANGLES VARYING FROM 30 TO 70 DEGREES AT AN INTERVAL OF 1 DEGREES, AND UPSLOPE DISTANCES TO THE TENSION CRACK FROM 1 TO 30 FEET AT AN INTERVAL OF 1 FEET.

THE HORIZONTAL UPSLOPE DISTANCE TO THE TENSION CRACK WHICH RESULTS IN THE HIGHEST HORIZONTAL THRUST ON THE RETAINING WALL IS 10 FEET. THE TOTAL EXTERNAL SURCHARGE ON THE FAILURE WEDGE IS 0 POUNDS.

DESIGN THE RETAINING WALL AS FOLLOWS:

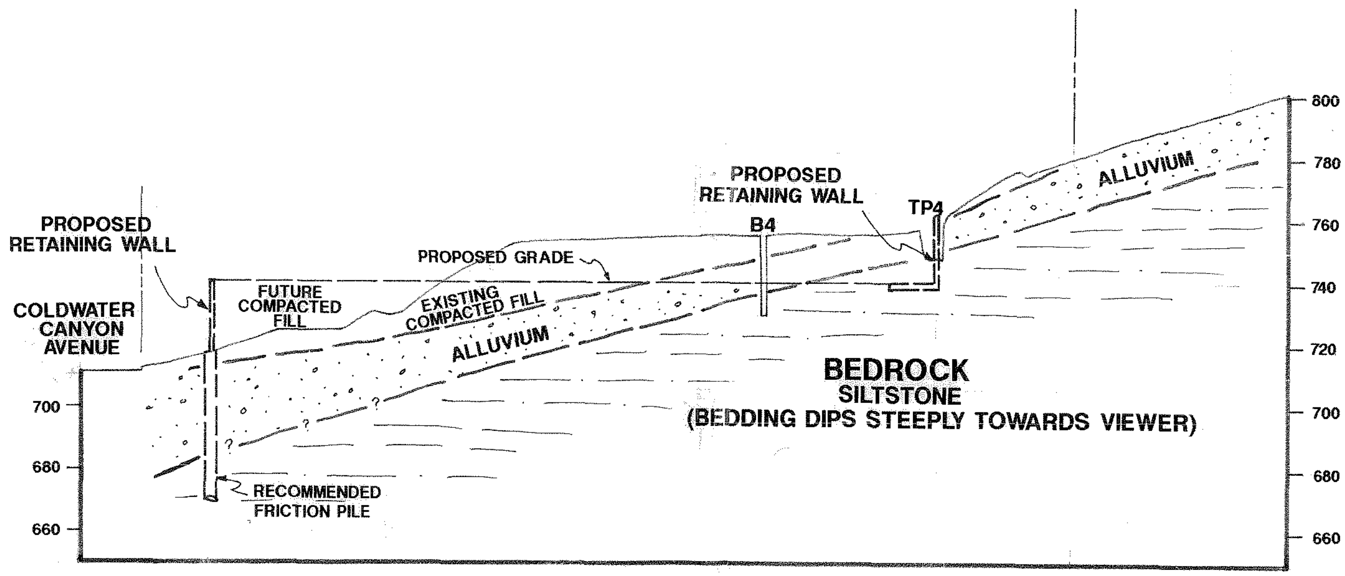
CRITICAL FAILURE ANGLE (degrees)	AREA OF FAILURE WEDGE (sq. ft.)	TENSION CRACK DEPTH (feet)	MAXIMUM HORIZONTAL THRUST (pounds)	EQUIVALENT FLUID PRESSURE (pcf)
55.00	148.59	7.72	5092.83	21.04

CONCLUSIONS:
THE CALCULATION INDICATES THAT THE PROPOSED RETAINING WALL UP TO 22 FEET HIGH SUPPORTING FUTURE FILL WITH A 0 DEGREE BACKSLOPE MAY BE DESIGNED FOR A MINIMUM EFP OF 43 PCF.

THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
(818) 549-9959 Tel • (818) 543-3747 Fax

SECTION A	
JB: 17973-B	HARVARD - WEST CAMPUS
CONSULTANT: JET	SCALE: 1" = 40'

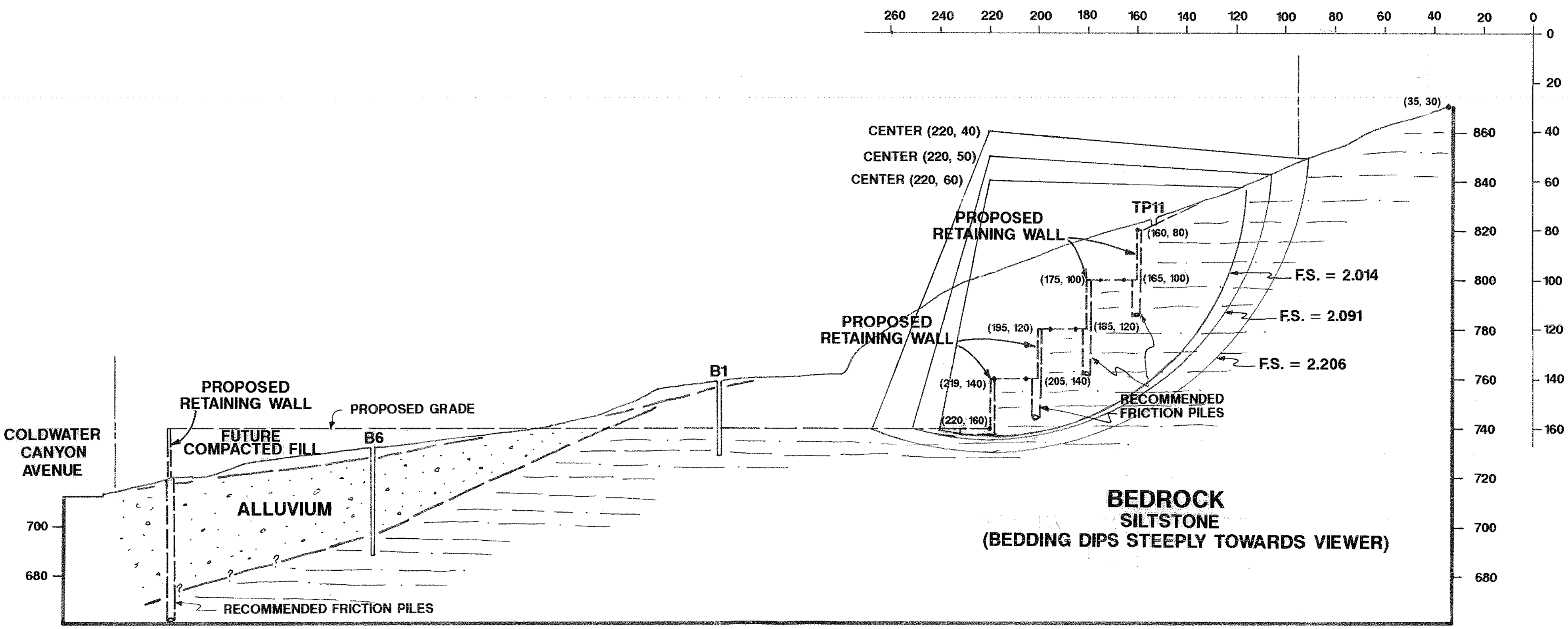
MARCH 4, 1999



SECTION A-A

THE J. BYER GROUP, INC. A GEOTECHNICAL CONSULTING FIRM	SECTION B	
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206 (818) 549-9959 Tel • (818) 543-3747 Fax	JB: 17973-B	HARVARD - WEST CAMPUS
	CONSULTANT: JET	SCALE: 1 " = 40 '

