REPORT
OF A
PAVEMENT DESIGN

FOR

LEMAY AVENUE AND
SOUTHRIDGE GREENS BOULEVARD

ENGINEERING PROFESSIONALS, INC.
FORT COLLINS, COLORADO
PROJECT NO. 5074-83

BY

EMPIRE LABORATORIES, INC.
214 NORTH HOWES STREET
FORT COLLINS, COLORADO 80521

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April 8, 1983

Engineering Professionals, Inc.
2625 Redwing Road
Drake Executive Plaza, Suite 110
Fort Collins, Colorado 80526

Gentlemen:

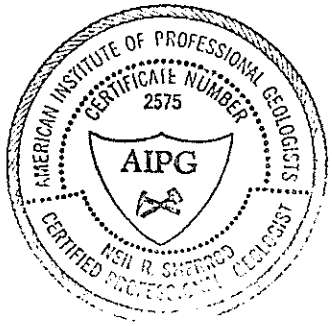
We are pleased to submit our Report of a Pavement Design prepared for the paving of Lemay Avenue from Oak Ridge Drive to Fossil Creek and Southridge Greens Boulevard located from Lemay Avenue to the Mail Creek Ditch, south of Fort Collins, Colorado.

The accompanying report presents our findings in the subsurface and our recommendations for pavement design based upon these findings.

Very truly yours,

EMPIRE LABORATORIES, INC.

Neil R. Sherrod
Senior Engineering Geologist



Reviewed by:

Chester C. Smith, P.E.
President

clc

REPORT
OF A
PAVEMENT DESIGN

SCOPE

This report presents the results of a pavement design prepared for a portion of Lemay Avenue between Oak Ridge Drive and Fossil and Southridge Greens Boulevard from Lemay Avenue to the Mail Creek Ditch, Larimer County, Colorado. The scope of the project included test borings and laboratory testing of samples obtained from these borings.

The objectives of this study were to (1) determine the soil and groundwater conditions at the site, (2) develop criteria for determining pavement design, (3) make recommendations regarding pavement types and thicknesses for the proposed streets to be constructed at the site, and (4) determine the suitability of the site for proposed box culvert construction.

SITE EXPLORATION

The field exploration, carried out on March 29 and April 5, 1983, consisted of drilling, logging, and sampling thirteen (13) test borings. The locations of the test borings are shown on the Test Boring Location Plan included in Appendix A of this report. Boring logs prepared from the field logs are shown in Appendix A. These logs show soils encountered, location of sampling, and groundwater at the time of the exploration.

The borings were advanced with a four-inch diameter, continuous-type, power-flight auger drill. During the drilling operation, a a geotechnical engineer from Empire Laboratories, Inc. was present and made continuous observations of the soils encountered.

SITE LOCATION AND DESCRIPTION

The proposed site consists of Lemay Avenue from Oak Ridge Drive to Fossil Creek and Southridge Greens Boulevard from Lemay Avenue to

the Mail Creek Ditch. More particularly, the site is described as a tract of land situate in the west 1/2 of Section 6 and the northwest 1/4 of Section 7, Township 6 North, Range 68 West and the east 1/2 of Section 1 and the northeast 1/4 of Section 12, Township 6 North, Range 69 West of the Sixth P.M., Larimer County, Colorado.

The proposed roadways traverse rolling farm and pasture land and several residences. Lemay Avenue consists of an existing gravel county Road, and Southridge Greens Boulevard traverses an area currently under construction. The northern portion of the site has positive drainage to the northeast, and the southern portion of the site drains to the south and southeast toward Fossil Creek. The area of Southridge Greens Boulevard is currently under construction. Site grading has been done in portions of the site. Approximately ten (10) feet has been cut in the area of Boring 2.

LABORATORY TESTS AND EVALUATION

Samples obtained from the test borings were subjected to testing in the laboratory to provide a sound basis for evaluating the physical properties of the soils encountered. Moisture contents, dry unit weights, unconfined compressive strengths, water soluble sulfates, and the Atterberg limits were determined. A summary of the test results is included in Appendix B. Hveem stabilometer tests were run to determine the "R" values of representative subgrade material at the site, and curves showing this data are included in Appendix B. In addition, consolidation characteristics were also determined, and a curve showing this data is also included in Appendix B.

SOIL AND GROUNDWATER CONDITIONS

The soil profile at the site consists of strata of materials arranged in different combinations. In order of increasing depths, they are as follows:

(1) Existing Surfacing: Lemay Avenue is overlain by an approximate six (6) inch layer of gravel surfacing material. The gravel surfacing may be stockpiled and ruesed as subbase material.

(2) Silty Topsoil: A six (6) inch layer of silty topsoil was encountered in Boring 1 drilled on Southridge Greens Boulevard. The topsoil has been penetrated by root growth and organic matter and should not be used as a subgrade or embankment material for the proposed roadway.

(3) Fill Material: A one (1) foot layer of fill was encountered below the gravel surfacing in Boring 5. It is anticipated that minor amounts of fill will be encountered below other portions of the roadway. The fill consists of a mixture of sand, silt, and clay and is suitable as embankment or subgrade material.

(4) Silty Clay: This stratum underlies the surface and/or gravel surfacing in Borings 1 through 5 for Lemay Avenue and Borings 2 and 3 of Southridge Greens Boulevard and extends to depths two and one-half (2-1/2) to great than nine and one-half (9-1/2) feet below the surface. The silty clay is plastic, contains minor amounts of sand, and is damp to moist in its natural state.

(5) Sandy Silty Clay: This stratum underlies the gravel surfacing, fill, topsoil and upper clay at depths one and one-half (1-1/2) to four (4) feet below the surface in Borings 2 through 9 for Lemay Avenue and Borings 1 through 3 for Southridge Greens Boulevard and extends to the bedrock below or the depths explored. The sandy silty clay is moderately plastic, is moist, and exhibits low to moderate bearing characteristics. When wetted, the shearing strength of the sandy silty clay is reduced; and upon loading, consolidation occurs.

(6) Siltstone-Claystone Bedrock: The bedrock was encountered in Boring 7 for Lemay Avenue and Boring 1 for Southridge Greens Boulevard at depths seven and one-half (7-1/2) to nine (9) feet below the surface and extends to greater depths. The upper one (1) foot of the bedrock is highly weathered; however, the underlying siltstone-claystone is firm to dense.

(7) Groundwater: At the time of the investigation, free groundwater was encountered at depths four and one-half (4-1/2) to six and one-half (6-1/2) feet below the surface in Borings 3 and 4 for Lemay Avenue. No free groundwater was encountered in the remaining test borings to the depths explored. Water levels in this area are subject to change due to seasonal variations and irrigation demands on and/or adjacent to the roadways.

RECOMMENDATIONS AND DISCUSSION

It is our understanding that Lemay Avenue is be widened to four lanes and paved and that Southridge Greens Boulevard is to be constructed as a four-lane roadway with a center median. Lemay Avenue has been classified as a minor arterial street, and Southridge Greens Boulevard has been classified as a collector street by the City of Fort Collins. A box culvert is to be constructed to carry the Mail Creek Dich below Lemay Avenue.

Site Grading

It is recommended that the existing gravel surfacing encountered at the site be stripped and stockpiled for reuse as subbase for the new roadway sections. The upper six (6) inches of the natural subgrade and/or existing fill below roadway sections should be scarified and recompacted at or wet of optimum moisture to at least ninety-five percent (95%) of Standard Proctor Density ASTM D 698-78. (See Appendix C.)

