



Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

January 16, 2019
Project No. 12223.001

J & C International Group
17700 Castleton Street, Suite 128
City of Industry, California 91748

Attention: Mr. Michael Chu

**Subject: Supplemental Rock Rippability Evaluation
Tentative Tract No. 33200
Perris, Riverside County, California**

INTRODUCTION

In accordance with your request and authorization, Leighton and Associates, Inc. (Leighton) has performed a supplemental evaluation of rock rippability within Tract 33200 in the City of Perris, Riverside County, California. The subject tract is located on the southwest corner of “North “A” Street and Metz Road. The location and approximate limits of the subject tract is depicted on the *Site Location Map* (see, Figure 1). This study is based on Tentative Tract Map No. 33200 prepared by Hunsaker and Associates (Hunsaker, 2018).

The purpose of this letter is to document our field activities, the results of our investigation, and our supplemental recommendations. Leighton has utilized pneumatic rotary percussion drilling for additional assessment of rock rippability. The rock bore drilling field data interpretation method described herein are useful in predicting the conditions that will be encountered during grading of those locations explored.

The depths of the percussion borings were determined based on the proposed design grades and/or assumed utility depths along the proposed streets as shown on Hunsaker plan.

FIELD ACTIVITIES

Earth Construction Mining (ECM) was contracted to provide rotary percussion test drilling to assess the rippability of the bedrock. Twenty-five test holes were drilled on January 8, 2019 at the approximate locations depicted on the Geotechnical Map (Plate 1) and the Geotechnical Design Map (Plate 2). The drill used was an Ingersoll Rand ECM 720 Crawler that provided 900 psi to 1200 psi rotation force under normal load and 900 psi to 1200 psi with percussion. The drill penetration resistance was recorded by the ECM drill

operator, as presented in the attached ECM Drilling Logs (Appendix). The Tentative Tract Map 32200 (Hunsaker, 2018) and provided cut/fill analysis was utilized in planning the test hole locations. The test holes were located in areas which were believed to likely contain nonrippable rock based on topography or visible outcrops. Attention was given to areas of deeper proposed cuts and likely street utilities. The target depths for the test holes were based on the proposed rough grades and the potential for underground utilities up to approximately 10 feet below street grade.

DATA INTERPRETATION

Rock drilling using “*percussion penetration*” is generally considered to be marginally to non-rippable rippable. In our experience with similar sites, marginally rippable material can often be excavated by heavy duty ripping dozers (Caterpillar D9) in good working condition (i.e. bulldozers). This material often produces a substantial volume of large boulders/core stones. If fractured, this rock can often be excavated by large bulldozers working at very low production rates. Blasting is sometimes, but not always, required to excavate this material. Drill penetration that drop sharply and then increase after a few feet are often indicative of buried boulders, or “corestones.” Penetration profiles that increase and decrease repeatedly generally indicate nested boulders or fractured rock. This material can often be excavated by bulldozers. Drill penetration with “*hard percussion*” rates is generally considered non-rippable from a production stand point and blasting should be anticipated.

The above criteria were applied to the attached ECM drilling logs. The estimated depths to medium hard to very hard (marginal and non-rippable) rock, where encountered are depicted on the drilling logs (Appendix).

CONCLUSIONS AND RECOMMENDATIONS

Based on the drilling results and Leighton’s experience with rock evaluation and grading of similar sites, we anticipate that a considerable amount of blasting will be required to complete the proposed grading of this site. It is, however, our opinion that a significant portion of the proposed cuts will consist of rippable to marginally rippable rock. These materials will generally be rippable using conventional earthmoving equipment, including large excavating bulldozers. Reduced production rates should be anticipated in areas of marginally rippable rock or extensive boulders.

Recommendations regarding the proposed grading are presented in the following paragraphs.

Pre-blasting: Grading contractors sometimes conduct blasting prior to excavation in order to achieve more efficient breaking of hard rock and increased production rates. Our experience has been that such pre-excavation blasting is often unproductive in areas of fractured rock or rock with widely varying hardness. Much of the explosive energy is lost due to fractures and weathered zones between corestones. Large amounts of oversize rock often remain, resulting in significant rock handling and breaking costs in addition to the blasting costs. For this reason, we generally recommend against “pre-blasting” of marginally rippable rock.

