



Project No. 07516-42-02  
February 9, 2022

Tri Pointe Homes  
13400 Sabre Springs Parkway, Suite 200  
San Diego, California 92128

Attention: Ms. April Tornillo

Subject: ADDENDUM GEOTECHNICAL REPORT AND  
RESPONSE TO CITY OF SAN DIEGO REVIEW COMMENTS  
NAKANO  
SAN DIEGO, CALIFORNIA

- References:
1. *City of San Diego Geology Review Comments* prepared by Patrick Thomas dated November 17, 2021.
  2. *Update Geotechnical Investigation, Nakano Property, Chula Vista, California* prepared by Geocon Incorporated dated September 18, 2020 (Project No. 07516-42-02).
  3. *Nakano – Site Plan, City of Chula Vista, California*, prepared by Civil Sense, Inc., dated February 3, 2022.

Dear Ms. Tornillo:

We prepared this addendum to provide an updated geologic map and to respond to review comments from the City of San Diego, LDR-Geology department (Reference 1). The updated geologic map and the log from a recent boring and test pit are appended. The review comments and our responses are presented below.

**Issue 3:** *Submit an addendum geotechnical report that specifically addresses the following:*

**Response:** The recommendations presented in our Update Geotechnical Investigation (Reference 2) remain applicable. This response serves as the requested addendum report.

**Issue 4:** *Clarify if the southeastern corner of the subject property is underlain by a landslide (geologic hazard zone 22) with a rupture surface deeper than the extent explored in the test pits.*

**Response:** The southeast corner of the property is not underlain by a landslide. A second large diameter boring (LD-2) was drilled to a depth of 70 feet at the east end of the proposed cut slope (Figure 1 and appended boring log). The boring bottom elevation is approximately 16 feet below proposed pad grade at toe of slope. Observations made during downhole logging show similar geologic conditions to those observed in LD-1, i.e., a massive to poorly bedded very fine-grained silty sandstone dipping approximately 14 degrees due west. There are no slide planes, bedding plane shears, or other geologic features indicative of landsliding present in LD-1 or LD-2.

Additionally, we excavated an additional test pit (TP-24) downslope of TP-2 to confirm the geologic conditions present in the smaller cut slope at the southeast corner of the project. The geologic unit and structure observed in TP-24 are consistent with the conditions observed in LD-1 and LD-2. Boring and test pit logs for LD-2 and TP-24 are included with this report.

**Issue 5:** *Per the State's Guidelines for Evaluating Seismic Hazards in California (2008), the commonly accepted factor of safety for slopes is >1.1 for dynamic loads. The projects' geotechnical consultant should demonstrate that the site will comply with this standard following project completion.*

**Response:** We performed a seismic slope stability analysis for cross sections C-C' and D-D' in accordance with *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California*, prepared by the Southern California Earthquake Center (SCEC), dated June 2002.

The seismic slope stability analysis was performed using an unweighted acceleration of 0.16g, corresponding to a 10 percent probability of exceedance in 50 years. In addition, a deaggregation analysis was performed on the 0.16g value for the site. A modal magnitude and modal distance of 6.1 and 11.1 kilometers, respectively, were used for the analysis.

Using the parameters discussed herein, an equivalent site acceleration,  $k_{EQ}$ , of approximately 0.1g was calculated (see Figure 4). Using this  $k_{EQ}$ , we get a factor of safety of 1.86 for Section C-C' (see Figure 5) and 2.2 for Section D-D' (see Figure 6). A slope is considered acceptable by the screening analysis if the calculated factor of safety is greater than 1.0 using  $k_{EQ}$ ; therefore, the slopes pass the screening analysis for seismic slope stability.

**Issue 6:** *Provide the Slope stability calculations.*

**Response:** Results of our stability analyses are appended.

**Issue 7:** *Clarify if the site will have a factor of safety of 1.5 or greater with respect to surficial slope stability following completion of the project based on utilizing a depth of saturation of 5 feet. Per the City's "Guidelines for Geotechnical Reports," if the depth of saturation is used in the analysis is less than 5 feet, the shallower depth must be justified.*

**Response:** For cut slopes in Tertiary age formational units, a saturation depth of 5 feet is unreasonable due to the impermeable nature of cemented geologic units. Therefore, the calculation presented in the referenced report which uses a saturation depth of 4 feet remains applicable. However, we have performed additional surficial slope stability analyses for fill slopes using a saturation depth of 5 feet (see Figure 7).

**Issue 8:** *Based on the slope stability analyses, the geotechnical consultant must provide a professional opinion whether or not slopes within and adjacent to the proposed development will have a factor of safety of 1.5 or greater with respect to gross and surficial stability following completion of the project.*

**Response:** Based on the results of our stability analyses, included herein, the slopes in and adjacent to the proposed project have a factor of safety of 1.5 or greater for gross and surficial stability following completion of the project, provided the grading recommendations in Reference 2 are followed.

