Soils Investigation Report

for

The Nord Avenue Apartments

Nord & West Lindo Avenue
Chico, California

Prepared for:

Epick Homes
901 Bruce Road, Suite 100
Chico, California 95928

Streamline Project No. 5305

October 16, 2023

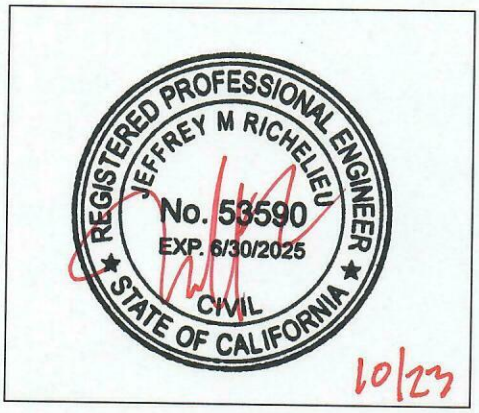

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TABLE OF CONTENTS

2571 California Park Drive, Ste. 210 • Chico, CA 95928 • (530) 892-1100

1.0 INTRODUCTION

1.1 General

At our client's request, Streamline Engineering, Inc. and Applied Testing Consultants have performed an investigation of the soil beneath the proposed building pad(s) for an apartment complex referenced on the cover sheet.

The purpose of this report is to provide the design parameters for the foundation system required to support the structure(s) described herein. This report is intended to satisfy the requirements of the 2022 CBC Section 1803. This report also provides information and recommendations pertaining to site preparation, engineered fill, utility trench backfill, drainage and landscaping, retaining walls, and concrete floor slabs. This report should not be used for additional structures on this site without written approval of Streamline Engineering.

A site map is included as "Figure 1" to show the approximate locations of the test pits used for soil sampling and profiling. A description of the soil profiles and testing results are included in the Appendices. When conflicts between the text and the appendices exist, the text references shall take precedence.

1.2 Proposed Construction

This report is prepared based on the assumption that the proposed structure(s) will be one, two, or three-story apartment buildings of light framed construction with shallow concrete spread foundations and slab-on-grade floors or raised wood floors at the designer's option. Footing loads are anticipated to be light to moderate. The building pad(s) are located as shown on plans prepared by others. The foundation system design is not within the scope of this report. The foundation designer is solely responsible for providing an adequate foundation design to support all imposed loads on the structure including loads required by the California Building Code (CBC) edition as noted in 1.1 above.

1.3 Scope of Work

The scope of our services included the following:

- Exploration of the subsurface conditions near the proposed building pad using exploratory test hole(s) as shown on Figure 1.
- On-site observations of the area surrounding the building pads.
- Provide the seismic design variables, SMs, SM1, SDs, SD1, soil site class, and the Seismic Design Category provided by the Unites States Geologic Survey.
- Provide soil classification per Table 1806.2 of the CBC based on on-site observations, and soil testing.
- Prepare report of findings and recommendations.
- The scope of work excludes any items not mentioned above.

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1.4 Attachments

This report contains Site and Test Pit Location Plans, a profile log for test pit(s) 1 thru 7, laboratory test data sheets (including Atterburg Limits, Gradations, and ASCE 7-16 Standard Seismic Design Provisions from the website: http://www.seismicmaps.org See Figures and Appendices.

2.0 FINDINGS

2.1 Site Description

The development site is located on a parcel bounded to the east by railroad tracks, to the north by West Lindo Avenue, to the west by Nord Avenue, and to the south by a subdivision. The site is located in Chico, California (See Figure 1). The site is relatively flat. We made a site visit on 9/14/2023 and found no significant areas of standing water.

2.2 Subsurface Soil Conditions

The soil encountered in the top 7.0' of our test hole(s) consists predominately of silty sand. It was determined that the test pit(s) were of sufficient depth to represent the soil profile of the site. The excavations revealed relatively consistent subsurface soil for the profile. The soil would be classified as SM Silty Sand. See Appendices for more information. After the test pit(s) were dug and soil samples taken, the hole(s) were filled back in. The hole(s) were not properly compacted to any standard specifications.

2.3 Erosion Controls

It is not within the scope of this report to determine erosion controls. The owner is solely responsible for monitoring erosion for this site. Erosion on or near the site could have a negative impact on any proposed structures on this site. The owner shall maintain the site and surrounding areas as necessary to protect the structure(s) from the effects of erosion and be in compliance with all government requirements.

2.4 Ground Water

At the time of our field investigation, groundwater was not encountered in our test holes. It should be noted that the groundwater level on this site will vary over time depending on the local rainfall, irrigation practices, land use, runoff conditions, and other factors. Therefore, water levels observed during construction may vary from those encountered at the time of our field investigation. The monitoring and remediation of any ground water encountered during construction and during the life of the proposed project is not within the scope of this report.

2.5 Asphalt Pavement

It is not within the scope of this report to provide any recommendations for the construction of asphalt pavement or exterior concrete. See Appendix C for R-Value.

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2.6 Corrosive Soils

It was not in the scope of this report to test for corrosive soils. It should be noted that Streamline Engineering does not provide corrosion engineering services. If it is necessary to test for corrosive soils, we recommend that a qualified corrosion engineer be retained to provide the necessary services and testing.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Site Clearing and Grubbing

The site was cleared at the time of our observation. Existing foundations, utilities, septic tanks, and leach fields must be located and removed prior to grading the site. Tree stumps and roots larger than 1" in diameter shall be removed from the building pad area and replaced with properly compacted engineered fill. All voids resulting from the removal of foreign objects shall be replaced with properly compacted engineered fill.

3.2 Site Preparation

After completing site clearing and grubbing, the exposed native soil to receive engineered fill should be scarified to a minimum depth of 8" and then uniformly moisture conditioned to within $\pm$ 4 percent of the ASTM D1557 optimum moisture content. All compactions shall be observed by Applied Testing Consultants.

All surface grades shall be constructed to drain surface water away from the structure in accordance with Section 3.3.2 of this report. Roof drain discharge should be collected and directed to discharge down slope from the building pad a minimum of 10' away from the building.

3.3 Engineered Fill Construction

Where engineered fills are used to support the proposed structure(s) they shall be constructed as noted below:

Prior to placement of engineered fill within the pad areas, all organics shall be removed and replaced with compacted engineered fill. The exposed sub-grades should be moisture conditioned and compacted to a minimum of 90% relative compaction, based on test method ASTM D1557. Engineered fill should be placed in 8" loose lifts, moisture conditioned and compacted to 90% relative compaction. The compacted thickness of each layer shall not exceed 6 inches.

Compaction control and testing should be performed by a qualified testing agency to insure the recommendations of this report are followed. Depending on the amount of rock encountered in the on-site or import soils. We recommend that compaction testing be performed using Sand Cone methods (per ASTM D1556), or Nuclear Density methods (per ASTM D2922). If imported off-site material is required to build the pads to finish grade, it must be approved by a representative from Applied Testing Consultants and meet the following minimum criteria. Import material must have a plasticity index of less than 14; be non-expansive (EI<20); have 100% passing the 3" sieve; 30% to 60% passing the #4 sieve; and no more than 20% passing the #200 sieve.

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Note:

At the owner's option the finished floor elevation can be raised with pea gravel. If pea gravel is used it shall be bounded on all sides by an engineered concrete stemwall. Compaction tests will not be required for pea gravel fills constructed in this manner.

3.3.1 Utility Trench Backfill

Utility trenches should be excavated according to accepted engineering practices following OSHA standards by a Contractor experienced in such work. Trenches excavated parallel to the foundations shall be set back from the edge of the footings such that the bottom of the trench lies above a projected 1.5 Horizontal:1 Vertical line extending downward from the bottom of the centerline of the footing. Backfill placed above the bedding in utility trenches should be properly placed and adequately compacted to minimize settlement and provide stable subgrade. Pipe bedding shall be in accordance with pipe manufacturer's recommendations.

The responsibility for the safety of open trenches shall be borne by the Contractor. Excavations to be entered by workers shall be properly shored up in accordance with current OSHA regulations. The contractor must provide an adequate shoring system in accordance with Federal, State, and local safety regulations to protect individuals working in or near an excavation that may expose them to the danger of moving ground. The shoring shall be designed by others to also support the additional weight of any stored materials or heavy equipment working near the excavation that would increase the pressure on the side walls of the excavation.

3.3.2 Drainage and Landscaping

The finished ground surface for non-impervious surfaces shall slope away from the building a minimum of 5% (1% for impervious surfaces) for a minimum distance of 10'. The surface shall slope towards a storm water collection system designed by others. Drainage swales located within 10' of foundations shall be sloped a minimum of 2%. These grades shall be maintained by others for the life of the project.

3.4 Foundation Design Recommendations:

Based on the results of our field investigation, it is our professional opinion that the structure(s) described in Section 1.2 may be supported on continuous or isolated reinforced concrete footings. The footings shall be properly sized by a design professional to support the design loads without exceeding the allowable design values provided in this report.

The footing excavations shall not be allowed to dry out any time prior to pouring concrete. The bottom of all footings shall be level and clean prior to pouring. Continuous footings shall be stepped and not sloped where the site conditions are not flat.

Design Criteria:

NOTE: THESE VALUES SHOWN ARE MINIMUM DESIGN VALUES AND DIMENSIONS. LARGER DIMENSIONS AND LOWER DESIGN VALUES MAY BE USED AT THE DISCRETION OF THE DESIGN PROFESSIONAL. IT IS NOT WITHIN THE SCOPE OF THIS REPORT TO DESIGN THE FOUNDATIONS.

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Class of Materials:	0 to -7.0' ±	Class 4 SM
Allowable Foundation at 12" below grade:		
	Dead + Live loads:	2,000 psf
	Wind or seismic loads:	2,500 psf
Allowable Lateral Bearing Pressure:		150 pcf
Lateral Sliding Resistance:		0.25 coefficient of friction
Minimum footing depth:		1 story building: 12"
		2 & 3 story buildings: 18"
Minimum footing width:		Determined by foundation design professional for all cases
Minimum footing steel:		Determined by foundation design professional for all cases
Moisture control through slabs:		Determined by design professional

(Note: Any deviation from the assumptions stated above will require written approval of Streamline Engineering.)

3.5 Interior Concrete Slabs on Grade for Moisture Sensitive Areas

This section pertains to interior concrete slabs that do not support loads greater than 225 psf. Slabs supporting loads greater than 225 psf shall be designed by a California registered design professional.