Marginally-rippable rock: We recommend that the corestones and weathered/fractured rock be excavated without large-scale blasting, where possible. Large dozers, loaders, and rock trucks will likely be needed to manage the oversize rock. Excavator-mounted breakers or non-explosive breaking techniques may be utilized to reduce the rock to manageable sizes near existing residences, as needed.

Non-rippable rock: Blasting will likely be required to excavate knobs of massive, slightly fractured/weathered non-rippable rock and large rock outcrop within otherwise rippable areas. It may be necessary to backfill a layer of soil over the nonrippable rock prior to blasting in order to contain the explosive energy. Although this process is inefficient, we anticipate that it will be more economical than large-scale blasting of generally rippable areas.

Extensive non-rippable rock: Relatively un-fractured and unweathered rock, considered to be nonrippable, is present within the large knolls and rock outcrop areas, as well as in most deep cut areas of the site (> 5 to 10 feet). Large-scale, pre-excavation blasting should be anticipated in areas where nonrippable rock has been identified. See Plate 2 for anticipated locations where non-rippable rock will likely be encountered.

Oversized rock: Careful planning will be required to ensure that the oversize rock produced by blasting or encountered as corestones can be reduced and/or buried within the fill. Riverside County requires that all oversized rock (greater than 12 inches) must be placed at least ten feet below finished pad grade.

Street overexcavation: Utility trenching equipment, such as tracked excavators, often have difficulty excavating even relatively rippable rock by large ripping dozers. Consideration should be given to overexcavation of the streets in bedrock cut areas. Overexcavation should extend at least 2 feet below the deepest planned utility.

Additional rippability data analysis: We recommend an earthwork grading consultant be utilized to review the data presented herein to model the anticipated quantities of

blasting, heavy ripping, and oversized rock. Based on that review, it may be considered by the project design team to reduce the cut depths (or areas) in areas where this investigation has indicated that non-rippable rock will likely be encountered.

LIMITATIONS

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, and spaced subsurface explorations. Such information is necessarily incomplete. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time.

This report was prepared for J & C International Group, based on their needs, directions, and requirements. This report is not authorized for use by, and is not to be relied upon by any party except J & C International Group and its successors and assigns as owner of the property, with whom Leighton has contracted for the work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton and Associates, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton and Associates, Inc.

If you have any questions regarding this report, please do not hesitate to contact this office. We appreciate this opportunity to provide continuing geotechnical services in support of this project.

Respectfully submitted,
LEIGHTON AND ASSOCIATES, INC.



