General Services Agency
Capital Projects
COUNTY OF TULARE
2637 W BURREL AVE., SUITE 200
VISALIA, CA 93291

January 05, 2021

ADDENDUM NO. 3
COUNTY OF TULARE – Sheriff and Fire Dispatch Project

Any Addenda issued by the Owner or Owner's Representative during the time of bidding are to be considered in the Bid and will become a part of the Agreement between Contractor and Owner. Bidders shall acknowledge receipt of all Addenda on the Bid Form in the space provided.

ITEM 1: Soils Report

Attached is the Soils Report that was referenced in the Plans. The report is for informational purposes only. The County does not view this report and the issuance thereof as a material change to the project. Therefore, the bid due date remains the same as in the Project Specifications.

Kyle Taylor
Capital Projects Coordinator III

End of Addendum No. 3

SOIL INVESTIGATION FOR
TULARE AKERS PROFESSIONAL
CENTER NEW COMMUNICATION TOWER
AKERS STREET,
VISALIA, CALIFORNIA

Submitted to:

Capital Projects

May 29, 2020

Submitted by:

CTL- INC.

CTL, INC.
CONSOLIDATED TESTING LABORATORIES

May 29, 2020
File No. E2755-20

Mr. Kyle Taylor
Capital Projects
5953 south Mooney Blvd.,
Visalia, Ca. 93277

SUBJECT: Soil Investigation for proposed Tulare Akers Professional Center New Communication Tower, Akers Street, Visalia, California.

Gentlemen:

At your authorization and request, we have performed a Soil Investigation for Tulare Akers Professional Center New Communication Tower, Akers Street, Visalia, California.

The accompanying report presents the results of our Soil Investigation for the above referenced project. The report describes our study, findings, conclusions, and recommendations for use in design by the project consultants. It is the client's responsibility to see that all parties to the project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety, including the Additional Services and Limitations sections.

We appreciate the opportunity to be of service. If you have questions regarding the information contained in this report, please contact us.

Respectfully submitted,

CTL, Inc.

Santiago Espinoza
Managing Engineer
RCE No. 83299

SE:rc

710 S. Kaweah Avenue, Exeter, Ca 93221 (559) 592-3555 * Fax 559-592-3553
ctl@consolidatedtesting.com

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APPENDIX

SOILS INVESTIGATION
FOR THE NEW COMMUNICATIONS TOWER
TULARE COUNTY AKERS PROFESSIONAL CENTER
5300 WEST TULARE STREET
VISALIA, CALIFORNIA

INTRODUCTION

This report presents the results of a Soils Investigation for the Proposed Communications Tower at the Tulare County Akers Professional Center, 5300 West Tulare Street in Visalia, California. The purpose of the investigation was to explore and evaluate the subsurface conditions, and to make recommendations for the site preparation procedures and foundation parameters. This report includes the field and laboratory investigation data and presents geotechnical conclusions and recommendations. This report is based upon data obtained from one soil boring and laboratory tests performed on samples obtained from the boring and bulk samples.

SITE LOCATION AND DESCRIPTION

The project is located at 5300 West Tulare Street in Visalia, California. The latitude is 36.3228 degrees and the longitude is -119.3514 degrees at the approximate center of the site. A Site Location Map is presented in Appendix C. At the time of the investigation, the proposed construction area lies within an existing solar parking structure. The description of the site is based on visual observations made during our field investigation on May 22, 2020.

PROPOSED DEVELOPMENT

Based on information obtained, the proposed Communication Tower will be self-supported. Structural loads for the Tower will be supported on a pier footing. No detailed structural information was provided at this time. Appurtenant construction will include underground utilities.

SOIL AND GROUNDWATER CONDITIONS

The subsurface soils encountered generally consist of sandy silt, sand and sandy clay. The upper surface is generally medium dense sandy silt to 13 feet below grade (BG) underlain by medium dense sand to a depth of 18 feet BG, the clayey sand was underlain by sandy silt, sand and sandy clay to a depth of 18 feet BG. The sand was underlain by dense to very dense silty sand, clayey sand and sandy clay to 36.5 feet BG, maximum depth explored.

