

## **Appendix E-1 - Geotechnical Engineering Investigation**

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**ENVIRONMENTAL  
GEOTECHNOLOGY  
LABORATORY, INC.**

April 21, 2021

**Grand Pacific Communities**

C/o Mr. Mike Daniels  
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West Covina, California 91791

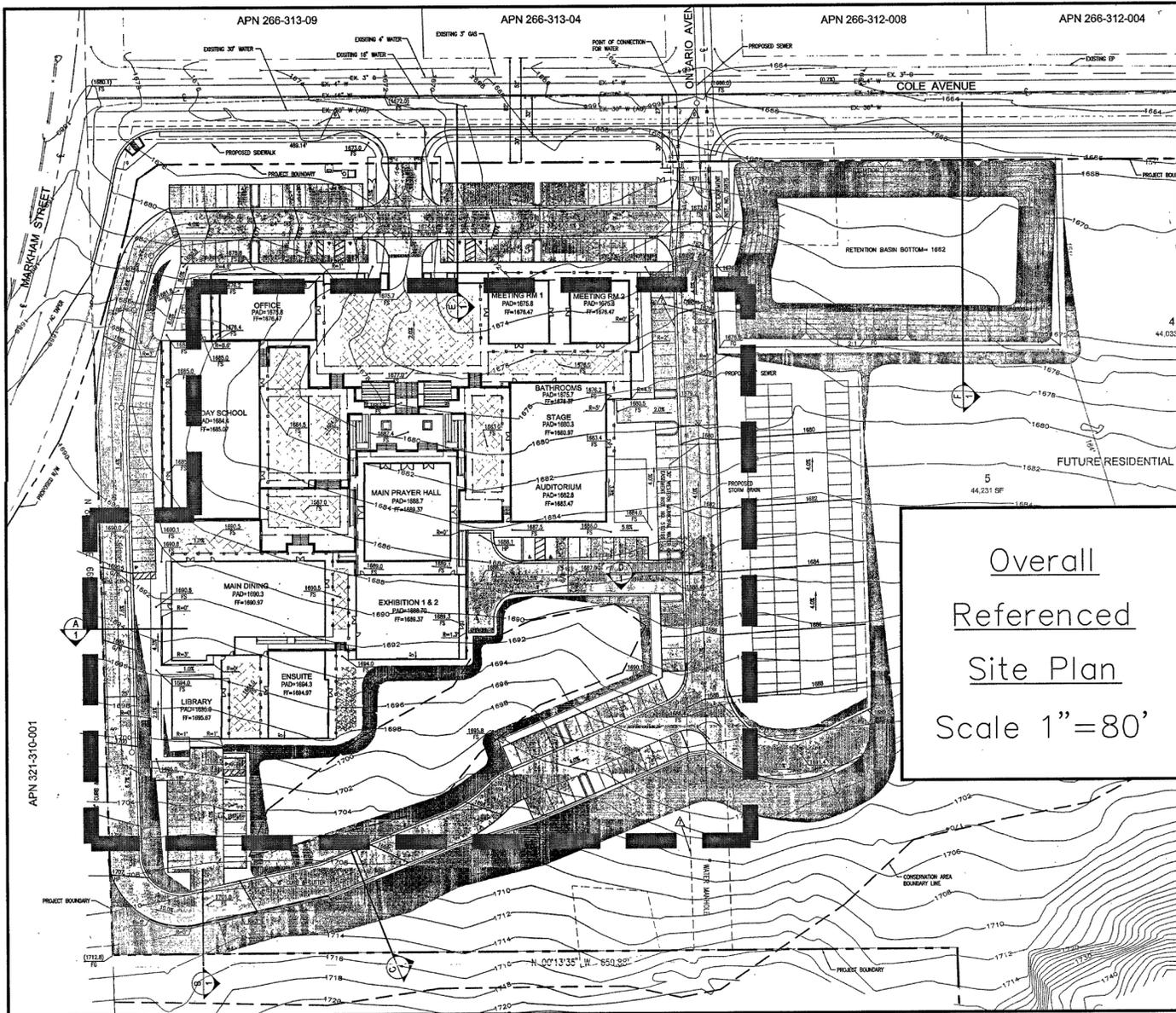
**Subject: Addendum Report to Geotechnical Engineering Investigation, Proposed New Temple Development, Ten (10) Single-Family Residences with ADUs and JADUs, and Associated Structures, APN: 266-320-025, Cole Avenue & Landin Lane, Riverside, California, EGL Project No.: 19-283-003GEA**