**Issue 9:** *The referenced plans indicate a cut slope at a gradient of 1.8 horizontal feet to 1 vertical foot. Revise the gradient to 2 horizontal feet to 1 vertical foot per the City of San Diego Municipal Code Section 142.0133.*

**Response:** The Project Civil Engineer will adjust slope gradients to meet City of San Diego requirements.

If there are any questions regarding this correspondence, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED



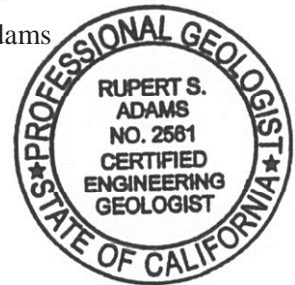
Rodney C. Mikesell  
GE 2533

RCM:RSA:arm

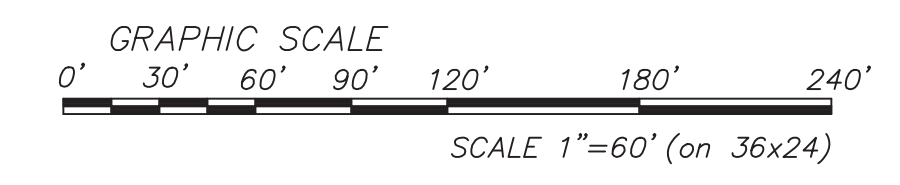
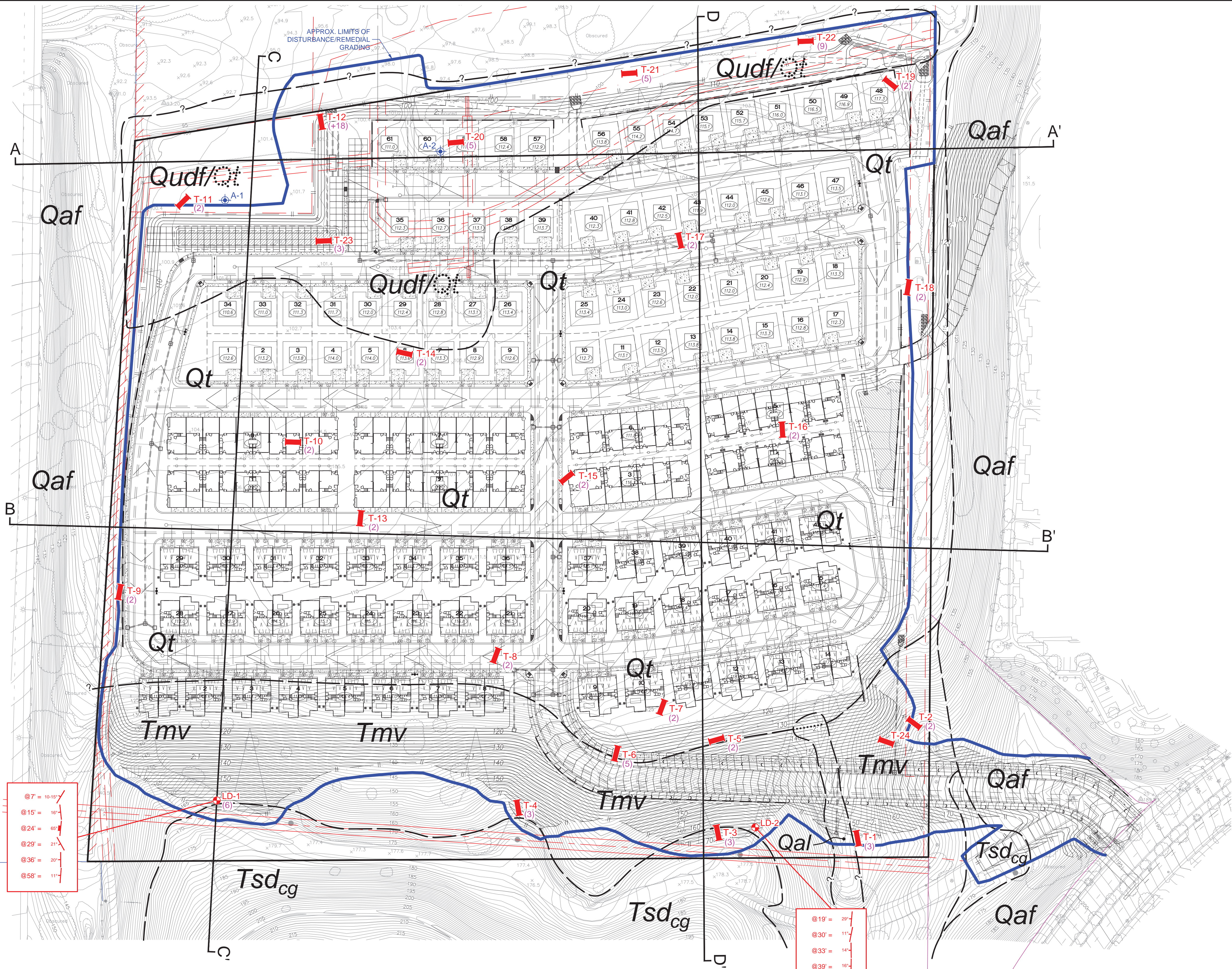
(e-mail) Addressee  
(e-mail) Civil Sense, Inc.  
Attention: Mr. Inh Ling