Slabs shall be a minimum of 4" thick and reinforced with #3 @ 24" o.c. in both directions placed in the center of the concrete. The steel shall be placed on dobies to insure that it stays in the center of the slab during the pour. If the finished area is sensitive to moisture or used for living space, the slab shall be placed over 10 mil., high density polyethylene membrane. The membrane shall be properly sealed at all laps, edges and penetrations. The membrane shall be placed over 4" minimum thick clean, crushed, and compacted rock. The rock shall be placed on sub-grade prepared as noted in this report. (The builder shall design a mix design for the concrete that will address bleeding, shrinkage, and curling of the concrete placed directly on the vapor barrier.)

The slab can be expected to crack as the concrete cures. This is normal and cannot be controlled with reinforcement or control joints. The purpose of the reinforcement is to minimize the number and size of the cracks, but not to eliminate cracking altogether.

3.6 Retaining Walls

All retaining walls (if required) are designed by others and shall be designed to resist lateral and vertical pressures imposed by the adjacent native material, fill material, backfill, and any anticipated surcharges that will be imposed adjacent to the wall. Any waterproofing of the wall required to prevent moisture from penetrating through the wall shall be designed by others.

Where the top of retaining walls are capable of deflecting a minimum of 0.10% of the wall height, an equivalent fluid active pressure of 38 psf per foot of depth can be used for design. Retaining walls that are fully constrained against deflection at the top may be designed for an equivalent fluid at-rest pressure of 55 psf per foot of depth. These pressures are unfactored and as such do not include factors of safety.

2571 California Park Drive, Ste. 210 • Chico, CA 95928 • (530) 892-1100

The design pressures provided here do not include the effects of any hydrostatic pressure from water that may build up behind the wall. The designer shall specify the non-expansive drainrock backfill and drainage system to prevent water from building up behind the wall. The drainage system shall flow to daylight.

The design pressures provided here do not include loads imposed by any surcharges such as construction equipment, roadways, landscaping, seismic events, or foundations from adjacent structures. The designer shall apply additional vertical or lateral loading to the wall as they deem necessary or as required by the building code.

At no time during construction after the wall is built shall heavy equipment be allowed within a horizontal distance equal to the retained height of the wall. Within this zone, only hand operated equipment shall be used for compaction of the backfill.

3.7 Special Inspections

The foundation system is conventional in nature and within the scope of the required Building Department inspections. There are no special inspections required for the excavations or concrete footings associated with this project. The contractor is required to contact Streamline Engineering if any unusual soil conditions are discovered.

3.8 Site Geology and Seismicity

The site is not within an Alquist-Priolo Special Studies Zone according to the State of California Department of Conservation. There are no active faults running through the site according to the book, "Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada". Based on these sources, surface rupture due to faulting activity should not be an issue for this site. Due to the frequency of earthquakes in Northern California, ground motion should be expected to occur at this site during the life of the proposed structure. Based on the ASCE 7-16 Standard Seismic Design Provisions for this parcel we have the following Seismic variables:

For Lat. = 39.740834 degrees N and Long. = 121.878090 degrees West

Soil Site Class	**D** (per CBC 1613.5.2)		
Ss, Period 0.2 sec.:	**0.782 g**	S1, Period 1.0 sec.:	**0.320 g**
SMs = Fa x Ss:	**0.938 g**	SM1 = Fv x S1:	null-See Section 11.4.8
SDs = 2/3 x SMs:	**0.625 g**	**SD1 = 2/3 x SM1:**	null-See Section 11.4.8

Seismic Design Category: **D** (As defined by the CBC)

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3.9 Soil Expansion Potential

Based on our review of the site, soil testing, and the soils maps, we have determined that the soil found at this site does not have significant expansion potential. The results of the Plasticity Index tests were low, so no Expansion Index testing was performed.

During grading operations if the contractor encounters areas that they deem to contain excessive clay or expansive soil, we recommend that they contact our office for a field observation to determine the best course of action.

3.10 Liquefaction Potential

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading. Liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. When liquefaction occurs, the strength of the soil decreases and, the ability of a soil deposit to support foundations for structures is significantly reduced. Based on our site review, the soil types found at this site are not prone to liquefaction.

3.11 CBC Requirements

This section is intended to address the applicable requirements listed in section 1803 (Foundation and Soils Investigations) of the CBC. The following code sections have been specifically addressed as noted below:

1803.3.1 The classification and investigation of the soil has been made by a registered design professional. The wet stamp and signature of the individual responsible for the report is on the cover sheet.

1803.5.1 The soil classification has been determined based on the soils map provided by the USDA, and on-site observation. For the purpose of soil classification, on-site observation by a registered design professional without testing is acceptable per Section 1803.3.1 of the CBC. See "Design Criteria" in Section 3.4 for soil classification.

1803.5.3 See section 3.8 "Soil Expansion potential" in this report.

1808.7 Foundations for all structures shall meet the requirements of this section and Figure 1808.7.1.

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4.0 LIMITATIONS

This report was prepared according to the scope of work included in our "Contract for Professional Services" agreement made between Streamline Engineering and our client. This report is intended for the sole use of our client. Use of the report by a third party is neither expressed nor implied and shall be at the party's sole risk.

Our recommendations contained in this report are based on our engineering judgment, research of government documents, and site observations for the site location described in this report. This report was prepared specifically for the proposed structure(s) described in this report. If additional structures are constructed at this property, the owner shall contact Streamline Engineering for approval. Our findings are based on the condition of the site as it existed at the time of our site observation. If site conditions have changed since our investigation was completed, we shall be notified to examine the changes and determine if our initial recommendations are still valid. This report is only valid for the CBC edition shown in section 1.1. **For structures built under newer additions of the CBC, written approval from Streamline Engineering is required.**

If on-site excavations during construction reveal conditions different than specified in this report, Streamline shall be contacted for a follow up evaluation and possibly new recommendations. This report is not valid for discovery items or other changes to the site. **This report should not be used after 2 years of the specified date on the cover sheet without written approval of Streamline Engineering.**

It is not within the scope of our work to locate buried objects or problems that were concealed by others. These objects include, but are not limited to existing foundations, leach fields, septic tanks, fuel tanks, and underground utilities. We cannot be held liable for hidden objects. The elevation of the groundwater noted in this project is only relevant for the date of the site observation. This depth to groundwater can change with time and location.

It is not within the scope of our work to identify or locate hazardous materials that may be contained on this site. These materials could be manmade or naturally occurring. If the owner would like to have a hazardous material survey performed, it is the owner's responsibility to contact a specialist in this field to perform the survey as needed.

These findings are based on our professional opinion and are not intended as a warranty of any kind. Design for consolidation, differential settlement, and engineered fill are by others. No warranty is expressed or implied. Please contact us with any questions at 530-892-1100.

4.5 Follow-up Geotechnical Services

To confirm that our recommendations are properly understood and implemented, we recommend that we be retained to review the grading and foundation plans as well as observe the earthwork and foundation construction.

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FIGURES

FIGURE 1
TEST PIT LOCATION MAP

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		SYMBOLS	CODE	TYPICAL NAMES
COARSE GRAINED SOILS (More than ½ of soil > No. 200 sieve size)	GRAVELS (More than ½ of coarse fraction > No. 4 sieve size)	GW		Well graded gravels or gravel - sand mixtures, little or no fines
		GP		Poorly graded gravels or gravel - sand mixtures, little of no fines
		GM		Silty gravels, gravel - sand - silt mixtures
		GC		Clayey gravels, gravel - sand - clay mixtures
	SANDS (More than ½ of coarse fraction < No. 4 sieve size)	SW		Well graded sands or gravely sands, little or no fines
		SP		Poorly graded sands of gravely sands, little or now fines
		SM		Silty sands, sand - silt mixtures
		SC		Clayey sands, sand - clay mixtures
FINE GRAINED SOILS (More than ½ of soil < No. 200 sieve size)	SILTS & CLAYS LL < 50	ML		Inorganic silts and very fine sands, rock , silty or clayey fine sands or clayey silts with slight plasticity
		CL		Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays
		OL		Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS LL > 50	MH		Inorganic silts, micaceous of diatomaceous fine sandy or silty coils, elastic silts
		CH		Inorganic clays of high plasticity, fat clays
		OH		Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		PT		Peat and other highly organic soils

OTHER SYMBOLS

= Drive Sample: 2-1/2" O.D. California sampler

= Drive Sample: no recovery

= Initial Water Level

= Final Water Level

= Estimated or gradational material change line

= Observed material change line

Laboratory Tests

PI = Plasticity Index

EI = Expansion Index

UCC = Unconfined Compression Test

TR = Triaxial Compression Test

GR = Gradation Analysis (Sieve)

CON = Consolidation Test

GRAIN SIZE CLASSIFICATION

CLASSIFICATION	RANGE OF GRAIN SIZE	
	U.S. Standard sieve size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL coarse\se (c) fine (f)	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
SAND coarse (c) medium (m) fine (f)	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.76 to 0.074 4.76 to 2.00 2.00 to 0.420 0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

CONSISTENCY CLASSIFICATION

COHESIVE SOILS		GRANULAR SOILS	
Description	Below/ ft.	Description	Below/ ft.
Very Soft	<3	Very Loose	<5
Soft	3-5	Loose	5-15
Medium (firm)	6-10	Medium Dense	16-40
Stiff	11-20	Dense	41-65
Very Stiff	21-40	Very Dense	>65
Hard	>40		

