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AMBIENT COMMUNITIES
179 Calle Magdalena Suite #201
Encinitas, CA 92024

March 28, 2022
PW 1912-01
Report No. 1912-01-B-6
City of San Diego Project No. 698277

Attention: **Duncan Budinger**
Director of Retail Development

Subject: **Geotechnical Addendum and Response to LDR-Geology Cycle 2 Review Comments, Multifamily Residential Development, 555 Hollister Street, San Diego, California**

References: Appendix A

Gentlemen:

In accordance with your request and authorization, Advanced Geotechnical Solutions, Inc., (AGS) has prepared this response to LDR-Geology Cycle 4 Review comments from the City of San Diego regarding the referenced geotechnical report by AGS (2021a) for the proposed multifamily residential development to be located on 555 Hollister Street in the City of San Diego, California. Specifically, this letter has been prepared in response to LDR-Geology Cycle 2 review comments 2 through 7 dated January 14, 2021. In preparing this response, we have first presented the review comment followed by our response. A copy of the review sheet is attached.

Item 2 ***-City of San Diego-*** *Submit an addendum geotechnical report or update letter that specifically addresses the proposed development for the purposes of environmental review and the following:*

Item 3 ***-City of San Diego-*** *The geotechnical consultant must indicate if the site is suitable for the proposed development as designed or provide recommendations to mitigate the geologic hazards to an acceptable level.*

AGS Response - AGS has updated the attached Plate 1, Geologic Map and Exploration Location Plan showing the exploratory locations, site geology, and geologic cross sections using the current Grading and Drainage plan (Sheet C005) by Pasco Laret Suiter & Associates (PLSA) dated November 10, 2021 as a base map. Based on our review of the current grading plan, the site is suitable for the proposed development as designed. The referenced geotechnical report by AGS (2021a) provided recommendations that should be incorporated into the design and construction of the project and will mitigate the site geologic hazards to an acceptable level.

Item 4 ***-City of San Diego-*** *The project's geotechnical consultant should provide a conclusion regarding if the proposed development will destabilize or result in settlement of adjacent property or the Right-of-Way.*

AGS Response - Based on our review of the grading and drainage plan by PLSA (2021), the proposed development will not destabilize nor result in settlement of adjacent property or areas within the City of San Diego Right-of-Way provided that the recommendations presented in the geotechnical report by AGS (2021a) are incorporated into the design and construction of the project.

***Item 5* -City of San Diego-** *An area of the project site is located in geologic hazard category (GHC) 31 as shown on the City's Seismic Safety Study Geologic Hazard Maps. GHC 31 is characterized by a high potential for liquefaction. The geotechnical consultant must specifically address liquefaction potential of the entire site and potential consequences of soil liquefaction on the proposed development/ project.*

AGS Response – AGS advanced borings B-5, B-6 and B-7 at the toe of the northern descending slope within the zone covered by GHC 31. Young alluvial flood-plain deposits were encountered in this area consisting of silty to clayey fine- to coarse-grained sand with abundant sub-rounded gravel and cobble in a moist to very moist and loose to medium dense condition extending to depths ranging between 6 to 11 feet. Old paralic deposits underlie young alluvium and consist of slightly moist to moist, silty, fine-grained micaceous sand interbedded with coarse-grained gravel and cobble-rich lenses in a medium dense to dense and weakly to moderately cemented condition.

Liquefaction and dry sand settlement analyses were performed using the computer program LiqSVs v.2.2 (Geoligismiki, 2019) and subsurface data from borings B-5 and B-7. The analyses considered an earthquake moment magnitude of 6.9, peak ground acceleration PGA_M of 0.62g, and groundwater level at El. 12.5 feet msl. Our analyses indicate that no liquefaction settlement will occur in boring B-5 and B-7. Dry sand settlement of approximately 0.5 inches during a seismic event was estimated at about 5 foot depth within boring B-5 as shown in Appendix B.

As indicated in Section 6.1.2 - Removals of the referenced geotechnical report by AGS (2021a), the alluvial materials at the toe of the descending slope and the undocumented fill on the slope should be removed and recompacted. After the recommended removal and recompaction, dry sand settlement of the upper layer within boring B-5 will be mitigated to a negligible level. It is our opinion that the remedial grading measures will mitigate any liquefaction potential onsite and the potential consequences of soil liquefaction on the proposed development/project.

***Item 6* -City of San Diego-** *Address lateral spread or flow slide potential of the site. If impacts are indicated, provide recommended mitigation measures.*

AGS Response – The liquefaction analyses presented in Appendix B indicate that the potential displacement due to lateral spread for borings B-5 and B-7 is zero. Since the recommended removal and recompaction measures will mitigate liquefaction onsite, it is anticipated that any potential lateral spread will also be mitigated.

***Item 7* -City of San Diego-** *Note - Storm Water Requirements for the proposed conceptual development will be evaluated by LDR-Engineering review. Priority Development Projects (PDPs) may require an investigation of storm water infiltration feasibility in accordance with the Storm Water Standards (including Appendix C and D). Check with your LDR-Engineering reviewer on requirements. LDR-Engineering may determine that LDR-Geology review of a storm water infiltration evaluation is required.*

AGS Response – AGS prepared an infiltration feasibility study for the project (AGS, 2021b) which was included in the project geotechnical report (AGS, 2021a) as Appendix D. We will respond to any review comments regarding the infiltration feasibility study when available.

Conditions of the referenced reports remain applicable unless specifically superseded herein. The opportunity to be of service is sincerely appreciated. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Respectfully Submitted,
Advanced Geotechnical Solutions, Inc.

ANDRES BERNAL, Sr. Geotechnical Engineer
RCE 62366/GE 2715, Reg. Exp. 9-30-23

Distribution: (1) Addressee

Attachments: Appendix A - References
Appendix B - Liquefaction Analyses
Plate 1 - Geologic Map and Exploration Location Map
City of San Diego LDR-Geology Cycle 2 Review Comments

APPENDIX A
REFERENCES

Advanced Geotechnical Solutions, Inc., 2021a, Supplemental Geotechnical Investigation and Design Recommendations, Multifamily Residential Development, 555 Hollister Street, San Diego, California, dated August 26, 2021, Report No. 1912-01-B-4.

---, 2021b, "Preliminary Infiltration Feasibility Study, Multifamily Residential Development, 555 Hollister Street, San Diego, California," dated August 26, 2021, Report No. 1912-01-B-5.

City of San Diego, 2021, LDR-Geology Cycle 2 Review Comments, dated January 14, 2021.

