SOIL REPORT

FOR

DENVER AVENUE COMMERCIAL PARK

Lot 2, Block 1 of Anderson Farm Third Subdivision
A Part of the SW1/4 of the SE1/4 of Section 18,
Township 5 North, Range 68W of the 6th PM,
Loveland, Larimer County, Colorado

by

ADVANCED PROFESSIONAL ENGINEERING INC.

P.O. Box 1391
Fort Collins, CO 80522-1391

Phone 970-484-0533
FAX 970-484-5086

Project # 68-5N-18-6
January 8, 2001

ADVANCED PROFESSIONAL ENGINEERING INC.

Registered Professional Engineers in Colorado, Arizona, New Mexico & Wyoming

P.O. Box 1391, 212 West Magnolia Street, Fort Collins, CO 80522-1391

Phone 970-484-0533 Fax 970-484-5086 E-mail apeinc@frii.com Web Site advancedpe.com

January 8, 2001

Tim Conine
Colorado Commercial Construction
2301 E. First Street
Loveland, Colorado 80537

Re: Soil report for Denver Avenue Commercial Park, Loveland, Colorado.

Dear TIm,

Enclosed is the soils report for Denver Avenue Commercial Park, Loveland, Larimer County, Colorado. **Based upon our findings of subsoil conditions found at the site, and in view of loads transmitted by the proposed construction, we believe the site is suitable for the proposed construction. We recommend that the best adequate foundation is spread footings placed on the undisturbed original soil. All footings should be designed for maximum allowable bearing capacity of 1,500 pounds per square foot (psf) of dead and live loads and a minimum of 500 psf of dead load only.**

If you have any questions or need more information and if we may be of further assistance please do not hesitate to call our office at 970-484-0533.

Sincerely,

Mohamed S. Worayeth
Professional Engineer
Colorado Reg. P.E. 23019

TABLE OF CONTENTS

INTRODUCTION

This report provides the results of a subsurface investigation for Lot 2, Block 1 of Anderson Farm Third Subdivision, Section 18, Township 5 North, Range 68 West of the 6th P.M., Loveland, Larimer County, Colorado, called Denver Avenue Commercial Park. The objectives of this investigation are to:

1- Obtain soil property data and technical information necessary for the design and construction of foundations for the proposed buildings.
2- Evaluate the sub-surface conditions at the site relative to the proposed construction.
3- Make recommendations regarding the design of the substructure.
4- Recommend certain precautions that should be taken into consideration because of adverse soil and/or groundwater conditions.

Subsoil, ground water conditions and the most suitable type of foundations are discussed in this report. The conclusions and recommendations presented in this report are based on analysis of field data and experience with soils in the general vicinity.

PROPOSED STRUCTURES

The proposed structures are pre-engineered steel buildings of one story. Five sets of these buildings will be divided by interior walls to suit the tenants. Four sets of the larger buildings will have offices on the front and warehouse space in the rear (office-warehouse facilities), with parking in front and truck delivery at the rear. One set of buildings will be open-space starter business buildings suitable to the zoning of the area, with parking at the front. The lot will be primarily portland concrete paved, with limited landscaping, and a large area for storm water detention facing on Denver Avenue. The detention area will also be landscaped.

SITE LOCATION AND CONDITIONS

The site is Lot 2, Block 1 of Anderson Farm Third Subdivision, Section 18, Township 5 North, Range 68 West of the 6th Principal Meridian, Loveland, Larimer County, Colorado. Total area of the site is 10 Acres, or 435,600 square feet. The site is located west of Denver Avenue between US34 (Eisenhower Avenue) and First Street. The general topography is very flat, with approximately 1% slope toward the east The east portion of the site has a drainage way from north to south. The Soil Conservation Service classifies the soil as Nunn clay loam. It has historically been used for agricultural crop land.

FIELD EXPLORATIONS

The explorations were conducted on September 26, 2000 by Drilling Engineers, Incorporated, Fort Collins. The soil tests consisted of drilling, logging five (5) boreholes. The holes were drilled with 4 inch continuos auger drill, the locations of the holes are shown on the Test Boring location Plan, Fig (1). Complete logs of the boring operations are also shown on Fig. (2), which includes visual classifications of each soil at four depths between 3 and 20 feet, and water table measurement at the time of drilling. During the drilling operations a civil engineer was present and made continuous observations of soil encountered. As the boring advanced characteristics of soil, type and depth were taken.

Results of the Standard Penetration Test, ASTM Standard Test D-1586, are listed on the log. These results are the number of blows required to drive the 2" spoon sampler one foot into the soil by a 140-pound hammer, dropped 30 inches. Undisturbed samples for use in the laboratory were taken in walled samplers (Shelby Tubes) pushed hydraulically into the soil. All samples were sealed in the field and preserved at natural moisture content until the time of the test.

LABORATORY TESTING

Terracon Geotechnical of Fort Collins tested the soils and provided the enclosed test report. Moisture content and dry unit-weights were determined from the laboratory tests and consolidation-swell tests were conducted. A summary of the test results is included the first page of the Terracon report. The consolidation-swell characteristics are displayed in the report.

SUBSOIL AND GROUND WATER CONDITIONS

The upper 6-inches of soil is topsoil rich in organic material. Topsoil should not be used as bearing soil or as backfill material. It should be stockpiled for reuse as topsoil. The following is a description and classification of the soil at each depth.

