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PRELIMINARY SOIL INVESTIGATION
SUPER BLOCK
RAILROAD AVENUE
LIVERMORE, CALIFORNIA
FOR
THE JONATHAN GROUP, INC.

November 6, 1987

Job No. 1387.200.1

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The Jonathan Group, Inc.
2682 Bishop Drive, Suite 212
Bishop Ranch 2
San Ramon, California 94583-2338

Attention: Mr. Stephen G. Johnson

Subject: Preliminary Soil Investigation
Super Block
Railroad Avenue
Livermore, California

Gentlemen:

INTRODUCTION

This report presents results of our preliminary soil investigation for the subject project. The site is located on the south side of Railroad Avenue between P and L Streets in Livermore, California. The site is shown in relation to the City of Livermore on the Vicinity Map, Plate 1.

We understand that tentatively the site will be developed with commercial structures at each end of the site with the middle portion for attached housing units and associated parking and landscape areas. We have assumed for this report that the buildings will be one and two stories in height with no unusual foundation loadings.

The purpose of this investigation is to characterize the general site soil conditions and discuss findings which may impact on the development of the site. Our scope of services consisted of performing a site reconnaissance, drilling seven boring, limited laboratory testing, engineering review of the results, and preparation of this report. Further investigation will be required for final design.

SITE HISTORY AND DEVELOPMENT

There is an existing commercial building in the southwest corner of the site, and poles and fencing for a Christmas tree lot in the northwest corner. The rest of the site is vacant except for three small slabs near the center of the site, a slightly larger slab in the northeast corner, and a pile of fill in the southeast corner.

EXPLORATION DETAILS

We explored subsurface soil conditions at the subject site, by drilling seven borings to depths of about 20 feet. We determined the boring locations, shown on the Site Plan, Plate 2, by pacing from existing surface features. These locations should be considered accurate only to the degree implied by the methods used.

Our representative logged the borings and obtained relatively undisturbed soil samples at various depths. The boring logs, showing soil classifications, blow counts, and sample depths are presented on Plates 3 through 9. The soils are classified according to the Unified Soil Classification system described on Plate 10.

In our laboratory, we re-examined the samples to verify the field classifications and selected representative samples for testing. Laboratory testing consisted of Atterberg Limits tests to confirm the classification. The test results are presented on Plate 10.

SITE CONDITIONS

In general, our test borings showed competent alluvium, somewhat coarse-grained, underlying the site. Except in Boring B-4, it was not possible to clearly define the presence of fill although the surface has been graded. In Boring B-4, asphalt and concrete debris and charred wood fragments were encountered in the soil to a depth of about 5 feet. Also in Boring B-4 a layer of soft silt was encountered from a depth of about 12½ feet to 17 feet.

We did not assess the pile of fill at the southeast corner of the site as part of this investigation. No free groundwater was encountered but some of the samples recovered near the bottom of the boring were wet. The free groundwater level is expected to fluctuate with weather conditions and time of year.

CONCLUSIONS AND RECOMMENDATIONS

The results of this preliminary investigation indicate the soils at this site should generally provide adequate support for the tentatively planned buildings and roadways. Design concerns at this site are the existing fill and soft layers at depth.

The drilling at Boring B-4 shows the presence of debris, but it is not possible to accurately assess the amount of debris by drilling, and a heavy concentration of debris can interfere with construction. Although the other borings did not clearly indicate fill, the results of Boring B-4 suggest that there may be other fill areas on the site.

A layer of soft silt was encountered in Boring B-4. It is anticipated that his layer would likely not be extensive, but this should be confirmed. If the layer is of limited extent and there is only minor grading and no unusual foundation loads, this layer is not expected to cause design problems.

Seismic Considerations

The San Francisco Bay area is recognized by geologists and seismologists as one of the most active seismic regions in the United States. The significant earthquakes which occur in the Bay Area are associated with crustal movements along well-defined active fault zones.

The subject site is not within a currently designated State of California Special Studies Zone for active faults (State of California, 1982). Of the major faults in the area, the Calaveras fault is located approximately 7½ miles southwest of the site, while the Hayward and San Andreas fault zones are located approximately 15 and 33 miles, respectively, southwest of the site.

