APPENDIX H

HYDROLOGY REPORT AND PRELIMINARY WATER QUALITY MANAGEMENT PLAN

This page intentionally left blank

PRELIMINARY
HYDROLOGY AND HYDRAULIC ANALYSIS

For:

Ganahl Lumber – San Juan Capistrano
25865 Stonehill Drive, San Juan Capistrano, CA 92675
Tract No. 18161
APN# 121-253-13, -15 & APN 121-240-39, -73, -76
General Plan Land Use Designation: LU 4.1 Quasi Industrial

Prepared for:

Ganahl Lumber Company
1220 East Ball Road
Anaheim, California 92805
(714) 772-5444

Prepared by:

Joseph C. Truxaw & Associates, Inc.
Civil Engineers & Land Surveyors
1915 W. Orangewood Avenue, Suite 101
Orange, California 92868
(714) 935-0265

Engineer: Geoffrey Ayton, PE Registration No.: 77291
Prepared on: October 15, 2019

CONTENTS

1.0 SITE DESCRIPTION 1
1.1 PURPOSE 1
1.2 METHODOLOGY 1
1.3 SITE LOCATION 2
1.4 WATERSHED DESCRIPTION 2
1.5 EXISTING SITE CONDITION 2
1.6 PROPOSED SITE IMPROVEMENTS 4
1.7 WATER QUALITY AND HYDROMODIFICATION 5

2.0 DISCUSSION 6
2.1 WATER QUALITY DESIGN STORM 6
2.2 10-YEAR STROM CONVEYANCE 6
2.3 SITE DISCHARGE 7
2.4 100-YEAR FLOOD PROTECTION 8

3.0 10-YEAR STORM CONVEYANCE CALCULATIONS 10
3.1 EXISTING CONDITION 10
10-year storm 10
100-year storm 10
3.2 PROPOSED CONDITION 11
10-year storm 11
100-year storm 11
3.3 CONVEYANCE PIPE DESIGN 12
3.4 OUTFALL DRAIN CAPACITY 12

4.0 100-YEAR FLOOD ANALYSIS 13
4.1 FLOOD PROTECTION FLOWRATE CALCULATION 13
4.2 SECONDARY OVERFLOW DESIGN 13
4.3 OVERFLOW VOLUME 14
Surface Volume Under Weir Flow Elevation 14
Runoff Volume 14

APPENDICES ..... **A**
APPENDIX A – MAPS 1
VICINITY MAP 2
LOCATION MAP 3
LATITUDE AND LONGITUDE OF THE PROJECT 4
SOIL MAP 5
WATERSHED MAP 6
ZONING MAP 7
RAINFALL ZONE MAP 8
FIRM MAP 9
APPENDIX B – EXHIBITS 1
HYDROLOGY MAP -EXISTING CONDITION 2
PROPOSED HYDROLOGY EXHIBIT – SHEET 1 OF 2 3
PROPOSED HYDROLOGY EXHIBIT – SHEET 2 OF 2 4
TIME OF CONCENTRATION NOMOGRAPH - OUTFALL 1 5
TIME OF CONCENTRATION NOMOGRAPH-OUTFALL - 2 6
TIME OF CONCENTRATION NOMOGRAPH – AREA A 7
TIME OF CONCENTRATION NOMOGRAPH - AREA B 8
TIME OF CONCENTRATION NOMOGRAPH - AREA D 9
TIME OF CONCENTRATION NOMOGRAPH – AREA E 10
TIME OF CONCENTRATION NOMOGRAPH – AREA G (RUN ON) 11
OVERFLOW EXHIBIT 12
TIME OF CONCENTRATION NOMOGRAPH – OVERFLOW AREA 1 13
TIME OF CONCENTRATION NOMOGRAPH – OVERFLOW AREA 2 14
APPENDIX C – REFERENCES 1
REFERENCE PLANS 2
WQMP PLOT PLAN 3

1.0 SITE DESCRIPTION

1.1 PURPOSE

This preliminary report is intended to show that the construction of the proposed buildings and improvements on the subject site can be design in such a way as to not cause drainage hazards. Because the site design is still in a conceptual state, this report makes conservative assumptions and ignores conceptually proposed improvements that could potently improve the site drainage condition.

This drainage study provides an analysis of the existing and proposed hydrology characteristics for the proposed site currently owned by the city of San Juan Capistrano and under a purchase agreement with Ganahl Lumber development, which will contain a Ganahl Lumber store and lumber yard, quick-serve restaurant PAD, and a vehicle storage area. The project site is located in the City of San Juan Capistrano, County of Orange, and is at latitude and longitude of 33.46281° N and 117.677833º W, respectively (see latitude and longitude map in appendix A). The project site is approximately 16.36 acres. The subject site is bounded on the north by Capistrano Valley Mobile Estates, east by A.T. & S.F. railroad, south by Stonehill Drive, and west by San Juan Creek channel. (See vicinity and location map in appendix A)

1.2 METHODOLOGY

For the purpose of this study, all drainage runoff has been calculated based on a 10-year storm event for pipe sizing analysis, and the 100-year storm event for building protection. All calculations are based on the Orange County Hydrology Manual dated October 1986, where the peak flow is determined by the equation: [Q=0.9*(I-Fm)*A].

The site is designed to capture and treat a Design Capture Volume (DCV) generated by the 85th percentile 24-hour storm event. This is described in the project Water Quality Management Plan (WQMP), included in appendix C for reference.

1.3 SITE LOCATION

The project site is approximately 16.36 acres and shown on Tentative Tract Map No. 18161 and is referred to as the lower Rosan Parcels, a portion of the Pryor Homestead. The property is bounded to the south by Stonehill Drive, to the west by San Juan Creek, to the north by Capistrano Valley mobile estates and to the east by the A.T. & S.F. Railroad. The site is proposed to be subdivided into 5 lots, as shown on the tentative tract map number 18161.

1.4 WATERSHED DESCRIPTION

The project site is located in the San Juan Creek watershed. Per the August 2002 *San Juan Creek Watershed Management* Study prepared by the Army Corps of Engineers. The San Juan Creek watershed is 176 square miles (112,640 acres), extending from the Cleveland National Forest in the Santa Ana Mountains to the Pacific Ocean at Doheny State Beach. During a 100-year storm event the peak flow reaches the San Juan Creek River mouth approximately 18 hours after the start of the storm event. Per calculations in this report the maximum time of concentration for the project site is 25 minutes. The proposed 16.36-acre project site constitutes less than 0.001% of this watershed area and is located approximately 1-mile north of the river mouth. The site peak flow will have discharged to San Juan Creek prior to the watershed peak reaching the site as a result of the significant lag time between the watershed peak flow and the project site peak flow.

1.5 EXISTING SITE CONDITION

According to the City of San Juan Capistrano Zoning map, the project site is in CM – Commercial Manufacturing District (see zoning map in appendix A). A majority of the existing site is undeveloped with the exception of the asphalt concrete drive entrance from Stonehill Drive into the property and undocumented fills providing elevated level satellite parking for the car dealerships located easterly of A.T. & S.F. railroad. A chainlink fence surrounds the parking areas. Pervious covers include native landscaping consisting of a brush, shrubs, small trees, bushes, well-graded gravel, and bare soil. The subject site is underlain by soil group type “A” soils (see soil map in appendix A) and is located in San Juan Creek Watershed (see watershed map in appendix A).

The current site is located in flood hazard “Zone AO-Flood depth of 1 foot” as identified by Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) and is subject to inundation (See FEMA maps in Appendix A). A Conditional Letter of Map Revision based on fill (CLOMR-F) has been prepared by JLC Engineering and Consulting, Inc. and has been accepted by the city of San Juan Capistrano. The CLOMR-F is currently under review by FEMA. The final approved CLOMR-F will be obtained prior to building permit approval. A Letter of Map Revision (LOMR) will be prepared and submitted to FEMA once final building elevation is certified by a Licensed Surveyor.

Existing outfall #1 located approximately 350 feet north of the Stonehill drive center line collects onsite runoff from 12.7 acres of drainage area, including run-on from the A.T. & S.F. railroad and the adjacent hillside from graded swales and culverts. Onsite runoff sheet flows to graded swales that convey stormwater to the overall #1 outlet structure that discharges directly to San Juan Creek through a 48" diameter pipe. (see Hydrology Map existing condition in appendix C).

Existing outfall # 2 located approximately 975 feet north of the Stonehill drive center line collects drainage from a 7.52-acre drainage area. Onsite run on sheet flows to graded swales that convey water to the Outfall #2 outlet structure that discharges directly to San Juan Creek through two (2) 48" diameter pipes.

The existing outfall structures are designed with flap gates. When San Juan Creek is experiencing high flows, the flap gates close to prevent water from backflowing into the site. These flap gates are expected to remain closed for short periods of time until sufficient head is accumulated onsite, causing the pressure to equalize with the San Juan Creek, resulting in the flap gates opening allowing flow to the creek to resume. Due to the limited size of the subject site relative to the total watershed, and its location about 1-mile north of the discharge point, there is a significant lag time between the watershed peak discharge and the site's peak discharge. The outfall flap gates are expected to be open during any major storm event occurring onsite. In the unlikely event that the flap gates are closed during a storm event, the site will overflow the east property line where it is conveyed along the west limit of the AT&SF railroad and flow southerly to discharge to the Pacific Ocean at Doheny State Beach through an existing drainage culvert.

Existing Land Uses

Land Use Description	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Imperviousness (%)
Parking Lot (Gravel)	1.9	0	1.9	0
Landscaping (Shrubs)	7.7	0	7.7	0
Graded Slope (Gravel)	0.7	0	0.7	0
Drive Entrance (AC)	0.1	0.1	0	100
Dirt Roads, Swales, and Parking Lot (Bare)	6.0	0	6.0	0
Total	16.4	0.1	16.3	0.5

1.6 PROPOSED SITE IMPROVEMENTS

The site will be developed for commercial and industrial uses for Ganahl, dealership vehicle parking, and future drive-thru restaurants. Surfaces will include both impervious and pervious covers. Impervious covers will consist of building roofs; Portland cement concrete pavement for the lumber yard; and asphalt concrete pavement for the main access roadway, and parking lots. Pervious covers will consist of urban landscaping, gravel for the self-storage dealership vehicle parking, and pervious AC paving for the emergency access roadway. Activities that will be routinely conducted outdoors will include vehicle traffic for parking and material pickup/delivery/transport, pedestrian traffic for navigating between the different buildings/sheds, diesel vehicle refueling, trash compacting, and material baling. Landscape maintenance and irrigation will also be routinely performed.

The development of the site marginally increases the runoff to San Juan Creek as quantified by calculation in section 4.3. The existing outfall structures have adequate capacity to convey the calculated runoff quantities. The project drains to a reach of San Juan Creek that is not subject to hydromodification requirements, per the South Orange County, Hydromodification Management Plan (HMP) revised September 28th, 2017. The project WQMP, as discussed in section 1.7 of this report, describes how the site meets the Low Impact Design requirements and how the design capture volume is collected and attenuated on site. Also, as stated in section 1.4 of this report, the site constitutes less than 0.001% of the San Juan Creek Watershed. Because the subject site is an insignificant area compared to the overall watershed area, the project will not have a measurable impact on the water level within San Juan Creek.

Outfall #1 collects run on from offsite and undeveloped lots 1 and 2 . it is expected that these lots will be developed into building pads for quick-serve restaurants. When these lots are developed, an underground storage tank and modular wetland will be installed to capture and treat the DCV, as described in the Project WQMP, included in appendix C. Overflow from the DCV will be conveyed underground to the Outfall 1 structure where it discharges to San Juan Creek.

Outfall #2 collects runoff from lots 3, 4, and 5. Lot 3 consists of paved parking, the 3 Ganahl buildings, and lumberyards. The Run-off from the lot 3 paved parking lot and other outdoor areas are directed, by sheet flow, to concrete gutters that convey flow to catch basins connected to underground storage tanks and directed proprietary modular wetlands for treatment. Runoff from the building roofs is conveyed to roof drains directly connected to underground storage tanks. All underground tanks are sized to collect the DCV, as described in the Project WQMP, included in appendix C. Lots 4 and 5 consisting of stabilized gravel parking lot that captures and treats the DCV. Overflow from the parking lot is collected in catch Basin and conveyed underground to outfall 2.

During conditions when the hydraulic pressure of San Juan Creek is greater than the hydraulic pressure exerted by the site drainage system carrying a design storm, the flap gates in the existing outfall structures will close causing the site runoff to back up into the onsite catch basins and create onsite ponding. The site is designed so that if the site experiences a 100-year storm event concurrently with a condition causing the flap gates to close, stormwater will crest the secondary overflows to the west limit of the AT&SF railroad to join the existing overflow path, before to rising to within 1' of the building Finish Floor elevations. The onsite ponding combined with the DCV storage will limit the increase in discharge volume during this unlikely catastrophic event. Due to the lag time between the watershed peak flow event and the site peak flow event this condition is not expected to occur during the project lifespan and is used to ensure a conservative design for structure protection.

Proposed Land Uses

Land Use Description	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Imperviousness (%)
Building	3.11	3.11	0	100
Site Paving	7.70	7.70	0	100
Landscaping	2.27	0	2.27	0
Gravel Parking Lot/Pervious AC Roadways	3.28	0	3.28	0
Total	16.36	10.81	5.55	66.07

1.7 WATER QUALITY AND HYDROMODIFICATION

The site is designed to capture and treat the design capture volume (DCV) generated by the 24-hour 85th percentile storm event. These calculations and Stormwater BMP's proposed for the site are described in the project Water Quality Management Plan (WQMP), included in appendix C. The report is being reviewed concurrently with this report. The project WQMP also discusses that hydromodification is not required per the South Orange County Hydromodification management plan (HMP) revised September 28^{th,} 2017.

To ensure that the calculations presented in this preliminary Drainage Report, to account for worst-case conditions, the conceptually proposed detention BMPs are ignored. (See Preliminary project WQMP in Appendix C).

2.0 DISCUSSION

2.1 WATER QUALITY DESIGN STORM

The site is designed to detain on-site the 24-hour 85th percentile storm event, also known as the Water Quality Design Storm. the detained volumes are presented in the table below; see project WQMP in appendix C for details.

DMA	Strom Water BMP	Design Capture Volume (cu. ft.)
A	Underground Detention System	3,345
B	Underground Detention System	3,288
C	Underground Detention System	3,470
D	Underground Detention System	18,405
E	Permeable Pavement	1,993
	Total Design Capture Volume	30,501

2.2 10-YEAR STROM CONVEYANCE

Runoff in excess of the water quality design storm (see section 2.1) will overflow through pipes sized to convey the entire flow rate generated by the 10-year storm to the existing outfall structures that discharge to San Juan Creek. Drainage areas match the Drainage Management Areas (DMA) shown in the WQMP. DMA A and offsite run-on are directed to Outfall #1 DMA's B, C, D, and E are directed to Outfall #2. The overflow from the underground storage basins collecting runoff from DMA B and DMA C share an overflow pipe. See pipe size summary below; see section 3.3 for calculations. (See Appendix B for Exhibit and Time of Concentration Nomographs)

Catch basins will be designed to effectively collect stormwater generated by the 10-year storm event with a minimum 50% clogging factor. (Calculations will be included in the final report)

Flow Path	**Pipe Slope**	**Overflow Pipe Diameter**
Future Restaurants (DMA A) to Outfall #1	0.5%	12 in
Offsite Run-on to Outfall #1	0.81%	24 in
South Ganahl Site (DMA B&C) to Outfall #2	0.5%	24 in
North Ganahl Site (DMA D) to Outfall #2	0.5%	30 in
Vehicle Storage (DMA E)Outfall #2	0.5%	18 in

2.3 SITE DISCHARGE

The site storm drain system is designed to separate runoff generated by different land uses of future properties. Outfall #1 receives drainage from the future Restaurant and from the offsite run-on. Outfall #2 receives drainage from the Main Ganahl Site, in two pipes, and the Vehicle Storage site in a third pipe.

For this preliminary report, it is assumed that the peak flow of all drainage areas tributary to each outfall occurs simultaneously. With this assumption, the site generates a moderate total increase in discharge to San Juan Creek. The change in drainage surface area conveyed to each outfall significantly changes the ratio of discharge collected by each outfall. Further analysis will account for travel time and convergence of flows at the outfall which will result in reduced peak flow. See section 3.1 for exiting conditions calculations, section 3.2 for proposed condition calculation, and 3.4 for outfall capacity calculations. These calculations are summarized in the table below.

Outfall	Outfall Capacity (Cap.)	Existing Drainage Area	Existing Discharge	Proposed Drainage Area	Proposed Discharge	Flow Difference
1	1-48” dia RCP 236 cfs	12.7 acre	22.9cfs (10% of Cap.)	5.25 acre	7.87cfs (3% of Cap.)	-15.03cfs (66% decrease)
2	2-48” dia RCP 2x281=560cfs	7.52 acre	10.9cfs (2% of Cap.)	14.9 acre	35.8cfs (8% of Cap.)	24.9cfs (228% increase)
Total	796 cfs	20.1 acre	33.8cfs (4% of Cap.)	20.1 acre	43.67cfs (5% of Cap.)	9.87cfs (29% increase)

2.4 100-YEAR FLOOD PROTECTION

The proposed design of the site results in two Overflow Drainage Area (ODA). ODA 1 consists of the Future Restaurant PAD and the south portion of the Ganahl site. ODA 2 consists of the northern portion of the Ganahl Site, the Vehicle Storage lot, and overflow from the North Emergency Access road. Each ODA is protected by secondary overflow along the eastern property line that matches the existing overflow path from the site. Assuming that the entire ODA is discharged at the secondary overflow, the time of concentration is determined from a high point at the building finish floor to a low point at the secondary overflow. The secondary overflows are approximated as broad crested weirs see as described in Sections 4.1 and 4.2.

The available storage volume below the water surface elevation is approximated by comparing the finished surface elevation to an approximate plane at the water surface height elevation as shown on the overflow exhibit in Appendix B. Additionally, the site is designed to detain onsite the DCV (see section 2.1). The combined storage volumes result in the site increasing the 100-year storm overflow runoff volume by less than 4% in the event that a catastrophic flood event occurs.

The FEMA FIRM map 06059C0506J, revised December 3, 2009, and further revised by a LOMR dated February 11, 2013 (included in appendix A of this report) shows the AT&SF railroad to be within the same flood zone as the subject site. Per the CLOMR-F, prepared by JLC Engineering and accepted by the city of San Juan Capistrano, the base flood elevation for the 100-year storm event is determined to be at elevation 40.00 based on NAVD 88 vertical datum. The top of rail elevation at the railroad tracks fronting the site range from elevation 34.6 to elevation 41.7 based on NAVD 88 datum, field measured as part of the Topographic and Boundary survey prepared by Truxaw and Associates dated July 31, 2017. This indicates that the railroad tracks are inundated and inoperable during a 100-year storm event. During the low likelihood condition that the site overflows to the railroad, the 4% increase in runoff will not further impede the operations of the railroad.

The results are summarized below. See section 4.0 for calculations. (See Appendix B for Exhibit and Time of Concentration Nomographs).

Overflow Area	Elevation of Overflow (ft)	Height of Water above Overflow (ft)	Water Surface Height (ft)	Lowest Finish Floor Elevation (ft)	Available Surface Stored Volume (cu. ft.)
Area 1	39.33	0.29	39.62	41.00	33,390
Area 2	38.84	0.24	38.84	41.00	34,980

	24-hour Runoff Volume (cu. ft.)	Runoff Volume increase (cu. ft.)	Total Surface Storage Volume (cu. ft.)	Total Design Capture Volume (cu. ft.)	Net runoff volume increase (cu. ft.)
Existing Site	112,842	102,987	68,370	30,501	4,112 (4% increase)
Proposed Site	215,830				

3.0 10-YEAR STORM CONVEYANCE CALCULATIONS

From Orange County Hydrology Manual:

$Q = 0.9(I_{10} - F_m)A$ Equation D.4

$I_{10} = 10.209(T_c)^{-0.573}$ Figure B-3

$F_m = a_p F_p$ Equation C.7

F_p = 0.4 for type A Soil Table C.2

3.1 EXISTING CONDITION

10-year storm

Outfall	Area, A (acre)	Flow Path Length, L(ft)	Elevation Difference, H(ft)	Time of Concentration, T_c (min)	Rainfall Intensity, I_{10}(in/hr)	Pervious Area Fraction, a_p	Pervious Area Loss Rate, F_m (in/hr)	Flow Rate, Q_{10} (cfs)
1	12.7	510	18	12.5	2.40	100%	.04	22.9
2	7.52	770	12	17	2.01	100%	.04	10.9
Total	20.2							33.8

100-year storm

Outfall	Area, A (acre)	Flow Path Length, L(ft)	Elevation Difference, H(ft)	Time of Concentration, T_c (min)	Rainfall Intensity, I_{100} (in/hr)	Pervious Area Fraction, a_p	Pervious Area Loss Rate, F_m (in/hr)	Flow Rate, Q_{100} (cfs)
1	12.7	510	18	12.5	3.66	100%	.04	37.2
2	7.52	770	12	17	3.07	100%	.04	18.1
Total	20.2							55.23

3.2 PROPOSED CONDITION

10-year storm

Subarea	Area, A (acre)	Flow Path Length, L (ft)	Elevation Difference, H (ft)	Time of Concentration, T_c (min)	Rainfall Intensity, I_{10} (in/hr)	Pervious Area Fraction, a_p	Pervious Area Loss Rate, F_m (in/hr)	Flow Rate, Q_{10} (cfs)
A (outfall 1)	1.41	335	1.6	9	2.9	11%	0.044	3.62
B+C (outfall 2)	2.99	240	1.9	6.75	3.42	16%	0.064	9.03
D (outfall 2)	7.40	320	2.2	8.25	3.05	6%	0.023	20.14
E (outfall 2)	4.35	520	4.9	16	2.08	98%	0.392	6.63
Run on (outfall 1)	3.86	975	75	25	1.61	98%	0.392	4.25

100-year storm

Subarea	Area, A (acre)	Flow Path Length, L (ft)	Elevation Difference, H (ft)	Time of Concentration, T_c (min)	Rainfall Intensity, I_{100} (in/hr)	Pervious Area Fraction, a_p	Pervious Area Loss Rate, F_m (in/hr)	Flow Rate, Q_{100} (cfs)
A (outfall 1)	1.41	335	1.6	9	4.42	11%	0.044	5.54
B+C (outfall 2)	2.99	240	1.9	6.75	5.21	16%	0.064	13.85
D (outfall 2)	7.40	320	2.2	8.25	4.64	6%	0.023	30.78
E (outfall 2)	4.35	520	4.9	16	3.18	98%	0.392	10.92
Run on (outfall 1)	3.86	975	75	25	2.46	98%	0.392	7.19

3.3 CONVEYANCE PIPE DESIGN

$Q = AV$ Continuity Equation

$Q = \frac{1.49}{n} AR^{\frac{2}{3}} S^{\frac{1}{2}}$ Manning's Equation for Open Channel Flow

n = 0.012 for N-12 HDPE pipe (per Manufacturer specification)

Flow Path	Conveyed Flow, Q_{10} (cfs)	Pipe Slope, S (ft/ft)	Minimum Pipe Diameter, d (in)	Flow Depth, D (in)	Flow Area	Hydraulic Radius, R (ft)	Flow Velocity, V (fps)
A to Outfall #1	3.62	0.005	15	9.45	0.81	0.355	4.45
B+C to Outfall #2	9.03	0.005	24	12.24	1.61	0.506	5.60
D to Outfall #2	20.14	0.005	30	17.4	2.95	0.683	6.83
E to Outfall #2	6.63	0.005	18	12.42	1.30	0.443	5.10
G to Outfall #1	4.25	0.0081	24	6.96	0.756	0.332	5.62

3.4 OUTFALL DRAIN CAPACITY

$Q = \frac{1.49}{n} AR^{\frac{2}{3}} S^{\frac{1}{2}}$ Manning's Equation for Open Channel Flow

n = 0.015 assumed for RCP

Total ex flow from section 3.1

Total pr. flow from section 3.2

Outfall	Outfall Pipes	Slope, S (ft/ft)	Flow Area, A (ft^2)	Hydraulic Radius, R (ft)	Flow Capacity, Q_{max} (cfs)	Total Ex. Flow, Qex (cfs)	Total Pr. Flow, Q_{pr} (cfs)
1	1 - 48" RCP	0.0434	10.112	1.208	236	22.9 (10% of Cap.)	7.87 (3% of Cap.)
2	2 - 48" RCP	0.061	10.112	1.208	281 x 2 = 560	10.9 (2% of Cap.)	43.67 (8% of Cap.)

4.0 100-YEAR FLOOD ANALYSIS

4.1 FLOOD PROTECTION FLOWRATE CALCULATION

See Equations in section 2.1

Subarea	Area, A (acre)	Flow Path Length, L (ft)	Elevation Difference, H (ft)	Time of Concentration, T_c (min)	Rainfall Intensity, I_{100} (in/hr)	Pervious Area Fraction, a_p	Pervious Area Loss Rate, F_m (in/hr)	Flow Rate, Q (cfs)
1	8.73	1000	1	21	2.72	30%	0.119	20.42
2	6.65	677	3	16	3.18	17%	0.067	7.53

4.2 SECONDARY OVERFLOW DESIGN

Secondary overflow designed as a broad crested weir using the equation

$$Q = CL_s H_s^{\frac{3}{2}}$$

Subarea	Flow Rate, Q (cfs)	Weir Coefficient, C	Length of Overflow, L_s (ft)	Height above overflow, H_s (ft)	Overflow Elevation (ft)	Water Surface Elevation (ft)
1	20.42	3.33	40	0.29	39.33	39.61
2	19.68	3.33	50	0.24	38.6	38.84

4.3 OVERFLOW VOLUME

Surface **Volume Under Weir F**low **E**levation

ODA1	=	33,390
ODA2	=	34,980
Total Storage	=	68,370

Runoff Volume

$V_{100yr-24} = runoff\ volume\ = \frac{A\, d_{100yr-24hr}\, C*43560}{12}$

Where;

$A = Site\ Area$

$d = rainfall\ depth\ (from\ OC\ Hydrology\ Manual\ table\ B.1)$

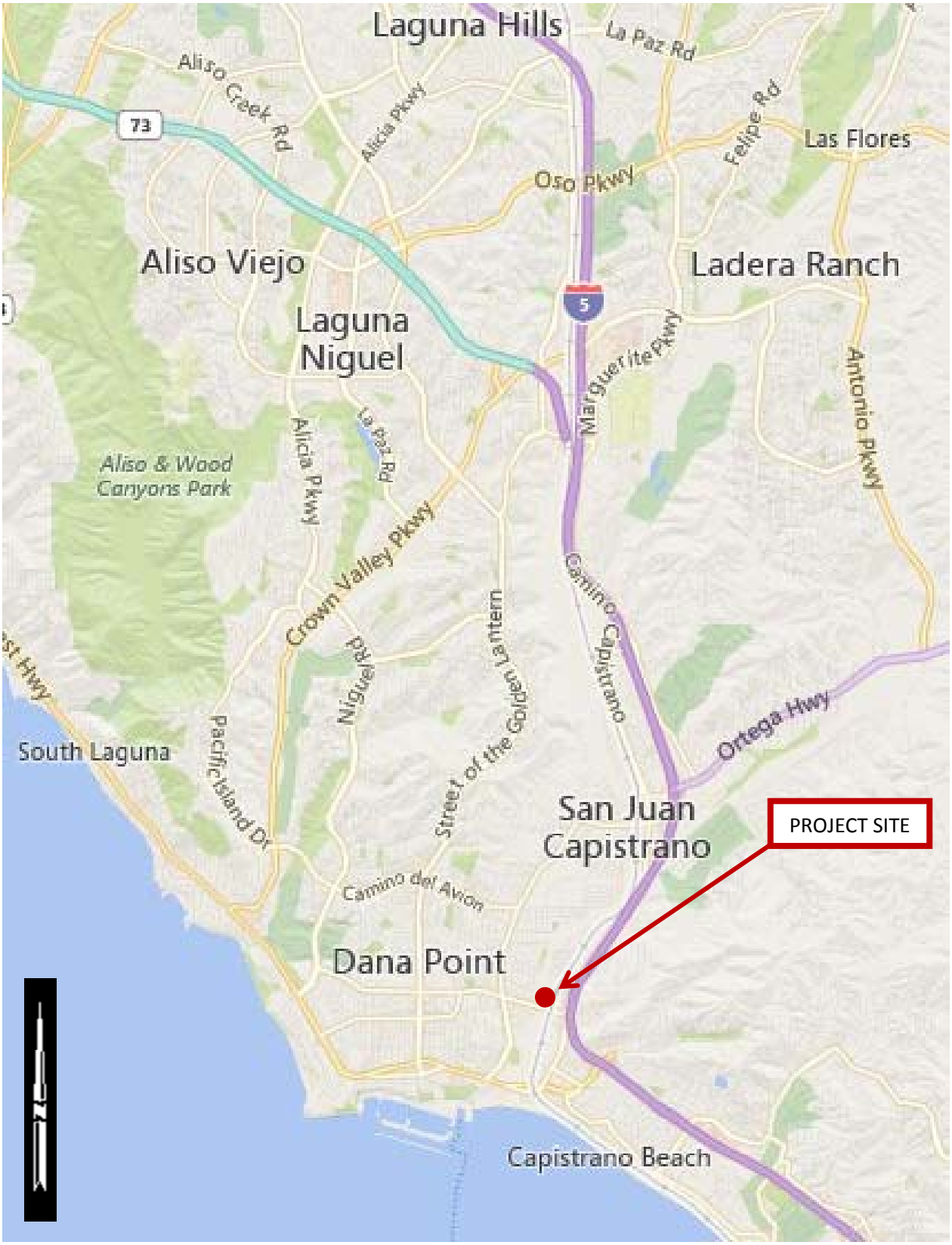
$C = Draiange\ Coeficent = (0.75 * \%imp_{sat}) + 0.15$

$\%imp_{sat} = percent\ Impervious\ Area\ saturated$

	%Imp	C	24hr rainfall depth	Area	Volume
Existing Site	0.25	0.34	5.63	16.36	112,840
Proposed Site	0.66	0.65	5.63	16.36	215,830
				Total Volume Increase	102,987
				Site Surface Storage	68,370
				Design Capture Volume	30,500
				Final Overflow Volume	4,112

APPENDICES

APPENDIX A – MAPS



DATE 5/31/17
DRAWN BY KJK
JOB NO. GNH17048
SHEET NO. 1
OF 1 SHEET

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA 92868 (714)935-0265 fax:(714)935-0106

VICINITY MAP

PARCEL 1-5, NORTH OF STONEHILL DR., EASTERLY OF SAN JUAN CREEK CHANNEL, WESTERLY OF A.T. & S.F. RAILROAD

SAN JUAN CAPISTRANO, OC, CA



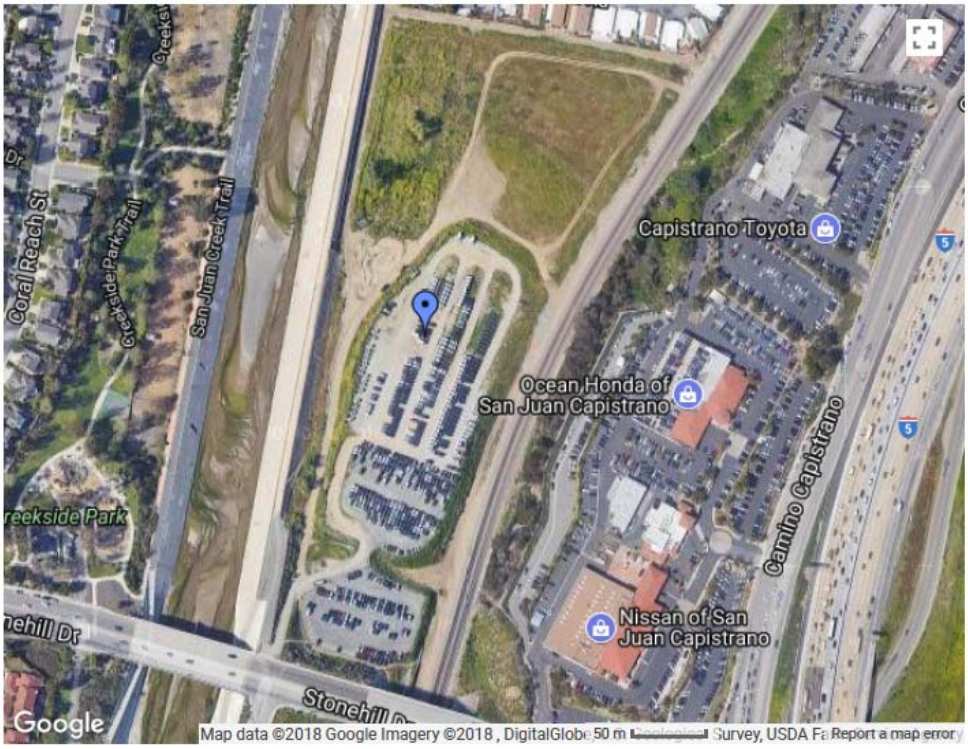
DATE 5/31/18
DRAWN BY KJK
JOB NO. GNH17048
SHEET NO. 1
OF 1 SHEET

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA 92868 (714)935-0265 fax:(714)935-0106

LOCATION MAP

PARCEL 1-5, NORTH OF STONEHILL DR., EASTERLY OF SAN JUAN CREEK CHANNEL, WESTERLY OF A.T. & S.F. RAILROAD

SAN JUAN CAPISTRANO, OC, CA



Clear / Reset | Remove Last Blue Marker | Center Red Marker

Get the Latitude and Longitude of a Point

When you click on the map, move the marker or enter an address the latitude and longitude coordinates of the point are inserted in the boxes below.

Latitude:	33.476281
Longitude:	-117.677833

	Degrees	Minutes	Seconds
Latitude:	33	28	34.6116
Longitude:	-117	40	40.1988

Show Point from Latitude and Longitude

Use this if you know the latitude and longitude coordinates of a point and want to see where on the map the point is.
Use: **+** for *N* Lat or *E* Long **-** for *S* Lat or *W* Long.
Example: +40.689060 -74.044636
Note: Your entry should not have any embedded spaces.

Decimal Deg. Latitude:	
Decimal Deg. Longitude:	

Show Point

Example: **+34 40 50.12** for *34N 40' 50.12"*

	Degrees	Minutes	Seconds
Latitude:			
Longitude:			

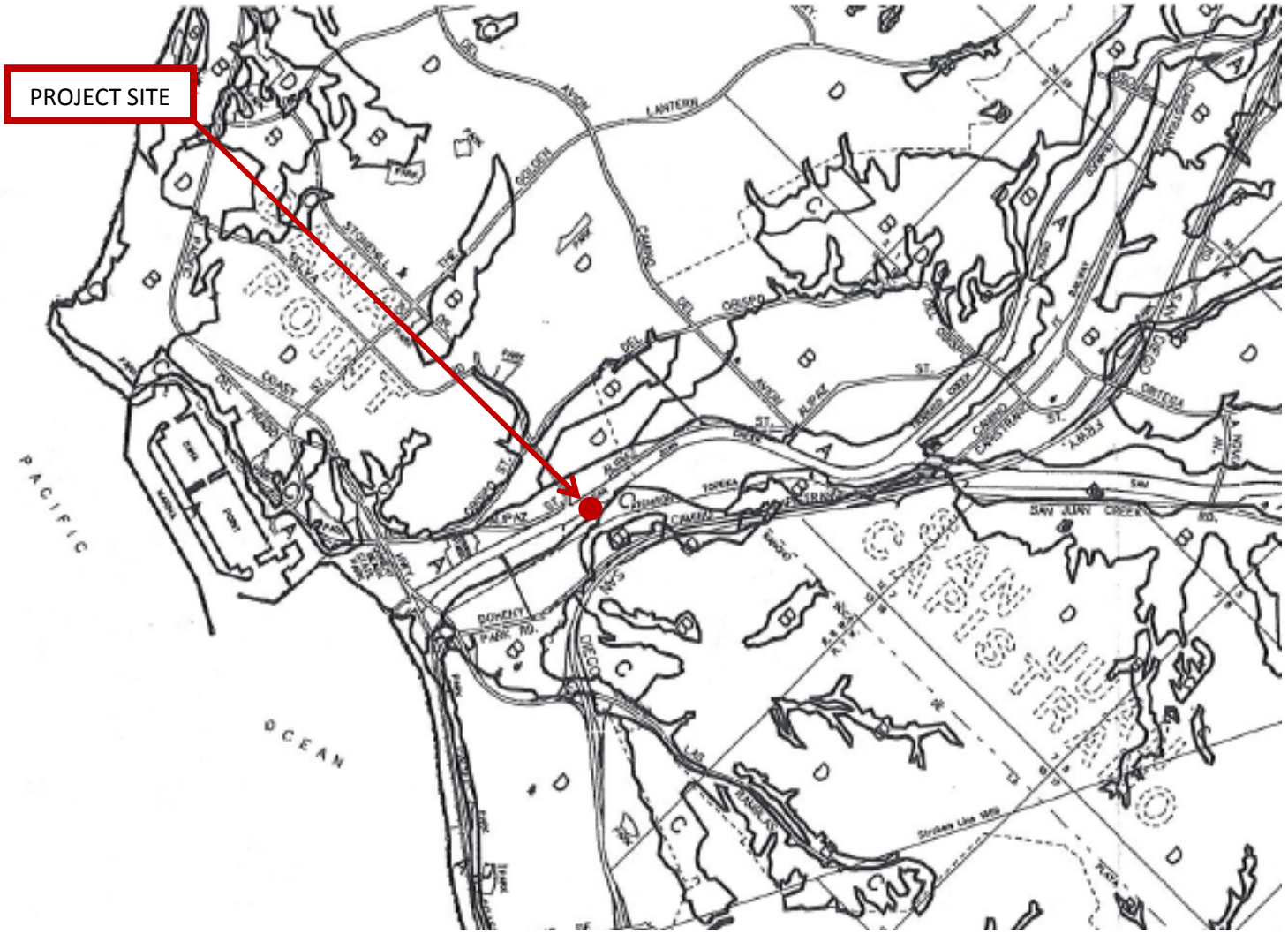
Show Point

DATE **5/31/18**
DRAWN BY KJK
JOB NO. GNH17048
SHEET NO. 1
OF 1 SHEET

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA 92868 (714)935-0265 fax:(714)935-0106

LATITUDE AND LONGITUDE OF PROJECT

PARCEL 1-5, NORTH OF STONEHILL DR., EASTERLY OF SAN JUAN CREEK CHANNEL, WESTERLY OF A.T. & S.F. RAILROAD
SAN JUAN CAPISTRANO, OC, CA



PROJECT SITE IS WITHIN SOIL GROUP TYPE "A" BOUNDARY.

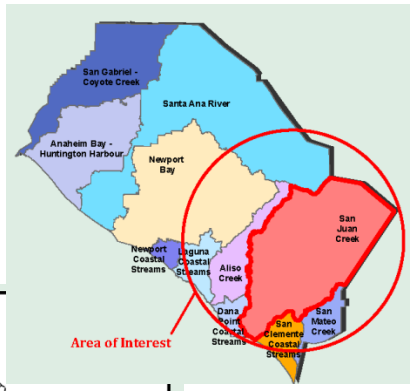
DATE	5/31/18
DRAWN BY	KJK
JOB NO.	GNH17048
SHEET NO.	1
OF 1 SHEET	

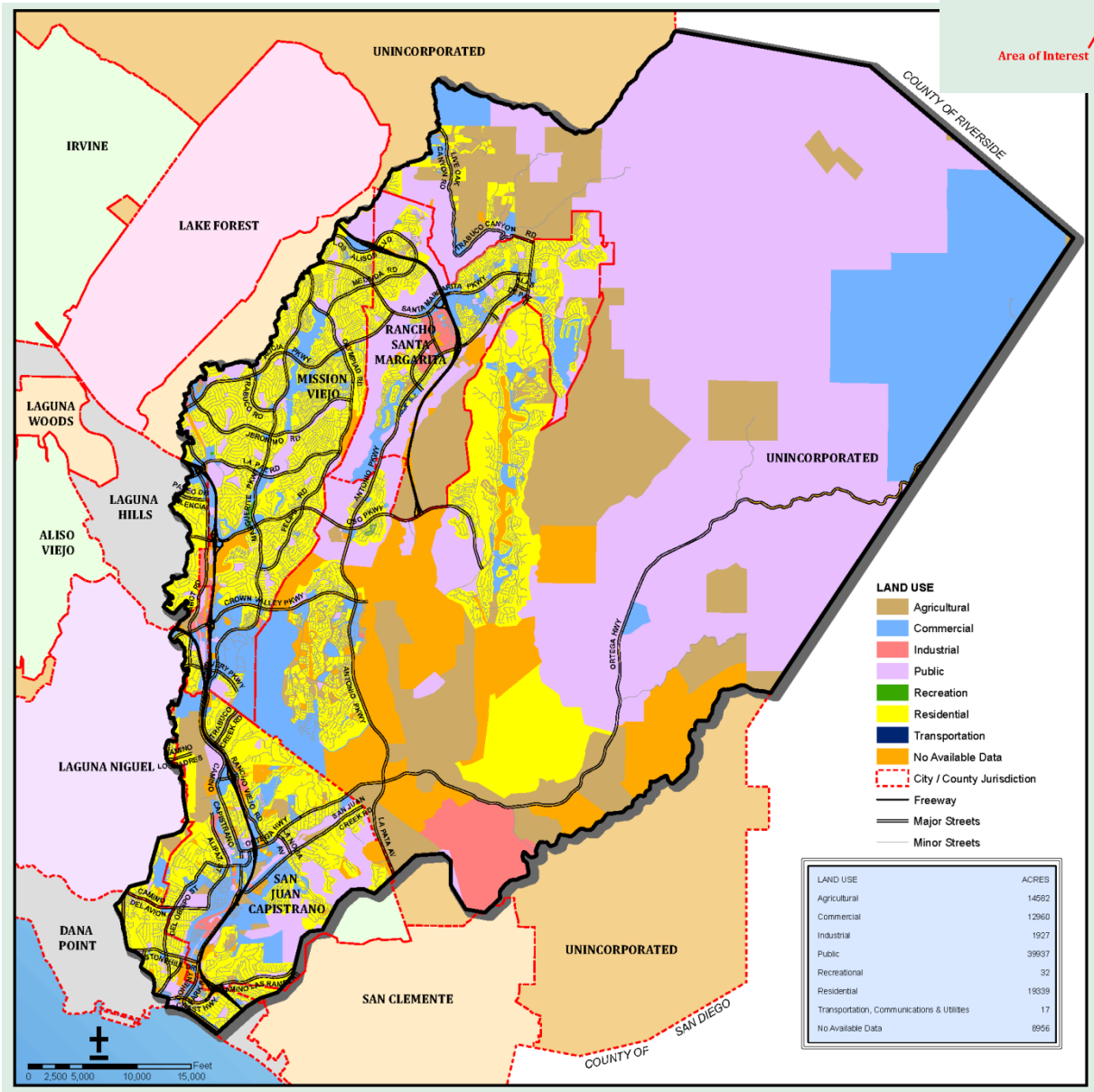
Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA 92868 (714)935-0265 fax:(714)935-0106

SOIL MAP

PARCEL 1-5, NORTH OF STONEHILL DR., EASTERLY OF SAN JUAN CREEK CHANNEL, WESTERLY OF A.T. & S.F. RAILROAD

SAN JUAN CAPISTRANO, OC, CA





LAND USE	ACRES
Agricultural	14582
Commercial	12960
Industrial	1927
Public	39937
Recreational	32
Residential	19339
Transportation, Communications & Utilities	17
No Available Data	8956

WATERSHED: SAN JUAN CREEK

COUNTY OF ORANGE, CALIFORNIA

DESIGNED AND PRODUCED BY:
OC Public Works
GIS Mapping Unit
Philip Pappas

DATA SOURCE:
- Geomatics Land Information Systems Division

The County of Orange and Geomatics/LIS/GIS make no representations or warranties regarding the accuracy of the data from which this map was derived. Neither the County nor Geomatics/LIS/GIS shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

DATE: October 1, 2009

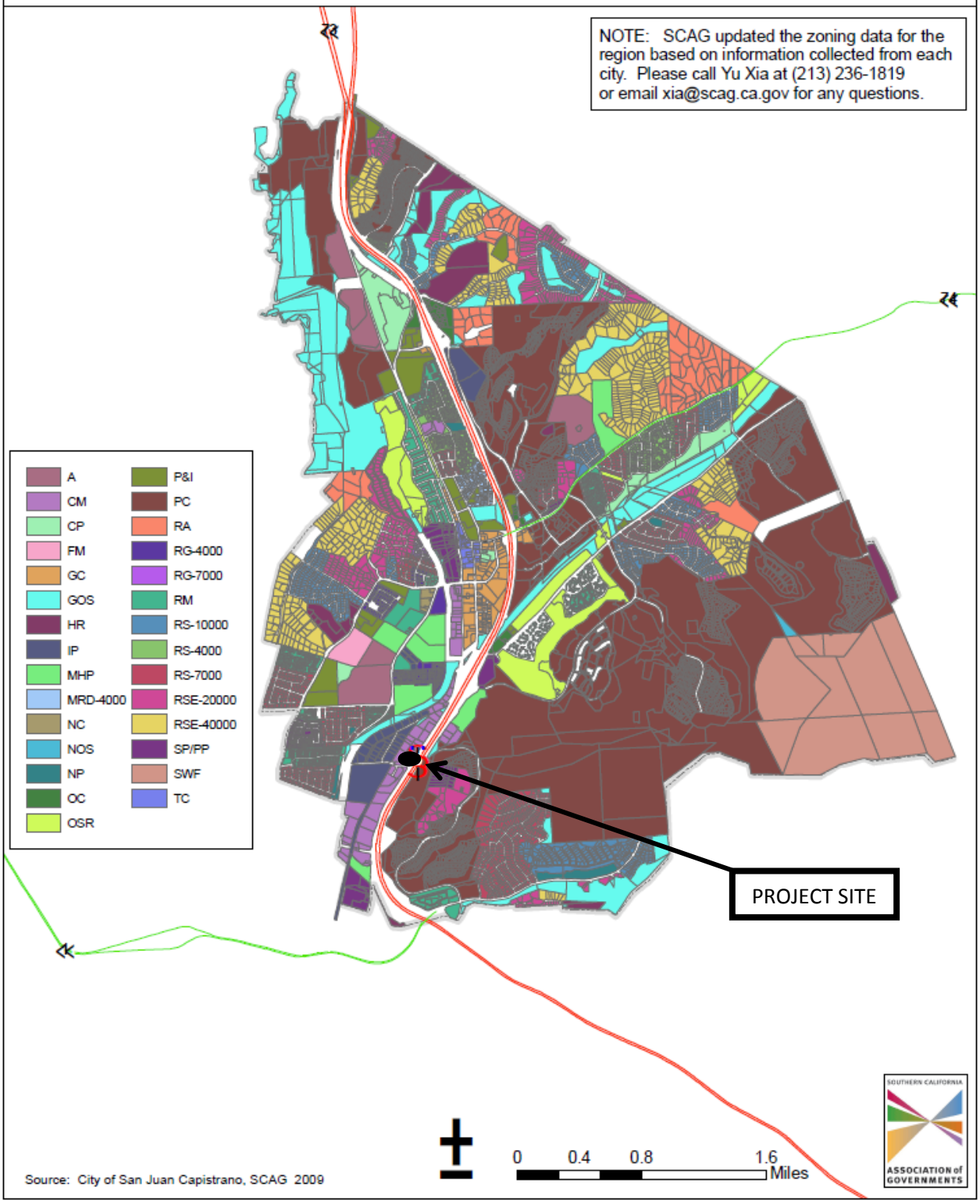
DATE **5/31/18**
DRAWN BY KJK
JOB NO. GNH17048
SHEET NO. 1
OF 1 SHEET

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA 92868 (714)935-0265 fax:(714)935-0106

WATERSHED MAP
PARCEL 1-5, NORTH OF STONEHILL DR., EASTERLY OF SAN JUAN CREEK CHANNEL, WESTERLY OF A.T. & S.F. RAILROAD
SAN JUAN CAPISTRANO, OC, CA

Zoning Map for City of San Juan Capistrano

NOTE: SCAG updated the zoning data for the region based on information collected from each city. Please call Yu Xia at (213) 236-1819 or email xia@scag.ca.gov for any questions.



Source: City of San Juan Capistrano, SCAG 2009

PROJECT SITE IS WITHIN "CM" ZONING AREA

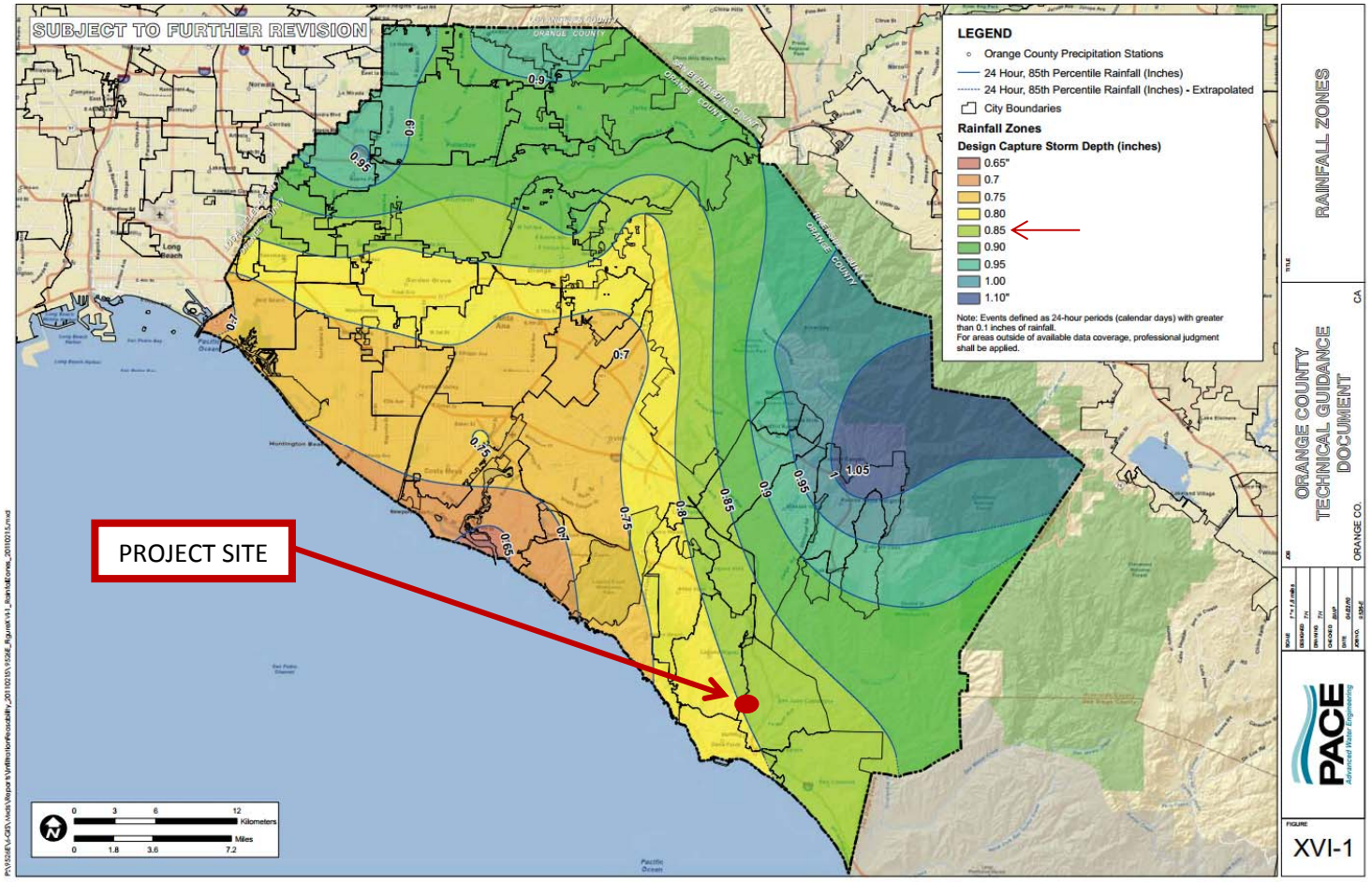
DATE	5/31/18
DRAWN BY	KJK
JOB NO.	GNH17048
SHEET NO.	1
OF 1 SHEET	

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA 92868 (714)935-0265 fax:(714)935-0106

ZONING MAP

PARCEL 1-5, NORTH OF STONEHILL DR., EASTERLY OF SAN JUAN CREEK CHANNEL, WESTERLY OF A.T. & S.F. RAILROAD

SAN JUAN CAPISTRANO, OC, CA



d = 0.85" (INCH)

DATE	09-14-17
DRAWN BY	TONY E
JOB NO.	GNH17048
SHEET NO.	1
	OF 1 SHEET

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA 92868 (714)935-0265 fax:(714)935-0106

RAINFALL ZONES MAP

PARCEL 1-5, NORTH OF STONEHILL DR., EASTERLY OF SAN JUAN CREEK CHANNEL, WESTERLY OF A.T. & S.F. RAILROAD

SAN JUAN CAPISTRANO, OC, CA

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only onward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Evelations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

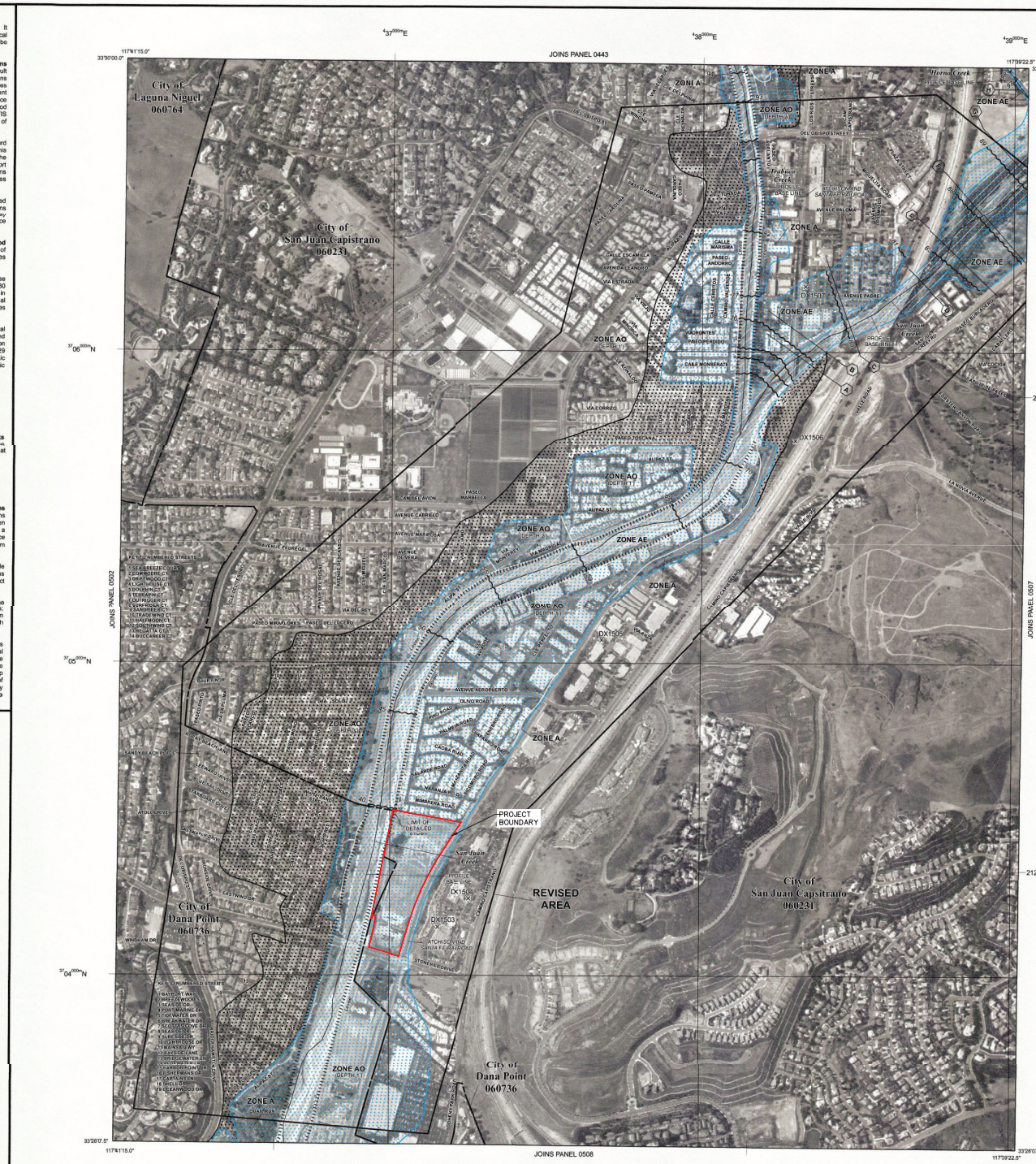
To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov/.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the **FEMA Map Service Center** website at http://msc.fema.gov. Available products may include previously issued Letters ofMap Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Usersmay determine the current map date for each FIRM panel by visiting the **FEMA Map Service Center** website or by calling the FEMA. Map Information eXchange.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A — No Base Flood Elevations determined.
- ZONE AE — Base Flood Elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN — 1000-meter Universal Transverse Mercator grid values, zone 11
- 6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, VI zone (FIPSZONE 0406), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 15, 1989
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 5, 1992

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0506J

FIRM
FLOOD INSURANCE RATE MAP
ORANGE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 506 OF 539
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DANA POINT, CITY OF	060736	0506	J
LAGUNA NIGUEL, CITY OF	060764	0506	J
SAN JUAN CAPISTRANO, CITY OF	060231	0506	J

REVISED TO REFLECT LOMR
EFFECTIVE: February 11, 2013

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06059C0506J

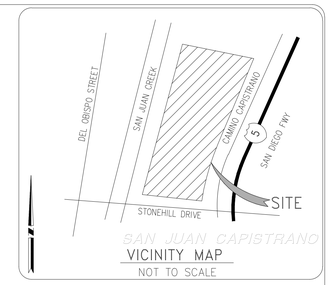
MAP REVISED
DECEMBER 3, 2009

Federal Emergency Management Agency

APPENDIX B – EXHIBITS

50 25 0 50 100 150

SCALE: 1"=50'



VICINITY MAP

NOT TO SCALE

SAN JUAN CREEK

N11°37'09"E 441.59' (N11°36'44"E 441.65' R1)

OUTFALL #1

OUTFALL #2

CULVERT

OVERFLOW SPILLWAY

OVERFLOW SPILLWAY

STONEHILL DRIVE

AT & SF RR

L=510'

L=710'

AMMONSEAN ROAD

POSSIBLE STORM DRAIN OUTLET

CMU RETAINING WALL (TYP.)

A.C. PAVEMENT

A.C. CURB

48" RCP

(2) 48" RCP STORM DRAIN

EXISTING 48" STORM DRAIN

CONCRETE WALL

SIDEWALK

R/W

RR

LEGEND

DRAINAGE BOUNDARY

PROPERTY LINE

PATH OF FLOW

SOIL TYPE "A"

NO.	REVISIONS	DATE

Prepared by:

Joseph C. Truxaw and Associates, Inc.

Civil Engineers and Land Surveyors

265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

HYDROLOGY MAP– EXISTING CONDITION

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL AND WESTERLY OF A.T. & S.F. RAILROAD IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

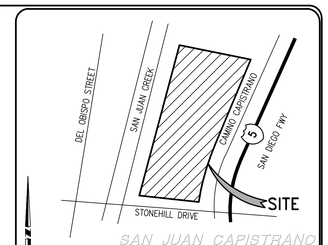
DATE	10/3/2019
DRAWN BY	KJK
CHECKED BY	CDB
JOB NO.	GNH17048
SHEET NO.	1 OF 1 SHEETS

LEGEND

- DMA-A 1.382 — DRAINAGE MANAGEMENT AREA AND ACREAGE
- DRAINAGE BOUNDARY
- DRAINAGE SUB-AREA
- PROPERTY LINE
- PATTERN OF PROPOSED FLOW
- PROPOSED LANDSCAPED AREA (PERVIOUS AREA)
- PROPOSED GRAVEL (PERVIOUS AREA)
- PROPOSED PAVED AREA (IMPERVIOUS AREA)
- PROPOSED IMPERVIOUS AREA (ROOF, PAVING, ETC.)

50 25 0 50 100 150

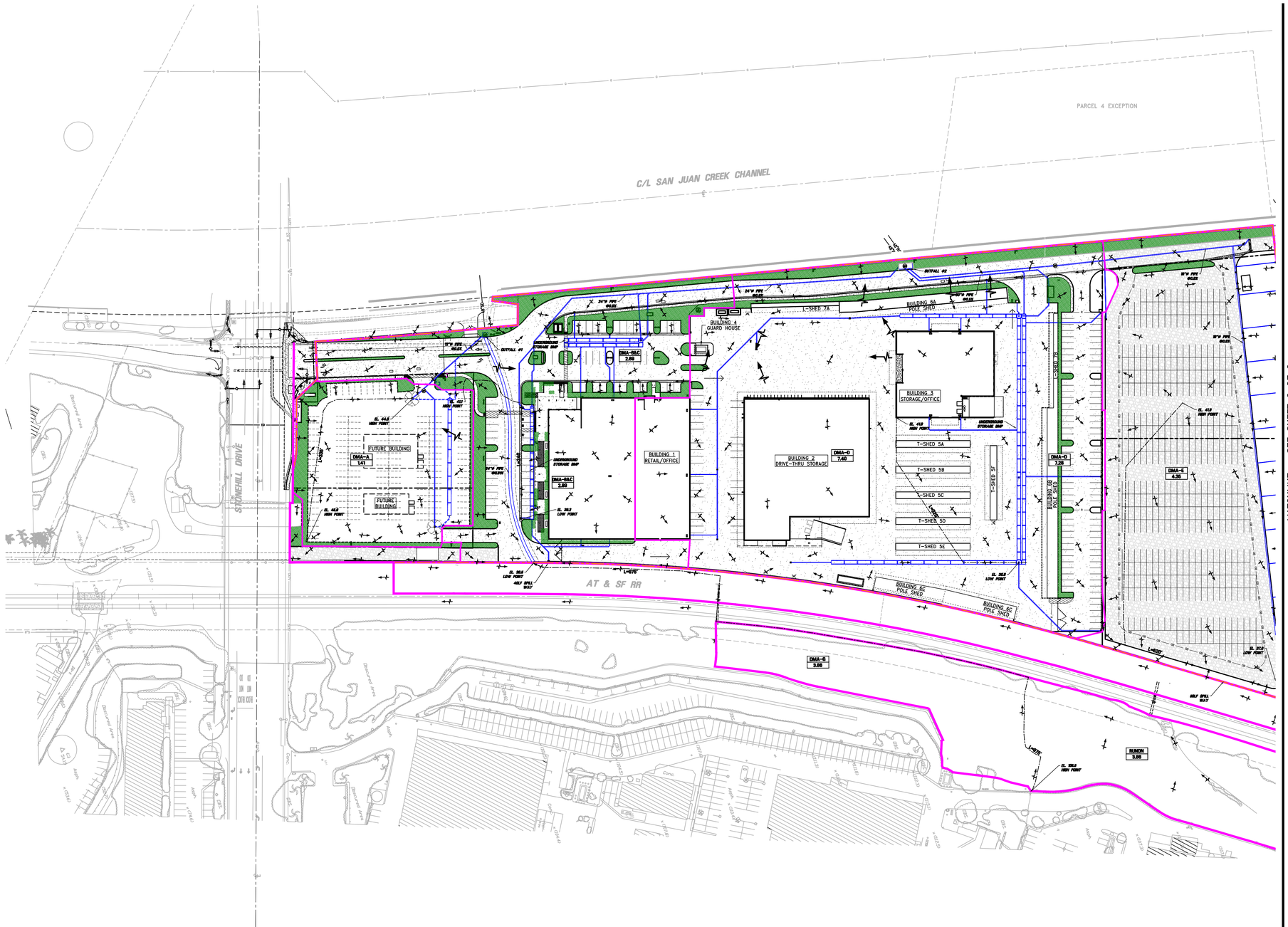
SCALE: 1"=50'



SAN JUAN CAPISTRANO

VICINITY MAP

NOT TO SCALE



Prepared by:

Joseph C. Truxaw and Associates, Inc.

Civil Engineers and Land Surveyors

1915 W. Orangewood Ave., Suite 101, Orange, CA 92868 (714) 935-0265 Truxaw.com

PROPOSED HYDROLOGY EXHIBIT

GANAHL LUMBER - SAN JUAN CAPISTRANO

25865 STONEHILL DRIVE

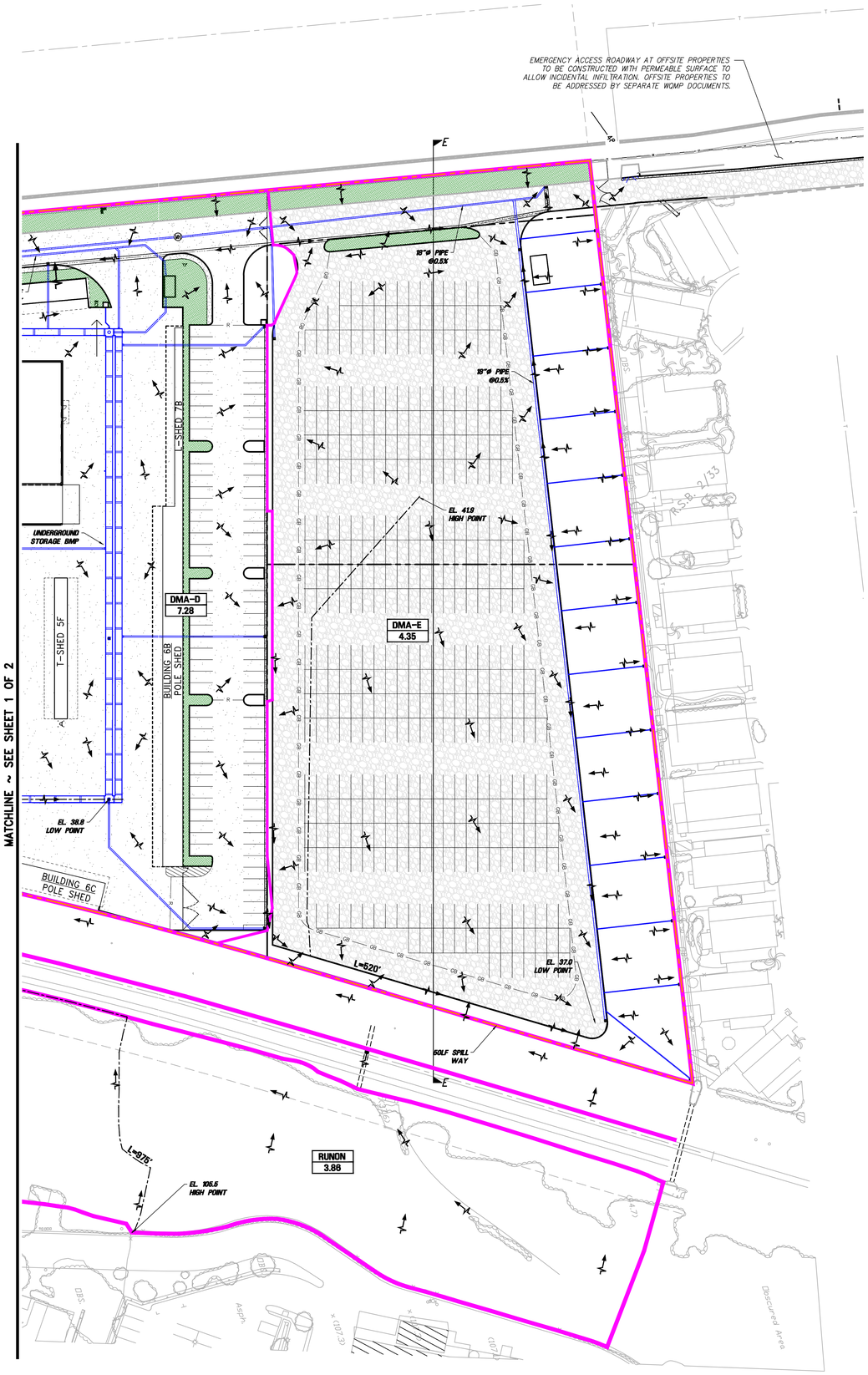
IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

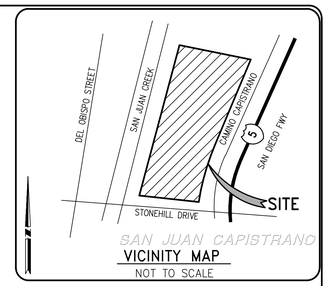
NO.	REVISIONS	DATE

DATE	10/3/2019
DRAWN BY	KJK
CHECKED BY	CDB
JOB NO.	GNH17048
SHEET NO.	1
OF	2 SHEETS

LEGEND

- DMA-A 1.382 — DRAINAGE MANAGEMENT AREA AND ACREAGE
- DRAINAGE BOUNDARY
- DRAINAGE SUB-AREA
- PROPERTY LINE
- PATTERN OF PROPOSED FLOW
- PROPOSED LANDSCAPED AREA (PERVIOUS AREA)
- PROPOSED GRAVEL (PERVIOUS AREA)
- PROPOSED PAVED AREA (IMPERVIOUS AREA)
- PROPOSED IMPERVIOUS AREA (ROOF, PAVING, ETC.)





VICINITY MAP
NOT TO SCALE

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

NO.	REVISIONS	DATE

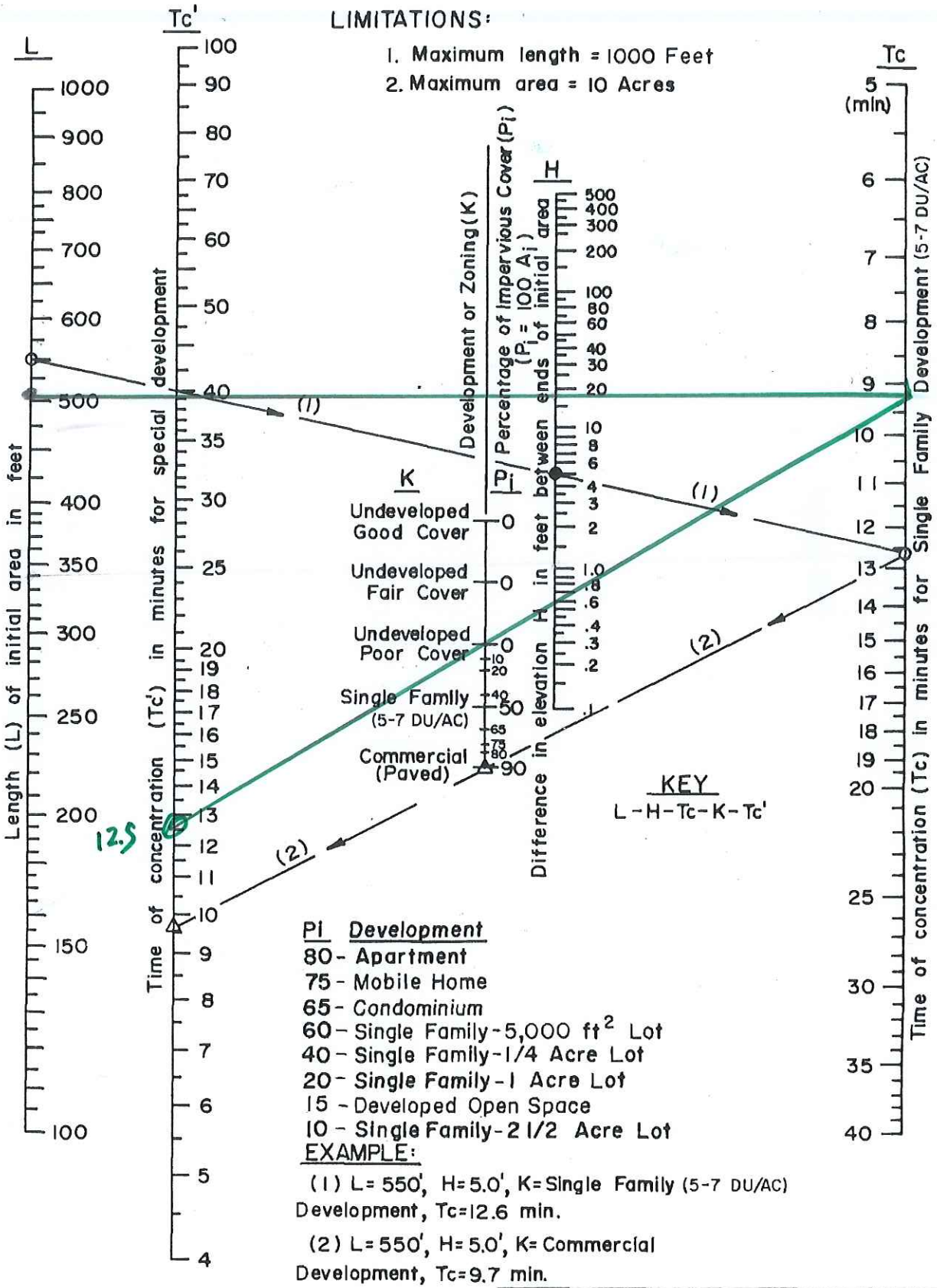
Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
1915 W. Orangewood Ave., Suite 101, Orange, CA 92868 (714) 935-0265 Truxaw.com

PROPOSED HYDROLOGY EXHIBIT

GANAHL LUMBER - SAN JUAN CAPISTRANO
25865 STONEHILL DRIVE
IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	9/13/19
DRAWN BY	KJK
CHECKED BY	CDB
JOB NO.	GNH17048
SHEET NO.	2 OF 2 SHEETS

EX OUTFALL #1

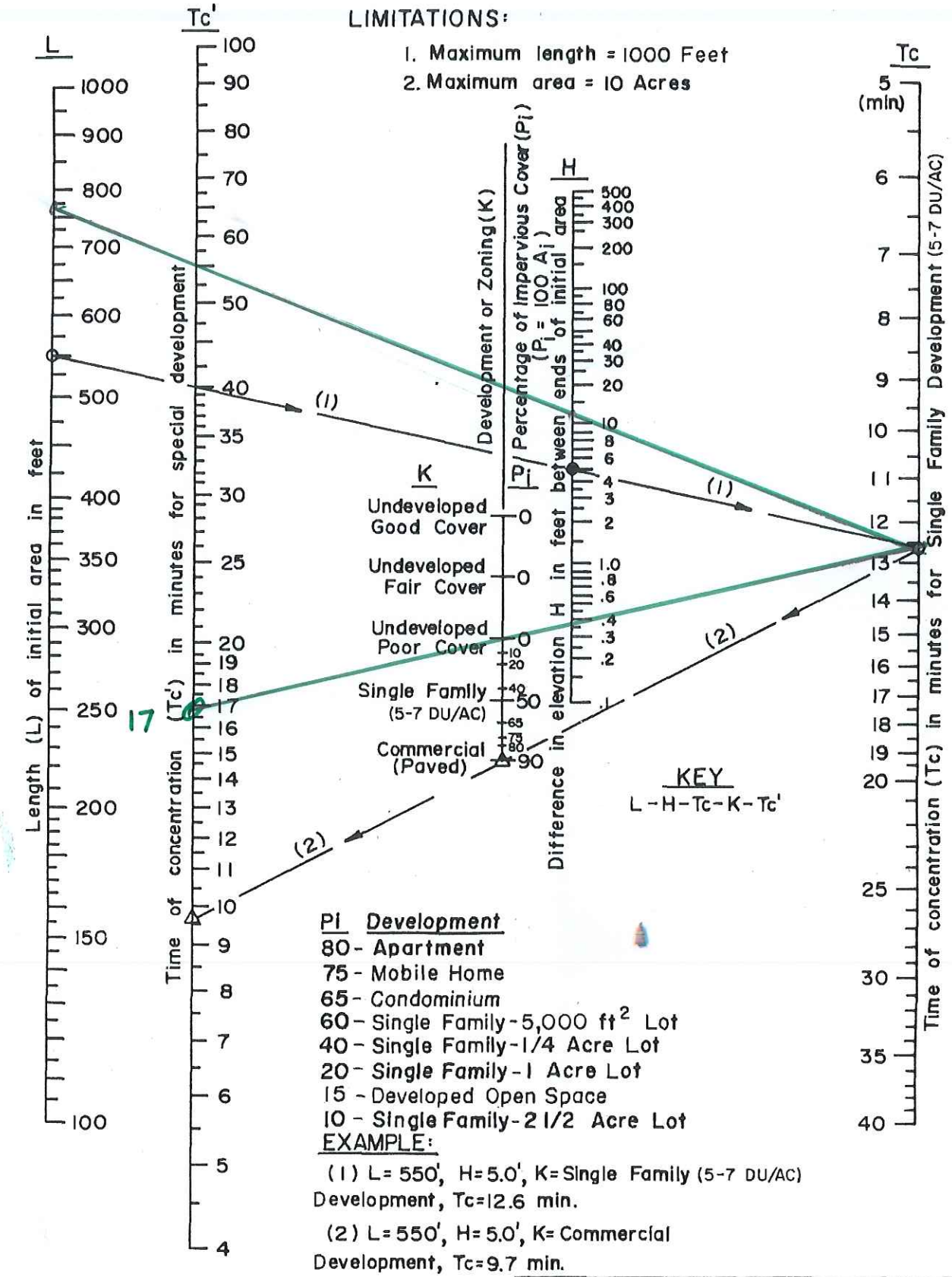


ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

EX OUTFALL # 2

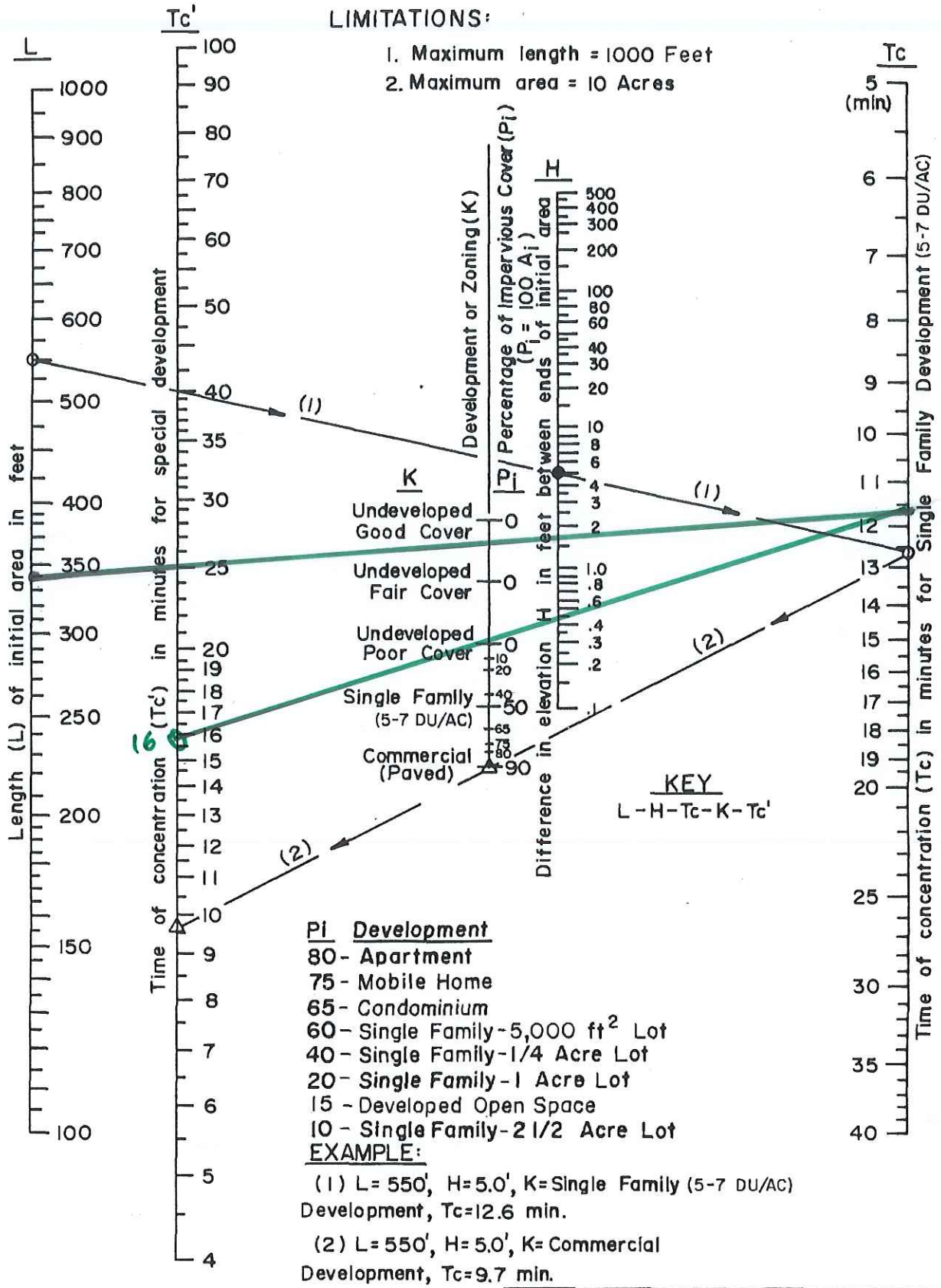


ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

AREA A

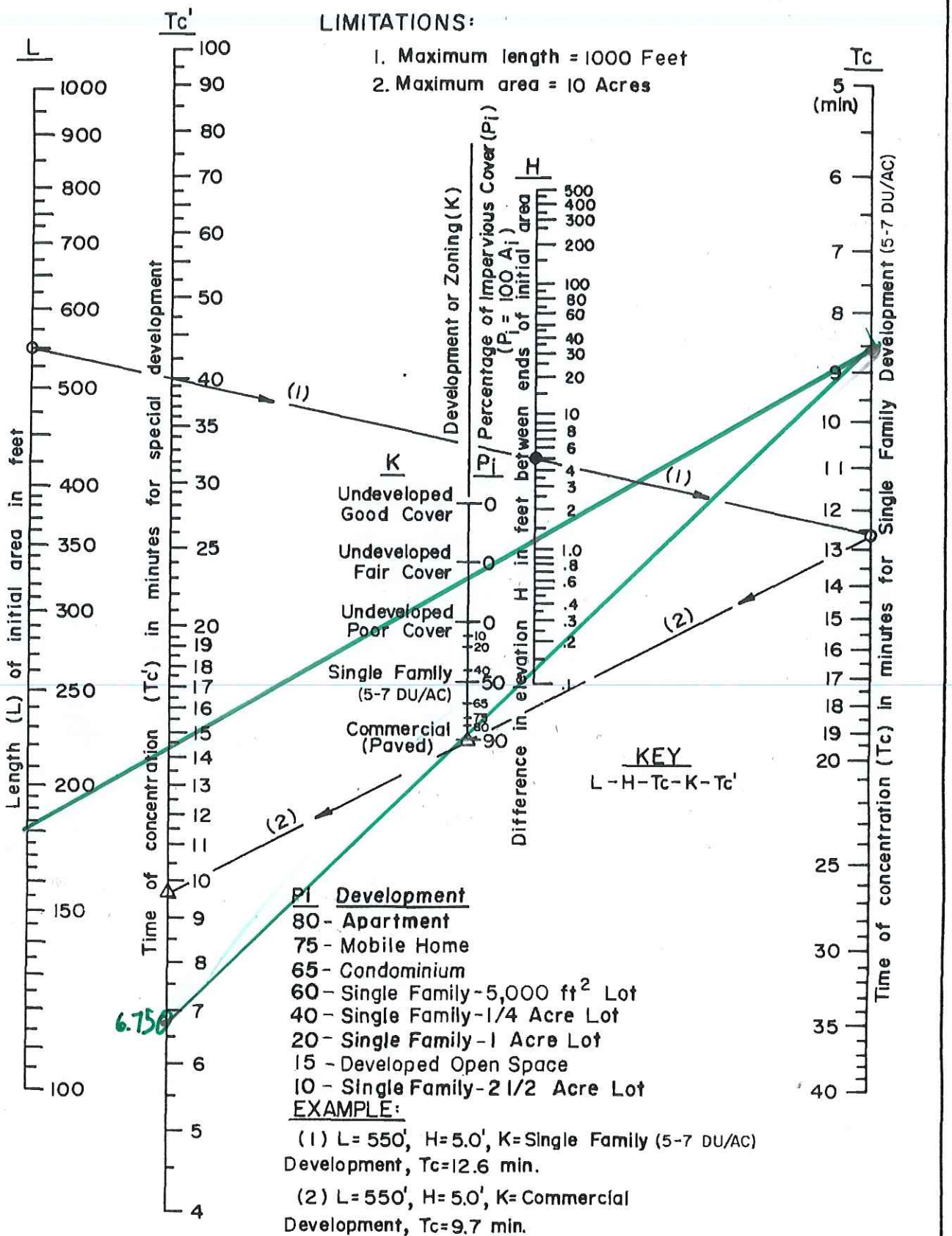


ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

AREA B

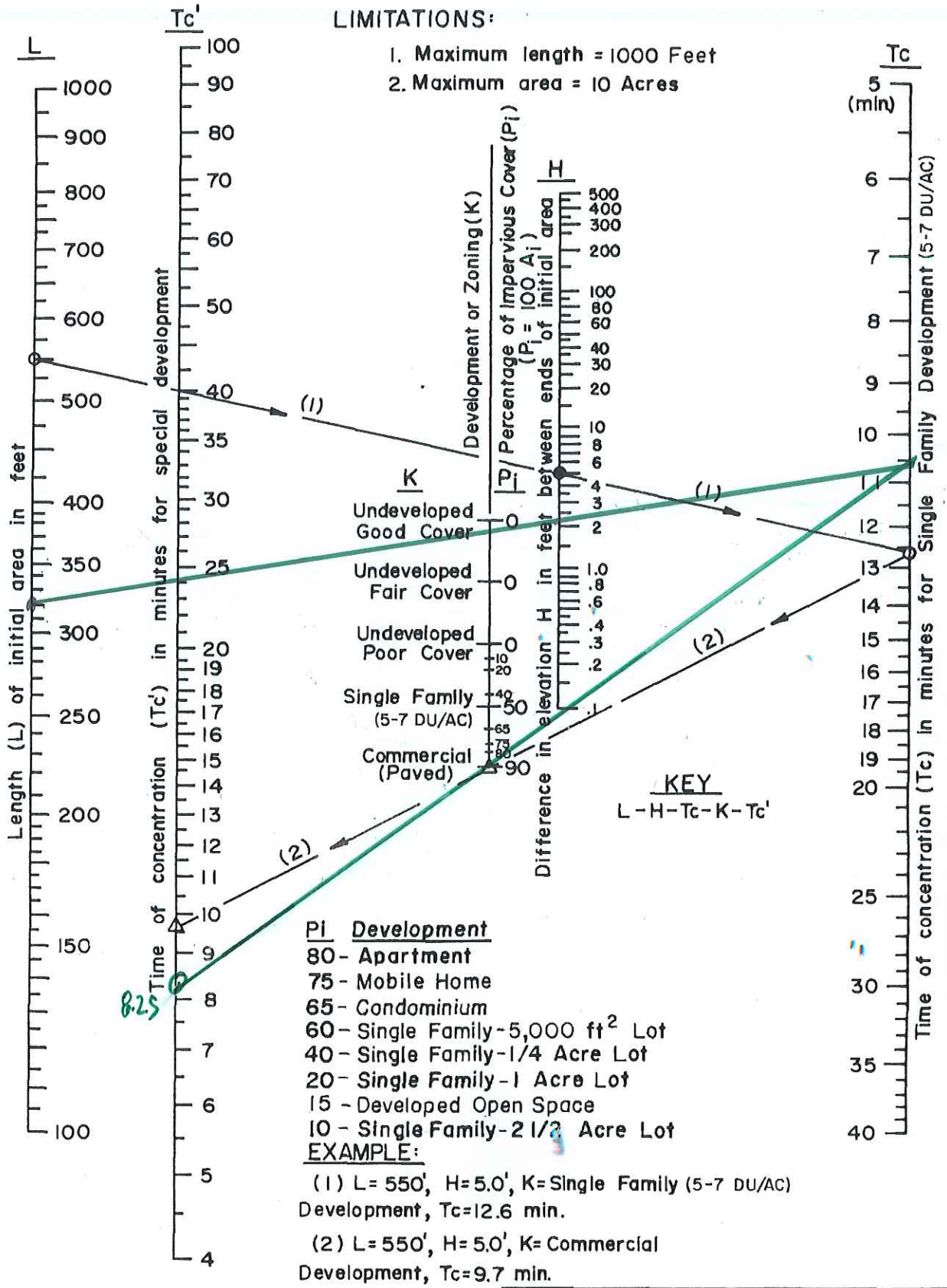


ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

AREA D



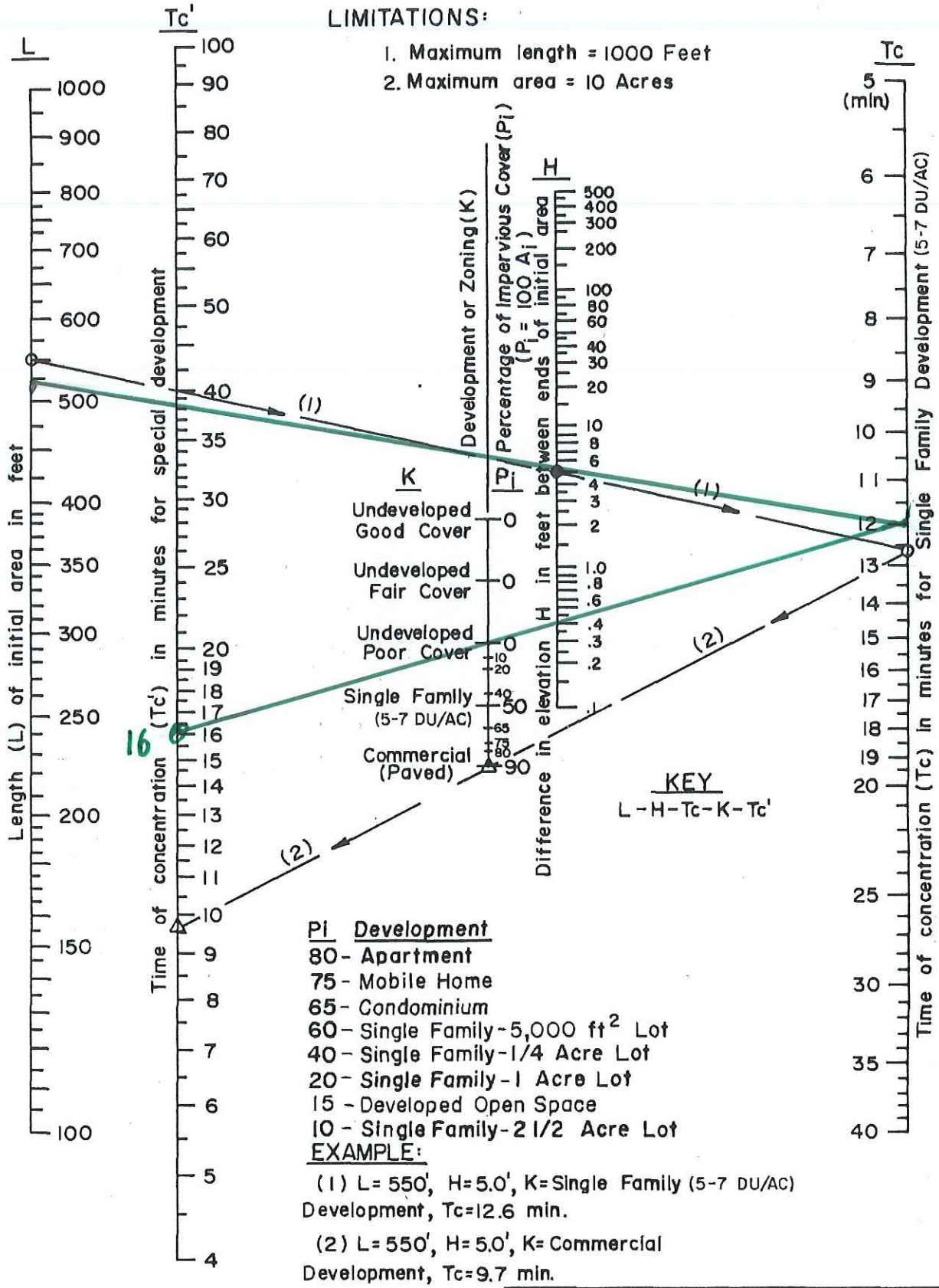
ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

AREA E

AREA E



LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum area = 10 Acres

PI	Development
80	Apartment
75	Mobile Home
65	Condominium
60	Single Family - 5,000 ft^2 Lot
40	Single Family - 1/4 Acre Lot
20	Single Family - 1 Acre Lot
15	Developed Open Space
10	Single Family - 2 1/2 Acre Lot

EXAMPLE:

(1) L = 550', H = 5.0', K = Single Family (5-7 DU/AC) Development, Tc = 12.6 min.

(2) L = 550', H = 5.0', K = Commercial Development, Tc = 9.7 min.

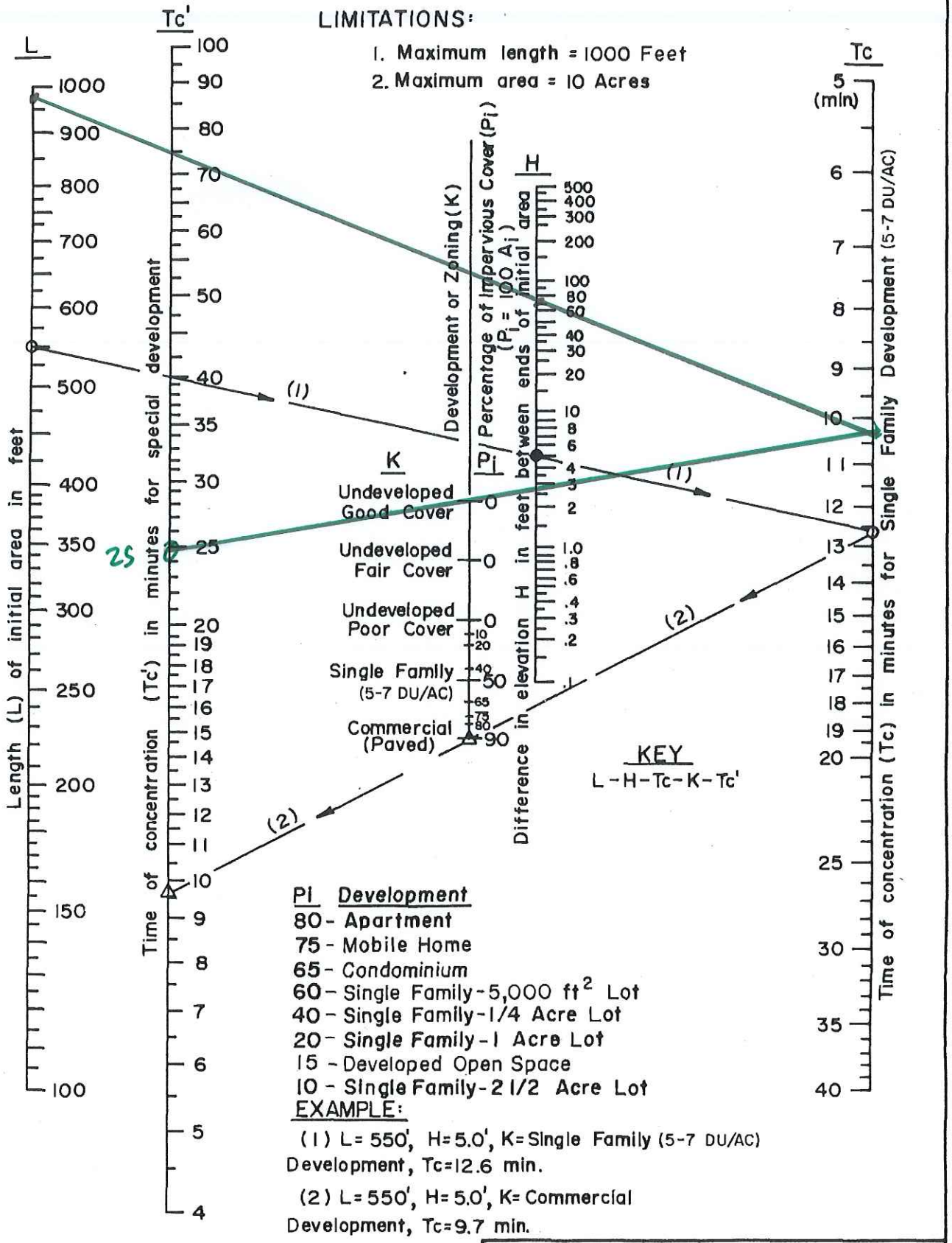
ORANGE COUNTY

HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

AREA G (RUN ON)



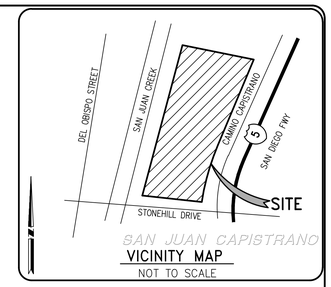
ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

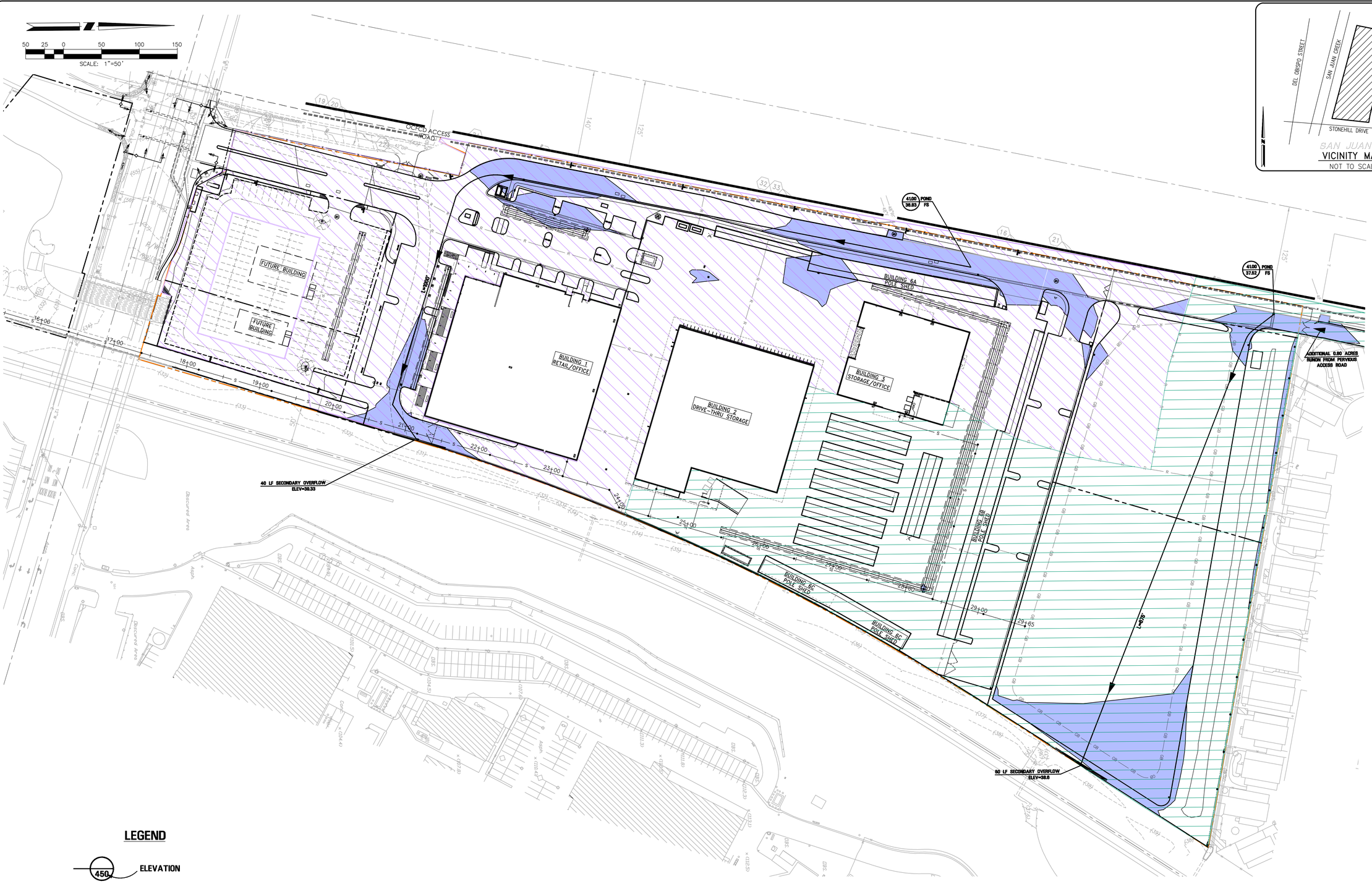
50 25 0 50 100 150

SCALE: 1"=50'



VICINITY MAP

NOT TO SCALE



LEGEND

- 450 — ELEVATION
- FLOW LENGTH
- AREA 1
- AREA 2

DATE

NO.	REVISIONS	DATE

Prepared by:

Joseph C. Truxaw and Associates, Inc.

Civil Engineers and Land Surveyors

1915 W. Orangewood Ave., Suite 101, Orange, CA 92868 (714) 935-0265 Truxaw.com

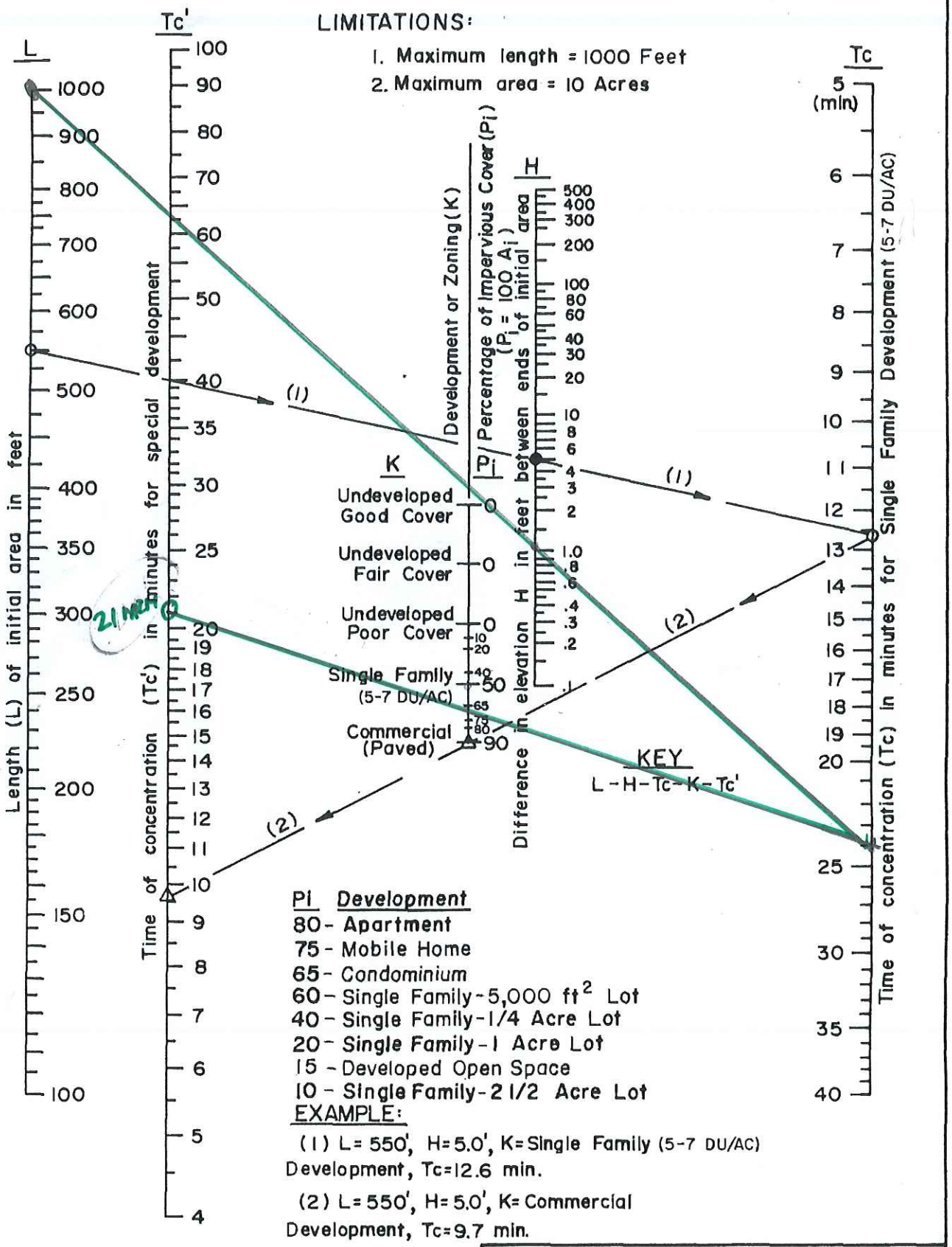
OVERFLOW EXHIBIT

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL AND WESTERLY OF A.T. & S.F. RAILROAD RIGHT-OF-WAY

IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	10/3/2019
DRAWN BY	GI
CHECKED BY	CDB
JOB NO.	GNH17048
SHEET NO.	1
OF	1 SHEETS

OVERFLOW AREA 1

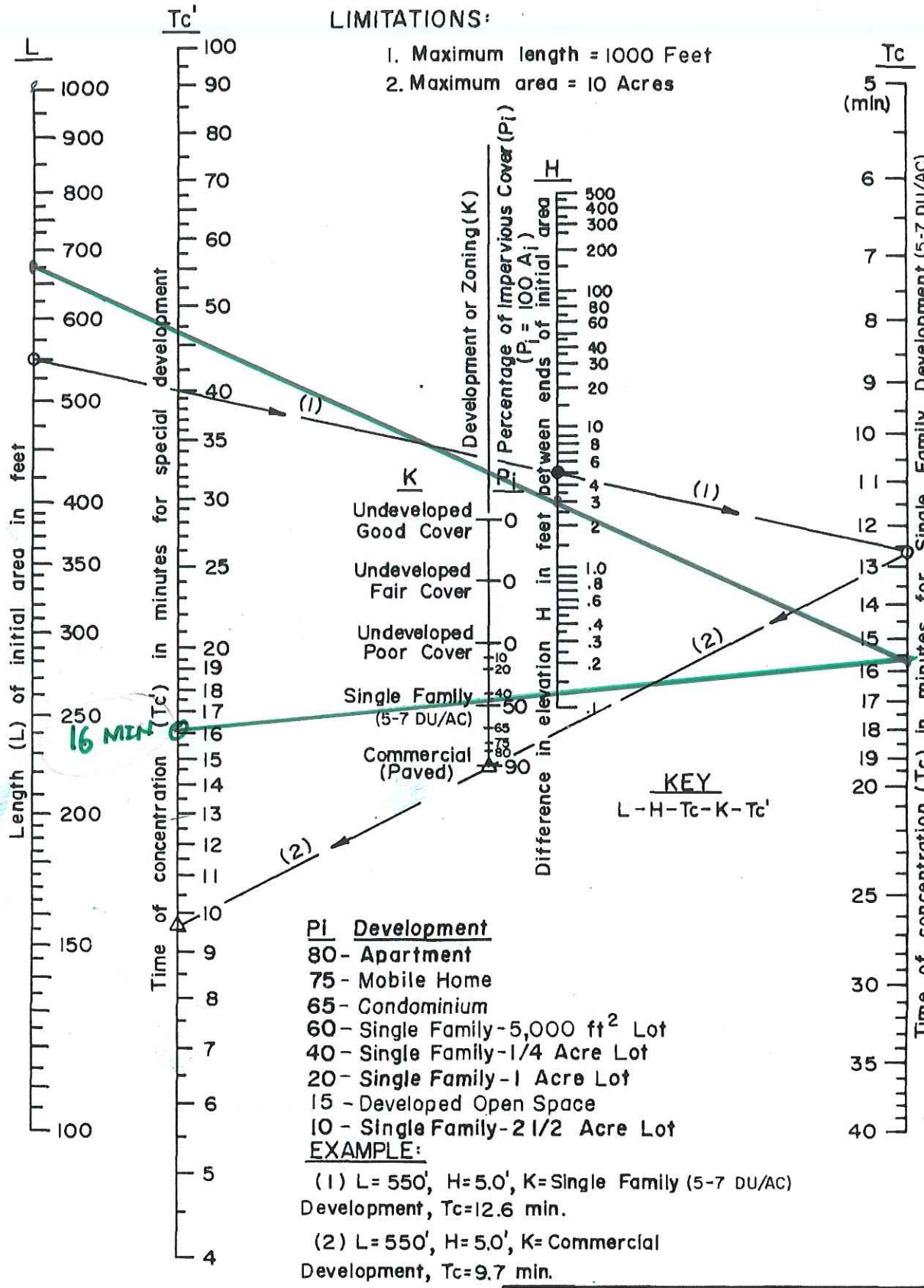


ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

OVERFLOW AREA 2



ORANGE COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

APPENDIX C – REFERENCES

REFERENCE PLANS

WQMP PLOT PLAN

Preliminary Water Quality Management Plan (PWQMP)

Project Name:

Ganahl Lumber – San Juan Capistrano
25865 Stonehill Drive, San Juan Capistrano, CA 92675
Tract No. 18161
APN: 121-253-13, -15 & APN 121-240-39, -73, -76
General Plan Land Use Designation: LU 4.1 Quasi Industrial

Prepared for:

Ganahl Lumber Company

1220 East Ball Road

Anaheim, California 92805

714-772-5444

Prepared by:

Joseph C. Truxaw and Associates, Inc.

Engineer: Kevin Kim

Registration No. 83474

1915 W Orangewood Avenue, Suite 101

Orange, California 92868

714-935-0265

Engineer's Seal



Prepared on:

September 30, 2019

Project Owner's Certification			
Permit/Application No.	TBD	Grading Permit No.	TBD
Tract/Parcel Map No.	18161	Building Permit No.	TBD
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract)			121-253-13, -15 121-240-39, -73, -76

This Preliminary Water Quality Management Plan (PWQMP) has been prepared for Ganahl Lumber Company by Joseph C. Truxaw and Associates, Inc. The PWQMP is intended to comply with the requirements of the local NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the San Diego Region (South Orange County). Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner: Patrick Ganahl			
Title	Construction Manager		
Company	Ganahl Lumber		
Address	1220 East Ball Road, Anaheim, CA 92805		
Email	patrick.ganahl@ganahlconstruction.com		
Telephone #	714-772-5444		
Signature		Date	

Contents

Page No.

Section 1 Discretionary Permit(s) and Water Quality Conditions 1

Section 2 Project Description 2

2.1 General Description 2

2.2 Post Development Drainage Characteristics 3

Section 3 Site & Watershed Characterization 5

3.1 Site Conditions 5

3.1.1 Existing Site Conditions 5

3.1.2 Infiltration-Related Characteristics 6

3.2 Proposed Site Development Activities 7

3.2.1 Overview of Site Development Activities 7

3.2.2 Project Attributes Influencing Stormwater Management 7

3.2.3 Effects on Infiltration and Harvest and Use Feasibility 8

3.3 Receiving Waterbodies 9

3.4 Stormwater Pollutants or Conditions of Concern 9

3.5 Hydrologic Conditions of Concern 10

3.6 Critical Course Sediment Yield Areas 10

Section 4 Site Plan and Drainage Plan 11

4.1 Drainage Management Area Delineation 11

4.2 Overall Site Design BMPs 11

4.3 DMA Characteristics and Site Design BMPs 12

4.3.1 DMA-A 12

4.3.2 DMA-B 13

4.3.3 DMA-C 14

4.3.4 DMA-D 14

4.3.5 DMA-E 15

4.3.6 DMA-F 16

4.3.7 DMA Summary 17

4.4 Source Control BMPs 18

Section 5 Low Impact Development BMPs 20

5.1 LID BMPs in DMA-A, -B, -C, and -D 20

5.1.1 Hydrologic Source Controls for DMA-A, -B, -C, and -D 20

5.1.2 Structural LID BMP for DMA-A, -B, -C, and -D 20

5.2 LID BMPs in DMA-E and -F 20

5.2.1 Hydrologic Source Controls for DMA-E and -F 20

5.2.2 Structural LID BMP for DMA-E and -F 21

5.3 Summary of LID BMPs 21

Section 6 Hydromodification BMPs 23

Section 7 Educational Materials Index 24

Attachment A: Educational Materials

Attachment B: Operations and Maintenance Plan

Attachment C: Calculations

Attachment D: Reference Plans

Attachment E: Exhibit(s)

Attachment F: Conceptual BMP Details

Attachment G: Figures

Attachment H: Geotechnical Report

Section 1 Discretionary Permit(s) and Water Quality Conditions

Project Infomation			
Permit/Application No.	Pending	Site Address or Tract/Parcel Map No.	25865 Stonehill Drive, San Juan Capistrano, CA 92675 Tract No. 18161
Additional Information/ Comments:	The site is part of a tract as described in the legal description of the Topographic and Boundary Survey (See Attachment D). Parcel 1 (APN: 121-253-13), Parcel 2 (APN: 121-253-15), Parcel 3 (APN: 121-240-73), Parcel 4 (APN: 121-240-39), Parcel 5 (APN: 121-240-76)		
Water Quality Conditions			
Water Quality Conditions from prior approvals or applicable watershed-based plans	City of San Juan Capistrano's Water Quality Requirements for Development Projects: • All development/redevelopment projects, regardless of priority, shall implement the site design and source control principles, where applicable and feasible, to maximize infiltration, provide retention, slow runoff, and reduce pollutants at the sources. • All priority projects shall meet Water Quality Management Plan (WQMP) and Hydromodification Management Plan (HMP) requirements as described in the documents. The project's WQMP is a plan for minimizing the adverse effects of urbanization on site hydrology, runoff flow rates and pollutant loads. Hydromodification management measures address the changes in the magnitude and frequency of stream flows and associated sediment load due to urbanization or other changes in the watershed land use and hydrology and the resulting impacts on receiving channels, such as erosion, sedimentation and potentially degradation of in-stream habitat. Per South Orange County Water Quality Improvement Plan dated June 2018, Highest Priority Water Quality Conditions (HPWQCs) for San Juan Creek are: • Unnatural Water Balance/Flow Regime		

Section 2 Project Description

2.1 General Description

<table>
<tr><th colspan="3">Description of Proposed Project</th></tr>
<tr><td>Site Location</td><td colspan="2">Parcels 1-5 North of Stonehill Drive, Easterly of San Juan Creek Channel and Westerly of A.T. & S.F. Railroad as described in the legal description (See the Topographic and Boundary Survey in Attachment D)
New Address: 25865 Stonehill Drive, San Juan Capistrano, CA 92675</td></tr>
<tr><td>Project Area (ft²): 712,489.41</td><td>Number of Dwelling Units: N/A</td><td>SIC Code:
5211 – Lumber and Other Building Materials Dealers
5812 – Eating Places
7521 – Automobile Parking</td></tr>
<tr><td>Narrative Project Description:</td><td colspan="2">Per Section 1.2.4 in the South Orange County TGD dated September 28, 2017, the project meets the criteria of a Priority Project:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

Project consists of an existing undeveloped 5 parcel site. The site is to be subdivided into five new parcels designated as lots (1, 2, 3, 4, and 5) and measures at approximately 17 acres (precisely 16.36 acres per tract map Tentative Tract No. 18161).

Lots 1 and 2 are to be developed separately as a restaurant and/or quick service food and beverage establishment at a later date by the future developer of the lot. The future developer will be required to obtain all necessary development permits at such time. However rough grading will be performed to bring the site ready for construction by the future developer. Development that will be a part of this permit are the landscaped areas that include the transitional slope to join Stonehill Drive, and perimeter planters. For CEQA clearance, future development scenarios were assumed to implement BMPs that would satisfy the WQMP requirements as if the entire site were developed (100% impervious in rough graded areas).

Lot 3 is to be developed as a Ganahl Lumber lumber yard. This parcel is to contain the main retail store and will call warehouse (Building 1), drive through storage shed with attached trash compactor and baler (Building 2), a storage/office building (Building 3), a guard house (Building 4), and outdoor product storage</td></tr>
</table>

	sheds (t-sheds: 5A-5F, pole sheds: 6A-6C, and l-sheds: 7A and 7B). Also proposed is a diesel refueling tank (south of pole shed 6C) and a wind turbine (west of the guard house). Landscaped areas include the raised median of the entry roadway, adjacent to sidewalk along the roadway on the westerly side, the transitional slope from the parcel 1 and 2, Building 1 perimeter planters, and parking lot planters and islands. Lots 4 and 5 are to be developed into parking and vehicle storage at a later date as leased property to the adjacent automobile dealerships. Landscaped areas include the berm at the northerly side of the lot, the perimeter planters, and barrier island adjacent to the roadway in Lot 3 on the westerly side. The access point at the northwest end of the site will be for an emergency access roadway for offsite properties to get onto Stonehill Drive. This roadway will not be owned and maintained by this WQMP's developer/owner and will be addressed by a separate WQMP document under a separate permit.			
Project Area	Pervious		Impervious	
	Area (acres or sq ft)	Percentage	Area (acres or sq ft)	Percentage
Pre-Project Conditions	16.28 acres	99.51%	0.08 acres	0.49%
Post-Project Conditions	5.55 acres	33.92%	10.81 acres	66.08%

2.2 Post Development Drainage Characteristics

The site drainage systems will maintain the existing drainage pattern and convey stormwater runoff from east to west towards San Juan Creek channel. On-site drainage up to the volume required per WQMP requirements will be retained and biofiltered on-site via underground proprietary treatment units. Existing off-site drainage from the adjacent hillside and railroad right-of-way that runs onto the project site will be conveyed via an underground storm drain pipe that will have a dedicated easement to the City. The existing off-site drainage will not be mitigated by the proprietary treatment units and will be bypassed to discharge directly into the San Juan Creek channel via a junction structure that will connect to an existing storm drain outfall (see below).

Two junction structures on-site will serve as the confluence of stormwater runoff conveyed by the underground storm drain systems before being discharged into San Juan Creek. A junction structure at the southwesterly edge of the site will converge flows for the off-site drainage and high flows of DMA-A. A junction structure located slightly north from the midwesterly edge of the site will converge high flows for the DMA-B, C, D, and E. Each junction structure will connect to an existing storm drain pipe that outfalls to San Juan Creek. San Juan Creek channel flows directly into the Pacific Ocean at Doheny State Beach in Dana Point.

DMA F, which will serve as the emergency access roadway for the offsite properties to the south, will generally drain southerly towards Stonehill Drive which mimics the existing drainage pattern. A small portion of the roadway will split drainage northerly via a ridgeline. Excess runoff will overflow and drain into a trench drain where it will be connected to the offsite bypass storm drain where it will be conveyed towards the junction structure that connects to an existing storm drain outfall.

2.3 Property Ownership / Management

The property owner is currently the City of San Juan Capistrano. Ganahl Lumber Company is in the process of acquiring the property from the City.

The property will be privately owned and does not have an owner's association. The owner will be responsible for the long term maintenance of the project's stormwater facilities.

Section 3 Site & Watershed Characterization

3.1 Site Conditions

3.1.1 Existing Site Conditions

A majority of the existing site is undeveloped with the exception of the asphalt concrete drive entrance from Stonehill Drive into the property and imported fills providing elevated level satellite parking for the car dealerships located easterly of A.T. & S.F. railroad. A chainlink fence surrounds the parking areas. Pervious covers include landscaping consisting of brush, shrubs, small trees, bushes, well graded gravel, and bare soil. Slopes on the site range from very steep (>15%) at the transitions to the elevated parking surfaces to very flat (<2%) around the rest of the site. Elevations range from a low of 26 feet to a high of 49 feet. The existing drainage pattern is from east to west where it is conveyed via sheet flow and discharged into San Juan Creek channel via outfalls.

A significant portion of offsite run-on from the A.T. & S.F. railroad and the adjacent hillside is bypassed through the property via storm drain culvert and natural swales where it is discharged into San Juan Creek channel Multiple storm drain outfalls provide discharge of the onsite and offsite runoff into San Juan Creek channel. San Juan Creek channel flows directly into the Pacific Ocean at Doheny State Beach in Dana Point. See "Hydrology Map – Existing Condition" in Attachment E for storm drain culvert and outfall locations.

San Juan Creek is identified as an environmentally sensitive area (ESA) due to being a Clean Water Act 303(d) listed pollutant impaired water body. Appropriate TMDLs for pollutants are currently in development and have future completion dates anticipated. See Section 3.3 for more information.

The subject site is underlain by soil group type "A" soils (see soil map in this report) and is located in San Juan Creek Watershed (see watershed map in this report). In addition, based on the updated geotechnical investigation report dated November 5, 2018 and conducted by Willdan Engineering Geotechnical Group, the site contains significant areas where artificial fill materials have been deposited. This fill has been identified as silty sand, poorly graded sand by AMEC (2009).

The current site is located in flood hazard "Zone AO-Flood depth of 1 foot" as identified by FEMA Flood Insurance Rate Map (FIRM) and is subject to inundation. As coordinated with the City, buildings to be protected from potential flooding shall have finished floors set to a minimum grade of 41. A CLOMR-F has been prepared by a separate consultant (JLC Engineering), accepted by the City, and is currently under review by FEMA for approval. Bringing the site to this minimum grade will require substantial engineered fill to be imported and deem the site infeasible for full infiltration of stormwater.

Existing Land Uses

Land Use Description	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Imperviousness (%)
Parking Lot (Gravel)	1.9	0	1.9	0
Landscaping (Shrubs)	7.7	0	7.7	0
Graded Slope (Gravel)	0.7	0	0.7	0
Drive Entrance (AC)	0.1	0.1	0	100

Dirt Roads, Swales, and Parking Lot (Bare)	6.0	0	6.0	0
Total	16.4	0.1	16.3	0.5

3.1.2 Infiltration-Related Characteristics

3.1.2.1 Hydrogeologic Conditions

Per document, Update Geotechnical Investigation Report & Response to Third Party Review dated November 5, 2018, by Willdan Engineering Geotechnical Group, groundwater was encountered at depths ranging from 18 to 22 feet at boring locations. The final site subsurface conditions will consist of up to 20 feet of fill underlain by alluvial deposits with groundwater at bottom of fill or less than 5 feet below the engineered fill.

3.1.2.2 Soil and Geologic Infiltration Characteristics

Per Appendix N.1 Countywide Precipitation and Infiltration Feasibility Exhibits, Figure XVI-2a of the South Orange County WQMP TGD, the predominant soil type is "A". Per USDA Natural Resources Conservation Service (NRCS), the expected soil infiltration rate for the characteristics of this soil type is >0.8 inches/hour which exceeds the minimum requirement of 0.3 inches/hour deemed as feasible for full infiltration by the County. It is important to note that this is only applicable to existing site in its current state. The site will be required to be overexacavated, recompacted, and fill imported in order to support the proposed structures. Once the proposed site is brought to the design grades, it is the opinion of the geotechnical engineer that the site will be infeasible for infiltration due to the geologic nature of the underlying soils.

Per document, Update Geotechnical Investigation Report & Response to Third Party Review dated November 5, 2018, by Willdan Engineering Geotechnical Group, the site area is primarily comprised of estuarine deposits from the San Juan Creek floodplain and artificial fill materials.

Bedrock was not encountered in any of the sample borings up to 81.5 feet in depth per the geotechnical investigation report.

3.1.2.3 Geotechnical Conditions

Per document, Update Geotechnical Investigation Report & Response to Third Party Review dated November 5, 2018, by Willdan Engineering Geotechnical Group, the site is in State of California designated Liquefaction Hazard Zones, Dana Point Quadrangle (CDMG 2001). The liquefaction potential was analyzed using the CPT data and the computer program CLiq 1.7. The results of the analyses indicate that sand and sandy silt layers within the alluvial deposits are likely to liquefy during an earthquake, generating ground deformation and settlement via shear strength loss.

3.1.2.4 Summary of Infiltration Opportunities and Constraints of Existing Site

Due to the presence of undocumented artificial fills, liquefaction potential, and remediation measures required for feasibility of construction of the new development, it is by professional opinion of Willdan Geotechnical Engineering Group, that the site is unfeasible for infiltration. However, the construction of the offsite north emergency access roadway (under separate permit) at the northwest end of the site, the vehicle storage/parking area in Lot 4 & 5 (DMA-E), south emergency access roadway at the southeast end of the site, and a portion of the westerly roadway in Lot 3 (DMA-F) will propose to allow for incidental infiltration via permeable surfaces (pervious AC and gravel) throughout its footprint. This is deemed acceptable for localized areas that are self-retaining as defined in the HSC-6 of the South Orange County WQMP TGD and mimics the existing unpaved condition. Although the site is subject to liquefaction during an earthquake, this only applies to existing soils

with shallow groundwater. In the proposed condition, the extensive overexcavation of the underlying soils and import fill will raise the site considerably, reinforce the subgrade, and minimize/eliminate any effects of liquefaction. See "Addendum Report for Stormwater Infiltration Recommendations, Proposed Ganahl Lumber Facility Development, San Juan Capistrano, California Willdan Geotechnical Project No. 108164-2000" in Attachment H.

3.2 Proposed Site Development Activities

3.2.1 Overview of Site Development Activities

The site will be developed for commercial and industrial uses for Ganahl Lumber hardware store/lumber yard, dealership vehicle parking, and a future drive-thru restaurant.

Surfaces will include both impervious and pervious covers. Impervious covers will consist of building roofs, portland cement concrete pavement for the lumber yard, asphalt concrete pavement for the main access roadway and parking lots. Pervious covers will consist of urban landscaping, gravel for the self-storage, dealership vehicle parking, and pervious AC paving for the emergency access roadway. The proposed development will be physically separated from adjacent parcels through retaining walls. Ingress and egress of the site will be the only means of access to adjacent parcels.

Activities that will be routinely conducted outdoors will include vehicle traffic for parking and material pickup/delivery/transport, pedestrian traffic for navigating between the different buildings/sheds, diesel engine refueling, trash compacting, and material baling. Landscape maintenance and irrigation will also be routinely performed.

3.2.2 Project Attributes Influencing Stormwater Management

The project will be classified under various SICs, 5211 – Lumber and Other Building Materials Dealers, 5812 – Eating Places, and 7521 – Automobile Parking. Materials and products to be used on site include manufactured lumber, heavy machinery, and food products. Wastes to be generated include trash and debris from the materials and products used on site as well as from stocking the Ganahl Lumber store and future food establishment.

Delivery areas will mainly be concentrated at the Ganahl Lumber store for will call and pick-up of customers' orders as well as for restocking and delivery of new products. The store's loading docks will be contained indoors with an impervious roof cover. This will eliminate any wastes generated from this area to be cross contaminated with the site stormwater runoff.

Although the development will provide vehicle parking and storage, there will be no cleaning or maintenance areas on site. Chemicals, oils, and grease, generated from such activities will not be a concern. However, a fueling area for delivery trucks will be present onsite. This will be located just south of pole shed building 6C. BMPs that will be implemented include but are not limited to spill prevention and cleanup education and routine fuel tank inspection for the fueling area to ensure proper operation and avoid any hazardous wastes that can be generated as a result.

Landscaping will be proposed throughout the site to reduce runoff volume generated. This includes all steep slopes and berm located in parcels 4 and 5. Landscape will be drought tolerant type and of medium to very-low water usage. Any non-beneficial use areas of the site will be landscaped to keep the existing pervious site characteristics as much as possible.

Existing drainage patterns will be preserved which is east to west. There are 2 main outfalls on the site that discharge to San Juan Creek. The single 48-inch diameter outfall will discharge a smaller tributary area that includes parcels 1, 2 and offsite drainage. The dual 48-inch diameter outfall will be the source of discharge for the remainder of the site.

Parcels 1 and 2 are to be developed separately as a restaurant and/or quick service food and beverage establishment at a later date by the future purchaser of the lot. Parcel 3 is to be developed as a Ganahl Lumber store and lumber yard. This parcel is to contain the main retail store and will call warehouse (building 1), drive through product shed with attached trash compactor and baler (building 2), pole sheds for storage of product (building 3), a guard house for monitoring access to the lumber yard (building 4), outdoor product storage sheds (t-sheds: 5A-5F, pole sheds: 6A-6C, and l-sheds: 7A and 7B), a fuel station, and the access roadway that run from the dedicated access limits at the south to the property limits at the north. Parcels 4 and 5 are to be developed into parking and vehicle storage at a later date as leased property to the adjacent automobile dealerships. The offsite emergency access roadways proposed to connect to the site at the northwest and southeast end will be constructed under a separate plan and permit.

The project surface composition will be 5.55 acres pervious and 10.81 acres impervious. Impervious land covers include asphalt pavement for the roadways and parking lots, concrete pavement for sidewalks and walkways, and the building roof for parcels 1 through 3. Pervious land covers include landscaping and vegetated slopes for all parcels and crushed gravel for the parking lot serving parcels 4 and 5. In addition, the surface cover for the offsite emergency access roadways are proposed to be pervious AC paving and will act as a self-treating area due to sufficient storage volume.

Proposed Land Uses

Land Use Description	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Imperviousness (%)
Building	3.11	3.11	0	100
Site Paving	7.70	7.70	0	100
Landscaping	2.27	0	2.27	0
Gravel Parking Lot/Pervious AC Roadways	3.28	0	3.28	0
Total	16.36	10.81	5.55	66.07

3.2.3 Effects on Infiltration and Harvest and Use Feasibility

The proposed development of the site will affect the infiltration characteristics of the site dramatically due to remediation measures required prior to construction. It is by professional opinion of the geotechnical engineer, Willdan Geotechnical Engineering Group, that remediation measures will make the site infeasible for infiltration.

Harvest and use was considered for this project and found to be infeasible due to low landscape to impervious area ratio as illustrated on Worksheet 10 in Attachment C.

3.3 Receiving Waterbodies

Two junction structures on-site will serve as the confluence of stormwater runoff conveyed by the underground storm drain systems before being discharged into San Juan Creek. San Juan Creek channel flows directly into the Pacific Ocean at Doheny State Beach in Dana Point.

San Juan Creek is identified as an ESA due to being a Clean Water Act 303(d) listed impaired water body and is listed in the 2014 and 2016 303(d) List of Impaired Waters as type Category 5. In 2010, TMDLs were adopted by the San Diego Regional Water Quality Control Board for Indicator Bacteria and must be satisfied by December 2019 [Source: *Revised Bacteria TMDLs Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) & South Orange County Watershed Management Area – IRWM Plan*]. The water body is also impaired by the following pollutants which require a TMDL but have not yet been completed. [() indicates proposed year of TMDL completion]:

- Benthic Community Effects (2025)
- Cadmium (2025)
- Copper (2025)
- DDE (2019)
- Nickel (2025)
- Nitrogen (2021)
- Nitrogen, ammonia (2025)
- Oxygen, Dissolved (2029)
- Phosphorus (2021)
- Selenium (2021)
- Toxicity (2021)

3.4 Stormwater Pollutants or Conditions of Concern

Pollutants or Conditions of Concern

Pollutant	Expected from Proposed Land Uses/Activities (Yes or No)	Receiving Waterbody Impaired (Yes or No)	Priority Pollutant from WQIP or other Water Quality Condition? (Yes or No)	**Pollutant of Concern (Primary, Other, or No)**
Suspended-Solids	Yes	No	Yes	Primary
Nutrients	Yes	Yes	Yes	Primary
Heavy Metals	Yes	Yes	No	Primary
Bacteria/Virus/Pathogens	Yes	Yes	Yes	Primary
Pesticides	Yes	Yes	Yes	Primary
Oil and Grease	Yes	No	No	Other
Toxic Organic Compounds	Yes	Yes	Yes	Primary
Trash and Debris	Yes	No	Yes	Primary
Dry Weather Runoff	Yes	No	Yes	Primary

3.5 Hydrologic Conditions of Concern

Does a hydrologic condition of concern exist for this project?

☒ No – An HCOC does not exist for this receiving water because:

☐ Project discharges directly to a protected conveyance (bed and bank are concrete lined the entire way from the point(s) of discharge to a receiving lake, reservoir, embayment, or the Ocean

☐ Project discharges directly to storm drains which discharge directly to a reservoir, lake, embayment, ocean or protected conveyance (as described above)

☒ The project discharges to an area identified in the WMAA as exempt from hydromodification concerns

☐ Yes – An HCOC does exist for this receiving water because none of the above are applicable.

Repeat this checklist for each different receiving water to which the project would discharge.

3.6 Critical Course Sediment Yield Areas

Per Appendix N.8, there are no potential critical coarse sediment yield areas on the site.

Section 4 Site Plan and Drainage Plan

4.1 Drainage Management Area Delineation

The disturbed site has six DMAs. Generally, the site was divided such that each parcel is a DMA and can have a BMP that can be managed independently. All DMAs, with the exception of DMA F, are comprised of multiple subareas. DMAs A, B, C, and D drain to localized catch basins and inlets and conveyed into an underground proprietary biofiltration treatment BMP. DMAs E and F are self-retaining areas and are comprised of pervious AC and gravel paving. The voids in the permeable pavement section will allow run-off to be retained in the DMAs for the 85th percentile 24-hour storm event.

In addition, the emergency access roadway at the southeast end of the site is proposed to be a self-retaining area via pervious AC pavement. The offsite emergency access roadway to the north is a separate drainage area under different ownership. This area will be addressed under a separate WQMP document as part of a separate plan and permit.

Biofiltration treatment BMPs were located such that there is sufficient setback from structural foundations to avoid surcharge loads and eliminate potential for impacts to the integrity of the soil bearing the loads of structures. An ideal location was within the open landscape areas which allows for convenient access for maintenance and inspection without affecting the use of the development.

Refer to the WQMP Plot Plan in Attachment D of this report for the delineation of DMAs, drainage patterns, and locations of proposed BMPs.

4.2 Overall Site Design BMPs

Minimize Impervious Area

Due to the proposed land uses and characteristics of the site, reducing impervious areas was not practical. Pervious areas were maximized based on availability. Any non-beneficial use of the site area is dedicated to landscaping. Disturbed areas not utilized for infrastructure are proposed to be vegetated. This includes the steep graded transitional slope areas and landscape buffers. The former aimed at reducing erosion potential and promoting evapotranspiration of runoff, contributing to an increase in time of concentration.

Maximize Natural Infiltration Capacity

Due to site remediation measures required to construct the proposed development, it is by the opinion of the project soils engineer that infiltration is not feasible for the site. A large volume of uncertified fill soils are present all across the site and will be required to be removed and recompacted to the recommendations of the soils report. Compaction of the underlying soils will deem infiltration infeasible.

Preserve Existing Drainage Patterns and Time of Concentration

The overall existing drainage pattern of the site draining towards San Juan Creek was maintained.
Two existing storm drain outfalls on the property were maintained and utilized as discharge points into the channel. Underground detention systems with significant retention capacity will hold runoff and limit discharge to predeveloped values thus maintaining time of concentration.

Disconnect Impervious Areas

Disconnect of impervious areas were utilized to the MEP for the walkways around Building 1 by implementing landscape areas adjacent to impervious sidewalk to encourage on-lot incidental infiltration before being dispersed onto the site paved areas, also contributing to reduction in the peak discharge rate by increasing the time of concentration.

Protect Existing Vegetation and Sensitive Areas

N/A. Due to the development of the entire site, protection of existing vegetation onsite will not be feasible.

Revegetate Disturbed Areas

Disturbed areas not utilized for infrastructure are proposed to be vegetated. This includes the steep graded transitional slope areas and landscape buffers. The former aimed at reducing erosion potential and promoting evapotranspiration of runoff, contributing to an increase in time of concentration.

Soil Stockpiling and Site Generated Organics

Soil stockpiling areas will be protected through use of erosion control BMPs. Reuse of properly stockpiled soils will be prioritized for disturbed topsoil and fills.

Firescaping

N/A. The site is not located in a "Very High Fire Hazard Severity Zones" as identified by California Department of Forestry and Fire Protection (CAL FIRE).

Water Efficient Landscaping

The City of San Juan Capistrano Municipal Code requires water efficient landscaping to be implemented into all proposed developments with planting areas that require irrigation. The proposed site landscaping consists of a low flow irrigation system and drought tolerant, very-low to medium water use plant types that will comply with the City's recommended list of plant materials.

Slopes and Channel Buffers

Steep slopes will be landscaped with drought tolerant vegetation to eliminate erosion potential and provide permanent stabilization. Runoff will be safely conveyed from slopes and into catch basins where it will be conveyed to the underground detention system and into the proprietary biofiltration treatment system before discharging into San Juan Creek channel.

4.3 DMA Characteristics and Site Design BMPs

4.3.1 DMA-A

The DMA is 1.41 acres but does not propose any impervious development as part of the building permit associated for this project. In the proposed condition, the area will be rough graded as shown on the grading plan and will be unpaved. This is to have the site ready for the future development of a restaurant facility which will be by separate developer under separate plan check and permit. In the proposed condition, the stormwater runoff will not co-mingle with the other DMAs and will be discharged independently at a separate outfall into San Juan Creek via de-silting basins.

Consideration was given on how the site would drain in the rough graded proposed condition. A de-silting basin will be provided at the northwesterly and northeasterly location of the DMA which will require storm drain connections. It is practical and economical that the storm drain connections are sized for the ultimate condition which can be determined by designating the DMA as a commercial site as defined by the Orange County Hydrology Manual (90% impervious cover).

For the purpose of obtaining environmental clearance for the entire development under CEQA and knowing what the future use of the area will be, the ultimate condition will be addressed in this WQMP. It is assumed that the DMA will be majority impervious with perimeter landscaping. This translates to an area that is 89.13% impervious and 10.87% pervious. The impervious surface covers will consist of a parking lot (assumed to be asphalt concrete) and roofs from two separate restaurant buildings each with a covered trash enclosure.

At grade, the DMA will be assumed to have 2 sub-areas in the proposed and ultimate condition that will drain to catch basins located near the drive entry/exit location at the northwest and the egress drive lane at the northeast. It is also assumed that the roof subareas will be directly conveyed, via a hard connection, to the underground storm drain system.

The design stormwater runoff (85th percentile) on the site will be captured by the ADS detention system, comprised of HDPE pipe, and treated by a proprietary treatment BMP via biofiltration process. The proprietary treatment BMP is a Modular Wetlands System (MWS). The MWS will be located south of the monument sign in the landscape planter island, west of Building 1 entrance. Highflows will bypass the BMP and continue down towards the outfall. Lowflows will continue to fill the upstream ADS detention system as it is being simultaneously treated.

Sizing of the systems was based on the 48 hour draw down of the DMA DCV. The DCV is calculated using the simple design capture volume sizing method in Worksheet 5 (see Attachment C). The DCV of the DMA is 3,345 cubic feet. The capacity of the proposed ADS detention system exceeds the DCV and will be confirmed in the final WQMP. The MWS will be able to provide a treatment capacity of 3,765 cubic feet within 48 hours. See Attachment C for calculations.

Prior to issuance of any building and grading permit, the City will require a separate WQMP from the future separate developer addressing the actual ultimate condition and design of appropriate BMPs.

4.3.2 DMA-B

The DMA is located north of DMA-A and includes landscaping, portion of the Ganahl Lumber main retail store building, and paving for pedestrian and vehicular accessibility. The area is 1.40 acres and is 88.11% impervious and 11.89% pervious. Significant topographic features include steep side slopes along the southerly edge of the site for grade transitions between the restaurant pad site and the Ganahl Lumber site in order to eliminate construction of retaining walls.

At grade, the DMA has 2 sub-areas with a larger tributary draining towards a catch basin at the bottom of the easternmost parking stall and a smaller tributary draining towards a catch basin located along the easterly edge. Above grade, the DMA includes a portion of Building 1 roof that contains 4 subareas. The roof subareas are directly conveyed, via a hard connection, to the underground storm drain system.

The design stormwater runoff (85th percentile) on the site will be captured by the ADS detention system, comprised of HDPE pipe, and treated by a proprietary treatment BMP via biofiltration process. The proprietary treatment BMP is a Modular Wetlands System (MWS). The MWS will be located south of the monument sign in the landscape planter island, west of Building 1 entrance. Highflows will bypass the BMP and continue down

towards the outfall. Lowflows will continue to fill the upstream ADS detention system as it is being simultaneously treated.

Sizing of the systems was based on the 48 hour draw down of the DMA DCV. The DCV is calculated using the simple design capture volume sizing method in Worksheet 5 (see Attachment C). The DCV of the DMA is 3,288 cubic feet. The capacity of the proposed ADS detention system exceeds the DCV and will be confirmed in the final WQMP. The MWS will be able to provide a treatment capacity of 3,765 cubic feet within 48 hours. See Attachment C for calculations.

Restriction of BMP placement was only limited to mainly being outside building footprint and not in areas that will disrupt site traffic. The DMA is subject to pedestrian and vehicular traffic. Main pollutants expected to be generated that can affect water quality are trash and debris pollutants such as oils and grease from vehicles. A majority of these pollutants will be treated by Flogard Catch Basin Filter Inserts with absorbant pouches before entering the storm drain system. Dry weather runoff from irrigation overspray is also a possibility. Site design BMPs incorporated include impervious area dispersion on adjacent landscaped areas and street trees.

4.3.3 DMA-C

The DMA is located in the southwesterly section of the site adjacent to DMA-A and DMA-B. This area includes landscaping, a portion of the Ganahl Lumber main retail store building, and paving for pedestrian and vehicular accessibility. The area is 1.59 acres and is 79.87% impervious and 20.13% pervious. There are no significant topographic features and is generally flat (<5%).

At grade, the DMA has 3 sub-areas and drains towards catch basins located in the parking lot and roadway. Above grade, the DMA includes a portion of Building 1 roof that contains 2 subareas. The roof subareas are directly conveyed, via a hard connection, to the underground storm drain system.

The design stormwater runoff (85th percentile) on the site will be captured by the ADS detention system, comprised of HDPE pipe, and treated by a proprietary treatment BMP via biofiltration process. The proprietary treatment BMP is a Modular Wetlands System (MWS). The MWS will be located in the landscape area between the roadway and parking lot west of Building 1. Highflows will bypass the BMP and continue down towards the outfall. Lowflows will continue to fill the upstream ADS detention system as it is being simultaneously treated.

Sizing of the systems was based on the 48 hour draw down of the DMA DCV. The DCV is calculated using the simple design capture volume sizing method in Worksheet 5 (see Attachment C). The DCV of the DMA is 3,470 cubic feet. The capacity of the proposed ADS detention system exceeds the DCV and will be confirmed in the final WQMP. The MWS will be able to provide a treatment capacity of 3,765 cubic feet within 48 hours. See Attachment C for calculations.

Restriction of BMP placement was only limited to mainly being outside building footprint and not in areas that will disrupt site traffic. The DMA is subject pedestrian and vehicular traffic. Main pollutants expected to be generated that can affect water quality are trash and debris and pollutants such as oils and grease from vehicles. A majority of these pollutants will be treated by Flogard Catch Basin Filter Inserts with absorbant pouches before entering the storm drain system. Dry weather runoff from irrigation overspray is also a possibility. Site design BMPs incorporated include impervious area dispersion on adjacent landscaped areas and street trees.

4.3.4 DMA-D

The DMA is centrally located in the site and is the largest tributary area of the site. Site areas include landscaping, portion of the Ganahl Lumber retail store building, the entire Will Call building, the entire lumber yard and storage sheds, and paving for pedestrian and vehicular accessibility. The area is 7.40 acres and is 94.18% impervious and 5.82% pervious. The DMA is generally flat (<5%) with the exception of the westerly edge

along the access roadway which has steep transitional slopes to join the existing trail along San Juan Creek to minimize construction of retaining walls.

At grade, the DMA has 11 sub-areas and drains in various directions towards local catch basins. Above grade, the DMA includes a portion of Building 1 roof that contains 3 subareas, the entirety of Building 2 and 3 roofs, with 4 subareas each, and all the storage shed roofs. The roof subareas are directly conveyed, via a hard connection, to the underground storm drain system.

The design stormwater runoff (85th percentile) on the site will be captured by the ADS detention system, comprised of HDPE pipe, and treated by a proprietary treatment BMP via biofiltration process. The proprietary treatment BMP is a Modular Wetlands System (MWS). The MWS will be located in the landscape area between the two vehicular entrances/exits at the northwesterly corner of Lot 3. Highflows will bypass the BMP and continue down towards the outfall. Lowflows will continue to fill the upstream ADS detention system as it is being simultaneously treated.

Sizing of the systems was based on the 48 hour draw down of the DMA DCV. The DCV is calculated using the simple design capture volume sizing method in Worksheet 5 (see Attachment C). The DCV of the DMA is 18,405 cubic feet. The capacity of the proposed ADS detention system exceeds the DCV and will be confirmed in the final WQMP. The MWS will be able to provide a treatment capacity of 23,707 cubic feet within 48 hours. See Attachment C for calculations.

Restriction of BMP placement was only limited to mainly being outside building footprint and not in areas that will disrupt site traffic. The DMA is subject to pedestrian and vehicular traffic. Main pollutants expected to be generated that can affect water quality are trash and debris and pollutants such as oils and grease from vehicles. A majority of these pollutants will be treated by Flogard Catch Basin Filter Inserts with absorbant pouches and a Flogard Trash & Debris Guard with absorbant pouch before entering the storm drain system. Dry weather runoff from irrigation overspray is also a possibility. Site design BMPs incorporated at the DMA level include street trees.

4.3.5 DMA-E

The DMA is located in the northerly section of the site and includes landscaping and pervious AC and gravel bed paving for pedestrian and vehicular accessibility. The area is 4.35 acres and is 1.01% impervious and 98.99% pervious. Significant topographic features include a steep landscaped berm along the northerly side and steep transitional slopes to join the existing trail along San Juan Creek.

The DMA has 20 subareas; 14 subareas are along the swale at the berm toe. The DMA generally drains in two directions, easterly and westerly, but is conveyed towards the outfall into San Juan Creek channel. The DMA is almost entirely pervious and will function as a self-retaining area. The entire parking area will be a pervious gravel surface and the roadways will be pervious AC pavement. The design stormwater runoff (85th percentile) on the site will be fully captured by the pervious surfaces and will not require a downstream structural BMP. In addition, rainfall will be taken in by the ample landscaping present on the site via evapotranspiration process. Any excess rainfall that is not taken in by landscaping generates stormwater runoff that will flow into the pervious AC.

During larger and frequent storm events where the storage within the voids of the permeable pavement storage layer is completely filled, the excess will overflow from the surface and sheet flow towards local catch basins. The catch basin will convey the overflow into the underground storm drain system and discharge into the junction structure where it will connect to the San Juan Creek outfall.

Main pollutants expected to be generated that can affect water quality are pollutants such as oils and grease from vehicles.

4.3.6 DMA-F

The DMA is located in the southeasterly section of the site and includes existing landscaping and concrete bridge embankment and pervious AC roadway for vehicular accessibility. The area is 0.21 acres and is 12.20% impervious and 87.80% pervious. Significant topographic features include steep transitional side slopes along the existing bridge embankment.

The DMA drains in the southeasterly direction and is entirely self-retaining due to the significant storage capacity of the pervious AC paving. The design stormwater runoff (85th percentile) on the site will be fully captured by the pervious surfaces and will not require a downstream structural BMP.

During larger and frequent storm events where the storage within the voids of the permeable pavement storage layer is completely filled, the excess will overflow from the surface and sheet flow towards the trench drain at the north end and towards a low point at the southeasterly side of the DMA. The trench drain will daylight and a weephole will be provided at the westerly retaining wall for the low point to allow the excess runoff to discharge out towards the rail road, which mimics the pre-development overflow condition.

Main pollutants expected to be generated that can affect water quality are pollutants such as oils and grease from vehicles.

4.3.7 DMA Summary

Drainage Management Areas				
DMA (Number/Description)	Total Area (acres)	Imperviousness (%)	Infiltration Feasibility Category (Full, Partial, or No Infiltration)	Hydrologic Source Controls Used
DMA-A, Southerly Section	1.41	89.13	No Infiltration	None
DMA-B, North of DMA-A	1.40	88.11	No Infiltration	None
DMA-C, Southwesterly Section	1.59	79.87	No Infiltration	None
DMA-D, Central Section	7.40	94.18	No Infiltration	None
DMA-E, Northerly Section	4.35	1.01	Full Infiltration*	HSC-6: Self-Retaining Areas
DMA-F, Southeasterly Section	0.21	12.20	Full Infiltration*	HSC-6: Self-Retaining Areas

*See "Addendum Report for Stormwater Infiltration Recommendations, Proposed Ganahl Lumber Facility Development, San Juan Capistrano, California Willdan Geotechnical Project No. 108164-2000" in Attachment H.

4.4 Source Control BMPs

Non-Structural Source Control BMPs				
Identifier	**Name**	**Check One**		**Reason Source Control is Not Applicable**
		Included	**Not Applicable**	
N1	Education for Property Owners, Tenants and Occupants	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	There are no hazardous wastes handled on-site.
N6	Local Industrial Permit Compliance	☐	☒	There will be no industrial activity on-site.
N7	Spill Contingency Plan	☐	☒	No hazardous materials are anticipated on-site. Therefore spills of hazardous materials on-site are not anticipated.
N8	Underground Storage Tank Compliance	☐	☒	There will be no underground storage tanks on-site.
N9	Hazardous Materials Disclosure Compliance	☐	☒	There are no hazardous materials anticipated on-site.
N10	Uniform Fire Code Implementation	☐	☒	Sources of toxic and highly toxic compressed gases will not be present on-site.
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☒	☐	
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☒	☐	
N16	Retail Gasoline Outlets	☐	☒	The project site will not be a location for a retail gasoline outlet.

Structural Source Control BMPs

Identifier	Name	Check One		Reason Source Control is Not Applicable
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	☒	☐	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	☒	☐	
S3	Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐	
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☒	☐	
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	☒	☐	
S6	Dock areas	☒	☐	
S7	Maintenance bays	☐	☒	There will be no maintenance bays on-site.
S8	Vehicle wash areas	☐	☒	There will be no vehicle wash areas on-site.
S9	Outdoor processing areas	☐	☒	There will be no outdoor processing areas on-site.
S10	Equipment wash areas	☐	☒	There will be no equipment wash areas on-site.
S11	Fueling areas	☒	☐	
S12	Hillside landscaping	☒	☐	
S13	Wash water control for food preparation areas	☐	☒	There will be no food preparation activity on-site.
S14	Community car wash racks	☐	☒	There will be no car wash activity on-site.

Section 5 Low Impact Development BMPs

5.1 LID BMPs in DMA-A, -B, -C, and -D

The site will utilize biofiltration via proprietary treatment BMPs (Modular Wetlands Stormwater Biofiltration System) for these DMAs. Detention systems by ADS will provide enough capacity to store the required DCV per DMA and also act as conveyance of high flows. The stormwater runoff will enter the ADS detention system where the low flow will be conveyed into the Modular Wetlands Biofiltration System.

5.1.1 Hydrologic Source Controls for DMA-A, -B, -C, and -D

HSCs were not taken into consideration for contribution toward the DCV at this preliminary stage. Sufficient area is available for the placement of underground LID BMPs. LID BMPs were sized per the DMA characteristics, not factoring HSCs.

5.1.2 Structural LID BMP for DMA-A, -B, -C, and -D

The structural LID BMP type for these DMAs will be TRT-2: Proprietary Treatment Control BMPs as categorized in the South Orange County WQMP TGD. This BMP has an H level of effectiveness for treating the primary pollutants of concern.

Sizing criteria is based on the full retention of the 24-hour 85th percentile storm event (DCV). Detention systems by ADS, located upstream of the BMP, will provide adequate storage to detain the entire DCV of the DMA. The proprietary treatment control BMP will be sized appropriately to be able to treat the entire DCV at a rate that is equivalent to a 48 hour drawdown of the DCV.

The proprietary treatment control BMP will be a Modular Wetlands Stormwater Biofiltration System identified as TRT-2 on the WQMP Exhibit in Attachment E. The treatment system incorporates an advanced pretreatment chamber that includes separation and prefilter cartridges. In this chamber, sediment and hydrocarbons are removed from runoff before entering the biofiltration chamber. The biofiltration chamber utilizes a unique horizontal flow where the water flow is subsurface. This results in as much as two to three times the surface area than traditional downward flow bioretention systems for higher treatment capacity and is also prone to less clogging. The BMP will also have a access manhole for cleanout and inspections. See WQMP Exhibit for BMP locations.

All catch basins in these DMAs will have a Flogard Catch Basin Insert Filter with absorbant pouches (for inlet type) or Flogard Trash and Debris Guard (for curb opening type) with absorbant pouch to prevent trash and debris from entering the storm drain system and ultimately be conveyed to the structural BMP systems.

5.2 LID BMPs in DMA-E and -F

The site will utilize full infiltration (via incidental infiltration as discussed in Section 3.1.2.4) as the BMP for all these DMAs via pervious AC and gravel paving for DMA-E and pervious AC paving for DMA-F.

5.2.1 Hydrologic Source Controls for DMA-E and -F

The LID BMP is also a hydrologic source control. The DMAs can be classified as self-retaining areas per HSC-6 in the South Orange County WQMP TGD. No runoff will be produced during the 85th percentile, 24-hour storm event. As a result, a downstream structural LID BMP will not be required.

5.2.2 Structural LID BMP for DMA-E and -F

The structural LID BMP type for these DMAs will be pervious AC and gravel paving for DMA-E and pervious AC paving for DMA-F, categorized as INF-5 in the South Orange County WQMP TGD. This BMP has an H level of effectiveness for treating the primary pollutants of concern.

Sizing criteria is based on the full retention of the 24-hour 85th percentile storm event (DCV). The BMP will provide adequate storage within the voids of the paving section to detain the entire DCV of the DMA. Although infiltration is infeasible, the BMP will mimic the existing pervious condition (and more likely than not, provide more storage) of incidental infiltration on the ground surface. The DMAs will be entirely self-retaining as defined by HSC-6 in the South Orange County WQMP TGD.

To avoid saturation of the BMP surface, the surface will be sloped to drain excess volume into catch basins and be conveyed into San Juan Creek channel via underground storm drain pipe. Adjustments to the BMP have not been made but adequately address DCV requirements due to the large storage volume available within the BMP that far exceeds the minimum required.

All catch basins in these DMAs will have Flogard Catch Basin Insert Filters with absorbant pouches to prevent trash and debris from entering the storm drain system and ultimately be conveyed to the structural BMP systems.

5.3 Summary of LID BMPs

LID BMP Summary Table

DMA (Number/Description)	LID BMP	Hydrologic Source Controls Used	Structural LID BMP Type	Sizing Criteria
DMA-A, Southerly Section	Proprietary Treatment	None	TRT-2: Proprietary Treatment Control	24-hour 85th Percentile Storm Event
DMA-B, North of DMA-A	Proprietary Treatment	None	TRT-2: Proprietary Treatment Control	24-hour 85th Percentile Storm Event
DMA-C, Southwesterly Section	Proprietary Treatment	None	TRT-2: Proprietary Treatment Control	24-hour 85th Percentile Storm Event
DMA-D, Central Section	Proprietary Treatment	None	TRT-2: Proprietary Treatment Control	24-hour 85th Percentile Storm Event

LID BMP Summary Table				
DMA (Number/Description)	LID BMP	Hydrologic Source Controls Used	Structural LID BMP Type	Sizing Criteria
DMA-E, Northerly Section	Self-Retaining	None	INF-5: Permeable Pavement	24-hour 85th Percentile Storm Event
DMA-F, Southeasterly Section	Self-Retaining	None	INF-5: Permeable Pavement	24-hour 85th Percentile Storm Event

Section 6 Hydromodification BMPs

N/A. No HCOCs exist for the site per Section 3.5.