Bore Hole # 1 depth in feet	Soil Classification
0 - 0.5	Topsoil
0.5 - 15	Light brown silty clay, soft, moist
15 - 20	Light brown gravel, soft, wet

Bore Hole #2 depth in feet	Soil Classification
0 - 0.5	Topsoil
0.5 - 5	Light brown silty clay, soft, dry
5 - 10	Reddish brown silty clay, soft, moist
10 -16	Light brown silty clay, soft, moist
16 - 20	Gravel, light brown silty clay, medium to hard, moist

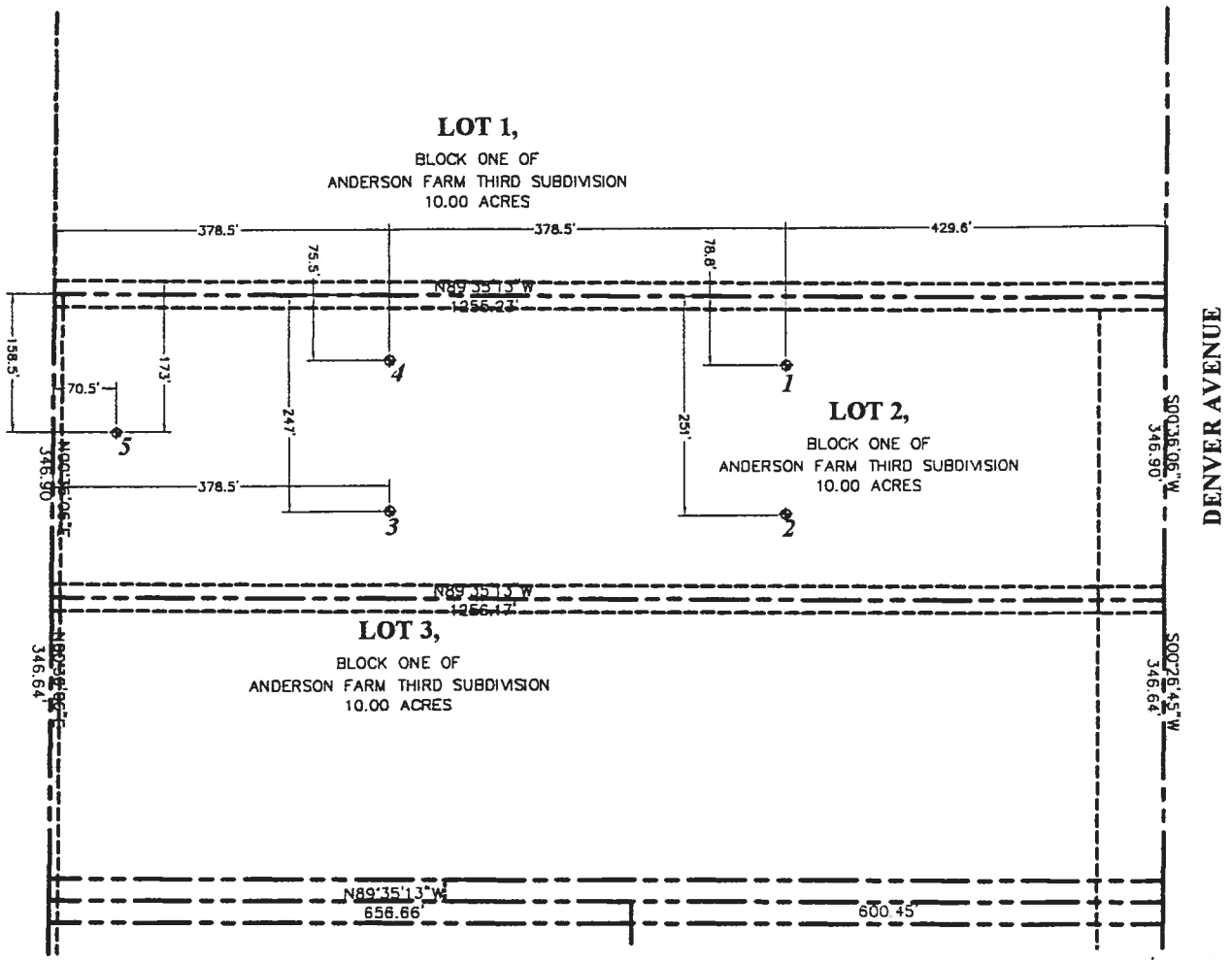
Bore Hole #3 depth in feet	Soil Classification
0 - 0.5	Topsoil
0.5 - 5	Light brown silty clay, soft, moist
5 - 10	Reddish brown silty clay, soft, moist
10 -15	Reddish brown silty clay, soft, wet
15 - 20	Brown Gravel, medium, wet

Bore Hole # 4 depth in feet	Soil Classification
0 - 0.5	Topsoil
0.5 - 5	Brown silty clay, soft, moist
5 - 10	Reddish brown silty clay, soft, moist
10 -16	Reddish brown silty clay, soft, moist
16 - 20	Brown Gravel, hard, wet

Bore Hole # 5 depth in feet	Soil Classification
0 - 0.5	Topsoil
0.5 - 5	Brown silty clay, soft, moist
5 - 10	Light brown silty clay, very soft, moist
10 -15	Light brown silty clay, hard, wet
15 - 20	Light brown silty clay and Gravel, hard, wet

Water table was encountered during testing at all bore holes at a consistent depth of 15'. In 24 hours the depth to water table was checked, with no significant change. Water levels in this area maybe subject to change depending upon seasonal variations.

SITE PLAN



NORTH

SCALE: 1"=200'

0 100 200 400

ADVANCED
PROFESSIONAL
ENGINEERING
INC.

P.O. Box 1391, Ft Collins, Co, 970-484-0533

PROJECT NO.: 68-5N-18-6
DATE: 9-26-2000
CLIENT: COLORADO COMMERCIAL CONSTRUCTION

FIGURE 1

SOIL INVESTIGATION SUMMARY

Location: Lot 2, Block 1, Anderson Farm, Loveland Colorado

Project: Denver Avenue Commercial Park

Inspection Date: 9/26/00

DEPTH in feet	DESC. – Hole #1	SYMBOL	PENETRATIONS blows/in	MOISTURE %	DRY DENSITY lbs/ft³
0	0'–4' Dry				
3' – 4'	Light Brown, Moist, Silty Clay, Soft		3' 4' 8/12	9.8	95.4
4' – 5'					
5					
8' – 9'	Light Brown, Moist, Silty Clay, Soft		8' 9' 8/12	19..5	102.0
9' – 10'					
10					
14' – 15'	Light Brown, Silty Clay, Soft, Moist		13' 14' 4/12		
15'	Water Table				
15					
19' – 20'	Light Brown, Wet, Soft, Gravel		19' 14/12		
20					

Gravel (GP)

Silty Clay

Clay (CL)

Water Table

Shelby Tube Sample

Standard Penetration Drive Sampler & Split Spoon Sampler (*)

(*) N/12 indicates that number of blows of a 140 pound hammer falling 30 inches was required to penetrate 12 inches.