Robert F. Riha, CEG 1921
Sr. VP / Senior Principal Geologist



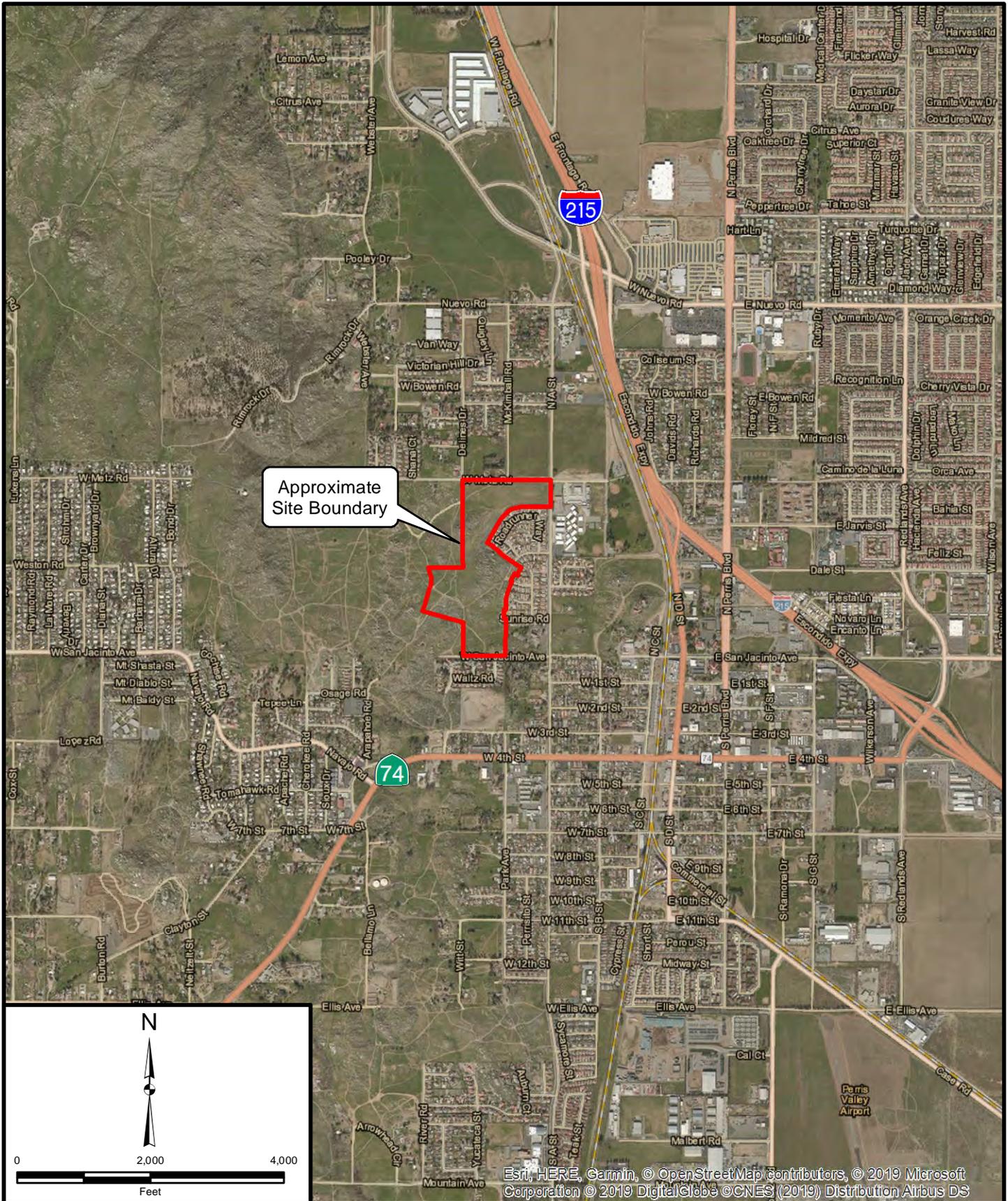
Attachments: Figure 1 – Site Location Map
Plate 1 – Geotechnical Map - Topo
Plate 2 – Geotechnical Design Map - TTM
Appendix – ECM Drilling Logs

Distribution: (1) Addressee (PDF via email)

References

Hunsaker & Associates, 2018, Tentative Tract Map No. 33200, City of 'Perris, California, 100-scale, dated December 6.

Leighton and Associates Inc., 2018, Geotechnical Exploration, Proposed Residential Development, TTM 33200, Perris California, Draft report dated December 14.