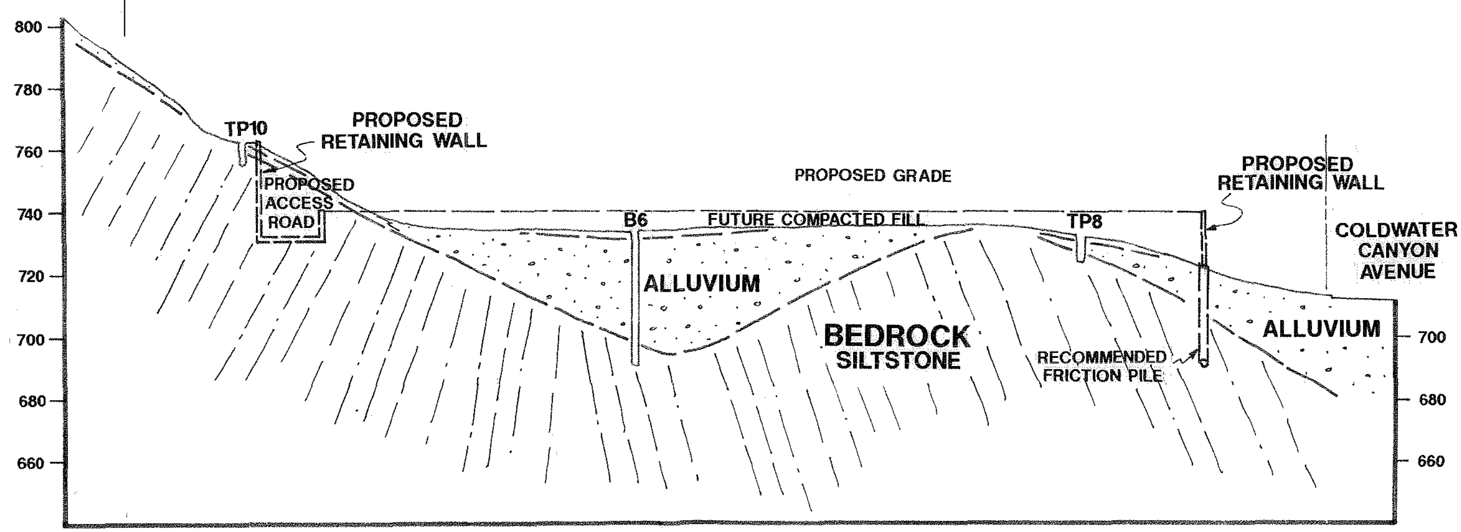
MARCH 4, 1999



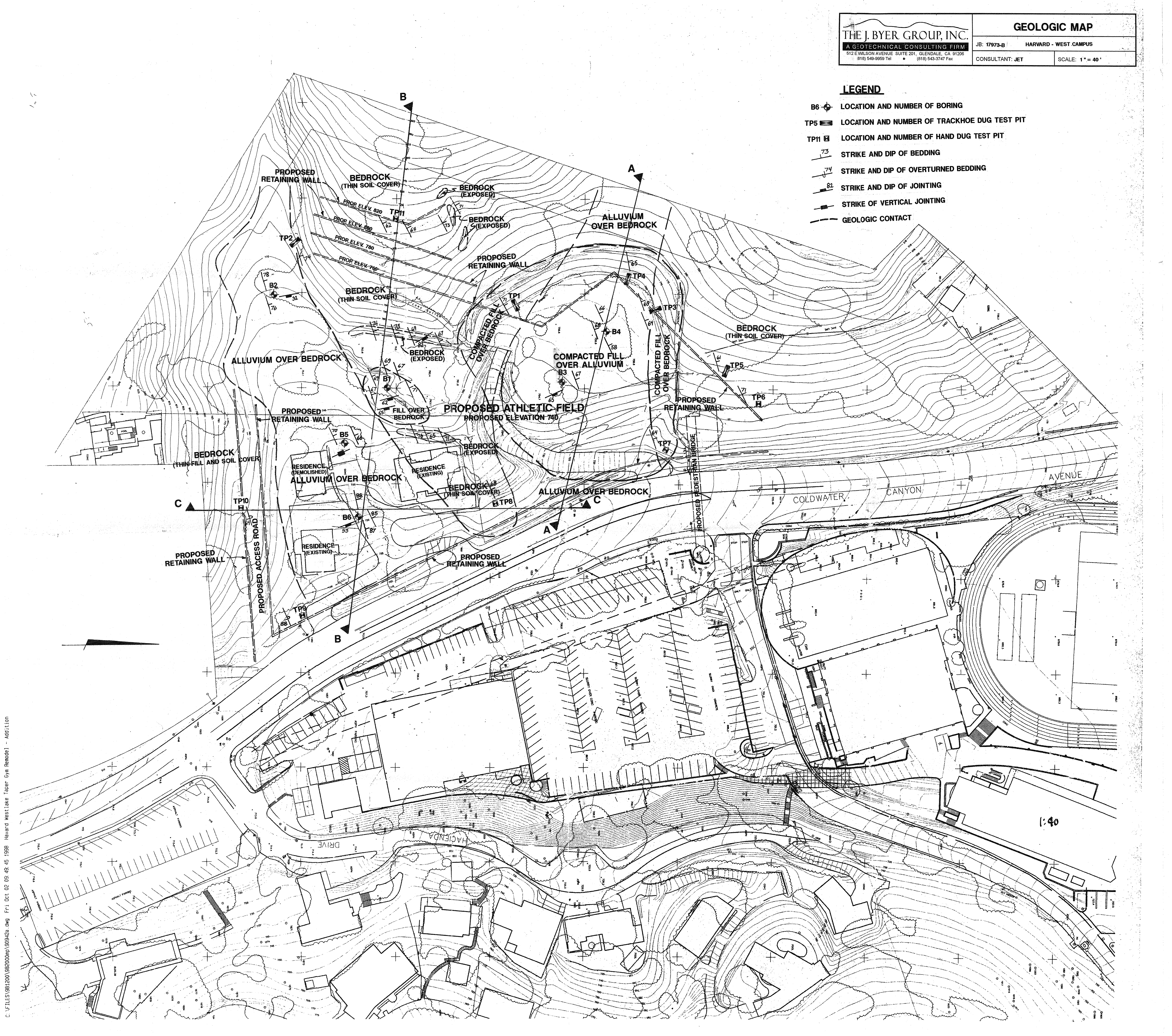
SECTION B-B

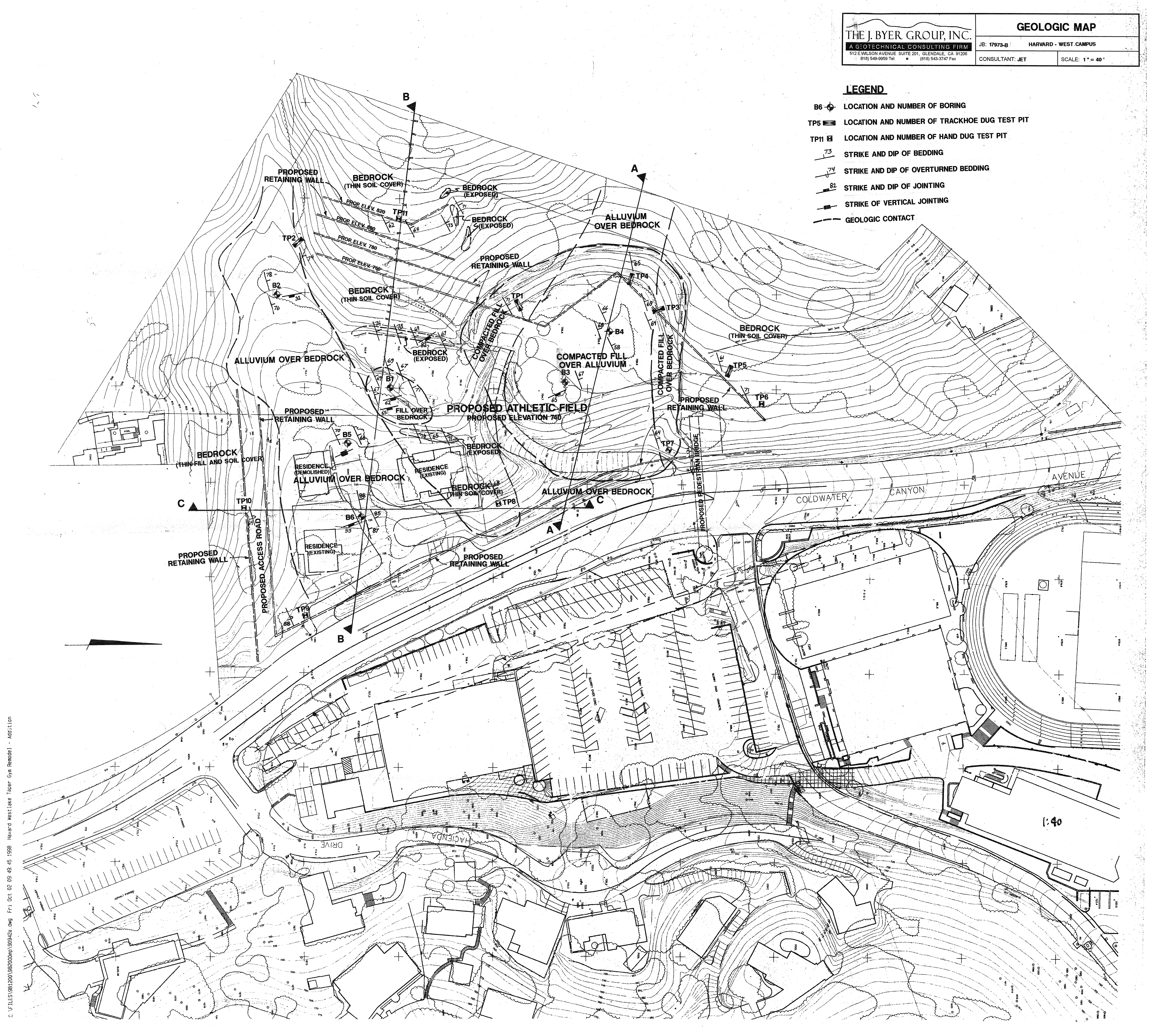
THE J. BYER GROUP, INC. A GEOTECHNICAL CONSULTING FIRM 512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206 (818) 549-9959 Tel • (818) 543-3747 Fax	SECTION C	
	JB: 17973-B HARVARD - WEST CAMPUS	
	CONSULTANT: JET	SCALE: 1 " = 40 '

MARCH 4, 1999



SECTION C-C


THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E. WILSON AVENUE SUITE 201, GLENDALE, CA 91206
