

UPDATE GEOTECHNICAL REPORT

DEL MAR HIGHLANDS ESTATES AFFORDABLE HOUSING SAN DIEGO, CALIFORNIA



GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

**PARDEE HOMES
SAN DIEGO, CALIFORNIA**

**JANUARY 24, 2020
PROJECT NO. 05439-42-95**



Project No. 05439-42-95
January 24, 2020

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

Attention: Mr. Jimmy Ayala

Subject: UPDATE GEOTECHNICAL REPORT
DEL MAR HIGHLANDS ESTATES
AFFORDABLE HOUSING
SAN DIEGO, CALIFORNIA

- References:
1. *Update Geotechnical Investigation, Del Mar Highlands Estates, Affordable Housing, San Diego, California*, prepared by Geocon Incorporated, dated June 24, 2016 (Project No. 05439-42-95);
 2. *Grading Plan, Del Mar Highlands Estates, Affordable Site PDP/SDP, For Amendment To PRD/PRP*, prepared by Civil Sense, Inc., dated December 20, 2019

Dear Mr. Ayala:

In accordance with your request, we have prepared this update to the referenced geotechnical investigation to update our geologic map and cross sections using the referenced grading plans as a base map and to provide seismic design criteria based on the 2019 California Building Code (CBC). The updated geologic map and geologic cross sections are provided on Figures 1 and 2. The geotechnical recommendations presented in Reference 1 remain applicable to the project.

SEISMIC DESIGN PARAMETERS

Table 1 summarizes site-specific design criteria obtained from the 2019 California Building Code (CBC; Based on the 2018 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. We used the computer program *Seismic Design Maps*, provided by the Structural Engineers Association (SEA) to calculate the seismic design parameters. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2019 CBC and Table 20.3-1 of ASCE 7-16. Based on as-graded information, Building 1 should be considered Site Class C and Buildings 2 through 5 Site Class D. The values presented herein are for the risk-targeted maximum considered earthquake (MCE_R). Sites designated as Site Class D, E and F may require additional analyses if requested by the project structural engineer and client.

TABLE 1
2019 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value		2019 CBC Reference
Site Class	D	C	Section 1613.2.2
MCE _R Ground Motion Spectral Response Acceleration – Class B (short), S _S	1.068g	1.068g	Figure 1613.2.1(1)
MCE _R Ground Motion Spectral Response Acceleration – Class B (1 sec), S ₁	0.382g	0.382g	Figure 1613.2.1(2)
Site Coefficient, F _A	1.073	1.2	Table 1613.2.3(1)
Site Coefficient, F _V	1.918	1.5	Table 1613.2.3(2)
Site Class Modified MCE _R Spectral Response Acceleration (short), S _{MS}	1.146g	1.282g	Section 1613.2.3 (Eqn 16-36)
Site Class Modified MCE _R Spectral Response Acceleration – (1 sec), S _{M1}	0.733g	0.574g	Section 1613.2.3 (Eqn 16-37)
5% Damped Design Spectral Response Acceleration (short), S _{DS}	0.764g	0.855g	Section 1613.2.4 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (1 sec), S _{D1}	0.489g	0.382g	Section 1613.2.4 (Eqn 16-39)

* Using the code-based values presented in this table, in lieu of a performing a ground motion hazard analysis, requires the exceptions outlined in ASCE 7-16 Section 11.4.8 be followed by the project structural engineer. Per Section 11.4.8 of ASCE/SEI 7-16, a ground motion hazard analysis should be performed for projects for Site Class “E” sites with S_s greater than or equal to 1.0g and for Site Class “D” and “E” sites with S₁ greater than 0.2g. Section 11.4.8 also provides exceptions which indicates that the ground motion hazard analysis may be waived provided the exceptions are followed.

Table 2 presents the mapped maximum considered geometric mean (MCE_G) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-16.