ADVANCED PROFESSIONAL ENGINEERING INC.
P.O. Box 1391, Ft Collins, Co, 970–484–0533

PROJECT NO.: 69–5N–13–7
Date: 11/2/2000
CLIENT: Colorado Avenue Commercial Project
Soil Logs, Page 1 of 5

SOIL INVESTIGATION SUMMARY

Location: Lot 2, Block 1, Anderson Farm, Loveland Colorado

Project: Denver Avenue Commercial Park

Inspection Date: 9/26/00

DEPTH in feet	DESC. – Hole #2	SYMBOL	PENETRATIONS blows/in	MOISTURE %	DRY DENSITY lbs/ft³
3' – 4' 4' – 5'	Light Brown, Dry, Silty Clay, Soft		3' 4' 5/12	12.4	101.5
8' – 9' 9' – 10'	Reddish Brown, Moist, Silty Clay, Soft		8' 9' 3/12	17.2	108.1
14' – 15'	Water Table 14'–9"	▽	14'	28.1	92.7
15' – 16'	Light Brown, Moist, Silty Clay, Soft		15' 3/12		
19' – 20'	Gravel, Silty Clay, Medium to Hard, Light Brown, Moist		19' 30/12		

Gravel (GP)

Silty Clay

Clay (CL)

▽ Water Table

Shelby Tube Sample

Standard Penetration Drive Sampler & Split Spoon Sampler (*)

(*) N/12 indicates that number of blows of a 140 pound hammer falling 30 inches was required to penetrate 12 inches.

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P.O. Box 1391, Ft Collins, Co, 970–484–0533

PROJECT NO.: 69–5N–13–7
Date: 11/2/2000
CLIENT: Colorado Avenue Commercial Project
Soil Logs, Page 2 of 5

SOIL INVESTIGATION SUMMARY

Location: Lot 2, Block 1, Anderson Farm, Loveland Colorado

Project: Denver Avenue Commercial Park

Inspection Date: 9/26/00

DEPTH in feet	DESC. – Hole #3	SYMBOL	PENETRATIONS blows/in	MOISTURE %	DRY DENSITY lbs/ft³
3' – 4' 4' – 5'	Light Brown, Silty Clay, Soft, Moist	Silty Clay	3' 4' 3/12	13.5	109.0
8' – 9' 9' – 10'	Reddish Brown, Silty Clay, Soft, Moist	Silty Clay	8' 9' 6/12	18.6	101.2
14' – 15'	Reddish Brown, Silty Clay, Wet, Soft	Silty Clay	14' 3/12		
19' – 20'	Wet, Gravel, Brown, Medium	Gravel (GP)	19' 17/12		

Gravel (GP)

Silty Clay

Clay (CL)

Water Table

Shelby Tube Sample

Standard Penetration Drive Sampler & Split Spoon Sampler (*)

(*) N/12 indicates that number of blows of a 140 pound hammer falling 30 inches was required to penetrate 12 inches.

ADVANCED PROFESSIONAL ENGINEERING INC.
P.O. Box 1391, Ft Collins, Co, 970–484–0533

PROJECT NO.: 69–5N–13–7
Date: 11/2/2000
CLIENT: Colorado Avenue Commercial Project

Soil Logs, Page 3 of 5

SOIL INVESTIGATION SUMMARY

Location: Lot 2, Block 1, Anderson Farm, Loveland Colorado

Project: Denver Avenue Commercial Park

Inspection Date: 9/26/00

DEPTH in feet	DESC. – Hole #4	SYMBOL	PENETRATIONS blows/in	MOISTURE %	DRY DENSITY lbs/ft³
3' – 4' 4' – 5'	Brown, Silty Clay, Moist, Soft	Silty Clay	3' 4' 3/12	12.1	105.9
8' – 9' 9' – 10'	Reddish Brown, Silty Clay, Moist, Soft	Silty Clay	8' 9' 5/12	15.0	112.7
14' – 15'		Silty Clay	14'	22.6	99.0
15' – 16'	Reddish Brown, Silty Clay, Moist, Soft	Silty Clay	15' 7/12		
19' – 20'	Wet, Gravel, Brown, Hard	Silty Clay	19' 47/2		

Gravel (GP)

Silty Clay

Clay (CL)

Water Table

Shelby Tube Sample

Standard Penetration Drive Sampler & Split Spoon Sampler (*)

(*) N/12 indicates that number of blows of a 140 pound hammer falling 30 inches was required to penetrate 12 inches.

ADVANCED PROFESSIONAL ENGINEERING INC.
P.O. Box 1391, Ft Collins, Co, 970-484-0533

PROJECT NO.: 69-5N-13-7
Date: 11/2/2000
CLIENT: Colorado Avenue Commercial Project

Soil Logs, Page 4 of 5

SOIL INVESTIGATION SUMMARY

Location: Lot 2, Block 1, Anderson Farm, Loveland Colorado

Project: Denver Avenue Commercial Park

Inspection Date: 9/26/00

DEPTH in feet	DESC. – Hole #5	SYMBOL	PENETRATIONS blows/in	MOISTURE %	DRY DENSITY lbs/ft^3
3' – 4' 4' – 5'	Brown, Moist, Soft, Silty Clay		3' 4' 3/12	18.1	97.8
8' – 9' 9' – 10'	Very Soft, Moist, Silty Clay, Light Brown		8' 9' 1/12	18.1	103.4
14' – 15'	Hard, Wet, Silty Clay, Light Brown	▽	14' 25/12		
19' – 20'	HArd, Wet, Gravel, Silty Clay, Light Brown		19' 48/12		

Gravel (GP) Silty Clay Clay (CL)

▽ Water Table

Shelby Tube Sample

Standard Penetration Drive Sampler & Split Spoon Sampler (*)

(*) N/12 indicates that number of blows of a 140 pound hammer falling 30 inches was required to penetrate 12 inches.

ADVANCED PROFESSIONAL ENGINEERING INC.
P.O. Box 1391, Ft Collins, Co, 970–484–0533

PROJECT NO.: 69–5N–13–7
Date: 11/2/2000
CLIENT: Colorado Avenue Commercial Project
Soil Logs, Page 5 of 5

DISCUSSION

Considering the proposed buildings and the subsoil conditions we believe the selection of foundation type for a given situation is governed by many considerations such as safety features against the following:

1- Shear failure in the underlying soil.
2- Differential settlement, swelling or other vertical movement of the foundation must be controlled at a reasonable level.