Figure 2

APPLIED TESTING CONSULTANTS

3060 Thorntree Drive, Suite #10 - Chico, CA 95973 - Telephone: (530) 891-6625 - Facsimile: (530) 891-4243

CALIFORNIA EARTHQUAKE EPICENTER MAP
1932 to 2000

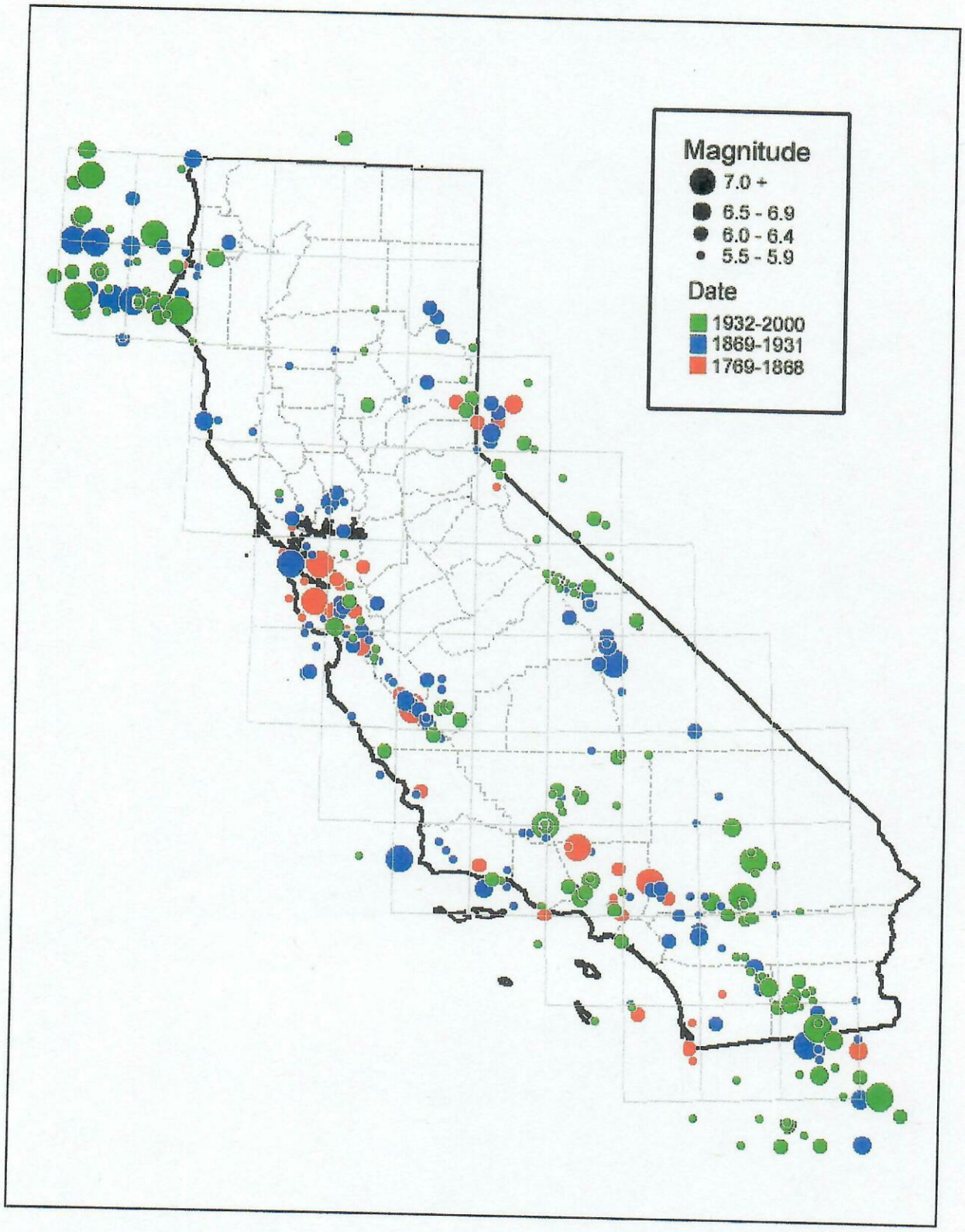


Figure 3

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

OSHPD

#5305 Nord Ave. Apartments

Latitude, Longitude: 39.740834, -121.878090

Date	10/15/2023, 9:36:40 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	0.782	MCE_R ground motion. (for 0.2 second period)
S_1	0.32	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.938	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	0.625	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.347	MCE_G peak ground acceleration
F_{PGA}	1.253	Site amplification factor at PGA
PGA_M	0.435	Site modified peak ground acceleration
T_L	16	Long-period transition period in seconds
SsRT	0.782	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.863	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.32	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.356	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.

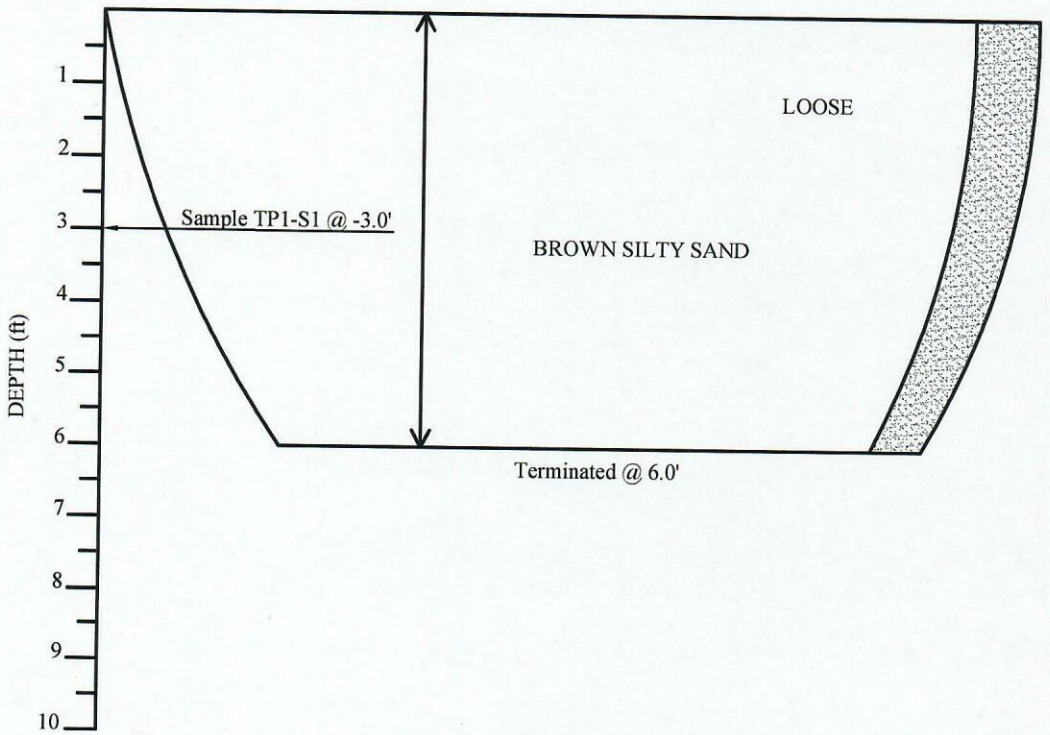
FIG. 4

APPENDIX A

Test Pit Log

PROJECT: NORD AVENUE APARTMENTS
CLIENT: EPICK HOMES
LOCATION: SW CORNER
EQUIPMENT: CAT 420 E

TEST PIT NUMBER: TP-1
DATE EXCAVATED: 09/14/2023
TOTAL DEPTH: 6.0'
LOGGED BY: B. FORSYTHE



Attachment (1)

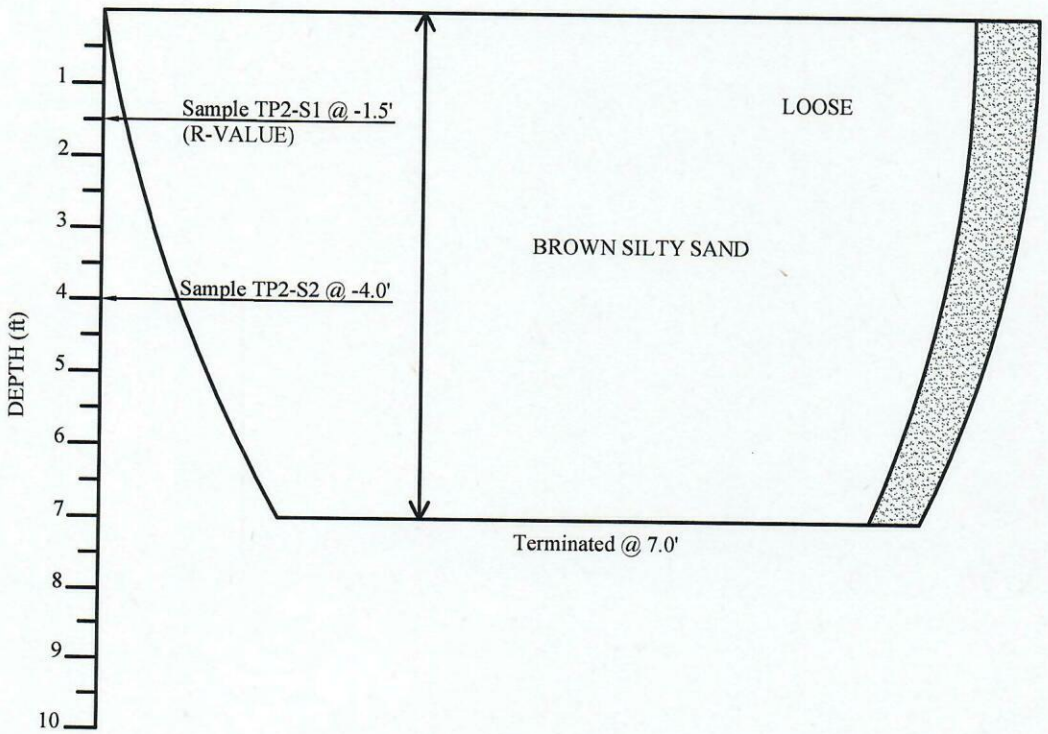
NORD AVENUE APARTMENTS	JOB NO.: 5305
NORD & WEST LINDO AVENUE	DATE: 10/16/2023
CHICO, CA	CHECKED BY: JMR
	PAGE: OF

2571 California Park Drive, Ste. 210 Chico, CA 95928 Ph: (530) 892-1100

Test Pit Log

PROJECT: NORD AVENUE APARTMENTS
CLIENT: EPICK HOMES
LOCATION: SE CORNER
EQUIPMENT: CAT 420 E

TEST PIT NUMBER: TP-2
DATE EXCAVATED: 09/14/2023
TOTAL DEPTH: 7.0'
LOGGED BY: B. FORSYTHE



Attachment (2)