All fill should consist of the on-site soils or imported material having an "R" value of 7 or greater for Lemay Avenue and 5 or greater for Southridge Greens Boulevard, and this material should be approved by the geotechnical engineer. Any fill placed at the site should be placed in uniform six (6) to eight (8) inch lifts and compacted at or slightly wet of optimum moisture to at least ninety-five percent (95%) of Standard Proctor Density ASTM D 698-78. The finished subgrade in cut sections below streets should be scarified a minimum of six (6) inches and recompacted at or wet of optimum moisture to at least ninety-five percent (95%) of Standard Proctor Density ASTM D 698-78. Where possible, cut and fill slopes should be placed on grades no steeper than 2:1. It is our understanding that due to right-of-way space problems, slopes as steep as 1½:1 are being considered in portions of the roadway area along Lemay Avenue. These steeper slopes may be constructed if special care is taken. It is suggested that additional precautions should be taken to provide good drainage away from the steeper slopes. Swales or drainage ditches should be constructed to minimize slope wash on cut and fill faces. Minor sloughing may occur on these steep slopes requiring periodic maintenance. Seeding of all cut and fill slopes is recommended but hydroseeding of the steeper slopes immediately after construction is strongly recommended. Each successive lift of fill placed on slopes should be benched slightly into existing grade. It is recommended that all stripping, subgrade preparation, and fill placement be inspected by the geotechnical engineer. Field density tests should be taken in the compacted subgrade and fill under the supervision of the geotechnical engineer to insure proper compaction.

Flexible Pavement

It is our opinion that flexible pavement is suitable for the proposed street construction at the site. The flexible pavement should consist of asphaltic concrete underlain by crushed aggregate base course and subbase or asphaltic concrete underlain by plant mix bituminous base course. Using the City of Fort Collins "Design Criteria and Standards for Streets," a serviceability index of 2.5, a regional factor of 0.75, an

"R" value of 7 for Lemay Avenue and an "R" 5 for Southridge Greens Boulevard, a twenty (20) year design life, an eighteen (18) kip equivalent daily load application of 85 for Lemay Avenue and 20 for Southridge Greens Boulevard, and weighted structural numbers of 3.40 for Lemay Avenue and 2.75 for Southridge Greens Boulevard, the following pavement thicknesses are recommended:

Lemay Avenue

Asphaltic Concrete	4"
Crushed Aggregate Base Course	8"
Select Subbase	7"
Total Pavement Thickness	19"

Asphaltic Concrete	2"
Plant Mix Bituminous Base Course	7½"
Total Pavement Thickness	9½"

Southridge Greens Boulevard

Asphaltic Concrete	3"
Crushed Aggregate Base Course	6"
Select Subbase	7"
Total Pavement Thickness	16"

Asphaltic Concrete	2"
Plant Mix Bituminous Base Course	5½"
Total Pavement Thickness	7½"

The select subbase and crushed aggregate base course should meet City of Fort Collins specifications. It is recommended that the on-site gravel surfacing and/or Class 1 material be used for the subbase. The crushed aggregate base course should meet Class 6 specifications. The subgrade below the proposed asphalt pavement should be prepared in accordance with the recommendations discussed in the "Site Grading" section of this report. Upon proper preparation of the subgrade, the subbase and base course should be placed and compacted at optimum moisture to at least ninety-five percent (95%) of Standard Proctor Density ASTM D 698-78. (See Appendix C.)

It is recommended that the asphaltic concrete and/or plant mix bituminous base be placed in two (2) to three (3) inch lifts. All plant mix base course and asphaltic concrete shall meet City of Fort Collins specifications and should be placed in accordance with these specifications. All subbase material shall have an "R" value of 69 or greater, the crushed aggregate base course shall have an "R" value of 78 or greater, the plant mix bituminous base course shall have an Rt value of 90 or greater, and the asphaltic concrete shall have an Rt value of 95 or greater. Field density tests should be taken in the aggregate base, bituminous base, and asphalt under the direction of the geotechnical engineer.

Box Culvert

It is recommended that the proposed box culvert be founded on the original, undisturbed soil. In no case should the box culvert be founded on the existing fill encountered at the site. The identification and undisturbed nature of the soil should be verified by the geotechnical engineer prior to placement of any foundation concrete. The box culvert founded on the original, undisturbed soil may be designed for a maximum allowable bearing capacity of one thousand (1000) pounds per square foot (dead load plus maximum live load). The bottom of the box culvert should be placed a minimum of thirty (30) inches below the flow line of the Mail Creek Ditch for frost protection. The predicted settlement under the above maximum loading should be less than one-half (1/2) inch, generally considered to be within acceptable tolerances.

A cutoff wall should be provided below the upstream end of the box culvert to minimize erosion below the culvert. The box culvert and wing walls should be backfilled with the on-site silty clay or sandy silty clay or imported material approved by the geotechnical engineer. The backfill should be placed in uniform six (6) to eight (8) inch lifts and compacted at or near optimum moisture to at least ninety-five percent (95%) of Standard Proctor Density ASTM D 698-78. (See Appendix C.) Puddling of the backfill should not be permitted as a method of compaction. The box culvert walls and wing walls should be designed

using a hydrostatic pressure distribution and equivalent fluid pressure of backfill of sixty (60) pounds per square foot per foot height of wall for the on-site clays compacted to the above-required density. It is recommended that all compaction requirements be verified in the field by field density tests performed under the direction of the geotechnical engineer.

GENERAL COMMENTS

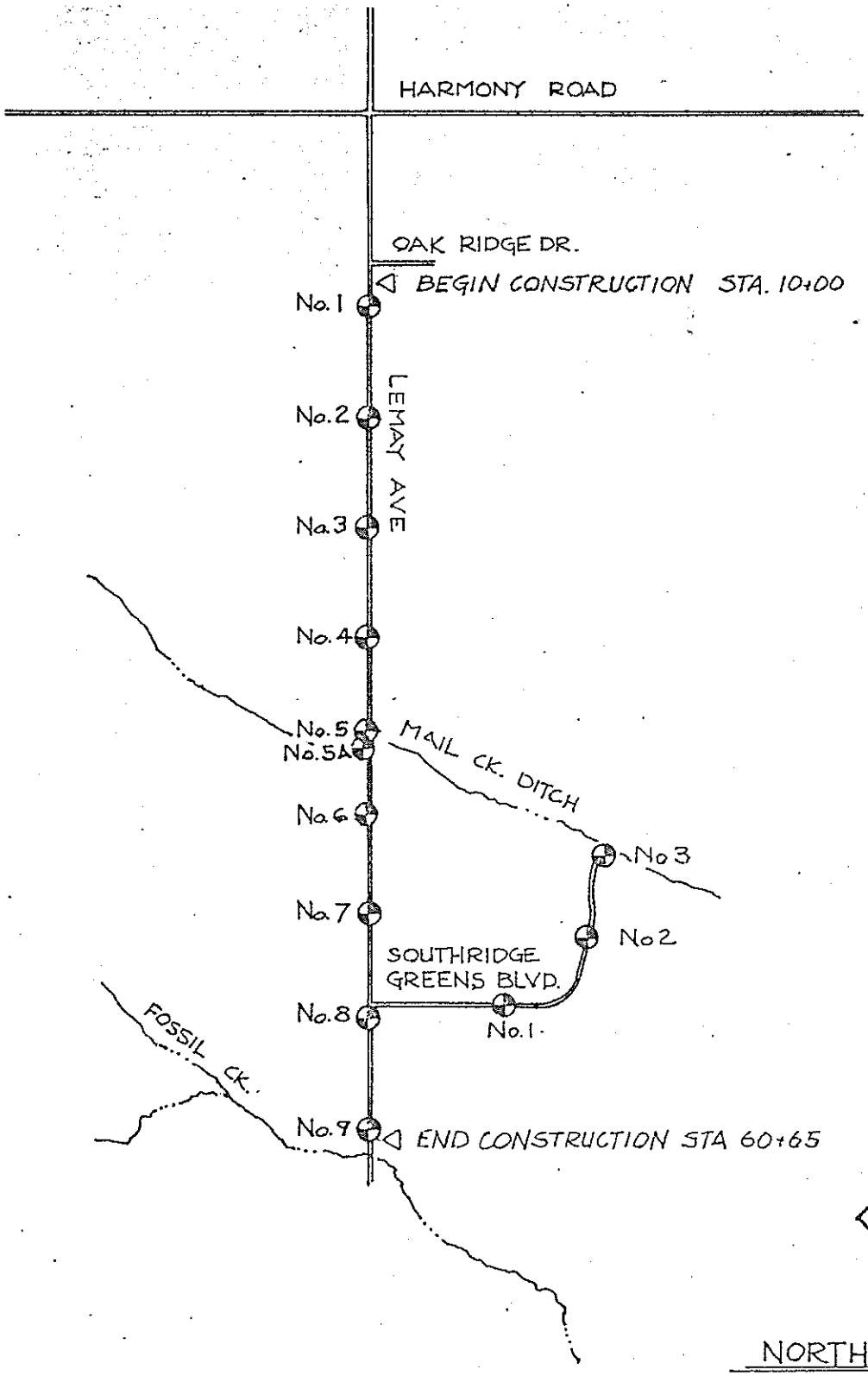
This report has been prepared to aid in the evaluation of the property and to assist the engineer in the design of this project. In the event that any changes in the street designs are planned, the conclusions and recommendations contained in this report will not be considered valid unless said changes are reviewed and conclusions of this report modified or approved in writing by Empire Laboratories, Inc., the geotechnical engineer of record.