Rupert S. Adams  
CEG 2561







**GEOCON LEGEND**

- Qudf ..... UNDOCUMENTED FILL
- Qaf ..... ARTIFICIAL FILL
- Qal ..... ALLUVIUM
- Qt ..... TERRACE DEPOSITS  
(Dotted Where Buried)
- Tsd<sub>cg</sub> ..... SAN DIEGO FORMATION (Conglomerate)
- Tmv ..... MISSION VALLEY FORMATION
- ~ ..... APPROX. LOCATION OF GEOLOGIC CONTACT  
(Queried Where Uncertain)
- LD-2 ..... APPROX. LOCATION OF BORING
- T-24 ..... APPROX. LOCATION OF TRENCH
- A-2 ..... APPROX. LOCATION OF INFILTRATION TEST
- (5) ..... APPROX. DEPTH OF REMEDIAL GRADING (in Feet, MSL)
- ..... APPROX. LOCATION OF GEOLOGIC CROSS SECTION

- @ 7' = 10:15"
- @ 15' = 16"
- @ 24' = 65"
- @ 29' = 21"
- @ 36' = 20"
- @ 58' = 11"

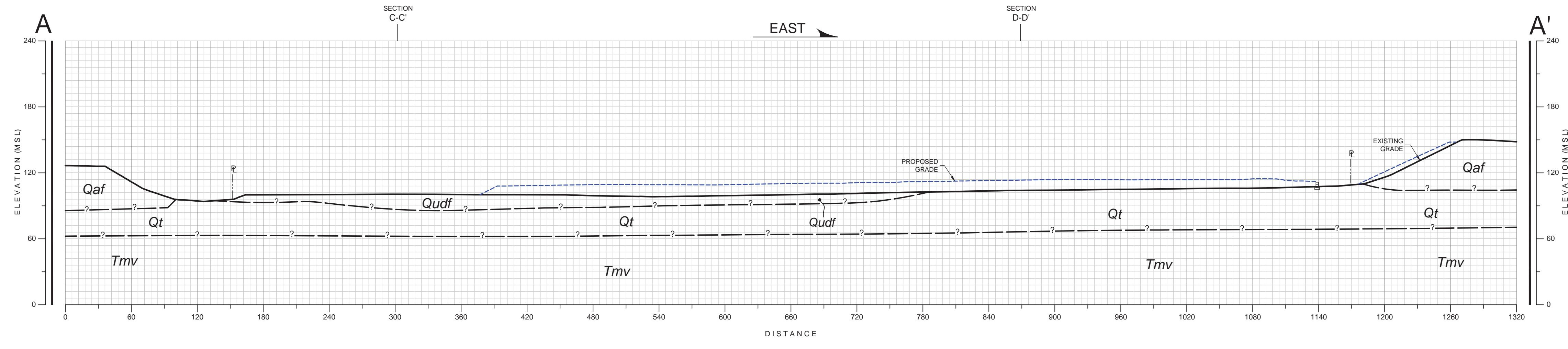
- @ 19' = 29"
- @ 30' = 11"
- @ 33' = 14"
- @ 39' = 16"
- @ 59' = 0-14"
- @ 61' = 10"
- @ 65' = 13"