Several smaller faults are located in relatively close proximity to the site. The Las Positas fault is a high angle, northeast trending fault located approximately 2 miles southeast of the site. The Greenville fault is a northwest trending strike-slip fault located approximately 4½ miles northeast of the site. Both faults are considered potentially active. The Mocho fault has been mapped as underlying the alluvial and colluvial deposits of the Livermore Valley. However, its existence is largely inferential and there is no evidence for recent faulting.

Although research on earthquake prediction has greatly increased in recent years, seismologists have not yet reached the point where they can say when and where an earthquake will occur. Nevertheless, on the basis of these recent studies, it is reasonable to assume that the proposed structures will be subjected to at least one moderate to severe earthquake during their design life.

Additional Soil Engineering Services

Before finalizing plans for the site, a design level geotechnical investigation should be performed. This investigation should be for the purposes of development of criteria for site grading, foundation design and pavement design. This investigation should include an assessment of fill on the site, and soft layers at depth.

INVESTIGATION LIMITATIONS

Our investigation is based on a surface reconnaissance, seven borings, laboratory testing and engineering analysis. The materials encountered in the borings are believed to be generally representative of the total area; however, soil conditions may vary in character between borings. The conclusions and recommendations contained herein are professional opinions derived in accordance with the current standards of soil engineering practice; no other warranty is expressed or implied.

