Project No. S2134-05-01
April 9, 2021

Randy Sater
Teichert Land Co./Stonebridge Properties
3500 American River Drive
Sacramento, California 95864
RSater@teichert.com

Subject: PRELIMINARY GEOTECHNICAL EVALUATION
LOOMIS RESIDENTIAL DEVELOPMNENT
LOOMIS, CALIFORNIA

Reference: *Preliminary Geotechnical Engineering Report, Loomis 25 Acre Site, Vicinity of Library Street, Loomis, California,* prepared by Wallace Kuhl & Associates, Inc. (Project No. 5782.01), November 19, 2003.

Mr. Sater:

In accordance with your request, we have prepared this Preliminary Geotechnical Evaluation for the 60-acre property located north of Interstate 80 and east of Horseshoe Bar Road in the Town of Loomis, California. The approximate location of the project area is shown on the Vicinity Map, Figure 1.

PROJECT DESCRITION, PURPOSE, AND SCOPE OF SERVICES

The site consists of several contiguous parcels totally approximately 60 acres. The site is largely undeveloped and is bordered by I-80 on the south, King Road and residential development on the north, and Horseshoe Bar Road on the west. The approximate site configuration is shown on the Site Plan, Figure 2. We understand that you are considering developing the site for residential use including single-family and multi-family developments. The Proposed Development Plan, Figure 3, shows the currently proposed conceptual development.

Wallace-Kuhl & Associates (WKA) prepared the referenced preliminary geotechnical investigation for a 25-acre portion of the site in 2003. WKA performed 12 test pits (T1 through T12) within the western portion of the site to characterize soil and rock conditions. The site is generally underlain by shallow granitic rock (Rocklin/Penryn Pluton) with a variable-thickness soil cover. Portions of the site contain granitic rock outcrop/surface boulders. The primary geotechnical constraint identified at the site is rock excavation/rippability. These conditions can significantly increase land development costs, especially for mass grading and underground utility construction. Therefore, we have performed additional geotechnical exploration to characterize previously unexplored portions of the site with emphasis on evaluating excavatability/rippability. The purpose of our Preliminary Geotechnical Evaluation was be to further characterize subsurface conditions at the site and to identify significant geotechnical constraints that may impact development. Our current evaluation did not include geotechnical laboratory testing. Additional investigation and laboratory testing will be required as part of future design-level studies for the project.

Our evaluation is based on our review of the referenced preliminary geotechnical report and supplemental field exploration performed between March 23 and April 2, 2021. Our field exploration program included 22 exploratory test pits (T1 through T22) and eleven (11) refraction seismic (RS) survey lines (RS Line 1 through RS Line 11) performed by Gasch Geophysical Services (G^2S). Approximate exploration locations (including the previous WKA test pits) are shown on the Site Plan,

Figure 2 and Proposed Development Plan, Figure 3. Logs of the current and previous test pits are attached as Appendix A, and the refraction seismic investigation report prepared by G^2S is attached as Appendix B. Photo Nos. 1 through 8 show surface conditions and typical soil/rock conditions encountered in select test pits at various locations within the site.

SUBSURFACE CONDTIONS

We identified geologic and soil conditions by observing and sampling exploratory test pits, reviewing the refraction seismic data, and reviewing available geologic literature for the site vicinity. Soil descriptions below include the USCS symbol where applicable. The site is predominantly underlain by shallow granitic rock (Penryn Pluton) with a relatively thin colluvial soil cover. Based on our explorations, the granitic rock is decomposed near the ground surface throughout the majority of the site and becomes less weathered with increasing depth, however rock outcrops are present in localized areas. Our approximate exploration locations and areas of outcropping rock are shown on the Site Plan, Figure 2.

The subsurface conditions encountered in our investigation are described as follows:

Colluvium

Colluvium is unconsolidated surficial material transported downslope by gravitational forces. We encountered approximately 1 to 3 feet of colluvium consisting of soft, moist, brown, sandy clay (CL) in each of our test pits.

Granitic Rock (Penryn Pluton)

Underlying the colluvium in each of our test pits we encountered decomposed to weathered granitic rock (Penryn Pluton). The granitic rock is generally decomposed near the ground surface and becomes less weathered with increasing depth. We encountered excavation refusal with a Volvo 220 excavator at depths ranging between 6 to 14 feet, and at depths ranging between 6 to 10½ feet with a John Deere 310 backhoe. In their 2003 investigation, WKA encountered excavation refusal as shallow as 1½ feet. The granitic rock generally excavates as dense, moist light brown clayey sand (SC) with varying amounts of gravel to boulder sized, less weathered clasts up to approximately 1 foot in the largest dimension.

The outcropping rock at the site appears to consist of both disconnected boulders (floaters) with the residual soil as well as outcropping (pinnacle) bedrock. In general, the smaller outcrops are likely disconnected floaters and the larger outcrops are likely outcropping (pinnacle) bedrock. The approximate areas of major rock outcrops are shown on the Site Plan, Figure 2.

Groundwater / Seepage

We encountered seepage in several of our test pits at variable depths. Although the depth to static groundwater in the area is relatively deep (greater than 50 feet), based on the geologic conditions at the site, perched groundwater/seepage develops at variable and shallow depths generally at the contacts between colluvial soil/completely weathered rock and the underlying less weathered rock, especially during winter and spring. Seepage can also occur within bedrock based on the degree of weathering, fracturing, and bedding.

Refraction Seismic Investigation

G^2S performed an RS investigation at the site on March, 29, 31 and April 2, 2021. The purpose of the RS investigation was to estimate the excavation characteristics of subsurface materials and to aid in evaluating the depth and continuity of the rock that underlies the proposed access road alignment. G^2A acquired data along eleven RS lines. Lines RS Line 1 through RS Line 11 were each approximately 260 feet long. The RS lines were oriented approximately as shown on the Site Plan, Figure 2, and Proposed Development Plan, Figure 3.

The RS investigation revealed a moderate to high degree of variation in the calculated seismic velocities of the subsurface materials, with the highest seismic velocity of greater than 19,000 ft/s measured at the maximum depth of exploration on Lines 1, 3, 4 and 7. Low velocity material was encountered in the near surface on all lines, which suggests highly weathered/fractured rock and soil or fill. The moderate velocity range of 4,000 ft/s to approximately 6,000 ft/s, suggests compacted soil/fill or moderately weathered/fractured rock. All eleven RS Lines show this low to moderate velocity section of material from surface to varying depths and high velocity material at the maximum depth of exploration. The higher velocity horizon (7,000 ft/s and greater) suggests rock of moderate weathering and/or fractures which continues to slightly weathered and/or less fractured rock at depth The results indicate that subsurface materials at the RS line locations should generally be excavatable to depths greater than 10 feet with a large excavator (such as a Cat 349 or comparable). Zones of less weathered surface bedrock are present that will likely require a single ripping shank, hydraulic breaker, and/or other means for excavation. Numerous rock outcrops were observed across the site. Many appear to be floater rock that can removed with conventional equipment (commonly known as "pull-outs"), however, some of the other outcrops were massive in nature (e.g. outcropping bedrock) and will likely require drilling and blasting for excavation.

The approximate locations of the G^2A RS lines are depicted on the Development Plan, Figure 3, and a copy of G^2A's Refraction Seismic Investigation report is attached as Appendix B.

GEOLOGIC HAZARDS AND SEISMICITY

The site is not located within a mapped geologic hazard zone designated by the state of California. The site is not located on any known "active" earthquake fault trace. In addition, the site is not contained within an Alquist-Priolo Earthquake Fault Zone. Therefore, fault rupture is not considered a hazard for the site.

Based on our reconnaissance, review of geologic maps and reports, and our experience in the area, the site is not subject to significant geologic hazards such as significant seismic shaking as a result of an earthquake, seismic-induced soil liquefaction, lateral spreading, or Landslides and Slope instability. Based on published mapping, the site is located in an area where there is a moderate potential for naturally occurring radon gas in the soil. Radon testing may be required as part of future development. Near-surface soil appears to be of low expansion potential and not significantly corrosive to concrete or steel, improvements. The site is in an area mapped These preliminary conclusions should be verified/confirmed as part of future design-level studies.

In accordance with the 2019 California Building Code (CBC), for seismic design purposes, sites are classified as Site Class "A" through "F" as follows:

- Site Class A – Hard Rock;
- Site Class B – Rock;
- Site Class C – Very Dense Soil and Soft Rock;

- Site Class D – Stiff Soil;
- Site Class E – Soft Clay Soil; and
- Site Class F – Soils Requiring Site Response Analysis.

Based on the subsurface conditions at the site, the site is likely classified as Site Class "B" ("Rock"). This should be verified by site-specific testing (surface shear wave velocity measurements) as part of the future design-level geotechnical study for the project.

DISCUSSION AND PRELIMINARY RECOMMENDATIONS

General

No soil or geologic conditions were encountered during our investigation that would preclude the proposed development as presently planned, provided the, provided the findings and preliminary recommendations contained in this report are considered during project planning. Additional design-level geotechnical studies and analyses will be required for final design and construction.

Excavation and Grading Characteristics

Excavation characteristics will vary in the project area depending on location and excavation depths. Table 1 summarizes anticipated excavation characteristics in each geologic material identified in the project area.

TABLE 1
ANTICIPATED EXCAVATION CHARACTERISTICS

Geologic Unit[1]	Excavation Characteristics	Rippability
Colluvium	Colluvium deposits in the project area are up to 3 feet thick and generally consists of unconsolidated sandy lean clay. We anticipate standard excavation effort with conventional, heavy-duty excavating equipment. We anticipate excavations will generate material predominantly 2 inches and smaller with occasional cobble to boulder-sized material (12 inches and larger).	Rippable
Decomposed Granitic Rock	The decomposed granitic rock encountered below the colluvium to typical depths of 3 to 14 feet and generally excavates as clayey sand with gravel and may include cobble to boulder size material. We anticipate that grading and excavation may be accomplished with standard effort using heavy-duty grading/excavation equipment (D8 dozer/Volvo 220).	Rippable
Slightly Weathered Granitic Rock	Weathering generally decreases with depth, and moderate to heavy ripping will likely be required at depths below about 14 feet. Pre-ripping with a large bulldozer (such as a Caterpillar D10 or larger) with a single ripping shank, or a large excavator (such as a Komatsu 490) equipped with ripping shank, may be required in less weathered rock. We anticipate excavations deeper than about 14 feet will generate significant oversize material (12 inches and larger) that would require special handling or placement.	Marginally Rippable
Fresh Granitic Rock	Massive, fresh (unweathered) granitic rock may be encountered at various depths throughout the site will likely require blasting to facilitate excavation. Pre-ripping with a large bulldozer (such as a Caterpillar D9 or larger) with a single ripping shank, or a large excavator (such as a Komatsu 490) equipped with a hydraulic hammer could be used but would likely result in slow excavation production.	Non-Rippable

Materials for Fill

Materials for engineered fill for the project may consist of soil/rock excavated in the project area that, in the opinion of the engineer, are suitable for use in construction of fills. In general, fill materials derived from site excavations can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

Soil fill is defined as material containing no rocks greater than 6 inches in maximum dimension and containing at least 40 percent of the soil passing the ¾-inch sieve and at least 20 percent passing the No. 4 sieve.

Oversize rock is defined as material greater than 12 inches in maximum dimension.

Soil-rock fill is defined as fill material containing no rocks larger than 2 feet in maximum dimension and containing a sufficient matrix of soil to fill voids between rock fragments and reduce rock nesting

(concentrations of rock with void space). *Oversize rock* up to 2 feet in maximum dimension may be incorporated into the *soil-rock* fill if distributed such that sufficient compaction can be achieved.

Rock fill is defined as fill containing no rocks larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than 3/4 inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the *rock* fill quantity.

Grading and Earthwork

We are providing the following grading/earthwork recommendations to aid in project planning and budget development only. As part of the future design-level study, we should review the final grading plans to evaluate the applicability of these recommendations.

Areas to be excavated and filled or left at grade shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1-1/2 inches in diameter shall be removed to a depth of 3 feet below the surface of the ground.

Areas to receive fill should be cleared of existing loose soil/rock to expose underlying formational material. After removal of loose soil/rock, exposed soil surfaces, when applicable, should be scarified at least 6 inches, uniformly moisture-conditioned near optimum moisture content and compacted to at least 90% relative compaction or in accordance with the performance specification provided below. References to relative compaction and optimum moisture content in this evaluation are based on the latest American Society for Testing and Materials (ASTM) D1557 Test Procedure. Scarification and re-compaction of exposed hard bedrock is not required.

In general, where fill will be placed on slopes steeper than 5H:1V, we recommend that horizontal benches angled slightly into the slope be cut into competent formational material on the slopes prior to placing fill. Benches should roughly parallel slope contours. These benches should extend at least 2 feet into competent formational material. In addition, a keyway should be cut into the slope at the base of the fill. In general, keyways should be at least 10 feet wide or sufficiently wide to permit complete coverage with the compaction equipment used. The keyway should extend at least 2 feet into competent formational material. Where hard rock is encountered in the bottom of the key, the depth and configuration of the key may be modified as approved by the engineer.

Engineered fill placed within 5 feet of building pad grade and within 15 feet of slope faces should consist of "soil" fill. Material placed below "soil" fill can consist of "soil-rock" fill with an approximate maximum rock size of 2 feet in maximum dimension in a matrix of compacted "soil" fill. We anticipate that "soil fill" can be obtained from the residual soil, alluvium, and highly weathered portions of the granitic rock.

Soil fill and *soil-rock* fill should be placed in horizontal lifts not exceeding 12 inches (loose thickness) and brought to final design elevations. *Oversize rock* up to 2 feet in maximum dimension may be incorporated into soil-rock fill if distributed such that sufficient compaction can be achieved. Each lift should be moisture-conditioned near optimum moisture content, and compacted to at least 90% relative compaction or in accordance with the performance specification provided herein.

Rock fills shall be placed in accordance with the following recommendations:

- The base of the *rock fill* shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall be sloped to facilitate drainage such that hydrostatic pressure buildup does not develop.
- *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2H:1V.
- *Rock* fill shall be placed in lifts not exceeding 3 feet.
- Spreading of the *rock* fill shall be by dozer to facilitate seating of the rock.
- The *rock* fill shall be sprayed continuously with water during rock placement.
- Compaction equipment used shall have compactive energy comparable to or greater than that of a 10-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches (loose thickness) and brought to final design elevations. Each lift should be moisture-conditioned at least 2% above optimum moisture content, and compacted to at least 90% relative compaction based on the American Society for Testing and Materials (ASTM) Test Method D1557.

Fill slopes should be built such that soils are uniformly compacted to at least 90% relative compaction to the face of the completed slope. The top 6 inches of final vehicular pavement subgrade, whether completed at-grade, by excavation, or by filling, should be uniformly moisture-conditioned at least 2% above optimum moisture content and compacted to at least 95% relative compaction. Final pavement subgrade should be finished to a smooth, unyielding surface. We recommend proof-rolling the subgrade with a loaded water truck (or similar equipment with high contact pressure) to verify the stability of the subgrade prior to placing AB.

Permanent cut slopes should be constructed no steeper than 2H:1V. We recommend that all cut slopes be observed by our engineering geologist during grading to determine if adversely oriented fractures exist. Recommendations for mitigation, if necessary, can be provided at that time. Fill slopes should be constructed no steeper than 2H:1V.

Foundations

Residential single-family and multi-family buildings and other similar structures may be supported on conventional shallow foundations bearing on engineered fill or undisturbed native materials. Foundations should consist of continuous perimeter strip footings with isolated interior spread footings. Footing embedment depths will likely range from 12 to 18 inches below lowest adjacent pad grade. Bridges and arched culverts can also likely be supported on shallow foundations/spread footings. Allowable soil bearing capacity for shallow foundations will likely be in the range of 3,000 to 5,000 pounds per square foot (psf) depending on the structure type and location..