Section 7 Educational Materials Index

Educational Materials			
Residential Material (http://www.ocwatersheds.com)	**Check If Applicable**	**Business Material (http://www.ocwatersheds.com)**	**Check If Applicable**
The Ocean Begins at Your Front Door	☒	Tips for the Automotive Industry	☐
Tips for Car Wash Fund-raisers	☐	Tips for Using Concrete and Mortar	☐
Tips for the Home Mechanic	☐	Tips for the Food Service Industry	☒
Homeowners Guide for Sustainable Water Use	☐	Proper Maintenance Practices for Your Business	☒
Household Tips	☐	Compliance BMPs for Mobile Businesses	☐
Proper Disposal of Household Hazardous Waste	☐	**Other Material**	**Check If Attached**
Recycle at Your Local Used Oil Collection Center (North County)	☐		
Recycle at Your Local Used Oil Collection Center (Central County)	☐	FF-2 Building Maintenance and Repair	☒
Recycle at Your Local Used Oil Collection Center (South County)	☐	FF-4 Fueling	☒
Tips for Maintaining a Septic Tank System	☐	FF-5 Landscape Maintenance	☒
Responsible Pest Control	☒	FF-6 Material Loading and Unloading	☒
Sewer Spill	☐	FF-9 Parking Lot Maintenance	☒
Tips for the Home Improvement Projects	☐	Tips for Protecting Your Watershed	☒
Tips for Horse Care	☐		☐
Tips for Landscaping and Gardening	☒		☐
Tips for Pet Care	☐		☐
Tips for Projects Using Paint	☐		☐

Attachment A: Educational Materials

Guidance: Leave as placeholder in the Conceptual WQMP. In the Final WQMP, attach all relevant materials checked in Section 7 of the template.

Attachment B: Operations and Maintenance Plan

Guidance: Leave as placeholder in Conceptual WQMP. In Final WQMP, include the O&M Plan.

See Section 2.8 of the TGD for guidance on preparing an O&M Plan and the applicable BMP fact sheets in Appendix G of the TGD for specific maintenance activities and frequencies for each BMP type.

See separate O&M Plan Template.

Attachment C: Calculations

Worksheet 5: Simple Design Capture Volume Sizing Method for Full Infiltration BMPs

Part 1: Calculate the DCV for DMA-A				
1	Enter design capture storm depth, *d* (inches)	d=	0.8	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4) including any other upstream BMPs	d_{HSC}=	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder}$ = d – d_{HSC}	$d_{remainder}$=	0.8	inches
3a	Enter DMA area tributary to BMP(s), *A* (acres) excluding any self-retaining areas	A=	1.407	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	imp=	0.8913	
3c	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.818	
3d	Calculate runoff volume, *DCV = (C x $d_{remainder}$ x A x 43560 x (1/12)) (See Section E.2.2)*	DCV=	3,345	cu-ft
Part 2: Design BMP and Calculate Effective Storage Depth and Footprint*				
4	Enter total effective storage depth (sum of values below)	$D_{total\_effective}$	N/A	inches
4a	Ponding storage depth	D_{pond}	N/A	inches
4b	Media effective storage depth (depth * 0.2)	$D_{media\_effective}$	N/A	inches
4c	Gravel effective storage (depth * 0.4)	$D_{gravel\_effective}$	N/A	inches
5	Determine required effective footprint: A_{BMP} = DCV /(D_{Total} *12 inches/ft) If sides are sloped, measure A_{BMP} at the mid-ponding depth of the BMP.	A_{BMP}=	N/A	sq-ft
Part 3: Check Drawdown Time*				
6a	Calculate design infiltration rate, K_{design} = $K_{observed}$ / S_{total} (See Worksheet 3 and Appendix D)	K_{design}=	N/A	in/hr
6b	Calculate drawdown time ($D_{total\_effective}$ / K_{design}) (must be less than or equal to 48 hours).	$T_{drawdown}$=	N/A	hours
6c	If using Method 2 for drawdown (Section E.2.5) which accounts for sidewall infiltration, insert result and attach relevant calculations below.	$T_{drawdown}$=	N/A	hours
Part 4: *Check Minimum Infiltrating Surface Area for Premature Clogging**				
7a	Calculate BMP infiltrating surface area as percent of tributary impervious area ($A_{infiltrating}$/(A * imp * 43560 sq-ft/ac)		N/A	%
7b	Calculate minimum infiltrating surface area required for BMP to avoid premature clogging (Section E.4.1)		N/A	%

*Part not applicable for DMA. DMA proposes detention system for full storage of DCV and proprietary biotreatment BMP. Worksheet used for DCV calculation purposes only.

Worksheet 5: Simple Design Capture Volume Sizing Method for Full Infiltration BMPs

Part 1: Calculate the DCV for DMA-B				
1	Enter design capture storm depth, *d* (inches)	d=	0.8	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4) including any other upstream BMPs	d_{HSC}=	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder} = d - d_{HSC}$	$d_{remainder}$=	0.8	inches
3a	Enter DMA area tributary to BMP(s), *A* (acres) excluding any self-retaining areas	A=	1.396	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	imp=	0.8811	
3c	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.811	
3d	Calculate runoff volume, *DCV = (C x $d_{remainder}$ x A x 43560 x (1/12)) (See Section E.2.2)*	DCV=	3,288	cu-ft
Part 2: Design BMP and Calculate Effective Storage Depth and Footprint*				
4	Enter total effective storage depth (sum of values below)	$D_{total\_effective}$	N/A	inches
4a	Ponding storage depth	D_{pond}	N/A	inches
4b	Media effective storage depth (depth * 0.2)	$D_{media\_effective}$	N/A	inches
4c	Gravel effective storage (depth * 0.4)	$D_{gravel\_effective}$	N/A	inches
5	Determine required effective footprint: A_{BMP} = DCV /(D_{Total} *12 inches/ft) If sides are sloped, measure A_{BMP} at the mid-ponding depth of the BMP.	A_{BMP}=	N/A	sq-ft
Part 3: Check Drawdown Time*				
6a	Calculate design infiltration rate, $K_{design} = K_{observed} / S_{total}$ (See Worksheet 3 and Appendix D)	K_{design}=	N/A	in/hr
6b	Calculate drawdown time ($D_{total\_effective} / K_{design}$) (must be less than or equal to 48 hours).	$T_{drawdown}$=	N/A	hours
6c	If using Method 2 for drawdown (Section E.2.5) which accounts for sidewall infiltration, insert result and attach relevant calculations below.	$T_{drawdown}$=	N/A	hours
Part 4: *Check Minimum Infiltrating Surface Area for Premature Clogging**				
7a	Calculate BMP infiltrating surface area as percent of tributary impervious area ($A_{infiltrating}$/(A * imp * 43560 sq-ft/ac)		N/A	%
7b	Calculate minimum infiltrating surface area required for BMP to avoid premature clogging (Section E.4.1)		N/A	%

*Part not applicable for DMA. DMA proposes detention system for full storage of DCV and proprietary biotreatment BMP. Worksheet used for DCV calculation purposes only.

Worksheet 5: Simple Design Capture Volume Sizing Method for Full Infiltration BMPs

Part 1: Calculate the DCV for DMA-C				
1	Enter design capture storm depth, *d* (inches)	d=	0.8	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4) including any other upstream BMPs	d_{HSC}=	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder}$ = d – d_{HSC}	$d_{remainder}$=	0.8	inches
3a	Enter DMA area tributary to BMP(s), *A* (acres) excluding any self-retaining areas	A=	1.595	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	imp=	0.7987	
3c	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.749	
3d	Calculate runoff volume, *DCV = (C x $d_{remainder}$ x A x 43560 x (1/12)) (See Section E.2.2)*	DCV=	3,470	cu-ft
Part 2: Design BMP and Calculate Effective Storage Depth and Footprint*				
4	Enter total effective storage depth (sum of values below)	$D_{total\_effective}$	N/A	inches
4a	Ponding storage depth	D_{pond}	N/A	inches
4b	Media effective storage depth (depth * 0.2)	$D_{media\_effective}$	N/A	inches
4c	Gravel effective storage (depth * 0.4)	$D_{gravel\_effective}$	N/A	inches
5	Determine required effective footprint: A_{BMP} = DCV /(D_{Total} *12 inches/ft) If sides are sloped, measure A_{BMP} at the mid-ponding depth of the BMP.	A_{BMP}=	N/A	sq-ft
Part 3: Check Drawdown Time*				
6a	Calculate design infiltration rate, K_{design} = $K_{observed}$ / S_{total} (See Worksheet 3 and Appendix D)	K_{design}=	N/A	in/hr
6b	Calculate drawdown time ($D_{total\_effective}$ / K_{design}) (must be less than or equal to 48 hours).	$T_{drawdown}$=	N/A	hours
6c	If using Method 2 for drawdown (Section E.2.5) which accounts for sidewall infiltration, insert result and attach relevant calculations below.	$T_{drawdown}$=	N/A	hours
Part 4: *Check Minimum Infiltrating Surface Area for Premature Clogging**				
7a	Calculate BMP infiltrating surface area as percent of tributary impervious area ($A_{infiltrating}$/(A * imp * 43560 sq-ft/ac)		N/A	%
7b	Calculate minimum infiltrating surface area required for BMP to avoid premature clogging (Section E.4.1)		N/A	%

*Part not applicable for DMA. DMA proposes detention system for full storage of DCV and proprietary biotreatment BMP. Worksheet used for DCV calculation purposes only.

Worksheet 5: Simple Design Capture Volume Sizing Method for Full Infiltration BMPs

Part 1: Calculate the DCV for DMA-D				
1	Enter design capture storm depth, *d* (inches)	d=	0.8	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4) including any other upstream BMPs	d_{HSC}=	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder}$ = d – d_{HSC}	$d_{remainder}$=	0.8	inches
3a	Enter DMA area tributary to BMP(s), *A* (acres) excluding any self-retaining areas	A=	7.401	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	imp=	0.9418	
3c	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.856	
3d	Calculate runoff volume, *DCV = (C x $d_{remainder}$ x A x 43560 x (1/12)) (See Section E.2.2)*	DCV=	18,405	cu-ft
Part 2: Design BMP and Calculate Effective Storage Depth and Footprint*				
4	Enter total effective storage depth (sum of values below)	$D_{total\_effective}$	N/A	inches
4a	Ponding storage depth	D_{pond}	N/A	inches
4b	Media effective storage depth (depth * 0.2)	$D_{media\_effective}$	N/A	inches
4c	Gravel effective storage (depth * 0.4)	$D_{gravel\_effective}$	N/A	inches
5	Determine required effective footprint: A_{BMP} = DCV /(D_{Total} *12 inches/ft) If sides are sloped, measure A_{BMP} at the mid-ponding depth of the BMP.	A_{BMP}=	N/A	sq-ft
Part 3: Check Drawdown Time*				
6a	Calculate design infiltration rate, K_{design} = $K_{observed}$ / S_{total} (See Worksheet 3 and Appendix D)	K_{design}=	N/A	in/hr
6b	Calculate drawdown time ($D_{total\_effective}$ / K_{design}) (must be less than or equal to 48 hours).	$T_{drawdown}$=	N/A	hours
6c	If using Method 2 for drawdown (Section E.2.5) which accounts for sidewall infiltration, insert result and attach relevant calculations below.	$T_{drawdown}$=	N/A	hours
Part 4: *Check Minimum Infiltrating Surface Area for Premature Clogging**				
7a	Calculate BMP infiltrating surface area as percent of tributary impervious area ($A_{infiltrating}$/(A * imp * 43560 sq-ft/ac)		N/A	%
7b	Calculate minimum infiltrating surface area required for BMP to avoid premature clogging (Section E.4.1)		N/A	%

*Part not applicable for DMA. DMA proposes detention system for full storage of DCV and proprietary biotreatment BMP. Worksheet used for DCV calculation purposes only.

Worksheet 5: Simple Design Capture Volume Sizing Method for Full Infiltration BMPs

Part 1: Calculate the DCV for DMA-E				
1	Enter design capture storm depth, *d* (inches)	d=	0.8	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4) including any other upstream BMPs	d_{HSC}=	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder}$ = d – d_{HSC}	$d_{remainder}$=	0.8	inches
3a	Enter DMA area tributary to BMP(s), *A* (acres) excluding any self-retaining areas	A=	4.355	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	imp=	0.0101	
3c	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.158	
3d	Calculate runoff volume, *DCV = (C x $d_{remainder}$ x A x 43560 x (1/12)) (See Section E.2.2)*	DCV=	1,993	cu-ft
Part 2: Design BMP and Calculate Effective Storage Depth and Footprint				
4	Enter total effective storage depth (sum of values below)	$D_{total\_effective}$	2.4	inches
4a	Ponding storage depth	D_{pond}	0	inches
4b	Media effective storage depth (depth * 0.2)	$D_{media\_effective}$	0	inches
4c	Gravel effective storage (depth * 0.4) [6 inches * 0.4]	$D_{gravel\_effective}$	2.4	inches
5	Determine required effective footprint: A_{BMP} = DCV /(D_{Total} *12 inches/ft) If sides are sloped, measure A_{BMP} at the mid-ponding depth of the BMP.	A_{BMP}=	9,965	sq-ft
Part 3: Check Drawdown Time*				
6a	Calculate design infiltration rate, K_{design} = $K_{observed}$ / S_{total} (See Worksheet 3 and Appendix D)	K_{design}=	0.3	in/hr
6b	Calculate drawdown time ($D_{total\_effective}$ / K_{design}) (must be less than or equal to 48 hours).	$T_{drawdown}$=	8	hours
6c	If using Method 2 for drawdown (Section E.2.5) which accounts for sidewall infiltration, insert result and attach relevant calculations below.	$T_{drawdown}$=	N/A	hours
Part 4: *Check Minimum Infiltrating Surface Area for Premature Clogging*				
7a	Calculate BMP infiltrating surface area as percent of tributary impervious area ($A_{infiltrating}$/(A * imp * 43560 sq-ft/ac) [$A_{infiltrating}$ = 137,576.60 sq-ft]		7,180.4	%
7b	Calculate minimum infiltrating surface area required for BMP to avoid premature clogging (Section E.4.1)		3.4	%

*Assumed minimum design infiltration rate of 0.3 in/hr. Infiltration rate was not measured because infiltration was not conducted. Infiltration testing is not required per D.4.1 of the South Orange County WQMP TGD because DMA is a self-retaining (as defined by HSC-6) pervious pavement site design BMP.

Worksheet 5: Simple Design Capture Volume Sizing Method for Full Infiltration BMPs

Part 1: Calculate the DCV for DMA-E				
1	Enter design capture storm depth, *d* (inches)	d=	0.8	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4) including any other upstream BMPs	d_{HSC}=	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder}$ = d – d_{HSC}	$d_{remainder}$=	0.8	inches
3a	Enter DMA area tributary to BMP(s), *A* (acres) excluding any self-retaining areas	A=	0.205	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	imp=	0.122	
3c	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.241	
3d	Calculate runoff volume, *DCV = (C x $d_{remainder}$ x A x 43560 x (1/12)) (See Section E.2.2)*	DCV=	144	cu-ft
Part 2: Design BMP and Calculate Effective Storage Depth and Footprint				
4	Enter total effective storage depth (sum of values below)	$D_{total\_effective}$	2.4	inches
4a	Ponding storage depth	D_{pond}	0	inches
4b	Media effective storage depth (depth * 0.2)	$D_{media\_effective}$	0	inches
4c	Gravel effective storage (depth * 0.4) [6 inches * 0.4]	$D_{gravel\_effective}$	2.4	inches
5	Determine required effective footprint: A_{BMP} = DCV /(D_{Total} *12 inches/ft) If sides are sloped, measure A_{BMP} at the mid-ponding depth of the BMP.	A_{BMP}=	720	sq-ft
Part 3: Check Drawdown Time*				
6a	Calculate design infiltration rate, K_{design} = $K_{observed}$ / S_{total} (See Worksheet 3 and Appendix D)	K_{design}=	0.3	in/hr
6b	Calculate drawdown time ($D_{total\_effective}$ / K_{design}) (must be less than or equal to 48 hours).	$T_{drawdown}$=	8	hours
6c	If using Method 2 for drawdown (Section E.2.5) which accounts for sidewall infiltration, insert result and attach relevant calculations below.	$T_{drawdown}$=	N/A	hours
Part 4: ***Check Minimum Infiltrating Surface Area for Premature Clogging***				
7a	Calculate BMP infiltrating surface area as percent of tributary impervious area ($A_{infiltrating}$/(A * imp * 43560 sq-ft/ac) [$A_{infiltrating}$ = 6,162.37 sq-ft]		565.6	%
7b	Calculate minimum infiltrating surface area required for BMP to avoid premature clogging (Section E.4.1)		3.4	%

*Assumed minimum design infiltration rate of 0.3 in/hr. Infiltration rate was not measured because infiltration was not conducted. Infiltration testing is not required per D.4.1 of the South Orange County WQMP TGD because DMA is a self-retaining (as defined by HSC-6) pervious pavement site design BMP.

Worksheet 10: Nomograph Method for Determining Capture Efficiency of Harvest and Use BMPs

Part 1: Calculate the EIATA and the effect of upstream HSCs				
1a	Landscape area irrigated with harvested water	LA=	2.265	acres
1b	Area-weighted landscape coefficient (typically 0.7 for active turf, 0.35 for conservation landscape design)	K_L=	0.35	
1c	Irrigation efficiency (typically 0.90)	IE	0.90	
1d	Enter DMA area tributary to BMP (s), *A* (acres) (not including any self-retaining areas)	A=	16.36	acres
1e	Enter DMA Imperviousness, *imp* (unitless)	imp=	0.638	
1f	Effective Irrigated Area to Tributary Area ratio, EIATA = LA * K_L / (IE * imp * A) *[Actually value is 0.08, but rounded up to 0.1 for simplicity to use the capture efficiency nomograph]*	EIATA	0.1	ac/ac
2	Enter capture efficiency corresponding to upstream HSCs (Worksheet 4) and locate on Figure E-8 or the figure within the worksheet below	Y_1=	0	%
3	Using Figure E-8 or the figure within the worksheet below, determine the cistern volume as a fraction of the DCV corresponding to the capture efficiency of the HSCs	X_1=	0	
Part 2: Calculate the DCV				
4	85th percentile, 24-hour design storm	d =	0.8	inches
5a	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.629	
5b	Calculate the DCV= *(C x d x A x 43560 sf/ac x (1 ft/12 in))*	DCV=	29,883.44	cu-ft
Part 3: Calculate capture efficiency				
6	Storage Volume of BMP (cistern, vault, etc.)	V	30,000	cu ft
7	Storage Volume as a fraction of DCV, V_{frac} = V/DCV	V_{frac}	1	
8	Final equivalent volume as a fraction of DCV from combination of HSCs and harvest and use BMPs, $X_2 = X_1 + V_{frac}$	X_2	1	
9	Using Figure E-8 or the figure within the worksheet below, determine the capture efficiency of the harvest and use BMPs and any upstream HSCs	Y_2	20	%

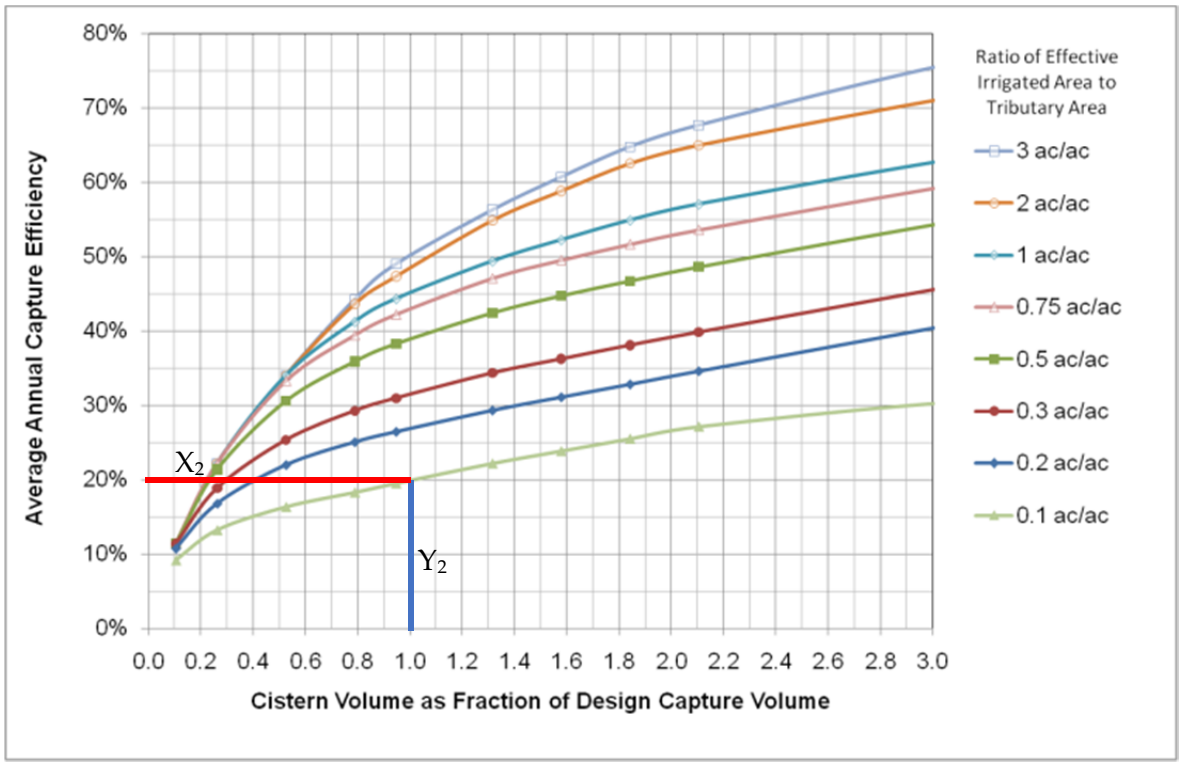
Worksheet 10: Nomograph Method for Determining Capture Efficiency of Harvest and Use BMPs

Supporting Calculations

Describe system:

N/A.
Per Appendix F.3 in the SOC WQMP TGD dated September 27, 2017, harvest and use for the entire DCV is feasible if the annual average capture efficiency is 80%.
Assuming a cistern sized for the DCV, the efficiency based on the nomograph below is 20%.
Therefore, harvest and use is not required to be considered as an LID option due to inefficiency.

Graphical Operations



Provide supporting graphical operations.

Modular Wetland System WQv Capacity for Ganahl Lumber in San Juan Capistrano, CA

Proposed: Unit Models = (3) MWS-L-4-6 and (1) MWS-L-8-16

MWS 4-6 WQv capacity

$$\boldsymbol{Avg\ Dischage\ rate} = (Wetland\ perimeter) * (\text{Max}\ design\ HGL) = (9.40\ sf) * (4.0\ ft) * \left(0.26\frac{gal}{min}\right)$$
$$= \mathbf{9.78\ gpm}$$

$$\boldsymbol{WQv\ Capacity} = (Design\ drain\ down\ time) * (avg\ discharge\ rate)(media\ loading\ rate)$$
$$= (48\ hr) * (9.78\ gpm) * \left(0.1337\frac{cf}{gal} * 60\ \frac{min}{hr}\right) = \mathbf{3765\ cf}$$

MWS 8-16 WQv capacity

$$\boldsymbol{Avg\ Dischage\ rate} = (Wetland\ perimeter) * (\text{Max}\ design\ HGL)$$
$$= (59.20\ sf) * (4.0\ ft) * \left(0.26\frac{gal}{min}\right) = \mathbf{61.57\ gpm}$$

$$\boldsymbol{WQv\ Capacity} = (Design\ drain\ down\ time) * (avg\ discharge\ rate)(media\ loading\ rate)$$
$$= (48\ hr) * (61.57\ gpm) * \left(0.1337\frac{cf}{gal} * 60\ \frac{min}{hr}\right) = \mathbf{23707\ cf}$$

CALCULATIONS PROVIDED BY BIO CLEAN

Attachment D: Reference Plans

STATEMENT WITH RESPECT TO EASEMENTS ON SUBJECT PROPERTY: ALL ENCUMBERED EASEMENTS DEPICTED ON THESE IMPROVEMENTS PLANS ARE REFERENCED FROM THE TOPOGRAPHIC AND BOUNDARY SURVEY PREPARED BY A LICENSED LAND SURVEYOR. SEE TITLE REPORT NUMBER NCS-805010-ONT1, DATED JULY 13, 2016 AS IT RELATES TO PROPERTY LOCATED AT STONEHILL DRIVE ALONG THE EAST SIDE OF SAN JUAN CREEK CHANNEL FOR MORE INFORMATION.

GENERAL GRADING NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE GRADING CODE OF THE CITY OF SAN JUAN CAPISTRANO, GEOTECHNICAL REPORTS NOTED HEREON, AND ANY SPECIAL REQUIREMENTS OF THE PERMIT.

2. INITIAL INSPECTION. PRIOR TO ANY GRADING OR BRUSHING, PREPARATORY TO GRADING, THERE SHALL BE A PRE-GRADING MEETING HELD ON THE SITE. THE PROJECT COORDINATOR SHALL CONTACT THE CITY GRADING/BUILDING INSPECTOR, CITY ENGINEERING INSPECTOR, AND CITY PUBLIC WORKS INSPECTOR AT LEAST 48 HOURS PRIOR AND SHALL CONTACT THE FOLLOWING PRINCIPALS TO BE REPRESENTED AT THE MEETING: OWNER, SOILS ENGINEER, ENGINEERING GEOLOGIST, CIVIL ENGINEER (OR ARCHITECT) AND GRADING CONTRACTOR.

3. SUBSEQUENT INSPECTIONS. REQUESTS FOR INSPECTION BY THE GRADING/BUILDING INSPECTOR OR RECORD OF THE FOLLOWING ITEMS SHALL BE MADE IN THE FORM AND MANNER AS REQUIRED BY THE BUILDING DIVISION:

(A) CANYON CLEANOUT. AFTER ALL BRUSH AND UNSUITABLE MATERIAL HAS BEEN REMOVED AND AN ACCEPTABLE BASE HAS BEEN EXPOSED, BUT BEFORE ANY FILL IS PLACED.

(B) TOE BENCH AND KEY INSPECTIONS. AFTER THE NATURAL GROUND OR BEDROCK IS EXPOSED AND PREPARED TO RECEIVE FILL, BUT BEFORE FILL IS PLACED.

(C) OVER-EXCAVATION. AFTER AREA HAS BEEN EXCAVATED, BUT BEFORE FILL IS PLACED.

(D) EXCAVATION INSPECTION. AFTER THE EXCAVATION IS STARTED, BUT BEFORE THE VERTICAL DEPTH OF THE EXCAVATION EXCEEDS TEN FEET.

(E) FILL INSPECTION. AFTER THE FILL PLACEMENT IS STARTED, BUT BEFORE THE VERTICAL HEIGHT OF THE FILL EXCEEDS TEN FEET.

(F) DRAINAGE DEVICE INSPECTION. CONTACT GRADING/BUILDING INSPECTOR OF RECORD FOR REQUIREMENTS.

(G) PAVING. FOR ON-SITE PAVING, CONTACT GRADING/BUILDING INSPECTOR OF RECORD FOR REQUIREMENTS AND INSPECTION. FOR PAVING IN PUBLIC RIGHT-OF-WAY, CONTACT ENGINEERING INSPECTOR FOR REQUIREMENTS AND INSPECTION.

(H) ROUGH GRADING. WHEN ALL ROUGH GRADING HAS BEEN COMPLETED. THIS INSPECTION MAY BE CALLED FOR AT THE COMPLETION OF ROUGH GRADING WITHOUT THE NECESSITY OF THE CITY ENGINEER HAVING PREVIOUSLY REVIEWED AND APPROVED THE REPORTS. UNDER NORMAL CIRCUMSTANCES, ALL SUBDRAINS AND SLOPE DRAINS SHALL BE IN PLACE AND APPROVED AS A CONDITION FOR ROUGH GRADING RELEASE.

(I) FINAL. ALL WORK, INCLUDING INSTALLATION OF ALL DRAINAGE STRUCTURES AND OTHER PROTECTIVE DEVICES HAS BEEN COMPLETED AND ALL WRITTEN PROFESSIONAL APPROVALS AND THE REQUIRED REPORTS HAVE BEEN SUBMITTED. REQUIRED REPORTS FROM THE SOILS ENGINEER SHALL INCLUDE, BUT NOT BE LIMITED TO, INTERIOR AND EXTERIOR UTILITY TRENCH BACKFILL COMPACTION AND RETAINING WALL BACKFILL COMPACTION. AN AS-BUILT PLAN WILL BE REQUIRED IF, IN THE OPINION OF THE CITY ENGINEER, THE FINISHED SITE SIGNIFICANTLY DEVIATES FROM THE APPROVED GRADING PLAN.

4. CUT SLOPES SHALL BE NOT STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL. ALL MANUFACTURED SLOPES SHALL BE DESIGNED AND CONSTRUCTED PER CITY OF SAN JUAN CAPISTRANO MUNICIPAL CODE SECTION 9-3.505 AND 9-4.112. ALL SUCH SLOPES SHALL BE 2:1 OR FLATTER. FILL SLOPES SHALL BE NO STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL AND SHALL HAVE NOT LESS THAN 90% COMPACTION OUT TO THE FINISHED SURFACE.

5. FILLS SHALL BE COMPACTED THROUGHOUT TO A MINIMUM OF 90% DENSITY AS DETERMINED BY C.B.C. STANDARD NO. 70-1-70 AND, CERTIFIED BY THE SOILS ENGINEER.

6. AREAS TO RECEIVE FILL SHALL BE PROPERLY PREPARED AND APPROVED BY THE CITY'S GRADING/BUILDING INSPECTOR OF RECORD AND SOILS ENGINEER PRIOR TO PLACEMENT OF ANY FILL. AFTER FILL IS PLACED, A COMPACTION REPORT, TEST RESULTS AND A LETTER OF CERTIFICATION SIGNED AND STAMPED BY THE SOILS ENGINEER SHALL BE SUBMITTED TO THE CITY'S GRADING/BUILDING INSPECTOR OF RECORD.

7. FILLS SHALL BE BENCHED INTO COMPETENT MATERIAL AS PER DETAIL ON PLAN.

8. ALL EXISTING FILLS SHALL BE APPROVED BY THE CITY ENGINEER OR REMOVED BEFORE ANY ADDITIONAL FILL IS ADDED.

9. ANY EXISTING IRRIGATION LINES AND CISTERNS SHALL BE REMOVED OR CRUSHED IN PLACE AND BACKFILLED PER ORANGE COUNTY HEALTH DEPARTMENT REQUIREMENTS AND APPROVED BY THE CITY ENGINEER AND SOILS ENGINEER.

10. THE FACE OF ALL CUT AND FILL SLOPES SHALL BE PLANTED AND MAINTAINED WITH A GROUND COVER APPROVED BY THE CITY ENGINEER. AN APPROVED IRRIGATION SYSTEM OR WATER FACILITIES MAY BE REQUIRED BY THE CITY ENGINEER PRIOR TO ROUGH GRADE APPROVALS.

11. THE STOCKPILING OF EXCESS MATERIAL SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO EXCAVATION.

12. THE DESIGN CIVIL ENGINEER, PRIOR TO ROUGH GRADE APPROVAL, SHALL PROVIDE A MINIMUM OF ONE BLUE TOP PER LOT, SET AT THE HIGHEST POINT IN THE FINISHED DRAINAGE SWALE. THE ELEVATION OF THE FLOOR SHALL BE CERTIFIED IN WRITING TO ENSURE PROPER CLEARANCE AND FALL TO DRAINAGE SWALE. THESE ELEVATIONS SHALL BE NOTED ON THE BUILDING PLANS.

13. ALL TRENCH BACKFILLS SHALL BE TESTED AND CERTIFIED BY THE SITE SOILS ENGINEER PER THE GRADING CODE AND LETTER REPORT SIGNED AND STAMPED AND SENT TO THE CITY'S GRADING/BUILDING INSPECTOR OF RECORD WITH RESULTS OF TESTS.

14. THE CIVIL ENGINEER/SURVEYOR SHALL CERTIFY LINE, GRADE AND DRAINAGE OF THE DEVELOPMENT AREA. THE CERTIFICATION SHALL BE SUBMITTED TO THE CITY'S GRADING/BUILDING INSPECTOR OF RECORD PRIOR TO FOOTING AND SLAB PLACEMENT.

15. PRESATURATION CERTIFICATION OF SUBGRADE IS REQUIRED TO BE SUBMITTED TO THE CITY'S GRADING/BUILDING INSPECTOR OF RECORD PRIOR TO FOOTING AND/OR SLAB PLACEMENT PER THE SOILS REPORT.

16. ANY LOT CORNER OR OCEMA BM, MONUMENT OR TIE DESTROYED OR DISPLACED SHALL BE RESTORED TO ITS ORIGINAL POSITION BY A LICENSED ENGINEER OR SURVEYOR. ANY CHANGE IN LOCATION OR ELEVATION SHALL BE REPORTED TO THE CITY ENGINEER AND ORANGE COUNTY RDMD BY A LICENSED ENGINEER OR LAND SURVEYOR ON 8½" X 11" PAPER (ONE SIDE ONLY) SHOWING LOCATION AND TIES OR LEVEL RUN.

17. SITUATION CONTROL FACILITIES (RAINY SEASON: OCTOBER 15 TO APRIL 15):

PRIOR TO THE START OF ANY WORK ON DESILTING BASINS AND EROSION CONTROL FACILITIES, THE CITY'S GRADING/BUILDING INSPECTOR OF RECORD AND THE DEPARTMENTAL EROSION CONTROL ENGINEER SHALL BE CALLED TO REVIEW THE PLACEMENT OF SAID FACILITIES.

DURING INSTALLATION, INSPECTIONS ARE TO BE CALLED BEFORE ANY CONCRETE IS POURED AND AFTER STRUCTURE IS COMPLETE.

(A) AFTER EXCAVATION, BUT PRIOR TO FILL PLACEMENT. PRE-FABRICATED DEVICES TO BE AVAILABLE ON SITE FOR INSPECTION.

(B) AFTER FILL PLACEMENT, BUT PRIOR TO PLACEMENT OF CONCRETE OR OTHER NON-EROSIVE MATERIALS.

(C) AFTER COMPLETION, IN ACCORDANCE WITH REQUIREMENTS OF THE CITY'S GRADING/BUILDING INSPECTOR OF RECORD.

18. THE PROJECT SITE SHALL BE MAINTAINED IN A "WET-DOWN" CONDITION TO THE DEGREE NECESSARY TO PREVENT EXCESSIVE DUST. PERIODICALLY, SPILLAGE AND DUST SHALL BE REMOVED FROM THE PUBLIC RIGHT-OF-WAY BY SWEEPING OR SPRINKLING; HOWEVER, WATERING THAT RESULTS IN MUD ON PUBLIC STREETS IS NOT PERMITTED AS A SUBSTITUTE FOR OTHER CLEANING METHODS.

19. CONTRACTOR SHALL FURNISH AND INSTALL ALL SIGNS, LIGHTS, BARRICADES, FLASHING ARROW BOARD AND ANY OTHER TRAFFIC CONTROL OR WARNING DEVICES, INCLUDING FLAGMEN, AS MAY BE REQUIRED BY THE CITY ENGINEER. ALL ITEMS MENTIONED SHALL BE IN CONFORMANCE WITH THE CURRENT REQUIREMENTS AS SPECIFIED IN THE LATEST EDITION OF THE "CONSTRUCTION SAFETY ORDERS", AND W.A.T.C.H.. FAILURE TO DO SO WILL BE CITED UNDER APPLICABLE SECTION OF THE C.V.C. AND CORRECTIVE COSTS TO THE CITY WILL BE CHARGED.

20. GEOLOGIC AND/OR SOILS REPORTS PREPARED BY WILLDAN ENGINEERING AND AND GEOTECHNICAL GROUP, DATED NOVEMBER 15, 2018 HAVE BEEN REVIEWED AND APPROVED BY THE CITY ENGINEER OR HIS DESIGNEE, INCLUDING ALL SUPPLEMENTS, ADDENDA AND AMENDMENTS THERETO ARE INCLUDED BY REFERENCE. ALL RECOMMENDATIONS CONTAINED THEREIN MUST BE FOLLOWED.

21. ESTIMATED QUANTITY OF CUT: 28,500 CU. YD.
ESTIMATED QUANTITY OF FILL: 47,500 CU. YD.
(FOR PLAN REVIEW AND PERMIT FEE PURPOSES ONLY, NOT FOR BID OR PAYMENT).

22. THE CONTRACTOR SHALL PAY FOR THE INITIAL SOIL AND MATERIALS TESTS AND ANY SUBSEQUENT SOIL AND MATERIALS TESTS DEEMED NECESSARY DUE TO FAILURE OF THE INITIAL TESTS, AS DETERMINED BY THE CITY ENGINEER OR DESIGNEE.

23. NO WORK SHALL BE DONE ON ADJACENT PROPERTIES OR ADJACENT OWNER'S IMPROVEMENTS WITHOUT OBTAINING WRITTEN PERMISSION FROM THE OWNERS OF THE ADJACENT PROPERTIES AND SUBMITTING A COPY THEREOF TO THE CITY ENGINEERING DIVISION.

24. ALL EXISTING DRAINAGE COURSES ON THE PROJECT MUST CONTINUE TO FUNCTION, ESPECIALLY DURING STORM CONDITIONS AND APPROVED PROTECTIVE MEASURES AND TEMPORARY DRAINAGE PROVISIONS MUST BE USED TO PROTECT ADJOINING PROPERTIES DURING THE GRADING PROJECT. IN ALL CASES, THE CONTRACTOR AND/OR DEVELOPER SHALL BE HELD LIABLE FOR ANY DAMAGE DUE TO OBSTRUCTION OF NATURAL DRAINAGE PATTERNS. IF THE FOREGOING CANNOT BE COMPLIED WITH, A FULLY EXECUTED, NOTARIZED AND RECORDED AGREEMENT BETWEEN THE AFFECTED PARTIES SHALL BE EXECUTED.

25. WORK, ONCE BEGUN, SHALL BE PROSECUTED TO COMPLETION WITHOUT DELAY SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND THE TRAVELING PUBLIC.

26. ALL STREET SECTIONS LOCATED WITHIN 20 FEET OR LESS, FROM THE TOE OF A SLOPE OF 10' IN HEIGHT OR MORE SHALL BE SHOWN AND MARKED ON THE PLANS. THESE SECTIONS SHALL BE PROTECTED FROM UNDERGROUND WATER SEEPAGE BY CUT-OFF SUBDRAIN BARRIERS IN ACCORDANCE WITH CITY STANDARD PLAN NO. 350. ANY DEVIATION TO DEVICE OR METHOD OF DRAINAGE SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE CITY ENGINEER.

27. ALL CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH ALL SECTIONS OF THE MUNICIPAL CODE OF THE CITY OF SAN JUAN CAPISTRANO, ESPECIALLY SECTION 6-3.06(B), (C), (D), AND (E), AND SHALL SECURE THE SERVICES OF THE CITY'S EXCLUSIVE SOLID WASTE HAULER FOR THEIR SOLID WASTE HANDLING NEEDS.

28. ISSUANCE OF A GRADING PERMIT DOES NOT ELIMINATE THE NEED FOR PERMITS FROM OTHER CITY REGULATORY DIVISIONS/DEPARTMENTS OR AGENCIES WITH REGULATORY RESPONSIBILITIES FOR CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE WORK AUTHORIZED ON THIS PLAN.

29. CONTRACTOR SHALL PROVIDE A CLEAR UNOBSTRUCTED WALKWAY FOR PEDESTRIANS PAST WORK AREA(S). AT NO TIME SHALL PEDESTRIANS BE DIRECTED INTO A VEHICULAR LANE.

30. NO STAGING OF CONSTRUCTION EQUIPMENT SHALL BE PERMITTED IN THE RIGHT-OF-WAY.

31. A TRAFFIC CONTROL PLAN SHALL BE REQUIRED FOR ALL LANE CLOSURES. SAID PLAN SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE TRAFFIC ENGINEER PRIOR TO ISSUANCE OF AN ENCROACHMENT PERMIT FOR WORK IN THE RIGHT-OF-WAY.

32. SEPARATE ENCROACHMENT PERMITS SHALL BE OBTAINED FROM THE ENGINEERING DIVISION FOR INSTALLATION OF "DRY" UTILITIES IN THE RIGHT-OF-WAY.

33. ALL SIDEWALK, CURB AND GUTTER, AND DRIVEWAY APPROACHES, WITHIN THE CITY'S RIGHT-OF-WAY, SHALL BE CONSTRUCTED OVER 6" MINIMUM CLASS II AGGREGATE BASE (3/4" MAXIMUM AGGREGATE SIZE) OR CMB, PER CITY STANDARD PLANS.

34. EROSION AND SEDIMENT CONTROL SHALL BE PURSUANT TO BEST MANAGEMENT PRACTICES AND SHALL BE INSTALLED AND MAINTAINED BY CONTRACTOR DURING ENTIRE CONSTRUCTION PERIOD.

35. PER CITY COUNCIL POLICY 601, AN ARCHAEOLOGICAL MONITOR IS REQUIRED TO BE ON SITE DURING ALL EXCAVATION ACTIVITIES IN EXCESS OF 18 INCHES, UNLESS DETERMINED TO BE EXEMPT BY THE PLANNING DIRECTOR. A FINAL REPORT MUST BE PREPARED AND SUBMITTED TO THE ENGINEERING DIVISION WHEN MONITORING REQUIREMENTS OF THIS PROJECT ARE COMPLETE. ALL COSTS SHALL BE BORNE BY PERMITTEE.

36. IMPROVEMENT AND/OR CONSTRUCTION OF BIKE TRAILS SHALL BE PER CITY STANDARD NO. 345.

37. THE DEVELOPER SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID CREATING ANY DRAINAGE PROBLEMS FOR PROPERTIES ADJACENT TO OR IN THE VICINITY OF THE PROPOSED DEVELOPMENT. IF ANY SUCH DRAINAGE PROBLEMS ARE EVIDENT, OR DO OCCUR, IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO PROVIDE AND IMPLEMENT A SOLUTION ACCEPTABLE TO THE CITY ENGINEER AT NO COST TO THE CITY, AND TO SUBMIT A RECORDED INSTRUMENT TO INSURE THE FUTURE OF THE SOLUTION.

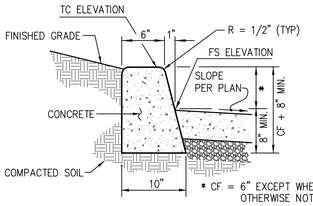
38. ANY CONNECTIONS TO THE CITY STORM DRAINS FROM PRIVATE ON-SITE DRAINS MUST BE APPROVED BY THE CITY ENGINEER. A PERMIT FOR WORK IN THE RIGHT-OF-WAY MUST BE OBTAINED FROM THE CITY ENGINEERING DIVISION PRIOR TO CONNECTION.

39. DRIVEWAYS, PEDESTRIAN WAYS, AND DRAINAGE FACILITIES SHALL BE LOCATED AND CONSTRUCTED PER CITY OF SAN JUAN CAPISTRANO MUNICIPAL CODE SECTION 9-4.1.

40. SEWER IMPROVEMENTS SHALL BE PER CITY OF SAN JUAN CAPISTRANO MUNICIPAL CODE SECTION 9-4.111.

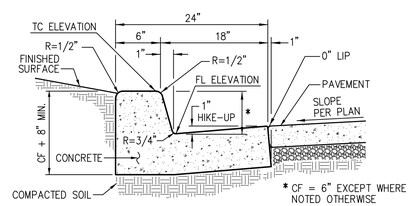
41. WATER SYSTEM IMPROVEMENTS SHALL BE PER CITY OF SAN JUAN CAPISTRANO MUNICIPAL CODE SECTION 9-4.109.

42. FULFILL FEE REQUIREMENTS AS SET FORTH IN SAN JUAN CAPISTRANO MUNICIPAL CODE SECTION 9-2.317.



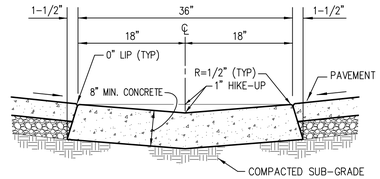
1. BOTTOM OF CURB TO BE SET ON COMPACTED SUB-GRADE OR NATURAL UNDISTURBED SOIL.
2. FINISH ALL EXPOSED CONCRETE SURFACES SMOOTH.
3. PROVIDE 1/2" EXPANSION JOINTS @ 25' O.C. MAXIMUM AT CURVES, TANGENTS AND CORNERS.
4. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (THE GREEN BOOK) AND THE SPECIFIC REQUIREMENTS OF THE GOVERNING AGENCY.

6" CURB DETAIL (1)
NOT TO SCALE



1. BOTTOM OF CURB TO BE SET ON COMPACTED SUB-GRADE OR NATURAL UNDISTURBED SOIL.
2. FINISH ALL EXPOSED CONCRETE SURFACES SMOOTH.
3. PROVIDE 1/2" EXPANSION JOINTS @ 25' O.C. MAXIMUM AT CURVES, TANGENTS AND CORNERS.
4. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (THE GREEN BOOK) AND THE SPECIFIC REQUIREMENTS OF THE GOVERNING AGENCY.

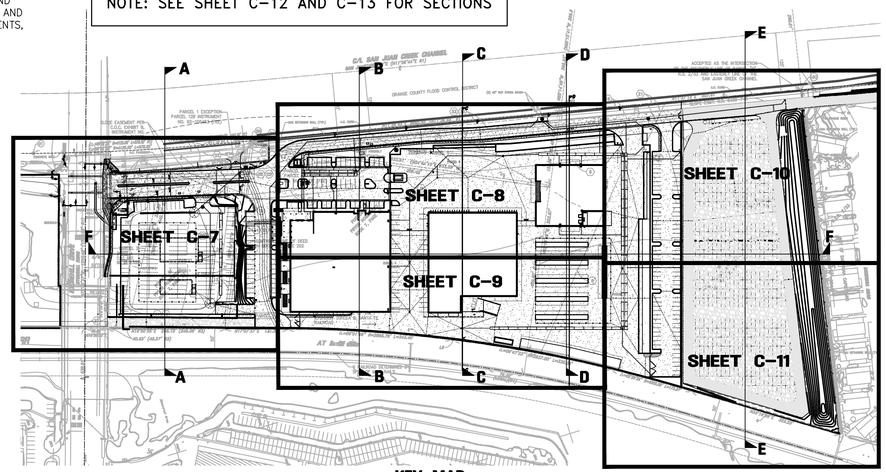
6" CURB & 18" GUTTER DETAIL (2)
NOT TO SCALE



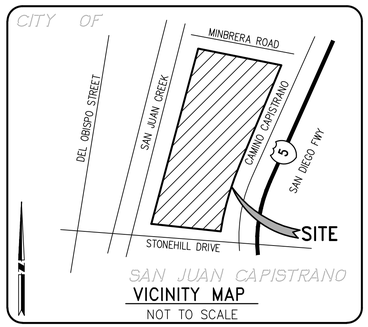
1. BOTTOM OF CURB TO BE SET ON COMPACTED SUB-GRADE OR NATURAL UNDISTURBED SOIL.
2. FINISH ALL EXPOSED CONCRETE SURFACES SMOOTH.
3. PROVIDE 1/2" EXPANSION JOINTS @ 25' O.C. MAXIMUM AT CURVES, TANGENTS AND CORNERS.
4. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (THE GREEN BOOK) AND THE SPECIFIC REQUIREMENTS OF THE GOVERNING AGENCY.

36" WIDE GUTTER DETAIL (7)
NOT TO SCALE

NOTE: SEE SHEET C-12 AND C-13 FOR SECTIONS



KEY MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

SHEET INDEX

C-1 TITLE SHEET
C-2 NOTES
C-3 DEMOLITION PLAN
C-4 DEMOLITION PLAN
C-5 HORIZONTAL CONTROL PLAN
C-6 HORIZONTAL CONTROL PLAN
C-7 CONCEPTUAL GRADING PLAN
C-8 CONCEPTUAL GRADING PLAN
C-9 CONCEPTUAL GRADING PLAN
C-10 CONCEPTUAL GRADING PLAN
C-11 CONCEPTUAL GRADING PLAN
C-12 SECTIONS
C-13 SECTIONS
C-14 DETAILS
C-15 EROSION CONTROL PLAN
C-16 EROSION CONTROL PLAN
C-17 STORM DRAIN PLAN
C-18 STORM DRAIN PLAN
C-19 STORM DRAIN PLAN
C-20 STORM DRAIN DETAILS
C-21 STORM DRAIN DETAILS
C-22 STORM DRAIN DETAILS
C-23 STORM DRAIN DETAILS
C-24 SEWER AND WATER PLAN
C-25 SEWER AND WATER PLAN
C-26 SEWER AND WATER DETAILS
C-27 COMPOSITE UTILITY PLAN
C-28 COMPOSITE UTILITY PLAN

REFERENCE PLANS

* 1-TITLE SHEET
* 2-TOPOGRAPHIC SURVEY
* 3-TOPOGRAPHIC SURVEY
* 4-BOUNDARY EXHIBIT

** 1-TITLE SHEET
** 2-ALTA/NSPS LAND TITLE SURVEY

* TOPOGRAPHIC AND BOUNDARY SURVEY
PREPARED BY:
TRUXAW AND ASSOCIATES
265 S. ANITA DRIVE, SUITE 111
ORANGE, CA 92868
(714) 935-0265
DATED: 7-31-17

** ALTA/NSPS LAND TITLE SURVEY
PREPARED BY:
DMG, INC.
2618 SAN MIGUEL DRIVE, SUITE 290
NEWPORT BEACH, CA 92660
(949) 825-7786
DATED: 11-13-16
JOB NO. 32-078-16-DMG

EARTHWORK QUANTITY ESTIMATES (CUBIC YARDS)

	TOTAL	LOTS 1&2	LOT 3	LOTS 4&5
OVER-EXCAVATION (CUT)	276,000	25,700	180,900	69,400
IMPORT ROCK (FILL)	53,000	4,900	34,750	13,350
IMPORT (FILL)	9,500	900	6,200	2,400

THE ABOVE QUANTITIES REFLECT A 20% LOSS FACTOR TO FILL FROM ONSITE SOURCES AND A 10% SHRINKAGE FACTOR TO FILL FROM OFFSITE SOURCES, BUT DO NOT REFLECT SWELLING, SUBSIDENCE, STRIPPING LOSS, OVER-EXCAVATION, DEMOLITION LOSSES, FOOTING SPOILS, OR ANY SPECIAL CONDITIONS THAT MAY BE SPECIFIED IN THE APPLICABLE GEOTECHNICAL REPORT(S) AND ARE FOR REFERENCE AND FEE PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING HIS OWN QUANTITIES FOR CONSTRUCTION AND CONTRACT PURPOSES.

SOILS ENGINEER
THESE PLANS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GEOTECHNICAL RECOMMENDATIONS MADE BY:

WILLDAN ENGINEERING
GEOTECHNICAL GROUP
1515 SOUTH SUNKIST STREET, SUITE E
ANAHEIM, CA 92806
(714) 634-3318
PROJECT No. 108164-2000
DATE: NOVEMBER 15, 2018
CONTRACTOR SHALL OBTAIN A COPY OF THIS REPORT AND FOLLOW THE RECOMMENDATIONS THEREIN. NOTIFY TRUXAW AND ASSOCIATES OF ANY DISCREPANCIES OR FIELD CHANGES PRIOR TO CONSTRUCTION.

NOTICE TO CONTRACTOR
THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER — CRAIG S. DI BIAS — No. 75205 — CIVIL — STATE OF CALIFORNIA

PLAN PREPARED FOR
GANAHL LUMBER
1220 EAST BALL ROAD
ANAHEIM, CA 92805
(714) 772-5444

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

JOB NO. GNH17048
SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

REVISIONS

NO.	INITIAL	DESCRIPTION	DATE	APPL

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

TITLE SHEET

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-1 OF 28
CHECKED BY:	CHECKED BY:	JEROME PARCO CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019	
CDB	CDB		

DATE: 4-12-19

* TITLE REPORT

THIS SURVEY AND EASEMENTS SHOWN HEREON ARE BASED ON INFORMATION CONTAINED IN THE PRELIMINARY TITLE REPORT PREPARED BY:

FIRST AMERICAN TITLE INSURANCE COMPANY
3281 E GUASTI ROAD, SUITE 440
ONTARIO, CA 91761
(909) 510-62072
ORDER/FILE NUMBER: NCS-805010-ONT1
DATED: JULY 13, 2016
TITLE OFFICER: MATTHEW HOOKS

* LEGAL DESCRIPTION

THE LAND REFERRED TO IN THIS COMMITMENT IS SITUATED IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE: (APN: 121-253-13)

THAT PORTION OF THE LAND DESCRIBED IN PARCEL 1 OF THE DEED TO PAUL N. YORBA AND OTHERS, RECORDED AUGUST 11, 1945 IN BOOK 1354, PAGE 91 OF OFFICIAL RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE WESTERLY RIGHT OF WAY LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, WITH THE SOUTH LINE OF THE LAND CONVEYED BY ROSA A. PRYOR TO ALBERT PRYOR AND CHRISTINA S. LANDELL, BY DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS OF SAID ORANGE COUNTY; THENCE SOUTH 16° 01' 30" WEST ALONG THE ABOVE MENTIONED WESTERLY RIGHT OF WAY LINE, 205.52 FEET TO A 2-INCH PIPE MONUMENT MARKED "R.D.E. 10301"; THENCE NORTH 61° 11' 37" WEST 1008.34 FEET TO AN INTERSECTION WITH THE NORTHWESTERLY LINE OF THE ABOVE MENTIONED PARCEL 1; THENCE NORTH 30° 03' 57" EAST 117.90 FEET TO THE MOST NORTHERLY CORNER OF SAID PARCEL 1; THENCE SOUTH 66° 16' 26" EAST ALONG SAID SOUTH LINE OF LAND CONVEYED TO ALBERT PRYOR AND CHRISTINA S. LANDELL, 963.82 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM, THE PORTION LYING WESTERLY OF THE EASTERLY LINE OF THE STRIP OF LAND 250.00 FEET IN WIDTH, DESCRIBED IN PARCEL L1-111.01 OF THE LIS PENDENS RECORDED MARCH 20, 1962 IN BOOK 6044, PAGE 731 OF OFFICIAL RECORDS, ENTITLED "ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY POLITIC AND CORPORATE OF THE STATE OF CALIFORNIA, PLAINTIFF, VS. PAUL N. YORBA AND OTHERS, DEFENDANTS." ALSO EXCEPTING THEREFROM THAT PORTION DESCRIBED AS PARCEL NO. 128 IN DEED TO THE COUNTY OF ORANGE RECORDED FEBRUARY 24, 1992 AS INSTRUMENT NO. 92-105463 OF SAID OFFICIAL RECORDS.

PARCEL TWO: (APN: 121-253-15)

PARCEL A AS SHOWN ON EXHIBIT "B" ATTACHED TO THAT CERTAIN CERTIFICATE OF COMPLIANCE RECORDED APRIL 29, 1999 AS INSTRUMENT NO. 99-313082 OF OFFICIAL RECORDS OF ORANGE COUNTY, CALIFORNIA.

PARCEL THREE: (APN: 121-240-73)

THAT PORTION OF THE LAND KNOWN AS THE PRYOR HOMESTEAD, AS SAID PRYOR HOMESTEAD IS DESCRIBED IN DECREE OF PARTITION, RECORDED APRIL 14, 1896, AS DOCUMENT NO. 5789 IN BOOK 27, PAGE 89 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A 4 X 4 REDWOOD POST MARKING THE SOUTHEAST CORNER OF THE LAND CONVEYED TO ALBERT PRYOR AND CHRISTINE LANDELL BY DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA; THENCE NORTH 5° 30' 30" EAST 341.14 FEET ALONG THE EASTERLY LINE OF SAID PARCEL, BEING THE EASTERLY LINE OF THE PRYOR HOMESTEAD AS SAID EASTERLY LINE IS SHOWN ON A MAP FILED IN BOOK 3, PAGE 59 OF RECORD OF SURVEYS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, TO AN IRON PIPE; THENCE NORTH 13° 32' EAST 240.03 FEET ALONG SAID EASTERLY LINE TO AN IRON PIPE; THENCE NORTH 66° 19' WEST 697.00 FEET, PARALLEL WITH THE SOUTHERLY LINE OF SAID LAND OF LANDELL AND OTHERS, TO THE CENTER LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD; THENCE NORTHERLY ALONG SAID CENTER LINE 76.00 FEET; THENCE NORTH 66° 19' WEST 400.00 FEET PARALLEL WITH SAID SOUTHERLY LINE THENCE SOUTH 23° 41' WEST TO SAID SOUTHERLY LINE; THENCE SOUTH 66° 19' EAST ALONG SAID SOUTHERLY LINE TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION LYING EASTERLY OF THE WESTERLY LINE OF THE 100 FOOT RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD.

ALSO EXCEPTING THEREFROM THAT PORTION THEREOF DESCRIBED IN PARCEL NO. 127 OF THE DEED TO THE COUNTY OF ORANGE RECORDED MAY 13, 1991 AS INSTRUMENT NO. 91- 231671 OF OFFICIAL RECORDS OF ORANGE COUNTY CALIFORNIA.

PARCEL FOUR: (APN: 121-240-39)

THAT PORTION OF THE LAND KNOWN AS THE PRYOR HOMESTEAD, AS SAID PRYOR HOMESTEAD IS DESCRIBED IN DECREE OF PARTITION, RECORDED APRIL 14, 1896, AS DOCUMENT NO. 5789 IN BOOK 27, PAGE 89 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO ALBERT PRYOR AND CRISTINA S. LANDELL BY DEED RECORDED MARCH 4, 1905 IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, SAID POINT BEING THE SOUTHEAST CORNER OF THE NORTHERLY 59 1/2 ACRES ALLOTTED TO ROSA A. DE PRYOR, CASE NO. 1210, SUPERIOR COURT OF SAID COUNTY AND RUNNING FROM SAID POINT OF BEGINNING SOUTH 80° 20' 30" EAST ALONG THE EASTERLY EXTENSION OF THE SOUTH LINE OF SAID 59 1/2 ACRES, 300.40 FEET TO A POINT IN THE CENTER LINE OF THAT CERTAIN RIGHT OF WAY DEEDED TO THE STATE OF CALIFORNIA BY DEED RECORDED JUNE 29, 1929 IN BOOK 293, PAGE 160 OF OFFICIAL RECORDS OF SAID COUNTY, SAID POINT BEING NORTH 38° 54' EAST 396.30 FEET FROM THE SOUTHERLY END OF A 1565.30 FOOT TANGENT LINE AS DESCRIBED IN SAID DEED; THENCE SOUTH 38° 54' WEST 396.30 FEET ALONG SAID CENTER LINE TO THE BEGINNING OF A TANGENT CURVE; THENCE ALONG A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 2000 FEET, THROUGH AN ANGLE OF 10° 57' 51" A DISTANCE OF 382.72 FEET TO THE EASTERLY LINE OF A PARCEL OF LAND CONVEYED TO ALBERT PRYOR BY DEED RECORDED JULY 24, 1929 IN BOOK 294, PAGE 162 OF SAID OFFICIAL RECORDS; THENCE SOUTH 13° 32' WEST 192.34 FEET, MORE OR LESS, ALONG SAID EASTERLY LINE OF SAID LAST MENTIONED PARCEL OF LAND TO AN IRON PIPE AT THE SOUTHEASTERLY CORNER OF SAID PARCEL; THENCE NORTH 66° 19' WEST 697 FEET PARALLEL TO THE SOUTHERLY LINE OF SAID PARCEL OF LAND DESCRIBED IN SAID DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF SAID COUNTY TO THE CENTER LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD RIGHT OF WAY; THENCE NORTHERLY ALONG THE SAID CENTER LINE 76 FEET TO A POINT; THENCE NORTH 66° 19' WEST 745.10 FEET TO THE SOUTHEASTERLY CORNER OF THE PARCEL OF 1.6384 ACRES CONVEYED TO JOHN O. FORSTER BY DEED RECORDED MAY 29, 1931 IN BOOK 480, PAGE 403 OF SAID OFFICIAL RECORDS; THENCE NORTH 9° 35' EAST ALONG THE EASTERLY LINE OF SAID LAST MENTIONED PARCEL 453.84 FEET TO THE NORTHEAST CORNER THEREOF; THENCE SOUTH 80° 20' 30" EAST 1450.34 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION LYING EASTERLY OF THE WESTERLY LINE OF THE 100 FOOT RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD.

ALSO EXCEPTING THEREFROM THAT PORTION THEREOF DESCRIBED IN THE DEED TO THE ORANGE COUNTY FLOOD CONTROL DISTRICT, RECORDED JANUARY 28, 1963 IN BOOK 6409, PAGE 742 OF SAID OFFICIAL RECORDS.

PARCEL FIVE: (APN: 121-240-76)

THAT PORTION OF THE PRYOR HOMESTEAD TRACT, IN THE RANCHO BOCA DE LA PLAYA, CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA, PER MAP OF PARTITION OF SAID TRACT IN THE DECREE OF THE SUPERIOR COURT OF THE STATE OF CALIFORNIA, IN AND FOR THE COUNTY OF ORANGE, IN CASE NO. 1210, DESCRIBED IN THAT CERTAIN FINAL ORDER OF CONDEMNATION AS PARCEL L1-113.01 RECORDED JANUARY 8, 1963 IN BOOK 6386, PAGE 776 OF OFFICIAL RECORDS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, LYING EASTERLY OF A LINE THAT IS PARALLEL WITH AND 125.00 FEET EASTERLY FROM THAT CERTAIN COURSE DESCRIBED AS "N.11° 37'17"E., 2223.48 FEET" IN SAID FINAL ORDER OF CONDEMNATION.

EXCEPT THEREFROM, AN UNDIVIDED 1/3 INTEREST IN AND TO ALL MINERALS, MINERAL DEPOSITS, MINERAL OILS AND NATURAL GASES OF EVERY KIND AND NATURE CONTAINED IN OR UPON SAID LAND, AS RESERVED BY JOHN F. POZAR AND MARTHA E. POZAR, RECORDED JANUARY 10, 1958 IN BOOK 4161, PAGE 281 OF OFFICIAL RECORDS.

ALSO EXCEPT THEREFROM, AN UNDIVIDED 1/6 INTEREST IN ALL MINERALS GAS, OIL, PETROLEUM, NAPHTHA AND OTHER HYDROCARBON SUBSTANCES BELOW THE DEPTH OF 500 FEET FROM THE SURFACE OF THE ABOVE DESCRIBED PROPERTY, SUBJECT TO THE EXPRESS LIMITATION THAT THE FOREGOING RESERVATION SHALL IN NO WAY BE INTERPRETED TO INCLUDE ANY RIGHT OF ENTRY IN AND UPON THE SURFACE OF THE ABOVE-DESCRIBED PROPERTY, OR THE FIRST 500 FEET OF THE SUBSURFACE THEREOF, AS RESERVED IN THE DEED FROM JOHN F. POZAR AND MARTHA E. POZAR, HUSBAND AND WIFE, RECORDED DECEMBER 12, 1962 IN BOOK 6357 PAGE 140, OFFICIAL RECORDS.

APN: 121-240-73 AND 121-253-13 AND 121-240-76 AND 121-240-39 AND 121-253-15

* EASEMENTS

ANY POLICY WE ISSUE WILL HAVE THE FOLLOWING EXCEPTIONS UNLESS THEY ARE TAKEN CARE OF TO OUR SATISFACTION. THE PRINTED EXCEPTIONS AND EXCLUSIONS FROM THE COVERAGE OF THE POLICY OR POLICIES ARE SET FORTH IN EXHIBIT A ATTACHED. COPIES OF THE POLICY FORMS SHOULD BE READ. THEY ARE AVAILABLE FROM THE OFFICE WHICH ISSUED THIS COMMITMENT.

6 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JUNE 11, 1938 AS BOOK 943, PAGE 245 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FOUR

EASEMENT ESTABLISHED FROM PARCEL MAP NO. 85-306, BOOK 223, PAGES 10-12. WIDTH OF EASEMENT INDETERMINABLE.

7 AN EASEMENT FOR INSTALLING AND MAINTAINING AN ANCHOR AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 10, 1940 AS BOOK 1029, PAGE 219 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.

AFFECTS: PARCELS THREE AND FOUR

8 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 23, 1946 AS BOOK 1382, PAGE 251 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FOUR

WIDTH OF EASEMENT INDETERMINABLE.

9 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 23, 1946 AS BOOK 1382, PAGE 253 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FIVE

WIDTH OF EASEMENT INDETERMINABLE.

10 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 47, PAGE 38 OF RECORD OF SURVEYS.

AFFECTS: PARCELS ONE AND TWO

11 AN EASEMENT FOR COMMON ROAD, SANITARY SEWER, UTILITY WATER LINE, RAILROAD SPUR TRACK AND INCIDENTAL PURPOSES, RECORDED MARCH 18, 1960 AS BOOK 5151, PAGE 591 OF OFFICIAL RECORDS.
IN FAVOR OF: FRANK L. WINTERBOURNE AND DAISY M. WINTERBOURNE, HUSBAND AND WIFE
AFFECTS: THE EASTERLY 50.00 FEET

AFFECTS: PARCELS ONE AND TWO

12 AN EASEMENT FOR COMMON ROAD, SANITARY SEWER, UTILITY WATER LINE, RAILROAD SPUR TRACK AND INCIDENTAL PURPOSES, RECORDED MARCH 18, 1960 AS BOOK 5152, PAGE 514 OF OFFICIAL RECORDS.
IN FAVOR OF: LORRIN HARRISON AND CECELIA YORBA HARRISON, HUSBAND AND WIFE
AFFECTS: THE EASTERLY 50.00 FEET

AFFECTS: PARCEL ONE

13 AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED JULY 24, 1961 AS BOOK 5793, PAGE 623 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE NORTHEASTERLY 5.00 FEET

AFFECTS: PARCEL ONE

14 AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 6, 1961 AS BOOK 5839, PAGE 219 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE SOUTHWESTERLY 5.00 FEET

AFFECTS: PARCEL THREE

15 AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED OCTOBER 6, 1961 AS BOOK 5873, PAGE 324 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE SOUTHERLY 5.00 FEET

AFFECTS: PARCEL FIVE

16 AN EASEMENT FOR SLOPES AND RIGHT OF WAY FOR FLOOD CONTROL PURPOSES AND INCIDENTAL PURPOSES, RECORDED JANUARY 28, 1963 AS BOOK 6409, PAGE 745 OF OFFICIAL RECORDS.
IN FAVOR OF: THE ORANGE COUNTY FLOOD CONTROL DISTRICT
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FOUR

17 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 12, 1979 AS BOOK 13307, PAGE 359 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCELS ONE AND THREE

18 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 12, 1979 AS BOOK 13307, PAGE 363 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCELS ONE AND TWO

19 AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MAY 17, 1985 AS INSTRUMENT NO. 85-178640 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A PUBLIC CORPORATION
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL ONE

20 AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MAY 17, 1985 AS INSTRUMENT NO. 85-178652 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A PUBLIC CORPORATION
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL TWO

21 AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MARCH 3, 1986 AS INSTRUMENT NO. 86-82825 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A BODY CORPORATE AND POLITIC
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FOUR

22 AN EASEMENT FOR SEWER PIPELINES AND INCIDENTAL PURPOSES, RECORDED DECEMBER 4, 1986 AS INSTRUMENT NO. 86-596848 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FIVE

23 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 223, PAGE 10 OF PARCEL MAPS.

AFFECTS: PARCELS THREE AND FOUR

24 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 122, PAGE 28 OF RECORD OF SURVEYS.

25 AN EASEMENT FOR SLOPE, DRAINAGE AND INCIDENTAL PURPOSES, RECORDED MAY 13, 1991 AS INSTRUMENT NO. 91-231671 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL THREE

26 AN EASEMENT FOR SLOPE, DRAINAGE AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 24, 1992 AS INSTRUMENT NO. 92-105463 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCELS ONE AND TWO

27 AN EASEMENT FOR DRAINAGE, SLOPE AND INCIDENTAL PURPOSES, RECORDED OCTOBER 5, 1994 AS INSTRUMENT NO. 94-596655 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, A POLITICAL SUBDIVISION OF THE STATE OF CALIFORNIA
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL TWO

28 THE TERMS, PROVISIONS AND EASEMENT(S) CONTAINED IN THE DOCUMENT ENTITLED "ACCESS EASEMENT" RECORDED APRIL 30, 1999 AS INSTRUMENT NO. 99-318235 OF OFFICIAL RECORDS.

DOCUMENT(S) DECLARING MODIFICATIONS THEREOF RECORDED AUGUST 22, 2000 AS INSTRUMENT NO. 00-436694 OF OFFICIAL RECORDS.

AFFECTS: PARCELS ONE, TWO AND THREE

EASEMENT IS PLOTTED HEREON PER EXHIBIT "D" PER SAID DOCUMENT. AN ALTERNATE LOCATION MAY BE IN EFFECT PER EXHIBIT "F" OF SAID DOCUMENT. IT IS NOT KNOWN WHICH LOCATION, IF ANY, IS IN EFFECT AT THE TIME OF THIS SURVEY. SEE DOCUMENT FOR FULL PARTICULARS.

29 THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "DECLARATION OF USE RESTRICTION" RECORDED APRIL 12, 2006 AS INSTRUMENT NO. 06-244975 OF OFFICIAL RECORDS.

AFFECTS: PARCELS THREE AND FOUR

30 EASEMENTS, COVENANTS AND CONDITIONS CONTAINED IN THE DEED FROM THE HOME DEPOT USA, INC., A DELAWARE CORPORATION, AS GRANTOR, TO THE SAN JUAN CAPISTRANO REDEVELOPMENT AGENCY, A CALIFORNIA MUNICIPAL AGENCY, AS GRANTEE, RECORDED APRIL 25, 2006 AS INSTRUMENT NO. 06-274911 OF OFFICIAL RECORDS. REFERENCE BEING MADE TO THE DOCUMENT FOR FULL PARTICULARS, BUT DELETING ANY COVENANT, CONDITION, OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, GENETIC INFORMATION, GENDER, GENDER IDENTITY, GENDER EXPRESSION, SOURCE OF INCOME (AS DEFINED IN CALIFORNIA GOVERNMENT CODE § 12955(P)) OR ANCESTRY, TO THE EXTENT SUCH COVENANTS, CONDITIONS OR RESTRICTIONS VIOLATION 42 U.S.C. § 3604(C) OR CALIFORNIA GOVERNMENT CODE § 12955. LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.

THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.

AFFECTS: PARCELS ONE AND TWO

31 THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "PRE-ANNEXATION AGREEMENT" RECORDED AUGUST 15, 2008 AS INSTRUMENT NO. 08-390972 OF OFFICIAL RECORDS.

AFFECTS: PARCEL FIVE

DOCUMENT OUTLINES TERMS OF AN ANNEXATION AGREEMENT. SEE DOCUMENT FOR FULL PARTICULARS.

32 EASEMENTS, COVENANTS AND CONDITIONS CONTAINED IN THE DEED FROM ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY CORPORATE AND POLITIC, AS GRANTOR, TO SAN JUAN CAPISTRANO COMMUNITY REDEVELOPMENT AGENCY, A PUBLIC BODY, CORPORATE AND POLITIC, AS GRANTEE, RECORDED JULY 29, 2009 AS INSTRUMENT NO. 09-407978 OF OFFICIAL RECORDS. REFERENCE BEING MADE TO THE DOCUMENT FOR FULL PARTICULARS, BUT DELETING ANY COVENANT, CONDITION, OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, GENETIC INFORMATION, GENDER, GENDER IDENTITY, GENDER EXPRESSION, SOURCE OF INCOME (AS DEFINED IN CALIFORNIA GOVERNMENT CODE §12955(P)) OR ANCESTRY, TO THE EXTENT SUCH COVENANTS, CONDITIONS OR RESTRICTIONS VIOLATION 42 U.S.C.§3604(C) OR CALIFORNIA GOVERNMENT CODE §12955. LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.

AFFECTS: PARCEL FIVE

33 AN EASEMENT FOR SLOPE AND INCIDENTAL PURPOSES, RECORDED JULY 29, 2009 AS INSTRUMENT NO. 09-407978 OF OFFICIAL RECORDS.
IN FAVOR OF: ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY CORPORATE AND POLITIC
AFFECTS: THE WESTERLY 20.00 FEET

AFFECTS: PARCEL FIVE

* BASIS OF BEARINGS

THE BEARING NORTH 72°53'38" WEST FOR THE CENTERLINE OF STONEHILL DRIVE BETWEEN FOUND MONUMENT (52) AND FOUND MONUMENT (77) PER (R1) WAS USED AS THE BASIS OF BEARING FOR THIS SURVEY.

* BENCHMARK

COUNTY OF ORANGE BENCHMARK NO. 3MM-1-78
ELEVATION = 62.899 FEET (NAVD88)

DESCRIBED BY OCS 2003 - FOUND 3 3/4" OCS ALUMINUM BENCHMARK DISK STAMPED "3MM-1-78", SET IN THE SOUTHWESTERLY CORNER OF A 4.3 FT. BY 11.5 FT. CONCRETE CATCH BASIN. MONUMENT IS LOCATED IN THE NORTHWESTERLY CORNER OF THE INTERSECTION OF STONEHILL DRIVE AND DEL OBISPO STREET, 228 FT. NORTHERLY OF THE CENTERLINE OF STONEHILL DRIVE AND 4 FT. WESTERLY OF THE WESTERLY CURB FACE ALONG DEL OBISPO. MONUMENT IS SET LEVEL WITH THE SIDEWALK.

* AREA

TOTAL AREA = 715,449 S.F. OR 16.424 ACRES

* RECORD DATA

(R1) - RECORD OF SURVEY NO. 87-1004, BOOK 122, PAGES 28-46.

(R2) - RECORD OF SURVEY NO. 94-1063, BOOK 147, PAGE 37.

(R3) - CERTIFICATE OF COMPLIANCE INSTRUMENT NO. 99-313082 OF OFFICIAL RECORDS, ORANGE COUNTY.

* MONUMENT NOTES

(52) FOUND MAG NAIL AND WASHER, STAMPED "L.S. 7754". NO REFERENCE.

(77) FOUND LEAD AND TACK, STAMPED "O.C.S. 92". NO REFERENCE.

(81) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (122) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).

(83) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (128) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).

(84) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (127) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).

(86) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (121) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS NORTHWEST CORNER OF PARCEL 5.

(88) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (117) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS THE SOUTHEAST CORNER OF PARCEL 5.

(89) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (102) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS THE SOUTHWEST CORNER OF PARCEL 5.

(91) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (68) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).

(160) FOUND 2" IRON PIPE WITH PK NAIL AND WASHER, STAMPED "R.C.E. 31688", IN LIEU OF 2" IRON PIPE AND TAG, STAMPED "R.C.E. 1604" PER P.M.B. 223/10-12 PER (R2). ACCEPTED AS THE INTERSECTION OF THE SOUTHERLY LINE OF PARCEL "G", RS 2/33 AND EASTERLY LINE OF SAN JUAN CREEK CHANNEL.

* FLOOD ZONE

COMMUNITY NUMBER: 060736 0506J, EFFECTIVE DATE: 12/3/2009

ZONE AO

SPECIAL FLOOD HAZARD AREA. AREAS OF 100 - YEARS SHALLOW FLOODING WHERE DEPTHS ARE BETWEEN ONE (1) AND THREE (3) FEET; AVERAGE DEPTHS OF INUNDATION ARE SHOWN, BUT NO FLOOD HAZARD FACTORS ARE DETERMINED. FLOOD INSURANCE REQUIRED.

INFORMATION OBTAINED FROM CERTIFIED FLOOD SYSTEMS, INC. ON 6/8/2017

* UTILITY PROVIDERS:

WATER....................................CITY OF SAN JUAN CAPISTRANO.......................(949) 493-1171
SEWER....................................CITY OF SAN JUAN CAPISTRANO........................(949) 493-1171
STORM DRAIN.............ORANGE COUNTY FLOOD CONTROL DISTRICT..................(714) 647-3999
GAS..................................SOUTHERN CALIFORNIA GAS COMPANY..................(714) 385-3377
TELEPHONE..AT&T..(858) 886-1288
ELECTRIC..............................SAN DIEGO GAS AND ELECTRIC............................(800) 411-7343
TV..COX COMMUNICATIONS.................................(619) 266-5605

LEGEND

- AB = AGGREGATE BASE
- AC = ASPHALT CONCRETE
- BLK = CONCRETE BLOCK
- BS = BACK OF SIDEWALK
- CB = CATCH BASIN
- CF = CURB FACE
- CL = CENTERLINE
- CLF = CHAIN LINK FENCE
- CO = CLEANOUT
- DCV = DETECTOR CHECK VALVE
- DS = ROOF DOWNSPOUT
- EG = EDGE OF GUTTER
- EP = EDGE OF PAVEMENT
- FD = FOUND
- FDC = FIRE DEPT. CONNECTION
- FF = FINISHED FLOOR
- FG = FINISHED GRADE
- FH = FIRE HYDRANT
- FL = FLOW LINE
- FS = FINISHED SURFACE
- GB = GRADE BREAK
- GM = GAS METER
- GR = TOP OF GRATE
- GV = GAS VALVE
- HP = HIGH POINT
- HT = HEIGHT
- ICV = IRRIGATION CONTROL VALVE
- IP = IRON PIPE
- LS = LIGHT STANDARD
- L&T = LEAD & TAG
- MH = MANHOLE
- NG = NATURAL GROUND
- N&T = NAIL & TAG
- OHW = OVERHEAD WIRE
- PB = PULL BOX
- PCC = CONCRETE
- PIV = POST INDICATOR VALVE
- PL = PROPERTY LINE
- RD = ROOF DRAIN
- RWH = REDWOOD HEADER
- SCB = SIGNAL CONTROL BOX
- SMH = SEWER MANHOLE
- SPK = SPIKE
- SW = SIDEWALK
- TC = TOP OF CURB
- TE = TRASH ENCLOSURE
- TP = TELEPHONE POLE
- TRAN = TRANSITION
- TRANS= TRANSFORMER
- TRW = TOP OF RETAINING WALL
- TW = TOP OF WALL
- UG = UNDERGROUND
- UP = UTILITY POLE
- VAR = VARIABLE
- W = WASHER
- WDF = WOOD FENCE
- WM = WATER METER
- WV = WATER VALVE
- N. = NORTH
- S. = SOUTH
- E. = EAST
- W. = WEST
- N'LY = NORTHERLY
- S'LY = SOUTHERLY
- E'LY = EASTERLY
- W'LY = WESTERLY
- N/O = NORTH OF
- S/O = SOUTH OF
- E/O = EAST OF
- W/O = WEST OF
- ℙ = PROPERTY LINE
- ℄ = CENTERLINE
- R/W = RIGHT OF WAY
- △ = DELTA
- R = RADIUS
- L = LENGTH
- T = TANGENT
- M = MEASURED DATA
- C = CALCULATED DATA
- (RAD)= RADIAL BEARING
- PRO = PROPORTIONATE MEASUREMENT
- (210.00' R) = RECORD DATA
- 210.00' M. = MEASURED DATA
- 210.00' PRO. = PRORATED DATA
- 210.00' C. = CALCULATED DATA
- (427.00) TC = EXISTING ELEVATION
- 427.00 TC = DESIGN ELEVATION
- —— CATV —— = CABLE TV LINE
- —— E —— = ELECTRICAL LINE
- —— G —— = GAS LINE
- —— GB —— GB —— = GRADE BREAK LINE
- —— R —— R —— = RIDGE LINE
- —— S —— = SEWER LINE
- —— SD —— = STORM DRAIN LINE
- —— T —— = TELEPHONE LINE
- —— W —— = WATER LINE

SYMBOLS

- FIRE HYDRANT
- STREET LIGHT
- TRAFFIC SIGNAL
- TRAFFIC SIGNAL ARM & POLE
- ☼ LIGHT STANDARD
- UTILITY POLE
- GUY WIRE & ANCHOR
- WM ☐ WATER METER
- GM ☐ GAS METER
- WV ⊗ WATER VALVE
- GAS VALVE
- PB ☐ PULL BOX
- ▤ GRATE INLET
- SIGN
- VENT
- Ⓢ SEWER MANHOLE
- Ⓓ STORM DRAIN MANHOLE
- Ⓣ TELEPHONE MANHOLE
- (MH) MANHOLE
- CO SEWER CLEANOUT
- Ⓦ MONITORING WELL
- ♿ HANDICAP PARKING STALL
- Ⓛ LANDSCAPED AREA
- Ⓟ PROTECT IN PLACE
- Ⓡ REMOVE AND DISPOSE OFFSITE
- (RE) RELOCATE
- ⟨3⟩ PLOTABLE EASEMENT ITEM No. PER TITLE REPORT
- —— (427.0) —— EXIST. CONTOUR
- —— 427.0 —— DESIGN CONTOUR
- TREE

* NOTE:

ALL BOUNDARY AND EASEMENT INFORMATION SHOWN ON THESE PLANS WAS OBTAINED FROM A TOPOGRAPHIC AND BOUNDARY SURVEY PREPARED BY TRUXAW AND ASSOCIATES AND DATED 7/31/17.

* SOURCE OF TOPOGRAPHIC AND BOUNDARY SURVEY

TRUXAW AND ASSOCIATES, DATED 7/31/17
TRUXAW AND ASSOCIATES
265 S. ANITA DRIVE, SUITE 111
ORANGE, CA 92868
(714) 935-0265

SOURCE OF AERIAL SURVEY

AERIAL SURVEY WAS COMPLETED ON 6-16-17 BY:
INLAND AERIAL SURVEYS, INC.
RIVERSIDE, CA 92503
(951) 687-4252

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

CRAIG S. DI BIAS
No. 75205
CIVIL

JOB NO.	SUBMITTAL	DATE	NO.	INITIAL	DESCRIPTION	APP'L
GNH17048	100% DESIGN DEVELOPMENT	3-15-19				

REVISIONS

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

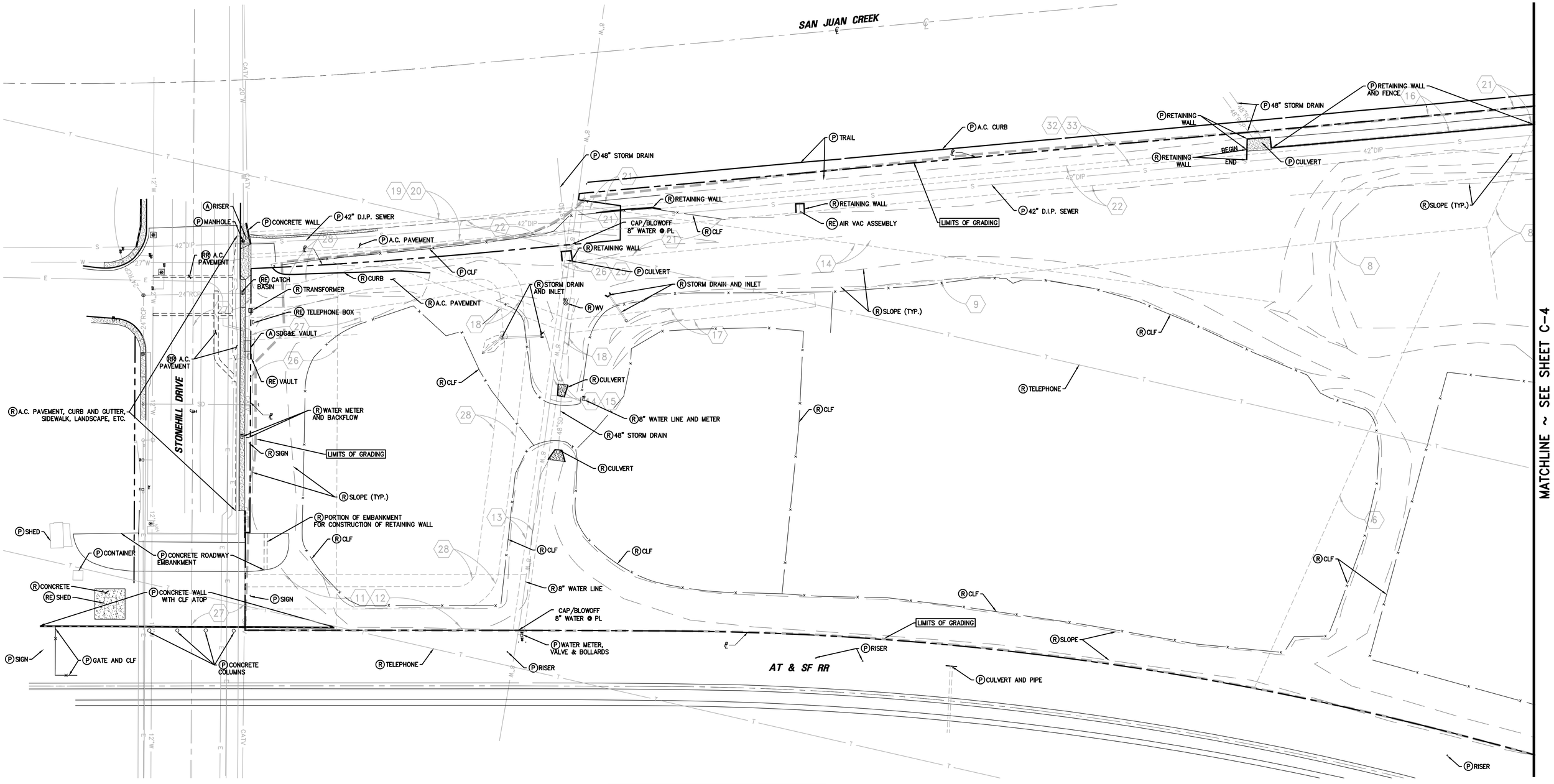
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

NOTES

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-2 OF 28
CHECKED BY:	CHECKED BY:	JEROME PARCO DATE	
CDB	CDB	CITY ENGINEER R.C.E. 50385 EXP. 06/30/2019	

DATE: 4-12-19



DISPOSITION NOTES

- (P) = PROTECT IN PLACE
- (R) = REMOVE AND DISPOSE OF OFFSITE
- (A) = ADJUST TO GRADE
- (RE) = RELOCATE
- (RR) = REMOVE AND REPLACE

NOTE:
CONTRACTOR TO PROTECT ALL UNDERGROUND AND OVERHEAD UTILITIES IN PLACE UNLESS NOTED OTHERWISE OR AS DIRECTED BY THE DEVELOPER

NOTE:
DEMOLITION CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING SEWER, WATER, GAS, TELEPHONE, CABLE TV, & ELECTRICAL LINES ON A PLAN & IN THE FIELD.

* **NOTE:** REMOVE ALL PAVEMENT, CONCRETE, FOOTINGS, AND STRUCTURES WITHIN THE LIMITS OF DEMOLITION AS SHOWN. PRIOR TO ANY DEMOLITION, CONTRACTOR SHALL SCHEDULE FIELD REVIEW WITH ARCHITECT, PROPERTY OWNER, DEVELOPER AND HIMSELF AND FIELD VERIFY ALL ITEMS TO BE DEMOLISHED, RELOCATED, AND PROTECTED. EXISTING UTILITIES ON SITE TO BE PROTECTED, REMOVED, ABANDONED OR CAPPED PER CITY REQUIREMENTS.

NOTE:
1. SEE SHEET C-2 FOR LEGEND AND EASEMENT NOTES.

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

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

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. DI BIAS
No. 75205
CIVIL
STATE OF CALIFORNIA

JOB NO. GNH17048
SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

NO.	INITIAL	DESCRIPTION	APPL	DATE

REVISIONS

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

DEMOLITION PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-3 OF 28
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019	

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

MATCHLINE ~ SEE SHEET C-4

DATE: 3-15-19

DISPOSITION NOTES

(P) = PROTECT IN PLACE

(R) = REMOVE AND DISPOSE OF OFFSITE

(A) = ADJUST TO GRADE

(RE) = RELOCATE

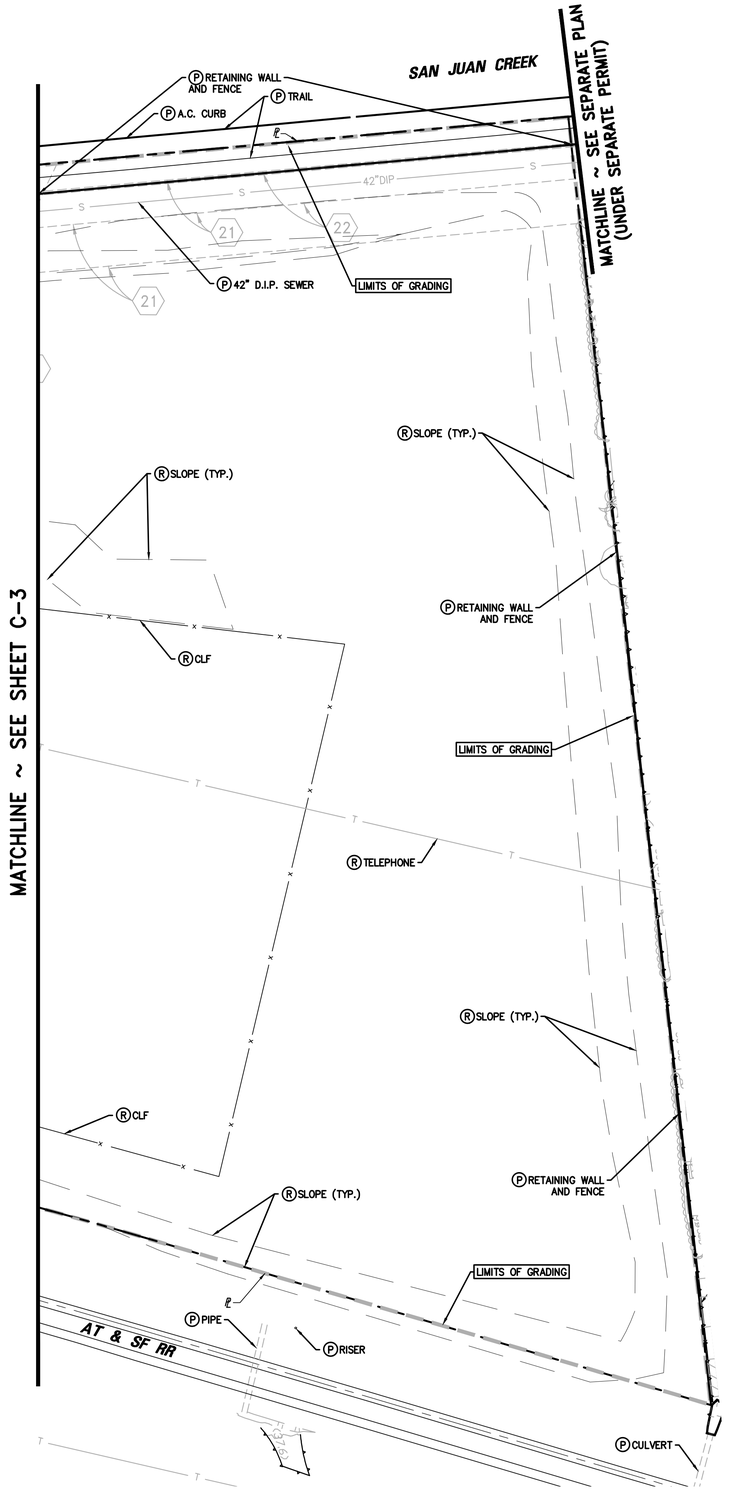
(RR) = REMOVE AND REPLACE

NOTE:
CONTRACTOR TO PROTECT ALL UNDERGROUND AND OVERHEAD UTILITIES IN PLACE UNLESS NOTED OTHERWISE OR AS DIRECTED BY THE DEVELOPER

NOTE:
DEMOLITION CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING SEWER, WATER, GAS, TELEPHONE, CABLE TV, & ELECTRICAL LINES ON A PLAN & IN THE FIELD.

* **NOTE:** REMOVE ALL PAVEMENT, CONCRETE, FOOTINGS, AND STRUCTURES WITHIN THE LIMITS OF DEMOLITION AS SHOWN. PRIOR TO ANY DEMOLITION, CONTRACTOR SHALL SCHEDULE FIELD REVIEW WITH ARCHITECT, PROPERTY OWNER, DEVELOPER AND HIMSELF AND FIELD VERIFY ALL ITEMS TO BE DEMOLISHED, RELOCATED, AND PROTECTED. EXISTING UTILITIES ON SITE TO BE PROTECTED, REMOVED, ABANDONED OR CAPPED PER CITY REQUIREMENTS.

NOTE:
1. SEE SHEET C-2 FOR LEGEND AND EASEMENT NOTES.



NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

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

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

JOB NO.	SUBMITTAL	DATE
GNH17048	100% DESIGN DEVELOPMENT	3-15-19

REVISIONS NO.	INITIAL	DESCRIPTION	DATE	APPL

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

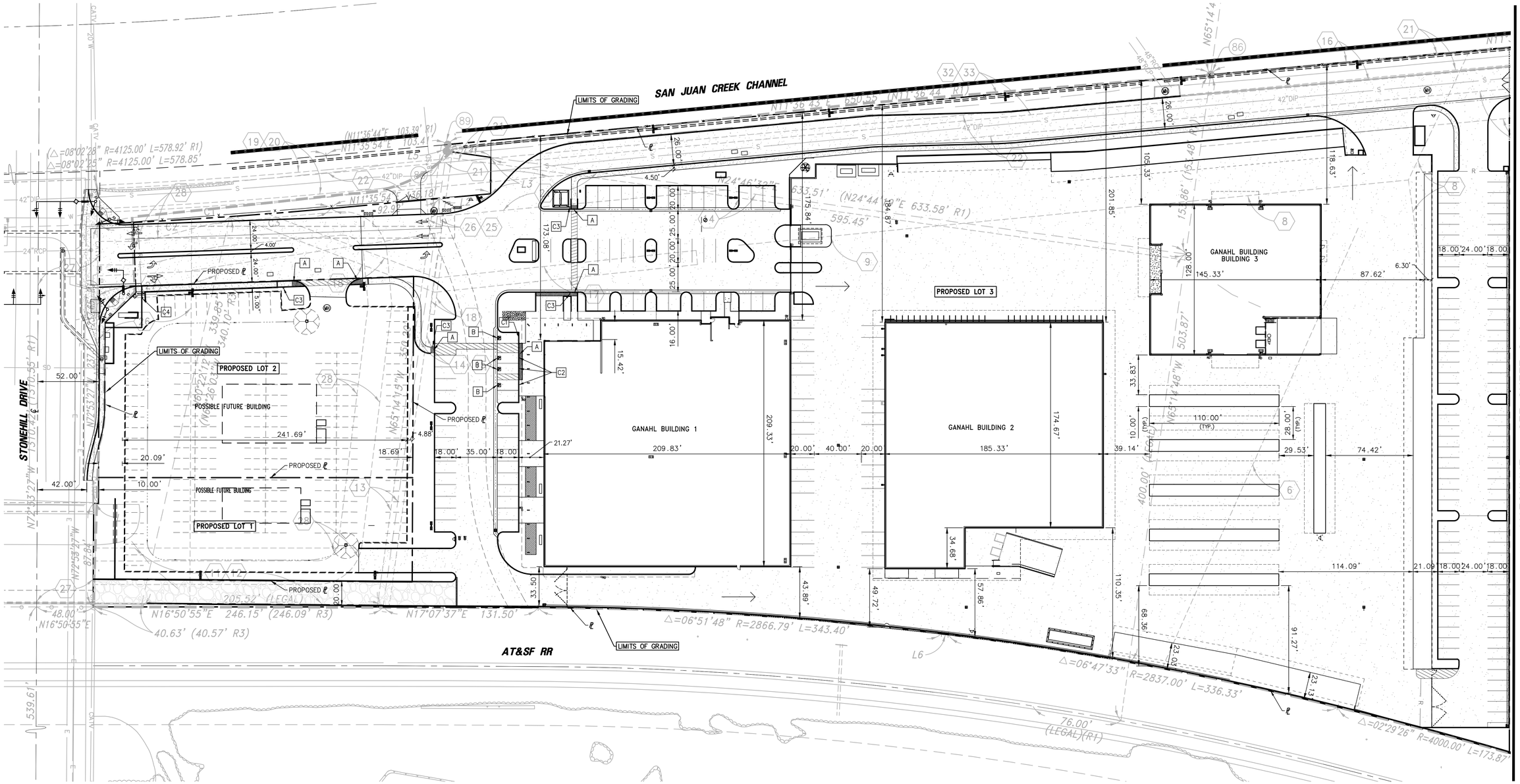
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

DEMOLITION PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-4 OF 28
CHECKED BY:	CHECKED BY:	JEROME PARCO CITY ENGINEER R.C.E. 50385	DATE EXP. 06/30/2019
CDB	CDB		

DATE: 3-15-19



THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

40 20 0 40 80 120

SCALE: 1"=40'

NOTE:

1. SEE SHEET C-6 FOR DETAILS

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DIBIAS No. 75205 CIVIL STATE OF CALIFORNIA

REVISIONS			
NO.	INITIAL	DESCRIPTION	APPL
		DATE	

JOB NO. GNH17048

SUBMITTAL 3-15-19

100% DESIGN DEVELOPMENT

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

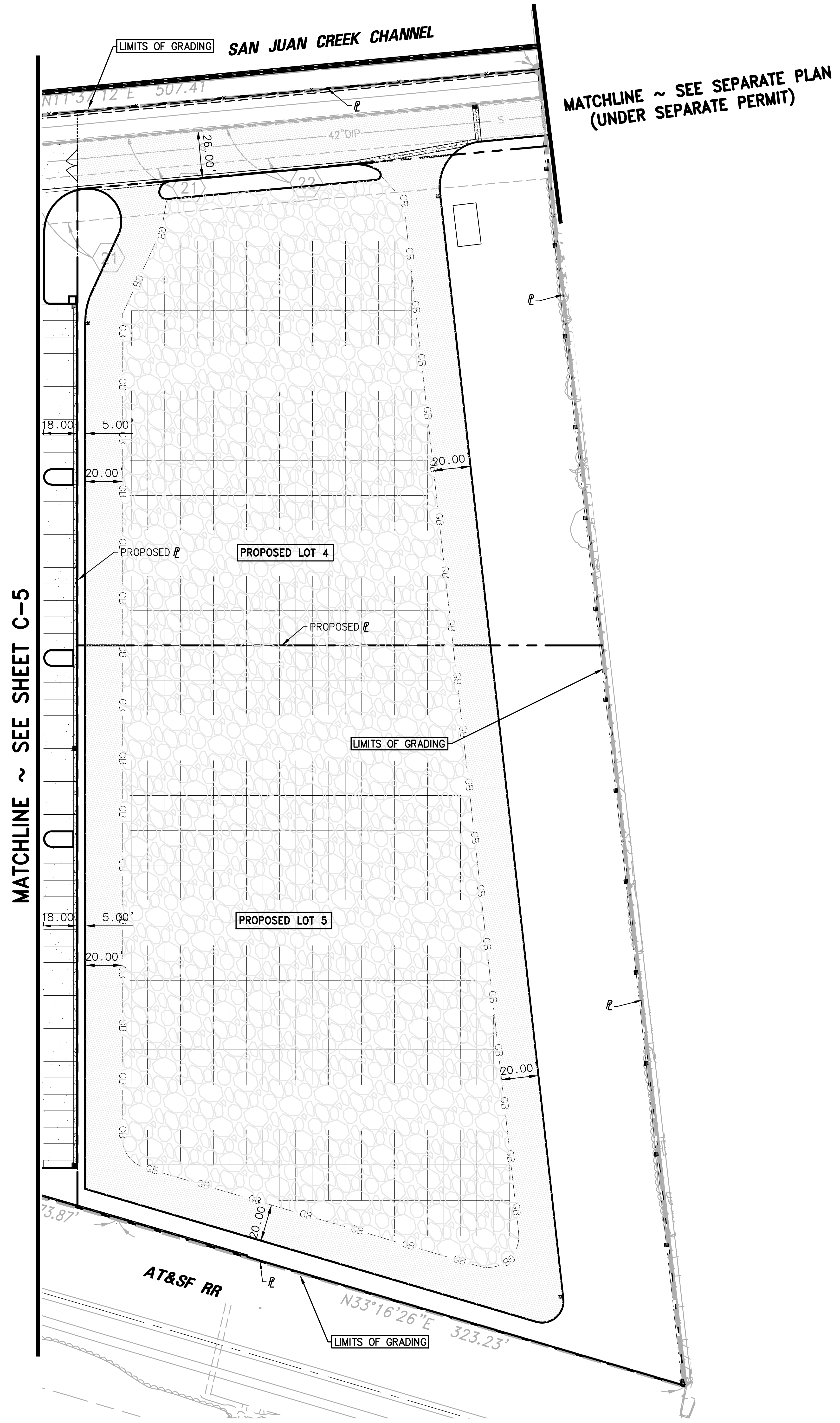
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

HORIZONTAL CONTROL PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-5 OF 28
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019	

DATE: 4-23-19

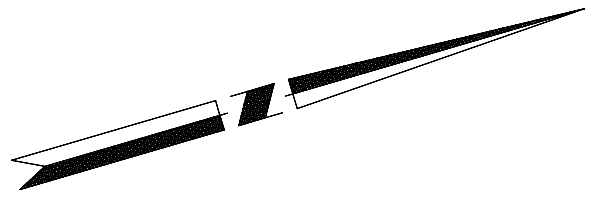


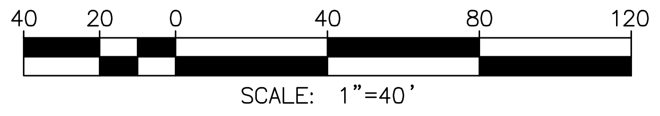
NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

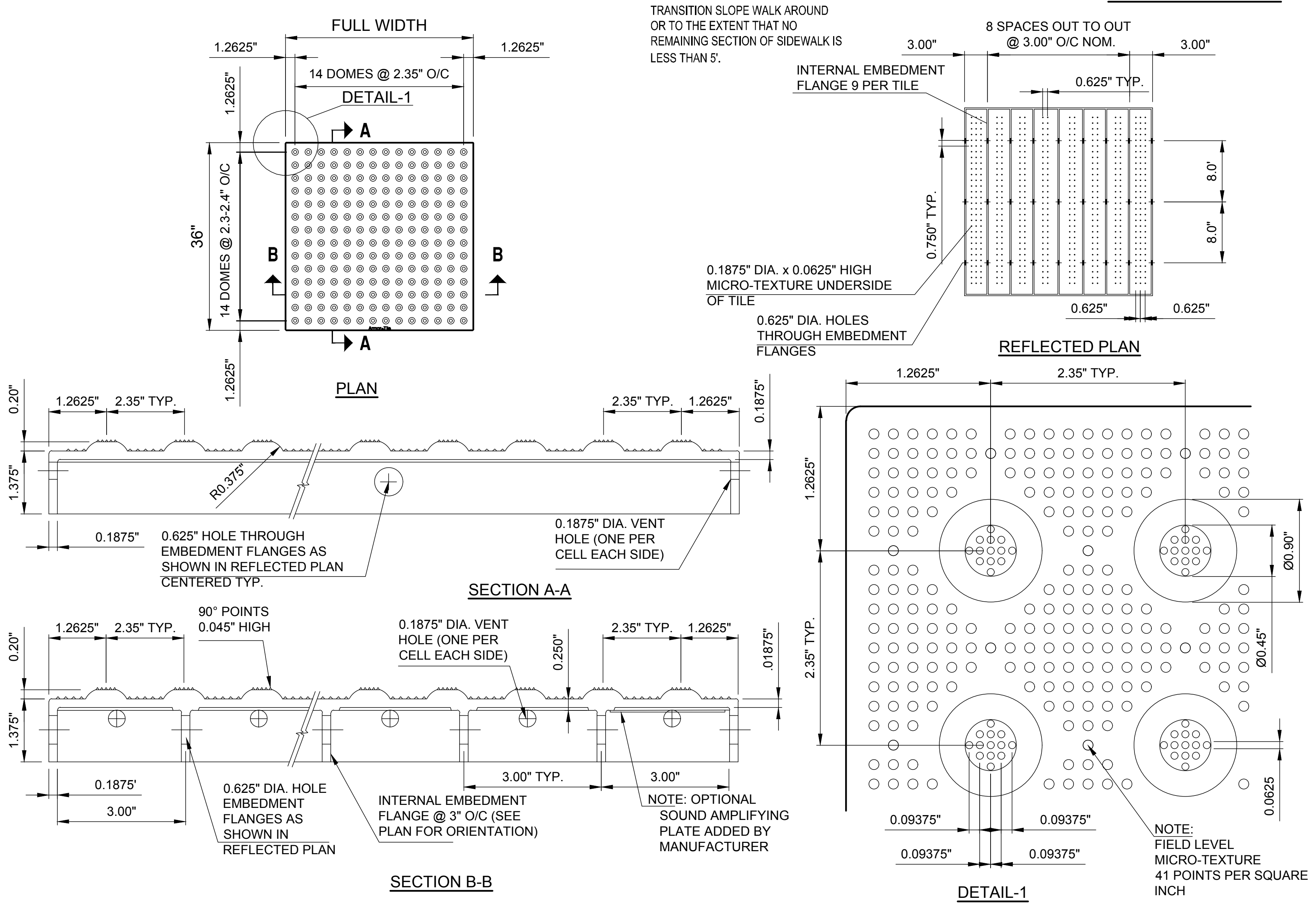
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.





NOTES:

1. CURB RAMP RUNNING SLOPES SHALL NOT BE STEEPER THAN 1:12 AND CROSS SLOPE SHALL BE 2% OR FLATTER.
2. DETECTABLE WARNING SURFACES SHALL BE CONSTRUCTED BY TEXTURING PRODUCTS CONFORMING TO CBC 11B-705. TRANSITION SLOPES ARE NOT TO HAVE DETECTABLE WARNINGS. CONTRACTOR SHALL CONFIRM LOCAL CODES ARE MET.
3. WHERE A CURB RAMP IS CONSTRUCTED WITHIN AN EXISTING CURB, CURB & GUTTER AND/OR SIDEWALK, THE EXISTING CURB & GUTTER SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE CURB TRANSITIONS OR TO THE EXTENT THAT NO REMAINING SECTION OF CURB OR CURB & GUTTER IS LESS THAN 5' LONG. THE EXISTING SIDEWALK SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE TRANSITION SLOPE WALK AROUND OR TO THE EXTENT THAT NO REMAINING SECTION OF SIDEWALK IS LESS THAN 5'.
4. THE PLAN MUST PROVIDE FOR DETECTABLE WARNING SURFACE COLORS OR MATERIALS THAT PROVIDE THE NECESSARY CONTRAST, EITHER DARK-ON-LIGHT, OR LIGHT-ON-DARK.
5. TRUNCATED DOMES TO BE INSTALLED USING ARMOR TILE CAST IN PLACE DOME TACTILE TILE. PART NUMBER ADA-2424 OR OTHER EQUIVALENT APPROVED MATERIAL. PREFERRED MANUFACTURER ARMOR TILE TACTILE SYSTEMS LANCE MITCHELL(919-622-4615 UNLESS PAVERS ARE REQUIRED, CONTRACTOR TO VERIFY THAT HANDICAP RAMPS MEET LOCAL CODES AND ADA REQUIREMENTS.



A TRUNCATED DOMES – CAST IN PLACE

NOT TO SCALE

PER CBC FIG. 11B-705.1



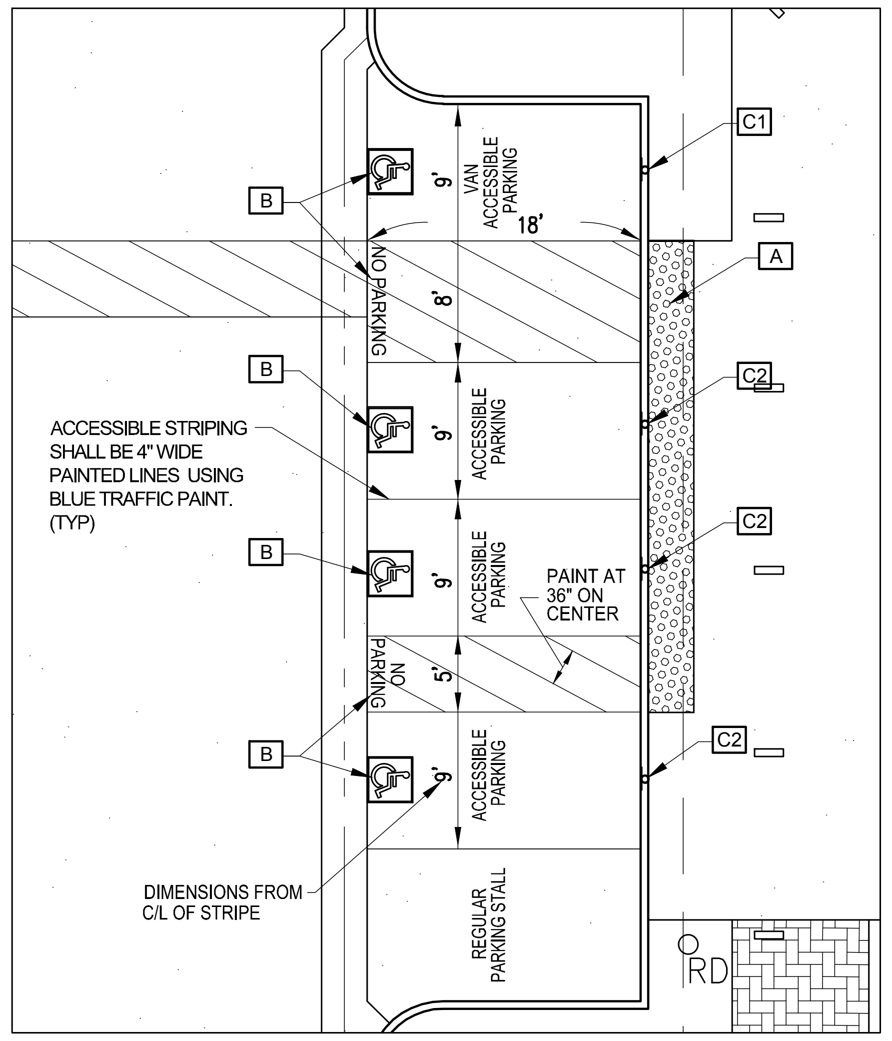
PAINT SPECIFICATION:

ENNIS TRAFFIC SAFETY SOLUTIONS TRAFFIC PAINT, WATER BORNE, RAPID DRY (100% ACRYLIC POLYMER EMULSION) 6006 HANDICAP BLUE

B 36" SQ. PAINTED HANDICAP SYMBOL & NO PARKING

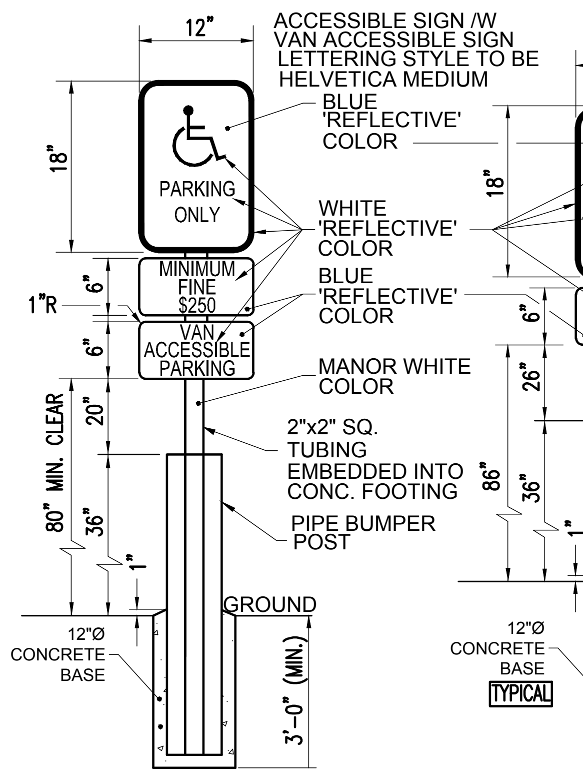
CBC 11B.502.3, 502.6 CGBC 5.106.5.2.1

NOT TO SCALE

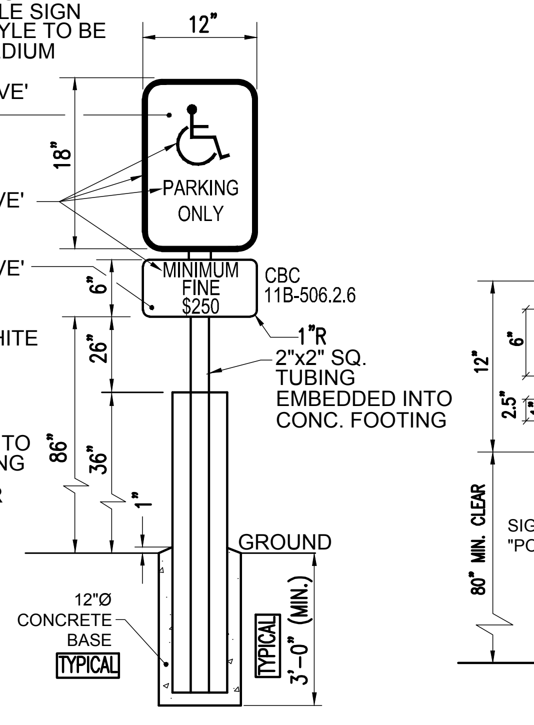


ACCESSIBLE PARKING STALL & STRIPING DETAIL

NOT TO SCALE

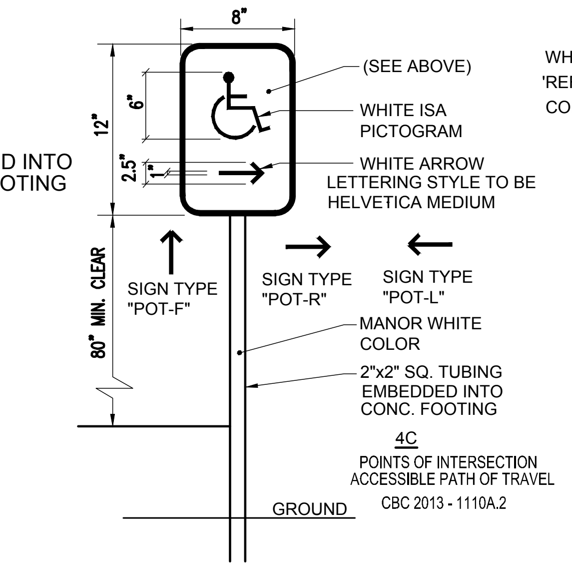


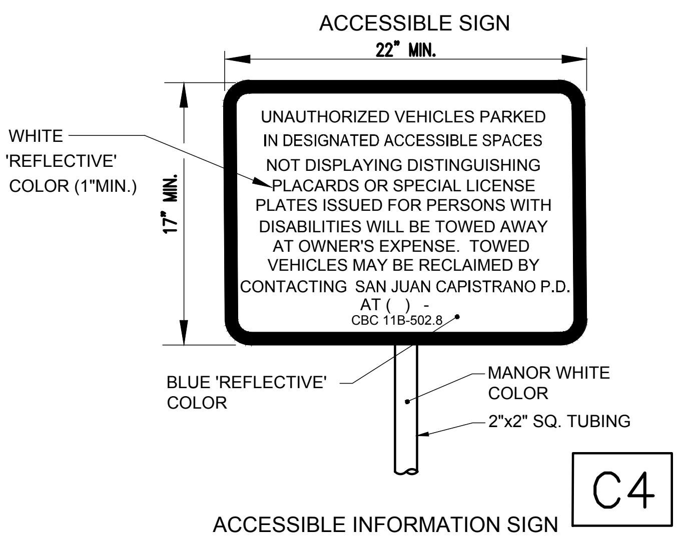
C1



C2

C3





ACCESSIBLE INFORMATION SIGN C4

C ** ADA SIGNAGE

NOT TO SCALE

** FOR REFERENCE ONLY, TO BE APPROVED BY THE BUILDING DEPARTMENT.

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

CRAIG S. DI BIAS No. 75205 CIVIL

JOB NO.	SUBMITTAL		
GNH17048	100% DESIGN DEVELOPMENT	3-15-19	

REVISIONS: NO. | INITIAL | DESCRIPTION | DATE | APP'L

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

HORIZONTAL CONTROL PLAN

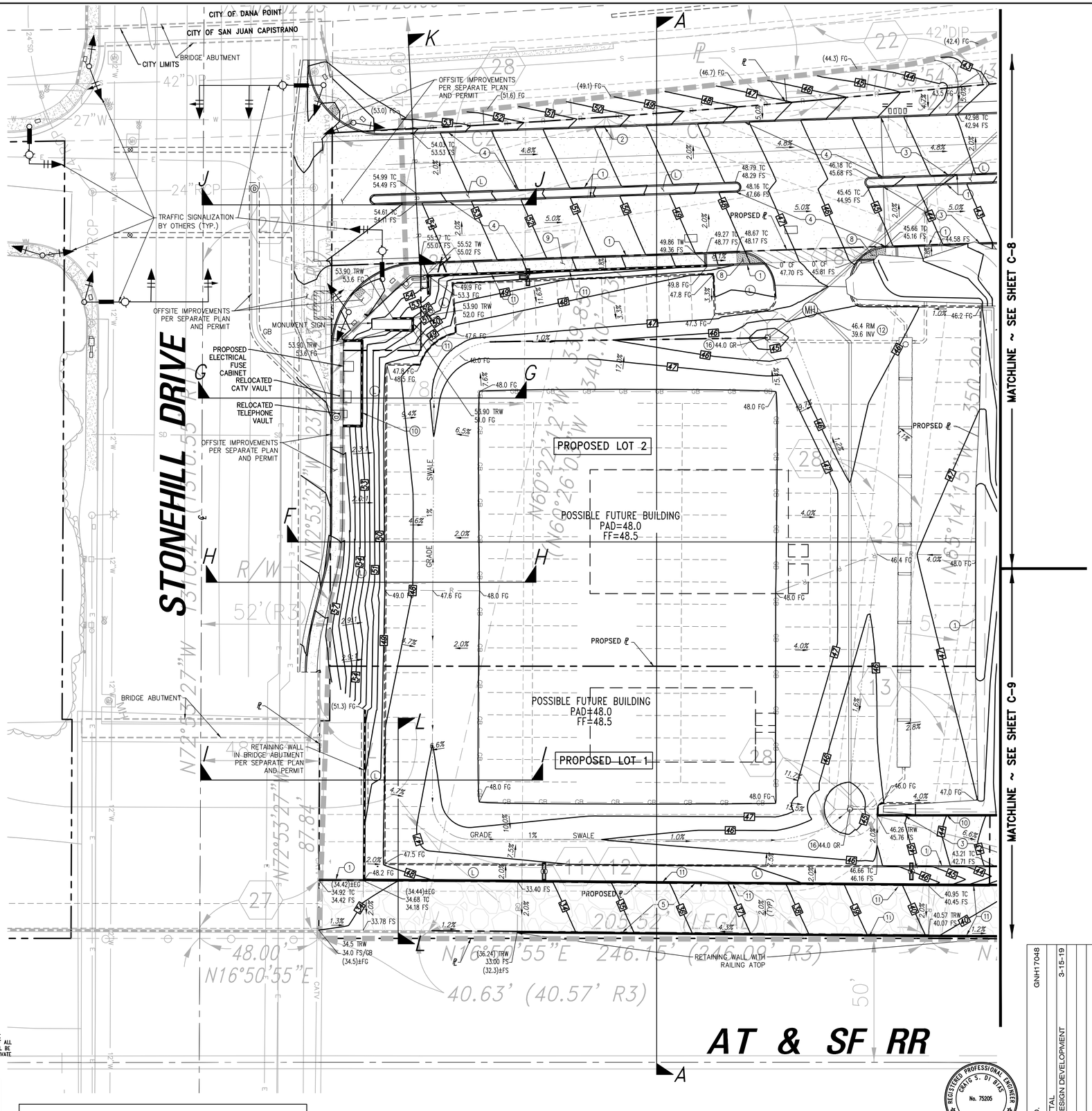
PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:
KDL/KJK	KJK
CHECKED BY:	CHECKED BY:
CDB	CDB

JEROME PARCO
CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019

SHEET C-6 OF 28

DATE: 4-23-19



NOTE: SEE SHEET C-12 AND C-13 FOR SECTIONS

NOTE
FOR STORM DRAIN IMPROVEMENT INFORMATION, SEE SEPARATE STORM DRAIN PLAN.

CONSTRUCTION NOTES (ONSITE)

1. CONSTRUCT CONCRETE CURB PER DETAIL ON SHEET C-1.
2. CONSTRUCT CONCRETE CURB AND GUTTER PER DETAIL ON C-1.
* 3. PAVE WITH 10-INCH REINFORCED CONCRETE OVER 6-INCH AB OVER COMPACTED SUBGRADE.
4. CONSTRUCT PAVERS PER LANDSCAPE PLANS.
* 5. PAVE WITH PERVIOUS ASPHALT PAVEMENT. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.
6. CONSTRUCT 24-INCH X 24-INCH CATCH BASIN PER DETAIL ON SHEET C-1.
7. CONSTRUCT 36-INCH WIDE CONCRETE V-GUTTER PER DETAIL ON SHEET C-1.
8. CONSTRUCT ADA RAMP WITH TRUNCATED DOMES PER C.B.C. REQUIREMENTS.
9. CONSTRUCT CONCRETE SIDEWALK.
10. CONSTRUCT VARIABLE HEIGHT RETAINING WALL PER STRUCTURAL PLANS.
11. VARIABLE HEIGHT RETAINING WALL. (UNDER SEPARATE PLAN CHECK AND PERMIT.)
12. CONSTRUCT STORM DRAIN MANHOLE.
13. CONSTRUCT MODULAR WETLANDS STORMWATER BIOFILTRATION SYSTEM.
14. CONSTRUCT SIDE OPENING CATCH BASIN PER SPPWC STD. PLAN 300-3.
15. CONSTRUCT STORM DRAIN JUNCTION STRUCTURE.
16. CONSTRUCT DESILTING BASIN PER ORANGE COUNTY STD. PLAN 1327.
* 17. PAVE WITH STABILIZED GRAVEL. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.

* PER RECOMMENDATION OF THE SOILS ENGINEER

SCALE: 1"=20'

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

JOB NO. GNH17048
SUBMITTAL 100% DESIGN DEVELOPMENT
DATE 3-15-19

NO.	INITIAL	DESCRIPTION	DATE	APPL

REVISIONS

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

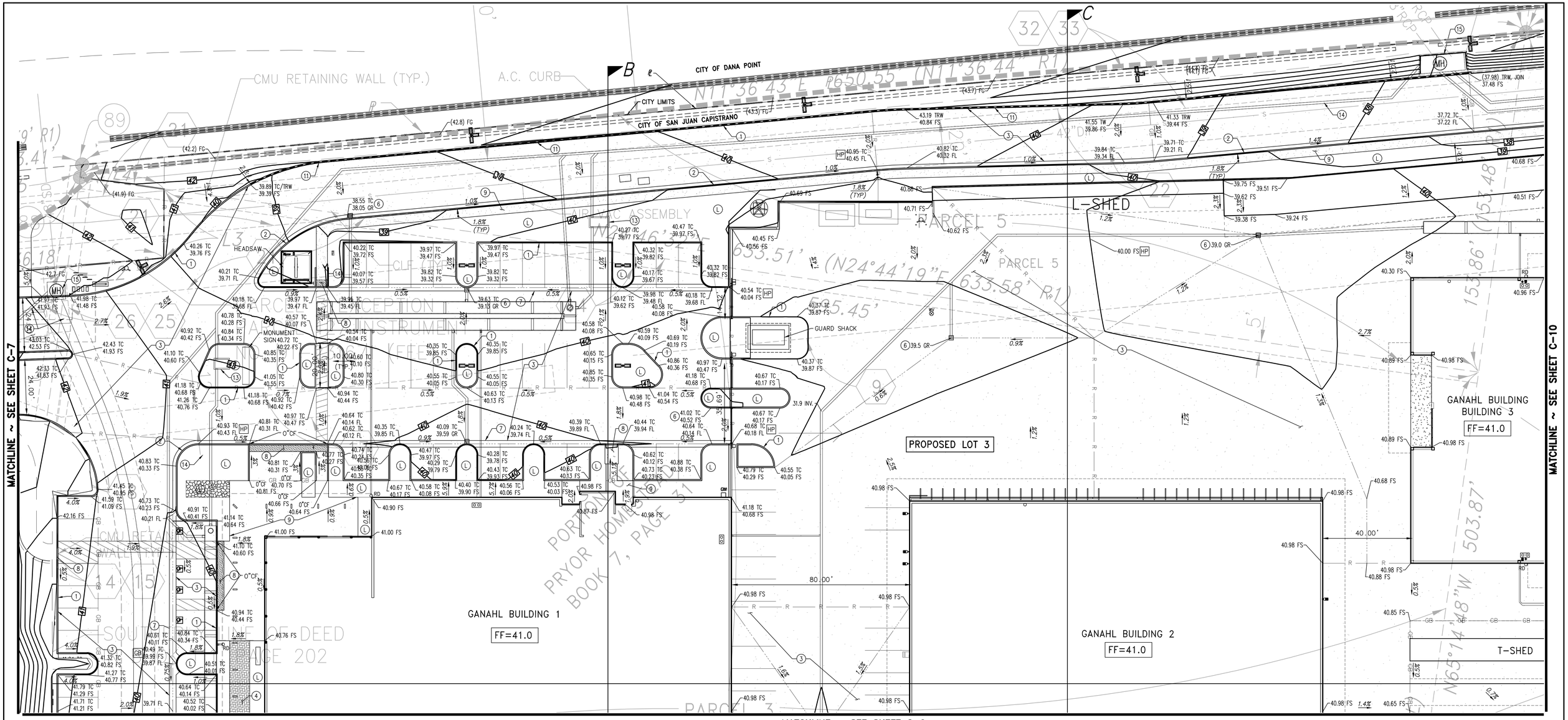
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

GRADING PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdiblas@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-7 OF 28
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 EXP. 06/30/2019 DATE	

DATE: 9-13-19



MATCHLINE ~ SEE SHEET C-9

NOTE
FOR STORM DRAIN IMPROVEMENT INFORMATION, SEE SEPARATE STORM DRAIN PLAN.

NOTE: SEE SHEET C-12 AND C-13 FOR SECTIONS

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

20 10 0 20 40 60
SCALE: 1"=20'

CONSTRUCTION NOTES (ONSITE)

1. CONSTRUCT CONCRETE CURB PER DETAIL ON SHEET C-1.
2. CONSTRUCT CONCRETE CURB AND GUTTER PER DETAIL ON C-1.
* 3. PAVE WITH 10-INCH REINFORCED CONCRETE OVER 6-INCH AB OVER COMPACTED SUBGRADE.
4. CONSTRUCT PAVERS PER LANDSCAPE PLANS.
* 5. PAVE WITH PERVIOUS ASPHALT PAVEMENT. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.
6. CONSTRUCT 24-INCH X 24-INCH CATCH BASIN PER DETAIL ON SHEET C-1.
7. CONSTRUCT 36-INCH WIDE CONCRETE V-GUTTER PER DETAIL ON SHEET C-1.
8. CONSTRUCT ADA RAMP WITH TRUNCATED DOMES PER C.B.C. REQUIREMENTS.
9. CONSTRUCT CONCRETE SIDEWALK.
10. CONSTRUCT VARIABLE HEIGHT RETAINING WALL PER STRUCTURAL PLANS.
11. VARIABLE HEIGHT RETAINING WALL. (UNDER SEPARATE PLAN CHECK AND PERMIT.)
12. CONSTRUCT STORM DRAIN MANHOLE.
13. CONSTRUCT MODULAR WETLANDS STORMWATER BIOFILTRATION SYSTEM.
14. CONSTRUCT SIDE OPENING CATCH BASIN PER SPPWC STD. PLAN 300-3.
15. CONSTRUCT STORM DRAIN JUNCTION STRUCTURE.
16. CONSTRUCT DESILTING BASIN PER ORANGE COUNTY STD. PLAN 1327.
*17. PAVE WITH STABILIZED GRAVEL. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.

* PER RECOMMENDATION OF THE SOILS ENGINEER

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

JOB NO. GNH17048

NO.	INITIAL	DESCRIPTION	APPL	DATE
		SUBMITTAL		3-15-19
		100% DESIGN DEVELOPMENT		

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675


GRADING PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

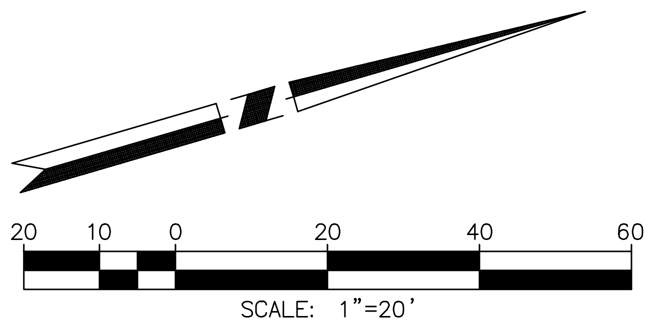
DRAWN BY:	DESIGN BY:		
KDL/KJK	KJK		
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER	DATE R.C.E. 50385 EXP. 06/30/2019

SHEET C-8 OF 28

DATE: 9-13-19



NOTE: SEE SHEET C-12 AND C-13 FOR SECTIONS



SCALE: 1"=20'

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

NOTE

FOR STORM DRAIN IMPROVEMENT INFORMATION, SEE SEPARATE STORM DRAIN PLAN.

CONSTRUCTION NOTES (ONSITE)

① CONSTRUCT CONCRETE CURB PER DETAIL ON SHEET C–1.
② CONSTRUCT CONCRETE CURB AND GUTTER PER DETAIL ON C–1.
∗ ③ PAVE WITH 10–INCH REINFORCED CONCRETE OVER 6–INCH AB OVER COMPACTED SUBGRADE.
④ CONSTRUCT PAVERS PER LANDSCAPE PLANS.
∗ ⑤ PAVE WITH PERVIOUS ASPHALT PAVEMENT. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.
⑥ CONSTRUCT 24–INCH X 24–INCH CATCH BASIN PER DETAIL ON SHEET C–1.
⑦ CONSTRUCT 36–INCH WIDE CONCRETE V–GUTTER PER DETAIL ON SHEET C–1.
⑧ CONSTRUCT ADA RAMP WITH TRUNCATED DOMES PER C.B.C. REQUIREMENTS.
⑨ CONSTRUCT CONCRETE SIDEWALK.
⑩ CONSTRUCT VARIABLE HEIGHT RETAINING WALL PER STRUCTURAL PLANS.
⑪ VARIABLE HEIGHT RETAINING WALL. (UNDER SEPARATE PLAN CHECK AND PERMIT.)
⑫ CONSTRUCT STORM DRAIN MANHOLE.
⑬ CONSTRUCT MODULAR WETLANDS STORMWATER BIOFILTRATION SYSTEM.
⑭ CONSTRUCT SIDE OPENING CATCH BASIN PER SPPWC STD. PLAN 300–3.
⑮ CONSTRUCT STORM DRAIN JUNCTION STRUCTURE.
⑯ CONSTRUCT DESILTING BASIN PER ORANGE COUNTY STD. PLAN 1327.
∗⑰ PAVE WITH STABILIZED GRAVEL. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.

∗ PER RECOMMENDATION OF THE SOILS ENGINEER

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

CRAIG S. DI BIAS No. 75205

JOB NO.	GNH17048
SUBMITTAL	100% DESIGN DEVELOPMENT
DATE	3-15-19

NO.	INITIAL	DESCRIPTION	APP'L

REVISIONS

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

GRADING PLAN

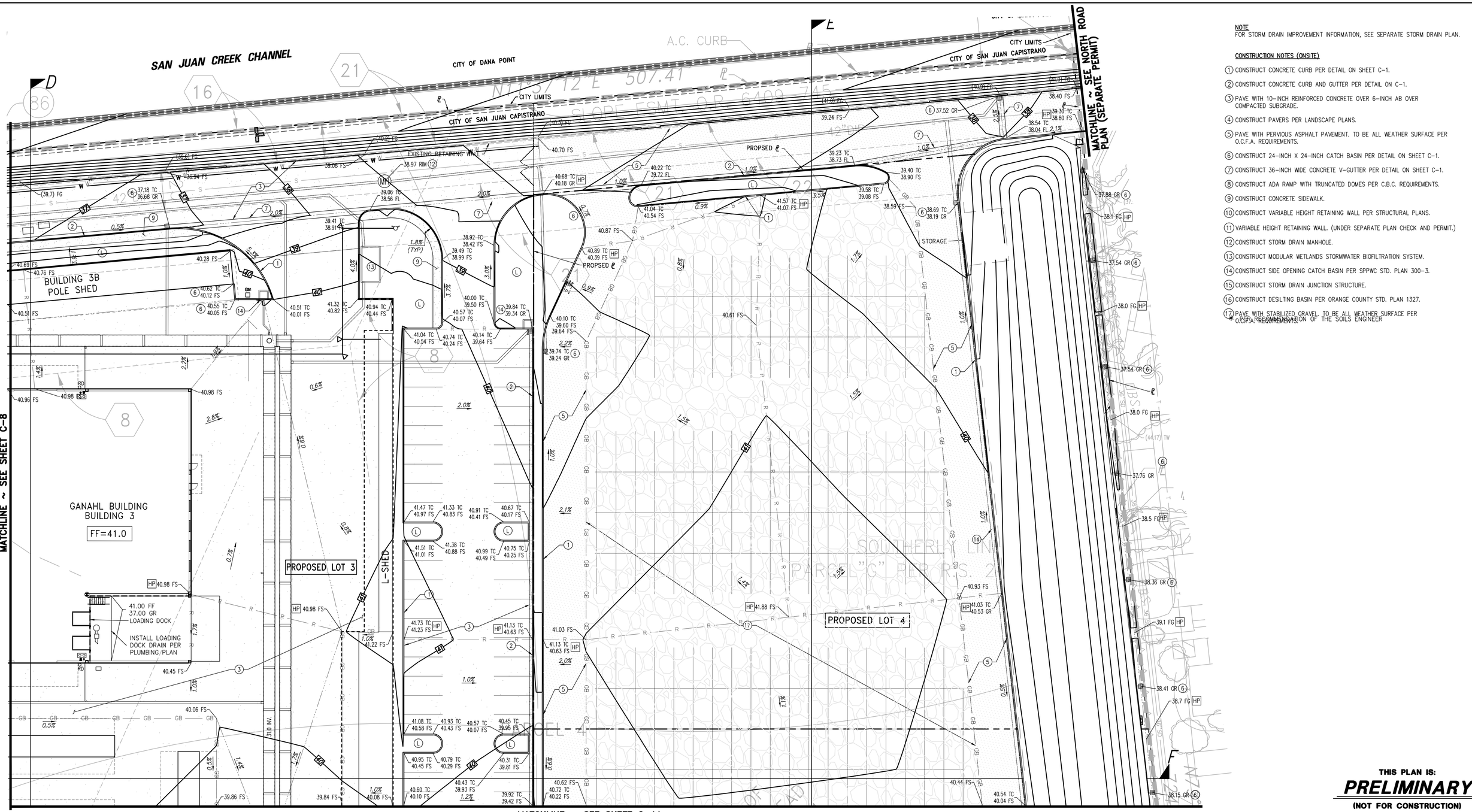
PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:
KDL/KJK	KJK
CHECKED BY:	CHECKED BY:
CDB	CDB

JEROME PARCO
CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019

SHEET
C-9 OF 28

DATE: 9-13-19



NOTE
FOR STORM DRAIN IMPROVEMENT INFORMATION, SEE SEPARATE STORM DRAIN PLAN.

CONSTRUCTION NOTES (ONSITE)

1. CONSTRUCT CONCRETE CURB PER DETAIL ON SHEET C-1.
2. CONSTRUCT CONCRETE CURB AND GUTTER PER DETAIL ON C-1.
3. PAVE WITH 10-INCH REINFORCED CONCRETE OVER 6-INCH AB OVER COMPACTED SUBGRADE.
4. CONSTRUCT PAVERS PER LANDSCAPE PLANS.
5. PAVE WITH PERVIOUS ASPHALT PAVEMENT. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.
6. CONSTRUCT 24-INCH X 24-INCH CATCH BASIN PER DETAIL ON SHEET C-1.
7. CONSTRUCT 36-INCH WIDE CONCRETE V-GUTTER PER DETAIL ON SHEET C-1.
8. CONSTRUCT ADA RAMP WITH TRUNCATED DOMES PER C.B.C. REQUIREMENTS.
9. CONSTRUCT CONCRETE SIDEWALK.
10. CONSTRUCT VARIABLE HEIGHT RETAINING WALL PER STRUCTURAL PLANS.
11. VARIABLE HEIGHT RETAINING WALL. (UNDER SEPARATE PLAN CHECK AND PERMIT.)
12. CONSTRUCT STORM DRAIN MANHOLE.
13. CONSTRUCT MODULAR WETLANDS STORMWATER BIOFILTRATION SYSTEM.
14. CONSTRUCT SIDE OPENING CATCH BASIN PER SPPWC STD. PLAN 300-3.
15. CONSTRUCT STORM DRAIN JUNCTION STRUCTURE.
16. CONSTRUCT DESILTING BASIN PER ORANGE COUNTY STD. PLAN 1327.
17. PAVE WITH STABILIZED GRAVEL. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS PER RECOMMENDATION OF THE SOILS ENGINEER *

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

20 10 0 20 40 60
SCALE: 1"=20'

NOTE: SEE SHEET C-12 AND C-13 FOR SECTIONS

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

REVISIONS	DESCRIPTION	DATE	APPL
NO.	INITIAL		

JOB NO. GNH17048
SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

GRADING PLAN

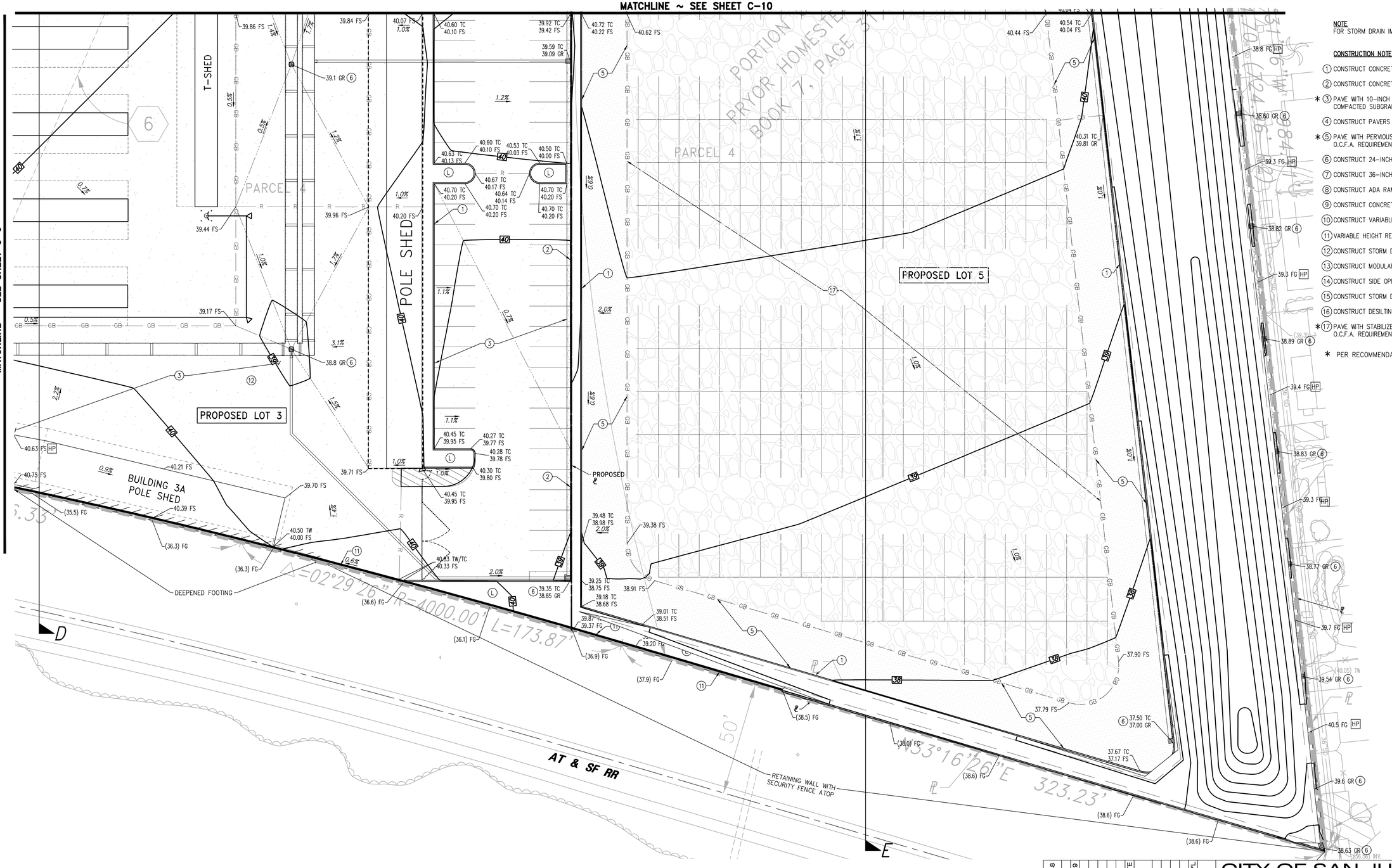
PREPARED BY:
TRUXAV AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-10 OF 28
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019	

DATE: 9-13-19

MATCHLINE ~ SEE SHEET C-10

MATCHLINE ~ SEE SHEET C-9



NOTE
FOR STORM DRAIN IMPROVEMENT INFORMATION, SEE SEPARATE STORM DRAIN PLAN.

CONSTRUCTION NOTES (ONSITE)

1. CONSTRUCT CONCRETE CURB PER DETAIL ON SHEET C-1.
2. CONSTRUCT CONCRETE CURB AND GUTTER PER DETAIL ON C-1.
3. * PAVE WITH 10-INCH REINFORCED CONCRETE OVER 6-INCH AB OVER COMPACTED SUBGRADE.
4. CONSTRUCT PAVERS PER LANDSCAPE PLANS.
5. * PAVE WITH PERVIOUS ASPHALT PAVEMENT. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.
6. CONSTRUCT 24-INCH X 24-INCH CATCH BASIN PER DETAIL ON SHEET C-1.
7. CONSTRUCT 36-INCH WIDE CONCRETE V-GUTTER PER DETAIL ON SHEET C-1.
8. CONSTRUCT ADA RAMP WITH TRUNCATED DOMES PER C.B.C. REQUIREMENTS.
9. CONSTRUCT CONCRETE SIDEWALK.
10. CONSTRUCT VARIABLE HEIGHT RETAINING WALL PER STRUCTURAL PLANS.
11. VARIABLE HEIGHT RETAINING WALL. (UNDER SEPARATE PLAN CHECK AND PERMIT.)
12. CONSTRUCT STORM DRAIN MANHOLE.
13. CONSTRUCT MODULAR WETLANDS STORMWATER BIOFILTRATION SYSTEM.
14. CONSTRUCT SIDE OPENING CATCH BASIN PER SPPWC STD. PLAN 300-3.
15. CONSTRUCT STORM DRAIN JUNCTION STRUCTURE.
16. CONSTRUCT DESILTING BASIN PER ORANGE COUNTY STD. PLAN 1327.
17. * PAVE WITH STABILIZED GRAVEL. TO BE ALL WEATHER SURFACE PER O.C.F.A. REQUIREMENTS.

* PER RECOMMENDATION OF THE SOILS ENGINEER

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

20 10 0 20 40 60
SCALE: 1"=20'

NOTE: SEE SHEET C-12 AND C-13 FOR SECTIONS

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

NO.	INITIAL	DESCRIPTION	DATE	APPL

REVISIONS

JOB NO. GNH17048
SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

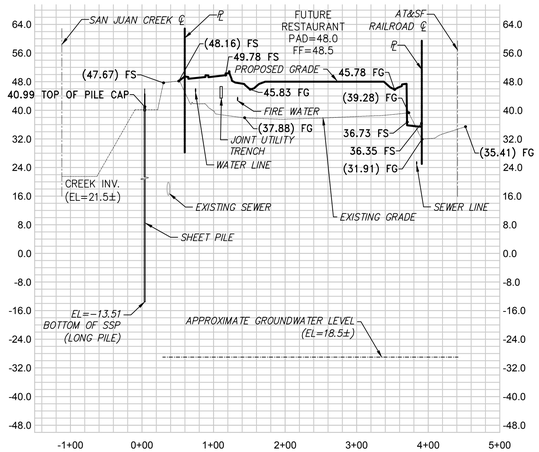
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

GRADING PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

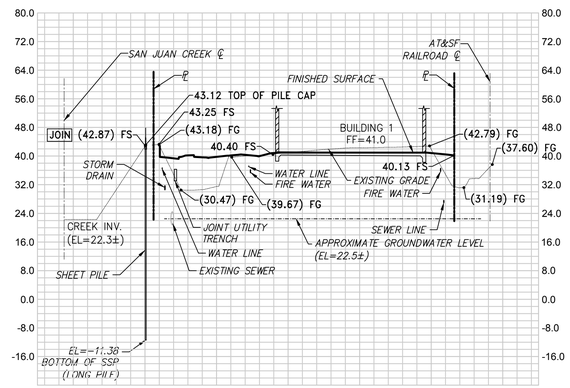
DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-11 OF 28
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 EXP. 06/30/2019	DATE

DATE: 9-13-19



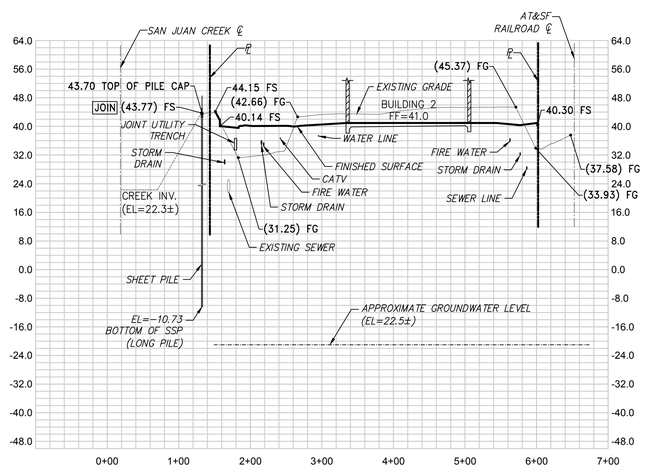
SECTION A–A

SCALE: HORIZONTAL (1"=100')
VERTICAL (1"=4')



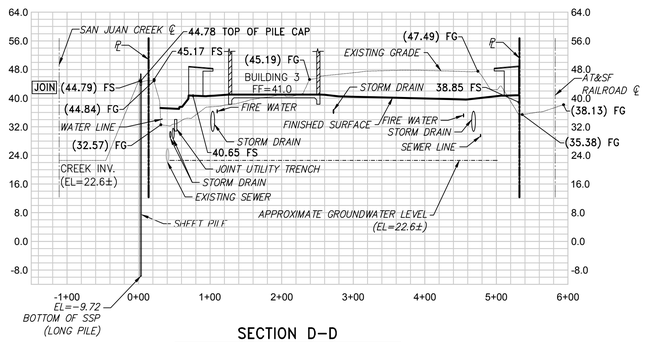
SECTION B–B

SCALE: HORIZONTAL (1"=100')
VERTICAL (1"=4')



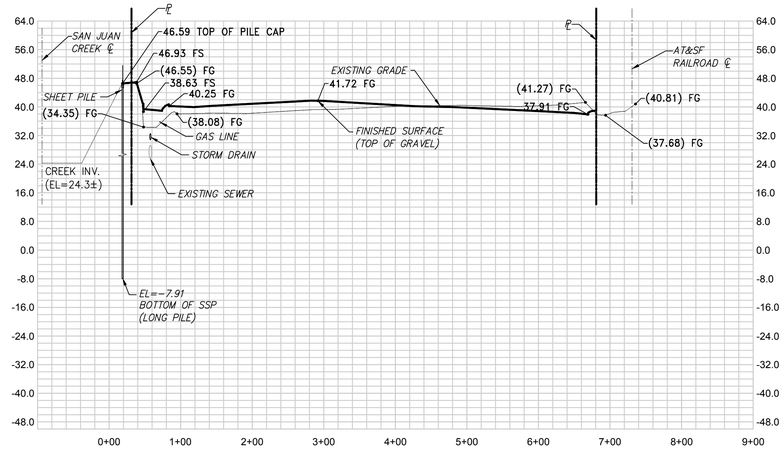
SECTION C–C

SCALE: HORIZONTAL (1"=100')
VERTICAL (1"=4')



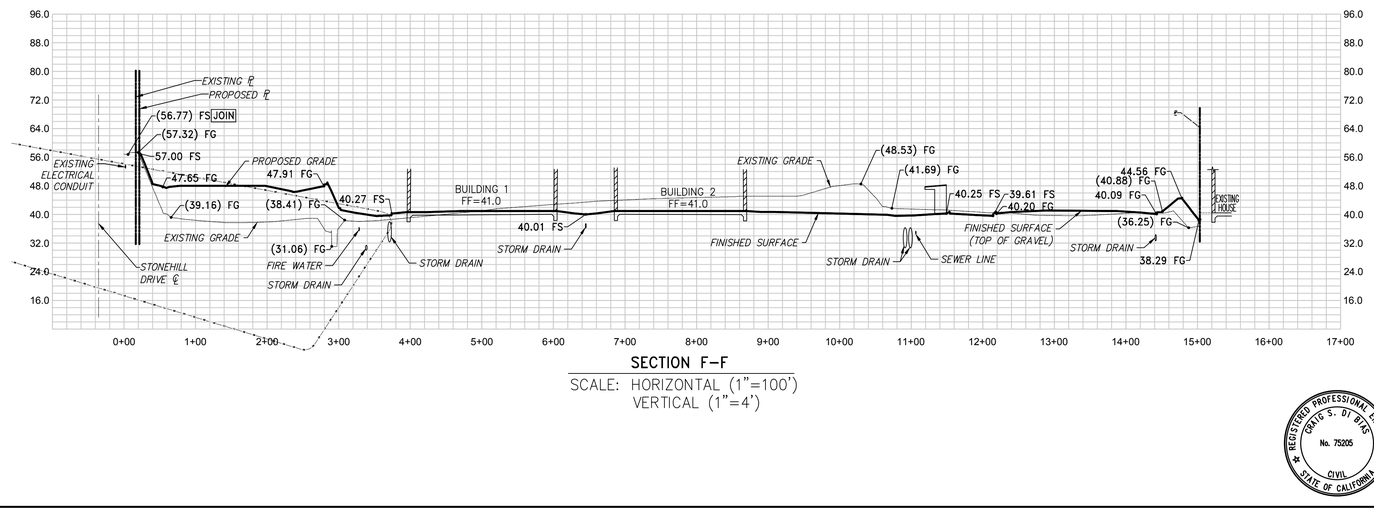
SECTION D–D

SCALE: HORIZONTAL (1"=100')
VERTICAL (1"=4')



SECTION E–E

SCALE: HORIZONTAL (1"=100')
VERTICAL (1"=4')



SECTION F–F

SCALE: HORIZONTAL (1"=100')
VERTICAL (1"=4')

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

JOB NO. GNH17048

NO.	INITIAL	DESCRIPTION	APPL	DATE
SUBMITTAL				3-15-19
100% DESIGN DEVELOPMENT				

REVISIONS

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

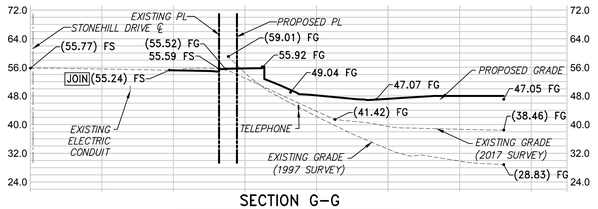
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

SECTIONS

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

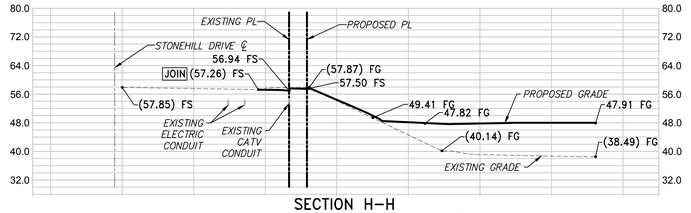
DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-12 OF 28
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO, CITY ENGINEER, R.C.E. 50385, DATE EXP. 06/30/2019	

DATE: 4-12-19



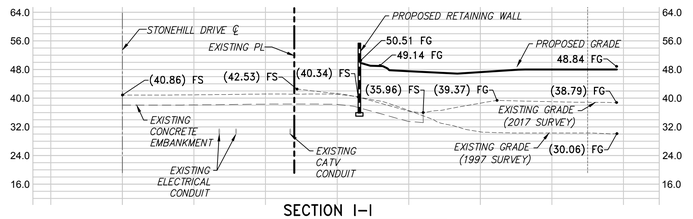
SECTION G–G

SCALE: HORIZONTAL (1"=20')
VERTICAL (1"=20')



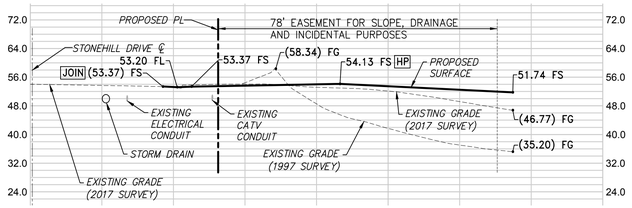
SECTION H–H

SCALE: HORIZONTAL (1"=20')
VERTICAL (1"=20')



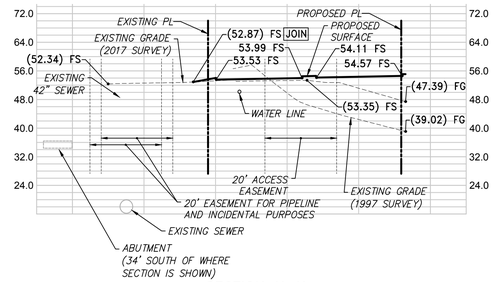
SECTION I–I

SCALE: HORIZONTAL (1"=20')
VERTICAL (1"=20')



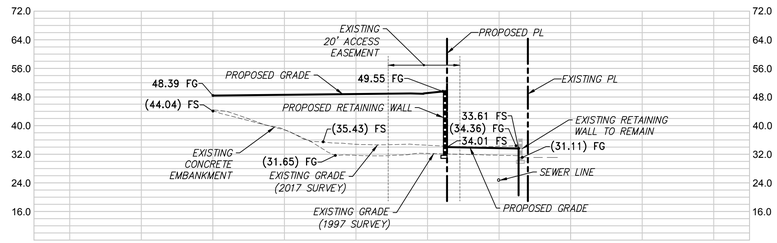
SECTION J–J

SCALE: HORIZONTAL (1"=20')
VERTICAL (1"=20')



SECTION K–K

SCALE: HORIZONTAL (1"=20')
VERTICAL (1"=20')



SECTION L–L

SCALE: HORIZONTAL (1"=20')
VERTICAL (1"=20')

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DIBIAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

JOB NO. GNH17048

NO.	INITIAL	DESCRIPTION	APPL	DATE
1		SUBMITTAL		3-15-19
2		100% DESIGN DEVELOPMENT		

REVISIONS

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

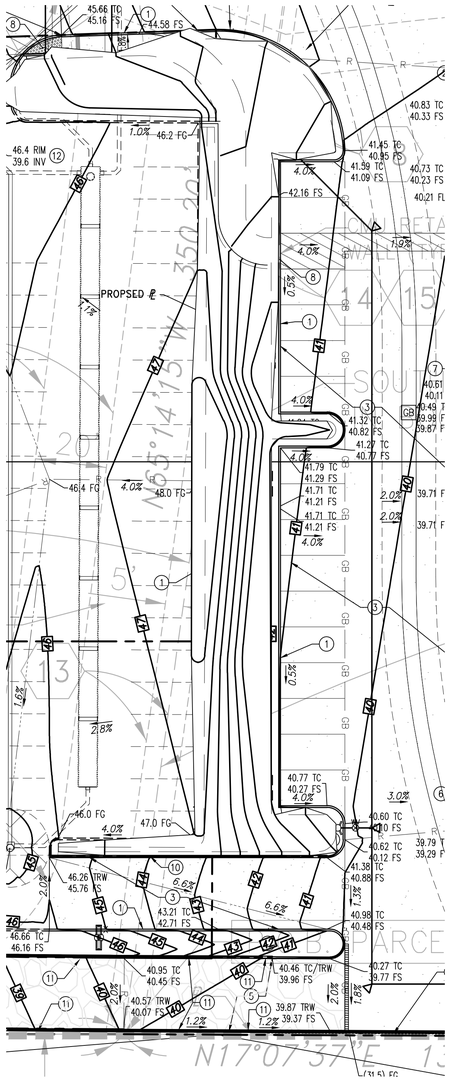
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

SECTIONS

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-13 OF 28
CHECKED BY:	CHECKED BY:	JEROME PARCO CITY ENGINEER R.C.E. 50385 EXP. 06/30/2019 DATE	
CDB	CDB		

DATE: 4-12-19



THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. DI BIAS
No. 75205
CIVIL
STATE OF CALIFORNIA

REVISIONS		
NO.	INITIAL	DESCRIPTION	DATE	APP'L

JOB NO. GNH17048

SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

DETAILS

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-14 OF 28
CHECKED BY:	CHECKED BY:	DATE	
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 EXP. 06/30/2019	

DATE: 4-12-19

EROSION CONTROL NOTES:

IN CASE OF EMERGENCY, CALL:

_____ (RESPONSIBLE PERON)

AT _____ (24-HOUR PHONE NUMBER).