Every effort was made to provide comprehensive site coverage through careful locations of the test borings, while keeping the site investigation economically feasible. Variations in soil and groundwater conditions between test borings may be encountered during construction. In order to permit correlation between the reported subsurface conditions and the actual conditions encountered during construction and to aid in carrying out the plans and specifications as originally contemplated, it is recommended that Empire Laboratories, Inc. be retained to perform continuous construction review during the excavation and foundation phases of the work. Empire Laboratories, Inc. assumes no responsibility for compliance with the recommendations included in this report unless they have been retained to perform adequate on-site construction review during the course of construction.

APPENDIX A.

TEST BORING LOCATION PLAN

LEMAY AVE ℄ SOUTHRIDGE GREENS BLVD.



KEY TO BORING LOGS


TOPSOIL


FILL


SILT


CLAYEY SILT


SANDY SILT


CLAY


SILTY CLAY


SANDY CLAY


SAND


SILTY SAND


CLAYEY SAND


SANDY SILTY CLAY


GRAVEL


SAND & GRAVEL


SILTY SAND & GRAVEL


COBBLES


SAND, GRAVEL & COBBLES


WEATHERED BEDROCK


SILTSTONE BEDROCK


CLAYSTONE BEDROCK


SANDSTONE BEDROCK

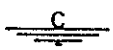

LIMESTONE


GRANITE


SHELBY TUBE SAMPLE


STANDARD PENETRATION DRIVE SAMPLER


WATER TABLE 24 HOURS AFTER DRILLING

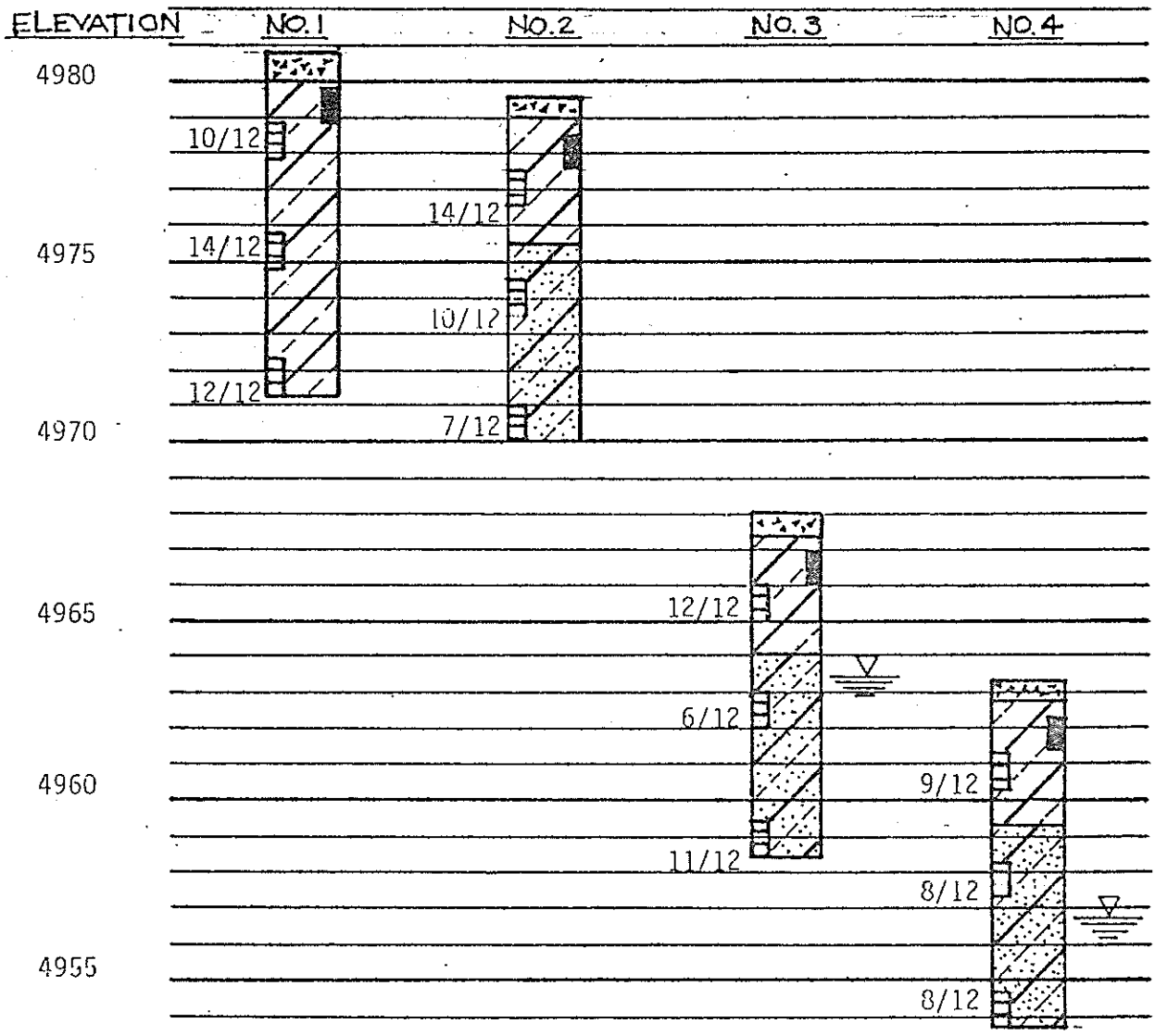


HOLE CAVED

5/12 Indicates that 5 blows of a 140 pound hammer falling 30 inches was required to penetrate 12 inches.