Concrete Flatwork and Pavements

Due to the low expansion potential of site soil, special procedures to stabilize subgrade soil beneath sidewalks and concrete flatwork is not likely necessary.

We anticipate that site soils will exhibit fair to good pavement support characteristics; therefore, conventional flexible pavement structural sections, such as hot mix asphalt (HMA) over compacted Class 2 aggregate base (AB) may be used. Specific pavement design recommendations will be provided as part of the future design-level geotechnical investigation.

Design-Level Geotechnical Investigation and Analysis

Additional site-specific subsurface exploration, laboratory testing, and engineering analysis will be necessary to provide geotechnical recommendations for design and construction. The investigation should be performed after site configuration/layout has been established and the areas of cuts and fills have been determined. The investigation may include additional test pits, geophysical testing to determine seismic Site Class, and possibly air-track borings to further evaluate rock characteristics and excavation conditions.

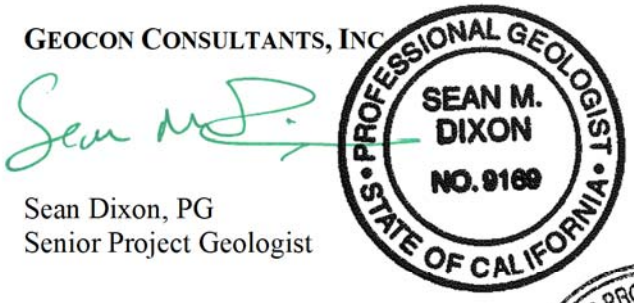
CLOSURE

The preliminary conclusions and recommendations contained herein are based on a limited field investigation, review of available information, and our geotechnical experience in the project area. This report is intended for your project planning and due-diligence purposes only. Additional geotechnical investigation and laboratory testing are required for project design and construction. Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices used in this area at this time. We make no warranty, either express or implied.

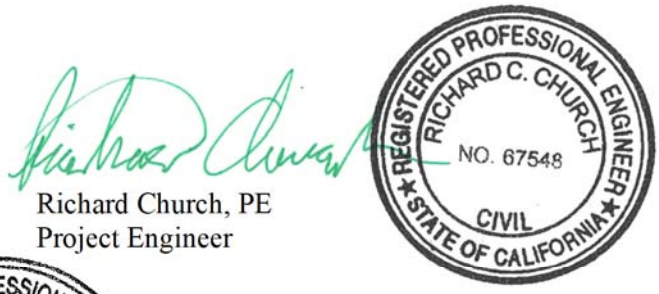
Please contact us if you have any questions regarding this report or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.



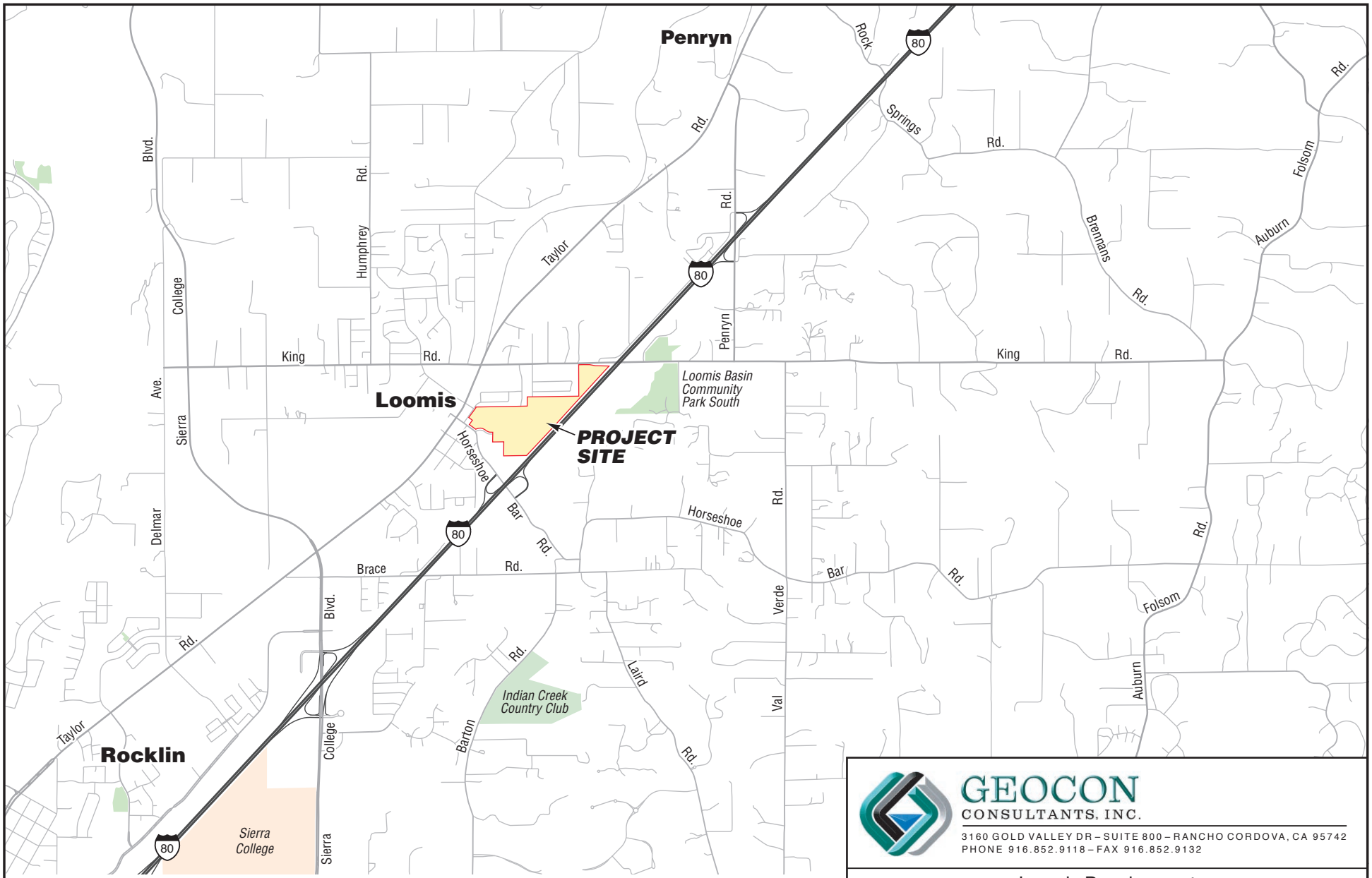
Sean Dixon, PG
Senior Project Geologist



Richard Church, PE
Project Engineer

Jeremy Zorne, PE, GE
Senior Engineer

Attachments: Figure 1, Vicinity Map
Figure 2, Site Plan
Figure 3, Development Plan
Photographs No. 1 through 8
Appendix A – *Logs of Test Pits (Geocon 2021 and WKA 2003)*
Appendix B – *Refraction Seismic Investigation at Loomis Development Project Site* – Gasch Geophysical Services, Inc., April 2021



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Loomis Development

Loomis,
California

VICINITY MAP

S2134-05-01	April 2021	Figure 1

LAIRD STREET
HORSESHOE BAR ROAD
LIBRARY DRIVE
SUN KNOLL DRIVE
DAY AVENUE
KING ROAD
INTERSTATE 80

RS Line 1
RS Line 2
RS Line 3
RS Line 4
RS Line 5
RS Line 6
RS Line 7
RS Line 8
RS Line 9
RS Line 10
RS Line 11

T1 12'
T2 13'
T3 12'
T4 13'
T5 13'
T6 9'
T7 9'
T8 11'
T9 8'
T10 14'
T11 6'
T12 7'
T13 9'
T14 7'
T15 8'
T16 6'
T17 10.5'
T18 6.5'
T19 7'
T20 10'
T21 7'
T22 7'

T1
T2
T3 5'
T4 1.5'
T5
T6
T7
T8 7.5'
T9
T10
T11
T12

LEGEND:

- Approximate Project Limits
- Outcrop Area
- T22 — Approximate Test Pit Location (Geocon, March 2021)
- T12 — Approximate Test Pit Location (Wallace Kuhl, October 2003)
- RS Line 11 — Approximate RS Line Location (Gasch, April 2021)
- 7' — Refusal Depth

0 250
Scale in Feet

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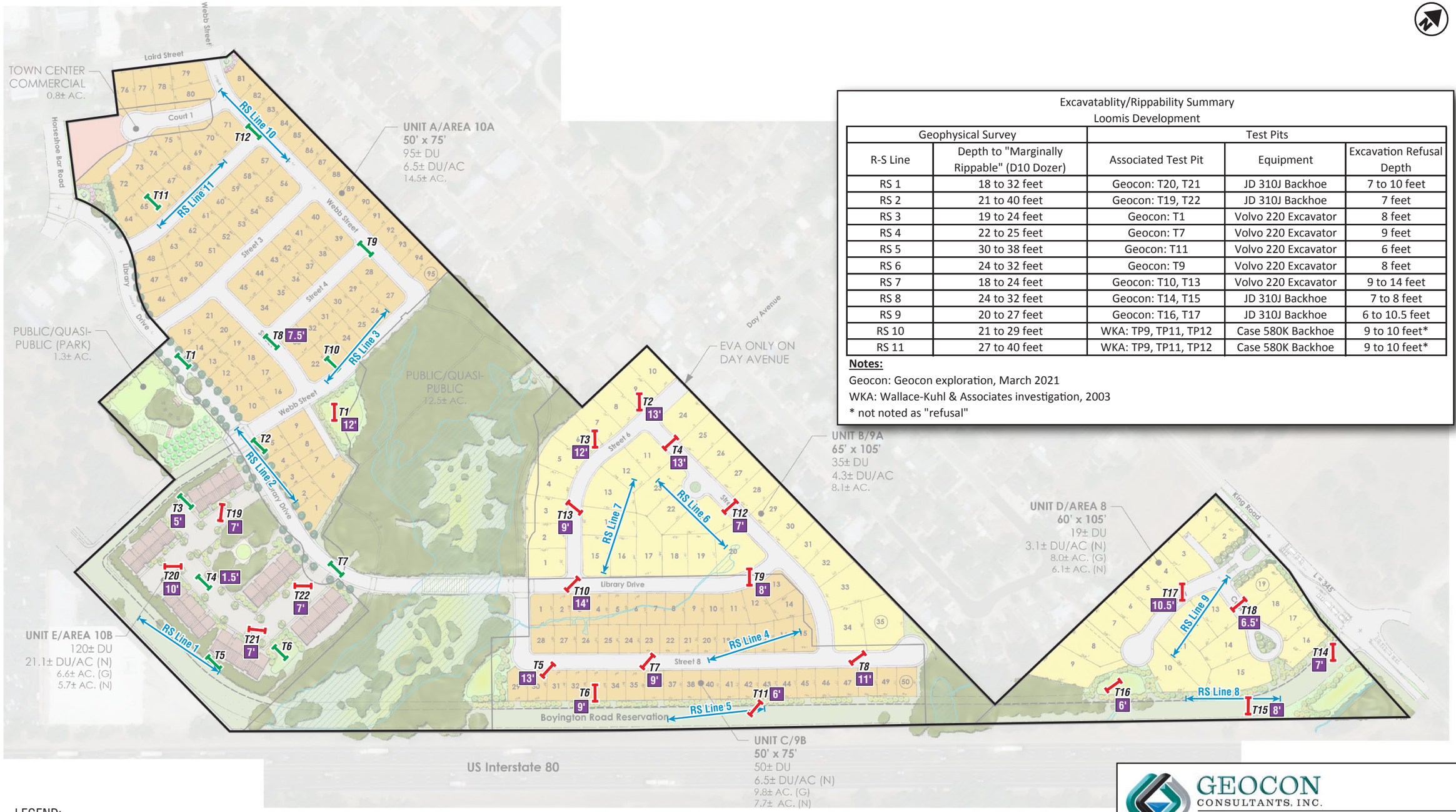
SITE PLAN

S2134-05-01	April 2021	Figure 2



Excavatablity/Rippability Summary
Loomis Development

Geophysical Survey		Test Pits		
R-S Line	Depth to "Marginally Rippable" (D10 Dozer)	Associated Test Pit	Equipment	Excavation Refusal Depth
RS 1	18 to 32 feet	Geocon: T20, T21	JD 310J Backhoe	7 to 10 feet
RS 2	21 to 40 feet	Geocon: T19, T22	JD 310J Backhoe	7 feet
RS 3	19 to 24 feet	Geocon: T1	Volvo 220 Excavator	8 feet
RS 4	22 to 25 feet	Geocon: T7	Volvo 220 Excavator	9 feet
RS 5	30 to 38 feet	Geocon: T11	Volvo 220 Excavator	6 feet
RS 6	24 to 32 feet	Geocon: T9	Volvo 220 Excavator	8 feet
RS 7	18 to 24 feet	Geocon: T10, T13	Volvo 220 Excavator	9 to 14 feet
RS 8	24 to 32 feet	Geocon: T14, T15	JD 310J Backhoe	7 to 8 feet
RS 9	20 to 27 feet	Geocon: T16, T17	JD 310J Backhoe	6 to 10.5 feet
RS 10	21 to 29 feet	WKA: TP9, TP11, TP12	Case 580K Backhoe	9 to 10 feet*
RS 11	27 to 40 feet	WKA: TP9, TP11, TP12	Case 580K Backhoe	9 to 10 feet*

Notes:
Geocon: Geocon exploration, March 2021
WKA: Wallace-Kuhl & Associates investigation, 2003
* not noted as "refusal"

LEGEND:

- T22 — Approximate Test Pit Location (Geocon, March 2021)
- T12 — Approximate Test Pit Location (Wallace Kuhl, October 2003)
- RS Line 11 — Approximate RS Line Location (Gasch, April 2021)
- 7' — Refusal Depth

0 250
Scale in Feet

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Loomis, California

PROPOSED DEVELOPMENT PLAN

S2134-05-01 | April 2021 | Figure 3

Photo No. 1 Typical Excavation Characteristics – Test Pit 1

Photo No. 2 Typical Excavation Characteristics – Test Pit 3

PHOTOS NO. 1 & 2

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Photo No. 3 Typical Excavation Characteristics – Test Pit 4

Photo No. 4 Typical Excavation Characteristics – Test Pit 8

PHOTOS NO. 3 & 4

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Photo No. 5 Typical Excavation Characteristics – Test Pit 9

Photo No. 6 Typical Excavation Characteristics – Test Pit 10

PHOTOS NO. 5 & 6

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Photo No. 7 Typical Excavation Characteristics – Test Pit 17

Photo No. 8 Typical Excavation Characteristics – Test Pit 20

PHOTOS NO. 7 & 8

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APPENDIX A

UNIFIED SOIL CLASSIFICATION

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS, MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS, MORE THAN HALF COARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 12% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS, MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO.4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS, MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS, LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS, LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC CLAYS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
	HIGHLY ORGANIC SOILS		PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

BORING/TRENCH LOG LEGEND

- No Recovery
- Shelby Tube Sample
- Bulk Sample
- SPT Sample
- Modified California Sample
- Groundwater Level (At Completion)
- Groundwater Level (Seepage)

PENETRATION RESISTANCE

SAND AND GRAVEL			SILT AND CLAY			
RELATIVE DENSITY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	CONSISTENCY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	COMPRESSIVE STRENGTH (tsf)
VERY LOOSE	0 - 4	0 - 6	VERY SOFT	0 - 2	0 - 3	0 - 0.25
LOOSE	5 - 10	7 - 16	SOFT	3 - 4	4 - 6	0.25 - 0.50
MEDIUM DENSE	11 - 30	17 - 48	MEDIUM STIFF	5 - 8	7 - 13	0.50 - 1.0
DENSE	31 - 50	49 - 79	STIFF	9 - 15	14 - 24	1.0 - 2.0
VERY DENSE	OVER 50	OVER 79	VERY STIFF	16 - 30	25 - 48	2.0 - 4.0
			HARD	OVER 30	OVER 48	OVER 4.0

*NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE LAST 12 INCHES OF AN 18-INCH DRIVE

MOISTURE DESCRIPTIONS

FIELD TEST	APPROX. DEGREE OF SATURATION, S (%)	DESCRIPTION
NO INDICATION OF MOISTURE; DRY TO THE TOUCH	S<25	DRY
SLIGHT INDICATION OF MOISTURE	25≤S<50	DAMP
INDICATION OF MOISTURE; NO VISIBLE WATER	50≤S<75	MOIST
MINOR VISIBLE FREE WATER	75≤S<100	WET
VISIBLE FREE WATER	100	SATURATED

QUANTITY DESCRIPTIONS

APPROX. ESTIMATED PERCENT	DESCRIPTION
<5%	TRACE
5 - 10%	FEW
11 - 25%	LITTLE
26 - 50%	SOME
>50%	MOSTLY

GRAVEL/COBBLE/BOULDER DESCRIPTIONS

CRITERIA	DESCRIPTION
PASS THROUGH A 3-INCH SIEVE AND BE RETAINED ON A NO. 4 SIEVE (#4 TO 3")	GRAVEL
PASS A 12-INCH SQUARE OPENING AND BE RETAINED ON A 3-INCH SIEVE (3"-12")	COBBLE
WILL NOT PASS A 12-INCH SQUARE OPENING (>12")	BOULDER

BEDDING SPACING DESCRIPTIONS

THICKNESS/SPACING	DESCRIPTOR
GREATER THAN 10 FEET	MASSIVE
3 TO 10 FEET	VERY THICKLY BEDDED
1 TO 3 FEET	THICKLY BEDDED
3 ⅝-INCH TO 1 FOOT	MODERATELY BEDDED
1 ⅛-INCH TO 3 ⅝-INCH	THINLY BEDDED
⅝-INCH TO 1 ⅛-INCH	VERY THINLY BEDDED
LESS THAN ⅝-INCH	LAMINATED

STRUCTURE DESCRIPTIONS

CRITERIA	DESCRIPTION
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS AT LEAST ⅛-INCH THICK	STRATIFIED
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS LESS THAN ⅛-INCH THICK	LAMINATED
BREAKS ALONG DEFINITE PLANES OF FRACTURE WITH LITTLE RESISTANCE TO FRACTURING	FISSURED
FRACTURE PLANES APPEAR POLISHED OR GLOSSY, SOMETIMES STRIATED	SLICKENSIDED
COHESIVE SOIL THAT CAN BE BROKEN DOWN INTO SMALLER ANGULAR LUMPS WHICH RESIST FURTHER BREAKDOWN	BLOCKY
INCLUSION OF SMALL POCKETS OF DIFFERENT SOIL, SUCH AS SMALL LENSES OF SAND SCATTERED THROUGH A MASS OF CLAY	LENSED
SAME COLOR AND MATERIAL THROUGHOUT	HOMOGENOUS

CEMENTATION/INDURATION DESCRIPTIONS

FIELD TEST	DESCRIPTION
CRUMBLES OR BREAKS WITH HANDLING OR LITTLE FINGER PRESSURE	WEAKLY CEMENTED/INDURATED
CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE	MODERATELY CEMENTED/INDURATED
WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE	STRONGLY CEMENTED/INDURATED

IGNEOUS/METAMORPHIC ROCK STRENGTH DESCRIPTIONS

FIELD TEST	DESCRIPTION
MATERIAL CRUMBLES WITH BARE HAND	WEAK
MATERIAL CRUMBLES UNDER BLOWS FROM GEOLOGY HAMMER	MODERATELY WEAK
⅛-INCH INDENTATIONS WITH SHARP END FROM GEOLOGY HAMMER	MODERATELY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **ONE** BLOW FROM GEOLOGY HAMMER	STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **COUPLE** BLOWS FROM GEOLOGY HAMMER	VERY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **MANY** BLOWS FROM GEOLOGY HAMMER	EXTREMELY STRONG

IGNEOUS/METAMORPHIC ROCK WEATHERING DESCRIPTIONS

DEGREE OF DECOMPOSITION	FIELD RECOGNITION	ENGINEERING PROPERTIES
SOIL	DISCOLORED, CHANGED TO SOIL, FABRIC DESTROYED	EASY TO DIG
COMPLETELY WEATHERED	DISCOLORED, CHANGED TO SOIL, FABRIC MAINLY PRESERVED	EXCAVATED BY HAND OR RIPPING (Saprolite)
HIGHLY WEATHERED	DISCOLORED, HIGHLY FRACTURED, FABRIC ALTERED AROUND FRACTURES	EXCAVATED BY HAND OR RIPPING, WITH SLIGHT DIFFICULTY
MODERATELY WEATHERED	DISCOLORED, FRACTURES, INTACT ROCK-NOTICEABLY WEAKER THAN FRESH ROCK	EXCAVATED WITH DIFFICULTY WITHOUT EXPLOSIVES
SLIGHTLY WEATHERED	MAY BE DISCOLORED, SOME FRACTURES, INTACT ROCK-NOT NOTICEABLY WEAKER THAN FRESH ROCK	REQUIRES EXPLOSIVES FOR EXCAVATION, WITH PERMEABLE JOINTS AND FRACTURES
FRESH	NO DISCOLORATION, OR LOSS OF STRENGTH	REQUIRES EXPLOSIVES

IGNEOUS/METAMORPHIC ROCK JOINT/FRACTURE DESCRIPTIONS

FIELD TEST	DESCRIPTION
NO OBSERVED FRACTURES	UNFRACTURED/UNJOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1 TO 3 FOOT INTERVALS	SLIGHTLY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 4-INCH TO 1 FOOT INTERVALS	MODERATELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1-INCH TO 4-INCH INTERVALS WITH SCATTERED FRAGMENTED INTERVALS	INTENSELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT LESS THAN 1-INCH INTERVALS; MOSTLY RECOVERED AS CHIPS AND FRAGMENTS	VERY INTENSELY FRACTURED/JOINTED

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

KEY TO LOGS | Figure A1

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T1

ELEV. (MSL.) **~389 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
3				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as; Dense, moist, reddish brown, Clayey SAND			
8					- becomes less weathered, light brown			
12					- becomes fresh TRENCH REFUSAL AT 12.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A2, Log of Trench, page 1 of 1

IN PROGRESS S2134-05-01 LOOMIS DEVELOPMENT LOGS.GPJ 04/05/21

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T2

ELEV. (MSL.) **~408 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sany CLAY			
3				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
8					- with clases up to 1' max			
11			▼		- seepage			
13					- becomes fresh TRENCH REFUSAL AT 13.0 FEET SEEPAGE ENCOUNTERED AT 11.0 FEET BACKFILLED WITH SOIL CUTTINGS			

Figure A3, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T3

ELEV. (MSL.) **~402 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
3								
4								
5								
6								
7								
8					- becomes light brown, less weathered clasts up to 1" maximium			
9								
10								
11								
12					- becomes fresh			

TRENCH REFUSAL AT 12.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A4, Log of Trench, page 1 of 1

IN PROGRESS S2134-05-01 LOOMIS DEVELOPMENT LOGS.GPJ 04/05/21

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T4

ELEV. (MSL.) **~401 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1				SC	**GRANITIC PLUTON; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
2								
3								
4								
5								
6								
7					- becomes light brown, less weathered			
8								
9					- with clasts up to 1" maximum			
10								
11								
12								
13					- becomes fresh			

TRENCH REFUSAL AT 13.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A5, Log of Trench, page 1 of 1

IN PROGRESS S2134-05-01 LOOMIS DEVELOPMENT LOGS.GPJ 04/05/21

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T5

ELEV. (MSL.) **~384 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
3				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
7					- becomes light brown, less weathered			
9					- with weak clasts up to 1" maximum			
13					- becomes fresh TRENCH REFUSAL AT 13.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A6, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T6

ELEV. (MSL.) **~388 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
7					- becomes less weathered, weak clasts up to 1" maximum			
9					- becomes fresh TRENCH REFUSAL AT 9.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A7, Log of Trench, page 1 of 1

IN PROGRESS S2134-05-01 LOOMIS DEVELOPMENT LOGS.GPJ 04/05/21

GEOCON

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ◪ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T7

ELEV. (MSL.) **~394 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
3								
4								
5								
6								
7					- becomes light brown, less weathered, clasts up to 1" maximum			
8								
9					- becomes fresh			

TRENCH REFUSAL AT 9.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A8, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
☐ ... SAMPLING UNSUCCESSFUL
◧ ... STANDARD PENETRATION TEST
■ ... DRIVE SAMPLE (UNDISTURBED)
⊠ ... DISTURBED OR BAG SAMPLE
◥ ... CHUNK SAMPLE
▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T8

ELEV. (MSL.) **~393 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2								
3				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Sandy CLAY			
4								
5								
6								
7					- becomes light brown, less weathered			
8								
9								
10								
11					- becomes fresh			

TRENCH REFUSAL AT 11.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A9, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T9

ELEV. (MSL.) **~393 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
7					- becomes light brown, less weathered - becomes fresh, clasts up to 1" maximum			
8					TRENCH REFUSAL AT 11.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A10, Log of Trench, page 1 of 1

IN PROGRESS S2134-05-01 LOOMIS DEVELOPMENT LOGS.GPJ 04/05/21

GEOCON

SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ◪ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T10

ELEV. (MSL.) **~390 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
7					- becomes light brown, less weathered			
14					- becomes fresh TRENCH REFUSAL AT 14.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A11, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T11

ELEV. (MSL.) **~390 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2								
3				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
4								
5								
6					- becomes fresh			

TRENCH REFUSAL AT 6.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A12, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T12

ELEV. (MSL.) **~400 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
3								
4								
5								
6								
7					- becomes fresh, with clasts up to 1" maximum			

TRENCH REFUSAL AT 7.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A13, Log of Trench, page 1 of 1

IN PROGRESS S2134-05-01 LOOMIS DEVELOPMENT LOGS.GPJ 04/05/21

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T13

ELEV. (MSL.) **~395 Feet** DATE COMPLETED **3/23/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **Volvo 220 Excavator w/ 24" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
2								
3								
4								
5								
6								
7					- becomes light brown, less weathered			
8								
9					- becomes fresh TRENCH REFUSAL AT 9.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A14, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T14

ELEV. (MSL.) **~394 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2								
3				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
4								
5								
6								
7					- becomes light brown, less weathered			

TRENCH REFUSAL AT 7.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A15, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
☐ ... SAMPLING UNSUCCESSFUL
◧ ... STANDARD PENETRATION TEST
■ ... DRIVE SAMPLE (UNDISTURBED)
⊠ ... DISTURBED OR BAG SAMPLE
◥ ... CHUNK SAMPLE
▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T15

ELEV. (MSL.) **~391 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
3				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
7					- becomes light brown, less weathered, with clasts up to 1" maximum			
8					TRENCH REFUSAL AT 8.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A16, Log of Trench, page 1 of 1

IN PROGRESS S2134-05-01 LOOMIS DEVELOPMENT LOGS.GPJ 04/05/21

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T16

ELEV. (MSL.) **~390 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
3								
4								
5								
6					TRENCH REFUSAL AT 6.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A17, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T17

ELEV. (MSL.) **~405 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
2								
3								
4								
5								
6								
7					- becomes light brown, less weathered			
8								
9					- with clasts up to 1" maximum			
10								
					TRENCH REFUSAL AT 10.5 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A18, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)
⊠ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T18

ELEV. (MSL.) **~396 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
3								
4								
5								
6					- becomes light brown, less weathered			
					TRENCH REFUSAL AT 6.5 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A19, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T19

ELEV. (MSL.) **~390 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
2								
3								
4								
5								
6								
7					TRENCH REFUSAL AT 7.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A20, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T20

ELEV. (MSL.) **~386 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
7					- becomes light brown, less weathered			
10					TRENCH REFUSAL AT 10.0 FEET GROUNDWATER NOT ENCOUNTERED BACKFILLED WITH SOIL CUTTINGS			

Figure A21, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T21

ELEV. (MSL.) **~383 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
3								
4								
5								
6								
7					- becomes light brown, less weathered			

TRENCH REFUSAL AT 7.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A22, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
☐ ... SAMPLING UNSUCCESSFUL
◧ ... STANDARD PENETRATION TEST
■ ... DRIVE SAMPLE (UNDISTURBED)
⊠ ... DISTURBED OR BAG SAMPLE
◪ ... CHUNK SAMPLE
▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S2134-05-01** PROJECT NAME **Loomis Development**

TRENCH T22

ELEV. (MSL.) **~384 Feet** DATE COMPLETED **3/24/2021**

ENG./GEO. **S. Dixon** DRILLER **Geocon**

EQUIPMENT **John Deere 310 J with 18" Bucket** HAMMER TYPE

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				CL	**COLLUVIUM** Soft, moist, brown, Sandy CLAY			
1								
2								
3				SC	**GRANITIC ROCK; PENRYN PLUTON** Massive, reddish brown, decomposed, soft; Excavates as: Dense, moist, reddish brown, Clayey SAND			
4								
5								
6								
7					- becomes light brown, less weathered			

TRENCH REFUSAL AT 7.0 FEET
GROUNDWATER NOT ENCOUNTERED
BACKFILLED WITH SOIL CUTTINGS

Figure A23, Log of Trench, page 1 of 1

GEOCON

SAMPLE SYMBOLS
☐ ... SAMPLING UNSUCCESSFUL
◧ ... STANDARD PENETRATION TEST
■ ... DRIVE SAMPLE (UNDISTURBED)
⊠ ... DISTURBED OR BAG SAMPLE
◥ ... CHUNK SAMPLE
▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

LOGS OF TEST PITS

October 30, 2003

TEST PIT 1

0 to 3'	Brown, silty, fine to coarse sand (SM)
3' to 6'	Red brown, weakly cemented, severely to moderately weathered, micaceous, clayey, fine to coarse sand – decomposed granodiorite rock ("saprolite")
6' to 9'	Gray, weakly cemented, moderately weathered, micaceous, silty, fine to coarse sand - weathered granodiorite rock
	Ground water was not encountered
	Harder excavation conditions observed at 6 feet
	Caving of sidewalls was not observed
	Test pit terminated at 9 feet

TEST PIT 2

0 to 2'	Brown, silty, fine to coarse sand (SM)
2' to 8'	Red brown, weakly cemented, moderately weathered, micaceous, clayey, fine to coarse sand – decomposed granodiorite rock ("saprolite")
8' to 10'	Gray, weakly cemented, moderately weathered, micaceous, silty, fine to coarse sand - weathered granodiorite rock
	Ground water was not encountered
	Harder excavation conditions observed at 5 feet
	Caving of sidewalls was not observed
	Test pit terminated at 10 feet

TEST PIT 3

0 to 2'	Brown, silty, fine to coarse sand (SM – Fill?)
	nested barbed wire was observed in the test pit wall at approximately 2 feet below the surface
2' to 4½'	Red brown, weakly cemented, moderately weathered, micaceous, clayey, fine to coarse sand – decomposed granodiorite rock ("saprolite")
4½' to 5'	Gray, weak to moderately cemented, micaceous, silty, fine sand - weathered granodiorite rock
	Ground water was not encountered
	Caving of sidewalls was not observed
	Practical refusal to excavation encountered at 5 feet

LOGS OF TEST PITS

October 30, 2003

TEST PIT 4

0 to 1½'	Brown, silty, fine to coarse, sand (SM)
1½' +	Gray brown, slightly weathered, granodiorite rock
	Ground water was not encountered
	Caving of sidewalls was not observed
	Refusal to excavation at 1½ feet

TEST PIT 5

0 to 2'	Brown to Red brown, silty, fine to coarse, sand (SM)
2' to 8'	Red brown, weakly cemented, severe to moderately weathered, micaceous, clayey, fine to coarse sand - weathered granodiorite rock ("saprolite")
8' to 10'	Gray, weakly cemented, severe to moderately weathered, micaceous, silty, fine to coarse sand - weathered granodiorite rock
	Ground water was not encountered
	Caving of sidewalls was not observed
	Test pit terminated at 10 feet