THE UNDERSIGNED CIVIL ENGINEER WILL SUPERVISE EROSION CONTROL WORK AND CERTIFY THAT THE SYSTEM FUNCTIONS PROPERLY AND IS IN ACCORDANCE WITH THE APPROVED PLANS.

_____ _____

(SIGNATURE AND REGISTRATION NUMBER) (DATE)

1. THE DIRECTOR OF ENGINEERING & BUILDING, OR DESIGNEE, RESERVES THE RIGHT TO MAKE CHANGES OR MODIFICATIONS TO THIS PLAN AS DEEMED NECESSARY.

2. A STANDBY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. NECESSARY MATERIALS SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID INSTALLATION OF TEMPORARY DEVICES OR TO REPAIR ANY DAMAGED EROSION CONTROL MEASURES WHEN RAIN IS IMMINENT.

3. DEVICES SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE CITY ENGINEER/CITY ENGINEER OR, IN AN EMERGENCY, BY THE DESIGN CIVIL ENGINEER OR DESIGNEE.

4. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE FIVE-DAY RAIN PROBABILITY FORECAST EXCEEDS 40 PERCENT. FORECASTS SHALL BE RECEIVED FROM BROADCASTS PROVIDED BY THE UNITED STATES WEATHER SERVICE.

5. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM CHECK BERMS AND DESILTING BASINS AND THE BASINS PUMPED DRY. ANY GRADED SLOPE SURFACE PROTECTION MEASURES DAMAGED DURING A RAINSTORM SHALL ALSO BE IMMEDIATELY REPAIRED. FAILURE TO PROVIDE EFFECTIVE MAINTENANCE MAY RESULT IN PENALTIES.

6. GRADED AREAS AROUND THE TRACT PERIMETER, IF APPLICABLE, MUST DRAIN AWAY FROM THE FACE OF SLOPE AT THE CONCLUSION OF EACH WORKING DAY.

7. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATER CREATES A HAZARDOUS CONDITION.

8. AREAS SHALL BE MAINTAINED IN SUCH STATE THAT FIRE ACCESS SHALL BE MAINTAINED AT ALL TIMES (INCLUDING ACCESS TO NEIGHBORING PROPERTIES).

9. FAILURE TO HAVE EROSION CONTROL MEASURES INSTALLED AT THE REQUIRED TIMES WILL RESULT IN FORFEITURE OF THE CLEAN-UP AND COMPLETION DEPOSIT. WORK SHALL NOT CONTINUE UNTIL THE DEPOSIT IS REPLENISHED.

10. PLANTING FOR SLOPE PROTECTION SHALL BE ACCOMPLISHED PRIOR TO ROUGH GRADE RELEASE UNLESS A WAIVER OF THIS REQUIREMENT HAS BEEN OBTAINED FROM THE CITY ENGINEER/CITY ENGINEER.

11. ALL LOT PADS SHALL BE DESIGNED TO DRAIN TO AN ACCEPTABLE LOCATION AT A MINIMUM OF 1 PERCENT.

12. DEVICES SHALL BE PROPERLY MAINTAINED IN PLACE UNTIL PROJECT COMPLETION; TORN GRAVEL BAGS SHALL BE REPLACED.

13. BUILD-UP OF SILT AROUND ANY DESILTERS SHALL BE PERIODICALLY REMOVED TO THE SATISFACTION OF THE CITY INSPECTOR AND THE FIELD SUPERINTENDENT. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR TEMPORARY STORAGE OF EXISTING MANHOLE COVERS, IF APPLICABLE, UNTIL DESILTER USE OF MANHOLE IS COMPLETE.

14. A GUARD SHALL BE POSTED ON THE SITE WHENEVER THE DEPTH OF WATER IN ANY DEVICE EXCEEDS 18 INCHES.

15. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM PUBLIC DRAINS OR PIPES, FROM DRAINS OR PIPES OF ADJACENT PROPERTIES, AND FROM ALL PUBLIC AND PRIVATE STREETS.

16. SUBSEQUENT RAINY SEASONS. FOR PROJECTS EXTENDING INTO SUBSEQUENT RAINY SEASONS, NEW TEMPORARY DRAINAGE AND EROSION CONTROL PLANS SHALL BE SUBMITTED. THESE PLANS SHALL COMPLY WITH ALL THE ABOVE MENTIONED REQUIREMENTS.

17. EROSION AND SEDIMENT CONTROL SHALL BE IN PLACE AND MAINTAINED DURING THE ENTIRE CONSTRUCTION PERIOD.

18. PROVIDE AT DOWNSTREAM CATCH BASINS A WAY TO CATCH DEBRIS FROM ENTERING CATCH BASIN AND PROVIDE PROTECTION AROUND IT DURING THE ENTIRE CONSTRUCTION PHASE (GRAVEL BAGS OR OTHER CITY APPROVED METHOD.) PROTECTION MUST BE IN PLACE AND MAINTAINED DURING THE ENTIRE CONSTRUCTION PROCESS.

19. PROVIDE PROTECTION DURING ENTIRE CONSTRUCTION PHASE AROUND ALL INLETS WHERE SOIL IS NOT STABILIZED YET WITH VEGETATION (GRAVEL BAGS OR OTHER CITY APPROVED METHOD.)

20. PROVIDE SEDIMENT TRAP AT OUTLET OF ALL PIPES, PRIOR TO ENTERING V-GUTTERS DURING ENTIRE CONSTRUCTION PHASE. RIP RAP MAY BE USED IF APPROPRIATE.

21. IF DEEMED NECESSARY BY CITY INSPECTOR, PROVIDE ADDITIONAL GRAVEL BAGS OR STRAW BALES ON-SITE, ESPECIALLY IN AREAS WITH STEEP SLOPES, TO SLOW WATER AND PROVIDE ADDITIONAL SEDIMENT CONTROL DURING ENTIRE CONSTRUCTION PHASE.

22. IF DEEMED NECESSARY BY CITY INSPECTOR, PROVIDE TWO ROW HIGH GRAVEL BAGS OR STRAW BALES ON THE SLOPE DOWNSIDE NEXT TO ANY PROPOSED SILT FENCES.

23. ALL DISTURBED SLOPES SHOULD BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION (SUCH AS HYDRO SEEDING, OR OTHER APPROVED MEASURES). ALL INLETS SHOULD BE PROTECTED UNTIL VEGETATION IS AT LEAST 80% ESTABLISHED.

24. STABILIZED CONSTRUCTION ENTRANCES MUST BE SET UP PRIOR TO ANY GRADING OR EARTHWORK OPERATION. CONTRACTOR TO MAINTAIN ENTRANCE DURING CONSTRUCTION.

25. SAW CUTTING WATER RUNOFF: SAW CUTTING WATER RUNOFF CONTAINS POLLUTANTS THAT MUST BE CONTAINED AND DISPOSED OF PROPERLY. THE CONTRACTOR SHALL:

PREVENT SAW CUT WATER RUNOFF FROM ENTERING CATCH BASINS, MANHOLES, AND STORM DRAINS.

DIRECT WATER INTO A TEMPORARY PIT, AND DISPOSE OF THE WATER BY VACUUMING THE WATER INTO A TRUCK AND REMOVING THE WATER FROM THE SITE.

PLACE DRIP PANS OR ABSORBENT MATERIALS UNDER SAW CUTTING EQUIPMENT WHEN NOT IN USE.

CLEAN UP SPILLS WITH ABSORBENT MATERIALS RATHER THAN BURYING. DISPOSE OF ABSORBENT MATERIAL PROPERLY.

26. CONCRETE AND MORTAR PRODUCTS: THE CONTRACTOR SHALL PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS INTO STORM WATER OR STORM WATER SYSTEMS FROM CONCRETE WASTE BY CONDUCTING WASHOUTS AT APPROPRIATE OFF-SITE LOCATIONS, PERFORMING ON-SITE WASHOUTS IN A DESIGNATED AREA, AND PROVIDING APPROPRIATE TRAINING FOR EMPLOYEES AND SUBCONTRACTORS.

THE CONTRACTOR SHALL STORE AND MIX DRY AND WET MATERIALS EITHER OFF-SITE OR UNDER COVER, AWAY FROM DRAINAGE AREAS.

FOR WASHOUT OF CONCRETE TRUCKS, THE CONTRACTOR SHALL PROVIDE APPROPRIATE OFF-SITE LOCATIONS OR DESIGNATED CONTAINED AREAS AT LEAST 50 FEET AWAY FROM STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS.

THE CONTRACTOR SHALL PREVENT RUN-OFF FROM DESIGNATED WASHOUT AREAS BY CONSTRUCTING A TEMPORARY PIT OR BERMED AREA LARGE ENOUGH TO HANDLE ALL PRODUCED LIQUID AND SOLID WASTE. WHEN CONCRETE SETS, BREAK UP AND DISPOSE OF CONCRETE IN CONSTRUCTION FILLS PER DIRECTION OF THE SOILS ENGINEER OR DISPOSE OF IT AS SOLID WASTE AND/OR RECYCLE.

THE CONTRACTOR SHALL INFORM CONCRETE SUPPLIERS AND SUBCONTRACTORS OF THE DESIGNATED WASHOUT LOCATIONS AND DISPOSAL SITES FOR CONCRETE AND MORTAR PRODUCTS AND SHALL BE RESPONSIBLE FOR ENSURING THAT ALL WORKERS USE IT APPROPRIATELY.

27. DURING CONSTRUCTION, CONTRACTOR MUST PROVIDE DAILY STREET SWEEPING. (SWEEP AT END OF EVERY DAY TO PICK-UP DIRT AND/OR DEBRIS.)

28. CONSTRUCTION WATER: THE CONTRACTOR SHALL REDUCE OR ELIMINATE EXCESSIVE CONSTRUCTION WATER THAT MAY CAUSE EROSION AND CARRY POLLUTANTS FROM THE SITE. IN ADDITION, THE CONTRACTOR SHALL:

STORE CONSTRUCTION WATER IN LEAK-PROOF TANKS LOCATED AWAY FROM DRAINAGE SYSTEMS.

USE CONSTRUCTION WATER CONSERVATIVELY.

WHENEVER POSSIBLE, DISPOSE OF EXCESS WATER ON-SITE, BY ALLOWING IT TO SOAK INTO THE GROUND.

29. ASPHALT AND BITUMINOUS PRODUCTS: THE CONTRACTOR SHALL PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS FROM ASPHALT AND BITUMINOUS OPERATIONS BY PREVENTING RUN-ON AND RUN-OFF OF WATER DURING PAVING OPERATIONS AND PROVIDING APPROPRIATE TRAINING FOR EMPLOYEES AND SUBCONTRACTORS. IN ADDITION, THE CONTRACTOR SHALL:

AVOID PRIME OR TACK COATING DURING WET WEATHER.

STORE MATERIALS AWAY FROM DRAINAGE COURSES.

COVER CATCH BASINS AND MANHOLES WHEN APPLYING SEAL COAT, TACK COAT, SLURRY SEAL, FOG SEAL, ETC.

MAKE SURE SAND OR GRAVEL PLACED OVER NEW ASPHALT DOES NOT WASH INTO STORM DRAINS, STREETS, OR CREEKS.

DISPOSE OF OLD ASPHALT PROPERLY AND COLLECT, AND REMOVE ALL BROKEN ASPHALT FROM THE SITE, AND RECYCLE WHENEVER POSSIBLE.

DO NOT DISPOSE OF ASPHALT PRODUCTS INTO WATERWAYS.

FOLLOW THE STORM WATER PERMITTING REQUIREMENTS FOR INDUSTRIAL ACTIVITIES IF PAVING INVOLVES AN ON-SITE MIXING PLANT.

30. HOUSEKEEPING/CLEANUP: THE CONTRACTOR SHALL PREVENT POLLUTION OF STORM WATER FROM CLEAN-UP AND DISPOSAL OPERATIONS BY USING GOOD HOUSEKEEPING METHODS. WHEN FLUIDS OR DRY MATERIALS SPILL, CLEAN-UP SHOULD BE IMMEDIATE, THOROUGH, AND ROUTINE. THE CONTRACTOR SHALL NEVER ATTEMPT TO "WASH THEM AWAY" WITH WATER OR BURY THEM. THE CONTRACTOR SHALL REPORT SIGNIFICANT SPILLS TO THE APPROPRIATE SPILL RESPONSE AGENCIES IMMEDIATELY. THE CONTRACTOR SHALL RECOGNIZE THAT DIFFERENT TYPES OF MATERIALS HAVE DIFFERENT DISPOSAL REQUIREMENTS AND FOLLOW APPROPRIATE PRACTICES. THE CONTRACTOR SHALL CONFINE NON-HAZARDOUS DEBRIS TO DUMPSTERS, COVERED AT NIGHT OR DURING WET WEATHER, AND TAKE THE DEBRIS TO A LANDFILL FOR RECYCLING OR DISPOSAL. THE CONTRACTOR SHALL HANDLE HAZARDOUS DEBRIS IN ACCORDANCE WITH SPECIFIC LAWS AND REGULATIONS AND DISPOSE OF THEM PROPERLY. A SEPARATE PERMIT MAY BE REQUIRED. COMMON HAZARDOUS DEBRIS FOUND ON CONSTRUCTION SITES ARE: LIQUID RESIDUES FROM PAINTS, THINNERS, SOLVENTS, GLUES, AND CLEANING FLUIDS; LEACHING AGENTS FROM LUMBER SUCH AS FORMALDEHYDE, ARSENIC, COPPER, CREOSOTE AND CHROMIUM; MOTOR OIL; GEAR OIL; ANTIFREEZE FLUIDS; BRAKE FLUIDS; ETC.; AND UNUSED PESTICIDES.

31. NPDES AND CLEAN WATER ACT OF 1990 COMPLIANCE. (ALL DEVELOPMENTS) THE APPLICANT SHALL SUBMIT TO THE CITY ENGINEER FOR REVIEW AND OBTAIN APPROVAL FOR A WATER QUALITY MANAGEMENT PLAN (WQMP)/EROSION CONTROL PLAN SPECIFICALLY IDENTIFYING STRUCTURAL AND NON-STRUCTURAL BEST MANAGEMENT PRACTICES (BMP'S) THAT WILL BE USED ON-SITE TO CONTROL PREDICTABLE POLLUTANT RUNOFF.

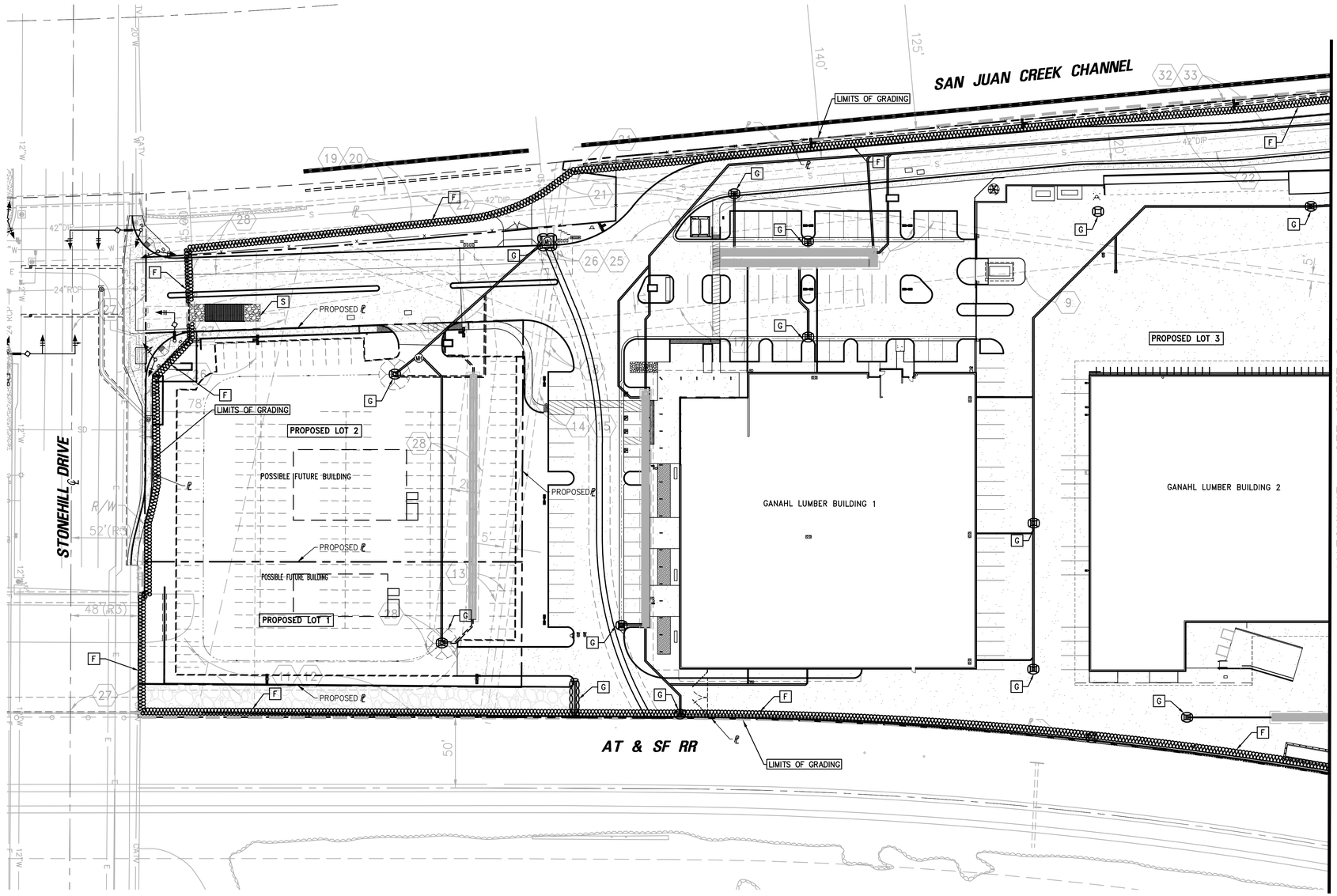
32. NPDES INDUSTRIAL PERMIT FOR GRADING IN EXCESS OF 1 ACRE. THE APPLICANT SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE CALIFORNIA STATE WATER RESOURCE CONTROL BOARD FOR COVERAGE UNDER THE STATE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PROGRAM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH DEVELOPMENT/CONSTRUCTION ACTIVITY IN EXCESS OF 1 ACRE OF LAND. EVIDENCE THAT THIS REQUIREMENT HAS BEEN MET SHALL BE SUBMITTED TO THE CITY ENGINEER.

33. THE CITY OF SAN JUAN CAPISTRANO, IN CONFORMANCE WITH THE CITY'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT, IS DEDICATED TO THE ELIMINATION/REDUCTION OF WATER POLLUTION AS A RESULT OF CONSTRUCTION PROJECTS. THE CONTRACTOR SHALL COMPLY WITH THE ITEMS DESCRIBED IN THIS SECTION NECESSARY TO ELIMINATE/REDUCE WATER POLLUTION. SAID ITEMS ARE INTENDED TO PROVIDE PREVENTION, CONTROL, AND ABATEMENT OF WATER POLLUTION INTO STORM DRAIN SYSTEMS, STREAMS, AND ANY OTHER BODIES OF WATER AS A RESULT OF THE CONTRACTOR'S OPERATIONS. THESE ITEMS ARE SUPPLEMENTAL TO THOSE REQUIRED OF THE CONTRACTOR IN SECTION 7-8 "PROJECT SITE MAINTENANCE" OF THE "GREENBOOK".

THE PERMITTEE SHALL PLACE EROSION CONTROL DEVICES IN ACCORDANCE WITH THE CITY'S APPROVED STANDARDS REGARDING EROSION CONTROL AND THE CITY OF SAN JUAN CAPISTRANO GRADING ORDINANCE, AND TO THE SATISFACTION OF THE BUILDING AND ENGINEERING DIRECTOR AND/OR DESIGNATED STAFF.

PERMITTEE SHALL BE RESPONSIBLE FOR PROVIDING THE FREE FLOW OF STORM RUNOFF AND FLOOD CONTROL CHANNELS, STORM DRAINS, AND TRIBUTARIES DURING THE CONSTRUCTION PERIOD; AND PERMITTEE AGREES TO ASSUME ALL LIABILITY FOR ANY AND ALL DAMAGES THAT MAY RESULT FROM SUCH. PERMITTEE SHALL DESIGN AND IMPLEMENT SEDIMENT BASINS OR USE ANY OTHER APPROVED METHOD TO MINIMIZE DOWNSTREAM SEDIMENT TRANSPORTATION DURING STREAM FLOW.

ALL SURPLUS EXCAVATED MATERIAL SHALL BE DISPOSED OF IN ACCORDANCE WITH THE CITY'S GRADING ORDINANCE AND WATER QUALITY ORDINANCE. DISPOSAL AREAS WILL BE UTILIZED IN A MANNER THAT ENSURES ADEQUATE EROSION CONTROL PROTECTION AND THE PREVENTION OF PONDING, AS APPROVED BY THE CITY BUILDING AND ENGINEERING DIRECTOR AND/OR DESIGNATED STAFF. ALL DISPOSAL (STOCKPILING) SITES WITHIN THE CITY MUST BE PERMITTED WITH A GRADING PERMIT.



NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

40 20 0 40 80 120

SCALE: 1"=40'

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI MAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

JOB NO.	NO.	INITIAL	DESCRIPTION	APPL	DATE
GNH17048					
SUBMITTAL					
100% DESIGN DEVELOPMENT 3-15-19					

REVISIONS

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

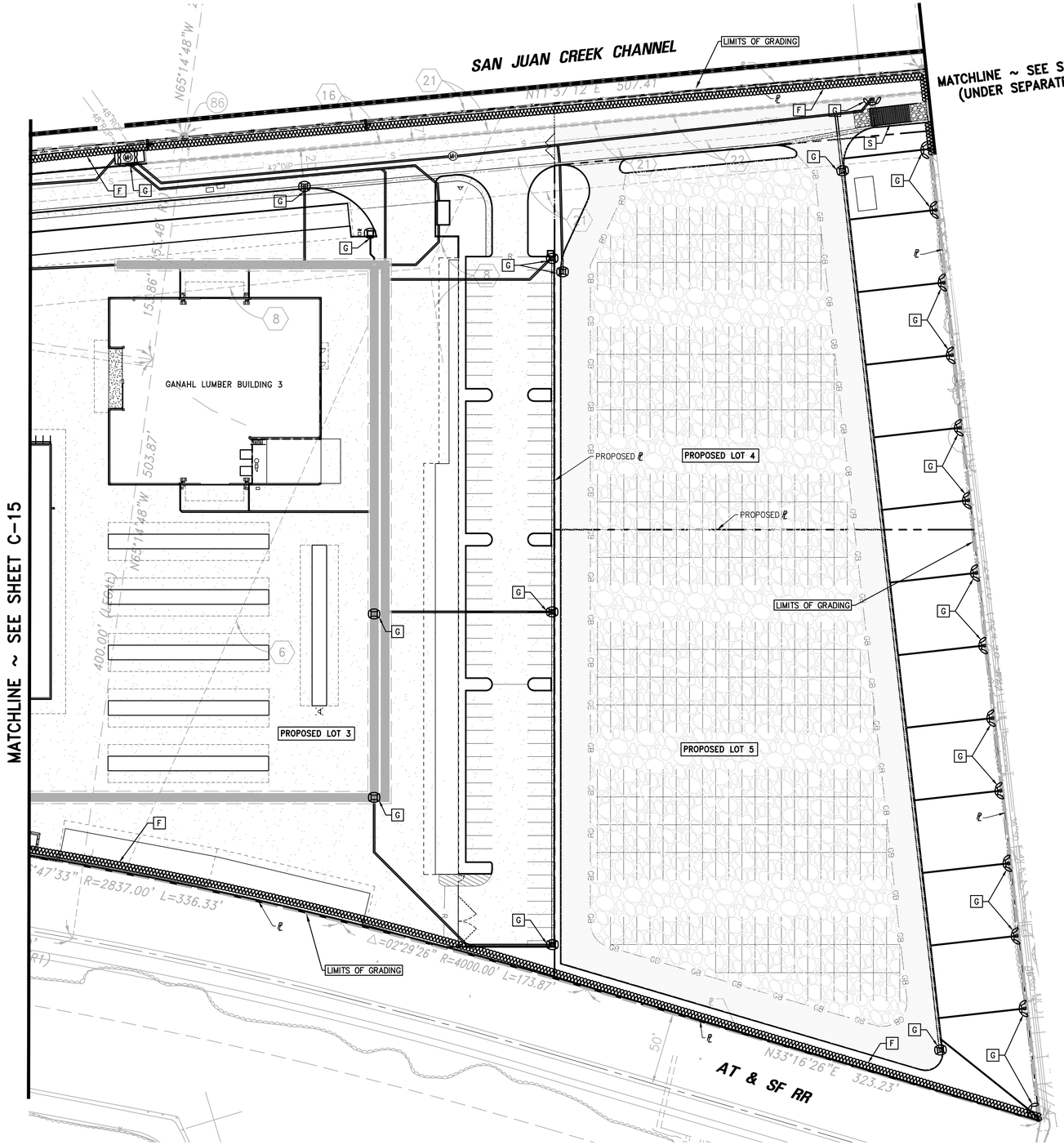
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

EROSION CONTROL PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-15 OF 28
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 EXP. 06/30/2019	

DATE: 3-15-19



NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

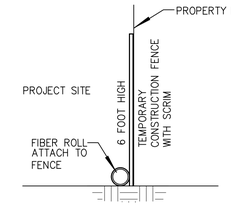
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

40 20 0 40 80 120

SCALE: 1"=40'

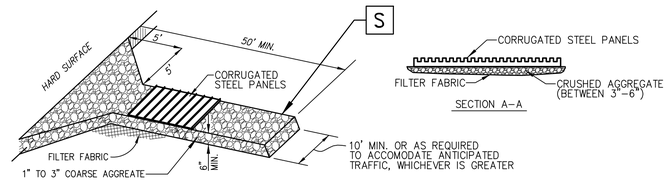
X:\FIBER ROLL.tif

X:\FIBER ROLL_1.tif



F FIBER ROLL AND TEMPORARY CONSTRUCTION FENCE DETAIL

NOT TO SCALE

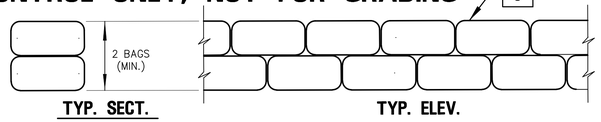


S STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

NOTE:

THIS PLAN IS FOR EROSION AND SEDIMENT CONTROL ONLY, NOT FOR GRADING



G GRAVEL BAG DETAIL

NOT TO SCALE

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI TIVIS No. 75205 CIVIL STATE OF CALIFORNIA

JOB NO. GNH17048

SUBMITTAL 3-15-19

100% DESIGN DEVELOPMENT

NO.	INITIAL	DESCRIPTION	DATE	APPL

REVISIONS

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

EROSION CONTROL PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		
CHECKED BY:	CHECKED BY:		C-16 OF 28
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019	

DATE: 3-15-19

CITY OF SAN JUAN CAPISTRANO UTILITIES DIVISION
ENGINEERING STANDARD STORM DRAIN IMPROVEMENT NOTES

1 ALL WORK SHOWN ON THESE PLANS SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, THE CITY OF SAN JUAN CAPISTRANO'S STANDARD PLANS, AND ORANGE COUNTY STANDARD PLANS.

2 ALL WORK SHALL CONFORM TO THE STATE CONSTRUCTION SAFETY ORDERS.

3 ALL WORK SHALL CONFORM TO THE CITY OF SAN JUAN CAPISTRANO LAND USE MANAGEMENT CODE.

4 NO GRADING, IF APPLICABLE, SHALL COMMENCE WITHOUT OBTAINING A GRADING PERMIT AND NOTIFYING THE GRADING INSPECTOR.

5 THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE CITY OF SAN JUAN CAPISTRANO ENGINEERING DIVISION PRIOR TO COMMENCING EXCAVATION IN ANY PUBLIC RIGHT-OF-WAY.

6 THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEERING INSPECTOR AT (949) 443-6354 AT LEAST 24 HOURS PRIOR TO STARTING ANY CONSTRUCTION.

7 PAVING PER THESE PLANS SHALL NOT COMMENCE UNTIL ALL UNDERGROUND WORK, IF ANY, IS COMPLETE. ALL UTILITY SERVICE CONNECTIONS SHALL BE EXTENDED BEYOND THE ROADWAY RIGHT-OF-WAY.

8 ALL TRENCH BACKFILL SHALL BE TO THE SATISFACTION OF THE SOILS ENGINEER AND IN ACCORDANCE WITH HIS/HER RECOMMENDATIONS.

9 THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. APPROVAL OF THESE PLANS BY THE CITY OF SAN JUAN CAPISTRANO DOES NOT CONSTITUTE A REPRESENTATION AS TO ACCURACY OR COMPLETENESS OF THE LOCATION OR THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THE CONTRACTOR IS REQUIRED TO TAKE ALL DUE PRECAUTIONARY MEANS TO PROTECT THE UTILITY LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION AND ELEVATIONS IN THE FIELD.

10 CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING WARNING SIGNS, DEVICES, LIGHTS AND FLAGMEN IN ACCORDANCE WITH THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION "MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE WORK ZONES".

11 DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SOIL AND MATERIAL TESTS.

12 REPORTS OF COMPACTION WITHIN THE TRAVELED WAY OF ALL STREETS SHALL BE SUBMITTED TO AND APPROVED BY THE CITY ENGINEER PRIOR TO PLACING ANY IMPROVEMENTS.

13 THE DESIGN CIVIL ENGINEER, IN CONJUNCTION WITH THE CONTRACTOR, SHALL VERIFY THE FLOW LINE OF EXISTING STRUCTURES IN THE FIELD AGAINST THE CONTROL PROVIDED, PRIOR TO CONSTRUCTION OF ANY MANHOLES OR ANY UPSTREAM STORM DRAIN. IF THE EXISTING FLOW LINE VARIES FROM THE PLANNED ELEVATION BY MORE THAN 00.10 FEET, THE DESIGN ENGINEER SHALL ADJUST THE GRADES BETWEEN THE JUNCTURE AND THE NEXT UPSTREAM MANHOLE.

14 ANY TRENCH CUTS EXCEEDING 5 FEET IN DEPTH SHALL REQUIRE A PERMIT FROM THE CALIFORNIA STATE DEPARTMENT OF INDUSTRIAL SAFETY.

15 ALL PAVING REMOVAL SHALL BE SAW CUT AT THE CITY ENGINEER?S DIRECTION, MINIMUM DEPTH OF CUT – 1 1/2 INCHES.

16 ALL REGULATORY SIGNS SHALL BE PLACED WITHIN 24 HOURS AFTER CURB RETURNS HAVE BEEN CONSTRUCTED IN THE LOCATIONS SHOWN ON THESE PLANS.

17 ALL GRADING OPERATIONS, WHEN APPLICABLE, INCLUDING REQUIRED SUBDRAINS, SHALL BE PERFORMED AND INSTALLED ACCORDING TO THE RECOMMENDATIONS INCLUDED IN THE SOILS REPORT BY _____, FOR _____, DATED _____.

18 PAVEMENT WHICH DOES NOT JOIN OTHER PAVEMENT OR BUILT UP AGAINST CONCRETE CURBS OR CUTTERS SHALL HAVE A 2-INCH X 6-INCH REDWOOD HEADER LEFT IN PLACE.

19 IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROTECT ALL TRAFFIC SIGNS WHERE APPLICABLE.

20 FOR DETOURS AND STREET CLOSURES, PUT FOLLOWING NOTE, "CONTRACTOR SHALL NOTIFY CITY ENGINEER (493-1171), ORANGE COUNTY SHERIFFS DEPARTMENT (834-6005), AND ORANGE COUNTY FIRE AUTHORITY (831-0872) AT LEAST 72 HOUR PRIOR TO STREET CLOSURE OR DETOUR".

21 WHERE GROUND WATER IS ENCOUNTERED DURING TRENCHING AND/OR EXCAVATION, A MINIMUM OF 1 FOOT OF NO. 2 ROCK SHALL BE PLACED BENEATH ANY PIPE TO THE SATISFACTION OF THE CITY ENGINEER.

22 STATIONING REFERS TO CENTERLINE OF CONDUITS UNLESS OTHERWISE NOTED.

23 CONCRETE SHALL BE 560-C-3250, 5-INCH MAXIMUM SLUMP AND, 560-B-3250, 4-INCH MAXIMUM SLUMP, BOTH AS PER STANDARD SPECIFICATIONS, SECTION 201.

24 ALL EXPOSED CONCRETE SURFACES SHALL CONFORM IN GRADE, COLOR AND FINISH TO ALL ADJOINING CURBS AND WALKS.

25 ALL EXPOSED FERROUS METAL PARTS TO BE GALVANIZED PER ASTM A-123 AFTER FABRICATION.

26 ALL R.C.P. SHALL BE CAST OR CENTRIFUGALLY SPUN REINFORCED CONCRETE PIPE, IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE STORM DRAIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH ORANGE COUNTY RDMD STANDARD PLAN 1319, BEDDING DETAIL.

27 ALL CATCH BASINS SHALL BE LINED WITH FABRIC FILTERS IN ACCORDANCE WITH THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS. FILTER FABRIC TYPE AND MATERIAL SHALL BE TO THE SATISFACTION OF THE CITY ENGINEER.

28 ALL CATCH BASINS SHALL HAVE WEEP HOLES PER ORANGE COUNTY RDMD STANDARD PLANS.

29 ALL CATCH BASINS SHALL BE STENCILED "NO DUMPING – DRAINS TO OCEAN" BY DEVELOPER, PER APPROVED CITY STANDARD (DEVELOPER TO PURCHASE CURB MARKERS FROM THE CITY OF SAN JUAN CAPISTRANO PUBLIC WORKS DEPARTMENT).

30 ALL JUNCTION STRUCTURES SHALL BE TYPE VI, PER ORANGE COUNTY RDMD STANDARD PLAN 1315, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

31 EXTRA THICK R.C.P. AT FLOW LINE ONLY SHALL HAVE A MINIMUM 1 1/2 " THICK CLEARANCE FROM REINFORCING AT INVERT AND SHALL BE PLACED AS NOTED IN PROFILE.

32 PIPE BEDDING SHALL BE PER ORANGE COUNTY RDMD STANDARD PLAN NO. 1319.

33 STORM DRAIN PIPE LENGTHS INDICATED ARE HORIZONTAL PROJECTIONS ON CENTERLINE OF PIPE. CONTRACTOR SHALL BE RESPONSIBLE FOR EXTRA ACTUAL LENGTH BASED ON PIPE SLOPE AND ANGULAR INLETS.

34 ALL STREET SECTIONS LOCATED WITHIN 20 FEET OR LESS, FROM THE TOE OF A SLOPE OF 10' IN HEIGHT OR MORE SHALL BE SHOWN AND MARKED ON THE PLANS. THESE SECTIONS SHALL BE PROTECTED FROM UNDERGROUND WATER SEEPAGE BY CUT-OFF SUBDRAIN BARRIERS IN ACCORDANCE WITH CITY STANDARD PLAN NO. 350. ANY DEVIATION TO DEVICE OR METHOD OF DRAINAGE SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE CITY ENGINEER.

35 EXCAVATION AND RESURFACING OF STREETS, FOR LATERAL (PERPENDICULAR TO STREET) TRENCHES, SHALL BE PER CITY STANDARD 700. THE ENTIRE LANE WIDTHS, PARTIALLY OR FULLY AFFECTED BY SUCH TRENCHES OR EXCAVATIONS SHALL REQUIRE COLD MILLING AND AT MINIMUM, AN ASPHALTIC OVERLAY OF 0.1 FOOT IN DEPTH. ALL COLD MILLING AND OVERLAYING AND/OR OTHER STREET RESURFACING METHODS, SUCH AS SLURRY-SEALS, IF APPROVED BY THE CITY ENGINEER, SHALL INCLUDE THE ENTIRE LENGTH OF THE EXCAVATION PLUS A THREE (3) FOOT EXTENSION PASSED THE LONGITUDINAL EDGES OF EACH CUT.

36 IN THE EVENT THAT EXISTING TRAFFIC STRIPING AND MARKINGS ARE OBLITERATED BY CONSTRUCTION, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE SAID STRIPING TO THE SATISFACTION OF THE CITY ENGINEER.

37 CONTRACTOR SHALL PROVIDE A CLEAR UNOBSTRUCTED WALKWAY FOR PEDESTRIANS PAST WORK AREA(S). AT NO TIME SHALL PEDESTRIANS BE DIRECTED INTO A VEHICULAR LANE.

38 NO STAGING OF CONSTRUCTION EQUIPMENT SHALL BE PERMITTED IN THE RIGHT-OF-WAY.

39 A TRAFFIC CONTROL PLAN SHALL BE REQUIRED FOR ALL LANE CLOSURES. SAID PLAN SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE TRAFFIC ENGINEER PRIOR TO ISSUANCE OF AN ENCROACHMENT PERMIT FOR WORK IN THE RIGHT-OF-WAY.

40 ALL CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH ALL SECTIONS OF THE MUNICIPAL CODE OF THE CITY OF SAN JUAN CAPISTRANO, ESPECIALLY SECTION 6-3.06(B), (C), (D), AND (E), AND SHALL SECURE THE SERVICES OF THE CITY'S EXCLUSIVE SOLID WASTE HAULER FOR THEIR SOLID WASTE HANDLING NEEDS.

41 MAINTAIN THE SITE IN A "WET-DOWN" CONDITION TO THE DEGREE NECESSARY TO PREVENT EXCESSIVE DUST. PERIODICALLY REMOVER SPILLAGE FROM THE PUBLIC RIGHT-OF-WAY BY SWEEPING OR SPRINKLING, HOWEVER, WATERING THAT RESULTS IN MUD ON PUBLIC STREETS IS NOT PERMITTED AS A SUBSTITUTE FOR OTHER CLEANING METHODS.

42 EROSION AND SEDIMENT CONTROL SHALL BE PURSUANT TO BEST MANAGEMENT PRACTICES AND SHALL BE INSTALLED AND MAINTAINED BY CONTRACTOR DURING ENTIRE CONSTRUCTION PERIOD.

43 PER CITY COUNCIL POLICY 601, AN ARCHAEOLOGICAL MONITOR IS REQUIRED TO BE ON SITE DURING ALL EXCAVATION ACTIVITIES IN EXCESS OF 18 INCHES, UNLESS DETERMINED TO BE EXEMPT BY THE PLANNING DIRECTOR. A FINAL REPORT MUST BE PREPARED AND SUBMITTED TO THE ENGINEERING DIVISION WHEN MONITORING REQUIREMENTS OF THIS PROJECT ARE COMPLETE. ALL COSTS SHALL BE BORNE BY PERMITTEE.

44 PER CITY COUNCIL POLICY 505, NIGHT TIME CONSTRUCTION WORK WILL BE REQUIRED ON HEAVILY TRAVELED STREETS (IN NON-RESIDENTIAL NEIGHBORHOODS). REFER TO POLICY FOR AFFECTED STREETS.

45 INGRESS AND EGRESS TO EXISTING ESTABLISHMENTS SHALL BE KEPT OPEN TO THE SATISFACTION OF THE CITY ENGINEER.

46 NO WORK SHALL BE DONE ON ADJACENT PROPERTIES OR ADJACENT OWNER?S IMPROVEMENTS WITHOUT OBTAINING WRITTEN PERMISSION FROM THE OWNER OF THE ADJACENT PROPERTIES, AND SUBMITTING A NOTARIZED COPY THEREOF TO THE CITY ENGINEERING DIVISION.

47 ISSUANCE OF A PERMIT FROM THE ENGINEERING DIVISION AND/OR BUILDING DIVISION DOES NOT ELIMINATE THE NEED FOR PERMITS FROM OTHER CITY REGULATORY DIVISIONS/DEPARTMENTS OR AGENCIES WITH REGULATORY RESPONSIBILITIES FOR CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE WORK AUTHORIZED ON THIS PLAN.

48 "AS BUILT" MYLAR DRAWINGS AND DIGITAL COPIES (IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF SAN JUAN CAPISTRANO DIGITAL SUBMISSION STANDARDS), SHALL BE SUBMITTED TO THE CITY ENGINEERING DIVISION UPON COMPLETION OF IMPROVEMENTS IN ACCORDANCE WITH APPROVED REVISIONS, TO THE SATISFACTION OF THE CITY ENGINEER.

LEGEND

AB = AGGREGATE BASE
AC = ASPHALT CONCRETE
BLK = CONCRETE BLOCK
BP = BOTTOM PIPE
BS = BACK OF SIDEWALK
CB = CATCH BASIN
CF = CURB FACE
CL = CENTERLINE
CLF = CHAIN LINK FENCE
CO = CLEANOUT
DCV = DETECTOR CHECK VALVE
DS = ROOF DOWNSPOUT
DW = DOMESTIC WATER
EG = EDGE OF GUTTER
EP = EDGE OF PAVEMENT
FD = FOUND
FDC = FIRE DEPT. CONNECTION
FF = FINISHED FLOOR
FG = FINISHED GRADE
FH = FIRE HYDRANT
FL = FLOW LINE
FS = FINISHED SURFACE
FW = FIRE WATER
GB = GRADE BREAK
GM = GAS METER
GR = TOP OF GRATE
GV = GAS VALVE
HP = HIGH POINT
HT = HEIGHT
ICV = IRRIGATION CONTROL VALVE
IP = IRON PIPE
LS = LIGHT STANDARD
L&T = LEAD & TAG
MH = MANHOLE
NG = NATURAL GROUND
N&T = NAIL & TAG
OHW = OVERHEAD WIRE
PB = PULL BOX
PCC = CONCRETE
PIV = POST INDICATOR VALVE
PL = PROPERTY LINE
RD = ROOF DRAIN
RWH = REDWOOD HEADER
SCB = SIGNAL CONTROL BOX
SMH = SEWER MANHOLE
SPK = SPIKE
SS = SANITARY SEWER
SW = SIDEWALK
TC = TOP OF CURB
TE = TRASH ENCLOSURE
TP = TOP PIPE
TRAN = TRANSITION
TRANS= TRANSFORMER
TRW = TOP OF RETAINING WALL
TW = TOP OF WALL
UG = UNDERGROUND
UP = UTILITY POLE
VAR = VARIABLE
W = WATER
WDF = WOOD FENCE
WM = WATER METER
WV = WATER VALVE

N. = NORTH
S. = SOUTH
E. = EAST
W. = WEST
N'LY = NORTHERLY
S'LY = SOUTHERLY
E'LY = EASTERLY
W'LY = WESTERLY
N/O = NORTH OF
S/O = SOUTH OF
E/O = EAST OF
W/O = WEST OF
℄ = PROPERTY LINE
℄ = CENTERLINE
R/W = RIGHT OF WAY
△ = DELTA
R = RADIUS
L = LENGTH
T = TANGENT
M = MEASURED DATA
C = CALCULATED DATA
(RAD)= RADIAL BEARING
PRO =PROPORTIONATE MEASUREMENT
(210.00' R) = RECORD DATA
210.00' M. = MEASURED DATA
210.00' PRO. = PRORATED DATA
210.00' C. = CALCULATED DATA
(427.00) TC = EXISTING ELEVATION
427.00 TC = DESIGN ELEVATION
—— CATV —— = CABLE TV LINE
—— E —— = ELECTRICAL LINE
—— G —— = GAS LINE
—— GB —— GB —— = GRADE BREAK LINE
—— R —— R —— = RIDGE LINE
—— S —— = SEWER LINE
—— SD —— = STORM DRAIN LINE
—— T —— = TELEPHONE LINE
—— W —— = WATER LINE

SYMBOLS

FIRE HYDRANT
STREET LIGHT
TRAFFIC SIGNAL
TRAFFIC SIGNAL ARM & POLE
LIGHT STANDARD
UTILITY POLE
GUY WIRE & ANCHOR
WM WATER METER
GM GAS METER
WV WATER VALVE
GAS VALVE
PB PULL BOX
GRATE INLET
SIGN
VENT
S SEWER MANHOLE
D STORM DRAIN MANHOLE
T TELEPHONE MANHOLE
MH MANHOLE
SEWER CLEANOUT
W MONITORING WELL
HANDICAP PARKING STALL
L LANDSCAPED AREA
P PROTECT IN PLACE
R REMOVE AND DISPOSE OFFSITE
RE RELOCATE
3 PLOTABLE EASEMENT ITEM No. PER TITLE REPORT
(427.0) EXIST. CONTOUR
427.0 DESIGN CONTOUR

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

REVISIONS

NO.	INITIAL	DESCRIPTION	DATE	APPL

JOB NO. GNH17048
SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

STORM DRAIN PLAN

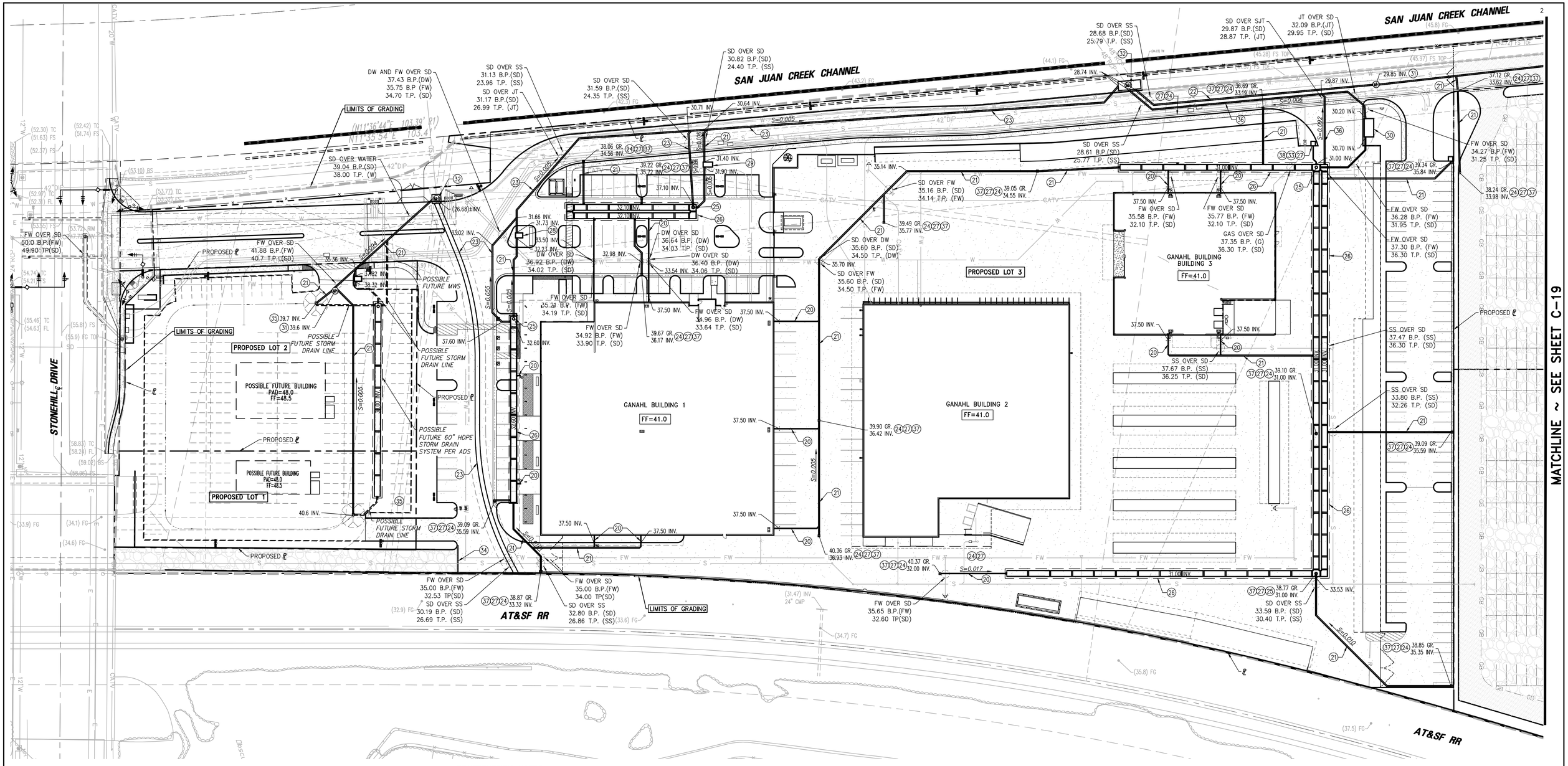
PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY: KDL/KJK
DESIGN BY: KJK
CHECKED BY: CDB
CHECKED BY: CDB

JEROME PARCO CITY ENGINEER R.C.E. 50385 EXP. 06/30/2019 DATE

SHEET C-17 OF 28

DATE: 9-13-19



CONSTRUCTION NOTES

(20) PLACE 6-INCH ADS N-12 HDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C-21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(21) PLACE 12-INCH ADS N-12 HDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C-21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(22) PLACE 18-INCH ADS N-12 NHDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C-21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(23) PLACE 24-INCH ADS N-12 HDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C-21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(24) CONSTRUCT 24" X 24" CATCH BASIN PER DETAIL ON SHEET C-20.

(25) CONSTRUCT 24-INCH ACCESS MANHOLE PER ADS DETAIL ON SHEET C-23.

(26) CONSTRUCT 60-INCH HDPE STORM DRAIN SYSTEM PER ADS DETAIL ON SHEET C-22.

(27) STENCIL "NO DUMPING, DRAINS TO OCEAN" IN A CONTRASTING COLOR TRAFFIC PAINT ON PAVING ADJACENT TO GRATED INLET PER DETAIL ON SHEET C-20.

(28) CONSTRUCT STORMWATER BIOFILTRATION SYSTEM MWS-L-4-6-9'-2.5"-V-HC PER DETAIL ON SHEET C-20.

(29) CONSTRUCT STORMWATER BIOFILTRATION SYSTEM MWS-L-4-6-8'-8"-V-HC PER DETAIL ON SHEET C-20.

(30) CONSTRUCT STORMWATER BIOFILTRATION SYSTEM MWS-L-8-16-9'-9.5"V PER DETAIL ON SHEET C-20.

(31) CONSTRUCT 48-INCH MANHOLE PER DETAIL ON SHEET _____.

(32) CONSTRUCT JUNCTION STRUCTURE PER DETAIL ON SHEET _____.

(33) CONSTRUCT CURB OPENING CATCH BASIN PER S.P.P.W.C. STD. 300-3.

(34) CONSTRUCT TRENCH DRAIN PER DETAIL ON SHEET ___.

(35) CONSTRUCT DESILTING BASIN PER OC RDMD. STD. 1327.

(36) PLACE 30-INCH ADS N-12 HDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C-21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(37) INSTALL FLOGARD CATCH BASIN INSERT FILTER WITH ABSORBANT POUCHES.

(38) INSTALL FLOGARD TRASH & DEBRIS GUARD WITH ABSORBANT POUCH.

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

40 20 0 40 80 120

SCALE: 1"=40'

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI VITAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

NO.	INITIAL	DESCRIPTION	APPL	DATE

REVISIONS

JOB NO. GNH17048

SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

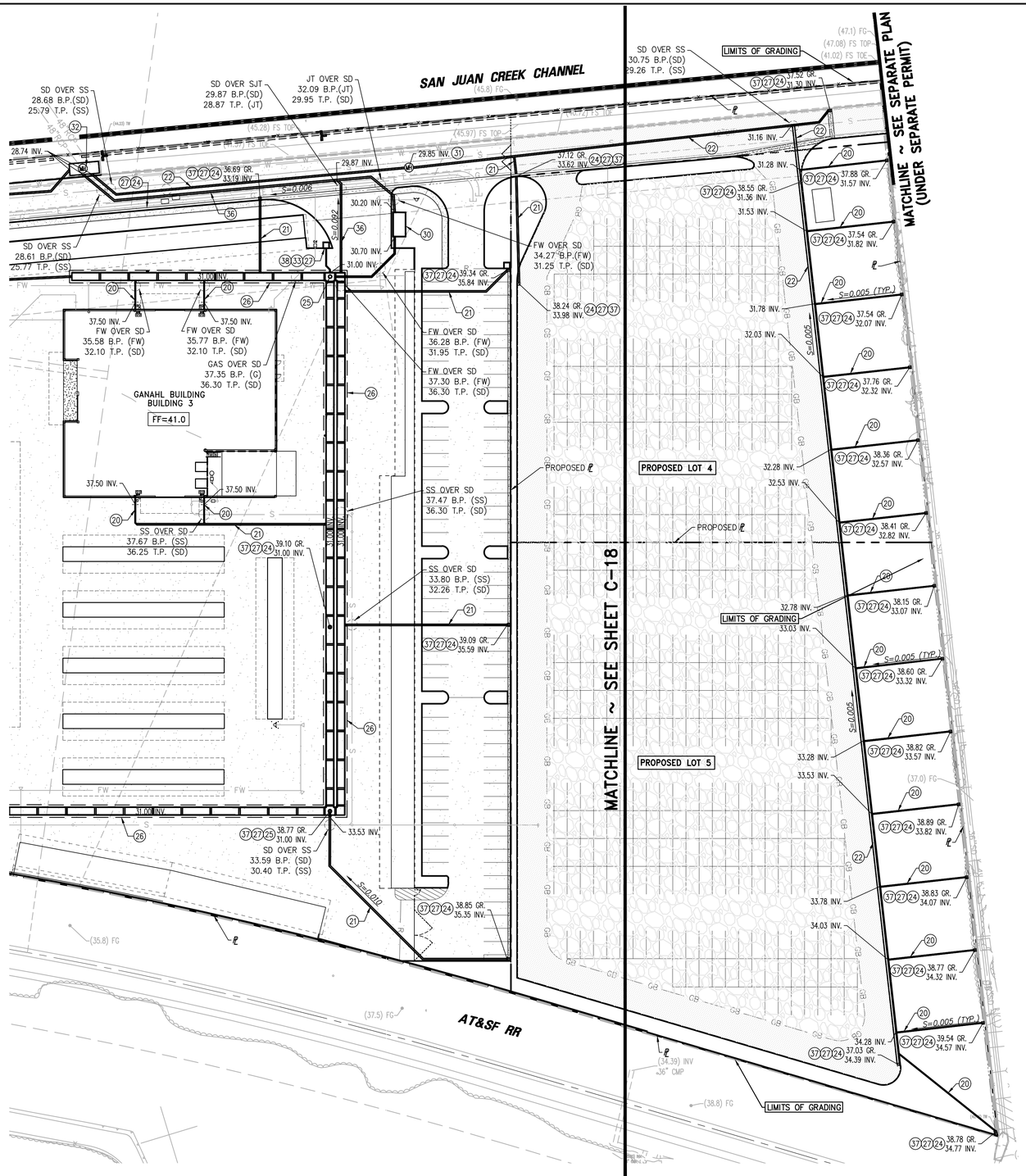
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

STORM DRAIN PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-18 OF 28
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019	

DATE: 9-13-19



CONSTRUCTION NOTES

(20) PLACE 6–INCH ADS N–12 HDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C–21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(21) PLACE 12–INCH ADS N–12 HDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C–21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(22) PLACE 18–INCH ADS N–12 NHDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C–21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(23) PLACE 24–INCH ADS N–12 HDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C–21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(24) CONSTRUCT 24" X 24" CATCH BASIN PER DETAIL ON SHEET C–20.

(25) CONSTRUCT 24–INCH ACCESS MANHOLE PER ADS DETAIL ON SHEET C–23.

(26) CONSTRUCT 60–INCH HDPE STORM DRAIN SYSTEM PER ADS DETAIL ON SHEET C–22.

(27) STENCIL "NO DUMPING, DRAINS TO OCEAN" IN A CONTRASTING COLOR TRAFFIC PAINT ON PAVING ADJACENT TO GRATED INLET PER DETAIL ON SHEET C–20.

(28) CONSTRUCT STORMWATER BIOFILTRATION SYSTEM MWS–L–4–6–9'–2.5"–V–HC PER DETAIL ON SHEET C–20.

(29) CONSTRUCT STORMWATER BIOFILTRATION SYSTEM MWS–L–4–6–8'–8"–V–HC PER DETAIL ON SHEET C–20.

(30) CONSTRUCT STORMWATER BIOFILTRATION SYSTEM MWS–L–8–16–9'–9.5"V PER DETAIL ON SHEET C–20.

(31) CONSTRUCT 48–INCH MANHOLE PER DETAIL ON SHEET _____.

(32) CONSTRUCT JUNCTION STRUCTURE PER DETAIL ON SHEET _____.

(33) CONSTRUCT CURB OPENING CATCH BASIN PER S.P.P.W.C. STD. 300–3.

(34) CONSTRUCT TRENCH DRAIN PER DETAIL ON SHEET ___.

(35) CONSTRUCT DESILTING BASIN PER OC RDMD. STD. 1327.

(36) PLACE 30–INCH ADS N–12 HDPE STORM DRAIN PIPE PER ADS DETAIL ON SHEET C–21. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.

(37) INSTALL FLOGARD CATCH BASIN INSERT FILTER WITH ABSORBANT POUCHES.

(38) INSTALL FLOGARD TRASH & DEBRIS GUARD WITH ABSORBANT POUCH.

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

40 20 0 40 80 120

SCALE: 1"=40'

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. DI BIAS
No. 75205
CIVIL
STATE OF CALIFORNIA

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

JOB NO. GNH17048
SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

NO.	INITIAL	DESCRIPTION	DATE	APPL

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

STORM DRAIN PLAN

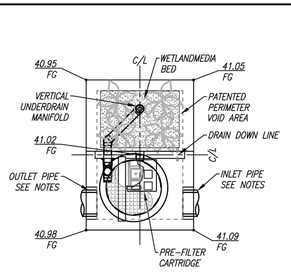
PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-19 OF 28
CHECKED BY:	CHECKED BY:	JEROME PARCO CITY ENGINEER R.C.E. 50385	DATE EXP. 06/30/2019
CDB	CDB		

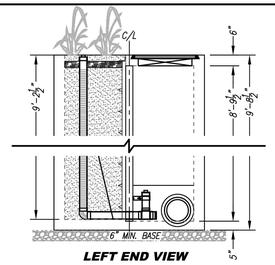
DATE: 9-13-19

SITE SPECIFIC DATA			
PROJECT NUMBER		7814	
ORDER NUMBER		----	
PROJECT NAME		GANAHL LUMBER	
PROJECT LOCATION		SAN JUAN CAPISTRANO, CA	
STRUCTURE ID		28	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
3288		N/A	
TREATMENT HGL AVAILABLE (FT)			3.5
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	32.23	HDPE	12"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	31.73	HDPE	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	41.02	41.02	41.02
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	ø 30"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			3.86
ORIFICE SIZE (DIA. INCHES)			ø1.22"

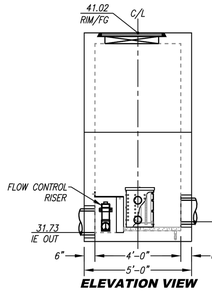
NOTES: UNIT IS CAPABLE OF TREATING UP TO 3765 CF WQv. UNIT IS TO BE INSTALLED LEVEL AT FG 41.02 AND THE SURRONDING FG WILL TRANSITION TO THE UNIT FOR DRAINAGE PURPOSES.



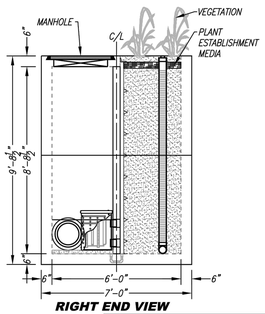
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

REQUIRED TREATMENT VOLUME (CF)	3288
DRAINDOWN DURATION (HOURS)	48
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	8.55
OPERATING HEAD (FT)	3.5
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

THE PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262, 7,470,293, 8,303,816, 8,500,918 AND RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

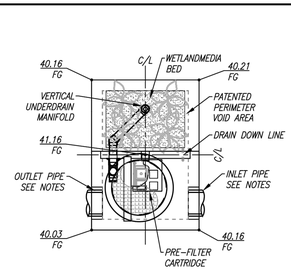
MWS-L-4-6-9'-2.5"-V-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

STORMWATER BIOFILTRATION DETAIL (28)

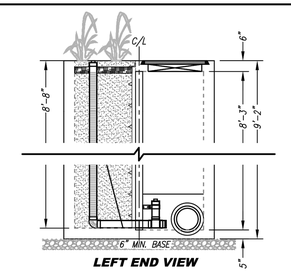
NOT TO SCALE

SITE SPECIFIC DATA			
PROJECT NUMBER		7814	
ORDER NUMBER		----	
PROJECT NAME		GANAHL LUMBER	
PROJECT LOCATION		SAN JUAN CAPISTRANO, CA	
STRUCTURE ID		29	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
3470		N/A	
TREATMENT HGL AVAILABLE (FT)			3.7
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	31.90	HDPE	12"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	31.40	HDPE	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	40.16	40.16	40.16
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	ø 30"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			3.64
ORIFICE SIZE (DIA. INCHES)			ø1.22"

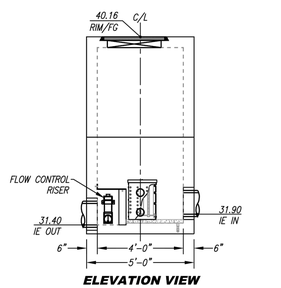
NOTES: UNIT IS CAPABLE OF TREATING UP TO 3765 CF WQv. UNIT IS TO BE INSTALLED LEVEL AT FG 40.16 AND THE SURRONDING FG WILL TRANSITION TO THE UNIT FOR DRAINAGE PURPOSES.



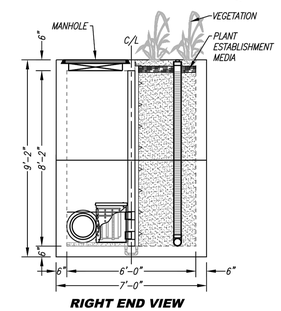
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

REQUIRED TREATMENT VOLUME (CF)	3470
DRAINDOWN DURATION (HOURS)	48
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	9.04
OPERATING HEAD (FT)	3.7
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

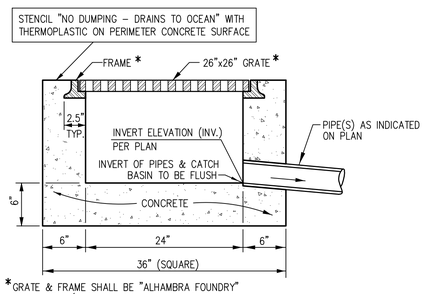
THE PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262, 7,470,293, 8,303,816, 8,500,918 AND RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

MWS-L-4-6-8'-8"-V-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

STORMWATER BIOFILTRATION DETAIL (29)

NOT TO SCALE



*GRATE & FRAME SHALL BE "ALHAMBRA FOUNDRY" NO. A-2012 (TRAFFIC-TYPE, PEDESTRIAN & BICYCLE-PROOF) OR APPROVED EQUAL.

24"x24" CONCRETE CATCH BASIN BOX (24)

NOT TO SCALE



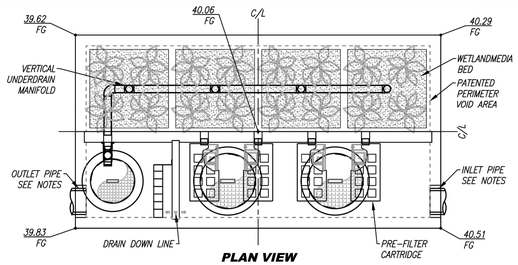
"NO DUMPING" STENCIL (27)

NOT TO SCALE

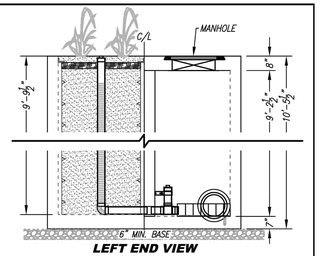
STENCIL "NO DUMPING – DRAINS TO OCEAN" WITH THERMOPLASTIC ON PERIMETER CONCRETE SURFACE

SITE SPECIFIC DATA			
PROJECT NUMBER		7814	
ORDER NUMBER		----	
PROJECT NAME		GANAHL LUMBER	
PROJECT LOCATION		SAN JUAN CAPISTRANO, CA	
STRUCTURE ID		30	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
18405		N/A	
TREATMENT HGL AVAILABLE (FT)			3.4
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	30.70	HDPE	12"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	30.20	HDPE	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	40.06	40.06	40.06
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	2EA ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			23.17
ORIFICE SIZE (DIA. INCHES)			ø3.07"

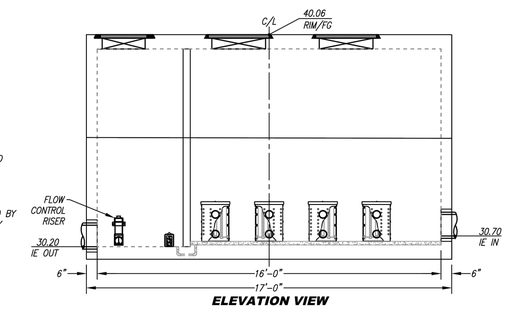
NOTES: UNIT IS CAPABLE OF TREATING UP TO 23707 CF WQv. UNIT IS TO BE INSTALLED LEVEL AT FG 40.06 AND THE SURRONDING FG WILL TRANSITION TO THE UNIT FOR DRAINAGE PURPOSES.



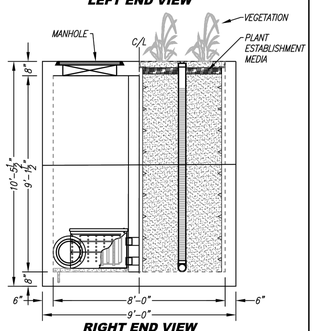
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

REQUIRED TREATMENT VOLUME (CF)	18405
DRAINDOWN DURATION (HOURS)	44
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	52.33
OPERATING HEAD (FT)	3.4
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

THE PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262, 7,470,293, 8,303,816, 8,500,918 AND RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

MWS-L-8-16-9'-9.5"V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

STORMWATER BIOFILTRATION DETAIL (30)

NOT TO SCALE

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI MAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

STORM DRAIN DETAILS

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:	SHEET
KDL/KJK	KJK	C-20 OF 28
CHECKED BY:	CHECKED BY:	
CDB	CDB	

JEROME PARCO, CITY ENGINEER, R.C.E. 50385, DATE EXP. 06/30/2019

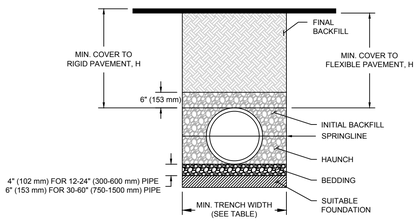
NO.	INITIAL	DESCRIPTION	APPL	DATE
JOB NO.	GNH17048			
SUBMITTAL	3-15-19			
100% DESIGN DEVELOPMENT				

REVISIONS

DATE: 9-13-19

ADS HDPE TYPICAL TRENCH DETAIL

NTS



RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
4" (100 mm)	21" (533 mm)
6" (150 mm)	23" (584 mm)
8" (200 mm)	26" (660 mm)
10" (250 mm)	28" (711 mm)
12" (300 mm)	30" (762 mm)
15" (375 mm)	34" (864 mm)
18" (450 mm)	39" (991 mm)
24" (600 mm)	48" (1219 mm)
30" (750 mm)	56" (1422 mm)
36" (900 mm)	64" (1626 mm)
42" (1050 mm)	72" (1829 mm)
48" (1200 mm)	80" (2032 mm)
60" (1500 mm)	96" (2438 mm)

MINIMUM RECOMMENDED COVER BASED ON VECHICLE LOADING CONDITIONS**

PIPE DIAM.	SURFACE LIVE LOADING CONDITION	
	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12-48" (300-1200 mm)	12" (305 mm)	48" (1219 mm)
60" (1500 mm)	24" (610 mm)	60" (1524 mm)

* VEHICLES WITH AXLE LOADS IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER
** SEE BACKFILL REQUIREMENTS IN NOTE 6

MINIMUM RECOMMENDED COVER BASED ON RAILWAY LOADING CONDITIONS

PIPE DIAMETER	COOPER E-80**
UP TO 24" (600 mm)	24" (610 mm)
30-36" (750-900 mm)	36" (914 mm)
42-60" (1050-1500 mm)	48" (1219 mm)

** COVER IS MEASURED FROM TOP OF PIPE TO BOTTOM OF RAILWAY TIE.
*** E-80 COVER REQUIREMENTS, ARE ONLY APPLICABLE TO ASTM F 2306 PIPE.

MAXIMUM RECOMMENDED COVER BASED ON BACKFILL MATERIAL AND COMPACTION EFFORT

PIPE DIAM.	CLASS I		CLASS II		CLASS III
	COMPACTED	DUMPED	95%	90%	95%
4" (100 mm)	37' (11.3 m)	18' (5.5 m)	25' (7.6 m)	18' (5.5 m)	18' (5.5 m)
6" (150 mm)	44' (13.4 m)	20' (6.1 m)	29' (8.8 m)	20' (6.1 m)	21' (6.4 m)
8" (200 mm)	32' (9.8 m)	15' (4.6 m)	22' (6.7 m)	15' (4.6 m)	16' (4.9 m)
10" (250 mm)	38' (11.6 m)	18' (5.5 m)	26' (7.9 m)	18' (5.5 m)	18' (5.5 m)
12" (300 mm)	35' (10.7 m)	17' (5.2 m)	24' (7.3 m)	17' (5.2 m)	17' (5.2 m)
15" (375 mm)	38' (11.6 m)	17' (5.2 m)	25' (7.6 m)	17' (5.2 m)	18' (5.5 m)
18" (450 mm)	36' (11.0 m)	17' (5.2 m)	24' (7.3 m)	17' (5.2 m)	17' (5.2 m)
24" (600 mm)	28' (8.5 m)	13' (4.0 m)	20' (6.1 m)	13' (4.0 m)	14' (4.3 m)
30" (750 mm)	28' (8.5 m)	13' (4.0 m)	20' (6.1 m)	13' (4.0 m)	14' (4.3 m)
36" (900 mm)	26' (7.9 m)	12' (3.7 m)	18' (5.5 m)	13' (4.0 m)	13' (4.0 m)
42" (1050 mm)	23' (7.0 m)	11' (3.4 m)	16' (4.9 m)	11' (3.4 m)	11' (3.4 m)
48" (1200 mm)	25' (7.6 m)	11' (3.4 m)	17' (5.2 m)	11' (3.4 m)	12' (3.7 m)
60" (1500 mm)	25' (7.6 m)	11' (3.4 m)	17' (5.2 m)	11' (3.4 m)	12' (3.7 m)

FILL HEIGHT TABLE GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:
- NO HYDROSTATIC PRESSURE
- UNIT WEIGHT OF SOIL (γs) = 120 PCF

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER, AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (102 mm) FOR 4-24" (100-600 mm); 6" (153 mm) FOR 30-60" (750-900 mm).
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" (150 mm) ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (305 mm) FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" (305 mm) UP TO 48" (1200 mm) DIAMETER PIPE AND 24" (610 mm) OF COVER FOR 60" (1500 mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. FOR TRAFFIC APPLICATIONS WITH LESS THAN FOUR FEET OF COVER, EMBEDMENT OF THE PIPE SHALL BE USING ONLY A CLASS I OR CLASS II BACKFILL.

TYPICAL PIPE TRENCH DETAIL

NOT TO SCALE

20 21 22 23 36

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. DI BIAS
No. 75205
CIVIL
STATE OF CALIFORNIA

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

JOB NO. GNH17048

NO.	INITIAL	DESCRIPTION	APPL	DATE
		SUBMITTAL		3-15-19
		100% DESIGN DEVELOPMENT		

REVISIONS

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

STORM DRAIN DETAILS

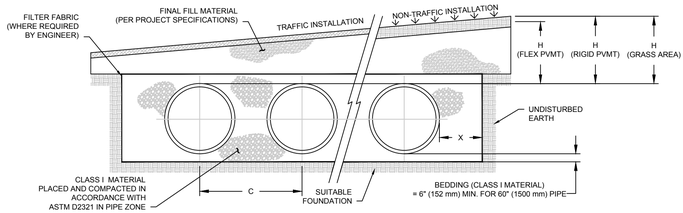
PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:
KDL/KJK	KJK
CHECKED BY:	CHECKED BY:
CDB	CDB

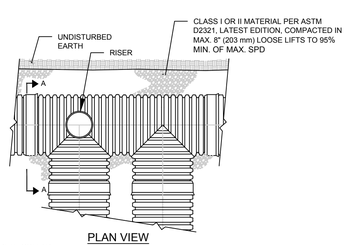
JEROME PARCO
CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019

SHEET
C-21 OF 28

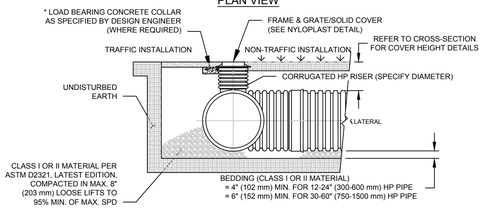
DATE: 9-13-19



NOMINAL DIAMETER	NOMINAL O.D.	TYPICAL SPACING "C"	TYPICAL SIDE WALL "X"	MIN. H (NON-TRAFFIC)	MIN. H (TRAFFIC)	MAX. H*
60" (1500 mm)	67" (1702 mm)	90" (2286 mm)	18" (457 mm)	12" (305 mm)	24" (610 mm)	8' (2.4 m)



PLAN VIEW



SECTION A-A

* MAXIMUM FILL HEIGHTS OVER MANIFOLD FITTINGS. CONTACT MANUFACTURER'S REPRESENTATIVE FOR INSTALLATION CONSIDERATIONS WHEN COVER EXCEEDS 8 FT (2.4 m).
**60" (1500 mm) SYSTEMS REQUIRE CLASS I BACKFILL AROUND ALL LATERALS AND FITTINGS.

NOTES:

1. ALL REFERENCES TO CLASS I MATERIAL ARE PER ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. ALL RETENTION AND DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, LATEST EDITION AND THE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.
3. MEASURES SHOULD BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO THE BACKFILL MATERIAL, WHEN REQUIRED. SEE ASTM D2321.
4. FILTER FABRIC: A GEOTEXTILE FABRIC MAY BE USED AS SPECIFIED BY THE ENGINEER TO PREVENT THE MIGRATION OF FINES FROM THE NATIVE SOIL INTO THE SELECT BACKFILL MATERIAL.
5. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
6. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (102 mm) FOR 4"-24" (100-600 mm); 6" (152 mm) FOR 30-60" (750-900 mm).
7. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" (152 mm) ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
8. COVER: MINIMUM COVER OVER ALL RETENTION/DETENTION SYSTEMS IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (305 mm) FROM TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER IS 12" (305 mm) UP TO 36" (900 mm) DIAMETER PIPE AND 24" (610 mm) OF COVER FOR 42-60" (1050-1500 mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. MAXIMUM FILL HEIGHT LIMITED TO 8 FT (2.4 m) OVER FITTINGS FOR STANDARD INSTALLATIONS. CONTACT A SALES REPRESENTATIVE WHEN MAXIMUM FILL HEIGHTS EXCEED 8 FT (2.4 m) FOR INSTALLATION CONSIDERATIONS.

* LOAD BEARING CONCRETE COLLAR SHALL BE CONSTRUCTED IN TRAFFIC AREAS SUCH THAT THE LIVE LOAD IS TRANSMITTED TO THE SURROUNDING SOIL AND NOT DIRECTLY TO THE RISER.

STORM DRAIN SYSTEM DETAIL (26)

NOT TO SCALE

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER — CRAIG S. DI BIAS — No. 75205 — CIVIL — STATE OF CALIFORNIA

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

JOB NO. GNH17048

NO.	INITIAL	DESCRIPTION	APPL	DATE
		SUBMITTAL		3-15-19
		100% DESIGN DEVELOPMENT		

REVISIONS

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

STORM DRAIN DETAILS

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:
KDL/KJK	KJK
CHECKED BY:	CHECKED BY:
CDB	CDB

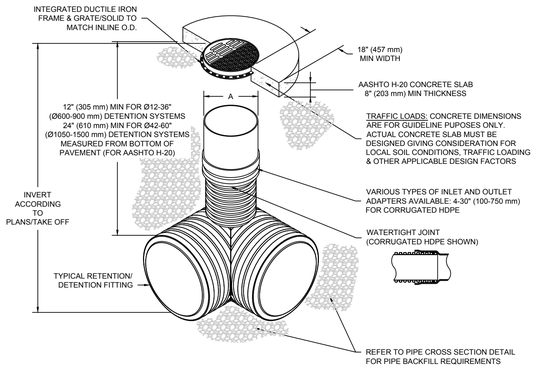
JEROME PARCO, CITY ENGINEER, R.C.E. 50385, DATE EXP. 06/30/2019

SHEET C-22 OF 28

DATE: 9-13-19

NYLOPLAST INLINE DRAIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2708AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2710AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2712AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2715AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2718AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2724AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2730AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

ACCESS MANHOLE DETAIL

NOT TO SCALE

25

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

JOB NO. GNH17048

NO.	INITIAL	DESCRIPTION	APPL	DATE
		SUBMITTAL		3-15-19
		100% DESIGN DEVELOPMENT		

REVISIONS

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

STORM DRAIN DETAILS

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-23 OF 28
CHECKED BY:	CHECKED BY:	JEROME PARCO CITY ENGINEER R.C.E. 50385	DATE EXP. 06/30/2019
CDB	CDB		

DATE: 9-13-19

CITY OF SAN JUAN CAPISTRANO UTILITIES DIVISION
ENGINEERING STANDARD WATER IMPROVEMENT NOTES

1. THE WATER SYSTEM IS TO BE INSTALLED BY THE APPLICANT. ALL WATER SYSTEM WORK SHALL CONFORM TO THE CITY'S "STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF DOMESTIC WATER AND NON-DOMESTIC WATER IRRIGATION FACILITIES,"AS LAST REVISED AND CITY'S MUNICIPAL CODES.

2.THE CITY'S WATER CONSTRUCTION INSPECTOR (MIKE SMITH) SHALL BE CALLED FOR INSPECTION TWO WORKING DAYS BEFORE START OF WORK AT (949) 487-4311.

3.A PRECONSTRUCTION CONFERENCE OF REPRESENTATIVES FROM AFFECTED AGENCIES AND THE CONTRACTOR SHALL BE HELD ON THE JOB SITE 24 HOURS PRIOR TO START OF WORK.

4. THE WATER SYSTEM IS TO BE INSTALLED AFTER CURB AND GUTTER IS PLACED, OR STAKED BY THE APPLICANT'S SURVEYOR AT A MINIMUM 50-FOOT STATIONING, IF NOT WITHIN A ROADWAY.

5. ANY WATER SERVICE FOUND TO BE WITHIN A DRIVEWAY OR SIDEWALK SHALL BE REMOVED COMPLETELY AND REINSTALLED AT THE PROPER LOCATION, AT NO COST TO THE CITY.

6. ALL MAIN LINE VALVES SHALL BE MAINTAINED SO AS TO BE ACCESSIBLE DURING TRACT DEVELOPMENT, AND ALL VALVE STEM TOPS HAVING OVER 48 INCHES OF COVER WILL REQUIRE AN EXTENSION AS PER DRAWING W-9.

7. THE CLEARANCES FROM THE TOP OF THE PIPE AND THE FINISHED STREET SURFACE SHALL HAVE A MINIMUM AS FOLLOWS -UNLESS OTHERWISE NOTED ON THE APPROVED PLANS:

WATER MAIN SIZE	SURFACE STREETS	STATE HIGHWAY
6-INCHES & SMALLER	36-INCHES	48-INCHES
8-INCHES	42-INCHES	48-INCHES
12-INCHES	48-INCHES	54-INCHES
16-INCHES	54-INCHES	60-INCHES

ALL WATER MAINS GREATER THAN 16-INCHES SHALL BE DECIDED ON A CASE BY CASE BASIS. PIPE SHALL BE BEDDED AND BACKFILLED PER CITY STANDARD W-8.

8. ALL FIRE HYDRANTS SHALL BE SET WITH THE BOTTOM FLANGE 4 INCHES ABOVE THE CONCRETE PAD OR SIDEWALK.

9. ALL WATER MAINS 4"THROUGH 12"SHALL BE PRESSURE CLASS 305, PVC (C900-07) AND FOR 14"AND LARGER SHALL BE DR 18, PVC (C905-97) UNLESS OTHERWISE NOTED.

10. NO TAPS OR OTHER CONNECTIONS SHALL BE MADE TO EXISTING CITY WATER MAINS PRIOR TO CONDUCTING AN APPROVED PRESSURE TEST ON THE NEW WATER DISTRIBUTION SYSTEM. TAPPING SLEEVES SHALL BE PRESSURE TESTED IN AN APPROVED MANNER, IN THE FIELD, IN THE PRESENCE OF THE CITY INSPECTOR, PRIOR TO TAPPING THE MAIN LINE. TAPPING OF THE MAIN LINE SHALL NOT PROCEED UNLESS A CITY WATER CONSTRUCTION INSPECTOR IS PRESENT.

11. WHERE METERS AND WATER BOXES ARE LOCATED WITHIN SLOPES, THE ANGLE METER STOPS SHALL BE LOCATED THAT THE METERS AND BOXES WILL BE PARALLEL AND FLUSH, RESPECTIVELY, WITH THE FINISHED STREET SURFACE. A RETAINING WALL MAY BE REQUIRED AROUND THE METER BOX.

12. THE APPLICANT SHALL FURNISH AND INSTALL THE SERVICE CONNECTIONS BETWEEN WATER MAINS AND METER AND FURNISH / INSTALL METER BOXES.

13. CURBS SHALL BE INSCRIBED WITH A "W"INDICATING LOCATIONS OF ALL DOMESTIC WATER SERVICES.

14. INDIVIDUAL PRESSURE REGULATORS WILL BE REQUIRED BY THE PLUMBING CODES OF THE CITY HAVING JURISDICTION IF STATIC PRESSURE REACHED 80 PSI OR MORE.

15. ALL 5/8"THROUGH 2"METERS AND CUSTOMER SERVICE VALVES WILL BE FURNISHED BY THE CITY FOLLOWING RECEIPT OF APPLICATION AND DEPOSIT. THE CONTRACTOR SHALL EXPOSE ALL ANGLE METER STOPS AND PROPERLY LOCATE THE METER BOXES TO GRADE AND INSTALL THE METER PRIOR TO REQUESTING FOR INSPECTION AND APPROVAL OF THE METER INSTALLATION BY THE CITY WATER INSPECTOR.

16. ANY CITY WATER USED SHALL BE METERED WITH A CONSTRUCTION METER OBTAINED FROM THE CITY. THE USE OF JUMPERS IS NOT ALLOWED. METERS MUST BE INSTALLED PRIOR TO OCCUPANCY OF A DWELLING.

17. AN ENCROACHMENT PERMIT FROM THE CITY HAVING JURISDICTION IS REQUIRED PRIOR TO ANY WORK WITHIN PUBLIC RIGHT-OF-WAY OR EASEMENT.

18. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. APPROVAL OF THESE PLANS BY THE CITY OF SAN JUAN CAPISTRANO DOES NOT GUARANTEE THE ACCURACY, COMPLETENESS, LOCATION, OR THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THE CONTRACTOR IS REQUIRED TO TAKE ALL DUE PRECAUTIONARY MEANS NECESSARY TO PROTECT THOSE UTILITY LINES SHOWN AND NOT SHOWN ON THESE PLANS.

19. ALL BELOW GRADE BOLTS AND NUTS SHALL BE STAINLESS STEEL 316 WITH FLUOROPOLYMER (TRIPAC 2000 OR EQUAL COATED NUTS).

20. A BACKFLOW PREVENTION ASSEMBLY IS REQUIRED TO BE INSTALLED FOR ALL COMMERCIAL DOMESTIC WATER AND IRRIGATION METERS. INSTALLATION OF A BACKFLOW PREVENTION DEVICE FOR A RESIDENTIAL WATER METER WILL BE REVIEWED AND DETERMINED ON A CASE BY CASE BASIS.

21. ONLY BACKFLOW PREVENTION ASSEMBLIES ON THE APPROVED LIST OF USC FOUNDATION FOR CROSS-CONNECTION CONTROL WILL BE ACCEPTABLE.

22. CONTRACTOR SHALL OBTAIN WATER SERVICE APPLICATION FORM THE CITY UTILITIES TO COMPLETE AND SUBMIT TO THE CITY UTILITIES DEPARTMENT FOR PROCESS TO SET UP AN ACCOUNT FOR THE BACKFLOW PREVENTION DEVICE IN TO THE CITY BACKFLOW PROGRAM AND CUSTOMER SERVICE SYSTEM.

23. LOCATION OF A REQUIRED BACKFLOW PREVENTION ASSEMBLY SHALL BE INSPECTED AND APPROVED BY THE UTILITIES WATER QUALITY-CROSS CONNECTION CONTROL SPECIALIST PRIOR TO INSTALLATION OF THE DEVICE. BACKFLOW SHALL BE TESTED BY AN ORANGE COUNTY CERTIFIED TESTER AND A COPY OF CERTIFIED TEST RESULT SHALL BE SUBMITTED TO THE UTILITIES WATER QUALITY DIVISION PRIOR TO APPROVAL OF CERTIFICATE OF OCCUPANCY OR AT THE START OF WATER USAGE WHICHEVER COMES FIRST. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL CONTACT UTILITIES AT 949-234-4415 FOR INSPECTION AND REQUIREMENTS PER CITY ORDINANCE NO. 895 -BACKFLOW AND CROSS-CONNECTIONS (TITLE 6). CSJC-UD_STANDARD WATER NOTES -REV. 2016 PAGE 2 OF 3

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert
CALL 811
Two working days before you dig.

CITY OF SAN JUAN CAPISTRANO UTILITIES DIVISION
ENGINEERING STANDARD SEWER IMPROVEMENT NOTES

1. ALL WORK SHOWN ON THESE PLANS SHALL BE IN ACCORDANCE WITH CITY OF SAN JUAN CAPISTRANO SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS.

2. ALL WORK SHALL CONFORM TO THE STATE CONSTRUCTION SAFETY ORDERS.

3. ALL WORK SHALL CONFORM TO THE CITY OF SAN JUAN CAPISRANO LAND USE MANAGEMENT CODE.

4. NO GRADING, IF APPLICABLE, SHALL COMMENCE WITHOUT OBTAINING A GRADING PERMIT AND NOTIFYING THE GRADING INSPECTOR.

5. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE CITY OF SAN JUAN CAPISTRANO PUBLIC WORKS DIVISION PRIOR TO COMMENCING EXCAVATION IN ANY PUBLIC RIGHT-OF-WAY.

6. THE CONTRACTOR SHALL NOTIFY THE CITY UTILITIES INSPECTOR, MIKE SMITH, AT (949) 487-4311 AT LEAST 24 HOURS PRIOR TO STARTING ANY SEWER CONSTRUCTION.

7. PAVING PER THESE PLANS SHALL NOT COMMENCE UNTIL ALL UNDERGROUND WORK, IF ANY, IS COMPLETE. ALL UTILITY SERVICE CONNECTIONS SHALL BE EXTENDED BEYOND THE ROADWAY RIGHT-OF-WAY.

8. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. APPROVAL OF THESE PLANS BY THE CITY OF SAN JUAN CAPISTRANO DOES NOT CONSTITUTE A REPRESENTATION AS TO ACCURACY OR COMPLETENESS OF THE LOCATION OR THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THE CONTRACTOR IS REQUIRED TO TAKE ALL DUE PRECAUTIONARY MEANS TO PROTECT THE UTILITY LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION AND ELEVATIONS IN THE FIELD.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING WARNING SIGNS, DEVICES, LIGHTS, AND FLAGMEN IN ACCORDANCE WITH THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (California MUTCD) 2012 EDITION.

10. REPORTS OF COMPACTION WITHIN THE TRAVELED WAY OF ALL STREETS SHALL BE SUBMITTED TO AND APPROVED BY THE CITY ENGINEER PRIOR TO PLACING ANY IMPROVEMENTS.

11. THE DESIGN ENGINEER SHALL VERIFY THE FLOW LINE OF EXISTING STRUCTURES IN THE FIELD AGAINST THE CONTROL PROVIDED, PRIOR TO CONSTRUCTION OF ANY MANHOLES OR ANY UPSTREAM SEWERS. IF THE EXISTING FLOW LINE VARIES FROM THE PLANNED ELEVATION BY MORE THAN 00.10 FEET, THE DESIGN ENGINEER SHALL ADJUST THE GRADES BETWEEN THE JUNCTURE AND THE NEXT UPSTREAM MANHOLE.

12. ANY TRENCH CUTS EXCEEDING 5 FEET IN DEPTH SHALL REQUIRE A SHORING PERMIT FROM THE CALIFORNIA STATE DEPARTMENT OF INDUSTRIAL SAFETY.

13. ALL PAVING REMOVAL SHALL BE SAW CUT AT THE CITY ENGINEER?S DIRECTION, MINIMUM DEPTH OF CUT – 1 ½ INCHES.

14. ALL REGULATORY SIGNS SHALL BE PLACED WITHIN 24 HOURS AFTER CURB RETURNS HAVE BEEN CONSTRUCTED IN THE LOCATIONS SHOWN ON THESE PLANS.

15. ALL GRADING OPERATIONS, WHEN APPLICABLE, INCLUDING REQUIRED SUBDRAINS, SHALL BE PERFORMED AND INSTALLED ACCORDING TO THE RECOMMENDATIONS INCLUDED IN THE SOILS REPORT BY WILLDAN ENGINEERING GEOTECHNICAL GROUP, PROJECT NO. 108164-2000 (DRAFT).

16. PAVEMENT WHICH DOES NOT JOIN OTHER PAVEMENT OR BUILT UP AGAINST CONCRETE CURBS OR CUTTERS SHALL HAVE A 2-INCH X 6-INCH REDWOOD HEADER LEFT IN PLACE.

17. DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SOIL AND MATERIALS TESTS.

18. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROTECT ALL TRAFFIC SIGNS WHERE APPLICABLE.

19. STATIONING REFERS TO CENTERLINE OF CONDUITS UNLESS OTHERWISE NOTED. STREET STATIONING IS IN ITALICS.

20. ALL SEWER PIPE, MAINLINE AND LATERALS SHALL BE PVC SCHEDULE SDR35 STANDARD STRENGTH IN ACCORDANCE WITH D-3034 OR VITRIFIED CLAY PIPE STANDARD STRENGTH IN ACCORDANCE WITH ASTM SPECIFICATION C-700, WITH COMPRESSION JOINTS PER ASTM C-425.

21. PIPE BEDDING AND TRENCH BACKFILL FOR ALL MAIN LINE AND HOUSE LATERAL SEWERS SHALL BE PER SAN JUAN CAPISTRANO STANDARD PLAN NO. 804 TYPE II AND STANDARD PLAN NO. 700.

22. SEWER CROSSINGS WITH WATER LINES SHALL BE IN ACCORDANCE WITH CITY OF SAN JUAN CAPISTRANO WATER STANDARD DRAWING NO. W-12.

23. EXCAVATION AND RESURFACING OF STREETS, FOR LATERAL (PERPENDICULAR TO STREET) TRENCHES, SHALL BE PER CITY STANDARD 700. THE ENTIRE LANE WIDTHS, PARTIALLY OR FULLY AFFECTED BY SUCH TRENCHES OR EXCAVATIONS SHALL REQUIRE COLD MILLING AND AT MINIMUM, AN ASPHALTIC OVERLAY OF 0.1 FOOT IN DEPTH. ALL COLD MILLING AND OVERLAYING AND/OR OTHER STREET RESURFACING METHODS, SUCH AS SLURRY-SEALS, IF APPROVED BY THE CITY ENGINEER, SHALL INCLUDE THE ENTIRE LENGTH OF THE EXCAVATION PLUS A THREE (3) FOOT EXTENSION PASSED THE LONGITUDINAL EDGES OF EACH CUT.

24. IN THE EVENT THAT EXISTING TRAFFIC STRIPING AND MARKINGS ARE OBLITERATED BY CONSTRUCTION, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE SAID STRIPING TO THE SATISFACTION OF THE CITY ENGINEER.

25. CONTRACTOR SHALL PROVIDE ENGINEER WITH AS-CONSTRUCTED (AS-BUILT) DRAWINGS SHOWING ACTUAL CONSTRUCTED PIPE LOCATIONS AND HOUSE LATERAL LOCATIONS.

26. ALL SEWER MANHOLES SHALL BE LINED WITH POLYURETHANE, OR EQUAL MATERIAL IN CONFORMANCE WITH SECTION 500 OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, "GREEN BOOK".

27. PRIOR TO ACCEPTANCE OF THE SEWER FACILITY BY THE CITY, THE SEWER LINE SHALL BE VIDEO TAPED BY THE DEVELOPER, IN THE PRESENCE OF A CITY UTILITIES STAFF REPRESENTATIVE/INSPECTOR. THE VIDEO TAPE SHALL BECOME THE PROPERTY OF THE CITY UTILITIES DIVISION.

28. CONTRACTOR SHALL PROVIDE A CLEAR UNOBSTRUCTED WALKWAY FOR PEDESTRIANS PAST WORK AREA(S). AT NO TIME SHALL PEDESTRIANS BE DIRECTED INTO A VEHICULAR LANE.

29. NO STAGING OF CONSTRUCTION EQUIPMENT SHALL BE PERMITTED IN THE RIGHT-OF-WAY.

30. A TRAFFIC CONTROL PLAN SHALL BE REQUIRED FOR ALL LANE CLOSURES. SAID PLAN SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE CITY ENGINEER PRIOR TO ISSUANCE OF AN ENCROACHMENT PERMIT FOR WORK IN THE RIGHT-OF-WAY.

31. FOR DETOURS AND STREET CLOSURES, PUT FOLLOWING NOTE, "CONTRACTOR SHALL NOTIFY CITY ENGINEER (949-493-1171), ORANGE COUNTY SHERIFFS DEPARTMENT (949-770-6011), AND ORANGE COUNTY FIRE AUTHORITY (714-573-6100) AT LEAST 72 HOUR PRIOR TO STREET CLOSURE OR DETOUR".

32. ALL CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH ALL SECTIONS OF THE MUNICIPAL CODE OF THE CITY OF SAN JUAN CAPISTRANO, ESPECIALLY SECTION 6-3.06(B), (C), (D), AND (E), AND SHALL SECURE THE SERVICES OF THE CITY'S EXCLUSIVE SOLID WASTE HAULER FOR THEIR SOLID WASTE HANDLING NEEDS.

33. EROSION AND SEDIMENT CONTROL SHALL BE PURSUANT TO BEST MANAGEMENT PRACTICES AND SHALL BE INSTALLED AND MAINTAINED BY CONTRACTOR DURING ENTIRE CONSTRUCTION PERIOD.

34. MAINTAIN THE SITE IN A "WET-DOWN" CONDITION TO THE DEGREE NECESSARY TO PREVENT EXCESSIVE DUST. PERIODICALLY REMOVE SPILLAGE FROM THE PUBLIC RIGHT-OF-WAY BY SWEEPING OR SPRINKLING, HOWEVER, WATERING THAT RESULT IN MUD ON PUBLIC STREETS IS NOT PERMITTED AS A SUBSTITUTE FOR OTHER CLEANING METHODS.

35. PER CITY COUNCIL POLICY 601, AN ARCHAEOLOGICAL MONITOR IS REQUIRED TO BE ON SITE DURING ALL EXCAVATION ACTIVITIES IN EXCESS OF 18 INCHES, UNLESS DETERMINED TO BE EXEMPT BY THE DEVELOPMENT SERVICES DIRECTOR. A FINAL REPORT MUST BE PREPARED AND SUBMITTED TO THE DEVELOPMENT SERVICES DEPARTMENT – PLANNING DIVISION AND TO THE PUBLIC WORKS AND UTILITIES DEPARTMENT – UTILITIES DIVISION WHEN MONITORING REQUIREMENTS OF THIS PROJECT ARE COMPLETE. ALL COSTS SHALL BE BORNE BY PERMITTEE.

36. PER CITY COUNCIL POLICY 505, NIGHT TIME CONSTRUCTION WORK WILL BE REQUIRED ON HEAVILY TRAVELED STREETS (IN NON-RESIDENTIAL NEIGHBORHOODS). REFER TO POLICY FOR AFFECTED STREETS.

37. WHERE GROUND WATER IS ENCOUNTERED DURING TRENCHING AND/OR EXCAVATION, A MINIMUM OF 1 FOOT OF NO. 2 ROCK SHALL BE PLACED BENEATH ANY PIPE TO THE SATISFACTION OF THE UTILITIES ENGINEER.

38. INGRESS AND EGRESS TO EXISTING ESTABLISHMENTS SHALL BE KEPT OPEN TO THE SATISFACTION OF THE CITY ENGINEER.

39. NO WORK SHALL BE DONE ON ADJACENT PROPERTIES OR ADJACENT OWNER'S IMPROVEMENTS WITHOUT OBTAINING WRITTEN PERMISSION FROM THE OWNER OF THE ADJACENT PROPERTIES, AND SUBMITTING A NOTARIZED COPY THEREOF TO THE CITY UTILITIES ENGINEERING DIVISION.

40. ISSUANCE OF A PERMIT FROM THE PUBLIC WORKS AND UTILITIES DEPARTMENT– UTILITIES AND PUBLIC WORKS DIVISIONS AND/OR DEVELOPMENT SERVICES – BUILDING DIVISION DOES NOT ELIMINATE THE NEED FOR PERMITS FROM OTHER CITY REGULATORY DIVISIONS/DEPARTMENTS OR AGENCIES WITH REGULATORY RESPONSIBILITIES FOR CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE WORK AUTHORIZED ON THIS PLAN.

41. ENGINEER SHALL SUBMIT STAMPED "AS BUILT" MYLAR DRAWINGS AND DIGITAL COPIES (IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF SAN JUAN CAPISTRANO DIGITAL SUBMISSION STANDARDS) TO THE CITY PUBLIC WORKS AND UTILITIES DEPARTMENT – UTILITIES ENGINEERING DIVISION, UPON COMPLETION OF IMPROVEMENTS IN ACCORDANCE WITH APPROVED REVISIONS, TO THE SATISFACTION OF THE ASSISTANT UTILITIES DIRECTOR.

ORANGE COUNTY FIRE AUTHORITY NOTES

INSPECTION REQUIREMENTS

1 A MINIMUM OF THREE OCFA INSPECTIONS ARE REQUIRED FOR UNDERGROUND PIPING SERVING SPRINKLER SYSTEMS AND/OR PRIVATE HYDRANTS: 1) PRE-POUR INSPECTION; 2) HYDROSTATIC TESTING; 3) FLUSH INSPECTION. PLEASE SCHEDULE ALL INSPECTIONS AT LEAST 48 HOURS IN ADVANCE. INSPECTIONS CANCELED AFTER 1 P.M. ON THE DAY BEFORE THE SCHEDULED DATE ARE SUBJECT TO A RE-INSPECTION FEE. CALL OCFA INSPECTION SCHEDULING AT (714) 573-6150.

2 PRE-POUR INSPECTION: THRUST BLOCK EXCAVATION SHALL BE COMPLETED, BUT THRUST BLOCKS SHALL NOT BE POURED. ALL PIPE SHALL BE IN PLACE AND EXPOSED FOR VISUAL INSPECTION. PIPE SHALL BE LAID ON A MINIMUM SIX-INCH BED OF CLEAN SAND. TRENCHES SHALL BE OF A SUFFICIENT DEPTH TO ALLOW THE REQUIRED COVER ABOVE PIPE. FERROUS PIPE AND FITTINGS SHALL BE ENCASED IN POLYETHYLENE TUBING (NOT WRAPPED) AND TIGHTLY TAPED TO INHIBIT WATER INFILTRATION. FERROUS JOINTS (WITH THE EXCEPTION OF STAINLESS STEEL 316) SHALL BE COATED WITH ASPHALTIC SEALANT OR OTHER CORROSION RETARDING MATERIAL. SEE ITEMS 11-19, 21 AND 22 BELOW FOR DETAILED REQUIREMENTS.

3 HYDRO TESTING: THRUST BLOCKS SHALL BE IN PLACE. PIPE SHALL BE CENTER-LOADED WITH CLEAN SAND TO PREVENT UPLIFT, BUT ALL JOINTS SHALL REMAIN EXPOSED. THE SYSTEM SHALL BE HYDROSTATICALLY TESTED AT 200 PSI (OR 50 PSI OVER MAXIMUM STATIC PRESSURE, WHICHEVER IS GREATER) FOR A DURATION OF AT LEAST TWO HOURS PRIOR TO THE ARRIVAL OF THE OCFA INSPECTOR. SEE ITEM 16 FOR DETAILED REQUIREMENTS.

4 FLUSH INSPECTION: ALL PORTIONS OF THE UNDERGROUND SYSTEM SHALL BE FLUSHED TO REMOVE DEBRIS PRIOR TO CONNECTION TO OVERHEAD PIPING. FLOW SHALL BE THROUGH A MINIMUM OF A FOUR-INCH HOSE OR PIPE, UNLESS OTHERWISE APPROVED BY THE OCFA INSPECTOR PRIOR TO SCHEDULING THE FLUSH. HOSE OR PIPE SHALL BE RESTRAINED TO PREVENT INJURY AND DAMAGE. DISCHARGED WATER SHALL BE COLLECTED OR DIVERTED IN ACCORDANCE WITH APPLICABLE SWPPP/NPDES PROVISIONS. THE LOCAL PUBLIC WORKS DEPARTMENT, WATER DISTRICT, AND/OR OTHER APPLICABLE AGENCY SHALL BE NOTIFIED OF THE SCHEDULED FLUSH BY THE CONTRACTOR. THE OCFA FLUSH AND HYDRO INSPECTIONS MAY BE SCHEDULED CONCURRENTLY. SEE ITEMS 11, 18, AND 20 – 23 BELOW FOR DETAILED REQUIREMENTS.

5 UPON FLUSH INSPECTION OR PRIOR TO FINAL SPRINKLER OR SITE INSPECTION, ALL DETECTOR CHECK ASSEMBLIES, CONTROL VALVES, AND FIRE DEPARTMENT CONNECTIONS (FDC) SHALL BE CLEARLY LABELED WITH THE ADDRESS(ES) SERVED BY THE DEVICE. ADDRESS SIGNS SHALL BE SECURELY ATTACHED TO THE DEVICE AND BE OF A DURABLE, FADE-RESISTANT MATERIAL WHICH IS VISIBLE AND LEGIBLE FROM THE FIRE LANE. FDC AND FOUR-INCH HYDRANT OUTLETS SHALL BE UNOBSTRUCTED AND ORIENTED TOWARD THE FIRE LANE. VALVES SHALL BE LOCKED IN THE OPEN POSITION WITH BREAKAWAY LOCKS. ALL PIV VALVES AND PRIVATE HYDRANTS SHALL BE PAINTED OSHA SAFETY RED. THE CLOSEST UPSTREAM INDICATING VALVE TO THE RISER SHALL BE PAINTED OSHA SAFETY RED. HYDRANT AND FDC CAPS SHALL BE IN PLACE. SEE ITEMS 6 – 9, 18, AND 20 – 23 FOR DETAILED REQUIREMENTS.

GENERAL REQUIREMENTS

6 INSTALLATION, INSPECTION, AND TESTING SHALL CONFORM TO 2016 EDITIONS OF NFPA 13 AND NFPA 24. OCFA JURISDICTION BEGINS AT THE DOWNSTREAM SIDE OF THE LAST VALVE ON THE DETECTOR CHECK ASSEMBLY. VERIFY DESIGN AND INSTALLATION REQUIREMENTS FOR THE PORTION OF THE SYSTEM PRECEDING THIS POINT WITH THE LOCAL WATER DISTRICT.

7 VEGETATION SHALL BE SELECTED AND MAINTAINED IN SUCH A MANNER AS TO ALLOW IMMEDIATE LOCATION OF, AND UNOBSTRUCTED ACCESS TO; ALL HYDRANTS, CONTROL VALVES, FIRE DEPARTMENT CONNECTIONS, AND OTHER DEVICES OR AREAS USED FOR FIREFIGHTING PURPOSES.

8 A MINIMUM THREE-FOOT CLEARANCE SHALL BE PROVIDED AROUND ALL HYDRANTS AND POST INDICATING VALVES. A MINIMUM THREE-FOOT CLEARANCE SHALL BE PROVIDED ON AT LEAST ONE SIDE OF A DETECTOR CHECK ASSEMBLY TO ALLOW PROPER OPERATION OF THE DEVICE. THE FRONT OF FDC AND THE ADJACENT FIRE ACCESS ROADWAY SHALL BE FREE OF ANY OBSTRUCTIONS.

9 ANY FUTURE MODIFICATION TO THE APPROVED PRIVATE UNDERGROUND PIPING SYSTEM IS SUBJECT TO REVIEW, INSPECTION, AND APPROVAL BY THE ORANGE COUNTY FIRE AUTHORITY.

10 APPROVAL OF THIS PLAN SHALL NOT BE INTERPRETED AS APPROVAL OF ANY INFORMATION OR PROJECT CONDITIONS OTHER THAN THOSE ITEMS AND REQUIREMENTS IDENTIFIED IN OCFA GUIDELINE B-03, AND APPLICABLE SECTIONS OF THE 2016 EDITIONS OF NFPA 13 AND NFPA 24. THIS PROJECT MAY BE SUBJECT TO ADDITIONAL REQUIREMENTS NOT STATED HEREIN UPON EXAMINATION OF ACTUAL SITE AND PROJECT CONDITIONS OR DISCLOSURE OF ADDITIONAL INFORMATION.

PIPE AND TRENCH REQUIREMENTS

11 A 6-INCH BED OF CLEAN FILL SAND SHALL BE PROVIDED BELOW THE PIPE AND 12-INCHES ABOVE THE PIPE (TOTAL OF 18 INCHES PLUS OUTER DIAMETER OF THE PIPE).

12 PIPE SHALL BE BURIED AT LEAST 36" WHERE SUBJECT TO LOADING (E.G., DRIVEWAYS, PARKING LOTS) AND AT LEAST 30" ELSEWHERE.

13 ALL PIPE SHALL BE APPROVED FOR USE IN FIRE SERVICE SYSTEMS. CLASS 150 WILL BE USED AT A MINIMUM, AND CLASS 200 PIPE SHALL BE USED WHERE THE WATER PRESSURE EXCEEDS 150 PSI. THE USE OF GALVANIZED PIPE IS PROHIBITED WHEN A PORTION OF THE SYSTEM IS BURIED.

14 ALL FERROUS PIPE AND FITTINGS SHALL BE PROTECTED WITH A LOOSE 8-MIL POLYETHYLENE TUBE. WRAPPING THE PIPE IN POLYETHYLENE SHEETING IS NOT ACCEPTABLE. THE ENDS OF THE TUBE AND ANY SPLICES MADE FOR TEES OR OTHER PIPING COMPONENTS SHALL BE TIGHTLY SEALED WITH TWO-INCH TAPE THAT IS APPROVED FOR UNDERGROUND USE.

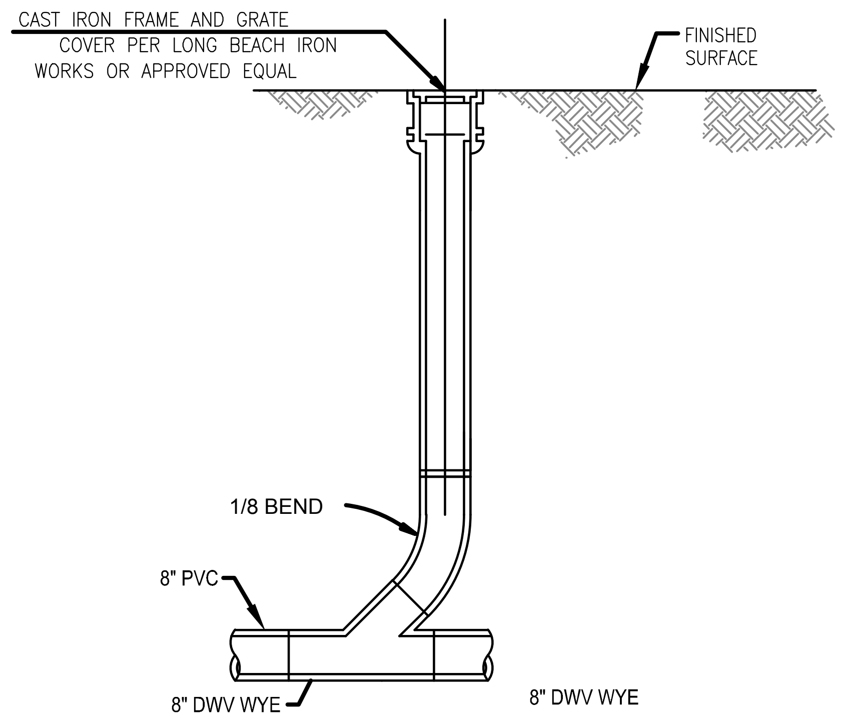
15 ALL BOLTS USED FOR UNDERGROUND CONNECTIONS, INCLUDING T BOLTS, SHALL BE 316 STAINLESS STEEL. ASPHALTIC SEALANTS (AND OTHER OPAQUE SEALANTS) SHALL NOT BE USED TO COAT BOLTS (THIS IS TO ENSURE BOLTS CAN STILL BE VERIFIED AS 316 STAINLESS STEEL DURING INSPECTION). ALL FERROUS FITTINGS (WITH THE EXCEPTION OF 316 STAINLESS STEEL) SHALL BE CLEANED AND THOROUGHLY COATED WITH ASPHALT OR OTHER CORROSION RETARDING MATERIAL AFTER ASSEMBLY AND PRIOR TO THE INSTALLATION OF POLYETHYLENE TUBE.

16 THRUST BLOCKS, OR ANOTHER APPROVED METHOD OF THRUST RESTRAINT, SHALL BE PROVIDED WHEREVER PIPE CHANGES DIRECTION.

17 A MINIMUM TWO-INCH CLEARANCE SHALL BE PROVIDED WHERE THE PIPE PASSES THROUGH SLABS OR WALLS. UNDERGROUND SYSTEM SHALL TERMINATE AT THE RISER FLANGE AND PLACED A MAXIMUM OF 18 INCHES FROM AN EXTERIOR WALL AND 6 INCHES ABOVE THE SLAB.

18 THE FDC SHALL CONTAIN A MINIMUM OF TWO 2 ½" INLETS. WHEN THE SYSTEM DESIGN DEMAND, INCLUDING THE INTERIOR HOSE STREAM DEMAND OR A STANDPIPE, IS A MINIMUM 500 GPM, FOUR 2 ½" INLETS SHALL BE PROVIDED. FDCS SHALL BE PAINTED OSHA SAFETY RED.

19 PIPE RUNNING UNDER A BUILDING OR BUILDING FOUNDATION SHALL BE STAINLESS STEEL AND SHALL NOT CONTAIN MECHANICAL JOINTS.



SEWER CLEANOUT (73)
NO SCALE

HYDRANT REQUIREMENTS

20 PRIVATE FIRE HYDRANTS SHALL BE LISTED WITH A MINIMUM OF ONE 2 ½" AND ONE 4" OUTLET. THE 4" OUTLET SHALL FACE THE FIRE DEPARTMENT ACCESS ROAD. ALL OUTLETS SHALL BE PROVIDED WITH NATIONAL STANDARD THREADS (NST). PRIVATE HYDRANTS SHALL BE PAINTED OSHA SAFETY RED.

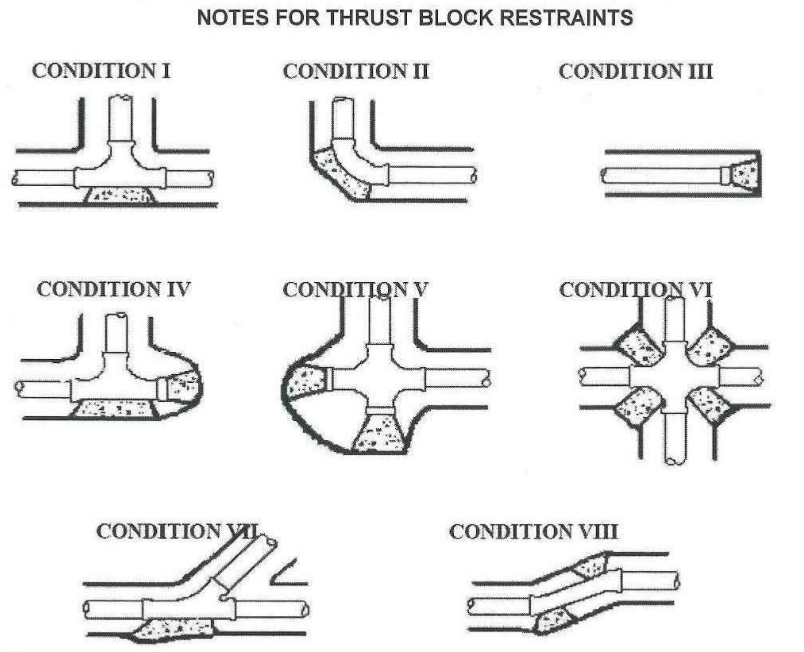
21 FIRE HYDRANT SUPPLY PIPING SHALL BE A MINIMUM OF SIX INCHES IN DIAMETER. THE LOWEST VALVE OPERATING NUT SHALL BE A MINIMUM OF EIGHTEEN INCHES ABOVE GRADE AND THE HYDRANT FLANGE SHALL BE A MINIMUM OF TWO INCHES ABOVE GRADE.

22 A KEYED GATE VALVE SHALL BE PROVIDED FOR EACH HYDRANT IN AN ACCESSIBLE LOCATION. KEYED GATE VALVES SHALL BE LOCATED WITHIN SIX TO TEN FEET OF THE HYDRANT IN AN AREA THAT IS UNOBSTRUCTED AND CLEARLY VISIBLE. VALVES SHALL NOT BE LOCATED IN PARKING STALLS.

23 ALL FIRE HYDRANTS SHALL HAVE A "BLUE REFLECTIVE PAVEMENT MARKER" INDICATING THEIR LOCATION PER ATTACHMENT 26 DETAILED IN OCFA GUIDELINE B-09. PRIVATE HYDRANTS AND MARKERS ARE TO BE MAINTAINED IN GOOD CONDITION BY THE PROPERTY OWNER.

PLACE THE FOLLOWING NOTES, VERBATIM, ON THE PLAN:

ORANGE COUNTY FIRE AUTHORITY
NOTES FOR THRUST BLOCK RESTRAINTS



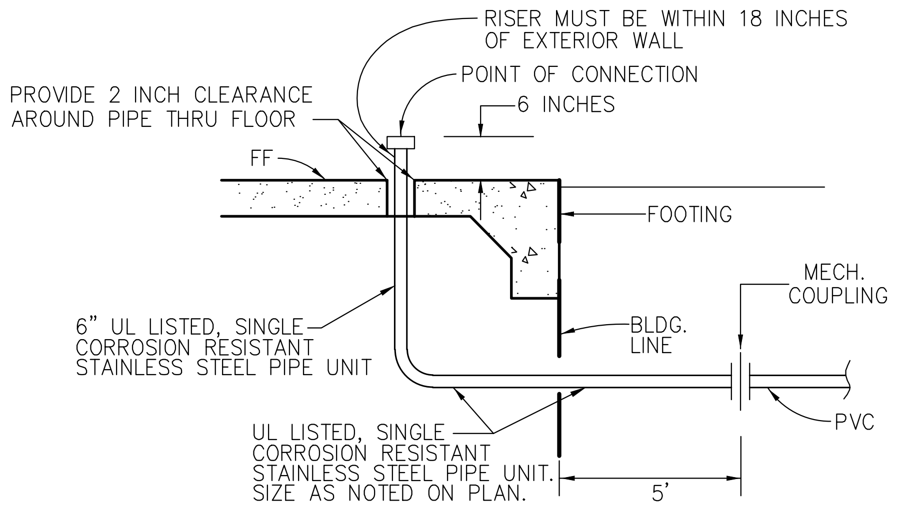
THRUST BLOCK BEARING AREA IN SQUARE FEET

Pipe Size	CONDITION							
	I	II	III	IV	V	VI	VII	VIII
<6"	2.0	2.9	2.0	2@ 2.0	2@ 2.0	4@ 1.6	2.0	2@ 1.6
6"	4.3	4.0	4.3	2@ 4.3	2@ 4.3	4@ 3.3	4.3	2@ 3.3
8"	7.4	10.6	7.4	2@ 7.4	2@ 7.4	4@ 5.7	7.4	2@ 5.7
10"	12.1	17.1	12.1	2@ 12.1	2@ 12.1	4@ 9.3	12.1	2@ 9.3
12"	17.2	24.1	17.2	2@ 17.2	2@ 17.2	4@ 13.2	17.2	2@ 13.2

NOTES

1. Thrust block areas based on 225 PSI and 2,000 PSF soil pressure with 2 ½ feet of cover minimum.
2. Thrust block bearing faces shall be placed against undisturbed soil, approved compacted backfill, or Class 100-E-100 slurry.
3. Thrust blocks shall be Class 560-C-3250 concrete, unless specified otherwise.
4. To facilitate future removal of thrust blocks and line extension use cardboard separators between blocks, if needed.

THRUST BLOCK DETAIL (45)
NO SCALE



FIRE RISER (68)
NO SCALE

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

CRAIG S. DI BIAS
No. 75205

JOB NO.	SUBMITTAL	DATE
GNH17048	100% DESIGN DEVELOPMENT	3-15-19

NO.	INITIAL	DESCRIPTION	APP'L

REVISIONS

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

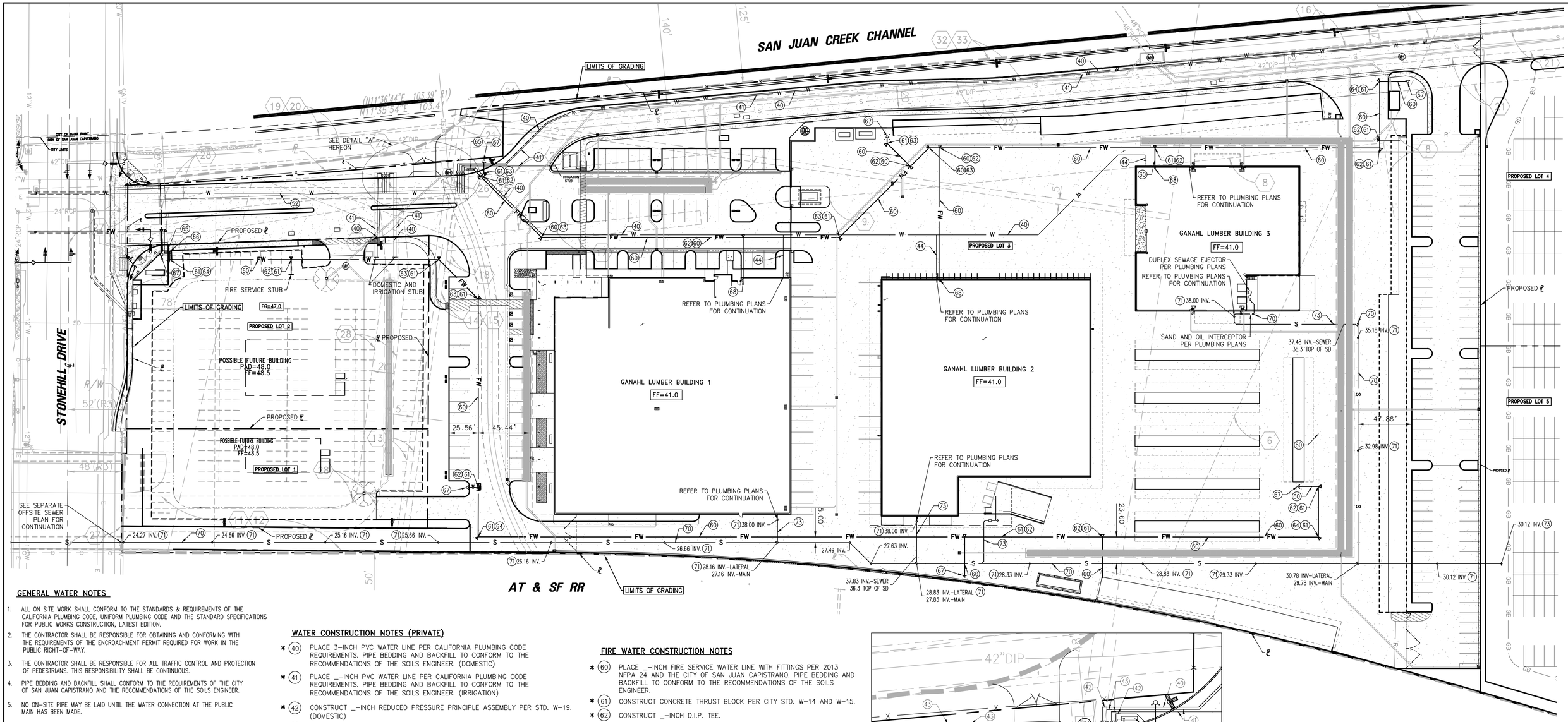
GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

SEWER AND WATER PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-24 OF 28
CHECKED BY:	CHECKED BY:	JEROME PARCO CITY ENGINEER R.C.E. 50385	
CDB	CDB	DATE EXP. 06/30/2019	

DATE: 3-15-19



GENERAL WATER NOTES

1. ALL ON SITE WORK SHALL CONFORM TO THE STANDARDS & REQUIREMENTS OF THE CALIFORNIA PLUMBING CODE, UNIFORM PLUMBING CODE AND THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND CONFORMING WITH THE REQUIREMENTS OF THE ENCROACHMENT PERMIT REQUIRED FOR WORK IN THE PUBLIC RIGHT-OF-WAY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND PROTECTION OF PEDESTRIANS. THIS RESPONSIBILITY SHALL BE CONTINUOUS.
4. PIPE BEDDING AND BACKFILL SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF SAN JUAN CAPISTRANO AND THE RECOMMENDATIONS OF THE SOILS ENGINEER.
5. NO ON-SITE PIPE MAY BE LAID UNTIL THE WATER CONNECTION AT THE PUBLIC MAIN HAS BEEN MADE.
6. FOR ALL EXISTING WATER SERVICES TO BE ABANDONED-SHUT OFF AT CORPORATION STOP AND RETURN METERS TO THE CITY OF GARDEN GROVE.

GENERAL SEWER NOTES

1. ALL ON SITE WORK SHALL CONFORM TO THE STANDARDS & REQUIREMENTS OF THE CALIFORNIA PLUMBING CODE, UNIFORM PLUMBING CODE AND THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND CONFORMING WITH THE REQUIREMENTS OF THE ENCROACHMENT PERMIT REQUIRED FOR WORK IN THE PUBLIC RIGHT-OF-WAY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND PROTECTION OF PEDESTRIANS. THIS RESPONSIBILITY SHALL BE CONTINUOUS.
4. PIPE BEDDING AND BACKFILL SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF SAN JUAN CAPISTRANO AND THE RECOMMENDATIONS OF THE SOILS ENGINEER.
5. NO ON-SITE PIPE MAY BE LAID UNTIL THE SEWER CONNECTION AT THE PUBLIC MAIN HAS BEEN MADE.
6. PIPE IS TO BE PLACED BEGINNING AT THE DOWNSTREAM POINT OF CONNECTION AND CONTINUING UPSTREAM. DEVIATIONS FROM THIS SEQUENCE ARE NOT PERMITTED.

WATER CONSTRUCTION NOTES (PRIVATE)

* (40) PLACE 3-INCH PVC WATER LINE PER CALIFORNIA PLUMBING CODE REQUIREMENTS. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER. (DOMESTIC)
* (41) PLACE _-INCH PVC WATER LINE PER CALIFORNIA PLUMBING CODE REQUIREMENTS. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER. (IRRIGATION)
* (42) CONSTRUCT _-INCH REDUCED PRESSURE PRINCIPLE ASSEMBLY PER STD. W-19. (DOMESTIC)
* (43) CONSTRUCT _-INCH REDUECED PRESSURE PRINCIPLE ASSEMBLY PER CITY STD. W-19. (IRRIGATION)
* (44) PLACE 2-INCH PVC WATER LINE PER CALIFORNIA PLUMBING CODE REQUIREMENTS. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER. (DOMESTIC)

WATER CONSTRUCTION NOTES (PUBLIC)

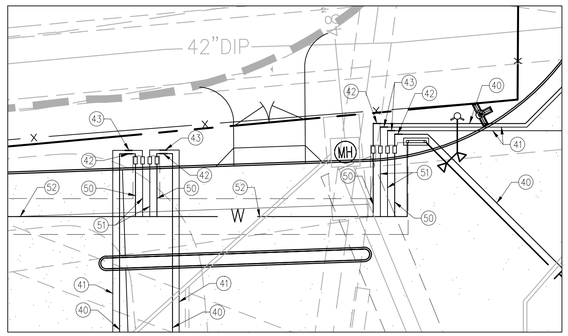
* (50) PLACE 2-INCH WATER METER AND SERVICE. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.(DOMESTIC)
* (51) PLACE _-INCH WATER METER AND SERVICE. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.(IRRIGATION)
* (52) PLACE _-INCH PVC WATER LINE. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATION OF THE SOILS ENGINEER.

FIRE WATER CONSTRUCTION NOTES

* (60) PLACE _-INCH FIRE SERVICE WATER LINE WITH FITTINGS PER 2013 NFPA 24 AND THE CITY OF SAN JUAN CAPISTRANO. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.
* (61) CONSTRUCT CONCRETE THRUST BLOCK PER CITY STD. W-14 AND W-15.
* (62) CONSTRUCT _-INCH D.I.P. TEE.
* (63) CONSTRUCT _-INCH 45-DEGREE D.I.P. BEND.
* (64) CONSTRUCT _-INCH 90-DEGREE D.I.P. BEND.
* (65) CONSTRUCT _-INCH DETECTOR CHECK PER CITY STD. W-17.
* (66) INSTALL UL APPROVED FIRE DEPARTMENT CONNECTION PER CITY STD. W-17.
* (67) CONSTRUCT FIRE HYDRANT PER CITY STD. W-7.
* (68) CONSTRUCT _-INCH FIRE RISER PER DETAIL ON SHEET C-23.
* CONTRACTOR TO VERIFY SIZE OF FIRE SERVICE APPURTENANCES PRIOR TO CONSTRUCTION.

SEWER CONSTRUCTION NOTES

* (70) PLACE 8-INCH SDR-35 SEWER PIPE PER CALIFORNIA BUILDING CODE REQUIREMENTS. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.
* (71) CONSTRUCT 8-INCH SEWER CLEANOUT PER CITY STD. 808.
* (72) CONSTRUCT TERMINAL CLEANOUT PER DETAIL ON SHEET C-23.
* (73) PLACE 4-INCH SDR-35 SEWER PIPE PER CALIFORNIA BUILDING CODE REQUIREMENTS. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER.
* CONTRACTOR TO VERIFY SIZE AND LOCATION OF APPURTENANCES PRIOR TO CONSTRUCTION.



DETAIL "A"
SCALE=1"=20'

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

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

REGISTERED PROFESSIONAL ENGINEER
CRAIG S. DI BIAS
No. 75205
CIVIL
STATE OF CALIFORNIA

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

JOB NO. GNH17048
SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

NO.	INITIAL	DESCRIPTION	DATE	APPL

CITY OF SAN JUAN CAPISTRANO
DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

SEWER AND WATER PLAN

PREPARED BY:
TRUXAV AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:	
KDL/KJK	KJK	
CHECKED BY:	CHECKED BY:	JEROME PARCO CITY ENGINEER R.C.E. 50385 DATE EXP. 06/30/2019
CDB	CDB	

SHEET C-25 OF 28

DATE: 3-15-19

DETAIL SHEET

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code
requires a Dig Alert Identification
Number be issued before a
"Permit to Excavate" will be valid.
For your Dig Alert I.D. Number call
Underground Service Alert
CALL 811
Two working days before you dig.

CRAIG S. DI BIAS
No. 75205
CIVIL

JOB NO.	GNH17048
SUBMITTAL	DATE
100% DESIGN DEVELOPMENT	3-15-19

REVISIONS

NO.	INITIAL	DESCRIPTION	APP'L

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

SEWER AND WATER PLAN DETAILS

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

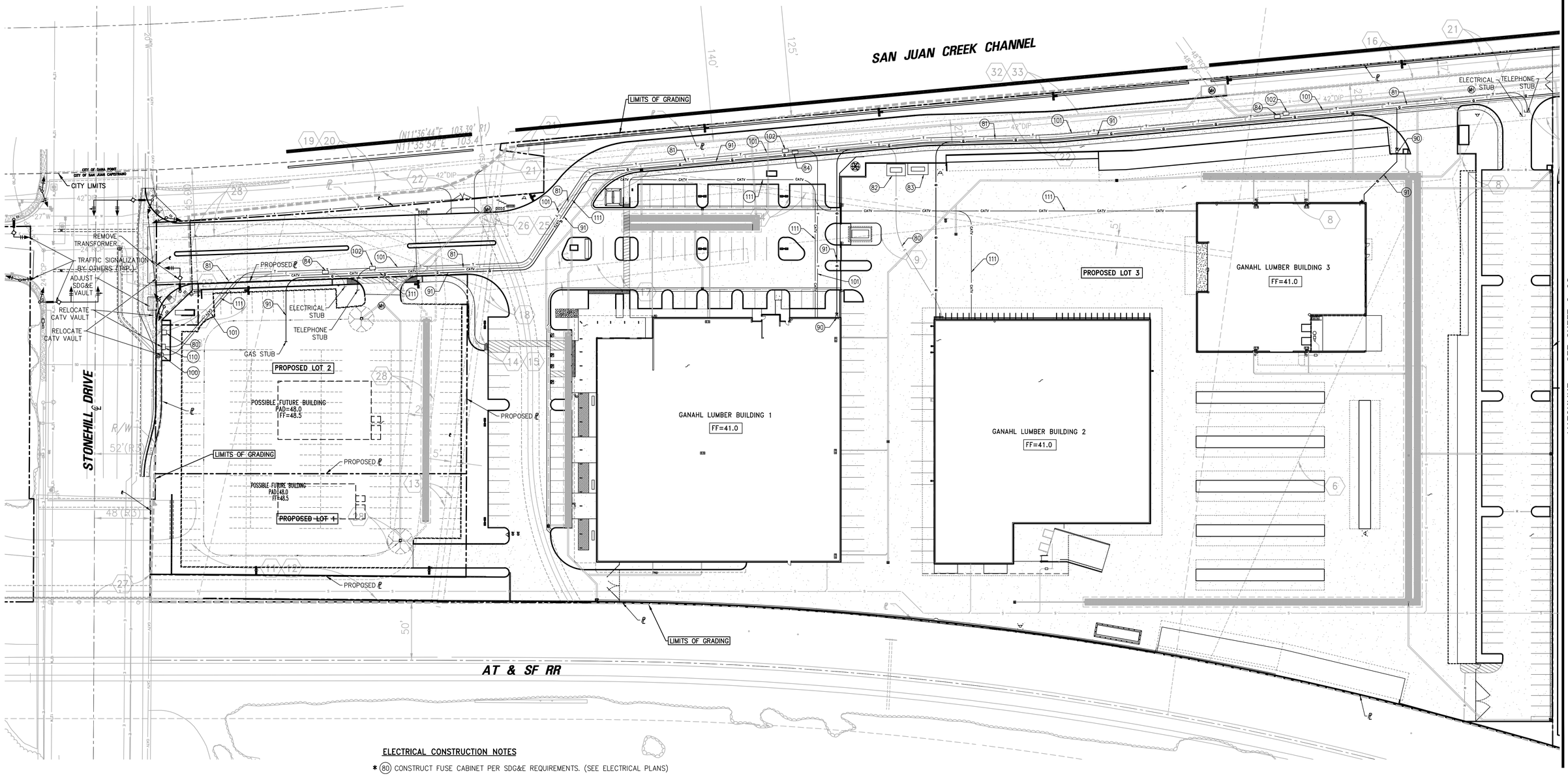
DRAWN BY:	DESIGN BY:
KDL/KJK	KJK
CHECKED BY:	CHECKED BY:
CDB	CDB

JEROME PARCO
CITY ENGINEER R.C.E. 50385

DATE
EXP. 06/30/2019

SHEET
C-26 OF 28

DATE: 3-15-19



ELECTRICAL CONSTRUCTION NOTES

* (80) CONSTRUCT FUSE CABINET PER SDG&E REQUIREMENTS. (SEE ELECTRICAL PLANS)
* (81) ELECTRICAL CONDUIT SDG&E REQUIREMENTS. PRIMARY ELECTRICAL CONDUITS TO HAVE A MINIMUM 40-INCHES OF COVER. (SEE ELECTRICAL PLANS)
* (82) TRANSFORMER PER SDG&E REQUIREMENTS. (SEE ELECTRICAL PLANS)
* (83) INSTALL EMERGENCY TRANSFORMER DIESEL GENERATOR PER SDG&E REQUIREMENTS. (SEE ELECTRICAL PLANS)
* (84) CONSTRUCT 3'X5' PULL BOX PER SDG&E REQUIREMENTS. (SEE ELECTRICAL PLANS)

GAS CONSTRUCTION NOTES

* (90) INSTALL GAS METER (BY GAS CO. FORCES)
* (91) PLACE GAS LINE. (BY GAS CO. FORCES)

TELEPHONE CONSTRUCTION NOTES

* (100) INSTALL TELEPHONE BOX PER TELEPHONE COMPANY REQUIREMENTS.
* (101) INSTALL TELEPHONE LINE PER TELEPHONE COMPANY REQUIREMENTS.
* (102) CONSTRUCT 3'X5' PULL BOX PER TELEPHONE COMPANY REQUIREMENTS.

CATV CONSTRUCTION NOTES

* (110) CONSTRUCT VAULT PER CATV COMPANY REQUIREMENTS.
* (111) INSTALL CATV LINE PER CATV COMPANY REQUIREMENTS.

* CONTRACTOR TO VERIFY SIZE AND LOCATION OF APPURTENANCES PRIOR TO CONSTRUCTION.

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

40 20 0 40 80 120

SCALE: 1"=40'

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

REVISIONS			
NO.	INITIAL	DESCRIPTION	APPL
		DATE	

JOB NO. GNH17048

SUBMITTAL 100% DESIGN DEVELOPMENT 3-15-19

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

COMPOSITE UTILITY PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		SHEET
KDL/KJK	KJK		C-27 OF 28
CHECKED BY:	CHECKED BY:	JEROME PARCO CITY ENGINEER R.C.E. 50385	DATE EXP. 06/30/2019
CDB	CDB		

DATE: 8-5-19

ELECTRICAL CONSTRUCTION NOTES

* (80) CONSTRUCT FUSE CABINET PER SDG&E REQUIREMENTS. (SEE ELECTRICAL PLANS)
* (81) ELECTRICAL CONDUIT SDG&E REQUIREMENTS. PRIMARY ELECTRICAL CONDUITS TO HAVE A MINIMUM 40-INCHES OF COVER. (SEE ELECTRICAL PLANS)
* (82) TRANSFORMER PER SDG&E REQUIREMENTS. (SEE ELECTRICAL PLANS)
* (83) INSTALL EMERGENCY TRANSFORMER DIESEL GENERATOR PER SDG&E REQUIREMENTS. (SEE ELECTRICAL PLANS)
* (84) CONSTRUCT 3'X5' PULL BOX PER SDG&E REQUIREMENTS. (SEE ELECTRICAL PLANS)

GAS CONSTRUCTION NOTES

* (90) INSTALL GAS METER (BY GAS CO. FORCES)
* (91) PLACE GAS LINE. (BY GAS CO. FORCES)

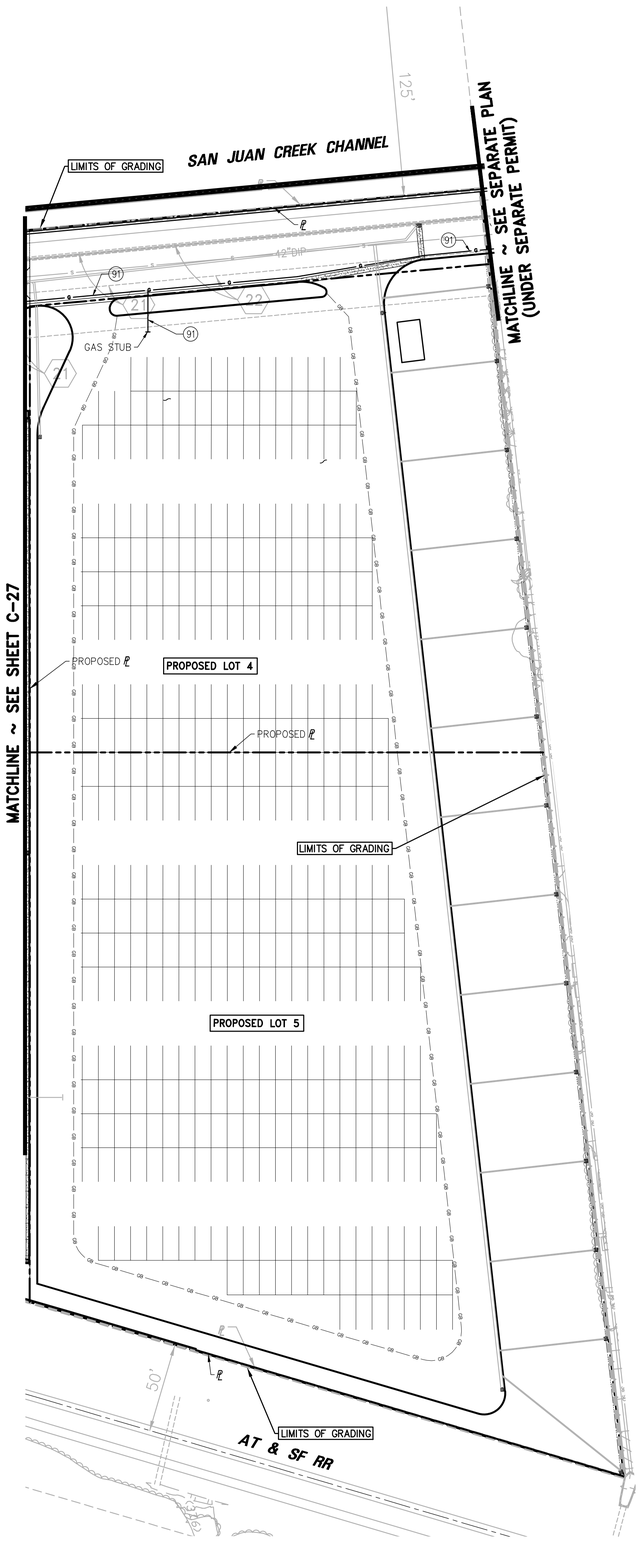
TELEPHONE CONSTRUCTION NOTES

* (100) INSTALL TELEPHONE BOX PER TELEPHONE COMPANY REQUIREMENTS.
* (101) INSTALL TELEPHONE LINE PER TELEPHONE COMPANY REQUIREMENTS.
* (102) CONSTRUCT 3'X5' PULL BOX PER TELEPHONE COMPANY REQUIREMENTS.

CATV CONSTRUCTION NOTES

* (110) CONSTRUCT VAULT PER CATV COMPANY REQUIREMENTS.
* (111) INSTALL CATV LINE PER CATV COMPANY REQUIREMENTS.

* CONTRACTOR TO VERIFY SIZE AND LOCATION OF APPURTENANCES PRIOR TO CONSTRUCTION.



NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

40 20 0 40 80 120

SCALE: 1"=40'

REGISTERED PROFESSIONAL ENGINEER CRAIG S. DI BIAS No. 75205 CIVIL STATE OF CALIFORNIA

JOB NO. GNH17048

NO.	INITIAL	DESCRIPTION	APPL	DATE
		SUBMITTAL		3-15-19
		100% DESIGN DEVELOPMENT		

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

CITY OF SAN JUAN CAPISTRANO

DEPARTMENT OF PUBLIC WORKS & UTILITIES

GANAHL LUMBER
25865 STONEHILL DRIVE,
SAN JUAN CAPISTRANO, CA 92675

COMPOSITE UTILITY PLAN

PREPARED BY:
TRUXAW AND ASSOCIATES
1915 W. ORANGEWOOD AVENUE, SUITE 101
ORANGE, CA 92868
(714) 935-0265
craigdibias@truxaw.com

DRAWN BY:	DESIGN BY:		
KDL/KJK	KJK		
CHECKED BY:	CHECKED BY:		
CDB	CDB	JEROME PARCO CITY ENGINEER	R.C.E. 50385 DATE EXP. 06/30/2019

SHEET C-28 OF 28

DATE: 8-5-19

TITLE REPORT

THIS SURVEY AND EASEMENTS SHOWN HEREON ARE BASED ON INFORMATION CONTAINED IN THE PRELIMINARY TITLE REPORT PREPARED BY:
FIRST AMERICAN TITLE INSURANCE COMPANY
3281 E GUASTI ROAD, SUITE 440
ONTARIO, CA 91761
(909) 510-62072
ORDER/FILE NUMBER: NCS-805010-ONT1
DATED: JULY 13, 2016
TITLE OFFICER: MATTHEW HOOKS

LEGAL DESCRIPTION

THE LAND REFERRED TO IN THIS COMMITMENT IS SITUATED IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE: (APN: 121-253-13)

THAT PORTION OF THE LAND DESCRIBED IN PARCEL 1 OF THE DEED TO PAUL N. YORBA AND OTHERS, RECORDED AUGUST 11, 1945 IN BOOK 1354, PAGE 91 OF OFFICIAL RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE WESTERLY RIGHT OF WAY LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, WITH THE SOUTH LINE OF THE LAND CONVEYED BY ROSA A. PRYOR TO ALBERT PRYOR AND CHRISTINA S. LANDELL, BY DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS OF SAID ORANGE COUNTY; THENCE SOUTH 16° 01' 30" WEST ALONG THE ABOVE MENTIONED WESTERLY RIGHT OF WAY LINE, 205.52 FEET TO A 2-INCH PIPE MONUMENT MARKED "R.D.E. 10301"; THENCE NORTH 61° 11' 37" WEST 1008.34 FEET TO AN INTERSECTION WITH THE NORTHWESTERLY LINE OF THE ABOVE MENTIONED PARCEL 1; THENCE NORTH 30° 03' 57" EAST 117.90 FEET TO THE MOST NORTHERLY CORNER OF SAID PARCEL 1; THENCE SOUTH 66° 16' 26" EAST ALONG SAID SOUTH LINE OF LAND CONVEYED TO ALBERT PRYOR AND CHRISTINA S. LANDELL, 963.82 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM, THE PORTION LYING WESTERLY OF THE EASTERLY LINE OF THE STRIP OF LAND 250.00 FEET IN WIDTH, DESCRIBED IN PARCEL L1-111.01 OF THE LIS PENDENS RECORDED MARCH 20, 1962 IN BOOK 6044, PAGE 731 OF OFFICIAL RECORDS, ENTITLED "ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY POLITIC AND CORPORATE OF THE STATE OF CALIFORNIA, PLAINTIFF, VS. PAUL N. YORBA AND OTHERS, DEFENDANTS." ALSO EXCEPTING THEREFROM THAT PORTION DESCRIBED AS PARCEL NO. 128 IN DEED TO THE COUNTY OF ORANGE RECORDED FEBRUARY 24, 1992 AS INSTRUMENT NO. 92-105463 OF SAID OFFICIAL RECORDS.

PARCEL TWO: (APN: 121-253-15)

PARCEL A AS SHOWN ON EXHIBIT "B" ATTACHED TO THAT CERTAIN CERTIFICATE OF COMPLIANCE RECORDED APRIL 29, 1999 AS INSTRUMENT NO. 99-313082 OF OFFICIAL RECORDS OF ORANGE COUNTY, CALIFORNIA.

PARCEL THREE: (APN: 121-240-73)

THAT PORTION OF THE LAND KNOWN AS THE PRYOR HOMESTEAD, AS SAID PRYOR HOMESTEAD IS DESCRIBED IN DECREE OF PARTITION, RECORDED APRIL 14, 1896, AS DOCUMENT NO. 5789 IN BOOK 27, PAGE 89 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A 4 X 4 REDWOOD POST MARKING THE SOUTHEAST CORNER OF THE LAND CONVEYED TO ALBERT PRYOR AND CHRISTINE LANDELL BY DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA; THENCE NORTH 5° 30' 30" EAST 341.14 FEET ALONG THE EASTERLY LINE OF SAID PARCEL, BEING THE EASTERLY LINE OF THE PRYOR HOMESTEAD AS SAID EASTERLY LINE IS SHOWN ON A MAP FILED IN BOOK 3, PAGE 59 OF RECORD OF SURVEYS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, TO AN IRON PIPE; THENCE NORTH 13° 32' EAST 240.03 FEET ALONG SAID EASTERLY LINE TO AN IRON PIPE; THENCE NORTH 66° 19' WEST 697.00 FEET, PARALLEL WITH THE SOUTHERLY LINE OF SAID LAND OF LANDELL AND OTHERS, TO THE CENTER LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD; THENCE NORTHERLY ALONG SAID CENTER LINE 76.00 FEET; THENCE NORTH 66° 19' WEST 400.00 FEET PARALLEL WITH SAID SOUTHERLY LINE THENCE SOUTH 23° 41' WEST TO SAID SOUTHERLY LINE; THENCE SOUTH 66° 19' EAST ALONG SAID SOUTHERLY LINE TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION LYING EASTERLY OF THE WESTERLY LINE OF THE 100 FOOT RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD.

ALSO EXCEPTING THEREFROM THAT PORTION THEREOF DESCRIBED IN PARCEL NO. 127 OF THE DEED TO THE COUNTY OF ORANGE RECORDED MAY 13, 1991 AS INSTRUMENT NO. 91- 231671 OF OFFICIAL RECORDS OF ORANGE COUNTY CALIFORNIA.

PARCEL FOUR: (APN: 121-240-39)

THAT PORTION OF THE LAND KNOWN AS THE PRYOR HOMESTEAD, AS SAID PRYOR HOMESTEAD IS DESCRIBED IN DECREE OF PARTITION, RECORDED APRIL 14, 1896, AS DOCUMENT NO. 5789 IN BOOK 27, PAGE 89 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO ALBERT PRYOR AND CRISTINA S. LANDELL BY DEED RECORDED MARCH 4, 1905 IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, SAID POINT BEING THE SOUTHEAST CORNER OF THE NORTHERLY 59 1/2 ACRES ALLOTTED TO ROSA A. DE PRYOR, CASE NO. 1210, SUPERIOR COURT OF SAID COUNTY AND RUNNING FROM SAID POINT OF BEGINNING SOUTH 80° 20' 30" EAST ALONG THE EASTERLY EXTENSION OF THE SOUTH LINE OF SAID 59 1/2 ACRES, 300.40 FEET TO A POINT IN THE CENTER LINE OF THAT CERTAIN RIGHT OF WAY DEEDED TO THE STATE OF CALIFORNIA BY DEED RECORDED JUNE 29, 1929 IN BOOK 293, PAGE 160 OF OFFICIAL RECORDS OF SAID COUNTY, SAID POINT BEING NORTH 38° 54' EAST 396.30 FEET FROM THE SOUTHERLY END OF A 1565.30 FOOT TANGENT LINE AS DESCRIBED IN SAID DEED; THENCE SOUTH 38° 54' WEST 396.30 FEET ALONG SAID CENTER LINE TO THE BEGINNING OF A TANGENT CURVE; THENCE ALONG A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 2000 FEET, THROUGH AN ANGLE OF 10° 57' 51" A DISTANCE OF 382.72 FEET TO THE EASTERLY LINE OF A PARCEL OF LAND CONVEYED TO ALBERT PRYOR BY DEED RECORDED JULY 24, 1929 IN BOOK 294, PAGE 162 OF SAID OFFICIAL RECORDS; THENCE SOUTH 13° 32' WEST 192.34 FEET, MORE OR LESS, ALONG SAID EASTERLY LINE OF SAID LAST MENTIONED PARCEL OF LAND TO AN IRON PIPE AT THE SOUTHEASTERLY CORNER OF SAID PARCEL; THENCE NORTH 66° 19' WEST 697 FEET PARALLEL TO THE SOUTHERLY LINE OF SAID PARCEL OF LAND DESCRIBED IN SAID DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF SAID COUNTY TO THE CENTER LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD RIGHT OF WAY; THENCE NORTHERLY ALONG THE SAID CENTER LINE 76 FEET TO A POINT; THENCE NORTH 66° 19' WEST 745.10 FEET TO THE SOUTHEASTERLY CORNER OF THE PARCEL OF 1.6384 ACRES CONVEYED TO JOHN O. FORSTER BY DEED RECORDED MAY 29, 1931 IN BOOK 480, PAGE 403 OF SAID OFFICIAL RECORDS; THENCE NORTH 9° 35' EAST ALONG THE EASTERLY LINE OF SAID LAST MENTIONED PARCEL 453.84 FEET TO THE NORTHEAST CORNER THEREOF; THENCE SOUTH 80° 20' 30" EAST 1450.34 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION LYING EASTERLY OF THE WESTERLY LINE OF THE 100 FOOT RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD.

ALSO EXCEPTING THEREFROM THAT PORTION THEREOF DESCRIBED IN THE DEED TO THE ORANGE COUNTY FLOOD CONTROL DISTRICT, RECORDED JANUARY 28, 1963 IN BOOK 6409, PAGE 742 OF SAID OFFICIAL RECORDS.

PARCEL FIVE: (APN: 121-240-76)

THAT PORTION OF THE PRYOR HOMESTEAD TRACT, IN THE RANCHO BOCA DE LA PLAYA, CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA, PER MAP OF PARTITION OF SAID TRACT IN THE DECREE OF THE SUPERIOR COURT OF THE STATE OF CALIFORNIA, IN AND FOR THE COUNTY OF ORANGE, IN CASE NO. 1210, DESCRIBED IN THAT CERTAIN FINAL ORDER OF CONDEMNATION AS PARCEL L1-113.01 RECORDED JANUARY 8, 1963 IN BOOK 6386, PAGE 776 OF OFFICIAL RECORDS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, LYING EASTERLY OF A LINE THAT IS PARALLEL WITH AND 125.00 FEET EASTERLY FROM THAT CERTAIN COURSE DESCRIBED AS "N.11° 37'17"E., 2223.48 FEET" IN SAID FINAL ORDER OF CONDEMNATION.

EXCEPT THEREFROM, AN UNDIVIDED 1/3 INTEREST IN AND TO ALL MINERALS, MINERAL DEPOSITS, MINERAL OILS AND NATURAL GASES OF EVERY KIND AND NATURE CONTAINED IN OR UPON SAID LAND, AS RESERVED BY JOHN F. POZAR AND MARTHA E. POZAR, RECORDED JANUARY 10, 1958 IN BOOK 4161, PAGE 281 OF OFFICIAL RECORDS.

ALSO EXCEPT THEREFROM, AN UNDIVIDED 1/6 INTEREST IN ALL MINERALS GAS, OIL, PETROLEUM, NAPHTHA AND OTHER HYDROCARBON SUBSTANCES BELOW THE DEPTH OF 500 FEET FROM THE SURFACE OF THE ABOVE DESCRIBED PROPERTY, SUBJECT TO THE EXPRESS LIMITATION THAT THE FOREGOING RESERVATION SHALL IN NO WAY BE INTERPRETED TO INCLUDE ANY RIGHT OF ENTRY IN AND UPON THE SURFACE OF THE ABOVE-DESCRIBED PROPERTY, OR THE FIRST 500 FEET OF THE SUBSURFACE THEREOF, AS RESERVED IN THE DEED FROM JOHN F. POZAR AND MARTHA E. POZAR, HUSBAND AND WIFE, RECORDED DECEMBER 12, 1962 IN BOOK 6357 PAGE 140, OFFICIAL RECORDS.

APN: 121-240-73 AND 121-253-13 AND 121-240-76 AND 121-240-39 AND 121-253-15

EASEMENTS

ANY POLICY WE ISSUE WILL HAVE THE FOLLOWING EXCEPTIONS UNLESS THEY ARE TAKEN CARE OF TO OUR SATISFACTION. THE PRINTED EXCEPTIONS AND EXCLUSIONS FROM THE COVERAGE OF THE POLICY OR POLICIES ARE SET FORTH IN EXHIBIT A ATTACHED. COPIES OF THE POLICY FORMS SHOULD BE READ. THEY ARE AVAILABLE FROM THE OFFICE WHICH ISSUED THIS COMMITMENT.

(6) AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JUNE 11, 1938 AS BOOK 943, PAGE 245 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL FOUR
EASEMENT ESTABLISHED FROM PARCEL MAP NO. 85-306, BOOK 223, PAGES 10-12. WIDTH OF EASEMENT INDETERMINABLE.

7 AN EASEMENT FOR INSTALLING AND MAINTAINING AN ANCHOR AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 10, 1940 AS BOOK 1029, PAGE 219 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN
THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.
AFFECTS: PARCELS THREE AND FOUR

(8) AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 23, 1946 AS BOOK 1382, PAGE 251 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL FOUR
WIDTH OF EASEMENT INDETERMINABLE.

(9) AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 23, 1946 AS BOOK 1382, PAGE 253 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL FIVE
WIDTH OF EASEMENT INDETERMINABLE.