Types of structure, anticipated loads, subsoil conditions, depth to water, and construction costs are also important factors in selecting the foundation type. Based on the above and considering the proposed construction, we believe that the most desirable type of foundation is spread footings placed on undisturbed soil.

FOUNDATIONS

Three basic controls are available to us in selecting the foundation type and allowable loads. These are the standard penetration test, swell consolidation test results and the type of structure. The ultimate bearing capacity of the foundation soil depends upon the size and shape of the foundation elements, the depth below the surface, and the physical characteristics of the supporting soil.

From the test results;

- The standard penetration test shows the blow count range between 1 blow per 12-inches to 47 blows per 2-inches.
- The consolidation-swell test shows the swelling potential is within 1% which is low.

In view of loads transmitted by the proposed construction and the sub-surface soil conditions found at the site, we recommend that the foundation should be spread footings placed on the original undisturbed soil. All footings should be designed for maximum allowable bearing capacity of 1,500 pounds per square foot (psf) of dead and live loads and a minimum of 500 psf of dead load only.

All foundations should be a minimum of 30" below finished grade. Use ½" isolation strip and slip joints between free floating slabs and structural members. All slabs should be free floating and separate from structural members. All concrete should be modified type II with a minimum strength of 3,000 psi at 28 days. Concrete and reinforcement should be installed per ACI 318 Code. Minimum cover of concrete over reinforcing steel should be 2-inches. Allow concrete to set (after pouring) a minimum of

7 days before backfilling and before applying any compaction.

Footing loads should be balanced as much as possible to reduce differential settlements. If footing loads are balanced and designed for the above specified soil bearing pressures, we would expect differential movement of the structures to be less than ½ inch, which is allowed by the Uniform Building Code for structures of this type. All reinforcing should be deformed type 60 or 40-grade steel. Minimum splice length is 2'-0". All steel should be tied in place.

LANDSCAPING AND DRAINAGE

Every precaution should be taken to prevent wetting of subsoil and percolation of water down the foundation elements. Finished grades should be sloped away from the structures on all sides to give positive drainage. A minimum of one foot of fall in the first ten feet of grade is recommended. Sprinkling systems should not be installed within ten (10) feet of the structure. Down-spouts are recommended and should be arranged to carry drainage at least five (5) feet from the projection of the roof.

SITE GRADING

It is recommended that all topsoil be removed below building site, fill sections and driveways. In backfill sections around buildings and driveways, the sub-grade below these areas should be scarified a minimum of one foot and compacted at or slightly above optimum moisture to at least 90% of Standard Proctor Density ASTM, D-698.

Fill should consist of the on-site soils or imported material approved by a geotechnical engineer. Fill material within 2% of optimum moisture content should be placed in six (6) to eight (8) inch layers and mechanically compacted to at least ninety-five per cent (95%) of Standard Proctor Density ASTM, D-698. For stability, cut and fill slopes should be designed on grades no steeper than 3 to 1. All existing structure should be removed, including any existing foundations, footings, leach-fields, septic tanks, piping materials and all concrete slabs. The site should be cleared of any other objects and foreign material except the original undisturbed soil.

SLABS ON GRADE

All Slabs should be constructed free-floating and isolated from all bearing members, reinforced with wire mesh, and jointed frequently to minimize and control shrinkage cracks which will develop; it is recommended to use Fiber Mesh in all concrete, particularly in the concrete used for slabs. All slabs on grade should be underlain with a minimum of a six (6) inch layer of clean gravel or crushed rock to help distribute loads and provide a capillary break. Minimum slab thickness should be no less than 4 inches. Minimum slab thickness for loading and unloading areas should be no less

than 6-inches, with a gravel or aggregate base of not less than 6-inches.

Positive drainage should be provided for the gravel under concrete to prevent pooling of water beneath slabs. Where perimeter drains are used, the gravel under slabs should tie into the perimeter drain to expedite the movement of water into the drain. To reduce and control shrinkage cracks which will develop in slabs-on-grade, it is suggested that control joints be placed every ten (10) feet and that the total area contained within these joints be no greater than one hundred (100) square feet.

Use 1/2" isolation strips and slip joints between free floating slabs and structural members. All concrete should be modified type II with a minimum strength of 3,000 psi at 28 days. Concrete and reinforcements should be installed per ACI 318 Code. Minimum cover of concrete over reinforcing steel should be 3".

FLEXIBLE PAVEMENT DESIGN

It is our opinion that a flexible pavement is suitable for the proposed drive areas A flexible pavement consists of an asphaltic cement layer underlain by Class 5 or 6 of aggregated as a base course. Using City of Loveland Development Standards, soil testing recommendations, and using Serviceability Index of 2.5, the recommended pavement thickness (from Table #2) for this area is as follows;

Industrial/Commercial Parking lot

Asphalt Cement thickness	**4"**
Class 5 or 6 base course	**10"**
TOTAL SECTION THICKNESS	**14"**

All topsoil, organic material and other unsuitable material should be stripped and removed from the parking lot sub-grade prior to placing any fill material, or sub-base course. The asphalt cement layer and base course should meet the City of Loveland specifications and should be placed in accordance with these specifications. Sub-grade below the proposed asphalt pavement should be prepared in accordance with the recommendations discussed in the "Site Grading and Utilities" section of this report. Upon proper preparation of the sub-grade, the sub-base and base course should be placed and compacted at optimum moisture to at least ninety-five per cent (95%) of Standard Proctor Density ASTM-D698. It is recommended that the asphalt concrete be placed in two (2) inch lifts. The asphalt should meet the City of Loveland specifications and should be placed in accordance with these specifications.

All base material should have an "R" value between 68 and 80. The asphalt should have a "Rt" value of 90 or greater. The "R" value of the pavement materials used

should be verified by laboratory test. Field density tests should be taken in the aggregate base course, and asphalt under the direction of a geo-technical engineer. The asphaltic cement should be C or CX Mix with percent passing as in Table #4.