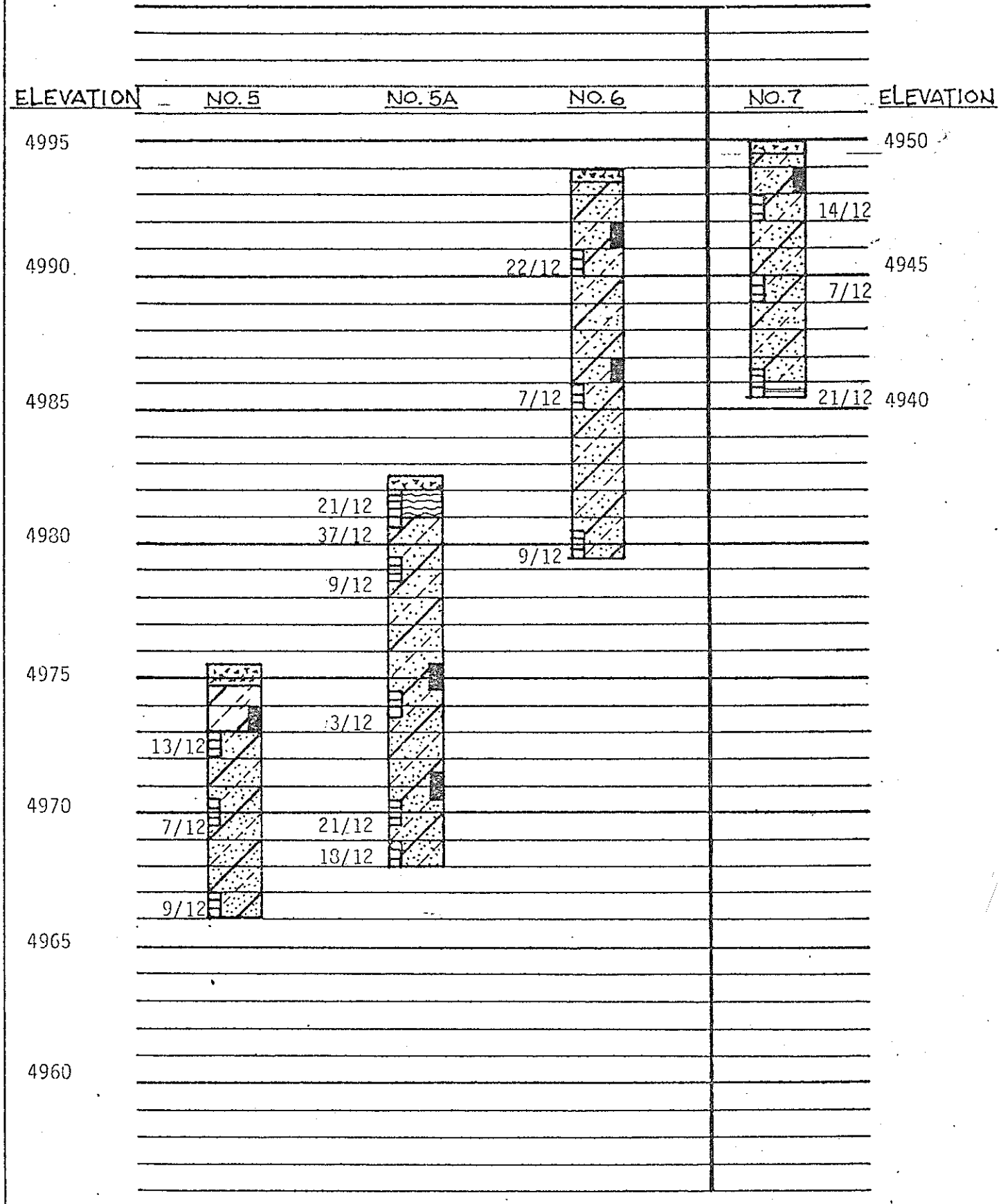
LOG OF BORINGS

LEMAY AVENUE

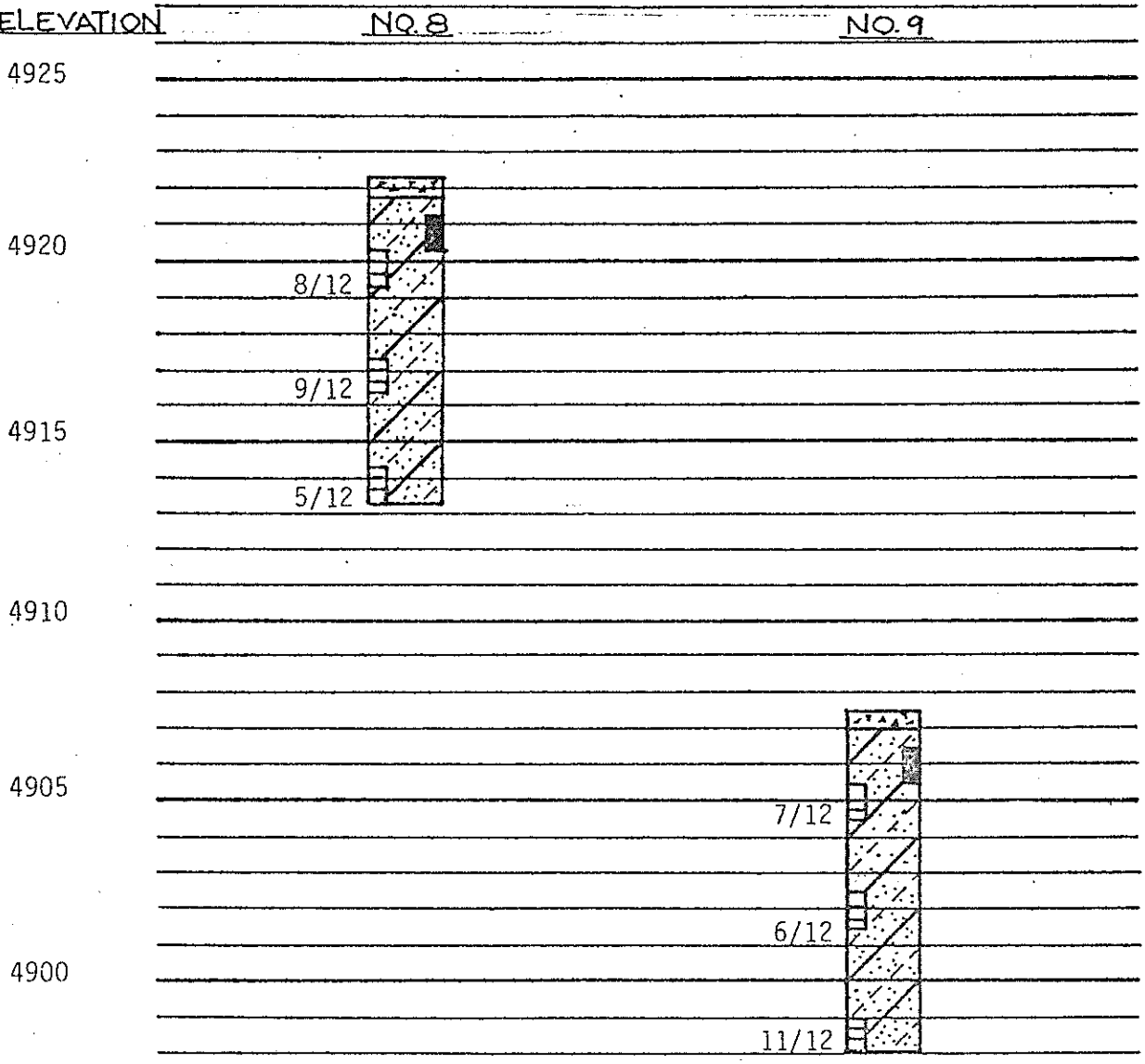


Elevations interpolated from plans and profile provided by Engineering Professionals, Inc. dated February 1983.