Ladies and Gentlemen:

This addendum report provides ripability and toughness information regarding to the field exploration performed at the provided proposed building corners relative to the delineated granitic dike as shown on the Site (Delineated Exploratory) Plan, Figure 1. EGL performed limited field exploration on April 8, 2021 with the aid of a rubber-tired 4x4 backhoe equipped with extended arm, three (3) feet wide bucket and hydraulic hammer attachment. Geotechnical sampling was not taken. A total of nine (9) shallow test pits were excavated in the proximity of the seven (7) survey staked building corner locations, relative to the proposed footing bottom, grade and/or pad elevations and the presence of a dislodged boulder.

Test Pit No.	Staking No.	Building Location	Field Elevation	Estimated Footing Bottom	Field Condition	Soils (Qt), ft	Bedrock	Total Depth, ft	Hydraulic Hammer Used
TP-1	309	NE Library Corner	1699.0	1692.5	Gentle Sloped	6.5	----	6.5	No
TP-2	308	SE Ensuite Corner	1699.0	1691.8		7.5	----	7.5	No
TP-3	307	NE Ensuite Corner	1698.0	1691.8		3.5	3.0	6.5	Yes*
TP-3A	-----	Cut Slope North of Ensuite	1696.5	1694.5		3.5	1.5	5.0	No
TP-4	305	NE Exhibition 1 & 2 Corner	1693.0	1686.2		2.5	5.0	7.0	Yes*
TP-5	306	SE Main Prayer Corner	1687.5	1686.2	7.0	----	7.0	No	
TP-6	-----	Auditorium Stage	1679.0	1677.8	Dislodged Boulder	3.0	3.0	6.0	No
TP-7	303	NW Auditorium (Bathroom) Corner	1676.5	1673.7	Gentle Sloped	4.0	2.0	6.0	No
TP-8	304	NE Auditorium Corner	1684.5	1680.3		4.0	3.0	7.0	No

Noted: \*Hydraulic hammer attachment used during the exploration for the current backhoe size and model type. The ultimate equipment used may be different than during the construction phase



Overall  
Referenced  
Site Plan  
Scale 1"=80'



Environmental  
Geotechnology  
Laboratory, Inc.