TABLE 2
2019 CBC SITE ACCELERATION DESIGN PARAMETERS

Parameter	Value		ASCE 7-10 Reference
Site Class	D	C	Section 1613.2.2 (2019 CBC)
Mapped MCE _G Peak Ground Acceleration, PGA	0.474g	0.474g	Figure 22-7
Site Coefficient, F _{PGA}	1.126	1.2	Table 11.8-1
Site Class Modified MCE _G Peak Ground Acceleration, PGA _M	0.534g	0.569g	Section 11.8.3 (Eqn 11.8-1)

Conformance to the criteria in Tables 1 and 2 for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large

earthquake occurs. The primary goal of seismic design is to protect life and not to avoid all damage, since such design may be economically prohibitive.

The project structural engineer and architect should evaluate the appropriate Risk Category and Seismic Design Category for the planned structures. The values presented herein assume a Risk Category II and resulting in a Seismic Design Category D. Table 3 presents a summary of the risk categories.

TABLE 3
ASCE 7-16 RISK CATEGORIES

Risk Category	Building Use	Examples
I	Low risk to Human Life at Failure	Barn, Storage Shelter
II	Nominal Risk to Human Life at Failure (Buildings Not Designated as I, III or IV)	Residential, Commercial and Industrial Buildings
III	Substantial Risk to Human Life at Failure	Theaters, Lecture Halls, Dining Halls, Schools, Prisons, Small Healthcare Facilities, Infrastructure Plants, Storage for Explosives/Toxins
IV	Essential Facilities	Hazardous Material Facilities, Hospitals, Fire and Rescue, Emergency Shelters, Police Stations, Power Stations, Aviation Control Facilities, National Defense, Water Storage

Should you have any questions regarding this update report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

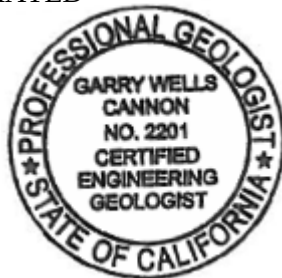
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Garry W. Cannon
CEG 2201
RCE 56468