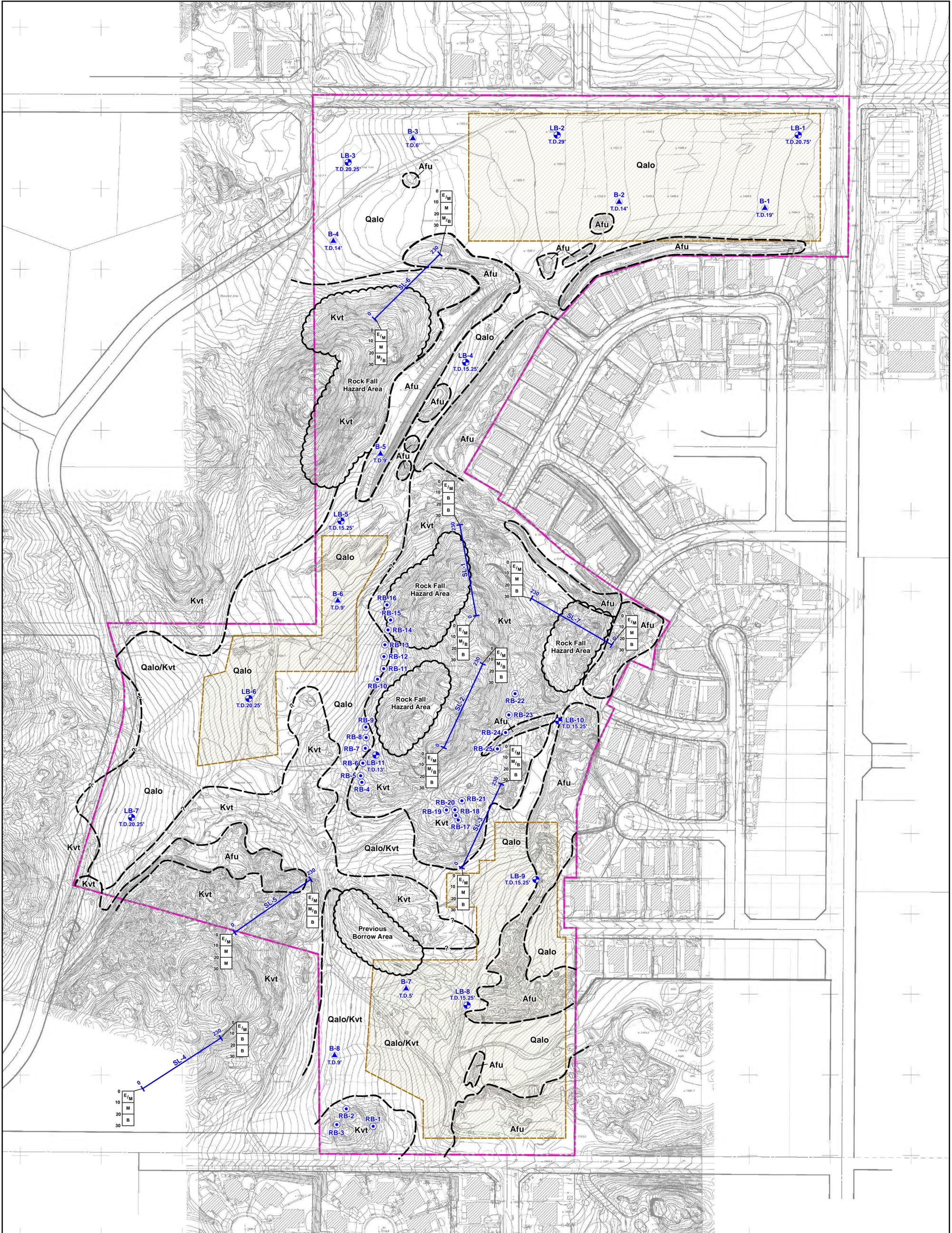


Project: 12223.001	Eng/Geol: SIS/RFR
Scale: 1" = 2,000'	Date: January 2019
Base Map: Bing Maps 2019	
Thematic Information: Leighton	
Author: Leighton Geomatics (mmurphy)	