Groundwater was not encountered during our field exploration during and after drilling. It should be noted that groundwater level fluctuates due to variations in precipitation, land use, irrigation, and other factors. The evaluation of these factors is beyond our scope of services.

The soil profile described above is generalized, therefore, the reader is advised to consult the Logs of Borings in Appendix A for soil conditions at specific locations or depths. Care should be exercised in interpolating or extrapolating subsurface conditions beyond the boring locations.

Locations of our exploratory borings, shown on the Boring Location Maps in Appendix C were determined with a measuring wheel from features shown on the Site Plan provided for our use. Hence, the accuracy of the boring locations can be implied only to the degree that this method warrants. Surface elevations at the boring locations were not measured.

CONCLUSIONS AND RECOMMENDATIONS

1.0 General

Based on field data and engineering analyses, the site is suitable for the proposed construction provided the site is graded in accordance with 2019 California Building Code and that our recommendations are incorporated into the project design and are followed throughout the construction.

Expansive soil was encountered within the near surface soils at the site. The subject site is not near any active known fault, and surface rupture does not apply. Groundwater was not encountered in our exploration boring. Therefore, there is a low liquefaction potential and lateral spreading to occur at the site. No special mitigation is required.

Detailed site grading and foundation design recommendations are presented in the following sections.

2.0 Site Preparation

2.1 Clearing: Prior to earthwork operations, the area to be developed should be stripped of vegetation, organic topsoil, undocumented fills and cleared of surface and subsurface obstructions and miscellaneous debris from the proposed construction areas. **We estimate the depth of clearing to be approximately four to nine inches**. Deeper clearing may be required in localized areas. The actual depth of clearing should be reviewed by CTL. Since no grading is involved with the construction of the tower, no further site preparation is required.

2.2 Compaction: The scarified subgrade and any subsequent fill placed at the site should be moisture conditioned to within 0 to 4 percent over the optimum moisture content and compacted to at least 90 percent of maximum dry density as determined by ASTM Test Method D1557. Aggregate Base should be compacted to 95 percent.

2.3 Engineered Fill: Fill should consist of select material. Native soils, free from organic, vegetation and rocks or cobbles larger than one inch and have an expansion index less than 20, may be used as Engineered Fill. Fill with an organic content higher than 3 percent by dry weight should not be used and removed from the site or used in non-structural areas as approved by the owner. Import material if required, must be reviewed by CTL prior to transport to the site. Import material should conform to the following criteria:

ENGINEERED FILL REQUIREMENTS	
Maximum Expansion Index	20
Maximum Particle Size (inch)	1
Percentage Passing #200 Sieve	12-70
Maximum Water-Soluble Sulfate in Soil, percent by dry weight	0.2

2.4 Fill Placement: Fill material should be moisture-conditioned to within 0 to 4 percent above the optimum moisture content prior to compaction. Fill material with excessive moisture should be allowed to dry prior to compaction or be mixed with dry soil to bring the fill to a workable moisture content. Fill should be placed in level lifts not exceeding a loose, uncompacted thickness of eight inches, and compacted as engineered fill.

2.5 Utility Trench Backfill: The underground utilities should be installed according to the manufacturer's recommendations. However, where no manufacturer's recommendations are available, underground utilities should be installed as described below. Underground utility lines should have no less than 18 inches of cover. A minimum of six inches of compacted sand bedding under the pipe, and a pipe envelop extending six inches above the pipe, should be provided. The remaining backfill material should consist of Engineered Fill as described previously in this report. Utility trench backfill should be moisture conditioned and compacted to 95 percent in the upper 2 feet in structural pavement areas and 90 percent below 2 feet from the top of final grade

3.0 Foundation Recommendations

3.1 Drilled Piers: The proposed structures may be supported on straight shaft, cast-in-place, concrete piers with the supporting capacity derived from friction and end bearing. The drilled piers should be a minimum of 24 inches in diameter. A structural engineer should design the piers to resist the moment, shear and axial loads.