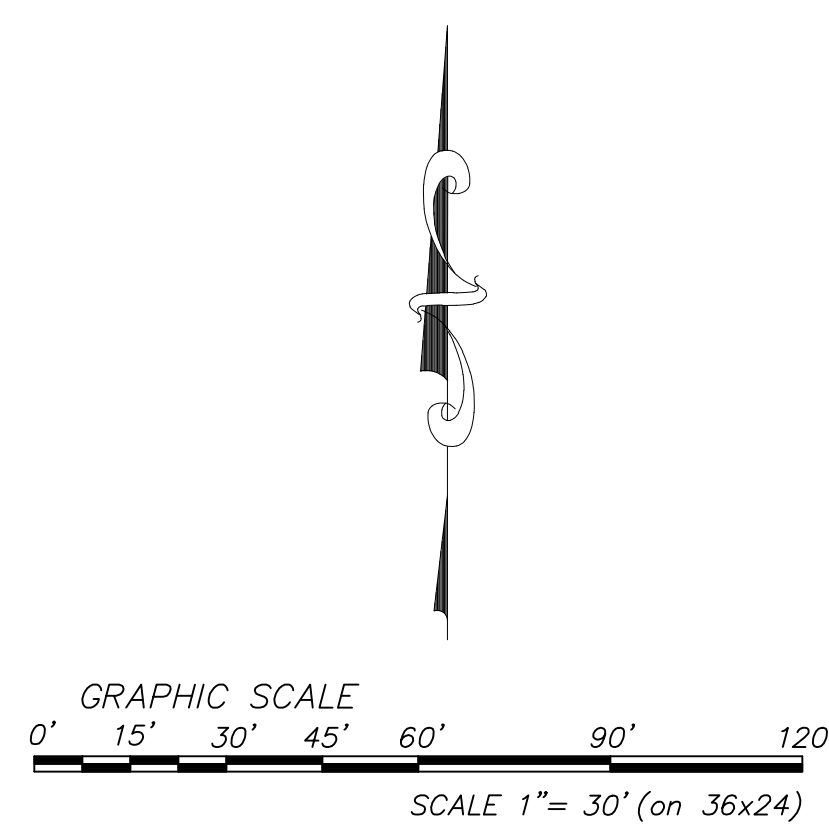
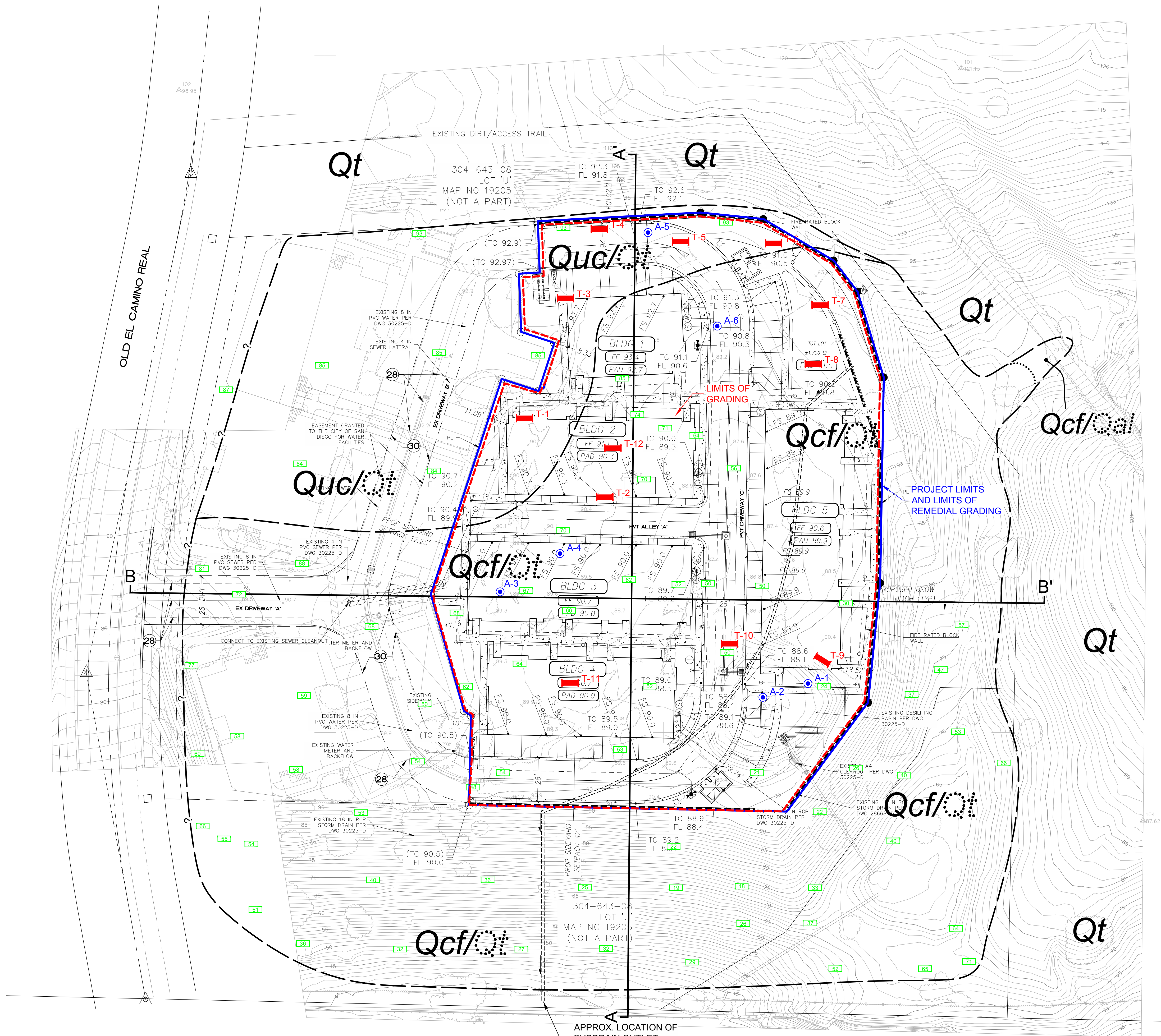
GWC:RCM:arm