**GEOLOGIC MAP**  
NAKANO  
CHULA VISTA, CALIFORNIA

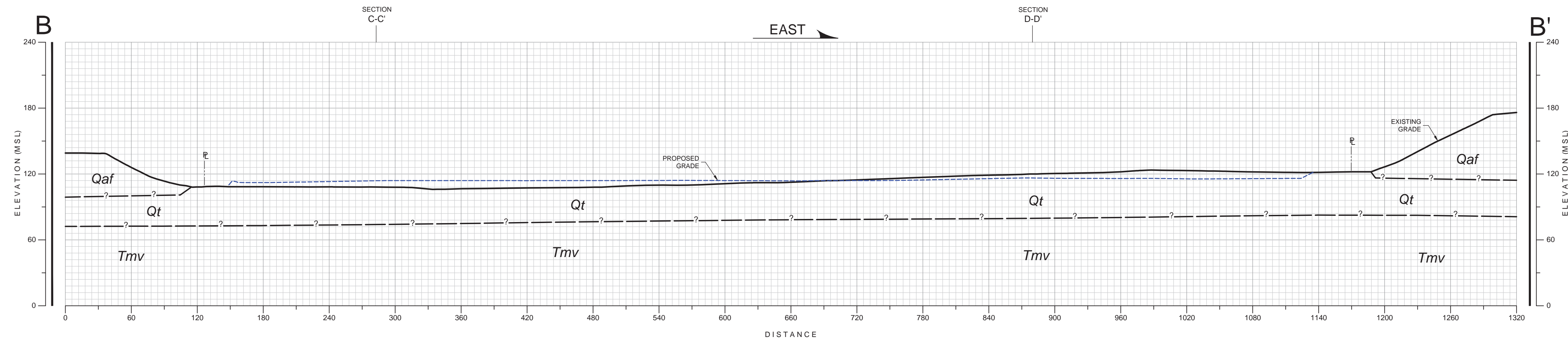
<b>GEOCON</b> INCORPORATED <small>GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS</small> <small>6940 ANDERS DRIVE ■ SAN DIEGO, CALIFORNIA 92121-2974</small> <small>PHONE 858.558.4900 ■ FAX 858.558.4159</small>	SCALE 1" = 60'	DATE 02 - 09 - 2022
	PROJECT NO. 07516 - 42 - 02	FIGURE 1
	SHEET 1 OF 1	

Printed 02/09/2022 7:48AM | By: ALVIN LADRILOVIC | File Location: W:\1\_GEO\TRENCH\075007516-42-02\2022-02-09\7516-42-02\_Geo\_Map\_30.dwg





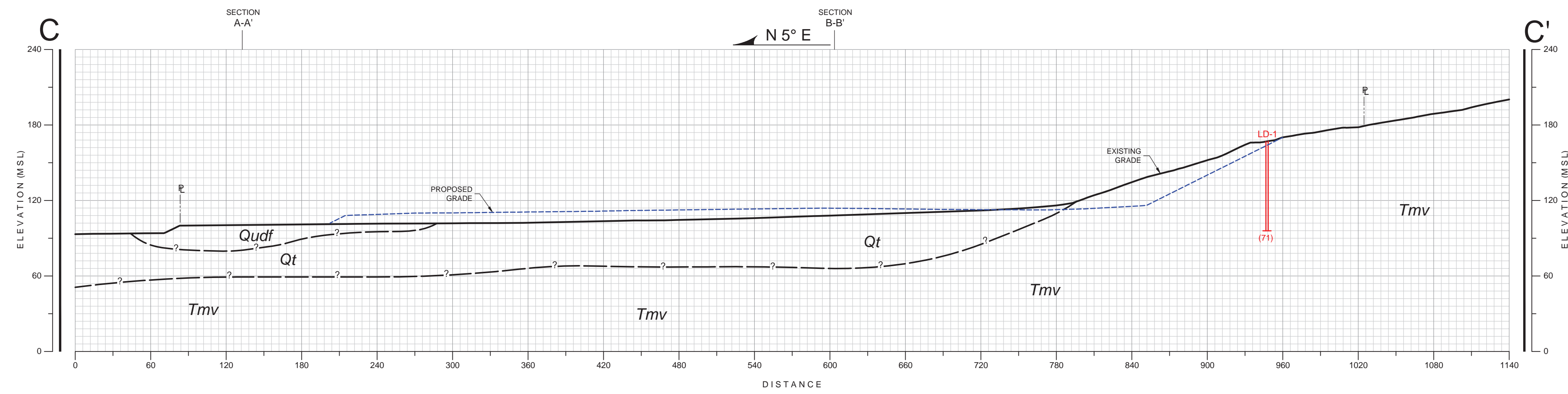
**GEOLOGIC CROSS-SECTION A-A'**  
SCALE: 1" = 60' (Vert. = Horiz.)