TEST PIT 6

0 to 2½'	Brown, silty, fine to coarse, sand (SM)
2½' to 10'	Red brown, weakly cemented, severe to moderately weathered, micaceous, clayey, fine to coarse sand - weathered granodiorite rock ("saprolite")
	Ground water was not encountered
	Caving of sidewalls was not observed
	Test pit terminated at 10 feet

TEST PIT 7

0 to 5'	Brown, silty, fine to coarse sand (SM)
5' to 10'	Gray, weakly cemented, severely weathered, micaceous, silty, fine to coarse sand - weathered granodiorite rock ("saprolite")
	Ground water was not encountered
	Caving of sidewalls was not observed
	Test pit terminated at 10 feet

LOGS OF TEST PITS

October 30, 2003

TEST PIT 8

0 to 3'	Brown, silty, fine to coarse sand (SM)
3' to 5'	Gray, weakly cemented, severely weathered, micaceous, silty, fine to coarse sand - weathered granodiorite rock ("saprolite")
5' to 7½'	Gray, weak to moderately cemented, micaceous, silty, fine sand - weathered granodiorite rock
	Ground water was not encountered
	Caving of sidewalls was not observed
	Practical refusal to excavation encountered at 7½ feet

TEST PIT 9

0 to 4'	Brown, silty, fine to coarse sand (SM)
4' to 9'	Gray, weakly cemented, moderately weathered, micaceous, silty, fine to coarse sand - weathered granodiorite rock ("saprolite")
	Ground water was not encountered
	Harder excavation conditions within less weathered rock observed at 6 feet
	Caving of sidewalls was not observed
	Test pit terminated at 9 feet

TEST PIT 10

0 to 3'	Brown, silty, fine to coarse sand (SM)
3' to 10'	Gray, weakly cemented, severe to moderately weathered, micaceous, silty, fine to coarse sand - weathered granodiorite rock ("saprolite")
	Perched water encountered at 7 feet
	Minor sloughing of pit walls observed at 7 feet
	Test pit terminated at 10 feet

LOGS OF TEST PITS

October 30, 2003

TEST PIT 11

0 to 2'	Brown, silty, fine to coarse sand (SM)
2' to 10'	Red brown, weakly cemented, moderately weathered, micaceous, clayey, fine to coarse sand - weathered granodiorite rock ("saprolite")
	Ground water was not encountered
	Harder excavation conditions observed at 8 feet
	Caving of sidewalls was not observed
	Test pit terminated at 10 feet

TEST PIT 12

0 to 1½'	Brown, silty, fine to coarse sand (SM)
1½' to 5'	Red brown, weakly cemented, moderately weathered, micaceous, clayey, fine to coarse sand - weathered granodiorite rock ("saprolite")
5' to 10'	Gray, weakly cemented, severe to moderately weathered, micaceous, silty, fine to coarse sand - weathered granodiorite rock
	Ground water was not encountered
	Caving of sidewalls was not observed
	Test pit terminated at 10 feet

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		SYMBOL	CODE	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of soil > no. 200 sieve size)	GRAVELS (More than 50% 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 or no fines
		GM		Silty gravels, gravel - sand - silt mixtures
		GC		Clayey gravels, gravel - sand - clay mixtures
	SANDS (50% or more of coarse fraction < no. 4 sieve size)	SW		Well graded sands or gravelly sands, little or no fines
		SP		Poorly graded sands or gravelly sands, little or no fines
		SM		Silty sands, sand - silt mixtures
		SC		Clayey sands, sand - clay mixtures
FINE GRAINED SOILS (50% or more of soil < no. 200 sieve size)	SILTS & CLAYS LL < 50	ML		Inorganic silts and very fine sands, rock flour, silty or 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 & CLAYS LL ≥ 50	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 silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt		Peat and other highly organic soils

OTHER SYMBOLS

= Drive Sample: 2-1/2" O.D. Modified 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 = Gradational Analysis (Sieve)
K = Permeability Test

GRAIN SIZE CLASSIFICATION

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL coarse (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

WALLACE ▪ KUHL & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERING
GEOLOGIC & ENVIRONMENTAL SERVICES

LOOMIS 25 ACRE SITE
Vicinity of Library Street
Loomis, California

WKA NO: 5782.01
DATE: 11/03
PLATE NO: 6

APPENDIX B

Refraction Seismic Investigation
at a
Loomis Development Project Site
Loomis, Placer County, California

GGSI Project No. 2021-08.01

Prepared by:

Gasch Geophysical Services, Inc.
Rancho Cordova, California 95742-6576

Submitted to:

Mr. Richard Church
Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, California 95742

April, 2021

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FOR THE ENGINEERING,
GROUNDWATER, OIL & GAS
AND BLASTING INDUSTRIES

Since 1969

April 6, 2021

Mr. Richard Church
Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, California 95742

Re: Refraction Seismic Investigation at a Loomis Development Project Site, in Loomis, Placer County, California.
GGSI Project No. 2021-08.01

Dear Mr. Church:

At your request and authorization, Gasch Geophysical Services, Inc. (GGSI) has completed a refraction seismic investigation at a Loomis Development Project Site in Loomis, Placer County, California (Figure 1).

Purpose

The purpose of this investigation was to determine the depth to higher velocity material and also define the rippability (excavatability) characteristics of the sub-surface materials at portions of the project site.

The refraction seismic (RS) method was used to evaluate the rock velocities on site, as seismic primary-wave travel times are used to quantify the rock velocities and, as a result, can determine the general competency/rippability in areas of various rock types.

Method, Instrumentation and Software

The RS method measures the velocity at which a seismic wave propagates through a soil or rock medium. In this case, the primary seismic wave (p-wave or compression wave) was measured. Higher seismic p-wave velocities (measured in feet per second, ft/s) indicate material of higher density, thus quantifying the competency, or strength, of the soil or rock medium and providing an estimation of the rippability and/or excavatability of the sub-surface materials.

The seismic data acquisition system used by GGSI was a Seistronix EX-6 Explorer, which is a distributed, 24-bit digital instrument with data output to electronic media for subsequent processing. Geophones were single, 10-Hz, digital grade units manufactured by OYO Geospace Corporation. Spread cables were manufactured by Pro-Seismic Services. The energy source for this project was a propelled energy generator employing a 40 kilogram (88 pound) accelerated weight drop mounted on an off-road utility vehicle with a hardwire link for system triggering. All data were processed in house, on our data reduction and plotting workstation.

Refraction seismic data processing was carried out using Rayfract® version 3.36. This refraction seismic processing software utilizes Wavepath Eikonal Traveltime (WET) tomography, which models multiple signal propagation paths contributing to one first break (the Fresnel volume approach). Conventional ray tracing tomography is limited to the modeling of just one ray path per first break. The WET inversion method is founded upon a back-projection formula for inverting velocities from travel times computed by a finite-difference solution to the Eikonal equation (Qin, et al. 1992). An Eikonal solver is used for traveltime field computation, which models diffraction in addition to refraction and transmission of acoustic waves. As a result, the velocity anomaly imaging capability is enhanced with the WET tomographic inversion method compared to conventional ray tomography. This software is developed by Intelligent Resources, Inc. of Vancouver, British Colombia, Canada.

A color-coded seismic velocity cross-section of the subsurface has been generated for each RS line, where cool colors (blues) indicate lower seismic velocities and warm colors (reds, purple) indicate higher velocities. Color scaling of these seismic velocity sections is based on the range of seismic velocity values calculated. Velocity scaling has been normalized on all RS velocity sections.

Data Acquisition Parameters

A total of 11 RS lines were acquired during this investigation. RS Line locations were suggested by Geocon personnel and slightly adjusted in the field to allow for safe and efficient data acquisition. Geophone stations on all RS Lines were spaced at 20-foot intervals, with energy source points located between every other geophone station, as well as off the ends of each line. All 11 RS Lines were acquired with 12 active geophone stations for a line length of 260 lineal feet for each RS Line. A total of 2,860 lineal feet of data were collected for this investigation. Field data acquisition was carried out on March 29th, 31st and April 2nd, 2021 by a field crew consisting of Professional Geophysicist Kent Gasch and geophysical technician Keith Peschel. The location of the RS lines are presented on Figure 2.

Seismic Velocities

Generally, seismic p-wave velocities less than 3,000 ft/s indicate native soil, fill material, or highly weathered and/or decomposed rock, while velocities in excess of 10,000 ft/s indicate fresh (essentially non-weathered) rock. Seismic velocities between these two values typically indicate rock with varying degrees of weathering and/or fracturing. Consolidation and cementation, as well as fracture spacing and density, also affect the measured seismic velocities. Moderate velocities may indicate native soil, compacted soil, moderately weathered rock, or loosely consolidated sediment such as gravel, sand, and silt. Saturated sediment below the water table characteristically displays seismic velocities near or slightly above 5,000 ft/s.

Extremes in seismic velocities may range from below 1,000 ft/s to over 20,000 ft/s. Very low seismic velocities usually indicate highly weathered or poorly compacted material, either natural or man-made. Extremely high velocities are rare in the near-surface, and only possible in certain types of rock. Rock velocities are dependent on the physical condition of the rock masses evaluated, as a result, seismic p-wave velocities are related to rock hardness, fracture density and sediment consolidation, saturation, and cementation.

Rippability

Rippability is dependent on the physical condition of the rock masses to be excavated. In addition to rock type and degree of weathering, structural features in the rock such as bedding planes, cleavage planes, joints, fractures, consolidation, and shear zones also influence rippability. Rock masses tend to be more easily ripped if they have well defined, closely spaced fractures, joints, or other planes of weakness. Massive rock bodies which lack discontinuities may allow for slow and difficult ripping or refusal, even where partially weathered, and may require blasting to break the rock for efficient removal.

Seismic p-wave velocities are related to both rock hardness and fracture density. Rippability has been empirically correlated to refraction seismic velocities by Caterpillar Inc. However, the Caterpillar Chart of Ripper Performance should be considered as being only one indicator of rippability. Ripper tooth penetration is the key to successful ripping, regardless of seismic velocity. This is particularly true in finer-grained, homogeneous materials and in tightly cemented formations. Ripping success may ultimately be determined by the operator finding the proper combination of factors, such as: number of shanks used, length and depth of shank, tooth angle, direction of travel, and use of throttle. Although low seismic velocities in any rock type indicate probable rippability; if the fractures, bedding and/or joints do not allow tooth penetration, the material still may not be ripped efficiently, and, in some cases, drilling and blasting may be required to induce sufficient fracturing to allow for excavation.

The association between the seismic velocity of any given earth material and its rippability varies greatly from one type of earth-moving equipment to another. For example, although a large track laying dozer with a single ripper tooth can sometimes rip material with seismic velocities in excess of 10,000 ft/s. GGSI has experienced a limiting (refusal) velocity for large excavators ranging from 3,000 ft/s to 4,500 ft/s, and a standard backhoe may meet refusal at seismic velocities as low as 2,000 ft/s. Ultimately, the relationship between seismic velocity and rippability is dependent on a combination of site conditions, equipment used, and operator ability.

Findings

The results of this refraction seismic investigation are summarized by Figures 3 through 13. These seismic velocity sections, which were created through the inversion process,

have very low error and provide a high degree of lateral definition of the seismic velocity horizons found beneath each line. The seismic velocity sections have been scaled from 1,500 ft/s to 20,000 ft/s for the velocity window. Spatial axes have been scaled to 40 feet per inch in the horizontal and 20 feet per inch in the vertical.

RS Line 1 (Figure 3)

RS Line 1 is located in the southern portion of the project area, directly behind the Raley's property, and is oriented approximately west to east (see Figure 2). Measured seismic velocities at this location grade at a moderate to moderately high rate from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 18 to 32 feet below ground surface (bgs). This marginally rippable velocity horizon undulates beneath the line and trends a bit deeper towards the east end of the line. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 2 (Figure 4)

RS Line 2 is located in the western central portion of the project area along the extension of the planned Library Drive and is oriented approximately west to east (see Figure 2). Measured seismic velocities at this location grade at moderate rates from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 21 to over 40 feet bgs with an undulating nature along the entirety of the line. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 3 (Figure 5)

RS Line 3 is located in the northern central portion of the project area along the northern portion of the Webb Street. This Line is oriented approximately north to south (see Figure 2). Measured seismic velocities at this location grade at a moderate rate from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 19 to 24 feet bgs with a general undulating character of the velocity contours. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 4 (Figure 6)

RS Line 4 is located in the northeastern portion of the project area, semi-parallel to Street 8 and is oriented approximately northeast to southwest (see Figure 2). Measured seismic velocities at this location grade moderately fast from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 22 to 25 feet bgs along the entirety of the line. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 5 (Figure 7)

RS Line 5 is also located in the northeastern portion of the project area, along the Boyington Road Reservation and semi-parallel to Interstate 80. This Line is oriented approximately northeast to southwest (see Figure 2). Measured seismic velocities at this location grade at moderate rates from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 30 to 38 feet bgs with a rise near distance stations 40 to 80 feet. This marginally rippable velocity horizon is closest to the surface near this rise, and velocity contours generally parallel surface topography along the remainder of the line. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 6 (Figure 8)

RS Line 6 is located in the northern central portion of the project area, just south and parallel to Street 7. This line is oriented approximately east to west (see Figure 2). Measured seismic velocities at this location grade at moderate rates from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 24 to 32 feet bgs with little variation along the length of the line. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 7 (Figure 9)

RS Line 7 is also located in the northern central portion of the project area and runs northeast and semi-parallel to Street 6 and ending near Library Drive. This line is oriented approximately northwest to southeast (see Figure 2). Measured seismic

velocities at this location grade moderately fast from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 18 to 24 feet bgs along the entirety of the line. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 8 (Figure 10)

RS Line 8 is located in the far northeastern portion of the project area, along the northern end of the Boyington Road Reservation and parallel to Interstate 80. This Line is oriented approximately northeast to southwest (see Figure 2). Measured seismic velocities at this location grade at slow to moderate rates from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 24 to 32 feet bgs with a minor rise of the velocity contours toward the southwest end of the line. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 9 (Figure 11)

RS Line 9 is also located in the far northeastern portion of the project area and is oriented approximately north to south. This line begins at the intersection of Court 9 and 10, just south of King Road (see Figure 2). Measured seismic velocities at this location grade at a moderate rate from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 20 to 27 feet below ground surface (bgs). Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 10 (Figure 12)

RS Line 10 is located in the northwestern portion of the project area along the western end of Webb Street near Laird Street and is oriented approximately west to east (see Figure 2). Measured seismic velocities at this location grade at moderate to moderately fast rates from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 21 to 29 feet bgs with a slight dip on the west end of the line. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may

become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

RS Line 11 (Figure 13)

RS Line 11 is also located in the northwestern portion of the project area along the Street 2. This Line is oriented approximately north to south (see Figure 2). Measured seismic velocities at this location grade at a moderate rate from low velocities (1,500 ft/s) at the surface to moderately high velocities in the marginally rippable range (approx. 7,000 ft/s) at depths ranging from approximately 27 to 40 feet bgs with a general undulating character of this horizon. Velocities at or above the depth of this horizon suggest that materials should be rippable with a D10T2 dozer (or equivalent); however, should excavations extend below this horizon, ripping may become difficult, and drilling and blasting may be the most efficient method to fracture the rock for deeper excavation.

Summary

This refraction seismic investigation was designed to provide a good sampling of the subsurface conditions at select locations of the Loomis Development Project Site. This investigation revealed a moderate to high degree of variation in the calculated seismic velocities of the subsurface materials, with the highest seismic velocity of greater than 19,000 ft/s measured at the maximum depth of exploration on Lines 1, 3, 4 and 7. Low velocity material was encountered in the near surface on all lines, which suggests highly weathered/fractured rock and soil or fill. The moderate velocity range of 4,000 ft/s to approximately 6,000 ft/s, suggests compacted soil/fill, moderately weathered/fractured rock. All eleven RS Lines show this low to moderate velocity section of material from surface to varying depths and high velocity material at the maximum depth of exploration. The higher velocity horizon (7,000 ft/s and greater) suggests rock of moderate weathering and/or fractures which continues to slightly weathered and/or less fractured rock at depth.