(818) 549-9959 Tel (818) 543-3747 Fax
GEOLOGIC MAP
JB: 17973-B
HARVARD - WEST CAMPUS
CONSULTANT: JET
SCALE: 1" = 40'
LEGEND
B6 LOCATION AND NUMBER OF BORING
TP5 LOCATION AND NUMBER OF TRACKHOE DUG TEST PIT
TP11 LOCATION AND NUMBER OF HAND DUG TEST PIT
STRIKE AND DIP OF BEDDING
STRIKE AND DIP OF OVERTURNED BEDDING
STRIKE AND DIP OF JOINTING
STRIKE OF VERTICAL JOINTING
GEOLOGIC CONTACT
PROPOSED RETAINING WALL
BEDROCK (THIN SOIL COVER)
BEDROCK (EXPOSED)
PROP. ELEV. 820
PROP. ELEV. 800
PROP. ELEV. 780
PROP. ELEV. 760
ALLUVIUM OVER BEDROCK
COMPACTED FILL OVER BEDROCK
COMPACTED FILL OVER ALLUVIUM
FILL OVER BEDROCK
PROPOSED ATHLETIC FIELD
PROPOSED ELEVATION 740
BEDROCK (THIN FILL AND SOIL COVER)
RESIDENCE (DEMOLISHED)
RESIDENCE (EXISTING)
PROPOSED ACCESS ROAD
PROPOSED PEDESTRIAN BRIDGE
COLDWATER CANYON AVENUE
HACIENDA DRIVE
1:40
C:\FILES\981200\982000mp\90942a.dwg Fri Oct 02 09:49:45 1998 Havard Westlake Taper Gym Remodel - Addition