RIGID PAVEMENT DESIGN

The following concrete minimum design criteria are taken from the Geotechnical Engineering Report by Terracon, Fort Collins, Colorado, for Pinetree Industrial Park, previously planned for this site, dated March 10, 1999:

Modulus of Rupture @ 28 days.....600 psi
Strength requirements.....ASTM C94
Minimum cement content.....6.0 sacks/cy
Cement type.....Type 1 Portland
Entrained air content.....4% to 8%
Concrete aggregate.....ASTM C33 and CDOT Section 703
Aggregate size.....Maximum 1"
Max Water Content.....0.49 lb/lb of cement
Max allowable slump.....4"

Industrial/Commercial Parking lot

	Alternative 1	Alternative 2
Portland Cement thickness	**5"**	**7"**
Class 5 or 6 base course	**6"**	**0"**
TOTAL SECTION THICKNESS	**11"**	**7"**

The recommendations for site preparation for flexible pavement design also applies for rigid pavements.

CONCLUSIONS

In view of loads transmitted by the proposed construction and sub-surface soil conditions found at the site, we recommend that the foundation for the proposed building should be spread footings placed on original undisturbed soil and should be designed for a maximum allowable bearing capacity of 1,500 pounds per square foot (psf) of dead and live loads and a minimum of 500 psf of dead load only. All present and future owners are directed to read and understand the information in the General Comments and Recommendations of this report. The findings and recommendations of this report have been obtained according to accepted common engineering practices. There is no other warranty either expressed or implied.

GENERAL COMMENTS

This report has been prepared to aid the evaluation of the property and to assist the architect and/or engineer in the design of the project. If any changes in design of the structure or its location, 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 Advanced Professional Engineering Inc.

The analysis and recommendations submitted in this report are based upon data obtained from soil boring performed at locations shown on test boring plan. Every effort was made to provide comprehensive site coverage through careful locations of the test boring while keeping the site investigation economically feasible.

This report does not reflect any variations that may occur between the boring, which may not become evident until construction. If variations are evident, it will be necessary for reevaluation of the recommendation of this report, the new recommendation should be made after performing an on site observations and inspection of the characteristics of any variations, before the construction begins.

It is recommended that Advanced Professional Engineering Inc., be retained to perform continuous construction review during the excavation and foundation phases of the work. Advanced Professional Engineering 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 construction.

*** It should be noted that the swelling pressure may develop when subsoil becomes wetted and it should be realized that the recommended foundation design will reduce but not prevent the swelling when it occurs.**

GENERAL RECOMMENDATIONS

1- Finished grades should be sloped away from the structure to give positive drainage. Grades should be ten per cent (10%) for the first five to ten (5-10) feet.

2- Backfill around the outside perimeter of the structure should be mechanically compacted at optimum moisture to at least 90% of Standard Proctor Density ASTM D-698. Puddling should not be permitted as a method of compaction.

3- Plumbing and utility trenches underlying slabs and paved areas should be backfilled with an approved material compacted to at least 95% of Standard Proctor Density ASTM D-698. Puddling should not be permitted as a method of compaction.

4- Gutters and Down spouts should be designed to carry roof runoff water well beyond the backfill area.

5- Underground sprinkling systems should be designed such that all pipes are placed a minimum of 10 feet outside the backfill of the structure. Sprinkler heads should be designed and placed so that irrigation water is not sprayed on the foundation walls. These recommendations should be taken into account in the landscape planning.

6- Plumbing under slabs should be eliminated whenever possible since plumbing failures are quite frequently the source of free water that may cause slab heave.

7- Footing and/or grade beam sizes should be proportioned to equalize the unit loads applied to the soil and thus reduce differential settlements.

8- It is recommended that compaction requirements specified herein be verified in the field with density tests performed under the direction of the geotechnical engineer.

9- It is recommended that a registered professional engineer design the substructure and that he/she considers the findings and recommendations of this report.

Terracon
301 N. Howes • P.O. Box 503
Fort Collins, Colorado 80521-0503
(970) 484-0359 Fax (970) 484-0454

January 4, 2001

Advanced Professional Engineering, Inc.
212 West Magnolia
Fort Collins, Colorado 80521

Attn: Mr. Mohamed S. Worayeth, P.E. – President

Re: Laboratory Test Results
Lot 2 Block 1 Anderson 4th Filing
Denver Avenue and 1st Street
Loveland, Colorado
Terracon Project No. 20005213

Enclosed please find the laboratory test results for Shelby Tube, split spoon and California Barrel samples delivered to Terracon's Fort Collins, Colorado on November 8, 2000. The samples were obtained by Advanced Professional Engineering, Inc. (APEI), personnel at the above referenced project. Terracon was requested by APEI to perform laboratory testing on selected soils samples consisting of in-situ moisture contents, dry densities, unconfined compressive strengths, and swell-consolidation characteristics. All laboratory tests were performed in general accordance with ASTM procedures.

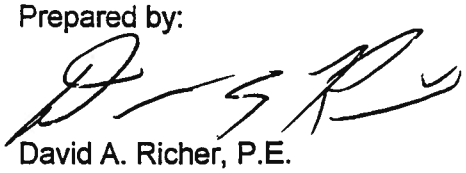
The following table provides the laboratory test results from the soil samples extracted from the Shelby Tube and California Barrel sampling devices, as requested by and collected by APEI personnel.

TEST BORING NO.	DEPTH, FT.	% MOISTURE	DRY DENSITY, PCF	UNCONFINED COMPRESSIVE STRENGTH, PSF	SWELL-CONSOLIDATION TEST RESULTS		
					% MOISTURE	DRY DENSITY, PCF	%SWELL (+), % CONSOLIDATION (-)
1	3	19	103	3020	--	--	--
1	8	19	102	805	--	--	--
2	3	14	105	--	14	105	+0.1
2	8	18	103	660	--	--	--
3	3	19	106	4675	--	--	--
3	8	20	106	1640	--	--	--
4	3	21	102	2595	--	--	--
4	9	24	98	610	--	--	--
5	3	17	102	3205	17	105	+0.1
5	8	19	107	--	--	--	--

The laboratory test results for the swell-consolidation characteristics for Shelby Tube samples collected for Test Boring Nos. 2, and 5 at the 3.0-foot interval are enclosed. The moisture content laboratory test results for the split spoon samples are enclosed with this report.

We appreciate being of service to you in the laboratory testing phase of this project. If you have any questions concerning the enclosed information, please feel free to contact us at your convenience.