These piers may be designed using the allowable end bearing capacity of 3,000 pounds per square foot (psf) and allowable skin resistance of 300 psf. The allowable pier support capacity is for combined dead and sustained live loads and may be increase by one-third (1/3) when including transient live loads due to wind or seismic loading. To calculate the uplift resistance, the allowable friction resistance is compression listed above may be multiplied by a reduction factor of 0.6, plus the pier weight. Settlement is expected to be due to substantially to elastic compression of the foundation materials and should be essentially complete following application of the design loads. The total settlement to the cast-in-place piers is expected to be on the order of ½ of an inch.

Resistance to lateral loads may be determined by using the "Pole Formula" given in Section 1807.3.2.1 of the California Building Code. For this method, we recommend the lateral soil bearing pressure of 300 pounds per square foot per foot of embedment to be used to establish the required embedment depth (maximum of 3,000 psf). It is recommended that the piers have a minimum embedment depth of 10 feet below grade. The design value may be increased to twice the above value of the structure which will not be adversely affected by a half inch lateral deflection at the ground surface due to short-term lateral loads.

Loose soils at the bottom of the drilled priers should be removed to the extent possible by a cleanout bucket or other pier cleaning equipment. A representative of CTL should be present at the site during pier drilling and concrete placement operation to establish substantial conformance with the design concepts and specification requirements.

The structural engineer should provide the structural specifications for the cast-in-place drilled hole foundation. Concrete should be placed in the drilled shaft as

soon as possible following the drilling. If required, sand layers require temporary casing to support the excavations during construction. The casing should be slowly removed from the shaft excavation during placement of concrete while ensuring the casing is not raised above the level of the concrete during the shaft construction. As an alternat to temporary casing, it may be possible to utilize a drilling slurry for temporary support of the foundation if unstable sidewall conditions occur.

3.2 Seismic Design Parameters: The proposed structure should be designed with construction specifications and structure properties to withstand the anticipated or probable effects of seismic ground motion, if a seismic event was to occur. The approximate center of the project site is at a latitude of 36.3228 ° and longitude of -119.3514°. Probabilistic values of ground motion corresponding to various levels of seismic hazards have been established by CGS and USGS based on ASCE 7-16. Based on the new procedure in Section 1613 of 2019 California Building Code (CBC), the seismic design parameters are provided as follows:

SEISMIC DESIGN PARAMETERS 2019 CBC		
Property	Symbol	Value
Occupancy Category	-	I, II or III
Site Class	-	D
Mapped MCE Acceleration at Short Periods	S_S	0.567
Mapped MCE Acceleration at 1-Second Periods	S_1	0.223
Site Coefficient	F_a	1.346
Adjusted MCE Spectral Response Acceleration Parameter	S_{MS}	0.764
Design Spectral Acceleration Parameter	S_{DS}	0.509
Mapped Maximum Considered Earthquake MCE_G	PGA	0.247
Maximum Considered Earthquake MCE_G adjusted for site effects	PGA_M	0.334

4.0 Lateral Earth Pressure and Frictional Resistance

For structures subject to lateral pressures from native soils and backfill at the Site, the following values are recommended:

Lateral Earth Pressures	
Lateral Pressure and Condition	**Equivalent Fluid Pressure, pcf**
Active case, drained	45
At-rest case, drained	60
Passive case, drained	360

Design values assume level, drained granular backfill. Pressures due to surcharge loads from adjacent footings, traffic, etc., should be analyzed separately. The upper one foot of soil of the adjacent grade should not be used in the passive pressure computation. A coefficient of friction of 0.35 may be used between subgrade soil and concrete footings. Vertical soil loads may be calculated based on soil bulk density of 120 pounds per cubic foot.