LOG OF BORINGS
LEMAY AVENUE

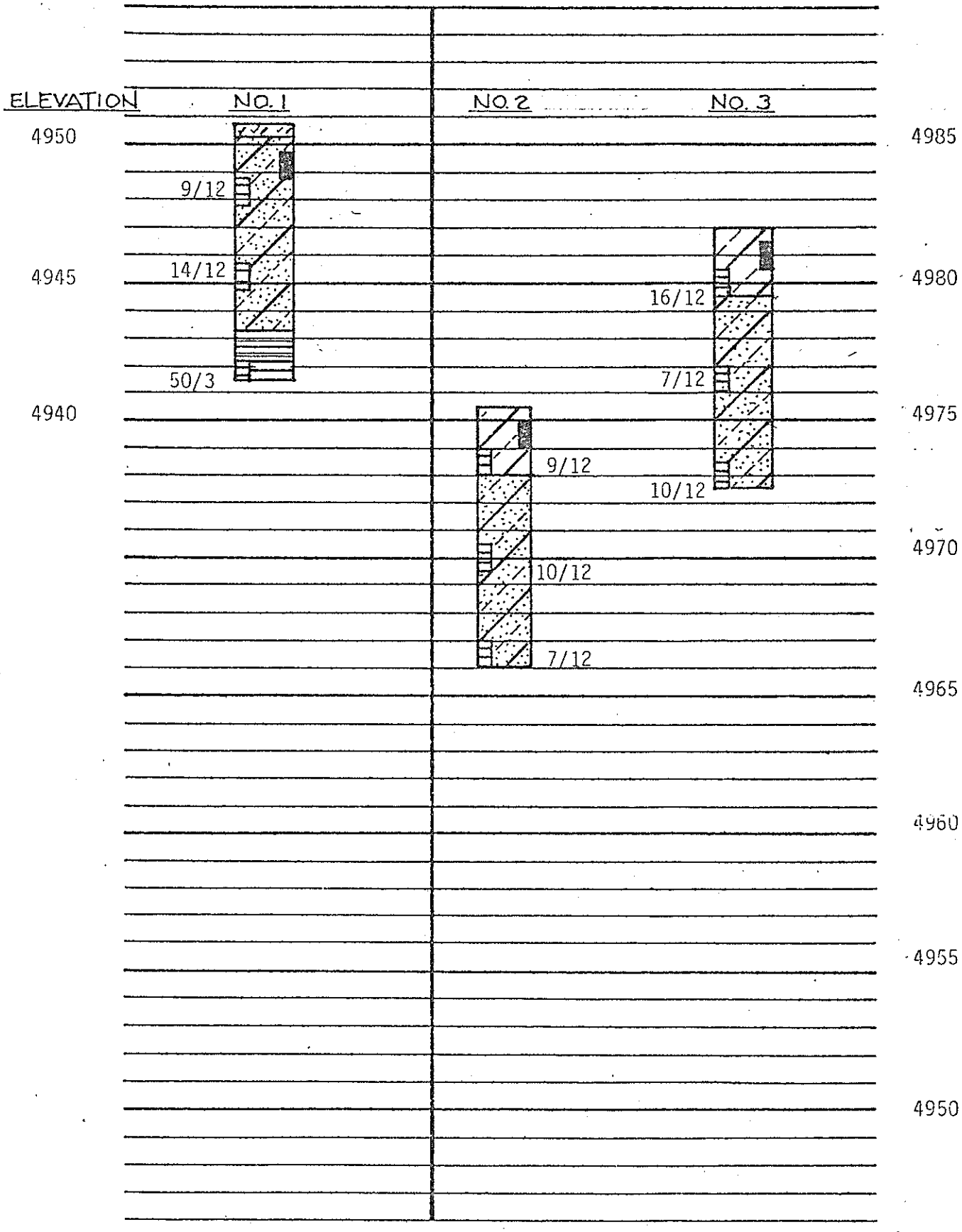


LOG OF BORINGS
LEMAY AVENUE



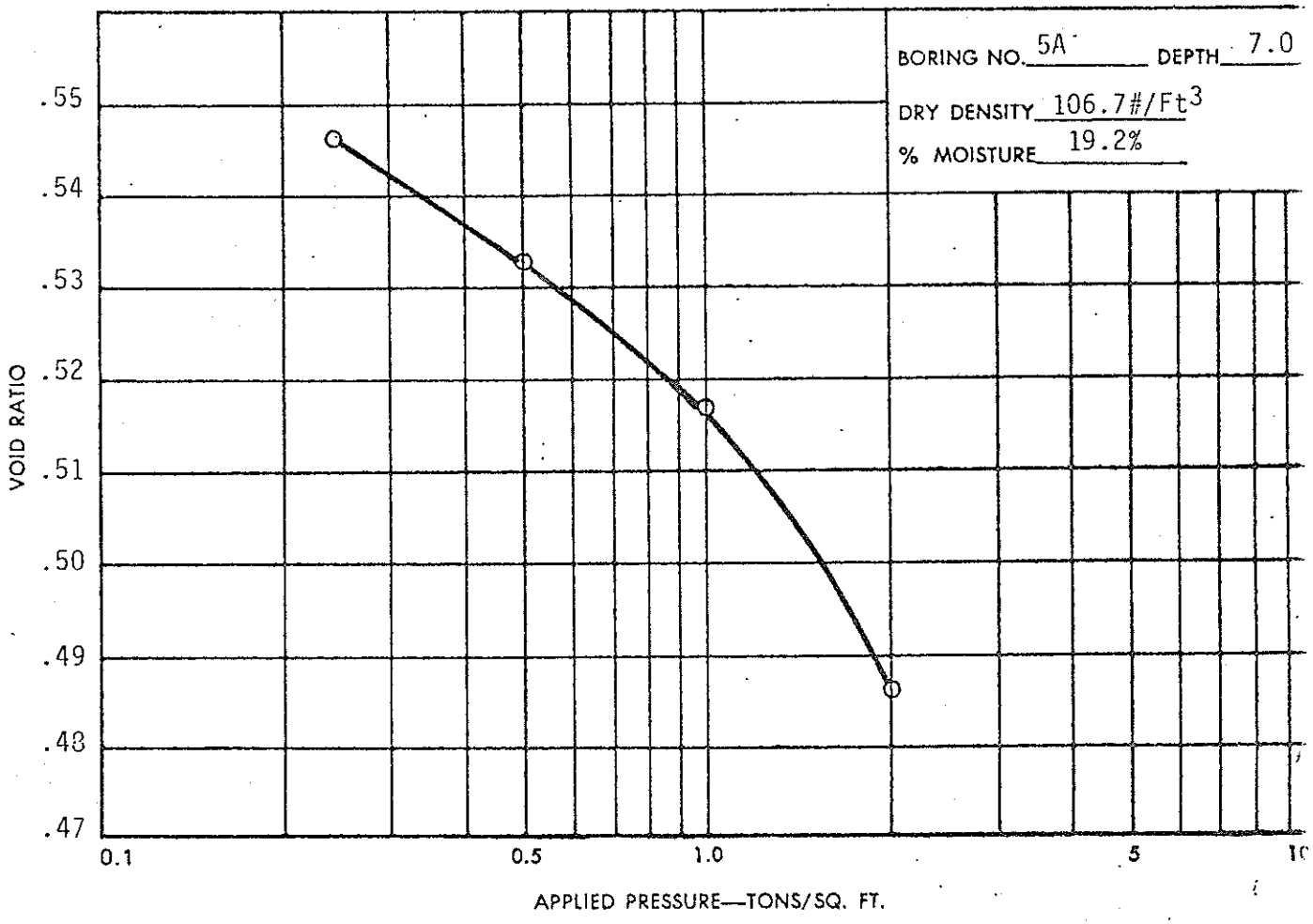
LOG OF BORINGS

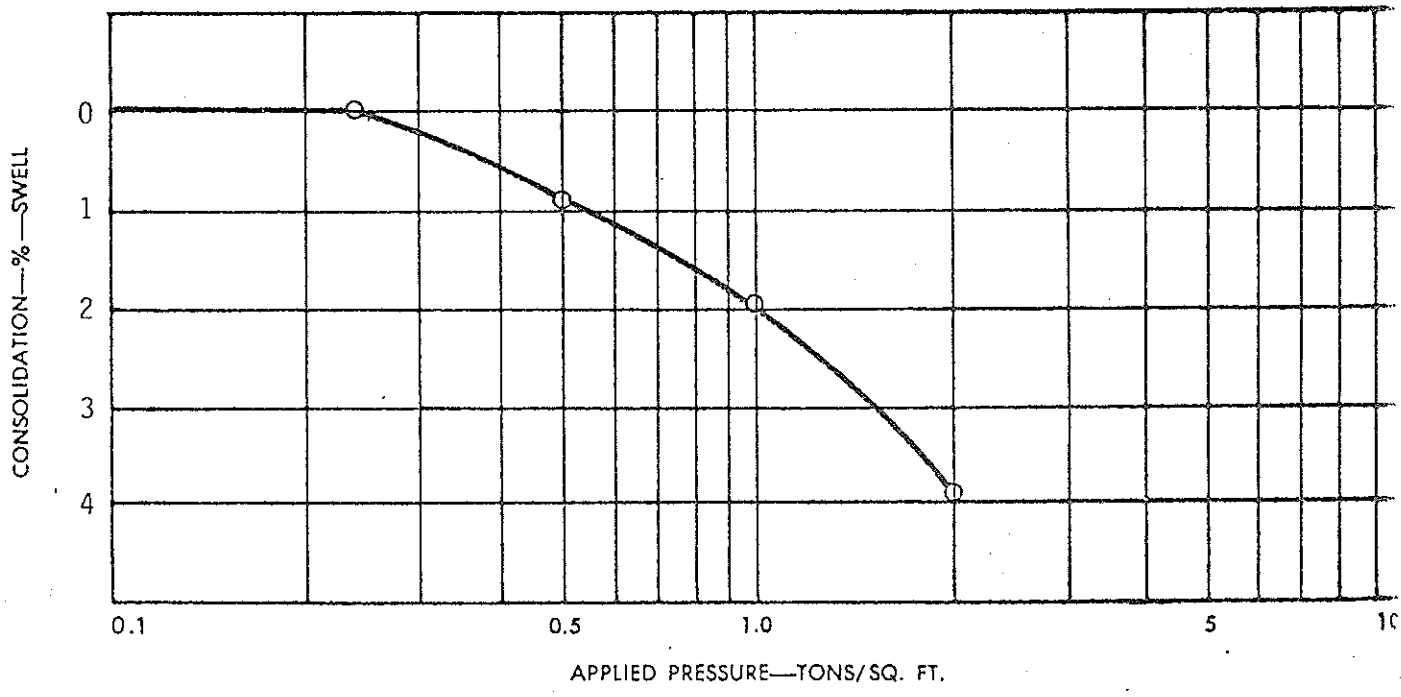
SOUTHRIDGE GREENS BOULEVARD



APPENDIX B.