Pasco Laret Suiter & Associates, 2021, Grading and Drainage Plan (Sheet C005) dated November 10, 2021.

APPENDIX B - LIQUEFACTION ANALYSES

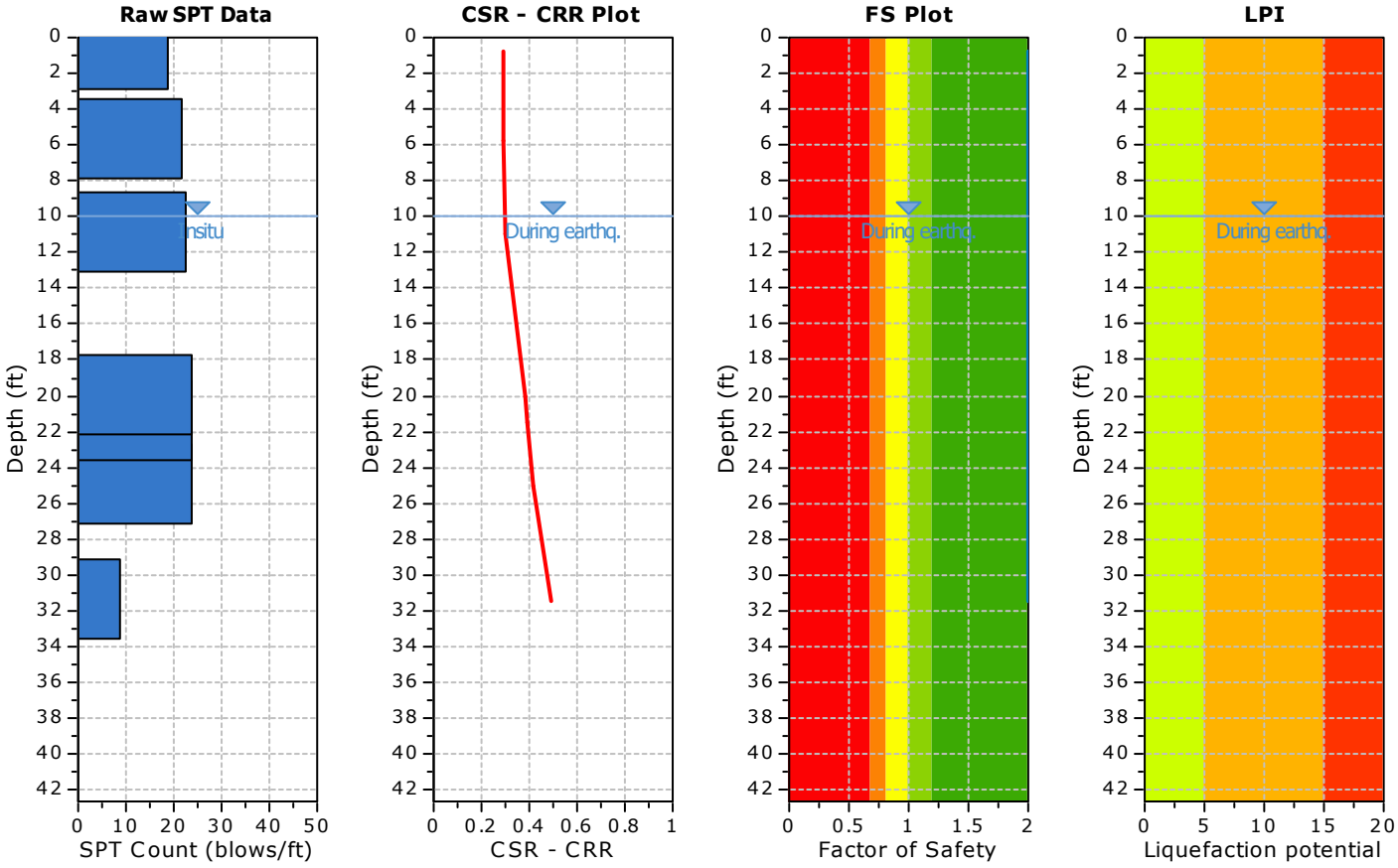
SPT BASED LIQUEFACTION ANALYSIS REPORT

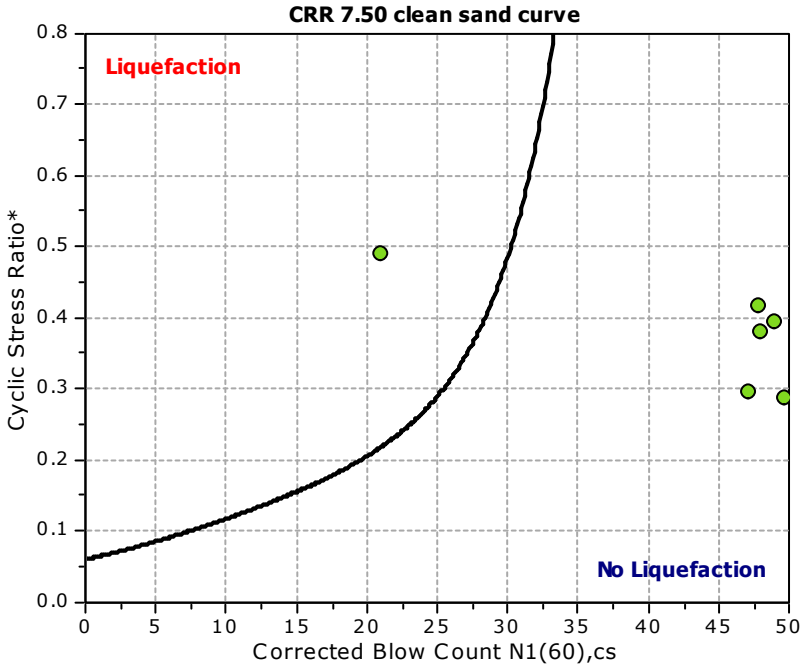
Project title : 1912-01 **SPT Name: B-5**

Location : 555 Hollister St. San Diego

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	10.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	10.00 ft
Sampling method:	Sampler wo liners	Earthquake magnitude M_w:	6.90
Borehole diameter:	200mm	Peak ground acceleration:	0.62 g
Rod length:	4.92 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.35		