Respectfully submitted,

BERLOGAR GEOTECHNICAL CONSULTANTS

W. Patrick Stewart

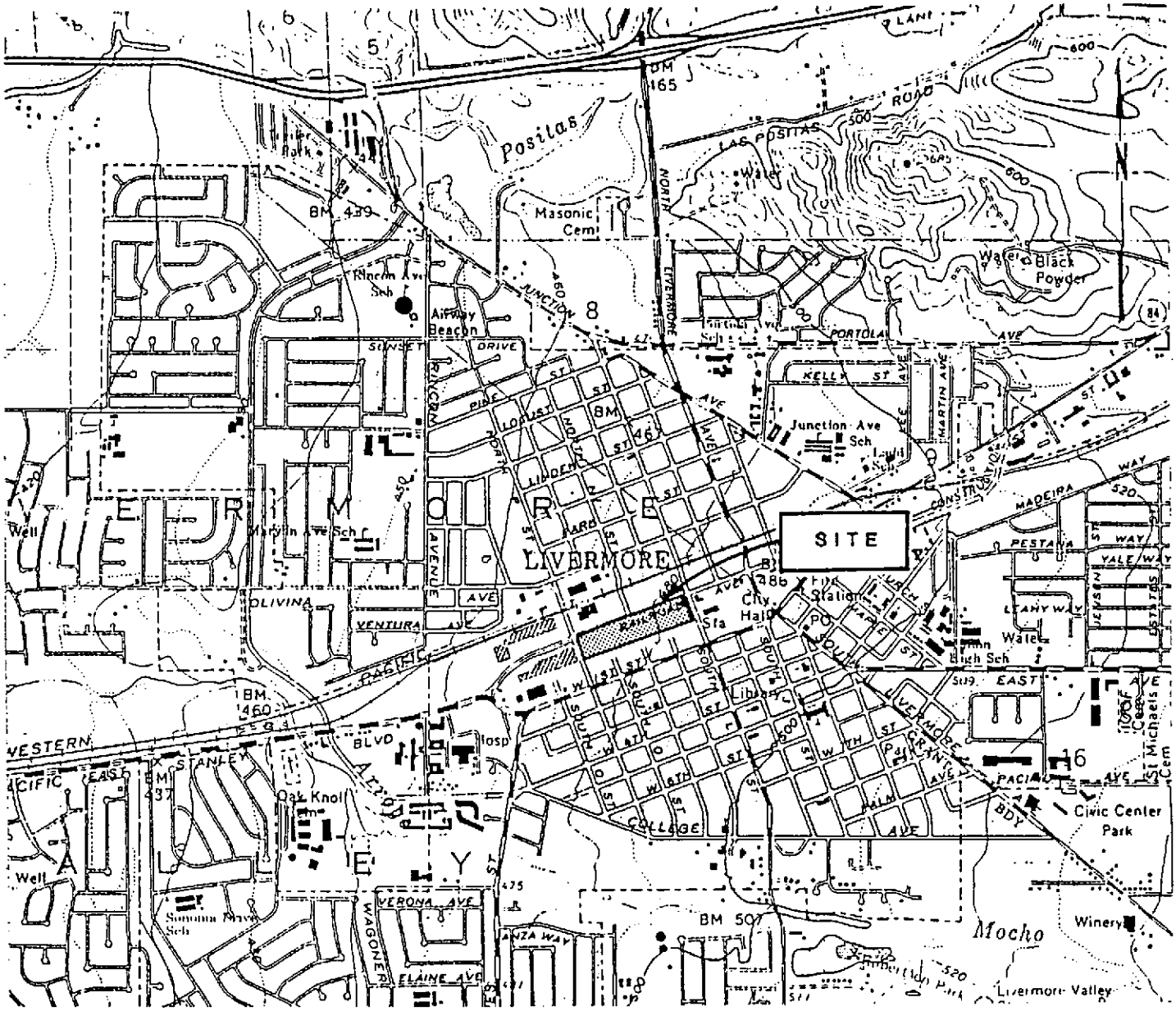
Frank Berlogar
RCE 20383 Exp. 9/30/89

REGISTERED PROFESSIONAL ENGINEER
FRANK BERLOGAR
No. 20383
CIVIL
STATE OF CALIFORNIA

WPS/FB:laj/cgm/1159

Attachments:
Plate 1 - Vicinity Map
Plate 2 - Site Plan
Plates 3 through 9 - Boring Logs
Plate 10 - Unified Soil Classification System
Plate 11 - Atterberg Limits Test Data

Copies: Addressee (6)



SCALE: 1"=2000'

VICINITY MAP

SUPER BLOCK

RAILROAD AVENUE

LIVERMORE, CALIFORNIA

FOR

THE JONATHAN GROUP, INC.

REFERENCE:
PORTION OF U.S.G.S. 7½ MINUTE TOPOGRAPHIC QUADRANT, LIVERMORE, CALIFORNIA; DATED 1961 AND PHOTO-REVISED 1980, AT A SCALE OF 1:24,000

BORING LOG B-1

JOB NUMBER: 1387.200.1
DATE DRILLED: 11/2/87
JOB NAME: Super Block
SURFACE ELEVATION: --
DRILL RIG: Solid Flight Auger
DATUM: --

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" ID Split Barrel	140	30
Standard Penetration Test	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
38				ML	SANDY SILT, gray-brown, dry to moist, hard some fine grained gravel
				CL	SANDY CLAY, red-brown, moist, very stiff some fine to coarse grained gravel
85			5	SP	GRAVELLY SAND, gray-brown, dry to moist, very dense fine to coarse grained, trace clay
25					medium dense
50/3"			10		very dense
60/6"			15		below 16 feet fine grained below 17 feet fine to coarse grained
70/6"			20		Boring terminated at 20½ feet No free water encountered during drilling

PLATE 3

B-2

BORING LOG

JOB NUMBER: 1387.200.1 — DATE DRILLED: 11/2/87

JOB NAME: Super Block — SURFACE ELEVATION: --

DRILL RIG: Solid Flight Auger — DATUM: --

SAMPLER TYPE:	DRIVE WEIGHT — LB	HEIGHT OF FALL — IN
2.5" ID Split Barrel	140	30
Standard Penetration Test	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
				SC	CLAYEY SAND, gray-brown, dry to moist, medium dense trace gravel
53				SP	GRAVELLY SAND, light gray-brown, dry to moist, dense trace clay
			5		
57					very dense
75					
			10		moist below 12½ feet, medium dense little clay
28				CL	SANDY CLAY, light red-brown, moist to wet, very stiff trace gravel
			15		
102/9"				SC	CLAYEY SAND, light gray-brown, wet, very dense trace gravel
			20		Boring terminated at 19½ feet No free water encountered during drilling

PLATE 4

B-3

BORING LOG

JOB NUMBER: 1387.200.1 — DATE DRILLED: 11/2/87

JOB NAME: Super Block — SURFACE ELEVATION: --

DRILL RIG: Solid Flight Auger — DATUM: --

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" ID Split Barrel	140	30
Standard Penetration Test	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
71				ML	SANDY SILT, gray-brown, dry, hard trace gravel, porous
46			5	SP	GRAVELLY SAND, gray-brown, dry to moist, dense trace clay
15			10	CL	SILTY CLAY, light gray-brown, moist, stiff trace sand
22			15	CL	SANDY CLAY, light gray-brown, moist to wet, very stiff trace gravel, minor dark brown mottling
33			20		Boring terminated at 20 feet No free water encountered during drilling