During our investigation, numerous rock outcrops were observed across the site. Many appear to be rock that can removed with conventional equipment (commonly known as “pull-outs”), however, some of the other outcrops were massive in nature and will likely require drilling and blasting for excavation.

Displayed on Figure 14 is the Caterpillar Performance chart for a CAT D10T2 (Caterpillar Performance Handbook, Edition 49, September, 2019). According to this chart, igneous rock, in this case granitic rock, becomes marginally rippable near 7,300 ft/s and non-rippable at about 8,500 ft/s for a D10T2 dozer with multiple or a single shank No. 10 ripper. These estimations are based on the published values for metamorphic rocks on the CAT chart; however, site geology and topography may cause some variations of these values.

In general, rippability with a D10T2 dozer (or equivalent) with multiple or single shank No. 10 ripper tooth should not be problematic to the depths noted above for each RS Line; however, depending on the maximum depth of excavation, progress may be slower as zones of higher velocity material are encountered. In such instances, alternative means of excavation, such as drilling and blasting, may be necessary.

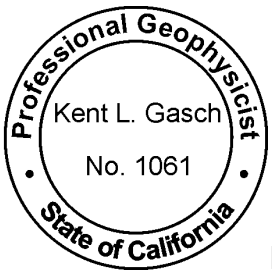
Warranty and Limitations

Gasch Geophysical Services, Inc. has performed these services in a manner which is consistent with standards of the profession. Site conditions can cause some variations of the calculated seismic velocities. Refraction seismic velocities assume that velocities increase with depth; therefore, a lower seismic velocity layer beneath a higher seismic velocity layer will not be resolved. No guarantee, with respect to the results and performance of services or products delivered for this project, is implied or expressed by Gasch Geophysical Services, Inc.

We trust that this is the information you require; however, should you have comments or questions, please contact our Rancho Cordova office at your convenience. Thank you for this opportunity to again be of service.

Sincerely,

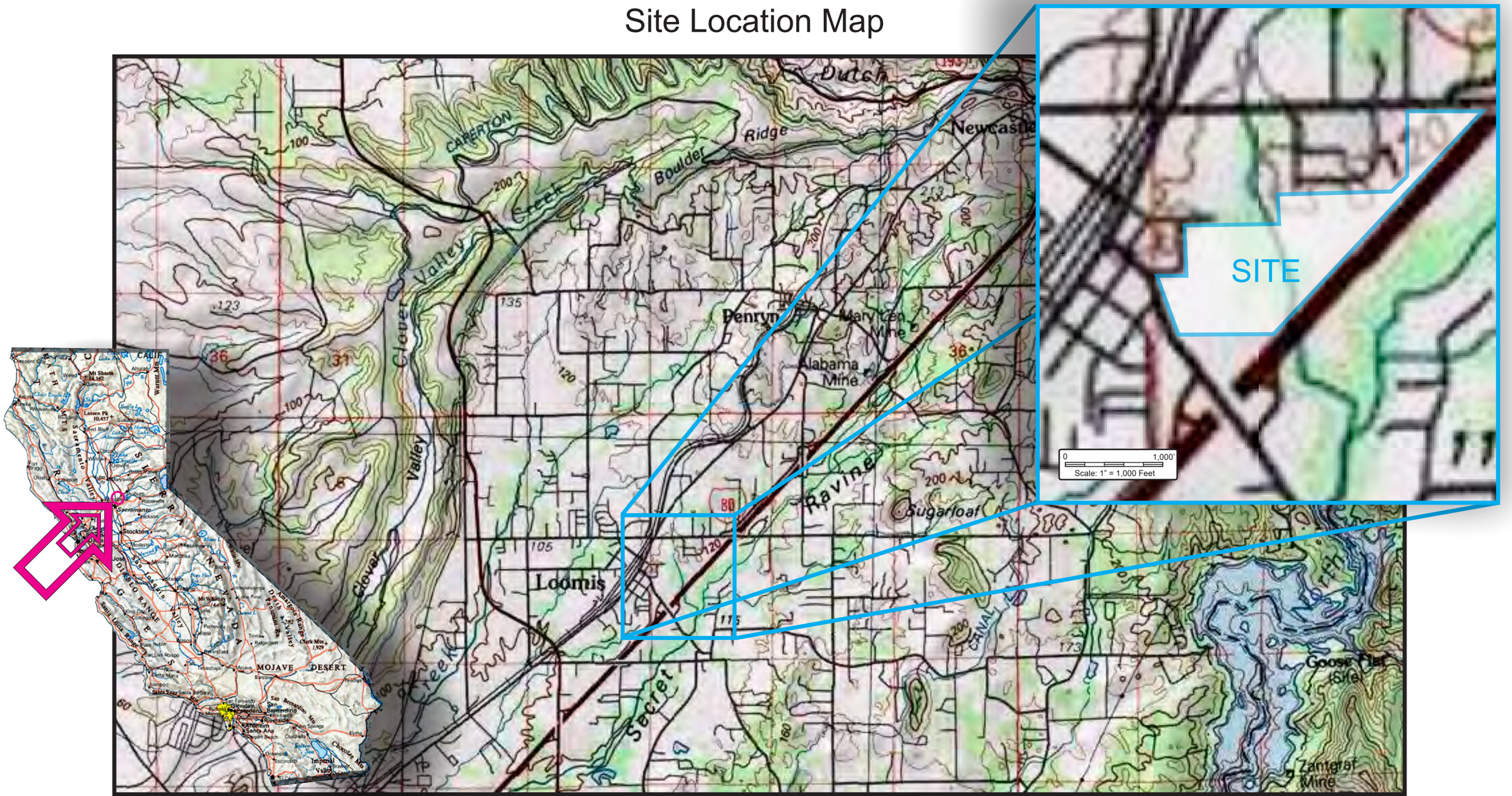
GASCH GEOPHYSICAL SERVICES, INC.



Expires 12/31/2021

Kent L. Gasch
Professional Geophysicist #1061
Blasting Consultant

Site Location Map



Base Maps Courtesy of: USGS

Figure 1

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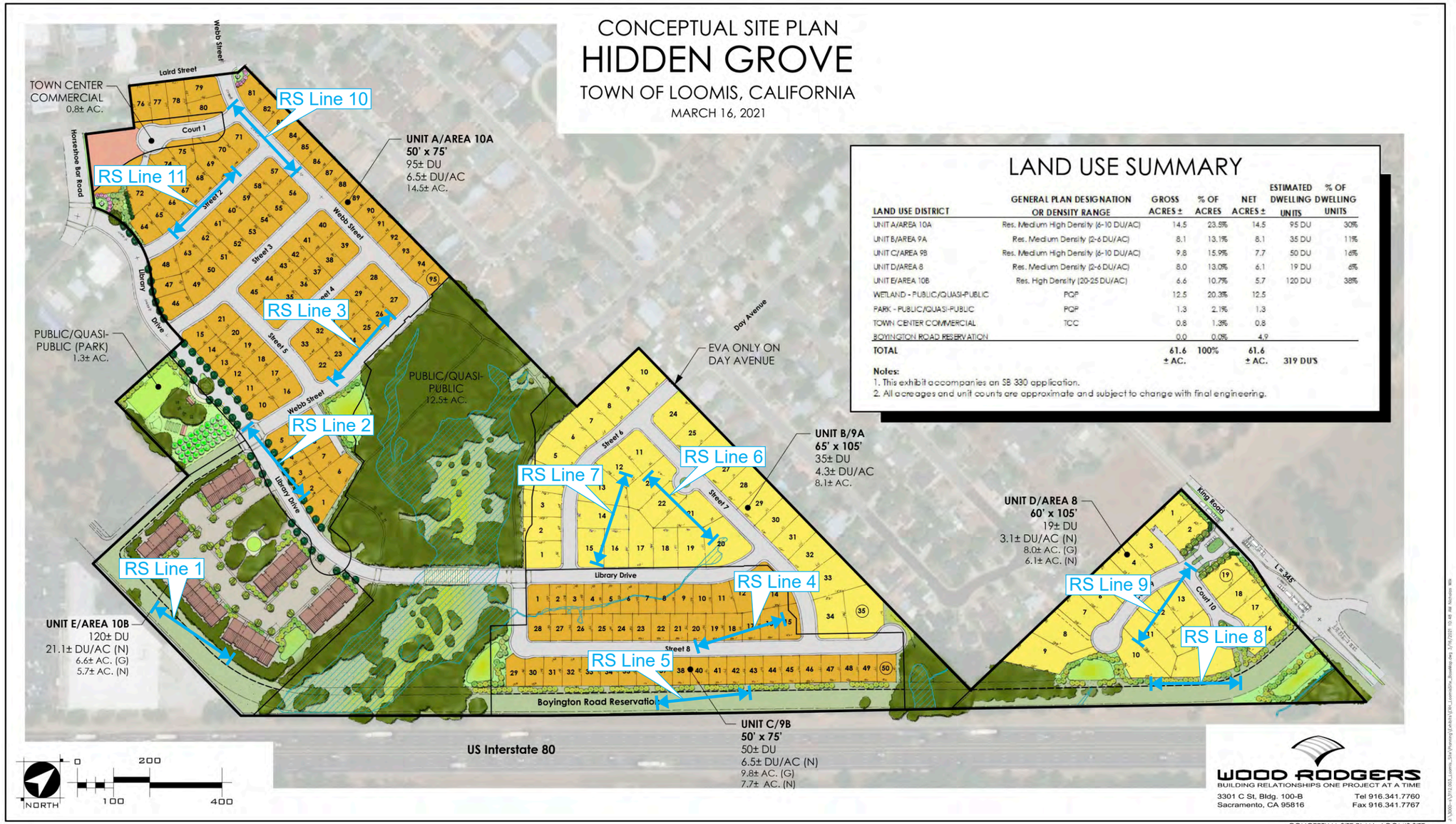
Refraction Seismic Investigation:
Loomis Development Project

Prepared for: ***Geocon Consultants, Inc.***

Project Number: 2021-08.01 ***Date:*** April, 2021

RS Line Location Map



LAND USE SUMMARY

LAND USE DISTRICT	GENERAL PLAN DESIGNATION OR DENSITY RANGE	GROSS ACRES ±	% OF ACRES	NET ACRES ±	ESTIMATED DWELLING UNITS	% OF DWELLING UNITS
UNIT A/AREA 10A	Res. Medium High Density (6-10 DU/AC)	14.5	23.5%	14.5	95 DU	30%
UNIT B/AREA 9A	Res. Medium Density (2-6 DU/AC)	8.1	13.1%	8.1	35 DU	11%
UNIT C/AREA 9B	Res. Medium High Density (6-10 DU/AC)	9.8	15.9%	7.7	50 DU	16%
UNIT D/AREA 8	Res. Medium Density (2-6 DU/AC)	8.0	13.0%	6.1	19 DU	6%
UNIT E/AREA 10B	Res. High Density (20-25 DU/AC)	6.6	10.7%	5.7	120 DU	38%
WETLAND - PUBLIC/QUASI-PUBLIC	PQP	12.5	20.3%	12.5		
PARK - PUBLIC/QUASI-PUBLIC	PQP	1.3	2.1%	1.3		
TOWN CENTER COMMERCIAL	TCC	0.8	1.3%	0.8		
BOYINGTON ROAD RESERVATION		0.0	0.0%	4.9		
TOTAL		61.6 ± AC.	100%	61.6 ± AC.	319 DU'S	

Notes:
1. This exhibit accompanies an SB 330 application.
2. All acreages and unit counts are approximate and subject to change with final engineering.

Base map courtesy of Wood Rodgers and provided by GEOCON Consultsnts, Inc.

N W E S

0' 300' 600'
Scale: 1 inch = 300 feet

Figure 2

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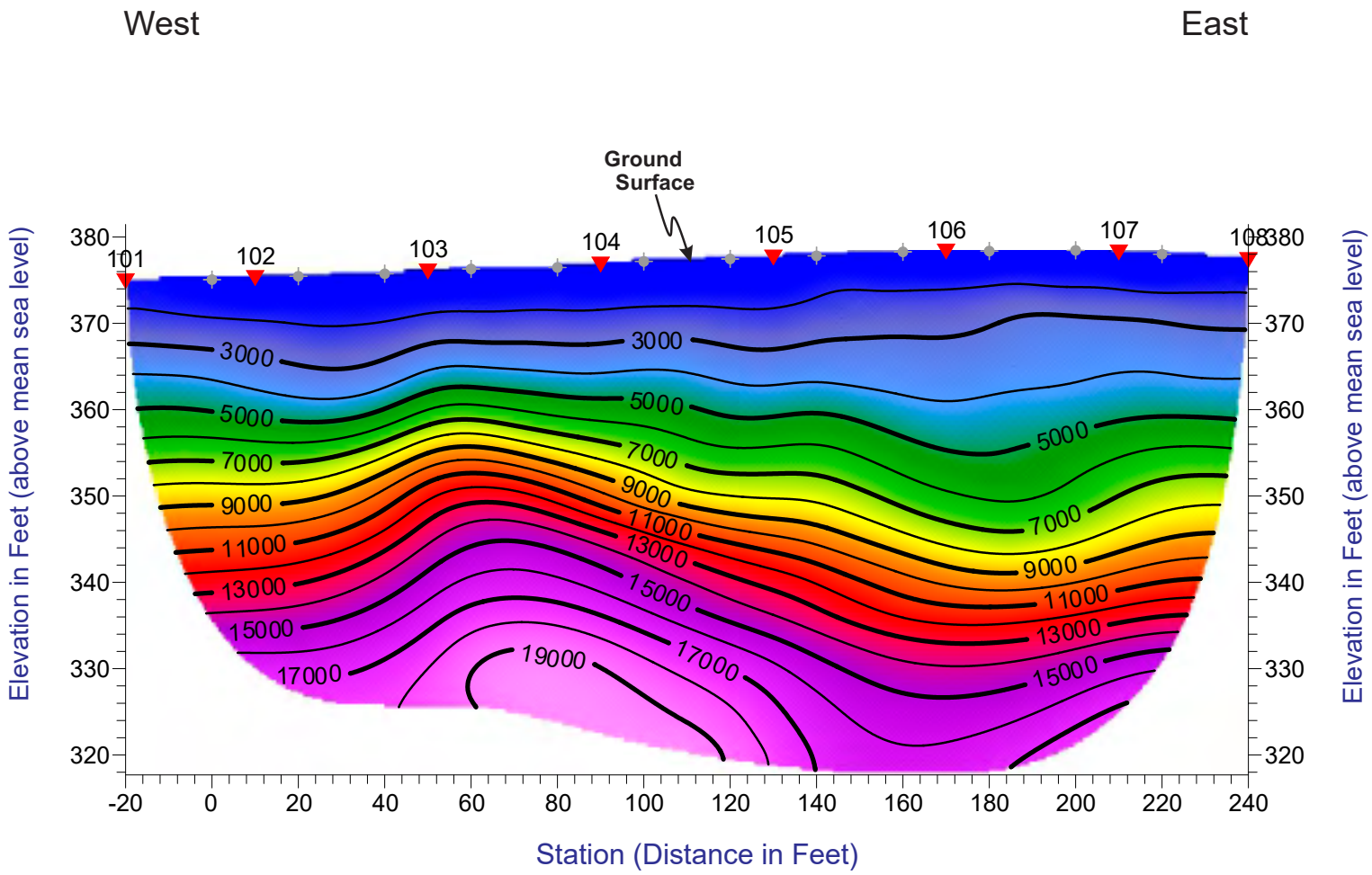
Refraction Seismic Investigation: Loomis Development Project