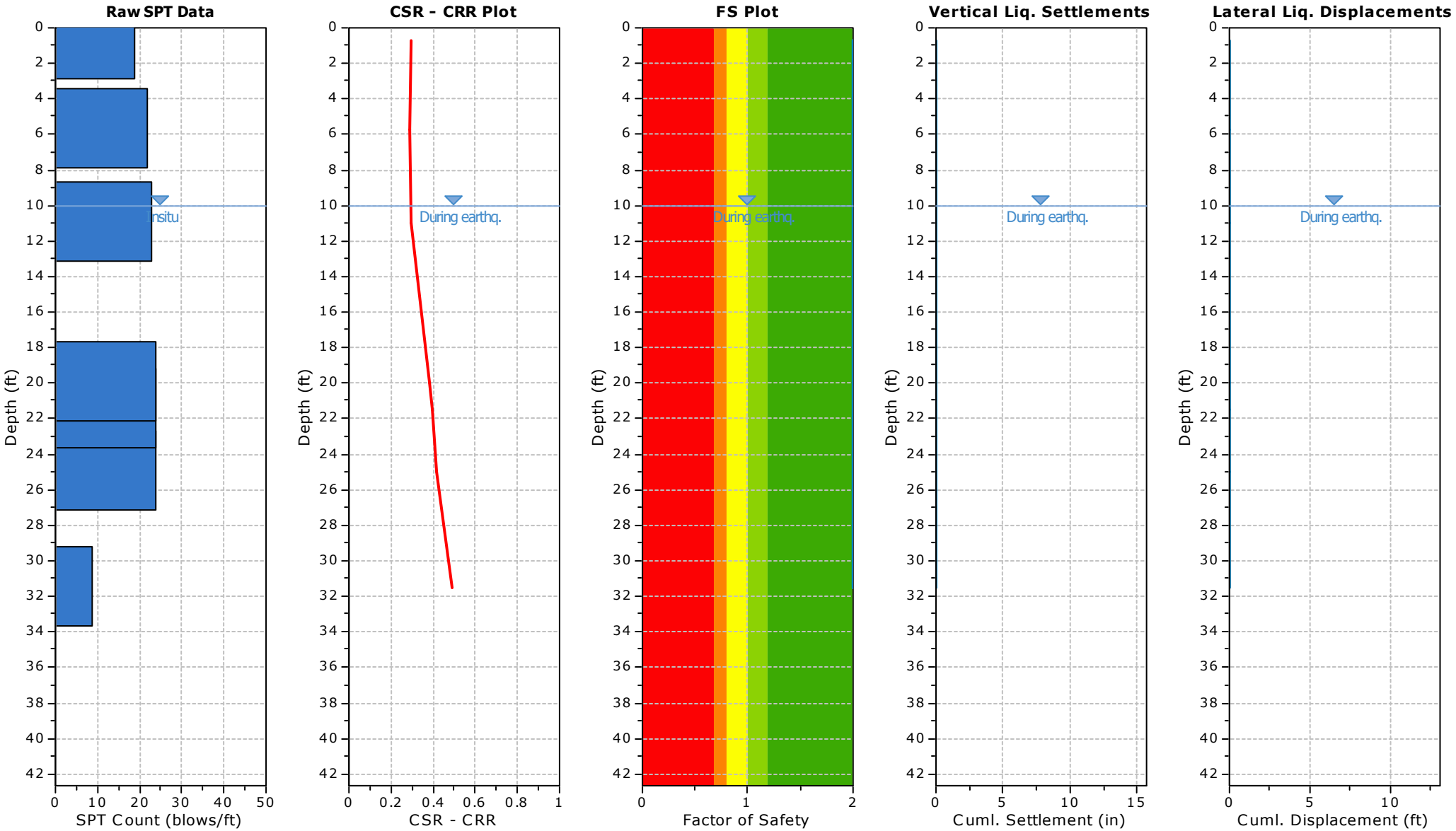
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
0.75	19	55.00	120.00	4.00	Yes
5.75	22	55.00	120.00	1.00	Yes
11.00	23	63.00	123.00	4.00	Yes
20.00	24	17.00	123.00	2.00	Yes
21.50	24	31.00	123.00	1.00	Yes
25.00	24	31.00	123.00	10.00	Yes
31.50	9	84.00	123.00	3.00	No

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	m	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	$CRR_{7.5}$
0.75	19	120.00	0.04	0.00	0.04	0.26	1.70	1.35	1.15	0.75	1.20	45	55.00	5.61	51	4.000
5.75	22	120.00	0.34	0.00	0.34	0.26	1.34	1.35	1.15	0.80	1.20	44	55.00	5.61	50	4.000
11.00	23	123.00	0.67	0.03	0.64	0.26	1.14	1.35	1.15	0.85	1.20	42	63.00	5.59	47	4.000
20.00	24	123.00	1.22	0.31	0.91	0.26	1.04	1.35	1.15	0.95	1.20	44	17.00	3.85	48	4.000
21.50	24	123.00	1.31	0.36	0.95	0.26	1.03	1.35	1.15	0.95	1.20	44	31.00	5.40	49	4.000
25.00	24	123.00	1.53	0.47	1.06	0.26	1.00	1.35	1.15	0.95	1.20	42	31.00	5.40	48	4.000
31.50	9	123.00	1.93	0.67	1.26	0.43	0.93	1.35	1.15	1.00	1.20	16	84.00	5.53	21	4.000

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
m: Stress exponent normalization factor
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
$\Delta(N_1)_{60}$ Equivalent clean sand adjustment
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF_{max}	$(N_1)_{60cs}$	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
0.75	120.00	0.04	0.00	0.04	1.00	1.00	0.405	2.20	51	1.26	0.322	1.10	0.293	2.000	●
5.75	120.00	0.34	0.00	0.34	0.99	1.00	0.398	2.20	50	1.26	0.317	1.10	0.288	2.000	●
11.00	123.00	0.67	0.03	0.64	0.97	1.00	0.409	2.20	47	1.26	0.325	1.10	0.296	2.000	●
20.00	123.00	1.22	0.31	0.91	0.93	1.00	0.501	2.20	48	1.26	0.399	1.04	0.382	2.000	●
21.50	123.00	1.31	0.36	0.95	0.92	1.00	0.509	2.20	49	1.26	0.405	1.03	0.393	2.000	●
25.00	123.00	1.53	0.47	1.06	0.90	1.00	0.523	2.20	48	1.26	0.416	1.00	0.416	2.000	●
31.50	123.00	1.93	0.67	1.26	0.86	1.00	0.534	1.54	21	1.12	0.479	0.98	0.490	2.000	●

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF_{max}	$(N_1)_{60cs}$	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d: Nonlinear shear mass factor
α: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted (user FS applied) ***
FS: Calculated factor of safety against soil liquefaction