SITE LOCATION MAP
 Tentative Tract Map 33200
 Perris, California

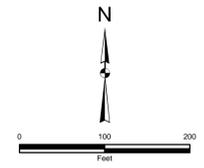
Figure 1

 Leighton



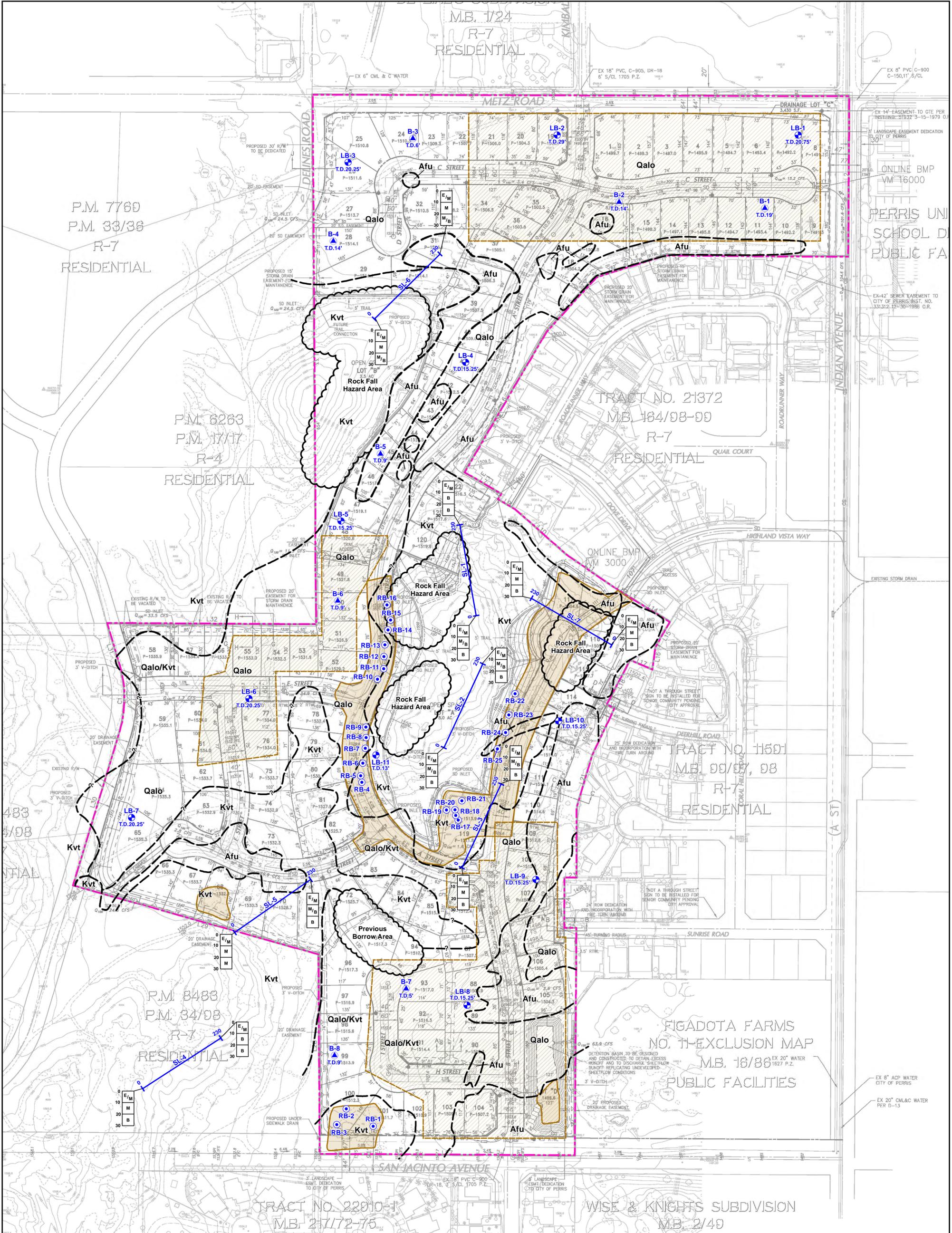
Legend

- RB-25 Approximate Location of Rock Bore
- LB-11 T.D.13' Approximate Location of Boring showing Total Depth (This Study)
- B-8 T.D.9' Approximate Location of Boring showing Total Depth (Global Geo-Engineering, Inc., September 2004)
- SL-7 Approximate Location of Seismic Refraction Survey Line (Global Geo-Engineering, Inc., September 2004)
- FEET 0 10 20 30 E/M M B Indicates Variable Ripping Conditions within Specified Depth Zone
- ? Approximate Geologic Contact Queried Where Uncertain
- Potential Areas for Deeper Excavation for Rock Burial
- Approximate Site Boundary
- Geologic Units**
- Afu** Undocumented Fill and Boulder Stockpile
- Qalo** Older Alluvium
- Qalo/Kvt** Older Alluvium with Outcrops of Granitic Bedrock
- Kvt** Granitic Bedrock (Tonalite)



GEOTECHNICAL MAP		
Tentative Tract Map 33200 Perris, California		
Project: 12223.001	Eng/Geol: SIS/RFR	
Scale: 1" = 100 feet	Date: January 2019	

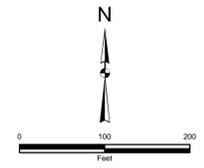
Map Based on 1/10/2019/22223.001/Map12223.001_Plat_01A_20190119.dwg as 1/10/2019 1:38:04 PM
Author: (mmj/phy)



Legend

- RB-25 Approximate Location of Rock Bore (This Study)
 - LB-11 Approximate Location of Boring showing Total Depth (Leighton, 2018)
 - B-8 Approximate Location of Boring showing Total Depth (Global Geo-Engineering, Inc., September 2004)
 - T.D.13' Approximate Location of Seismic Refraction Survey Line (Global Geo-Engineering, Inc., September 2004)
 - SL-7
- | | |
|--|--|
| <p>FEET</p> <p>0
E</p> <p>10
M</p> <p>30
B</p> | <p>0
E/M</p> <p>10
M</p> <p>30
B</p> |
|--|--|
- Easy to Moderate Ripping within Specified Depth Zone
 - Moderate to Difficult Ripping with Specified Depth Zone
 - Blasting Probable within Specified Depth Zone
 - Indicates Variable Ripping Conditions within Specified Depth Zone