10 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 47, PAGE 38 OF RECORD OF SURVEYS.
AFFECTS: PARCELS ONE AND TWO

(11) AN EASEMENT FOR COMMON ROAD, SANITARY SEWER, UTILITY WATER LINE, RAILROAD SPUR TRACK AND INCIDENTAL PURPOSES, RECORDED MARCH 18, 1960 AS BOOK 5151, PAGE 591 OF OFFICIAL RECORDS.
IN FAVOR OF: FRANK L. WINTERBOURNE AND DAISY M. WINTERBOURNE, HUSBAND AND WIFE
AFFECTS: THE EASTERLY 50.00 FEET
AFFECTS: PARCELS ONE AND TWO

(12) AN EASEMENT FOR COMMON ROAD, SANITARY SEWER, UTILITY WATER LINE, RAILROAD SPUR TRACK AND INCIDENTAL PURPOSES, RECORDED MARCH 18, 1960 AS BOOK 5152, PAGE 514 OF OFFICIAL RECORDS.
IN FAVOR OF: LORRIN HARRISON AND CECELIA YORBA HARRISON, HUSBAND AND WIFE
AFFECTS: THE EASTERLY 50.00 FEET
AFFECTS: PARCEL ONE

(13) AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED JULY 24, 1961 AS BOOK 5793, PAGE 623 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE NORTHEASTERLY 5.00 FEET
AFFECTS: PARCEL ONE

(14) AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 6, 1961 AS BOOK 5839, PAGE 219 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE SOUTHWESTERLY 5.00 FEET
AFFECTS: PARCEL THREE

(15) AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED OCTOBER 6, 1961 AS BOOK 5873, PAGE 324 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE SOUTHERLY 5.00 FEET
AFFECTS: PARCEL FIVE

(16) AN EASEMENT FOR SLOPES AND RIGHT OF WAY FOR FLOOD CONTROL PURPOSES AND INCIDENTAL PURPOSES, RECORDED JANUARY 28, 1963 AS BOOK 6409, PAGE 745 OF OFFICIAL RECORDS.
IN FAVOR OF: THE ORANGE COUNTY FLOOD CONTROL DISTRICT
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL FOUR

(17) AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 12, 1979 AS BOOK 13307, PAGE 359 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCELS ONE AND THREE

(18) AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 12, 1979 AS BOOK 13307, PAGE 363 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCELS ONE AND TWO

(19) AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MAY 17, 1985 AS INSTRUMENT NO. 85-178640 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A PUBLIC CORPORATION
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL ONE

(20) AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MAY 17, 1985 AS INSTRUMENT NO. 85-178652 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A PUBLIC CORPORATION
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL TWO

(21) AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MARCH 3, 1986 AS INSTRUMENT NO. 86-82825 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A BODY CORPORATE AND POLITIC
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL FOUR

(22) AN EASEMENT FOR SEWER PIPELINES AND INCIDENTAL PURPOSES, RECORDED DECEMBER 4, 1986 AS INSTRUMENT NO. 86-596848 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL FIVE

23 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 223, PAGE 10 OF PARCEL MAPS.
AFFECTS: PARCELS THREE AND FOUR

24 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 122, PAGE 28 OF RECORD OF SURVEYS.

(25) AN EASEMENT FOR SLOPE, DRAINAGE AND INCIDENTAL PURPOSES, RECORDED MAY 13, 1991 AS INSTRUMENT NO. 91-231671 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL THREE

(26) AN EASEMENT FOR SLOPE, DRAINAGE AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 24, 1992 AS INSTRUMENT NO. 92-105463 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCELS ONE AND TWO

(27) AN EASEMENT FOR DRAINAGE, SLOPE AND INCIDENTAL PURPOSES, RECORDED OCTOBER 5, 1994 AS INSTRUMENT NO. 94-596655 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, A POLITICAL SUBDIVISION OF THE STATE OF CALIFORNIA
AFFECTS: AS DESCRIBED THEREIN
AFFECTS: PARCEL TWO

(28) THE TERMS, PROVISIONS AND EASEMENT(S) CONTAINED IN THE DOCUMENT ENTITLED "ACCESS EASEMENT" RECORDED APRIL 30, 1999 AS INSTRUMENT NO. 99-318235 OF OFFICIAL RECORDS.

DOCUMENT(S) DECLARING MODIFICATIONS THEREOF RECORDED AUGUST 22, 2000 AS INSTRUMENT NO. 00-436694 OF OFFICIAL RECORDS.
AFFECTS: PARCELS ONE, TWO AND THREE
EASEMENT IS PLOTTED HEREON PER EXHIBIT "D" PER SAID DOCUMENT. AN ALTERNATE LOCATION MAY BE IN EFFECT PER EXHIBIT "F" OF SAID DOCUMENT. IT IS NOT KNOWN WHICH LOCATION, IF ANY, IS IN EFFECT AT THE TIME OF THIS SURVEY. SEE DOCUMENT FOR FULL PARTICULARS.

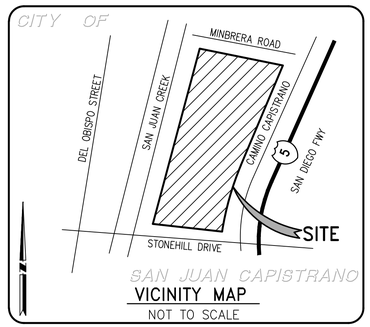
29 THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "DECLARATION OF USE RESTRICTION" RECORDED APRIL 12, 2006 AS INSTRUMENT NO. 06-244975 OF OFFICIAL RECORDS.
AFFECTS: PARCELS THREE AND FOUR

30 EASEMENTS, COVENANTS AND CONDITIONS CONTAINED IN THE DEED FROM THE HOME DEPOT USA, INC., A DELAWARE CORPORATION, AS GRANTOR, TO THE SAN JUAN CAPISTRANO REDEVELOPMENT AGENCY, A CALIFORNIA MUNICIPAL AGENCY, AS GRANTEE, RECORDED APRIL 25, 2006 AS INSTRUMENT NO. 06-274911 OF OFFICIAL RECORDS. REFERENCE BEING MADE TO THE DOCUMENT FOR FULL PARTICULARS, BUT DELETING ANY COVENANT, CONDITION, OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, GENETIC INFORMATION, GENDER, GENDER IDENTITY, GENDER EXPRESSION, SOURCE OF INCOME (AS DEFINED IN CALIFORNIA GOVERNMENT CODE § 12955(P)) OR ANCESTRY, TO THE EXTENT SUCH COVENANTS, CONDITIONS OR RESTRICTIONS VIOLATION 42 U.S.C. § 3604(C) OR CALIFORNIA GOVERNMENT CODE § 12955. LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.
THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.
AFFECTS: PARCELS ONE AND TWO

31 THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "PRE-ANNEXATION AGREEMENT" RECORDED AUGUST 15, 2008 AS INSTRUMENT NO. 08-390972 OF OFFICIAL RECORDS.
AFFECTS: PARCEL FIVE
DOCUMENT OUTLINES TERMS OF AN ANNEXATION AGREEMENT. SEE DOCUMENT FOR FULL PARTICULARS.

(32) EASEMENTS, COVENANTS AND CONDITIONS CONTAINED IN THE DEED FROM ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY CORPORATE AND POLITIC, AS GRANTOR, TO SAN JUAN CAPISTRANO COMMUNITY REDEVELOPMENT AGENCY, A PUBLIC BODY, CORPORATE AND POLITIC, AS GRANTEE, RECORDED JULY 29, 2009 AS INSTRUMENT NO. 09-407978 OF OFFICIAL RECORDS. REFERENCE BEING MADE TO THE DOCUMENT FOR FULL PARTICULARS, BUT DELETING ANY COVENANT, CONDITION, OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, GENETIC INFORMATION, GENDER, GENDER IDENTITY, GENDER EXPRESSION, SOURCE OF INCOME (AS DEFINED IN CALIFORNIA GOVERNMENT CODE §12955(P)) OR ANCESTRY, TO THE EXTENT SUCH COVENANTS, CONDITIONS OR RESTRICTIONS VIOLATION 42 U.S.C.§3604(C) OR CALIFORNIA GOVERNMENT CODE §12955. LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.
AFFECTS: PARCEL FIVE

(33) AN EASEMENT FOR SLOPE AND INCIDENTAL PURPOSES, RECORDED JULY 29, 2009 AS INSTRUMENT NO. 09-407978 OF OFFICIAL RECORDS.
IN FAVOR OF: ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY CORPORATE AND POLITIC
AFFECTS: THE WESTERLY 20.00 FEET
AFFECTS: PARCEL FIVE



VICINITY MAP
NOT TO SCALE

BASIS OF BEARINGS

THE BEARING NORTH 72°53'38" WEST FOR THE CENTERLINE OF STONEHILL DRIVE BETWEEN FOUND MONUMENT (52) AND FOUND MONUMENT (77) PER (R1) WAS USED AS THE BASIS OF BEARING FOR THIS SURVEY.

BENCHMARK

COUNTY OF ORANGE BENCHMARK NO. 3MM-1-78
ELEVATION = 62.899 FEET (NAVD88)

DESCRIBED BY OCS 2003 - FOUND 3 3/4" OCS ALUMINUM BENCHMARK DISK STAMPED "3MM-1-78", SET IN THE SOUTHWESTERLY CORNER OF A 4.3 FT. BY 11.5 FT. CONCRETE CATCH BASIN. MONUMENT IS LOCATED IN THE NORTHWESTERLY CORNER OF THE INTERSECTION OF STONEHILL DRIVE AND DEL OBISPO STREET, 228 FT. NORTHERLY OF THE CENTERLINE OF STONEHILL DRIVE AND 4 FT. WESTERLY OF THE WESTERLY CURB FACE ALONG DEL OBISPO. MONUMENT IS SET LEVEL WITH THE SIDEWALK.

AREA

TOTAL AREA = 715,449 S.F. OR 16.424 ACRES

RECORD DATA

(R1) - RECORD OF SURVEY NO. 87-1004, BOOK 122, PAGES 28-46.
(R2) - RECORD OF SURVEY NO. 94-1063, BOOK 147, PAGE 37.
(R3) - CERTIFICATE OF COMPLIANCE INSTRUMENT NO. 99-313082 OF OFFICIAL RECORDS, ORANGE COUNTY.

MONUMENT NOTES

(52) FOUND MAG NAIL AND WASHER, STAMPED "L.S. 7754". NO REFERENCE.
(77) FOUND LEAD AND TACK, STAMPED "O.C.S. 92". NO REFERENCE.
(81) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (122) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).
(83) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (128) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).
(84) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (127) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).
(86) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (121) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS NORTHWEST CORNER OF PARCEL 5.
(88) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (117) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS THE SOUTHEAST CORNER OF PARCEL 5.
(89) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (102) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS THE SOUTHWEST CORNER OF PARCEL 5.
(91) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (68) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).
(160) FOUND 2" IRON PIPE WITH PK NAIL AND WASHER, STAMPED "R.C.E. 31688", IN LIEU OF 2" IRON PIPE AND TAG, STAMPED "R.C.E. 1604" PER P.M.B. 223/10-12 PER (R2). ACCEPTED AS THE INTERSECTION OF THE SOUTHERLY LINE OF PARCEL "G", RS 2/33 AND EASTERLY LINE OF SAN JUAN CREEK CHANNEL.

FLOOD ZONE

COMMUNITY NUMBER: 060736 0506J, EFFECTIVE DATE: 12/3/2009
ZONE AO
SPECIAL FLOOD HAZARD AREA. AREAS OF 100 - YEARS SHALLOW FLOODING WHERE DEPTHS ARE BETWEEN ONE (1) AND THREE (3) FEET; AVERAGE DEPTHS OF INUNDATION ARE SHOWN, BUT NO FLOOD HAZARD FACTORS ARE DETERMINED. FLOOD INSURANCE REQUIRED.

INFORMATION OBTAINED FROM CERTIFIED FLOOD SYSTEMS, INC. ON 6/8/2017

UTILITY PROVIDERS:

WATER.....CITY OF SAN JUAN CAPISTRANO.....(949) 493-1171
WATER.....SANTA MARGARITA WATER DISTRICT.....(949) 459-6420
SEWER.....CITY OF SAN JUAN CAPISTRANO.....(949) 493-1171
STORM DRAIN.....ORANGE COUNTY FLOOD CONTROL DISTRICT.....(714) 647-3999
GAS.....SOUTHERN CALIFORNIA GAS COMPANY.....(714) 385-3377
TELEPHONE.....AT&T.....(858) 886-1288
ELECTRIC.....SAN DIEGO GAS AND ELECTRIC.....(800) 411-7343
TV.....COX COMMUNICATIONS.....(619) 266-5605

SOURCE OF TOPOGRAPHIC SURVEY

AERIAL SURVEY WAS COMPLETED ON 6-16-17 BY:
INLAND AERIAL SURVEYS, INC.
RIVERSIDE, CA 92503
(951) 687-4252

SHEET INDEX

1 - TITLE SHEET
2 - TOPOGRAPHIC SURVEY
3 - TOPOGRAPHIC SURVEY
4 - BOUNDARY EXHIBIT

REGISTERED LAND SURVEYOR
JOSEPH D. DEAL
NO. 9276
STATE OF CALIFORNIA

PLAN PREPARED FOR
GANAHL LUMBER
1220 E. BALL ROAD
ANAHEIM, CA 92805
(714) 772-5444

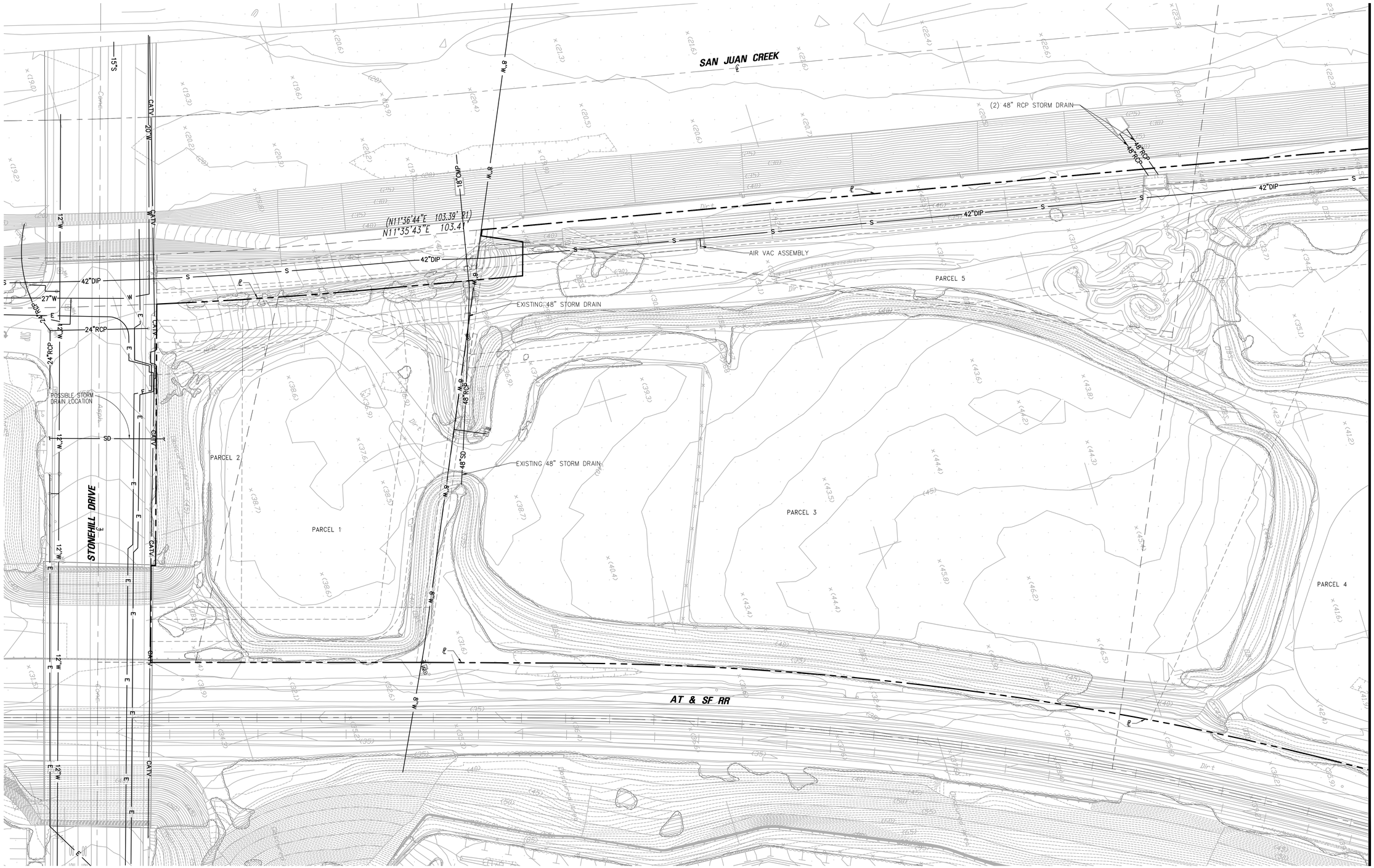
NO.	REVISIONS	DATE

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

TOPOGRAPHIC AND BOUNDARY SURVEY

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL AND WESTERLY OF A.T. & S.F. RAILROAD
IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	7-31-17
DRAWN BY	KDL
CHECKED BY	CDB/JDD
JOB NO.	GNH17048
SHEET NO.	1 OF 4 SHEETS



MATCHLINE ~ SEE SHEET 3

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

40 20 0 40 80 120

SCALE: 1"=40'

NOTE

1. SEE SHEET 4 FOR BOUNDARY, EASEMENTS AND MONUMENTATION.

LEGEND

CONTROL, EDGE OF CONC., EDGE OF ASPH., EDGE OF DIRT, AWNING, BUILDING, SIDEWALK, CURB AND GUTTER, FENCE, WALL, RETAINING WALL, GUARD RAIL, PIPE LINE, PARKING STRIPES, ROAD STRIPING, POOL, RAILROAD, RAIL SIGNAL, TANK, VAULT, DROP INLET, VALVE, CATCH BASIN, WATER LINE, FIRE HYDRANT, MANHOLE, STANDPIPE, SIGN, POWER POLE GUY WIRE, POWER POLE STREET LIGHT, STREET LIGHT STOP LIGHT, MISCELLANEOUS, TREES, SINGLE TREE, PALM, INDEX CONTOUR, INTER CONTOUR

NO.	REVISIONS	DATE

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

TOPOGRAPHIC AND BOUNDARY SURVEY

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL AND WESTERLY OF A.T. & S.F. RAILROAD

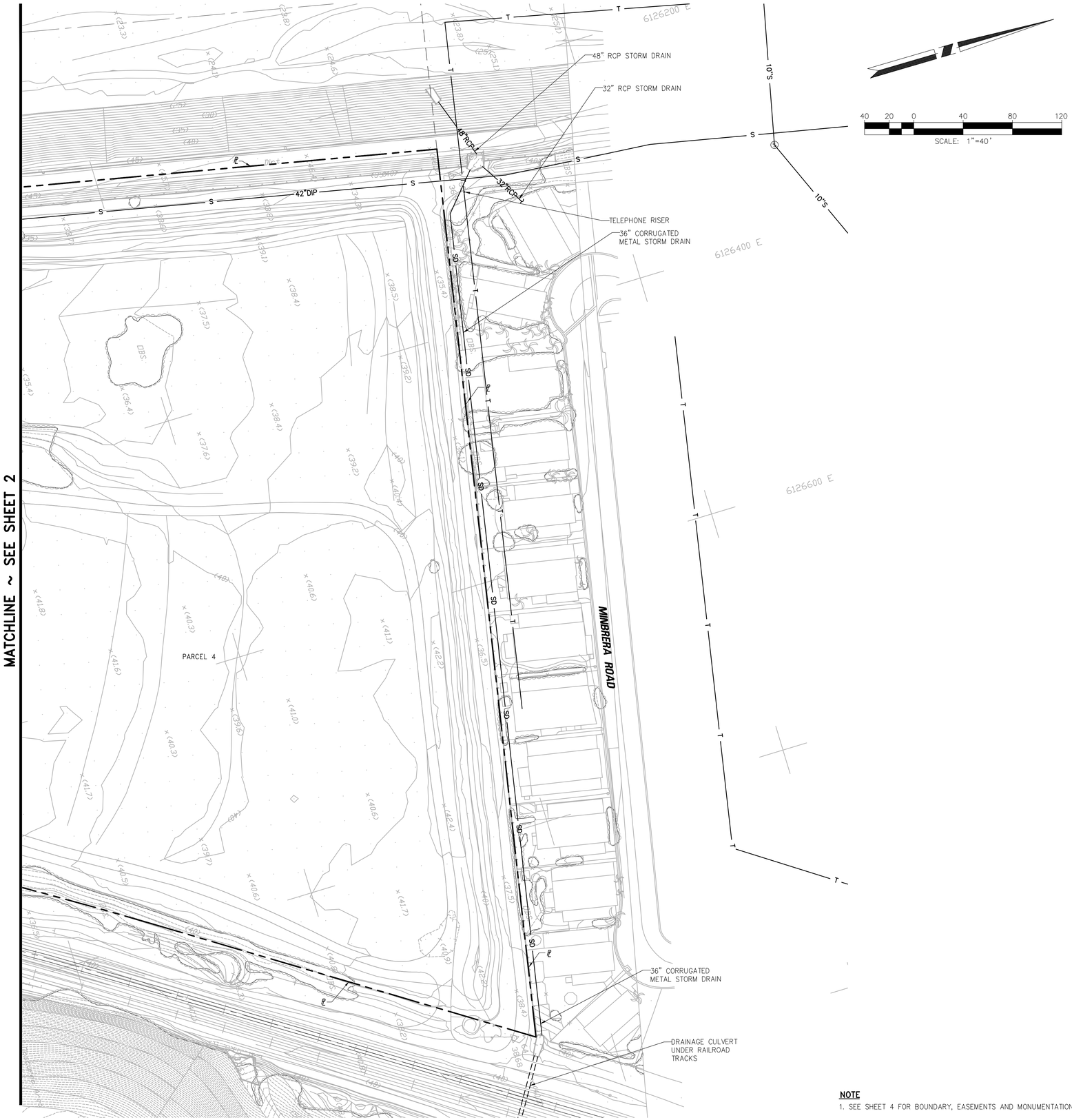
IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	7-31-17
DRAWN BY	KDL
CHECKED BY	CDB/JDD
JOB NO.	GNH17048
SHEET NO.	2

OF 4 SHEETS

LEGEND

CONTROL — HV=1 1350.00 — V=1 1350.00
EDGE OF CONC.
EDGE OF ASPH.
EDGE OF DIRT
AWNING
BUILDING
SIDEWALK
CURB AND GUTTER
FENCE
WALL
RETAINING WALL
GUARD RAIL
PIPE LINE
PARKING STRIPES
ROAD STRIPING
POOL
RAILROAD
RAIL SIGNAL
TANK
VAULT
DROP INLET
VALVE
CATCH BASIN
WATER LINE
FIRE HYDRANT
MANHOLE
STANDPIPE
SIGN
POWER POLE GUY WIRE
POWER POLE STREET LIGHT
STREET LIGHT STOP LIGHT
MISCELLANEOUS
TREES
SINGLE TREE
PALM
INDEX CONTOUR 1350
INTER CONTOUR 1340



NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

NOTE

1. SEE SHEET 4 FOR BOUNDARY, EASEMENTS AND MONUMENTATION.

NO.	REVISIONS	DATE

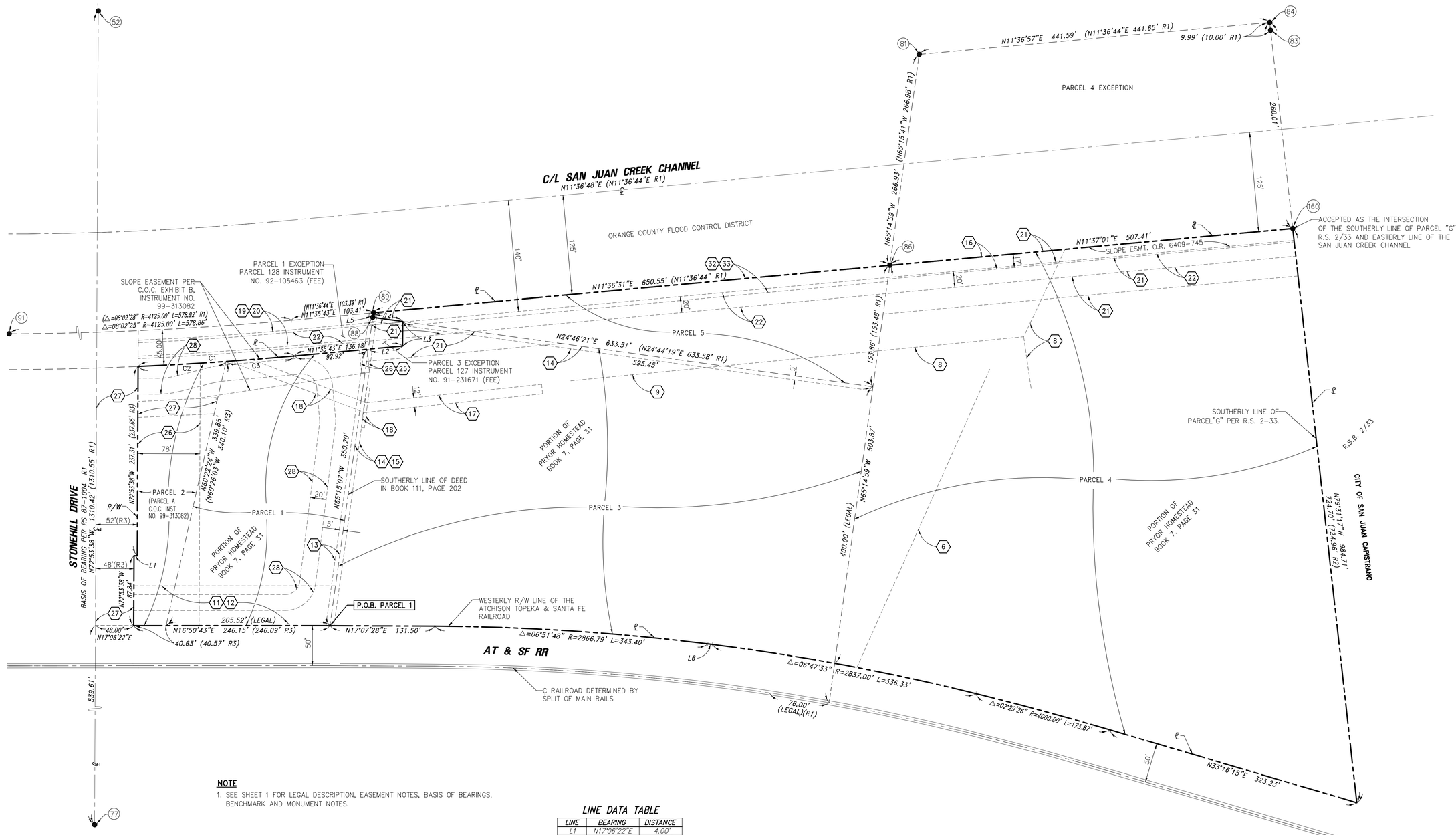
Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

TOPOGRAPHIC AND BOUNDARY SURVEY

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL AND WESTERLY OF A.T. & S.F. RAILROAD

IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	7-31-17
DRAWN BY	KDL
CHECKED BY	CDB/JDD
JOB NO.	GNH17048
SHEET NO.	3 OF 4 SHEETS



NOTE

1. SEE SHEET 1 FOR LEGAL DESCRIPTION, EASEMENT NOTES, BASIS OF BEARINGS, BENCHMARK AND MONUMENT NOTES.

LINE DATA TABLE

LINE	BEARING	DISTANCE
L1	N17°06'22"E	4.00'
L2	N11°35'43"E	43.26'
L3	N72°48'16"W	30.91'
L4	N24°46'21"E	38.06'
L5	N65°15'07"W	5.71'
L6	N23°59'15"E	5.76'

CURVE DATA TABLE

CURVE	DELTA	RADIUS	LENGTH
C1	02°42'12"	4170.00'	196.75'
C2	01°31'06"	4170.00'	110.52'
C2(R3)	01°30'49"(R3)	4170.00'(R3)	110.16'(R3)
C3	01°11'06"	4170.00'	86.23'

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE

Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert CALL 811 Two working days before you dig.

NO.	REVISIONS	DATE

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

TOPOGRAPHIC AND BOUNDARY SURVEY

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL AND WESTERLY OF A.T. & S.F. RAILROAD

IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	7-31-17
DRAWN BY	KDL
CHECKED BY	CDB/JDD
JOB NO.	GNH17048
SHEET NO.	4

OF 4 SHEETS

TITLE REPORT

THIS SURVEY AND EASEMENTS SHOWN HEREON ARE BASED ON INFORMATION CONTAINED IN THE PRELIMINARY TITLE REPORT PREPARED BY:

FIRST AMERICAN TITLE INSURANCE COMPANY
3281 E GUASTI ROAD, SUITE 440
ONTARIO, CA 91761
(909) 510-62072
ORDER/FILE NUMBER: NCS-805010-ONT1
DATED: JULY 13, 2016
TITLE OFFICER: MATTHEW HOOKS

LEGAL DESCRIPTION

THE LAND REFERRED TO IN THIS COMMITMENT IS SITUATED IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE: (APN: 121-253-13)

THAT PORTION OF THE LAND DESCRIBED IN PARCEL 1 OF THE DEED TO PAUL N. YORBA AND OTHERS, RECORDED AUGUST 11, 1945 IN BOOK 1354, PAGE 91 OF OFFICIAL RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE WESTERLY RIGHT OF WAY LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD, WITH THE SOUTH LINE OF THE LAND CONVEYED BY ROSA A. PRYOR TO ALBERT PRYOR AND CHRISTINA S. LANDELL, BY DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS OF SAID ORANGE COUNTY; THENCE SOUTH 16° 01' 30" WEST ALONG THE ABOVE MENTIONED WESTERLY RIGHT OF WAY LINE, 205.52 FEET TO A 2-INCH PIPE MONUMENT MARKED "R.D.E. 10301"; THENCE NORTH 61° 11' 37" WEST 1008.34 FEET TO AN INTERSECTION WITH THE NORTHWESTERLY LINE OF THE ABOVE MENTIONED PARCEL 1; THENCE NORTH 30° 03' 57" EAST 117.90 FEET TO THE MOST NORTHERLY CORNER OF SAID PARCEL 1; THENCE SOUTH 66° 16' 26" EAST ALONG SAID SOUTH LINE OF LAND CONVEYED TO ALBERT PRYOR AND CHRISTINA S. LANDELL, 963.82 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM, THE PORTION LYING WESTERLY OF THE EASTERLY LINE OF THE STRIP OF LAND 250.00 FEET IN WIDTH, DESCRIBED IN PARCEL L1-111.01 OF THE LIS PENDENS RECORDED MARCH 20, 1962 IN BOOK 6044, PAGE 731 OF OFFICIAL RECORDS, ENTITLED "ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY POLITIC AND CORPORATE OF THE STATE OF CALIFORNIA, PLAINTIFF, VS. PAUL N. YORBA AND OTHERS, DEFENDANTS." ALSO EXCEPTING THEREFROM THAT PORTION DESCRIBED AS PARCEL NO. 128 IN DEED TO THE COUNTY OF ORANGE RECORDED FEBRUARY 24, 1992 AS INSTRUMENT NO. 92-105463 OF SAID OFFICIAL RECORDS.

PARCEL TWO: (APN: 121-253-15)

PARCEL A AS SHOWN ON EXHIBIT "B" ATTACHED TO THAT CERTAIN CERTIFICATE OF COMPLIANCE RECORDED APRIL 29, 1999 AS INSTRUMENT NO. 99-313082 OF OFFICIAL RECORDS OF ORANGE COUNTY, CALIFORNIA.

PARCEL THREE: (APN: 121-240-73)

THAT PORTION OF THE LAND KNOWN AS THE PRYOR HOMESTEAD, AS SAID PRYOR HOMESTEAD IS DESCRIBED IN DECREE OF PARTITION, RECORDED APRIL 14, 1896, AS DOCUMENT NO. 5789 IN BOOK 27, PAGE 89 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A 4 X 4 REDWOOD POST MARKING THE SOUTHEAST CORNER OF THE LAND CONVEYED TO ALBERT PRYOR AND CHRISTINE LANDELL BY DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA; THENCE NORTH 5° 30' 30" EAST 341.14 FEET ALONG THE EASTERLY LINE OF SAID PARCEL, BEING THE EASTERLY LINE OF THE PRYOR HOMESTEAD AS SAID EASTERLY LINE IS SHOWN ON A MAP FILED IN BOOK 3, PAGE 59 OF RECORD OF SURVEYS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, TO AN IRON PIPE; THENCE NORTH 13° 32' EAST 240.03 FEET ALONG SAID EASTERLY LINE TO AN IRON PIPE; THENCE NORTH 66° 19' WEST 697.00 FEET, PARALLEL WITH THE SOUTHERLY LINE OF SAID LAND OF LANDELL AND OTHERS, TO THE CENTER LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD; THENCE NORTHERLY ALONG SAID CENTER LINE 76.00 FEET; THENCE NORTH 66° 19' WEST 400.00 FEET PARALLEL WITH SAID SOUTHERLY LINE THENCE SOUTH 23° 41' WEST TO SAID SOUTHERLY LINE; THENCE SOUTH 66° 19' EAST ALONG SAID SOUTHERLY LINE TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION LYING EASTERLY OF THE WESTERLY LINE OF THE 100 FOOT RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD.

ALSO EXCEPTING THEREFROM THAT PORTION THEREOF DESCRIBED IN PARCEL NO. 127 OF THE DEED TO THE COUNTY OF ORANGE RECORDED MAY 13, 1991 AS INSTRUMENT NO. 91- 231671 OF OFFICIAL RECORDS OF ORANGE COUNTY CALIFORNIA.

PARCEL FOUR: (APN: 121-240-39)

THAT PORTION OF THE LAND KNOWN AS THE PRYOR HOMESTEAD, AS SAID PRYOR HOMESTEAD IS DESCRIBED IN DECREE OF PARTITION, RECORDED APRIL 14, 1896, AS DOCUMENT NO. 5789 IN BOOK 27, PAGE 89 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO ALBERT PRYOR AND CRISTINA S. LANDELL BY DEED RECORDED MARCH 4, 1905 IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF ORANGE COUNTY, CALIFORNIA, SAID POINT BEING THE SOUTHEAST CORNER OF THE NORTHERLY 59 1/2 ACRES ALLOTTED TO ROSA A. DE PRYOR, CASE NO. 1210, SUPERIOR COURT OF SAID COUNTY AND RUNNING FROM SAID POINT OF BEGINNING SOUTH 80° 20' 30" EAST ALONG THE EASTERLY EXTENSION OF THE SOUTH LINE OF SAID 59 1/2 ACRES, 300.40 FEET TO A POINT IN THE CENTER LINE OF THAT CERTAIN RIGHT OF WAY DEEDED TO THE STATE OF CALIFORNIA BY DEED RECORDED JUNE 29, 1929 IN BOOK 293, PAGE 160 OF OFFICIAL RECORDS OF SAID COUNTY, SAID POINT BEING NORTH 38° 54' EAST 396.30 FEET FROM THE SOUTHERLY END OF A 1565.30 FOOT TANGENT LINE AS DESCRIBED IN SAID DEED; THENCE SOUTH 38° 54' WEST 396.30 FEET ALONG SAID CENTER LINE TO THE BEGINNING OF A TANGENT CURVE; THENCE ALONG A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 2000 FEET, THROUGH AN ANGLE OF 10° 57' 51" A DISTANCE OF 382.72 FEET TO THE EASTERLY LINE OF A PARCEL OF LAND CONVEYED TO ALBERT PRYOR BY DEED RECORDED JULY 24, 1929 IN BOOK 294, PAGE 162 OF SAID OFFICIAL RECORDS; THENCE SOUTH 13° 32' WEST 192.34 FEET, MORE OR LESS, ALONG SAID EASTERLY LINE OF SAID LAST MENTIONED PARCEL OF LAND TO AN IRON PIPE AT THE SOUTHEASTERLY CORNER OF SAID PARCEL; THENCE NORTH 66° 19' WEST 697 FEET PARALLEL TO THE SOUTHERLY LINE OF SAID PARCEL OF LAND DESCRIBED IN SAID DEED RECORDED IN BOOK 111, PAGE 202 OF DEEDS, RECORDS OF SAID COUNTY TO THE CENTER LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD RIGHT OF WAY; THENCE NORTHERLY ALONG THE SAID CENTER LINE 76 FEET TO A POINT; THENCE NORTH 66° 19' WEST 745.10 FEET TO THE SOUTHEASTERLY CORNER OF THE PARCEL OF 1.6384 ACRES CONVEYED TO JOHN O. FORSTER BY DEED RECORDED MAY 29, 1931 IN BOOK 480, PAGE 403 OF SAID OFFICIAL RECORDS; THENCE NORTH 9° 35' EAST ALONG THE EASTERLY LINE OF SAID LAST MENTIONED PARCEL 453.84 FEET TO THE NORTHEAST CORNER THEREOF; THENCE SOUTH 80° 20' 30" EAST 1450.34 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION LYING EASTERLY OF THE WESTERLY LINE OF THE 100 FOOT RIGHT OF WAY OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD.

ALSO EXCEPTING THEREFROM THAT PORTION THEREOF DESCRIBED IN THE DEED TO THE ORANGE COUNTY FLOOD CONTROL DISTRICT, RECORDED JANUARY 28, 1963 IN BOOK 6409, PAGE 742 OF SAID OFFICIAL RECORDS.

PARCEL FIVE: (APN: 121-240-76)

THAT PORTION OF THE PRYOR HOMESTEAD TRACT, IN THE RANCHO BOCA DE LA PLAYA, CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA, PER MAP OF PARTITION OF SAID TRACT IN THE DECREE OF THE SUPERIOR COURT OF THE STATE OF CALIFORNIA, IN AND FOR THE COUNTY OF ORANGE, IN CASE NO. 1210, DESCRIBED IN THAT CERTAIN FINAL ORDER OF CONDEMNATION AS PARCEL L1-113.01 RECORDED JANUARY 8, 1963 IN BOOK 6386, PAGE 776 OF OFFICIAL RECORDS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, LYING EASTERLY OF A LINE THAT IS PARALLEL WITH AND 125.00 FEET EASTERLY FROM THAT CERTAIN COURSE DESCRIBED AS "N.11° 37'17"E., 2223.48 FEET" IN SAID FINAL ORDER OF CONDEMNATION.

EXCEPT THEREFROM, AN UNDIVIDED 1/3 INTEREST IN AND TO ALL MINERALS, MINERAL DEPOSITS, MINERAL OILS AND NATURAL GASES OF EVERY KIND AND NATURE CONTAINED IN OR UPON SAID LAND, AS RESERVED BY JOHN F. POZAR AND MARTHA E. POZAR, RECORDED JANUARY 10, 1958 IN BOOK 4161, PAGE 281 OF OFFICIAL RECORDS.

ALSO EXCEPT THEREFROM, AN UNDIVIDED 1/6 INTEREST IN ALL MINERALS GAS, OIL, PETROLEUM, NAPHTHA AND OTHER HYDROCARBON SUBSTANCES BELOW THE DEPTH OF 500 FEET FROM THE SURFACE OF THE ABOVE DESCRIBED PROPERTY, SUBJECT TO THE EXPRESS LIMITATION THAT THE FOREGOING RESERVATION SHALL IN NO WAY BE INTERPRETED TO INCLUDE ANY RIGHT OF ENTRY IN AND UPON THE SURFACE OF THE ABOVE-DESCRIBED PROPERTY, OR THE FIRST 500 FEET OF THE SUBSURFACE THEREOF, AS RESERVED IN THE DEED FROM JOHN F. POZAR AND MARTHA E. POZAR, HUSBAND AND WIFE, RECORDED DECEMBER 12, 1962 IN BOOK 6357 PAGE 140, OFFICIAL RECORDS.

APN: 121-240-73 AND 121-253-13 AND 121-240-76 AND 121-240-39 AND 121-253-15

EASEMENTS

ANY POLICY WE ISSUE WILL HAVE THE FOLLOWING EXCEPTIONS UNLESS THEY ARE TAKEN CARE OF TO OUR SATISFACTION. THE PRINTED EXCEPTIONS AND EXCLUSIONS FROM THE COVERAGE OF THE POLICY OR POLICIES ARE SET FORTH IN EXHIBIT A ATTACHED. COPIES OF THE POLICY FORMS SHOULD BE READ. THEY ARE AVAILABLE FROM THE OFFICE WHICH ISSUED THIS COMMITMENT.

6 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JUNE 11, 1938 AS BOOK 943, PAGE 245 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FOUR

EASEMENT ESTABLISHED FROM PARCEL MAP NO. 85-306, BOOK 223, PAGES 10-12. WIDTH OF EASEMENT INDETERMINABLE.

7 AN EASEMENT FOR INSTALLING AND MAINTAINING AN ANCHOR AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 10, 1940 AS BOOK 1029, PAGE 219 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.

AFFECTS: PARCELS THREE AND FOUR

8 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 23, 1946 AS BOOK 1382, PAGE 251 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FOUR

WIDTH OF EASEMENT INDETERMINABLE.

9 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 23, 1946 AS BOOK 1382, PAGE 253 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO CONSOLIDATED GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FIVE

WIDTH OF EASEMENT INDETERMINABLE.

10 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 47, PAGE 38 OF RECORD OF SURVEYS.

AFFECTS: PARCELS ONE AND TWO

11 AN EASEMENT FOR COMMON ROAD, SANITARY SEWER, UTILITY WATER LINE, RAILROAD SPUR TRACK AND INCIDENTAL PURPOSES, RECORDED MARCH 18, 1960 AS BOOK 5151, PAGE 591 OF OFFICIAL RECORDS.
IN FAVOR OF: FRANK L. WINTERBOURNE AND DAISY M. WINTERBOURNE, HUSBAND AND WIFE
AFFECTS: THE EASTERLY 50.00 FEET

AFFECTS: PARCELS ONE AND TWO

12 AN EASEMENT FOR COMMON ROAD, SANITARY SEWER, UTILITY WATER LINE, RAILROAD SPUR TRACK AND INCIDENTAL PURPOSES, RECORDED MARCH 18, 1960 AS BOOK 5152, PAGE 514 OF OFFICIAL RECORDS.
IN FAVOR OF: LORRIN HARRISON AND CECELIA YORBA HARRISON, HUSBAND AND WIFE
AFFECTS: THE EASTERLY 50.00 FEET

AFFECTS: PARCEL ONE

13 AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED JULY 24, 1961 AS BOOK 5793, PAGE 623 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE NORTHEASTERLY 5.00 FEET

AFFECTS: PARCEL ONE

14 AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 6, 1961 AS BOOK 5839, PAGE 219 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE SOUTHWESTERLY 5.00 FEET

AFFECTS: PARCEL THREE

15 AN EASEMENT FOR INGRESS, EGRESS, PIPELINE AND INCIDENTAL PURPOSES, RECORDED OCTOBER 6, 1961 AS BOOK 5873, PAGE 324 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, FOR AND IN BEHALF OF ORANGE COUNTY WATER WORKS DISTRICT NO. 4
AFFECTS: THE SOUTHERLY 5.00 FEET

AFFECTS: PARCEL FIVE

16 AN EASEMENT FOR SLOPES AND RIGHT OF WAY FOR FLOOD CONTROL PURPOSES AND INCIDENTAL PURPOSES, RECORDED JANUARY 28, 1963 AS BOOK 6409, PAGE 745 OF OFFICIAL RECORDS.
IN FAVOR OF: THE ORANGE COUNTY FLOOD CONTROL DISTRICT
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FOUR

17 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 12, 1979 AS BOOK 13307, PAGE 359 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCELS ONE AND THREE

18 AN EASEMENT FOR POLE LINES AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 12, 1979 AS BOOK 13307, PAGE 363 OF OFFICIAL RECORDS.
IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCELS ONE AND TWO

19 AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MAY 17, 1985 AS INSTRUMENT NO. 85-178640 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A PUBLIC CORPORATION
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL ONE

20 AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MAY 17, 1985 AS INSTRUMENT NO. 85-178652 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A PUBLIC CORPORATION
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL TWO

21 AN EASEMENT FOR PIPELINES AND INCIDENTAL PURPOSES, RECORDED MARCH 3, 1986 AS INSTRUMENT NO. 86-82825 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT, A BODY CORPORATE AND POLITIC
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FOUR

22 AN EASEMENT FOR SEWER PIPELINES AND INCIDENTAL PURPOSES, RECORDED DECEMBER 4, 1986 AS INSTRUMENT NO. 86-596848 OF OFFICIAL RECORDS.
IN FAVOR OF: SANTA MARGARITA WATER DISTRICT
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL FIVE

23 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 223, PAGE 10 OF PARCEL MAPS.

AFFECTS: PARCELS THREE AND FOUR

24 THE EFFECT OF A MAP PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, FILED IN BOOK 122, PAGE 28 OF RECORD OF SURVEYS.

25 AN EASEMENT FOR SLOPE, DRAINAGE AND INCIDENTAL PURPOSES, RECORDED MAY 13, 1991 AS INSTRUMENT NO. 91-231671 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL THREE

26 AN EASEMENT FOR SLOPE, DRAINAGE AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 24, 1992 AS INSTRUMENT NO. 92-105463 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCELS ONE AND TWO

27 AN EASEMENT FOR DRAINAGE, SLOPE AND INCIDENTAL PURPOSES, RECORDED OCTOBER 5, 1994 AS INSTRUMENT NO. 94-596655 OF OFFICIAL RECORDS.
IN FAVOR OF: THE COUNTY OF ORANGE, A POLITICAL SUBDIVISION OF THE STATE OF CALIFORNIA
AFFECTS: AS DESCRIBED THEREIN

AFFECTS: PARCEL TWO

28 THE TERMS, PROVISIONS AND EASEMENT(S) CONTAINED IN THE DOCUMENT ENTITLED "ACCESS EASEMENT" RECORDED APRIL 30, 1999 AS INSTRUMENT NO. 99-318235 OF OFFICIAL RECORDS.

DOCUMENT(S) DECLARING MODIFICATIONS THEREOF RECORDED AUGUST 22, 2000 AS INSTRUMENT NO. 00-436694 OF OFFICIAL RECORDS.

AFFECTS: PARCELS ONE, TWO AND THREE

EASEMENT IS PLOTTED HEREON PER EXHIBIT "D" PER SAID DOCUMENT. AN ALTERNATE LOCATION MAY BE IN EFFECT PER EXHIBIT "F" OF SAID DOCUMENT. IT IS NOT KNOWN WHICH LOCATION, IF ANY, IS IN EFFECT AT THE TIME OF THIS SURVEY. SEE DOCUMENT FOR FULL PARTICULARS.

29 THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "DECLARATION OF USE RESTRICTION" RECORDED APRIL 12, 2006 AS INSTRUMENT NO. 06-244975 OF OFFICIAL RECORDS.

AFFECTS: PARCELS THREE AND FOUR

30 EASEMENTS, COVENANTS AND CONDITIONS CONTAINED IN THE DEED FROM THE HOME DEPOT USA, INC., A DELAWARE CORPORATION, AS GRANTOR, TO THE SAN JUAN CAPISTRANO REDEVELOPMENT AGENCY, A CALIFORNIA MUNICIPAL AGENCY, AS GRANTEE, RECORDED APRIL 25, 2006 AS INSTRUMENT NO. 06-274911 OF OFFICIAL RECORDS. REFERENCE BEING MADE TO THE DOCUMENT FOR FULL PARTICULARS, BUT DELETING ANY COVENANT, CONDITION, OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, GENETIC INFORMATION, GENDER, GENDER IDENTITY, GENDER EXPRESSION, SOURCE OF INCOME (AS DEFINED IN CALIFORNIA GOVERNMENT CODE § 12955(P)) OR ANCESTRY, TO THE EXTENT SUCH COVENANTS, CONDITIONS OR RESTRICTIONS VIOLATION 42 U.S.C. § 3604(C) OR CALIFORNIA GOVERNMENT CODE § 12955. LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.

THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.

AFFECTS: PARCELS ONE AND TWO

31 THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "PRE-ANNEXATION AGREEMENT" RECORDED AUGUST 15, 2008 AS INSTRUMENT NO. 08-390972 OF OFFICIAL RECORDS.

AFFECTS: PARCEL FIVE

DOCUMENT OUTLINES TERMS OF AN ANNEXATION AGREEMENT. SEE DOCUMENT FOR FULL PARTICULARS.

32 EASEMENTS, COVENANTS AND CONDITIONS CONTAINED IN THE DEED FROM ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY CORPORATE AND POLITIC, AS GRANTOR, TO SAN JUAN CAPISTRANO COMMUNITY REDEVELOPMENT AGENCY, A PUBLIC BODY, CORPORATE AND POLITIC, AS GRANTEE, RECORDED JULY 29, 2009 AS INSTRUMENT NO. 09-407978 OF OFFICIAL RECORDS. REFERENCE BEING MADE TO THE DOCUMENT FOR FULL PARTICULARS, BUT DELETING ANY COVENANT, CONDITION, OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, GENETIC INFORMATION, GENDER, GENDER IDENTITY, GENDER EXPRESSION, SOURCE OF INCOME (AS DEFINED IN CALIFORNIA GOVERNMENT CODE §12955(P)) OR ANCESTRY, TO THE EXTENT SUCH COVENANTS, CONDITIONS OR RESTRICTIONS VIOLATION 42 U.S.C.§3604(C) OR CALIFORNIA GOVERNMENT CODE §12955. LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.

AFFECTS: PARCEL FIVE

33 AN EASEMENT FOR SLOPE AND INCIDENTAL PURPOSES, RECORDED JULY 29, 2009 AS INSTRUMENT NO. 09-407978 OF OFFICIAL RECORDS.
IN FAVOR OF: ORANGE COUNTY FLOOD CONTROL DISTRICT, A BODY CORPORATE AND POLITIC
AFFECTS: THE WESTERLY 20.00 FEET

AFFECTS: PARCEL FIVE

BASIS OF BEARINGS

THE BEARING NORTH 72°53'38" WEST FOR THE CENTERLINE OF STONEHILL DRIVE BETWEEN FOUND MONUMENT (52) AND FOUND MONUMENT (77) PER (R1) WAS USED AS THE BASIS OF BEARING FOR THIS SURVEY.

BENCHMARK

COUNTY OF ORANGE BENCHMARK NO. 3MM-1-78
ELEVATION = 92.899 FEET (NAVD88)

DESCRIBED BY OCS 2003 - FOUND 3 3/4" OCS ALUMINUM BENCHMARK DISK STAMPED "3MM-1-78", SET IN THE SOUTHWESTERLY CORNER OF A 4.3 FT. BY 11.5 FT. CONCRETE CATCH BASIN. MONUMENT IS LOCATED IN THE NORTHWESTERLY CORNER OF THE INTERSECTION OF STONEHILL DRIVE AND DEL OBISPO STREET, 228 FT. NORTHERLY OF THE CENTERLINE OF STONEHILL DRIVE AND 4 FT. WESTERLY OF THE WESTERLY CURB FACE ALONG DEL OBISPO. MONUMENT IS SET LEVEL WITH THE SIDEWALK.

AREA

TOTAL AREA = 715,449 S.F. OR 16.424 ACRES

RECORD DATA

(R1) - RECORD OF SURVEY NO. 87-1004, BOOK 122, PAGES 28-46.

(R2) - RECORD OF SURVEY NO. 94-1063, BOOK 147, PAGE 37.

(R3) - CERTIFICATE OF COMPLIANCE INSTRUMENT NO. 99-313082 OF OFFICIAL RECORDS, ORANGE COUNTY.

MONUMENT NOTES

(52) FOUND MAG NAIL AND WASHER, STAMPED "L.S. 7754". NO REFERENCE.

(77) FOUND LEAD AND TACK, STAMPED "O.C.S. 92". NO REFERENCE.

(81) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (122) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).

(83) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (128) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).

(84) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (127) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).

(86) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (121) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS NORTHWEST CORNER OF PARCEL 5.

(88) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (117) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS THE SOUTHEAST CORNER OF PARCEL 5.

(89) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (102) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1). ACCEPTED AS THE SOUTHWEST CORNER OF PARCEL 5.

(91) FOUND 2" IRON PIPE WITH 2 1/2" BRASS O.C.S. DISK, STAMPED "O.C.F.C.D. R/W V (68) 1/1989". DOWN 0.3' UNLESS OTHERWISE NOTED PER (R1).

(160) FOUND 2" IRON PIPE WITH PK NAIL AND WASHER, STAMPED "R.C.E. 31688", IN LIEU OF 2" IRON PIPE AND TAG, STAMPED "R.C.E. 1604" PER P.M.B. 223/10-12 PER (R2). ACCEPTED AS THE INTERSECTION OF THE SOUTHERLY LINE OF PARCEL "G", RS 2/33 AND EASTERLY LINE OF SAN JUAN CREEK CHANNEL.

FLOOD ZONE

COMMUNITY NUMBER: 060736 0506J, EFFECTIVE DATE: 12/3/2009

ZONE AO

SPECIAL FLOOD HAZARD AREA. AREAS OF 100 - YEARS SHALLOW FLOODING WHERE DEPTHS ARE BETWEEN ONE (1) AND THREE (3) FEET; AVERAGE DEPTHS OF INUNDATION ARE SHOWN, BUT NO FLOOD HAZARD FACTORS ARE DETERMINED. FLOOD INSURANCE REQUIRED.

INFORMATION OBTAINED FROM CERTIFIED FLOOD SYSTEMS, INC. ON 6/8/2017

UTILITY PROVIDERS:

WATER....................................CITY OF SAN JUAN CAPISTRANO.......................(949) 493-1171
WATER....................................SANTA MARGARITA WATER DISTRICT..................(949) 459-6420
SEWER....................................CITY OF SAN JUAN CAPISTRANO........................(949) 493-1171
STORM DRAIN.............ORANGE COUNTY FLOOD CONTROL DISTRICT..................(714) 647-3999
GAS...................................SOUTHERN CALIFORNIA GAS COMPANY..................(714) 385-3377
TELEPHONE..AT&T...(858) 886-1288
ELECTRIC..............................SAN DIEGO GAS AND ELECTRIC...........................(800) 411-7343
TV..COX COMMUNICATIONS.................................(619) 266-5605

SOURCE OF TOPOGRAPHIC SURVEY

AERIAL SURVEY WAS COMPLETED ON 6-16-17 BY:
INLAND AERIAL SURVEYS, INC.
RIVERSIDE, CA 92503
(951) 687-4252

THIS TENTATIVE PARCEL MAP WAS PREPARED UNDER MY DIRECTION MARCH 2018.

JOSEPH D. DEAL
PROFESSIONAL LAND SURVEYOR NO. 9276

JOSEPH D. DEAL
NO. 9276

THIS PLAN IS:

PRELIMINARY

(NOT FOR CONSTRUCTION)

PLAN PREPARED BY:

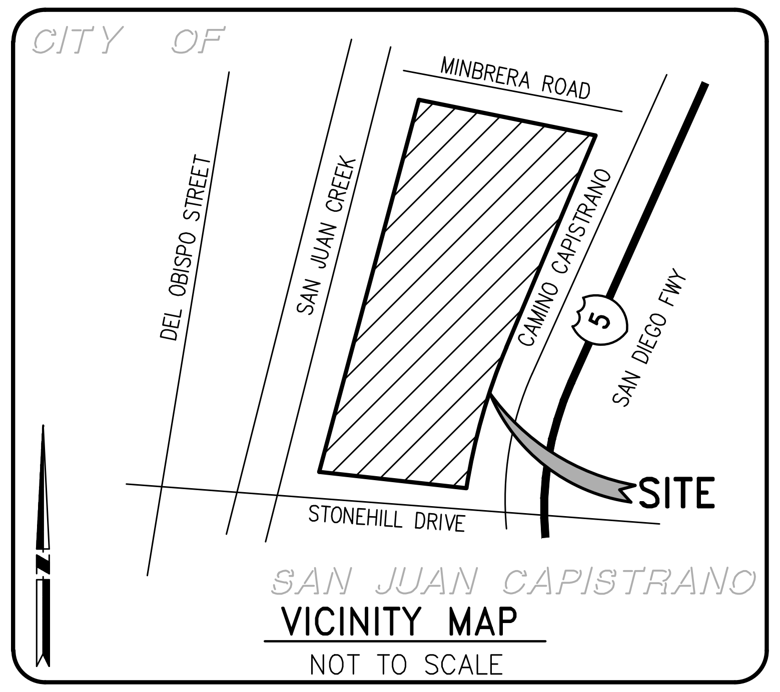
JOSEPH C. TRUXAW AND ASSOCIATES, INC.
Civil Engineers & Land Surveyors
265 S. ANITA DRIVE, SUITE 111
ORANGE, CA 92868
PHONE: (714) 935-0265
FAX: (714) 935-0106

OWNER

CITY OF SAN JUAN CAPISTRANO
32400 PASEO ADELANTO
SAN JUAN CAPISTRANO, CA 92675
(949) 443-6331

SUBDIVIDER

GANAHL LUMBER
1220 E. BALL ROAD
ANAHEIM, CA 92805
(714) 772-5444



VICINITY MAP
NOT TO SCALE

LEGEND

AB = AGGREGATE BASE
AC = ASPHALT CONCRETE
BLK = CONCRETE BLOCK
BS = BACK OF SIDEWALK
CB = CATCH BASIN
CF = CURB FACE
CL = CENTERLINE
CLF = CHAIN LINK FENCE
CO = CLEANOUT
DCV = DETECTOR CHECK VALVE
DS = ROOF DOWNSPOUT
EG = EDGE OF GUTTER
EP = EDGE OF PAVEMENT
FD = FOUND
FDC = FIRE DEPT. CONNECTION
FF = FINISHED FLOOR
FG = FINISHED GRADE
FH = FIRE HYDRANT
FL = FLOW LINE
FS = FINISHED SURFACE
GB = GRADE BREAK
GM = GAS METER
GR = TOP OF GRATE
GV = GAS VALVE
HP = HIGH POINT
HT = HEIGHT
ICV = IRRIGATION CONTROL VALVE
IP = IRON PIPE
LS = LIGHT STANDARD
L&T = LEAD & TAG
MH = MANHOLE
NG = NATURAL GROUND
N&T = NAIL & TAG
OHW = OVERHEAD WIRE
PB = PULL BOX
PCC = CONCRETE
PIV = POST INDICATOR VALVE
PL = PROPERTY LINE
RD = ROOF DRAIN
RWH = REDWOOD HEADER
SCB = SIGNAL CONTROL BOX
SMH = SEWER MANHOLE
SPK = SPIKE
SW = SIDEWALK
TC = TOP OF CURB
TE = TRASH ENCLOSURE
TP = TELEPHONE POLE
TRAN = TRANSITION
TRANS= TRANSFORMER

TRW = TOP OF RETAINING WALL
TW = TOP OF WALL
UG = UNDERGROUND
UP = UTILITY POLE
VAR = VARIABLE
W = WASHER
WDF = WOOD FENCE
WM = WATER METER
WV = WATER VALVE

N. = NORTH
S. = SOUTH
E. = EAST
W. = WEST
N'LY = NORTHERLY
S'LY = SOUTHERLY
E'LY = EASTERLY
W'LY = WESTERLY
N/O = NORTH OF
S/O = SOUTH OF
E/O = EAST OF
W/O = WEST OF
℄ = PROPERTY LINE
℄ = CENTERLINE
R/W = RIGHT OF WAY
△ = DELTA
R = RADIUS
L = LENGTH
T = TANGENT
M = MEASURED DATA
C = CALCULATED DATA
(RAD)= RADIAL BEARING
PRO = PROPORTIONATE MEASUREMENT
(210.00' R) = RECORD DATA
210.00' M. = MEASURED DATA
210.00' PRO. = PRORATED DATA
210.00' C. = CALCULATED DATA
(427.00) TC = EXISTING ELEVATION
427.00 TC = DESIGN ELEVATION
—— CATV —— = CABLE TV LINE
—— E —— = ELECTRICAL LINE
—— G —— = GAS LINE
—— GB —— GB —— = GRADE BREAK LINE
—— R —— R —— = RIDGE LINE
—— S —— = SEWER LINE
—— SD —— = STORM DRAIN LINE
—— T —— = TELEPHONE LINE
—— W —— = WATER LINE

SYMBOLS

FIRE HYDRANT
STREET LIGHT
TRAFFIC SIGNAL
TRAFFIC SIGNAL ARM & POLE
LIGHT STANDARD
UTILITY POLE
GUY WIRE & ANCHOR
WM ☐ WATER METER
GM ☐ GAS METER
WV ⊗ WATER VALVE
GAS VALVE
PB ☐ PULL BOX
▤ GRATE INLET
SIGN
VENT
Ⓢ SEWER MANHOLE
Ⓓ STORM DRAIN MANHOLE
Ⓣ TELEPHONE MANHOLE
(MH) MANHOLE
CO SEWER CLEANOUT
Ⓦ MONITORING WELL
HANDICAP PARKING STALL
Ⓛ LANDSCAPED AREA
Ⓟ PROTECT IN PLACE
Ⓡ REMOVE AND DISPOSE OFFSITE
(RE) RELOCATE
3 PLOTABLE EASEMENT ITEM No. PER TITLE REPORT
—(427.0)— EXIST. CONTOUR
—427.0— DESIGN CONTOUR

NO.	REVISIONS	DATE

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

TENTATIVE TRACT NO. 18161

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL AND WESTERLY OF A.T. & S.F. RAILROAD

IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE
1/29/19
DRAWN BY
CL
CHECKED BY
CDB/JDD
JOB NO.
GNH17048
SHEET NO.
1
OF 2 SHEETS

DEVELOPMENT STANDARDS FOR INDUSTRIAL DISTRICTS

DISTRICT	MINIMUM LOT AREA	MINIMUM STREET FRONTAGE	(ONE STORY)			FLOOR AREA RATIO	
			MINIMUM FRONT YARD	MINIMUM SIDE YARD	MINIMUM REAR YARD	1ST FLR/LOT AREA	BUILDING HEIGHT
CM	7,200 SQ. FT.	60 FEET	20 FEET	5 FEET	25 FEET	0.30	35 FEET

SITE PLANNING DATA

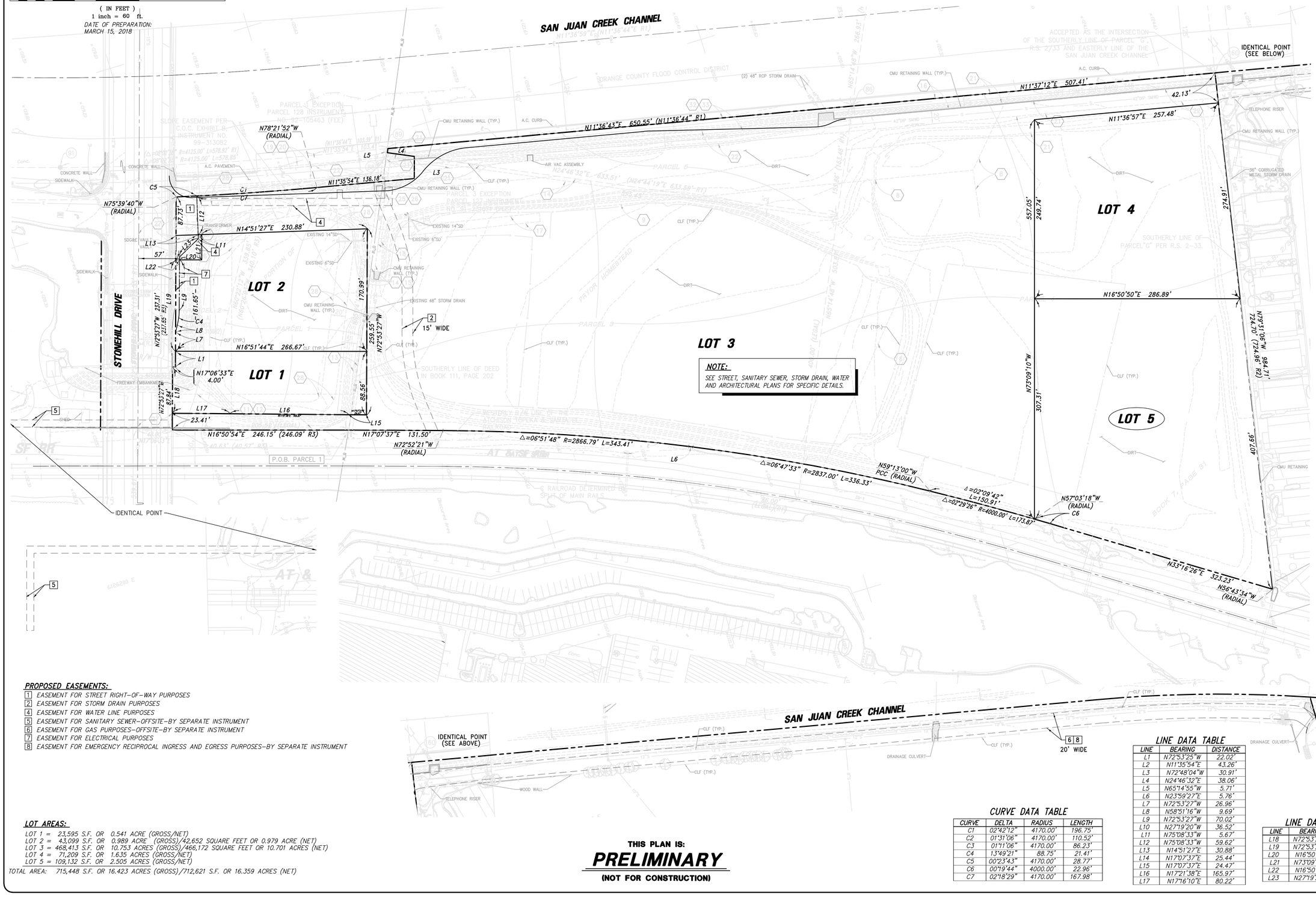
GENERAL PLAN LAND USE DESIGNATION: LU 4.1 QUASI INDUSTRIAL

ZONING DISTRICT CLASSIFICATION: CO-COMMERCIAL MANUFACTURING DISTRICT

ADJACENT LAND USE:
NORTH-MHP (MOBILE HOME PARK DISTRICT)
EAST-GOS (GENERAL OPEN SPACE)
SOUTH-CM (COMMERCIAL MANUFACTURING DISTRICT)
WEST-SAN JUAN CREEK CHANNEL

PARKING-BUSINESS AND COMMERCIAL USES-PARKING REQUIREMENTS
LAND USE TYPE: BUILDINGS MATERIALS AND EQUIPMENT SALES AND STORAGE YARDS.
REQUIRED OFF-STREET PARKING:
1.0 OFF-STREET PARKING SPACE PER EACH 800 SQUARE FEET OF GROSS FLOOR AREA; AND 1.0 PER EACH 10,000 SQUARE FEET OF OUTDOOR SALES, STORAGE, OR SERVICE AREA; AND 1.0 PER EACH REGISTERED MOTOR VEHICLE OPERATED IN CONJUNCTION WITH THE USE OR BUILDING.

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.
DATE OF PREPARATION:
MARCH 15, 2018



PROPOSED EASEMENTS:

1. EASEMENT FOR STREET RIGHT-OF-WAY PURPOSES
2. EASEMENT FOR STORM DRAIN PURPOSES
4. EASEMENT FOR WATER LINE PURPOSES
5. EASEMENT FOR SANITARY SEWER-OFFSITE-BY SEPARATE INSTRUMENT
6. EASEMENT FOR GAS PURPOSES-OFFSITE-BY SEPARATE INSTRUMENT
7. EASEMENT FOR ELECTRICAL PURPOSES
8. EASEMENT FOR EMERGENCY RECIPROCAL INGRESS AND EGRESS PURPOSES-BY SEPARATE INSTRUMENT

NOTE:
SEE STREET, SANITARY SEWER, STORM DRAIN, WATER AND ARCHITECTURAL PLANS FOR SPECIFIC DETAILS.

LOT AREAS:

LOT 1 = 23,595 S.F. OR 0.541 ACRE (GROSS/NET)
LOT 2 = 43,099 S.F. OR 0.989 ACRE (GROSS)/42,652 SQUARE FEET OR 0.979 ACRE (NET)
LOT 3 = 468,413 S.F. OR 10.753 ACRES (GROSS)/466,172 SQUARE FEET OR 10.701 ACRES (NET)
LOT 4 = 71,209 S.F. OR 1.635 ACRES (GROSS/NET)
LOT 5 = 109,132 S.F. OR 2.505 ACRES (GROSS/NET)
TOTAL AREA: 715,448 S.F. OR 16.423 ACRES (GROSS)//712,621 S.F. OR 16.359 ACRES (NET)

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

CURVE DATA TABLE

CURVE	DELTA	RADIUS	LENGTH
C1	02°42'12"	4170.00'	196.75'
C2	01°31'06"	4170.00'	110.52'
C3	01°11'06"	4170.00'	86.23'
C4	13°49'21"	88.75'	21.41'
C5	00°23'43"	4170.00'	28.77'
C6	00°19'44"	4000.00'	22.96'
C7	02°18'29"	4170.00'	167.98'

LINE DATA TABLE

LINE	BEARING	DISTANCE
L1	N72°53'28"W	22.02'
L2	N11°35'54"E	43.26'
L3	N72°48'04"W	30.91'
L4	N24°46'32"E	38.06'
L5	N65°14'55"W	5.71'
L6	N23°59'27"E	5.76'
L7	N72°53'27"W	26.96'
L8	N58°51'16"W	9.69'
L9	N72°53'27"W	70.02'
L10	N27°19'20"W	36.52'
L11	N75°08'33"W	5.67'
L12	N75°08'33"W	59.62'
L13	N14°51'27"E	30.88'
L14	N17°07'37"E	25.44'
L15	N17°07'37"E	24.47'
L16	N17°21'38"E	165.97'
L17	N17°16'10"E	80.22'

LINE DATA TABLE

LINE	BEARING	DISTANCE
L18	N72°53'27"W	64.43'
L19	N72°53'27"W	127.55'
L20	N16°50'50"E	31.12'
L21	N73°09'10"W	35.35'
L22	N16°50'50"E	5.00'
L23	N27°19'20"W	36.52'

NO.	REVISIONS	DATE

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

TENTATIVE TRACT NO. 18161

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL AND WESTERLY OF A.T. & S.F. RAILROAD
IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	1/29/19
DRAWN BY	CL
CHECKED BY	CDB/JDD
JOB NO.	GNH17048
SHEET NO.	2 OF 2 SHEETS

Attachment E: Exhibit(s)

LEGEND

DMA-A 1.382 — DRAINAGE MANAGEMENT AREA AND ACREAGE

DRAINAGE BOUNDARY

DRAINAGE SUB-AREA

PROPERTY LINE

PATTERN OF PROPOSED FLOW

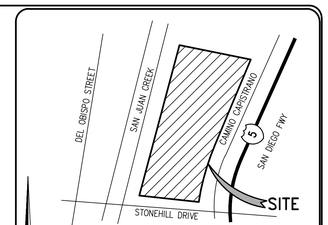
PROPOSED LANDSCAPED AREA (PERVIOUS AREA)

PROPOSED GRAVEL (PERVIOUS AREA)

PROPOSED PAVED AREA (IMPERVIOUS AREA)

PROPOSED IMPERVIOUS AREA (ROOF, PAVING, ETC.)

- N_ — DENOTES NON-STRUCTURAL MEASURES
- N3 — COMMON AREA LANDSCAPE MANAGEMENT
- N4 — BMP MAINTENANCE
- N11 — COMMON AREA LITTER CONTROL
- N13 — HOUSEKEEPING OF LOADING DOCKS
- N14 — COMMON AREA CATCH BASIN INSPECTION
- N15 — STREET SWEEPING PRIVATE STREETS AND PARKING LOTS
- S– — DENOTES ROUTINE STRUCTURAL SOURCE CONTROL BMPs
- S1 — STORM DRAIN SYSTEM STENCILING AND SIGNAGE
- S2 — DESIGN AND CONSTRUCT OUTDOOR MATERIAL STORAGE AREAS TO REDUCE POLLUTION INTRODUCTION
- S3 — DESIGN AND CONSTRUCT TRASH AND WASTE STORAGE AREAS
- S4 — EFFICIENT IRRIGATION SYSTEMS AND LANDSCAPE DESIGN
- S5 — PROTECT SLOPES AND CHANNELS AND PROVIDE ENERGY DISSIPATION
- S6 — DOCK AREAS
- S11 — FUELING AREAS
- S12 — HILLSIDE LANDSCAPING
- INF– — DENOTES INFILTRATION BMPs
- INF-5 — PERMEABLE PAVEMENT
- TRT– — DENOTES TREATMENT CONTROL BMPs
- TRT-2 — PROPRIETARY TREATMENT CONTROL BMP (MODULAR WETLANDS BIOFILTRATION SYSTEM)
- FTD– — DENOTES FULL-CAPTURE TRASH DEVICE (FLOGARD CATCH BASIN FILTER INSERT/ TRASH & DEBRIS GUARD)
- HSC– — DENOTES HYDROLOGIC SOURCE CONTROL BMPs
- HSC-6 — SELF-RETAINING AREAS
- ADS– — DENOTES ADS DETENTION SYSTEM
- DENOTES STORM DRAIN PIPE FLOW DIRECTION



SAN JUAN CAPISTRANO
VICINITY MAP
NOT TO SCALE

50 25 0 50 100 150
SCALE: 1"=50'

OUTFALL #1

MODULAR WETLANDS SYSTEM

MODULAR WETLANDS SYSTEM

WIND TURBINE

BUILDING 4 GUARD HOUSE

L-SHED 7A

BUILDING 6A POLE SHED

BUILDING 3 STORAGE/OFFICE

BUILDING 1 RETAIL/OFFICE

BUILDING 2 DRIVE-THRU STORAGE

BUILDING 6C POLE SHED

T-SHED 5A

T-SHED 5B

T-SHED 5C

T-SHED 5D

T-SHED 5E

FUTURE RESTAURANT BUILDING

FUTURE RESTAURANT BUILDING

DMA-A 1.41

DMA-B 1.40

DMA-C 1.59

DMA-D 7.40

DMA-F 0.21

TRASH COMPACTOR

BALER

LOADING DOCK

DIESEL FUEL TANK

STONEHILL DRIVE

AT & SF RR

MATCHLINE ~ SEE SHEET 2 OF 2

NO.	REVISIONS	DATE

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

WQMP EXHIBIT

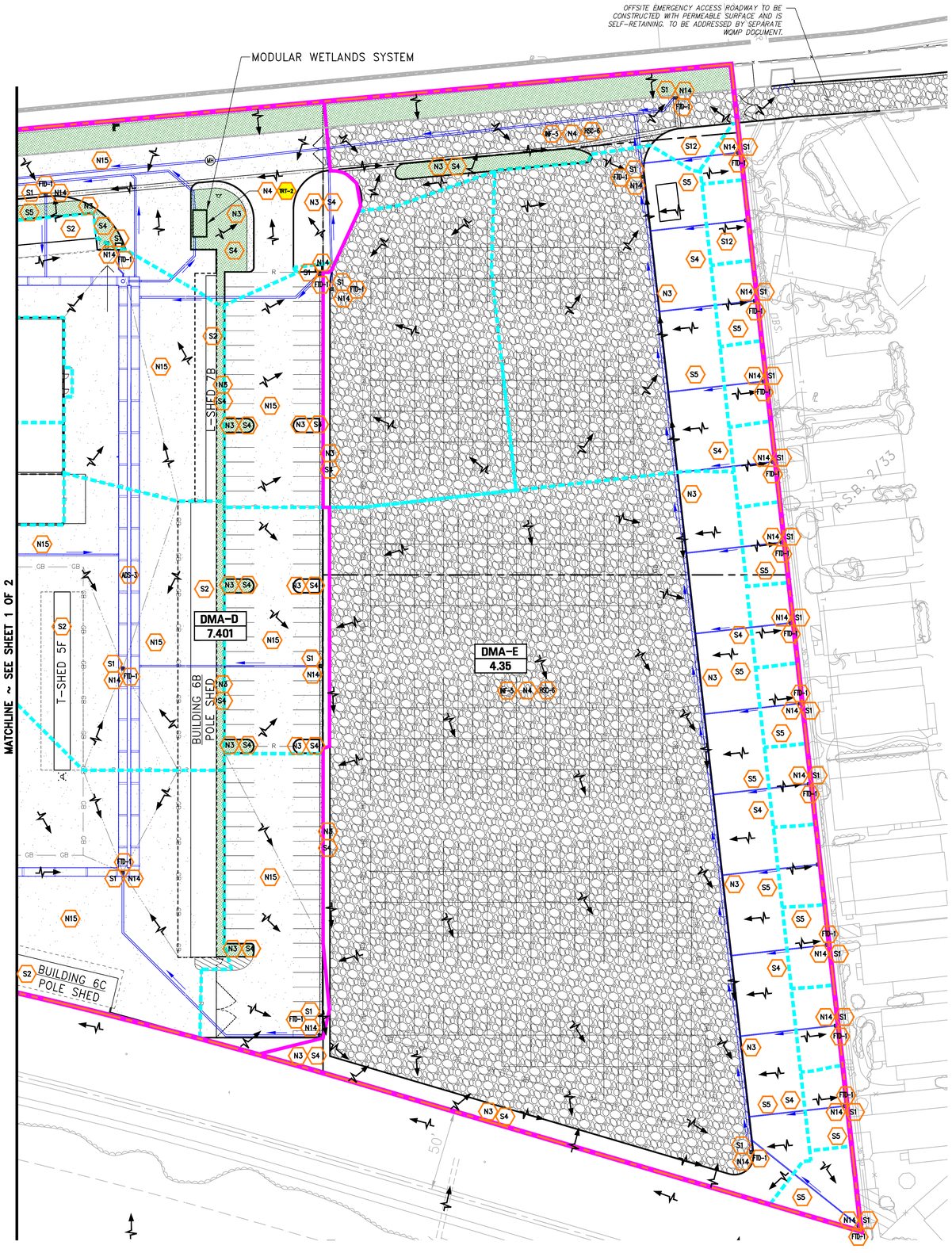
GANAHL LUMBER – SAN JUAN CAPISTRANO
25865 STONEHILL DRIVE
IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

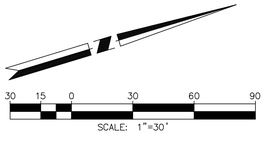
DATE	9/13/19
DRAWN BY	KJK
CHECKED BY	CDB
JOB NO.	GNH17048
SHEET NO.	1 OF 2 SHEETS

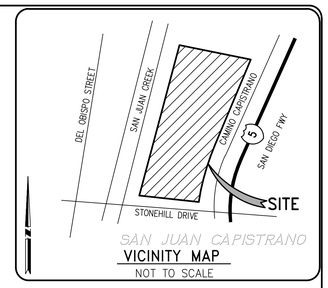
LEGEND

- DMA-A 1.382 — DRAINAGE MANAGEMENT AREA AND ACREAGE
- DRAINAGE BOUNDARY
- DRAINAGE SUB-AREA
- PROPERTY LINE
- PATTERN OF PROPOSED FLOW
- PROPOSED LANDSCAPED AREA (PERVIOUS AREA)
- PROPOSED GRAVEL (PERVIOUS AREA)
- PROPOSED PAVED AREA (IMPERVIOUS AREA)
- PROPOSED IMPERVIOUS AREA (ROOF, PAVING, ETC.)

- N_ — DENOTES NON-STRUCTURAL MEASURES
- N3 — COMMON AREA LANDSCAPE MANAGEMENT
- N4 — BMP MAINTENANCE
- N14 — COMMON AREA CATCH BASIN INSPECTION
- N15 — STREET SWEEPING PRIVATE STREETS AND PARKING LOTS
- S- — DENOTES ROUTINE STRUCTURAL SOURCE CONTROL BMPs
- S1 — STORM DRAIN SYSTEM STENCILING AND SIGNAGE
- S2 — DESIGN AND CONSTRUCT OUTDOOR MATERIAL STORAGE AREAS TO REDUCE POLLUTION INTRODUCTION
- S4 — EFFICIENT IRRIGATION SYSTEMS AND LANDSCAPE DESIGN
- S5 — PROTECT SLOPES AND CHANNELS AND PROVIDE ENERGY DISSIPATION
- INF- — DENOTES INFILTRATION BMPs
- INF-5 — PERMEABLE PAVEMENT
- TRT- — DENOTES TREATMENT CONTROL BMPs
- TRT-2 — PROPRIETARY TREATMENT CONTROL BMP (MODULAR WETLANDS BIOFILTRATION SYSTEM)
- HSC- — DENOTES HYDROLOGIC SOURCE CONTROL BMPs
- HSC-6 — SELF-RETAINING AREAS
- ADS- — DENOTES ADS DETENTION SYSTEM
- FTD- — DENOTES FULL-CAPTURE TRASH DEVICE (CATCH BASIN FILTER INSERT/SCREEN GUARD)
- DENOTES STORM DRAIN PIPE FLOW DIRECTION







VICINITY MAP
NOT TO SCALE

NO.	REVISIONS	DATE

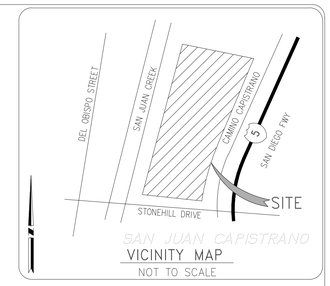
Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

WQMP EXHIBIT

GANAHL LUMBER - SAN JUAN CAPISTRANO
25865 STONEHILL DRIVE
IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	9/13/19
DRAWN BY	KJK
CHECKED BY	CDB
JOB NO.	GNH17048
SHEET NO.	2
	OF 2 SHEETS

50 25 0 50 100 150
SCALE: 1"=50'



VICINITY MAP
NOT TO SCALE

OUTFALL #1

OUTFALL #2

CULVERT

OVERFLOW SPILLWAY

OVERFLOW SPILLWAY

SAN JUAN CREEK

STONEHILL DRIVE

AT & SF RR

LEGEND
- DRAINAGE BOUNDARY
- PROPERTY LINE
- PATH OF FLOW

SOIL TYPE "A"

NO.	REVISIONS	DATE

Prepared by:
Joseph C. Truxaw and Associates, Inc.
Civil Engineers and Land Surveyors
265 S. Anita Dr., Suite 111, Orange, CA. 92868 (714)935-0265 fax:(714)935-0106

HYDROLOGY MAP– EXISTING CONDITION

PARCELS 1-5 NORTH OF STONEHILL DRIVE, EASTERLY OF SAN JUAN CREEK CHANNEL
AND WESTERLY OF A.T. & S.F. RAILROAD
IN THE CITY OF SAN JUAN CAPISTRANO, COUNTY OF ORANGE, STATE OF CALIFORNIA

DATE	9/13/19
DRAWN BY	KJK
CHECKED BY	CDB
JOB NO.	GNH17048
SHEET NO.	1 OF 1 SHEETS

Attachment F: Conceptual BMP Details

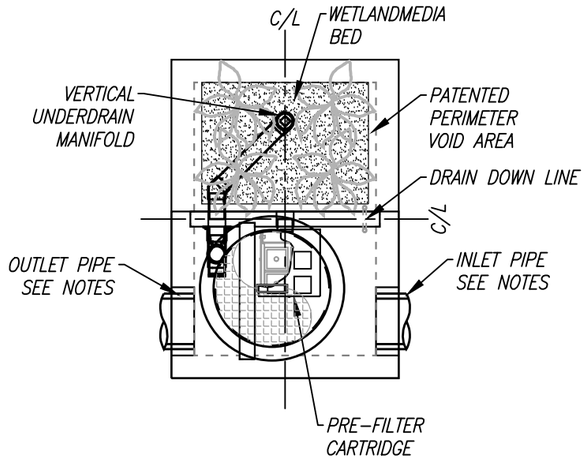
SITE SPECIFIC DATA			
PROJECT NUMBER		7814	
ORDER NUMBER		----	
PROJECT NAME		GANAHL LUMBER	
PROJECT LOCATION		SAN JUAN CAPISTRANO, CA	
STRUCTURE ID		----	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
3345		N/A	
TREATMENT HGL AVAILABLE (FT)			4.0
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	38.32	HDPE	12"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	37.82	HDPE	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	46.9	46.9	46.9
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	ø 30"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			3.77
ORIFICE SIZE (DIA. INCHES)			ø1.22"
NOTES: UNIT IS CAPABLE OF TREATING UP TO 3765 CF WQv.			

INSTALLATION NOTES

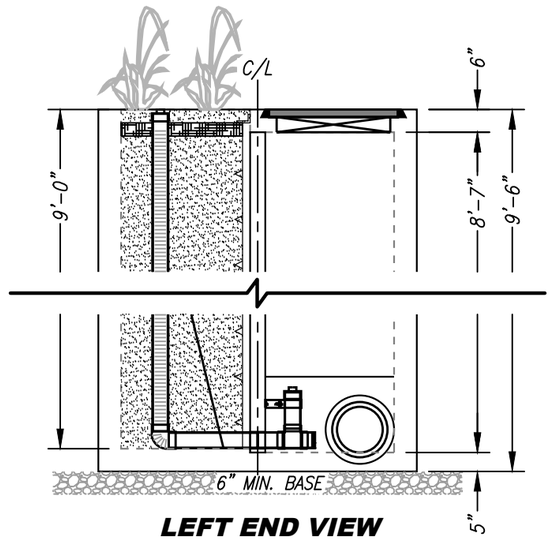
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

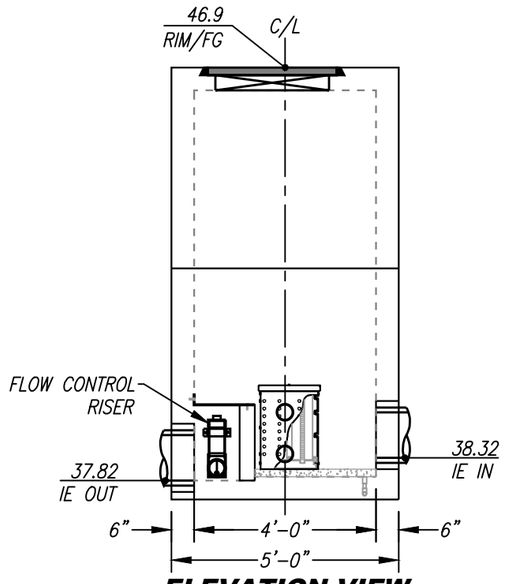
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



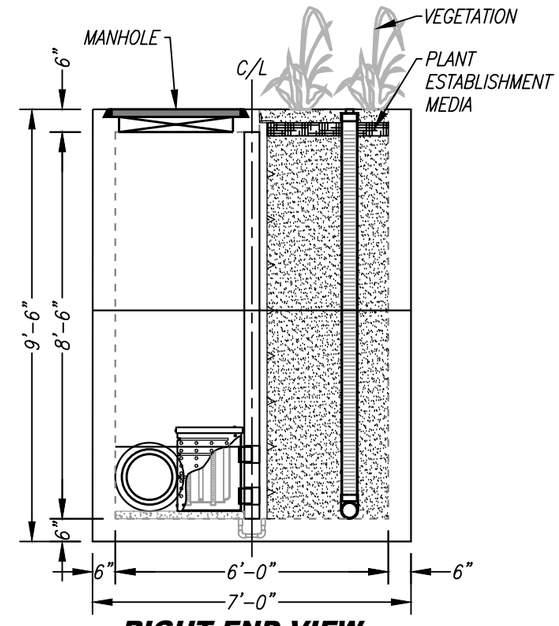
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

REQUIRED TREATMENT VOLUME (CF)	3345
DRAINDOWN DURATION (HOURS)	47
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	8.80
OPERATING HEAD (FT)	3.6
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

MODULAR WETLANDS
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

Bio Clean
A Forterra Company

MWS-L-4-6-9'-2.5"-V-HC
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

9/16/19TOLEE

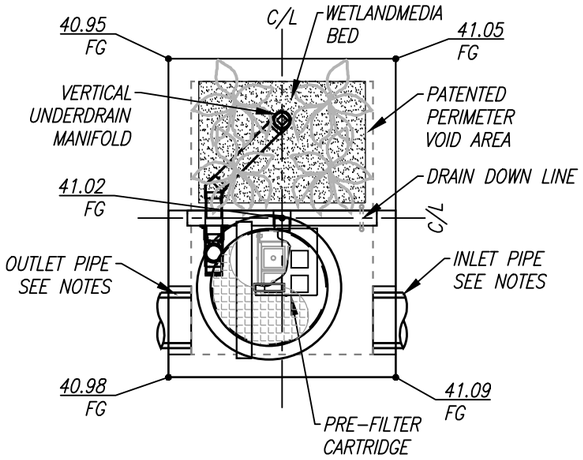
SITE SPECIFIC DATA			
PROJECT NUMBER		7814	
ORDER NUMBER		----	
PROJECT NAME		GANAHL LUMBER	
PROJECT LOCATION		SAN JUAN CAPISTRANO, CA	
STRUCTURE ID		28	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
3288		N/A	
TREATMENT HGL AVAILABLE (FT)			3.5
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	32.23	HDPE	12"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	31.73	HDPE	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	41.02	41.02	41.02
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	ø 30"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			3.86
ORIFICE SIZE (DIA. INCHES)			ø1.22"
NOTES: UNIT IS CAPABLE OF TREATING UP TO 3765 CF WQv. UNIT IS TO BE INSTALLED LEVEL AT FG 41.02 AND THE SURRONDING FG WILL TRANSITION TO THE UNIT FOR DRAINAGE PURPOSES.			

INSTALLATION NOTES

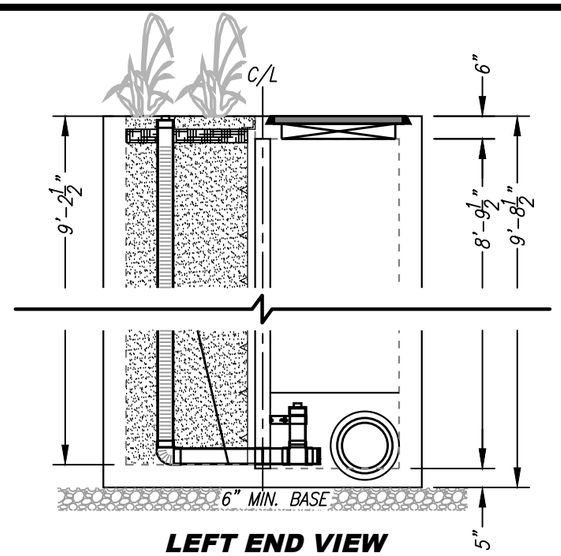
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

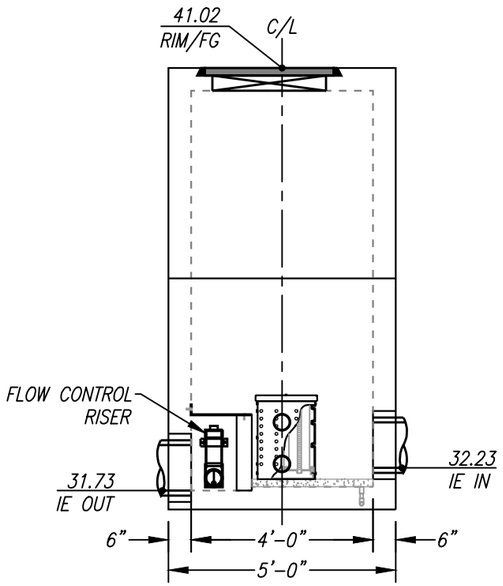
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



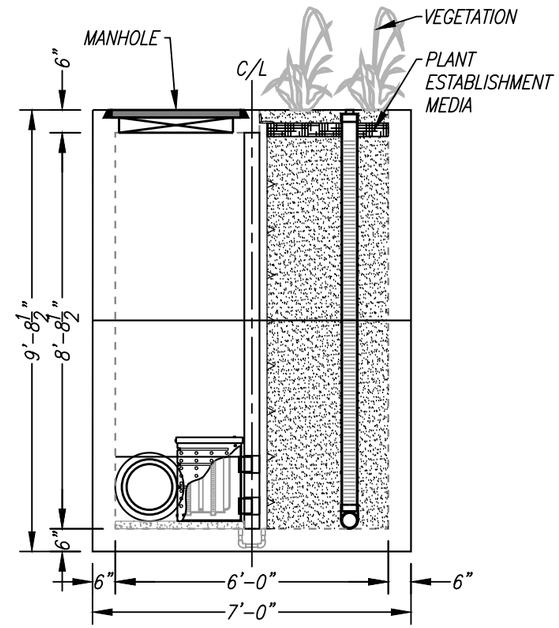
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

REQUIRED TREATMENT VOLUME (CF)	3288
DRAINDOWN DURATION (HOURS)	48
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	8.55
OPERATING HEAD (FT)	3.5
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

MODULAR WETLANDS
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

Bio Clean
A Forterra Company

MWS-L-4-6-9'-2.5"-V-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

4/11/19TOLEE

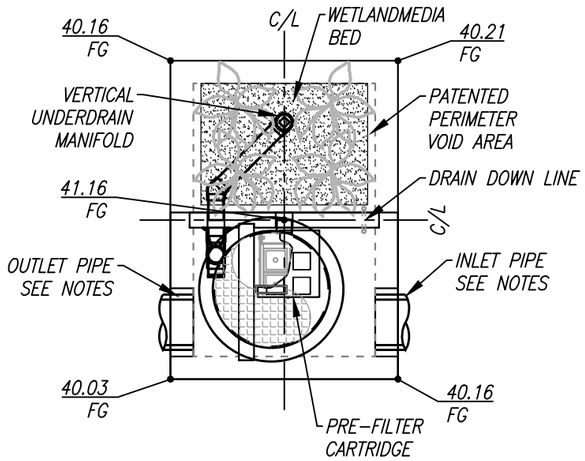
SITE SPECIFIC DATA			
PROJECT NUMBER		7814	
ORDER NUMBER		----	
PROJECT NAME		GANAHL LUMBER	
PROJECT LOCATION		SAN JUAN CAPISTRANO, CA	
STRUCTURE ID		29	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
3470		N/A	
TREATMENT HGL AVAILABLE (FT)			3.7
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	31.90	HDPE	12"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	31.40	HDPE	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	40.16	40.16	40.16
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	ø 30"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			3.64
ORIFICE SIZE (DIA. INCHES)			ø1.22"
NOTES: UNIT IS CAPABLE OF TREATING UP TO 3765 CF WQv. UNIT IS TO BE INSTALLED LEVEL AT FG 40.16 AND THE SURRONDING FG WILL TRANSITION TO THE UNIT FOR DRAINAGE PURPOSES.			

INSTALLATION NOTES

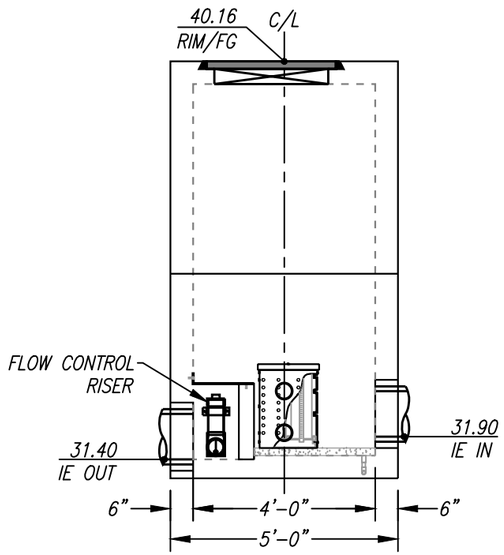
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

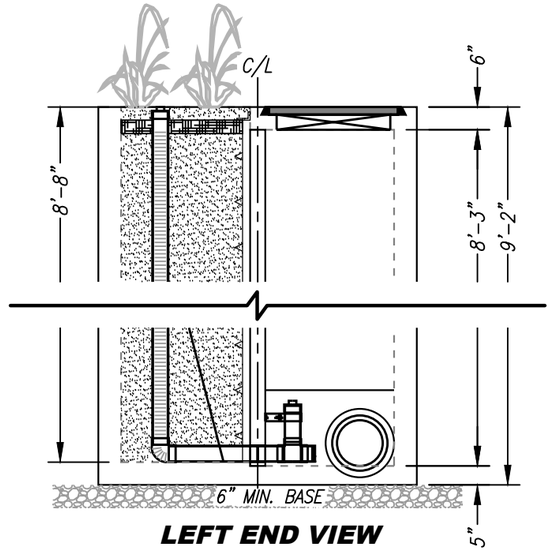
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



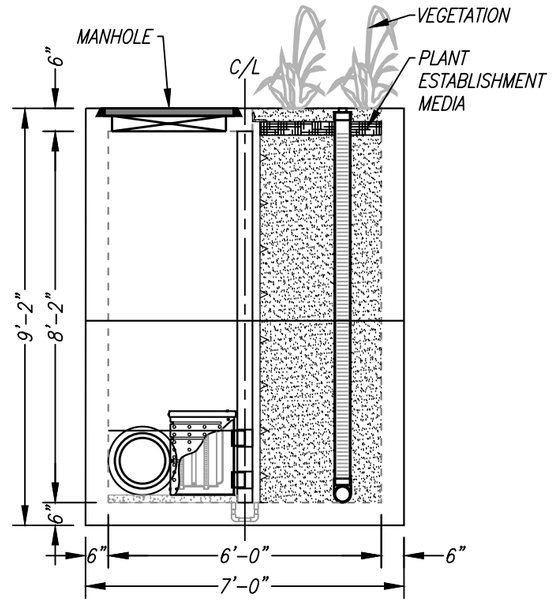
PLAN VIEW



ELEVATION VIEW



LEFT END VIEW



RIGHT END VIEW

REQUIRED TREATMENT VOLUME (CF)	3470
DRAINDOWN DURATION (HOURS)	48
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	9.04
OPERATING HEAD (FT)	3.7
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

MODULAR WETLANDS
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:

THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

Bio Clean
A Forterra Company

MWS-L-4-6-8'-8"-V-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

4/11/19TOLEE

SITE SPECIFIC DATA			
PROJECT NUMBER		7814	
ORDER NUMBER		----	
PROJECT NAME		GANAHL LUMBER	
PROJECT LOCATION		SAN JUAN CAPISTRANO, CA	
STRUCTURE ID		30	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
18405		N/A	
TREATMENT HGL AVAILABLE (FT)			3.4
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	30.70	HDPE	12"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	30.20	HDPE	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	40.06	40.06	40.06
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	2EA ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			23.17
ORIFICE SIZE (DIA. INCHES)			ø3.07"

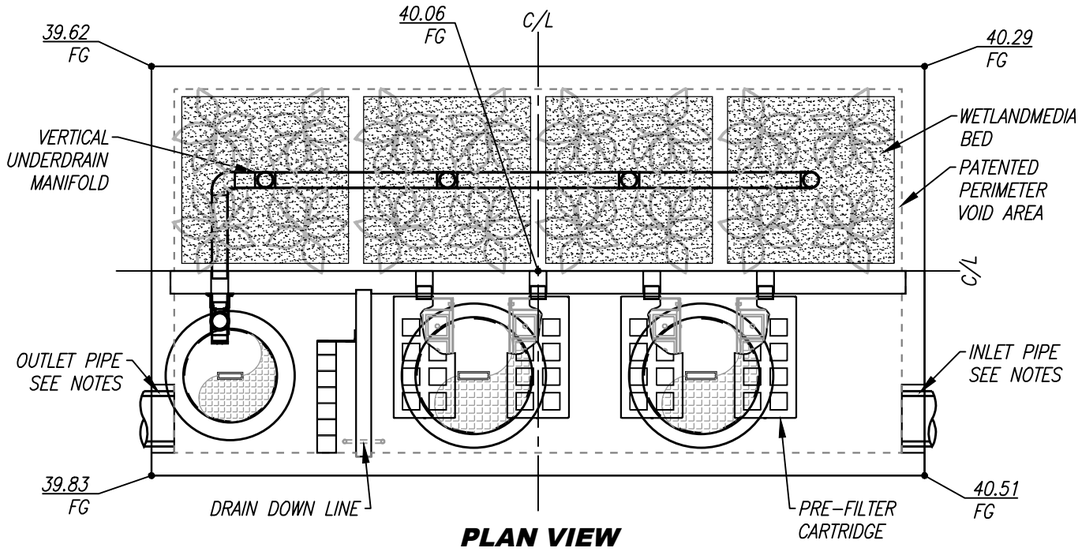
NOTES: UNIT IS CAPABLE OF TREATING UP TO 23707 CF WQv. UNIT IS TO BE INSTALLED LEVEL AT FG 40.06 AND THE SURRONDING FG WILL TRANSITION TO THE UNIT FOR DRAINAGE PURPOSES.

INSTALLATION NOTES

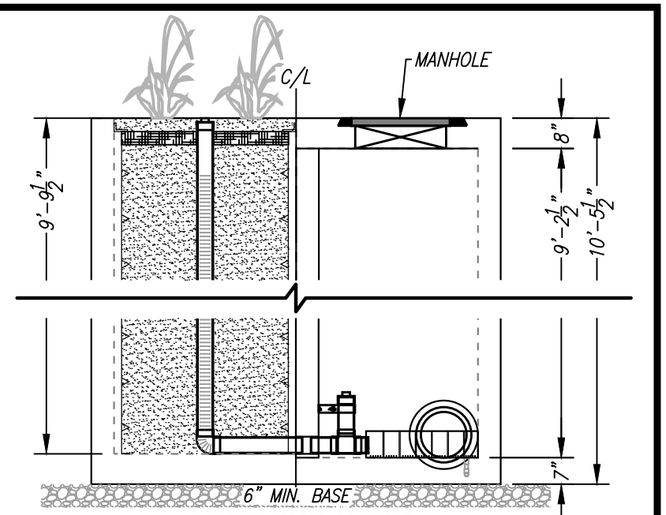
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

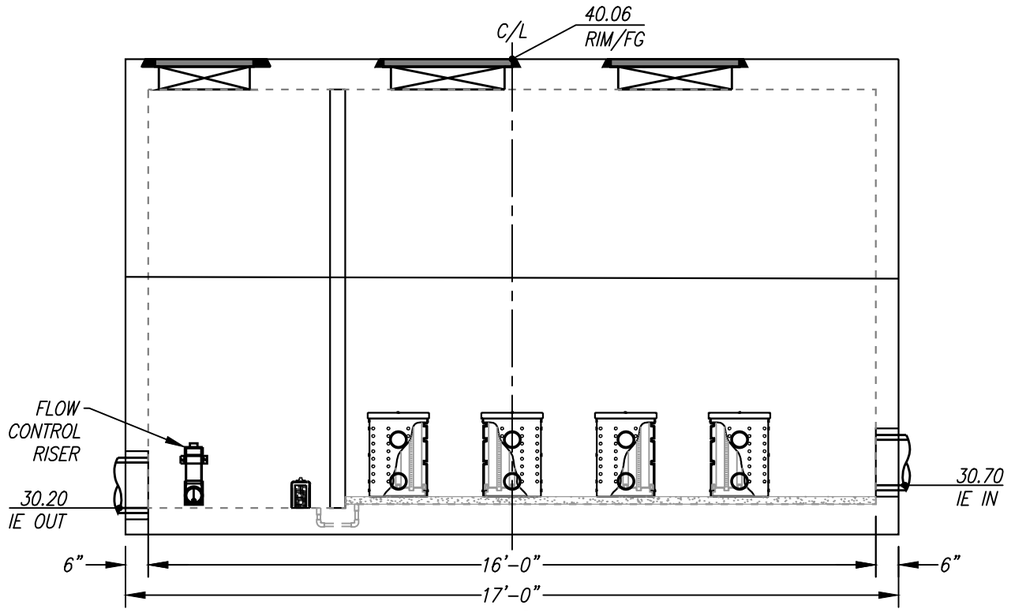
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



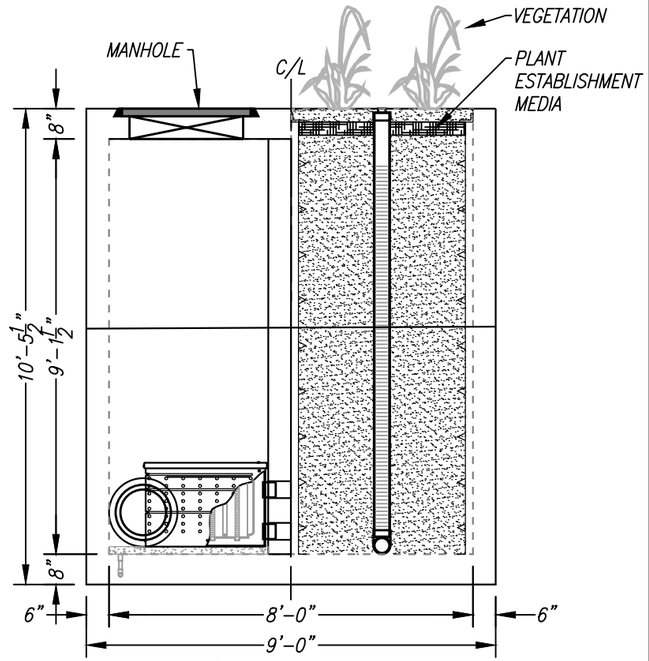
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

REQUIRED TREATMENT VOLUME (CF)	18405
DRAINDOWN DURATION (HOURS)	44
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	52.33
OPERATING HEAD (FT)	3.4
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

MODULAR WETLANDS
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,376; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

Bio Clean
A Forterra Company

MWS-L-8-16-9'-9.5"V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

4/10/19DLEE

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	TERENCE ZHAO 626-425-2874 TERENCE.ZHAO@ADS-PIPE.COM
ADS SALES REP:	ALLAN WARBRICK 760-330-0746 ALLAN.WARBRICK@ADS-PIPE.COM
PROJECT NO:	S116097

ADVANCED DRAINAGE SYSTEMS, INC.

SAN JUAN CAPISTRANO - DMA A

SAN JUAN CAPISTRANO - CA

ADS RETENTION/DETENTION PIPE SYSTEM SPECIFICATION

SCOPE
THIS SPECIFICATION DESCRIBES ADS RETENTION/DETENTION PIPE SYSTEMS FOR USE IN NON-PRESSURE GRAVITY-FLOW STORM WATER COLLECTION SYSTEMS UTILIZING A CONTINUOUS OUTFALL STRUCTURE.

PIPE REQUIREMENTS
ADS RETENTION/DETENTION SYSTEMS MAY UTILIZE ANY OF THE VARIOUS PIPE PRODUCTS BELOW:
- N-12® STIB PIPE (PER AASHTO) SHALL MEET AASHTO M 294, TYPE S OR ASTM F2306
- N-12® STIB PIPE (PER ASTM F2648) SHALL MEET ASTM F2648
- N-12® MEGA GREEN™ STIB SHALL MEET ASTM F2648

ALL PRODUCTS SHALL HAVE A SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS. ALL STIB PIPE PRODUCTS ARE AVAILABLE AS PERFORATED OR NON-PERFORATED. WTIB PIPE PRODUCTS ARE ONLY AVAILABLE AS NON-PERFORATED. PRODUCT-SPECIFIC PIPE SPECIFICATIONS ARE AVAILABLE IN THE DRAINAGE HANDBOOK SECTION 1 "SPECIFICATIONS".

JOINT PERFORMANCE
PLAIN END / SOIL-TIGHT (STIB):
STIB PIPE SHALL BE JOINED USING A BELL AND SPIGOT JOINT. THE BELL AND SPIGOT JOINT SHALL MEET THE SOIL-TIGHT REQUIREMENTS OF ASTM F2306 AND GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477.

PLAIN END PIPE AND FITTINGS CONNECTIONS SHALL BE JOINED WITH COUPLING BANDS COVERING AT LEAST TWO FULL CORRUGATIONS ON EACH END OF THE PIPE. GASKETED SOIL-TIGHT COUPLING BAND CONNECTIONS SHALL INCORPORATE A CLOSED-CELL SYNTHETIC EXPANDED RUBBER GASKET MEETING THE REQUIREMENTS OF ASTM D1056 GRADE 2A2. GASKETS, WHEN APPLICABLE, SHALL BE INSTALLED BY THE PIPE MANUFACTURER.

FITTINGS
FITTINGS SHALL CONFORM TO ASTM F2306 AND MEET JOINT PERFORMANCE INDICATED ABOVE FOR FITTINGS CONNECTIONS. CUSTOM FITTINGS ARE AVAILABLE AND MAY REQUIRE SPECIAL INSTALLATION CRITERION.

INSTALLATION
INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321 AND ADS RECOMMENDED INSTALLATION GUIDELINES, WITH THE EXCEPTION THAT MINIMUM COVER IN NON-TRAFFIC AREAS FOR 12-60 INCH (300-1500 mm) DIAMETERS SHALL BE 1 FT (0.3 m). MINIMUM COVER IN TRAFFICKED AREAS FOR 12-36 INCH (300-900 mm) DIAMETERS SHALL BE 1 FT (0.3 m) AND FOR 42-60 INCH (1050-1500 mm) DIAMETERS, THE MINIMUM COVER SHALL BE 2 FT (0.6 m). BACKFILL SHALL CONSIST OF CLASS I (COMPACTED) OR CLASS II (MINIMUM 95% SPD) MATERIAL, WITH THE EXCEPTION THAT 60 INCH (1500 mm) SYSTEMS SHALL USE CLASS I MATERIAL ONLY. MINIMUM COVER HEIGHTS DO NOT ACCOUNT FOR PIPE BUOYANCY. REFER TO ADS TECHNICAL NOTE 5.05 "PIPE FLOTATION" FOR BUOYANCY DESIGN CONSIDERATIONS. MAXIMUM COVER OVER SYSTEM USING STANDARD BACKFILL IS 8 FT (2.4 m); CONTACT A REPRESENTATIVE WHEN MAXIMUM FILL HEIGHT MAY BE EXCEEDED. ADDITIONAL INSTALLATION REQUIREMENTS ARE PROVIDED IN THE DRAINAGE HANDBOOK SECTION 6 "RETENTION/DETENTION".

ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES:

1) ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS, INLETS AND OUTLETS, SHALL BE VERIFIED BY THE ENGINEER PRIOR TO RELEASING FOR FABRICATION.

2) IN SITUATIONS WHERE A FINE-GRAINED BACKFILL MATERIAL IS USED ADJACENT TO THE PIPE SYSTEM, AND ESPECIALLY INVOLVING GROUND WATER CONDITIONS, CONSIDERATION SHOULD BE GIVEN TO THE USE OF GASKETED PIPE JOINTS. AT THE VERY LEAST THE PIPE JOINTS SHOULD BE WRAPPED IN A SUITABLE, NON-WOVEN GEOTEXTILE FABRIC TO PREVENT INFILTRATION OF FINES INTO THE PIPE SYSTEM.

3) CONSIDERATION FOR CONSTRUCTION EQUIPMENT LOADS MUST BE TAKEN INTO ACCOUNT.

4) ALL PIPE DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

5) ALL RISERS TO BE FIELD EXTENDED OR TRIMMED TO FINAL GRADE.

THE UNDERSIGNED HERBY APPROVES THE ATTACHED PAGES.

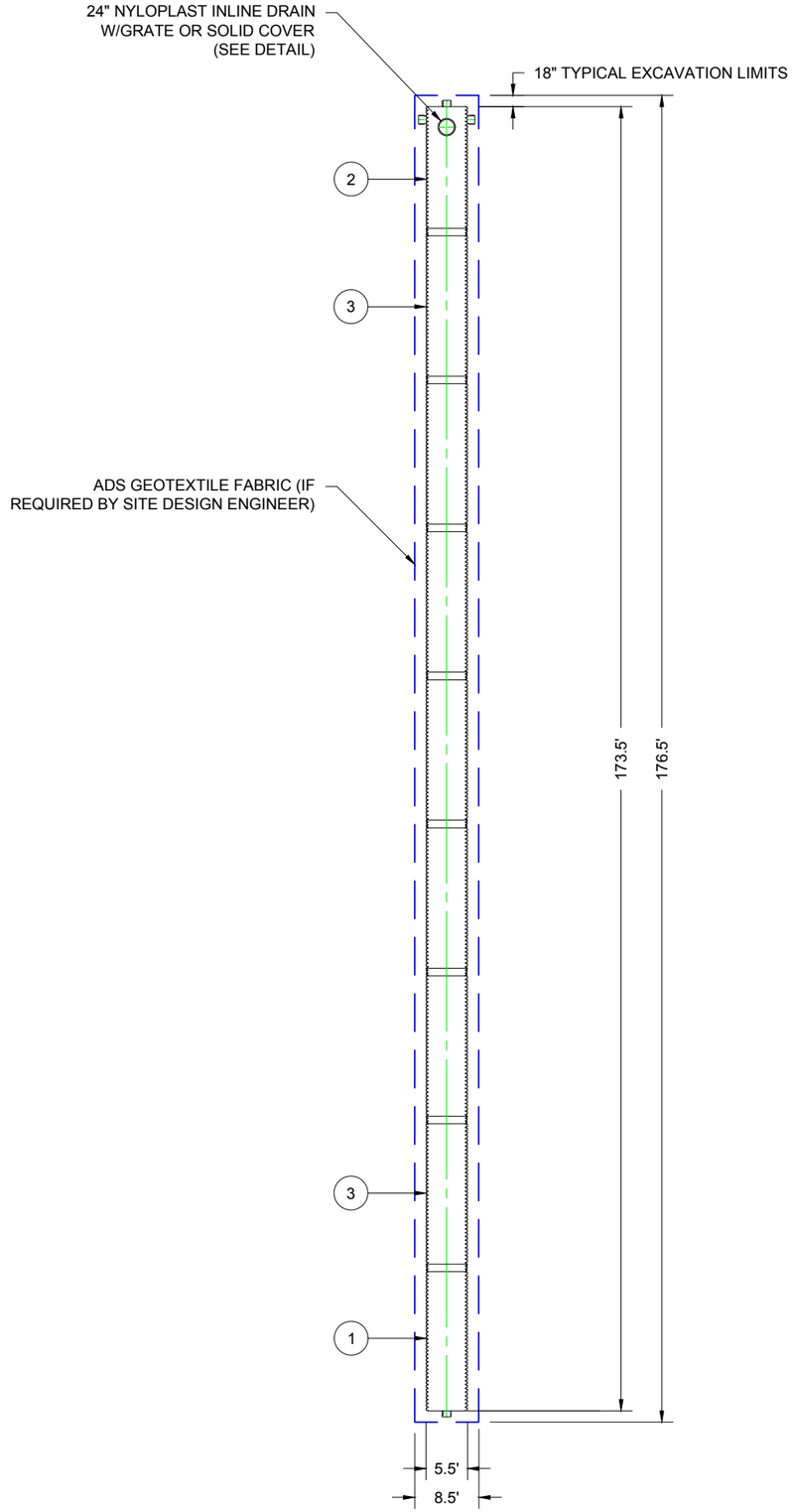
CUSTOMER DATE

©2013 ADS, INC.

BILL OF MATERIALS

*THE COMPONENTS AND QUANTITIES LISTED HEREIN ARE NOT INTENDED TO BE A COMPREHENSIVE MATERIAL LIST.
EXTRA COMPONENTS, NOT LISTED HEREIN, MAY BE NECESSARY TO COMPLETE THE CONSTRUCTION OF THE SYSTEM.

ITEM	QTY.	PART #	DESCRIPTION	MATERIAL	VENDOR	NOTE
1	1	STICK-1	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
2	1	STICK-2	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
3	7	6065-0020IB	60" PIPE STICK : SOLID	HDPE	ADS	WTIB
	1	2724AG	24" NYLOPLAST INLINE DRAIN	AS SPECIFIED	ADS	SEE DETAIL
	1	TBD BY ENGINEER	ADS GEOTEXTILE FABRIC	AS SPECIFIED	ADS	AS NEEDED



NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE PIPE COVER REQUIREMENTS ARE MET.
- STUB SIZES AND INVERTS TO BE VERIFIED BY THE SITE DESIGN ENGINEER PRIOR TO FABRICATION.
- ADS RISERS ARE FABRICATED 36" (900 mm) FROM TOP OF PIPE TO TOP OF RISER DUE TO SHIPPING LIMITATIONS. ADDITIONAL PIPE AND COUPLERS CAN BE USED TO EXTEND THE RISERS TO GRADE.

SAN JUAN CAPISTRANO - DMA A
SAN JUAN CAPISTRANO - CA

DATE: 9/9/19 DRAWN: MJK CHECKED: JWE
PROJECT #: S116097

DATE	DRWN	CHKD	DESCRIPTION

60" WTIB
DETENTION SYSTEM

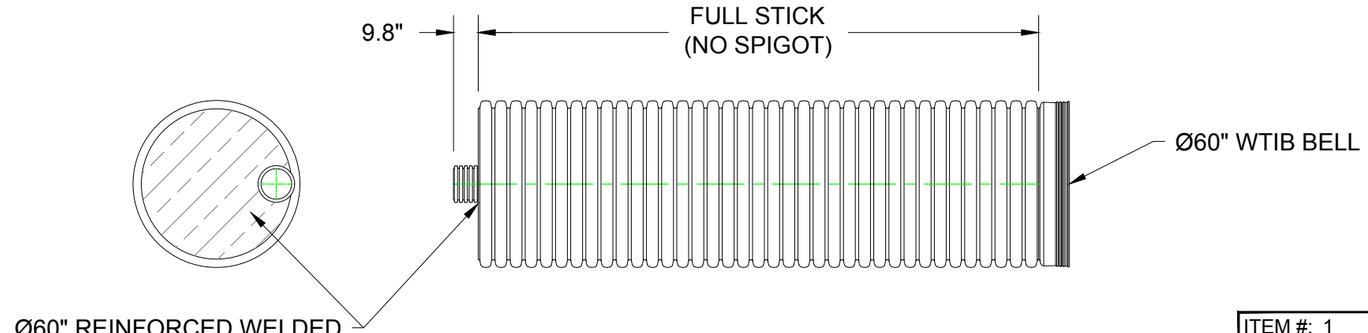
HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADVANCED DRAINAGE SYSTEMS, INC.

0 20' 40'

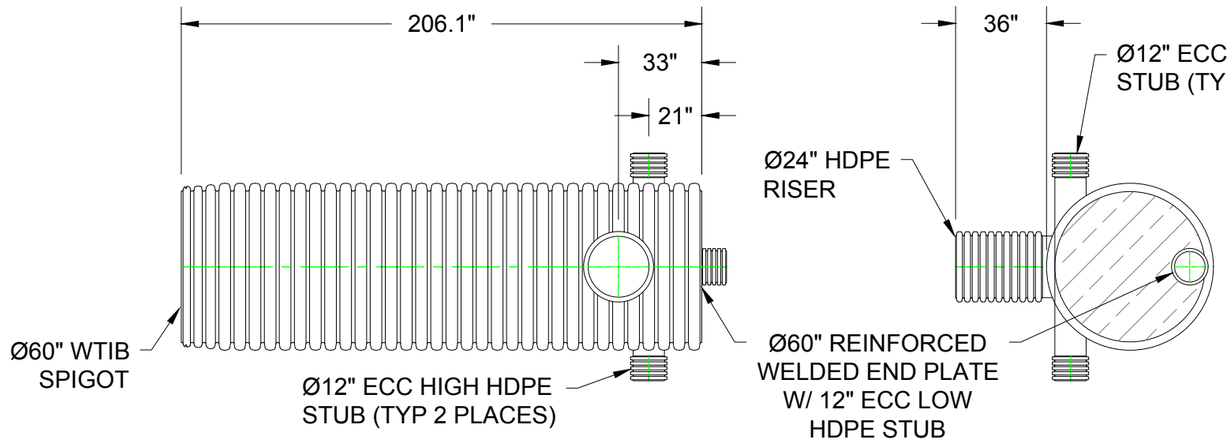
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

60" PIPE STICK : SOLID W/ 12" STUB & WELDED END PLATE



ITEM #: 1
QTY: 1
STICK-1

60" PIPE STICK : SOLID W/ (3) 12" STUBS, 24" RISER, & WELDED END PLATE



ITEM #: 2
QTY: 1
STICK-2

SAN JUAN CAPISTRANO - DMA A
SAN JUAN CAPISTRANO - CA
DATE: 9/9/19 DRAWN: MJK
PROJECT #: S116097 CHECKED: JWE

DATE	DRWN	CHKD	DESCRIPTION

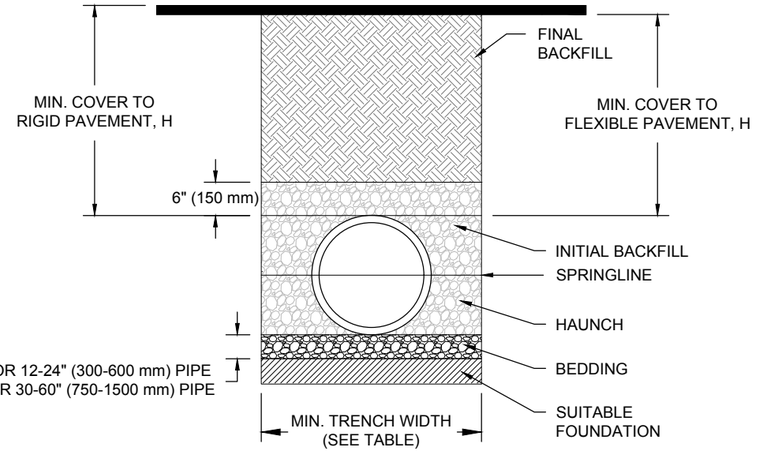
60" WTIB
DETENTION SYSTEM
HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ADS HDPE TYPICAL TRENCH DETAIL

NTS



NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100 mm) FOR 4-24" (100-600 mm); 6" (150 mm) FOR 30-60" (750-900 mm).

5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" (150 mm) ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (300 mm) FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" (300 mm) UP TO 48" (1200 mm) DIAMETER PIPE AND 24" (600 mm) OF COVER FOR 54-60" (1350-1500 mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
4" (100 mm)	21" (530 mm)
6" (150 mm)	23" (580 mm)
8" (200 mm)	26" (660 mm)
10" (250 mm)	28" (710 mm)
12" (300 mm)	30" (750 mm)
15" (375 mm)	34" (860 mm)
18" (450 mm)	39" (990 mm)
24" (600 mm)	48" (1200 mm)
30" (750 mm)	56" (1420 mm)
36" (900 mm)	64" (1620 mm)
42" (1050 mm)	72" (1820 mm)
48" (1200 mm)	80" (2020 mm)
54" (1350 mm)	88" (2230 mm)
60" (1500 mm)	96" (2440 mm)

MINIMUM RECOMMENDED COVER BASED ON VECHICLE LOADING CONDITIONS

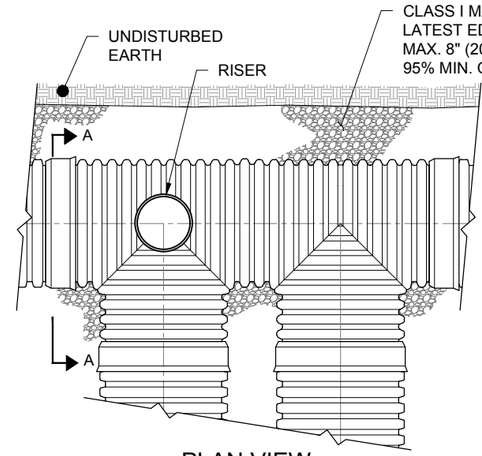
	SURFACE LIVE LOADING CONDITION	
PIPE DIAM.	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12-48" (300-1200 mm)	12" (300 mm)	48" (1200 mm)
54-60" (1350-1500 mm)	24" (600 mm)	60" (1500 mm)

* VEHICLES WITH AXLE LOADS IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

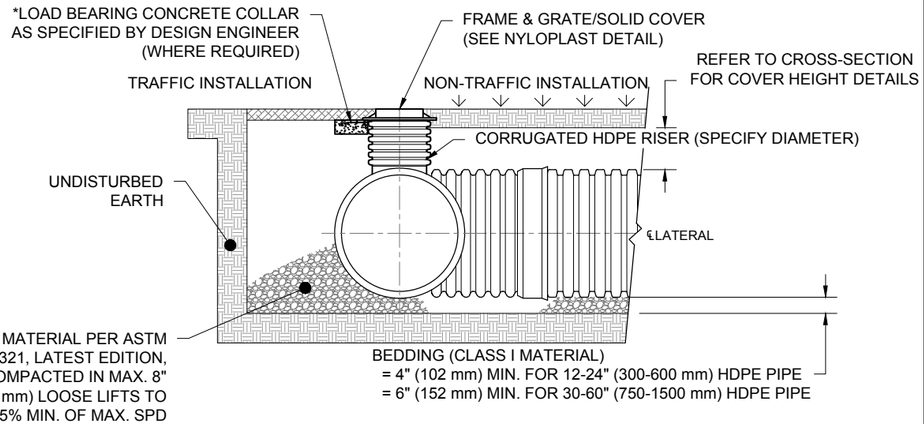
MINIMUM RECOMMENDED COVER BASED ON RAILWAY LOADING CONDITIONS

PIPE DIAMETER	COOPER E-80**
UP TO 24" (600 mm)	24" (600 mm)
30-36" (750-900 mm)	36" (900 mm)
42-60" (1050-1500 mm)	48" (1200 mm)

** COVER IS MEASURED FROM TOP OF PIPE TO BOTTOM OF RAILWAY TIE.
*** E-80 COVER REQUIREMENTS, ARE ONLY APPLICABLE TO ASTM F 2306 PIPE.



PLAN VIEW



SECTION A-A

* LOAD BEARING CONCRETE COLLAR SHALL BE CONSTRUCTED IN TRAFFIC AREAS SUCH THAT THE LIVE LOAD IS TRANSMITTED TO THE SURROUNDING SOIL AND NOT DIRECTLY TO THE RISER.

SAN JUAN CAPISTRANO - DMA A
SAN JUAN CAPISTRANO - CA

DATE: 9/9/19 | DRAWN: MJK | CHECKED: JWE
PROJECT #: S116097

DATE	DRWN	CHKD	DESCRIPTION

60" WTIB DETENTION SYSTEM

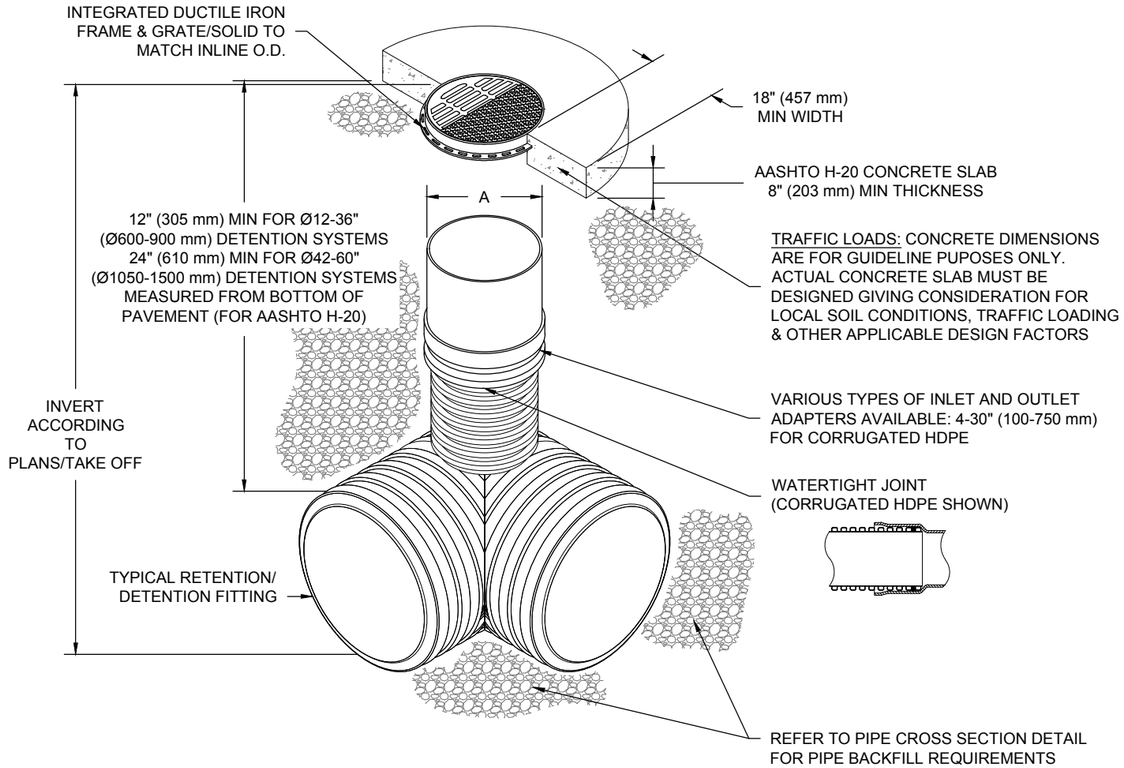
HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

NYLOPLAST INLINE DRAIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2708AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2710AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2712AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2715AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2718AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2724AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2730AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

SAN JUAN CAPISTRANO - DMA A

SAN JUAN CAPISTRANO - CA

DATE: 9/9/19 | DRAWN: MJK | PROJECT #: S116097 | CHECKED: JWE

DATE	DRWN	CHKD	DESCRIPTION

3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

Nyloplast

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	TERENCE ZHAO 626-425-2874 TERENCE.ZHAO@ADS-PIPE.COM
ADS SALES REP:	ARNE ERIKSEN 951-796-2048 ARNE.ERIKSEN@ADS-PIPE.COM
PROJECT NO:	S116097

ADVANCED DRAINAGE SYSTEMS, INC.

SAN JUAN CAPISTRANO - DMA B

SAN JUAN CAPISTRANO, CA

ADS RETENTION/DETENTION PIPE SYSTEM SPECIFICATION

SCOPE

THIS SPECIFICATION DESCRIBES ADS RETENTION/DETENTION PIPE SYSTEMS FOR USE IN NON-PRESSURE GRAVITY-FLOW STORM WATER COLLECTION SYSTEMS UTILIZING A CONTINUOUS OUTFALL STRUCTURE.

PIPE REQUIREMENTS

ADS RETENTION/DETENTION SYSTEMS MAY UTILIZE ANY OF THE VARIOUS PIPE PRODUCTS BELOW:

- N-12® WTIB PIPE (PER AASHTO) SHALL MEET AASHTO M 294, TYPE S OR ASTM F2306
- N-12® WTIB PIPE (PER ASTM F2648) SHALL MEET ASTM F2648
- N-12® MEGA GREEN™ WTIB SHALL MEET ASTM F2648

ALL PRODUCTS SHALL HAVE A SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS. ALL STIB PIPE PRODUCTS ARE AVAILABLE AS PERFORATED OR NON-PERFORATED. WTIB PIPE PRODUCTS ARE ONLY AVAILABLE AS NON-PERFORATED. PRODUCT-SPECIFIC PIPE SPECIFICATIONS ARE AVAILABLE IN THE DRAINAGE HANDBOOK SECTION 1 "SPECIFICATIONS".

JOINT PERFORMANCE

WATERTIGHT (WTIB):
WTIB PIPE SHALL BE JOINED USING A BELL AND SPIGOT JOINT. THE JOINT SHALL BE WATERTIGHT ACCORDING TO THE REQUIREMENTS OF ASTM D3212. GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. 12-60 INCH (300-1500 mm) DIAMETERS SHALL HAVE A BELL REINFORCED WITH A POLYMER COMPOSITE BAND. THE BELL TOLERANCE DEVICE SHALL BE INSTALLED BY THE MANUFACTURER.

PIPE AND FITTING CONNECTIONS SHALL BE WITH A BELL AND SPIGOT CONNECTION UTILIZING A SPUN-ON OR WELDED BELL AND VALLEY OR SADDLE GASKET. THE JOINT SHALL MEET THE WATERTIGHT REQUIREMENTS OF ASTM D3212, AND GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. DETENTION SYSTEMS ARE SUBJECT TO GREATER LEAKAGE THAN TYPICAL SINGLE RUN STORM SEWER APPLICATIONS AND THEREFORE ARE NOT APPROPRIATE FOR APPLICATIONS REQUIRING LONG-TERM FLUID CONTAINMENT OR HYDROSTATIC PRESSURE. FOR ADDITIONAL DETAILS REFER TO TECHNICAL NOTE 7.01 "RAINWATER HARVESTING WITH HDPE PIPE CISTERNS".

FITTINGS

FITTINGS SHALL CONFORM TO ASTM F2306 AND MEET JOINT PERFORMANCE INDICATED ABOVE FOR FITTINGS CONNECTIONS. CUSTOM FITTINGS ARE AVAILABLE AND MAY REQUIRE SPECIAL INSTALLATION CRITERION.

INSTALLATION

INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321 AND ADS RECOMMENDED INSTALLATION GUIDELINES, WITH THE EXCEPTION THAT MINIMUM COVER IN NON-TRAFFIC AREAS FOR 12-60 INCH (300-1500 mm) DIAMETERS SHALL BE 1 FT (0.3 m). MINIMUM COVER IN TRAFFICKED AREAS FOR 12-36 INCH (300-900 mm) DIAMETERS SHALL BE 1 FT (0.3 m) AND FOR 42-60 INCH (1050-1500 mm) DIAMETERS, THE MINIMUM COVER SHALL BE 2 FT (0.6 m). BACKFILL SHALL CONSIST OF CLASS I (COMPACTED) OR CLASS II (MINIMUM 95% SPD) MATERIAL, WITH THE EXCEPTION THAT 60 INCH (1500 mm) SYSTEMS SHALL USE CLASS I MATERIAL ONLY. MINIMUM COVER HEIGHTS DO NOT ACCOUNT FOR PIPE BUOYANCY. REFER TO ADS TECHNICAL NOTE 5.05 "PIPE FLOTATION" FOR BUOYANCY DESIGN CONSIDERATIONS. MAXIMUM COVER OVER SYSTEM USING STANDARD BACKFILL IS 8 FT (2.4 m); CONTACT A REPRESENTATIVE WHEN MAXIMUM FILL HEIGHT MAY BE EXCEEDED. ADDITIONAL INSTALLATION REQUIREMENTS ARE PROVIDED IN THE DRAINAGE HANDBOOK SECTION 6 "RETENTION/DETENTION".

ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES:

1) ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS, INLETS AND OUTLETS, SHALL BE VERIFIED BY THE ENGINEER PRIOR TO RELEASING FOR FABRICATION.

2) IN SITUATIONS WHERE A FINE-GRAINED BACKFILL MATERIAL IS USED ADJACENT TO THE PIPE SYSTEM, AND ESPECIALLY INVOLVING GROUND WATER CONDITIONS, CONSIDERATION SHOULD BE GIVEN TO THE USE OF GASKETED PIPE JOINTS. AT THE VERY LEAST THE PIPE JOINTS SHOULD BE WRAPPED IN A SUITABLE, NON-WOVEN GEOTEXTILE FABRIC TO PREVENT INFILTRATION OF FINES INTO THE PIPE SYSTEM.

3) CONSIDERATION FOR CONSTRUCTION EQUIPMENT LOADS MUST BE TAKEN INTO ACCOUNT.

4) ALL PIPE DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

5) ALL RISERS TO BE FIELD EXTENDED OR TRIMMED TO FINAL GRADE.

THE UNDERSIGNED HERBY APPROVES THE ATTACHED PAGES.

CUSTOMER DATE

©2013 ADS, INC.

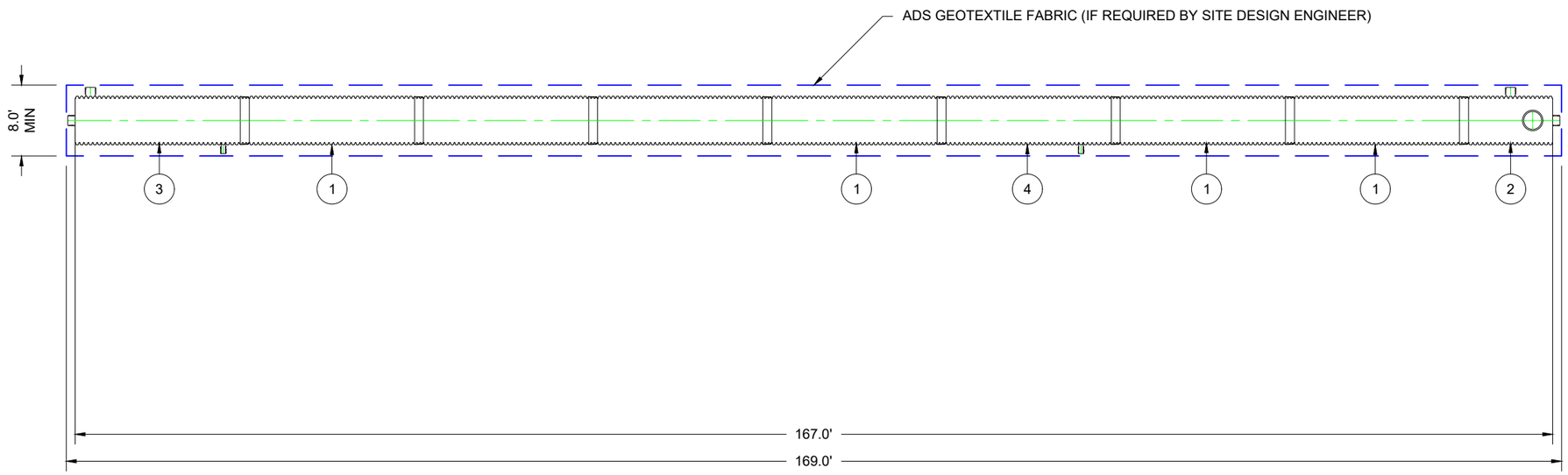
BILL OF MATERIALS

*THE COMPONENTS AND QUANTITIES LISTED HEREIN ARE NOT INTENDED TO BE A COMPREHENSIVE MATERIAL LIST.
EXTRA COMPONENTS, NOT LISTED HEREIN, MAY BE NECESSARY TO COMPLETE THE CONSTRUCTION OF THE SYSTEM.

ITEM	QTY.	PART #	DESCRIPTION	MATERIAL	VENDOR	NOTE
1	6	6065-0020IB	60" PIPE STICK : SOLID	HDPE	ADS	WTIB
2	1	STICK-01	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
3	1	STICK-02	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
4	1	STICK-03	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
	1	TBD BY ENGINEER	ADS GEOTEXTILE FABRIC	AS SPECIFIED	ADS	AS REQUIRED

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE PIPE COVER REQUIREMENTS ARE MET.
- STUB SIZES AND INVERTS TO BE VERIFIED BY THE SITE DESIGN ENGINEER PRIOR TO FABRICATION.
- ADS RISERS ARE FABRICATED 36" (900 mm) FROM TOP OF PIPE TO TOP OF RISER DUE TO SHIPPING LIMITATIONS. ADDITIONAL PIPE AND COUPLERS CAN BE USED TO EXTEND THE RISERS TO GRADE.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.



SAN JUAN CAPISTRANO - DMA B
SAN JUAN CAPISTRANO, CA
DATE: 01-28-19
DRAWN: KR
PROJECT #: S116097
CHECKED: AJD

DATE	DRWN	CHKD	DESCRIPTION

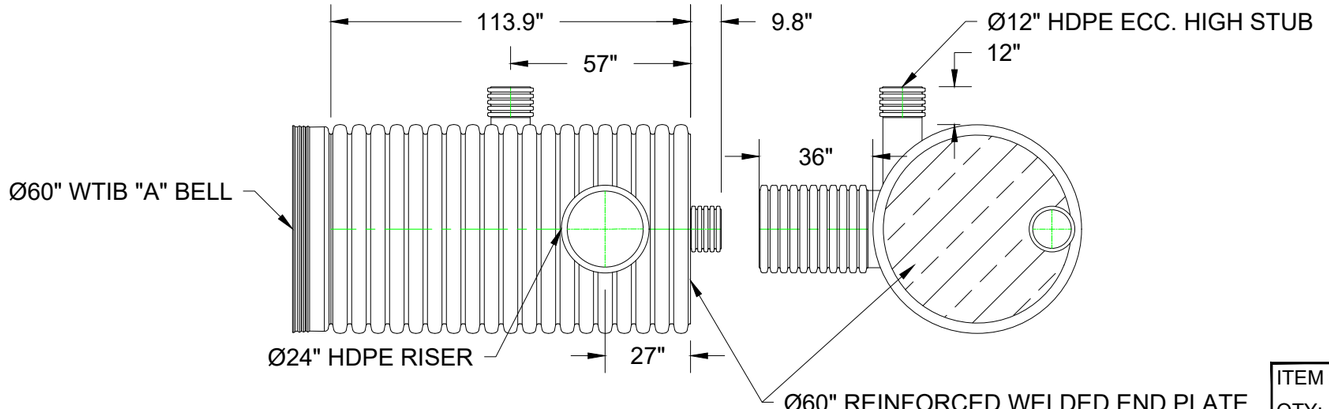
60" WTIB : SOLID
DETENTION
HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADVANCED DRAINAGE SYSTEMS, INC.

0 15' 30'

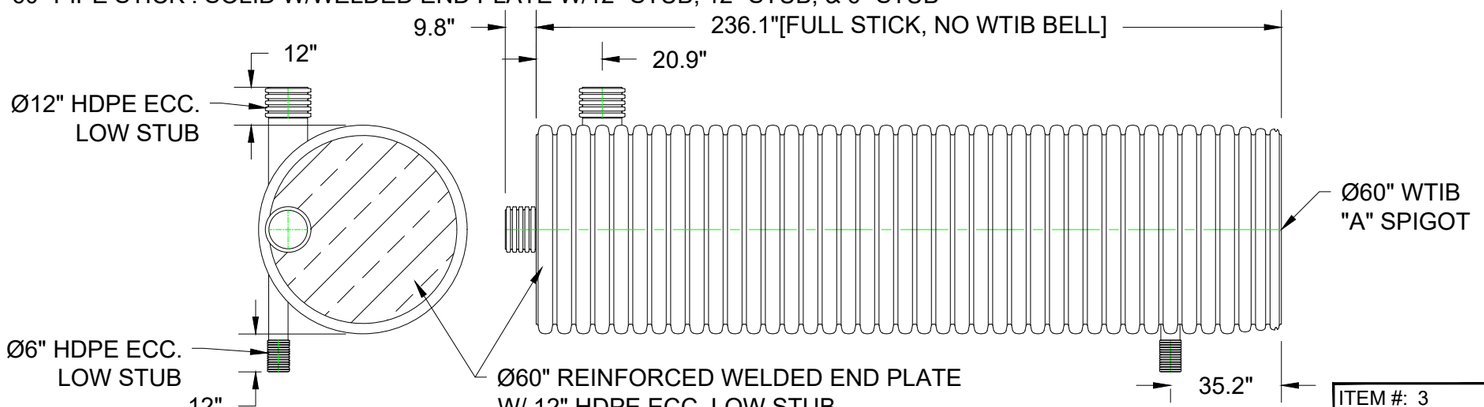
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

60" PIPE STICK : SOLID W/WELDED AND PLATE W/12" STUB, 12" STUB, & 24" RISER



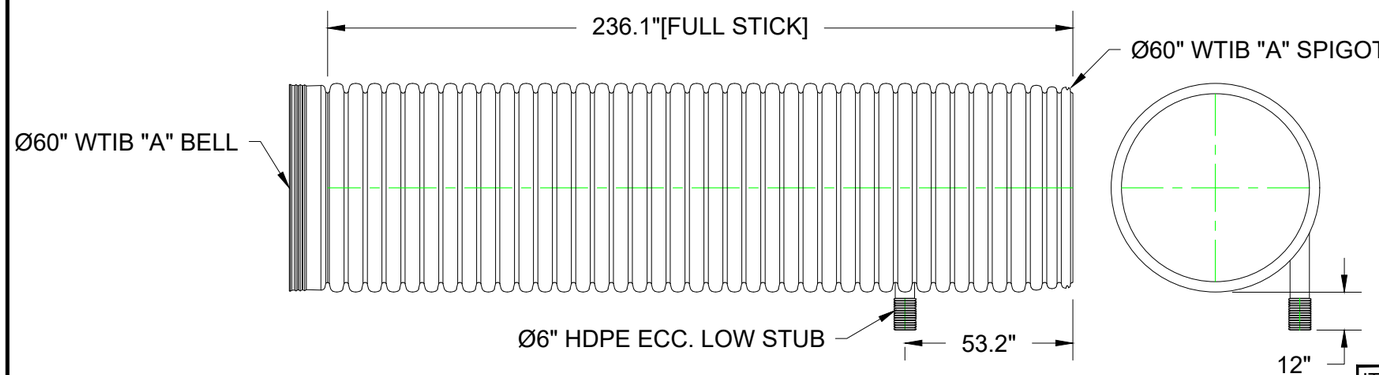
ITEM #: 2
QTY: 1
STICK-01

60" PIPE STICK : SOLID W/WELDED END PLATE W/12" STUB, 12" STUB, & 6" STUB



ITEM #: 3
QTY: 1
STICK-02

60" PIPE STICK : SOLID W/6" STUB



ITEM #: 4
QTY: 1
STICK-03

SAN JUAN CAPISTRANO - DMA B
SAN JUAN CAPISTRANO, CA
DATE: 01-28-19 DRAWN: KR
PROJECT #: S116097 CHECKED: AJD

DATE	DRWN	CHKD	DESCRIPTION

60" WTIB : SOLID
DETENTION

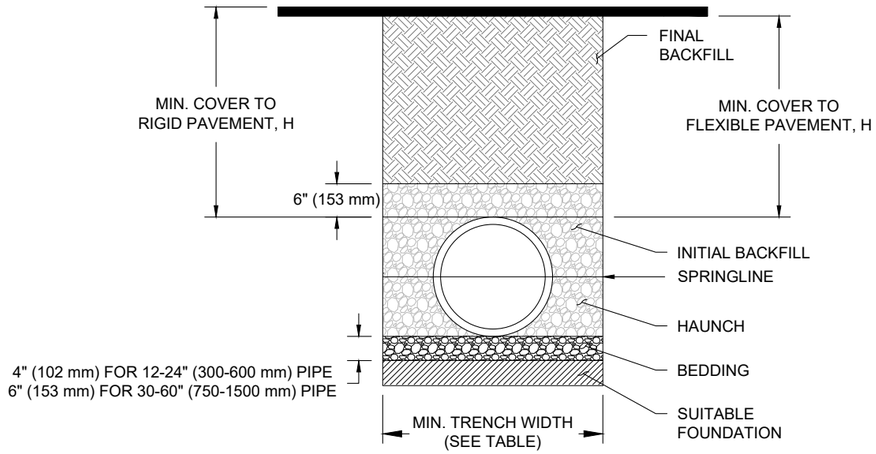
HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ADS HDPE TYPICAL TRENCH DETAIL

NTS



RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
4" (100 mm)	21" (533 mm)
6" (150 mm)	23" (584 mm)
8" (200 mm)	26" (660 mm)
10" (250 mm)	28" (711 mm)
12" (300 mm)	30" (762 mm)
15" (375 mm)	34" (864 mm)
18" (450 mm)	39" (991 mm)
24" (600 mm)	48" (1219 mm)
30" (750 mm)	56" (1422 mm)
36" (900 mm)	64" (1626 mm)
42" (1050 mm)	72" (1829 mm)
48" (1200 mm)	80" (2032 mm)
60" (1500 mm)	96" (2438 mm)

MINIMUM RECOMMENDED COVER BASED ON VECHICLE LOADING CONDITIONS**

PIPE DIAM.	SURFACE LIVE LOADING CONDITION	
	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12-48" (300-1200 mm)	12" (305 mm)	48" (1219 mm)
60" (1500 mm)	24" (610 mm)	60" (1524 mm)

* VEHICLES WITH AXLE LOADS IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

** SEE BACKFILL REQUIREMENTS IN NOTE 6

MINIMUM RECOMMENDED COVER BASED ON RAILWAY LOADING CONDITIONS

PIPE DIAMETER	COOPER E-80**
UP TO 24" (600 mm)	24" (610 mm)
30-36" (750-900 mm)	36" (914 mm)
42-60" (1050-1500 mm)	48" (1219 mm)

** COVER IS MEASURED FROM TOP OF PIPE TO BOTTOM OF RAILWAY TIE.

*** E-80 COVER REQUIREMENTS, ARE ONLY APPLICABLE TO ASTM F 2306 PIPE.

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (102 mm) FOR 4-24" (100-600 mm); 6" (153 mm) FOR 30-60" (750-900 mm).

5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" (150 mm) ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (305 mm) FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" (305 mm) UP TO 48" (1200 mm) DIAMETER PIPE AND 24" (610 mm) OF COVER FOR 60" (1500 mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. FOR TRAFFIC APPLICATIONS WITH LESS THAN FOUR FEET OF COVER, EMBEDMENT OF THE PIPE SHALL BE USING ONLY A CLASS I OR CLASS II BACKFILL.

MAXIMUM RECOMMENDED COVER BASED ON BACKFILL MATERIAL AND COMPACTION EFFORT

PIPE DIAM.	CLASS I		CLASS II		CLASS III
	COMPACTED	DUMPED	95%	90%	95%
4" (100 mm)	37' (11.3 m)	18' (5.5 m)	25' (7.6 m)	18' (5.5 m)	18' (5.5 m)
6" (150 mm)	44' (13.4 m)	20' (6.1 m)	29' (8.8 m)	20' (6.1 m)	21' (6.4 m)
8" (200 mm)	32' (9.8 m)	15' (4.6 m)	22' (6.7 m)	15' (4.6 m)	16' (4.9 m)
10" (250 mm)	38' (11.6 m)	18' (5.5 m)	26' (7.9 m)	18' (5.5 m)	18' (5.5 m)
12" (300 mm)	35' (10.7 m)	17' (5.2 m)	24' (7.3 m)	17' (5.2 m)	17' (5.2 m)
15" (375 mm)	38' (11.6 m)	17' (5.2 m)	25' (7.6 m)	17' (5.2 m)	18' (5.5 m)
18" (450 mm)	36' (11.0 m)	17' (5.2 m)	24' (7.3 m)	17' (5.2 m)	17' (5.2 m)
24" (600 mm)	28' (8.5 m)	13' (4.0 m)	20' (6.1 m)	13' (4.0 m)	14' (4.3 m)
30" (750 mm)	28' (8.5 m)	13' (4.0 m)	20' (6.1 m)	13' (4.0 m)	14' (4.3 m)
36" (900 mm)	26' (7.9 m)	12' (3.7 m)	18' (5.5 m)	13' (4.0 m)	13' (4.0 m)
42" (1050 mm)	23' (7.0 m)	11' (3.4 m)	16' (4.9 m)	11' (3.4 m)	11' (3.4 m)
48" (1200 mm)	25' (7.6 m)	11' (3.4 m)	17' (5.2 m)	11' (3.4 m)	12' (3.7 m)
60" (1500 mm)	25' (7.6 m)	11' (3.4 m)	17' (5.2 m)	11' (3.4 m)	12' (3.7 m)

FILL HEIGHT TABLE GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:

- NO HYDROSTATIC PRESSURE
- UNIT WEIGHT OF SOIL (Ys) = 120 PCF

SAN JUAN CAPISTRANO - DMA B

SAN JUAN CAPISTRANO, CA

DATE: 01-28-19 DRAWN: KR

PROJECT #: S116097 CHECKED: AJD

DATE	DRWN	CHKD	DESCRIPTION

60" WTIB : SOLID DETENTION

HP STORM

4640 TRUEMAN BLVD
HILLIARD, OH 43026

ADS®
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	TERENCE ZHAO 626-425-2874 TERENCE.ZHAO@ADS-PIPE.COM
ADS SALES REP:	ARNE ERIKSEN 951-796-2048 ARNE.ERIKSEN@ADS-PIPE.COM
PROJECT NO:	S116097

ADVANCED DRAINAGE SYSTEMS, INC.

SAN JUAN CAPISTRANO - DMA C

SAN JUAN CAPISTRANO, CA

ADS RETENTION/DETENTION PIPE SYSTEM SPECIFICATION

SCOPE

THIS SPECIFICATION DESCRIBES ADS RETENTION/DETENTION PIPE SYSTEMS FOR USE IN NON-PRESSURE GRAVITY-FLOW STORM WATER COLLECTION SYSTEMS UTILIZING A CONTINUOUS OUTFALL STRUCTURE.

PIPE REQUIREMENTS

ADS RETENTION/DETENTION SYSTEMS MAY UTILIZE ANY OF THE VARIOUS PIPE PRODUCTS BELOW:

- N-12® WTIB PIPE (PER AASHTO) SHALL MEET AASHTO M 294, TYPE S OR ASTM F2306
- N-12® WTIB PIPE (PER ASTM F2648) SHALL MEET ASTM F2648
- N-12® MEGA GREEN™ WTIB SHALL MEET ASTM F2648

ALL PRODUCTS SHALL HAVE A SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS. ALL STIB PIPE PRODUCTS ARE AVAILABLE AS PERFORATED OR NON-PERFORATED. WTIB PIPE PRODUCTS ARE ONLY AVAILABLE AS NON-PERFORATED. PRODUCT-SPECIFIC PIPE SPECIFICATIONS ARE AVAILABLE IN THE DRAINAGE HANDBOOK SECTION 1 "SPECIFICATIONS".

JOINT PERFORMANCE

WATERTIGHT (WTIB):
WTIB PIPE SHALL BE JOINED USING A BELL AND SPIGOT JOINT. THE JOINT SHALL BE WATERTIGHT ACCORDING TO THE REQUIREMENTS OF ASTM D3212. GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. 12-60 INCH (300-1500 mm) DIAMETERS SHALL HAVE A BELL REINFORCED WITH A POLYMER COMPOSITE BAND. THE BELL TOLERANCE DEVICE SHALL BE INSTALLED BY THE MANUFACTURER.

PIPE AND FITTING CONNECTIONS SHALL BE WITH A BELL AND SPIGOT CONNECTION UTILIZING A SPUN-ON OR WELDED BELL AND VALLEY OR SADDLE GASKET. THE JOINT SHALL MEET THE WATERTIGHT REQUIREMENTS OF ASTM D3212, AND GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. DETENTION SYSTEMS ARE SUBJECT TO GREATER LEAKAGE THAN TYPICAL SINGLE RUN STORM SEWER APPLICATIONS AND THEREFORE ARE NOT APPROPRIATE FOR APPLICATIONS REQUIRING LONG-TERM FLUID CONTAINMENT OR HYDROSTATIC PRESSURE. FOR ADDITIONAL DETAILS REFER TO TECHNICAL NOTE 7.01 "RAINWATER HARVESTING WITH HDPE PIPE CISTERNS".

FITTINGS

FITTINGS SHALL CONFORM TO ASTM F2306 AND MEET JOINT PERFORMANCE INDICATED ABOVE FOR FITTINGS CONNECTIONS. CUSTOM FITTINGS ARE AVAILABLE AND MAY REQUIRE SPECIAL INSTALLATION CRITERION.

INSTALLATION

INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321 AND ADS RECOMMENDED INSTALLATION GUIDELINES, WITH THE EXCEPTION THAT MINIMUM COVER IN NON-TRAFFIC AREAS FOR 12-60 INCH (300-1500 mm) DIAMETERS SHALL BE 1 FT (0.3 m). MINIMUM COVER IN TRAFFICKED AREAS FOR 12-36 INCH (300-900 mm) DIAMETERS SHALL BE 1 FT (0.3 m) AND FOR 42-60 INCH (1050-1500 mm) DIAMETERS, THE MINIMUM COVER SHALL BE 2 FT (0.6 m). BACKFILL SHALL CONSIST OF CLASS I (COMPACTED) OR CLASS II (MINIMUM 95% SPD) MATERIAL, WITH THE EXCEPTION THAT 60 INCH (1500 mm) SYSTEMS SHALL USE CLASS I MATERIAL ONLY. MINIMUM COVER HEIGHTS DO NOT ACCOUNT FOR PIPE BUOYANCY. REFER TO ADS TECHNICAL NOTE 5.05 "PIPE FLOTATION" FOR BUOYANCY DESIGN CONSIDERATIONS. MAXIMUM COVER OVER SYSTEM USING STANDARD BACKFILL IS 8 FT (2.4 m); CONTACT A REPRESENTATIVE WHEN MAXIMUM FILL HEIGHT MAY BE EXCEEDED. ADDITIONAL INSTALLATION REQUIREMENTS ARE PROVIDED IN THE DRAINAGE HANDBOOK SECTION 6 "RETENTION/DETENTION".

ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES:

1) ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS, INLETS AND OUTLETS, SHALL BE VERIFIED BY THE ENGINEER PRIOR TO RELEASING FOR FABRICATION.

2) IN SITUATIONS WHERE A FINE-GRAINED BACKFILL MATERIAL IS USED ADJACENT TO THE PIPE SYSTEM, AND ESPECIALLY INVOLVING GROUND WATER CONDITIONS, CONSIDERATION SHOULD BE GIVEN TO THE USE OF GASKETED PIPE JOINTS. AT THE VERY LEAST THE PIPE JOINTS SHOULD BE WRAPPED IN A SUITABLE, NON-WOVEN GEOTEXTILE FABRIC TO PREVENT INFILTRATION OF FINES INTO THE PIPE SYSTEM.

3) CONSIDERATION FOR CONSTRUCTION EQUIPMENT LOADS MUST BE TAKEN INTO ACCOUNT.

4) ALL PIPE DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

5) ALL RISERS TO BE FIELD EXTENDED OR TRIMMED TO FINAL GRADE.

THE UNDERSIGNED HERBY APPROVES THE ATTACHED PAGES.

CUSTOMER DATE

©2013 ADS, INC.

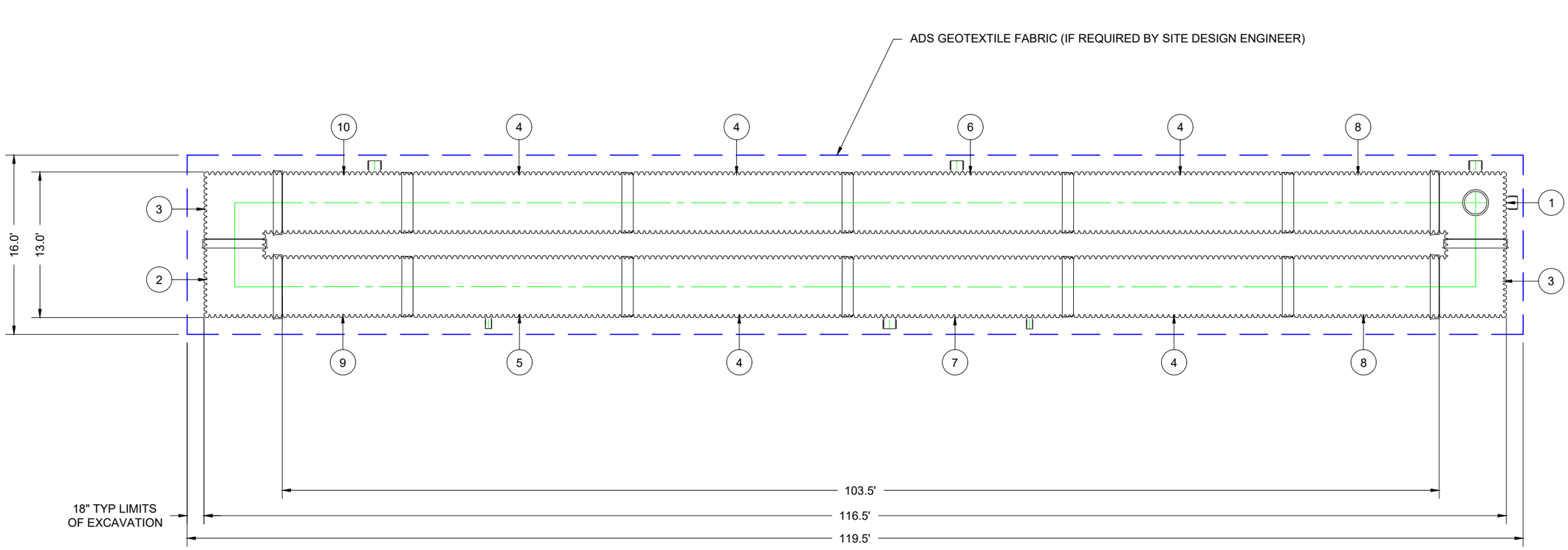
BILL OF MATERIALS

*THE COMPONENTS AND QUANTITIES LISTED HEREIN ARE NOT INTENDED TO BE A COMPREHENSIVE MATERIAL LIST.
EXTRA COMPONENTS, NOT LISTED HEREIN, MAY BE NECESSARY TO COMPLETE THE CONSTRUCTION OF THE SYSTEM.

ITEM	QTY.	PART #	DESCRIPTION	MATERIAL	VENDOR	NOTE
1	1	6098ANBC-01	60" X 90° MANIFOLD BEND	HDPE	ADS	SEE DETAIL
1-1	2	1206AN	12" STUB	HDPE	ADS	COMPONENT
1-2	1	2403AN	24" RISER	HDPE	ADS	COMPONENT
2	1	6098AN65GG	60" X 90° MANIFOLD BEND	HDPE	ADS	SEE DETAIL
3	2	6098AN65BG	60" x 90° MANIFOLD BEND	HDPE	ADS	SEE DETAIL
4	5	6065-0020IB	60" PIPE STICK : SOLID	HDPE	ADS	WTIB
5	1	STICK-01	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
6	1	STICK-02	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
7	1	STICK-03	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
8	2	STICK-04	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
9	1	STICK-05	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
10	1	STICK-06	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
	1	TBD BY ENGINEER	ADS GEOTEXTILE FABRIC	AS SPECIFIED	ADS	AS REQUIRED

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE PIPE COVER REQUIREMENTS ARE MET.
- STUB SIZES AND INVERTS TO BE VERIFIED BY THE SITE DESIGN ENGINEER PRIOR TO FABRICATION.
- ADS RISERS ARE FABRICATED 36" (900 mm) FROM TOP OF PIPE TO TOP OF RISER DUE TO SHIPPING LIMITATIONS. ADDITIONAL PIPE AND COUPLERS CAN BE USED TO EXTEND THE RISERS TO GRADE.



SAN JUAN CAPISTRANO - DMA C
SAN JUAN CAPISTRANO, CA
DATE: 01-28-19 DRAWN: KR CHECKED: AJD
PROJECT #: S116097

DATE	DRWN	CHKD	DESCRIPTION

60" WTIB : SOLID
DETENTION

HDPE N-12

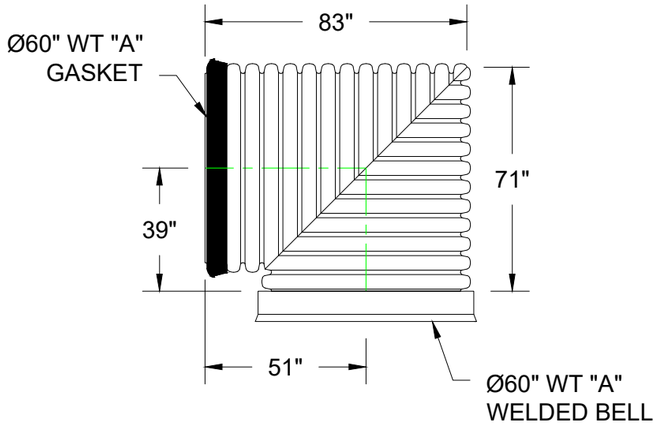
4640 TRUEMAN BLVD
HILLIARD, OH 43026

ADVANCED DRAINAGE SYSTEMS, INC.

0 10' 20'

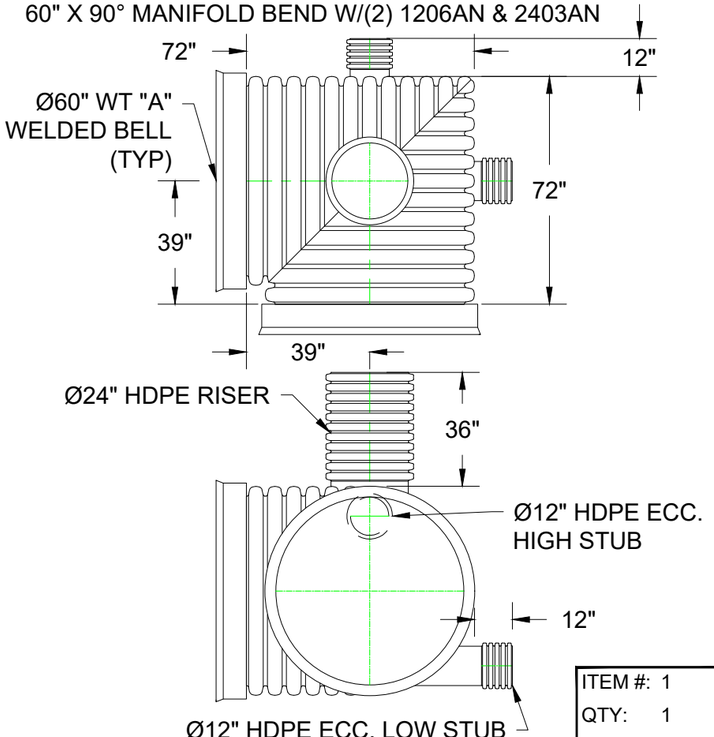
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

60" X 90° MANIFOLD BEND



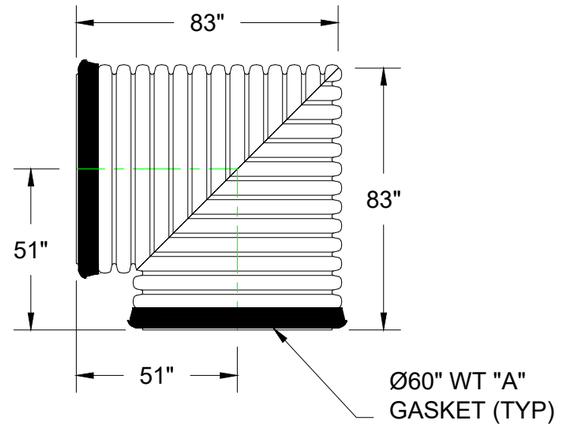
ITEM #: 3
QTY: 2
6098AN65BG

60" X 90° MANIFOLD BEND W/(2) 1206AN & 2403AN



ITEM #: 1
QTY: 1
6098AN65BBC-01

60" X 90° MANIFOLD BEND



ITEM #: 2
QTY: 1
6098AN65GG

SAN JUAN CAPISTRANO - DMA C
SAN JUAN CAPISTRANO, CA
DATE: 01-28-19
DRAWN: KR
PROJECT #: S116097
CHECKED: AJD

DATE	DRWN	CHKD	DESCRIPTION

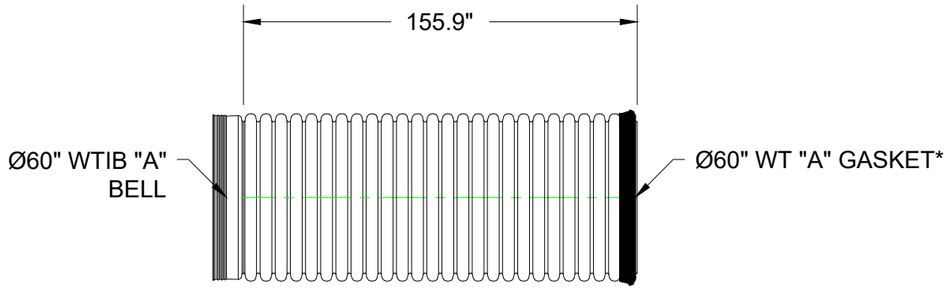
60" WTIB : SOLID
DETENTION

HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS®
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

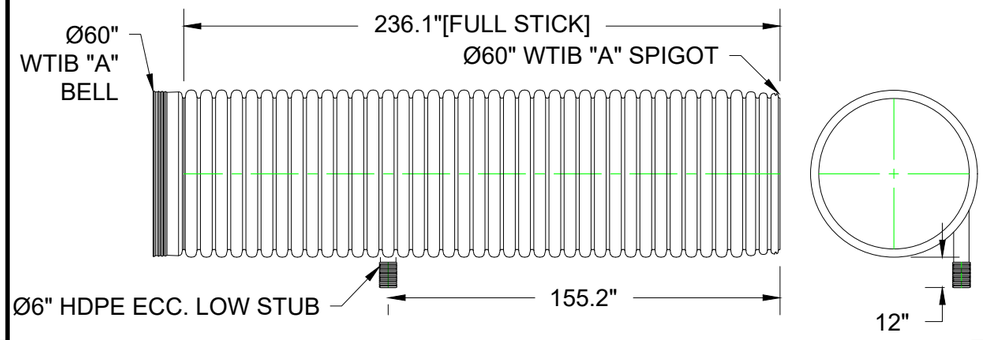
60" PIPE STICK : SOLID



*WELD VENT TUBES SHUT PRIOR TO SHIPPING

ITEM #: 8
QTY: 2
STICK-04

60" PIPE STICK : SOLID W/ 6" STUB



ITEM #: 5
QTY: 1
STICK-01

60" PIPE STICK : SOLID

ITEM #: 9
QTY: 1
STICK-05

60" PIPE STICK : SOLID W/ 12" STUB

ITEM #: 6
QTY: 1
STICK-02

60" PIPE STICK : SOLID W/12" STUB

ITEM #: 10
QTY: 1
STICK-06

60" PIPE STICK : SOLID W/12" STUB & 6" STUB

ITEM #: 7
QTY: 1
STICK-03

SAN JUAN CAPISTRANO - DMA C
SAN JUAN CAPISTRANO, CA

DATE: 01-28-19 | DRAWN: KR | CHECKED: AJD
PROJECT #: S116097

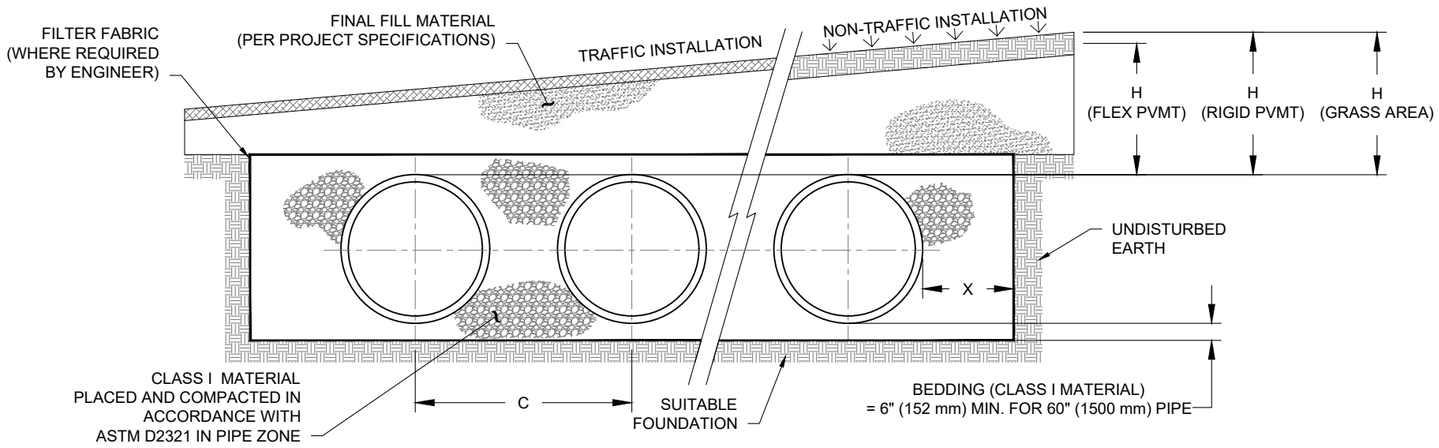
DATE	DRWN	CHKD	DESCRIPTION

60" WTIB : SOLID
DETENTION

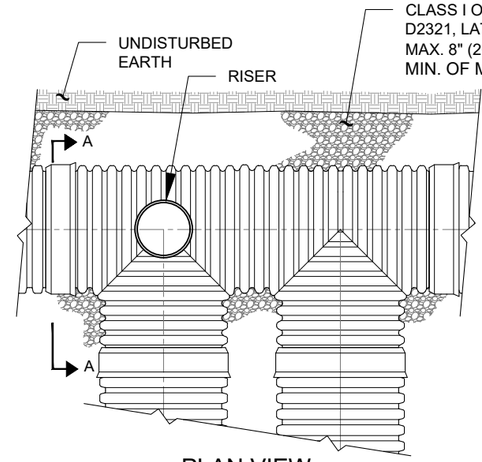
HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS®
ADVANCED DRAINAGE SYSTEMS, INC.

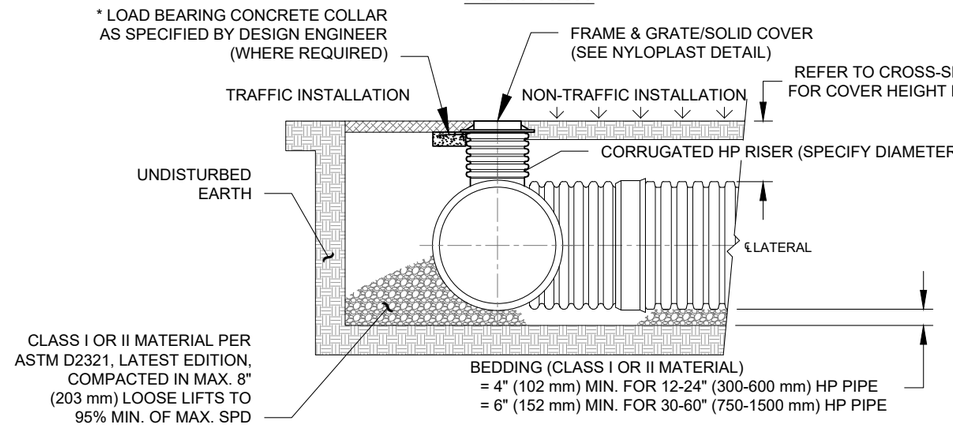
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.



NOMINAL DIAMETER	NOMINAL O.D.	TYPICAL SPACING "C"	TYPICAL SIDE WALL "X"	MIN. H (NON-TRAFFIC)	MIN. H (TRAFFIC)	MAX. H*
60" (1500 mm)	67" (1702 mm)	90" (2286 mm)	18" (457 mm)	12" (305 mm)	24" (610 mm)	8' (2.4 m)



PLAN VIEW



SECTION A-A

* MAXIMUM FILL HEIGHTS OVER MANIFOLD FITTINGS. CONTACT MANUFACTURER'S REPRESENTATIVE FOR INSTALLATION CONSIDERATIONS WHEN COVER EXCEEDS 8 FT (2.4 m).
**60" (1500 mm) SYSTEMS REQUIRE CLASS I BACKFILL AROUND ALL LATERALS AND FITTINGS.

NOTES:

1. ALL REFERENCES TO CLASS I MATERIAL ARE PER ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. ALL RETENTION AND DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, LATEST EDITION AND THE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.
3. MEASURES SHOULD BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO THE BACKFILL MATERIAL, WHEN REQUIRED. SEE ASTM D2321.
4. FILTER FABRIC: A GEOTEXTILE FABRIC MAY BE USED AS SPECIFIED BY THE ENGINEER TO PREVENT THE MIGRATION OF FINES FROM THE NATIVE SOIL INTO THE SELECT BACKFILL MATERIAL.
5. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE. THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
6. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (102 mm) FOR 4"-24" (100-600 mm); 6" (152 mm) FOR 30-60" (750-900 mm).
7. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" (152 mm) ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
8. COVER: MINIMUM COVER OVER ALL RETENTION/DETENTION SYSTEMS IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (305 mm) FROM TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER IS 12" (305 mm) UP TO 36" (900 mm) DIAMETER PIPE AND 24" (610 mm) OF COVER FOR 42-60" (1050-1500 mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. MAXIMUM FILL HEIGHT LIMITED TO 8 FT (2.4 m) OVER FITTINGS FOR STANDARD INSTALLATIONS. CONTACT A SALES REPRESENTATIVE WHEN MAXIMUM FILL HEIGHTS EXCEED 8 FT (2.4 m) FOR INSTALLATION CONSIDERATIONS.

* LOAD BEARING CONCRETE COLLAR SHALL BE CONSTRUCTED IN TRAFFIC AREAS SUCH THAT THE LIVE LOAD IS TRANSMITTED TO THE SURROUNDING SOIL AND NOT DIRECTLY TO THE RISER.

SAN JUAN CAPISTRANO - DMA C
SAN JUAN CAPISTRANO, CA
DATE: 01-28-19 DRAWN: KR CHECKED: AJD
PROJECT #: S116097

DATE	DRWN	CHKD	DESCRIPTION

60" WTIB : SOLID
DETENTION

HP STORM

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.
ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	TERENCE ZHAO 626-425-2874 TERENCE.ZHAO@ADS-PIPE.COM
ADS SALES REP:	ARNE ERIKSEN 951-796-2048 ARNE.ERIKSEN@ADS-PIPE.COM
PROJECT NO:	S116097

ADVANCED DRAINAGE SYSTEMS, INC.

SAN JUAN CAPISTRANO - DMA D

SAN JUAN CAPISTRANO, CA

ADS RETENTION/DETENTION PIPE SYSTEM SPECIFICATION

SCOPE

THIS SPECIFICATION DESCRIBES ADS RETENTION/DETENTION PIPE SYSTEMS FOR USE IN NON-PRESSURE GRAVITY-FLOW STORM WATER COLLECTION SYSTEMS UTILIZING A CONTINUOUS OUTFALL STRUCTURE.

PIPE REQUIREMENTS

ADS RETENTION/DETENTION SYSTEMS MAY UTILIZE ANY OF THE VARIOUS PIPE PRODUCTS BELOW:

- N-12® WTIB PIPE (PER AASHTO) SHALL MEET AASHTO M 294, TYPE S OR ASTM F2306
- N-12® WTIB PIPE (PER ASTM F2648) SHALL MEET ASTM F2648
- N-12® MEGA GREEN™ WTIB SHALL MEET ASTM F2648

ALL PRODUCTS SHALL HAVE A SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS. ALL STIB PIPE PRODUCTS ARE AVAILABLE AS PERFORATED OR NON-PERFORATED. WTIB PIPE PRODUCTS ARE ONLY AVAILABLE AS NON-PERFORATED. PRODUCT-SPECIFIC PIPE SPECIFICATIONS ARE AVAILABLE IN THE DRAINAGE HANDBOOK SECTION 1 "SPECIFICATIONS".

JOINT PERFORMANCE

WATERTIGHT (WTIB):
WTIB PIPE SHALL BE JOINED USING A BELL AND SPIGOT JOINT. THE JOINT SHALL BE WATERTIGHT ACCORDING TO THE REQUIREMENTS OF ASTM D3212. GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. 12-60 INCH (300-1500 mm) DIAMETERS SHALL HAVE A BELL REINFORCED WITH A POLYMER COMPOSITE BAND. THE BELL TOLERANCE DEVICE SHALL BE INSTALLED BY THE MANUFACTURER.

PIPE AND FITTING CONNECTIONS SHALL BE WITH A BELL AND SPIGOT CONNECTION UTILIZING A SPUN-ON OR WELDED BELL AND VALLEY OR SADDLE GASKET. THE JOINT SHALL MEET THE WATERTIGHT REQUIREMENTS OF ASTM D3212, AND GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. DETENTION SYSTEMS ARE SUBJECT TO GREATER LEAKAGE THAN TYPICAL SINGLE RUN STORM SEWER APPLICATIONS AND THEREFORE ARE NOT APPROPRIATE FOR APPLICATIONS REQUIRING LONG-TERM FLUID CONTAINMENT OR HYDROSTATIC PRESSURE. FOR ADDITIONAL DETAILS REFER TO TECHNICAL NOTE 7.01 "RAINWATER HARVESTING WITH HDPE PIPE CISTERNS".

FITTINGS

FITTINGS SHALL CONFORM TO ASTM F2306 AND MEET JOINT PERFORMANCE INDICATED ABOVE FOR FITTINGS CONNECTIONS. CUSTOM FITTINGS ARE AVAILABLE AND MAY REQUIRE SPECIAL INSTALLATION CRITERION.

INSTALLATION

INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321 AND ADS RECOMMENDED INSTALLATION GUIDELINES, WITH THE EXCEPTION THAT MINIMUM COVER IN NON-TRAFFIC AREAS FOR 12-60 INCH (300-1500 mm) DIAMETERS SHALL BE 1 FT (0.3 m). MINIMUM COVER IN TRAFFICKED AREAS FOR 12-36 INCH (300-900 mm) DIAMETERS SHALL BE 1 FT (0.3 m) AND FOR 42-60 INCH (1050-1500 mm) DIAMETERS, THE MINIMUM COVER SHALL BE 2 FT (0.6 m). BACKFILL SHALL CONSIST OF CLASS I (COMPACTED) OR CLASS II (MINIMUM 95% SPD) MATERIAL, WITH THE EXCEPTION THAT 60 INCH (1500 mm) SYSTEMS SHALL USE CLASS I MATERIAL ONLY. MINIMUM COVER HEIGHTS DO NOT ACCOUNT FOR PIPE BUOYANCY. REFER TO ADS TECHNICAL NOTE 5.05 "PIPE FLOTATION" FOR BUOYANCY DESIGN CONSIDERATIONS. MAXIMUM COVER OVER SYSTEM USING STANDARD BACKFILL IS 8 FT (2.4 m); CONTACT A REPRESENTATIVE WHEN MAXIMUM FILL HEIGHT MAY BE EXCEEDED. ADDITIONAL INSTALLATION REQUIREMENTS ARE PROVIDED IN THE DRAINAGE HANDBOOK SECTION 6 "RETENTION/DETENTION".

ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES:

1) ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS, INLETS AND OUTLETS, SHALL BE VERIFIED BY THE ENGINEER PRIOR TO RELEASING FOR FABRICATION.

2) IN SITUATIONS WHERE A FINE-GRAINED BACKFILL MATERIAL IS USED ADJACENT TO THE PIPE SYSTEM, AND ESPECIALLY INVOLVING GROUND WATER CONDITIONS, CONSIDERATION SHOULD BE GIVEN TO THE USE OF GASKETED PIPE JOINTS. AT THE VERY LEAST THE PIPE JOINTS SHOULD BE WRAPPED IN A SUITABLE, NON-WOVEN GEOTEXTILE FABRIC TO PREVENT INFILTRATION OF FINES INTO THE PIPE SYSTEM.

3) CONSIDERATION FOR CONSTRUCTION EQUIPMENT LOADS MUST BE TAKEN INTO ACCOUNT.

4) ALL PIPE DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

5) ALL RISERS TO BE FIELD EXTENDED OR TRIMMED TO FINAL GRADE.

THE UNDERSIGNED HERBY APPROVES THE ATTACHED PAGES.

CUSTOMER DATE

©2013 ADS, INC.

BILL OF MATERIALS

*THE COMPONENTS AND QUANTITIES LISTED HEREIN ARE NOT INTENDED TO BE A COMPREHENSIVE MATERIAL LIST.
EXTRA COMPONENTS, NOT LISTED HEREIN, MAY BE NECESSARY TO COMPLETE THE CONSTRUCTION OF THE SYSTEM.

ITEM	QTY.	PART #	DESCRIPTION	MATERIAL	VENDOR	NOTE
1	1	MANIFOLD-01	60" SINGLE MANIFOLD TEE	HDPE	ADS	SEE DETAIL
2	1	6051AN65GC-01	60" SINGLE MANIFOLD TEE	HDPE	ADS	SEE DETAIL
2-1	1	2403AN	24" RISER	HDPE	ADS	COMPONENT
2-2	1	1206AN	12" STUB	HDPE	ADS	COMPONENT
3	1	6098AN65BG	60" x 90° MANIFOLD BEND	HDPE	ADS	SEE DETAIL
4	1	6098ANBGC-01	60" x 90° MANIFOLD BEND	HDPE	ADS	SEE DETAIL
4-1	2	1206AN	12" STUB	HDPE	ADS	COMPONENT
5	45	6065-0020IB	60" PIPE STICK : SOLID	HDPE	ADS	WTIB
6	1	STICK-01	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
7	1	STICK-02	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
8	1	STICK-03	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
9	1	STICK-04	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
10	2	STICK-05	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
11	1	STICK-06	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
12	1	STICK-07	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
13	2	STICK-08	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
14	1	STICK-09	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
15	1	STICK-10	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
16	2	STICK-11	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
17	1	STICK-12	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
18	1	STICK-13	60" PIPE STICK : SOLID	HDPE	ADS	SEE DETAIL
	1	TBD BY ENGINEER	ADS GEOTEXTILE FABRIC	AS SPECIFIED	ADS	AS REQUIRED
	2	2724AG	24" NYLOPLAST INLINE DRAIN	VARIES	ADS	SEE DETAIL

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE PIPE COVER REQUIREMENTS ARE MET.
- STUB SIZES AND INVERTS TO BE VERIFIED BY THE SITE DESIGN ENGINEER PRIOR TO FABRICATION.
- ADS RISERS ARE FABRICATED 36" (900 mm) FROM TOP OF PIPE TO TOP OF RISER DUE TO SHIPPING LIMITATIONS. ADDITIONAL PIPE AND COUPLERS CAN BE USED TO EXTEND THE RISERS TO GRADE.

SAN JUAN CAPISTRANO - DMA D
SAN JUAN CAPISTRANO, CA
DATE: 01-28-19 DRAWN: KR
PROJECT #: S116097 CHECKED: AJD

DATE	DRWN	CHKD	DESCRIPTION

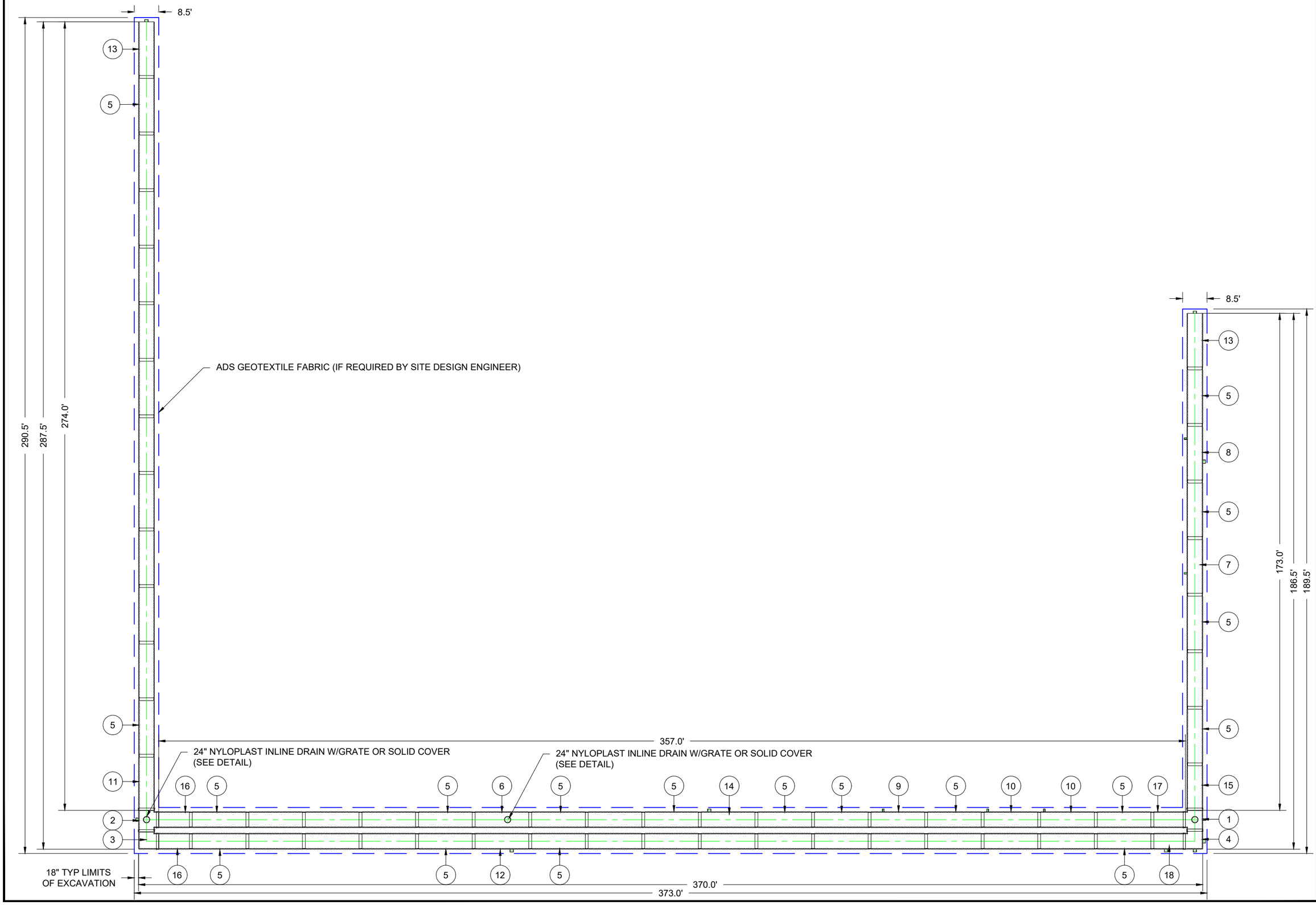
60" WTIB : SOLID
DETENTION

HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADVANCED DRAINAGE SYSTEMS, INC.

NOT TO SCALE

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.



SAN JUAN CAPISTRANO - DMA D

SAN JUAN CAPISTRANO, CA

DATE: 01-28-19 DRAWN: KR

PROJECT #: S116097 CHECKED: AJD

DATE	DRWN	CHKD	DESCRIPTION

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

60" WTIB : SOLID
DETENTION

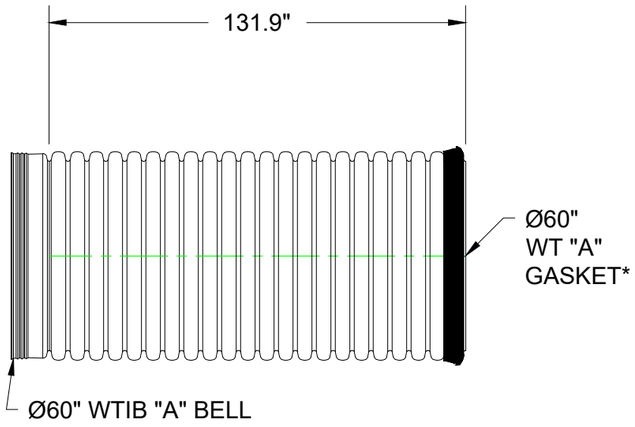
HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026

ADS®
ADVANCED DRAINAGE SYSTEMS, INC.

60'
30'
0

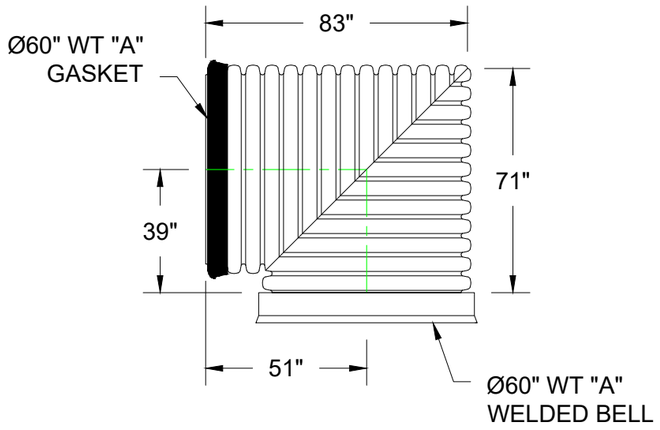
60" PIPE STICK : SOLID



*WELD VENT TUBES SHUT PRIOR TO SHIPPING

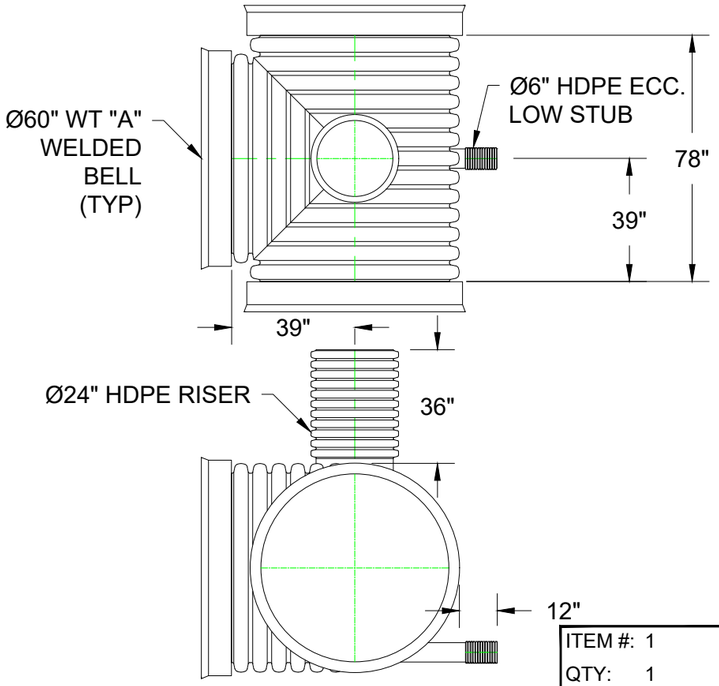
ITEM #: 17
QTY: 1
STICK-12

60" X 90° MANIFOLD BEND



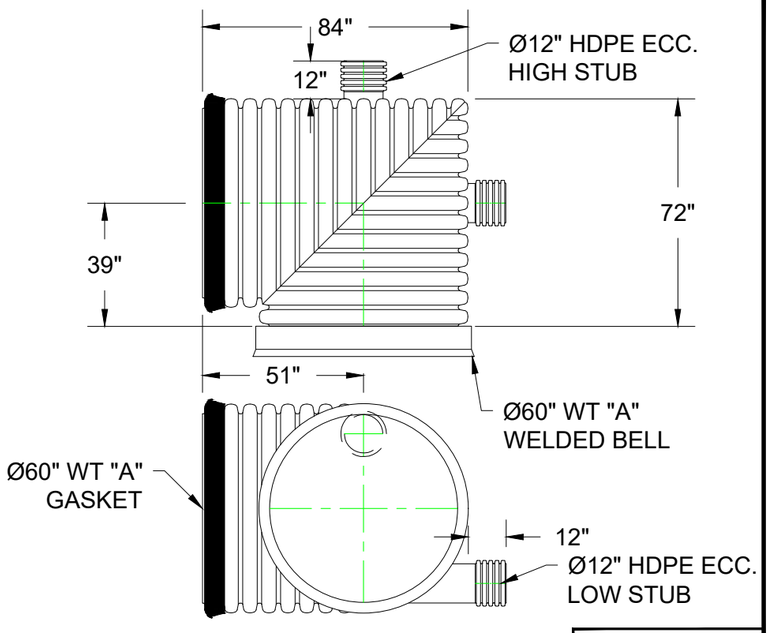
ITEM #: 3
QTY: 1
6098AN65BG

60" SINGLE MANIFOLD TEE W/ 24" RISER & 6" STUB



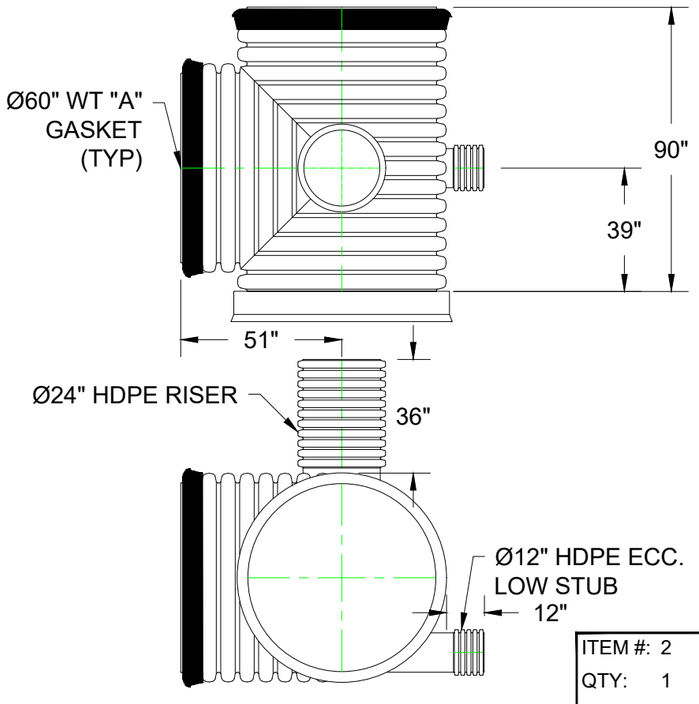
ITEM #: 1
QTY: 1
MANIFOLD-01

60" X 90° MANIFOLD BEND W/(2) 1206AN



ITEM #: 4
QTY: 1
6098ANBGC-01

60" SINGLE MANIFOLD TEE W/2403AN & 1206AN



ITEM #: 2
QTY: 1
6051ANGC-01

SAN JUAN CAPISTRANO - DMA D
SAN JUAN CAPISTRANO, CA
DATE: 01-28-19
DRAWN: KR
CHECKED: AJD
PROJECT #: S116097

DATE	DRWN	CHKD	DESCRIPTION

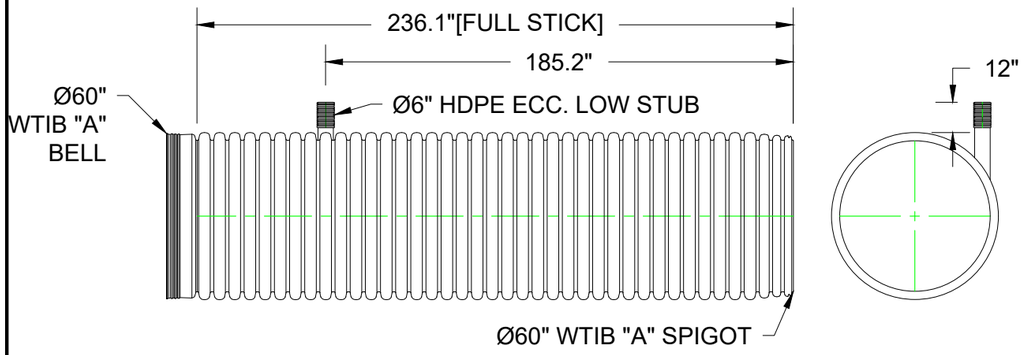
60" WTIB : SOLID
DETENTION

HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS®
ADVANCED DRAINAGE SYSTEMS, INC.

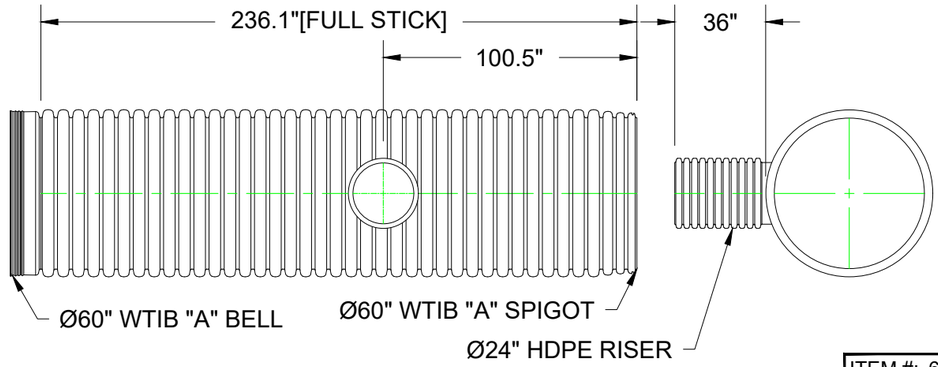
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

60" PIPE STICK : SOLID W/ 6" STUB



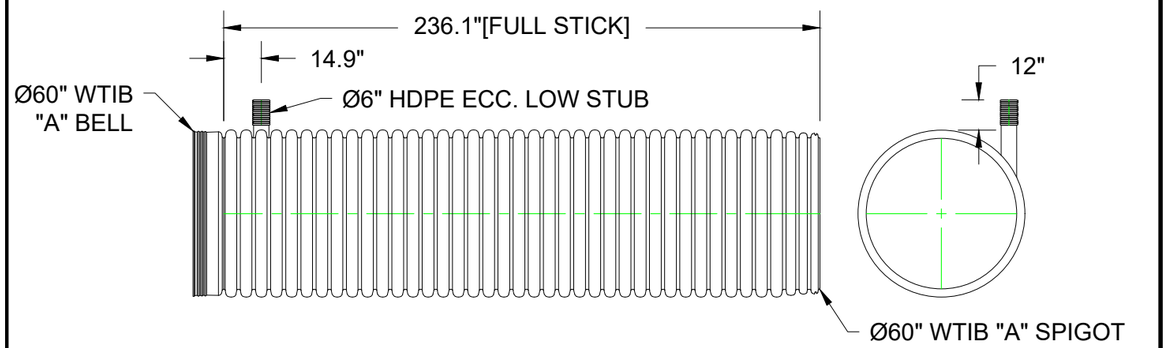
ITEM #: 9
QTY: 1
STICK-04

60" PIPE STICK : SOLID W/24" RISER



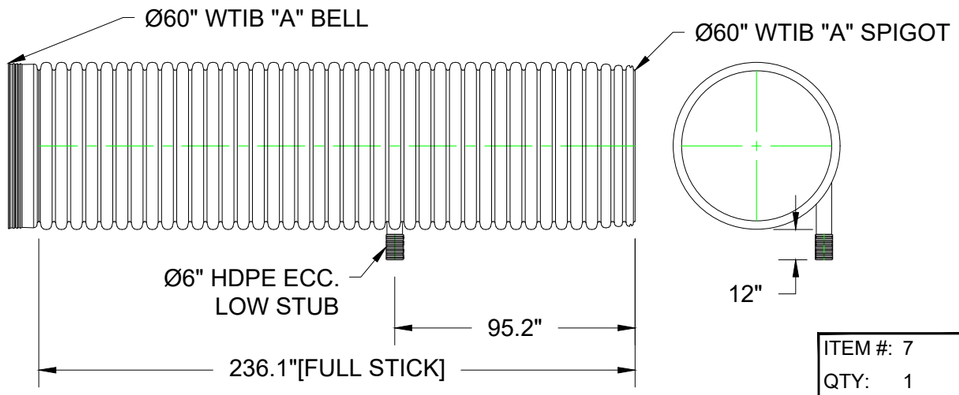
ITEM #: 6
QTY: 1
STICK-01

60" PIPE STICK : SOLID W/6" STUB



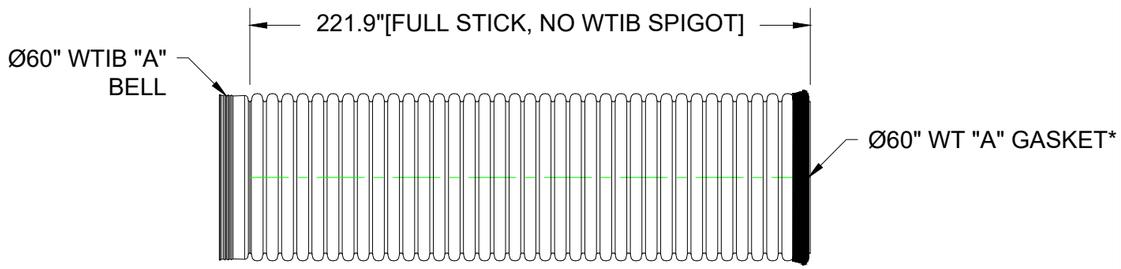
ITEM #: 10
QTY: 2
STICK-05

60" PIPE STICK : SOLID W/6" STUB



ITEM #: 7
QTY: 1
STICK-02

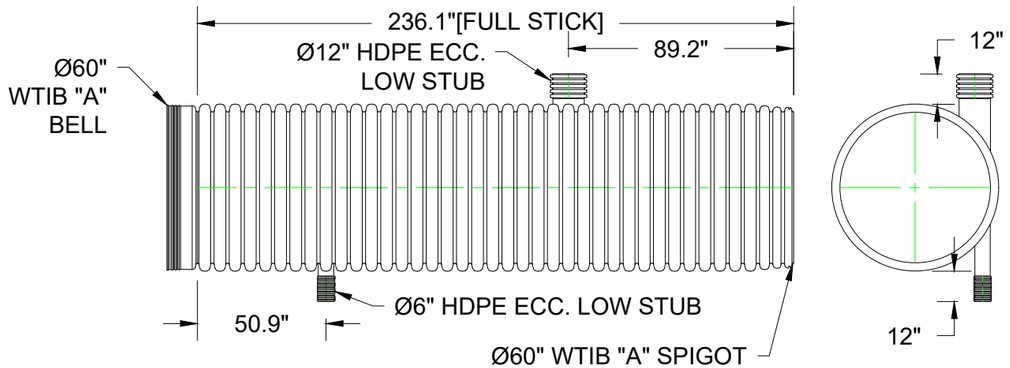
60" PIPE STICK : SOLID



*WELD VENT TUBES SHUT PRIOR TO SHIPPING

ITEM #: 11
QTY: 1
STICK-06

60" PIPE STICK : SOLID W/ 12" STUB & 6" STUB



ITEM #: 8
QTY: 1
STICK-03

SAN JUAN CAPISTRANO - DMA D
SAN JUAN CAPISTRANO, CA

DATE: 01-28-19 DRAWN: KR CHECKED: AJD
PROJECT #: S116097

DATE	DRWN	CHKD	DESCRIPTION

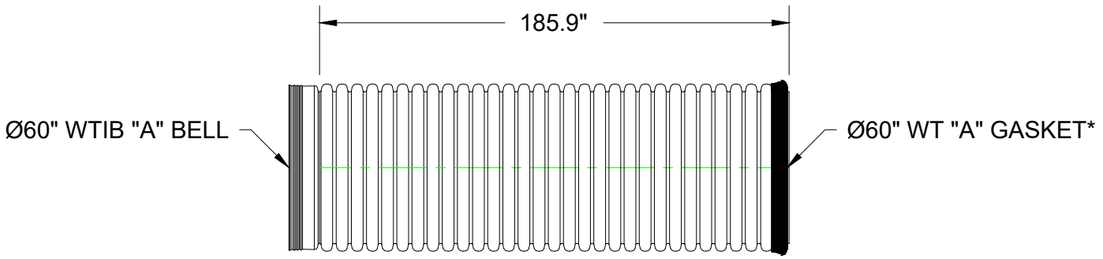
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

60" WTIB : SOLID DETENTION

HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS®
ADVANCED DRAINAGE SYSTEMS, INC.

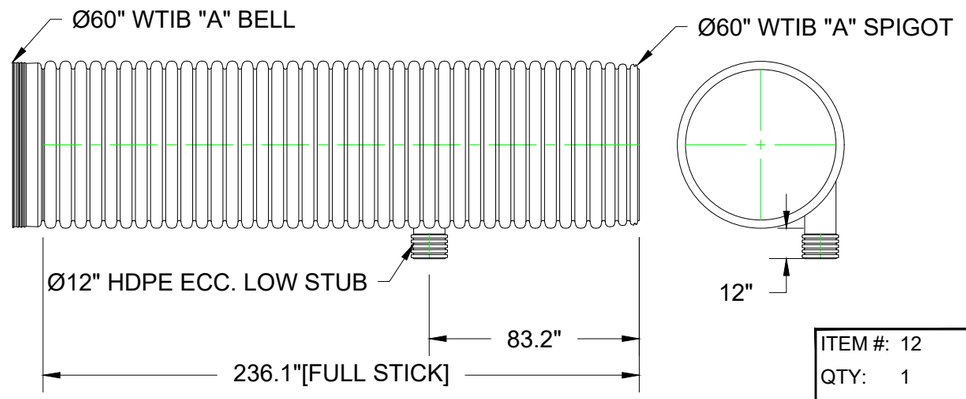
60" PIPE STICK : SOLID



ITEM #: 15
QTY: 1
STICK-10

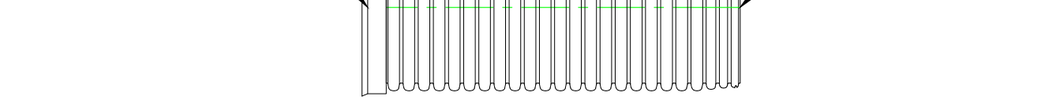
*WELD VENT TUBES SHUT PRIOR TO SHIPPING

60" PIPE STICK : SOLID W/ 12" STUB



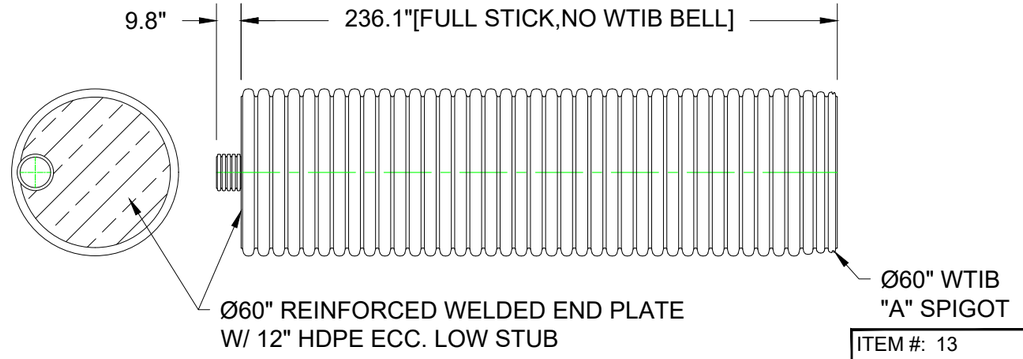
ITEM #: 12
QTY: 1
STICK-07

60" PIPE STICK : SOLID



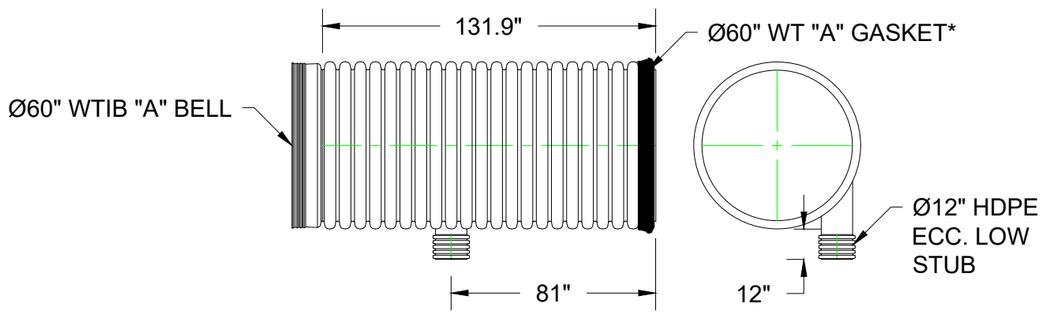
ITEM #: 16
QTY: 2
STICK-11

60" PIPE STICK : SOLID W/ WELDED END PLATE W/12" STUB



ITEM #: 13
QTY: 2
STICK-08

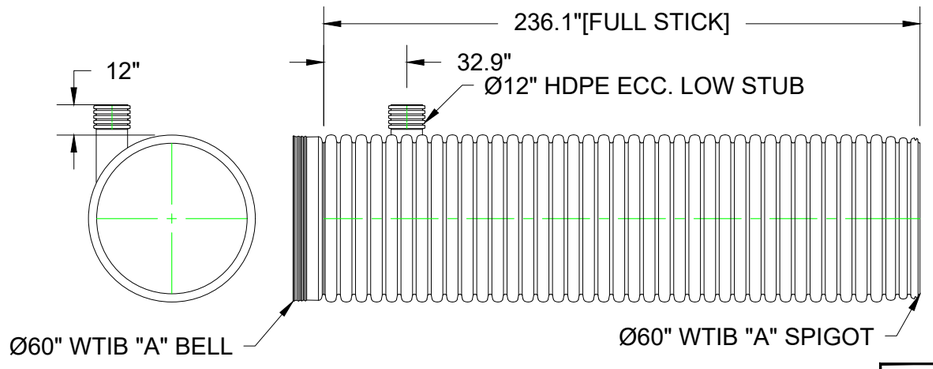
60" PIPE STICK : SOLID W/12" STUB



ITEM #: 18
QTY: 1
STICK-13

*WELD VENT TUBES SHUT PRIOR TO SHIPPING

60" PIPE STICK : SOLID W/ 12" STUB



ITEM #: 14
QTY: 1
STICK-09

SAN JUAN CAPISTRANO - DMA D
SAN JUAN CAPISTRANO, CA
DATE: 01-28-19 DRAWN: KR CHECKED: AJD
PROJECT #: S116097

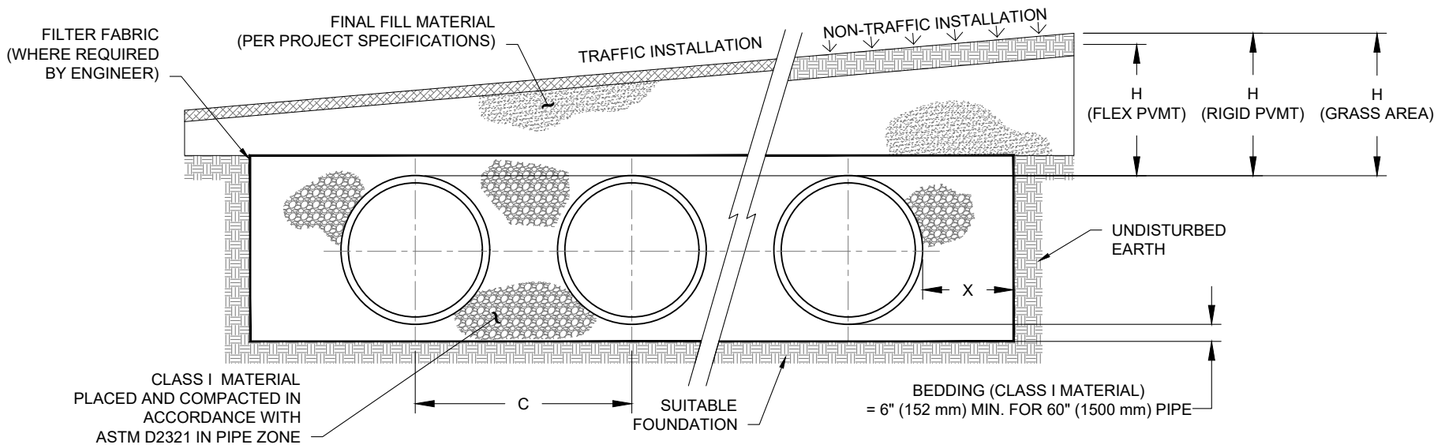
DATE	DRWN	CHKD	DESCRIPTION

60" WTIB : SOLID
DETENTION

HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS®
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.



NOMINAL DIAMETER	NOMINAL O.D.	TYPICAL SPACING "C"	TYPICAL SIDE WALL "X"	MIN. H (NON-TRAFFIC)	MIN. H (TRAFFIC)	MAX. H*
60" (1500 mm)	67" (1702 mm)	90" (2286 mm)	18" (457 mm)	12" (305 mm)	24" (610 mm)	8' (2.4 m)

* MAXIMUM FILL HEIGHTS OVER MANIFOLD FITTINGS. CONTACT MANUFACTURER'S REPRESENTATIVE FOR INSTALLATION CONSIDERATIONS WHEN COVER EXCEEDS 8 FT (2.4 m).
**60" (1500 mm) SYSTEMS REQUIRE CLASS I BACKFILL AROUND ALL LATERALS AND FITTINGS.

NOTES:

1. ALL REFERENCES TO CLASS I MATERIAL ARE PER ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.

2. ALL RETENTION AND DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, LATEST EDITION AND THE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.

3. MEASURES SHOULD BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO THE BACKFILL MATERIAL, WHEN REQUIRED. SEE ASTM D2321.

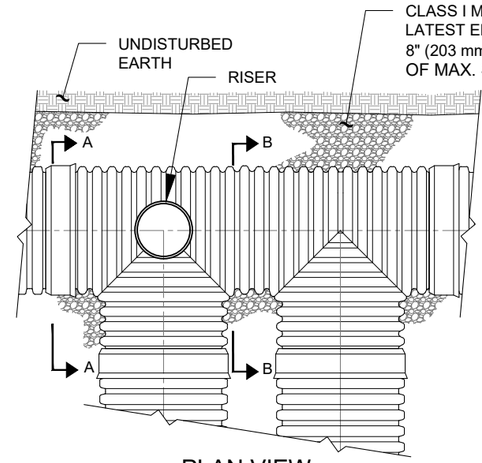
4. FILTER FABRIC: A GEOTEXTILE FABRIC MAY BE USED AS SPECIFIED BY THE ENGINEER TO PREVENT THE MIGRATION OF FINES FROM THE NATIVE SOIL INTO THE SELECT BACKFILL MATERIAL.

5. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE. THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

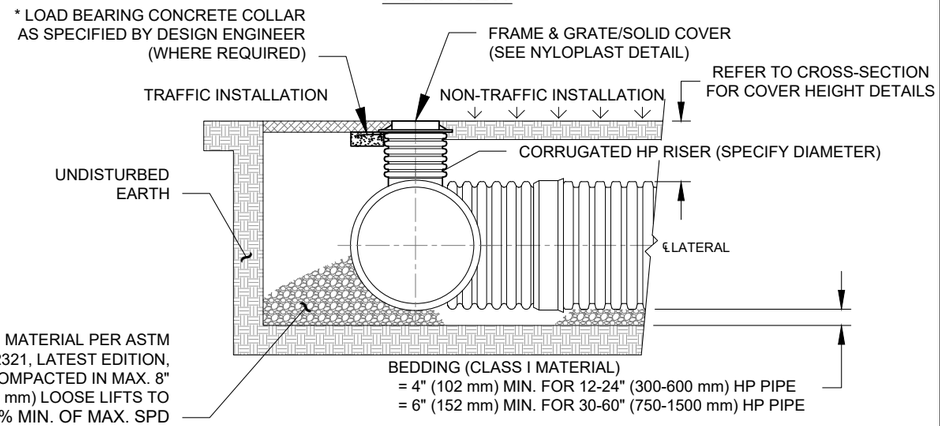
6. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (102 mm) FOR 4"-24" (100-600 mm); 6" (152 mm) FOR 30-60" (750-900 mm).

7. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" (152 mm) ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

8. COVER: MINIMUM COVER OVER ALL RETENTION/DETENTION SYSTEMS IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (305 mm) FROM TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER IS 12" (305 mm) UP TO 36" (900 mm) DIAMETER PIPE AND 24" (610 mm) OF COVER FOR 42-60" (1050-1500 mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. MAXIMUM FILL HEIGHT LIMITED TO 8 FT (2.4 m) OVER FITTINGS FOR STANDARD INSTALLATIONS. CONTACT A SALES REPRESENTATIVE WHEN MAXIMUM FILL HEIGHTS EXCEED 8 FT (2.4 m) FOR INSTALLATION CONSIDERATIONS.



PLAN VIEW



SECTION A-A

* LOAD BEARING CONCRETE COLLAR SHALL BE CONSTRUCTED IN TRAFFIC AREAS SUCH THAT THE LIVE LOAD IS TRANSMITTED TO THE SURROUNDING SOIL AND NOT DIRECTLY TO THE RISER.

SAN JUAN CAPISTRANO - DMA D
SAN JUAN CAPISTRANO, CA

DATE: 01-28-19 DRAWN: KR
PROJECT #: S116097 CHECKED: AJD

DATE	DRWN	CHKD	DESCRIPTION

60" WTIB : SOLID
DETENTION

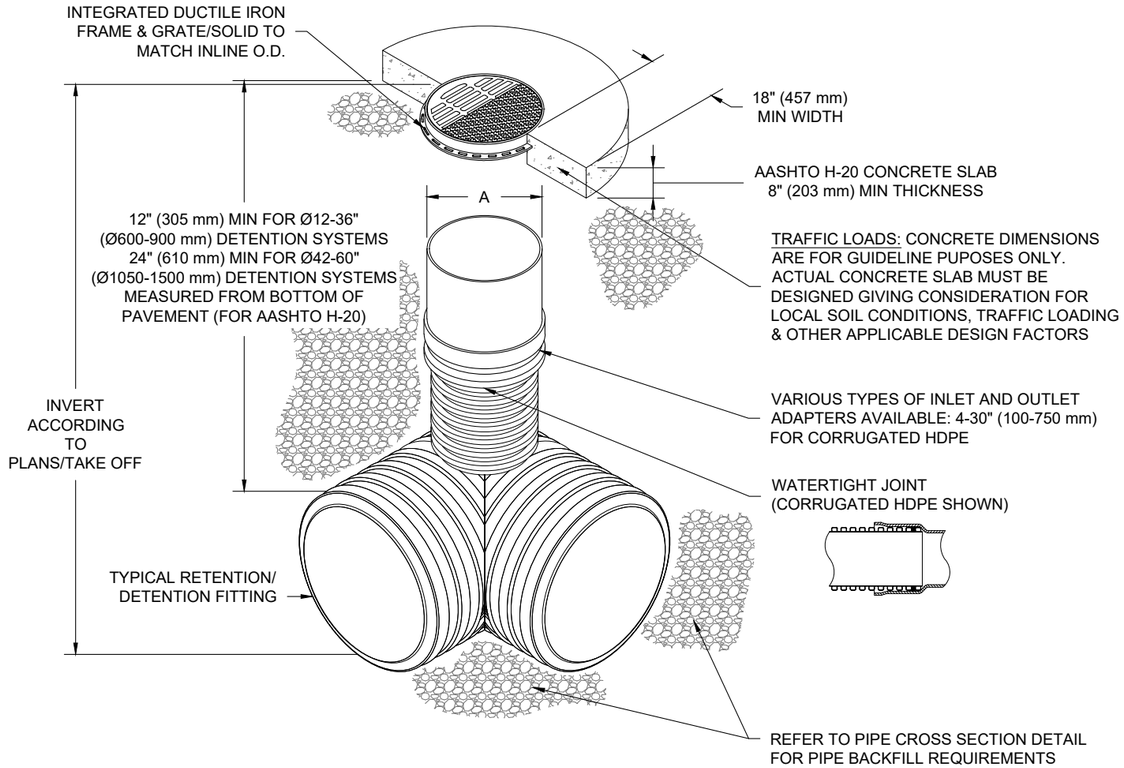
HP STORM

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

NYLOPLAST INLINE DRAIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2708AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2710AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2712AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2715AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2718AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2724AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2730AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

SAN JUAN CAPISTRANO - DMA D

SAN JUAN CAPISTRANO, CA

DATE: 01-28-19 | DRAWN: KR | PROJECT #: S116097 | CHECKED: AJD

DATE	DRWN	CHKD	DESCRIPTION

3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

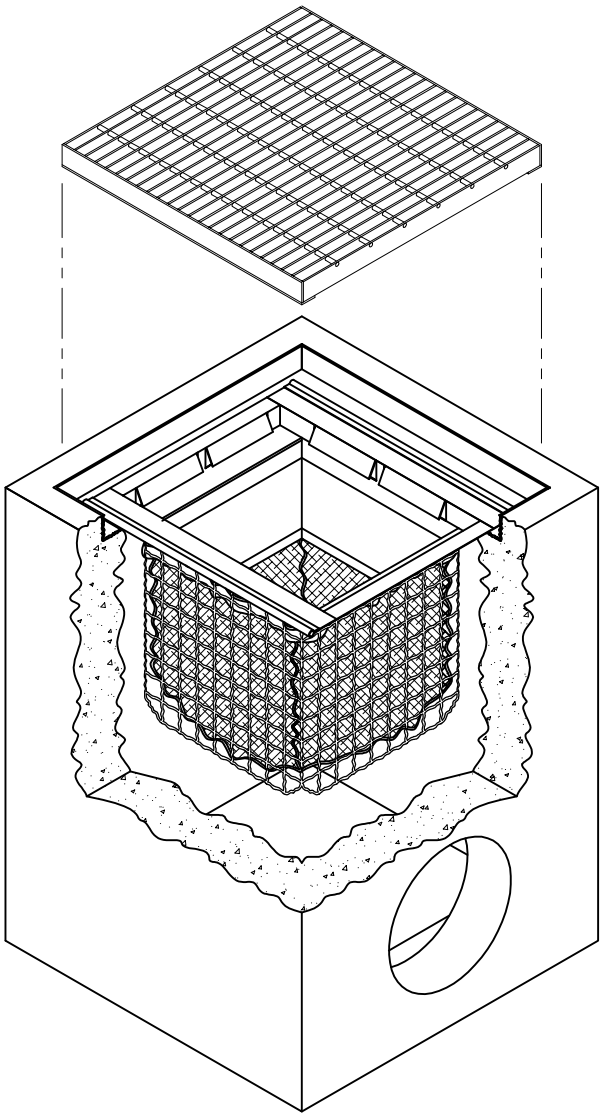
Nyloplast

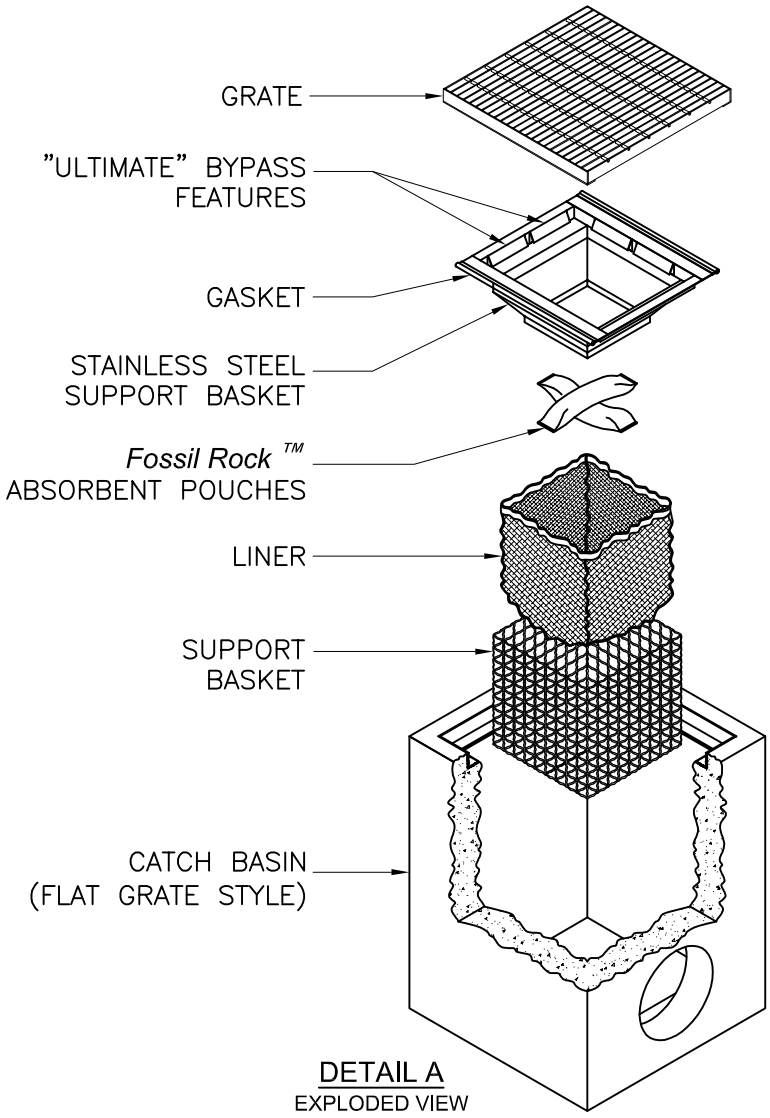
4640 TRUEMAN BLVD
HILLIARD, OH 43026

ADS
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

FGP-0001





DETAIL A
EXPLODED VIEW

FloGard® FILTER
-INSTALLED INTO CATCH BASIN-

U.S. PATENT # 6,00,023 & 6,877,029

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock* ™, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

Inlet Filtration

FloGard®

Catch Basin Insert Filter

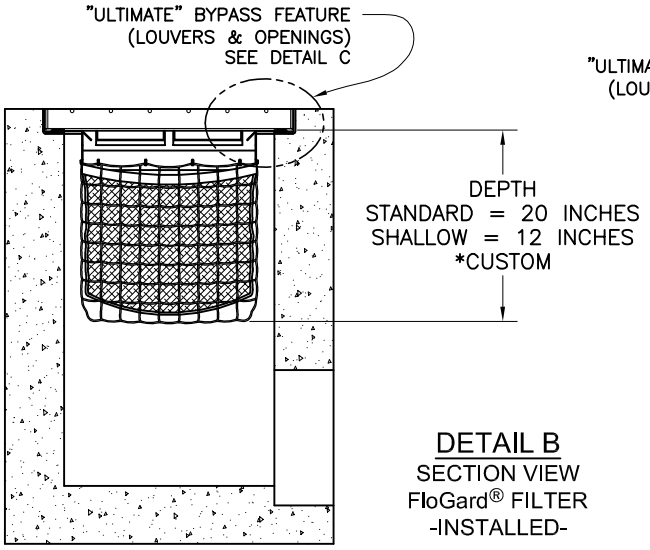
Grated Inlet Style

Oldcastle® Stormwater Solutions
7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com

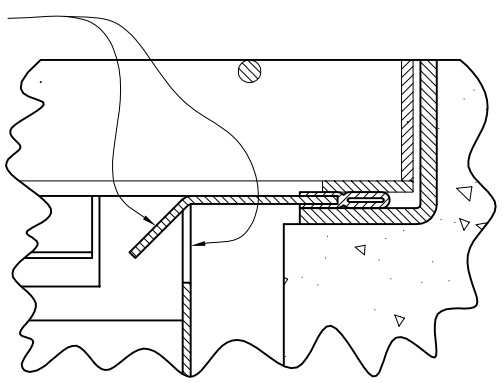
THIS DOCUMENT IS THE PROPERTY OF OLDCASTLE PRECAST, INC. IT IS SUBMITTED FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED IN ANY WAY INJURIOUS TO THE INTERESTS OF SAID COMPANY. COPYRIGHT © 2010 OLDCASTLE PRECAST, INC. ALL RIGHTS RESERVED.

DRAWING NO.	REV	ECO	DATE	
FGP-0001	G	ECO-0142 JPR 7/13/16	JPR 11/3/06	SHEET 1 OF 2

U.S. PATENT # 6,00,023 & 6,877,029



DETAIL B
SECTION VIEW
FloGard® FILTER
-INSTALLED-



DETAIL C
"ULTIMATE"
BYPASS FEATURES

* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART

MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data In these columes Is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO. SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft. / sec.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1824F	16 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	18 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	26 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-28F	28 X 28	32 X 32	6.3	2.2	1.5	FGP-28F8	1.25	.85
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-SD24F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-SD24F8	1.25	.85



Inlet Filtration

FloGard®

Catch Basin Insert Filter

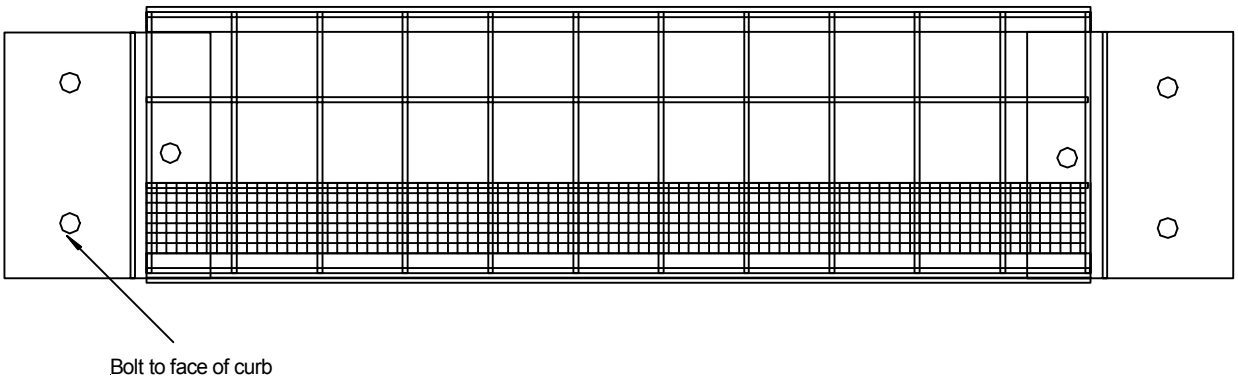
Grated Inlet Style

Oldcastle® Stormwater Solutions
7921 Southpark Plaza, Suite 200 | Littleton, CO | 80120 | Ph: 800.579.8819 | oldcastlestormwater.com

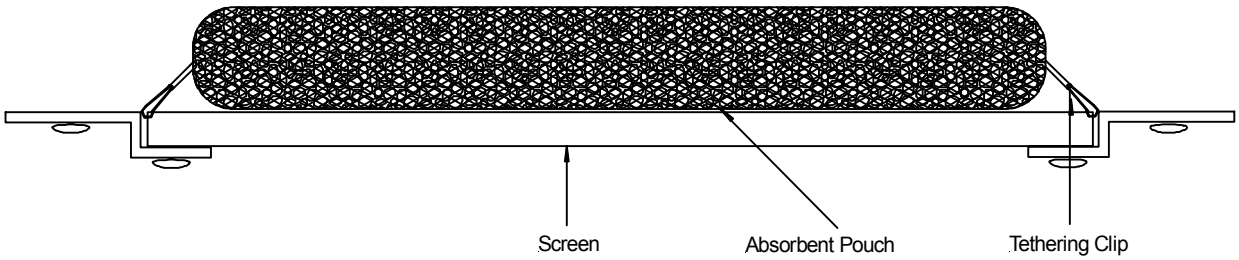
THIS DOCUMENT IS THE PROPERTY OF OLDCASTLE PRECAST, INC. IT IS SUBMITTED FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED IN ANY WAY INJURIOUS TO THE INTERESTS OF SAID COMPANY. COPYRIGHT © 2010 OLDCASTLE PRECAST, INC. ALL RIGHTS RESERVED.

DRAWING NO.	REV	ECO	DATE	
FGP-0001	G	ECO-0142 JPR 7/13/16	JPR 11/3/06	SHEET 2 OF 2

FRONT VIEW



TOP VIEW



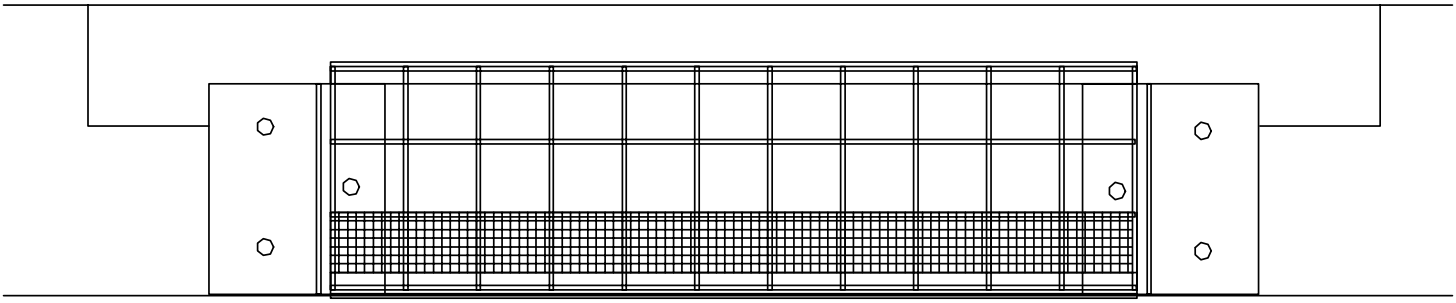
FLO-GARD™

TRASH & DEBRIS GUARD

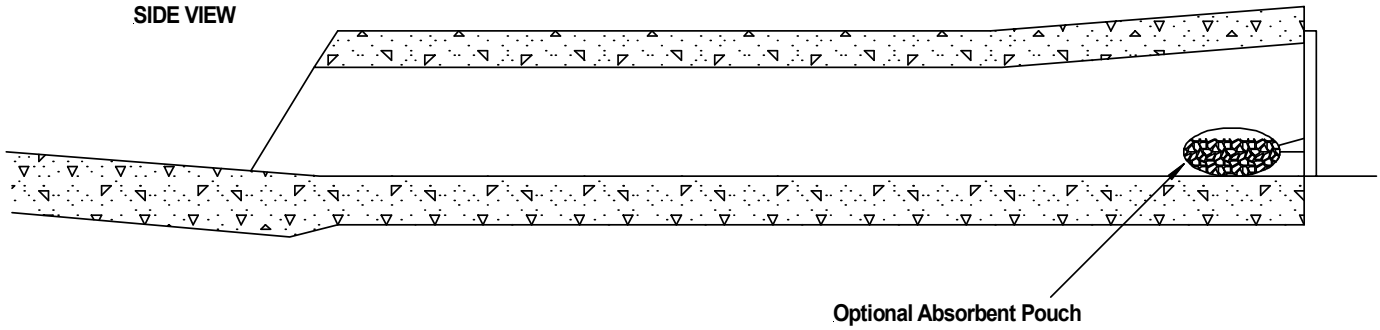
KriStar Enterprises, Inc., Santa Rosa, CA (800) 579-8819

06/04

FRONT VIEW



SIDE VIEW



FLO-GARD™

TRASH & DEBRIS GUARD

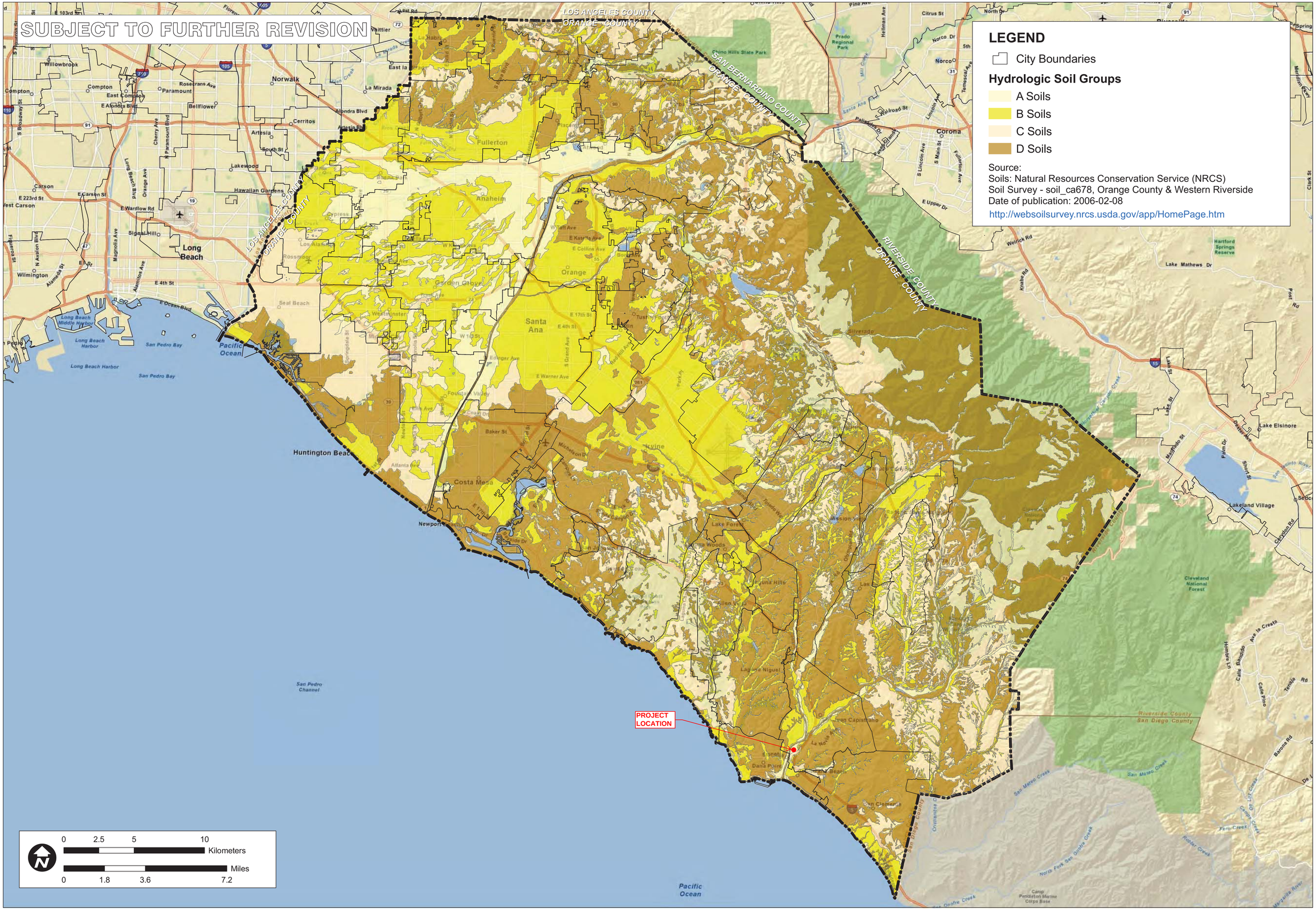
(Parkway Culvert Installation)

KriStar Enterprises, Inc., Santa Rosa, CA (800) 579-8819

06/04

Attachment G: Figures

SUBJECT TO FURTHER REVISION



LEGEND

- City Boundaries

Hydrologic Soil Groups

- A Soils
- B Soils
- C Soils
- D Soils

Source:
Soils: Natural Resources Conservation Service (NRCS)
Soil Survey - soil_ca678, Orange County & Western Riverside
Date of publication: 2006-02-08
http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

0 2.5 5 10 Kilometers

0 1.8 3.6 7.2 Miles

P:\19526E\6-GIS\Mxds\Reports\InfiltrationFeasability_20110215\19526E_FigureXVI-2a_HydroSoils_20110215.mxd

TITLE
NRCS HYDROLOGIC SOILS GROUPS

JOB
ORANGE COUNTY INFILTRATION STUDY
ORANGE CO. CA

SCALE	1" = 1.8 miles
DESIGNED	TH
DRAWING	TH
CHECKED	BMP
DATE	02/09/11
JOB NO.	19526-E

PACE
Advanced Water Engineering

FIGURE
XVI-2a

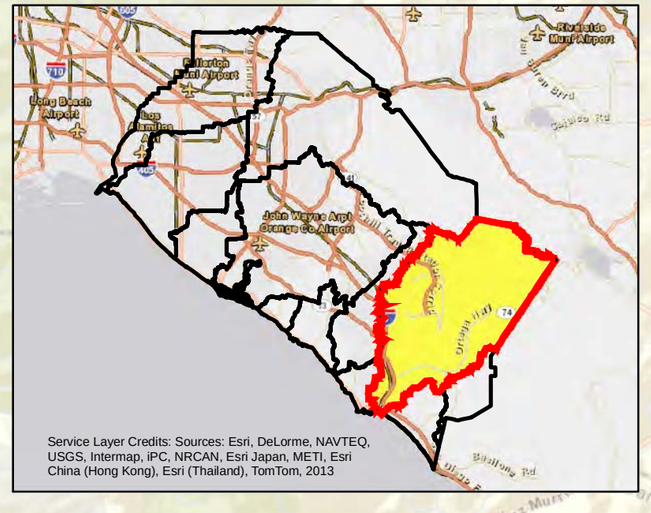
85th Percentile Precipitation (in)

- 0.76 - 0.8
- 0.81 - 0.85
- 0.86 - 0.9
- 0.91 - 0.95
- 0.96 - 1
- 1.01 - 1.05

1
0.95
0.9
0.85

PROJECT LOCATION

0 5,250 10,500 21,000 Feet



P:\9526E\6-GIS\Mxds\Reports\WIHMP_20131029\9526E_Fig9-8_WIHMP_85thPercentileRainfall_SanJuanCreek_20131029.mxd

PACE Advanced Water Engineering

COUNTY OF ORANGE
WATERSHED INFILTRATION HYDROMODIFICATION MANAGEMENT PLAN (WIHMP)

FIGURE 9.8

PRECIPITATION - 85TH PERCENTILE
SAN JUAN CREEK WATERSHED

Attachment H: Geotechnical Report

WILLDAN Geotechnical | extending your reach

March 21, 2019

Mr. Patrick Ganahl
Ganahl Lumber Company
1200 East Ball Road
Anaheim, CA 92805

Subject: Addendum Report for Stormwater Infiltration Recommendations, Proposed Ganahl Lumber Facility Development, San Juan Capistrano, California
Willdan Geotechnical Project No. 108164-2000

Reference:

- Update Geotechnical Investigation Report and Response to Third Party Review, Proposed Ganahl Lumber Facility Development, San Juan Capistrano, California; Dated November 15, 2018, Prepared by Willdan Geotechnical, Project No. 108164-2000

- Addendum Report for Pavement Recommendations, Proposed Ganahl Lumber Facility Development, San Juan Capistrano, California; Dated February 21, 2019, Prepared by Willdan Geotechnical, Project No. 108164-2000

Dear Mr. Ganahl,

Willdan Engineering, Geotechnical Group (Willdan Geotechnical) has provided this addendum report to clarify our recommendations for feasibility of on-site stormwater disposal at the subject project site. Our conclusion presented in the referenced report was that on-site stormwater disposal systems such as infiltration trench, infiltration basin, and/or dry well, are not feasible due to the recorded historical shallow groundwater levels and engineered fill. This is to confirm that incidental and localized stormwater infiltration systems limited to designated areas, such as pervious pavement or permeable granular surfaces, are certainly feasible at the subject site, provided the surfaces are designed and constructed as recommended in the referenced addendum report.

We appreciate the opportunity to assist you and look forward to future projects. If you have any questions, please contact us.

Respectfully submitted,
WILLDAN ENGINEERING
GEOTECHNICAL GROUP

Mohsen Rahimian

REGISTERED PROFESSIONAL ENGINEER
MOHSEN RAHIMIAN
No. 3059
GEOTECHNICAL
STATE OF CALIFORNIA

Mohsen Rahimian, P.E., G.E.
Principal Engineer

Distribution: Addressee

February 21, 2019

Mr. Patrick Ganahl
Ganahl Lumber Company
1200 East Ball Road
Anaheim, CA 92805

Subject: Addendum Report for Pavement Recommendations
Proposed Ganahl Lumber Facility Development, San Juan Capistrano, California
Willdan Geotechnical Project No. 108164-2000

Dear Mr. Ganahl,

Willdan Engineering, Geotechnical Group (Willdan Geotechnical) is pleased to present this addendum report presenting our recommendations for pavement design. We provided the recommendations for asphalt concrete (AC) pavement for various traffic indices (TI) in the original geotechnical investigation report. Per the request of the project's design team, we are providing recommendations for additional pavements including AC, pervious asphalt (PA) and Portland cement concrete (PCC) pavements.

The following pavement sections are recommended for various Traffic Indices, using an assumed R-value of 25 for the subgrade soils. Bulk samples should be collected from within the pavement subgrade at the project site upon completion of grading for laboratory testing, and the pavement design should be revised accordingly.

Table 1. Pavement Design (R-Value = 25)

Location	TI	Pavement Type			
		AC		PCC	PA
		AC/AB (in/in)	Full Depth AC (in)	JPCP/AB (in/in)	OGFC/ATPB/AB (in/in)
Auto Parking Areas	4	2.0/5.5	4.5	6.0/7.5	1.2/7.5/6.0
Driveways	7	4.0/11.0	9.0	8.0/9.0	1.2/9.5/7.0
Fire Truck Access Road	10	6.0/16.5	13.5	9.0/12.0	1.2/13.0/11.0

AC: Asphalt Concrete PCC: Portland Cement Concrete PA: Pervious Asphalt
AB: Aggregate Base OGFC: Open Graded Friction Course
ATPB: Asphalt Treated Permeable Base JPCP: Jointed Plain Concrete Pavement

The subgrade for non-pervious pavements shall be scarified for a minimum of 8 inches and compacted to a minimum of 90% relative compaction per ASTM D1557. The scarification should laterally extend at least 2 feet beyond the perimeter of the proposed pavement area. The base material shall consist of crushed aggregate base (CAB) or crushed miscellaneous base (CMB) as

specified in the Greenbook and compacted to a minimum of 95% relative compaction per ASTM D1557.

The subgrade for pervious pavements shall be tested to have a relative compaction of at least 87% and not more than 92% of the maximum dry density obtained per ASTM D1557. The subgrade areas with relative compaction not within the recommended limits should be scarified to a depth of 8 inches and re-compacted to a relative compaction within the recommended limits. In lieu of processing the unsuitable subgrade, it may be replaced with the aggregate base compacted to the required relative compaction.

Aggregate base used in non-pervious pavement sections should be crushed aggregate base (CAB) or crushed miscellaneous base (CMB) complying with applicable sections of the latest edition of Standard Specifications for Public Works Construction (Greenbook) or Class 2 aggregate base (AB) complying with the applicable sections of the latest edition of Caltrans Standard Specifications. The AB material should have a minimum R-value of 78 and should be compacted to at least 95% of the maximum dry density obtained per ASTM D1557. Asphalt concrete shall comply with the requirements addressed in the latest edition of the Greenbook.

Aggregate base used in pervious pavement sections should be crushed aggregate base (CAB) complying with Class 4 aggregate base (AB) as specified in the Caltrans Pervious Pavement Design Guidance (Caltrans, 2014). Any nominal maximum aggregate size from 3/4 to 2 inches may be used for Class 4 AB material. The Class 4 AB material should have a gradation that will result in material with compacted dry density not more than 115 pounds per cubic foot (pcf). The Class 4 AB material should have a minimum R-value of 60 and should be compacted to at least 95% of the maximum dry density obtained per ASTM D1557. Surface layer pervious asphalt concrete (OGFC), permeable asphalt treated base (ATPB) material, and pervious concrete shall comply with the requirements addressed in the latest edition of the Greenbook, Caltrans Pervious Pavement Design Guidance, or Caltrans Standard Specifications. JPCP should be constructed per Chapter 620 of Caltrans Highway Design Manual. PCC should have a minimum compressive strength of 4,000 psi.

We appreciate the opportunity to assist you and look forward to future projects. If you have any questions, please contact us.

Respectfully submitted,
WILLDAN ENGINEERING
GEOTECHNICAL GROUP



Mohsen Rahimian, P.E., G.E.
Principal Engineer

Distribution: Addressee

UPDATE GEOTECHNICAL INVESTIGATION REPORT AND RESPONSE TO THIRD PARTY REVIEW PROPOSED GANAHL LUMBER FACILITY DEVELOPEMENT SAN JUAN CAPISTRANO, CALIFORNIA

PREPARED FOR

GANAHL LUMBER COMPANY
1220 EAST BALL ROAD
ANAHEIM, CALIFORNIA 92805

PREPARED BY

WILLDAN ENGINEERING
GEOTECHNICAL GROUP
1515 SOUTH SUNKIST STREET, SUITE E
ANAHEIM, CALIFORNIA 92806
WILLDAN GEOTECHNICAL PROJECT NO. 108164-2000

NOVEMBER 15, 2018

November 15, 2018

Mr. Patrick Ganahl
Ganahl Lumber Company
1200 East Ball Road
Anaheim, CA 92805

Subject: Update Geotechnical Investigation Report and Response to Third Party Review
Proposed Ganahl Lumber Facility Development, San Juan Capistrano, California
Willdan Geotechnical Project No. 108164-2000

Dear Mr. Ganahl,

Willdan Engineering, Geotechnical Group (Willdan Geotechnical) is pleased to present this report presenting our review of all available reports and plans, and reanalysis of available data from geotechnical viewpoint relevant to the proposed development and provide responses to review comments generated by the Third Party Reviewer of the City of San Juan Capistrano, as well as our conclusions and recommendations for the design and construction of the proposed developments.

In preparation of this report we have reviewed all the readily available subsurface data, borings and cone penetration test (CPT) soundings relevant to the proposed project site, laboratory test results and analyses presented in the following referenced reports:

1. "Preliminary Geotechnical Investigation, Proposed Commercial Development and Ganahl Lumber Facility, Stonehill Drive and San Juan Creek Trail, San Juan Capistrano, California", Prepared by G.A. Nicoll and Associates, Dated October 5, 2017 (Original), February 16, 2018 (Revision 1), and March 21, 2018 (Revision 2), Project 7082-04.

2. "Third Party Review of G. A. Nicoll and Associates, Inc., Preliminary Geotechnical Investigation, Proposed Commercial Development and Ganahl Lumber Facility, Stonehill Drive and San Juan Creek Trail, San Juan Capistrano, California", Prepared by LGC Geotechnical, Inc., Dated June 22, 2018, Project No. 11126-01, City of SJC Project No. DA17-003.

3. "Conceptual Grading Plans, Ganahl Lumber, Stonehill Drive along the East Side of the San Juan Creek Channel, City of San Juan Capistrano, Sheet C-7 through C-20", Prepared by Joseph C. Truxaw and Associates, Inc., Dated 6-1-18.

4. "Geotechnical Report, San Juan Creek (L01) Channel Levee Protection, Phases 4 & 5 (Station 51+00 to 112+00), San Juan Capistrano, California", Prepared by AMEC Earth & Environmental, Inc., Dated June 24, 2010, Job No. 9-212-100147.

5. "Design Level Analysis for Sheet Pile Wall, San Juan Creek (L01) – Phases 4 &5, East Levee Station 51+00 to Station 112+00, Orange County, CA", Prepared by TETRA TECH, Dated March 25, 2016.

Based on the results of our review of the aforementioned documents and engineering evaluation and analyses, the proposed developments are feasible from a geotechnical standpoint, provided the recommendations in this report are followed.

We appreciate the opportunity to assist you and look forward to future projects. If you have any questions, please contact us.

Respectfully submitted,
WILLDAN ENGINEERING
GEOTECHNICAL GROUP



Ross Khiabani, P.E., G.E.
Senior Geotechnical Engineer



Afshin Mantegh, Ph.D., P.G., C.E.G.
Sr. Engineering Geologist

Mohsen Rahimian, P.E., G.E.
Principal Engineer

Distribution: Addressee

TABLE OF CONTENTS

SECTION **PAGE**

1. SITE DESCRIPTION 1
2. PROPOSED DEVELOPMENT 1
3. GEOLOGY 1
4. SUBSURFACE CONDITIONS 2
5. GROUNDWATER 3
6. SEISMIC CONSIDERATIONS 3
   - 6.1. REGIONAL SEISMICITY 3
   - 6.2. LOCAL FAULTING 3
   - 6.3. GROUND SHAKING AND SEISMIC DESIGN PARAMETERS 4
   - 6.4. SOIL LIQUEFACTION 5
   - 6.5. LANDSLIDE 5
   - 6.6. LATERAL SPREADING 5
7. CONCLUSIONS AND RECOMMENDATIONS 6
   - 7.1. GENERAL 6
   - 7.2. EARTHWORKS 6
   - 7.3. FILL MATERIAL 6
   - 7.4. UTILITY TRENCH BEDDING AND BACKFILL 7
   - 7.5. TEMPORARY EXCAVATIONS 7
   - 7.6. SHORING DESIGN 8
   - 7.7. FOUNDATION DESIGN 8
   - 7.8. MOISTURE SENSITIVE FLOOR COVERING 9
   - 7.9. CONCRETE FLATWORKS 10
   - 7.10. RETAINING WALLS 10
   - 7.11. SURFACE DRAINAGE 11
   - 7.12. ON-SITE INFILTRATION 12
   - 7.13. PAVEMENT DESIGN 12
   - 7.14. SOIL CORROSIVITY 12
8. REFERENCES 13

APPENDICES

APPENDIX A. FIGURES
APPENDIX B. BORING LOGS AND CPT DATA
APPENDIX C. LIQUEFACTION ANALYSES

1. SITE DESCRIPTION

The subject property is a rectangular shape, approximately 16-acre parcel, bounded by Stonehill Drive on the south, BNSF Railroad on the east, existing mobile home park on the north, and the San Juan Creek on the west. The San Juan Creek drainage extends in the southwesterly direction from the Santa Ana Mountains in the easterly portion of Orange County. The general area, historically has been a flood plain along the flow of the San Juan Creek. The site is presently fenced and used for the storage of dealer inventory of automobiles. The project site location is shown on Figure 1 in Appendix A.

2. PROPOSED DEVELOPMENT

It is our understanding that the proposed development will consist of a total of four commercial/industrial building pads and relatively flat, paved and unpaved driveways, surface storage, and parking areas. The most recent conceptual plans show an elevated pad adjacent to Stonehill Drive using additional fill and a retaining wall. Structural loads were not available at the time of preparation of this report.

3. GEOLOGY

The subject site lies within the southerly portion of the Central Block of Los Angeles Basin. The Los Angeles Basin is a northwest trending alluvial lowland plain about 50 miles long and 20 miles wide. Mountains and hills that generally expose late Mesozoic to late Pleistocene age sedimentary and igneous rocks bound the Basin along the north, northeast, east and southeast. The Basin is part of the Peninsular Ranges Geomorphic Province of California, which is characterized by regional compression due to the bend in the San Andreas Fault and sub-parallel blocks sliced longitudinally by young, steeply dipping northwest trending fault zones. The Basin is a site of Active sedimentation, and strata are interpreted to be much as 31,000 feet thick in the center of the trough.

The site locally is situated in an area of generally underlain by estuarine deposits of the San Juan Creek flood plain. Subsequently, some of these areas have been modified by addition of the artificial fill materials described in the attached boring logs and subsurface geological maps. This fill predominantly includes fine-grained materials such as silt and clay. Artificial fill materials also appear within the levee system of the San Juan Creek drainage at the west side of the subject project site. This fill has been identified as silty sand, poorly graded sand by AMEC (2009). This lies on the young alluvial floor along the San Juan Creek drainage which has been eroded through the bedrock and was filled by stream alluvial.

In the hillside areas, particularly to the east of the site, coastal hills and ridges composed of sedimentary bedrock of the Miocene age siltstone facies of Capistrano Formation are exposed. None of these materials were encountered within the limits of the subjects site. Based on the published geologic maps (Morton, Russel and Miller, 1973) numerous landslides and landslide complexes have been mapped within Capistrano Formation bedrock in the immediate vicinity east of the site

4. SUBSURFACE CONDITIONS

According to the references, the subsurface conditions of the site were explored and documented by:

- Five (5) deep hollow-stem auger (HSA) borings (B-1 through B-5) drilled to depths between 51.5 and 61.5 feet below ground surface (bgs), six (6) relatively shallow HSA borings (P-1 through P-6) drilled to depths between 6.5 and 16.5 feet bgs, and three (3) shallow HSA borings (SSGB-1 through SSGB-3) drilled to depth of 16.6 feet bgs, These borings logs are presented in Reference 1 above.
- Eleven (11) CPT soundings advanced to depths between 25 and 60 feet bgs. These CPT soundings are presented in Reference 1 above.
- Three (3) deep HSA borings (B-1 through B-3) drilled to depth of 81.5 feet, and three (3) CPT soundings (CPT-1, CPT-2, and CPT-7) advanced to depths between 43.64 and 71.85 feet bgs, on top of the berm, along San Juan Creek. These boring logs and CPT soundings are presented in References 4 and 5, above.

The borings and CPT soundings locations are shown on Figure 2 in Appendix A. Also, the boring logs and CPT data are excerpted from the references and are provided in Appendix B.

Review of the available site-specific borings and CPT data indicates that the site is covered by a layer of man-made, undocumented fill to depths between 15 and 20 feet bgs, as visually defined during drilling hollow-stem auger borings and as interpreted from review of the CPT data. The fill is classified as brown to gray sandy silt to clayey silt and silty sand with traces of fine to coarse gravel. The fill was found in soft to stiff and medium dense at dry to moist conditions.

The underlying alluvial deposits, under the fill as encountered in the borings and CPT soundings consist of fine to coarse silty sand and gravel. The alluvial soils also included dark gray to dark brown sandy silt and sandy clay. Standard Penetration Test (SPT) N-values for alluvial layer varied from 10 to greater than 100 blows per foot indicating that alluvial deposits are interbedded lenses and layers of soft to hard fine material and very loose to very dense granular material. Occasional

hard drilling was experienced, and unsuccessful sample recoveries were encountered at different depths within alluvial deposits due to presence of gravels and cobbles.

Bedrock exposures near the subject site are marine sedimentary rocks of Miocene and Pliocene age, specifically, the Niguel Formation described as a fine sandstone and silty sandstone, and Capistrano Formation described as a siltstone, mudstone and soft diatomaceous and silty shale. None of these materials were encountered within limits of the subject site. The cross sections depicting the project site subsurface conditions have been prepared and are provided in Appendix A of this report.

5. GROUNDWATER

Groundwater was encountered in all borings at depths ranging from 18 to 22 feet bgs at the locations explored during the drilling. Historical groundwater within the subject project site has not been identified by California Geological Survey (CGS). Generally, groundwater depth can be affected by seasonal fluctuations of rainfall and environmental changes such as irrigation or pumping and in this case the water presence and flow in the adjacent Creek. Groundwater is expected to be a significant issue for site development.

6. SEISMIC CONSIDERATIONS

6.1. REGIONAL SEISMICITY

The project site is located in the general proximity of several active and potentially active faults. The southern California region is known to be seismically active and much geologic and seismologic evidence is readily available. It is our opinion that the faults of most concern to this project site are active faults. Active faults are those which have ruptured during the past 11,000 years. The available literature indicates that no active fault crosses the subject site and the site is not located within an Alquist-Priolo Special Studies (AP) Zone.

6.2. LOCAL FAULTING

The closest identified active fault is the Newport-Inglewood-Rose Canyon Fault (Dana Point section) is the most important for the seismic evaluation of the subject site. This fault lies to the south and southwest of the site at approximately 3.7 miles, capable to produce strong ground motion. A significant contribution to potential ground motion is also indicated for the San Joaquin Hills Fault located approximately 5.6 miles northwest of the project site.

6.3. GROUND SHAKING AND SEISMIC DESIGN PARAMETERS

A site location of Longitude 117.6777° W and Latitude 33.4758° N and Site Class D was used for developing seismic ground motion parameters. The site class per Section 1613.3.2 of the CBC 2016 is based upon the site soil conditions. Utilizing the United States Geologic Survey (USGS) Unified Hazard Tool, for a 2475-year return period (2% probability of exceedance in 50 years), deaggregation of the earthquake magnitude and distance from USGS model indicate that this peak acceleration is associated with a mean magnitude of 6.7 at a mean hypocentral distance of 11.74 km. This mean magnitude and hypocentral distance is associated with the Newport-Inglewood fault.

For the purposes of this report, an acceleration of 0.550g may be used for the design maximum considered earthquake geometric mean (MCE_G) peak ground acceleration adjusted for site class effects (PGA_M). This acceleration is based on the requirements addressed in Section 1803.5.12 of CBC 2016.

For design of the structures based on the seismic provisions of the CBC 2016, we recommend the parameters in the following Table 1:

Table 1. Seismic Design Parameters

Seismic Item	Value	IBC Reference
Site Class	D	Section 1613.3.2
F_a	1.0	Table 1613.3.3(1)
S_s	1.390	Figure 1613.3.1(1)
S_{MS}	1.390	Section 1613.3.3
S_{DS}	0.927	Section 1613.3.4
F_v	1.5	Table 1613.3.3(2)
S_1	0.521	Figure 1613.3.1(2)
S_{M1}	0.781	Section 1613.3.3
S_{D1}	0.521	Section 1613.3.4

Site Coordinates: Latitude: 33.4758° N Longitude: 117.6777° W

6.4. SOIL LIQUEFACTION

Liquefaction is the full or partial loss of shear strength in soils during shaking caused by earthquake. Potential adverse consequences of liquefaction include loss of bearing capacity leading to structural damage or collapse and ground settlement.

The project site is in a State of California designated Liquefaction Hazard Zones, Dana Point Quadrangle (CDMG 2001). The liquefaction potential is greatest where the groundwater level is shallow, and where saturated, loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases as clay and gravel content increase.

We analyzed liquefaction potential of the site using CPT data and the computer program CLiq 1.7 (GeoLogismiki, 2014). We performed our liquefaction evaluation for each CPT, that provides a continuous subsurface profile at the point of exploration, assuming groundwater at a depth of 20 feet below the ground surface. The results of the liquefaction analyses are provided in Appendix C. Liquefaction analyses was not performed for borings, since boring logs are prepared based on the samples taken at 5 feet intervals and augur cuttings between points of sampling which does not provide as accurate profile of subsurface conditions as CPT data, and may result in misleading and non-accurate results.

The results of our analyses indicate that sand and sandy silt layers within the alluvial deposits are likely to liquefy during earthquake. These sand layers will experience a loss of shear strength associated with liquefaction that will likely generate ground deformation and settlement. The result of our analysis indicates that the seismic settlements of the existing conditions at the site, due to liquefaction and dry settlement of material above the water level, will be up to 2.0 inches. This estimated settlement will be reduced to 1.75 inches upon completion of recommended removal and re-compaction of the top 12 feet of the existing fill.

6.5. LANDSLIDE

Seismic hazard zone map for Dana Point 7.5-Minute Quadrangle (CGS, 2001a) does not indicate that the site is susceptible to landslide. Also, the project site area is generally flat and there is not a potential for landslides. As such, it is our opinion that landslide is not a potential hazard at the project site.

6.6. LATERAL SPREADING

Liquefaction may lead to lateral spreading. Lateral spreading happens when surficial soil moves in a direction parallel to the ground surface due to liquefaction of underlying subsurface soils layers. Lateral spreads generally move down gentle slopes, usually less than 6%, (Naeim 1989) or slip toward a free face such as an incised river channel. Lateral spreading of the San Juan Capistrano Creek Levee was analyzed with the constructed sheet piles (AMEC 2010). It should be noted that lateral spreading at the subject property is not a concern due to proposed final level

ground surface and recently constructed sheet pile system along the San Juan Creek, penetrating below the lowest liquefiable layer identified within the site for protection of the creek levee.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. GENERAL

Based on our review of all available data (References) and engineering analysis, it is our opinion that the proposed project is suitable for construction provided the recommendations in this report are incorporated into grading and design. The geologic and geotechnical hazards described in the previous sections that will affect geotechnical design includes seismic ground shaking, potential for liquefaction and associated settlement, and presence of undocumented fill within the upper 15 to 20 feet bgs.

The grading of the site should consider remedial measures for removing and re-compaction of the undocumented fill to the recommended depths and foundation design to accommodate potential static and seismic settlement. The following sections present more details of our conclusions and recommendations.

7.2. EARTHWORKS

Prior to any grading activities, organics and debris shall be removed and hauled off-site. The undocumented fill within the entire proposed development limit should be over-excavated to a minimum depth of 12 feet below proposed grade or saturated zone, whichever occurs first. The bottom of excavated area should be underlain by a layer of filter fabric (Mirafi 140) overlain by minimum two (2) feet of crushed rock, reinforced with a geogrid layer (Tensar Triax TX160). The recommended filter fabric will prevent contamination of crushed aggregate base from underlying fine soils and the geogrid will provide additional reinforcement by spreading the vertical stresses laterally and minimizing propagation/manifestation of the vertical settlements to the surface. The combined positive effect of the above measure will provide a relatively stiff layer over potentially saturated alluvium and act as a competent surface to receive the proposed engineered fill layer.

The excavated zone then shall be backfilled with engineered fill. Unless stated otherwise, all fill materials should be placed in loose lifts of 8 inches or less, moisture-conditioned within optimum and 3% above optimum moisture content and compacted to at least 90% relative compaction of the maximum density as determined by the ASTM D1557. Compaction should be verified by observation, probing and testing by a geotechnical consultant's representative.

7.3. FILL MATERIAL

The on-site soils with an EI less than 35 and free of organic materials, debris and cobbles larger than 3 inches may be used for backfilling purposes. Also, imported granular soils may be used in

the required compacted fills within the subject project site. Imported materials should contain sufficient fines (binder material) so as to be relatively impermeable and result in a stable subgrade when compacted. The imported materials should also be non-expansive, with an EI less than 35 and free of organic materials, debris and cobbles larger than 3 inches, with no more than 25 percent of materials being larger than 2 inches in size and no more than 25 percent passing #200 Sieve. Within the upper 2 feet of fills the materials should be free of particles greater than 2 inches in size. A bulk sample of potential import material, weighing at least 30 pounds, should be submitted to the Geotechnical Consultant at least 48 hours before fill operations. All proposed import materials should be approved by the Geotechnical Consultant prior to being placed at the site.

7.4. UTILITY TRENCH BEDDING AND BACKFILL

Bedding materials consisting of sand, gravel, or crushed aggregate should be used to backfill around utility pipes to approximately one foot above the top of the pipe. Onsite soils which have a Sand Equivalent (SE) of 30 or greater can also be used as bedding material. Prior to placing the pipes, the pipe trench subgrade should be observed by a representative of the project geotechnical engineer. If the exposed subgrade is loose or unstable, the unsuitable subgrade soil must be excavated and replaced with bedding material. Bedding must be placed uniformly on each side of the pipe and mechanically compacted. Flooding or jetting to densify the bedding materials is not allowed due to the clayey nature of onsite soils. The fill should be placed in loose lifts not to exceed 8 inches, moisture-conditioned within optimum and 3 percent above optimum moisture content, and mechanically compacted to at least 90 percent relative compaction in accordance with ASTM D1557. Thinner lifts may be necessary to achieve the recommended level of compaction of the backfill due to equipment limitations.

Trenches in pavement areas should be capped with at least 12 inches of compacted, on-site soil similar to that of the adjoining subgrade. The upper 12 inches of trench backfill in areas to be paved should be compacted to at least 95 percent relative compaction. Special care should be taken in the control of utility trench backfilling in the pavement areas. Poor compaction may cause excessive settlement resulting in damage to the pavement structural section.

7.5. TEMPORARY EXCAVATIONS

Temporary excavations must be properly sloped or shored. Based on the earth materials encountered in our borings, excavation of 3.5 feet or less in depth may be performed with vertical sidewalls. Deeper excavation up to a depth of 10 feet can be accomplished in accordance with the Occupational Safety and Health Administration (OSHA) requirements for Type C soils and may be laid back at 1H:1.5V gradient, or 1H:1V, upon review and approval by the project geotechnical engineer.

The contractor is responsible for maintaining the stability of the cuts and personnel safety in the field during construction. All excavations shall be performed in accordance with applicable

requirements established by the State, County, or local government. The regulatory requirement may supersede the recommendations presented in this section. The Geotechnical Engineer of Record's representative should be present during all excavations.

7.6. SHORING DESIGN

Typical cantilever shoring up to 20 feet should be designed based on an active fluid pressure of 35 pounds per cubic foot (pcf), assuming level ground above the shoring. If excavations are braced at specific design intervals, the active pressure may then be approximated by a trapezoidal soil pressure distribution with the pressure per foot of width equal to 25H pounds per square foot (psf) applied within the middle 0.6H of the excavation, where H is the depth of the excavation in feet. Surcharge loads within a 1H:1V plane extending up from the base of the excavation should be included in the design lateral pressures by taking 35 percent of the surcharge pressure applied as a uniform load along the shoring system.

For a soldier beam shoring system, the soldier piles should be spaced at a maximum of 8 feet on-center. For design purposes, the lagging should be designed using a uniform pressure of 300 psf. The passive pressure used to design the soldier pile may be taken as 500 psf per foot of depth. The maximum passive pressure should not be taken more than 5,000 psf. The space between the soil and the soldier beam should be backfilled with concrete with a minimum compressive strength of 2,500 pounds per cubic inch (psi). A factor of safety of 1.5 shall be considered for passive resistance.

All shoring should be designed in accordance with the latest edition of the Trenching and Shoring Manual (Caltrans, 2011). The geotechnical consultant should review the contractor's shoring design. The shoring design must consider support of the proposed adjacent traffic lanes, parking, structures and/or underground utilities. A licensed surveyor should be retained to establish monuments on the shoring and the surrounding ground prior to excavation. Such monuments should be monitored for horizontal and vertical movement during construction. Results of the monitoring program should be provided immediately to the project structural (shoring) engineer and Willdan Geotechnical for review and evaluation. It is recommended that Willdan Geotechnical review the shoring plans for conformance with our recommendations and that a geotechnical consultant's representative observe the installation of shoring.

7.7. FOUNDATION DESIGN

General: It is our opinion that the proposed structures may be supported on shallow foundations. The shallow foundation may be spread/strip footings with slab on grade or mat foundation, capable of tolerating the total and differential settlements as addressed in the forthcoming sections.

Conventional Spread/Strip Footings: Spread and/or strip footings should be at least 24 and 18 inches wide, respectively, and embedded at least 18 inches below the lowest adjacent grade in the engineered fill prepared as recommended in "Earthworks" section. The footings may be designed

to impose a maximum allowable pressure of 2,500 pounds per square foot (psf) due to dead plus live loads. The bearing capacity may be increased by one-third for transient loads such as seismic or wind.

The slab-on-grade should be at least 5 inches thick and reinforced with No. 3 rebar at 18 inches on center. Concrete slab-on-grade may be designed using a maximum bearing pressure of 1,000 psf. The structural design of the slab based on applied loads may exceed the above recommended minimum thickness and reinforcement.

In order to maintain adequate support for the foundations located adjacent to utility trenches, including existing utility trenches or other footings, the footings should be deepened as necessary so that their bearing surfaces are below an imaginary plane having an inclination of 1H:1V, extending upward from the bottom edge of the adjacent trench or footing.

Mat Foundation: Mat foundation system would be appropriate alternative when the estimated settlements cannot be tolerated by spread and strip footings design or as is desired by the owner for more rigid foundation. The mat should be at least 10 inches thick and be embedded at least 18 inches below the lowest adjacent grade in the engineered fill prepared as recommended in "Earthworks" section. The mat footing may be designed to impose a maximum allowable pressure of 1,000 pounds per square foot (psf) due to dead plus live loads. The bearing capacity may be increased by one-third for transient loads such as seismic or wind. A modulus of subgrade reaction, K_s, equal to 75 pounds per cubic inch (pci), and a subgrade modulus of elasticity, E_s, equal to 1,200 pounds per square inch (psi) may be used for design of the mat foundation.

Resistance to Lateral Loads: Lateral soil resistance will be provided by a combination of frictional resistance between the bottom of the footings and the underlying soils and by passive soil resistance acting against side of the footing. For frictional resistance between concrete and soil, a frictional coefficient of 0.35 may be used. For passive resistance, an allowable fluid pressure of 350 pcf may be used for a level ground surface condition in front of the footing/wall. When combining both frictional and passive resistance, the passive resistance should be reduced by one-third. The recommended value may be increased by one-third for short-term loading.

Settlement: Based on the results of our analyses and considering the above grading remediations, the total static settlements due to structural loads are expected to be less than 0.5 inch, and the differential static settlements are expected to be less than 0.25 inch over a 50-foot span. Also, the total seismic settlements are expected to be less than 1.75 inches, and the differential seismic settlements are expected to be less than 1.0 inch over a 50-foot span.

7.8. MOISTURE SENSITIVE FLOOR COVERING

In areas where moisture-sensitive floor coverings (such as tile, hardwood floors, linoleum or carpeting) are planned, an impermeable membrane (vapor barrier) should be installed below the

concrete slab or mat to reduce excess vapor drive through the slab. The membrane should be at least 10-mil thick and care should be taken to preserve the continuity and integrity of the membrane beneath the floor slab. At least 4 inches of free drainage gravel, with no more than 2 percent passing No. 200 sieve, should be placed below the vapor barrier to serve as a capillary break. The gravel layer shall be compacted to a minimum of 92% relative compaction per ASTM D1557. The gradation for the free drainage material used shall conform to the requirements for No. 3 Concrete Aggregates as specified in section 200-1.4 of the latest edition of Greenbook.

7.9. CONCRETE FLATWORKS

Frequent construction or control joints should be provided in all concrete slabs where cracking is objectionable. Contraction or weakened plane joints should extend slightly deeper than one-quarter the slab thickness to be effective. Control joints should be spaced a minimum of 10-feet intervals on both directions. The contractor should be responsible for monitoring of the concrete during initial set or hardening and to determine the optimal timing for cutting of the slabs.

Exterior concrete slab-on-grade may be subjected to periods of drying, and consequently, to edge effects due to the fluctuation in the moisture content of the subgrade soils along the outer edges of the slab. Deepened edge sections (also referred to as down turned curbs) will aid in reducing the potential for the shrinkage and swelling of the underling soils. By deepening the edge section to a minimum of 12 inches below the subgrade soils, there is less potential for soil moisture change below at least the perimeter of the slabs.

The above recommendations, including deepened edge sections and steel reinforcement are intended to help reduce the potential for distress in concrete slab, but may not eliminate such distress completely.

7.10. RETAINING WALLS

Lateral Earth Pressures: Anticipated lateral earth pressures and frictional coefficients for the design of the foundations and retaining structures at the site are listed in the following Table 2. Active pressure should be used for design of a retaining wall which is free to rotate at the top. At-rest pressures should be utilized if the wall is restrained from moving at the top, or in the case of below-grade walls of structures such as the planned inspection pits, or any utility and/or cable vault walls.

Table 2. Summary of Earth Lateral Loads and Resistance Factors

Active Pressure (Equivalent Fluid Density)	40 pcf
Passive Pressure (Equivalent Fluid Density)	350 pcf
At-rest Pressure (Equivalent Fluid Density)	55 pcf
Friction Factor	0.35

The distribution of active and passive pressures on a cantilever wall is equal to that pressure developed by an equivalent fluid with a density as presented in Table 2.

Also, retaining walls of 6 feet or taller in height should also be designed for additional seismic pressure equal to hydrostatic pressure of an equivalent liquid with density of 24 pcf as inverted triangular distribution.

A drainage system should be provided behind the walls to reduce the potential for development of hydrostatic pressure. If a drainage system is not installed, the wall should be designed to resist a hydrostatic pressure in addition to the introduced pressures.

Retaining Wall Foundation: The footing for the retaining wall should be embedded a minimum of 18 inches below the lowest adjacent finish grade supported on a minimum of 2 feet of fill compacted to at least 90% relative compaction. The retaining wall may be supported on strip footings designed using a maximum allowable bearing capacity of 2,000 psf. A one-third increase in the bearing capacity may be used when considering wind or seismic loads.

The footings may be designed for resisting against lateral loads using the passive pressure and friction factor values provided in Table 2. The top one foot of the subgrade should be deleted in passive pressure computations for the buried structures. When combining both frictional and passive resistance, the passive resistance should be reduced by one-third. The recommended value may be increased by one-third for short-term loading.

Retaining Wall Backfill: All the backfill should be placed in layers which, when loose, should not exceed 8 inches per layer, and compacted to a minimum relative compaction of 90% of maximum density per ASTM D1557. Subdrain systems shall be installed to prevent hydrostatic pressure build-up acting as an additional lateral load. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading.

7.11. SURFACE DRAINAGE

Inadequate control of run-off water and/or heavy irrigation after construction of the proposed developments may lead to adverse conditions. Maintaining adequate surface drainage, proper disposal of run-off water, and control of irrigation will help reduce the potential for future moisture related problems and differential movements from soil heave/settlement. Surface drainage should be carefully taken into consideration during grading, landscaping and building construction. Positive surface drainage should be provided to direct surface water away from wall and toward a suitable drainage device.

7.12. ON-SITE INFILTRATION

Following the recommendations provided in this report, and considering the groundwater levels encountered in the borings, the final site subsurface conditions will consist of up to 20 feet of fill underlain by alluvial deposits with groundwater at bottom of fill or less than 5 feet below the engineered fill. As such, it is our opinion that the subject site is not feasible for onsite infiltration and infiltration test is not warranted.

7.13. PAVEMENT DESIGN

Pavement sections have been developed in accordance with the procedures presented in the Caltrans Highway Design Manual (HDM). This pavement design procedure is based on the volume of traffic (Traffic Index, or "TI") and the subgrade R-value. The following pavement sections are recommended for various Traffic Indices, using an assumed R-value of 25 for the subgrade soils. Bulk samples should be collected from within the pavement subgrade at the project site upon completion of grading for laboratory testing, and the pavement design should be revised accordingly.

Table 3. Flexible Pavement Design (R-Value = 25)

TI	AC/AB (in/in)	Full Depth AC (in)
6	3.0/9.5	8.0
8	4.5/13.0	10.5
10 (Fire Truck Access Road)	6.0/16.5	13.5

The subgrade shall be scarified for a minimum of 8 inches and compacted to a minimum of 90% relative compaction per ASTM D1557. The scarification should laterally extend at least 2 feet beyond the perimeter of the proposed pavement area. The base material shall consist of crushed aggregate base (CAB) or crushed miscellaneous base (CMB) as specified in the Greenbook and compacted to a minimum of 95% relative compaction per ASTM D1557.

7.14. SOIL CORROSIVITY

A representative bulk sample of soils in contact with concrete and pipes should be collected and tested for pH, minimum resistivity, soluble chloride content and soluble sulfate content. The test results will be used to determine the chemical properties and provide appropriate recommendations.

8. REFERENCES

- "Geotechnical Report, San Juan Creek (L01) Channel Levee Protection, Phases 4 & 5 (Station 51+00 to 112+00), San Juan Capistrano, California", Prepared by AMEC Earth & Environmental, Inc., Dated June 24, 2010

- "Final Geotechnical Investigation Report for San Juan Creek (L01) Channel Levee Protection Project, Phase 6 (Western Levee Station 51+00 to 72+00), Cities of Dana Point and San Juan Capistrano, Orange County, California", Prepared by URS Corporation, Dated April 14, 2011

- "Supplemental Geotechnical Investigation, San Juan Creek East Levee Protection Phases 4 and 5, County Project No. EF0379+1, Station 51+00 to Station 112+00, San Juan Capistrano, California", Prepared by Tetra Tech Bas Geoscience, Dated November 4, 2015

- "San Juan Creek (L01) – Phases 4 & 5, East Levee Station 51+00 to 112+00, Orange County, CA, DRAFT, Design-Level Analysis for Steel Sheet Pile Wall", Prepared by Tetra Tech Bas Geoscience, Dated March 25, 2016

- "Preliminary Geotechnical Investigation, Proposed Commercial Development and Ganahl Lumber Facility, Stonehill Drive and San Juan Creek Trail, San Juan Capistrano, California", Prepared by G.A., Nicoll and Associates, Dated October 5, 2017

- "Preliminary Geotechnical Investigation, Proposed Commercial Development and Ganahl Lumber Facility, Stonehill Drive and San Juan Creek Trail, San Juan Capistrano, California", Prepared by G.A., Nicoll and Associates, Dated October 5, 2017 (Revision 1 – February 16, 2018) (Revision 2 – March 21, 2018).

- American Society for Testing and Materials (ASTM), Annual Book of Standards, Soil and Rock; Dimension Stone; Geosynthetics, Vol. 04.08.

- California Building Code, CBC 2016.

- State of California Geological Survey (CGS), 2001, Seismic Hazard Zone Report for the Dana Point 7.5-Minute Quadrangle, Orange County, California, Seismic Hazard Zone Report 049.

- State of California Geological Survey (CGS), 1998, Earthquake Zones of Required Investigation, Dana Point Quadrangle, Seismic Hazard Zones, December 21, 2001.

APPENDIX A. FIGURES

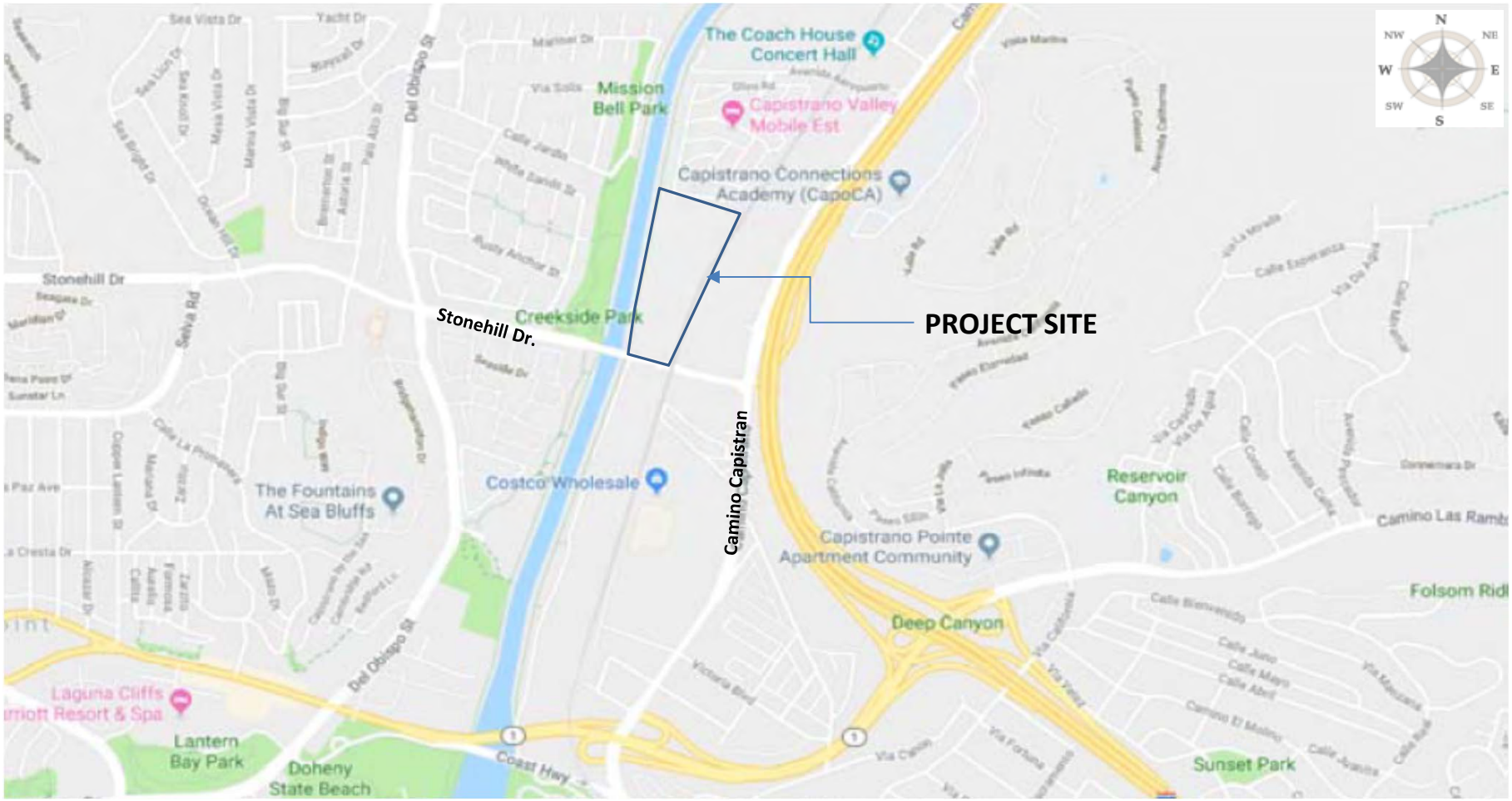


FIGURE 1. SITE LOCATION MAP

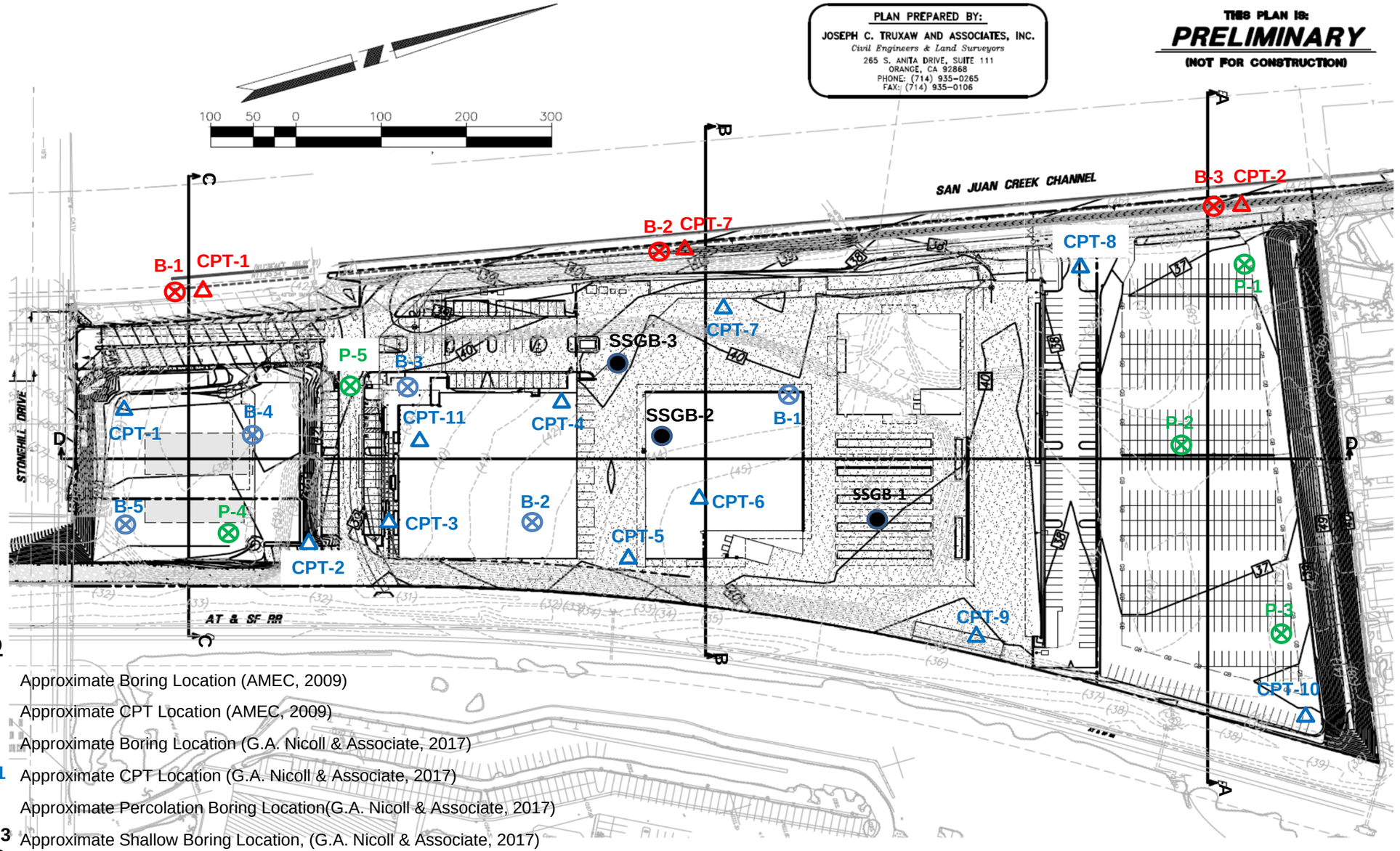
PROPOSED DEVELOPMENT AND GANAHL LUMBER FACILITY,
SAN JUAN CAPISTRANO, CALIFORNIA

WILLDAN Geotechnical | extending your reach

Drawn By:	AM	Date:	20-Sep-18
Approved By:	MR	Project No.:	108164-2000

PLAN PREPARED BY:
JOSEPH C. TRUXAW AND ASSOCIATES, INC.
Civil Engineers & Land Surveyors
265 S. ANITA DRIVE, SUITE 111
ORANGE, CA 92868
PHONE: (714) 935-0265
FAX: (714) 935-0106

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)



LEGEND

B-3	Approximate Boring Location (AMEC, 2009)
CPT-7	Approximate CPT Location (AMEC, 2009)
B-5	Approximate Boring Location (G.A. Nicoll & Associate, 2017)
CPT-11	Approximate CPT Location (G.A. Nicoll & Associate, 2017)
P-5	Approximate Percolation Boring Location(G.A. Nicoll & Associate, 2017)
SSGB-3	Approximate Shallow Boring Location, (G.A. Nicoll & Associate, 2017)
D D	Approximate Location of Geologic Cross Section

FIGURE 2. EXPLORATORY BORING, PERCOLATION BORING, CPT, AND CROSS SECTION LOCATION PLAN

PROPOSED COMMERCIAL DEVELOPMENT AND GANAHL LUMBER FACILITY

WILLDAN Geotechnical *extending your reach*

Drawn By: AM Date: September 19, 2018

Approved By: MR Project No.: 108164-2000

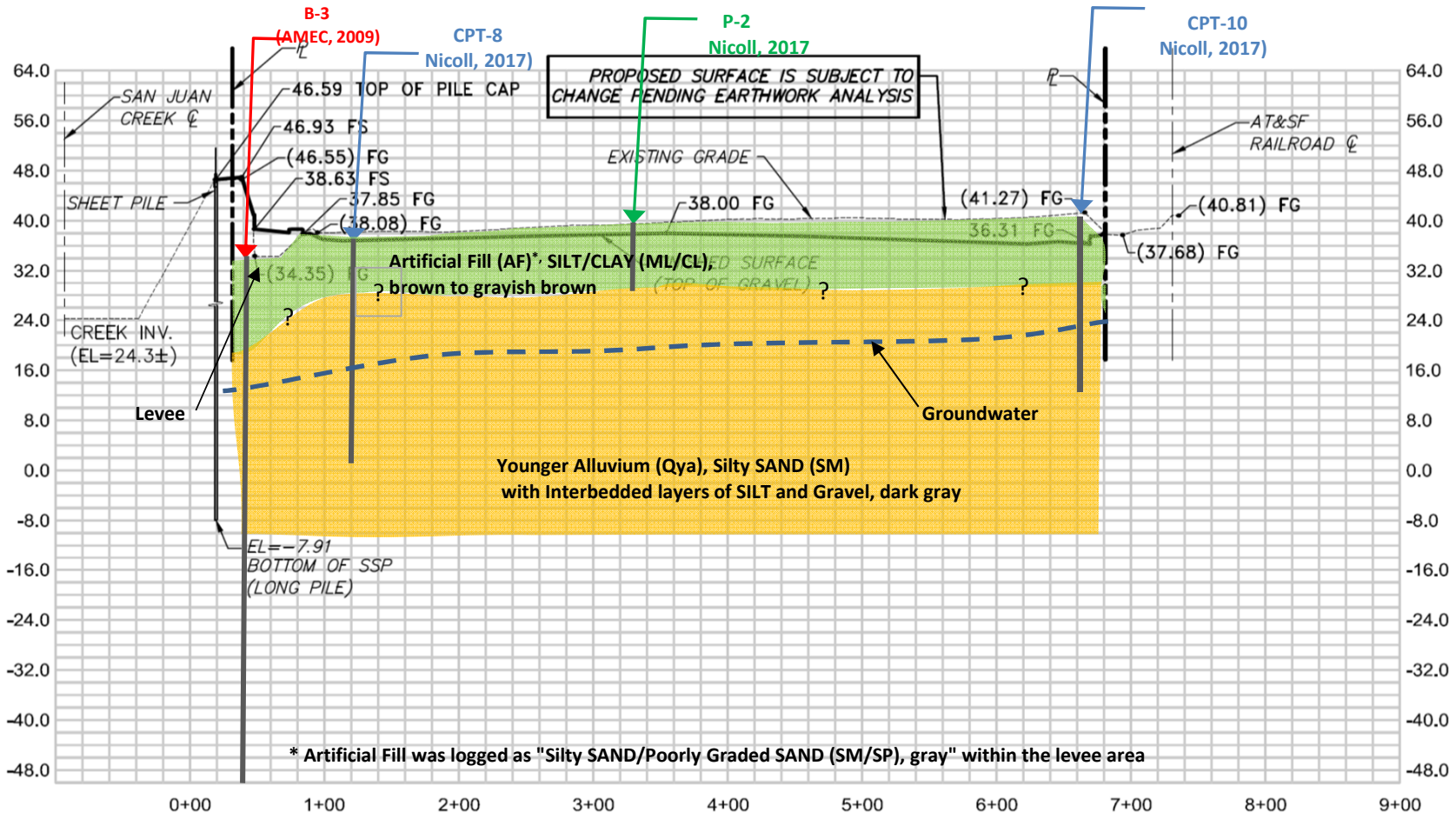


FIGURE 3A. SUBSURFACE GEOLOGICAL MAP - CROSS SECTION A-A

PROPOSED DEVELOPMENT AND GANAHL LUMBER FACILITY
SAN JUAN CAPISTRANO, CALIFORNIA

WILLDAN Geotechnical — extending your reach

Drawn By:	AM	Date:	20-Sep-18
Approved By:	MR	Project No.:	108164-2000

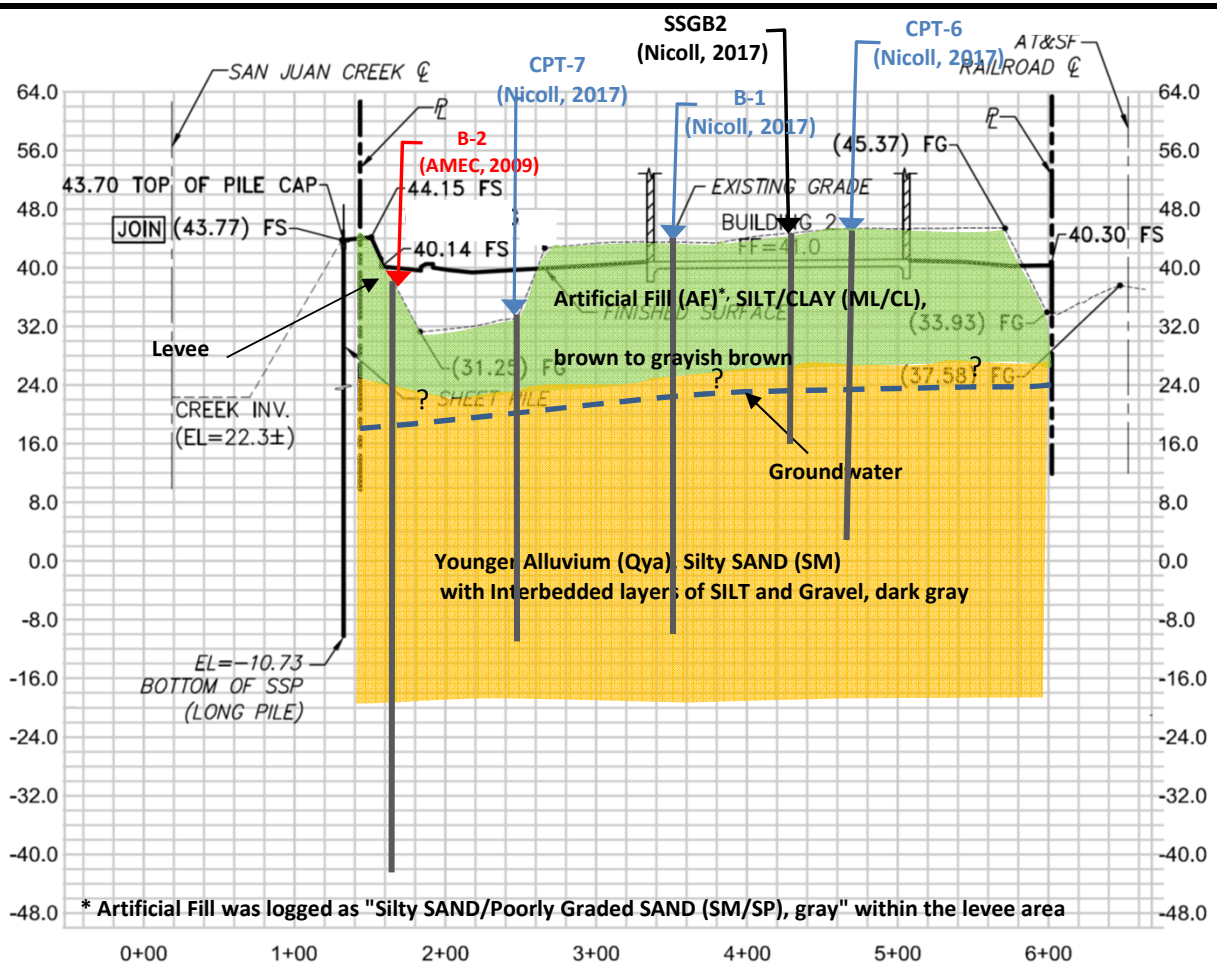


FIGURE 3B. SUBSURFACE GEOLOGICAL MAP - CROSS SECTION B-B

PROPOSED DEVELOPMENT AND GANAHL LUMBER FACILITY
SAN JUAN CAPISTRANO, CALIFORNIA

WILLDAN Geotechnical | extending your reach

Drawn By:	AM	Date:	20-Sep-18
Approved By:	MR	Project No.:	108164-2000

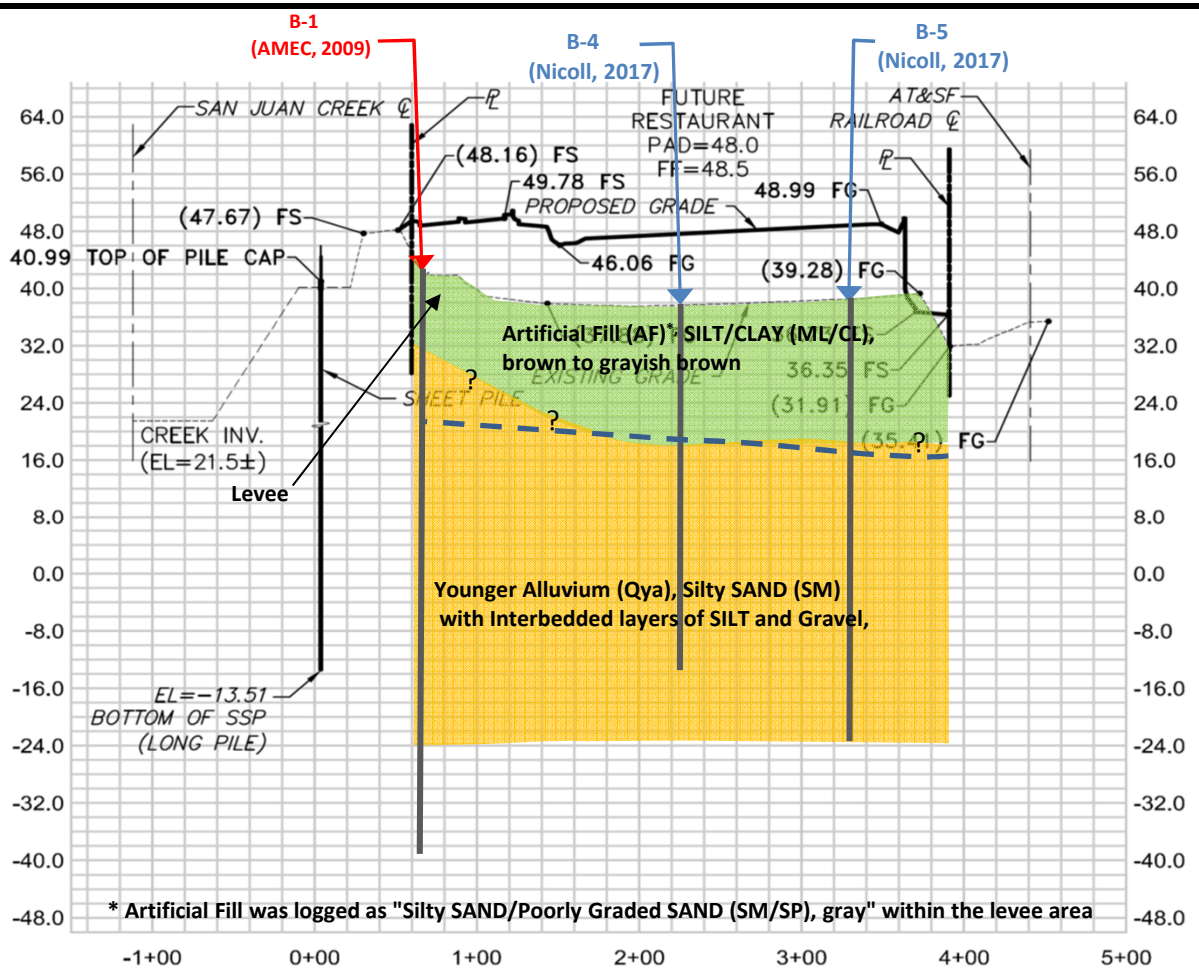


FIGURE 3C. SUBSURFACE GEOLOGICAL MAP - CROSS SECTION C-C

PROPOSED DEVELOPMENT AND GANAHL LUMBER FACILITY
SAN JUAN CAPISTRANO, CALIFORNIA

WILLDAN Geotechnical | extending your reach

Drawn By:	AM	Date:	20-Sep-18
Approved By:	MR	Project No.:	108164-2000

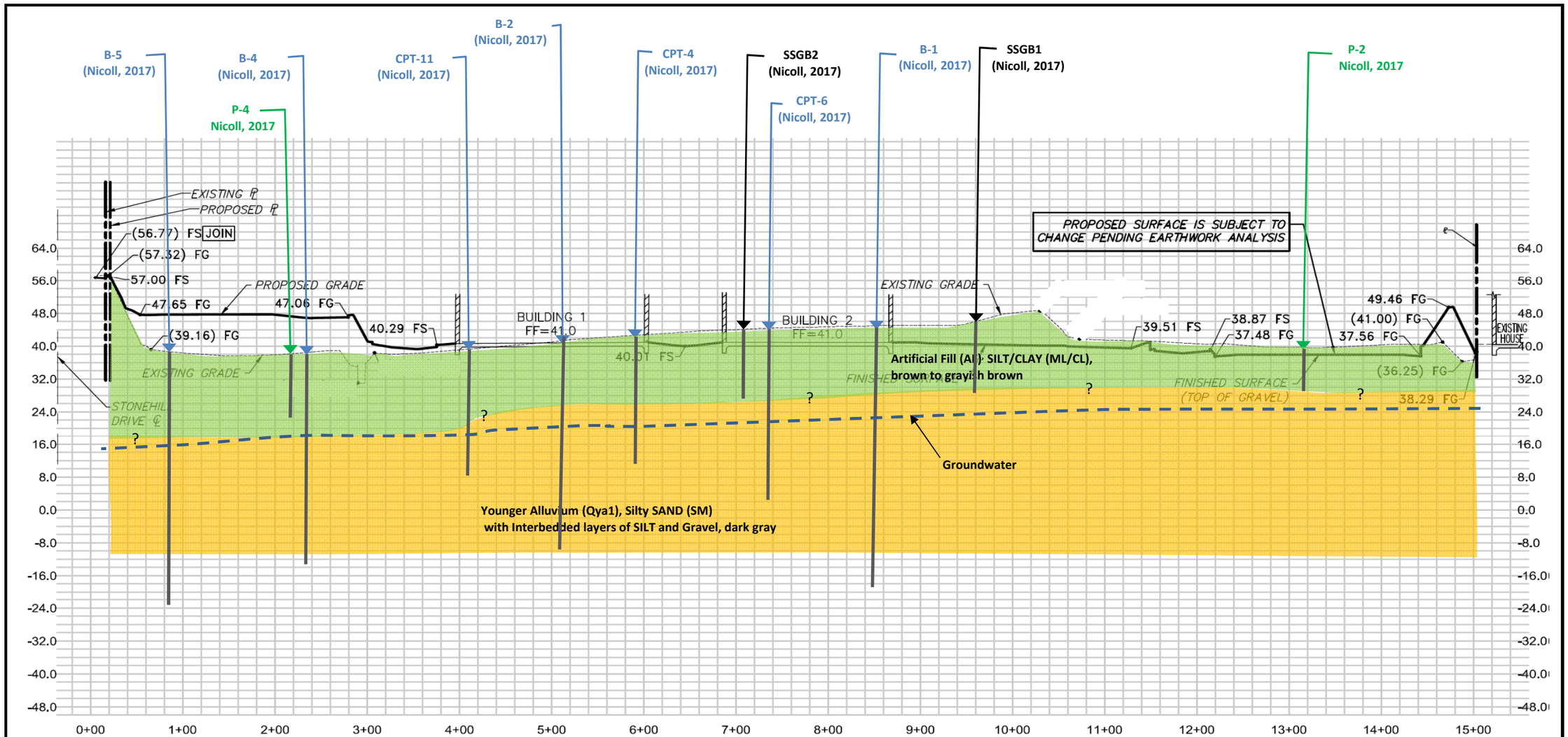


FIGURE 3D. SUBSURFACE GEOLOGICAL MAP - CROSS SECTION D-D

PROPOSED DEVELOPMENT AND GANAHL LUMBER FACILITY
SAN JUAN CAPISTRANO, CALIFORNIA

WILLDAN Geotechnical | extending your reach

Drawn By:	AM	Date:	September 20, 2018
Approved By:	MR	Project No.	108164-2000

APPENDIX B. BORING LOGS AND CPT DATA

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS		DESCRIPTIONS
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size.)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines)		GW	Well graded gravels, gravel-sand mixtures, little or no fines.
				GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)		GM	Silty gravels, gravel-sand-silt mixtures.
				GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size.)	CLEAN SANDS (Little or no fines)		SW	Well graded sands, gravelly sands, little or no fines.
				SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)		SM	Silty sands, sand-silt mixtures.
				SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size.)	SILTS AND CLAYS (Liquid limit LESS than 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 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 of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS				Pt	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

SILT OR CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

No. 200 No. 40 No. 10 No.4 ¾ in. 3 in. 12 in.

U.S. STANDARD SIEVE SIZE

G. A. NICOLL & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill & San Juan
Creek Trail, San Juan Capistrano, CA

Date: October 2017

Project No.: 7082-04

Figure No.: B-3

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		B-1

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling With the passage of time or at any other location, there may be consequential changes in conditions

SAMPLE										
12" DROP	BULK	TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
	X								ML	@ 0 feet, ARTIFICIAL FILL, (AF): SILT: light brown, dry, very soft
		X	5/10/9 N=19	13.2	104.9		5		ML/ CL	@ 5 feet, Clayey SILT and Silty CLAY: medium brown to brownish-gray, moist, stiff, some iron-oxide staining, mottled, trace coarse and fine-grained, mottled
		X	4/6/10 N=16	15.5	98.2		10		ML/ CL	@ 10 feet, The materials encountered are generally the same as those described above
		X	6/9/1 N=10	8.7	88.6		15		ML	@ 15 feet, SILT: medium brown, moist, stiff and some very fine, dark gray, very fine sand, mottled
									SM	@ 16 feet, CONTACT: YOUNGER ALLUVIUM, (Qyal): Silty SAND: dark gray, moist, medium dense, fine to very fine-grained
		X	2/6/13 N=19	29.8	92.1		20		SM/ ML	@ 20 feet, transitions from dark gray, moist, fine SAND to very dark gray, very moist SILT, medium dense to stiff
										@ 21 feet, groundwater encountered
		X	14/8/17 N=25	21.8	103.4		25		SM	@ 25 feet, Silty SAND: very dark gray, saturated, very dense, fine to medium-grained

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-4.1

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		B-1

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

SAMPLE

12" DROP	BULK	TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
		X	5/10/15 N=15	28.6	93.2				ML/ GW	@ 30 feet, transitions from black SILT to well graded (poorly sorted) gravelly, very coarse to medium green Silty SAND, fine to medium SAND, saturted, medium dense
		X	5/13/18 N=31	19.8	104.4		35		SM	@ 35 feet, Silty SAND: very dark gray to black, saturted, medium dense, very fine to medium-grained
		X	19/50 for 3"	18.1	111.6		40		SM/ GW	@ 40 feet, transitions from black, very fine SAND to dark gray, well graded medium to very coarse SAND and some fine GRAVEL: saturated, very dense
		X	22/50 for 4"	18.9	105.1		45		SM	@ 45 feet, transitions from very fine to coarse Silty SAND: light brown, saturated, very dense
			10/22/37 N=59	10 2			50		SM/ GW	@ 50 feet, transitions from coarse, Silty SAND to silty, medium to coarse Sandy fine GRAVEL: medium brownish-gray to greenish-gray, saturated, very dense
		X	23/50 for 4"				55			@ 55 feet, Silty SAND: gray, saturated, poor recovery

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

Figure No.: B-4.2

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inchees		B-1

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

SAMPLE										
12" DROP	BULK	TUBE OR SPT	BLOWS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
			14/16/12 N=28	10.5					SM/ GW	
							65			
							70			
							75			
							80			
							85			

Bottom of boring at 61.5 feet.
NOTE:
1) Groundwater encountered at 21 feet.
2) Caving experienced from 21 feet to total depth.