Prepared for: *Geocon Consultants, Inc.*

Project Number: 2021-08.01 ***Date:*** April, 2021

Seismic Velocity Section • RS Line 1



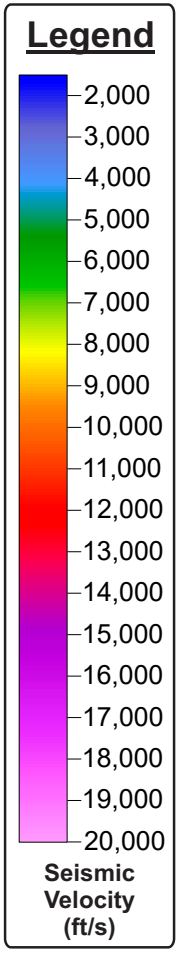
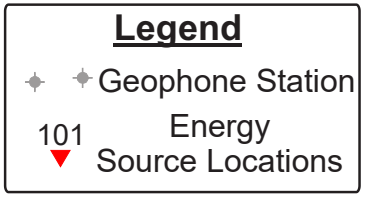


Figure 3

Scale:
Horizontal: 1" = 40'
Vertical: 1" = 20'



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Refraction Seismic Investigation:
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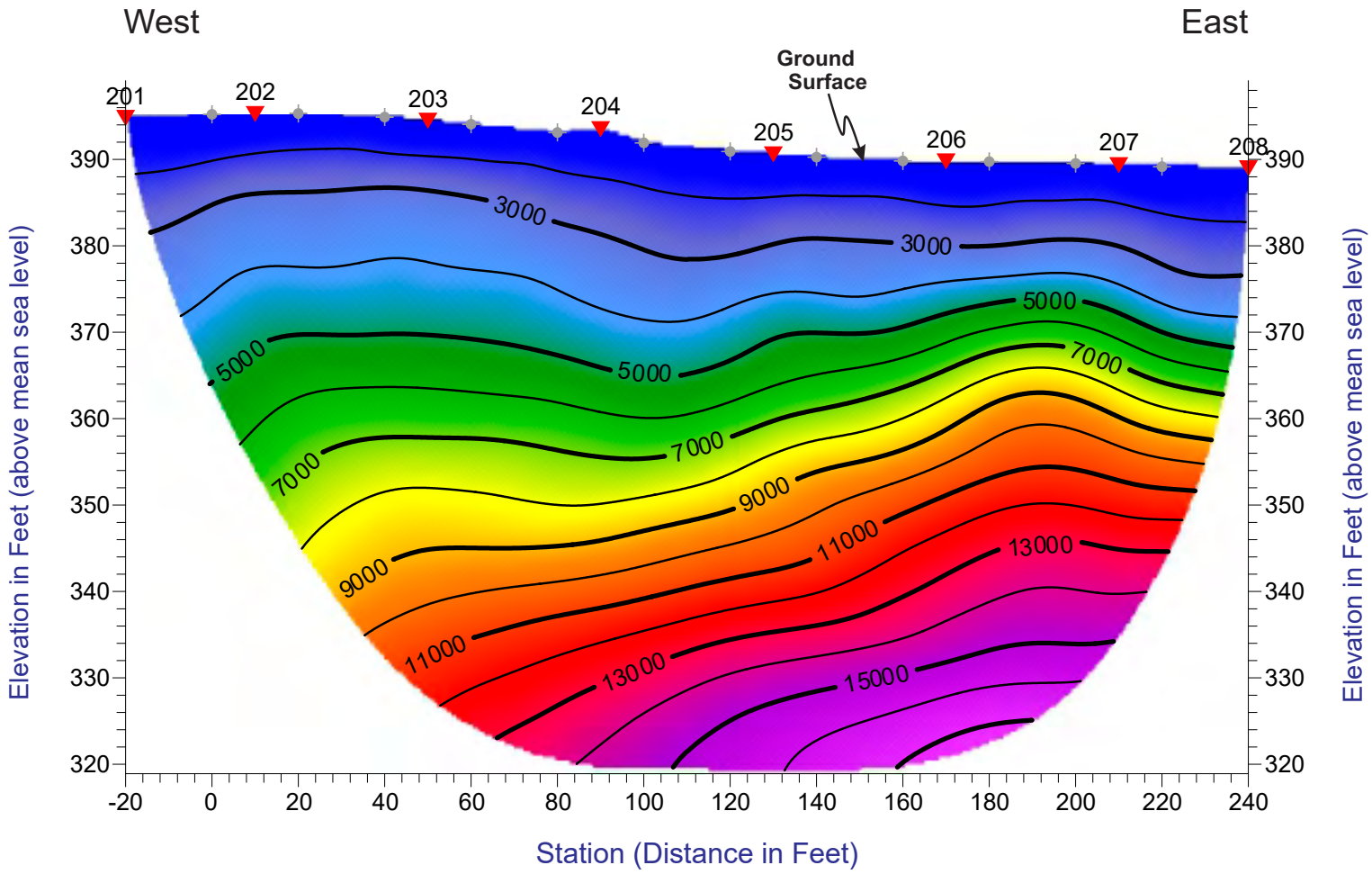
Seismic Velocity Section • RS Line 2



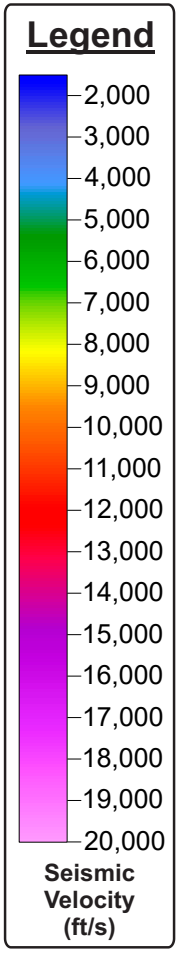


Figure 4

Scale:
Horizontal: 1" = 40'
Vertical: 1" = 20'

Legend

Geophone Station

201 Energy Source Locations

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Refraction Seismic Investigation:
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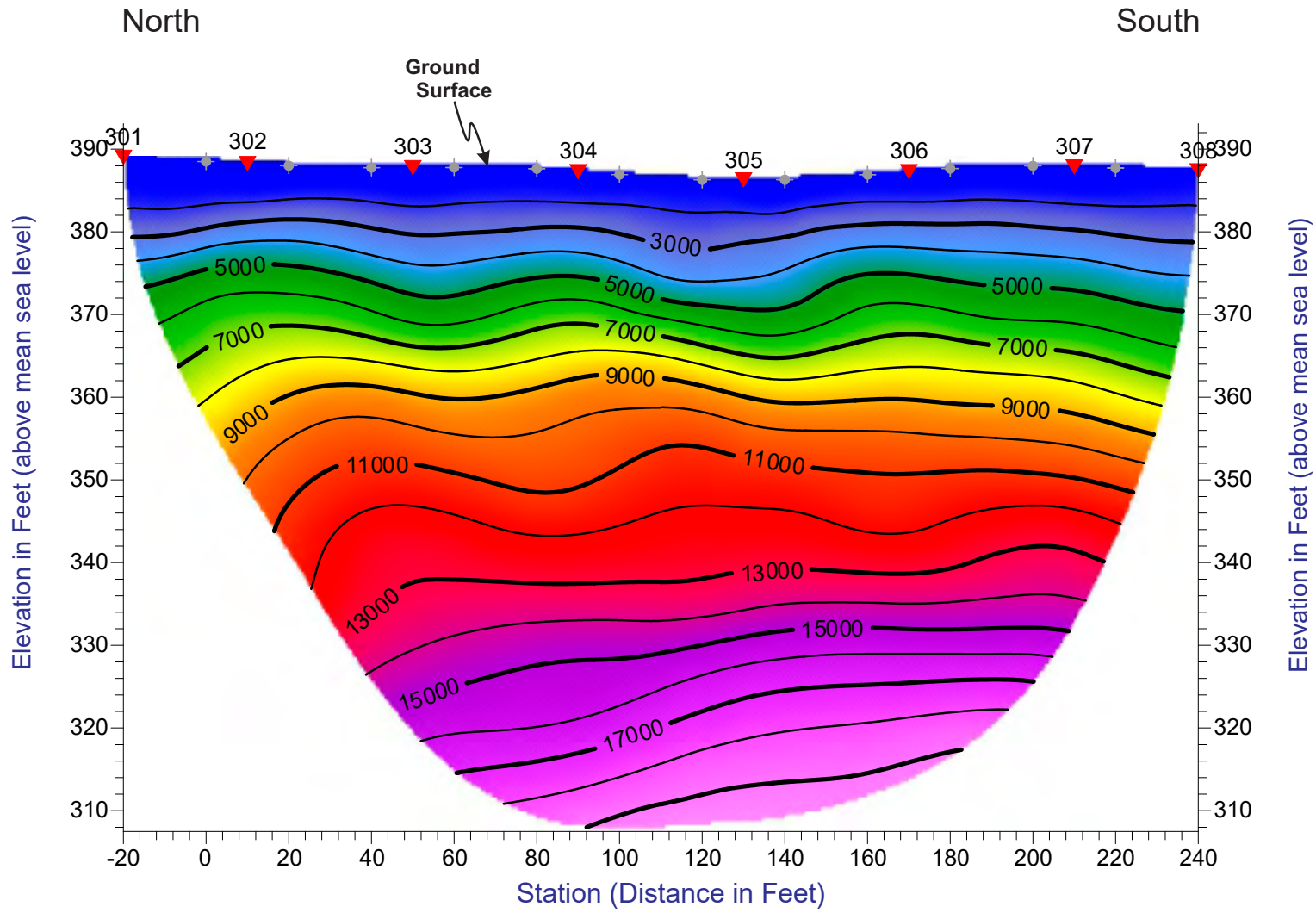
Prepared for: ***Geocon Consultants, Inc.***

Project Number: 2021-08.01 ***Date:*** April, 2021

Seismic Velocity Section • RS Line 3



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Seismic Velocity (ft/s)

Figure 5

Scale:
Horizontal: 1” = 40’
Vertical: 1” = 20’

Legend

Geophone Station

301 Energy Source Locations

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Refraction Seismic Investigation:
Loomis Development Project

Prepared for: ***Geocon Consultants, Inc.***

Project Number: 2021-08.01 ***Date:*** April, 2021

Seismic Velocity Section • RS Line 4

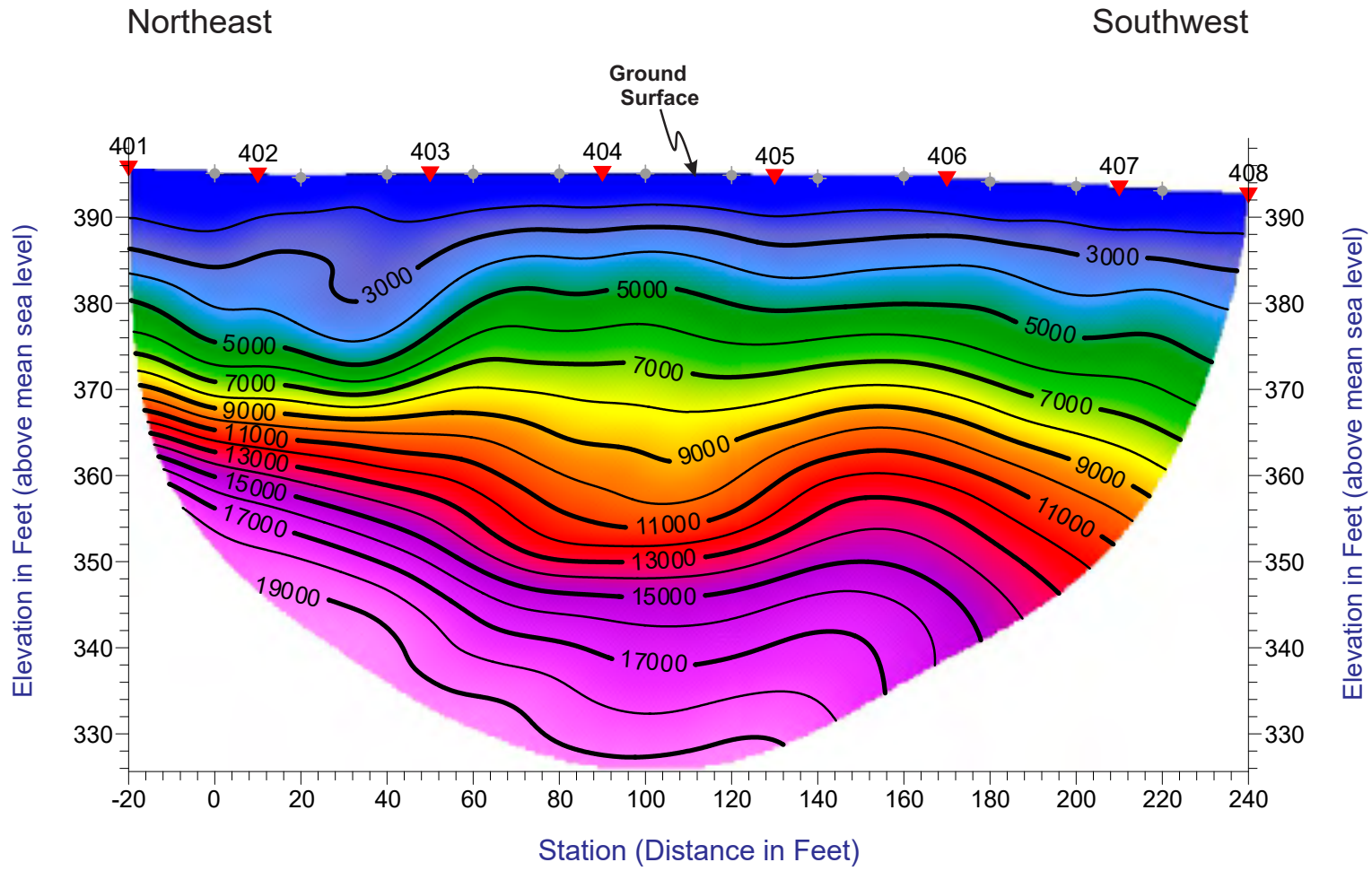

Figure 6

Scale:
Horizontal: 1" = 40'
Vertical: 1" = 20'

Legend
Geophone Station
401 Energy Source Locations

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Refraction Seismic Investigation:
Loomis Development Project