Sincerely,
TERRACON
Prepared by:



David A. Richer, P.E.
Geotechnical Engineer/Department Manager

Copies to: Addressee (3)

Enclosures: Grain Size Distribution Data (1)
Void Ratio Curves from Consolidation Data (3)
% Swell – Consolidation Curves (3)

LABORATORY TEST RESULTS - MOISTURE CONTENTS

CLIENT: ADVANCED PROFESSIONAL ENGINEERS DATE: 1/4/01

PROJECT: Lot 2 Block 1 Anderson 4th Filing PROJECT NO. 20005213

LOCATION: DENVER AVENUE & 1ST STREET - LOVELAND, CO. OPERATOR: 3986

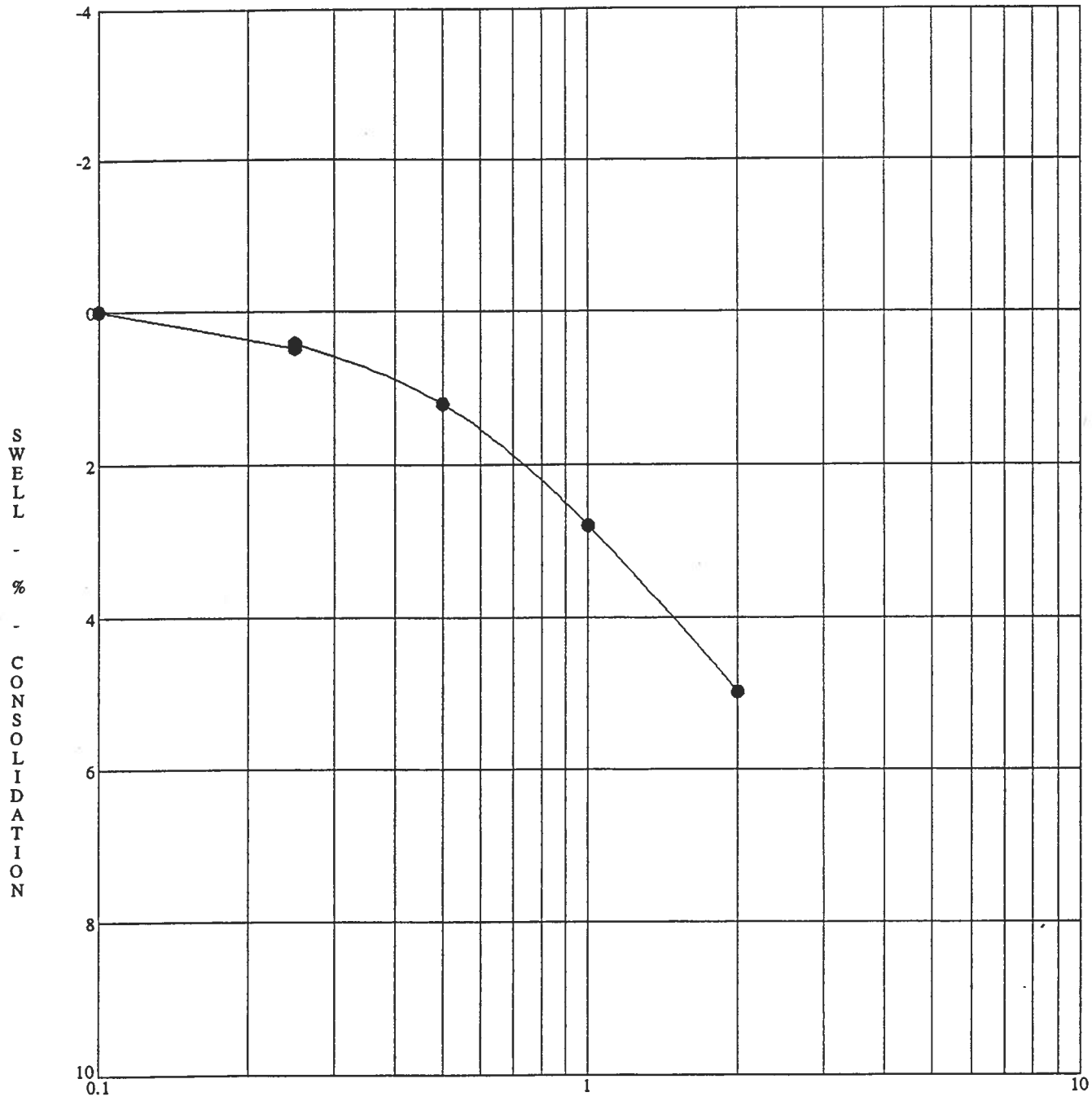
BORING NO.	1	1	1	2	2	2
DEPTH, FT.	4	9	14	4	9	14
WET WEIGHT	93.24	102.07	172.01	82.29	102.83	133.83
DRY WEIGHT	79.96	86.3	151.77	74.62	84.64	114.22
TARE WEIGHT	14.46	14.58	16.3	11.1	12.54	16.33
% MOISTURE	**20.3**	**22.0**	**14.9**	**12.1**	**25.2**	**20.0**

BORING NO.	3	3	3	4	4	5
DEPTH, FT.	4	9	14	4	14	4
WET WEIGHT	94.63	116.68	129.28	84.41	158.19	93.29
DRY WEIGHT	79.79	96.55	111.68	71.03	132.98	79.61
TARE WEIGHT	16.24	13.64	14.86	14.61	13.72	13.48
% MOISTURE	**23.4**	**24.3**	**18.2**	**23.7**	**21.1**	**20.7**

BORING NO.	5	5				
DEPTH, FT.	9	14				
WET WEIGHT	81.69	148.62				
DRY WEIGHT	69.11	132.12				
TARE WEIGHT	13.95	16.18				
% MOISTURE	**22.8**	**14.2**				