SPT = Standard Penetrometer Test

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

Figure No.: B-4.3

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		B-2

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
							0		ML	@ 0 feet, ARTIFICIAL FILL, (AF): SILT: light brown, dry, soft
		X	5/8/7 N=15	4.9	95.5		5		ML	@ 5 feet, SILT: medium brown, moist, stiff, some fine to very coarse sand and fine gravel; some iron-oxide staining, mottled
		X	4/7/9 N=16	11.4	101.2		10		ML	@ 10 feet, The materials encountered are generally the same as those described above
		X	2/4/8 N=12	27.0	87.1		15		ML	@ 15 feet, CONTACT: YOUNGER ALLUVIUM, (Qyal): SILT. very dark gray, moist, very stiff, some very fine sand and organics
		X	1/16/23 N=39	14.8	107.8		20		SM	@ 20 feet, Silty SAND: very dark gray, groundwater encountered, dense, some coare gravel, trace fine gravel and coarse sand
		X	13/24/16 N=40	17.0	107.3		25		SM	@ 25 feet, Silty SAND: very dark green, saturated, dense, very fine to fine gravel

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

Figure No.: B-5.1

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger			
Date Drilled: 9/6-7/2017 JS	This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.		B-2

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
		X	15/30/32 N=62	11.1	126.0				SP	@ SAND: very dark gray, saturated,very dense, coarsely-grained
		X	23/50 for 2"	12.6	122.7		35			@ 35 feet, SAND: very dark gray, saturated, very dense, fine to coarse-grained, trace fine gravel
		X	36/37/30 N=67	15.9	111.2		40			@ 40 feet, Silty SAND: very dark gray, saturated, very dense, fine to very coarse-grained, some medium to coarse gravel
			6/14/16 N=30	12.8			45		SM	@ 45 feet, The materials encountered are generally the same as those decribed above
			12/15/20 N=35	11.4			50			@ 50 feet, predominately very coarse SAND and fine GRAVEL
							55			Bottom of boring at 51.5 feet. NOTE: 1) Groundwater encountered at 20 feet. 2) Caving experienced from 20 feet to total depth. SPT = Standard Penetrometer Test

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-5.2

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		B-3
Date Drilled: 9/6-7/2017 JS	This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.		

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
							0		ML	@ 0 feet, SILT: light brown, dry, very soft
		X	8/10/11 N-21	11.9	104.2		5		CL/ ML	@ 5 feet, CLAY and Silty CLAY: light brown, slightly moist, hard, trace iron-oxide staining
		X	9/7/10 N=17	4.2	110.3		10		SM	@ 10 feet, Silty SAND: light brown, dry, medium dense, well graded, fine to very coarse, trace very fine gravel
		X	4/6/12 N=18	7.5	97.8		15		ML	@ 15 feet, SILT: very dark gray to rust brown, very moist, very stiff, mottled
										@ 18 feet, groundwater encountered
		X	6/9/8 N=17	14.3	114.4		20		SM	@ 20 feet, CONTACT, YOUNGER ALLUVIUM, (Qyal): Silty SAND: dark gray, saturated, fine to medium grained, trace very coarse SAND
		X	9/13/13 N=26				25		GW	@ 25 feet, No Recovery

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-6.1

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		
Date Drilled: 9/6-7/2017 JS	This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.		B-3

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
			6/12/20 N=32	10.2					SM/ GW	@ 30 feet, Gravelly SAND: dark gray, saturated, dense medium to very coarse-grained, fine to medium gravel
			5/6/7 N=13	29.4	94.0		35		ML	@ 35 feet, Clayey SILT: dark gray, saturated, stiff
			1/3/4 N=7	14.3			40			@ 40 feet, CLAY: dark gray, very moist, firm, highly plastic
			5/6/7 N=13	28.0	94.6		45		CL	@ 45 feet, The materials encountered are generally the same as those decribed above
			6/9/13 N=22	29.6			50			@ 50 feet, The materials encountered are generally the same as those decribed above
							55			Bottom of boring at 51.5 feet. NOTE: 1) Groundwater encountered at 18 feet. 2) Caving experienced from 18 feet to total depth. SPT = Standard Penetrometer Test

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

Figure No.: B-6.2

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		
Date Drilled: 9/6-7/2017 JS	This log is a representation of subsurface conditions at the time and place of drilling With the passage of time or at any other location, there may be consequential changes in conditions.		B-4

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
							0		ML	@ 0 feet, ARTIFICIAL FILL, (AF): SILT: light brown, dry, very soft
		X	6/12/15 N=27	19.0	100.4		5		ML	@ 5 feet, SILT: light brown and gray, mottling, slightly moist, hard, mottled
		X	6/16/16 N=32	14.6	108.7		10			@ 10 feet, SILT, Sandy SILT and Clayey SILT: dark brown to light brown, dry to slightly moist, hard, fine to mdium and, mottled
		X	7/12/13 N=25	4.6	90.0		15		SM	@ 15 feet, dark gray, Silty, Clayey SAND and orange-brown Silty SAND: moist to very moist, medium dense, mottled
										@ 19 feet, groundwater encountered
		X	12/24/17 N=41	17.7	102.7		20		SM/ SP	@ 20 feet, CONTACT, YOUNGER ALLUVIUM, (Qyal): Silty SAND and SAND: predominately medium-grained, green, dark gray, dense, very dark gray, saturated, dense, poorly graded
			6/13/17 N=30	14.9			25		SM	@ 25 feet, Silty SAND: very dark gray, saturated, dense

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

Figure No : B-7.1

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		B-4

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
		X	19/36/36 N=72	14.6	110.1				SM/ SP	@ 30 feet, Silty SAND and SAND: dark gray, saturated, very dense, poorly graded
		|	5/6/7 N=13	20.4			35		SM	@ 35 feet, Silty SAND: very dark gray, saturated, dense
			6/9/9 N=18							
		X	14/24/29 N=53	17.3	106.8		40		SM	@ 40 feet, Silty SAND: dark gray, saturated, very dense, fine to medium-grained
		|	10/12/13 N=25	19.4			45		SM	@ 45 feet, Silty SAND: dark gray, saturated, medium dense, predominately medium grained, trace fine gravel and clay
		X	5/6/8 N=25	32.2	88.6		50		CL	@ 50 feet, CLAY: very dark gray, saturated, very stiff, trace to some silt
							55			Bottom of boring at 51.5 feet. NOTE: 1) Groundwater encountered at 19 feet. 2) Caving experienced from 19 feet to total depth. SPT = Standard Penetrometer Test

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-7.2

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		B-5
Date Drilled: 9/6-7/2017 JS	This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions		

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
	X								ML	@ 0 feet, Clayey SILT and CLAY: light brown, dry, very soft, trace to some fine to coare SAND
		X	3/6/6 N=12	11.0	106.8		5		ML	@ 5 feet, Sandy SILT: light brown, dry, very stiff, fine to medium sand, trace very coarse and and fine gravel
		X	7/16/16 N=32	12.0	109.1		10		SM	@ 10 feet, Silty SAND. dark brown, dry to slightly moist, dense, fine to very coarse-grained, trace fine gravel, well graded
		X	11/10/7 N=17				15			@ 15 feet, No Recovery
		X	11/29/41 N=70	3.6	105.9		20		SM	@ 20 feet, CONTACT, YOUNGER ALLUVIUM, (Qyal): Silty SAND: light brown, moist, very dense, fine to medium-grained, some coarse sand
										@ 22 feet, groundwater encountered
		X	6/13/17 N=30	17.1			25		SM	@ 25 feet, some very coarse SAND

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-8.1

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		B-5

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
		X	7/15/15 N=30	19.4	107.5				SM	The materials encountered are generally the same as described at 20 feet, medium dense
		X	8/10/10 N=20	21.4			35		SM	@ 35 feet, Silty SAND: dark gray, saturated, medium dense
		X	15/28/29 N=57	16.7	111.6		40		SM	@ 40 feet, Silty SAND: very dark gray, saturated, very dense, fine-grained
			7/23/21 N=44	11.8			45		SM	@ 45 feet, Silty SAND: very dark gray, saturated, dense, trace fine gravel and clay, predominately medium grained sand
		X	28/50 for 5"	11.9	119.9		50		SP	@ 50 feet, SAND: light gray, saturated, very dense, predominately medium-grained
									SM/GW	@ 53 feet, Difficult drilling due to cobble layer
							55			@ 55 feet, No recovery

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

Figure No.: B-8.2

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		B-5

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE OR SPT	BLOWS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
									SM/ GW	@ 60 feet, No Recovery
							65			Bottom of boring at 61.5 feet. NOTE: 1) Groundwater encountered at 22 feet. 2) Caving experienced from 22 feet to total depth. SPT = Standard Penetrometer Test
							70			
							75			
							80			
							85			

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

Figure No.: B-8.3

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		P-1

Date Drilled: 9/6-7-2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

SAMPLE BULK	SAMPLE TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
								ML/ CL	@ 0 feet, ARTIFICIAL FILL, (AF), Silty CLAY/Clayey SILT: dark brown, moist, soft
	X	14/9/10 N=19	9.7	105.8					@ 3 feet, the materials encountered are generally the same as described above
	X	4/4/7 N=11	13.2	105.0		5		ML	@ 5 feet, SILT: light to medium brown, moist, firm, trace clay @ 5.5 feet, Sandy SILT: dark brown, moist, firm, fine to medium sand, trace fine gravel, mottled
						10			Total Depth at 6.5 feet. NOTE: 1) No ground water encountered. 2) No caving experienced.

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-9

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		P-2

Date Drilled: 9/6-7-2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

SAMPLE BULK	SAMPLE TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
									@ 0 feet, ARTIFICIAL FILL, (AF), SILT: very light brown, dry, very soft
								ML/ CL	@ 2 feet, mottled dark brown SILT: dark gray CLAY and light brown, very fine SAND: moist, firm
	X	6/9/9 N=18	15.5	110.2					
						5		ML/ SM	@ 5 feet, mottled soft and very fine SAND: dark gray-brown, slightly moist, firm, trace dry, coarse SAND and fine GRAVEL
	X	6/9/13 N=22	14.5	109.9					
								ML/ SM	
						10		ML	@ 10 feet, transitions from SILT: medium brown, slightly moist, very soft to organic SILT, very dark gray, very moist, very soft
	X	2/3/5 N=8	46.9	72.5					@ 11 feet, CONTACT: YOUNGER ALLUVIUM, (Qyal) possible estuarine deposits, very dark gray, very moist, poorly sorted
									Total Depth at 11.5 feet. NOTE: 1) No ground water encountered. 2) No caving experienced.

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Project No.:	Figure No.:
7082-04	B-10

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		
Date Drilled: 9/6-7-2017 JS	This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.		P-3

SAMPLE BULK	SAMPLE TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
								ML	@ 0 feet, ARTIFICIAL FILL, (AF), SILT: very light grayish-brown, dry, very loose, approximately 20% fine cobbles, some very
	X	15/18/15 N=33	11.5	108.7				ML	@ 3 feet, mottled, light brown SILT and dark gray plastic CLAY, dry to slightly moist, very dense, some iron-oxide staining, fine gravel-size angular rock fragments
	X	5/8/9 N=17	14.5	111.5		5		ML	@ 5 feet, mottled dark brown SILT: very light brown, very fine SAND, very dark gray CLAY, slightly moist, stiff to medium dense
	X	3/4/5 N=9	13.2	108.5		10		ML	@ 10 feet, SILT: medium brownish-gray, moist, soft, some iron-oxide staining, poor recovery
									Total Depth at 11.5 feet. NOTE: 1) No ground water encountered. 2) No caving experienced.

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-11

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		P-4

Date Drilled: 9/6-7-2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

SAMPLE BULK	SAMPLE TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
								ML	@ 0 feet, ARTIFICIAL FILL, (AF), SILT: light brown, dry, very soft, some clay
								ML	
						5			
								SM/ CL	
	X	7/9/11 N=20	9.6	107.7					@ 7 feet, mottled fine-grained, Silty SAND: cream, light to medium brown and dark grayish-brown clay, dry, stiff
								SM/ CL	
						10		ML	@ 10 feet, SILT: medium brownish-gray, moist, soft, some iron-oxide staining, poor recovery
	X	7/11/11 N=22	6.8	101.2				ML	@ 12 feet, SILT: dark brown, dry, stiff, trace to some clay
									Total Depth at 15 feet. NOTE: 1) No ground water encountered. 2) No caving experienced.

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-12

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		P-5

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in cond tions

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
							0		ML	@ 0 feet, ARTIFICIAL FILL, (AF): SILT: light brown, dry, very soft, trace to some clay
							5			
		X	6/7/11 N=18	9.7	115.5				ML/ CL	@ 7 feet, SILT: very dark brown, dry, stiff, some clay
		X	7/11/12 N=23	2.9	110.7		10		SM	@ 10 feet, Silty SAND: light brown, slightly moist, stiff, fine to medium-grained, trce fine gravel
		X	9/11/11 N=23	17.9	108.3		15		SM	@ 15 feet, CLAY: light brown, moist, stiff, some silt
							20			Total Depth at 16.5 feet. NOTE: 1) No ground water encountered. 2) No caving experienced.
							25			

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

Figure No.: B-13

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		P-6

Date Drilled: 9/6-7-2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

SAMPLE

BULK	TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
						0		ML	@ 0 feet, SILT: light brown, dry, very loose
	X	5/7/9 N=16	4.8	87.8				ML	@ 3 feet, SILT: light grayish-brown, dry, firm, trace fine sand and clay
						5			
	X	3/4/5 N=9	2.5	95.2				SM/ SP	@ 7 feet, SAND: light orange-bown, dry, loose, fine to medium-grained, trace to some silt, poorly graded
						10			Total Depth at 8.5 feet. NOTE: 1) No ground water encountered. 2) Caving experienced from 7 feet to total depth.

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-14

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inchees		SSGB-1

Date Drilled: 9/6-7/2017 JS

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
	X								ML	@ 0 feet, ARTIFICIAL FILL, (AF): SILT: medium brown, slightly
		X	8/12/13 N=25	11.7	110.0				ML	@ 3 feet, SILT: light brown, very slightly moist, stiff, some fine- to medium-grained, some iron-oxide staining, trace organics and shell fragments, mottled
		X	9/13/14 N=27	15.0	103.6		5		ML	@ 6 feet, The materials encountered are generally the same as those described above
							10		ML	@ 15 feet, SILT: light brownish-gray, moist, stiff, some iron-oxide staining and organics, mottled
									ML	@ 16 feet, CONTACT, YOUNGER ALLUVIUM, (Qyal), Clayey SILT: very dark gray to black, very moist, soft to firm, some organics including wood fragments and shell fragments
		X	8/8/9 N=17	12.9	107.4		15		ML/CL	@ 15 to 16 feet, represents the contact between artificial fill materials and estuarine, back-bay mud deposited in late Pleistocene to early Holocene inland extension of San Juan Creek Coastal Marsh Remants of which remain and can be seen south of PCH to Doheny Beach
							20			Total Depth at 16.5 feet. NOTE 1) No ground water encountered. 2) No caving experienced.
							25			

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Project No.: 7082-04

Figure No.: B-15

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		SSGB-2
Date Drilled: 9/6-7/2017 JS	This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.		

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
	X								CL	@ 0 feet, ARTIFICIAL FILL, (AF): Silty CLAY: light brown, moist but deep desiccation cracks at surface
							5		ML	@ 3 feet, SILT: light brown, very slightly moist, stiff, some fine- to medium-grained, some iron-oxide staining, trace organics and shell fragments, mottled
		X	7/10/15 N=25	11.9	78.5		10		ML	@ 6 feet, The materials encountered are generally the same as those described above
		X	4/11/8 N=19	23.0	85.0		15		ML/CL	@ 15 feet, SILT and Clayey SILT dark gray, moist, stiff moderately organic
							20			Total Depth at 16.5 feet. NOTE: 1) No ground water encountered. 2) No caving experienced.
							25			

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin, California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.:	Figure No.:
7082-04	B-16

LOG OF BORING

Drill Rig:	Boring Diameter:	Boring Elevation:	Boring No.
Hollow Stem Auger	8 inches		SSGB-3
Date Drilled: 9/6-7/2017 JS	This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions		

SAMPLE 12" DROP	SAMPLE BULK	SAMPLE TUBE	BLOWS/6"	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT	DEPTH FEET	SOIL/ROCK SYMBOL	SOIL/ROCK TYPE	Descriptions and Remarks
							0		ML	@ 0 feet, ARTIFICIAL FILL, (AF): Silty CLAY: light brown, moist but deep desiccation cracks at surface
		X	5/8/14 N=22	19.4	105.9		5		ML/ CL	@ 7 feet, mottled dark brown to black Silty CLAY/Clayey SILT:some iron-oxide staining, very fine-grained SAND, slightly moist, very stiff, some coarse gravel-size angular fragments of asphaltic concrete and base
							10			@ 16 feet, CONTACT: YOUNGER ALLUVIUM (Qyal): Silty SAND: slightly moist, very loose, fine-grained
		X	2/3/4 N=7	5.3	84.7		15		SM	
							20			Total Depth at 16.5 feet. NOTE: 1) No ground water encountered. 2) No caving experienced.
							25			

G. A. Nicoll & Associates, Inc.
EARTH SCIENCE CONSULTANTS
Tustin California

Ganahl Construction Corporation
Ganahl Lumber Facility
Stonehill and San Juan Creek Trail
San Juan Capistrano, California

Project No.: 7082-04

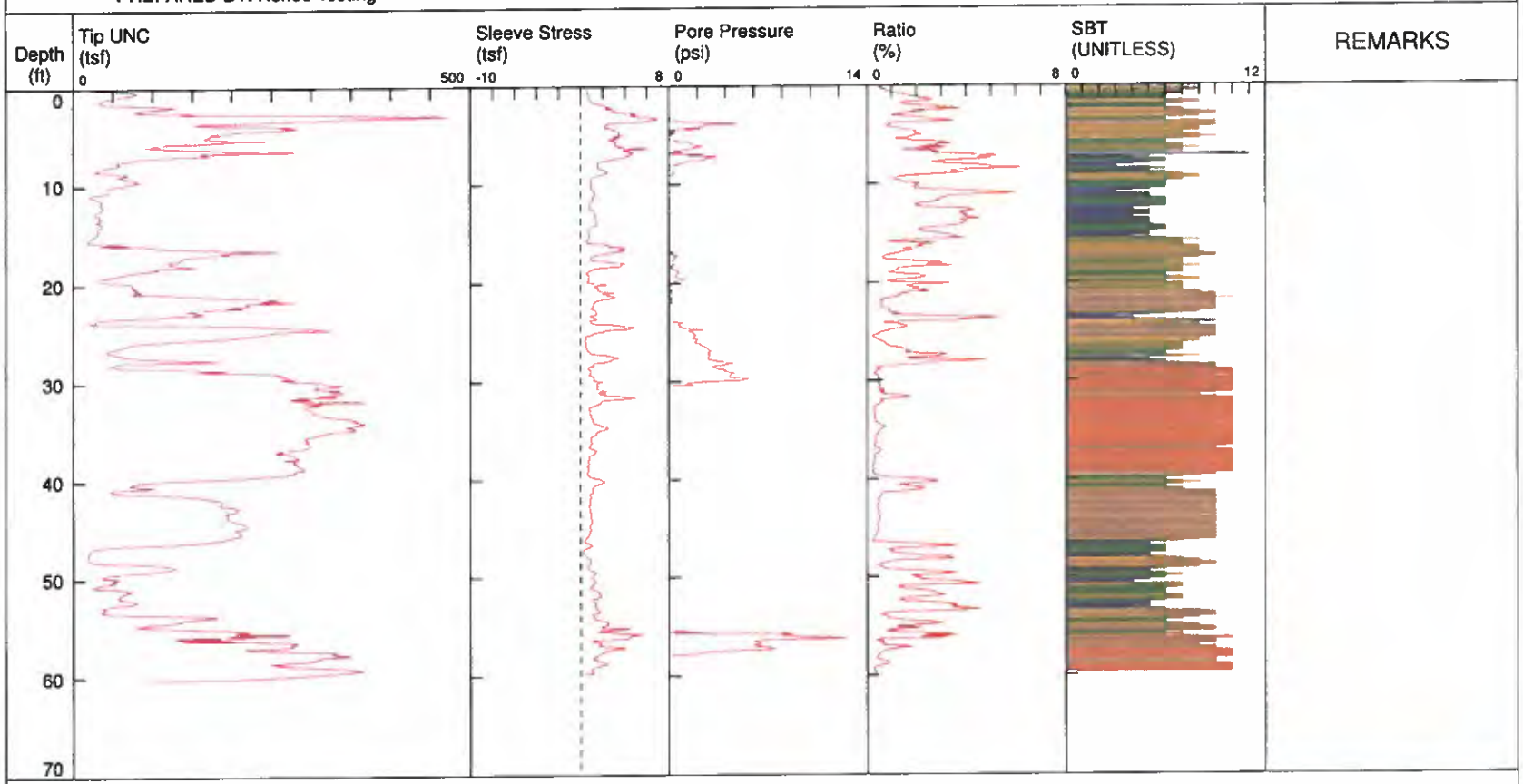
Figure No.: B-17

APPENDIX C

CPT Summary of Soundings

"Field Plots"

TEST ID: CPT-1
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



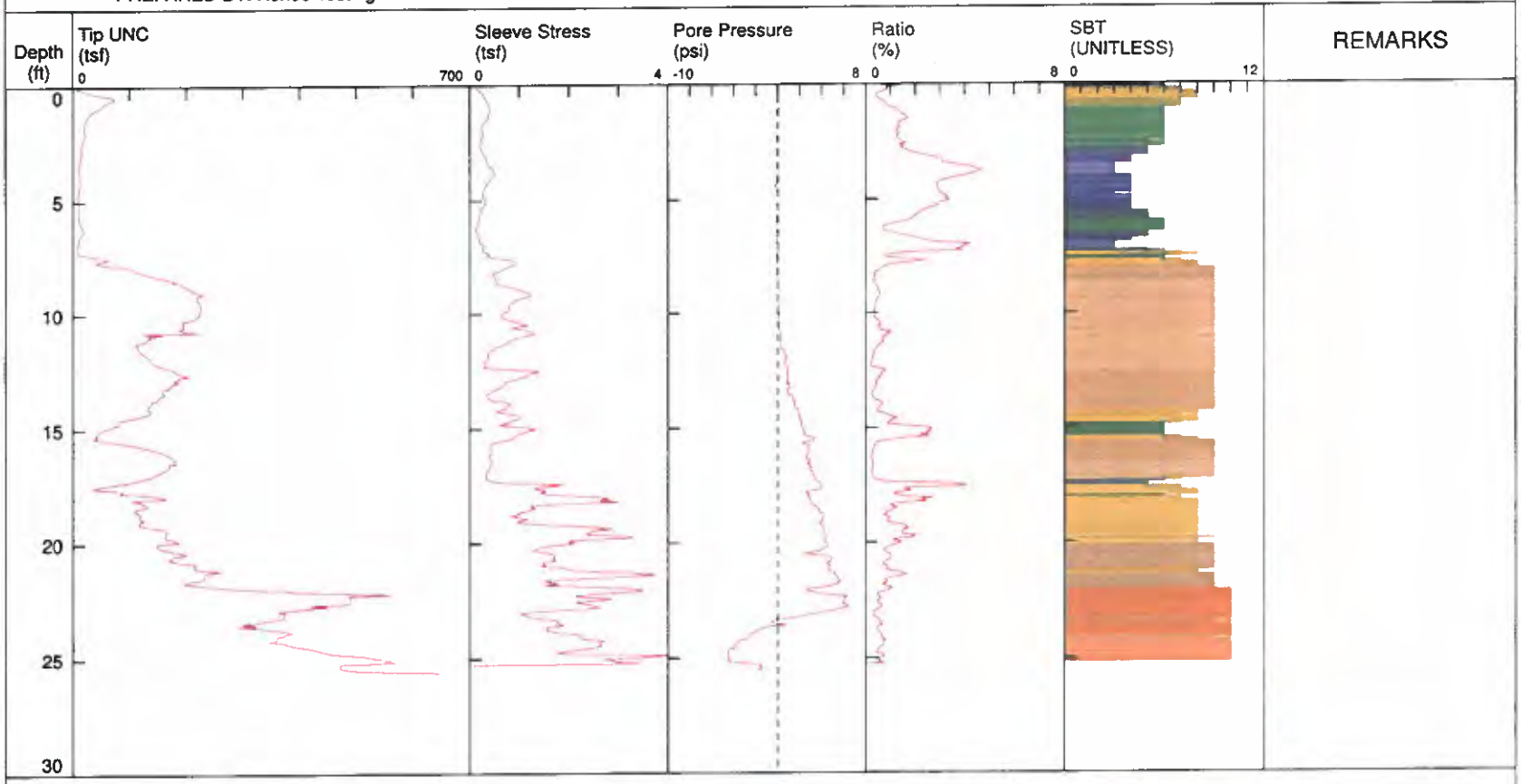
TOTAL DEPTH: 18.309 m

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-2
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



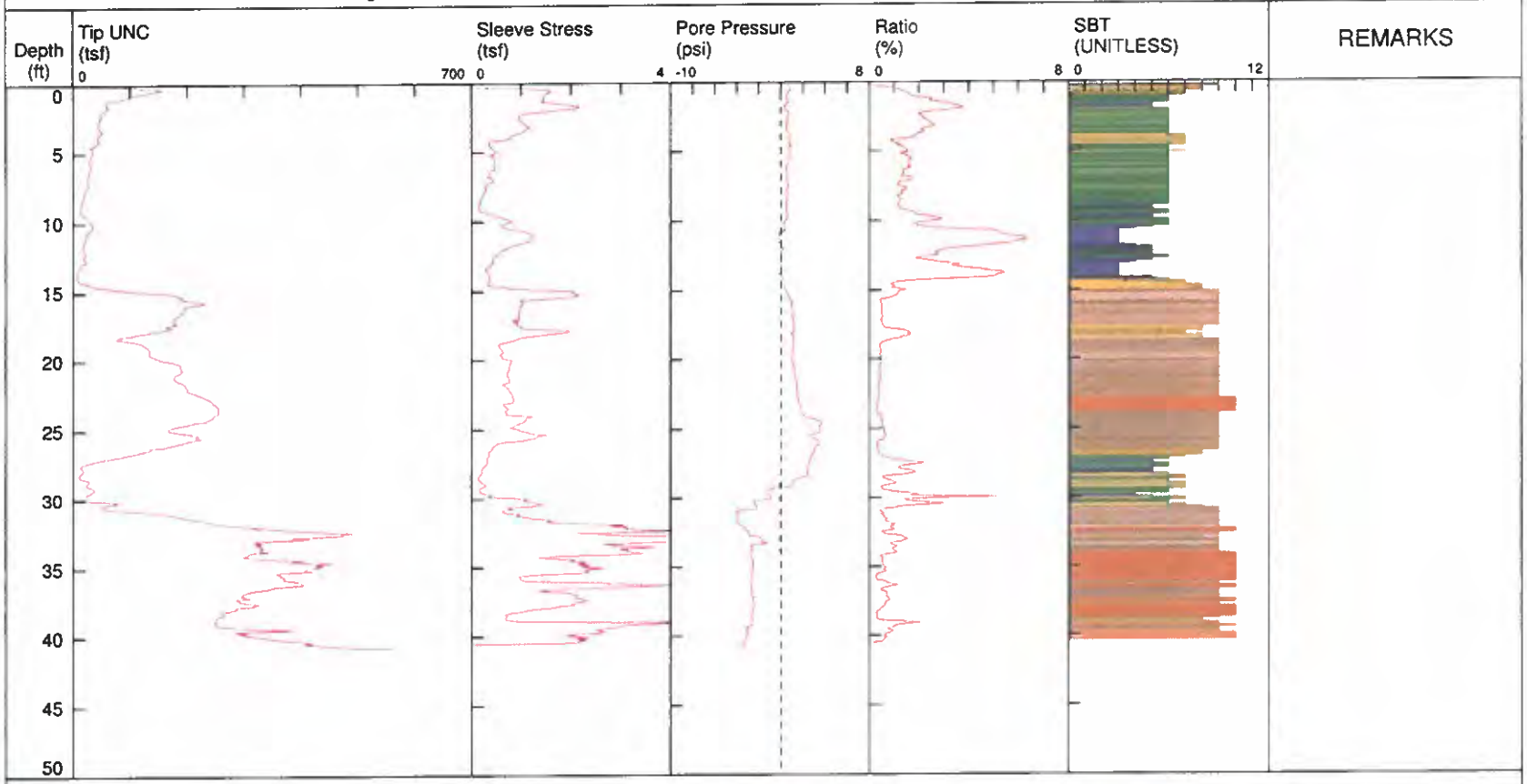
TOTAL DEPTH: 7.803 m

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-3
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



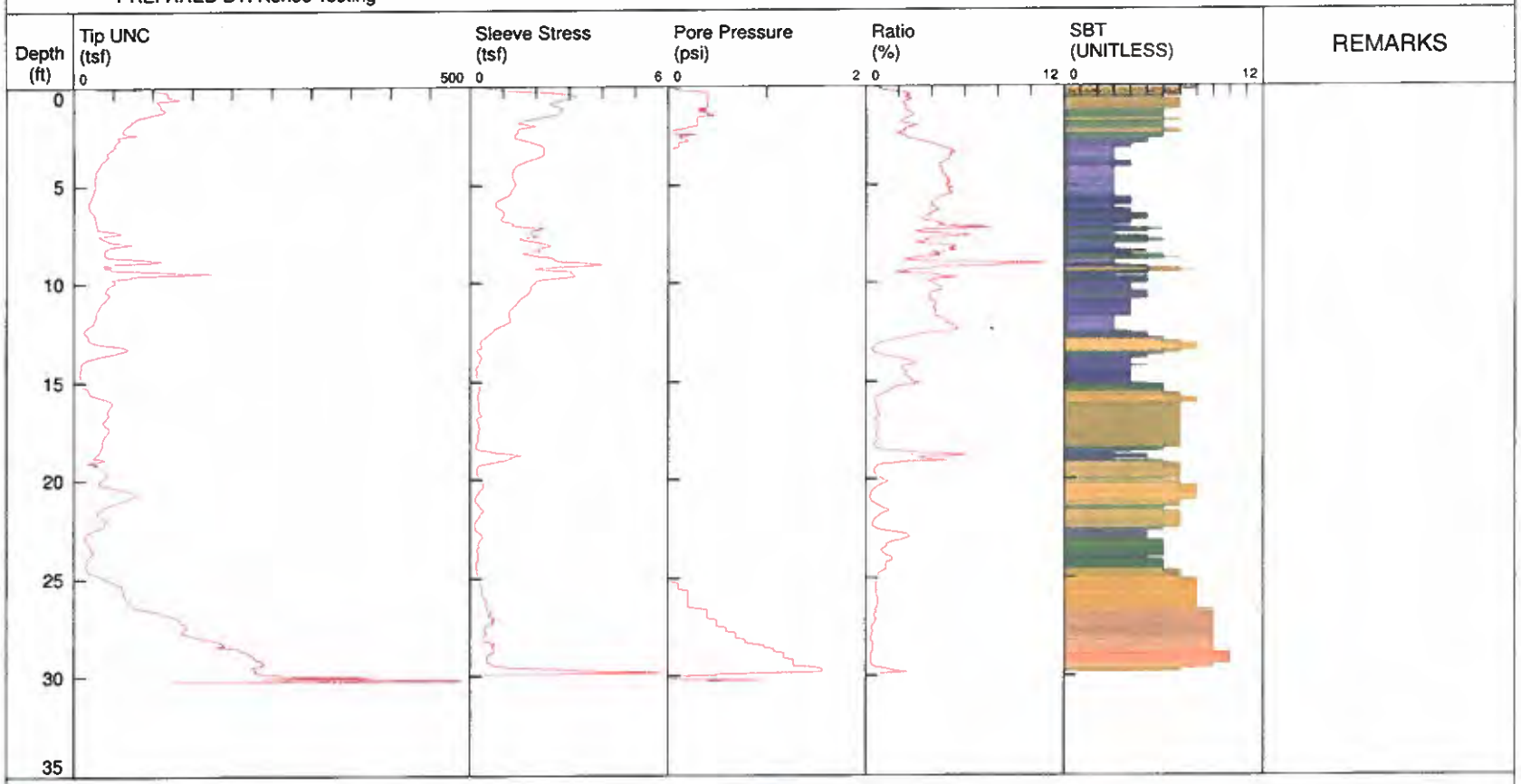
TOTAL DEPTH: 40.749 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-4
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



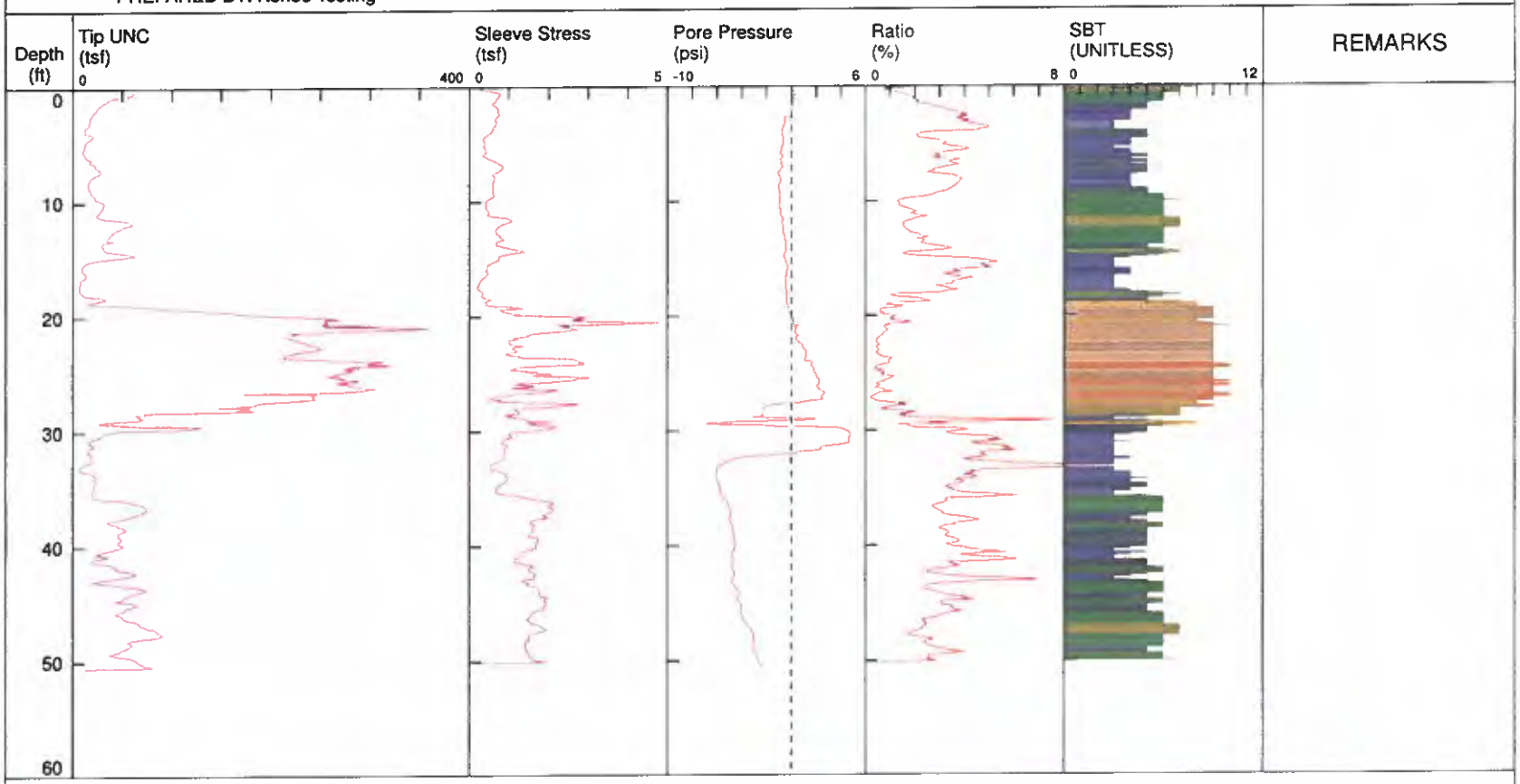
TOTAL DEPTH: 30.218 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-5
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



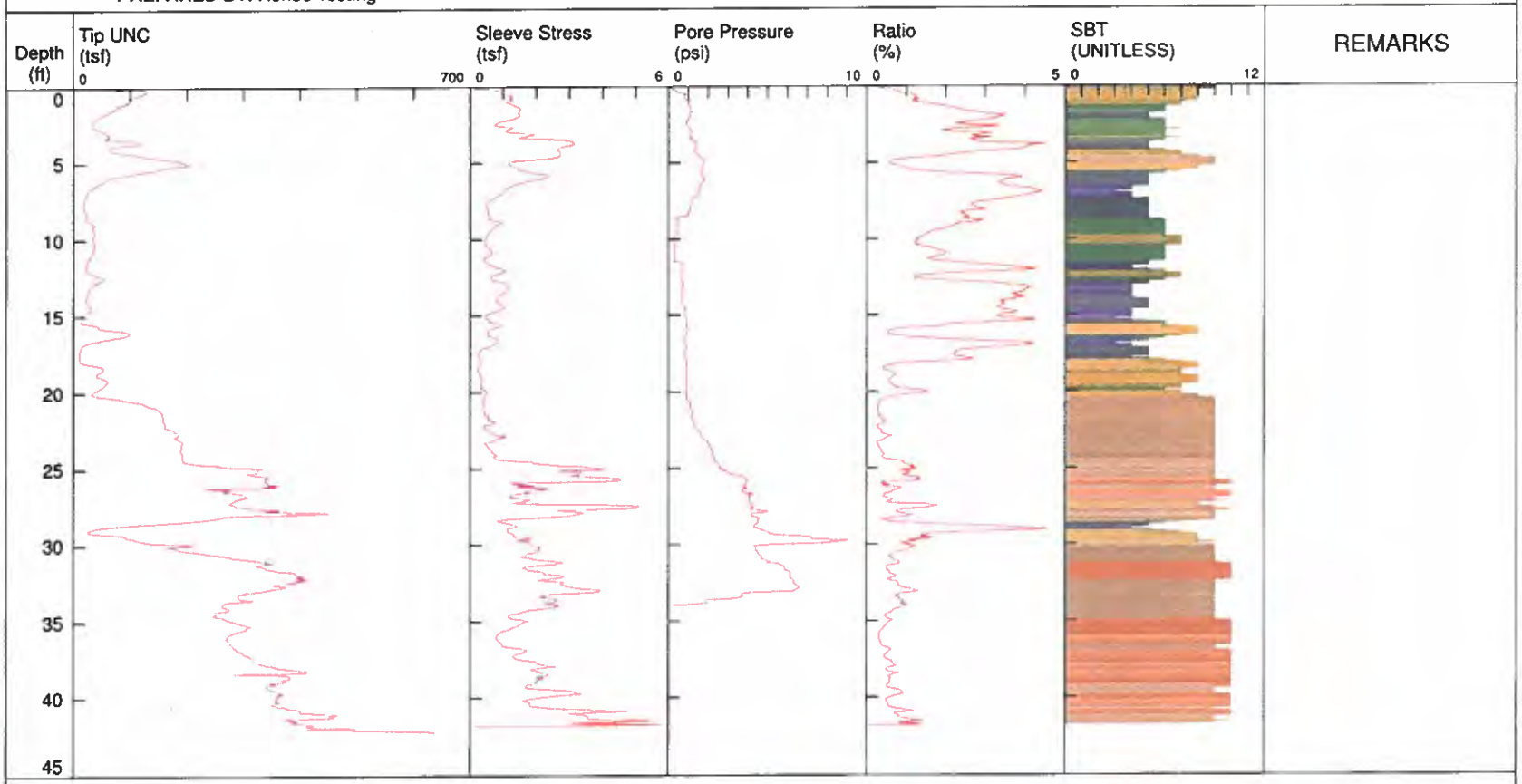
TOTAL DEPTH: 15.381 m

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-6
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



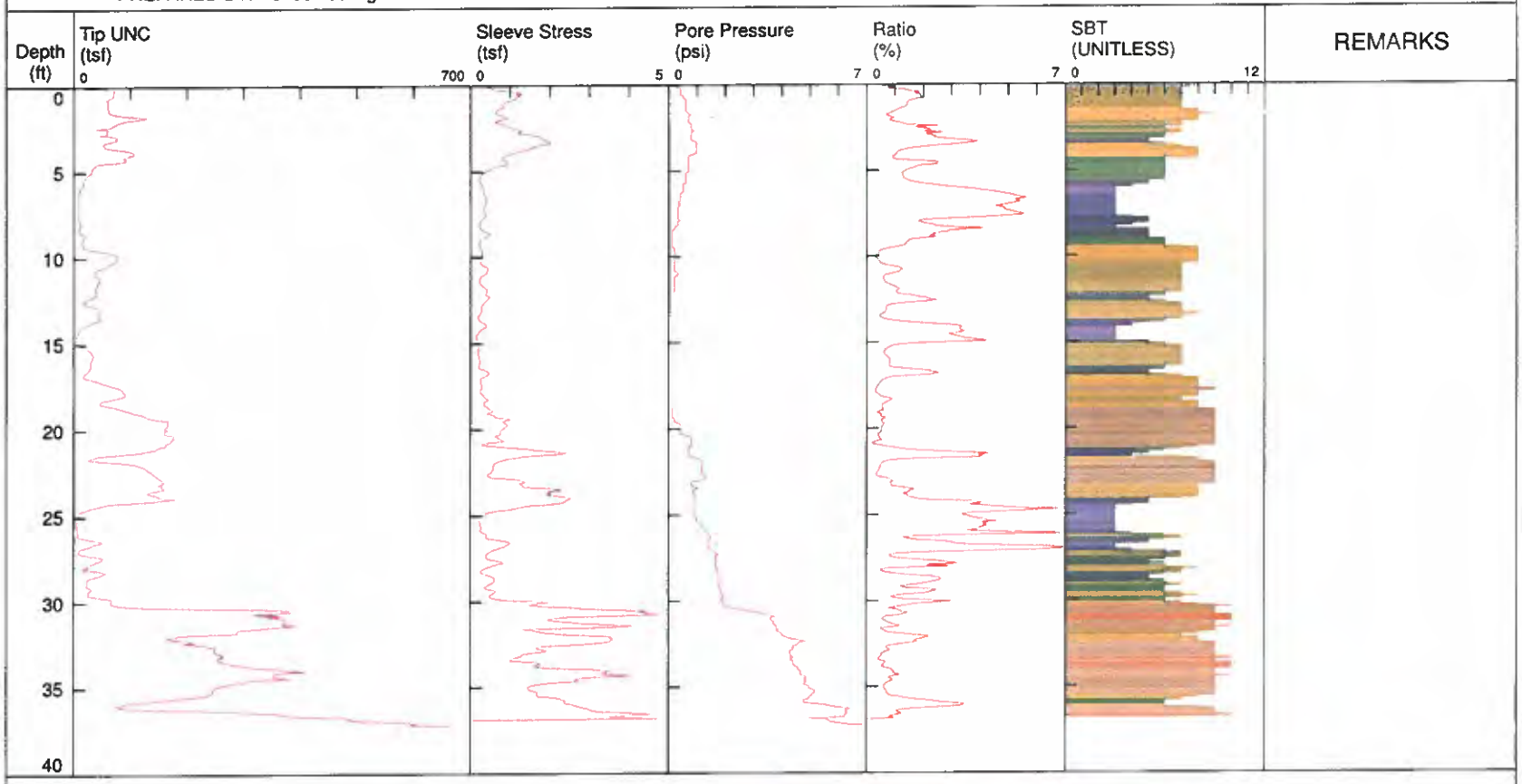
TOTAL DEPTH: 42.130 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-8
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



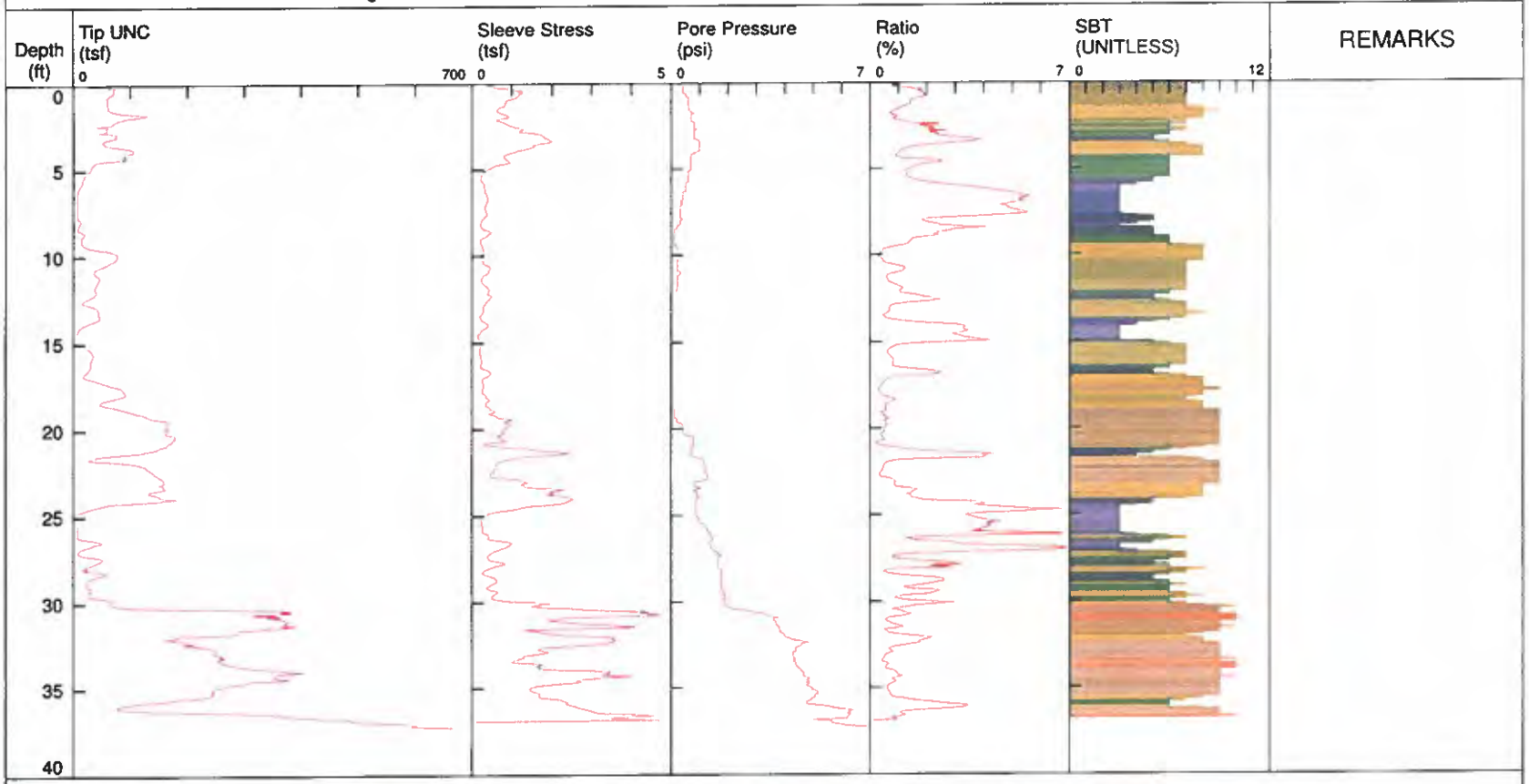
TOTAL DEPTH: 37.212 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-8
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoli & Associates, Inc.
PREPARED BY: Kehoe Testing



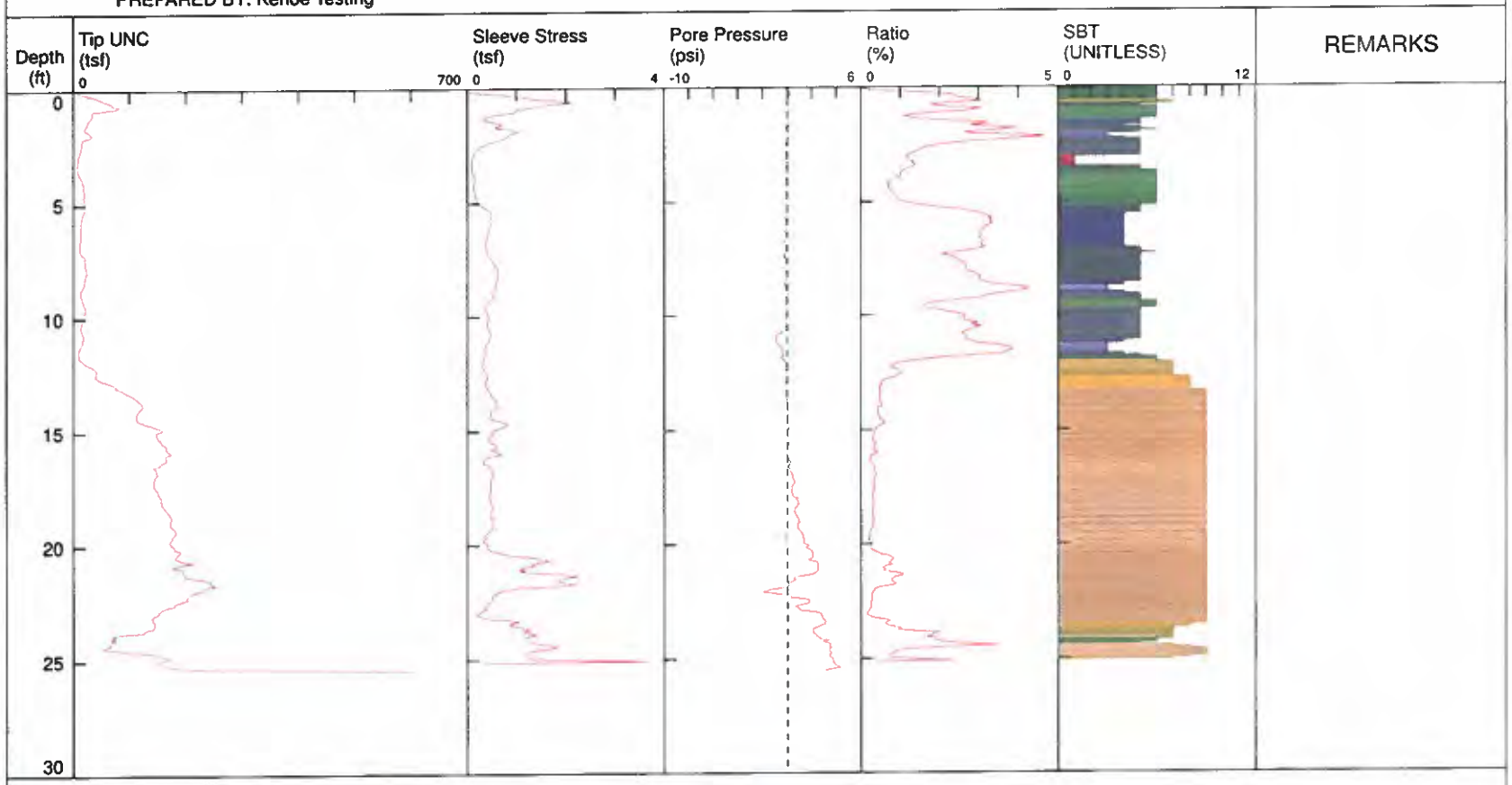
TOTAL DEPTH: 37.212 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-9
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



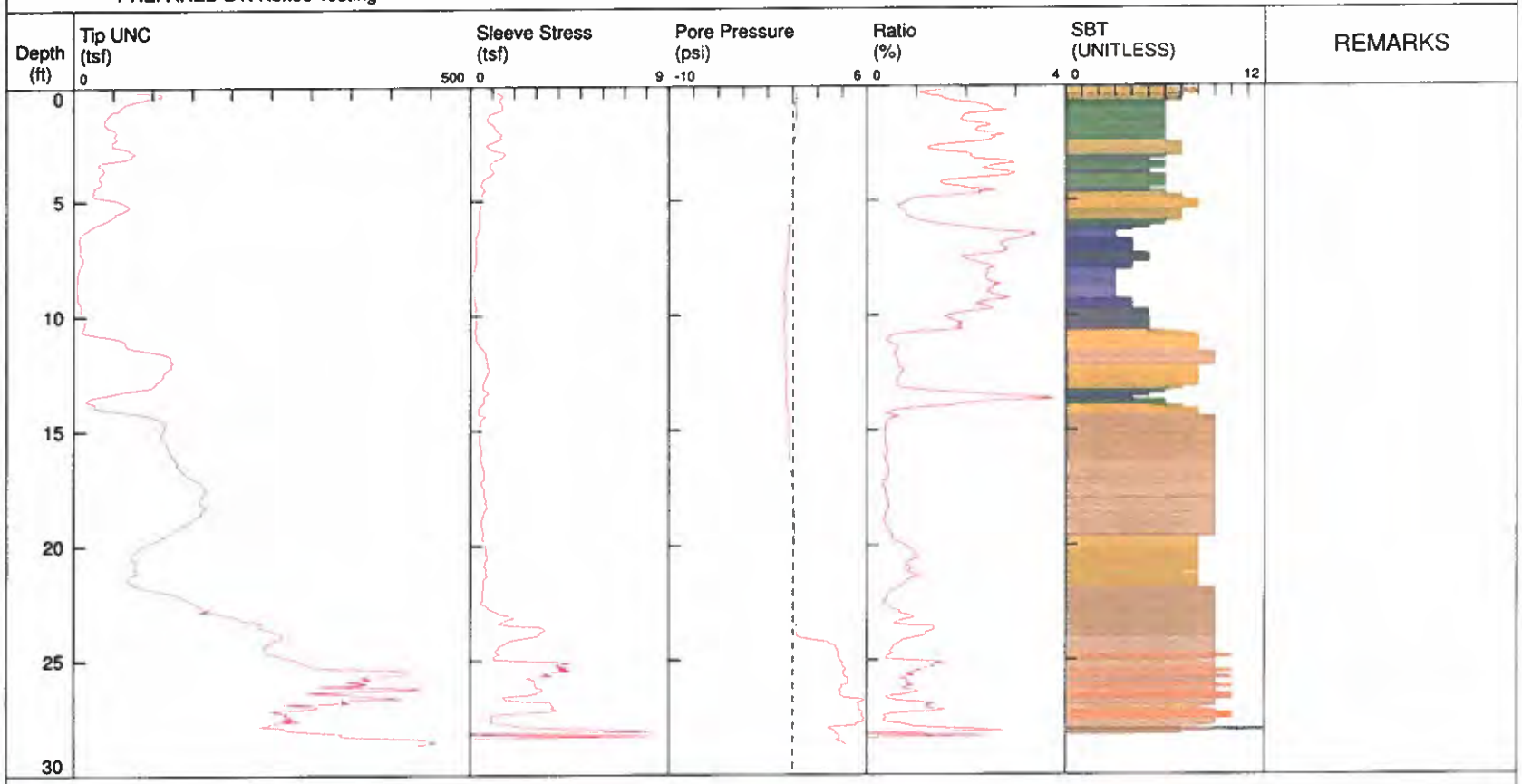
TOTAL DEPTH: 25.471 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-10
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoli & Associates, Inc.
PREPARED BY: Kehoe Testing



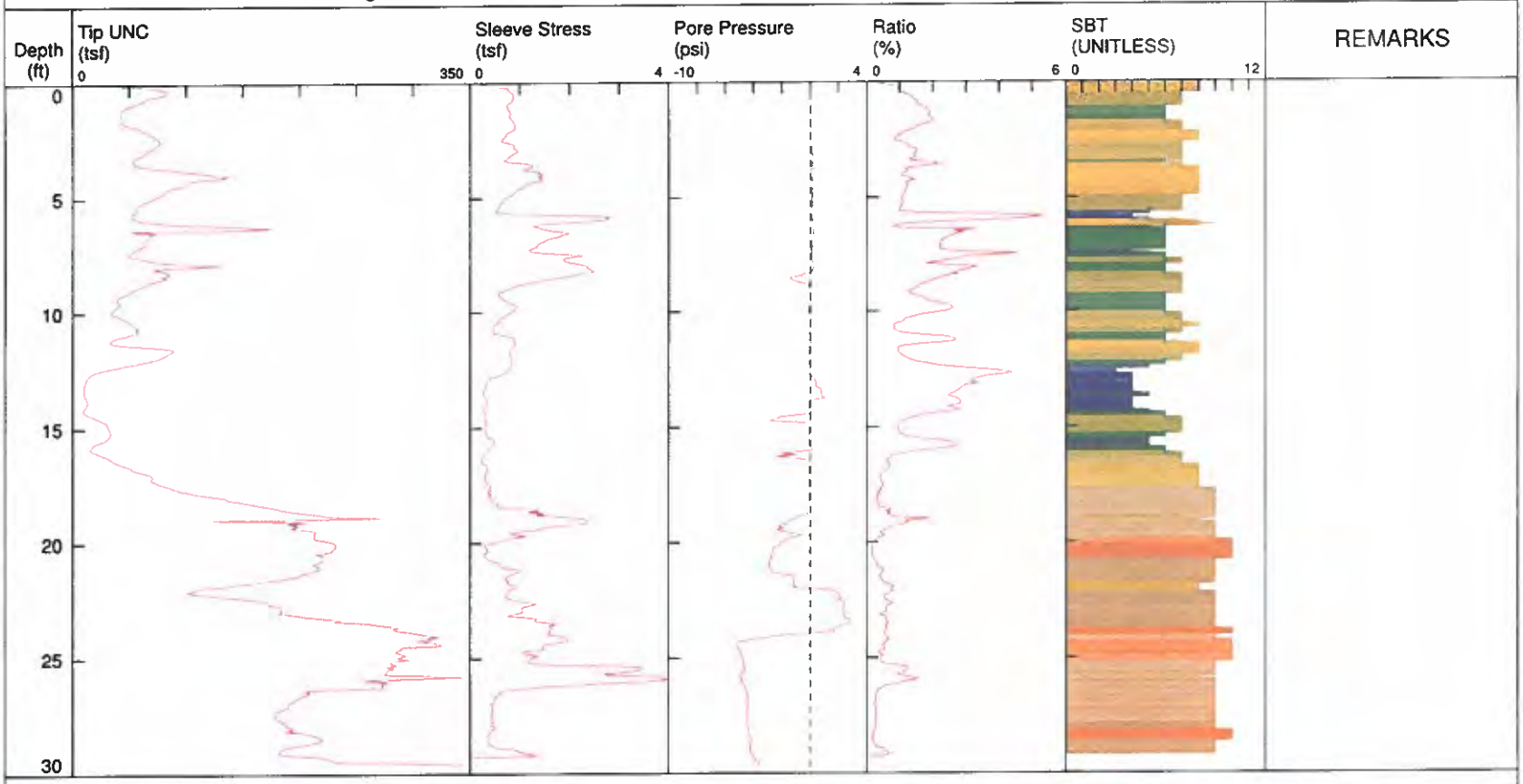
TOTAL DEPTH: 28.680 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-11
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



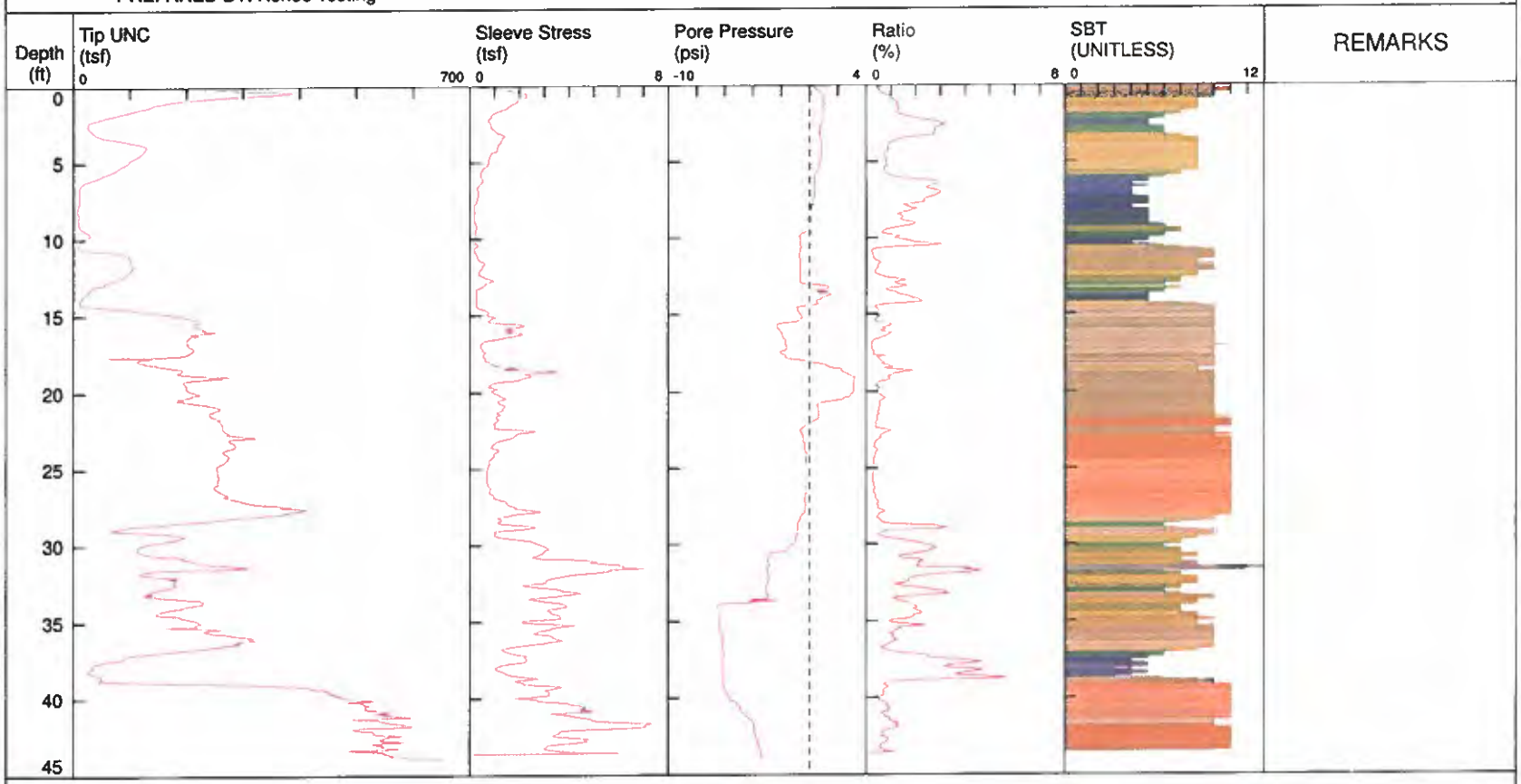
TOTAL DEPTH: 29.597 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-7
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



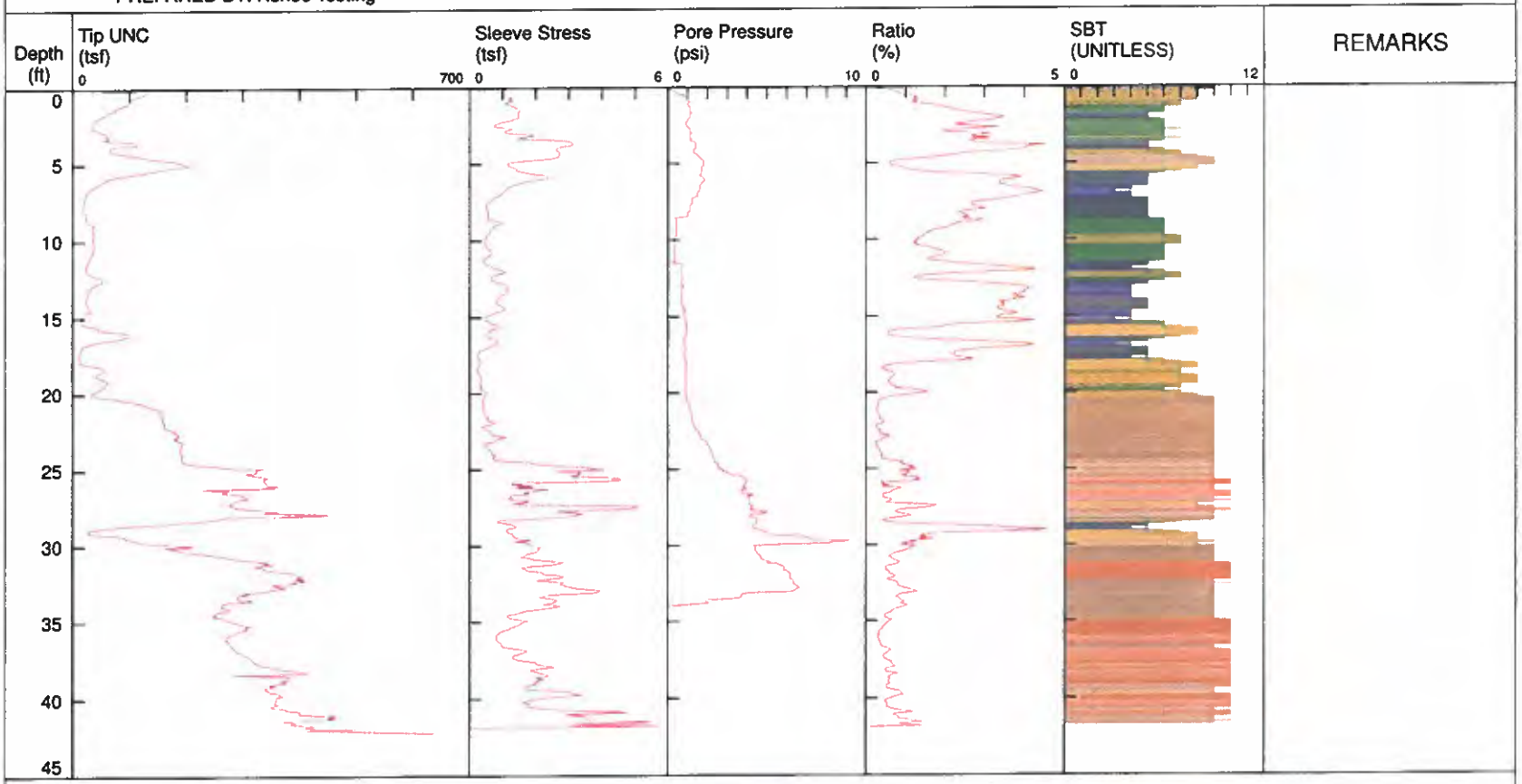
TOTAL DEPTH: 43.902 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-6
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoli & Associates, Inc.
PREPARED BY: Kehoe Testing



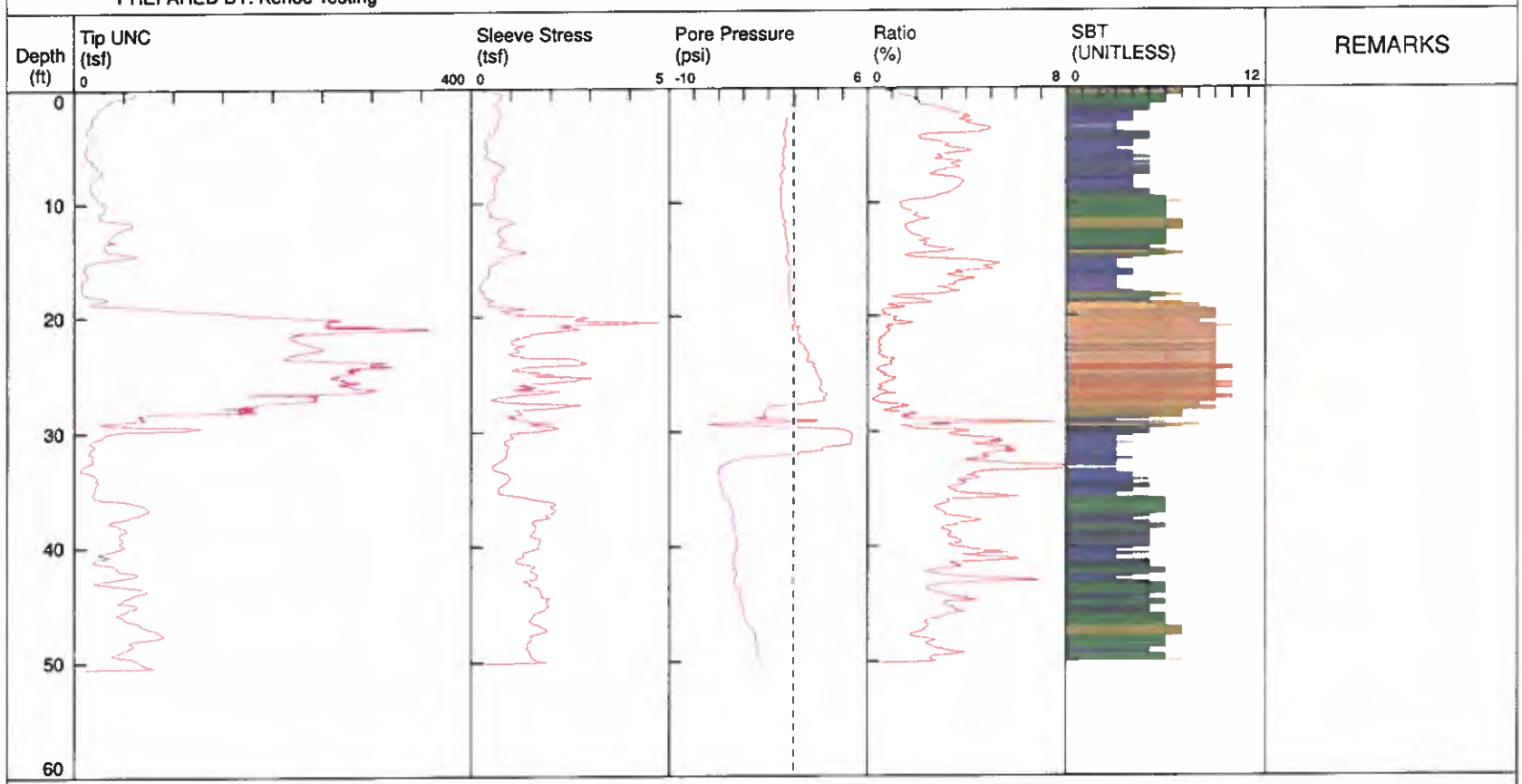
TOTAL DEPTH: 42.130 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-5
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



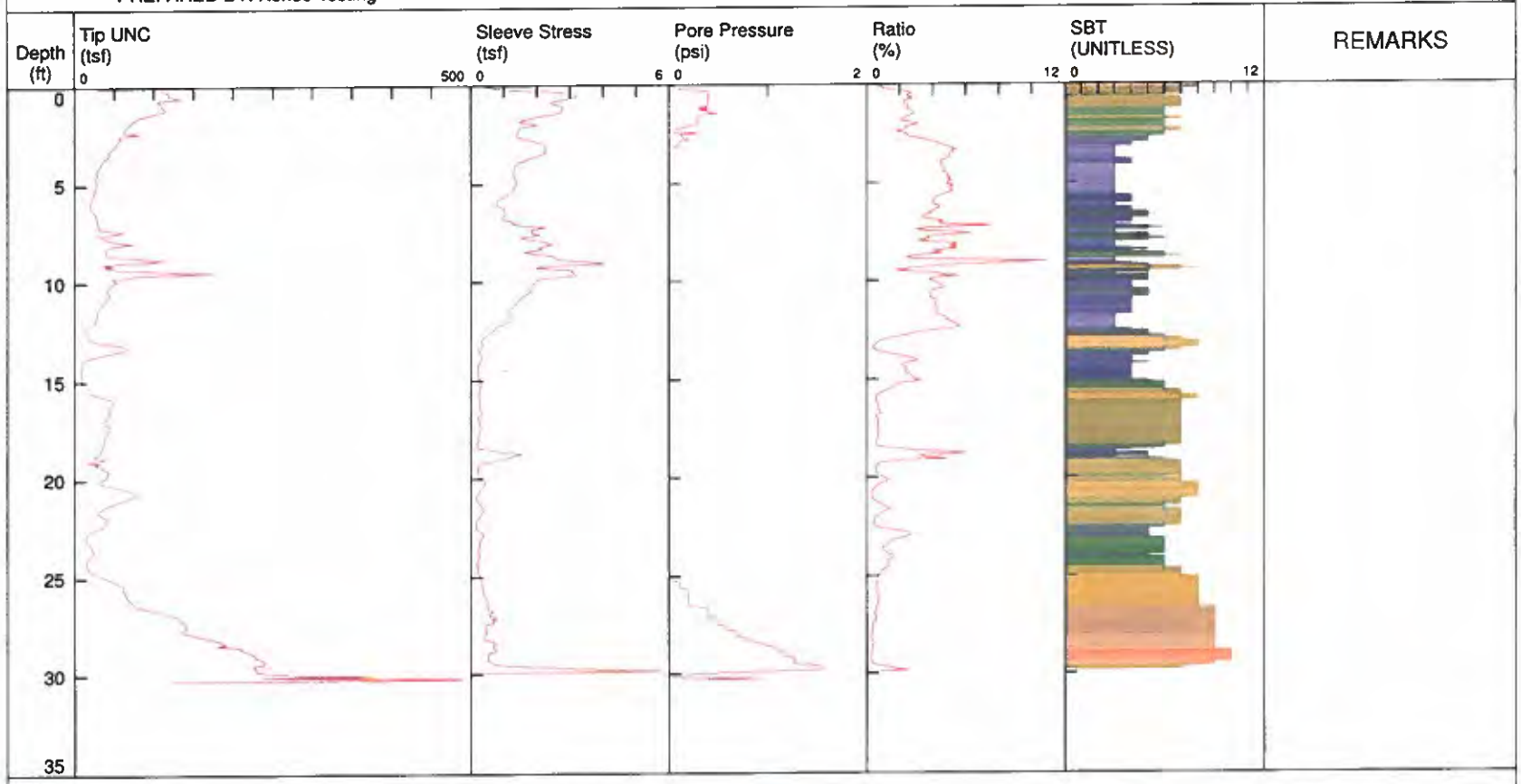
TOTAL DEPTH: 15.381 m

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-4
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



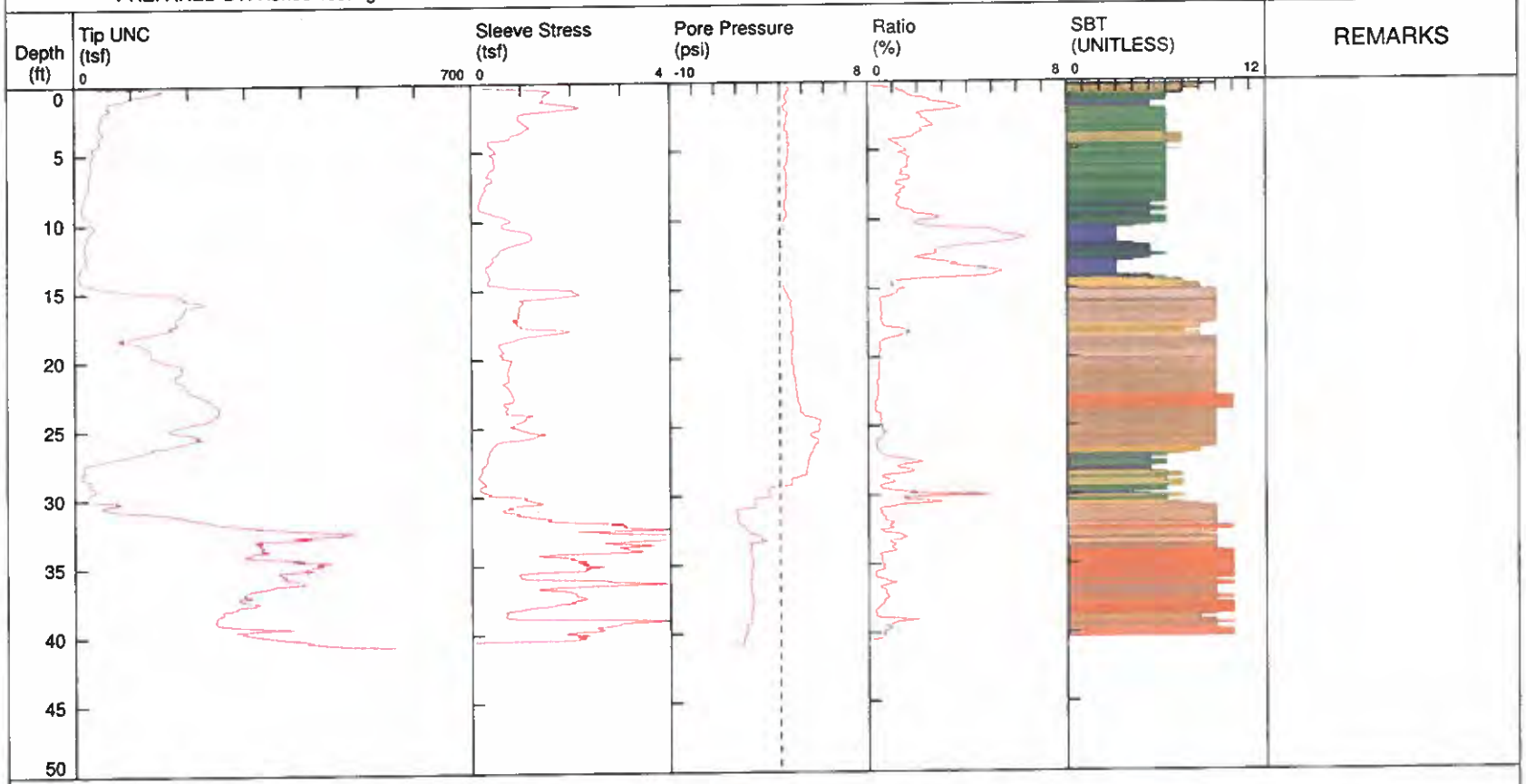
TOTAL DEPTH: 30.218 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-3
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



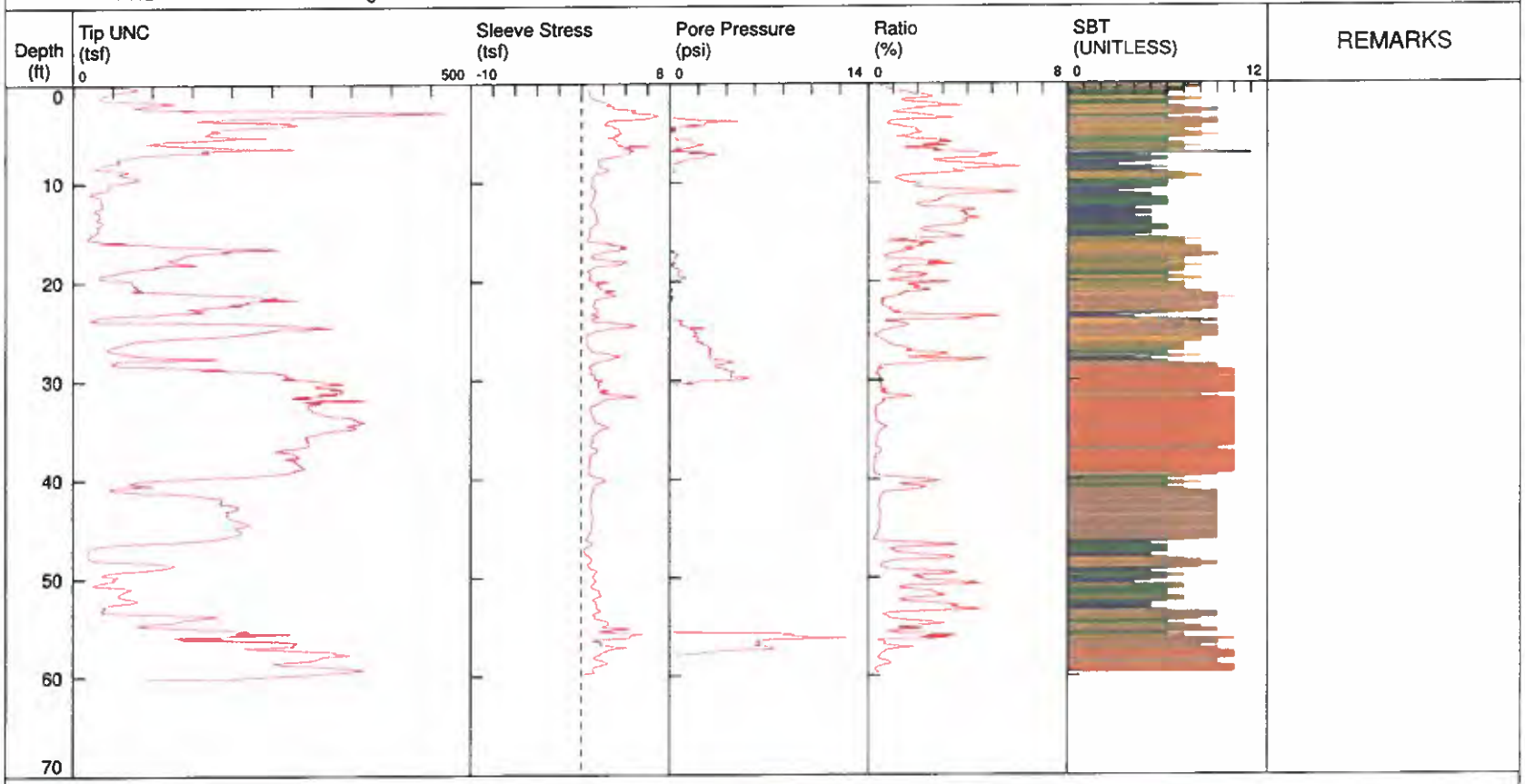
TOTAL DEPTH: 40.749 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-1
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



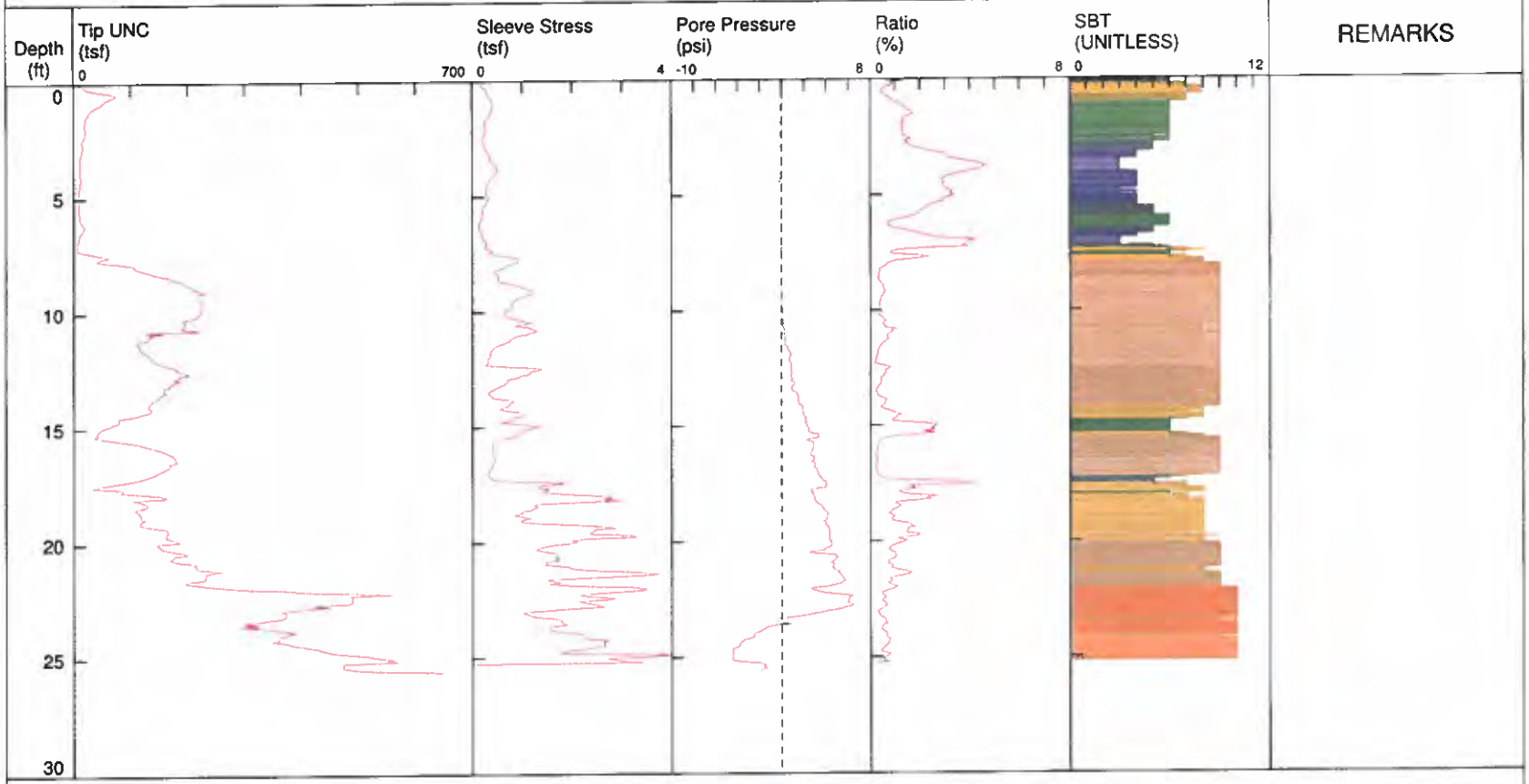
TOTAL DEPTH: 18.309 m

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-2
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



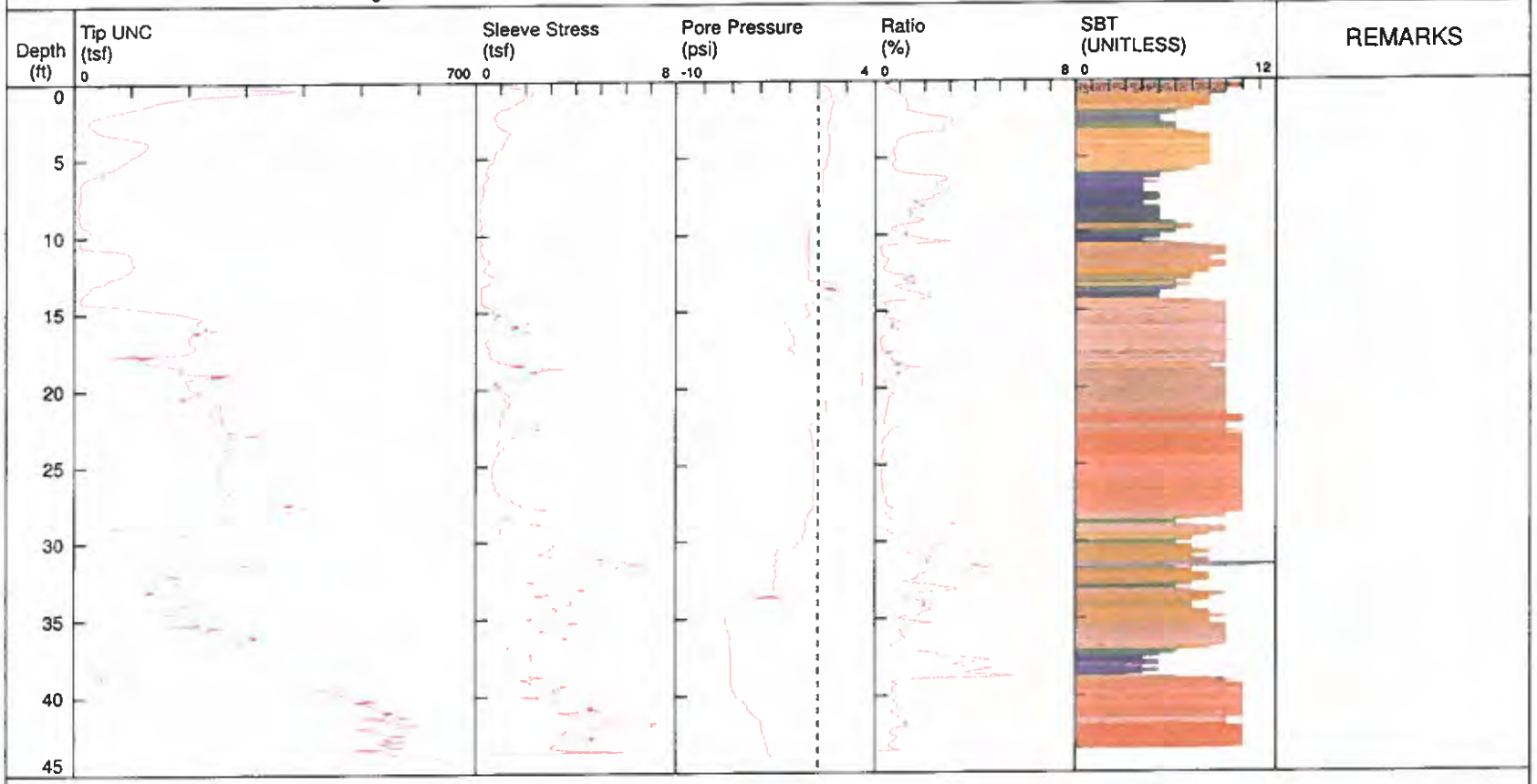
TOTAL DEPTH: 7.803 m

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-7
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



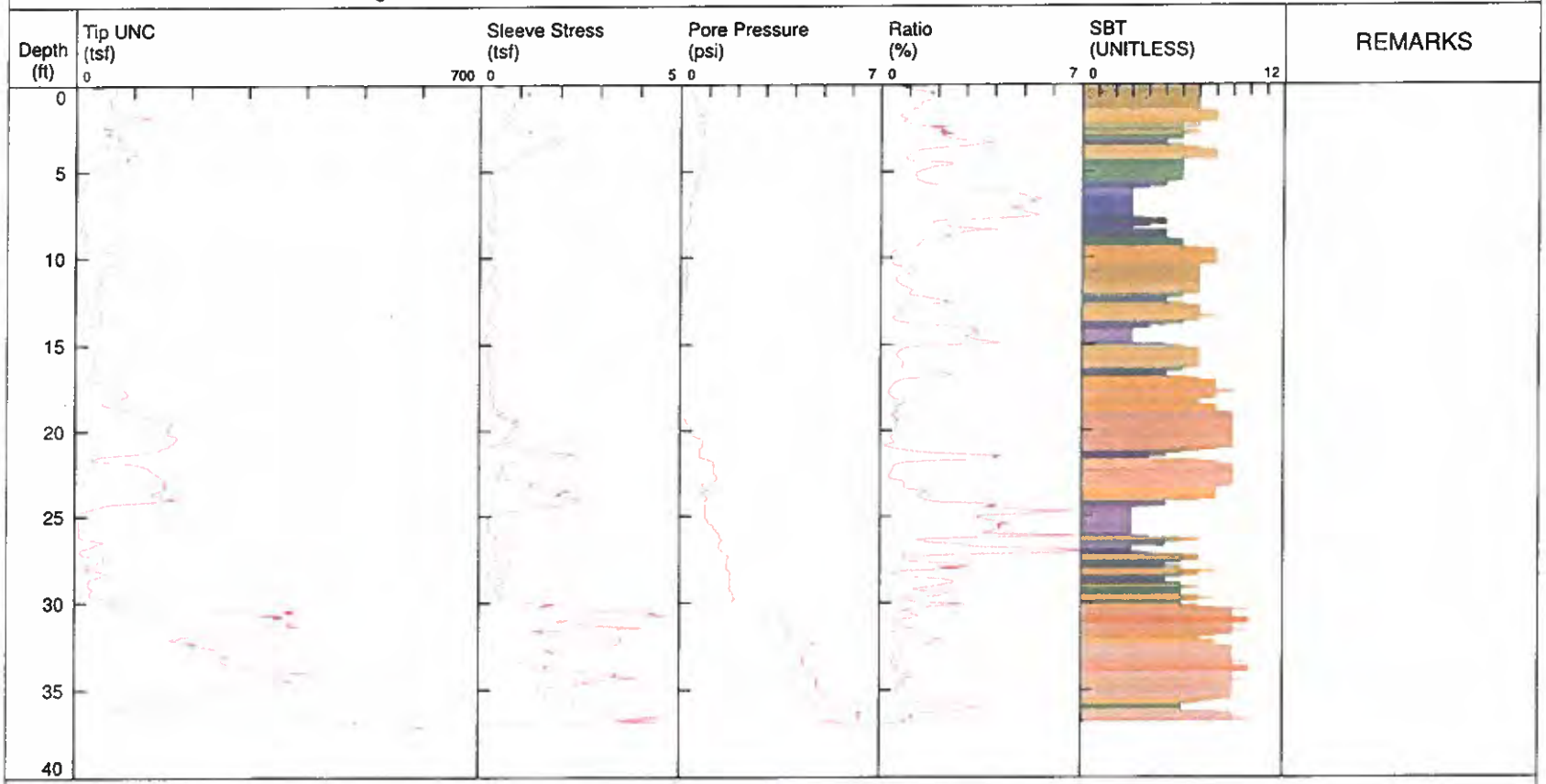
TOTAL DEPTH: 43.902 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-8
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



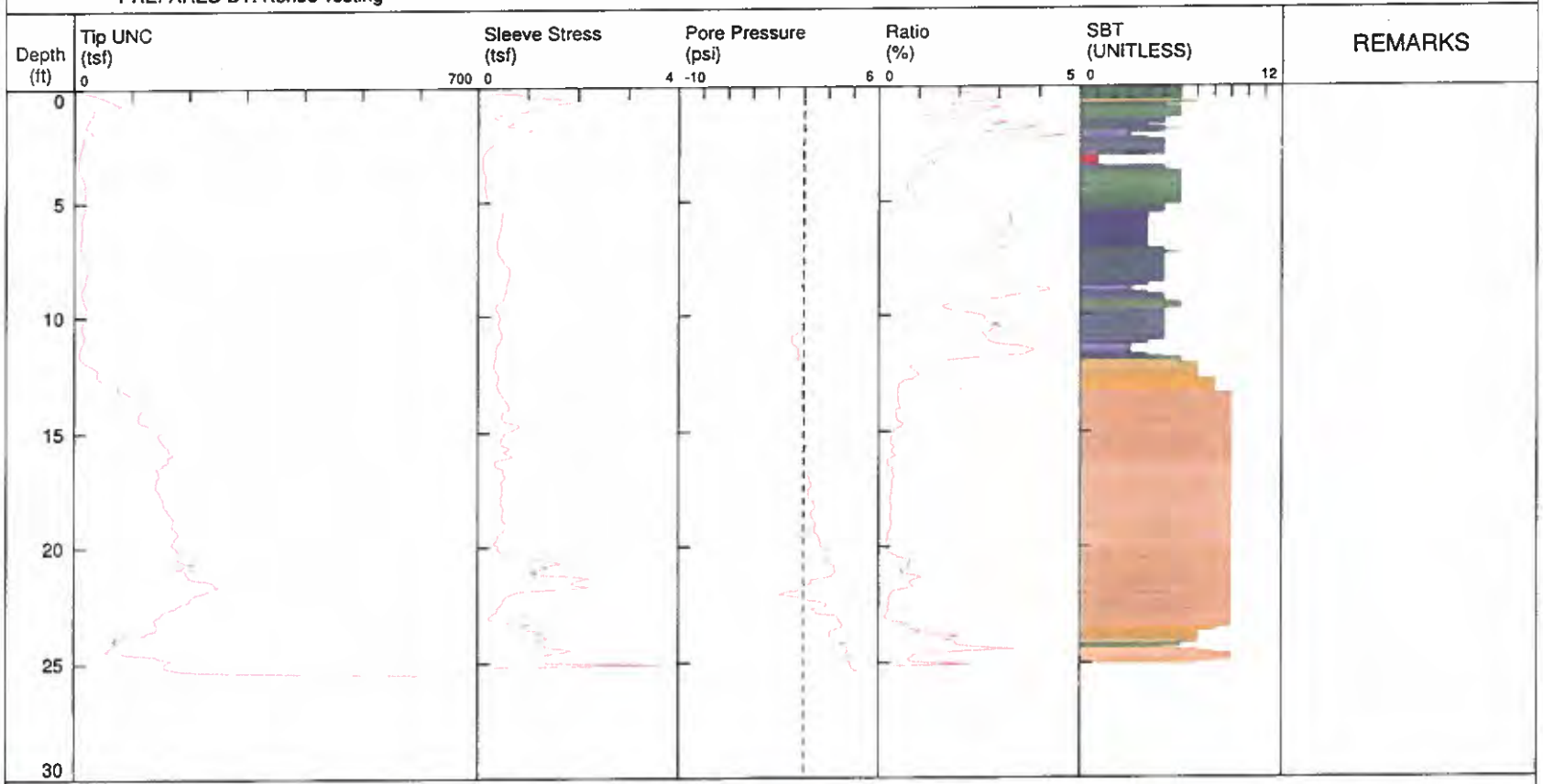
TOTAL DEPTH: 37.212 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-9
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



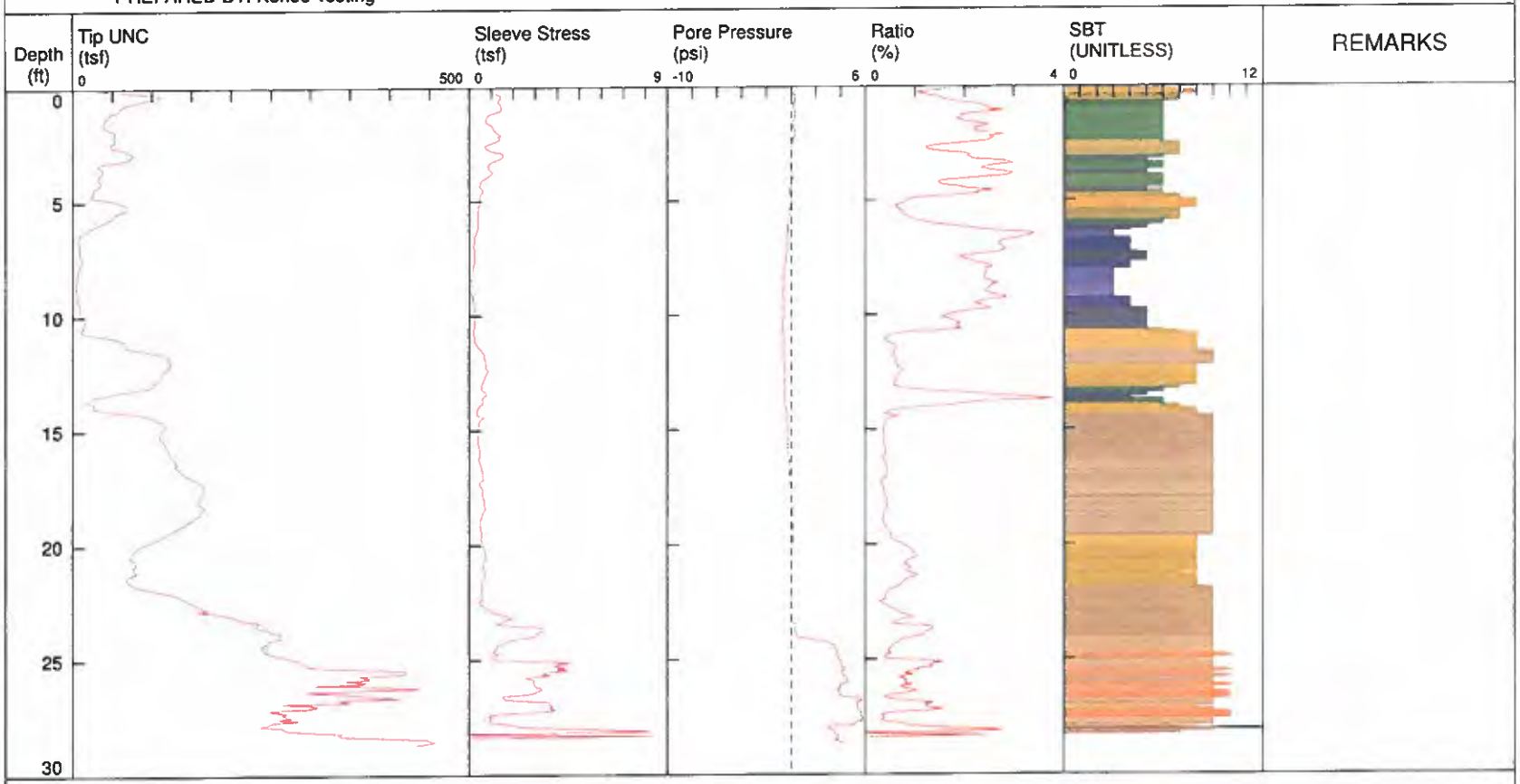
TOTAL DEPTH: 25.471 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-10
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



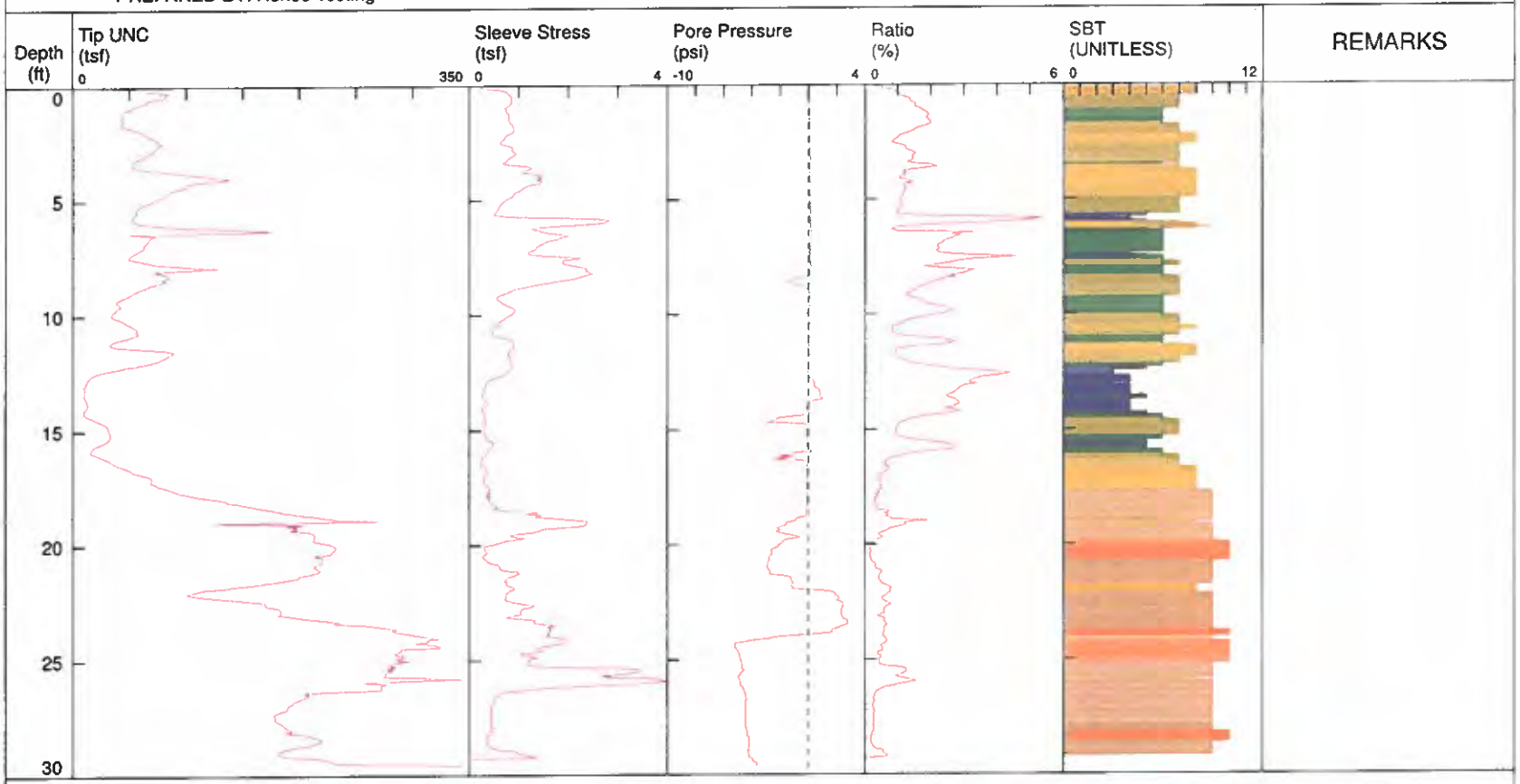
TOTAL DEPTH: 28.680 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

"Field Plots"

TEST ID: CPT-11
TEST DATE: Mon 11/Sep/2017
LOCATION: SanJuanCapistrano
CLIENT: G.A. Nicoll & Associates, Inc.
PREPARED BY: Kehoe Testing



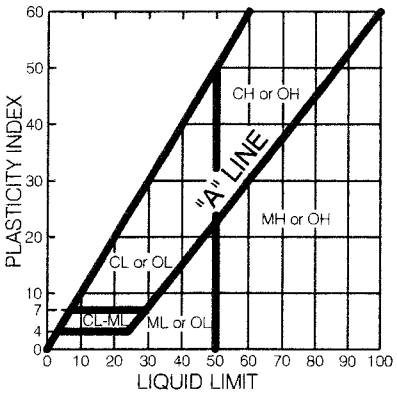
TOTAL DEPTH: 29.597 ft

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

UNIFIED SOIL CLASSIFICATION

PT	OH	CH	MH	OL	CL	ML	SC	SM	SP	SW	GC	GM	GP	GW
Highly organic soils	Silts and clays Liquid limit ≥50			Silts and clays Liquid limit <50			Sands with fines >12% fines		Clean sands <5% fines		Gravels with fines >12% fines		Clean gravels <5% fines	
							Sands-more than 50% of coarse fraction is smaller than No.4 sieve				Gravels-more than 50% of coarse fraction is larger than No. 4 sieve			
Fine grained soils (More than 50% is smaller than 200 sieve)							Coarse grained soils (More than 50% is larger than No. 200 sieve)							



LABORATORY CLASSIFICATION CRITERIA

$$Cu = \frac{D_{60}}{D_{10}} \qquad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

GW if $Cu \geq 4$ and $1 \leq Cc \leq 3$
SW if $Cu \geq 6$ and $1 \leq Cc \leq 3$

GP and SP - Clean gravel or sand not meeting requirements for GW and SW.
GM and SM - Atterburg limits below "A" line or P.I. less than 4.
GC and SC - Atterburg limits above "A" line and P.I. greater than 7.

FINES (silt or clay)	Fine sand	Medium sand	Coarse sand	Fine gravel	Coarse gravel	Cobbles	Boulders
Sieve sizes	200	40	10	4	3/4"	3"	12"

Classification of earth materials shown on this sheet is based on field inspection and should not be construed to imply laboratory analysis unless so stated.

MATERIAL SYMBOLS

- ASPHALT
- CONCRETE
- CLAYSTONE
- CLAYEY SANDSTONE
- CLAYEY SILTSTONE
- INTERBEDDED LIMESTONE AND SHALE
- LIMESTONE
- SANDY CLAYSTONE
- SANDSTONE
- SANDY SILTSTONE
- SILTSTONE
- SILTY CLAYSTONE
- SILTY SANDSTONE
- INTRUSIVE IGNEOUS ROCK
- EXTRUSIVE IGNEOUS ROCK
- CONGLOMERATE
- BRECCIA
- METAMORPHIC ROCK

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

(ACCORDING TO STANDARD PENETRATION TEST)

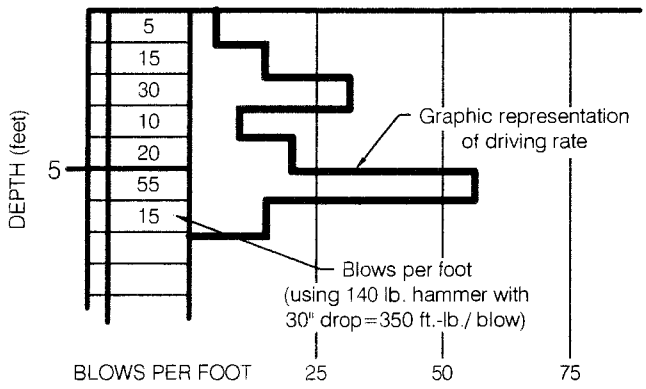
GRANULAR

Consistency	Blows/Foot
Very loose	0 - 4
Loose	5 - 10
Medium dense	11 - 30
Dense	31 - 50
Very dense	Over 50

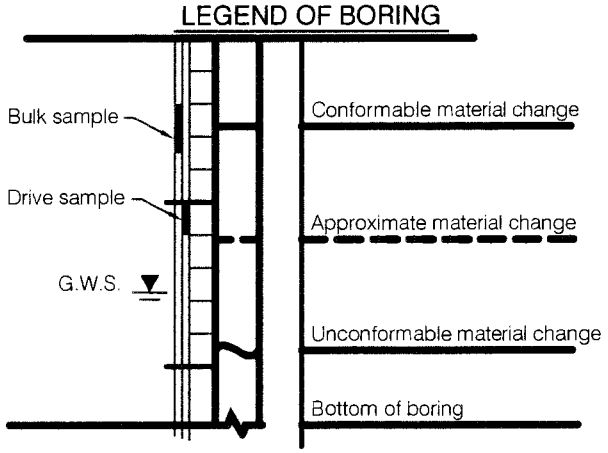
COHESIVE

Consistency	Blows/Foot
Very soft	Under 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very stiff	16 - 30
Hard	Over 30

LEGEND OF PENETRATION INDEX



LEGEND OF BORING



11-26-2001
USC-FORM
ANAHEIM R:\Drawings\AMEC\FORMS\USC-FORM.dwg, USC-FORM 11/26/2001 1:34:45 PM

AMEC Earth & Environmental, Inc.

TEST BORING LOG

TYPE **8" DIA. HOLLOW STEM AUGER** | ELEVATION **39.8 FEET** | BORING **B-01**

LAB TESTING	RELATIVE COMPACTION	DRY DENSITY (lbs/cu.ft.)	MOISTURE (%)	BLOWS/FOOT	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	MATERIAL SYMBOL	UNIFIED SOIL CLASS.	
PA, SE, SS					BAG	1		SM SP		**ARTIFICIAL FILL - LEVEE (afc):** Mottled brown and gray, poorly graded SAND with SILT and GRAVEL up to 1 inch in diameter
				45	1.4	2				. . . (2.5 feet) GRAVEL up to 3/4 inch in diameter, subrounded, dense
DS		121.8	3.3	51	2.4	3	5	SM		Gray SILTY SAND with GRAVEL up to 3 inches in diameter, subrounded
				54	1.4	4				. . . (7 feet) becoming more GRAVELLY with small COBBLES up to 4 inches
		116.2	6.5	55	2.4	5	10	SM		. . . (7.5 feet) GRAVEL up to 2 inches in diameter, subrounded, very dense
				32	1.4	6				**ALLUVIUM (Qal):** Gray, medium to coarse grained SILTY SAND
PA		111.9	14.7	27	2.4	7	15	SC		. . . (12.5 feet) mottled brown to gray, GRAVEL up to 1/2 inch in diameter, subrounded, red staining, dense
				8	1.4	8		SM		Mottled brown to dark green CLAYEY SAND, fines are medium plastic
CR, CH					BAG	9				Mottled gray to brown, fine grained SILTY SAND, vertical rootlets approximately 1/8 inch in diameter, loose
		112	3.9	32	2.4	10	20 ▼			. . . (20 feet) coarse grained
FC				17	1.4	11		SP		Gray, poorly graded, coarse grained SAND, medium dense
		119.8	13.1	51	2.4	12	25	SP SM		Gray, poorly graded, coarse grained SAND with SILT
PI			8.7	7	1.4	13		CL ML		Dark green SILTY CLAY, low plasticity, firm
		118.9	14.5	9	2.4	14	30	SM		Dark gray, fine grained SILTY SAND, nonplastic
				26	1.4	15	35	SP		Gray and brown, poorly graded SAND with GRAVEL up to 1/2 inch in diameter, subrounded, medium dense
		112.2	17.4	53	2.4	16	40			. . . (40 feet) coarse grained
				18	1.4	17	45			. . . (45 feet) medium grained, medium dense
							50			

Continued

THIS BORING LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND TIMES.

LOGGED BY **B.J./M.V.** | DATE **12-8-09**

AMEC Earth & Environmental, Inc.

TEST BORING LOG

TYPE	8" DIA. HOLLOW STEM AUGER	ELEVATION	39.8 FEET	BORING	B-01

LAB TESTING	RELATIVE COMPACTION	DRY DENSITY (lbs/cu.ft.)	MOISTURE (%)	BLOWS/FOOT	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	MATERIAL SYMBOL	UNIFIED SOIL CLASS.	
		113.6	16.3	93/11"	2.4	18				. . . (50 feet) coarse grained, feldspar crystals
				31	1.4	19	55			. . . (55 feet) medium grained, dense
		129.4	11.9	52	2.4	20	60		SM	Gray and brown, coarse grained SILTY SAND with GRAVEL up to 1/2 inch diameter
				36	1.4	21	65		SP SM	Gray, poorly graded, fine to medium grained SAND with SILT and GRAVEL up to 1/2 inch in diameter, dense
		135.5	7.6	99/9"	2.4	22	70		SM	Gray SILTY SAND with GRAVEL up to 1-1/2 inch in diameter, angular
				50/5"	1.4	23	75		ML	Gray, very fine grained SANDY SILT, non-plastic, hard
		125.3	10.8	47	2.4	24	80		SM	. . . (80 feet) gray, coarse grained SILTY SAND with GRAVEL up to 1-1/2 inch in diameter, angular

NOTES:

1. Total depth of boring 81.5 feet.
2. Groundwater encountered at 20.5 feet during drilling.
3. Boring elevation based on plans provided by Orange County Surveyor, dated January 5, 2010.
4. Boring backfilled with cement bentonite slurry on December 8, 2009.

THIS BORING LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND TIMES.

LOGGED BY **B.J./M.V.** DATE **12-8-09**

AMEC Earth & Environmental, Inc.

TEST BORING LOG

TYPE **8" DIA. HOLLOW STEM AUGER** | ELEVATION **41.8 FEET** | BORING **B-02**

LAB TESTING	RELATIVE COMPACTION	DRY DENSITY (lbs/cu.ft.)	MOISTURE (%)	BLOWS/FOOT	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	MATERIAL SYMBOL	UNIFIED SOIL CLASS.	
EI					BAG	1			SM	**ARTIFICIAL FILL - LEVEE (afc):** Gray SILTY SAND with GRAVEL up to 3/4 inch
		121.9	3.5	79/11"	2.4	2				. . . (2.5 feet) brown GRAVEL, subrounded
				53	1.4	3	5			. . . (5 feet) mix of angular and subrounded GRAVEL, very dense
DS		119.4	3.1	32	2.4	4			SP SM	Gray and brown, poorly graded SAND with SILT and GRAVEL up to 3/4 inch in diameter, subrounded
				15	1.4	5	10		SM	Brown, fine grained SILTY SAND, non-plastic, medium dense
		101.4	12.1	30	2.4	7			SM	**ALLUVIUM (Qal):** Mottled brown and gray, fine grained SILTY SAND, some rootlets,
					BAG	6				non-plastic, minor amount of staining
FC, PI			19.6	8	1.4	8	15		ML	
									CL	Fine grained SANDY SILT, firm
		109.1	4.4	35	2.4	9				Dark green, lean CLAY, some rootlets, firm
									SP SM	Brown, poorly graded, coarse grained SAND with SILT
				9	1.4	10	20 ▼			. . . (20 feet) loose
DS		121.9	11.2	30	2.4	11				
				9	1.4	12	25			. . . (25 feet) loose
		117.1	15.6	35	2.4	13			SM	Gray to brown, coarse grained SILTY SAND with GRAVEL up to 1-1/2 inches in diameter, subrounded
				5	1.4	14	30		SP	Gray, poorly graded, coarse grained SAND, feldspar crystals, loose
		114.2	17.1	50	2.4	15	35			. . . (35 feet) medium to coarse grained
				31	1.4	16	40		SM	Gray SILTY SAND with GRAVEL up to 1/2 inch in diameter, dense
		124.9	14.1	50/4"	2.4	17	45			. . . (45 feet) coarse grained, GRAVEL up to 1-1/2 inch in diameter, subrounded
							50			

Continued

THIS BORING LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND TIMES.

LOGGED BY **B.J./M.V.** | DATE **12-9-09**

AMEC Earth & Environmental, Inc.

TEST BORING LOG

TYPE **8" DIA. HOLLOW STEM AUGER** | ELEVATION **41.8 FEET** | BORING **B-02**

LAB TESTING	RELATIVE COMPACTION	DRY DENSITY (lbs/cu.ft.)	MOISTURE (%)	BLOWS/FOOT	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	MATERIAL SYMBOL	UNIFIED SOIL CLASS.	
				22	1.4	18				. . . (50 feet) fine grained, non-plastic fines, medium dense
		123.9	12.9	50/6"	2.4	19	55			. . . (55 feet) medium grained, GRAVEL up to 1/2 inch in diameter, subangular
				39	1.4	20	60			. . . (60 feet) fine to medium grained, dense
		123.9	14.7	93	2.4	21	65		SP SM	Gray, poorly graded, medium to coarse grained SAND with SILT and GRAVEL up to 1 inch in diameter
				29	1.4	22	70		SM	Gray, fine grained SILTY SAND, medium dense
		98.2	28.8	41	2.4	23	75		ML	Gray, very fine grained SANDY SILT, fines are non-plastic
			14.3	35	1.4	24	80		CL	Dark green SANDY lean CLAY with GRAVEL up to 1/2 inch in diameter, medium to high plasticity, hard

NOTES:

1. Total depth of boring 81.5 feet.
2. Groundwater encountered at 20 feet during drilling.
3. Boring elevation based on plans provided by Orange County Surveyor, dated January 5, 2010.
4. Boring backfilled with cement bentonite slurry on December 9, 2009.

THIS BORING LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND TIMES.

LOGGED BY **B.J./M.V.** | DATE **12-9-09**

AMEC Earth & Environmental, Inc.

TEST BORING LOG

TYPE	8" DIA. HOLLOW STEM AUGER	ELEVATION	44 FEET	BORING	B-03

LAB TESTING	RELATIVE COMPACTION	DRY DENSITY (lbs/cu.ft.)	MOISTURE (%)	BLOWS/FOOT	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	MATERIAL SYMBOL	UNIFIED SOIL CLASS.	
MD, SS					BAG	1			SM	**ARTIFICIAL FILL - LEVEE (afc):** Gray SILTY SAND with GRAVEL up to 3/4 inch
				36	1.4	2				. . . (2.5 feet) gray and brown, GRAVEL up to 1 inch in diameter, dense
		117.3	9.4	41	2.4	3	5			. . . (5 feet) becoming more GRAVELLY, subrounded
PA			6.7	14	1.4	4			SC	Mottled brown and dark green, CLAYEY SAND, medium plasticity, some GRAVEL, medium dense
EI					BAG	5				
		124	5.7	63	2.4	6	10		SM CL	Mottled brown and gray, SILTY SAND/SANDY CLAY, some GRAVEL, medium plasticity, some oxidation staining in the SANDY CLAY
				22	1.4	7			SM	Brown SILTY SAND with GRAVEL up to 3/4 inch, angular, medium dense
			2.3	10	2.4	8	15		SM	**ALLUVIUM (Qal):** Mottled brown and gray, SILTY SAND with GRAVEL, oxidation staining, minor amount of rootlets, slight porosity
				10	1.4	9				. . . (17.5 feet) brown, fine grained, non-plastic, loose
PA, DS		93.7	9.4	6	2.4	10	20 ▼		SP	Dark green to brown, poorly graded SAND
				9	1.4	11				. . . (22.5 feet) brown, coarse grained, loose
CR, CH					BAG	12				
		118.9	12.1	11	2.4	13	25			. . . (25 feet) dark brown, GRAVEL up to 1/2 inch in diameter
FC, PI			40.8	2	1.4	14			SM	Dark gray, fine grained SILTY SAND, low-plasticity, very loose
		121.6	16.4	24	2.4	15	30			. . . (30 feet) mottled brown and gray, fine to medium grained, GRAVEL up to 1 inch in diameter, rounded, non-plastic
PA				11	1.4	16	35		SC	Dark gray, medium to coarse grained, CLAYEY SAND, medium to highly plastic, medium dense
		130.2	9.6	47	2.4	17	40		SP SM	Gray, poorly graded, coarse grained SAND with SILT, minor amount of GRAVEL up to 1/2 inch in diameter
				29	1.4	18	45			. . . (45 feet) dark gray, GRAVEL up to 1/2 inch in diameter, subrounded, medium dense
							50			

Continued

THIS BORING LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND TIMES.

LOGGED BY **B.J./M.V.** DATE **12-8-09**

AMEC Earth & Environmental, Inc.

TEST BORING LOG

TYPE	8" DIA. HOLLOW STEM AUGER	ELEVATION	44 FEET	BORING	B-03

LAB TESTING	RELATIVE COMPACTION	DRY DENSITY (lbs/cu.ft.)	MOISTURE (%)	BLOWS/FOOT	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	MATERIAL SYMBOL	UNIFIED SOIL CLASS.	
		101	23.8	50/4"	2.4	19			CL SP	Interbedded light gray to dark green, poorly graded SAND and lean CLAY, moderately plastic
				91/9"	1.4	20	55		SP	Light gray, poorly graded, medium grained SAND, very dense
		113.2	16.3	50/4"	2.4	21	60			. . . (60 feet) gray, fine to medium grained, minor amount of oxidation staining
				41	1.4	22	65		SM ML	Interbedded lenses of mottled gray to brown SANDY SILT/SILTY SAND, some oxidation in the SAND portion, dense
PI		108.4	20.4	50/5"	2.4	23	70			**Displaced CAPISTRANO FORMATION - Ancient Landslide Deposits (Qls):** Mottled brown and green CLAYEY SILTSTONE, some caliche stringers, oxidation staining, medium to high plasticity, massive to thinly bedded
				72/11"	1.4	24	75			. . . (75 feet) dark green
		97.8	29.5	90/11"	2.4	25	80			. . . (80 feet) dark brown, low to medium plasticity

NOTES:

1. Total depth of boring 81.5 feet.
2. Groundwater encountered at 21 feet during drilling.
3. Boring elevation based on plans provided by Orange County Surveyor, dated January 5, 2010.
4. Boring backfilled with cement bentonite slurry on December 9, 2009.

THIS BORING LOG SUMMARY APPLIES ONLY AT THE TIME AND LOCATION INDICATED. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND TIMES.

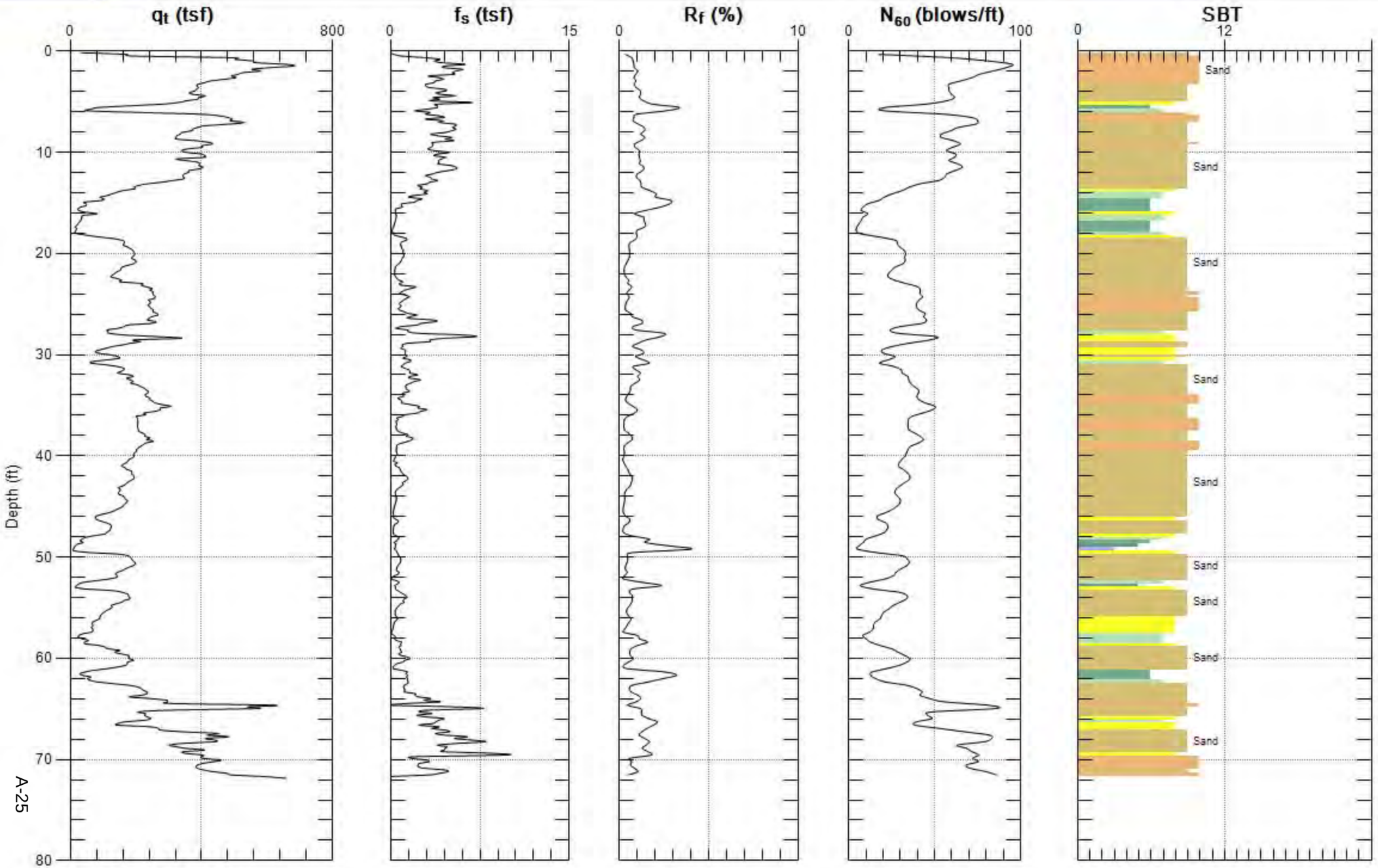
LOGGED BY **B.J./M.V.** DATE **12-8-09**

GREGG

AMEC

Site: SAN JUAN CREEK
Sounding: CPT-01

Engineer: C.SPITZER
Date: 2009-12-11 07:38



Max. Depth: 71.850 (ft)
Avg. Interval: 0.328 (ft)

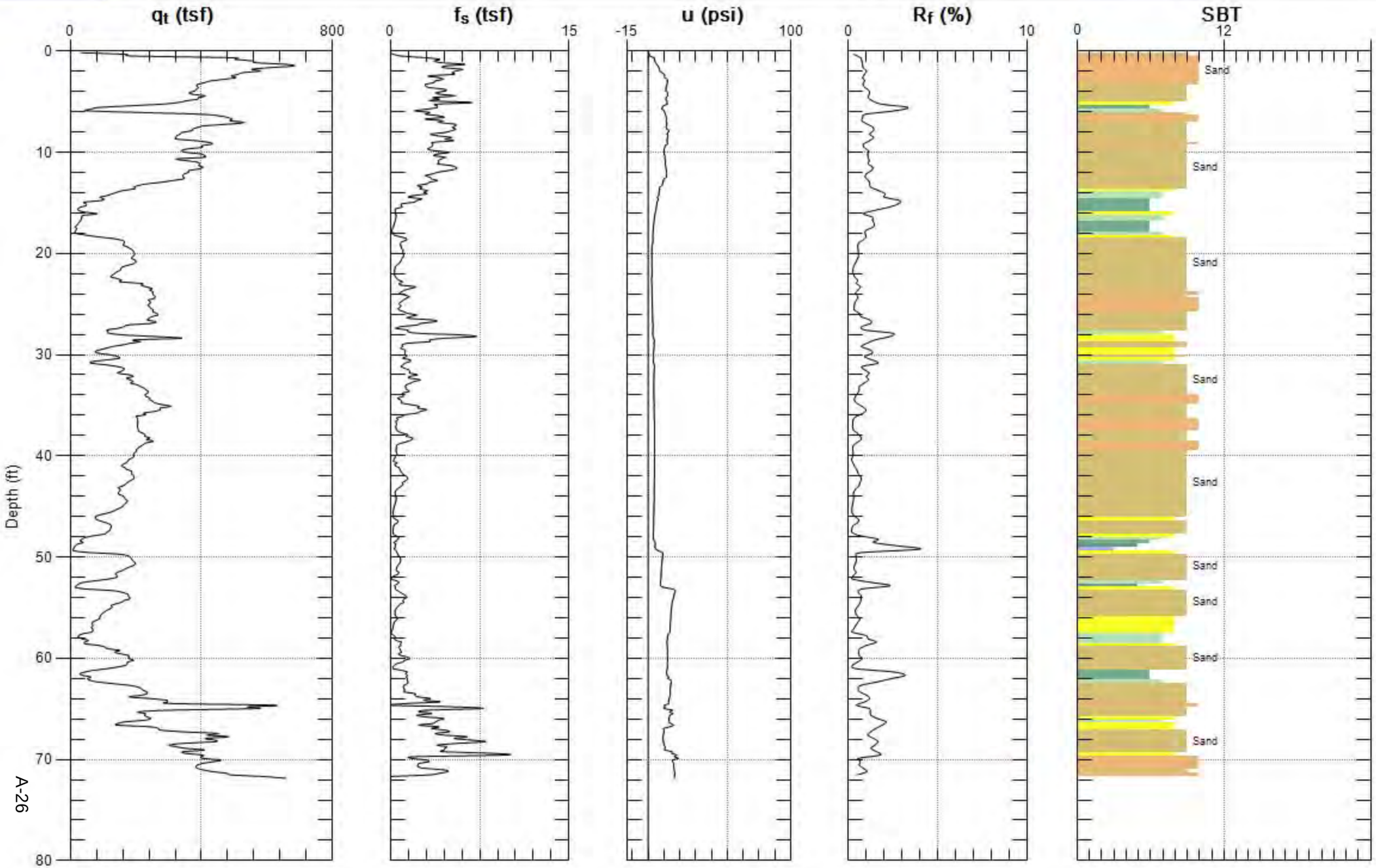
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AMEC

Site: SAN JUAN CREEK
Sounding: CPT-01

Engineer: C.SPITZER
Date: 2009-12-11 07:38



Max. Depth: 71.850 (ft)
Avg. Interval: 0.328 (ft)

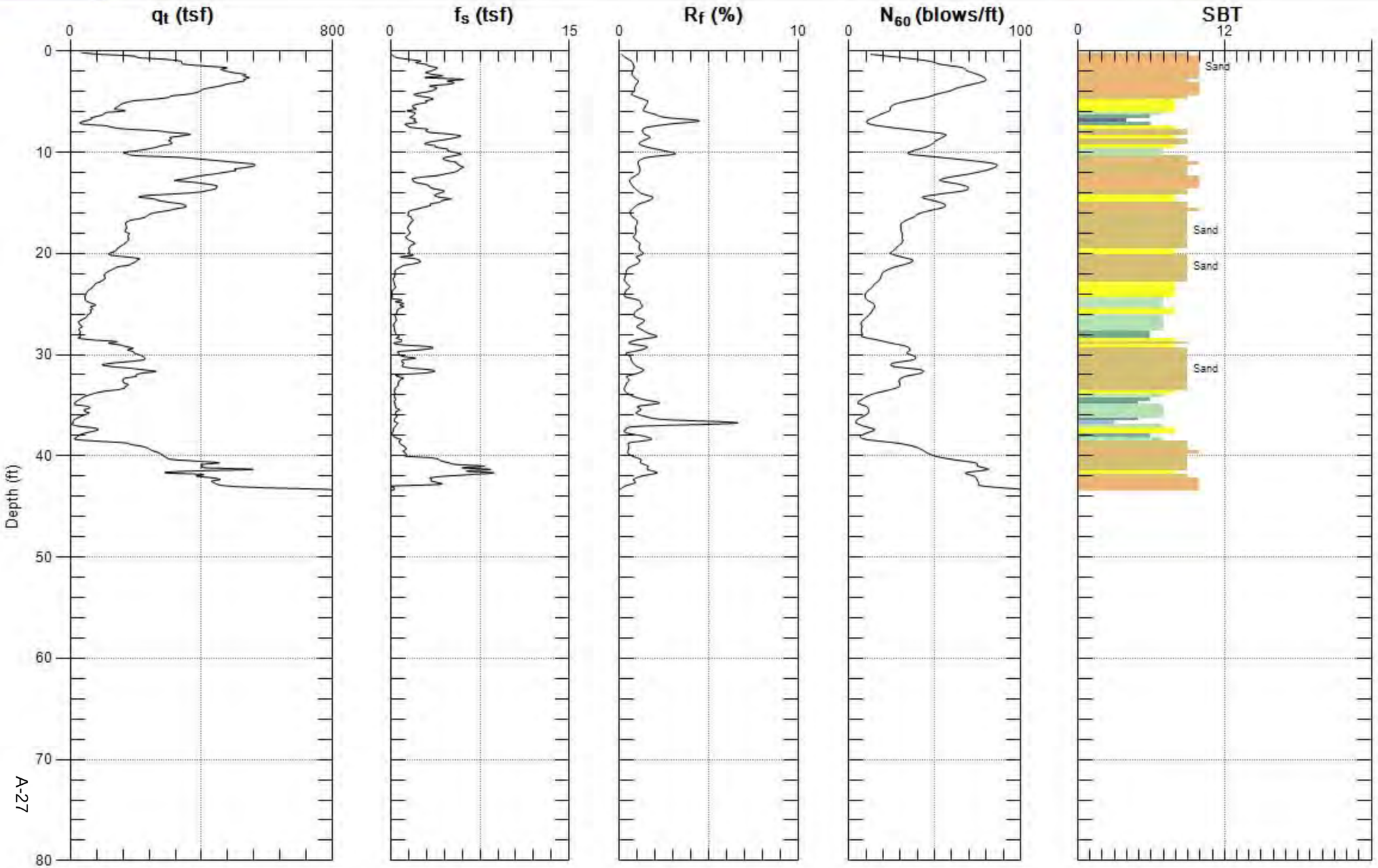
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AMEC

Site: SAN JUAN CREEK
Sounding: CPT-02

Engineer: C.SPITZER
Date: 2009-12-11 08:43



Max. Depth: 43.635 (ft)
Avg. Interval: 0.328 (ft)

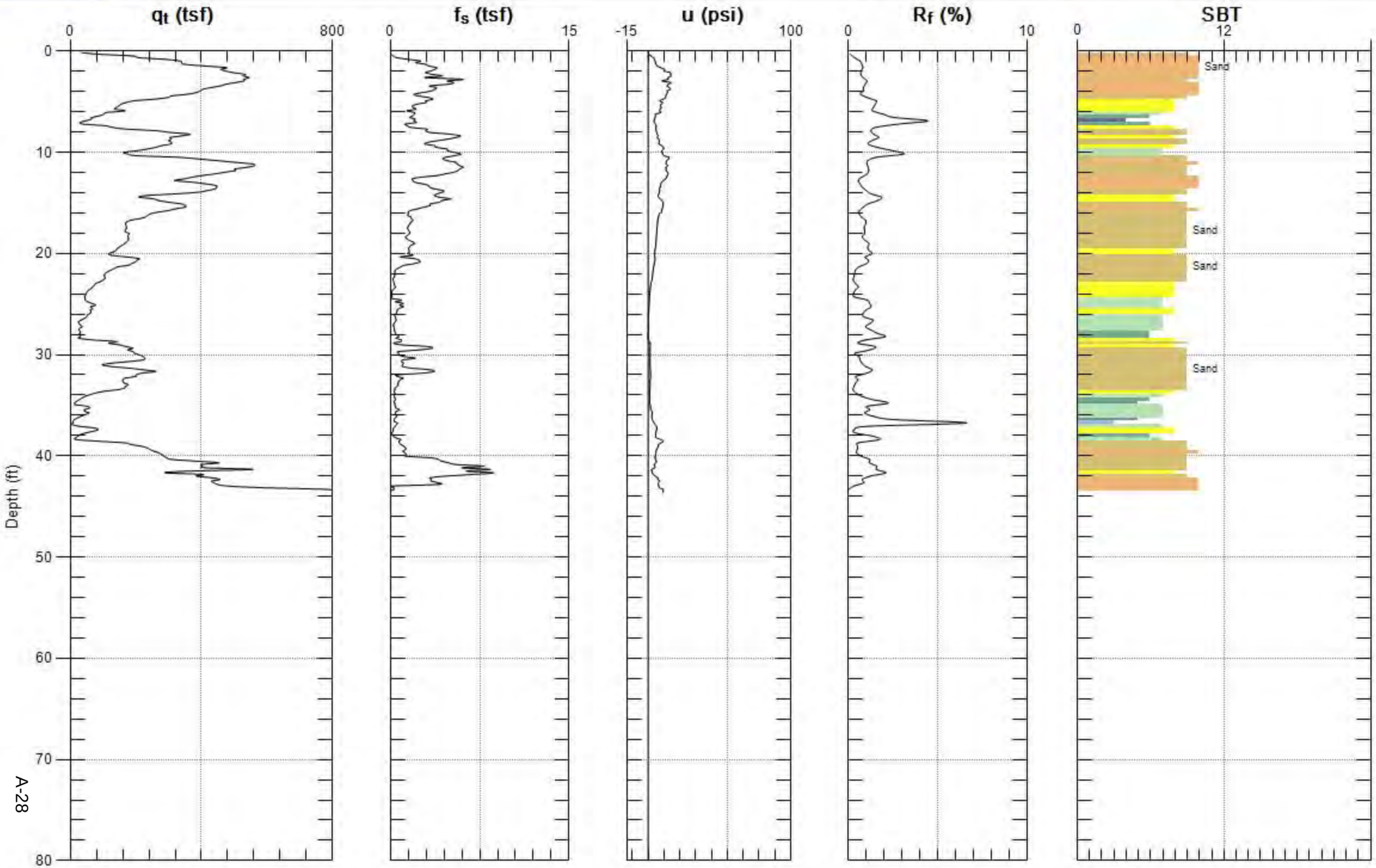
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AMEC

Site: SAN JUAN CREEK
Sounding: CPT-02

Engineer: C.SPITZER
Date: 2009-12-11 08:43



Max. Depth: 43.635 (ft)
Avg. Interval: 0.328 (ft)

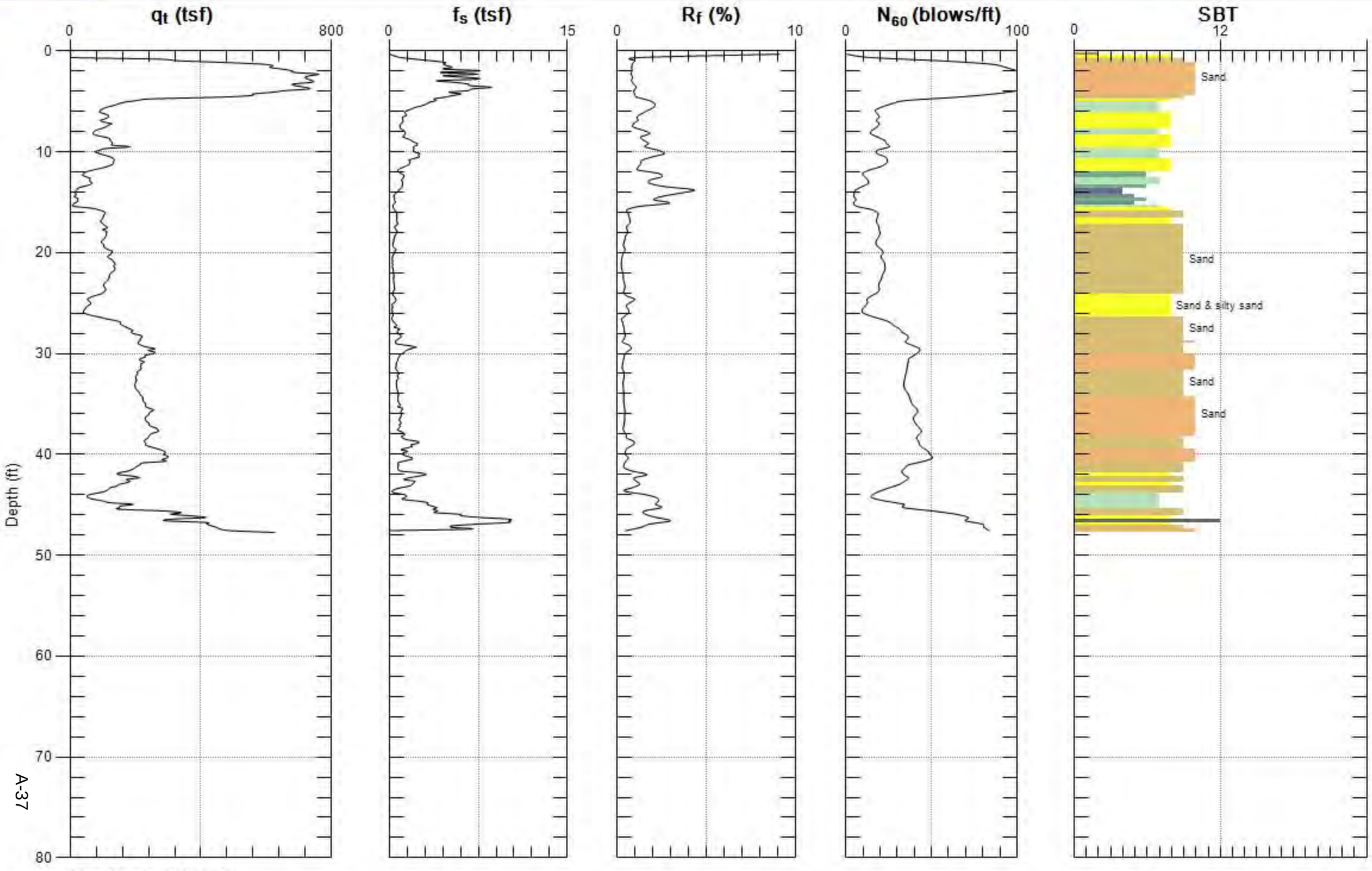
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AMEC

Site: SAN JUAN CREEK
Sounding: CPT-07

Engineer: C.SPITZER
Date: 2009-12-11 12:51



Max. Depth: 47.736 (ft)
Avg. Interval: 0.328 (ft)

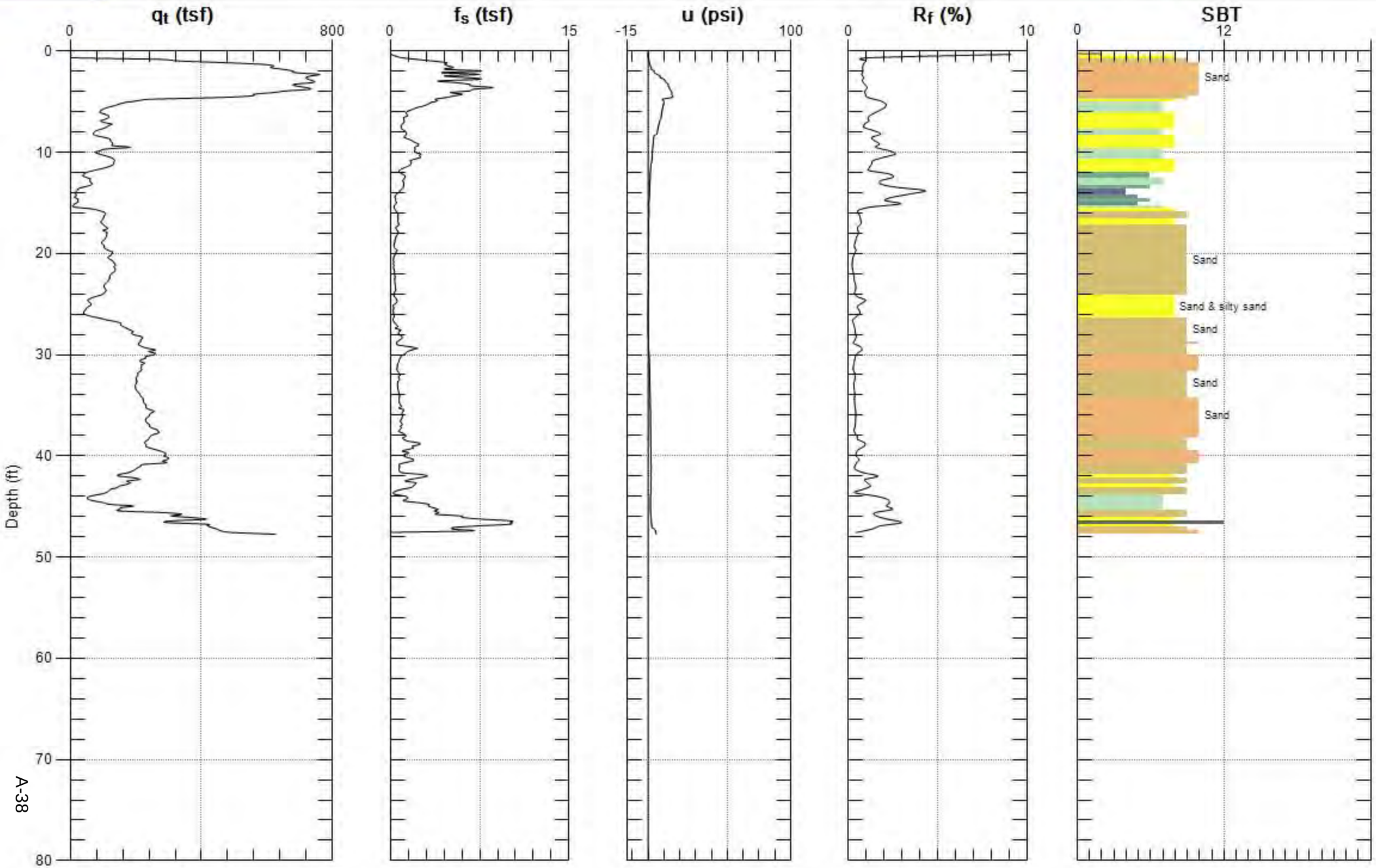
SBT: Soil Behavior Type (Robertson 1990)

GREGG

AMEC

Site: SAN JUAN CREEK
Sounding: CPT-07

Engineer: C.SPITZER
Date: 2009-12-11 12:51



Max. Depth: 47.736 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

APPENDIX C. LIQUEFACTION ANALYSES

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

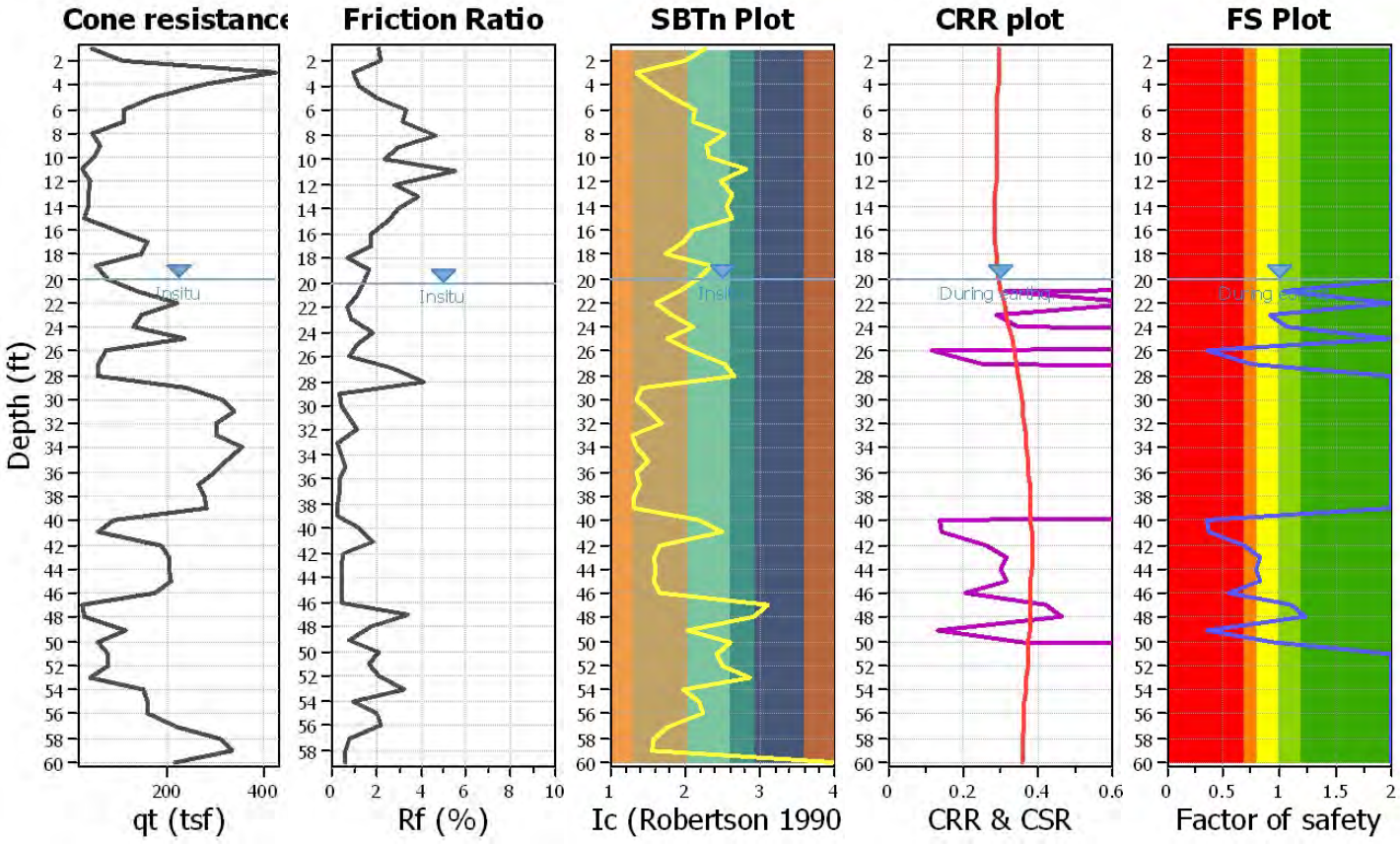
LIQUEFACTION ANALYSIS REPORT

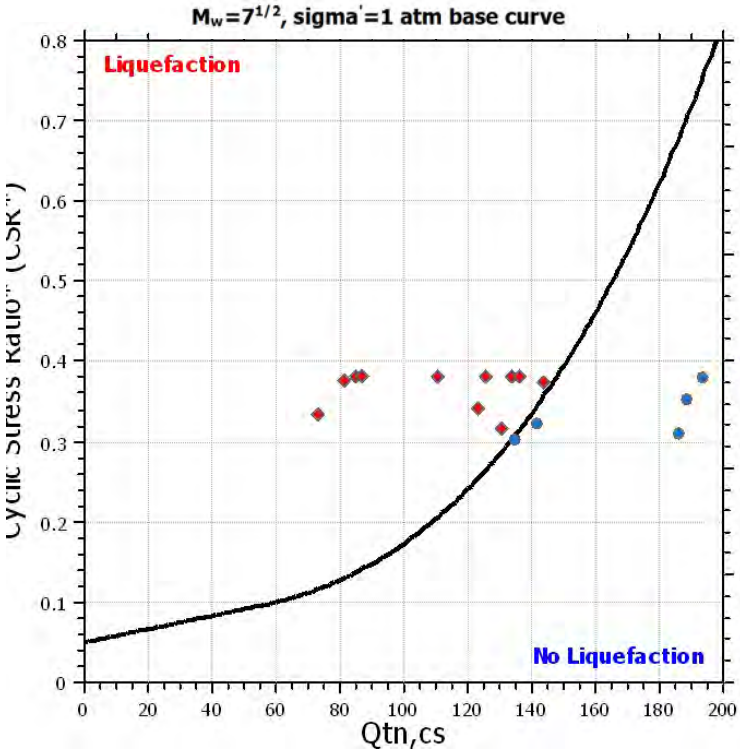
Project title : Ganahl SJC **Location :**

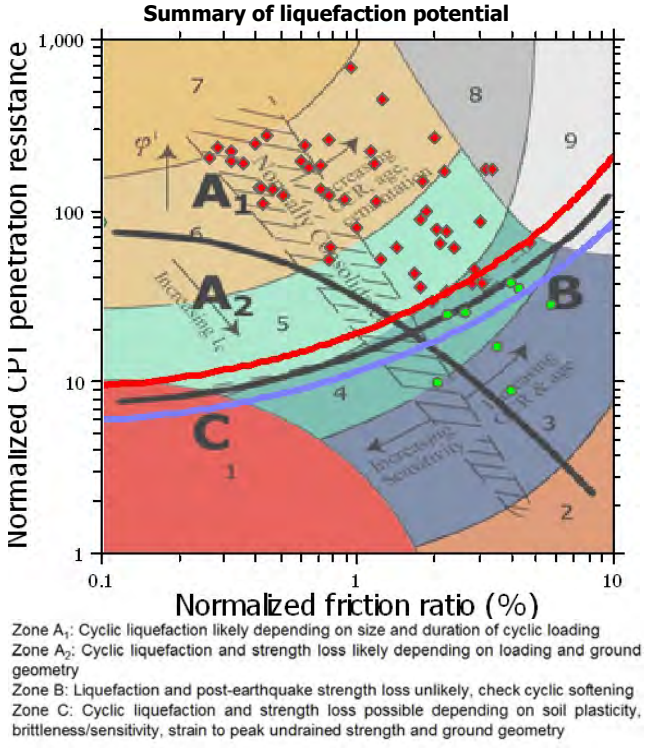
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