*** User FS: 1.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
0.75	2.000	0.00	9.89	5.00	0.00
5.75	2.000	0.00	9.12	5.00	0.00
11.00	2.000	0.00	8.32	5.25	0.00
20.00	2.000	0.00	6.95	9.00	0.00
21.50	2.000	0.00	6.72	1.50	0.00
25.00	2.000	0.00	6.19	3.50	0.00
31.50	2.000	0.00	5.20	6.50	0.00

Overall potential I_L : 0.00

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for dry sands ::

Depth (ft)	$(N_1)_{60}$	τ_{av}	p	G_{max} (tsf)	α	b	γ	ε_{15}	N_c	ε_{Nc} weight factor	ε_{Nc} (%)	Δh (ft)	ΔS (in)
0.75	45	0.02	0.03	0.28	0.13	52312.75	0.00	0.00	10.08	1.00	0.01	4.00	0.009
5.75	44	0.14	0.23	0.76	0.13	15411.45	0.00	0.00	10.08	1.00	0.02	1.00	0.004

Cumulative settlemetns: 0.013

Abbreviations

τ_{av}: Average cyclic shear stress
p: Average stress
G_{max}: Maximum shear modulus (tsf)
α, b: Shear strain formula variables
γ: Average shear strain
ε_{15}: Volumetric strain after 15 cycles
N_c: Number of cycles
ε_{Nc}: Volumetric strain for number of cycles N_c (%)
Δh: Thickness of soil layer (in)
ΔS: Settlement of soil layer (in)

:: Vertical & Lateral displ.acements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60cs}$	γ_{lim} (%)	F_a	FS_{liq}	γ_{max} (%)	e_v weight factor	e_v (%)	dz (ft)	S_{v-1D} (in)	LDI (ft)
11.00	47	0.12	-1.37	2.000	0.00	1.00	0.00	4.00	0.000	0.00
20.00	48	0.09	-1.43	2.000	0.00	1.00	0.00	2.00	0.000	0.00
21.50	49	0.06	-1.51	2.000	0.00	1.00	0.00	1.00	0.000	0.00
25.00	48	0.10	-1.42	2.000	0.00	1.00	0.00	10.00	0.000	0.00
31.50	21	0.00	0.00	2.000	0.00	0.00	0.00	3.00	0.000	0.00
							Cumulative settlements:	**0.000**	**0.00**	

Abbreviations

γ_{lim}: Limiting shear strain (%)
F_a/N: Maximun shear strain factor
γ_{max}: Maximum shear strain (%)
e_v:: Post liquefaction volumetric strain (%)
S_{v-1D}: Estimated vertical settlement (in)
LDI: Estimated lateral displacement (ft)