BORING NO.						
DEPTH, FT.						
WET WEIGHT						
DRY WEIGHT						
TARE WEIGHT						
% MOISTURE						

BORING NO.						
DEPTH, FT.						
WET WEIGHT						
DRY WEIGHT						
TARE WEIGHT						
% MOISTURE						



Boring and depth (ft.)	Classification	DD	MC%
● 2 3.0		105	14

PROJECT Lot 2, Block 1 Anderson 4th - Denver Avenue & 1st Street

JOB NO. 20005213

DATE 1/5/01

CONSOLIDATION TEST
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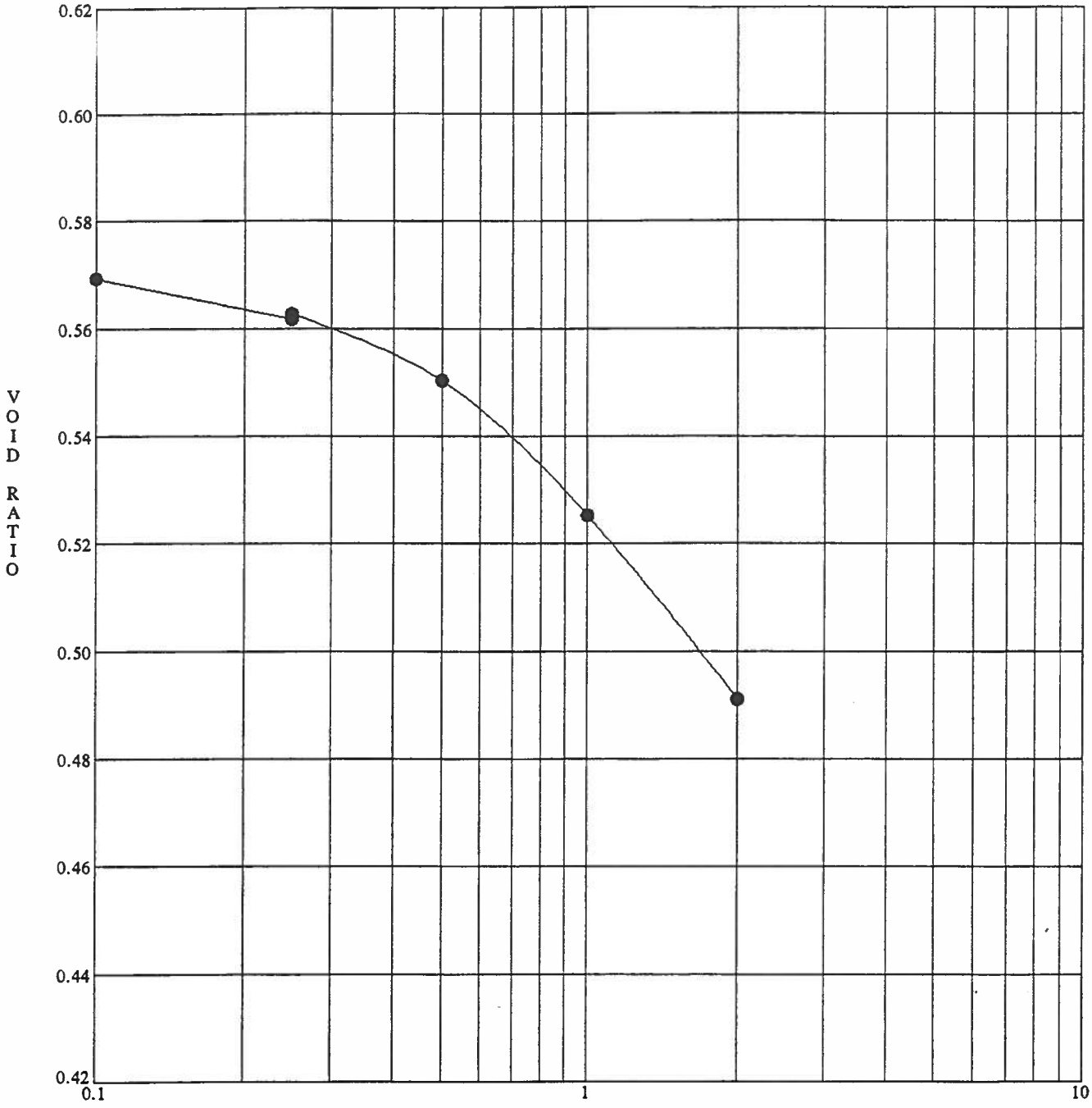

Boring and depth (ft.)		Classification	DD	MC%
● 2	3.0		105	14

PROJECT Lot 2, Block 1 Anderson 4th - Denver Avenue & 1st Street

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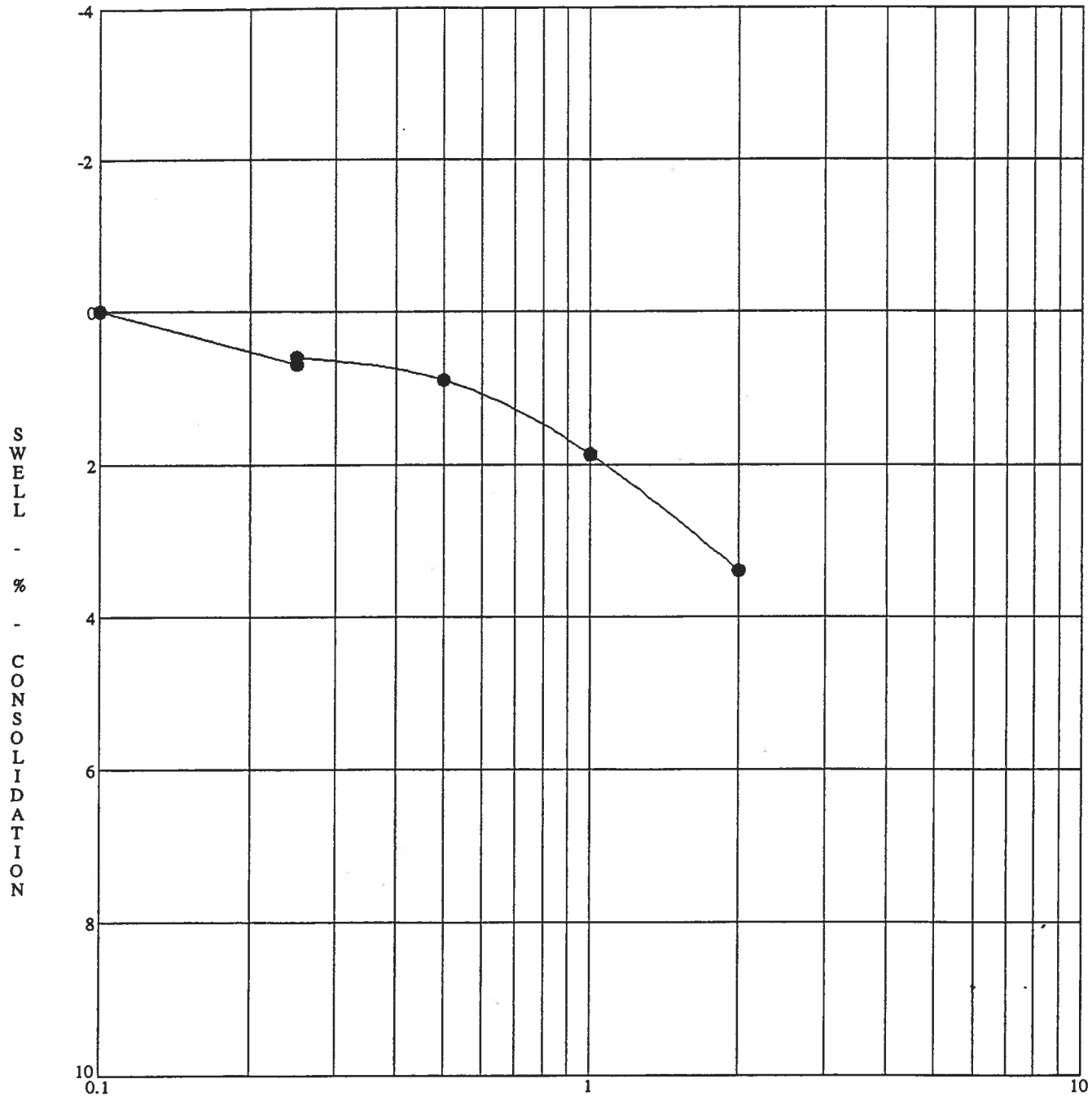