BORING LOG B-4

JOB NUMBER: 1387.200.1 DATE DRILLED: 11/2/87

JOB NAME: Super Block SURFACE ELEVATION: --

DRILL RIG: Solid Flight Auger DATUM: --

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" ID Split Barrel	140	30
Standard Penetration Test	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
33				SC	FILL: CLAYEY SAND WITH GRAVEL, gray-brown, dry to moist, medium dense concrete and asphalt debris
25				SM	FILL: SILTY SAND WITH GRAVEL, gray-brown, moist, medium dense concrete and asphalt debris, charred wood fragments
			5	GP	SANDY GRAVEL, light gray-brown, dry to moist, dense trace clay
46				CL	SANDY CLAY, gray-brown, moist, hard some fine grained gravel
			10		
5				ML	CLAYEY SILT, light yellow-brown, wet, soft trace sand, porous
			15		
				CL	SANDY CLAY, light yellow-brown, moist to wet, hard trace gravel
56					little gravel below 19½ feet
			20		Boring terminated at 20 feet No free water encountered during drilling

PLATE 6

BORING LOG B-5

JOB NUMBER: 1387.200.1 DATE DRILLED: 11/3/87

JOB NAME: Super Block SURFACE ELEVATION: --

DRILL RIG: Solid Flight Auger DATUM: --

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" ID Split Barrel	140	30
Standard Penetration Test	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
88				CL	SANDY CLAY, gray-brown, dry to moist, hard trace gravel, porous
50/3"			5	SP	GRAVELLY SAND, light gray-brown, dry to moist, very dense occasional cobbles up to 6 to 7 inches diameter
62/6"			10	ML	CLAYEY SILT, light yellow-brown, dry to moist, hard occasional traces of sand, porous
50/5"			15	CL	SANDY CLAY, red-brown, moist, hard some gravel
				SP	GRAVELLY SAND, light gray-brown, dry to moist, very dense trace silt and clay
11			20	CL	SANDY CLAY, light gray-brown, moist to wet, stiff
					Boring terminated at 20½ feet No free water encountered during drilling

PLATE 7

BORING LOG B-6

JOB NUMBER: 1387.200.1 DATE DRILLED: 11/3/87

JOB NAME: Super Block SURFACE ELEVATION: --

DRILL RIG: Solid Flight Auger DATUM: --

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" ID Split Barrel	140	30
Standard Penetration Test	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
104				CL	SANDY CLAY, gray-brown, dry to moist, hard trace gravel, slightly porous
42			5	SP	GRAVELLY SAND, light red-brown, moist, medium dense trace clay
85/10"					very dense
			10	CL	SANDY CLAY, light gray-brown, moist, hard trace gravel
50/5"				SP	GRAVELLY SAND, light gray-brown, moist, very dense bright orange mottling, trace clay
			15	CL	SANDY CLAY, light yellow-brown, moist, hard trace gravel
80					
			20		Boring terminated at 20 feet No free water encountered during drilling

PLATE 8

BORING LOG B-7

JOB NUMBER: 1387.200.1 DATE DRILLED: 11/3/87

JOB NAME: Super Block SURFACE ELEVATION: --

DRILL RIG: Solid Flight Auger DATUM: --

SAMPLER TYPE:	DRIVE WEIGHT – LB	HEIGHT OF FALL – IN
2.5" ID Split Barrel	140	30
Standard Penetration Test	140	30

BLOWS PER FT.	MOISTURE CONTENT %	DRY UNIT WEIGHT p.c.f.	DEPTH IN FEET	USCS CLASSIFICATION	DESCRIPTION
100/3"				CL	SANDY CLAY, gray-brown, dry to moist, hard some gravel
55			5	SP	GRAVELLY SAND, gray-brown, moist, dense trace clay
32					
50/6"			10		very dense little clay
				SC	CLAYEY SAND, red-brown, moist, very dense some gravel
95			15		
				CL	SANDY CLAY, light yellow-brown, moist, hard trace gravel below 18 feet some gravel
100/6"			20		Boring terminated at 21 feet No free water encountered during drilling