NORD AVENUE APARTMENTS	JOB NO.: 5305
NORD & WEST LINDO AVENUE	DATE: 10/16/2023
CHICO, CA	CHECKED BY: JMR
	PAGE: OF

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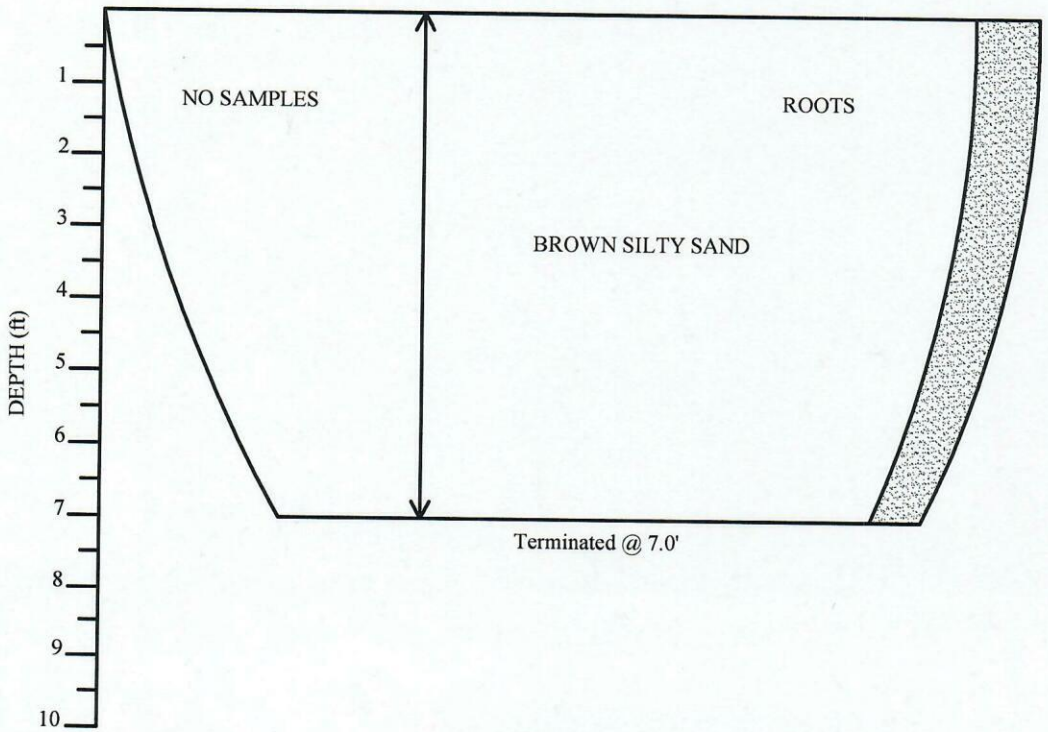
Test Pit Log

PROJECT: NORD AVENUE APARTMENTS
CLIENT: EPICK HOMES
LOCATION: S. CENTER
EQUIPMENT: CAT 420 E

TEST PIT NUMBER: TP-3
DATE EXCAVATED: 09/14/2023
TOTAL DEPTH: 7.0'
LOGGED BY: B. FORSYTHE



Attachment (3)

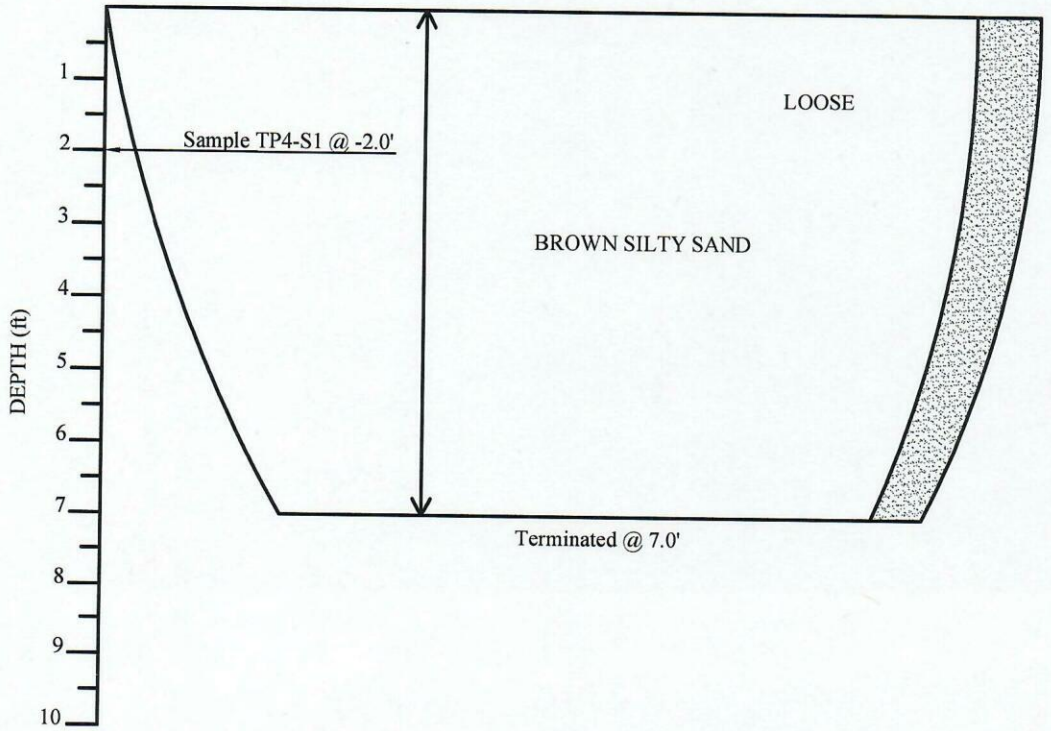
NORD AVENUE APARTMENTS	JOB NO.: 5305
NORD & WEST LINDO AVENUE	DATE: 10/16/2023
CHICO, CA	CHECKED BY: JMR
	PAGE: OF

2571 California Park Drive, Ste. 210 Chico, CA 95928 Ph: (530) 892–1100

Test Pit Log

PROJECT: NORD AVENUE APARTMENTS
CLIENT: EPICK HOMES
LOCATION: N. CENTER
EQUIPMENT: CAT 420 E

TEST PIT NUMBER: TP-4
DATE EXCAVATED: 09/14/2023
TOTAL DEPTH: 7.0'
LOGGED BY: B. FORSYTHE



Attachment (4)

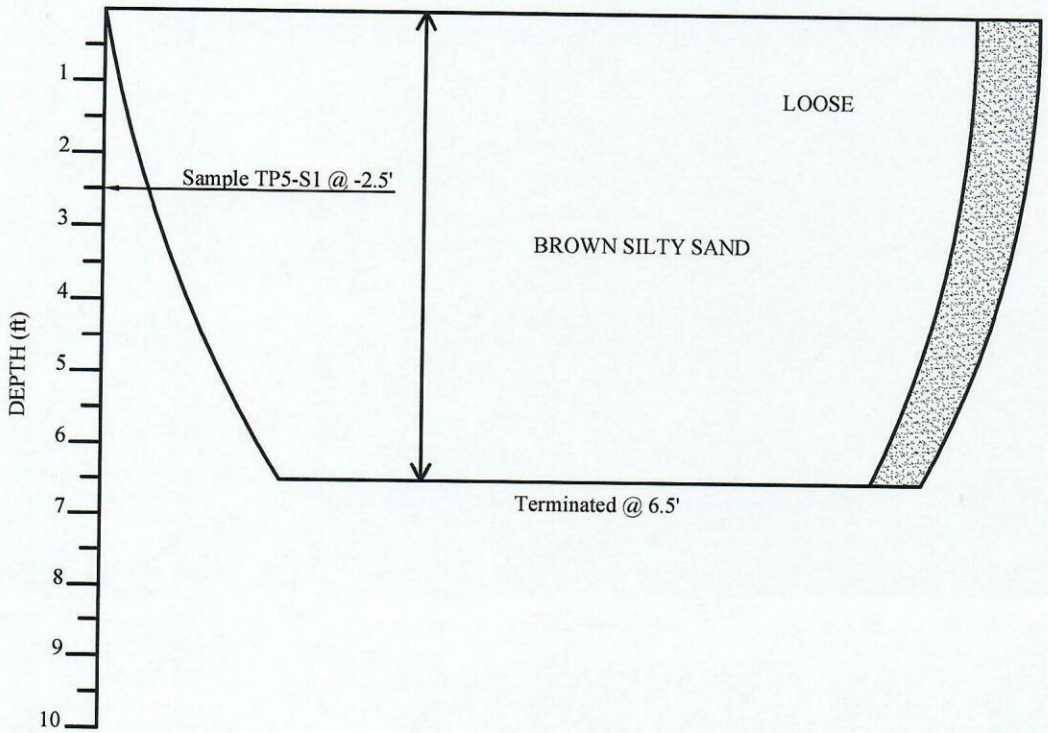
NORD AVENUE APARTMENTS	JOB NO.: 5305
NORD & WEST LINDO AVENUE	DATE: 10/16/2023
CHICO, CA	CHECKED BY: JMR
	PAGE: OF

2571 California Park Drive, Ste. 210 Chico, CA 95928 Ph: (530) 892–1100

Test Pit Log

PROJECT: NORD AVENUE APARTMENTS
CLIENT: EPICK HOMES
LOCATION: NW CORNER
EQUIPMENT: CAT 420 E

TEST PIT NUMBER: TP-5
DATE EXCAVATED: 09/14/2023
TOTAL DEPTH: 6.5'
LOGGED BY: B. FORSYTHE



Attachment (5)