Boring and depth (ft.)	Classification	DD	MC%
● 5 3.0	LEAN CLAY with SAND CL	105	17

PROJECT Lot 2, Block 1 Anderson 4th - Denver Avenue & 1st Street

JOB NO. 20005213

DATE 1/5/01

CONSOLIDATION TEST
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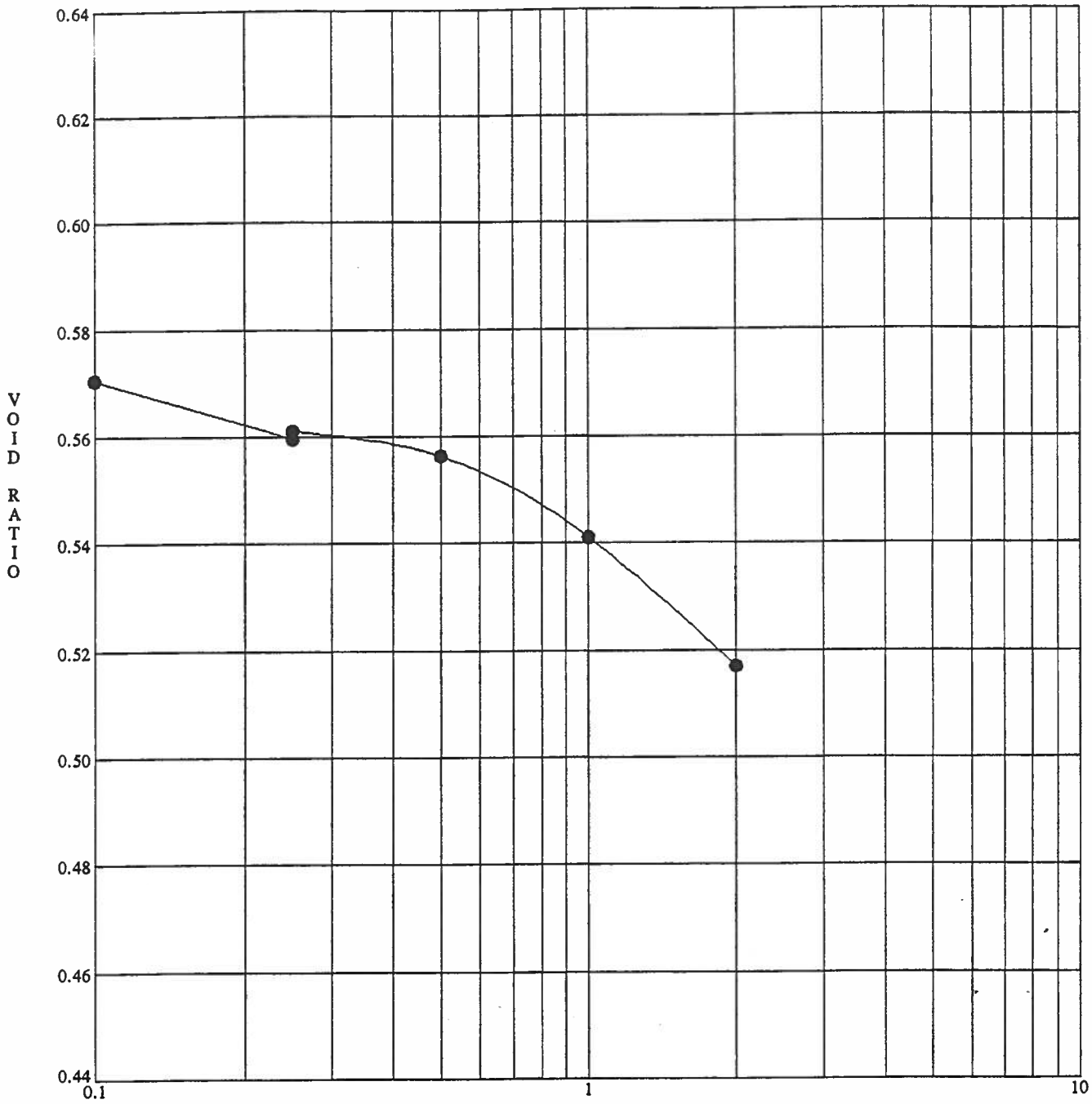

Boring and depth (ft.)		Classification	DD	MC%
● 5	3.0	LEAN CLAY with SAND CL	105	17

PROJECT Lot 2, Block 1 Anderson 4th - Denver Avenue & 1st Street

JOB NO. 20005213

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CONSOLIDATION TEST
TERRACON