Prepared for: ***Geocon Consultants, Inc.***

Project Number: 2021-08.01 ***Date:*** April, 2021

Seismic Velocity Section • RS Line 5

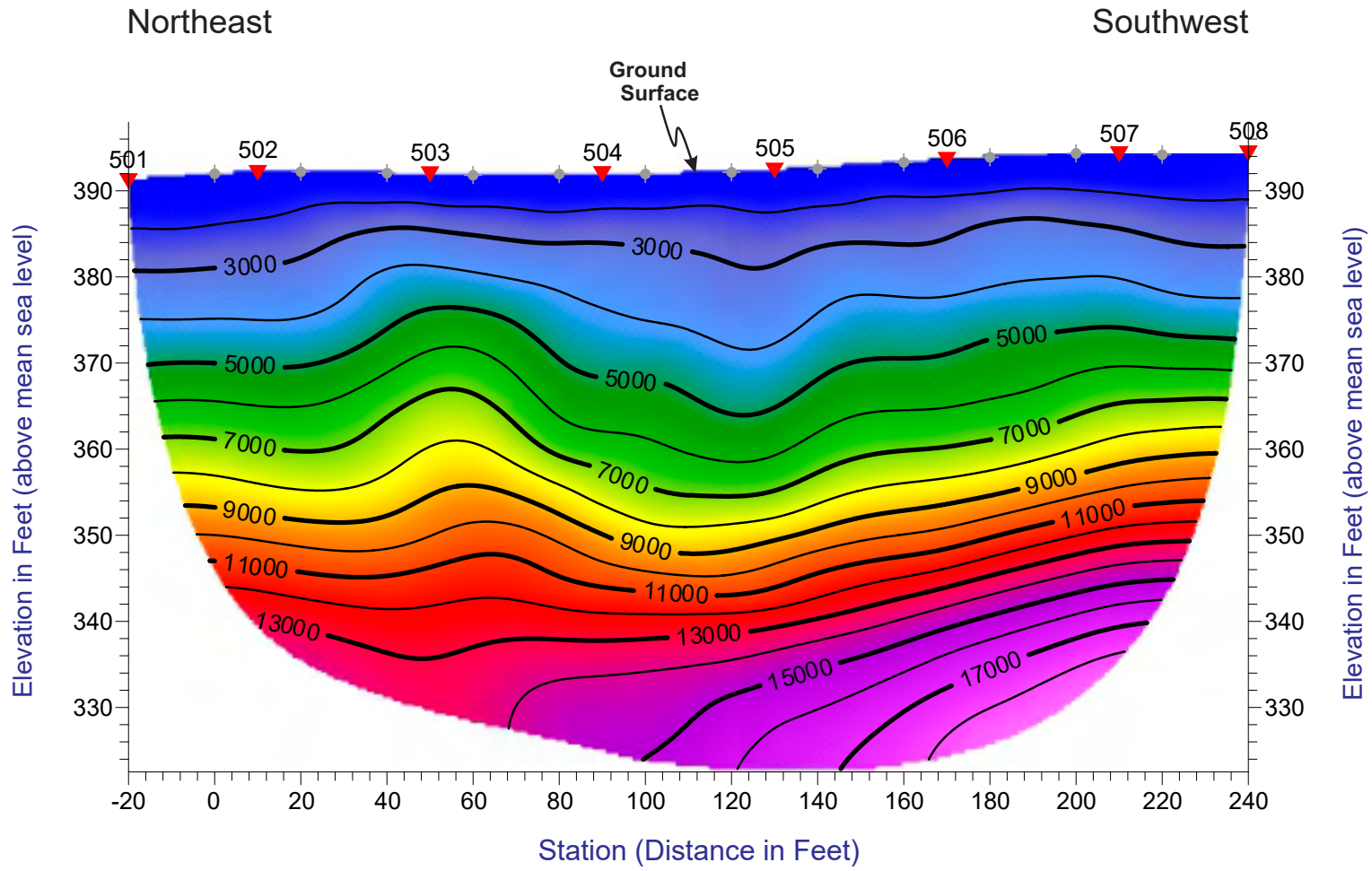

Figure 7

Scale:
Horizontal: 1" = 40'
Vertical: 1" = 20'

Legend

Geophone Station

501 Energy Source Locations

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Refraction Seismic Investigation:
Loomis Development Project

Prepared for: ***Geocon Consultants, Inc.***

Project Number: 2021-08.01 ***Date:*** April, 2021

Seismic Velocity Section • RS Line 6

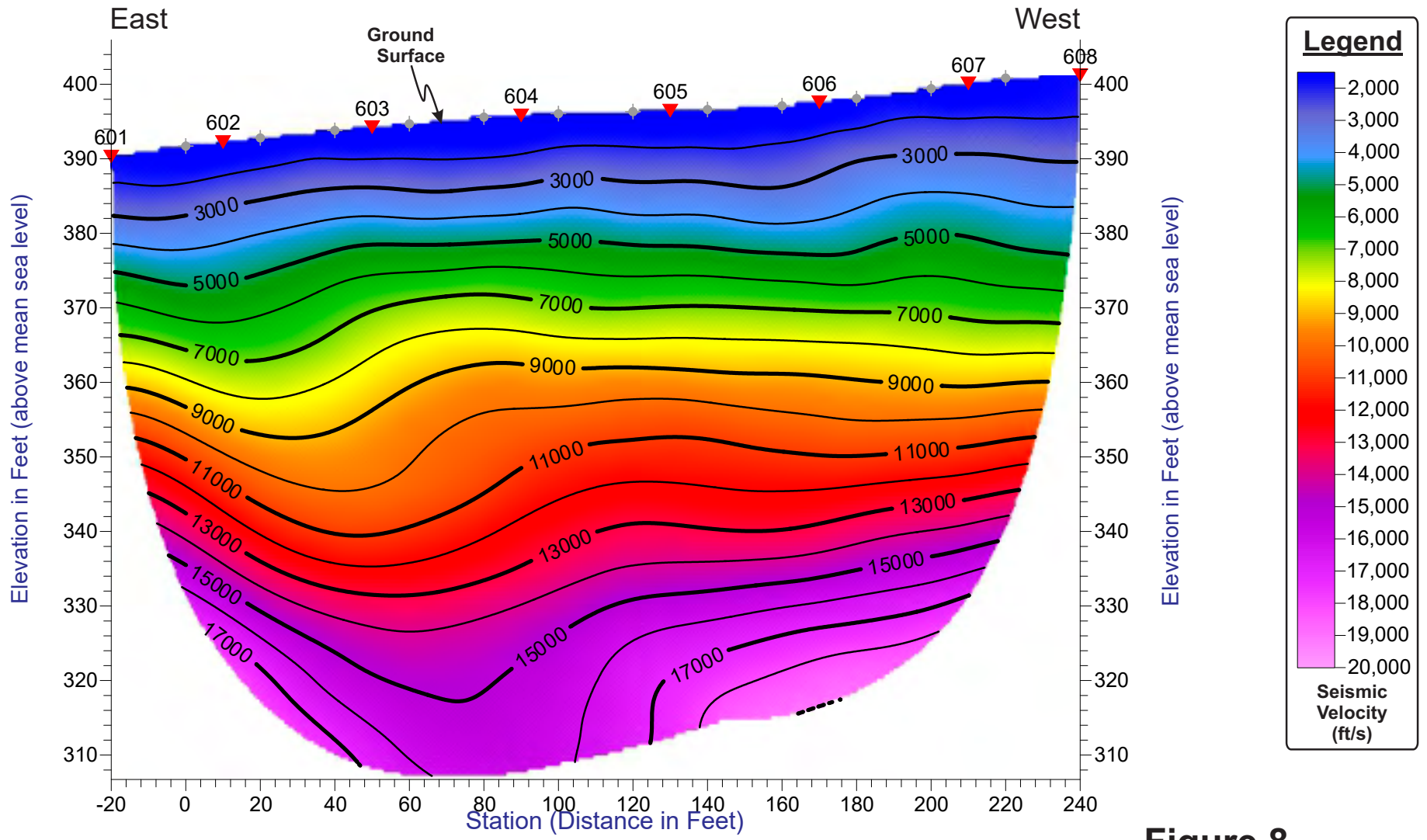

Figure 8

Scale:
Horizontal: 1” = 40’
Vertical: 1” = 20’

Legend

Geophone Station

601 Energy Source Locations

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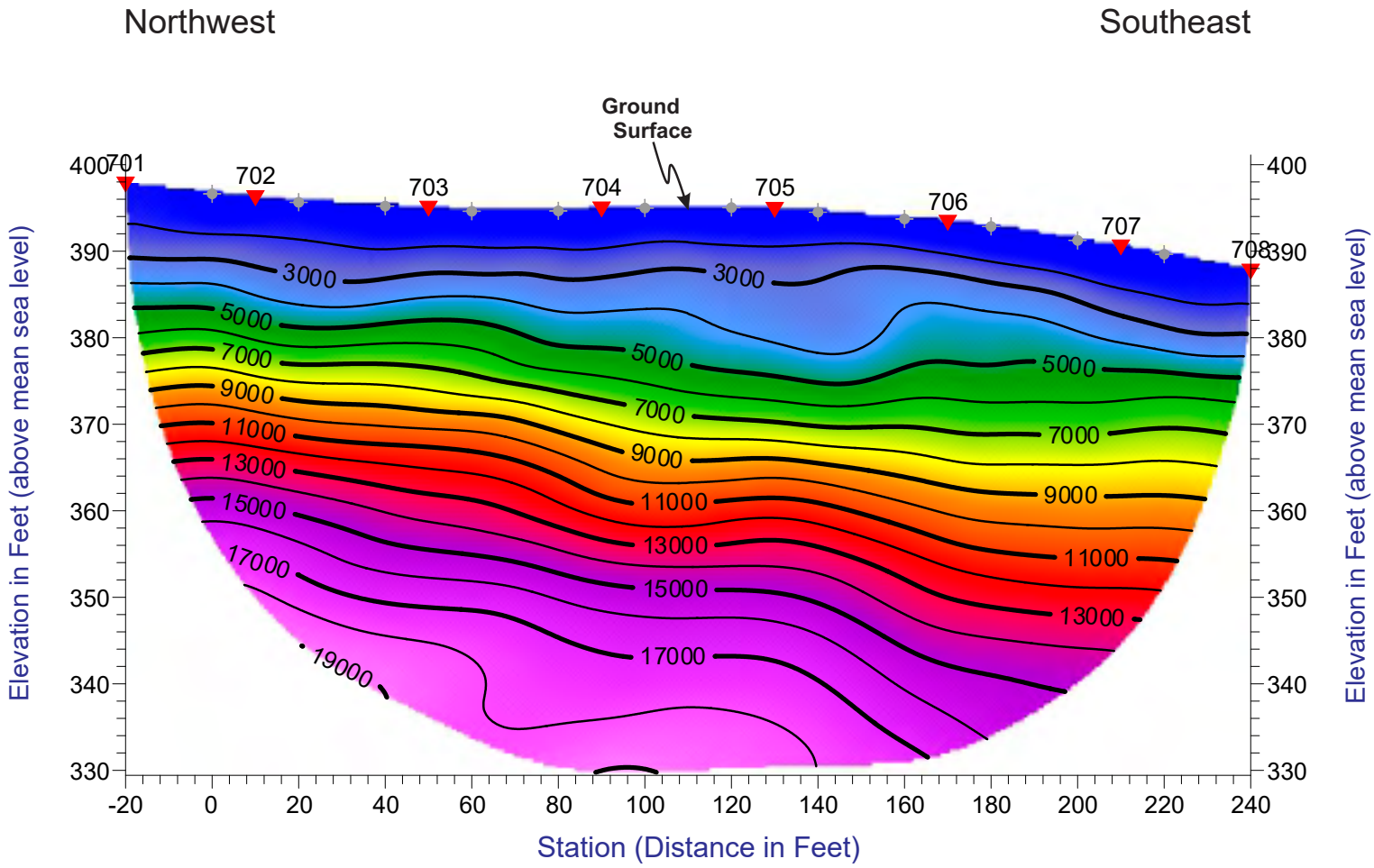
Refraction Seismic Investigation:
Loomis Development Project

Prepared for: ***Geocon Consultants, Inc.***

Project Number: 2021-08.01 ***Date:*** April, 2021

Seismic Velocity Section • RS Line 7



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20,000

Seismic Velocity (ft/s)

Figure 9

Scale:
Horizontal: 1” = 40’
Vertical: 1” = 20’

Legend

Geophone Station

701 Energy Source Locations

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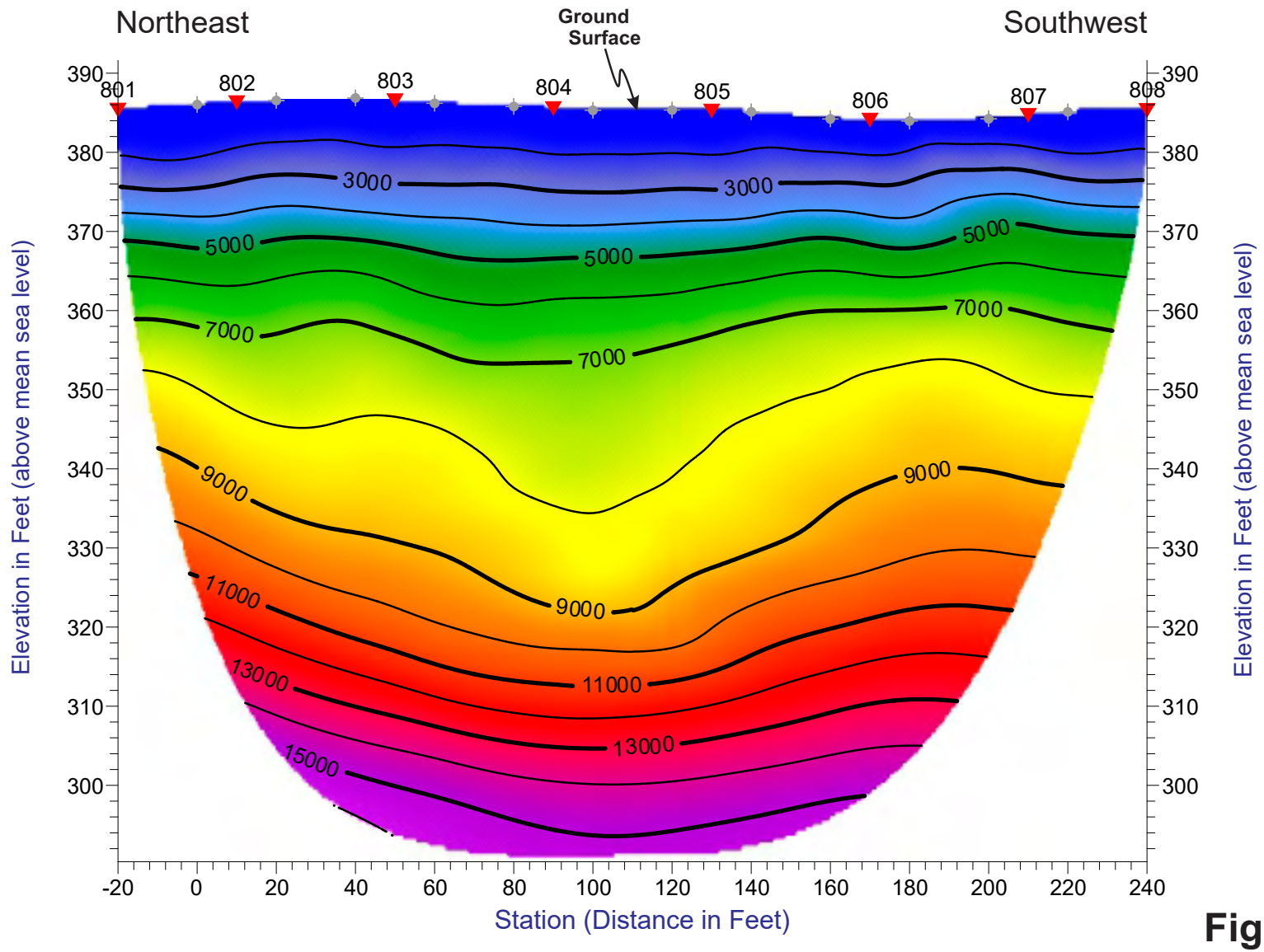
Seismic Velocity Section • RS Line 8



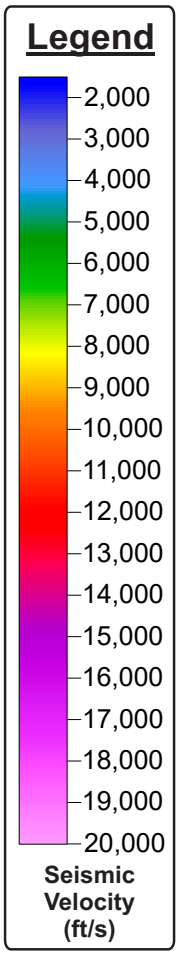
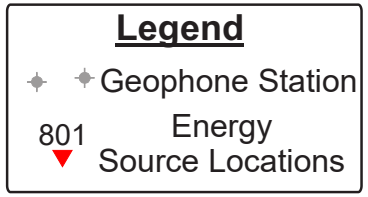


Figure 10

Scale:
Horizontal: 1” = 40’
Vertical: 1” = 20’



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Seismic Velocity Section • RS Line 9