- ?— Approximate Geologic Contact Queried Where Uncertain
 - Approximate Limits of Anticipated Non-Rippable Rock
 - Potential Areas for Deeper Excavation for Rock Burial
 - Approximate Site Boundary
- Geologic Units**
- Afu** Undocumented Fill and Boulder Stockpile
 - Qalo** Older Alluvium
 - Qalo/Kvt** Older Alluvium with Outcrops of Granitic Bedrock
 - Kvt** Granitic Bedrock (Tonalite)



GEOTECHNICAL DESIGN MAP – TTM		Plate 2
Tentative Tract Map 33200 Perris, California		
Project: 12223.001	Eng/Geol: SIS/FR	
Scale: 1" = 100 feet	Date: January 2019	
Reference: Hantakor, 2018		



DRILL INVESTIGATION RESULTS FOR

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11542 KNOTT STREET #10, GARDEN GROVE, CA 92841
 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #1	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND Model: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2		Soft	Dirt
3			
4			
5		Medium	Rotation Brown
6			
7			
8		Hard	Percussion Gray
9			
10			
11			
12			
13			
14			
15			
16			
17		Med.Hard	Dark Gray Slow penetration W/Rotation no percussion
18			
19			
20		Hard	Percussion Gray
21			
22			
23			
24			
25		Med.Hard	Slow penetration W/Rotation onl Gray
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #2	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND Model: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3		Med.Soft	Brown Gray Suspended Rocks and dirt
4			
5			
6			
7		Hard	Percussion Gray
8			
9		Very Hard	Gray Percussion
10		Soft	Rotation only - 12"± seam
11		HARD	Percussion Gray cuttings 11' - 25' DEPTH
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Very Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #3	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2		Soft	Brown
3			
4		Med.Hard	Rotation Gray
5			
6		Void	
7			
8			
9			
10			
11			
12			
13		Hard	Percussion Gray
14			
15		Void	Cavity of broken rock
16			
17			
18			
19		Hard	Percussion Gray
20			
21			
22			
23			
24			
25		Very Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #4	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3			
4			
5			
6			
7			
8		Med.Hard	Gray Very Slow Penetration W/Rotation
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Hard	Percussion Gray/White
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #6	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3			
4			
5			
6			
7			
8			
9			
10		Med.Soft	Rotation Brown/Grey
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Hard	Gray Percussion White
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #7	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3			
4			
5			
6			
7		Soft	Brown Rotation
8			
9			
10			
11		Med.Soft	Rotation Gray/Brown
12		Med.Hard	Rotation Gray
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Hard	Gray Percussion
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #8	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3			
4			
5			
6		Soft	Brown Rotation Loose Material
7			
8			
9			
10		Med.Soft	Brown Rotation
11			
12			
13			
14		Med.Hard	Brown/Gray Slow Penetration W/Rotation
15			
16			
17			
18			
19			
20		Hard	Gray Percussion
21			
22			
23			
24			
25		Med.Hard	Gray Very Slow Penetration W/Rotation
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #9	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2		Soft	Brown
3			
4			
5		Med.Soft	Rotation Brown
6			
7		Medium	Gray Rotation
8			
9			
10			
11		Med.Hard	Gray Rotation
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Hard	Gray/White Very Hard Percussion
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #10	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3			
4		Soft	Rotation Brown
5			
6		Medium	Gray Rotation
7			
8			
9			
10			
11		Soft	Brown Rotation
12			
13			
14			
15			
16			
17		Med.Hard	Rotation Gray Slow Penetration
18			
19			
20			
21			
22			
23			
24			
25		Hard	Gray Percussion
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #11	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
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DEPTH		RQ	NOTES
1			
2		Soft	Rotation Brown
3			
4			
5			
6			
7		Medium	Rotation Brown/Gray
8			
9			
10		Medium	Rotation Gray
11			
12			
13		Med.Hard	Rotation Gray
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			



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ATTN: Bob Riha
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41715 Enterprise Cir N #1013
Temecula, CA 92590