SPT BASED LIQUEFACTION ANALYSIS REPORT

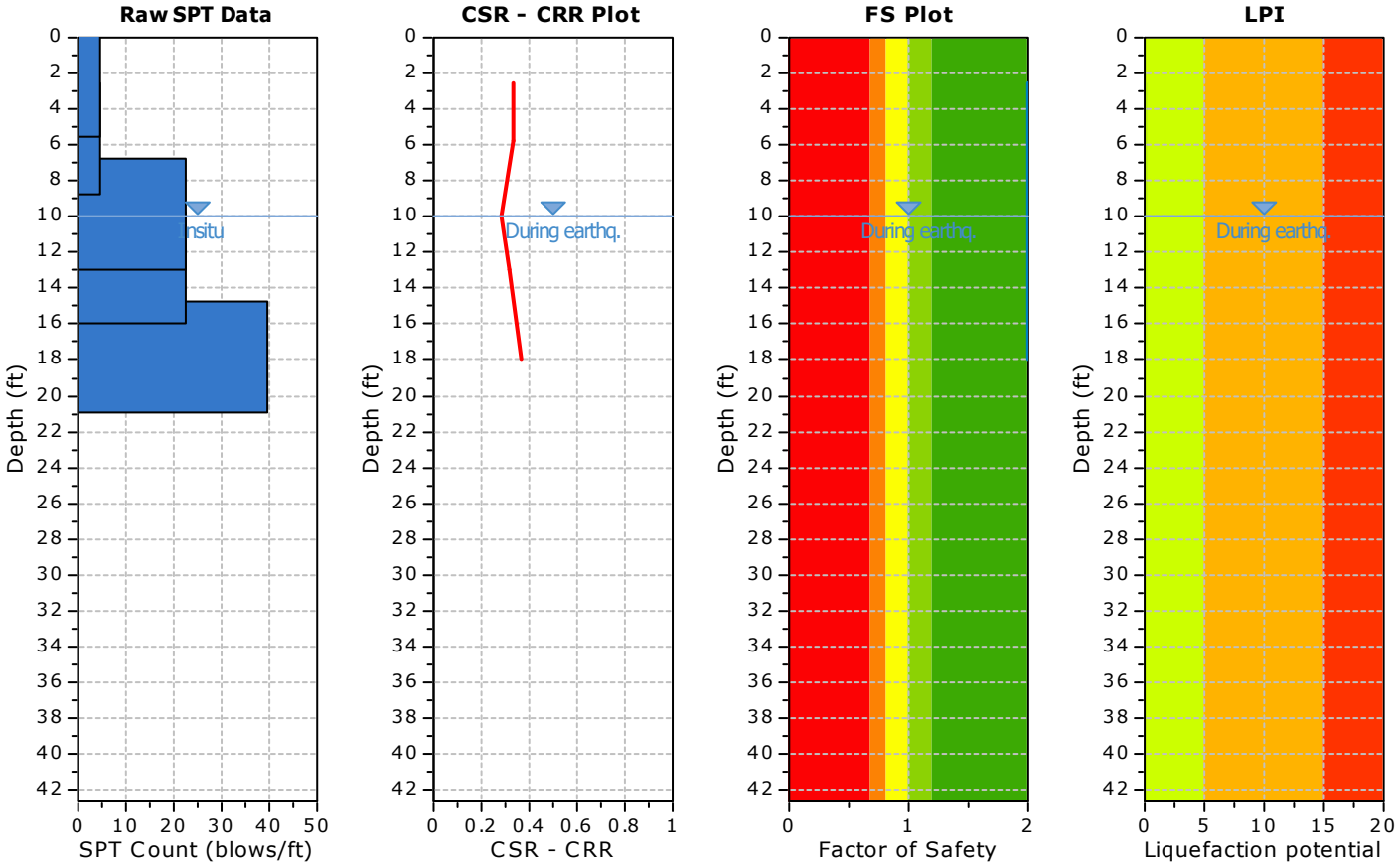
Project title : 1912-01

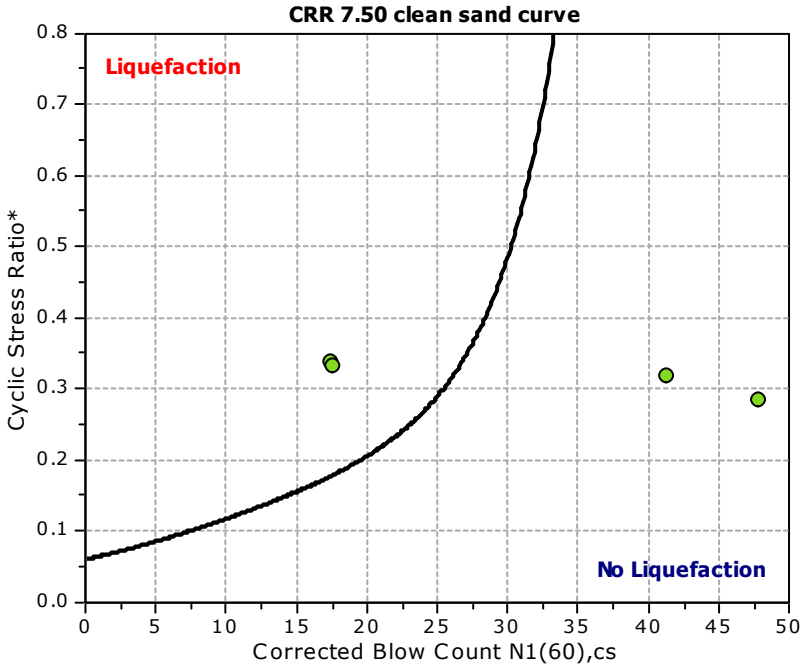
SPT Name: B-7

Location : 555 Hollister St. San Diego

:: Input parameters and analysis properties ::

Analysis method:	Boulanger & Idriss, 2014	G.W.T. (in-situ):	10.00 ft
Fines correction method:	Boulanger & Idriss, 2014	G.W.T. (earthq.):	10.00 ft
Sampling method:	Sampler wo liners	Earthquake magnitude M_w:	6.90
Borehole diameter:	200mm	Peak ground acceleration:	0.62 g
Rod length:	4.92 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.35		





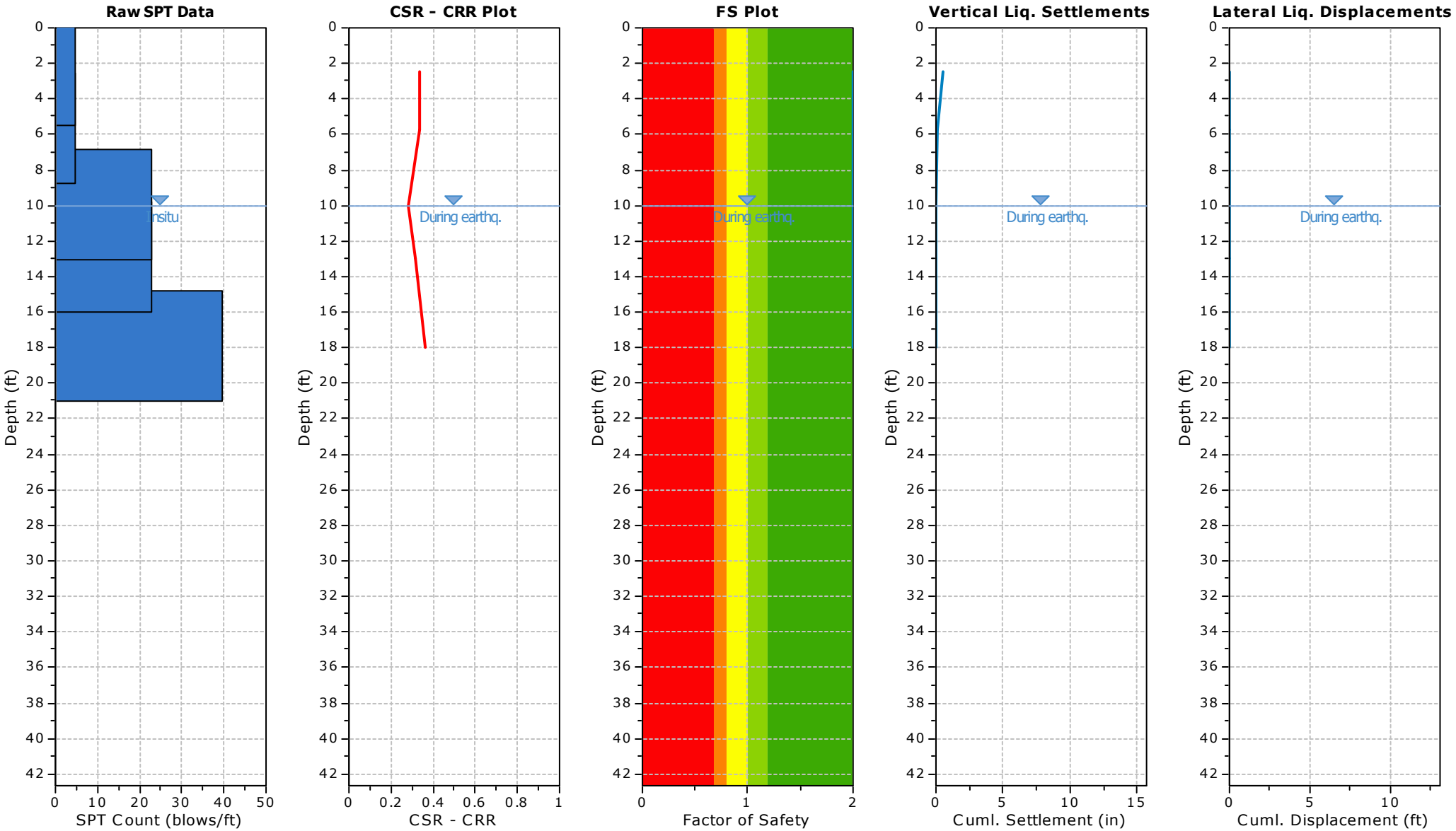
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
2.50	5	55.00	120.00	4.00	Yes
5.75	5	40.00	120.00	1.00	Yes
10.00	23	40.00	120.00	5.50	Yes
13.00	23	5.00	120.00	2.00	Yes
18.00	40	5.00	120.00	5.00	Yes