THE J. BYER GROUP, INC.
A GEOTECHNICAL CONSULTING FIRM
512 E.WILSON AVENUE SUITE 201, GLENDALE, CA 91206
(818) 549-9959 Tel (818) 543-3747 Fax
GEOLOGIC MAP
JB: 17973-B
HARVARD - WEST CAMPUS
CONSULTANT: JET
SCALE: 1" = 40'
LEGEND
B6 LOCATION AND NUMBER OF BORING
TP5 LOCATION AND NUMBER OF TRACKHOE DUG TEST PIT
TP11 LOCATION AND NUMBER OF HAND DUG TEST PIT
STRIKE AND DIP OF BEDDING
STRIKE AND DIP OF OVERTURNED BEDDING
STRIKE AND DIP OF JOINTING
STRIKE OF VERTICAL JOINTING
GEOLOGIC CONTACT
PROPOSED RETAINING WALL
BEDROCK (THIN SOIL COVER)
BEDROCK (EXPOSED)
PROP ELEV. 820
PROP ELEV. 800
PROP ELEV. 780
PROP ELEV. 760
ALLUVIUM OVER BEDROCK
COMPACTED FILL OVER BEDROCK
COMPACTED FILL OVER ALLUVIUM
FILL OVER BEDROCK
PROPOSED ATHLETIC FIELD
PROPOSED ELEVATION 740
BEDROCK (THIN FILL AND SOIL COVER)
RESIDENCE (DEMOLISHED)
RESIDENCE (EXISTING)
PROPOSED ACCESS ROAD
PROPOSED PEDESTRIAN BRIDGE
COLDWATER CANYON AVENUE
HACIENDA DRIVE
1:40
C:\FILES\981200\982000mp\90942a.dwg Fri Oct 02 09:49:45 1998 Havard Westlake Taper Gym Remodel - Addition

CITY OF LOS ANGELES

CALIFORNIA

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

ANDREW A. ADELMAN
GENERAL MANAGER

RICHARD E. HOLGUIN
EXECUTIVE OFFICER

March 15, 1999

Log # 27226
SOILS/GEOLOGY FILE - 2

Harvard Westlake School
3700 Coldwater Canyon Avenue
North Hollywood, CA 91604

TRACT: 1000/6293
LOT: 1112 (ARB 45)/FR. 135
LOCATION: 3801 Coldwater Cyn. Ave.

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Geo/Soil Report	JB-17973-B	02/24/1999	The J. Byer Group
Ovrszd Doc	"	"	"

The reference report has been reviewed by Grading Section of the Department of Building and Safety. It is proposed to create a 2:1 cut slope in the southwest portion of the site.

The report is acceptable, provided the following conditions are complied with during the site development:

1. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

2. All new graded slopes shall be no steeper than 2:1.

3. All recommendations of the report which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

4. The interceptor terraces shall be a minimum 8 feet wide, as required by the Code.

5. A diverter terrace shall be provided at the top of the cut slope.

6. If the grading permit involves the import or export of more than 1000 cubic yards of earth materials, and is in the grading hillside area, approval is required by the Board of Building

and Safety. Application for approval of the import-export route should be filed with the Grading Section. Processing time of this application is approximately 8 weeks to hearing plus 10-day appeal period.

7. A grading permit shall be obtained.

8. Secure the written consent from all owners upon whose property the proposed grading is to extend.

9. Grading shall be scheduled for completion prior to the start of the rainy season, or detailed temporary erosion control plans shall be filed in a manner satisfactory to the Department and the Department of Public Works, for any grading work in excess of 200 cu yd.