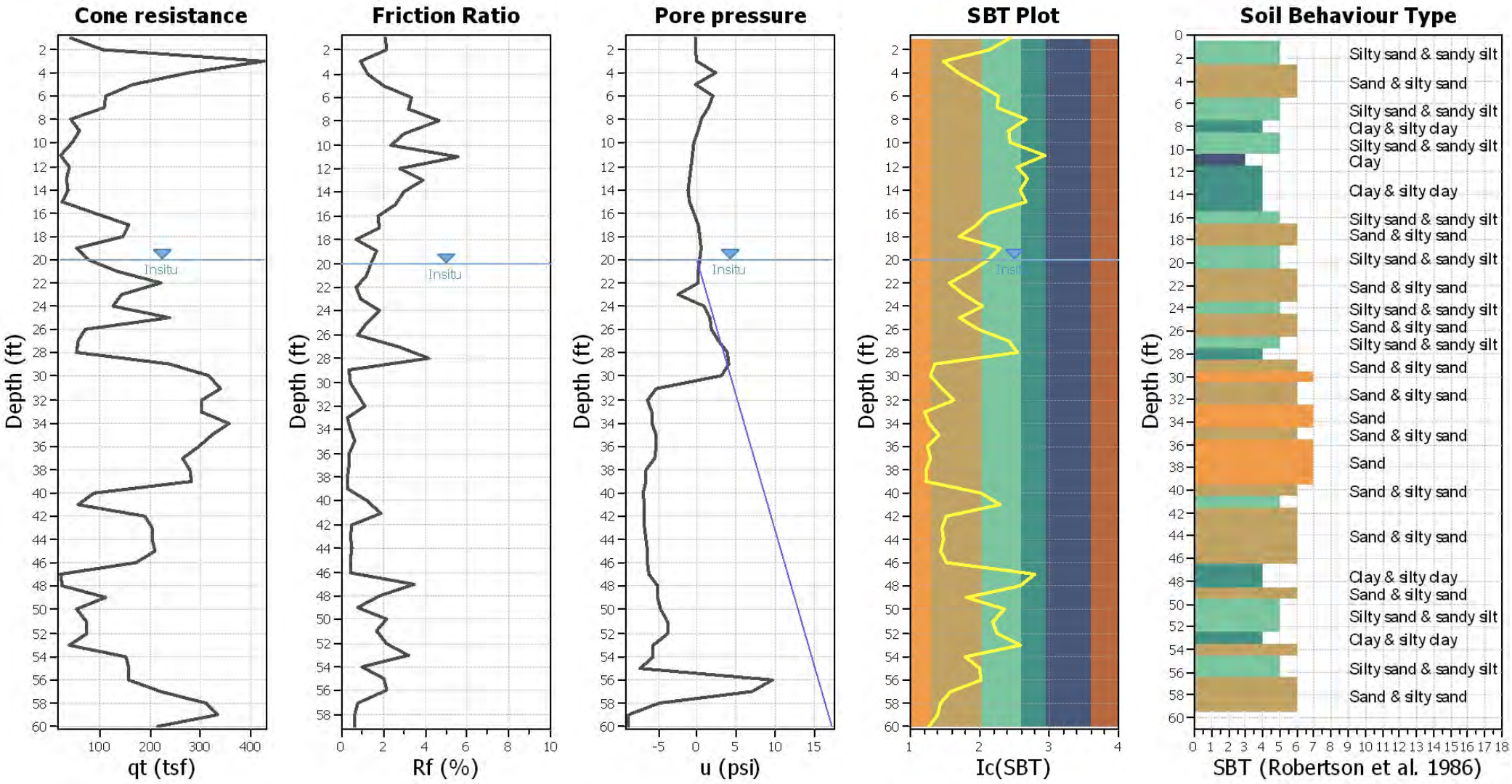






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



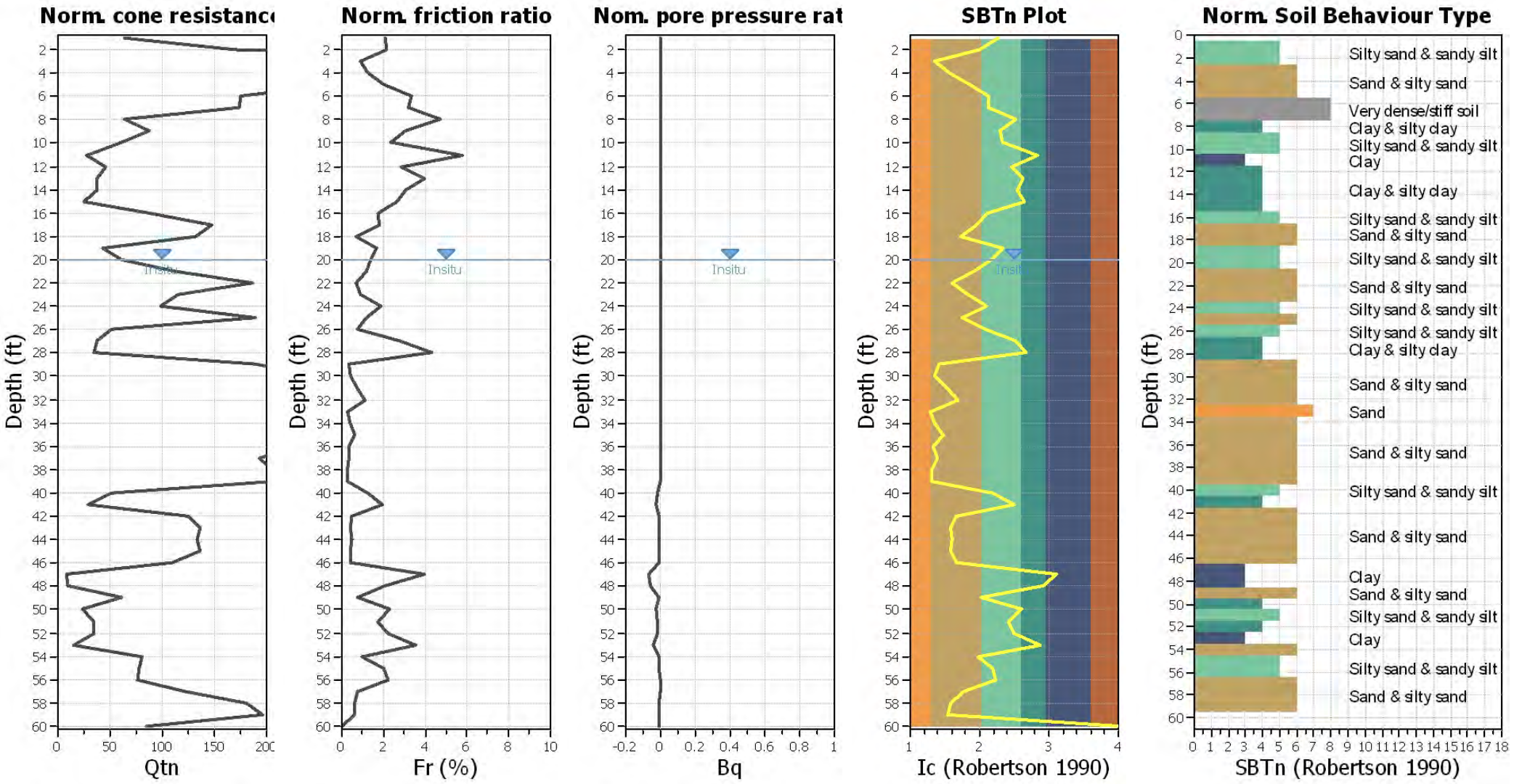
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



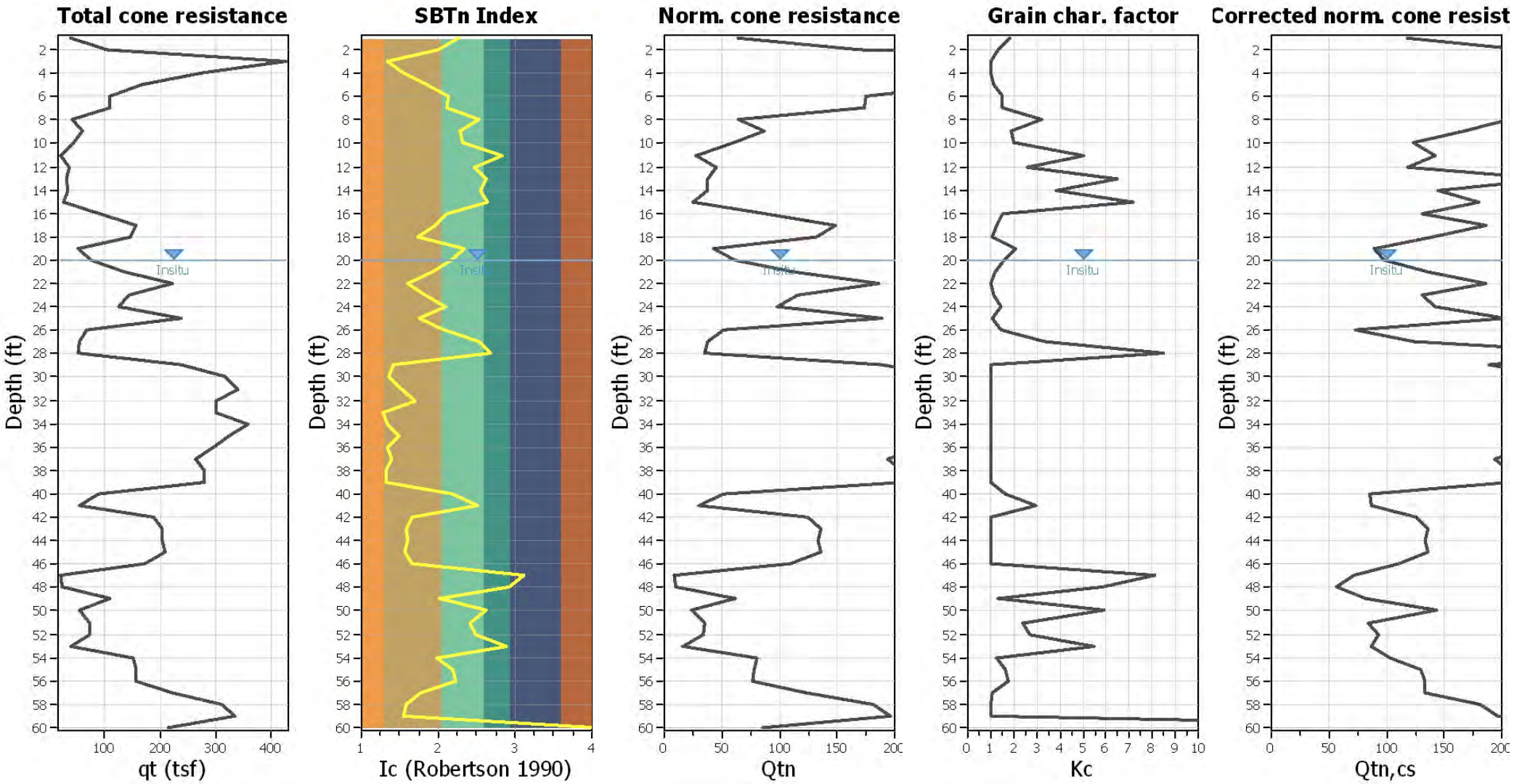
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

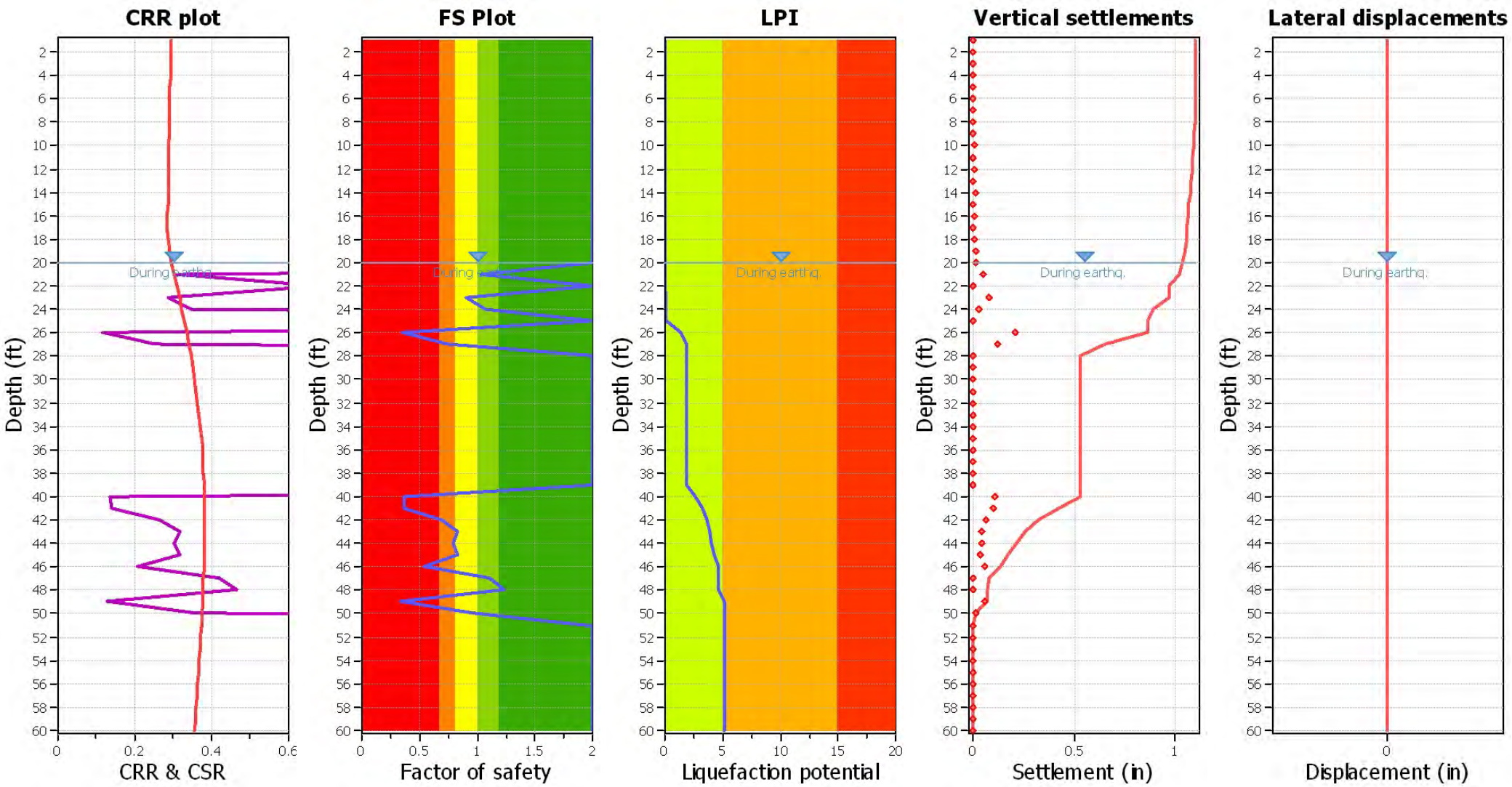
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

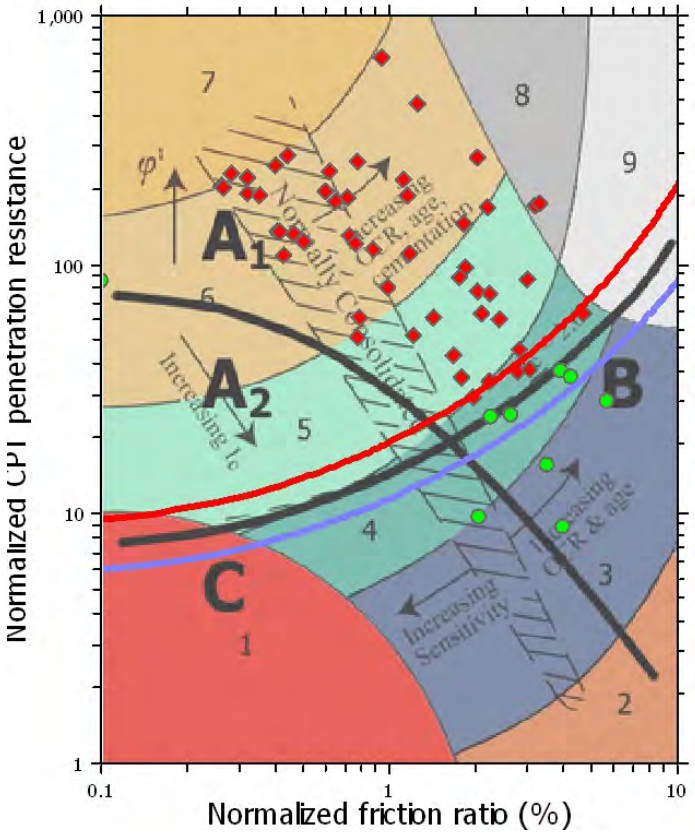
F.S. color scheme

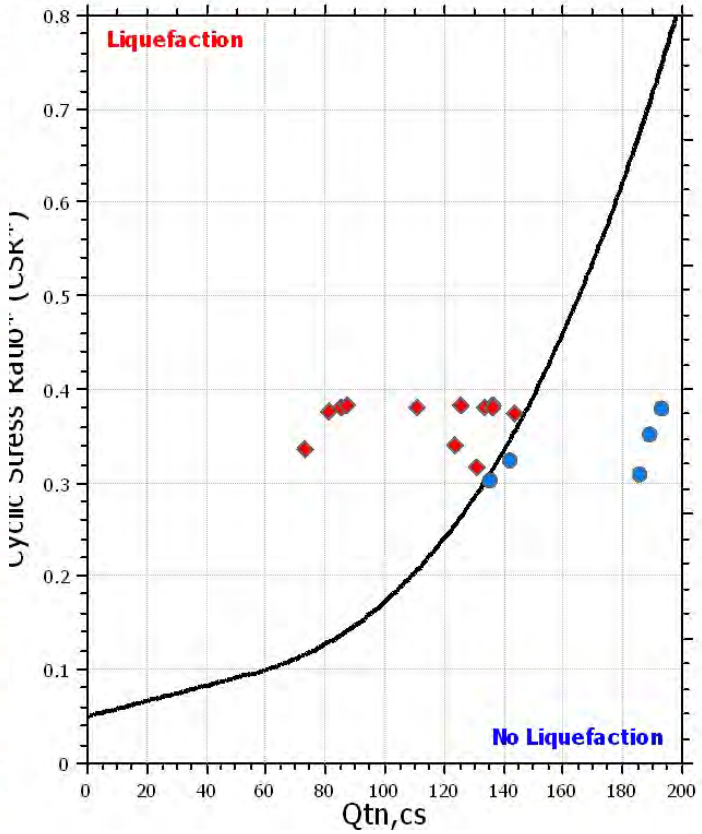
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

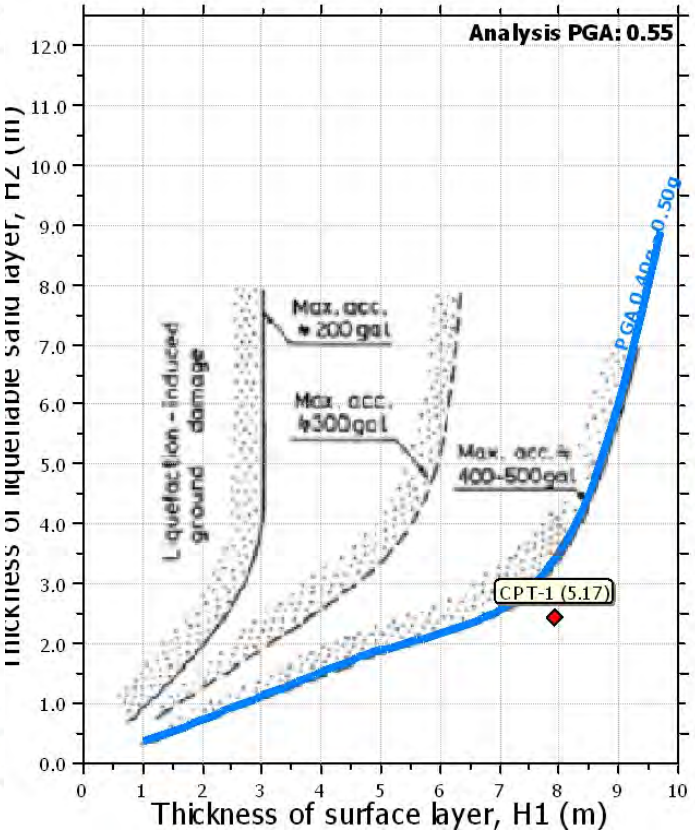
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



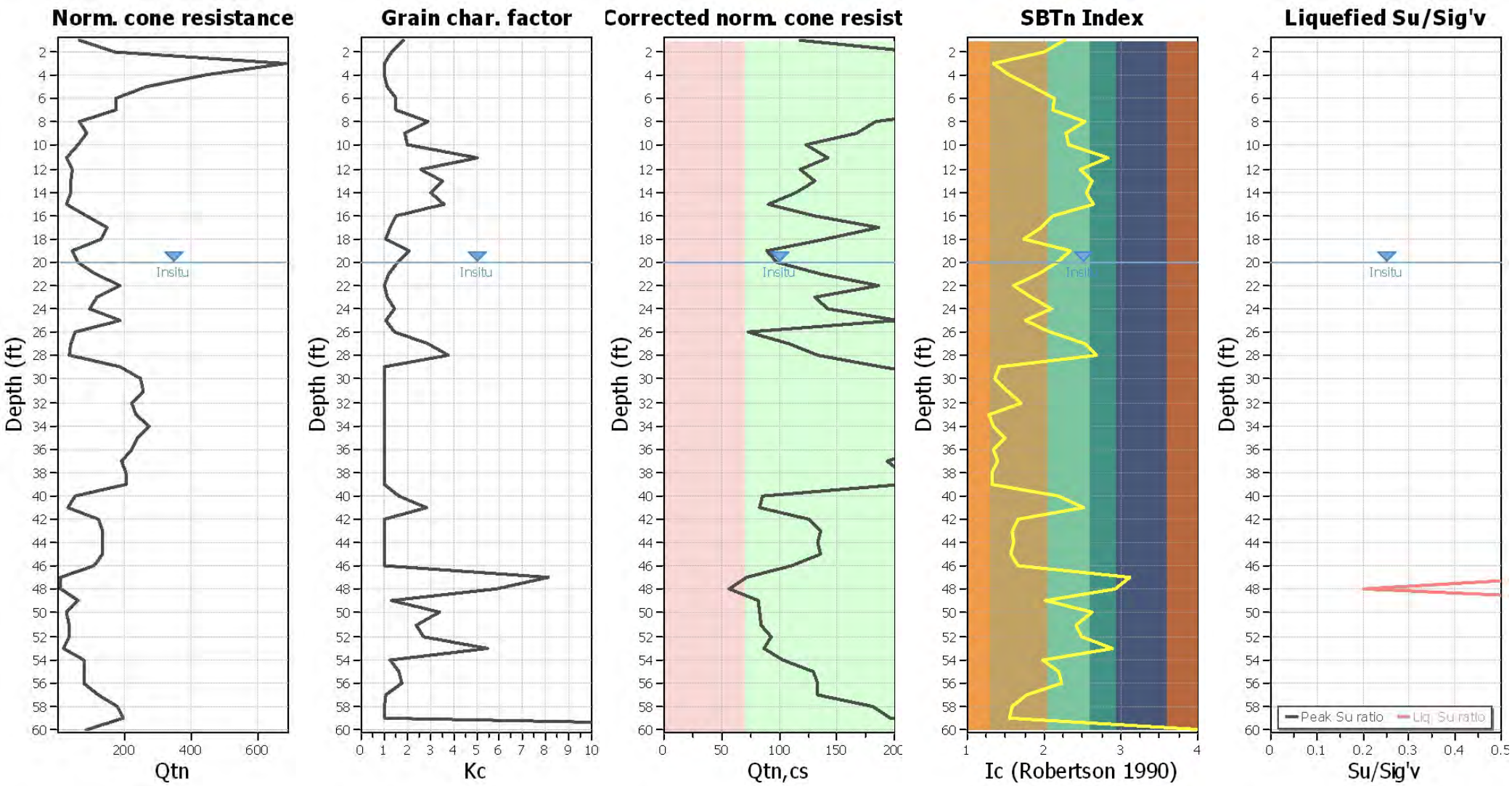




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

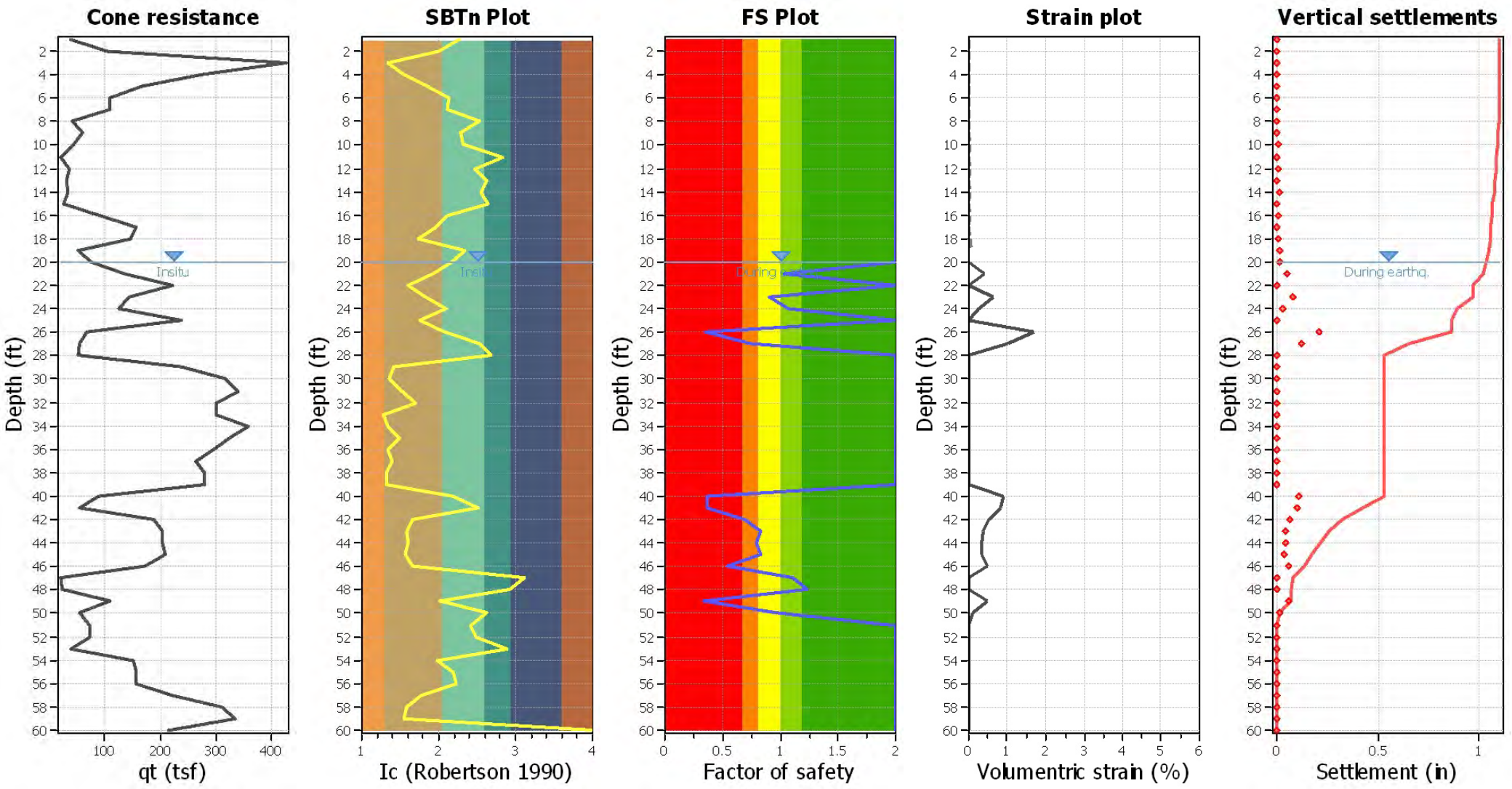
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	2.27	64.32	1.85	118.78	28	636	0.29	0.004	0.00	8.63	0.00	0.001
2.00	1.99	169.25	1.29	218.50	45	1183	0.29	0.004	0.00	8.63	0.00	0.000
3.00	1.35	684.40	1.00	684.40	114	2114	0.29	0.003	0.00	8.63	0.00	0.000
4.00	1.55	442.06	1.00	442.06	79	1774	0.29	0.006	0.00	8.63	0.00	0.000
5.00	1.85	267.58	1.14	305.31	60	1550	0.29	0.009	0.00	8.63	0.00	0.000
6.00	2.13	175.42	1.52	265.85	58	1462	0.29	0.012	0.00	8.63	0.00	0.001
7.00	2.12	173.62	1.49	258.45	56	1422	0.29	0.014	0.00	8.63	0.00	0.001
8.00	2.52	63.95	2.88	184.12	48	873	0.29	0.038	0.01	8.63	0.01	0.002
9.00	2.29	87.21	1.91	166.76	39	957	0.29	0.037	0.02	8.63	0.01	0.003
10.00	2.33	60.48	2.03	123.00	29	743	0.29	0.078	0.05	8.63	0.03	0.008
11.00	2.83	28.19	5.03	141.88	0	0	0.29	0.000	0.00	10.85	0.00	0.000
12.00	2.47	45.63	2.60	118.66	30	748	0.29	0.104	0.06	8.63	0.04	0.010
13.00	2.63	37.40	3.51	131.14	0	0	0.29	0.000	0.00	10.85	0.00	0.000
14.00	2.55	37.88	3.01	114.15	30	771	0.29	0.124	0.08	8.63	0.05	0.011
15.00	2.64	25.06	3.61	90.50	0	0	0.29	0.000	0.00	10.85	0.00	0.000
16.00	2.11	88.28	1.48	130.59	28	1171	0.28	0.054	0.04	8.63	0.02	0.005
17.00	1.97	147.83	1.26	186.03	38	1701	0.28	0.030	0.01	8.63	0.01	0.002
18.00	1.73	131.47	1.06	139.04	26	1156	0.29	0.066	0.05	8.63	0.03	0.006
19.00	2.33	43.36	2.06	89.38	21	866	0.29	0.151	0.14	8.63	0.07	0.018

Total estimated settlement: 0.07

Abbreviations

Q_{tn}:	Equivalent clean sand normalized cone resistance
K_c:	Fines correction factor
$Q_{tn,cs}$:	Post-liquefaction volumentric strain
G_{max}:	Small strain shear modulus
CSR:	Soil cyclic stress ratio
γ:	Cyclic shear strain
$e_{vol(15)}$:	Volumetric strain after 15 cycles
N_c:	Equivalent number of cycles
e_v:	Volumetric strain
Settle.:	Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	98.21	2.00	0.00	0.67	0.00	21.00	135.25	1.03	0.43	0.65	0.05
22.00	185.97	2.00	0.00	0.63	0.00	23.00	130.56	0.91	0.65	0.62	0.08
24.00	141.95	1.07	0.26	0.60	0.03	25.00	202.44	2.00	0.00	0.58	0.00
26.00	72.87	0.35	1.72	0.57	0.21	27.00	123.32	0.75	1.00	0.55	0.12
28.00	296.81	2.00	0.00	0.53	0.00	29.00	188.96	2.00	0.00	0.52	0.00
30.00	250.23	2.00	0.00	0.50	0.00	31.00	259.03	2.00	0.00	0.48	0.00
32.00	229.07	2.00	0.00	0.47	0.00	33.00	234.43	2.00	0.00	0.45	0.00
34.00	273.41	2.00	0.00	0.43	0.00	35.00	238.09	2.00	0.00	0.42	0.00
36.00	222.38	2.00	0.00	0.40	0.00	37.00	193.55	2.00	0.00	0.38	0.00
38.00	206.04	2.00	0.00	0.37	0.00	39.00	206.16	2.00	0.00	0.35	0.00
40.00	84.96	0.36	0.89	0.33	0.11	41.00	86.97	0.37	0.83	0.32	0.10
42.00	125.37	0.69	0.54	0.30	0.06	43.00	136.43	0.83	0.37	0.28	0.04
44.00	133.59	0.79	0.35	0.27	0.04	45.00	136.36	0.83	0.32	0.25	0.04
46.00	110.83	0.54	0.50	0.23	0.06	47.00	71.32	1.11	0.01	0.22	0.00
48.00	57.10	1.23	0.01	0.20	0.00	49.00	81.20	0.34	0.51	0.18	0.06
50.00	143.79	0.95	0.11	0.17	0.01	51.00	84.42	2.00	0.00	0.15	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
52.00	93.04	2.00	0.00	0.13	0.00	53.00	86.59	2.00	0.00	0.12	0.00
54.00	102.79	2.00	0.00	0.10	0.00	55.00	129.51	2.00	0.00	0.08	0.00
56.00	133.58	2.00	0.00	0.07	0.00	57.00	133.05	2.00	0.00	0.05	0.00
58.00	180.67	2.00	0.00	0.03	0.00	59.00	195.89	2.00	0.00	0.02	0.00
60.00	2270.34	2.00	0.00	0.00	0.00						

Total estimated settlement: 1.02

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

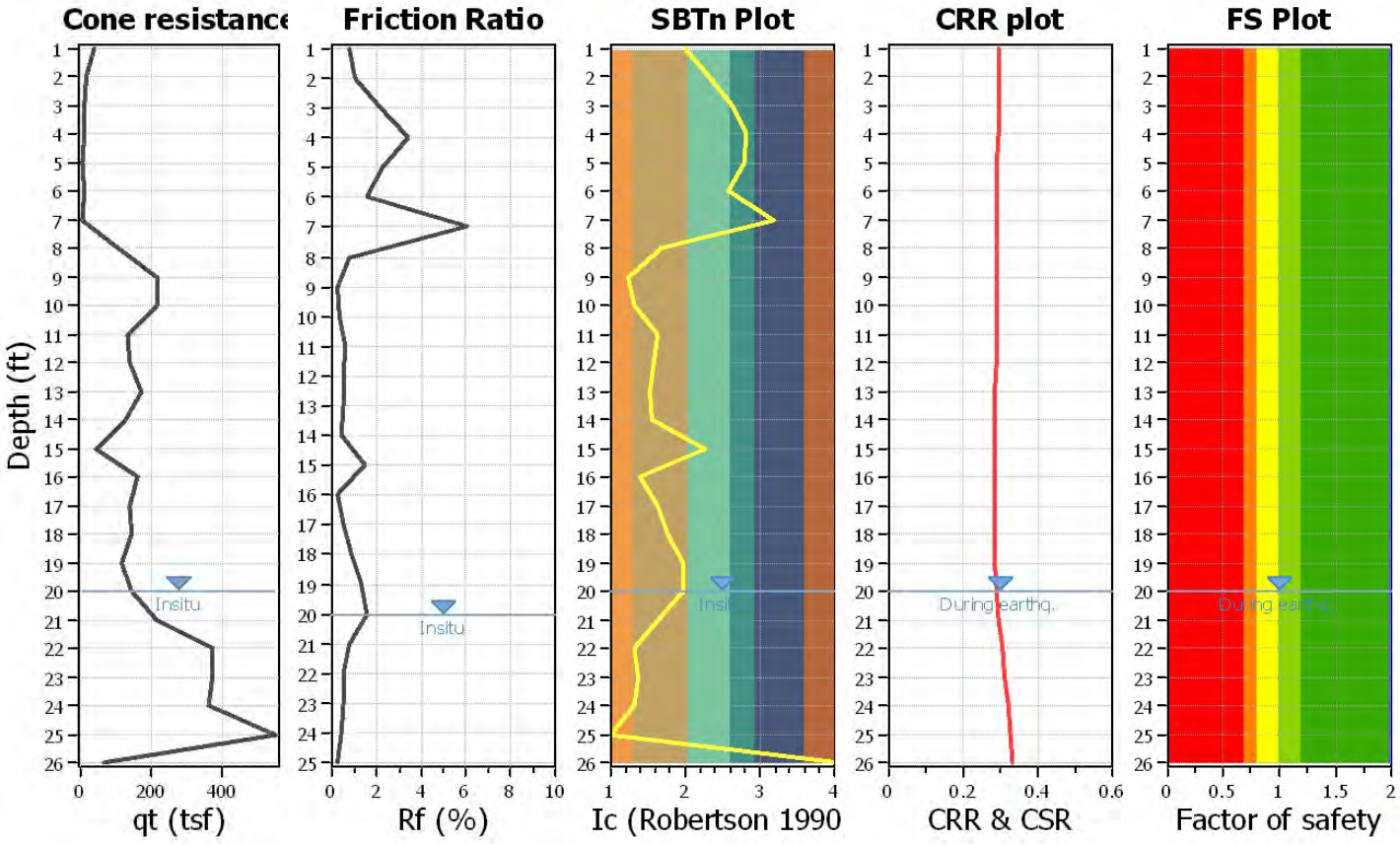
LIQUEFACTION ANALYSIS REPORT

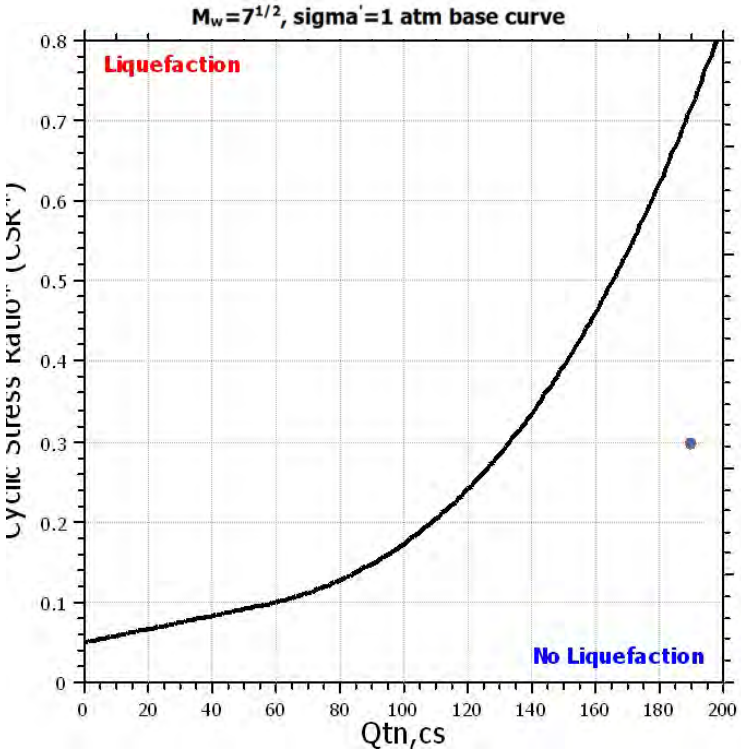
Project title : Ganahl SJC **Location :**

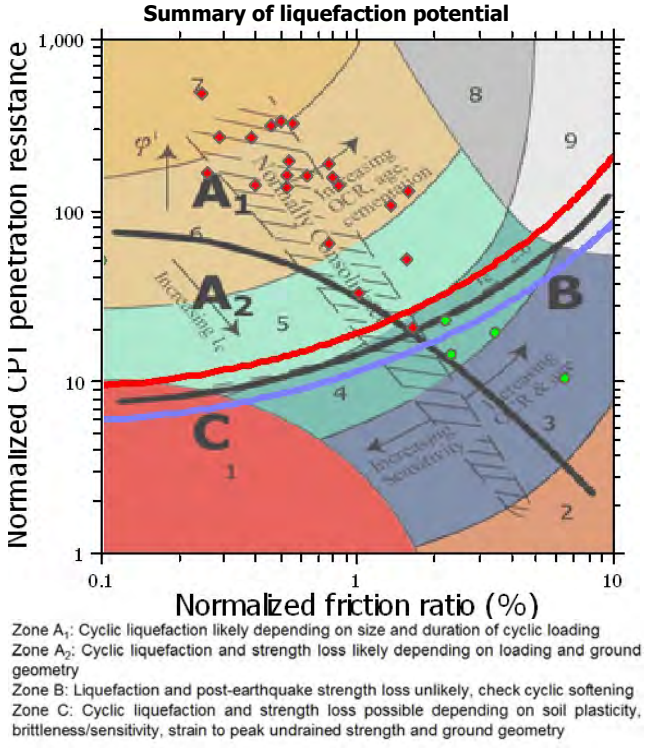
CPT file : CPT-2

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

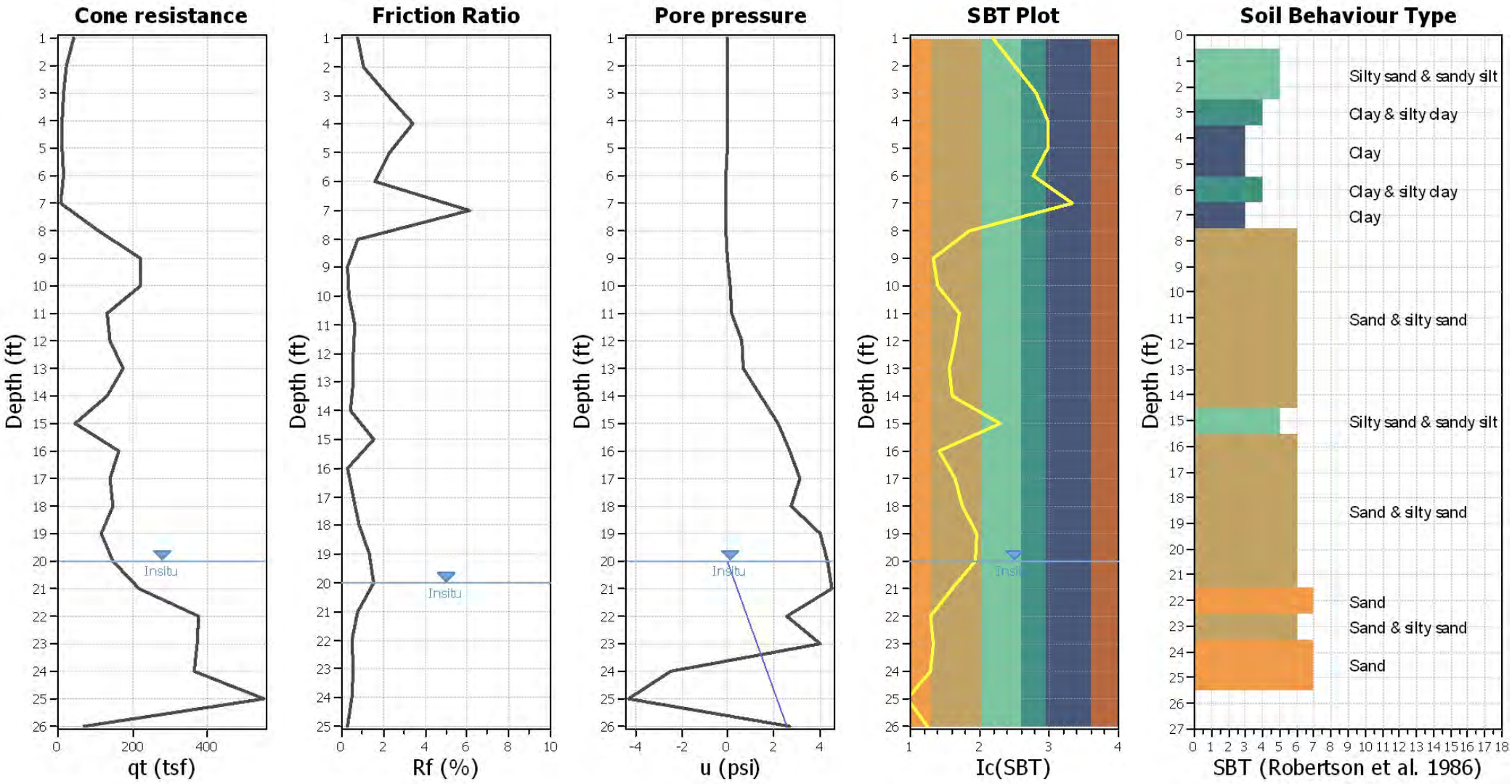






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



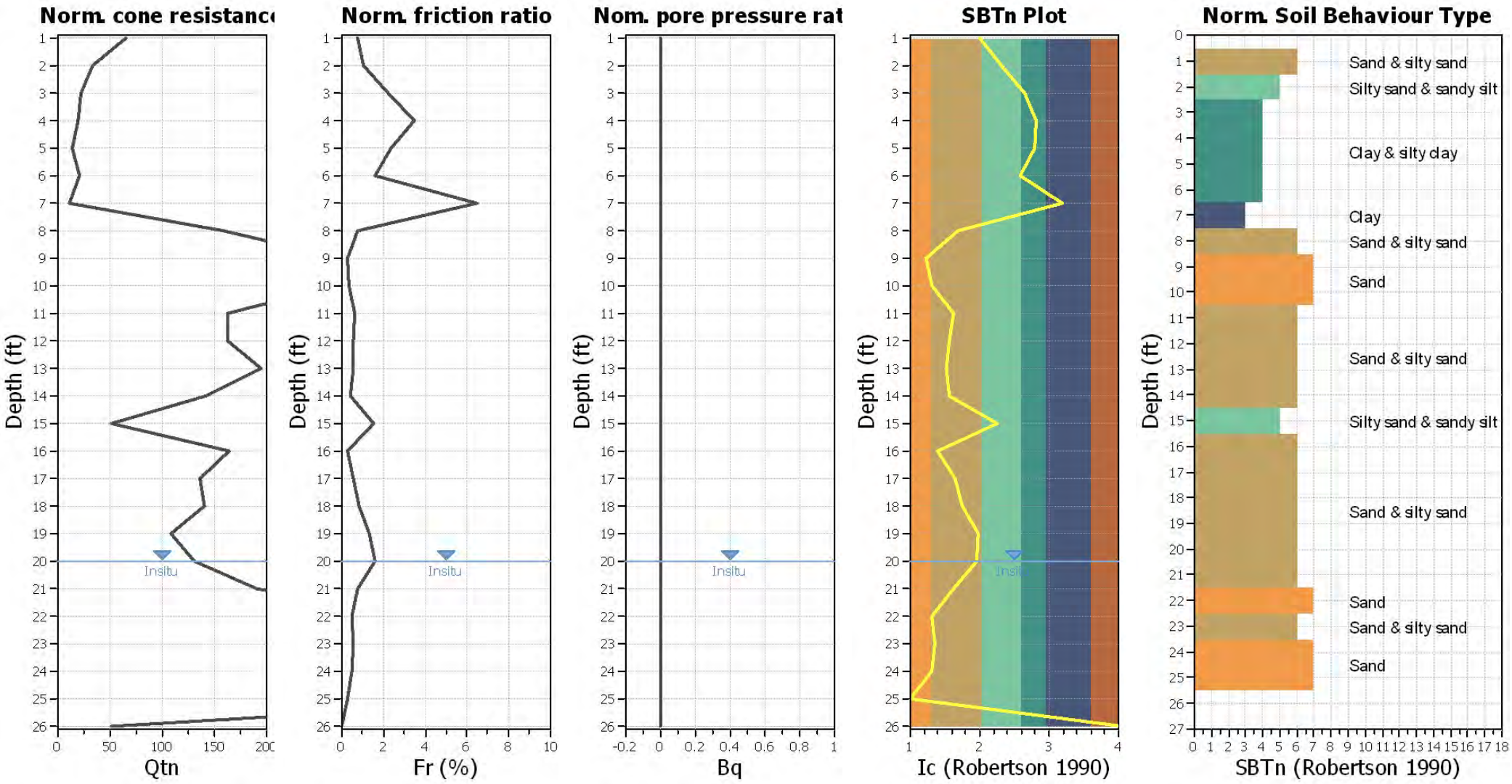
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



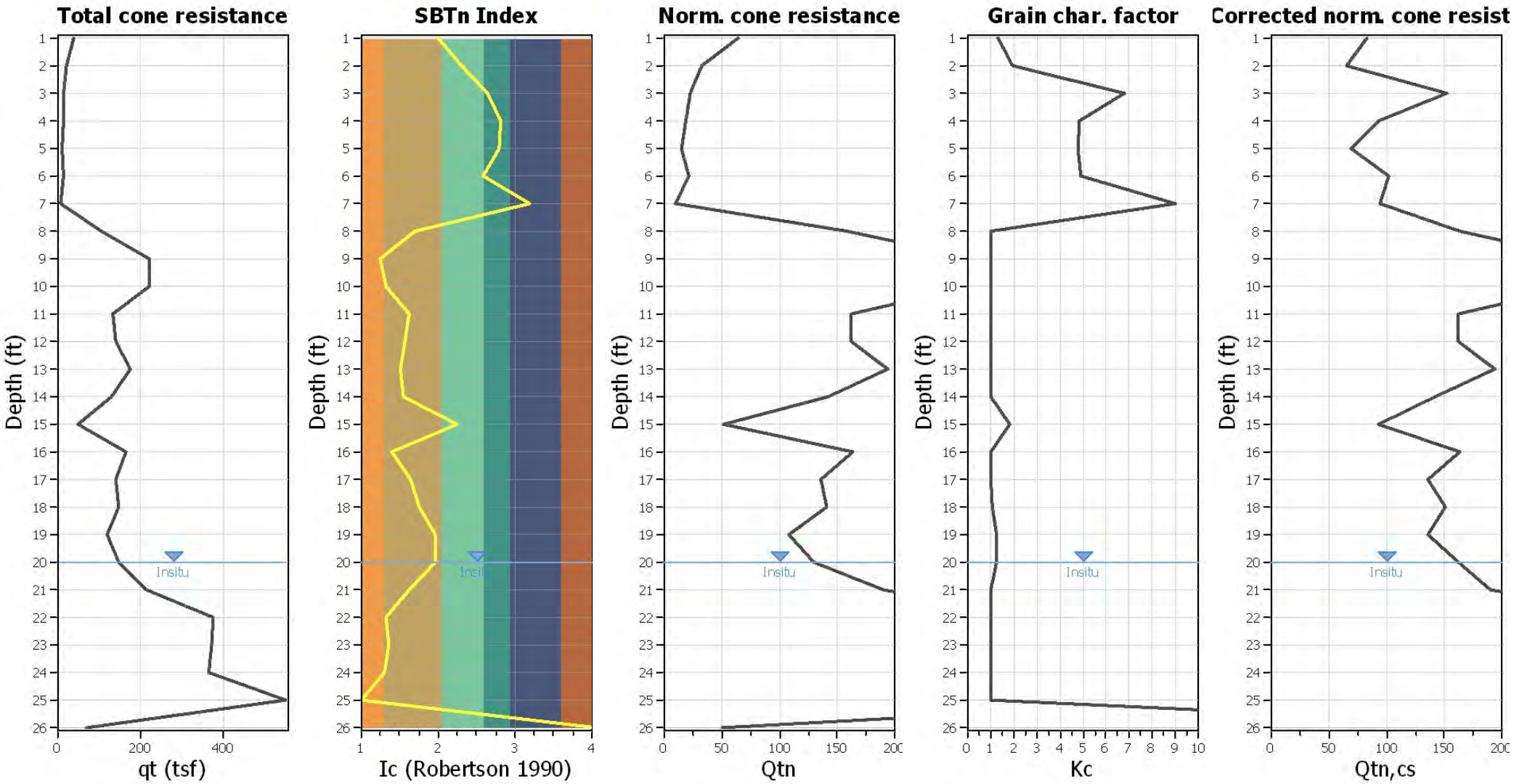
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

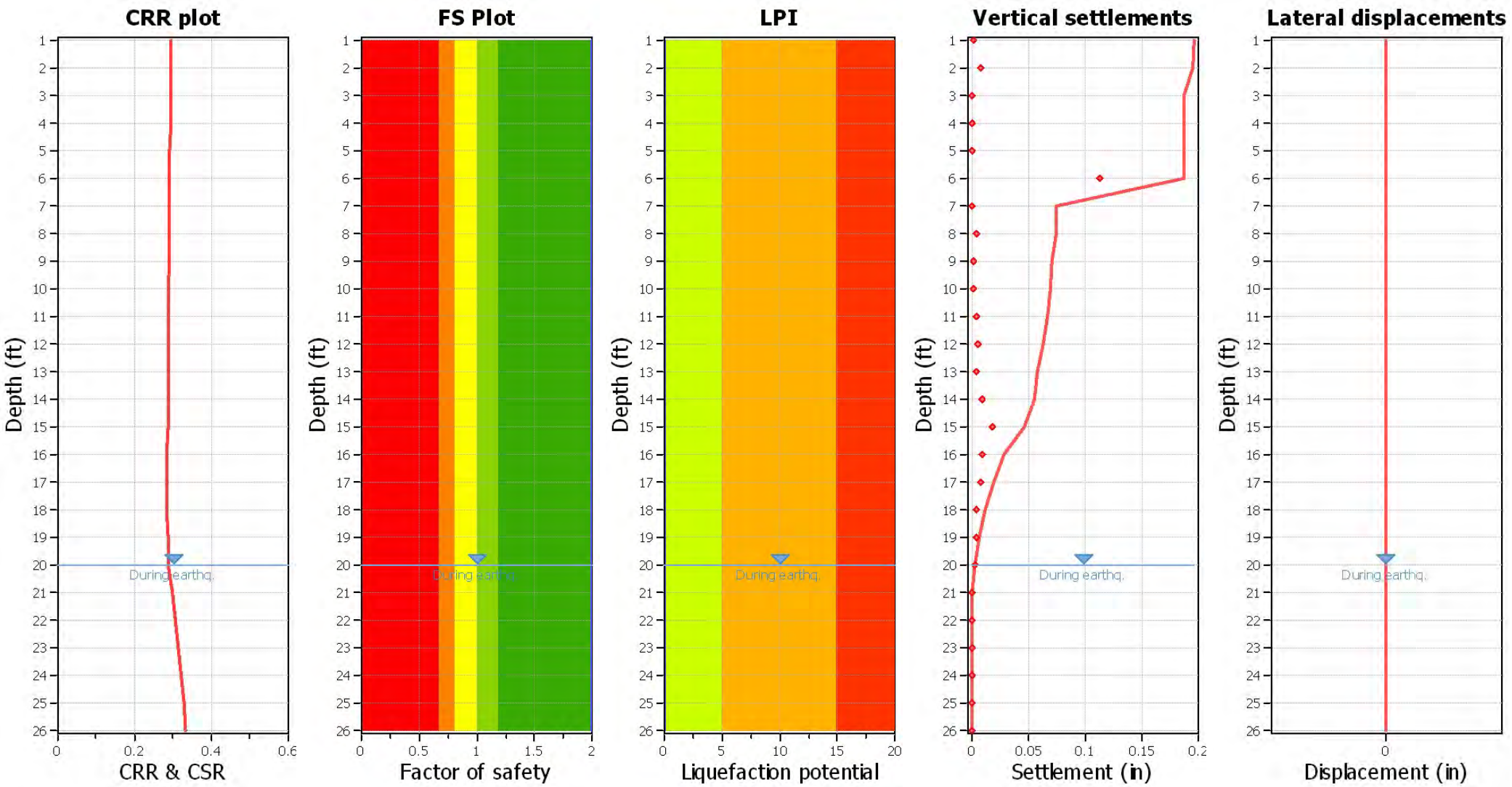
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

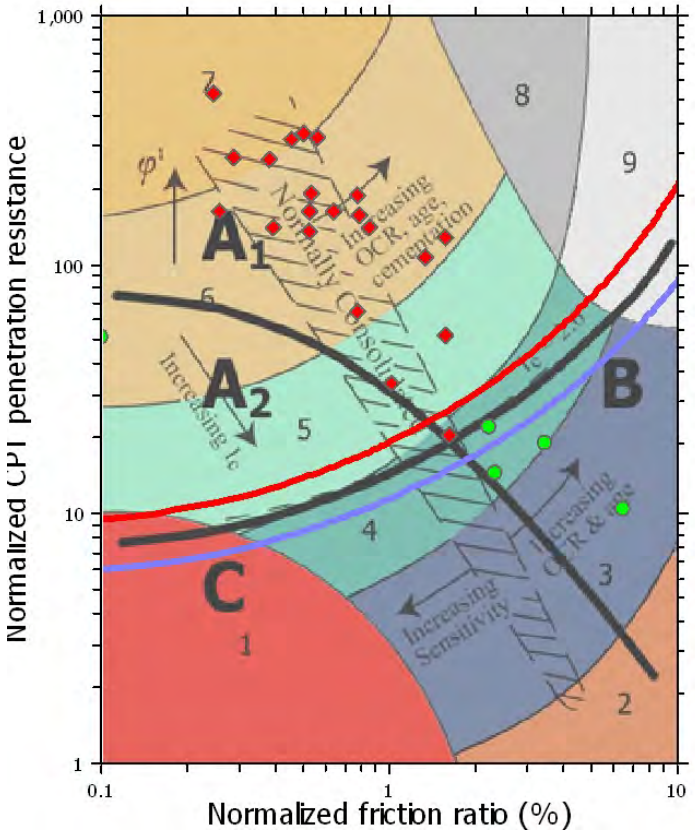
F.S. color scheme

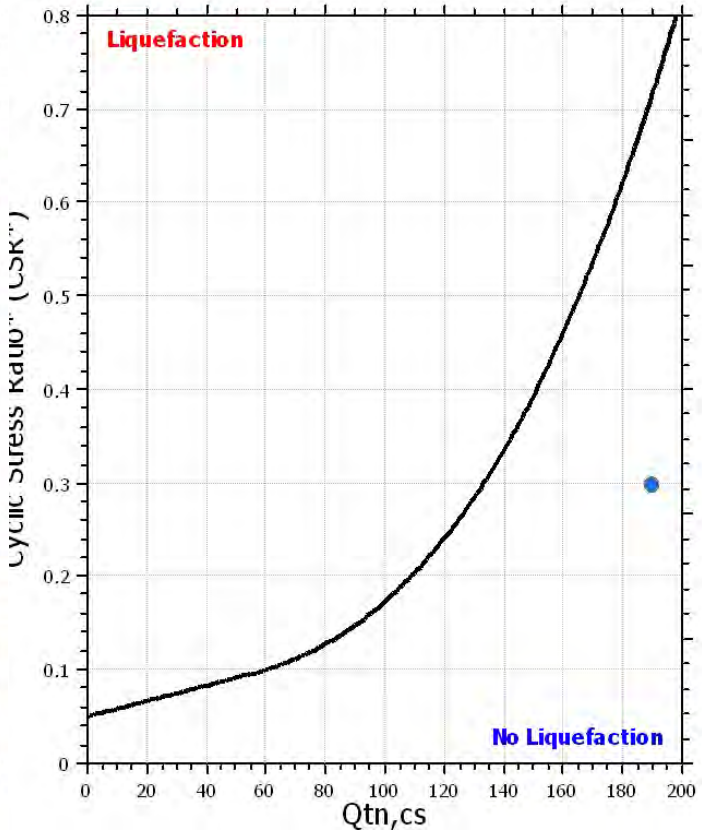
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

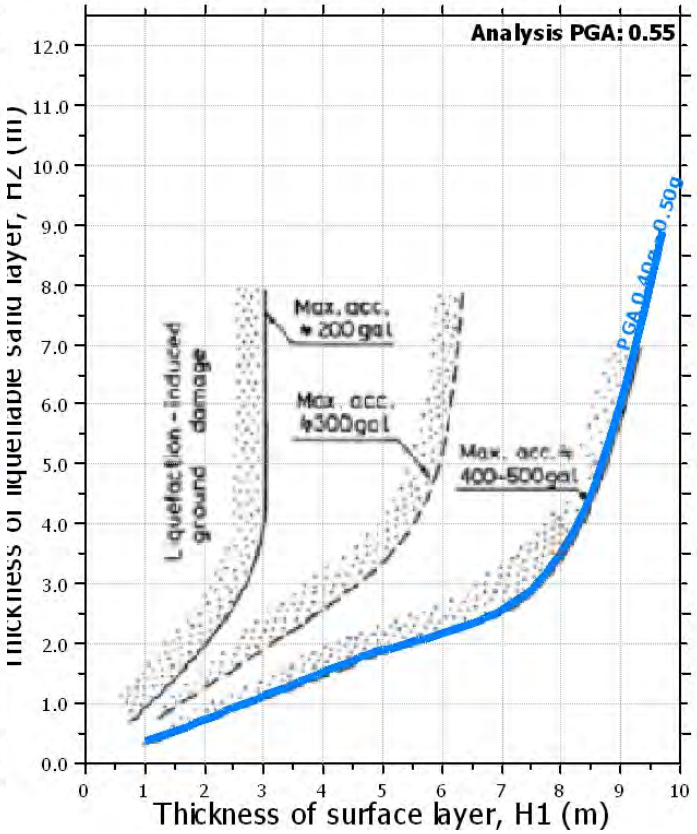
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



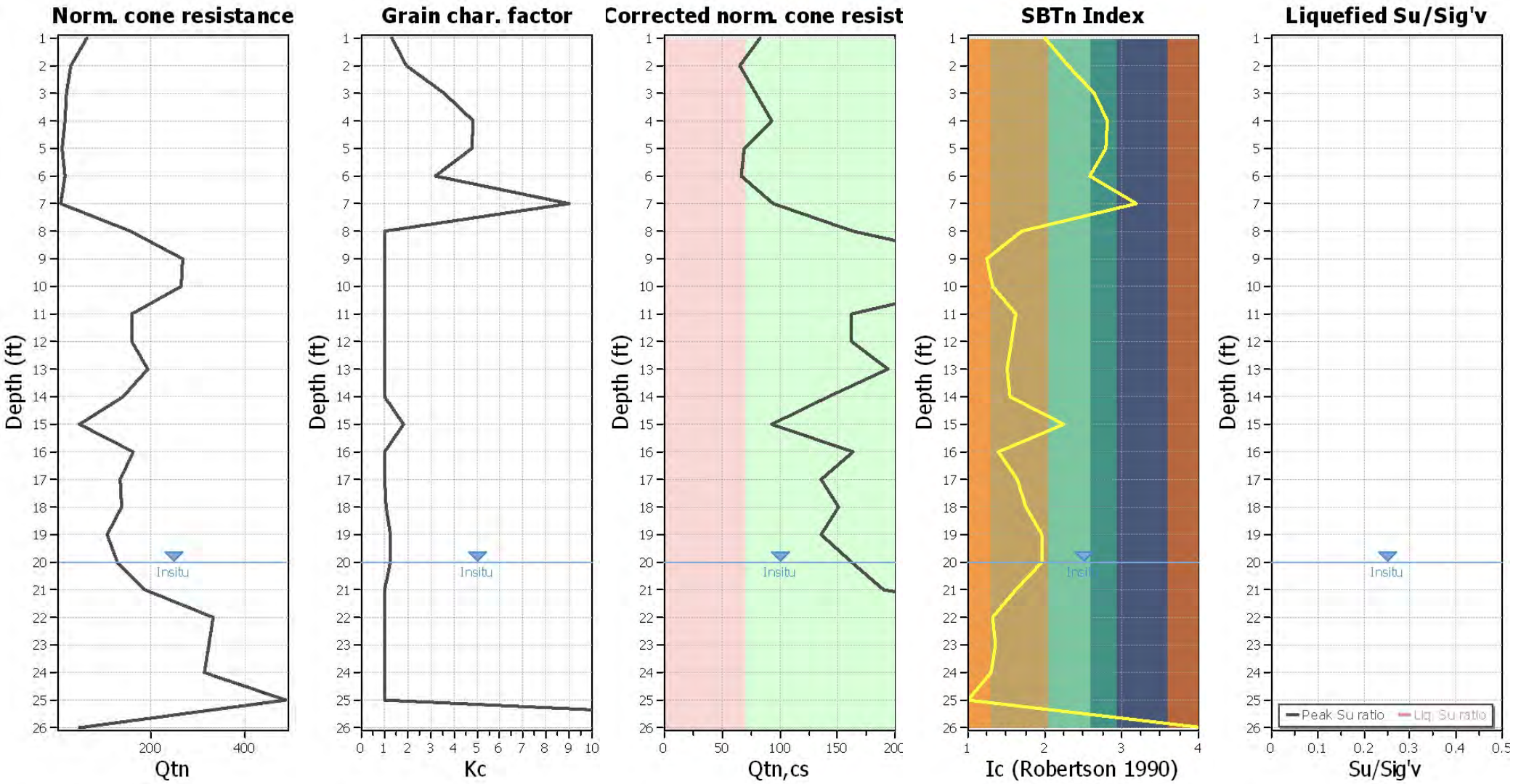




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

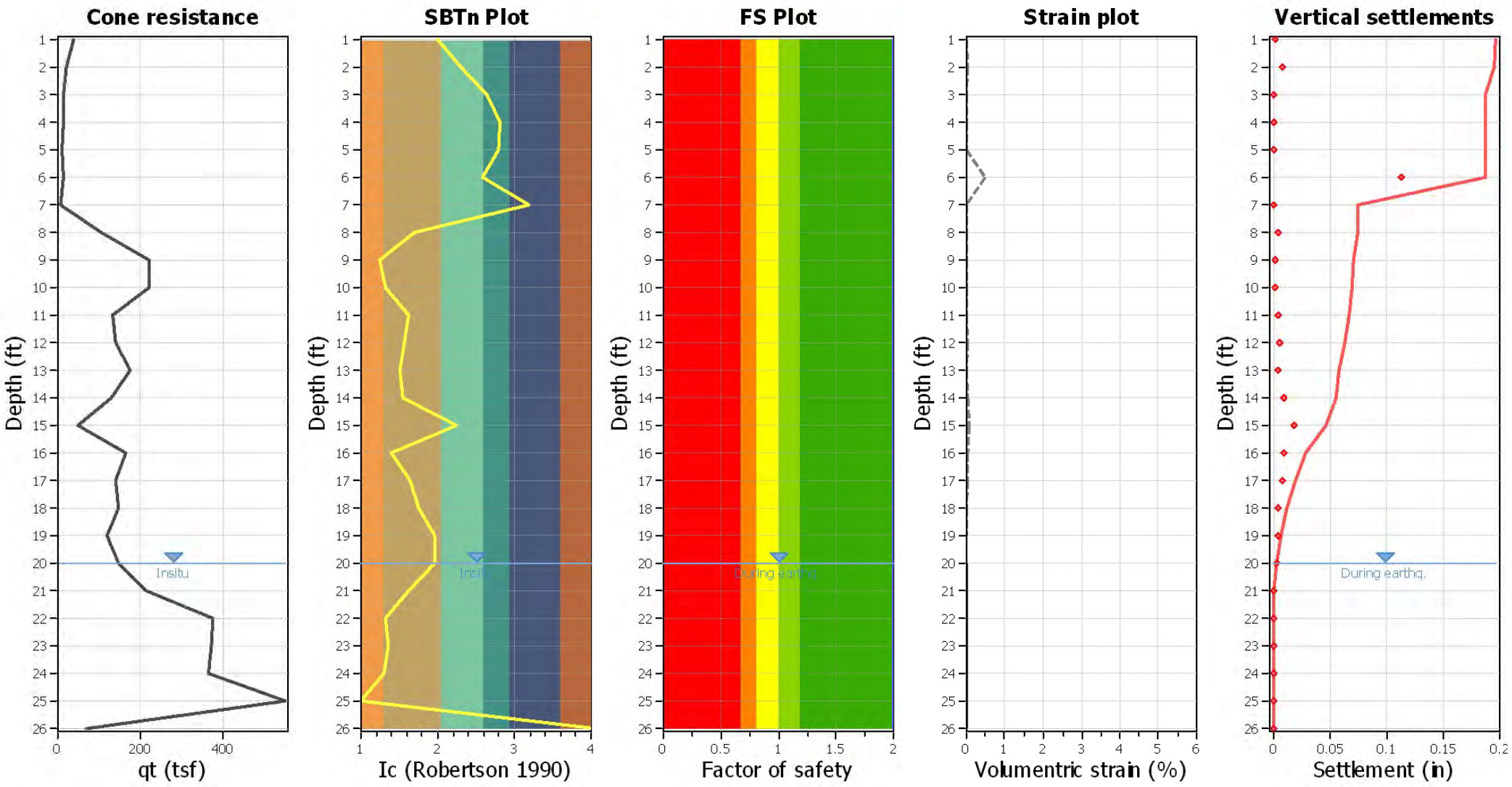
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	1.99	64.67	1.29	83.61	17	453	0.29	0.006	0.01	8.63	0.01	0.001
2.00	2.30	33.21	1.96	65.01	15	344	0.29	0.032	0.04	8.63	0.03	0.008
3.00	2.64	22.39	3.56	79.64	0	0	0.29	0.000	0.00	12.48	0.00	0.000
4.00	2.81	19.28	4.85	93.58	0	0	0.29	0.000	0.00	0.00	0.00	0.000
5.00	2.80	14.49	4.80	69.54	0	0	0.29	0.000	0.00	0.00	0.00	0.000
6.00	2.58	20.78	3.23	67.17	18	307	0.29	0.594	0.67	8.63	0.47	0.113
7.00	3.18	10.46	9.00	94.13	0	0	0.29	0.000	0.00	10.85	0.00	0.000
8.00	1.69	158.07	1.03	163.36	30	814	0.29	0.035	0.02	8.63	0.01	0.003
9.00	1.24	270.45	1.00	270.45	44	952	0.29	0.030	0.01	8.63	0.01	0.002
10.00	1.32	265.45	1.00	265.45	44	1052	0.29	0.030	0.01	8.63	0.01	0.002
11.00	1.62	162.70	1.00	162.70	30	926	0.29	0.044	0.03	8.63	0.02	0.004
12.00	1.57	162.71	1.00	162.71	29	915	0.29	0.052	0.03	8.63	0.02	0.005
13.00	1.52	194.32	1.00	194.32	34	1071	0.29	0.042	0.02	8.63	0.01	0.003
14.00	1.55	141.60	1.00	141.60	25	841	0.29	0.082	0.06	8.63	0.04	0.009
15.00	2.25	51.79	1.81	93.69	22	731	0.29	0.139	0.13	8.63	0.07	0.018
16.00	1.40	164.01	1.00	164.01	28	869	0.28	0.094	0.06	8.63	0.04	0.009
17.00	1.64	136.13	1.00	136.13	25	986	0.28	0.076	0.06	8.63	0.03	0.008
18.00	1.75	140.88	1.07	151.02	29	1217	0.28	0.052	0.03	8.63	0.02	0.004
19.00	1.97	107.69	1.26	136.12	28	1276	0.29	0.052	0.03	8.63	0.02	0.004

Total estimated settlement: 0.19

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	162.69	2.00	0.00	0.67	0.00	21.00	190.17	2.00	0.00	0.65	0.00
22.00	333.33	2.00	0.00	0.63	0.00	23.00	325.82	2.00	0.00	0.62	0.00
24.00	316.29	2.00	0.00	0.60	0.00	25.00	487.69	2.00	0.00	0.58	0.00
26.00	1351.26	2.00	0.00	0.57	0.00						

Total estimated settlement: 0.00

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

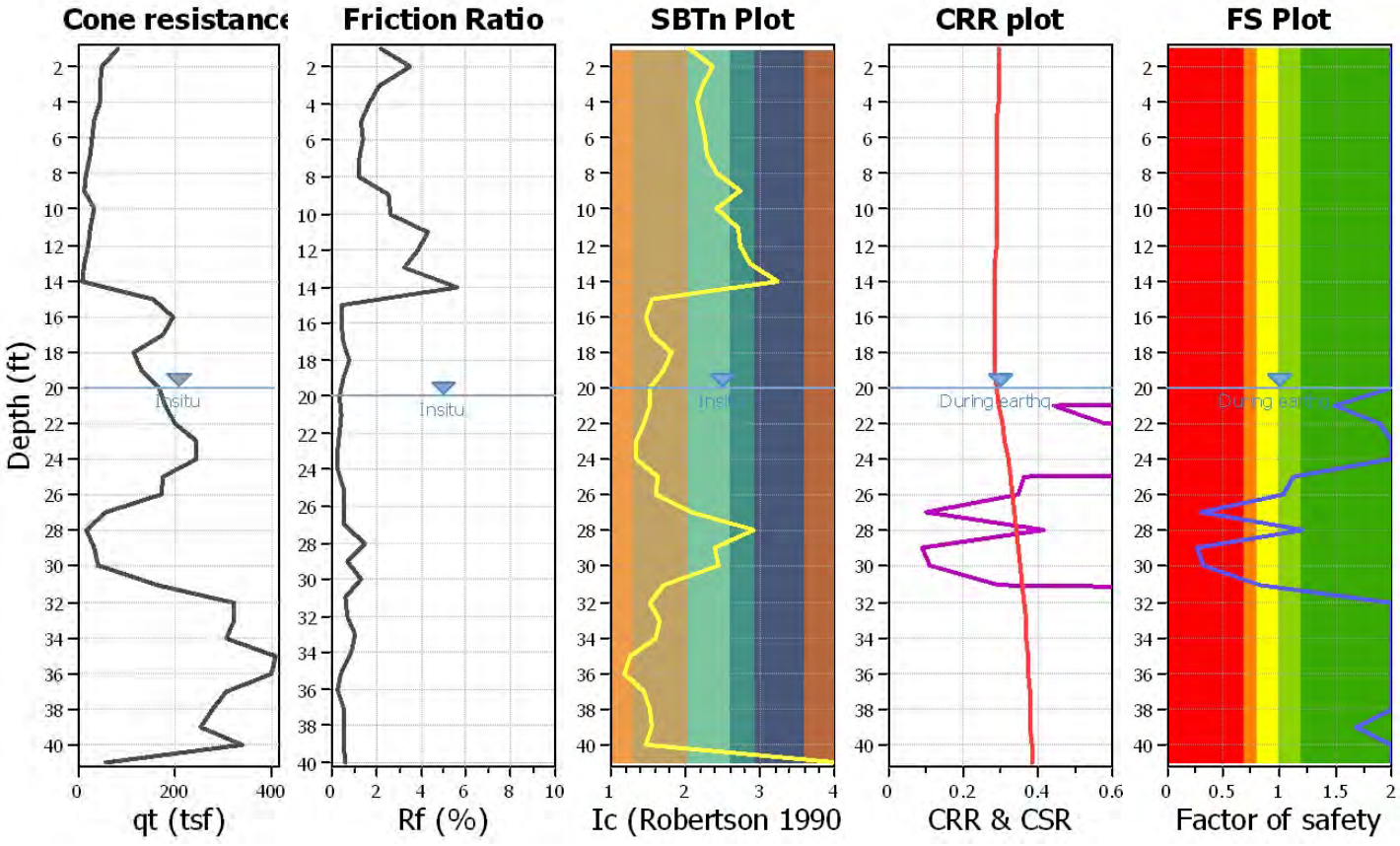
LIQUEFACTION ANALYSIS REPORT

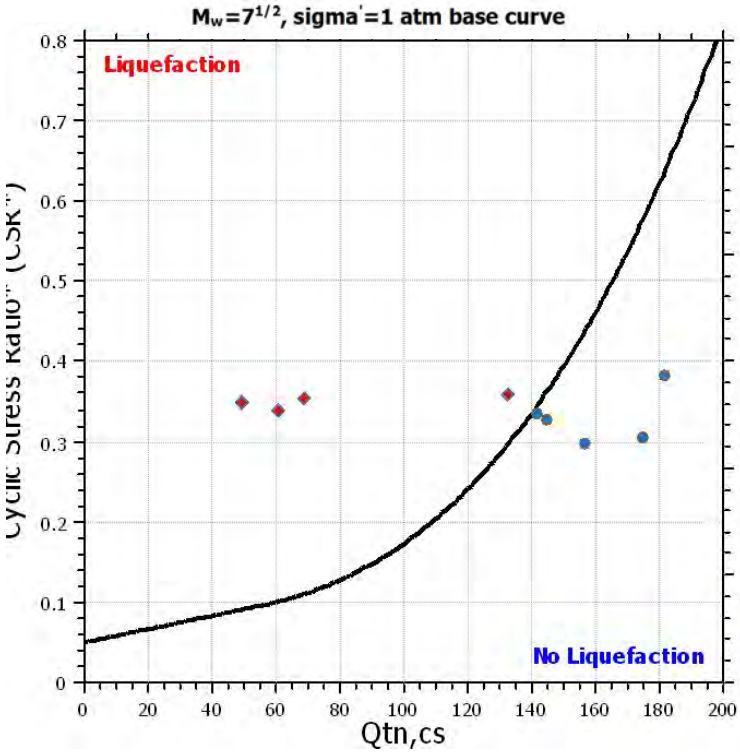
Project title : Ganahl SJC **Location :**

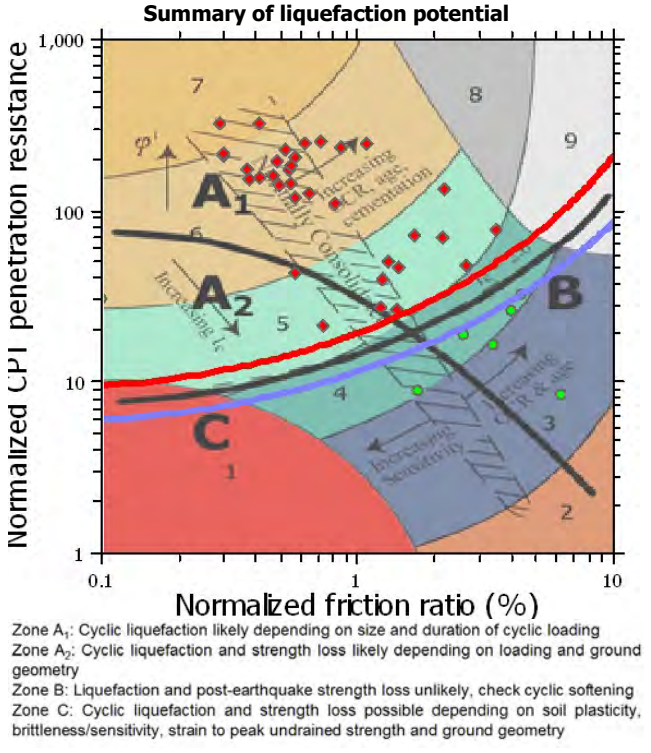
CPT file : CPT-3

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

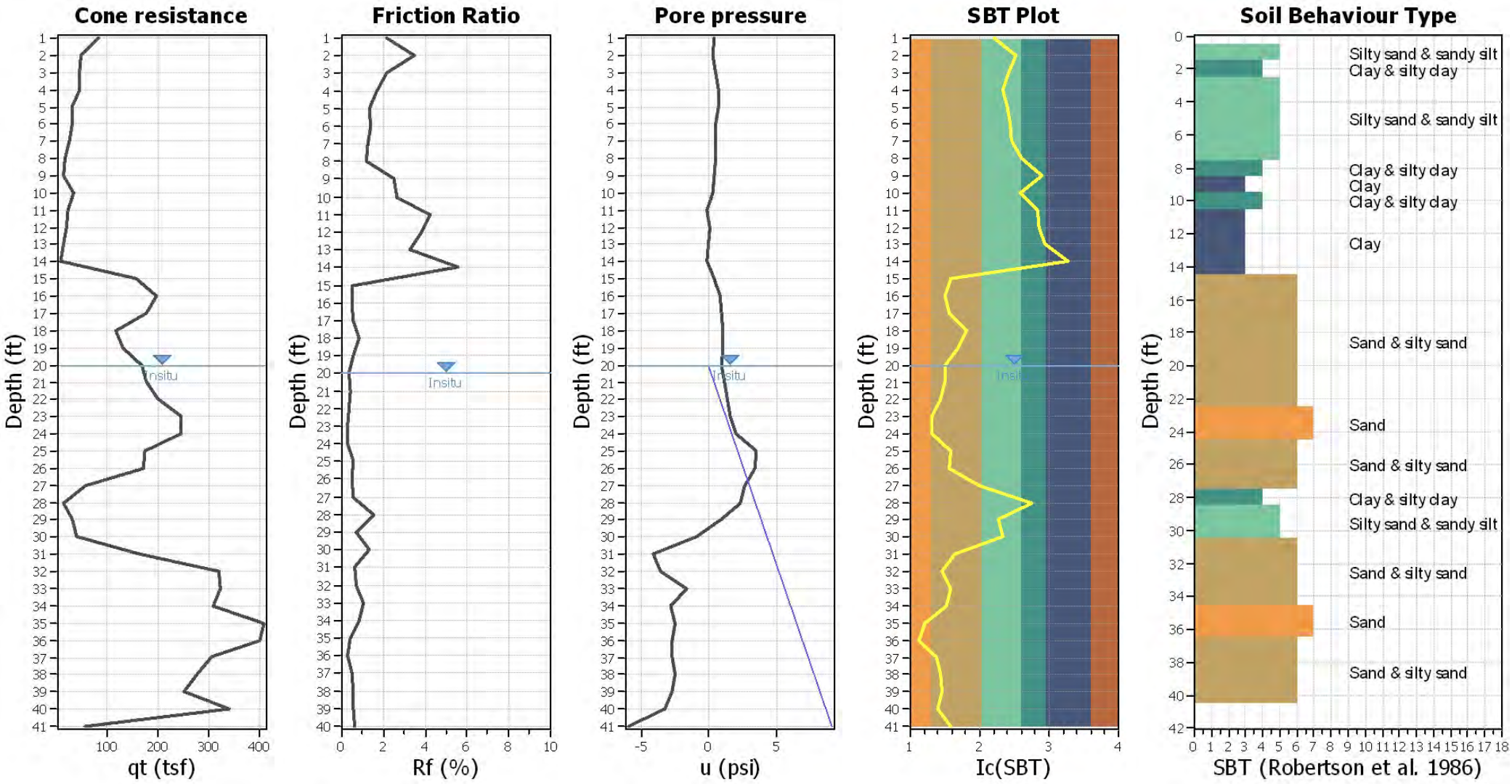






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



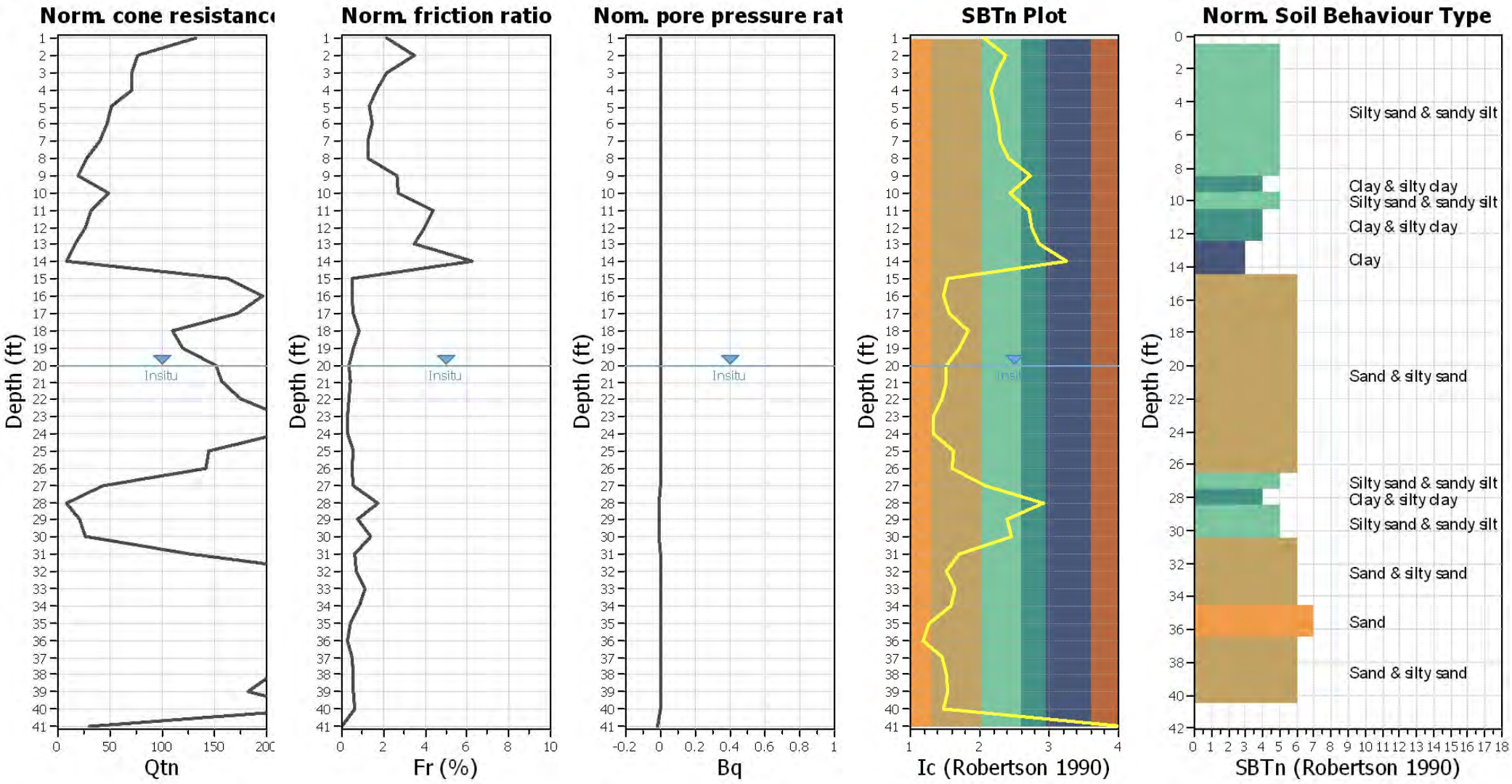
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_o applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



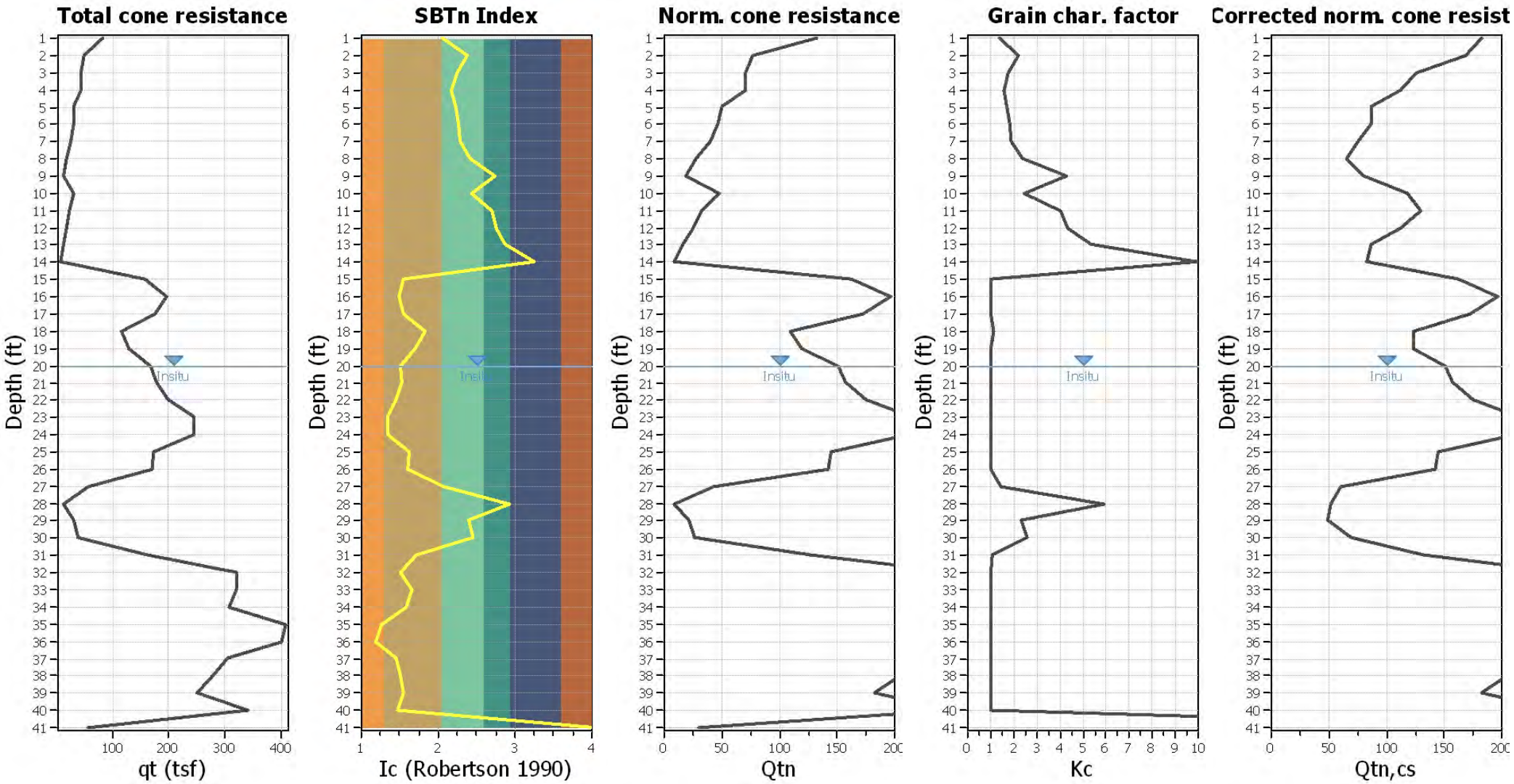
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

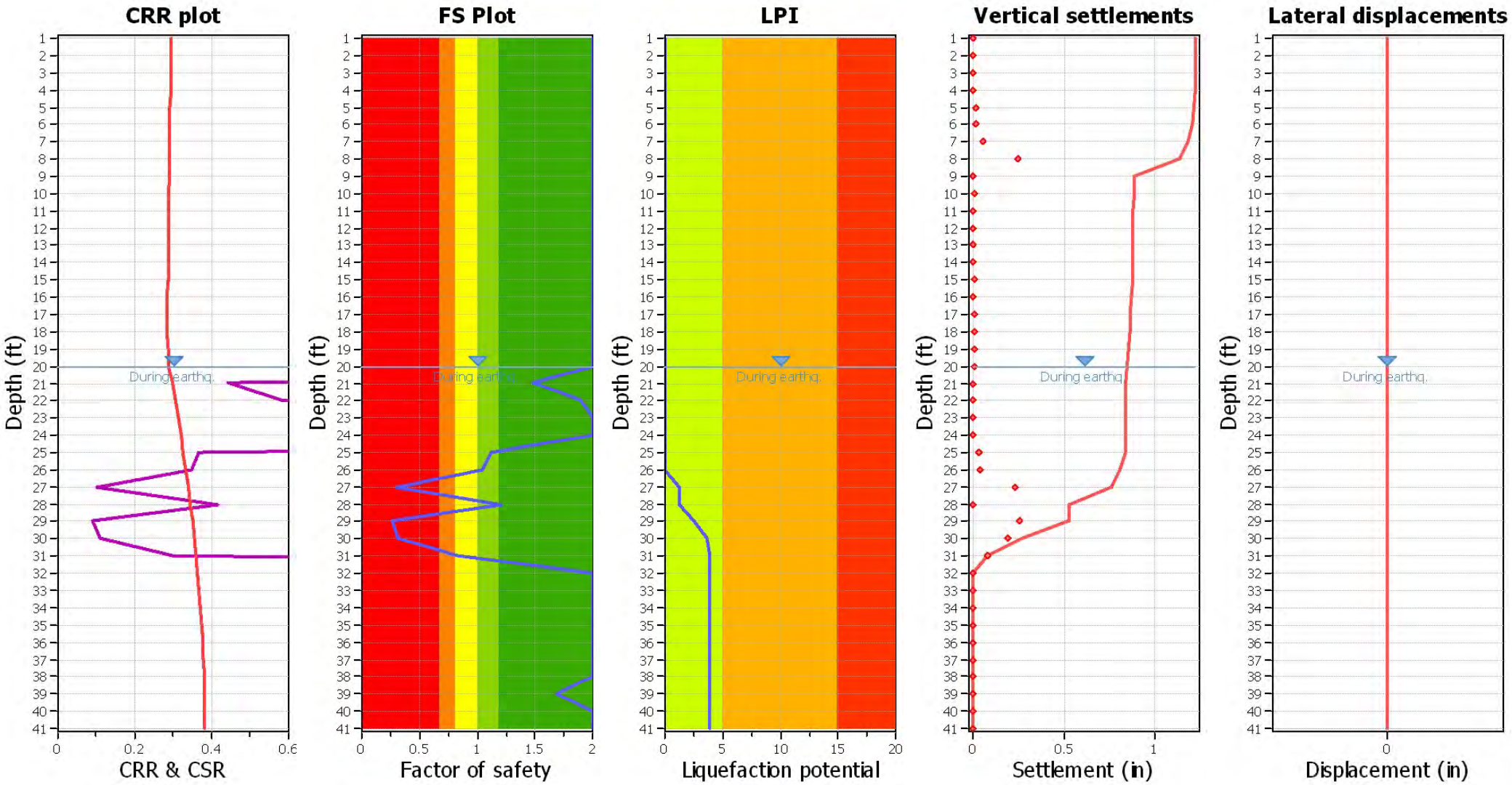
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

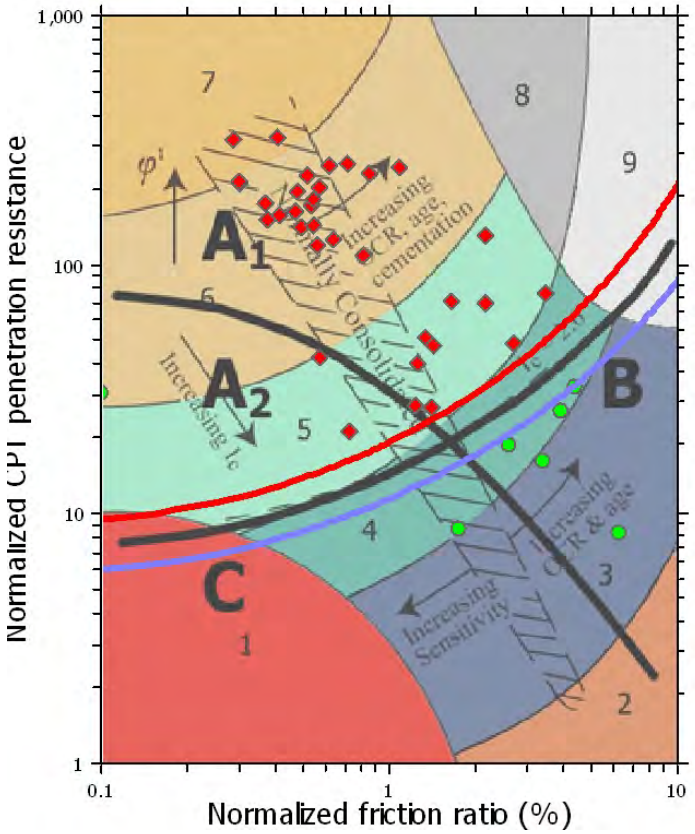
F.S. color scheme

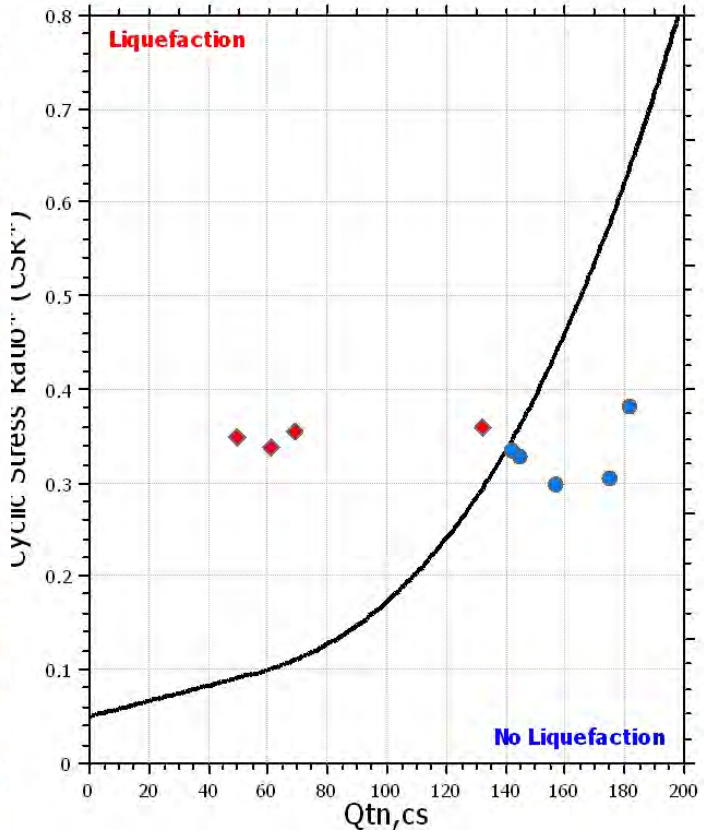
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

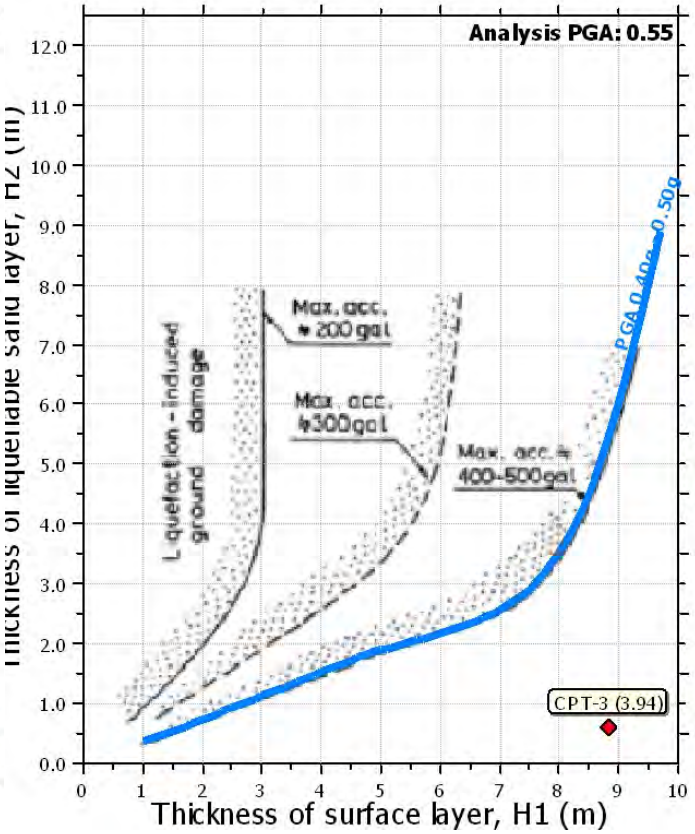
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



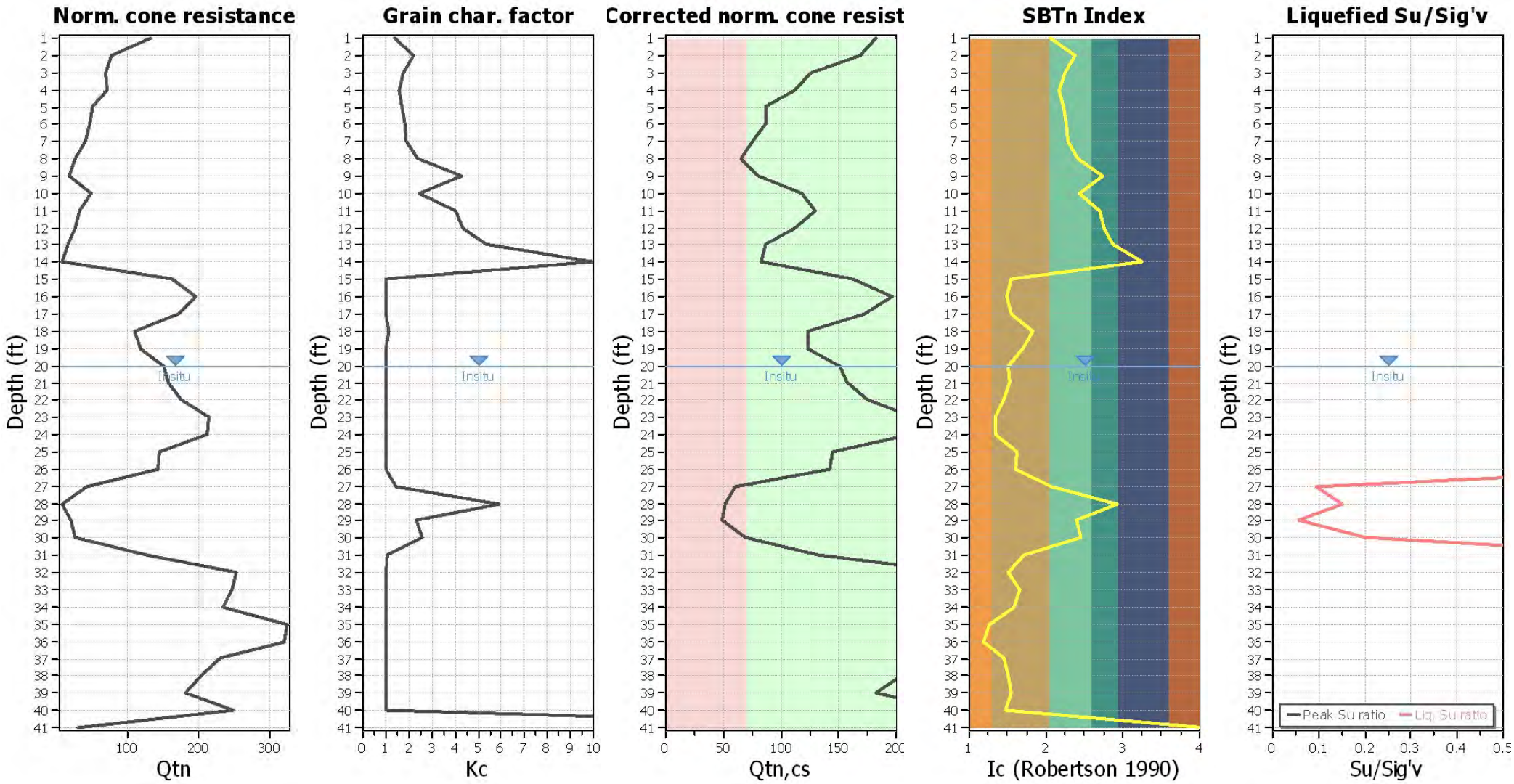




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

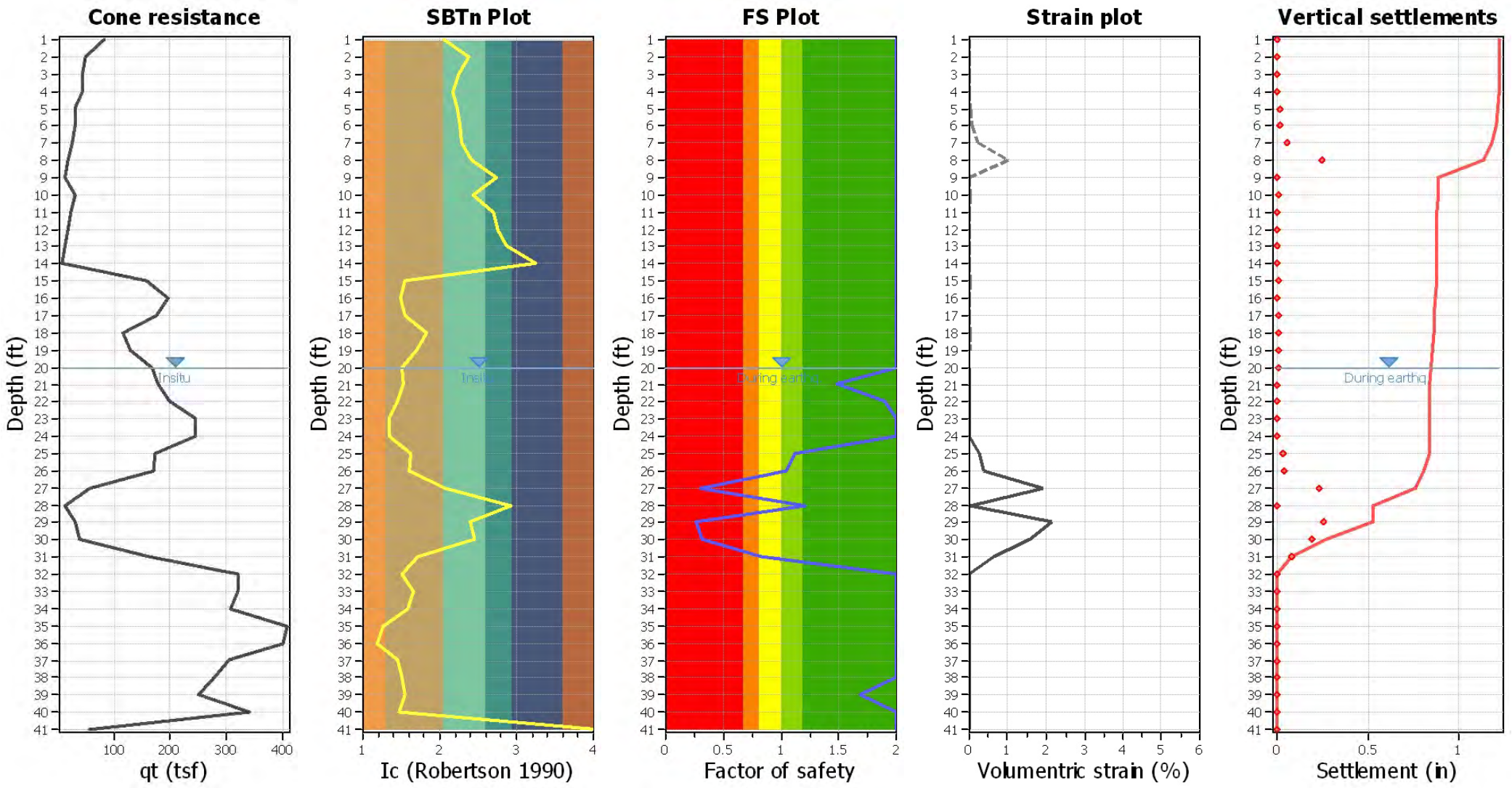
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	2.06	132.12	1.38	182.98	39	1004	0.29	0.003	0.00	8.63	0.00	0.000
2.00	2.37	76.81	2.20	168.71	41	866	0.29	0.006	0.00	8.63	0.00	0.000
3.00	2.25	70.34	1.79	125.58	29	677	0.29	0.015	0.01	8.63	0.01	0.002
4.00	2.17	70.93	1.59	112.57	25	617	0.29	0.027	0.02	8.63	0.01	0.004
5.00	2.22	50.71	1.71	86.87	20	471	0.29	0.077	0.08	8.63	0.06	0.013
6.00	2.26	47.09	1.84	86.50	20	464	0.29	0.115	0.11	8.63	0.08	0.019
7.00	2.28	40.13	1.89	76.01	18	405	0.29	0.277	0.32	8.63	0.22	0.053
8.00	2.42	27.29	2.40	65.44	16	328	0.29	1.174	1.51	8.63	1.02	0.244
9.00	2.74	18.97	4.27	81.08	0	0	0.29	0.000	0.00	10.85	0.00	0.000
10.00	2.43	48.39	2.44	117.89	29	612	0.29	0.115	0.07	8.63	0.05	0.011
11.00	2.71	32.25	4.03	130.07	0	0	0.29	0.000	0.00	10.85	0.00	0.000
12.00	2.75	25.72	4.37	112.30	0	0	0.29	0.000	0.00	0.00	0.00	0.000
13.00	2.86	16.21	5.34	86.60	0	0	0.29	0.000	0.00	0.00	0.00	0.000
14.00	3.25	8.39	9.93	83.31	0	0	0.29	0.000	0.00	10.85	0.00	0.000
15.00	1.54	162.59	1.00	162.59	29	989	0.29	0.062	0.04	8.63	0.02	0.006
16.00	1.48	196.07	1.00	196.07	34	1148	0.28	0.050	0.03	8.63	0.02	0.004
17.00	1.56	172.32	1.00	172.32	31	1135	0.28	0.056	0.03	8.63	0.02	0.005
18.00	1.83	109.42	1.13	123.14	24	1043	0.28	0.074	0.06	8.63	0.03	0.008
19.00	1.70	119.12	1.04	123.61	23	999	0.29	0.089	0.08	8.63	0.04	0.010

Total estimated settlement: 0.38

Abbreviations

Q_{tn}:	Equivalent clean sand normalized cone resistance
K_c:	Fines correction factor
$Q_{tn,cs}$:	Post-liquefaction volumentric strain
G_{max}:	Small strain shear modulus
CSR:	Soil cyclic stress ratio
γ:	Cyclic shear strain
$e_{vol(15)}$:	Volumetric strain after 15 cycles
N_c:	Equivalent number of cycles
e_v:	Volumetric strain
Settle.:	Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	151.38	2.00	0.00	0.67	0.00	21.00	157.18	1.49	0.00	0.65	0.00
22.00	175.12	1.90	0.00	0.63	0.00	23.00	214.87	2.00	0.00	0.62	0.00
24.00	212.72	2.00	0.00	0.60	0.00	25.00	145.12	1.12	0.25	0.58	0.03
26.00	142.08	1.04	0.36	0.57	0.04	27.00	60.86	0.30	1.93	0.55	0.23
28.00	51.46	1.21	0.02	0.53	0.00	29.00	49.35	0.26	2.15	0.52	0.26
30.00	68.85	0.31	1.59	0.50	0.19	31.00	132.50	0.83	0.65	0.48	0.08
32.00	253.72	2.00	0.00	0.47	0.00	33.00	247.39	2.00	0.00	0.45	0.00
34.00	234.44	2.00	0.00	0.43	0.00	35.00	324.15	2.00	0.00	0.42	0.00
36.00	319.93	2.00	0.00	0.40	0.00	37.00	230.04	2.00	0.00	0.38	0.00
38.00	204.96	2.00	0.00	0.37	0.00	39.00	182.12	1.68	0.00	0.35	0.00
40.00	248.27	2.00	0.00	0.33	0.00	41.00	809.56	2.00	0.00	0.32	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)

Total estimated settlement: 0.84

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

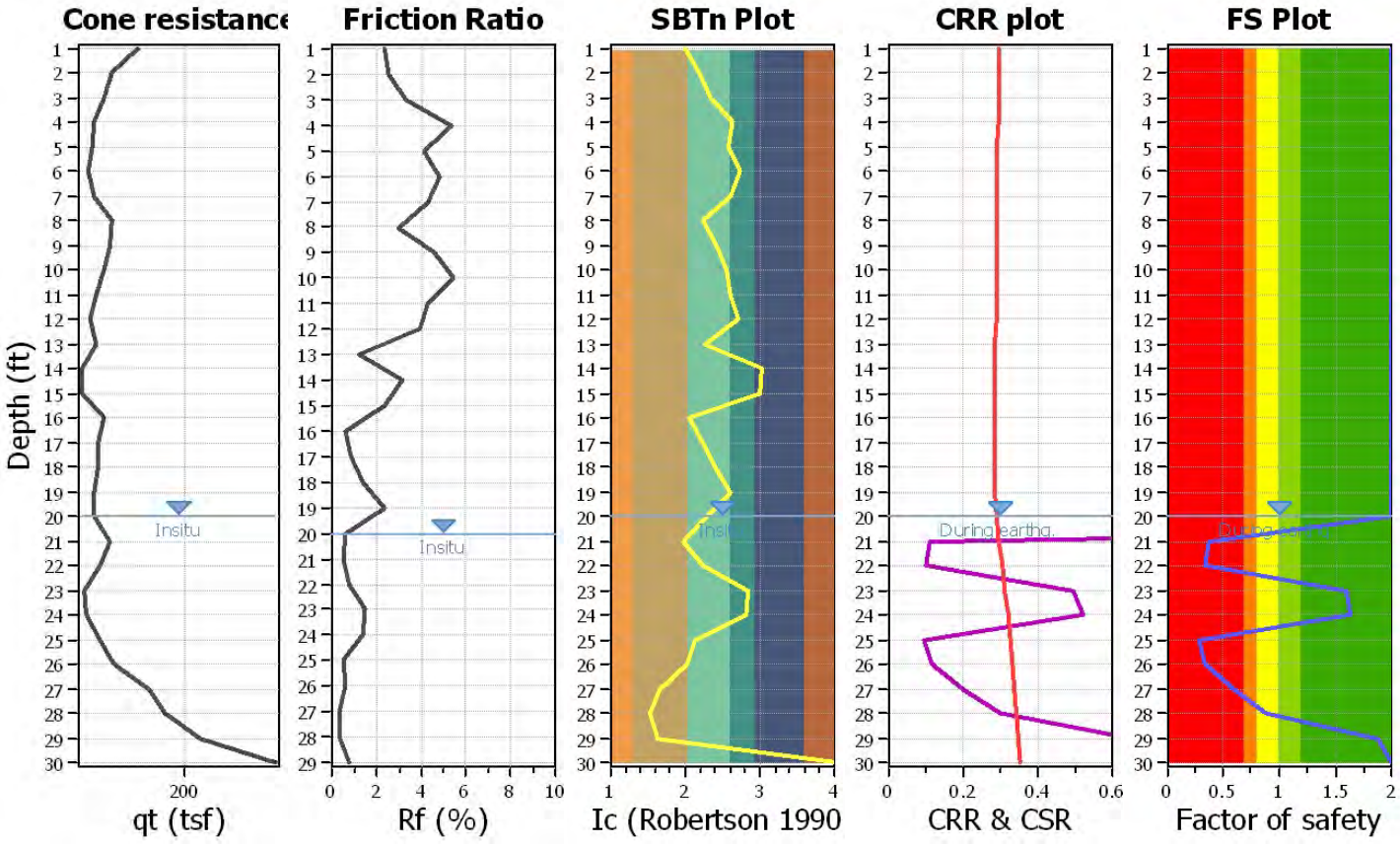
LIQUEFACTION ANALYSIS REPORT

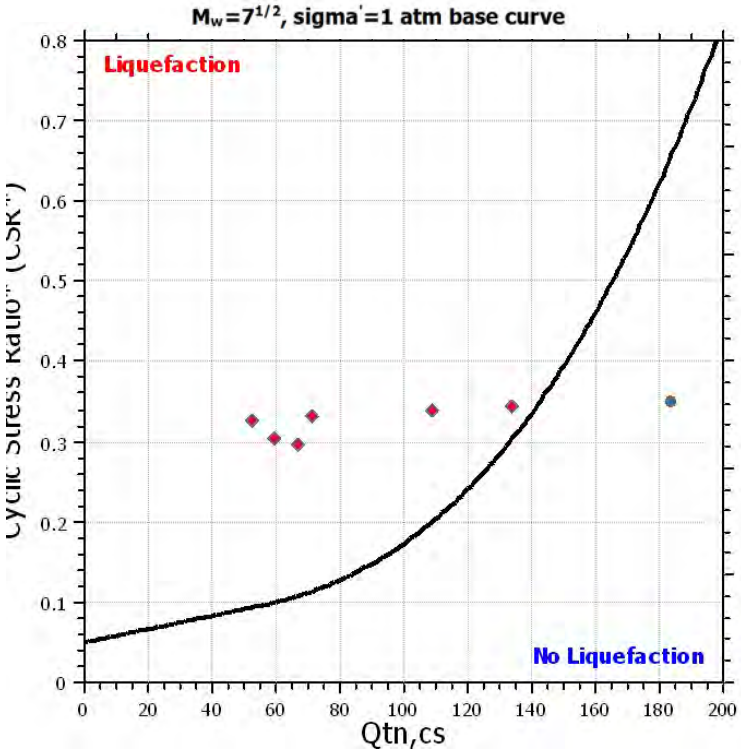
Project title : Ganahl SJC **Location :**

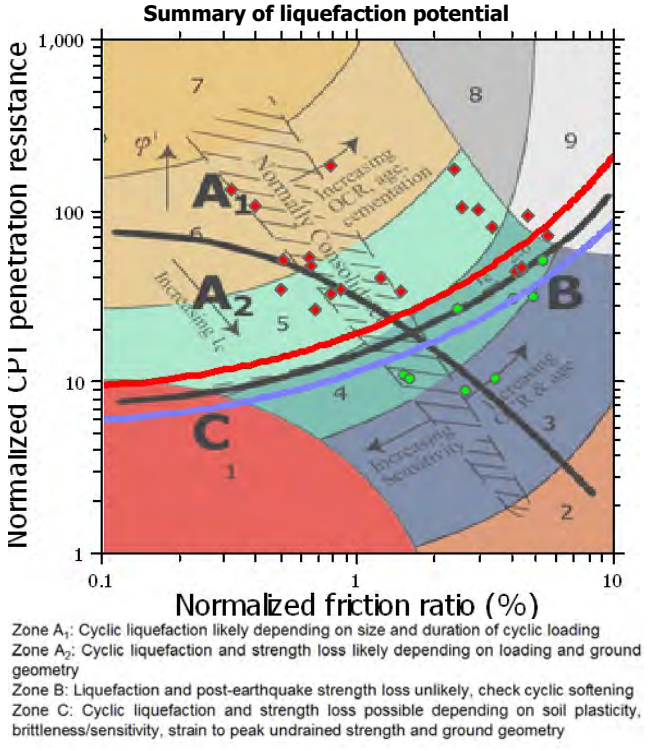
CPT file : CPT-4

Input parameters and analysis data

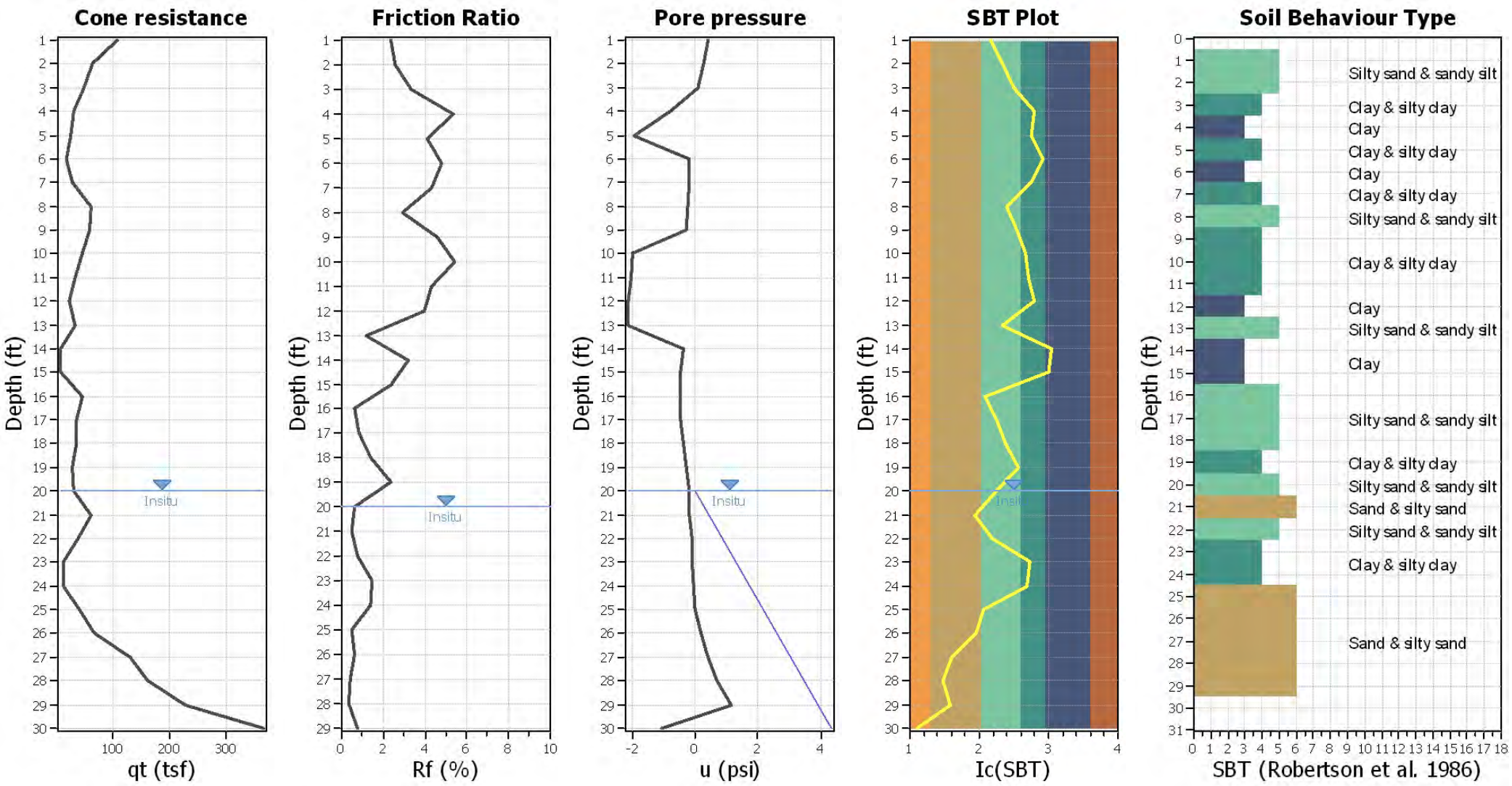
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		







CPT basic interpretation plc



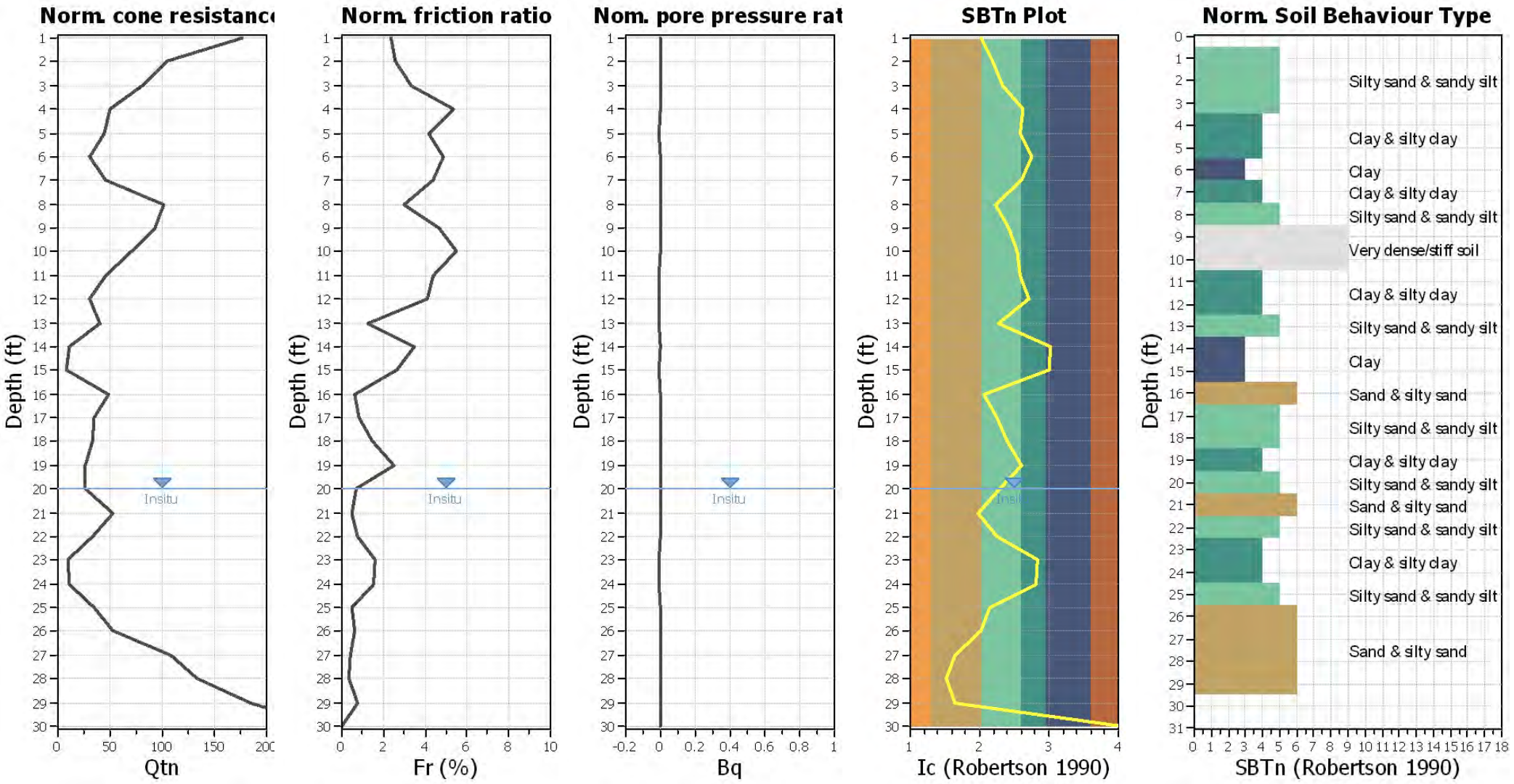
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_o applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



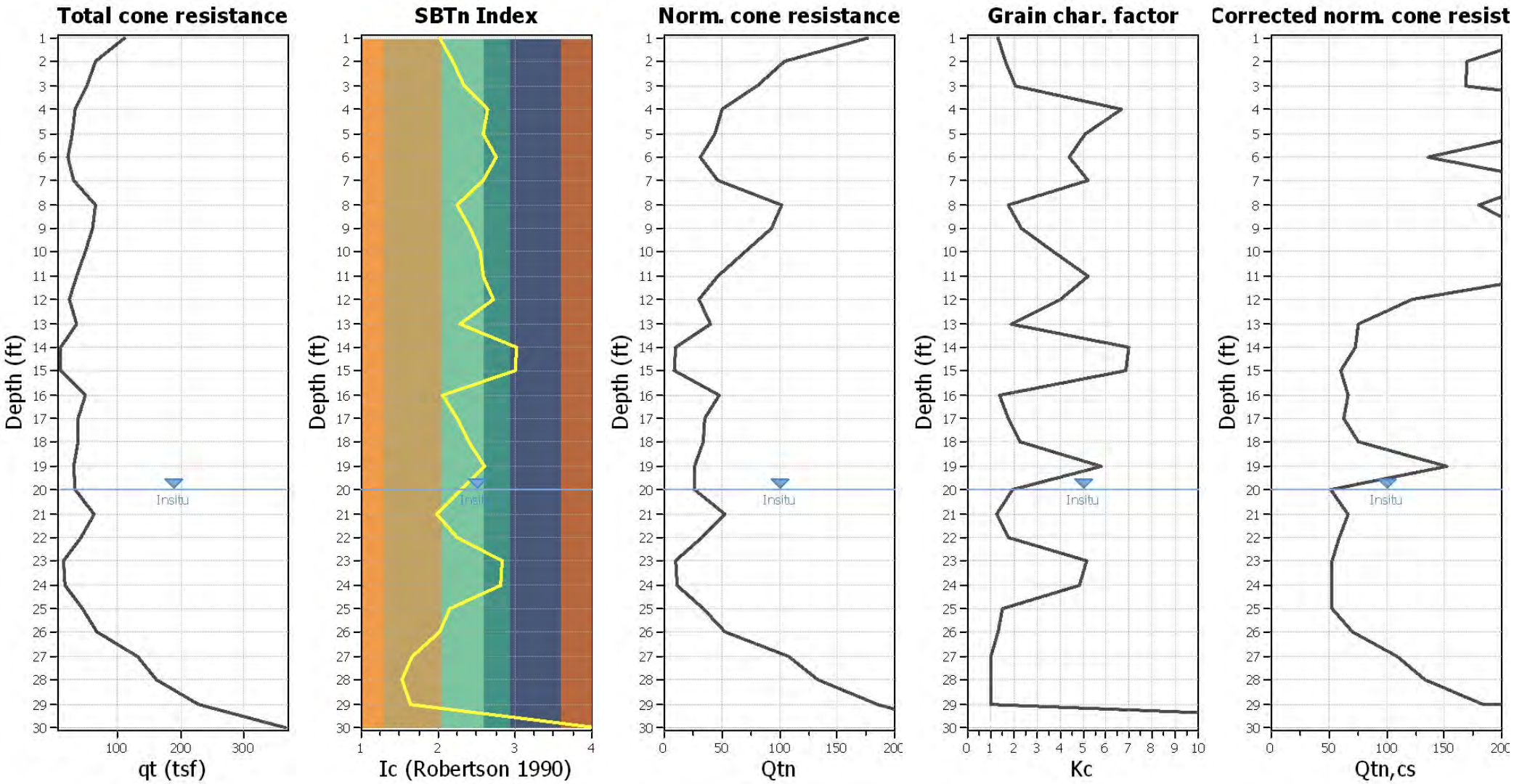
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

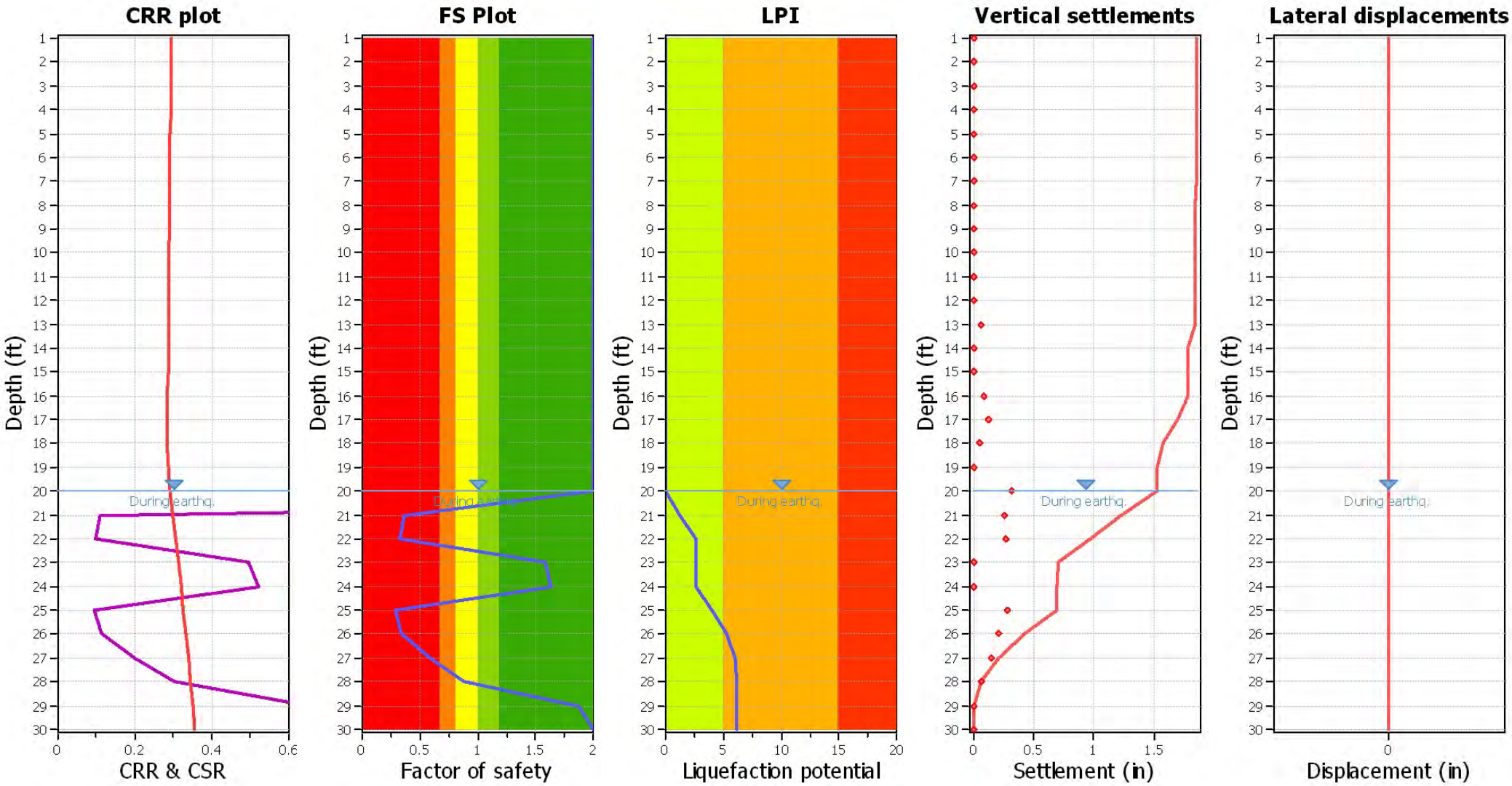
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

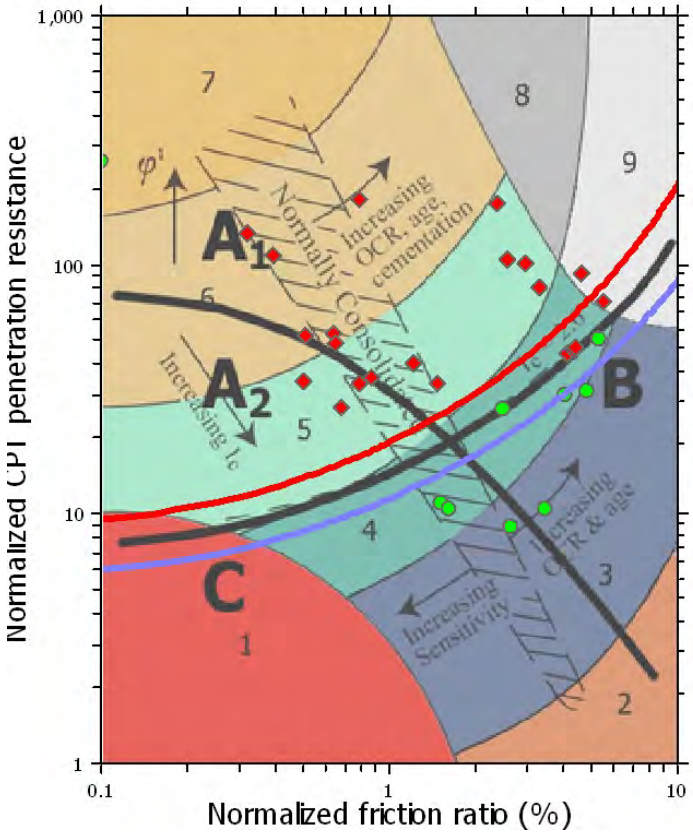
F.S. color scheme

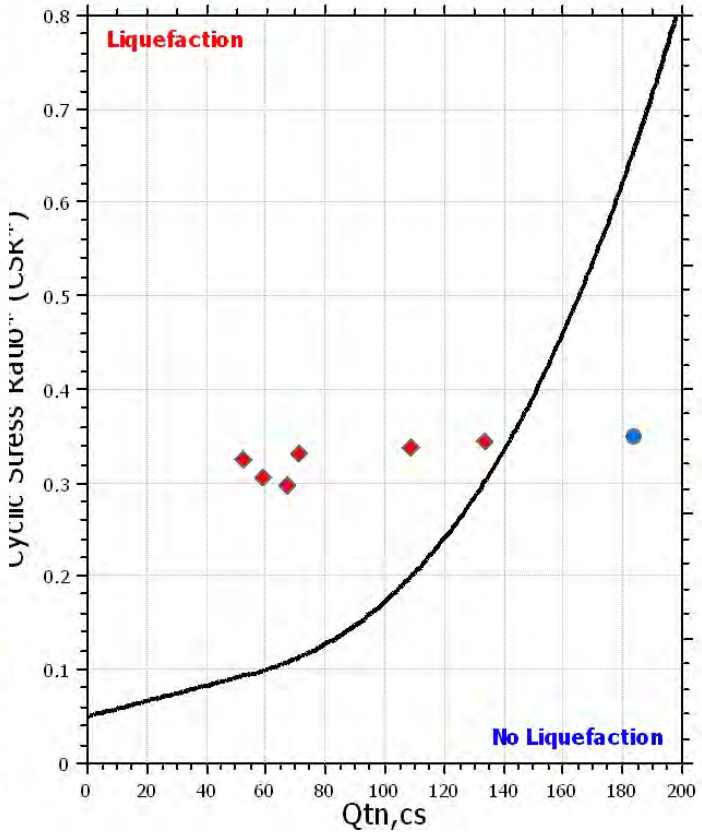
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

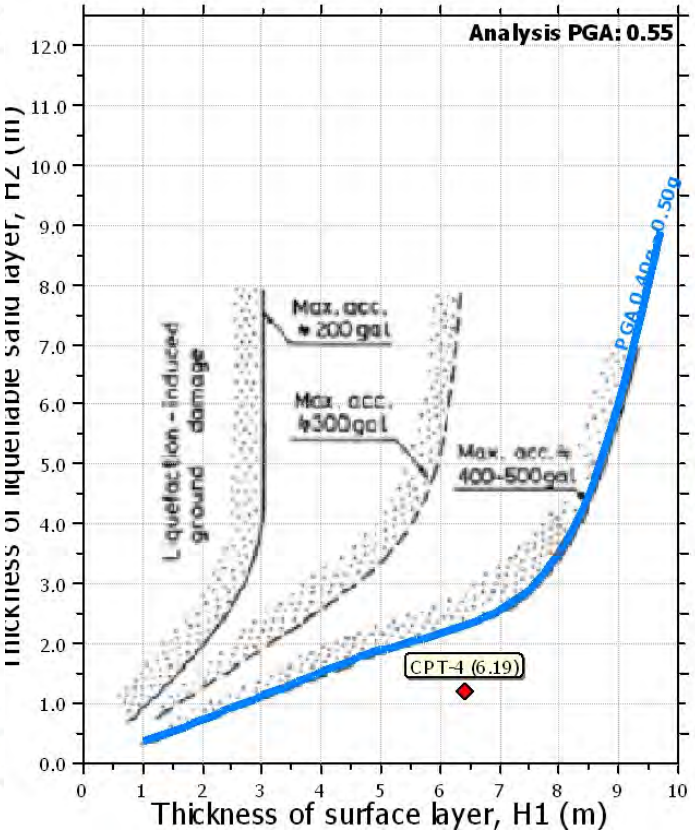
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



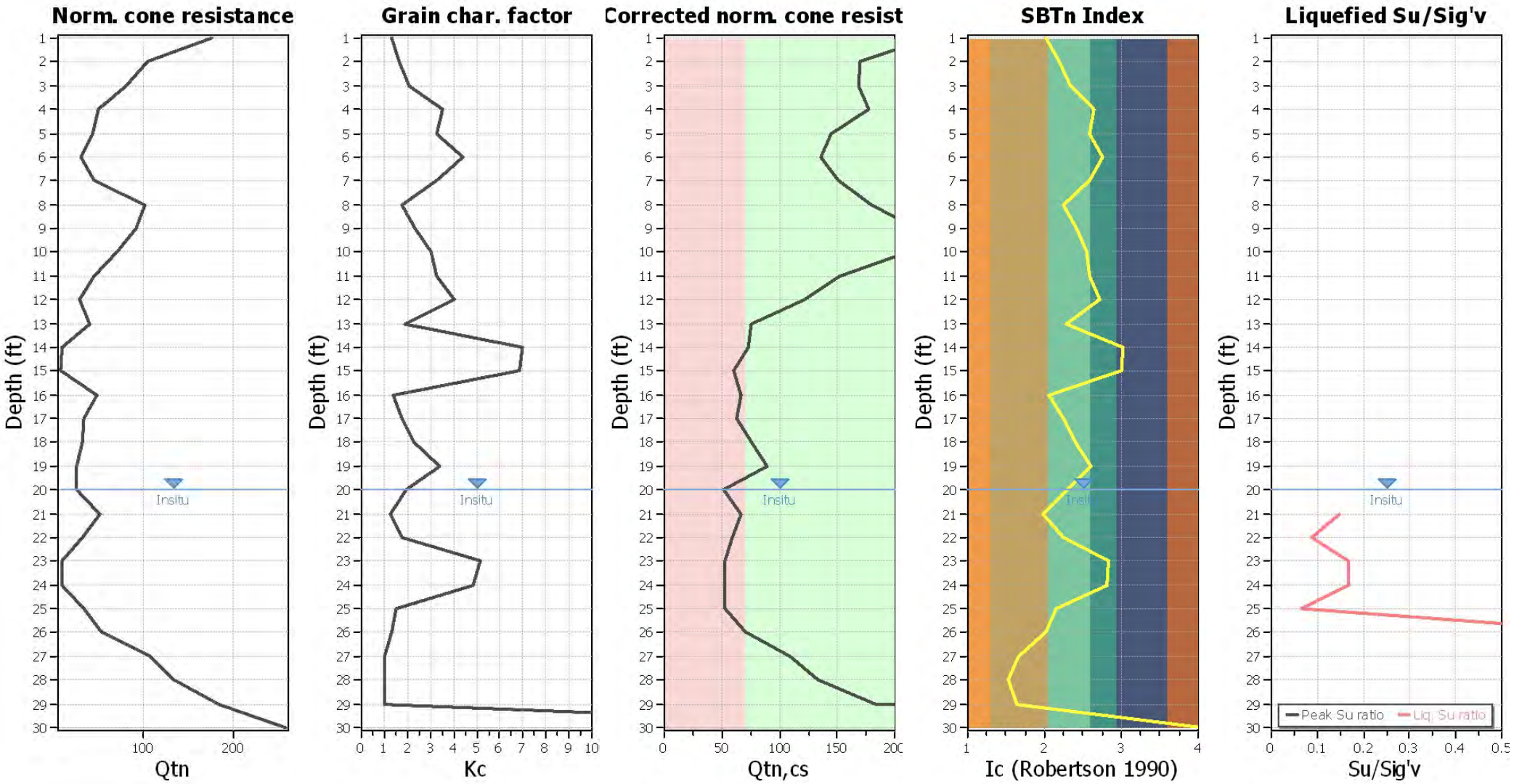




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

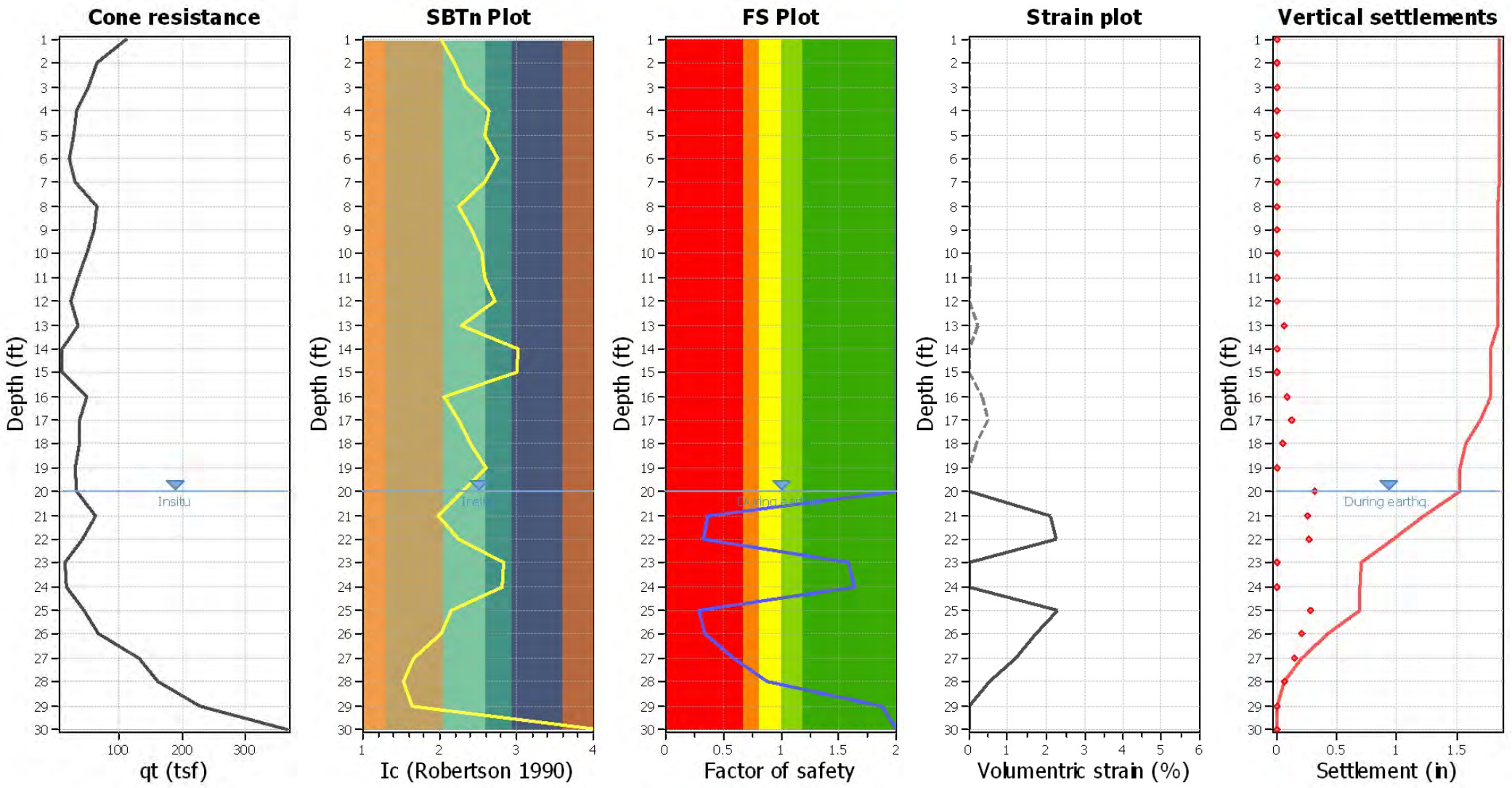
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	2.01	176.57	1.31	232.00	48	1262	0.29	0.002	0.00	8.63	0.00	0.000
2.00	2.18	104.83	1.62	169.71	38	928	0.29	0.006	0.00	8.63	0.00	0.001
3.00	2.34	80.56	2.09	168.26	40	875	0.29	0.010	0.00	8.63	0.00	0.001
4.00	2.63	50.08	3.53	177.02	0	0	0.29	0.000	0.00	12.48	0.00	0.000
5.00	2.59	44.25	3.27	144.90	39	660	0.29	0.033	0.01	8.63	0.01	0.003
6.00	2.75	30.94	4.37	135.28	0	0	0.29	0.000	0.00	0.00	0.00	0.000
7.00	2.59	45.95	3.29	151.22	41	688	0.29	0.049	0.02	8.63	0.01	0.003
8.00	2.24	101.89	1.76	179.29	41	969	0.29	0.029	0.01	8.63	0.01	0.002
9.00	2.41	93.00	2.35	218.79	54	1120	0.29	0.026	0.01	8.63	0.01	0.001
10.00	2.54	70.88	2.99	212.13	56	1069	0.29	0.033	0.01	8.63	0.01	0.002
11.00	2.59	46.26	3.29	152.11	41	798	0.29	0.072	0.03	8.63	0.02	0.005
12.00	2.71	30.06	4.06	121.90	0	0	0.29	0.000	0.00	10.85	0.00	0.000
13.00	2.27	40.49	1.87	75.73	18	553	0.29	0.338	0.39	8.63	0.24	0.058
14.00	3.02	10.46	6.96	72.82	0	0	0.29	0.000	0.00	10.85	0.00	0.000
15.00	3.01	8.87	6.84	60.68	0	0	0.29	0.000	0.00	10.85	0.00	0.000
16.00	2.06	48.25	1.39	67.22	14	585	0.28	0.409	0.61	8.63	0.35	0.084
17.00	2.24	35.19	1.78	62.70	14	555	0.28	0.595	0.88	8.63	0.49	0.118
18.00	2.39	33.50	2.26	75.69	19	660	0.28	0.317	0.35	8.63	0.19	0.046
19.00	2.61	26.26	3.39	89.08	0	0	0.29	0.000	0.00	10.85	0.00	0.000

Total estimated settlement: 0.32

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	52.00	2.00	0.00	0.67	0.00	21.00	66.96	0.36	2.11	0.65	0.25
22.00	59.32	0.33	2.27	0.63	0.27	23.00	53.30	1.59	0.01	0.62	0.00
24.00	52.87	1.64	0.01	0.60	0.00	25.00	52.67	0.29	2.31	0.58	0.28
26.00	70.99	0.34	1.75	0.57	0.21	27.00	108.89	0.59	1.20	0.55	0.14
28.00	133.47	0.88	0.55	0.53	0.07	29.00	183.60	1.88	0.00	0.52	0.00
30.00	6861.19	2.00	0.00	0.50	0.00						

Total estimated settlement: 1.22

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

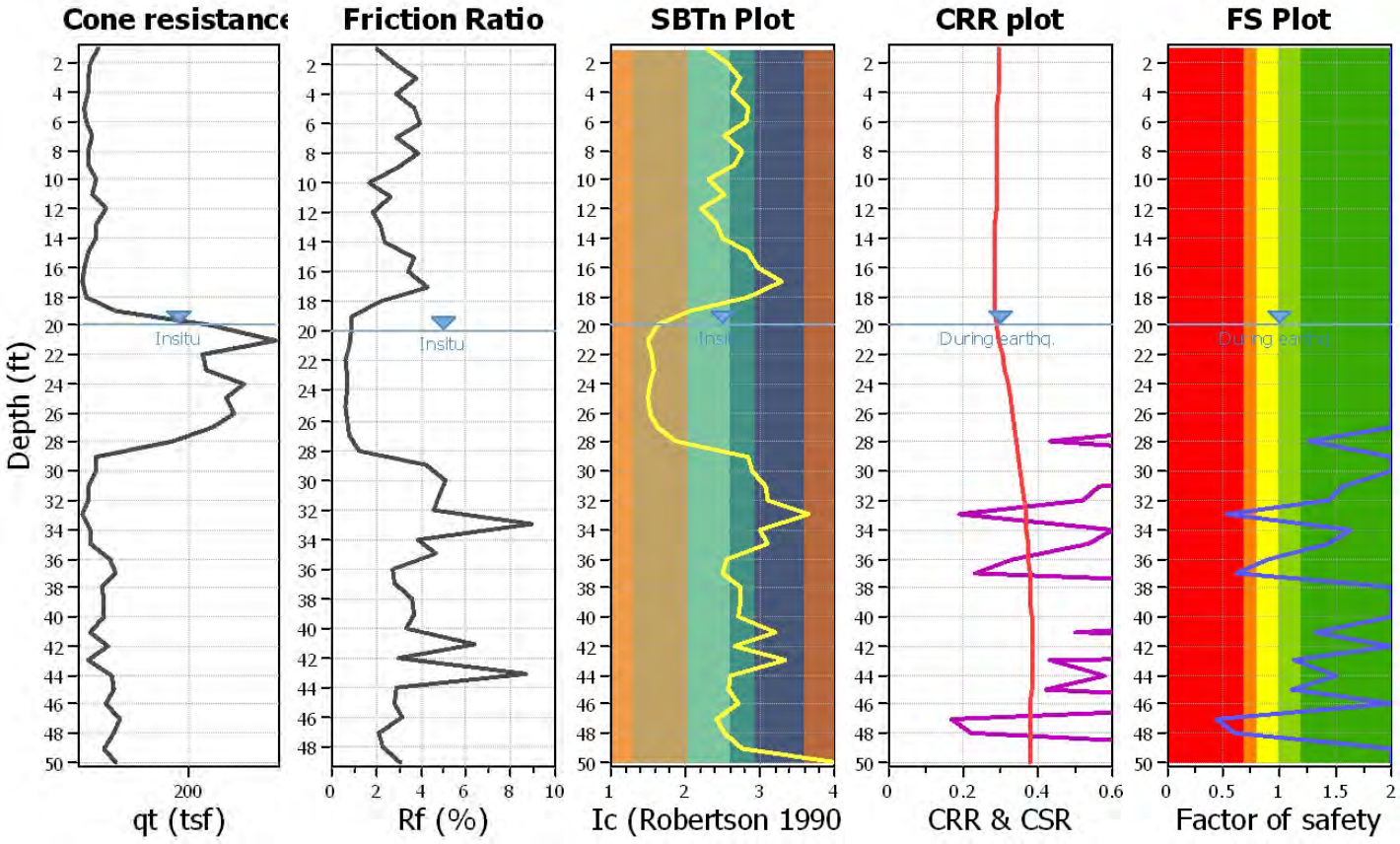
LIQUEFACTION ANALYSIS REPORT

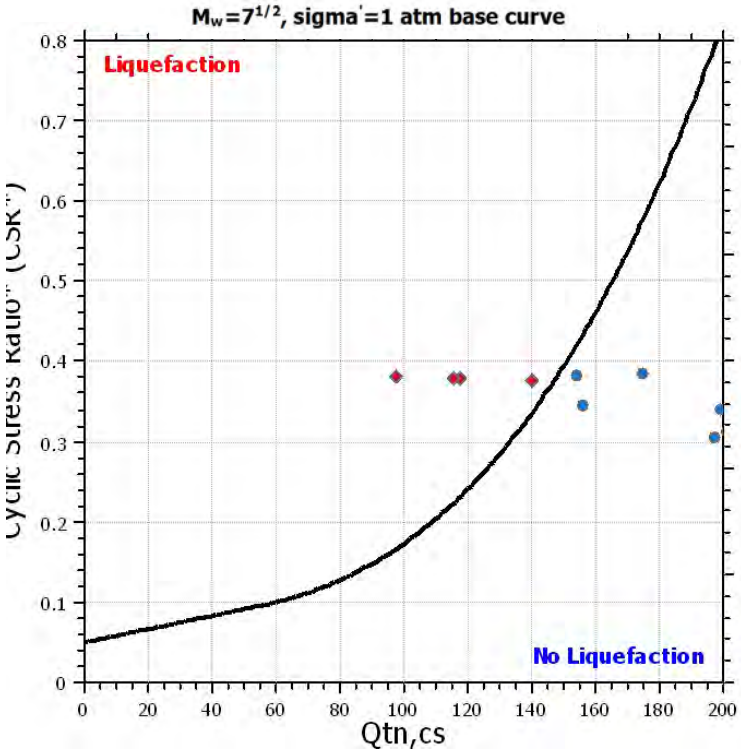
Project title : Ganahl SJC **Location :**

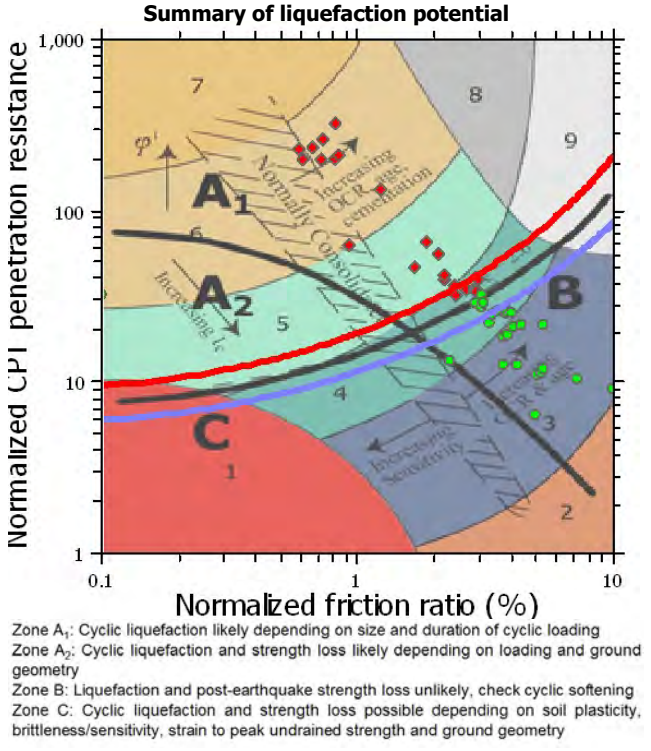
CPT file : CPT-5

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

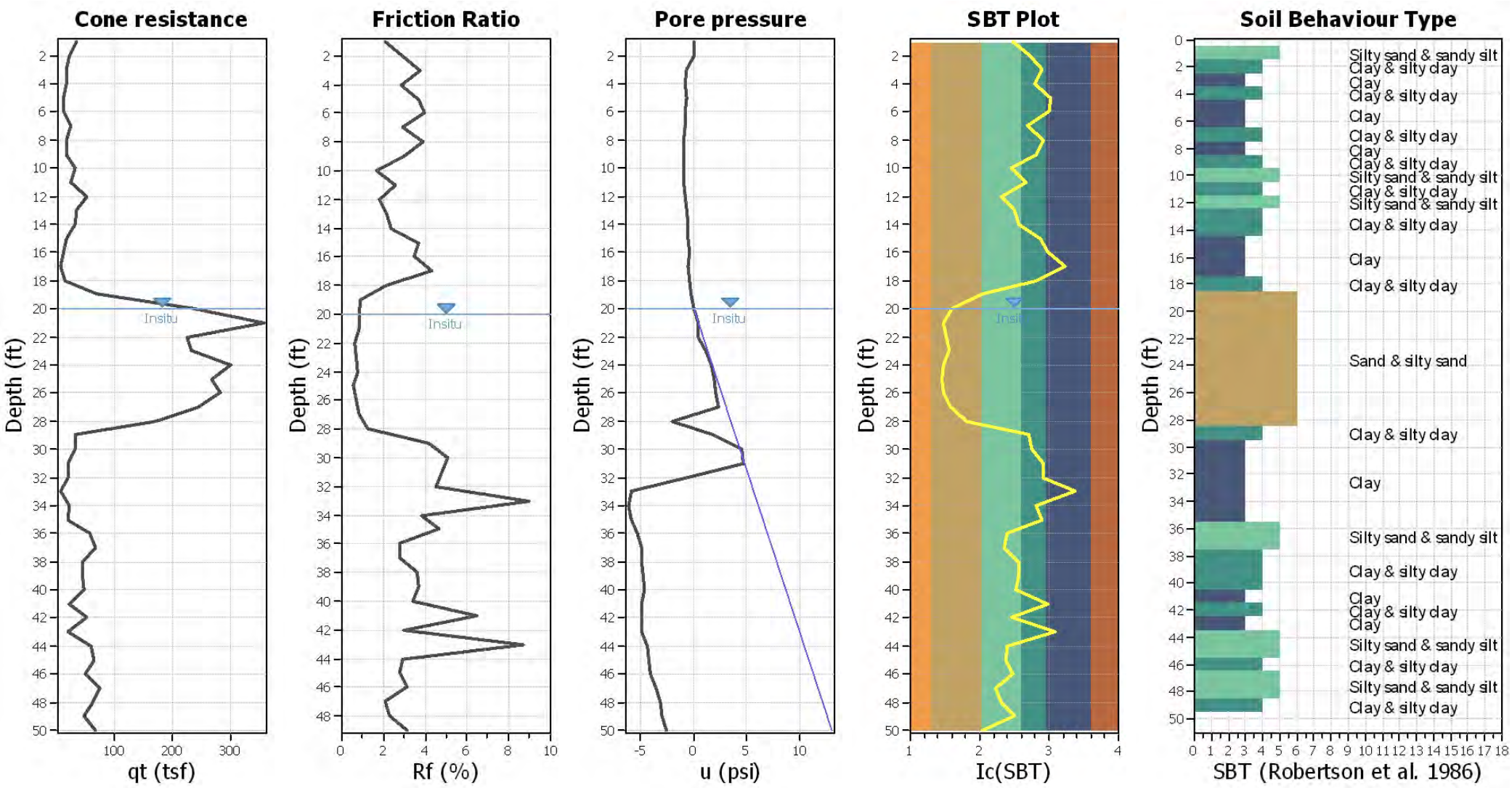






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



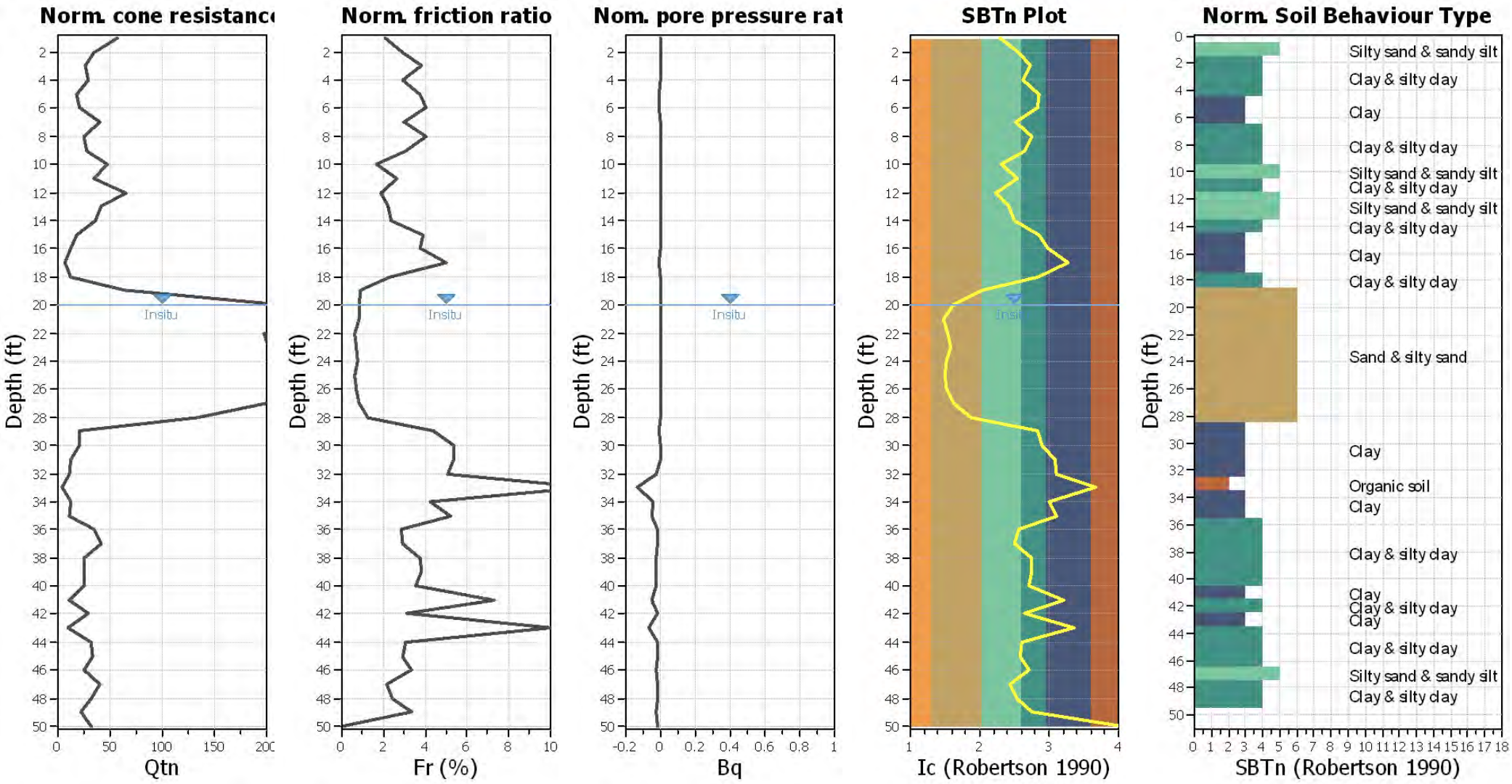
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