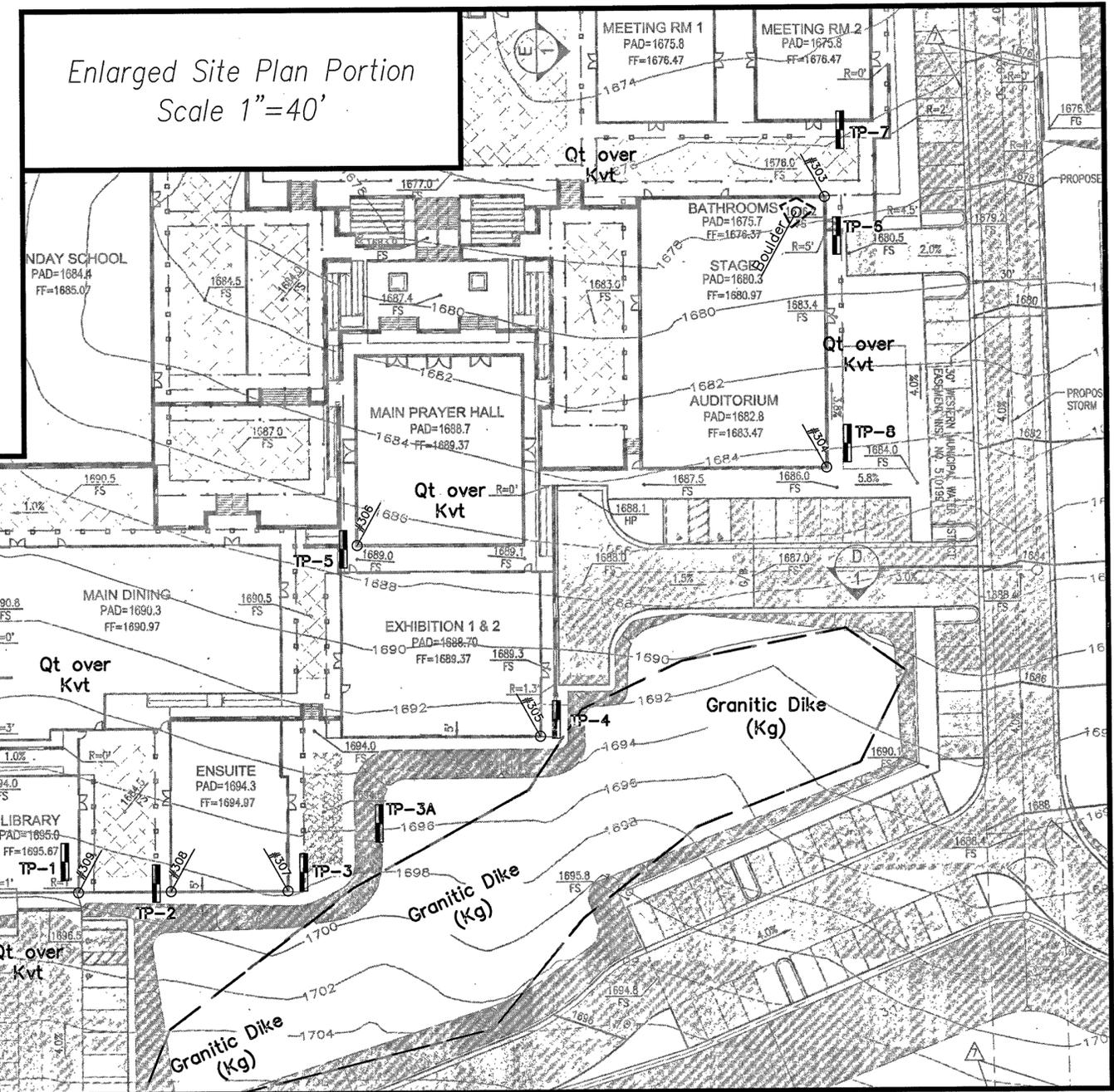
Project Address:  
APN: 266-320-025  
NE Markham Street and Cole Avenue  
Glen Valley, Riverside Co., California  
EGL Project No. 19-283-003GEA

Site (Delineated Exploratory) Plan

04/21

FIGURE 1

Noted: base map adopted and modified from conceptual architectural plan (CDA, 2019) and conceptual grading plan (Allard Engineering, 2020) at scale 1"= 10', 2' contour interval



Enlarged Site Plan Portion  
Scale 1"=40'

LEGEND

- Qt Natural Alluvial Terrace Deposits
- Kvt Late Cretaceous Val Verde Tonalite
- Kg Cretaceous Intrusive Granitic Dikes
- #309 Survey Staking Number
- TP-8 Location of Exploratory Test Pits (EGL, 2021)

The earth materials exposed within the excavated test pits revealed harder bedrock at approximate depths of 2.5 to 3.5 feet below existing ground surface. Detailed description of the earth materials exposed within the excavated test pits are shown in Field Exploration of Appendix A. Additional assistance with hydraulic hammer attachment was used in the test pits, TP-3 and TP-4, at the northeasterly building corners of Ensuite and Exhibition 1 and 2, but without applied additional downward force during deepening. The hydraulic hammer attachment was not used solely but was interchangeably used with the backhoe bucket attachment on removing and deepening during exploration. It is EGL's opinion that larger equipment such as a large excavator or a full-sized bucket loader with rippers may enhanced performance and sufficiently under a wider open working environment.