10. Prior to excavation, an initial inspection shall be called at which time sequence of shoring (if required), protection fences and dust and traffic control will be scheduled.

DAVID HSU
Chief of Grading Section

Dana Prevost

DANA PREVOST
Engineering Geologist II

ANDRZEJ T. SZPIKOWSKI
Geotechnical Engineer I

DP/ATS:dp/ats
27726
(213) 977-6329

cc: The J. Byer Group, Inc.
Applicant
VN District Office

CITY OF LOS ANGELES

CALIFORNIA

RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

ANDREW A. ADELMAN
GENERAL MANAGER

RICHARD E. HOLGUIN
EXECUTIVE OFFICER

March 18, 1999

Log # 27150
C.D. --

SOILS/GEOLOGY FILE - 2

Harvard Westlake School
3700 Coldwater Canyon Ave
North Hollywood, CA

TRACT: 1000
LOT: 1111
LOCATION: 3700 Coldwater Canyon Av

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soils Report	JB 17866-B	10-23-98	J. Byer Group
" "	" "	10-16-98	" "

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soils Report	KB 614	07-16-79	Kovacs-Byer
" "	GSC 614	01-29-73	Geo. & Soils Cons.
Department Letter	n/a	03-07-73	Building & Safety
" "	n/a	12-14-84	" "
" "	26646-01	02-12-99	" "

The reports have been reviewed by the Grading Section of the Department of Building and Safety. The report dated October 23, 1998 relates to the previously approved gymnasium project, and is acknowledged.

According to the October 16, 1998 report, it is planned to construct an attached addition to the existing Taper Athletic Pavilion. The Pavilion was previously explored by, and constructed under the observation of Kovacs-Byer and Associates. The Pavilion is supported on friction piles extending through the alluvium and into the bedrock. Depths to bedrock range from 10 to about 40 feet.

The J. Byer Group accepts responsibility for use of the information provided in the previous reports, pursuant to Code Section 91.7008.5.

The October 16, 1998 report indicates that the site is within an Official State Seismic Hazard Zone (liquefaction). The report indicates that the occurrence of a liquefaction event is low, but will be mitigated by supporting structures on bedrock. This satisfies the requirement of the Los Angeles City Building Code Section 91.1804.5 and the State of California Public Resources Code, Section 2690 et seq. (Seismic Hazard Mapping Act).

The report is acceptable, provided the following conditions are complied with during site development:

1. All footings shall be founded in bedrock, as recommended.

2. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill.

3. Slab-on-uncertified fill shall be designed as a structural slab.

4. Existing uncertified fill shall not be used for lateral support of deep foundation.

5. All recommendations of the reports which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

6. All conditions of the above referenced Department letter shall apply.

7. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

8. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety.

9. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

10. The geologist shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading or foundation excavations.

11. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesion-less soil having less than 15 percent of finer than 0.005 millimeters is used for fill, it shall be

compacted to a minimum of 95 percent of the maximum dry density.

12. All roof and pad drainage shall be conducted to the street in an acceptable manner.

13. The geologist and soils engineer shall inspect the excavations for the footings to determine that they are founded in the recommended strata before calling the Department for footing inspection.

14. All friction pile or caisson drilling and installation shall be performed under the continuous inspection and approval of the geologist and soils engineer.

15. Prior to the placing of compacted fill, a representative of the consulting Soils Engineer shall inspect and approve the bottom excavations. He shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the City Grading Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be filed with the Department upon completion of the work. The fill shall be placed under the inspection and approval of the Soils Engineer. A compaction report shall be submitted to the Department upon completion of the compaction.

16. Prior to the pouring of concrete, a representative of the consulting Geologist and Soil Engineer shall inspect and approve the footing excavations. He shall post a notice on the job site for the City Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Department upon completion of the work.

DAVID HSU
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