The foregoing equivalent fluid pressures and fractional coefficients represent ultimate soil values, and a safety factor consistent with design conditions should be included. A minimum safety factor of 1.5 against lateral sliding is recommended if the sliding is resisted only by frictional resistance. When combined passive and frictional resistance is used, we recommend a minimum safety factor of 2.0. For lateral stability against seismic loading, we recommend a minimum safety factor of 1.1.

5.0 Additional Services

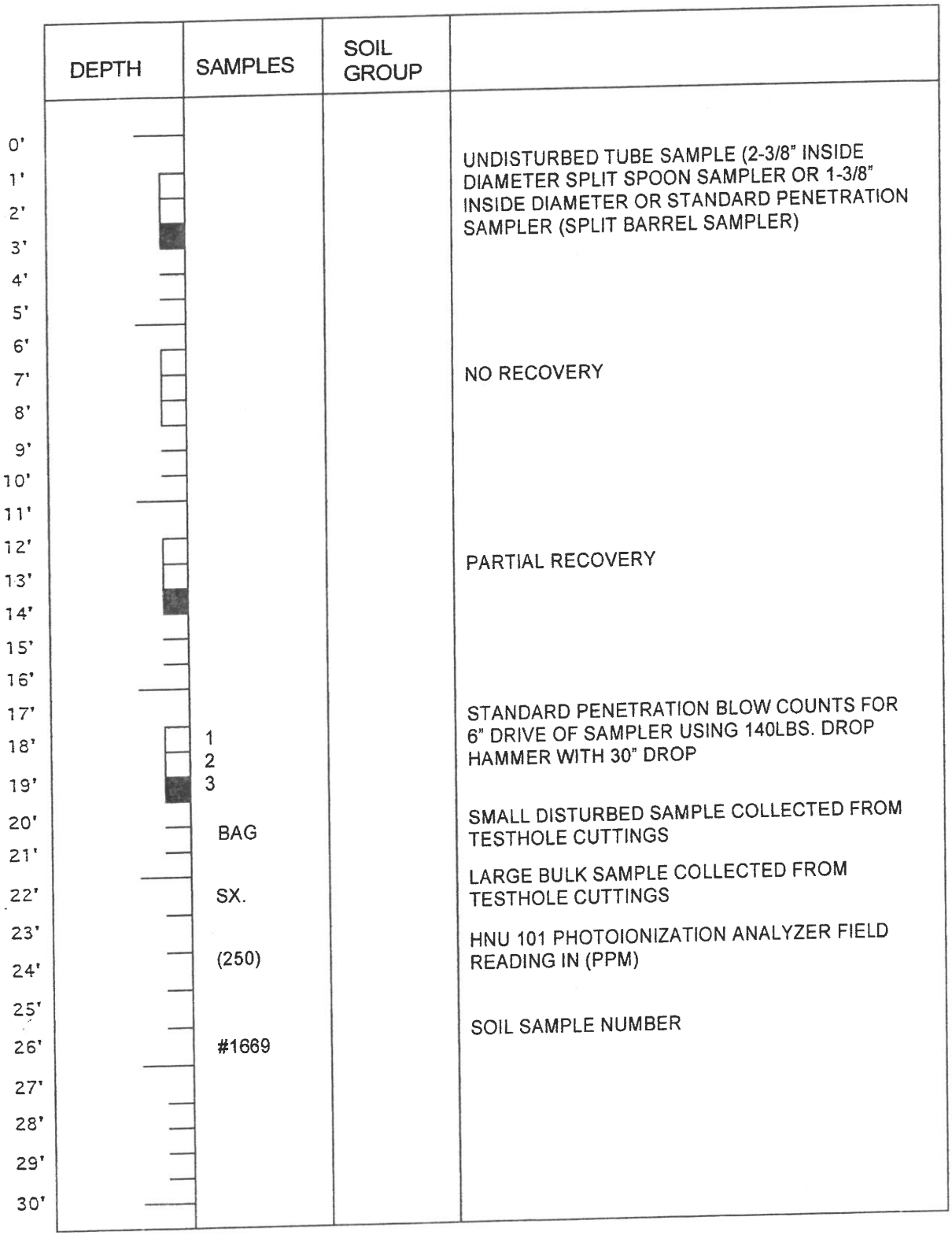
The review of plans and specifications, construction consultation, and field observation by CTL, Inc. are an integral part of the conclusions and recommendations made in this report. These are vital elements and extensions of this geotechnical engineering investigation. We recommend that following the development of construction plans and specifications, those portions of the contract drawings and specifications that pertain to earthwork be made available to CTL, Inc.