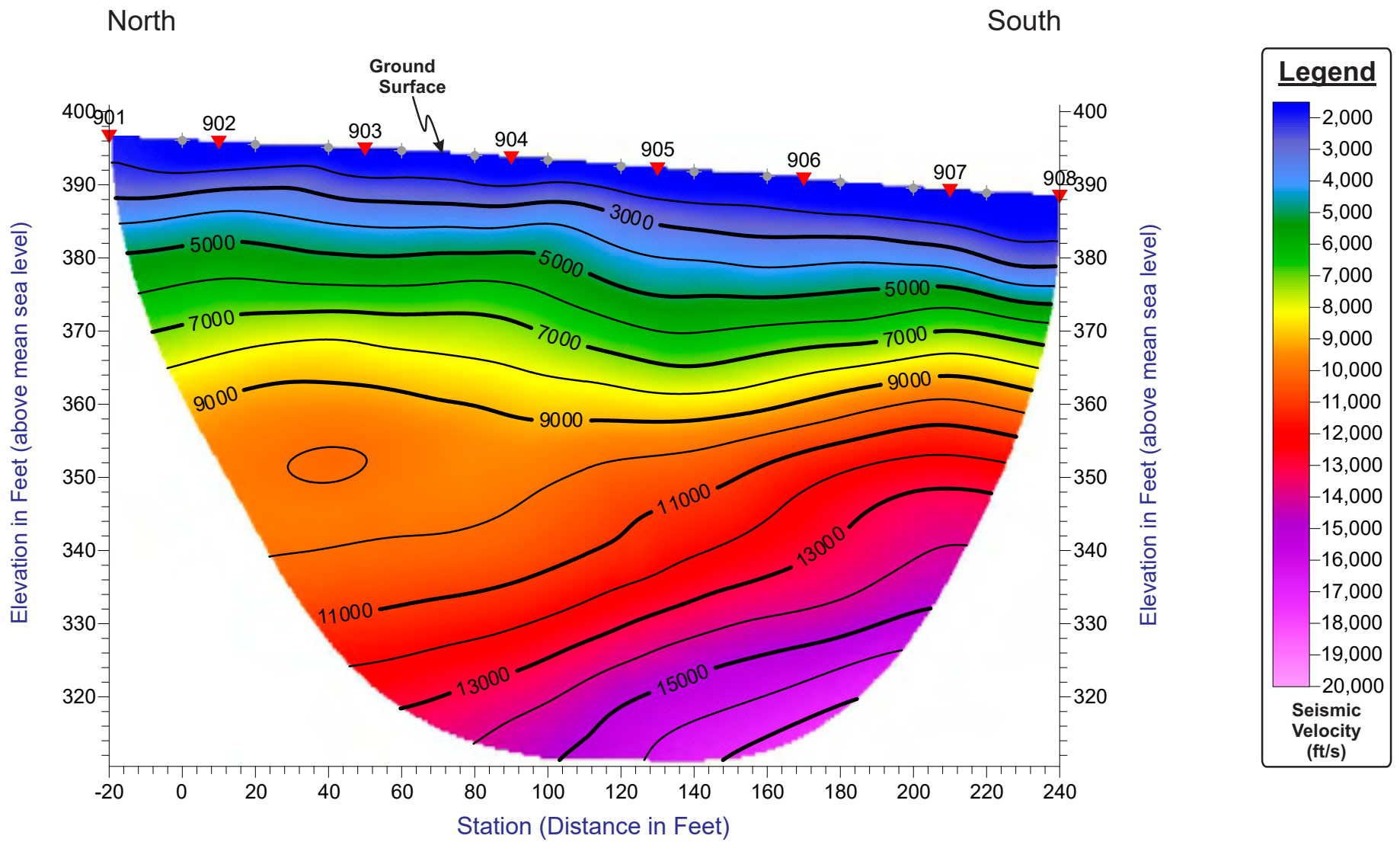

Figure 11

Scale:
Horizontal: 1" = 40'
Vertical: 1" = 20'

Legend

Geophone Station

901 Energy Source Locations

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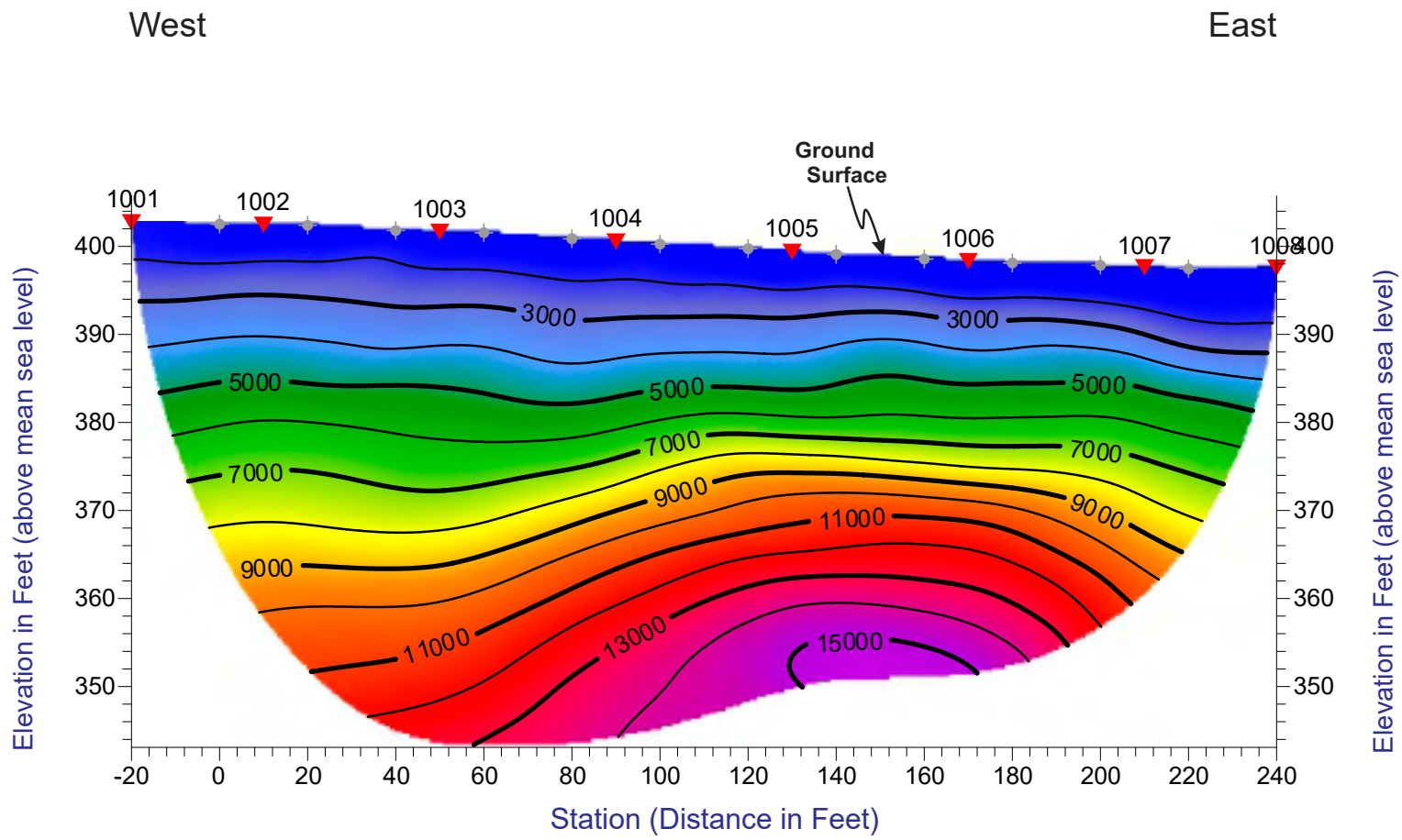
Seismic Velocity Section • RS Line 10



Legend

2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
14,000
15,000
16,000
17,000
18,000
19,000
20,000

Seismic Velocity (ft/s)

Figure 12

Scale:
Horizontal: 1” = 40’
Vertical: 1” = 20’

Legend

Geophone Station

1001 Energy Source Locations

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Seismic Velocity Section • RS Line 11

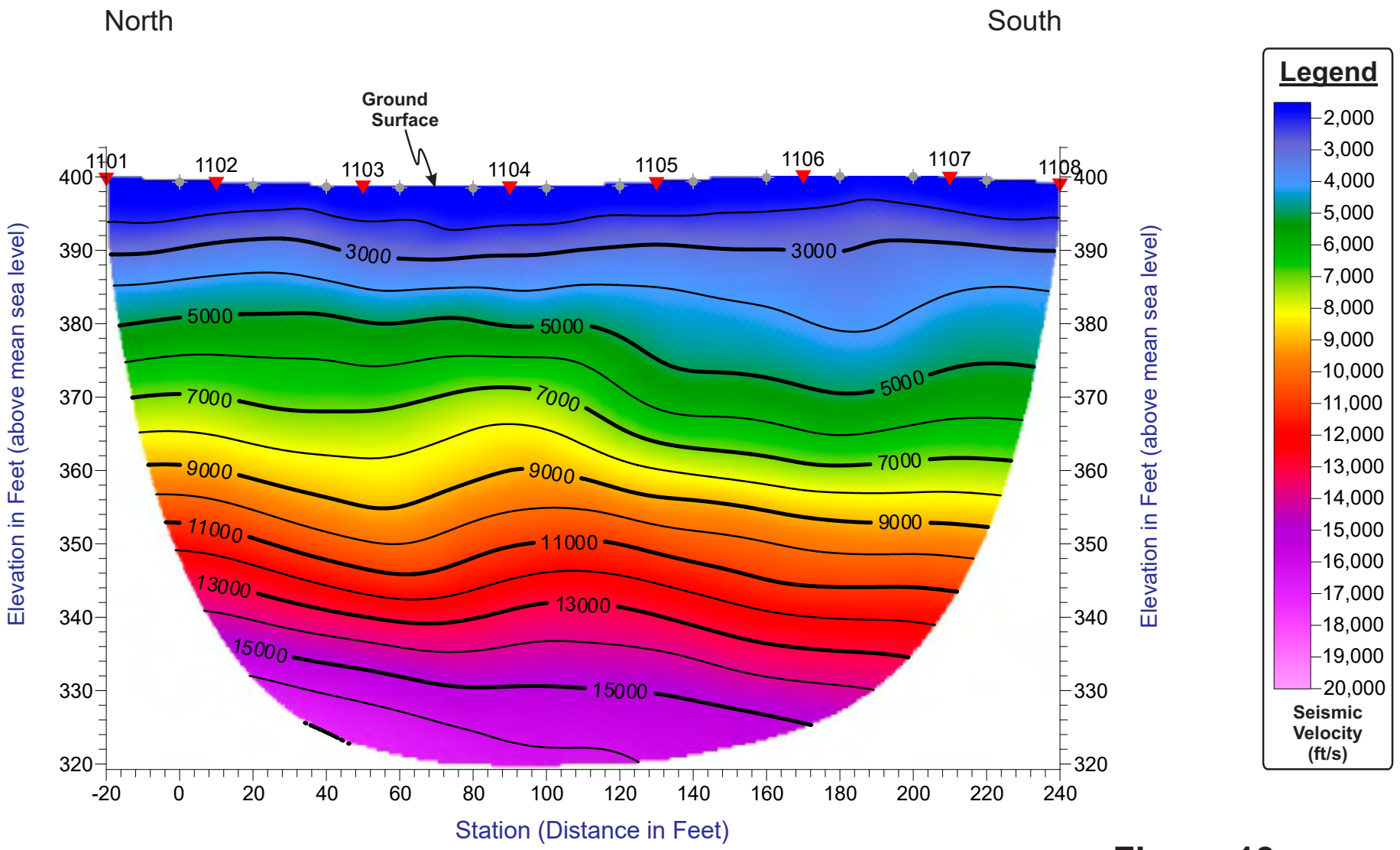

Figure 13

Scale:
Horizontal: 1" = 40'
Vertical: 1" = 20'

Legend

Geophone Station

1101 Energy Source Locations

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Caterpillar D10T2 Ripper Performance Chart*

D10T2

Multi or Single Shank No. 10 Ripper
Estimated by Seismic Wave Velocities

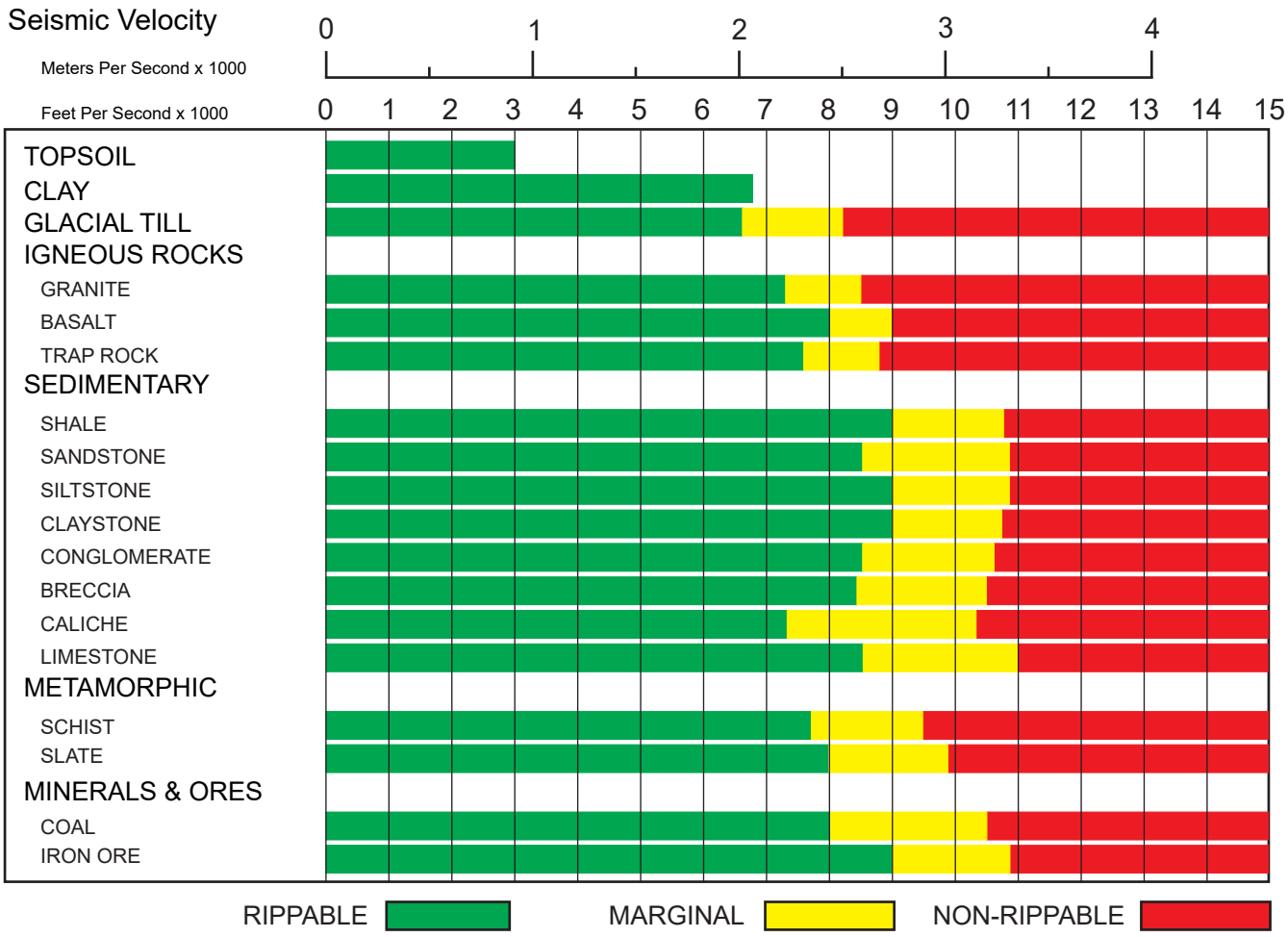

Figure 14

* Based on the Caterpillar Performance Handbook Edition 49 - September, 2019

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