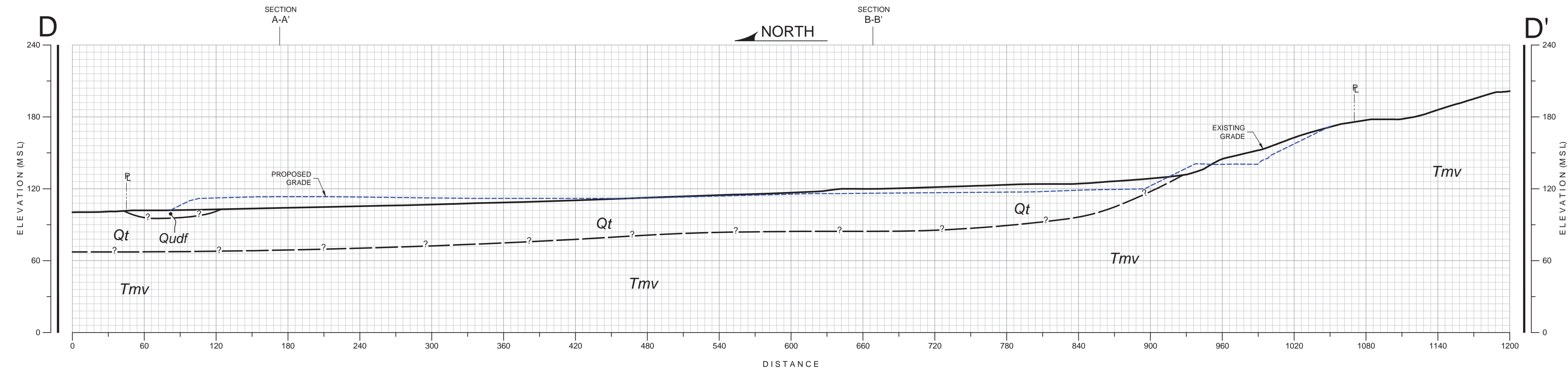
**GEOLOGIC CROSS-SECTION B-B'**  
SCALE: 1" = 60' (Vert. = Horiz.)

- GEOCON LEGEND**
- Qudf* ..... UNDOCUMENTED FILL
  - Qaf* ..... ARTIFICIAL FILL
  - Qt* ..... TERRACE DEPOSITS
  - Tmv* ..... MISSION VALLEY FORMATION
  - ~?~ ..... APPROX. LOCATION OF GEOLOGIC CONTACT  
(Queried Where Uncertain)

<b>GEOLOGIC CROSS SECTION</b>			
NAKANO CHULA VISTA, CALIFORNIA			
<b>GEOCON</b> INCORPORATED GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS 6940 SANDERS DRIVE ■ SAN DIEGO, CALIFORNIA 92121-2974 PHONE 858.558.4900 ■ FAX 858.558.4159	SCALE	DATE	FIGURE
	1" = 60'	02 - 09 - 2022	2
	PROJECT NO.	07516 - 42 - 02	SHEET



**GEOLOGIC CROSS-SECTION C-C'**  
SCALE: 1" = 60' (Vert. = Horiz.)



**GEOLOGIC CROSS-SECTION D-D'**  
SCALE: 1" = 60' (Vert. = Horiz.)

- GEOCON LEGEND**
- Qudf*.....UNDOCUMENTED FILL
  - Qaf*.....ARTIFICIAL FILL
  - Qt*.....TERRACE DEPOSITS
  - Tmv*.....MISSION VALLEY FORMATION
  - .....APPROX. LOCATION OF GEOLOGIC CONTACT  
(Queried Where Uncertain)

<b>GEOLOGIC CROSS SECTION</b>			
NAKANO CHULA VISTA, CALIFORNIA			
 <small>GEOCON INCORPORATED          GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS          6940 RANDERS DRIVE ■ SAN DIEGO, CALIFORNIA 92121-2974          PHONE 858.558.4900 ■ FAX 858.558.4159</small>	SCALE 1" = 60'	DATE 02 - 09 - 2022	 <b>3</b>
	PROJECT NO. 07516 - 42 - 02	FIGURE	

Printed: 02/09/2022 4:48PM | By ALVIN LADRILLON | File Location: Y:\PROJECTS\07516-42-02 (Nakano)\SHEETS\07516-42-02-Section 30.dwg



## Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Nakano  
 Project Number 07516-42-02  
 Date 02/08/22  
 Filename Case 1\_Proposed Slope\_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), $MHA_r$ , g	0.16	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, $k_v/g$	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, $V_s$ (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft <sup>2</sup> (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$ , sec	6.670	
Coefficient, $C_1$	0.5190	
Coefficient, $C_2$	0.0837	
Coefficient, $C_3$	0.0019	
Standard Error, $\epsilon_T$	0.437	
Mean Square Period, $T_m$ , sec	0.550	

### Initial Screening with $MHEA = MHA = k_{max}g$

$k_v/MHA$	NA
$f_{EO}(u=5cm) = (NRF/3.477) * (1.87 * \log(u / ((MHA_r/g) * NRF * D_{5-95})))$	0.4730
$k_{EO} = feq(MHA_r)/g$	0.076
Factor of Safety in Slope Analysis Using $k_{EO}$	2.20