(e-mail) Addressee



Rodney C. Mikesell
GE 2533

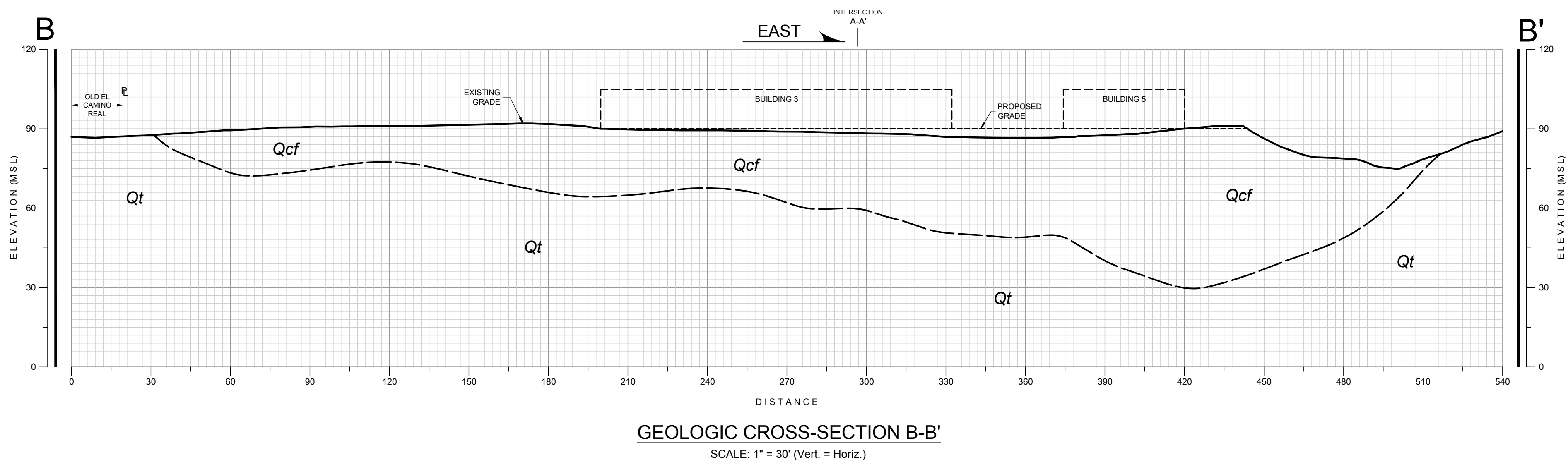
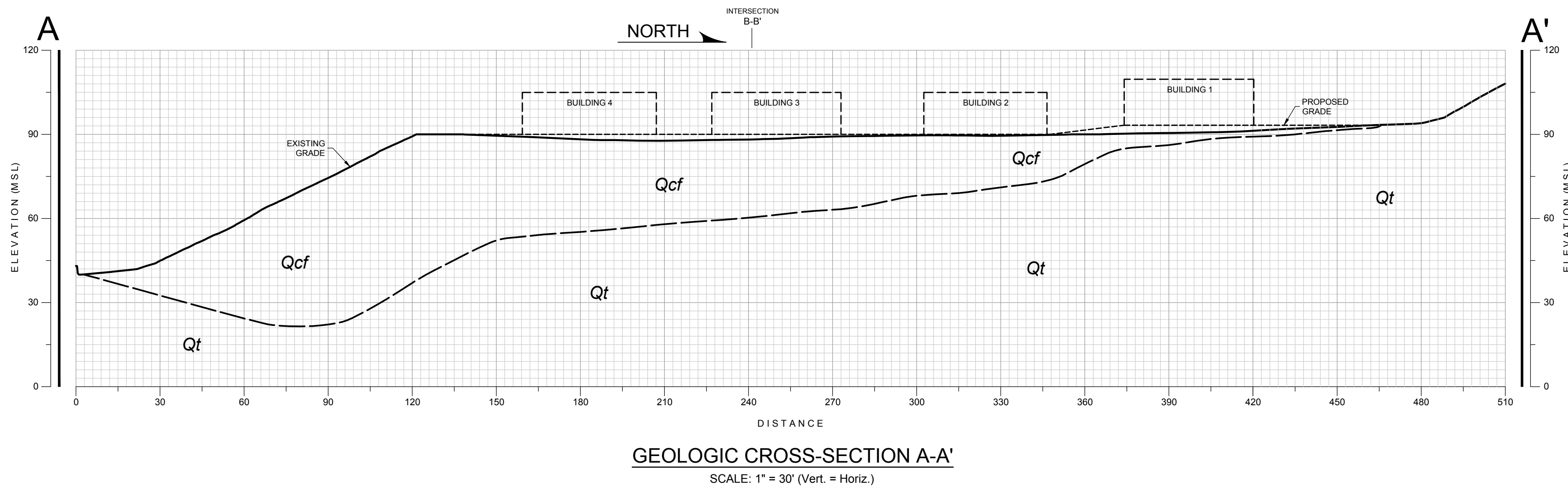