CONSOLIDATION--SWELL TEST





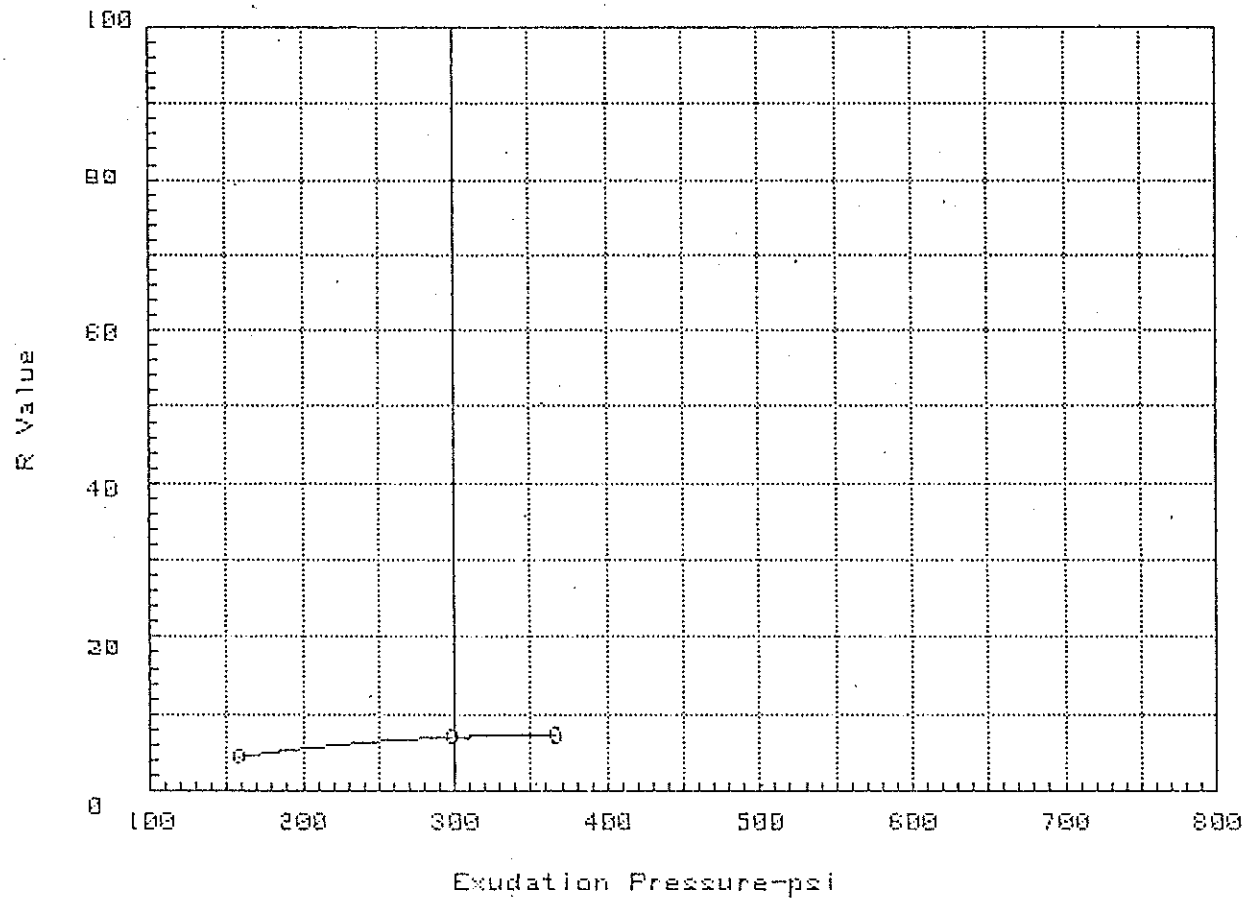
STABILOMETER
TEST RESULTS

Client ENGINEERING PROFESSIONALS

Project SOUTH LEMAY AVENUE

Boring 2 Depth 0.5 - 3.5

R Value at 300 psi exudation 7.0



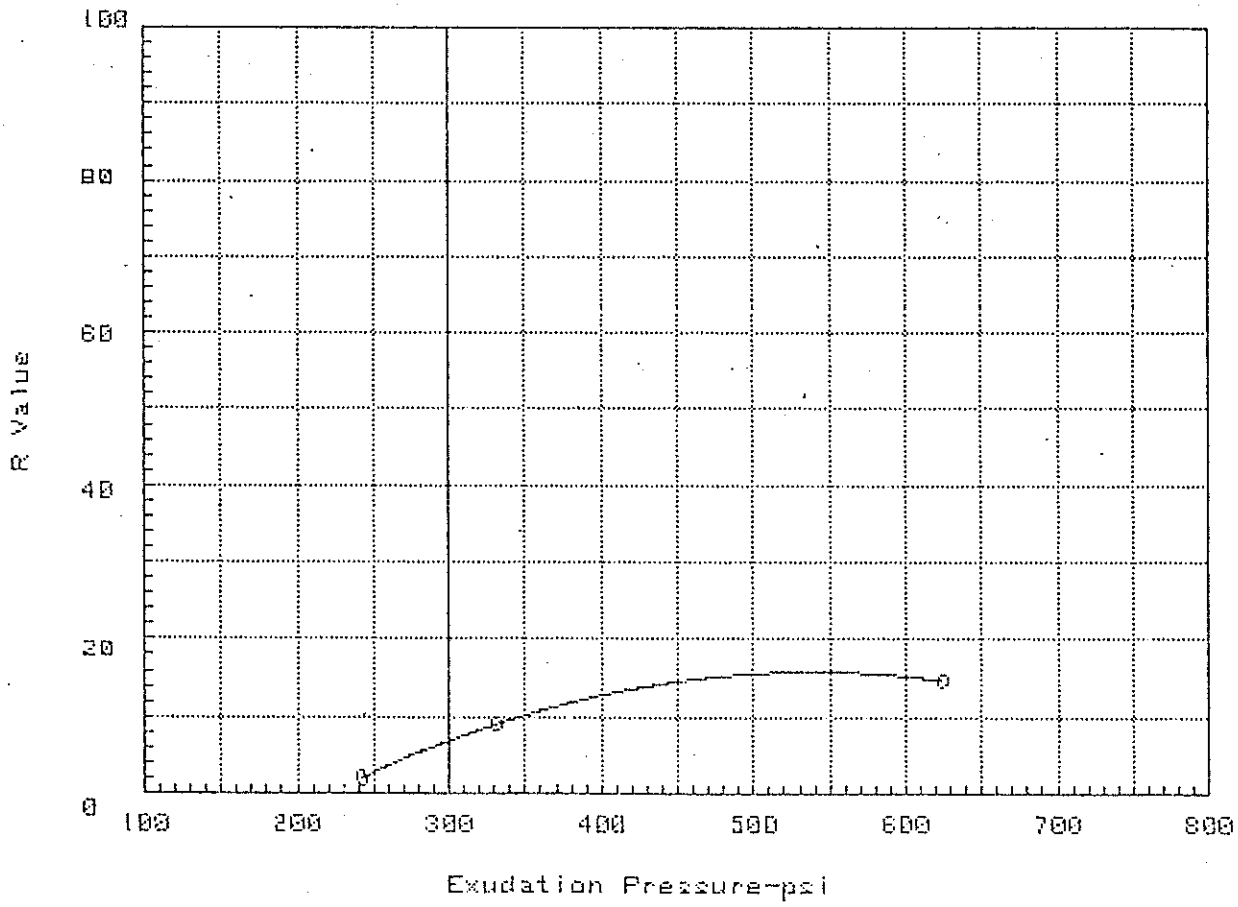
STABILOMETER TEST RESULTS

Client ENGINEERING PROFESSIONALS

Project SOUTH LEMAY AVENUE

Boring 9 Depth 1.0 - 3.5

R Value at 300 psi exudation 7.5



"R" VALUE DATA

Boring No. Depth (Ft.)	Compaction Pressure (PSI)	Density (PCF)	Moisture (%)	Expansion Pressure (PSI)	Horizontal Pressure (PSI)*	Sample Height (In.)	Stabilometer R-Value**	Design R-Value
Lemay Avenue								
2 @ 0.5-3.5'	0	90.9	31.5	0	145	2.53	4.4	---
	0	95.8	27.8	0	143	2.47	7.0	---
	0	101.0	24.0	0	142	2.59	7.3	7.0
9 @ 1.0-3.5'	0	95.6	28.2	0	153	2.39	2.0	---
	0	104.6	23.4	0	135	2.45	9.0	---
	125	114.5	18.7	0	120	2.55	14.7	7.5
Southridge Greens Boulevard								
2 @ 0.5-2.0'	0	96.6	32.1	---	---	2.40	≤5	≤5

* At 160 psi vertical pressure
** $100 - 100/((2.5/D)(160/Ph - 1) + 1)$

LEMAY AVENUE

SUMMARY OF TEST RESULTS

Boring No.	Depth (Ft.)	Moisture (%)	Dry Density (PCF)	Compressive Strength (PSF)	Swell Pressure (PSF)	Soluble Sulfates (%)	pH	Liquid Limit (%)	Plasticity Index (%)	Group Index	Classification AASHTO USCS	Resistivity (OHM-CM)	Penetration Blows/In.
1	1.0-2.0	25.7	96.4					52.3	26.1	24.5	A-7-6(25); CH		
	2.0-3.0	22.2											10/12
	5.0-6.0	21.3											14/12
	8.5-9.5	22.2											12/12
2	1.0-2.0	20.5	103.2										
	2.0-3.0	19.8											14/12
	5.0-6.0	22.4											10/12
	8.5-9.5	22.9											7/12
Composite Sample	0.5-3.5							45.3	26.9	19.6	A-7-6(20); CL		