to verify that they are consistent with our recommendations contained in this report. We recommend that CTL, Inc. be retained to provide geotechnical consultation and construction testing services during site preparation and grading phases of the project. This would include observation and testing of the earthwork.

CHANGED CONDITIONS AND LIMITATIONS

Findings of this report are valid as of the present. However, changes in proposed construction such as structure type, design loads, and location may invalidate the report. Also, site conditions and applicable standards may change. Therefore, this report should be reviewed to determine its applicability considering changed conditions or after a substantial lapse of time between the preparation of our report and the start of work at the site (two years or more). The analyses and recommendations submitted in this report are based upon the data obtained from the exploratory borings performed. The samples obtained and tested, and the observations made, are assumed to be representative of the site soils. The report does not reflect variations which may occur between borings. The validity of the recommendations contained in this report is also dependent upon the prescribed testing and observation program during the site preparation and construction phases. Our firm assumes no responsibility for construction compliance with these design concepts and recommendations unless we have been retained to perform observation and review during site preparation, grading, and foundation/slab construction. CTL, Inc. has prepared this report for the exclusive use of the client noted on the cover page and the project design consultants. The report has been prepared in accordance with generally accepted practices by reputable geotechnical engineers practicing in this or a similar locality at the time the report was written. No other warranties, either expressed or implied, are made as to the professional advice provided under the terms of this agreement and included in this report.

TEST BORING LOG LEGEND



UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

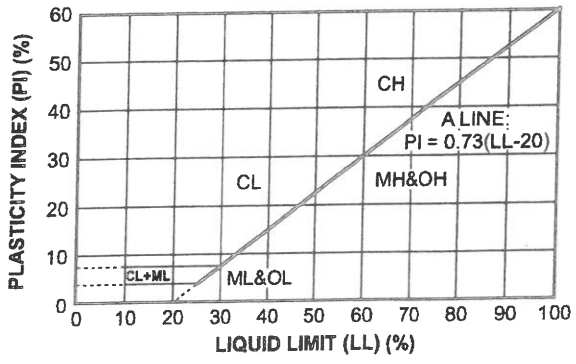
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



PROJECT: Soils Investigation
New Tower at Akers Professional Building Visalia, California

CTL, INC.
Consolidated Testing Laboratories
710 S. Kaweah Avenue, Exeter, Ca
559-592-3555 Fax 559-592-3553

JOB NO.: E2755-20
DATE: 05/22/20
BY: Z. Boudreaux

BORING LOG NUMBER B1

DEPTH	%REC.	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
0'					0-4" Asphalt concrete		
		6 9 9	2.5"		4"-9" ¾" Class II Aggregate Base		
		4 4 6	2.5"		9"-5'		
				ML	Sandy silt; dark grayish brown, moist, very fine to fine grained sand.		
5'		3 4 8	2.5"		5'-9'		
				ML	Sandy silt; grayish brown, moist, very fine to Medium grained sand.		
					9'-13'		
10'				ML	Sandy silt; brown, moist, very fine to fine grained sand, slight clay binder.		
		5 8 12	2.5"				
					13'-18'		
				SP	Sand; dark yellowish brown, moist, very fine to coarse grained sand.		
15'		4 5 7	2.5"				
					18'-23'		
				ML	Sandy silt; brown, moist, very fine to fine grained sand.		
20'		3 4 6	2.5"				
					23'-31'-3"		
				SP	Sand; grayish brown, moist, very fine to fine grained.		
25'		6 10 11	2.5"				
30'							

LOCATION: B1 (See location map)
EQUIPMENT: B-80 drill rig with 3.25" hollow stem augers with 2.5" and 1.5' split spoon sampler.