- GEOCON LEGEND**
- Qcf*.....COMPACTED FILL
 - Quc*.....COMPACTED FILL IN UNDERCUT AREA
 - Qal*.....ALLUVIUM (Dotted Where Buried)
 - Qt*.....TERRACE DEPOSITS (Dotted Where Buried)
 -APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)
 - A-6.....APPROX. LOCATION OF INFILTRATION TEST
 - T-12.....APPROX. LOCATION OF EXPLORATORY TRENCH
 -APPROX. LOCATION OF EXISTING SUBDRAIN
 - [53].....APPROX. ELEVATION AT BASE OF FILL

GEOLOGIC MAP
DEL MAR HIGHLANDS ESTATES
AFFORDABLE HOUSING
SAN DIEGO, CALIFORNIA

GEOCON INCORPORATED GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS 6960 FLANDERS DRIVE, SAN DIEGO, CALIFORNIA 92121 - 2974 PHONE 858 558-6900 - FAX 858 558-6159  <tr><td colspan="2">SCALE 1" = 30'</td><td>DATE 01 - 24 - 2020</td></tr> <tr><td colspan="2">PROJECT NO. 05439 - 42 - 95</td><td>FIGURE 1</td></tr> <tr><td colspan="2">SHEET 1 OF 1</td><td></td></tr>	SCALE 1" = 30'		DATE 01 - 24 - 2020	PROJECT NO. 05439 - 42 - 95		FIGURE 1	SHEET 1 OF 1		
	SCALE 1" = 30'		DATE 01 - 24 - 2020						
	PROJECT NO. 05439 - 42 - 95		FIGURE 1						
	SHEET 1 OF 1								



GEOCON LEGEND

Qcf.....COMPACTED FILL

Qt.....TERRACE DEPOSITS

~.....APPROX. LOCATION OF GEOLOGIC CONTACT

GEOLOGIC CROSS SECTION

DEL MAR HIGHLANDS ESTATES
AFFORDABLE HOUSING
SAN DIEGO, CALIFORNIA

GEOCON L I N C O R P O R A T E D G E O T E C H N I C A L ■ E N V I R O N M E N T A L ■ M A T E R I A L S 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974 PHONE 858.558-6900 - FAX 858.558-6159	SCALE 1" = 30'	DATE 01 - 24 - 2020	FIGURE 2
	PROJECT NO. 05439 - 42 - 95		
	SHEET 1 OF 1		