3	1.0-2.0	23.3	103.2					42.8	22.6	18.4	A-7-6(18); CL		
	2.0-3.0	20.0											12/12
	5.0-6.0	27.6											6/12
	8.5-9.5	22.3											11/12
4	1.0-2.0	20.6	101.9					42.2	20.6	17.5	A-7-6(18); CL		
	2.0-3.0	21.6											9/12
	5.0-6.0	24.7											8/12
	8.5-9.5												8/12
5	1.5-2.5	19.6	96.2										
	2.5-3.5	19.2											13/12
	5.0-6.0	18.4											7/12
	8.5-9.5	19.0											9/12
Composite Sample	1.0-3.5							42.6	24.1	12.9	A-7-6(13); CL		

SUMMARY OF TEST RESULTS

Boring No.	Depth (Ft.)	Moisture (%)	Dry Density (PCF)	Compressive Strength (PSF)	Swell Pressure (PSF)	Soluble Sulfates (%)	pH	Liquid Limit (%)	Plasticity Index (%)	Group Index	Classification AASHTO USCS	Resistivity (OHM-CM)	Penetration Blows/In.
5a	0.0-1.0	15.8											21/12
	1.0-2.0	13.5											37/12
	3.0-4.0	15.2											9/12
	7.0-8.0	19.2	100.0	1420		.0002							
	8.0-9.0												3/12
	11.0-12.0	5.8	121.0	980									
	12.0-13.0	17.6											21/12
	13.5-14.5	18.0											18/12
6	2.0-3.0	17.0	107.3					36.9	19.7	13.8	A-6(14); CL		22/12
	3.0-4.0	15.8											7/12
	7.0-8.0	15.5	111.2					33.6	16.5	10.0	A-6(10); CL		
	8.0-9.0	15.7											9/12
7	1.0-2.0	13.8	107.6					34.6	16.0	8.5	A-6(9); CL		
	2.0-3.0	14.9											14/12
	5.0-6.0	16.6											7/12
	8.5-9.5	16.6											21/12
8	1.0-2.0	17.5	108.3										
	2.0-3.0	14.3											8/12
	5.0-6.0	17.2											9/12
	8.0-9.0	16.9											5/12
Composite Sample	1.0-3.5							33.3	17.0	7.5	A-6(8); CL		
9	1.0-2.0	15.0	111.9										
	2.0-3.0	19.9											7/12
	5.0-6.0	24.7											6/12
	8.5-9.5	26.1											11/12
Composite Sample	1.0-3.5							34.2	17.7	13.7	A-6(14); CL		