PROJECT: Soil Investigation for New Tower at Akers Professional Building, Visalia, California

CTL, INC.
Consolidated Testing Laboratories
710 S. Kaweah Avenue, Exeter, Ca
559-592-3555 Fax 559-592-3553

JOB NO.: E2755-20
DATE: 05/22/20
BY: Z. Boudreaux
PAGE: 2 of 2

BORING LOG NUMBER B1

DEPTH	%REC	BLOW COUNTS	SAMPLE NO.	SOIL GROUP	SOIL DESCRIPTION	PERCENT MOISTURE	DRY DENSITY
30'		7 12 13	2.5"				
35'		9 13 16	2.5"	CL	31'-3"-36.5' Sandy clay; grayish brown, moist, very fine to fine grained sand fraction, low plasticity clay.		
40'							
45'							
50'							
55'					Terminated drilling at 36.5' below existing ground. No free-standing ground water encountered		
60'							

LOCATION: B1 (See location map)
EQUIPMENT: B-80 mobile drill rig with 3¼" I.D. hollow stem augers with 1.5 and 2.5 split spoon sampler.

APPENDIX C

LABORATORY
SOIL TEST DATA

DIRECT SHEAR TEST

Quick-consolidated, direct shear tests were performed on undisturbed, saturated samples of native materials. These tests provide information on soil shear strength vs. Normal load and are used to determine the angle of internal friction and cohesion of earth materials under essentially "drained" conditions.

SOLUBLE SULFATE TEST

Combined samples from various locations on the site were collected for soluble sulfate tests. Tests were performed on samples taken from the upper five (5) feet to determine the extent to which measures should be taken (if any) to prevent sulfate attack on concrete surfaces exposed to direct contact with soils. The result of the tests show sulfate content in the areas to be tested are less than 0.1% by weight, indicating that special procedures as mentioned above should not be required.

Grain size distributions for samples selected as most representative of sub-soils encountered in our test borings were determined by Sieve Analysis (ASTM Test D422).

PROJECT: New Tower at Akers Professional Complex, Visalia, Ca.

FILE NO. E2755-20
DATE: 05/28/20

DIRECT SHEAR TESTS (UNDISTURBED SAMPLES)

SAMPLE LOCATION	DEPTH	MOISTURE CONTENT % OF DRY WT. BEFORE TEST	MOISTURE CONTENT % OF DRY WT. AFTER TEST	COHESION LBS./SQ.FT.	INTERNAL FRICTION	USCS
B1	6'-6.5'	17.5	26.8	90	30°	ML
B1	11'-11.5'	2.89	10.10	0	32°	SP
B1	25'-25.5'	5.50	12.48	0	30°	SP

PROJECT: Soils investigation
for New Tower at Akers Professional Complex
Visalia, Ca.