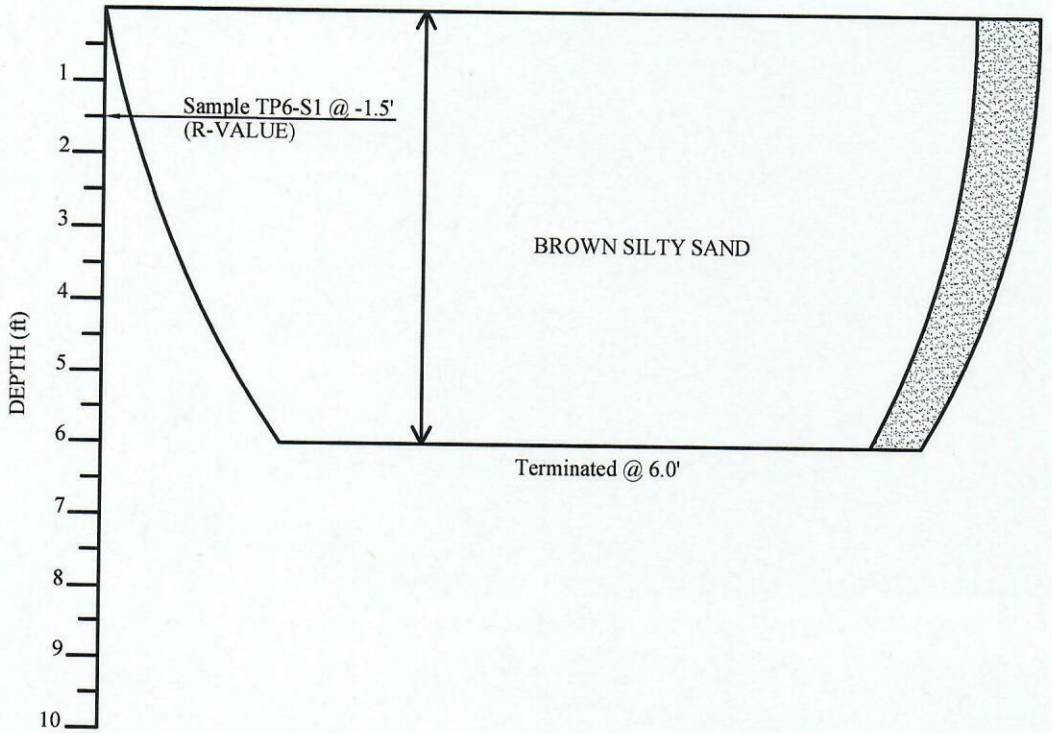
NORD AVENUE APARTMENTS	JOB NO.: 5305
NORD & WEST LINDO AVENUE	DATE: 10/16/2023
CHICO, CA	CHECKED BY: JMR
	PAGE: OF

2571 California Park Drive, Ste. 210 Chico, CA 95928 Ph: (530) 892–1100

Test Pit Log

PROJECT: NORD AVENUE APARTMENTS
CLIENT: EPICK HOMES
LOCATION: W. LINDO ENTRANCE
EQUIPMENT: CAT 420 E

TEST PIT NUMBER: TP-6
DATE EXCAVATED: 09/14/2023
TOTAL DEPTH: 6.0'
LOGGED BY: B. FORSYTHE



Attachment (6)

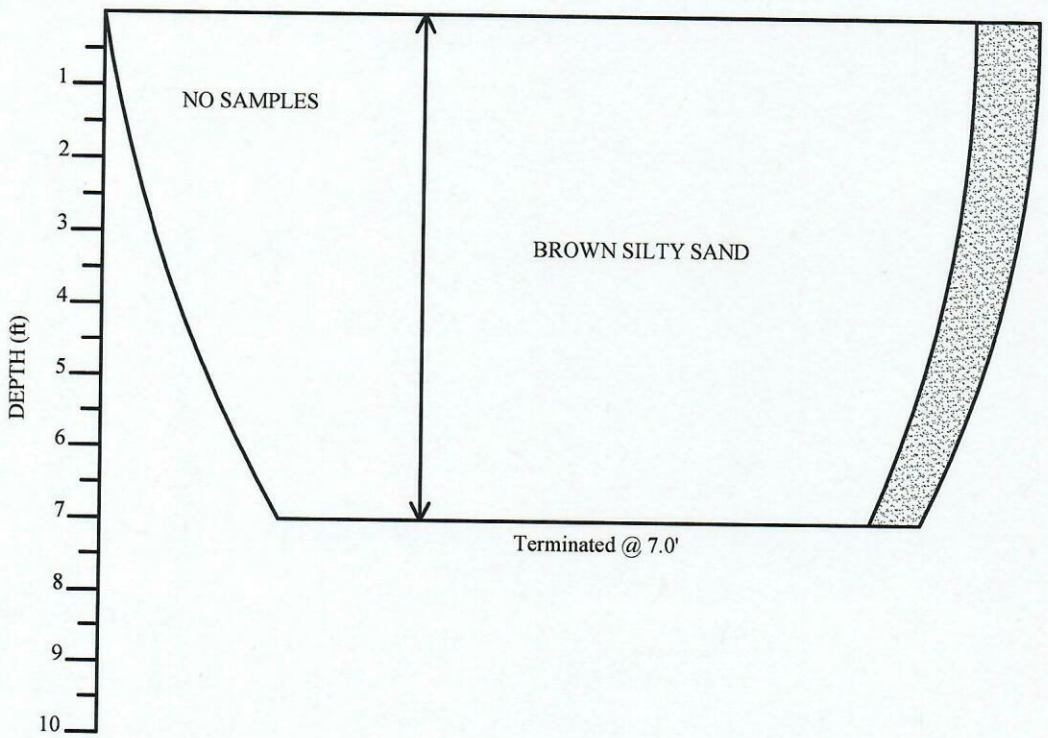
NORD AVENUE APARTMENTS	JOB NO.: 5305
NORD & WEST LINDO AVENUE	DATE: 10/16/2023
CHICO, CA	CHECKED BY: JMR
	PAGE: OF

2571 California Park Drive, Ste. 210 Chico, CA 95928 Ph: (530) 892–1100

Test Pit Log

PROJECT: NORD AVENUE APARTMENTS
CLIENT: EPICK HOMES
LOCATION: NE CORNER
EQUIPMENT: CAT 420 E

TEST PIT NUMBER: TP-7
DATE EXCAVATED: 09/14/2023
TOTAL DEPTH: 7.0'
LOGGED BY: B. FORSYTHE



Attachment (7)

NORD AVENUE APARTMENTS	JOB NO.: 5305
NORD & WEST LINDO AVENUE	DATE: 10/16/2023
CHICO, CA	CHECKED BY: JMR
	PAGE: OF

2571 California Park Drive, Ste. 210 Chico, CA 95928 Ph: (530) 892-1100

APPENDIX B

2571 California Park Drive, Ste. 210 • Chico, CA 95928 • (530) 892-1100

Plasticity Index

Project: 2240 Nord Avenue Apartments
Client: Streamline Engineering
Address 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928
Attention: Jeff Richelieu
Source: sample taken by ATC

Test Pit#: 1
Sample No: 1
Date: 9/20/2023
Depth: -3'
Technician: K. Sahasgun

Material Description: (SC-SM) Silty Clayey Sand

Liquid Limit:

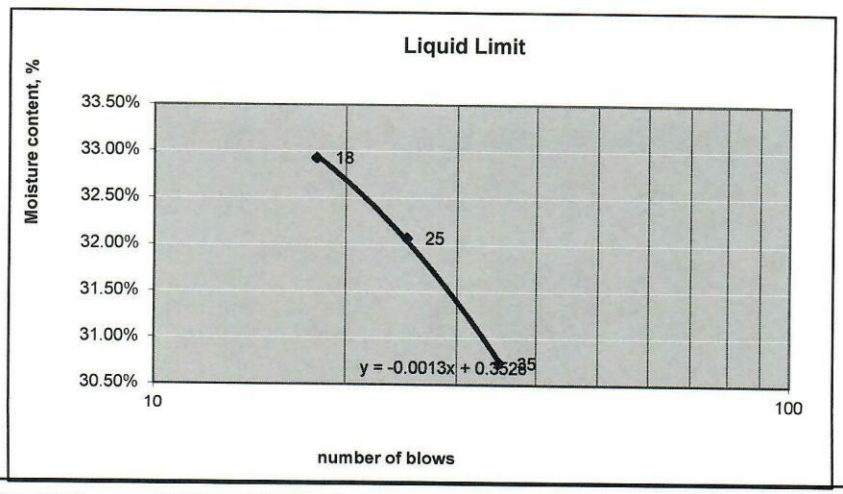
Trial Number:	1	2	3	4	5	6
Tin Label:	31	32	33			
Wet Weight + Tare:	35.8	35.14	35.83			
Dry Weight + Tare:	34.5	33.95	34.47			
Weight of Water:	1.30	1.19	1.36			
Weight of Tare:	30.27	30.24	30.34			
Weight of Dry Soil:	4.23	3.71	4.13			
Moisture Content:	30.73%	32.08%	32.93%			
Number of Blows:	35	25	18			

Liquid Limit, LL	Plastic Limit, PL	Plasticity Index, PI
32	25	7

Below A Line

Plastic Limit:

Trial Number:	1	2	3	4	5	6
Tin Label:	34	35				
Wet Weight + Tare:	39.97	37.61				
Dry Weight + Tare:	37.99	36.18				
Weight of Water:	1.98	1.43				
Weight of Tare:	30.22	30.35				
Weight of dry soil:	7.77	5.83				
Moisture Content:	25.48%	24.53%				



APPLIED TESTING CONSULTANTS

MATERIALS TESTING, ENGINEERING AND INSPECTION

Sieve Analysis - Combined

Client: Streamline Engineering
Address: 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928

Sample No: TP-1 S-1
Date: 9/19/2023
Tech: K. Sahagun

Project: 2240 Nord Avenue Apartments

Sample Description: (SC-SM) Silty Clayey Sand
Sample depth: -3'

Start Wt, Course:	12,632.5 g
Start Wt. fine:	506.5 g

Sieve Size	Weight Retained	Percent retained	Cumulative Percent		Specified
			Retained	Passing	
4				100.0%	
3 1/2				100.0%	
3				100.0%	
2 1/2				100.0%	
2				100.0%	
1 1/2				100.0%	
1				100.0%	
3/4				100.0%	
1/2				100.0%	
3/8	2.1 g	0.0%	0.0%	100.0%	
#4	10.2 g	0.1%	0.1%	99.9%	
#8	2.1 g	0.4%	0.5%	99.5%	
#16	5.3 g	1.0%	1.6%	98.4%	
#30	28.6 g	5.6%	7.2%	92.8%	
#50	56.9 g	11.2%	18.4%	81.6%	
#100	76.1 g	15.0%	33.4%	66.6%	
#200	95.8 g	18.9%	52.3%	47.7%	