PLATE 9

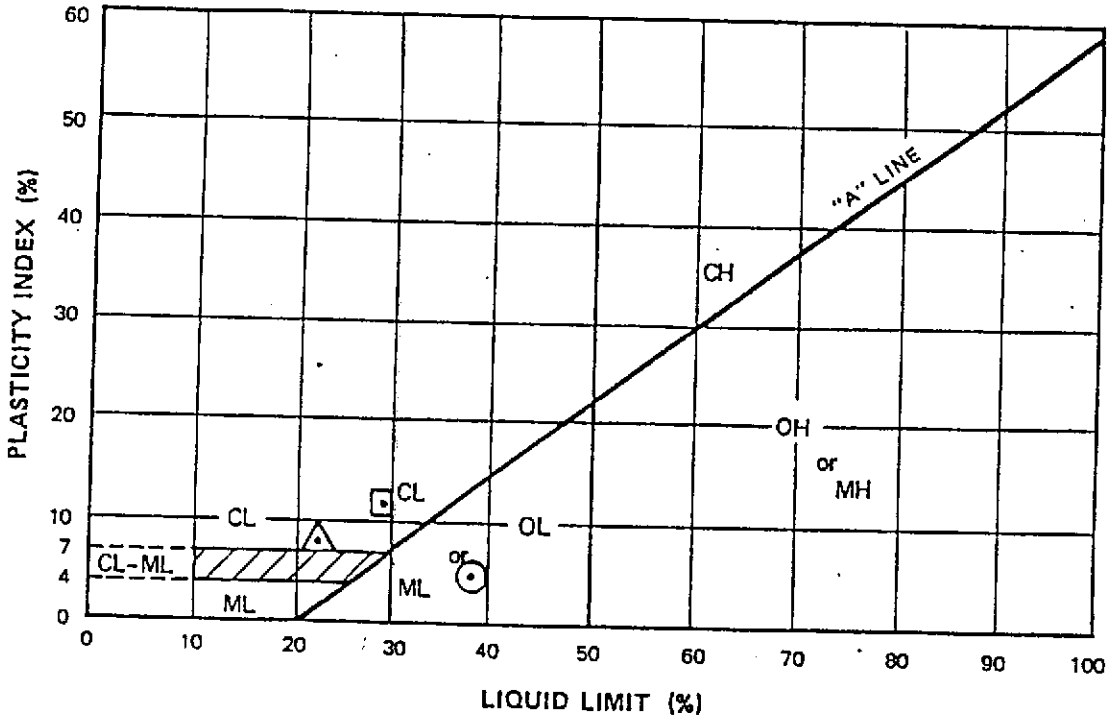
MAJOR DIVISIONS			CLASSIFICATION	TYPICAL NAMES
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN # 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL – SAND MIXTURES
			GP	POORLY GRADED GRAVELS; GRAVEL – SAND MIXTURES
		GRAVEL 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 SIZE	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 MORE THAN HALF IS SMALLER THAN # 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 DIATOMACIOUS 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 SILTS

UNIFIED SOIL CLASSIFICATION SYSTEM

Blows per ft.	Moisture Content %	Dry Unit Weight (PCF)	Depth in feet	USCS Classification	DESCRIPTION
					Bulk sample
					2.5" I.D. Split Barrel Sample
					2.8" I.D. Shelby Tube Sample
					No sample recovered
					Standard Penetration Test Interval.
					Well defined stratum change.
					Gradual stratum change
					Interpreted stratum change
					Apparent ground water level at date noted. Seasonal weather conditions, site topography, etc., may cause changes in water level indicated on logs

NOTE: Soils described as dry, moist, and wet are estimated to be dry of optimum, near optimum, and wet of optimum moisture content, respectively. Saturated soils are estimated to be within areas of free groundwater.