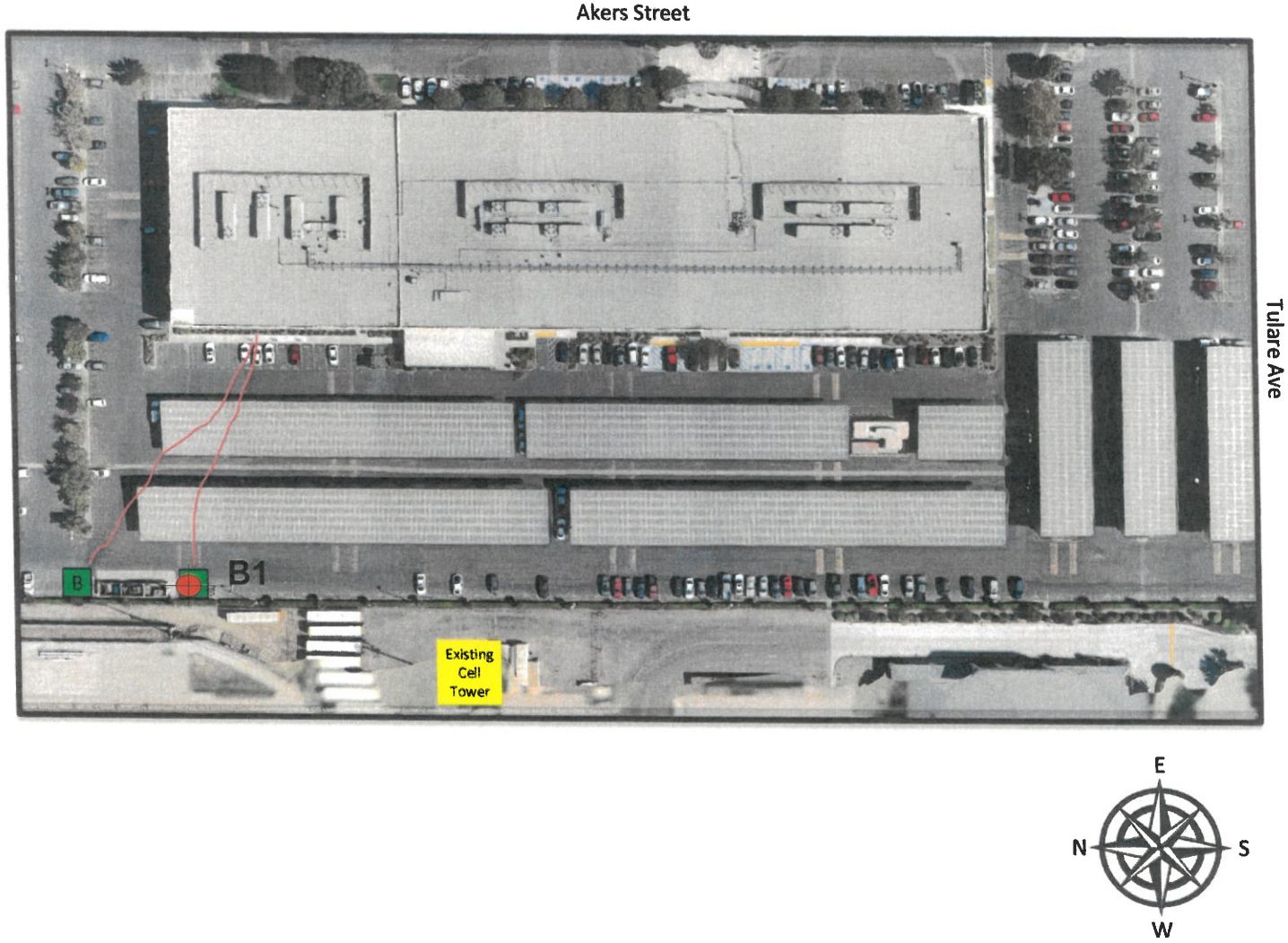
FILE NO: E2755-20
Date: 5/26/2020

TABLE 2

CHEMICAL TESTS

SAMPLE I.D.	SULFATE CONTENT (ppm)	CHLORIDE CONTENT (ppm)	pH (Std. units)	MINIMUM RESISTIVITY (ohm-cm)
B1 @ 0-3'	300	120	7.5	2,500

Cigna Building Aerial View



Tulare Akers Professional Center
New Communication Tower
Akers Street,
Visalia, Ca

LEGEND

Approximate location of testhole boring

CTL, INC.