Office: 951-296-0530
Direct: 951-252-8914
Fax:
Mobile: 951-830-9290

11542 KNOTT STREET #10, GARDEN GROVE, CA 92841
PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #12	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1		Soft	Brown red
2			
3		Medium	Rotation Brown
4			
5			
6		Soft	Brown Rotation
7			
8		Med.Soft	Tan Rotation
9		Soft	Tan Rotation
10			
11			
12			
13			
14			
15		Med.Hard	Gray Rotation
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #13	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1		Soft	Rotation Brown
2			
3			
4		Medium	Gray Rotation
5			
6			
7			
8			
9			
10			
11			
12		Med.Hard	Rotation Gray
13			
14			
15		Hard	Percussion Gray
16			
17		Void	Brown
18			
19			
20			
21			
22			
23			
24			
25		Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #14	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1		Soft	Brown
2			
3			
4			
5			
6			
7		Soft	Brown Rotation
8			
9		Med.Soft	Brown Rotation
10			
11			
12		Medium	Brown Rotation
13			
14			
15		Med.Hard	Gray Rotation
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #15	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2		Soft	Brown
3			
4			
5			
6			
7		Med.Soft	Rotation Gray
8			
9		Med.Hard	Rotation Gray
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25		Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #16	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2		Soft	Brown Rotation
3			
4			
5			
6			
7			
8			
9		Med.Soft	Rotation Brown/Gray
10			
11			
12			
13			
14			
15			
16			
17			
18		Hard	Percussion Gray
19			
20			
21			
22			
23			
24			
25		Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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11542 KNOTT STREET #10, GARDEN GROVE, CA 92841
 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #17	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1		Soft	Rotation Brown
2			
3		Med.Hard	Rotation Gray
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19		Hard	Percussion Gray
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #18	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			6" Soft Dirt
2			
3			
4			
5			
6			
7		Hard	Percussion Gray Brown
8		Void	
9			Percussion Gray
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20		Hard	
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #19	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1		Soft	dirt
2			
3			
4		Med.Soft	Rotation Brown/Gray
5			
6		Med.Hard	Rotation Gray
7			
8		Soft	Brown Rotation
9			
10		Med.Hard	Percussion Gray
11			
12		Soft	Brown Rotation
13			
14			
15			
16			
17			
18			
19			
20		Hard	Percussion Gray
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #20	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3		Soft	Brown Rotation
4		Soft	Gray
5		Med.Hard	Rotation Gray
6			
7		Hard	Percussion Gray
8		Med.Hard	Rotation Gray
9			
10			
11			
12			
13			
14			
15			
16			
17		Hard	Percussion Gray
18		Soft	Brown Rotation
19			
20		Hard	Percussion Gray
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #21	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3			
4		Med.Hard	Rotation Brown/Gray
5			
6		Soft	Rotation Brown
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20		Hard	Percussion Gray
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #22	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12		Hard	Percussion Gray
13			
14		Soft	Rotation Brown
15			
16			
17			
18			
19			
20		Hard	Percussion Gray
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #23	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3		Soft	Rotation Brown
4			
5			
6			
7			
8		Hard	Percussion Gray
9			
10		Soft	Rotation Brown
11			
12			
13			
14			
15			
16			
17			
18			
19			
20		Hard	Percussion Gray
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			



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JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #24	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2		Soft	Rotation Brown
3			
4		Medium	Rotation Brown
5			
6			
7			
8		Soft	Rotation Gray
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20		Hard	Percussion Gray
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			



DRILL INVESTIGATION RESULTS FOR

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 PH: 714-897-4ECM [4326] · FX: 714-897-2016

JOB: 4345		HOLE NUMBER, STAKE NUMBER, OTHER IDENTIFIER : #25	
DRILLED DATE: 1/8/19		LOCATION : Property North of Jazz Ln. x San Jacinto Ave Perris Ca.	
RIPPABLE:		DRILL MAKE AND MODEL: INGERSOL RAND ECM 720 Crawler, ECM UNIT NUMBER 839	
MARGINAL		ROTATION UNDER LOAD - FEED 900 PSI / ROTATION 700 PSI / FAST ROTATION 1200 PSI	
BLASTING May be required		DRILL W/PERCUSSION : Feed 900psi / percussion 1200psi	
DEPTH		RQ	NOTES
1			
2			
3			
4			
5		Soft	Rotation Brown
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18		Hard	Percussion Gray
19			
20		Soft	Rotation Brown
21			
22			
23			
24			
25		Hard	Percussion Gray
26			
27			
28			
29			
30			
31			
32			