SOUTHRIDGE GREENS BOULEVARD

SUMMARY OF TEST RESULTS

Boring No.	Depth (Ft.)	Moisture (%)	Dry Density (PCF)	Compressive Strength (PSF)	Swell Pressure (PSF)	Soluble Sulfates (%)	pH	Liquid Limit (%)	Plasticity Index (%)	Group Index	Classification AASHTO USCS	Resistivity (OHM-CM)	Penetration Blows/In.
1	1.0-2.0	24.3	100.0					38.4	19.4	13.3	A-6(13); CL		
	2.0-3.0	11.8											9/12
	5.0-6.0	16.0											14/12
	8.5-9.5	15.7											50/3
2	0.5-1.5	19.7	98.7										
	1.5-2.5	13.3											9/12
	5.0-6.0	12.6											10/
	8.5-9.5	12.4											7/12
Composite Sample	0.5-2.0							40.7	20.5	16.1	A-7-6(16); CL		
3	0.5-1.5	18.0	101.5										
	1.5-2.5	12.1											16/12
	5.0-6.0	17.8											7/12
	8.5-9.5	15.0											10/12
Composite Sample	0.5-3.5							38.8	20.0	12.4	A-6(12); CL		

APPENDIX C.

APPENDIX C.

Suggested Specifications for Placement of Compacted Earth Fill and/or Backfills.

GENERAL

A soils engineer shall be on-site to provide continuous observation during filling and grading operations and shall be the owner's representative to inspect placement of all compacted fill and/or backfill on the project. The soils engineer shall approve all earth materials prior to their use, the methods of placing, and the degree of compaction obtained.

MATERIALS

Soils used for all compacted fill and backfill shall be approved by the soils engineer prior to their use. The upper two (2) feet of compacted earth backfill placed adjacent to exterior foundation walls shall be an impervious, nonexpansive material. No material, including rock, having a maximum dimension greater than six inches shall be placed in any fill. Any fill containing rock should be carefully mixed to avoid nesting and creation of voids. In no case shall frozen material be used as a fill and/or backfill material.

PREPARATION OF SUBGRADE

All topsoil, vegetation (including trees and brush), timber, debris, rubbish, and other unsuitable material shall be removed to a depth satisfactory to the soils engineer and disposed of by suitable means before beginning preparation of the subgrade. The subgrade surface of the area to be filled shall be scarified a minimum depth of six inches, moistened as necessary, and compacted in a manner specified below for the subsequent layers of fill. Fill shall not be placed on frozen or muddy ground.

PLACING FILL

No sod, brush, frozen or thawing material, or other unsuitable material shall be placed in the fill, and no fill shall be placed during unfavorable weather conditions. All clods shall be broken into small pieces, and distribution of material in the fill shall be such as to preclude the formation of lenses of material differing from the surrounding material. The materials shall be delivered to and spread on the fill surface in a manner which will result in a uniformly compacted fill. Each layer shall be thoroughly blade mixed during spreading to insure uniformity of material and moisture in each layer. Prior to compacting, each layer shall have a maximum thickness of eight inches, and its upper surface shall be approximately horizontal. Each successive 6" to 8" lift of fill being placed on slopes or hillsides should be benched into the existing slopes, providing good bond between the fill and existing ground.

MOISTURE CONTROL

While being compacted, the fill material in each layer shall as nearly as practical contain the amount of moisture required for optimum compaction or as specified, and the moisture shall be uniform throughout the fill. The contractor may be required to add necessary moisture to the fill material and to uniformly mix the water with the fill material if, in the opinion of the soils engineer, it is not possible to obtain uniform moisture content by adding water on the fill surface. If, in the opinion of the soils engineer, the material proposed for use in the compacted fill is too wet to permit adequate compaction, it shall be dried in an acceptable manner prior to placement and compaction.

COMPACTION

When an acceptable, uniform moisture content is obtained, each layer shall be compacted by a method acceptable to the soils engineer and as specified in the foregoing report as determined by applicable standards. Compaction shall be performed by rolling with approved tamping rollers,

pneumatic-tired rollers, three-wheel power rollers, vibratory compactors, or other approved equipment well-suited to the soil being compacted. If a sheepfoot roller is used, it shall be provided with cleaner bars attached in a manner which will prevent the accumulation of material between the tamper feet. The rollers should be designed so that effective weight can be increased.

MOISTURE-DENSITY DETERMINATION

Samples of representative fill materials to be placed shall be furnished by the contractor to the soils engineer for determination of maximum density and optimum moisture or percent of Relative Density for these materials. Tests for this determination will be made using methods conforming to requirements of ASTM D 698, ASTM D 1557, or ASTM D 2049. Copies of the results of these tests will be furnished to the owner, the project engineer, and the contractor. These test results shall be the basis of control for all compaction effort.

DENSITY TESTS

The density and moisture content of each layer of compacted fill will be determined by the soils engineer in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 2922. Any material found not to comply with the minimum specified density shall be recompacted until the required density is obtained. Sufficient density tests shall be made and submitted to support the soils engineer's recommendations. The results of density tests will also be furnished to the owner, the project engineer, and the contractor by the soils engineer.

FORT COLLINS
rials Testing Lab
Revised Sept. 15, 1977
ECI Form No. 21

NUCLEAR FIELD DENSITY REPORT

ASTM Designation D 2922-71
D 3017-72

Contractor Hahn Exc

24" H_2O in leeway from Southridge Grns Blvd - South

Test No.	1-W	2-W	3-W 10/15	4-W 10/15	5W 10/15
Location	100' S of Southridge Grns Blvd	200' S of Southridge Grns Blvd	100' S of Southridge Grns Blvd	250' S of Southridge Grns Blvd	50' S of Southridge Grns Blvd
Elevation below F.G.	-3.0	-3.0	-2.0	-2.5	-1.0
Probe Depth	8"	8"	8"	6"	8"
Density Count					
Density Count Ratio					
Wet Density PCF	107.6	102.8	117.4	112.1	119.5
Moisture Count					
Moisture Count Correct					
Adj. Moisture Count					
Moisture Count Ratio					
Moisture PCF					
Dry Density	96.1	93.6	102.3	100.5	103.4
% Moisture	12.0	9.8	14.8	11.5	15.6
Maximum Density	107.2	107.2	107.2	107.2	107.2
Optimum Moisture	17.5	17.5	17.5	17.5	17.5
% Compaction	89.6	87.3	95.4	93.8	96.4

Standard Count	Density	Moisture

Wall-Trench Count	
Moisture Standard Count	
Moisture Count Correction	

Tested By: RCA Date: 10/14/83 Troxler Unit No.: 4

REMARKS:

CITY OF FORT COLLINS
Materials Testing Lab
Revised Sept. 15, 1977
ECI Form No. 21

NUCLEAR FIELD DENSITY REPORT

ASTM Designation D 2922-71
D 3017-72

Contractor Hahn Ex

	Test No.	10-15 6-W		10/15 7-W							
	Location	150'S of Southridge Greens Blvd.		250'S of SRGB							
	Elevation below F.G.	-0.5		-1.0							
	Probe Depth	8"		8"							
	Density Count										
	Density Count Ratio										
	Wet Density PCF	112.2		111.2							
	Moisture Count										
	Moisture Count Correct										
	Adj. Moisture Count										
	Moisture Count Ratio										
	Moisture PCF										
	Dry Density	97.3		101.0							
	% Moisture	15.3		10.1							
	Maximum Density	107.2		107.2							
	Optimum Moisture	17.2		17.2							
	% Compaction	90%		94.2							

	Standard Count	Density	Moisture

	Wall-Trench Count			
	Moisture Standard Count			
	Moisture Count Correction			

Tested By: _____ Date: _____ Troxler Unit No.: _____

REMARKS: _____