### **106 STATEMENT**

Based on EGL's field investigation and the laboratory testing results, it is EGL's opinion that the grading and proposed structures will be safe against hazard from landslide, settlement, or slippage and the proposed construction will have no adverse effect on the geologically or geotechnical stability of the adjacent properties provided EGL's recommendations are properly followed.

This report has been prepared in accordance with generally accepted professional engineering principles and practice. No warranty is expressed or implied. This report is subject to review by controlling public agencies having jurisdiction.

Thank you for this opportunity to be of service. If you have any questions, or know of any additional information pertaining to this project, please do not hesitate to contact EGL.

Respectfully submitted,  
**Environmental Geotechnology Laboratory, Inc.**

  
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Ryan Jones, GE 2852  
Project Engineer



HJ/RJ/ry  
Dist: (4) Addressee

## REFERENCES

1. Allard Engineering, (2020), "County of Riverside, Conceptual Grading Plan, I Kuan Tao, Corner of Markham Street and Cole Avenue, Riverside County, California"; dated December 2020, scale 1"=100' and 1"=30'
2. American Concrete Institute, (2014), "*Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary*", Chapter 19: Durability Requirements, Sections 19.3.1: Exposure Categories and Classes & 19.3.2: Requirements for Concrete Mixtures; pages 317 to 323, Tables 19.3.1.1 and 19.3.2.1".
3. ASCE, (2017), "ASCE/SEI 7-16, Minimum Design Loads for Associated Criteria for Buildings and Other Structures; prepared and published by American Society of Civil Engineers.
4. CBC, (2019), "California Building Code: California Code of Regulations, Title 24, Part 2, Volume 2 of 2, California Building Standards Commission"; Section 1613 Earthquake Loads.
5. City of Riverside, (2012), "Public Safety Element amended November 2012", [https://www.riversideca.gov/planning/gp2025program/GP/10\\_Public\\_Safety\\_Element.pdf](https://www.riversideca.gov/planning/gp2025program/GP/10_Public_Safety_Element.pdf)
6. Creative Design Associates Inc., (2019) "Site Plan, Corner of Markham Street and Cole Avenue, Riverside, California", scale: 1" = 80', date November, 2019, CDA project No: 1921, drawing No: AS-101.
7. EGL, (2020), "Report of Geotechnical Engineering Investigation, Proposed New Temple Development, Ten (10) Single-Family Residences with ADUs and JADUs, and Associated Structures, APN: 266-320-025, Cole Avenue & Landin Lane, Riverside, California," dated 01-15-2020; EGL Project No.: 19-283-003GE
8. RCIT, (2019), "Map My County Version 8.1, Riverside County, California", [https://gis.countyofriverside.us/Html5Viewer/?viewer=MMC\\_Public](https://gis.countyofriverside.us/Html5Viewer/?viewer=MMC_Public)
9. Riverside County, (2011), "Low Impact Development BMP Design Handbook, Appendix A - Infiltration testing"; revised September, 2011, Page 34.
10. USGS, (2001), "Geologic Map of Riverside East 7.5' Quadrangle, Riverside, Riverside County, California"; Version 1.0, dated 10-03-2001, prepared by United States, Geological Survey; Open File Report 01-452; scale 1" = 2000'
11. USGS, (2001), "Geologic Map of Steel Peak 7.5' Quadrangle, Riverside County, California"; prepared by United States, Geological Survey; Open File Report 01-449, scale 1" = 2000'
12. USGS, (2019), "US Seismic Design Maps"; updated 12-05-2019; prepared by United States, Geological Survey; <https://earthquake.usgs.gov/ws/designmaps/asce7-16.html>