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	m	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	FC (%)	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$	$CRR_{7.5}$
2.50	5	120.00	0.15	0.00	0.15	0.43	1.70	1.35	1.15	0.75	1.20	12	55.00	5.61	17	4.000
5.75	5	120.00	0.34	0.00	0.34	0.43	1.62	1.35	1.15	0.80	1.20	12	40.00	5.58	18	4.000
10.00	23	120.00	0.60	0.00	0.60	0.26	1.16	1.35	1.15	0.85	1.20	42	40.00	5.58	48	4.000
13.00	23	120.00	0.78	0.09	0.69	0.29	1.13	1.35	1.15	0.85	1.20	41	5.00	0.00	41	4.000
18.00	40	120.00	1.08	0.25	0.83	0.26	1.07	1.35	1.15	0.95	1.20	75	5.00	0.00	75	4.000

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
m: Stress exponent normalization factor
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
$\Delta(N_1)_{60}$ Equivalent clean sand adjustment
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF_{max}	$(N_1)_{60cs}$	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
2.50	120.00	0.15	0.00	0.15	1.00	1.00	0.403	1.40	17	1.09	0.371	1.10	0.337	2.000	●
5.75	120.00	0.34	0.00	0.34	0.99	1.00	0.398	1.40	18	1.09	0.367	1.10	0.333	2.000	●
10.00	120.00	0.60	0.00	0.60	0.97	1.00	0.392	2.20	48	1.26	0.312	1.10	0.283	2.000	●
13.00	120.00	0.78	0.09	0.69	0.96	1.00	0.439	2.20	41	1.26	0.349	1.10	0.318	2.000	●
18.00	120.00	1.08	0.25	0.83	0.94	1.00	0.491	2.20	75	1.26	0.390	1.07	0.364	2.000	●

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF_{max}	$(N_1)_{60cs}$	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d: Nonlinear shear mass factor
α: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted (user FS applied) ***
FS: Calculated factor of safety against soil liquefaction

*** User FS: 1.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
2.50	2.000	0.00	9.62	3.25	0.00
5.75	2.000	0.00	9.12	3.25	0.00
10.00	2.000	0.00	8.48	4.25	0.00
13.00	2.000	0.00	8.02	3.00	0.00
18.00	2.000	0.00	7.26	5.00	0.00

Overall potential I_L : 0.00

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for dry sands ::

Depth (ft)	$(N_1)_{60}$	τ_{av}	p	G_{max} (tsf)	α	b	γ	ε_{15}	N_c	ε_{Nc} weight factor	ε_{Nc} (%)	Δh (ft)	ΔS (in)
2.50	12	0.06	0.10	0.32	0.13	25402.73	0.00	0.00	10.08	1.00	0.41	4.00	0.392
5.75	12	0.14	0.23	0.49	0.13	15411.45	0.00	0.00	10.08	1.00	0.41	1.00	0.097

Cumulative settlemetns: 0.489

Abbreviations

τ_{av}: Average cyclic shear stress
p: Average stress
G_{max}: Maximum shear modulus (tsf)
α, b: Shear strain formula variables
γ: Average shear strain
ε_{15}: Volumetric strain after 15 cycles
N_c: Number of cycles
ε_{Nc}: Volumetric strain for number of cycles N_c (%)
Δh: Thickness of soil layer (in)
ΔS: Settlement of soil layer (in)

:: Vertical & Lateral displ.acements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60cs}$	γ_{lim} (%)	F_α	FS_{liq}	γ_{max} (%)	e_v weight factor	e_v (%)	dz (ft)	S_{v-1D} (in)	LDI (ft)
10.00	48	0.10	-1.42	2.000	0.00	1.00	0.00	5.50	0.000	0.00

:: Vertical & Lateral displ.acements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60cs}$	γ_{lim} (%)	F_a	FS_{liq}	γ_{max} (%)	e_v weight factor	e_v (%)	dz (ft)	S_{v-1D} (in)	LDI (ft)
13.00	41	0.66	-0.90	2.000	0.00	1.00	0.00	2.00	0.000	0.00
18.00	75	0.00	-3.78	2.000	0.00	1.00	0.00	5.00	0.000	0.00
						Cumulative settlements:		**0.000**	**0.00**	

Abbreviations

γ_{lim}: Limiting shear strain (%)
F_a/N: Maximun shear strain factor
γ_{max}: Maximum shear strain (%)
e_v:: Post liquefaction volumetric strain (%)
S_{v-1D}: Estimated vertical settlement (in)
LDI: Estimated lateral displacement (ft)

References

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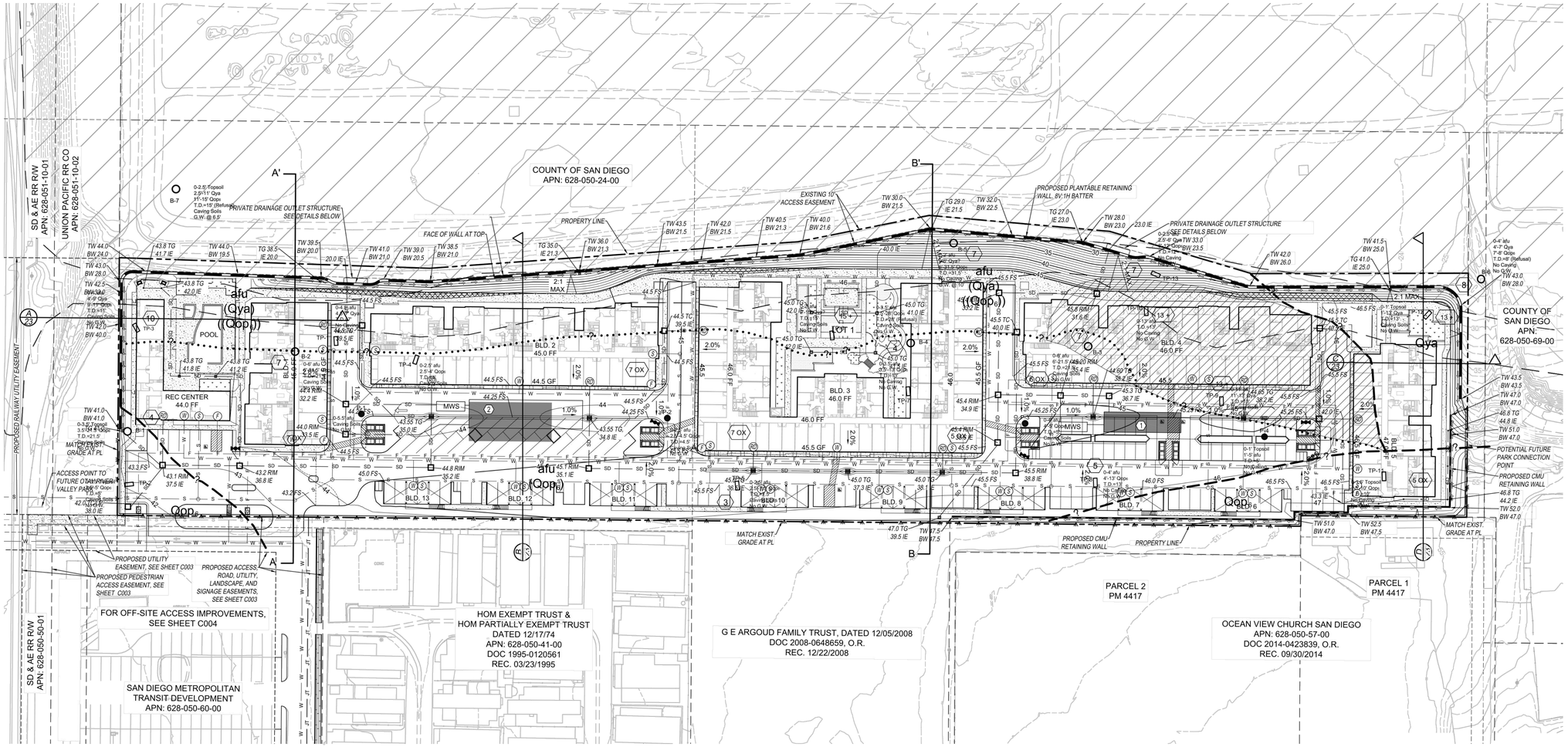