**Passes Initial Screening Analysis**

### Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$ , sec	NA
$T_s/T_m$	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 * \exp(-2.25 * MHA_r/g)$	1.26
MHEA/g	NA
$k_v/MHEA = k_v/k_{max}$	NA
Normalized Displacement, Normu	NA
<b>Estimated Displacement, u (cm)</b>	<b>NA</b>

FIGURE 4

Nakano  
 Project No. 07516-42-02  
 Name: C-C'\_Proposed - Seismic.gsz  
 Date: 02/08/2022 Time: 07:07:54 PM  
 Horz Seismic Coef.: 0.1

Material Properties:

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
Yellow	Qcf	125	300	27
Orange	Qt	125	300	27
Green	Tmv	130	675	30

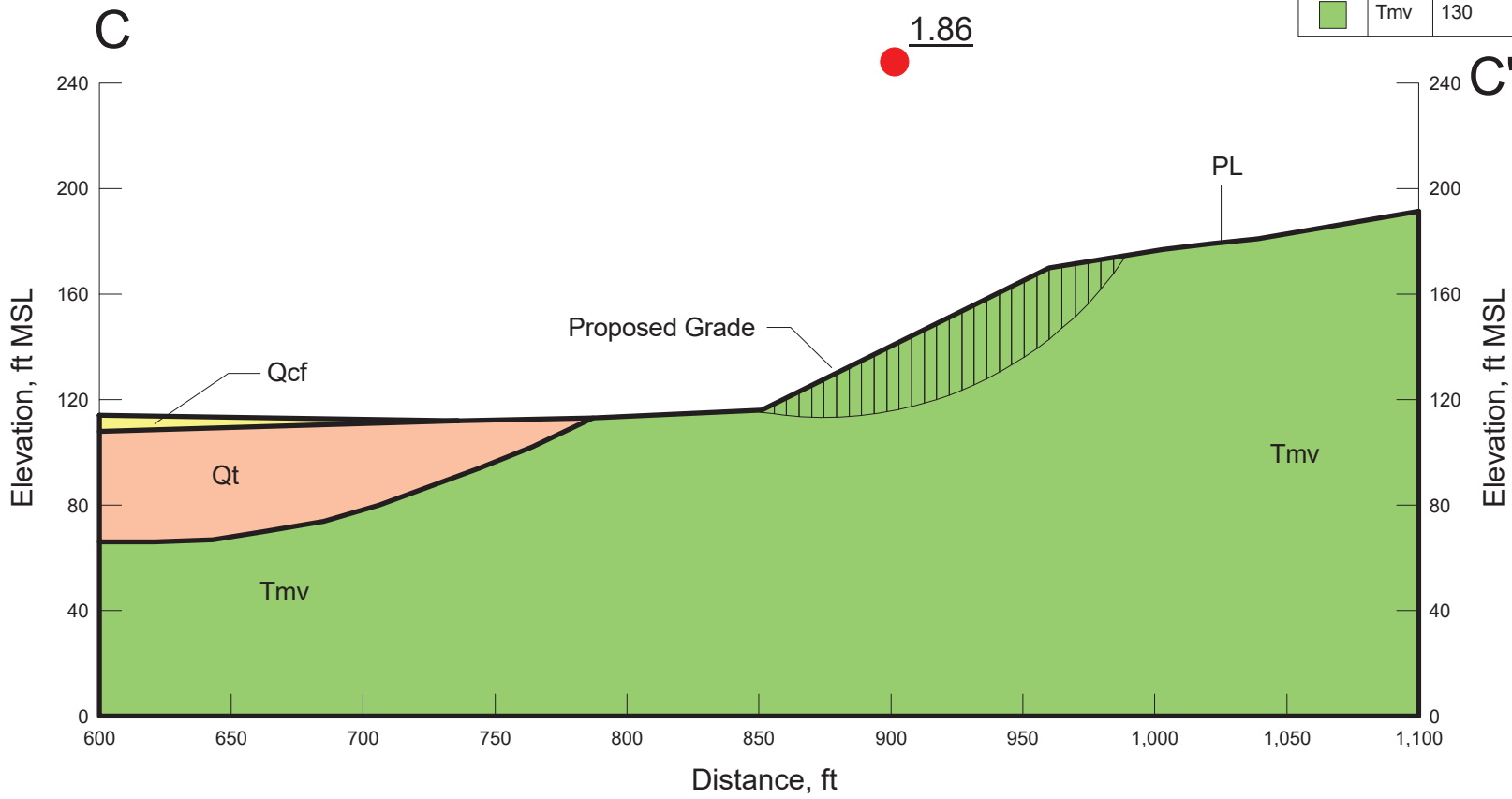


Figure 5



Nakano  
 Project No. 07516-42-02  
 Name: D-D'Proposed Slope\_Seismic.gsz  
 Date: 02/08/2022 Time: 07:02:01 PM  
 Horz Seismic Coef.: 0.1