**APPENDIX A**  
**FIELD INVESTIGATION**

EGL performed subsurface explorations on April 8, 2021 for the subject property with the aid of a rubber-tired 4x4 backhoe, CAT 420E, of *Best Bobcat, Inc.*, equipped with extended arm, three (3) feet wide bucket and hydraulic hammer attachment. A total of nine (9) shallow test pits were excavated at the specified survey staked locations and extended to maximum depth of 7.5 feet below the existing ground surface. Exploratory locations are shown on the attached Site (Delineated Exploratory) Plan, Figure 1. Purpose of the explorations was to assess the ripability and toughness characteristics of the onsite subsurficial granitic bedrock materials with respect to the proposed building construction. Exploratory logs are presented on Plates A-1 to A-3.

EGL's field geologist supervised the exploratory operation and logged for all test pits, and conducted site vicinity reconnaissance. No geotechnical samples were taken during the exploration.

# EGL

## TEST PIT LOG: TP-1

Best Bobcat, Inc.

PROJECT LOCATION: NE Markham Street and Cole Avenue, Glen Valey, Riverside County, California (NE Library Building Corner, Stake #309)

EXCAVATION SERVICE: \_\_\_\_\_  
 DATE EXCAVATED: 04-08-2021  
 DATE LOGGED: 04-08-2021  
 EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1699.0'  
 LOGGED BY: RY

EGL PROJECT NO: 19-283-003GEA

S: Standard Penetration Test      B: Bulk Sample      R: Ring Sample

Depth (ft)	Sample			USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Earth Material Descriptions
	Bulk	Undisturbed	Blows Counts; ft				
0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 6.5'): Silty sand, fine- to medium-grained, brown, dry to slightly moist, uniform, porous and moderately dense to dense
2							
4							
6							Total Depth = 6.5 feet; No Caving; No Groundwater. Backfilled and Tamped
8							

LOCATION: (Southeast Ensuite Building Corner, Stake #308)

## TEST PIT LOG: TP-2

EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1699.0'  
 LOGGED BY: RY

0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 7.5'): Silty sand, fine- to medium-grained, brown, dry to slightly moist, uniform, porous and moderately dense to dense
2							
4							
6							Total Depth = 7.5 feet; No Caving; No Groundwater. Backfilled and Tamped
8							

LOCATION: (Northeast Ensuite Building Corner, Stake #307)

## TEST PIT LOG: TP-3

EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1698.0'  
 LOGGED BY: RY

0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 3.5'): Silty sand, fine- to medium-grained, brown, dry to slightly moist, uniform, porous and dense
2							
4							Bedrock, Cretaceous Granitic Intrusive (Kg, 3.5' - 6.5'): crystalline, feldspathic, aphanitic to medium-grained, massive, slightly moist, jointed, moderately hard and moderately tough.  Noted: hydraulic hammer attachment was used to aid in excavation
6							
8							Total Depth = 6.5 feet; No Caving; No Groundwater. Backfilled and Tamped

# EGL

## TEST PIT LOG: TP-3A

Best Bobcat, Inc.

PROJECT LOCATION: NE Markham Street and Cole Avenue, Glen Valey, Riverside County, California (Cut Slope north of Ensuite Building)

EXCAVATION SERVICE: \_\_\_\_\_  
 DATE EXCAVATED: 04-08-2021  
 DATE LOGGED: 04-08-2021  
 EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1696.5'  
 LOGGED BY: RY

EGL PROJECT NO: 19-283-003GEA

S: Standard Penetration Test      B: Bulk Sample      R: Ring Sample

Depth (ft)	Sample			USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Earth Material Descriptions
	Bulk	Undisturbed	Blows Counts; ft				
0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 3.5'): Silty sand, fine- to medium-grained, brown, dry to slightly moist, uniform, porous and dense
2							Bedrock, Cretaceous Granitic Intrusive (Kg, 3.5' - 5.0'): crystalline, feldspathic, aphanitic to medium-grained, massive, slightly moist, jointed, moderately hard and moderately tough.
4							
6							Total Depth = 5.0 feet; No Caving; No Groundwater. Backfilled and Tamped
8							