This test was performed according to ASTM D2487

APPLIED TESTING CONSULTANTS
MATERIALS TESTING, ENGINEERING AND INSPECTION

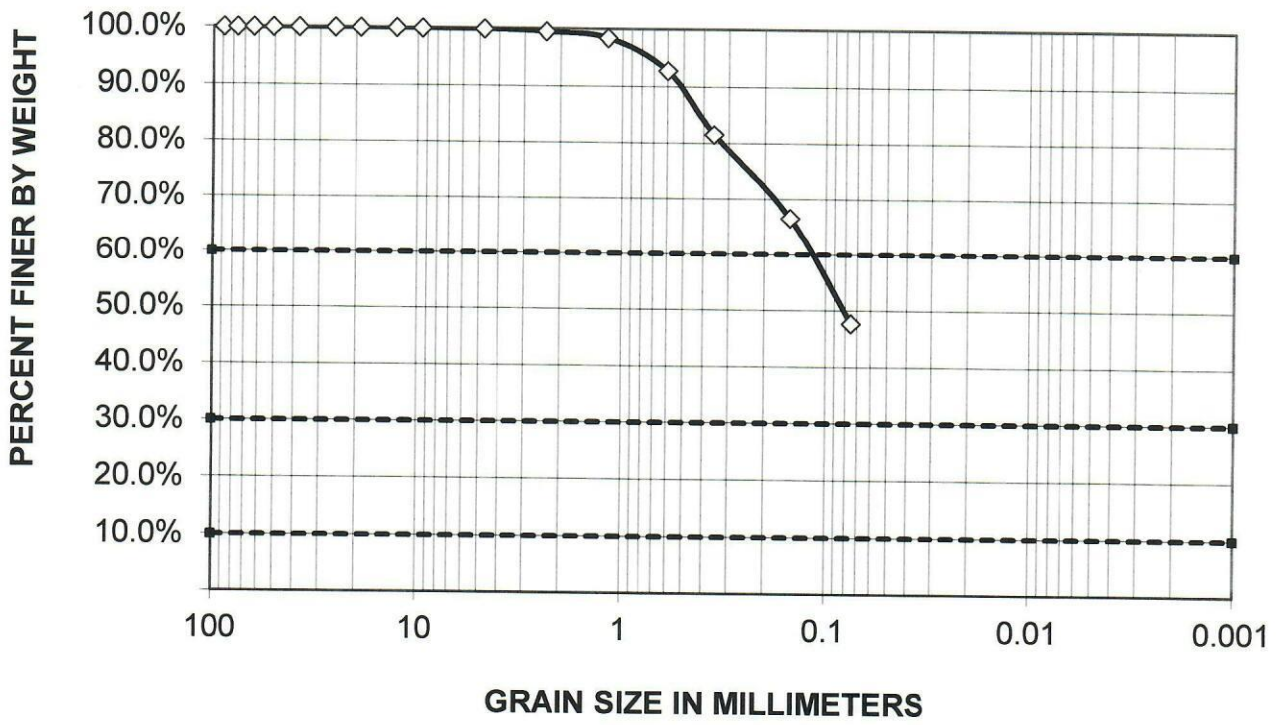
Sieve Analysis - Combined

Sample No: TP-1 S-1
Date: 9/19/2023
Tech: K. Sahagun

Client: Streamline Engineering
Address: 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928

Project: 2240 Nord Avenue Apartments

Sample Description: (SC-SM) Silty Clayey Sand
Sample location: TP-1 S-1
Sample depth: -3'



Plasticity Index

Project: 2240 Nord Avenue Apartments
Client: Streamline Engineering
Address 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928
Attention: Jeff Richelieu
Source: *sample taken by ATC*

Test Pit#: 2
Sample No: 2
Date: 9/26/2023
Depth: -4'
Technician: K. Sahasgun

Material Description: (SC-SM) Silty Clayey Sand

Liquid Limit:

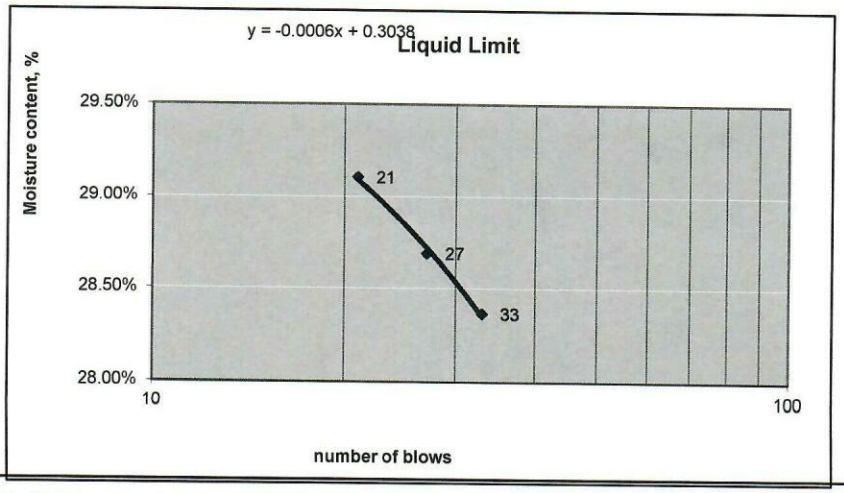
Trial Number:	1	2	3	4	5	6
Tin Label:	1	2	3			
Wet Weight + Tare:	35.62	35.2	35.32			
Dry Weight + Tare:	34.44	34.15	34.15			
Weight of Water:	1.18	1.05	1.17			
Weight of Tare:	30.28	30.49	30.13			
Weight of Dry Soil:	4.16	3.66	4.02			
Moisture Content:	28.37%	28.69%	29.10%			
Number of Blows:	33	27	21			

Liquid Limit, LL	Plastic Limit, PL	Plasticity Index, PI
29	23	6

Below A Line

Plastic Limit:

Trial Number:	1	2	3	4	5	6
Tin Label:	4	5				
Wet Weight + Tare:	42.41	42.39				
Dry Weight + Tare:	40.14	40.13				
Weight of Water:	2.27	2.26				
Weight of Tare:	30.12	30.2				
Weight of dry soil:	10.02	9.93				
Moisture Content:	22.65%	22.76%				



APPLIED TESTING CONSULTANTS

MATERIALS TESTING, ENGINEERING AND INSPECTION

Sieve Analysis - Combined

Client: Streamline Engineering
Address: 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928

Sample No: TP-2 S-2
Date: 9/25/2023
Tech: K. Sahagun

Project: 2240 Nord Avenue Apartments

Sample Description: (SC-SM) Silty Clayey Sand
Sample depth: -4'

Start Wt, Course:	12,950.1 g
Start Wt. fine:	506.9 g

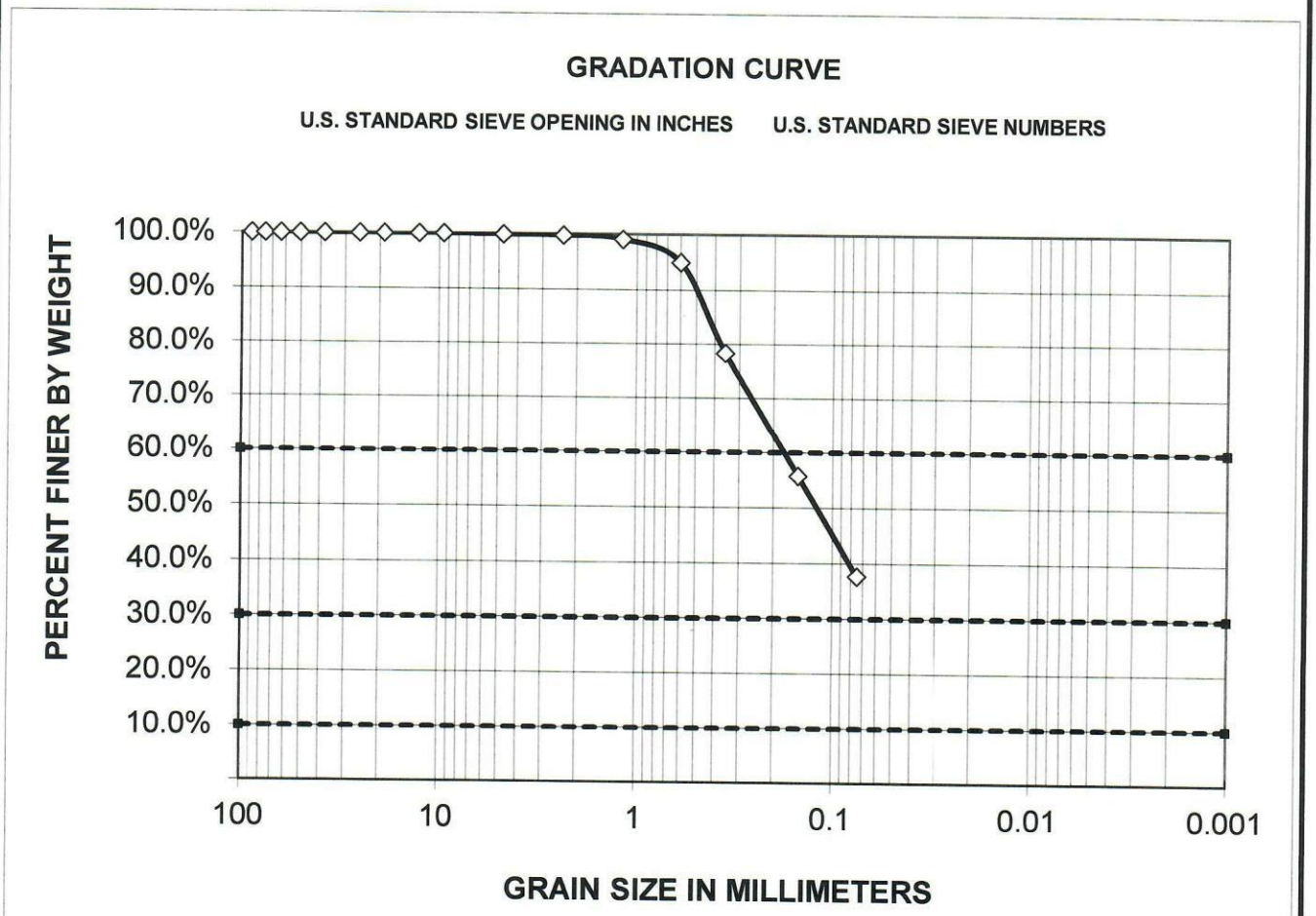
Sieve Size	Weight Retained	Percent retained	Cumulative Percent		Specified
			Retained	Passing	
4				100.0%	
3 1/2				100.0%	
3				100.0%	
2 1/2				100.0%	
2				100.0%	
1 1/2				100.0%	
1				100.0%	
3/4				100.0%	
1/2				100.0%	
3/8				100.0%	
#4	11.7 g	0.1%	0.1%	99.9%	
#8	0.6 g	0.1%	0.2%	99.8%	
#16	3.3 g	0.7%	0.9%	99.1%	
#30	21.4 g	4.2%	5.1%	94.9%	
#50	84.0 g	16.6%	21.6%	78.4%	
#100	114.5 g	22.6%	44.2%	55.8%	
#200	91.8 g	18.1%	62.3%	37.7%	