Material Properties:

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
Yellow	Qcf	125	300	27
Orange	Qt	125	300	27
Green	Tmv	130	675	30

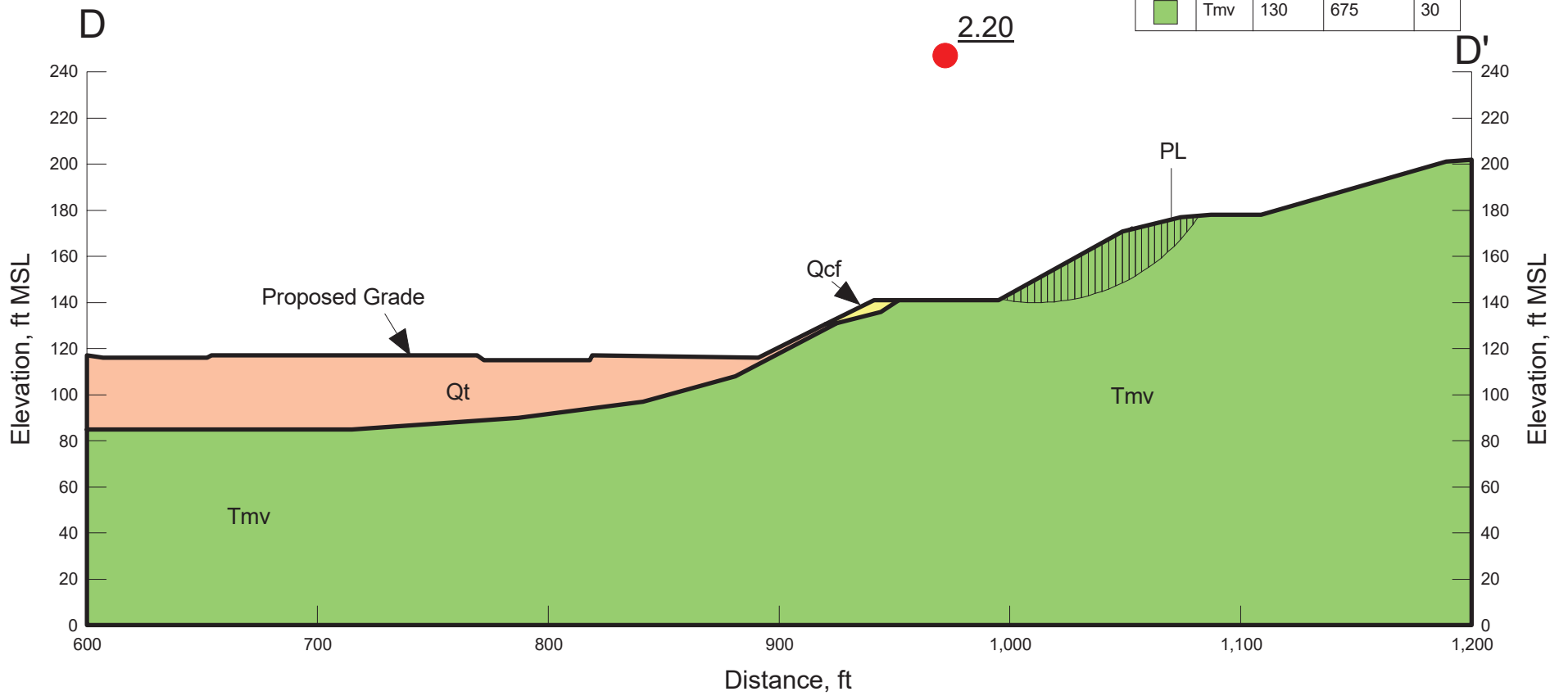


Figure 6

**Surficial Slope Stability Evaluation - Fill Slopes**

Slope Height, H (feet)	$\infty$
Vertical Depth of Stauration, Z (feet)	5
Slope Inclination	2.00 :1
Slope Inclination, I (degrees)	26.6
Unit Weight of Water, $\gamma_W$ (pcf)	62.4
Total Unit Weight of Soil, $\gamma_T$ (pcf)	125
Friction Angle, $\phi$ (degrees)	27
Cohesion, C (psf)	300
Factor of Safety = $(C+(\gamma_T-\gamma_W)Z \cos^2 i \tan \phi)/(\gamma_T Z \sin i \cos i)$	<u>1.71</u>

*References:* (1) Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62.

(2) Skempton, A. W., and F. A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81.