LEGEND

- PROPERTY LINE
- ADJACENT PARCEL LINE
- ROADWAY CENTERLINE
- EXISTING CONTOUR
- EXISTING SEWER MANHOLE / MAIN
- EXISTING PUBLIC SANITARY SEWER MAIN
- EXISTING PUBLIC WATER MAIN
- EXISTING STORM DRAIN STRUCTURE
- PROPOSED CONTOUR
- PROPOSED 6" PCC CURB
- PROPOSED 6" PCC CURB & GUTTER
- LIMIT OF GRADING LINE
- PROPOSED SEWER MANHOLE (SMH)
- PROPOSED PRIVATE FIRE MAIN
- PROPOSED PRIVATE WATER MAIN
- PROPOSED PRIVATE SANITARY SEWER MAIN
- PROPOSED STORM DRAIN
- PROPOSED DRY UTILITY JOINT TRENCH
- PROPOSED STORM DRAIN STRUCTURE / INLET
- PROPOSED UNDERGROUND STORM WATER CISTERN
- PROPOSED MODULAR WETLAND SYSTEM MWS-L-8-24-V
- BUILDING FIRE SERVICE
- BUILDING WATER SERVICE
- BUILDING SEWER SERVICE
- BUILDING ROOF DRAIN
- PROPOSED BROW DITCH
- PROPOSED RETAINING WALL
- PROPOSED DECK OVERHANG PER LANDSCAPE SHEETS
- PROPOSED DOMESTIC WATER METER AND BACKFLOW DEVICE
- PROPOSED FIRE SERVICE BACKFLOW
- PROPOSED PRIVATE FIRE HYDRANT
- PROPOSED PRIVATE FDC/PIV
- PROPOSED CONCRETE SIDEWALK PER LANDSCAPE SHEETS
- PROPOSED DECOMPOSED GRANITE PER LANDSCAPE SHEETS
- PROPOSED ARTIFICIAL TURF PER LANDSCAPE SHEETS
- FEMA ZONE AE PER MAP NUMBER 06073C2154H REVISED APRIL 5, 2016
- FEMA ZONE X PER MAP NUMBER 06073C2154H REVISED APRIL 5, 2016

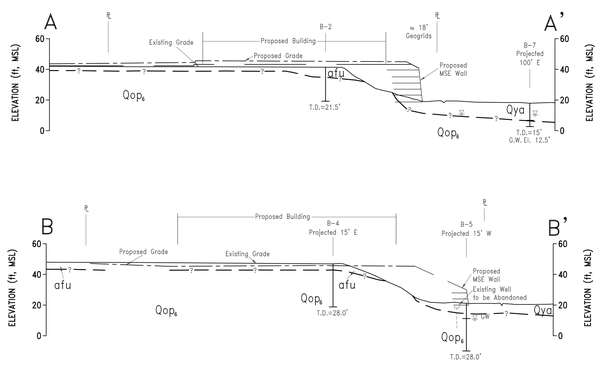
GRADING QUANTITIES

TOTAL SITE AREA	5.92 ACRES
GRADED AREA	5.50 ACRES
CUT QUANTITIES	15,000 CY
FILL QUANTITIES	38,500 CY
IMPORT	23,500 CY
MAX CUT DEPTH	13 FT
MAX FILL DEPTH	25 FT
MAX SLOPE	2:1

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THEIR OWN INDEPENDENT QUANTITY & MATERIAL TAKE-OFFS TO CONSTRUCT THE DESIGN AS INDICATED ON THESE DRAWINGS & IN CONFORMANCE WITH THE PROJECT'S GEOTECHNICAL REPORT & SUBSEQUENT UPDATE LETTERS.

REMEDIAL GRADING QUANTITIES

TOTALVOLUME:67,000CY
MAX CUT: 17 FT



LEGEND

- B-7 — Aproximate Boring Location (AGS, 2021)
- P-1 — Aproximate Percolation Boring Location (AGS, 2021)
- TP-7 — Aproximate Exploratory Test Pit Location (AGS, 2019)
- Aproximate Location of Geologic Contact (Queried where uncertain, dotted where buried)
- Aproximate Location of Deep Undocumented Fill
- afu — Artificial Fill - Undocumented
- Qya — Young Alluvial Flood-plain Deposits
- Qop_6 — Old Paralic Deposits, Unit 6
- A — A' — Cross Section Location
- 5 OX — Estimated Overexcavation Depth (in feet)
- 4 — Estimated Removal Depth (in feet)

PLATE 1

AGS ADVANCED GEOTECHNICAL SOLUTIONS, INC.
485 Corporate Drive, Suite B
Escondido, California 92029
Telephone: (714) 786-5661 Fax: (714) 409-3287