LOCATION: (Northeast Exhibition 1 and 2 Building Corner, Stake #305)

## TEST PIT LOG: TP-4

EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1693.0'  
 LOGGED BY: RY

0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 2.5'): Silty sand, fine- to medium-grained, brown, dry, uniform, porous and dense
2							Bedrock, Cretaceous Granitic Intrusive (Kg, 2.5' - 7.0'): crystalline, feldspathic, aphanitic to medium-grained, massive, slightly moist, jointed, moderately hard and moderately tough.
4							
6							Noted: hydraulic hammer attachment was used to aid in excavation
8							Total Depth = 7.0 feet; No Caving; No Groundwater. Backfilled and Tamped

LOCATION: (Southeast Main Prayer Building Corner, Stake #306)

## TEST PIT LOG: TP-5

EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1687.5'  
 LOGGED BY: RY

0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 7.0'): Silty sand, fine- to medium-grained, brown, dry to slightly moist, uniform, porous and moderately dense to dense
2							Total Depth = 7.0 feet; No Caving; No Groundwater. Backfilled and Tamped
4							
6							
8							

# EGL

## TEST PIT LOG: TP-6

Best Bobcat, Inc.

PROJECT LOCATION: NE Markham Street and Cole Avenue, Glen Valey, Riverside County, California (Dislodged Boulder at Auditorium Stage)

EXCAVATION SERVICE: \_\_\_\_\_  
 DATE EXCAVATED: 04-08-2021  
 DATE LOGGED: 04-08-2021  
 EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1679.0'  
 LOGGED BY: RY

EGL PROJECT NO: 19-283-003GEA

S: Standard Penetration Test      B: Bulk Sample      R: Ring Sample

Depth (ft)	Sample			USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Earth Material Descriptions
	Bulk	Undisturbed	Blows Counts; ft				
0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 3.0'): Silty sand, fine- to medium-grained, brown, dry to slightly moist, uniform, porous and dense
2							Bedrock, Late Cretaceous Val Verde Tonalite (Kvt, 3.0' - 6.0'): crystallined, mafic, aphanitic to medium-grained, massive, moist, friable, soft to moderately hard.
4							
6							Total Depth = 6.0 feet; No Caving; No Groundwater. Backfilled and Tamped
8							

LOCATION: (Northwest Auditorium Building Corner, Stake #303)

## TEST PIT LOG: TP-7

EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1676.5'  
 LOGGED BY: RY

0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 4.0'): Silty sand, fine- to medium-grained, brown, dry, uniform, porous and moderately dense
2							Bedrock, Late Cretaceous Val Verde Tonalite (Kvt, 4.0' - 6.0'): crystallined, mafic, aphanitic to medium-grained, massive, moist, friable, soft to moderately hard.
4							
6							Total Depth = 6.0 feet; No Caving; No Groundwater. Backfilled and Tamped
8							

LOCATION: (Northeast Auditorium Building Corner, Stake #304)

## TEST PIT LOG: TP-8

EXCAVATION METHOD: Backhoe  
 SAMPLE METHOD: N / A  
 ELEVATION: ~ 1684.5'  
 LOGGED BY: RY

0							Natural Alluvial Terrace Deposits (Qt, 0.0' to 4.0'): Silty sand, fine- to medium-grained, brown, dry, uniform, porous and moderately dense
2							Bedrock, Late Cretaceous Val Verde Tonalite (Kvt, 4.0' - 7.0'): crystallined, mafic, aphanitic to medium-grained, massive, moist, soft to moderately hard and moderately tough; with weathered crystallined granitic irregular-shaped cores, 6- to 12-inch sized
4							
6							Total Depth = 7.0 feet; No Caving; No Groundwater. Backfilled and Tamped
8							