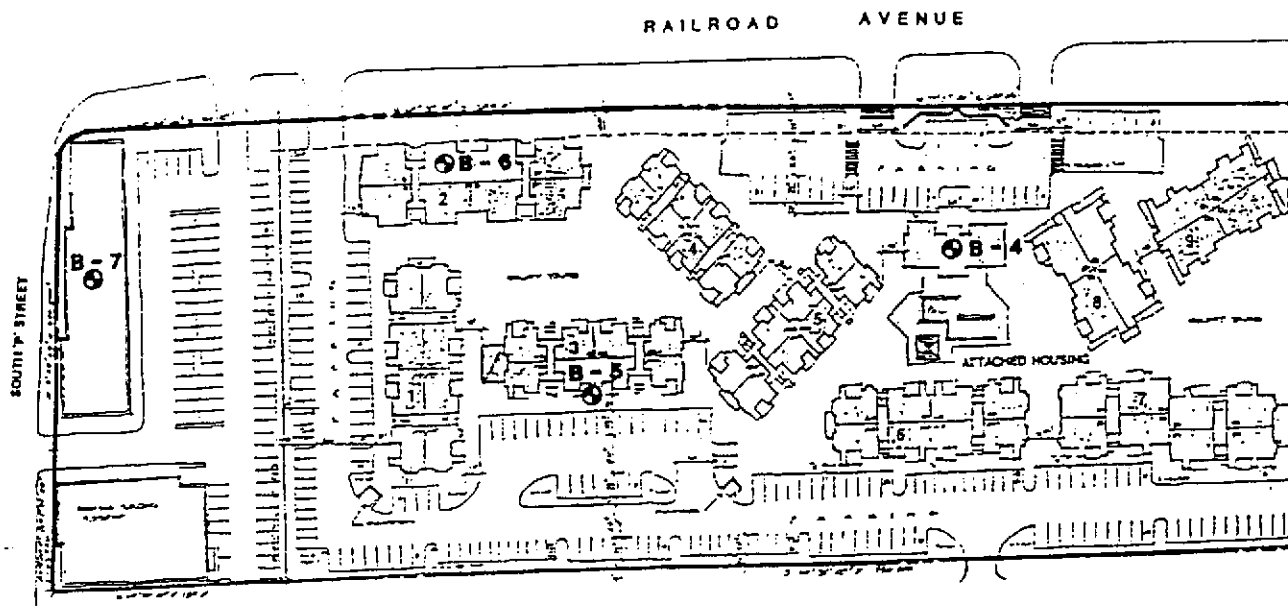
KEY TO BORING LOG SYMBOLS



SYMBOL	BORING NO.	DEPTH, FT.	LIQUID LIMIT, %	PLASTICITY INDEX, %	USCS SYMBOL
⊙	B-4	3-3½	38	5	ML
△	B-5	1½-2	22	8	CL
⊡	B-7	2-3½	29	12	CL

ATTERBERG LIMITS TEST DATA

JOB NUMBER: 1387.200.1 DATE: 11-4-87 BY: WPS/CR

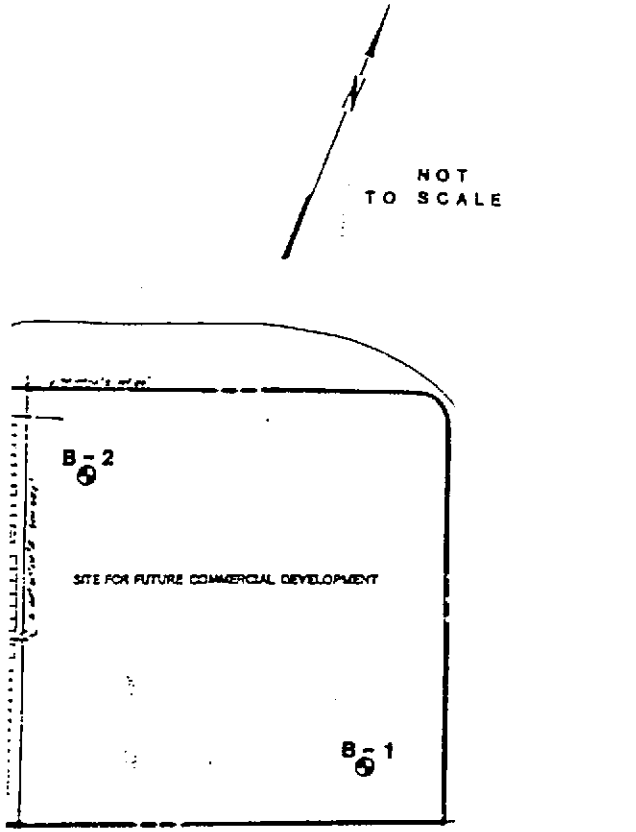


EXPLANATION

LIMITS OF INVESTIGATION

B-7 TEST BORING LOCATION

REFERENCE: BASE PLAN SUPPLIED BY CLIENT



SITE PLAN

SUPER BLOCK
RAILROAD AVENUE
LIVERMORE, CALIFORNIA
FOR
THE JONATHAN GROUP, INC

Berlogar Geotechnical Consultants
SOIL ENGINEERS