**GEOCON**  
INCORPORATED



GEOTECHNICAL CONSULTANTS  
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974  
PHONE 858 558-6900 - FAX 858 558-6159

RCM / LR

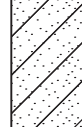
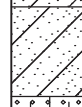











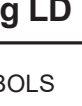
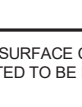
SLOPE STABILITY ANALYSIS

NAKANO  
CHULA VISTA, CALIFORNIA

PROJECT NO. 07516-42-02

FIG. 7



DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LD 2</b>		PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) <u>172'</u>	DATE COMPLETED <u>01-10-2022</u>			
					EQUIPMENT <u>EZ-BORE</u>		BY: <u>R. ADAMS</u>		
MATERIAL DESCRIPTION									
0				CL	<b>UNDOCUMENTED FILL (Qudf)</b> Soft, wet, dark reddish brown, Sandy CLAY; some cobble				
2				CL	<b>TOPSOIL</b> Stiff, damp, brown and reddish brown, Sandy CLAY; trace cobble up to 6-inch diameter; few roots				
4				SM	<b>MISSION VALLEY FORMATION (Tmv)</b> Dense, damp, pale yellowish brown, orangish brown to grayish white, Silty, very fine grained SANDSTONE; friable, micaceous, massive to weakly bedded/laminated				
6	LB2-1								
8									
10									
12									
14									
16	LB2-2						5		
18									
20									
22									
24									
26									
28									
					-At 19 feet: Bedding N5E/29°W (Possible cross-bedding)				
					-At 29 feet: Hard, dry to damp, grayish brown, clay bed, discontinuous, and				

**Figure A-1,**  
**Log of Boring LD 2, Page 1 of 3**

07516-42-02 (2022).GPJ

SAMPLE SYMBOLS		
	... SAMPLING UNSUCCESSFUL	
	... DISTURBED OR BAG SAMPLE	
		
		

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.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LD 2</b>		PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) <u>172'</u>	DATE COMPLETED <u>01-10-2022</u>			
					EQUIPMENT <u>EZ-BORE</u> BY: <u>R. ADAMS</u>				
MATERIAL DESCRIPTION									
30	LB2-3					probable clay drapes along bedding surface (no remoding). Bedding N10E/11°W -At 30 feet: 6-inch thick, medium course x-bedded sand lens	12		
32									
34				SM		Very dense, damp, grayish white, Silty, fine fine grained SANDSTONE; massive, micaceous, trace charcoal flecks. Bedding at contact at 33': N2W/14°W -Between 35 and 39 feet: Heavily bioturbated			
36									
38									
40	LB2-4					-At 39 feet: Bedding along oxidized bilobated surface N-S/16°W			
42									
44									
46	LB2-5						12		
48									
50									
52						-At 51 feet: Becomes pale yellowish brown to grayish brown, very weakly bedded			
54									
56									
58						-At 59 feet: Bedding N-S/0-14°/Undulatory			






**Figure A-1,**  
**Log of Boring LD 2, Page 2 of 3**

07516-42-02 (2022).GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL		... 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.





DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>BORING LD 2</b>		PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) <u>172'</u>	DATE COMPLETED <u>01-10-2022</u>			
					EQUIPMENT <u>EZ-BORE</u> BY: <u>R. ADAMS</u>				
MATERIAL DESCRIPTION									
60	LB2-6						30/8"		
62						-At 61 feet: Bedding N25E/10°W Dense, damp to moist, yellowish brown, Clayey, fine to medium SANDSTONE; some gravel and cobble, subrounded up to 5-inch diameter, no imbrication			
64						Dense, damp, pale yellowish brown to grayish brown, Silty, fine SANDSTONE; highly micaceous, moderately laminated/bedded. Bedding N5E/13°W			
66									
68						Logged to 68 feet; slough below 68 feet			
70						BORING TERMINATED AT 70 FEET Groundwater not encountered Backfilled with soil and bentonite chips			

**Figure A-1,**  
**Log of Boring LD 2, Page 3 of 3**

07516-42-02 (2022).GPJ





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.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	<b>TRENCH T 24</b>		PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) <u>145'</u>	DATE COMPLETED <u>01-10-2022</u>			
					EQUIPMENT <u>Backhoe (CAT 430F)</u>		BY: <u>R. ADAMS</u>		
MATERIAL DESCRIPTION									
0				CL	<b>TOPSOIL</b> Soft, moist to wet, brown, Sandy CLAY; some cobble				
2				SM	<b>MISSION VALLEY FORMATION (Tmv)</b> Dense, damp, orange brown brown to yellowish brown, Silty, fine grained SANDSTONE; micaceous, weathered, abundant rootlets, massive				
4					TRENCH TERMINATED AT 5 FEET Groundwater not encountered Backfilled on 01/10/2022				

**Figure A-2,**  
**Log of Trench T 24, Page 1 of 1**

07516-42-02 (2022).GPJ

<b>SAMPLE SYMBOLS</b>	 ... 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.