Project #	Report #	Date:
P/W 1912-01	1912-01-B-6	March 2022

GRAPHIC SCALE: 1" = 40'
40 20 0 40 80 120

APPROVAL NUMBERS:

VESTING TENTATIVE MAP APPROVAL NO. 2587526
SDP APPROVAL NO. 2587528
PDP APPROVAL NO. 2587257
REZONE NO. 2587530

VESTING TENTATIVE MAP 2587526
PLANNED DEVELOPMENT PERMIT/SITE DEVELOPMENT PERMIT/REZONE
PALM HOLLISTER APARTMENTS
CITY OF SAN DIEGO, CALIFORNIA
THIS IS A PLANNED RESIDENTIAL DEVELOPMENT PROJECT AS DEFINED IN THE SAN DIEGO LAND DEVELOPMENT CODE

PROJECT ADDRESS:
555 HOLLISTER STREET
SAN DIEGO, CA 92154

SHEET No. / TITLE:
GRADING AND DRAINAGE
SHEET C005

REGISTERED PROFESSIONAL ENGINEER GREGORY W. LANG RCE No. C68075 EXP. 06-30-23 CIVIL STATE OF CALIFORNIA

PREPARED BY:
PASCO LARET SUITER & ASSOCIATES
San Diego | Encinitas | Orange County
Phone 858.259.8212 | www.plsaengineering.com

PROJECT NO: 698277

REVISION 10:
REVISION 9:
REVISION 8:
REVISION 7:
REVISION 6:
REVISION 5:
REVISION 4:
REVISION 3:
REVISION 2:
REVISION 1:

ORIGINAL DATE: 11/10/21

THE CITY OF SAN DIEGO
Development Services Department
1222 1st Avenue, San Diego, CA 92101-4154

L64A-003B

Review Information

Cycle Type:	2 Submitted (Multi-Discipline)	**Submitted:**	12/03/2021	Deemed Complete on 12/03/2021
Reviewing Discipline:	LDR-Geology	**Cycle Distributed:**	12/03/2021	
Reviewer:	**Washburn, Jacobe**	**Assigned:**	12/03/2021	
	(619) 446-5075	**Started:**	01/11/2022	
	jwashburn@sandiego.gov	**Review Due:**	01/17/2022	
Hours of Review:	3.50	**Completed:**	01/14/2022	
Next Review Method:	Submitted (Multi-Discipline)	**Closed:**		

. The review due date was changed to 01/20/2022 from 01/20/2022 per agreement with customer.
. The reviewer has indicated they want to review this project again. Reason chosen by the reviewer: First Review Issues.
. The reviewer has requested more documents be submitted.
. Your project still has 7 outstanding review issues with LDR-Geology (all of which are new).

698277-2 (1/14/2022)

References:

Cleared?	Issue Num	Issue Text
☐	1	Supplemental Geotechnical Investigation and Design recommendations, Multifamily Residential development, 555 Hollister Street, San Diego, California, prepared by Advanced Geotechnical Solutions, Inc., dated August 26, 2021 (their project no. 1912-01) Development plans: Palm and Hollister, prepared by Summa Architecture, dated November 11, 2021. (New Issue)

Review Comments:

Cleared?	Issue Num	Issue Text
☐	2	Submit an addendum geotechnical report or update letter that specifically addresses the proposed development for the purposes of environmental review and the following (New Issue)
☐	3	The geotechnical consultant must indicate if the site is suitable for the proposed development as designed or provide recommendations to mitigate the geologic hazards to an acceptable level. (New Issue)
☐	4	The project's geotechnical consultant should provide a conclusion regarding if the proposed development will destabilize or result in settlement of adjacent property or the Right-of-Way. (New Issue)
☐	5	An area of the project site is located in geologic hazard category (GHC) 31 as shown on the City's Seismic Safety Study Geologic Hazard Maps. GHC 31 is characterized by a high potential for liquefaction. The geotechnical consultant must specifically address liquefaction potential of the entire site and potential consequences of soil liquefaction on the proposed development/ project. (New Issue)
☐	6	Address lateral spread or flow slide potential of the site. If impacts are indicated, provide recommended mitigation measures. (New Issue)
☐	7	Note - Storm Water Requirements for the proposed conceptual development will be evaluated by LDR-Engineering review. Priority Development Projects (PDPs) may require an investigation of storm water infiltration feasibility in accordance with the Storm Water Standards (including Appendix C and D). Check with your LDR-Engineering reviewer on requirements. LDR-Engineering may determine that LDR-Geology review of a storm water infiltration evaluation is required. (New Issue)

For questions regarding the 'LDR-Geology' review, please call Jacobe Washburn at (619) 446-5075. Project Nbr: 698277 / Cycle: 2

THE CITY OF SAN DIEGO
Development Services Department
1222 1st Avenue, San Diego, CA 92101-4154

L64A-003B

Review Information

Cycle Type:	2 Submitted (Multi-Discipline)	**Submitted:**	12/03/2021	Deemed Complete on 12/03/2021
Reviewing Discipline:	Fire-Plan Review	**Cycle Distributed:**	12/03/2021	
Reviewer:	**Larson, Willard**	**Assigned:**	12/06/2021	
	(619) 323-6108	**Started:**	12/29/2021	
	WTLARSON@sandiego.gov	**Review Due:**	01/17/2022	
Hours of Review:	1.00	**Completed:**	01/05/2022	
Next Review Method:	Submitted (Multi-Discipline)	**Closed:**		

. The review due date was changed to 01/20/2022 from 01/20/2022 per agreement with customer.
. The reviewer has indicated they want to review this project again. Reason chosen by the reviewer: First Review Issues.
. The reviewer has requested more documents be submitted.
. Your project still has 3 outstanding review issues with Fire-Plan Review (all of which are new).

Fire 01/05/2021

Cleared?	Issue Num	Issue Text
☐	1	Fire access roads need to show turning radius of Pierce Fire Trucks utilized by SDFD. (New Issue)
☐	2	(Provide as a NOTE and SHOW on FAP) "Aerial fire access road(s) adjacent to buildings that are greater than 30 feet in height from grade plane, shall have a minimum width of 26 feet. The proximal edge of Aerial fire access shall be a minimum of 15-30 feet from the building facade(s) and/or plumb line of eave(s). Aerial access shall be provided along one entire long side(s) of the building(s). Show ALL proposed locations where aerial access is being provided. (See CFC appendix D/FPB Policy A-14-1)" (New Issue)
☐	3	Contact FIRE PLAN Reviewer to discuss aerial access and turning radius (New Issue)