This test was performed according to ASTM D2487

Sieve Analysis - Combined

Sample No: TP-2 S-2
Date: 9/25/2023
Tech: K. Sahagun

Client:	Streamline Engineering
Address:	2571 California Park Dr, Ste 210
City, State, Zip:	Chico, CA 95928
Project:	2240 Nord Avenue Apartments
Sample Description:	(SC-SM) Silty Clayey Sand
Sample location:	TP-2 S-2
Sample depth:	-4'



Plasticity Index

Project: 2240 Nord Avenue Apartments
Client: Streamline Engineering
Address 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928
Attention: Jeff Richelieu
Source: *sample taken by ATC*

Test Pit#: 4
Sample No: 1
Date: 9/20/2023
Depth: -2'
Technician: K. Sahasgun

Material Description: (SC-SM) Silty Clayey Sand

Liquid Limit:

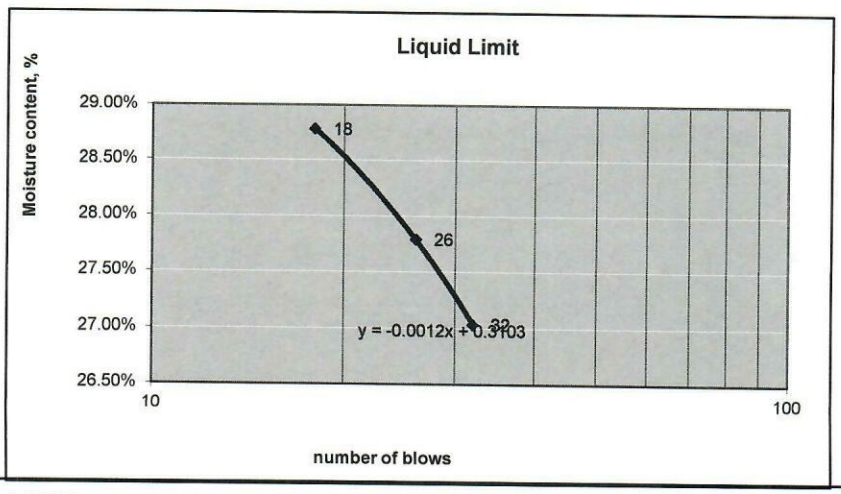
Trial Number:	1	2	3	4	5	6
Tin Label:	21	22	23			
Wet Weight + Tare:	34.99	35.26	35.73			
Dry Weight + Tare:	33.96	34.19	34.55			
Weight of Water:	1.03	1.07	1.18			
Weight of Tare:	30.15	30.34	30.45			
Weight of Dry Soil:	3.81	3.85	4.1			
Moisture Content:	27.03%	27.79%	28.78%			
Number of Blows:	32	26	18			

Liquid Limit, LL	Plastic Limit, PL	Plasticity Index, PI
28	23	5

Below A Line

Plastic Limit:

Trial Number:	1	2	3	4	5	6
Tin Label:	24	25				
Wet Weight + Tare:	36.6	36.03				
Dry Weight + Tare:	35.44	34.98				
Weight of Water:	1.16	1.05				
Weight of Tare:	30.42	30.52				
Weight of dry soil:	5.02	4.46				
Moisture Content:	23.11%	23.54%				



APPLIED TESTING CONSULTANTS

MATERIALS TESTING, ENGINEERING AND INSPECTION

Sieve Analysis - Combined

Client: Streamline Engineering
Address: 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928

Sample No: TP-4 S-1
Date: 9/19/2023
Tech: K. Sahagun

Project: 2240 Nord Avenue Apartments

Sample Description: (SM-SM) Silty Clayey Sand
Sample depth: -2'

Start Wt, Course:	12,541.8 g
Start Wt. fine:	510.6 g

Sieve Size	Weight Retained	Percent retained	Cumulative Percent		Specified
			Retained	Passing	
4				100.0%	
3 1/2				100.0%	
3				100.0%	
2 1/2				100.0%	
2				100.0%	
1 1/2				100.0%	
1				100.0%	
3/4				100.0%	
1/2	7.7 g	0.1%	0.1%	99.9%	
3/8	5.6 g	0.0%	0.1%	99.9%	
#4	18.7 g	0.1%	0.3%	99.7%	
#8	1.9 g	0.4%	0.6%	99.4%	
#16	3.8 g	0.7%	1.4%	98.6%	
#30	17.5 g	3.4%	4.8%	95.2%	
#50	52.2 g	10.2%	15.0%	85.0%	
#100	110.8 g	21.6%	36.6%	63.4%	
#200	115.5 g	22.6%	59.2%	40.8%	

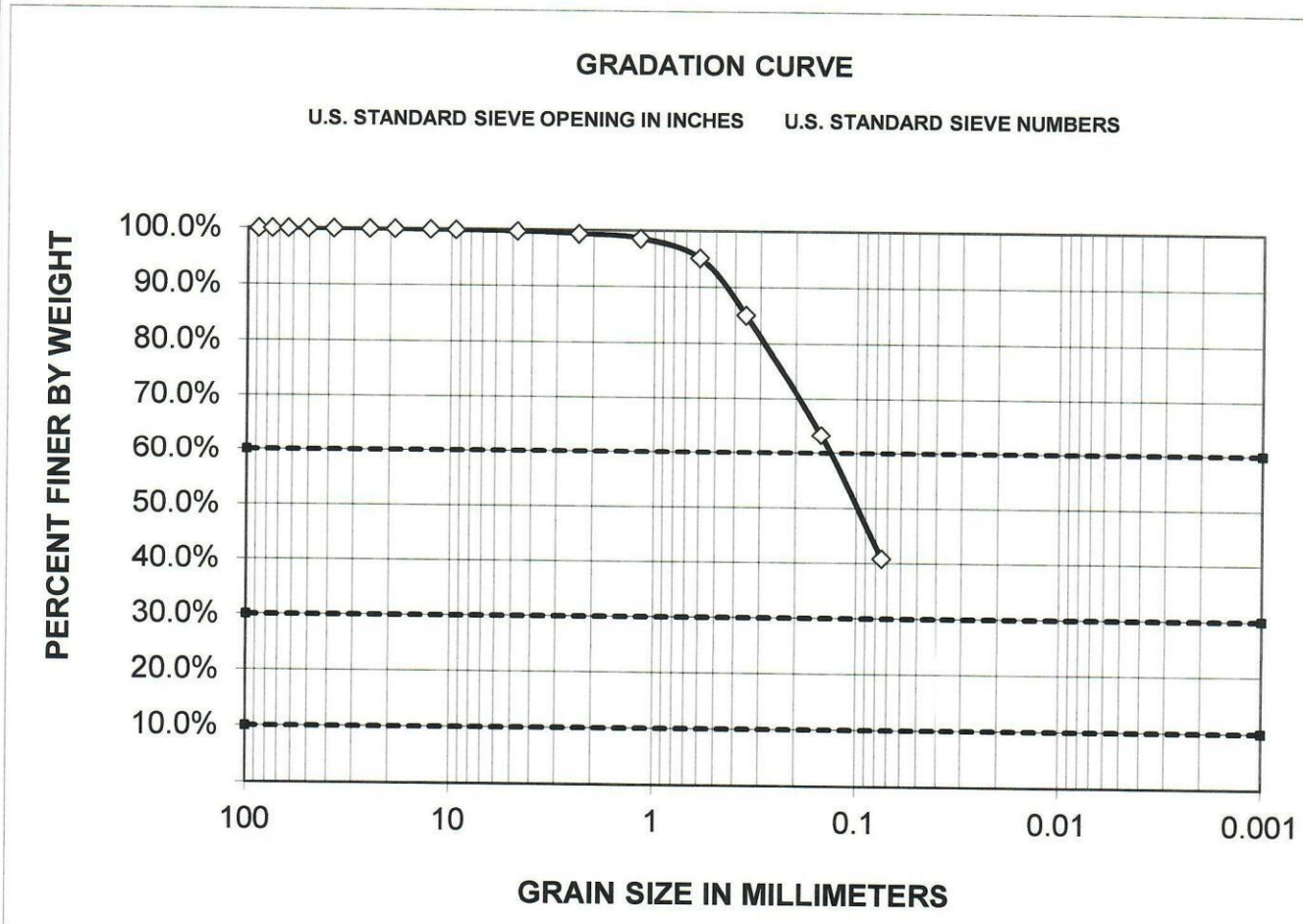
This test was performed according to ASTM D2487

APPLIED TESTING CONSULTANTS
MATERIALS TESTING, ENGINEERING AND INSPECTION

Sieve Analysis - Combined

Sample No: TP-4 S-1
Date: 9/19/2023
Tech: K. Sahagun

Client:	Streamline Engineering
Address:	2571 California Park Dr, Ste 210
City, State, Zip:	Chico, CA 95928
Project:	2240 Nord Avenue Apartments
Sample Description:	(SM-SM) Silty Clayey Sand
Sample location:	TP-4 S-1
Sample depth:	-2'



Plasticity Index

Project: 2240 Nord Avenue Apartments
Client: Streamline Engineering
Address 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928
Attention: Jeff Richelieu
Source: sample taken by ATC

Test Pit#: 5
Sample No: 1
Date: 9/20/2023
Depth: -2.5'
Technician: K. Sahasgun

Material Description: (SC-SM) Silty Clayey Sand

Liquid Limit:

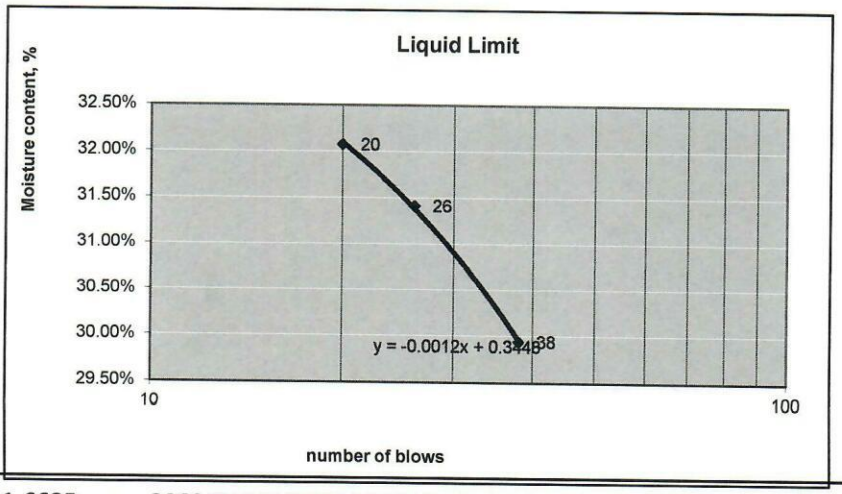
Trial Number:	1	2	3	4	5	6
Tin Label:	16	17	18			
Wet Weight + Tare:	34.45	34.64	35.05			
Dry Weight + Tare:	33.45	33.55	33.86			
Weight of Water:	1.00	1.09	1.19			
Weight of Tare:	30.11	30.08	30.15			
Weight of Dry Soil:	3.34	3.47	3.71			
Moisture Content:	29.94%	31.41%	32.08%			
Number of Blows:	38	26	20			

Liquid Limit, LL	Plastic Limit, PL	Plasticity Index, PI
32	26	6

Below A Line

Plastic Limit:

Trial Number:	1	2	3	4	5	6
Tin Label:	19	20				
Wet Weight + Tare:	38.54	37.92				
Dry Weight + Tare:	36.75	36.29				
Weight of Water:	1.79	1.63				
Weight of Tare:	29.85	29.98				
Weight of dry soil:	6.9	6.31				
Moisture Content:	25.94%	25.83%				



APPLIED TESTING CONSULTANTS

MATERIALS TESTING, ENGINEERING AND INSPECTION

Sieve Analysis - Combined

Client: Streamline Engineering
Address: 2571 California Park Dr, Ste 210
City, State, Zip: Chico, CA 95928

Sample No: TP-5 S-1
Date: 9/19/2023
Tech: K. Sahagun

Project: 2240 Nord Avenue Apartments

Sample Description: (SC-SM) Silty Clayey Sand
Sample depth: -2.5'

Start Wt, Course:	13,222.2 g
Start Wt. fine:	516.6 g

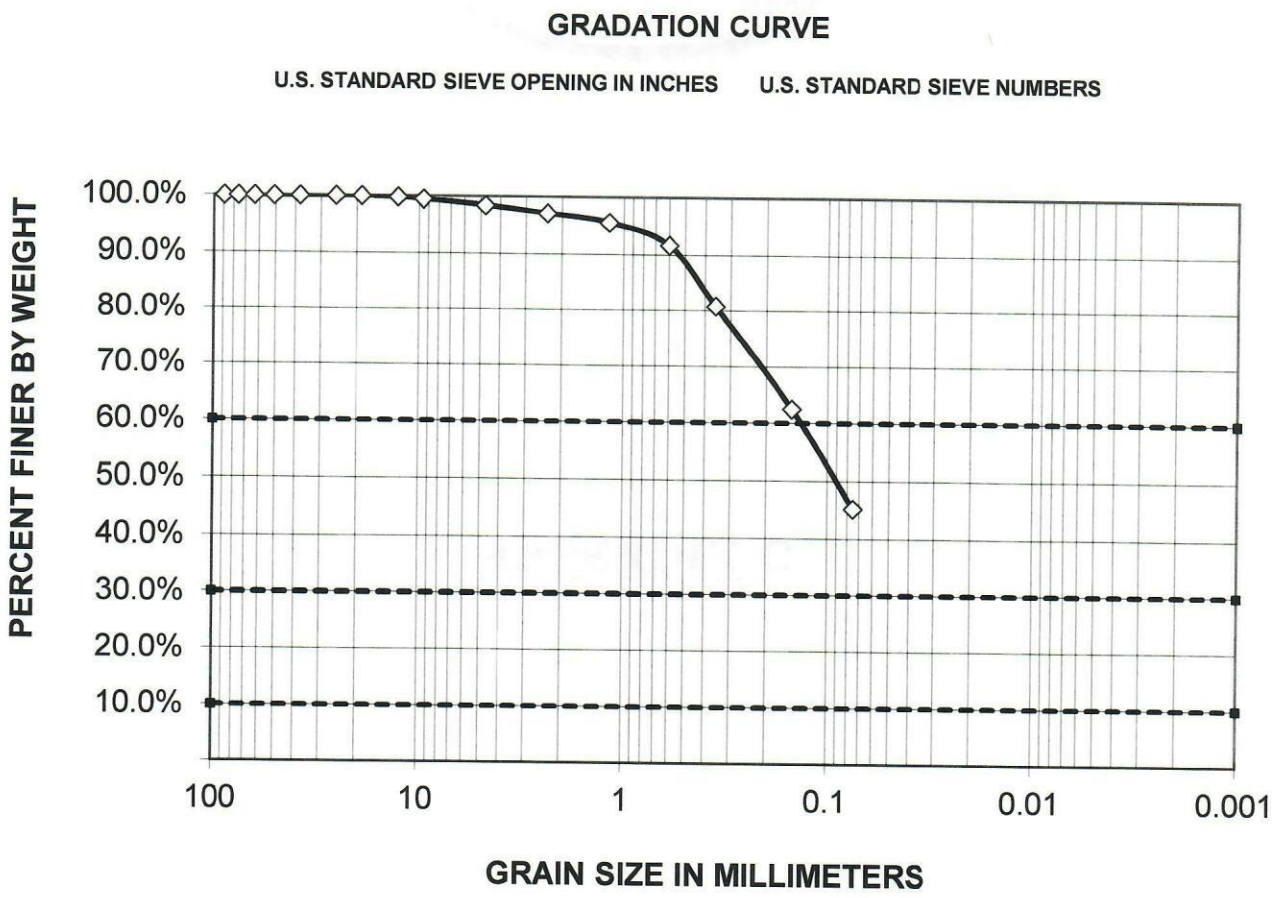
Sieve Size	Weight Retained	Percent retained	Cumulative Percent		Specified
			Retained	Passing	
4				100.0%	
3 1/2				100.0%	
3				100.0%	
2 1/2				100.0%	
2				100.0%	
1 1/2				100.0%	
1				100.0%	
3/4				100.0%	
1/2	23.7 g	0.2%	0.2%	99.8%	
3/8	39.5 g	0.3%	0.5%	99.5%	
#4	138.4 g	1.0%	1.5%	98.5%	
#8	7.2 g	1.4%	2.9%	97.1%	
#16	8.0 g	1.5%	4.4%	95.6%	
#30	20.6 g	3.9%	8.3%	91.7%	
#50	57.1 g	10.9%	19.2%	80.8%	
#100	95.7 g	18.2%	37.5%	62.5%	
#200	90.8 g	17.3%	54.8%	45.2%	

This test was performed according to ASTM D2487

Sieve Analysis - Combined

Sample No: TP-5 S-1
Date: 9/19/2023
Tech: K. Sahagun

Client:	Streamline Engineering
Address:	2571 California Park Dr, Ste 210
City, State, Zip:	Chico, CA 95928
Project:	2240 Nord Avenue Apartments
Sample Description:	(SC-SM) Silty Clayey Sand
Sample location:	TP-5 S-1
Sample depth:	-2.5'



Materials Testing, Inc.

8798 Airport Road
Redding, California 96002
(530) 222-1116, fax 222-1611

865 Cotting Lane, Suite A
Vacaville, California 95688
(707) 447-4025, fax 447-4143

Client: Applied Testing Consultants
3060 Thorntree Drive, Suite 10
Chico, CA 95973

Project: 2240 Nord Apartments
Source: ---

Pages: 1 of 1
Client No: 0800-120
Report No: 0300-001
Date: 09/26/2023
Submitted by: Client
Date Submitted: 09/18/2023

"R" VALUE TEST REPORT (CTM 301)

Sample: 1
Description: Dark Brown Sandy Silt
Location: TP2 S-1 @ 18.0"

SIEVE ANALYSIS

Sieve Size	2"	1-1/2"	1"	3/4"	1/2"	3/8"	#4
As Received (% Pass)	---	---	---	---	---	---	100
As Used (% Pass)	---	---	---	---	---	---	100

RESISTANCE VALUE

Specimen Number	Dry Unit Weight, PCF	Moisture (%)	Exudation Pressure (PSI)	Expansion Pressure Dial Reading & PSF		R-Value
1	111.3	15.5	626	50	217	67
2	108.3	17.7	294	10	43	50
3	106.0	19.1	205	6	26	28

R-Value @ 300 PSI Exudation Pressure = **50**

Notes:

Tested by John Hubbard.
The samples were tested according to the referenced standard test procedures and relate only to the items inspected or tested. Results are not transferable and shall not be reproduced, except in full, without written permission from MTI.

Materials Testing, Inc.

8798 Airport Road
Redding, California 96002
(530) 222-1116, fax 222-1611

865 Cotting Lane, Suite A
Vacaville, California 95688
(707) 447-4025, fax 447-4143

Client: Applied Testing Consultants
3060 Thorntree Drive, Suite 10
Chico, CA 95973

Project: 2240 Nord Apartments
Source: ---

Pages: 1 of 1
Client No: 0800-120
Report No: 0300-002
Date: 09/26/2023
Submitted by: Client
Date Submitted: 09/18/2023

"R" VALUE TEST REPORT (CTM 301)

Sample: 2
Description: Dark Brown Sandy Silt
Location: TP6 S-1 @ 18.0"

SIEVE ANALYSIS

Sieve Size	2"	1-1/2"	1"	3/4"	1/2"	3/8"	#4
As Received (% Pass)	---	---	---	---	---	---	100
As Used (% Pass)	---	---	---	---	---	---	100

RESISTANCE VALUE

Specimen Number	Dry Unit Weight, PCF	Moisture (%)	Exudation Pressure (PSI)	Expansion Pressure Dial Reading & PSF		R-Value
1	107.3	18.3	503	34	147	65
2	104.4	19.3	286	14	61	54
3	104.1	20.5	204	6	26	31

R-Value @ 300 PSI Exudation Pressure = **55**

Notes:

Tested by John Hubbard.
The samples were tested according to the referenced standard test procedures and relate only to the items inspected or tested. Results are not transferable and shall not be reproduced, except in full, without written permission from MTI.