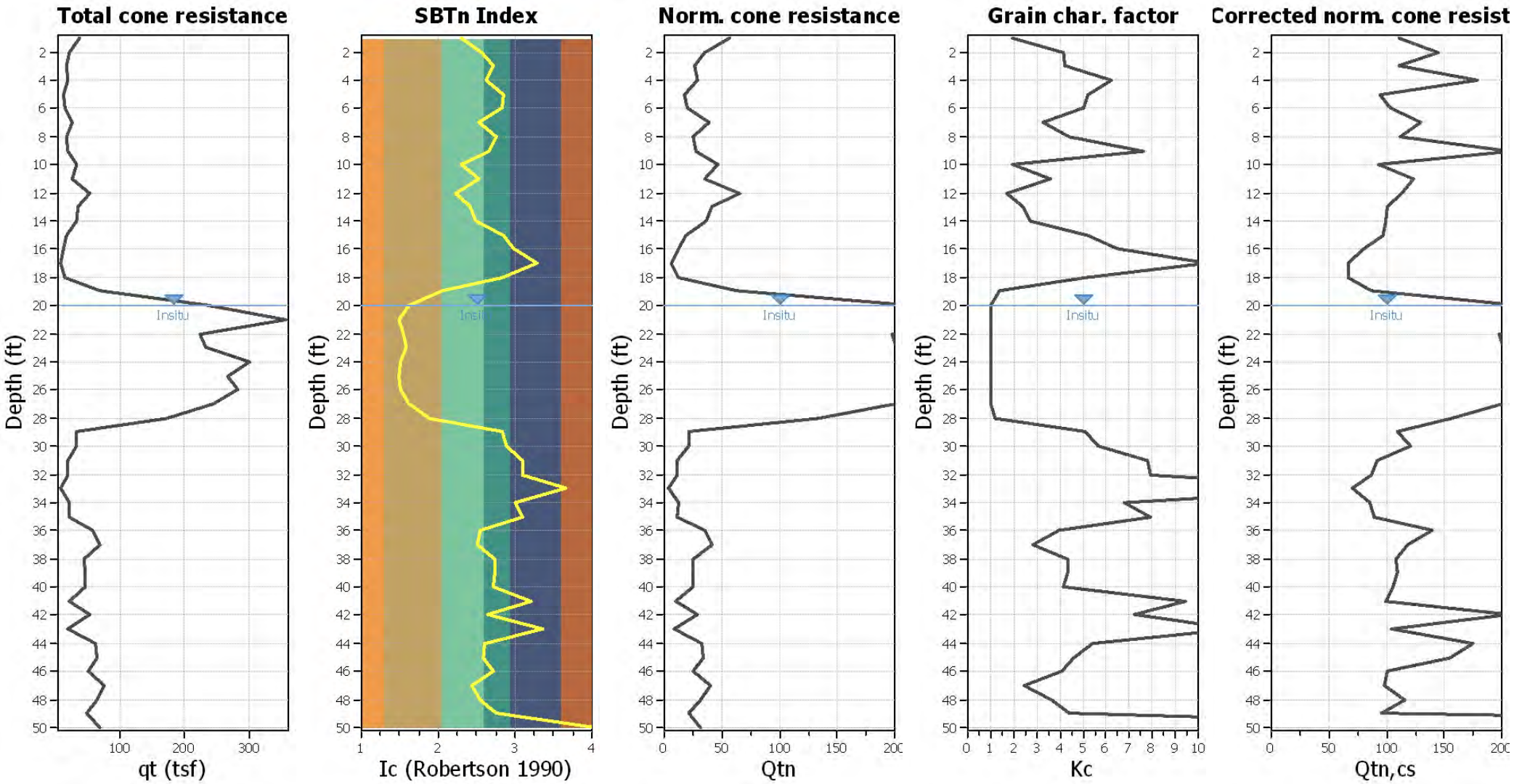
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

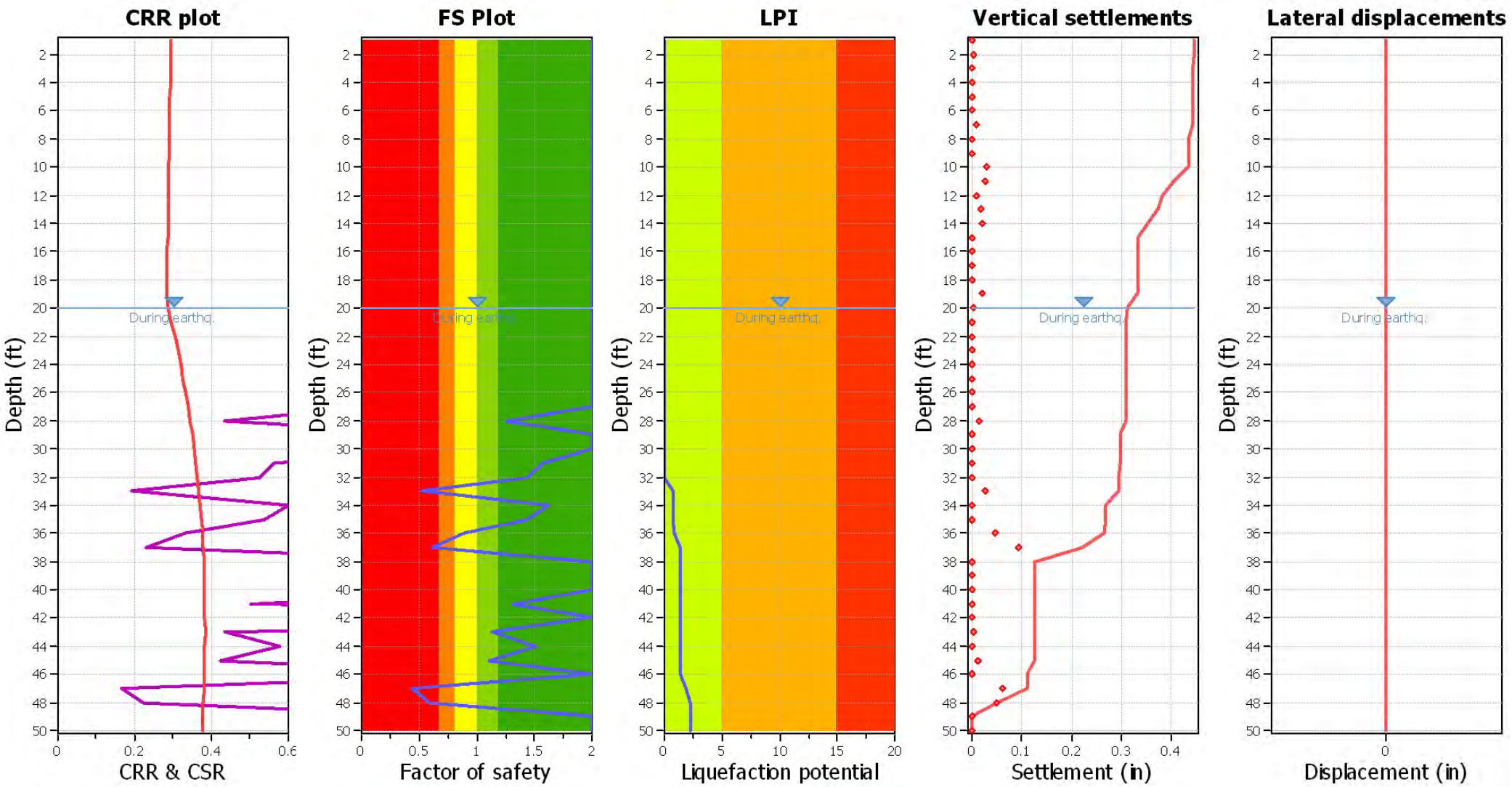
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

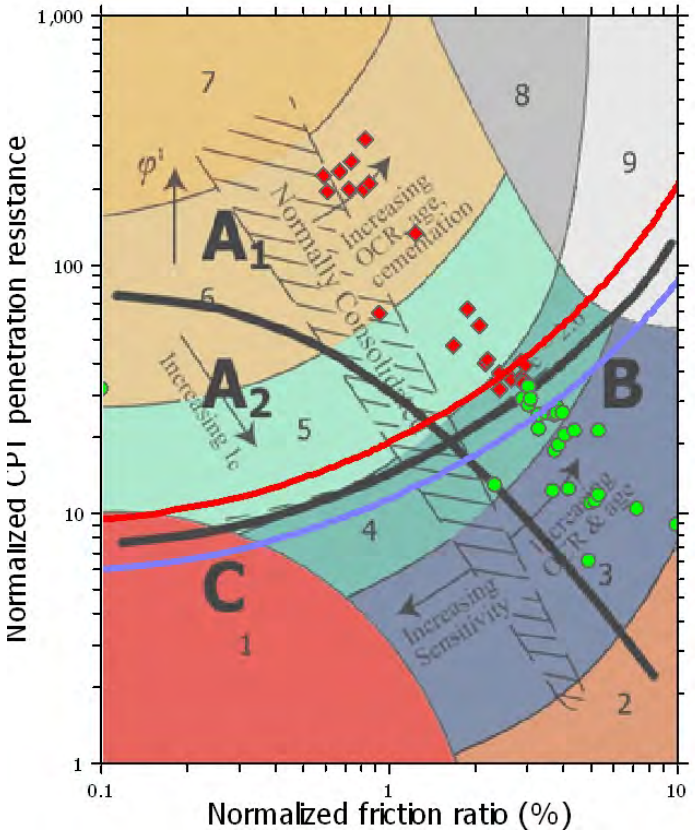
F.S. color scheme

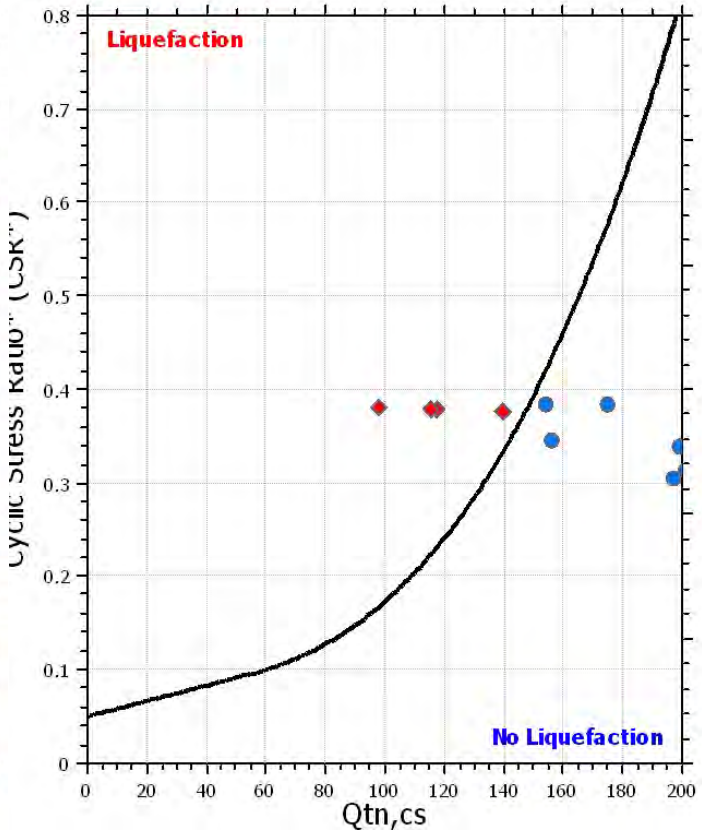
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

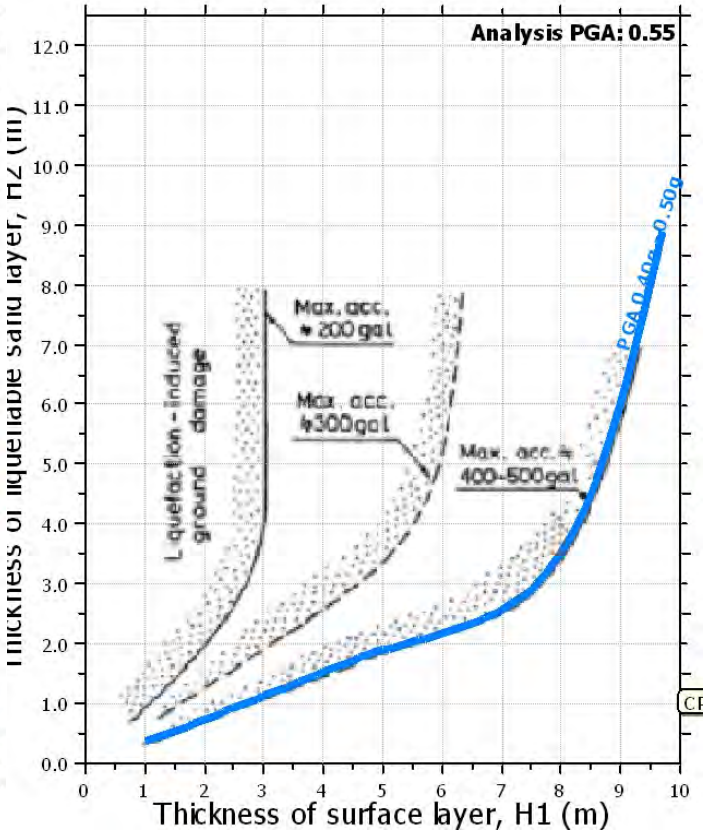
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



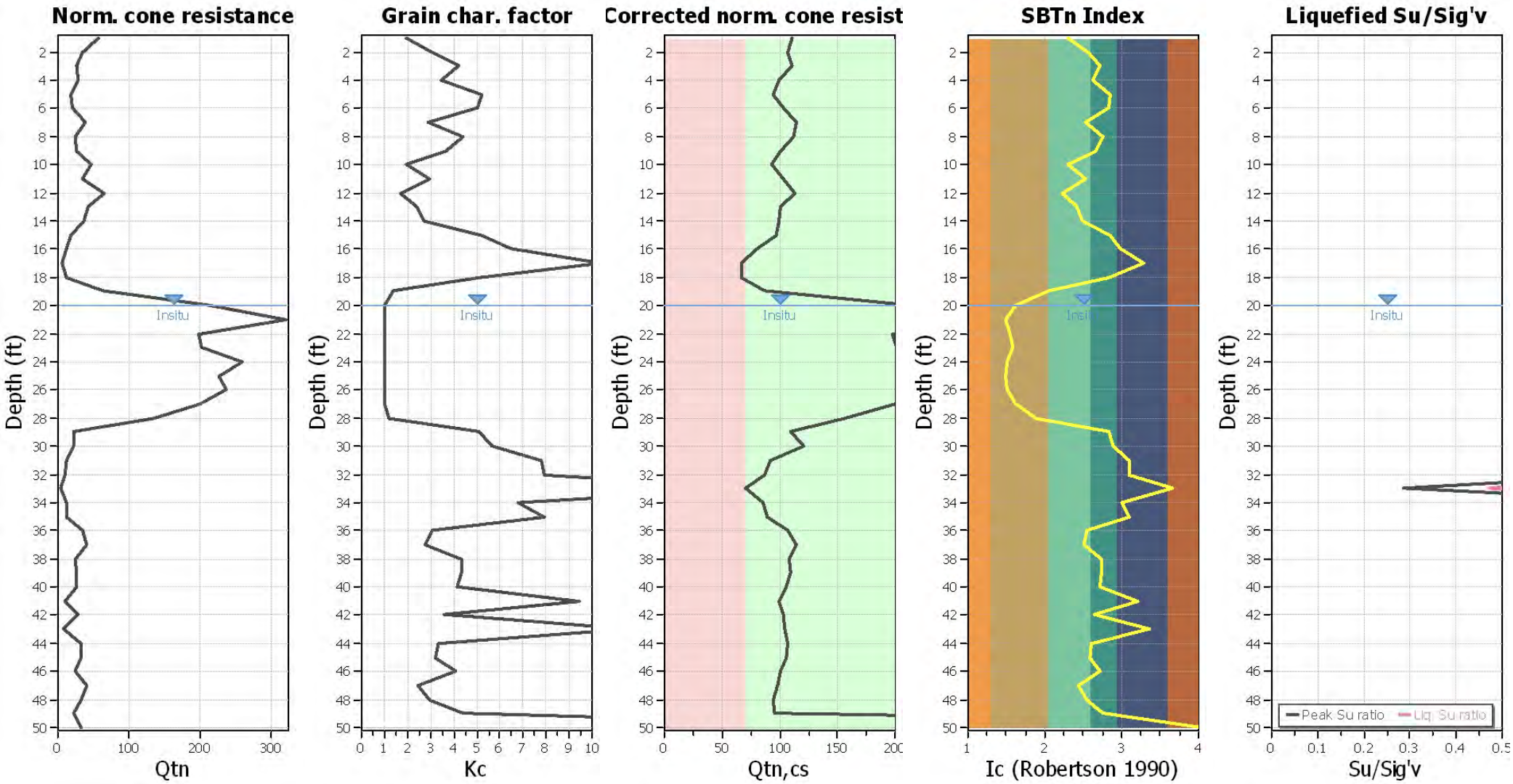




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

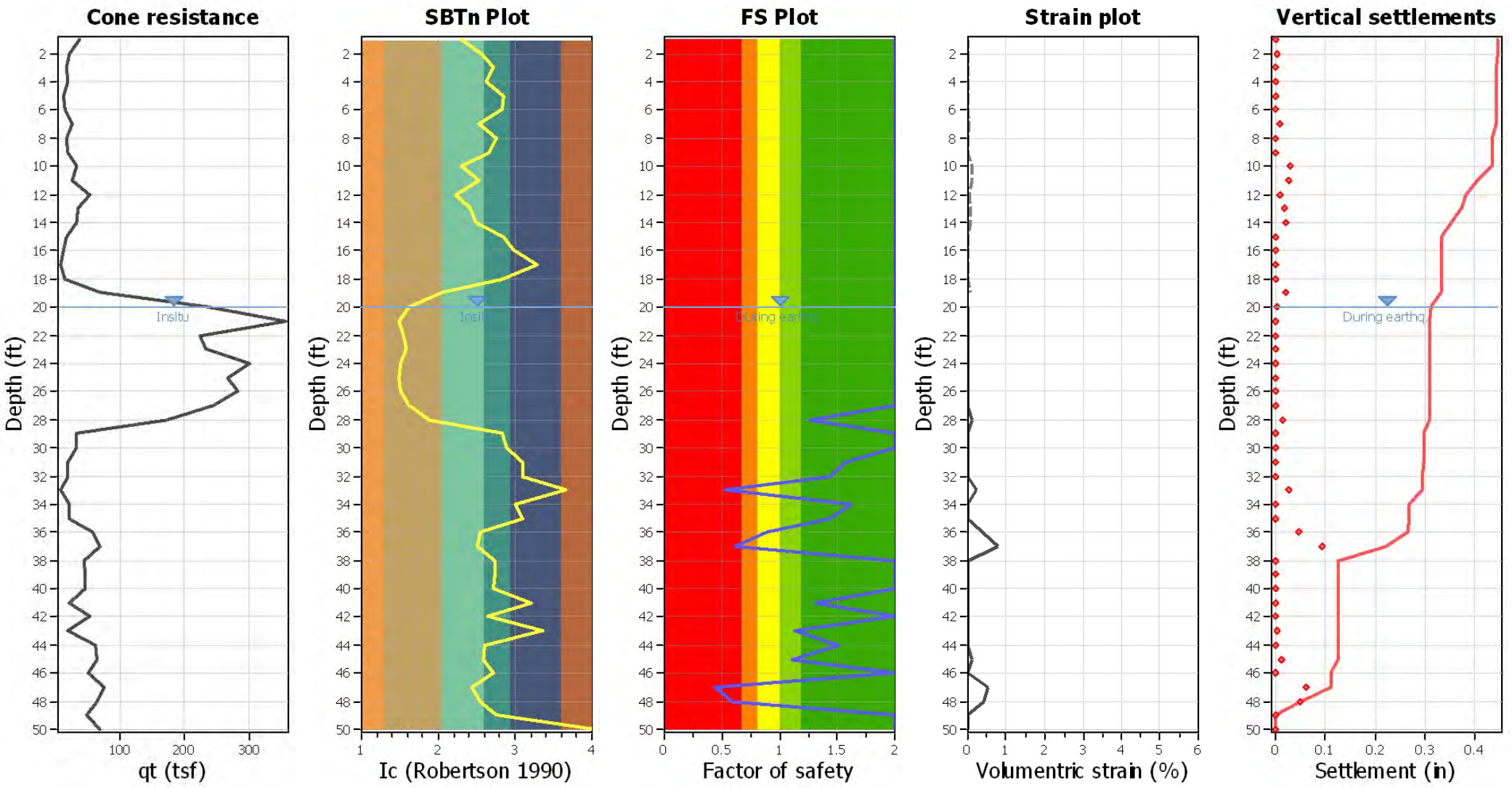
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	2.30	57.12	1.94	111.05	26	588	0.29	0.005	0.00	8.63	0.00	0.001
2.00	2.56	34.89	3.08	107.52	29	499	0.29	0.014	0.01	8.63	0.01	0.002
3.00	2.73	26.56	4.19	111.19	0	0	0.29	0.000	0.00	0.00	0.00	0.000
4.00	2.62	28.81	3.46	99.71	0	0	0.29	0.000	0.00	12.48	0.00	0.000
5.00	2.85	17.99	5.23	94.07	0	0	0.29	0.000	0.00	0.00	0.00	0.000
6.00	2.83	20.58	5.02	103.35	0	0	0.29	0.000	0.00	0.00	0.00	0.000
7.00	2.52	39.61	2.89	114.40	30	542	0.29	0.085	0.05	8.63	0.04	0.009
8.00	2.76	25.26	4.42	111.78	0	0	0.29	0.000	0.00	0.00	0.00	0.000
9.00	2.65	27.34	3.67	100.36	0	0	0.29	0.000	0.00	10.85	0.00	0.000
10.00	2.30	47.16	1.96	92.47	22	519	0.29	0.204	0.18	8.63	0.12	0.029
11.00	2.54	34.81	2.96	102.87	27	527	0.29	0.238	0.17	8.63	0.11	0.025
12.00	2.22	65.81	1.73	113.57	26	762	0.29	0.082	0.06	8.63	0.04	0.009
13.00	2.42	41.74	2.40	100.19	25	641	0.29	0.164	0.13	8.63	0.08	0.018
14.00	2.49	36.41	2.72	98.95	25	643	0.29	0.189	0.14	8.63	0.08	0.020
15.00	2.85	18.73	5.20	97.46	0	0	0.29	0.000	0.00	0.00	0.00	0.000
16.00	2.98	12.38	6.48	80.22	0	0	0.28	0.000	0.00	0.00	0.00	0.000
17.00	3.28	6.46	10.39	67.06	0	0	0.28	0.000	0.00	0.00	0.00	0.000
18.00	2.84	13.11	5.10	66.89	0	0	0.28	0.000	0.00	10.85	0.00	0.000
19.00	2.05	63.37	1.37	86.63	18	817	0.28	0.151	0.17	8.63	0.09	0.021

Total estimated settlement: 0.13

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	212.53	2.00	0.00	0.67	0.00	21.00	319.51	2.00	0.00	0.65	0.00
22.00	197.61	2.00	0.00	0.63	0.00	23.00	201.23	2.00	0.00	0.62	0.00
24.00	257.59	2.00	0.00	0.60	0.00	25.00	226.57	2.00	0.00	0.58	0.00
26.00	235.89	2.00	0.00	0.57	0.00	27.00	199.47	2.00	0.00	0.55	0.00
28.00	156.06	1.26	0.11	0.53	0.01	29.00	109.62	2.00	0.00	0.52	0.00
30.00	120.32	2.00	0.00	0.50	0.00	31.00	91.90	1.57	0.01	0.48	0.00
32.00	86.68	1.44	0.01	0.47	0.00	33.00	69.85	0.52	0.23	0.45	0.03
34.00	85.60	1.62	0.00	0.43	0.00	35.00	89.06	1.44	0.01	0.42	0.00
36.00	139.73	0.89	0.38	0.40	0.05	37.00	117.68	0.61	0.78	0.38	0.09
38.00	107.66	2.00	0.00	0.37	0.00	39.00	109.86	2.00	0.00	0.35	0.00
40.00	105.65	2.00	0.00	0.33	0.00	41.00	99.14	1.31	0.01	0.32	0.00
42.00	206.01	2.00	0.00	0.30	0.00	43.00	104.69	1.13	0.01	0.28	0.00
44.00	174.95	1.51	0.00	0.27	0.00	45.00	154.24	1.10	0.10	0.25	0.01
46.00	100.83	2.00	0.00	0.23	0.00	47.00	97.69	0.44	0.52	0.22	0.06
48.00	115.41	0.59	0.42	0.20	0.05	49.00	95.72	2.00	0.00	0.18	0.00
50.00	843.81	2.00	0.00	0.17	0.00						

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)

Total estimated settlement: 0.31

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

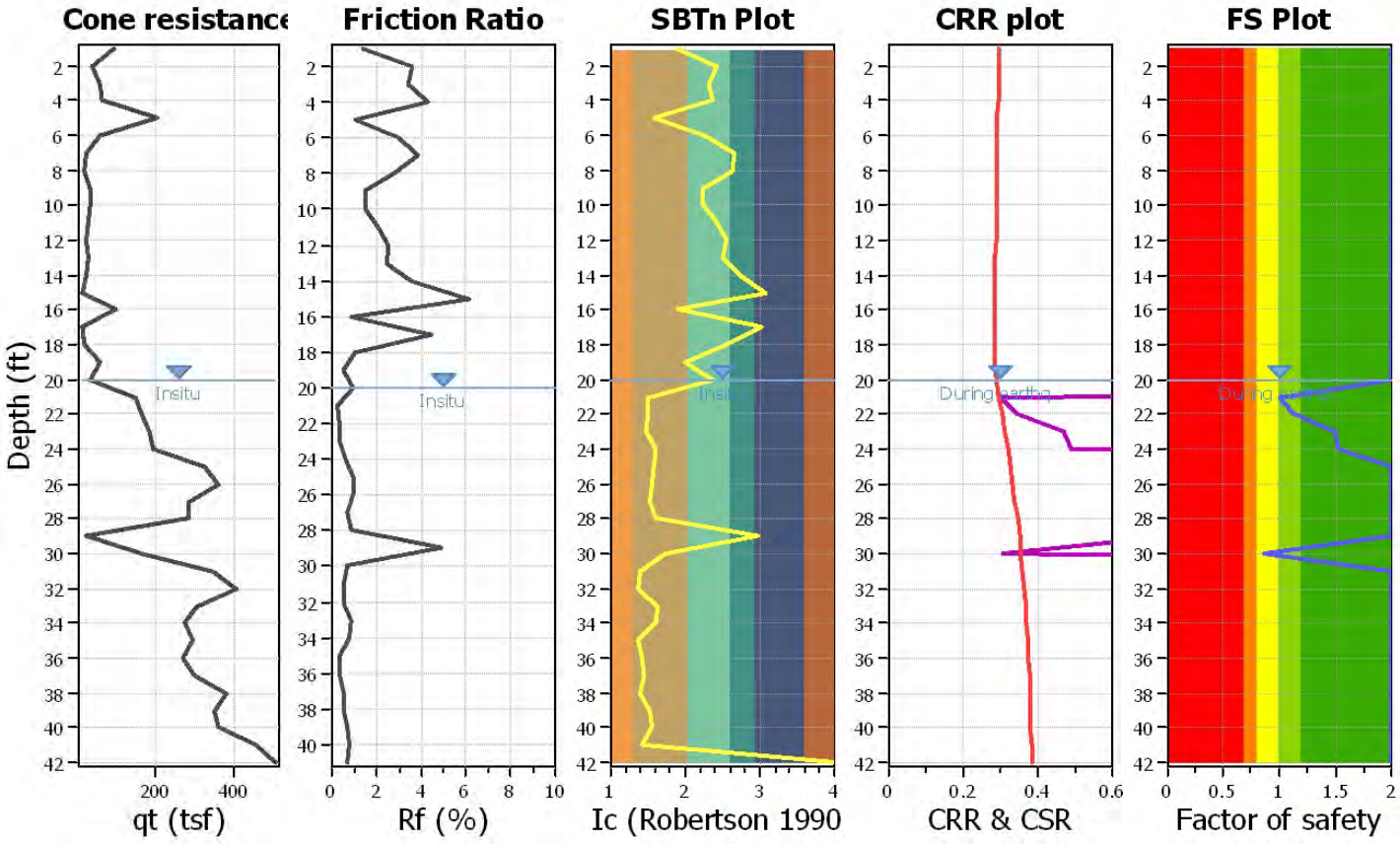
LIQUEFACTION ANALYSIS REPORT

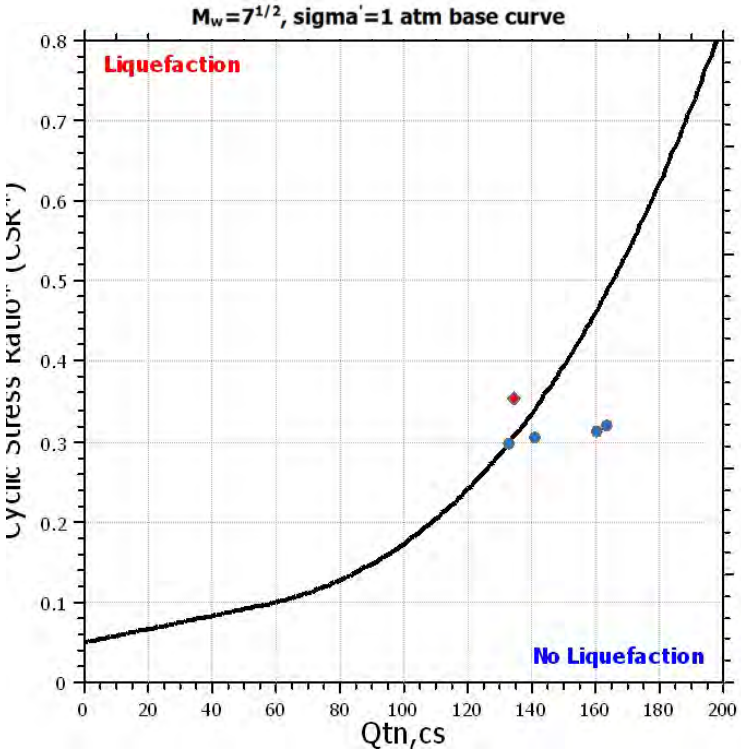
Project title : Ganahl SJC **Location :**

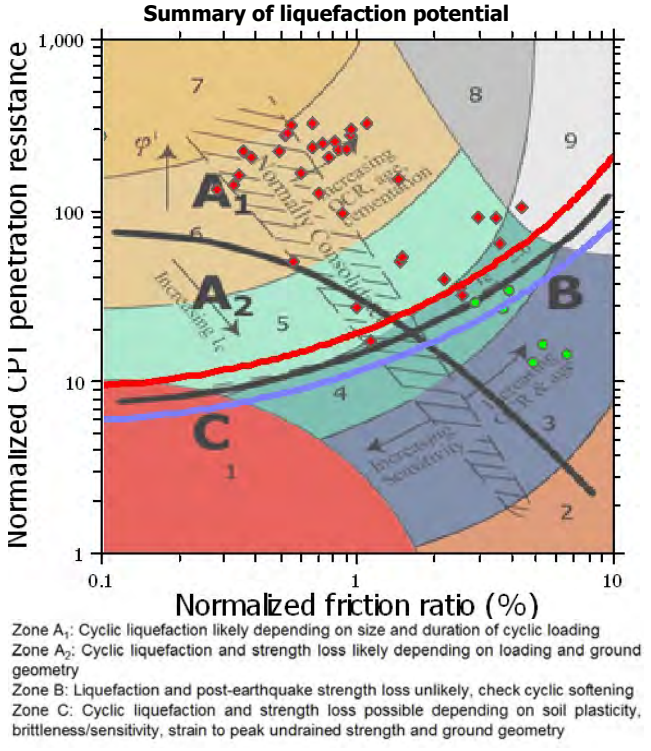
CPT file : CPT-6

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

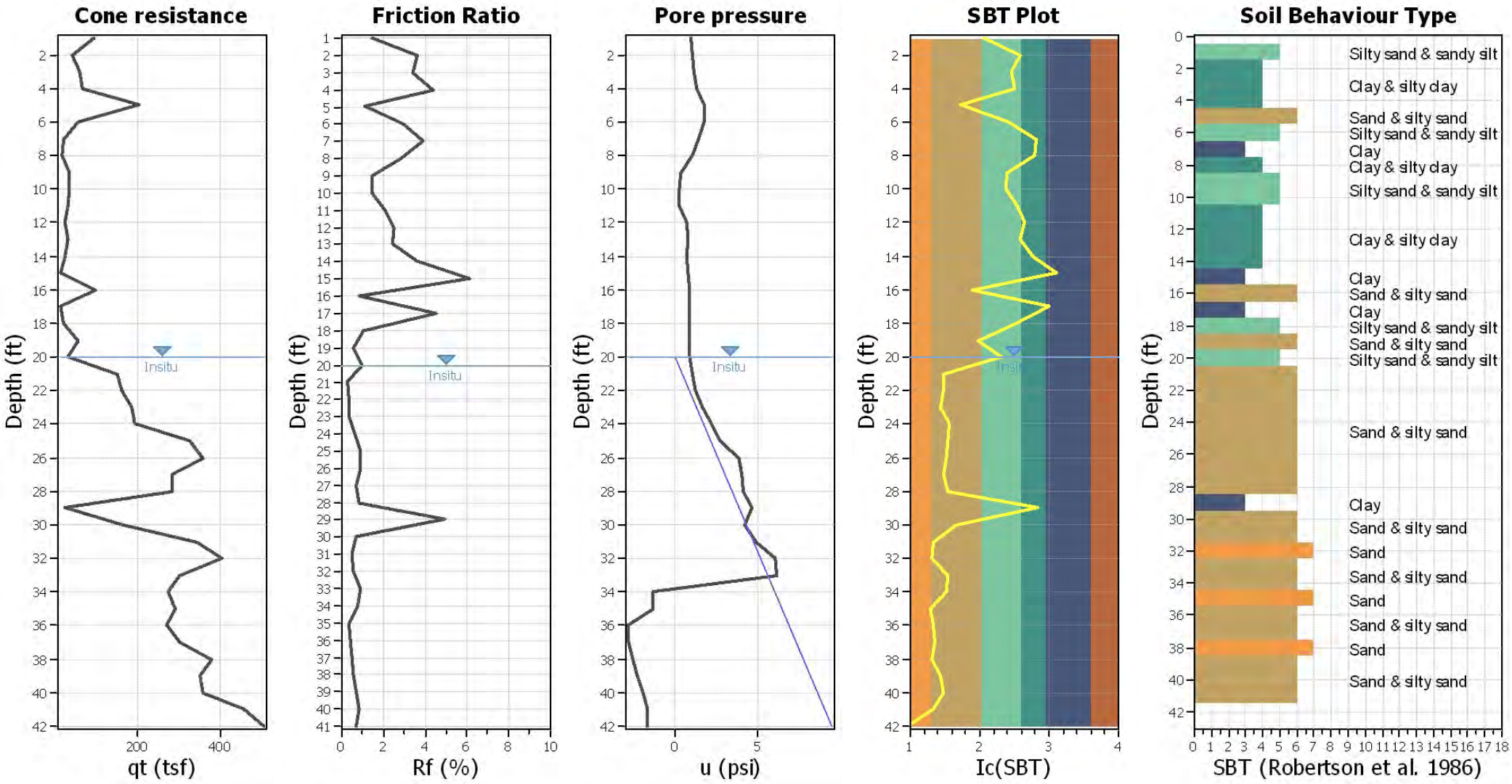






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



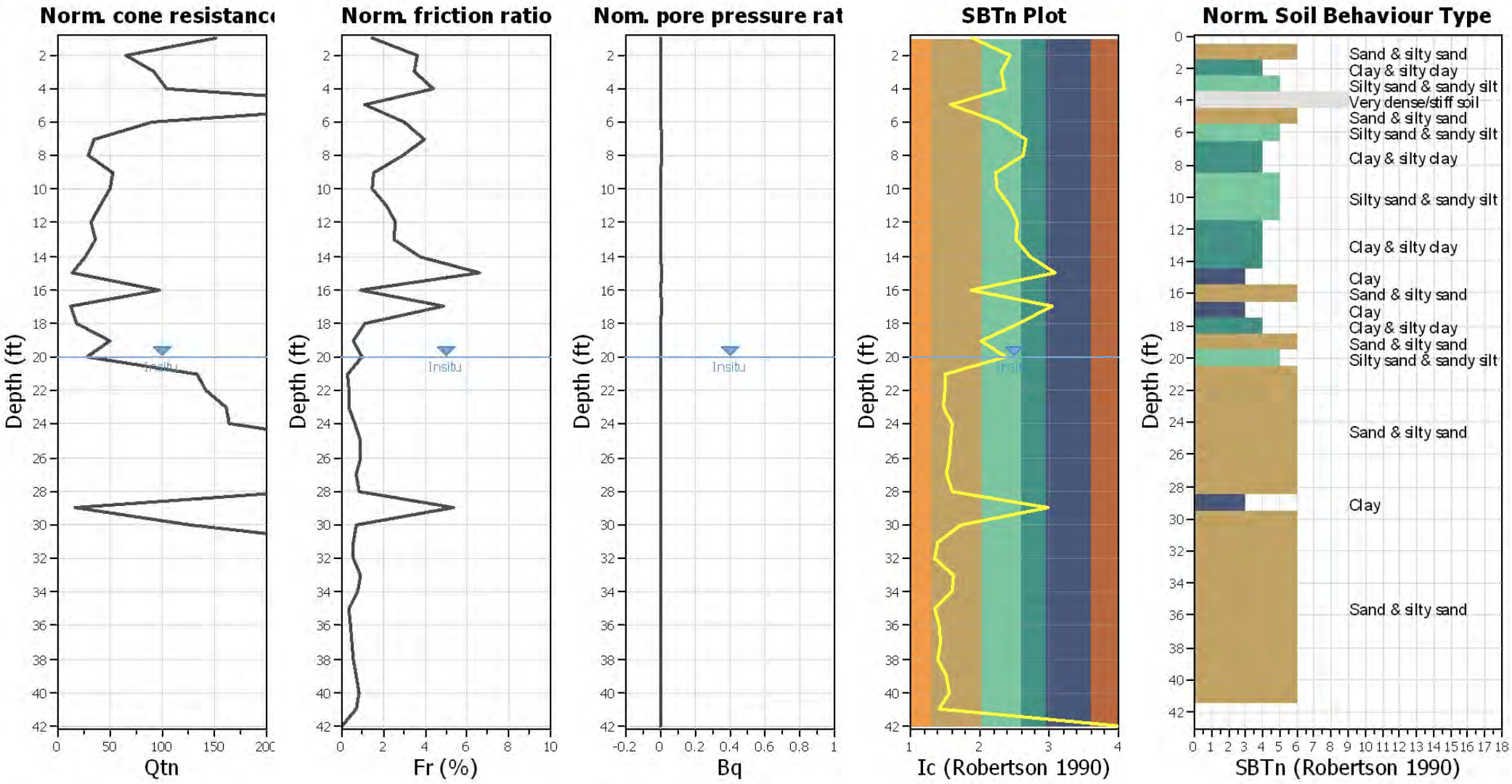
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



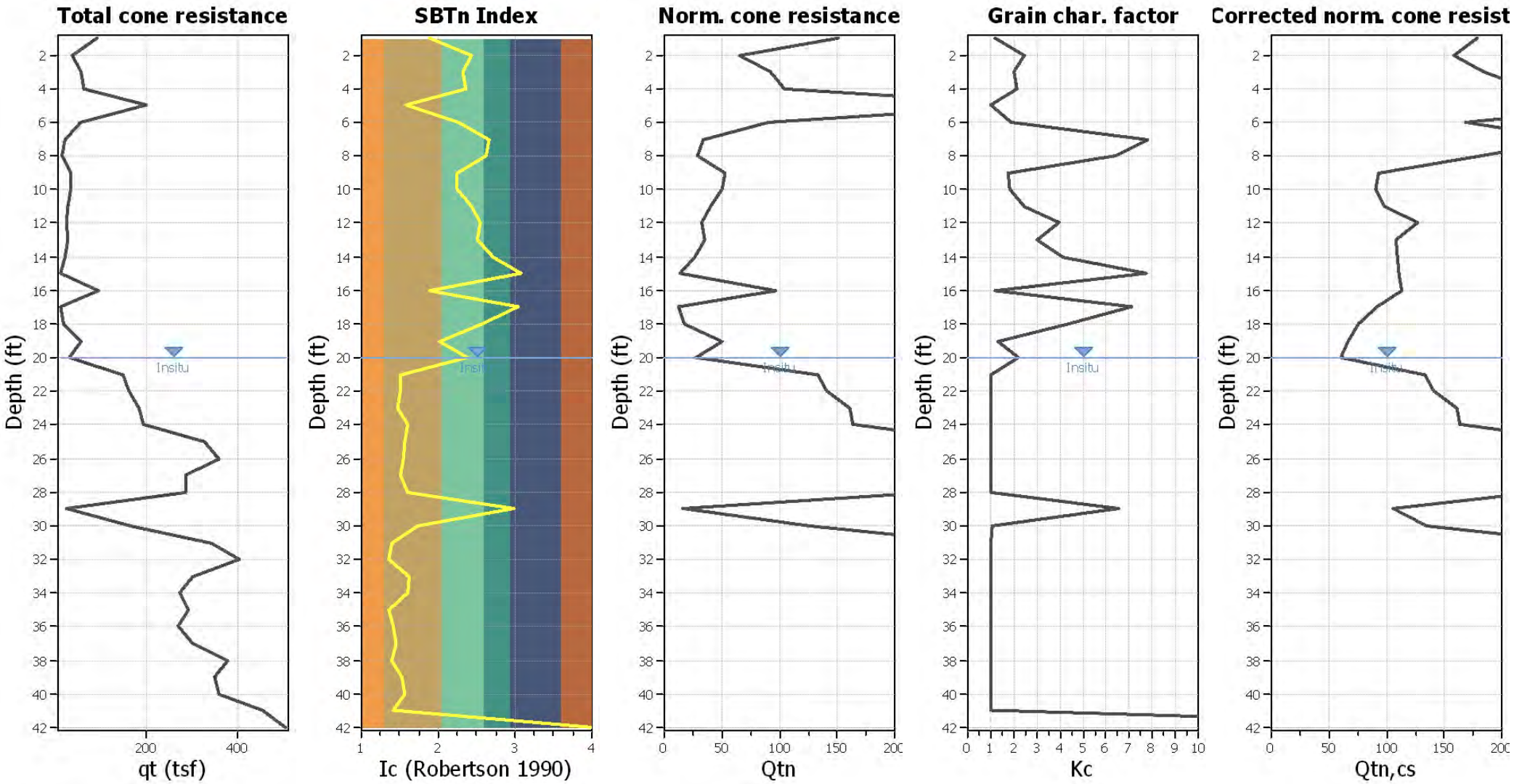
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

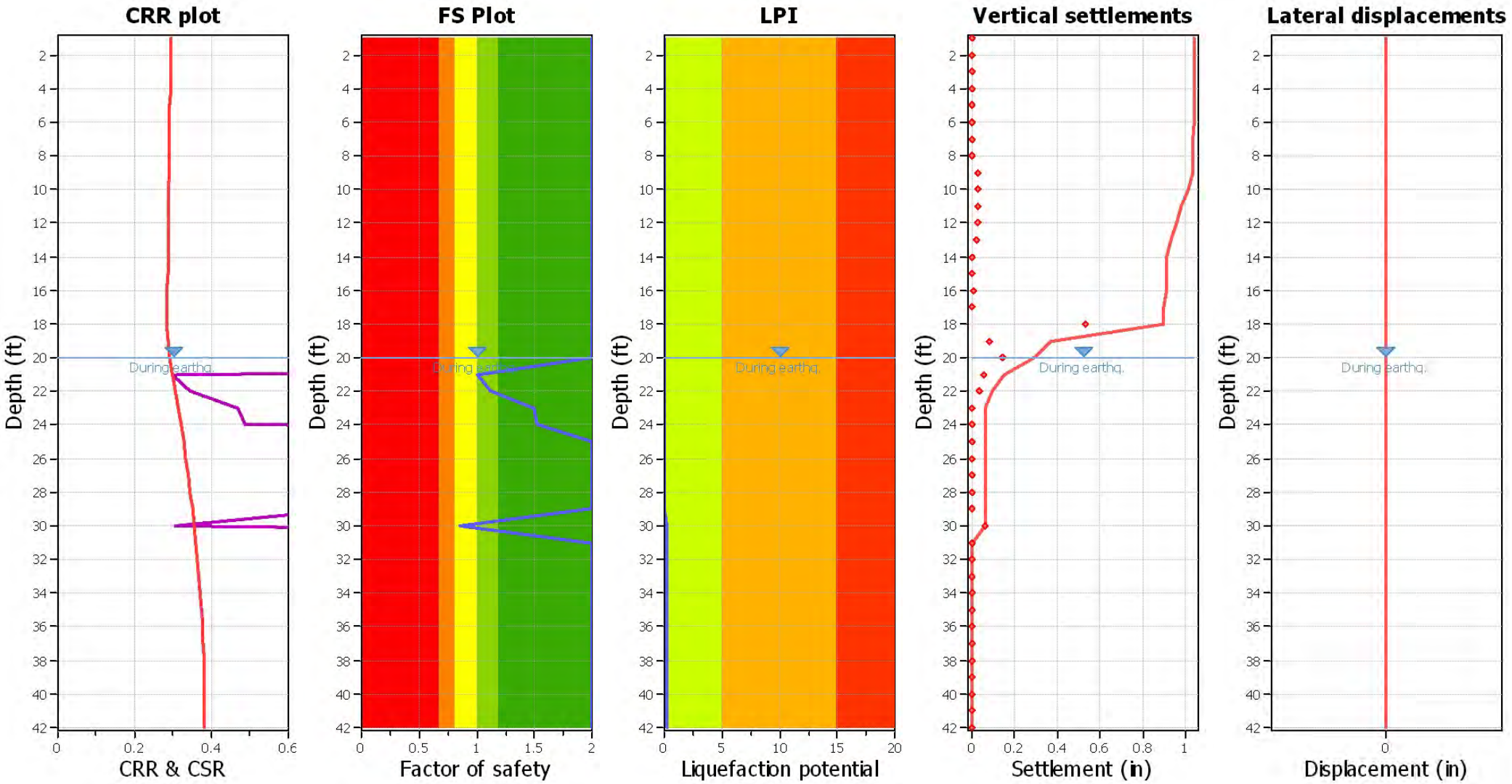
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

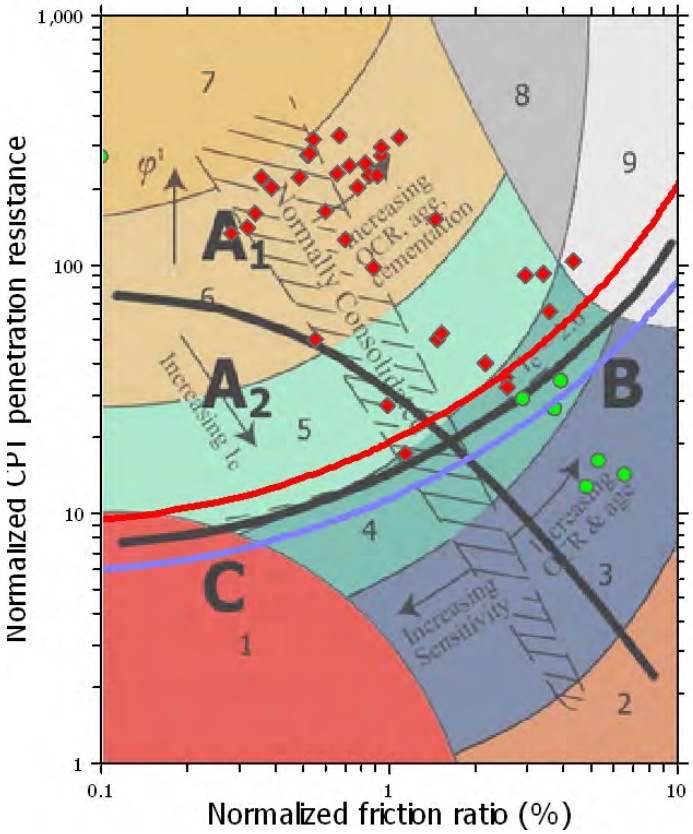
F.S. color scheme

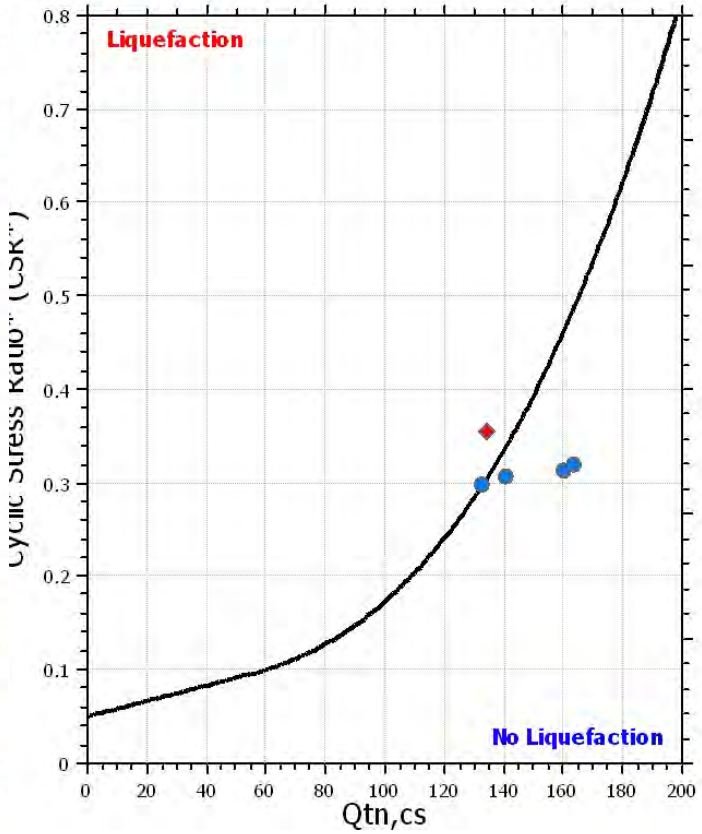
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

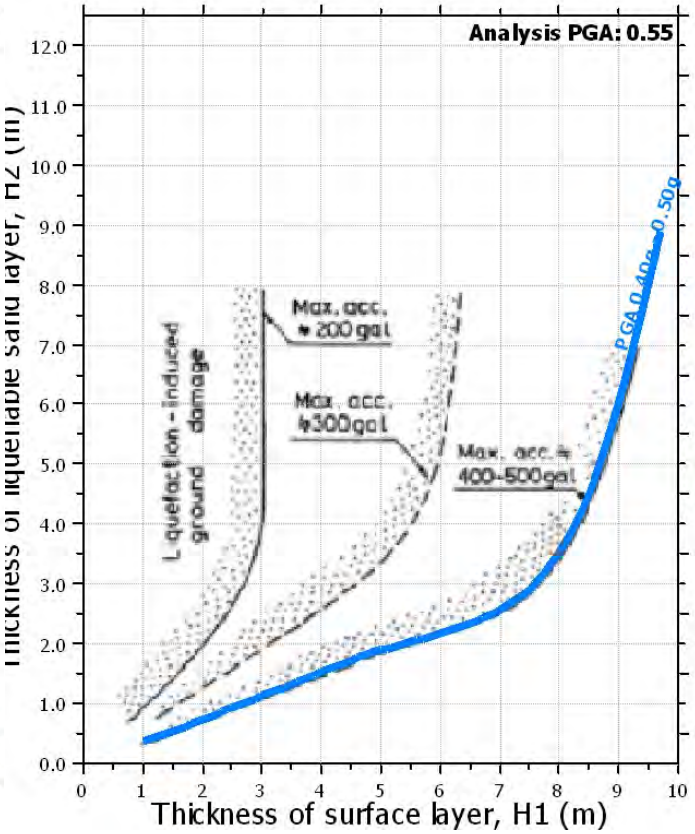
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



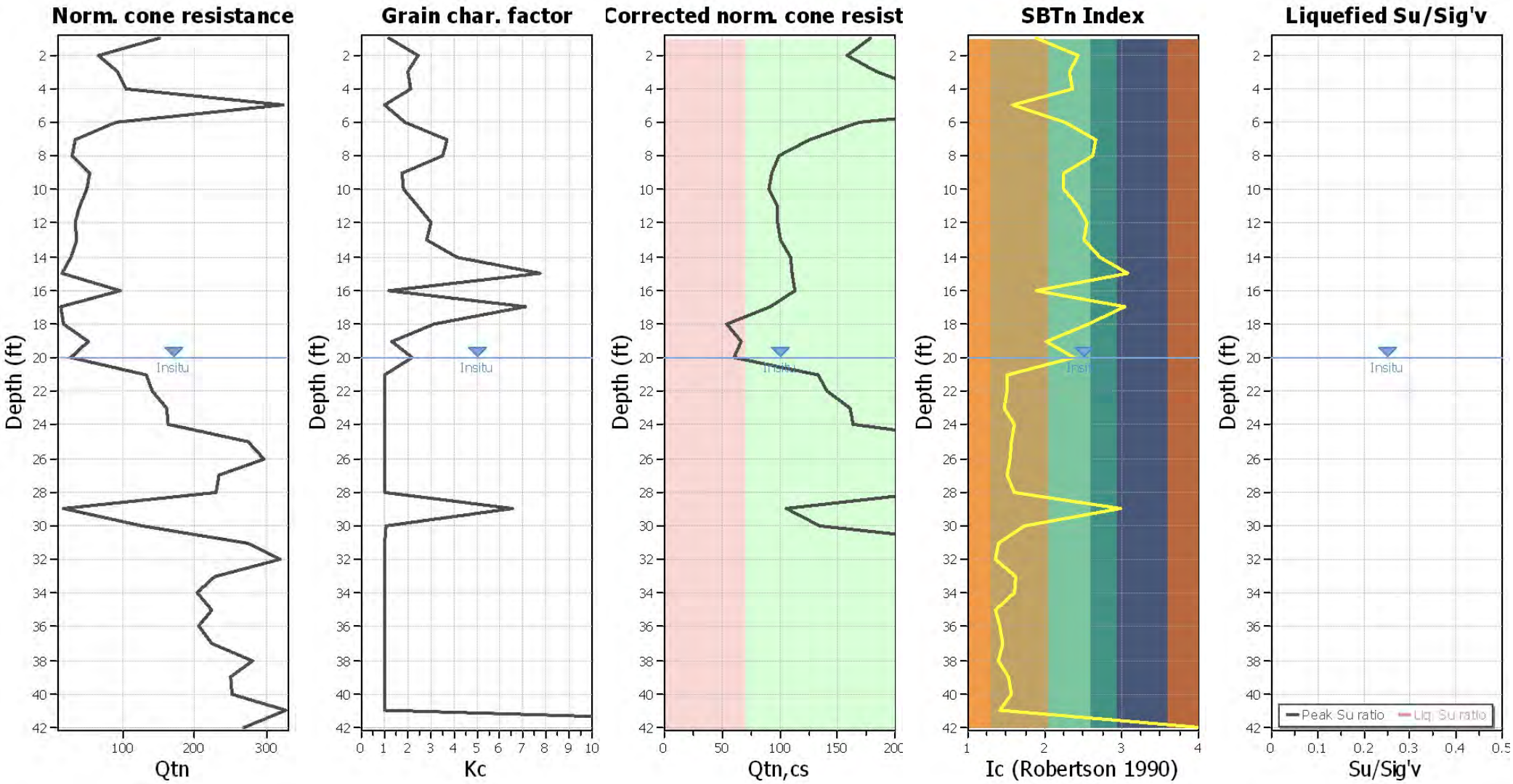




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

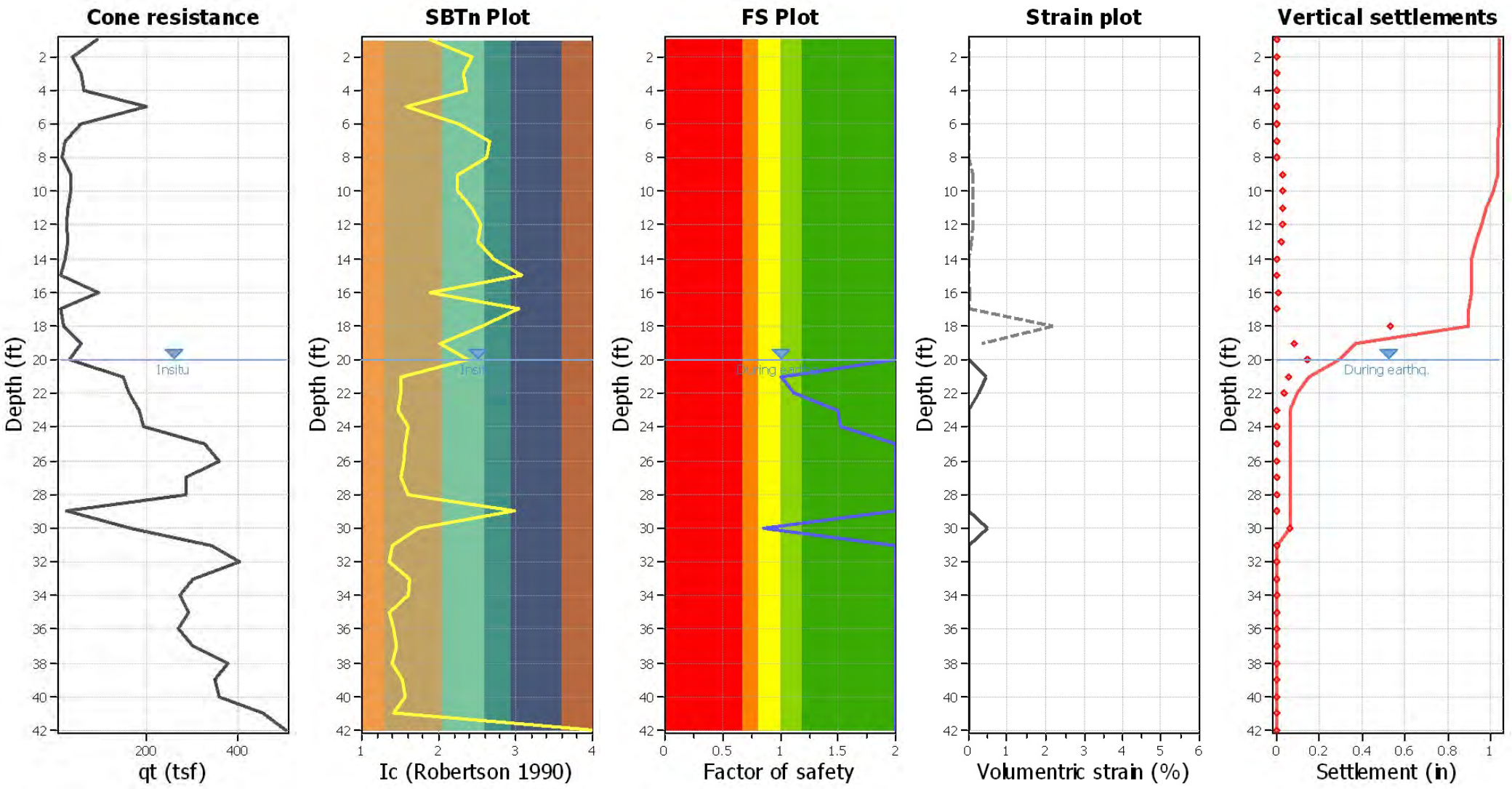
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	1.89	151.09	1.18	178.19	36	926	0.29	0.003	0.00	8.63	0.00	0.000
2.00	2.43	64.93	2.44	158.56	40	790	0.29	0.007	0.00	8.63	0.00	0.001
3.00	2.31	92.33	1.99	183.97	44	968	0.29	0.009	0.00	8.63	0.00	0.001
4.00	2.36	103.98	2.16	224.10	54	1156	0.29	0.010	0.00	8.63	0.00	0.001
5.00	1.58	323.34	1.00	323.34	58	1342	0.29	0.010	0.00	8.63	0.00	0.000
6.00	2.27	90.37	1.86	167.98	39	898	0.29	0.023	0.01	8.63	0.01	0.002
7.00	2.66	34.07	3.69	125.82	0	0	0.29	0.000	0.00	10.85	0.00	0.000
8.00	2.63	28.59	3.49	99.81	0	0	0.29	0.000	0.00	12.48	0.00	0.000
9.00	2.24	52.79	1.76	93.11	21	529	0.29	0.176	0.16	8.63	0.11	0.026
10.00	2.25	50.24	1.80	90.24	21	547	0.29	0.191	0.18	8.63	0.12	0.029
11.00	2.43	40.15	2.44	97.84	24	568	0.29	0.202	0.16	8.63	0.10	0.024
12.00	2.55	32.17	3.04	97.92	26	557	0.29	0.261	0.19	8.63	0.12	0.029
13.00	2.51	35.54	2.83	100.61	26	628	0.29	0.194	0.14	8.63	0.09	0.021
14.00	2.72	26.29	4.18	109.91	0	0	0.29	0.000	0.00	0.00	0.00	0.000
15.00	3.08	14.32	7.72	110.49	0	0	0.29	0.000	0.00	10.85	0.00	0.000
16.00	1.88	96.87	1.17	113.75	23	941	0.28	0.082	0.07	8.63	0.04	0.010
17.00	3.03	12.86	7.13	91.68	0	0	0.28	0.000	0.00	10.85	0.00	0.000
18.00	2.57	17.48	3.12	54.59	15	431	0.28	2.751	4.04	8.63	2.20	0.529
19.00	2.01	50.60	1.32	66.66	14	640	0.29	0.399	0.61	8.63	0.33	0.079

Total estimated settlement: 0.75

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	59.76	2.00	0.00	0.67	0.00	21.00	132.82	1.00	0.44	0.65	0.05
22.00	141.18	1.12	0.28	0.63	0.03	23.00	160.73	1.49	0.00	0.62	0.00
24.00	163.56	1.52	0.00	0.60	0.00	25.00	273.76	2.00	0.00	0.58	0.00
26.00	297.45	2.00	0.00	0.57	0.00	27.00	233.59	2.00	0.00	0.55	0.00
28.00	228.99	2.00	0.00	0.53	0.00	29.00	106.01	2.00	0.00	0.52	0.00
30.00	134.16	0.86	0.51	0.50	0.06	31.00	273.89	2.00	0.00	0.48	0.00
32.00	318.99	2.00	0.00	0.47	0.00	33.00	228.14	2.00	0.00	0.45	0.00
34.00	203.09	2.00	0.00	0.43	0.00	35.00	224.59	2.00	0.00	0.42	0.00
36.00	204.61	2.00	0.00	0.40	0.00	37.00	223.16	2.00	0.00	0.38	0.00
38.00	281.17	2.00	0.00	0.37	0.00	39.00	249.99	2.00	0.00	0.35	0.00
40.00	252.72	2.00	0.00	0.33	0.00	41.00	327.20	2.00	0.00	0.32	0.00
42.00	7152.81	2.00	0.00	0.30	0.00						

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)

Total estimated settlement: 0.15

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

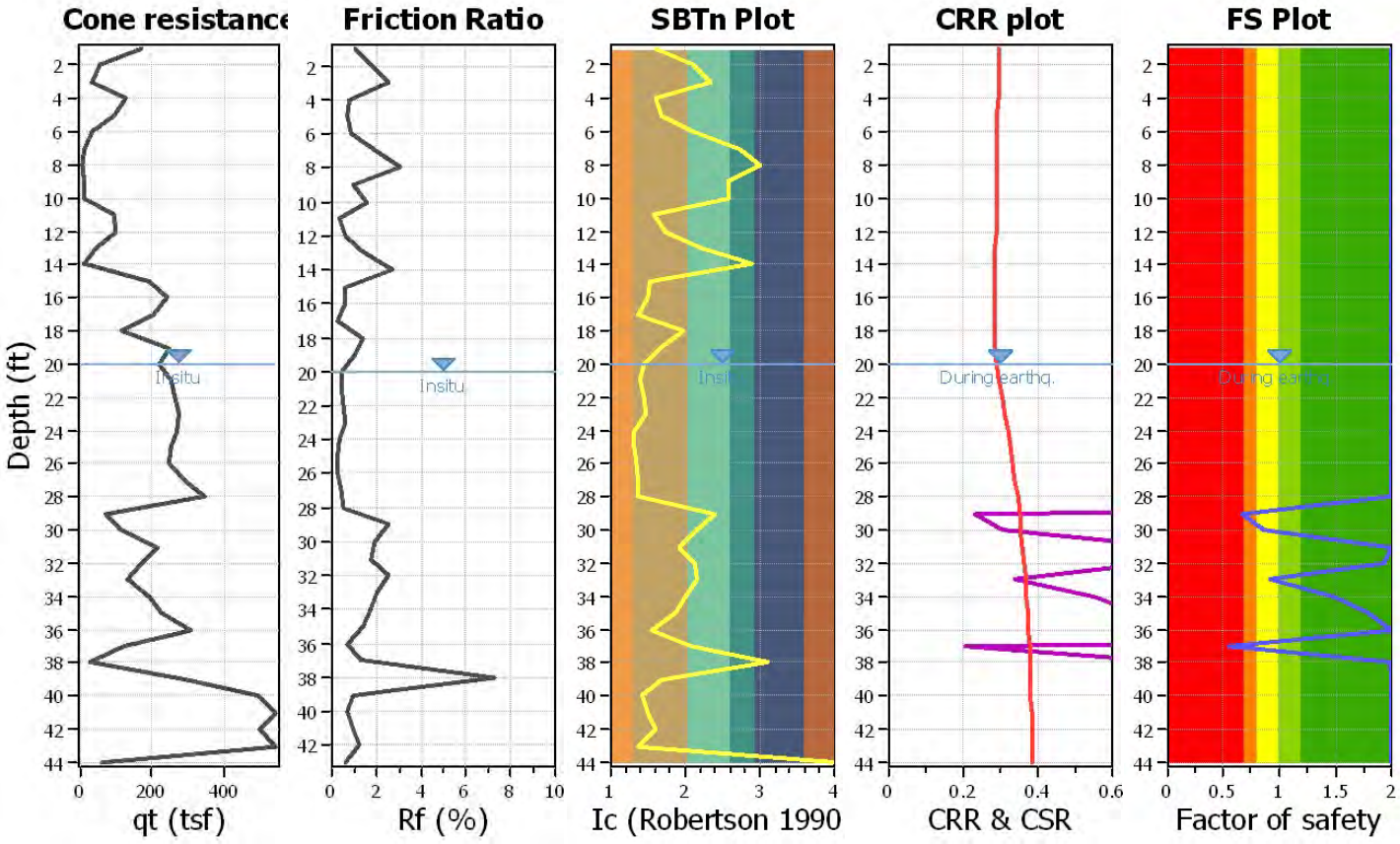
LIQUEFACTION ANALYSIS REPORT

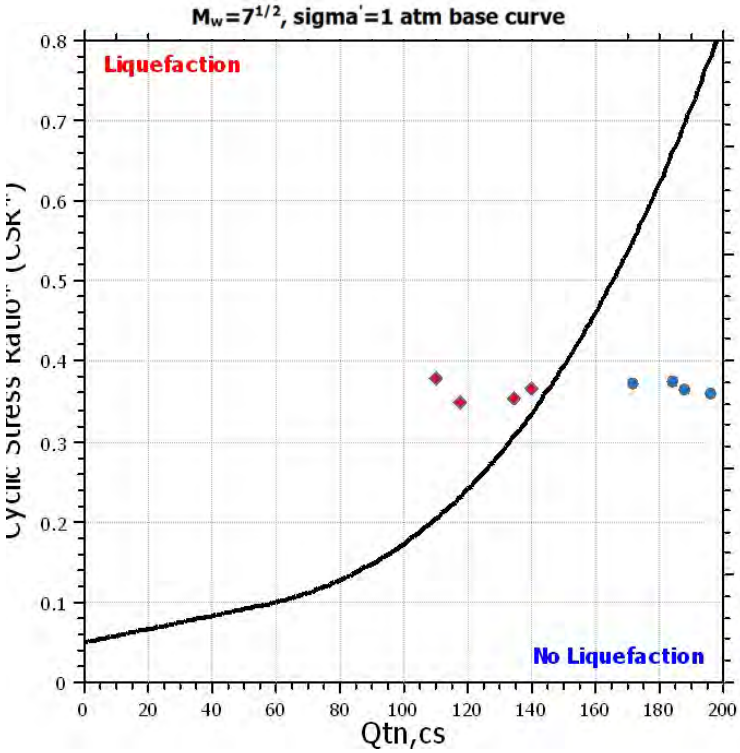
Project title : Ganahl SJC **Location :**

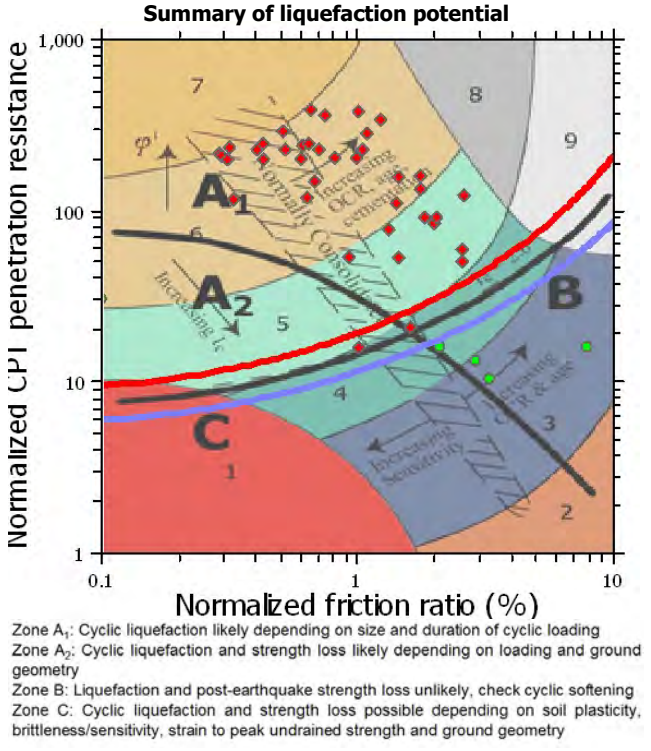
CPT file : CPT-7

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

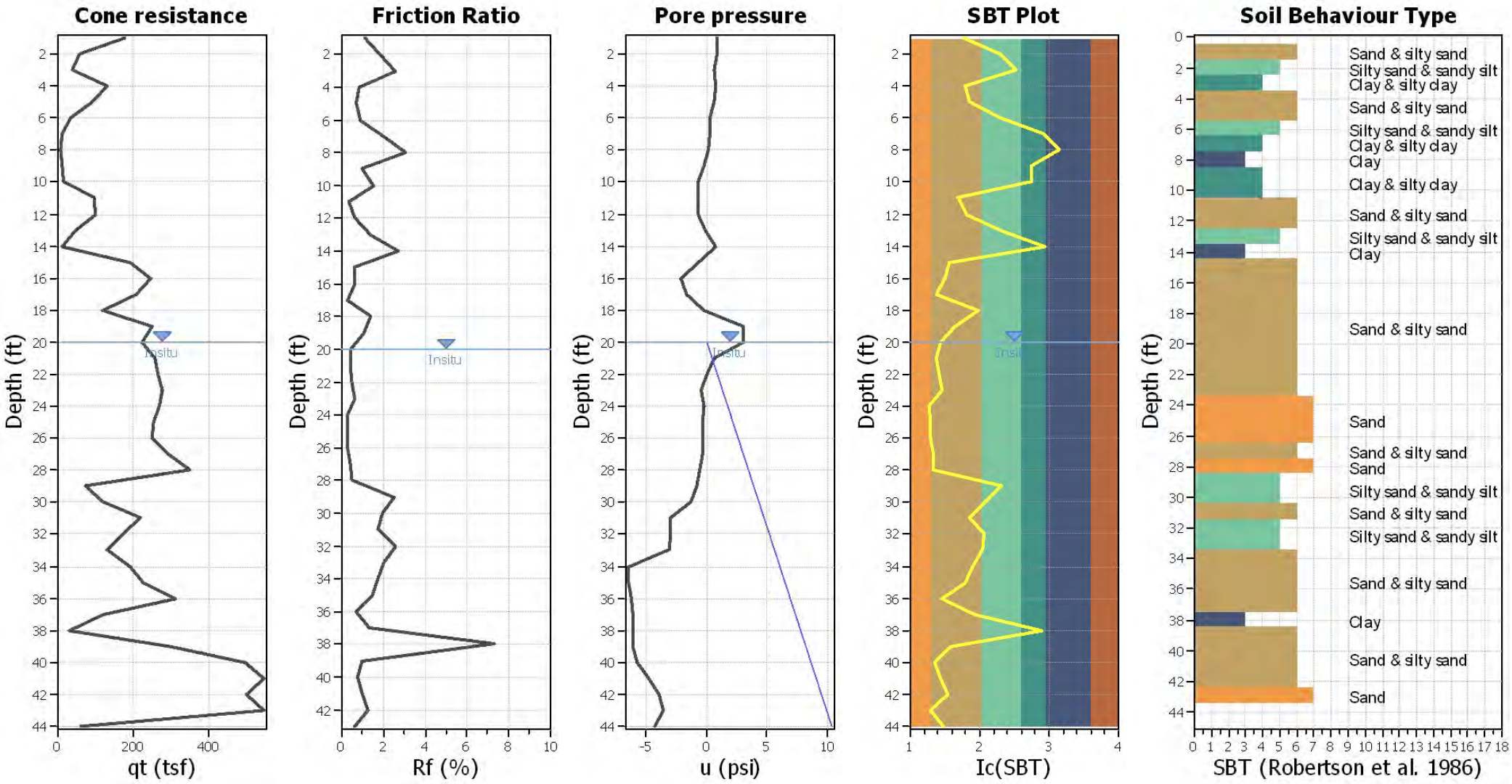






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



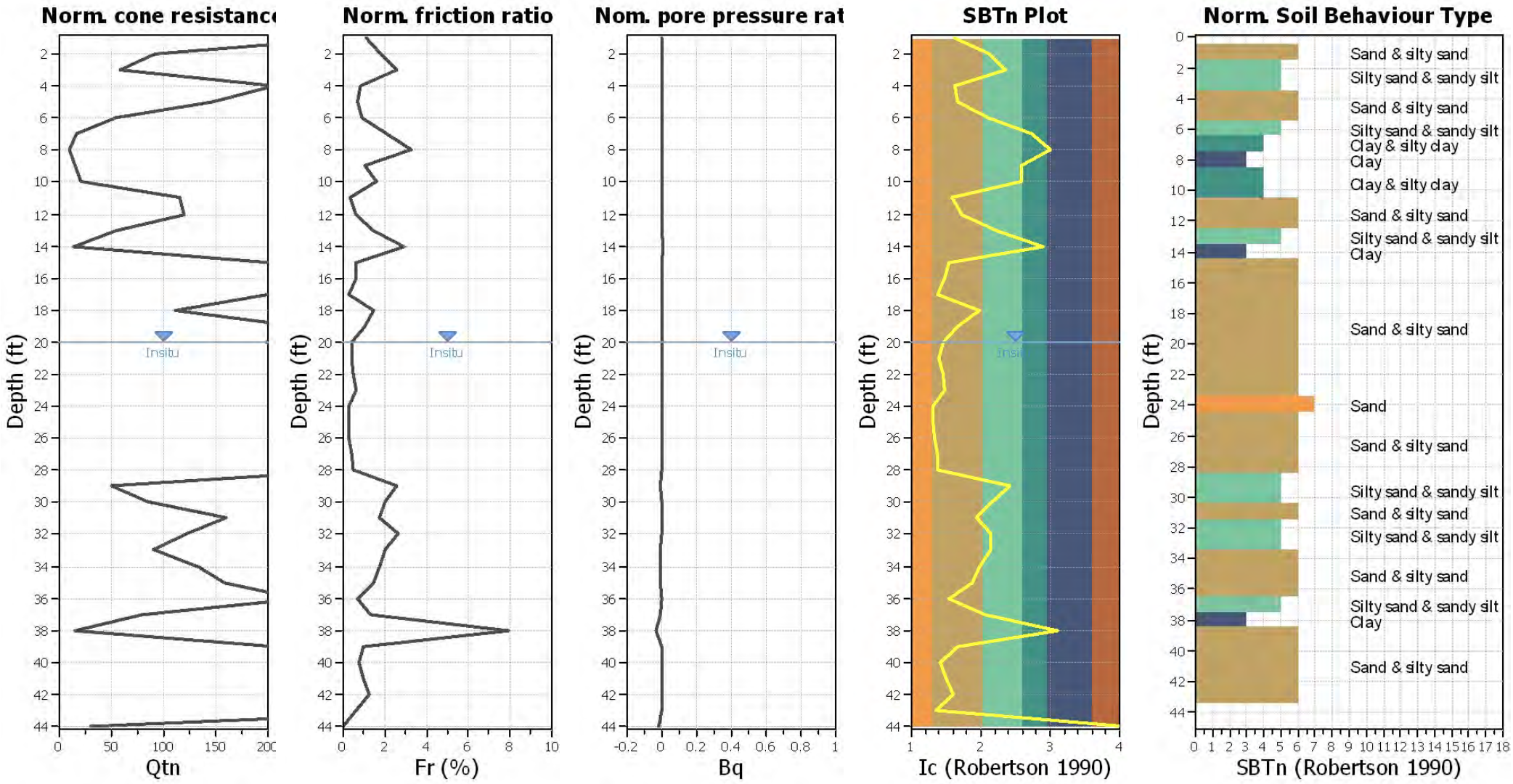
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



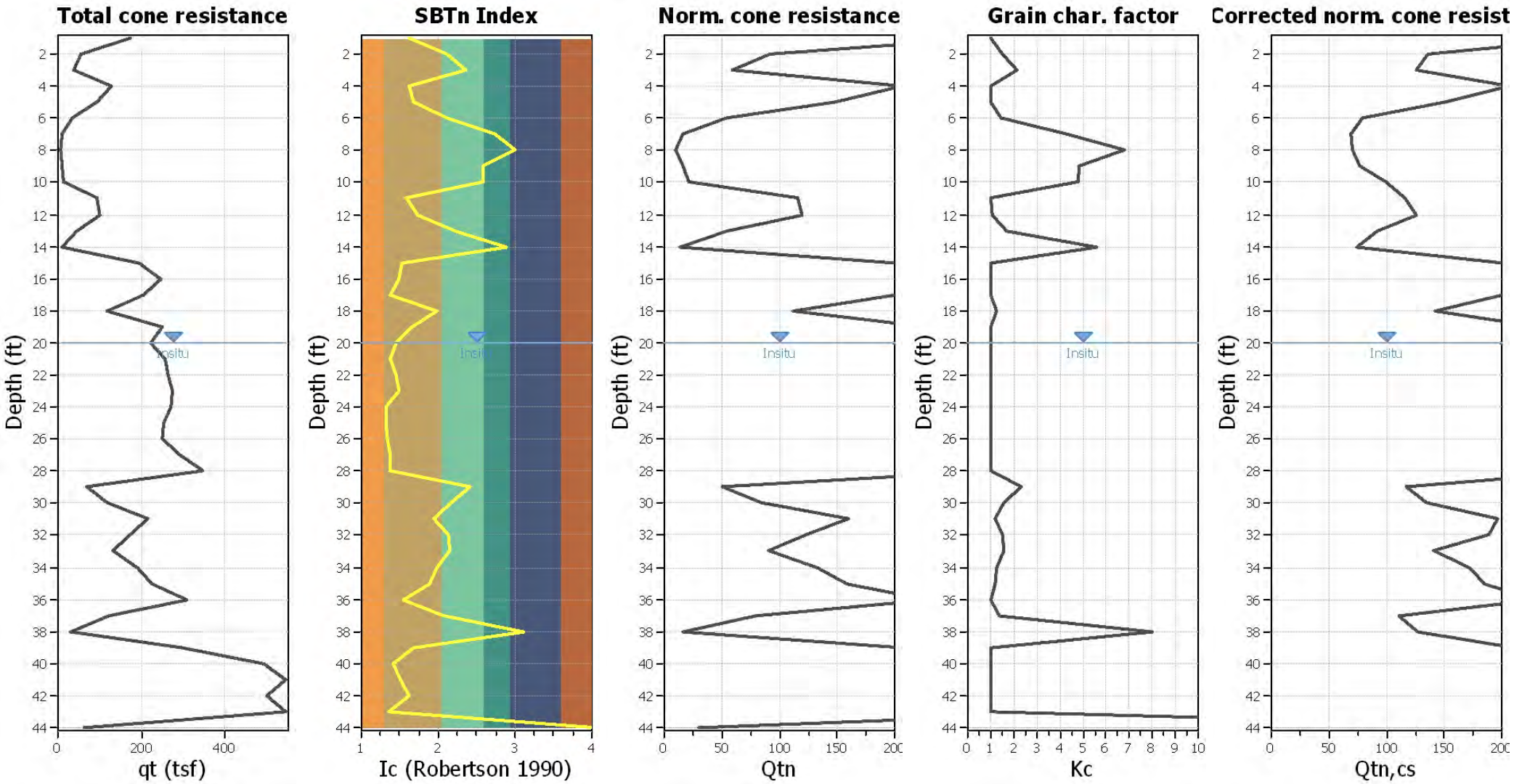
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

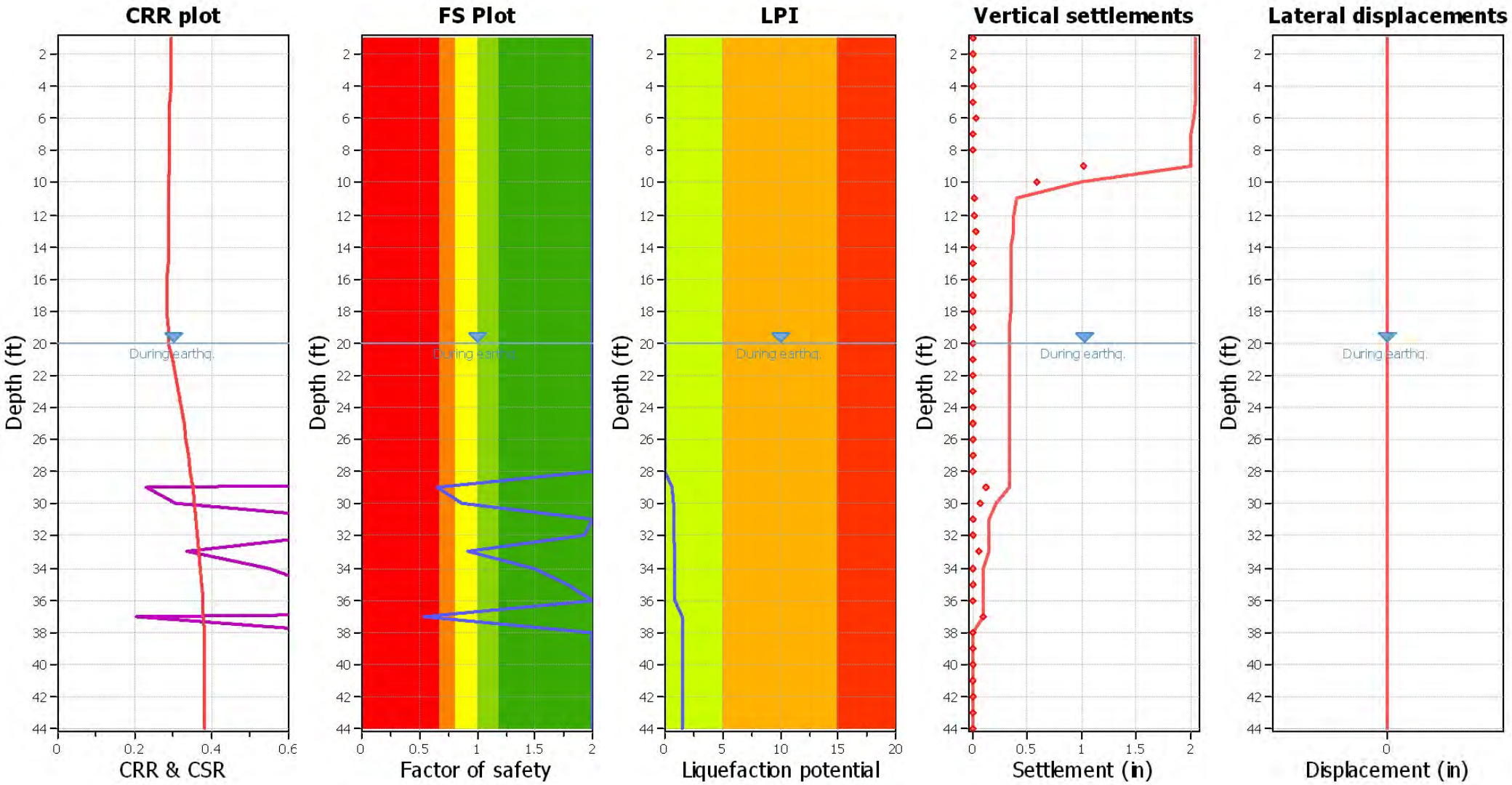
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

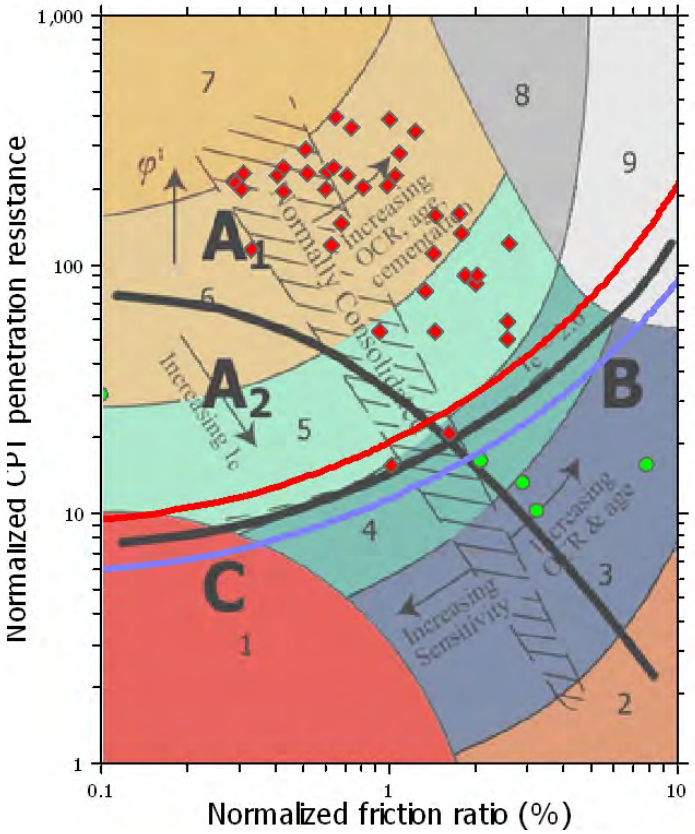
F.S. color scheme

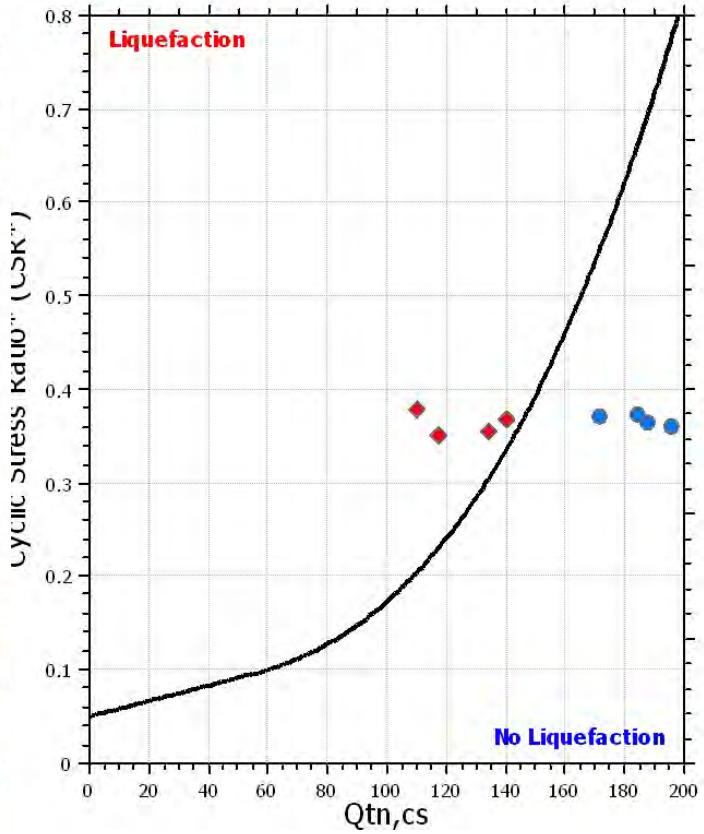
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

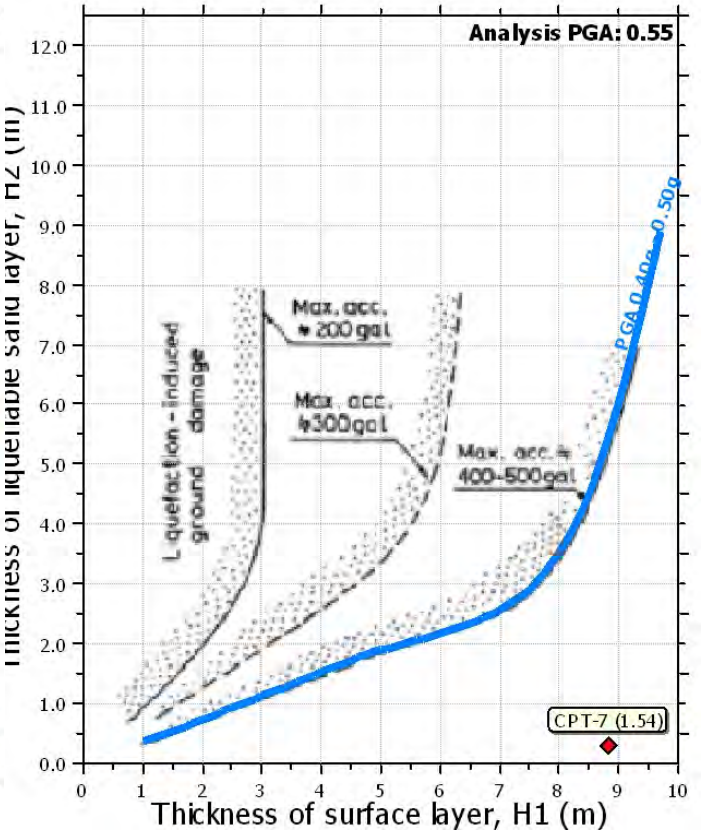
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



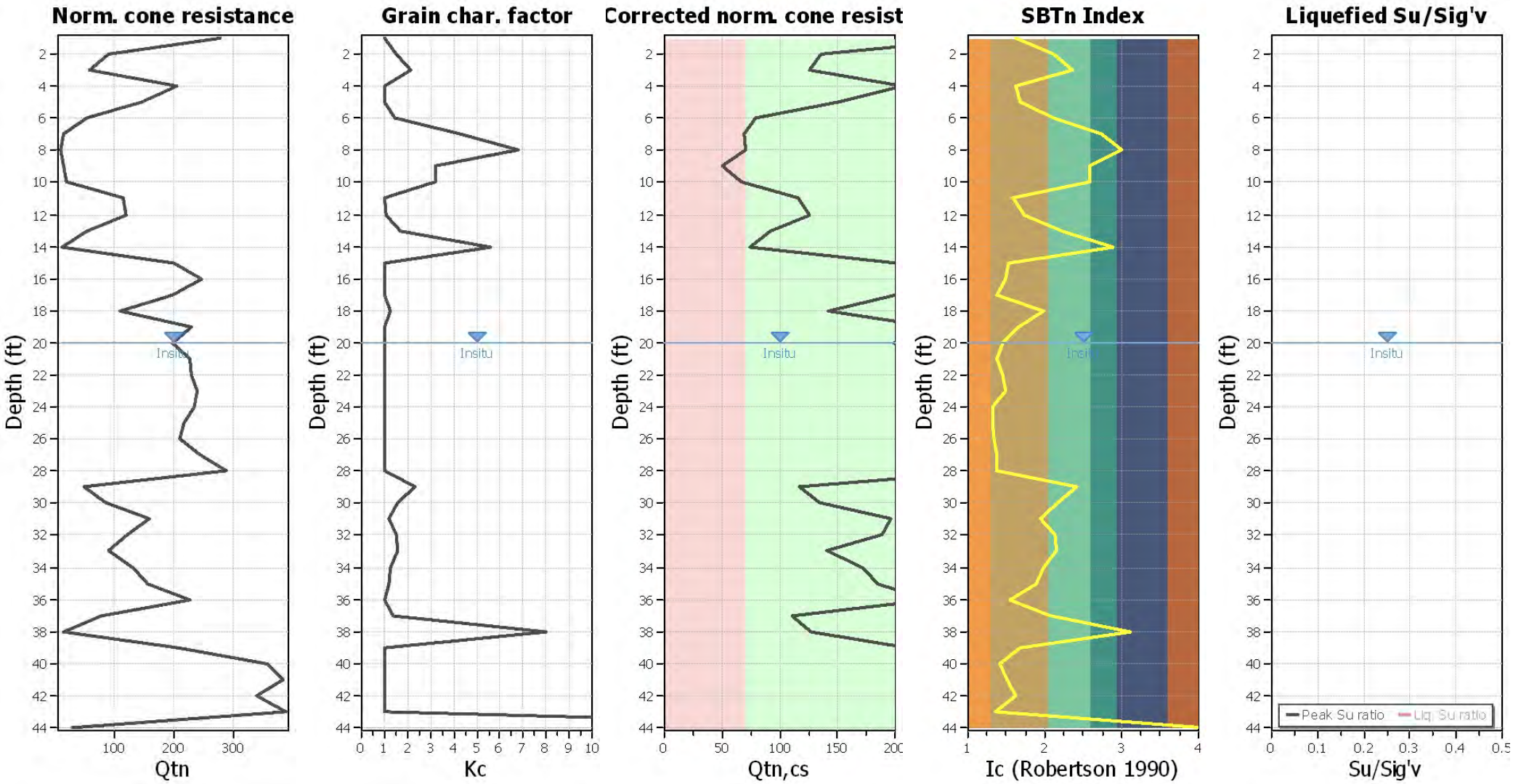




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

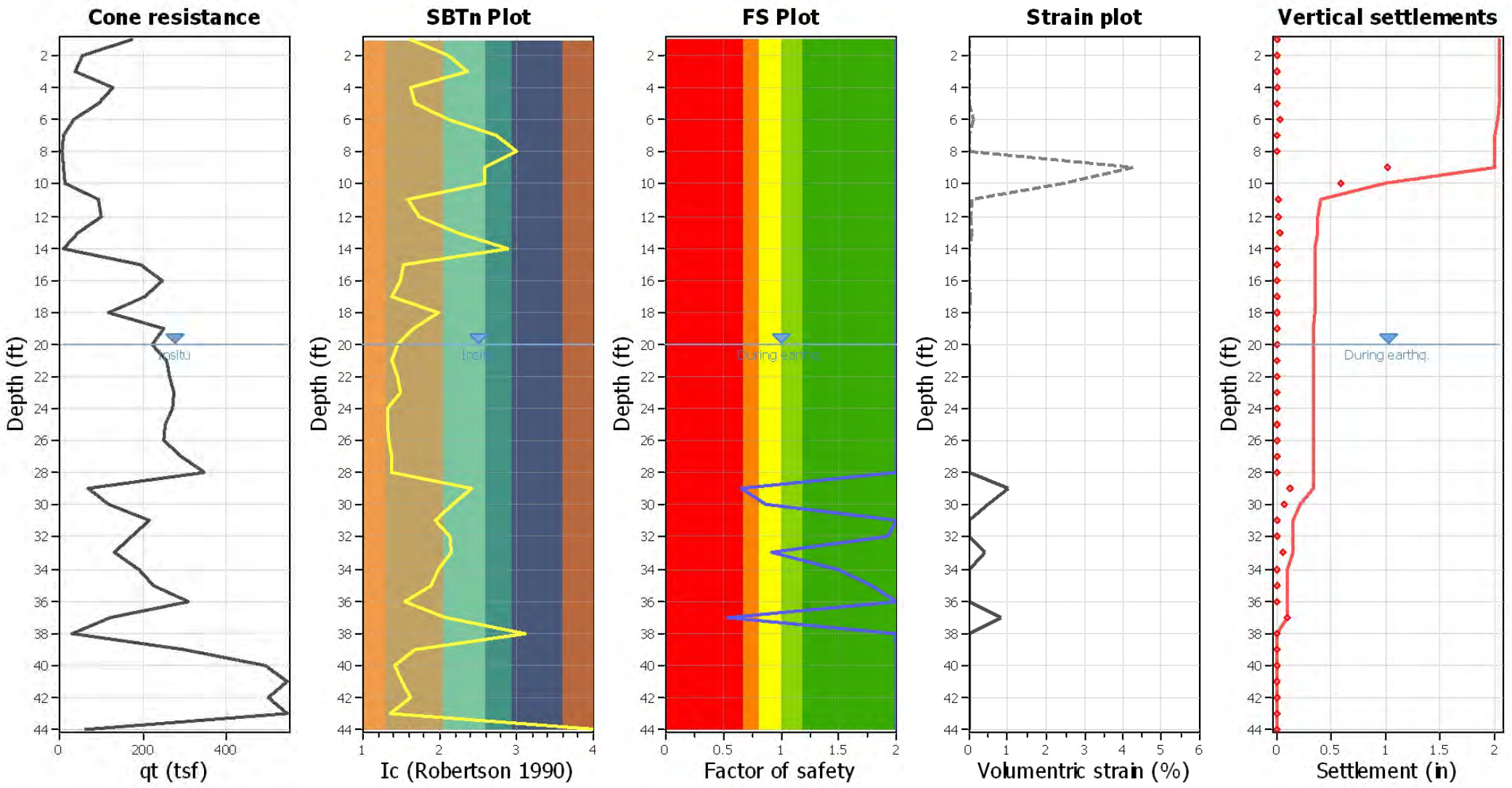
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	1.62	280.28	1.00	280.28	51	1216	0.29	0.002	0.00	8.63	0.00	0.000
2.00	2.11	91.43	1.48	135.53	30	746	0.29	0.008	0.00	8.63	0.00	0.001
3.00	2.35	58.94	2.13	125.78	30	651	0.29	0.016	0.01	8.63	0.01	0.002
4.00	1.62	205.82	1.00	205.82	37	893	0.29	0.014	0.01	8.63	0.00	0.001
5.00	1.67	147.84	1.02	150.88	28	690	0.29	0.029	0.02	8.63	0.01	0.003
6.00	2.11	53.62	1.47	78.73	17	433	0.29	0.152	0.18	8.63	0.13	0.031
7.00	2.74	16.12	4.28	68.94	0	0	0.29	0.000	0.00	10.85	0.00	0.000
8.00	3.01	10.33	6.82	70.40	0	0	0.29	0.000	0.00	0.00	0.00	0.000
9.00	2.58	15.79	3.22	50.82	14	233	0.29	20.113	31.86	8.63	4.25	1.020
10.00	2.58	20.90	3.21	67.13	18	308	0.29	3.326	3.78	8.63	2.45	0.589
11.00	1.59	115.24	1.00	115.24	21	635	0.29	0.119	0.11	8.63	0.07	0.017
12.00	1.73	119.45	1.06	126.15	24	798	0.29	0.072	0.06	8.63	0.04	0.009
13.00	2.22	53.54	1.72	92.23	21	653	0.29	0.151	0.14	8.63	0.09	0.021
14.00	2.89	13.33	5.58	74.46	0	0	0.29	0.000	0.00	10.85	0.00	0.000
15.00	1.54	200.90	1.00	200.90	35	1207	0.29	0.041	0.02	8.63	0.01	0.003
16.00	1.49	247.21	1.00	247.21	43	1451	0.28	0.033	0.01	8.63	0.01	0.002
17.00	1.37	199.56	1.00	199.56	33	1040	0.28	0.067	0.04	8.63	0.02	0.005
18.00	1.98	111.55	1.27	142.03	29	1287	0.28	0.047	0.03	8.63	0.02	0.004
19.00	1.67	229.28	1.01	232.48	43	1841	0.29	0.028	0.01	8.63	0.01	0.001

Total estimated settlement: 1.71

Abbreviations

Q_{tn}:	Equivalent clean sand normalized cone resistance
K_c:	Fines correction factor
$Q_{tn,cs}$:	Post-liquefaction volumentric strain
G_{max}:	Small strain shear modulus
CSR:	Soil cyclic stress ratio
γ:	Cyclic shear strain
$e_{vol(15)}$:	Volumetric strain after 15 cycles
N_c:	Equivalent number of cycles
e_v:	Volumetric strain
Settle.:	Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	198.35	2.00	0.00	0.67	0.00	21.00	228.63	2.00	0.00	0.65	0.00
22.00	230.63	2.00	0.00	0.63	0.00	23.00	238.84	2.00	0.00	0.62	0.00
24.00	233.98	2.00	0.00	0.60	0.00	25.00	217.77	2.00	0.00	0.58	0.00
26.00	211.80	2.00	0.00	0.57	0.00	27.00	244.01	2.00	0.00	0.55	0.00
28.00	287.77	2.00	0.00	0.53	0.00	29.00	117.45	0.66	1.01	0.52	0.12
30.00	134.44	0.86	0.51	0.50	0.06	31.00	195.96	2.00	0.00	0.48	0.00
32.00	188.23	1.93	0.00	0.47	0.00	33.00	140.28	0.92	0.43	0.45	0.05
34.00	171.91	1.49	0.00	0.43	0.00	35.00	184.61	1.78	0.00	0.42	0.00
36.00	228.55	2.00	0.00	0.40	0.00	37.00	110.31	0.54	0.83	0.38	0.10
38.00	126.42	1.99	0.00	0.37	0.00	39.00	211.52	2.00	0.00	0.35	0.00
40.00	358.25	2.00	0.00	0.33	0.00	41.00	383.99	2.00	0.00	0.32	0.00
42.00	339.72	2.00	0.00	0.30	0.00	43.00	389.14	2.00	0.00	0.28	0.00
44.00	800.55	2.00	0.00	0.27	0.00						

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)

Total estimated settlement: 0.33

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

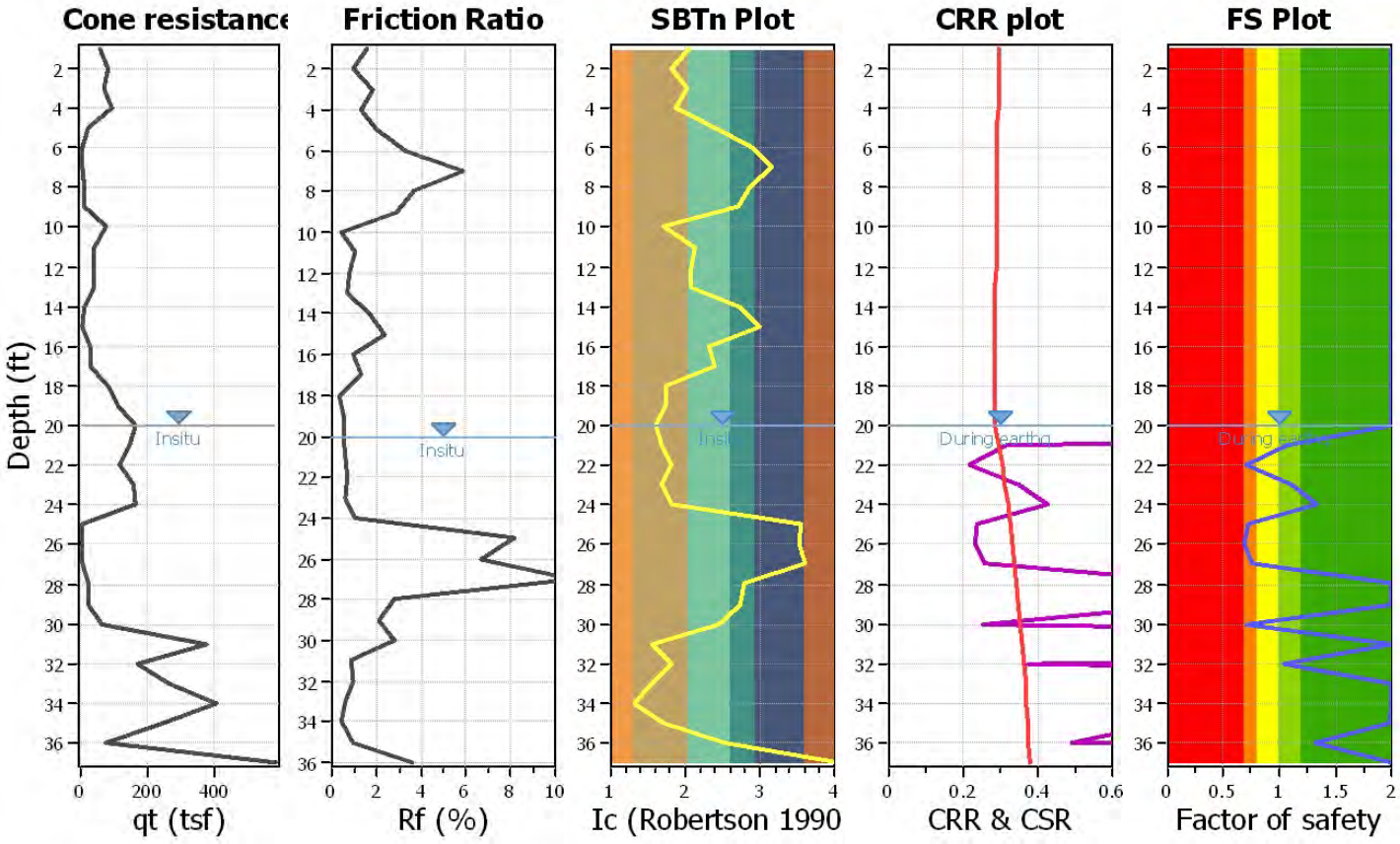
LIQUEFACTION ANALYSIS REPORT

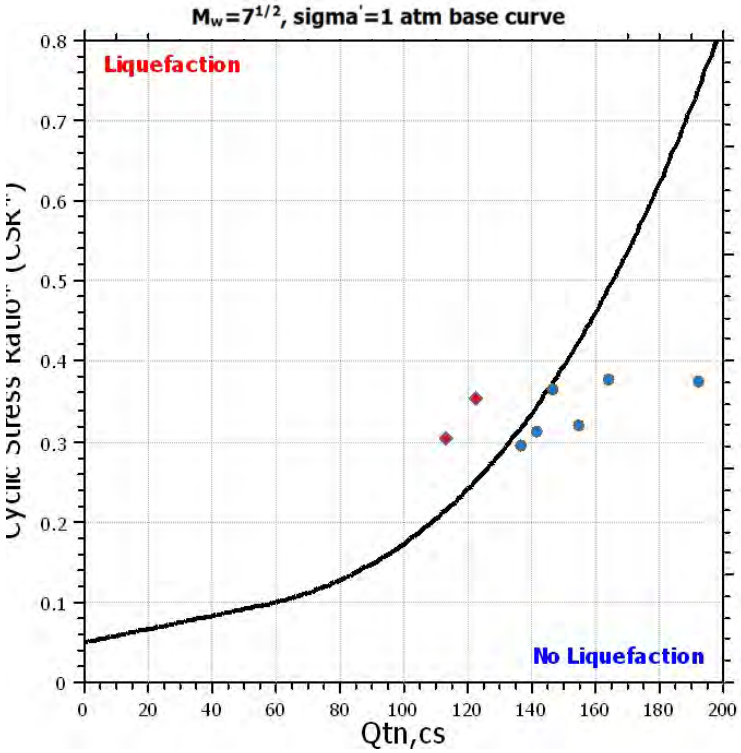
Project title : Ganahl SJC **Location :**

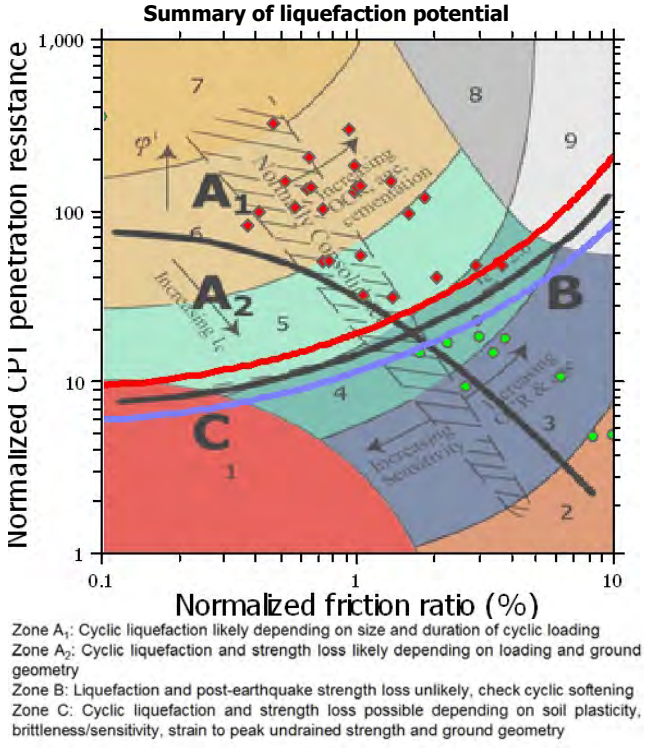
CPT file : CPT-8

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

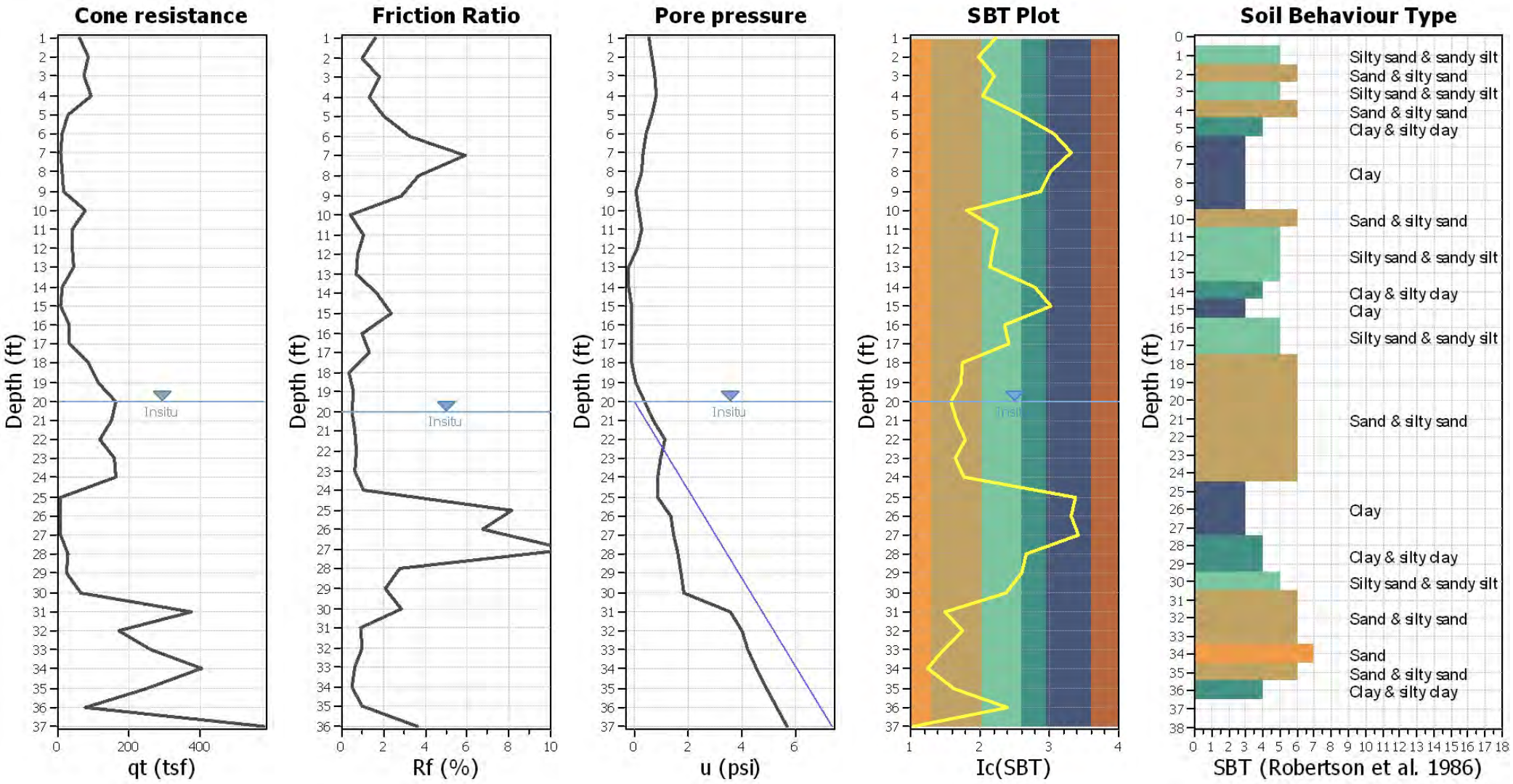






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



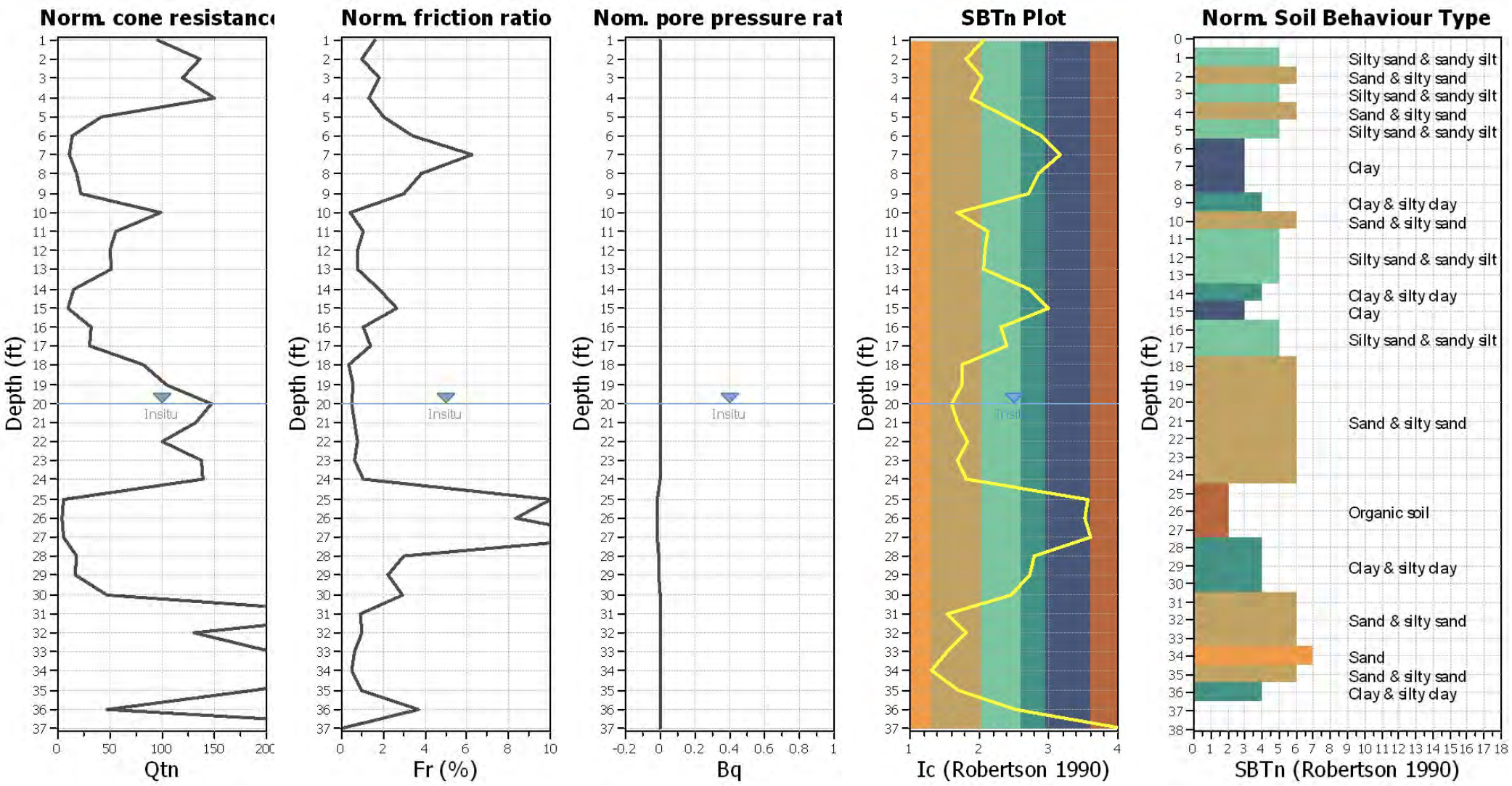
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



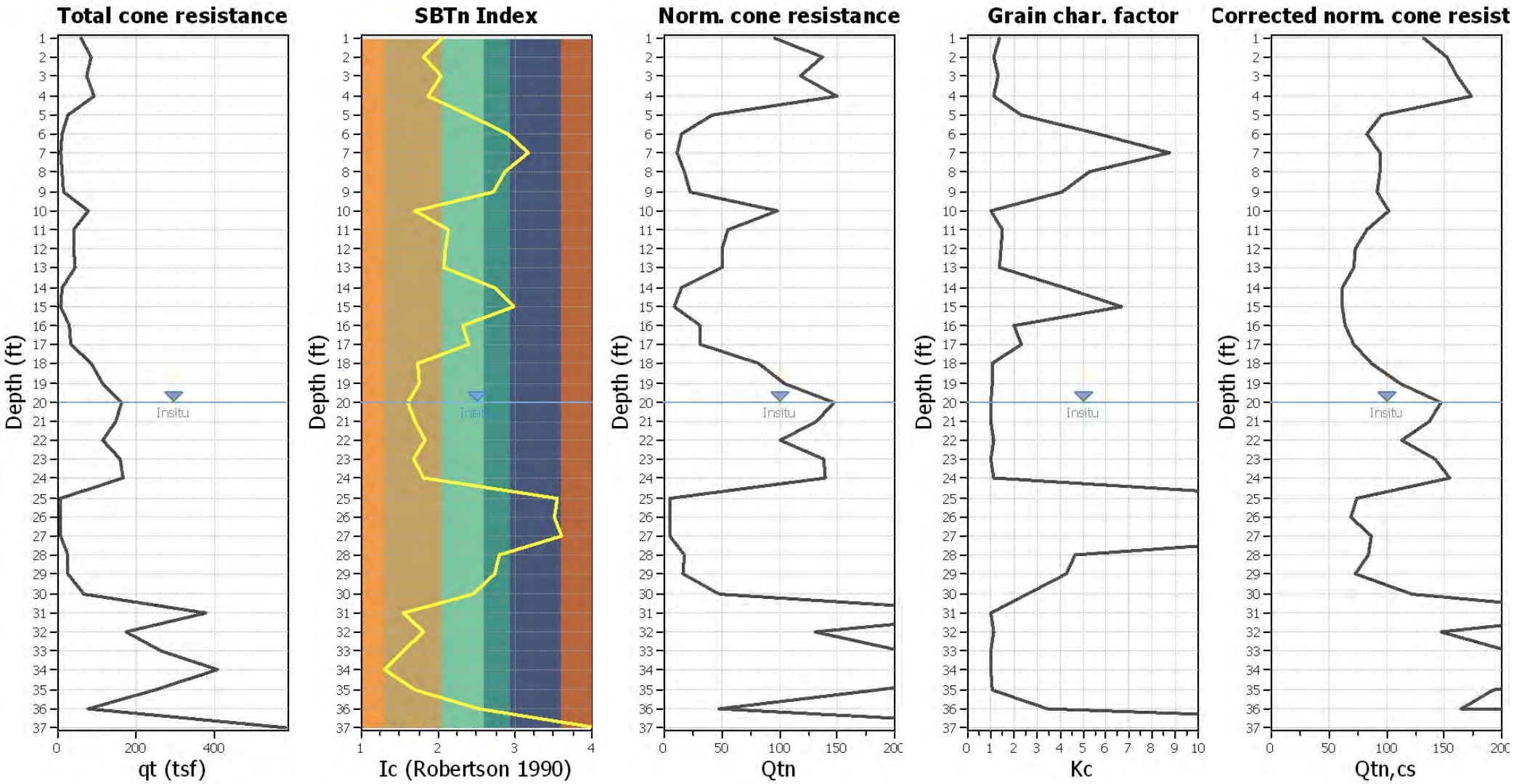
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

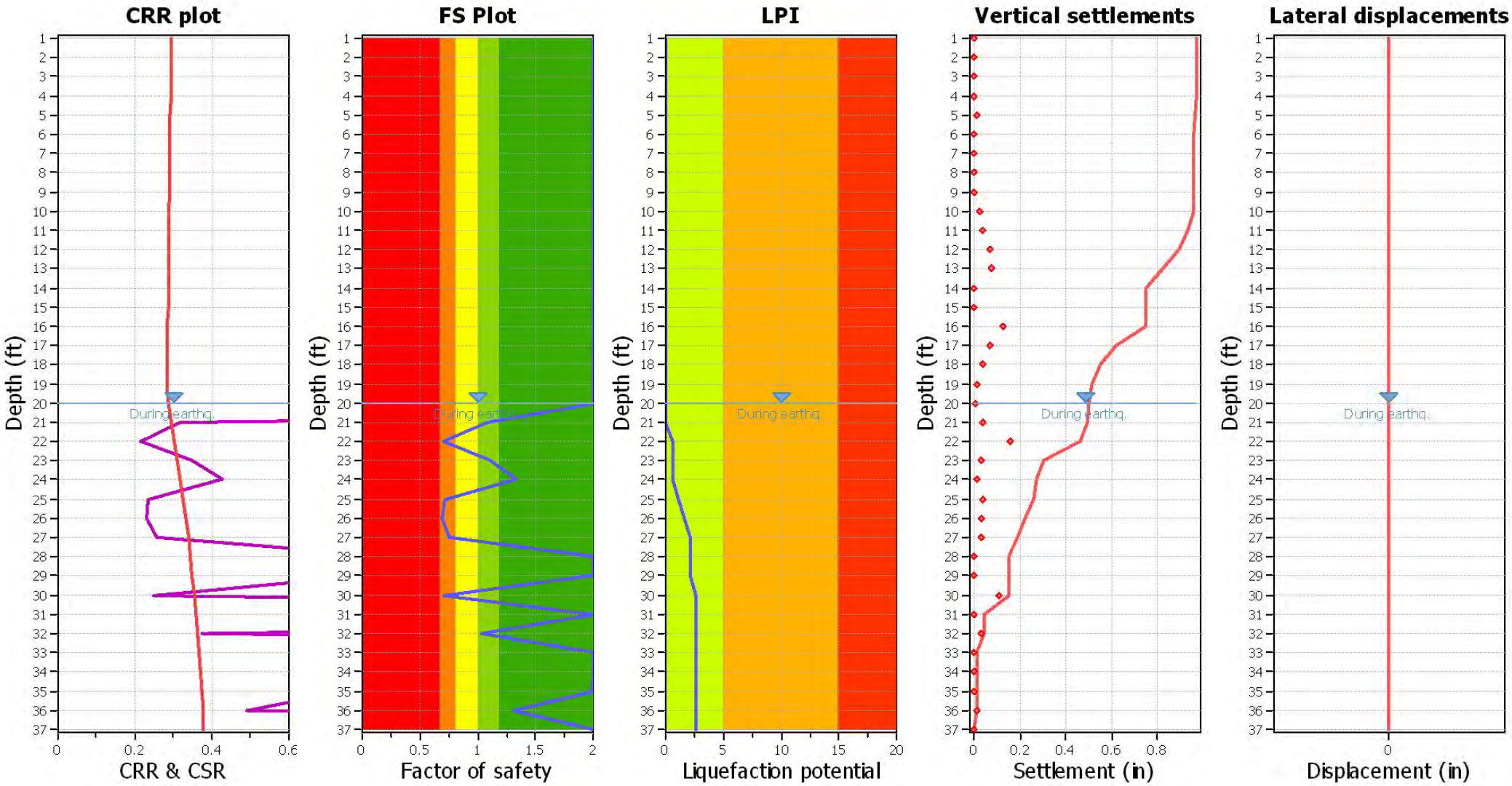
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

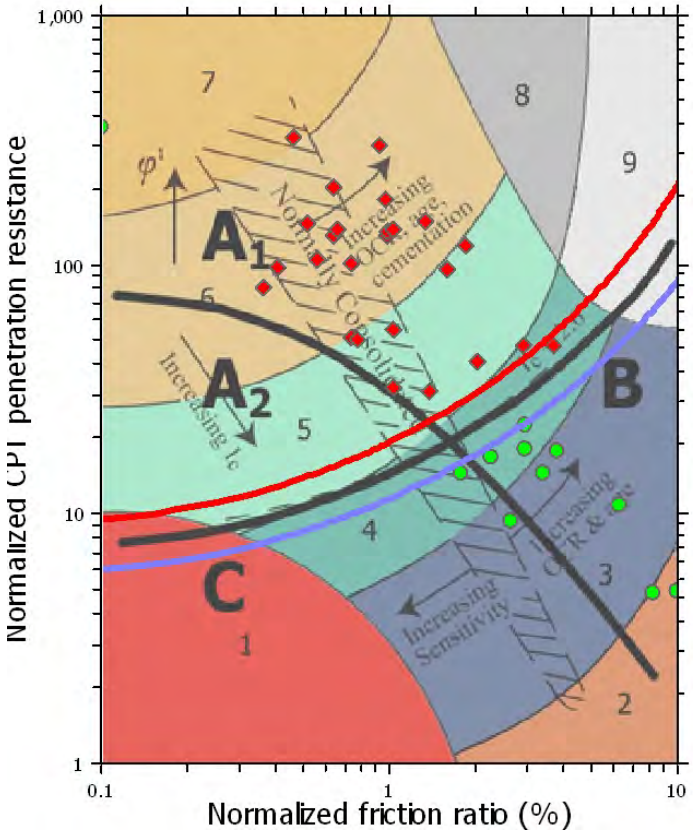
F.S. color scheme

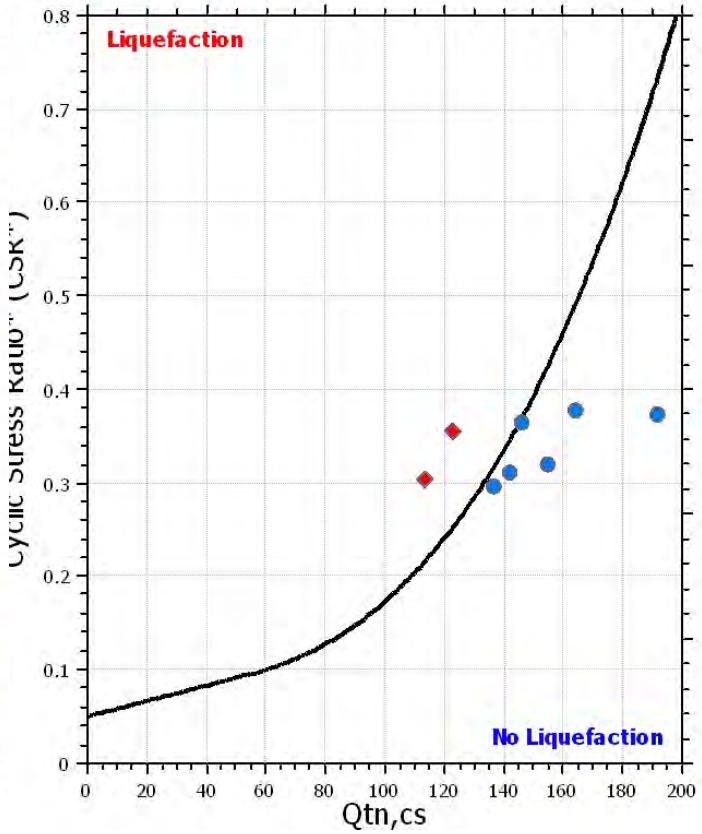
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

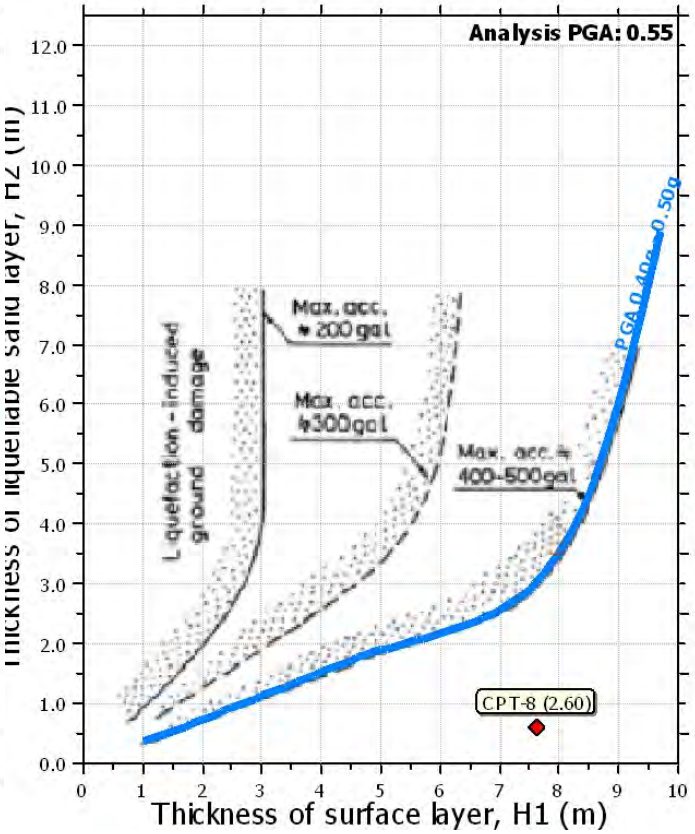
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



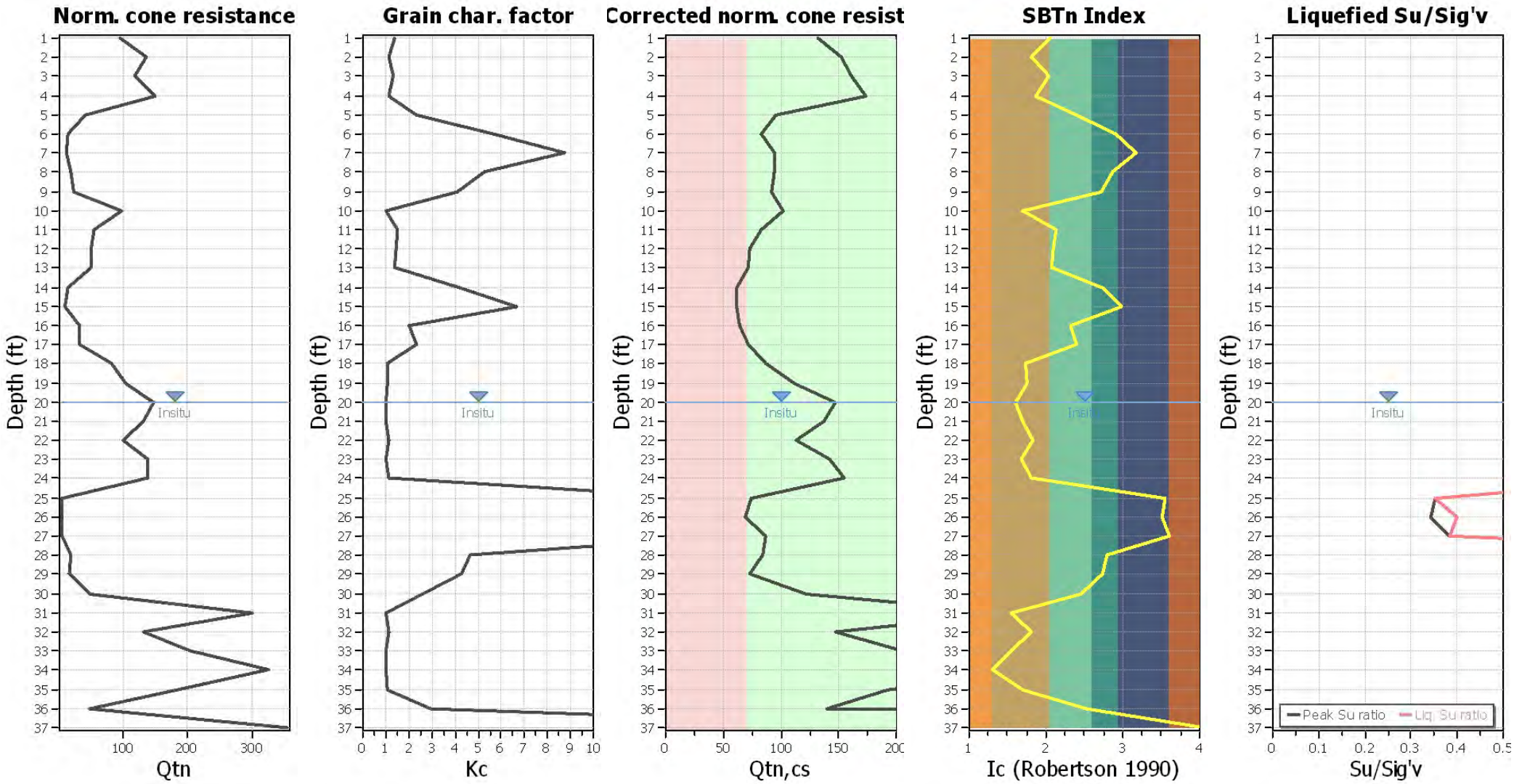




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

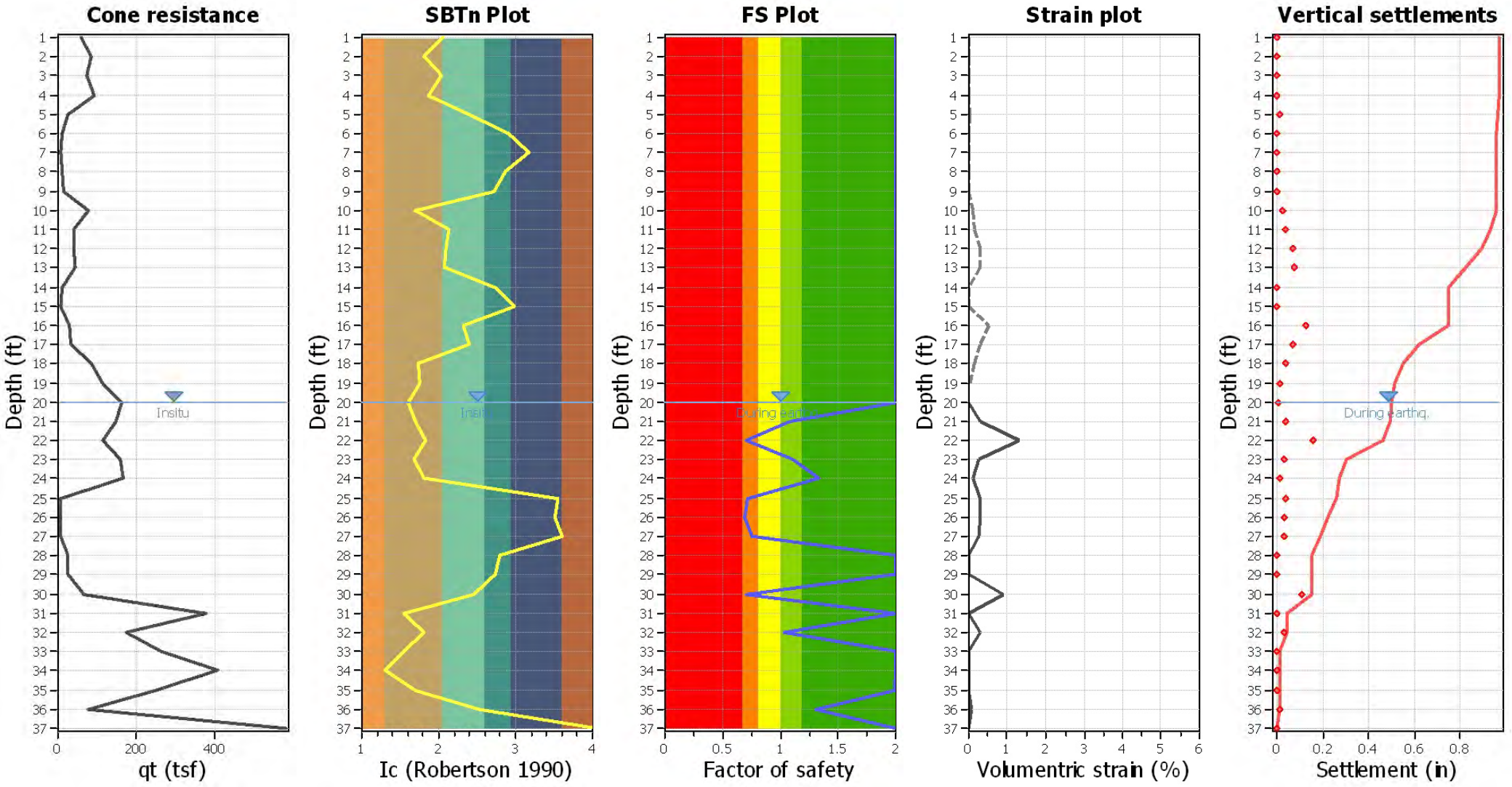
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	2.06	95.72	1.38	132.16	28	725	0.29	0.004	0.00	8.63	0.00	0.000
2.00	1.80	136.73	1.11	151.71	29	752	0.29	0.008	0.00	8.63	0.00	0.001
3.00	2.04	118.84	1.35	160.63	34	878	0.29	0.010	0.01	8.63	0.00	0.001
4.00	1.87	149.79	1.16	173.83	34	894	0.29	0.014	0.01	8.63	0.01	0.001
5.00	2.40	41.31	2.32	95.71	24	484	0.29	0.071	0.06	8.63	0.04	0.010
6.00	2.90	14.55	5.68	82.69	0	0	0.29	0.000	0.00	0.00	0.00	0.000
7.00	3.16	10.76	8.76	94.30	0	0	0.29	0.000	0.00	0.00	0.00	0.000
8.00	2.86	17.72	5.31	94.17	0	0	0.29	0.000	0.00	0.00	0.00	0.000
9.00	2.71	22.66	4.07	92.13	0	0	0.29	0.000	0.00	10.85	0.00	0.000
10.00	1.70	98.11	1.04	101.66	19	582	0.29	0.136	0.15	8.63	0.09	0.023
11.00	2.12	55.00	1.50	82.53	18	540	0.29	0.219	0.25	8.63	0.16	0.038
12.00	2.09	50.63	1.43	72.35	16	504	0.29	0.356	0.48	8.63	0.30	0.072
13.00	2.07	50.80	1.40	71.37	15	524	0.29	0.361	0.50	8.63	0.30	0.073
14.00	2.73	14.62	4.24	62.05	0	0	0.29	0.000	0.00	10.85	0.00	0.000
15.00	2.99	9.37	6.64	62.18	0	0	0.29	0.000	0.00	10.85	0.00	0.000
16.00	2.32	32.03	2.02	64.61	15	509	0.28	0.674	0.93	8.63	0.53	0.127
17.00	2.40	31.24	2.30	71.96	18	571	0.28	0.451	0.52	8.63	0.29	0.070
18.00	1.74	81.74	1.07	87.27	17	692	0.28	0.235	0.29	8.63	0.16	0.039
19.00	1.75	104.58	1.07	111.79	21	916	0.28	0.107	0.10	8.63	0.05	0.013

Total estimated settlement: 0.47

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	147.71	2.00	0.00	0.67	0.00	21.00	136.70	1.08	0.29	0.65	0.04
22.00	113.19	0.71	1.31	0.63	0.16	23.00	141.96	1.11	0.27	0.62	0.03
24.00	154.94	1.34	0.13	0.60	0.02	25.00	74.55	0.72	0.29	0.58	0.04
26.00	68.97	0.69	0.28	0.57	0.03	27.00	86.21	0.76	0.28	0.55	0.03
28.00	84.69	2.00	0.00	0.53	0.00	29.00	72.42	2.00	0.00	0.52	0.00
30.00	122.49	0.71	0.92	0.50	0.11	31.00	300.96	2.00	0.00	0.48	0.00
32.00	146.60	1.03	0.29	0.47	0.03	33.00	204.55	2.00	0.00	0.45	0.00
34.00	324.69	2.00	0.00	0.43	0.00	35.00	192.27	1.99	0.00	0.42	0.00
36.00	164.17	1.31	0.08	0.40	0.01	37.00	9446.94	2.00	0.00	0.38	0.00

Total estimated settlement: 0.50

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

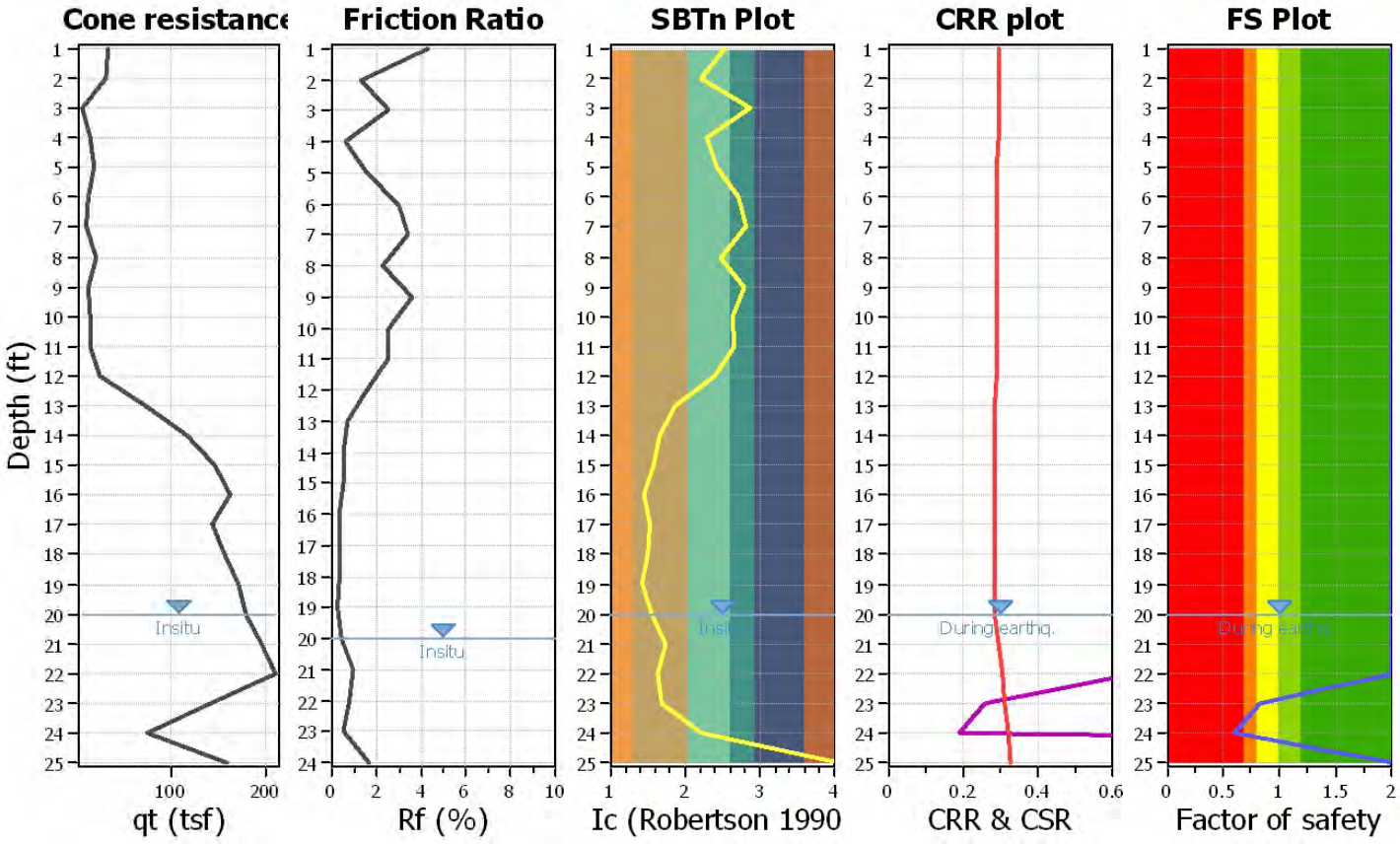
LIQUEFACTION ANALYSIS REPORT

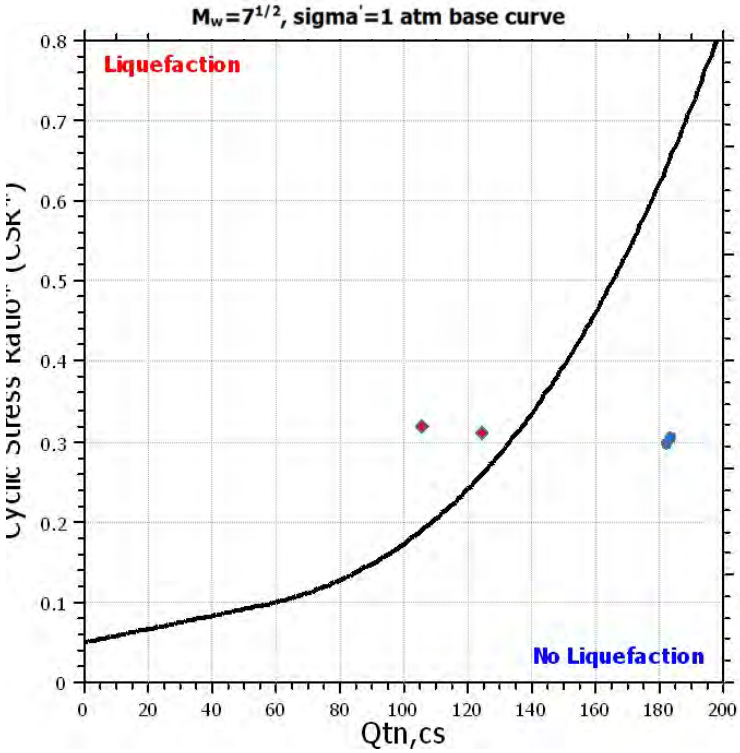
Project title : Ganahl SJC **Location :**

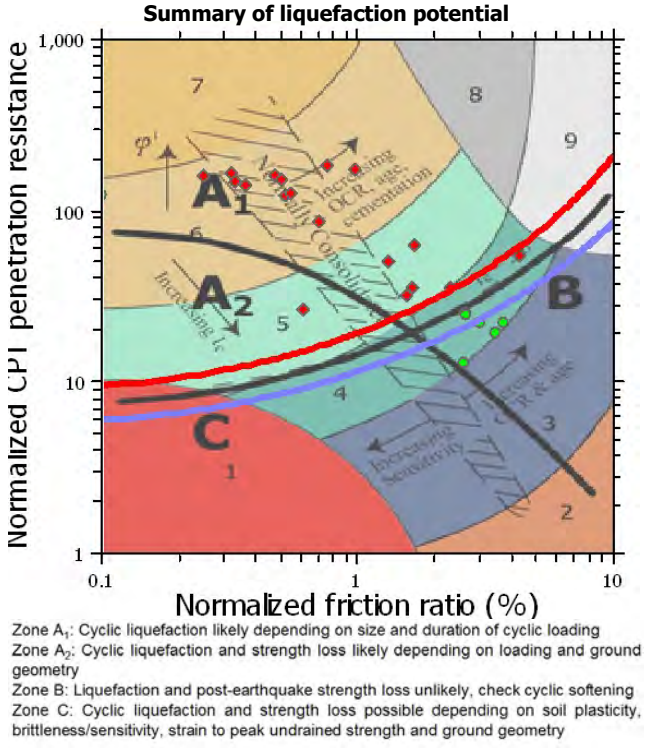
CPT file : CPT-9

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

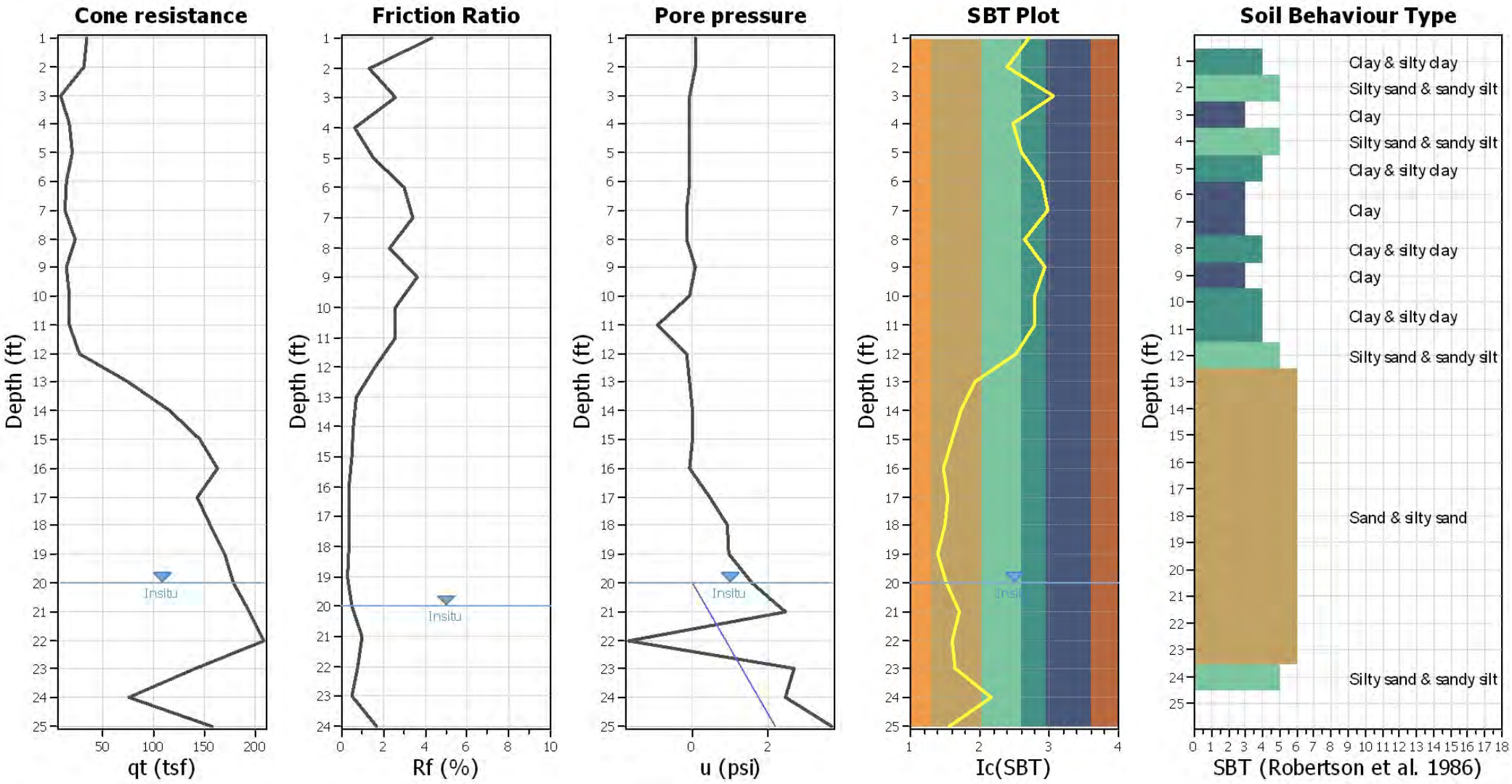






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



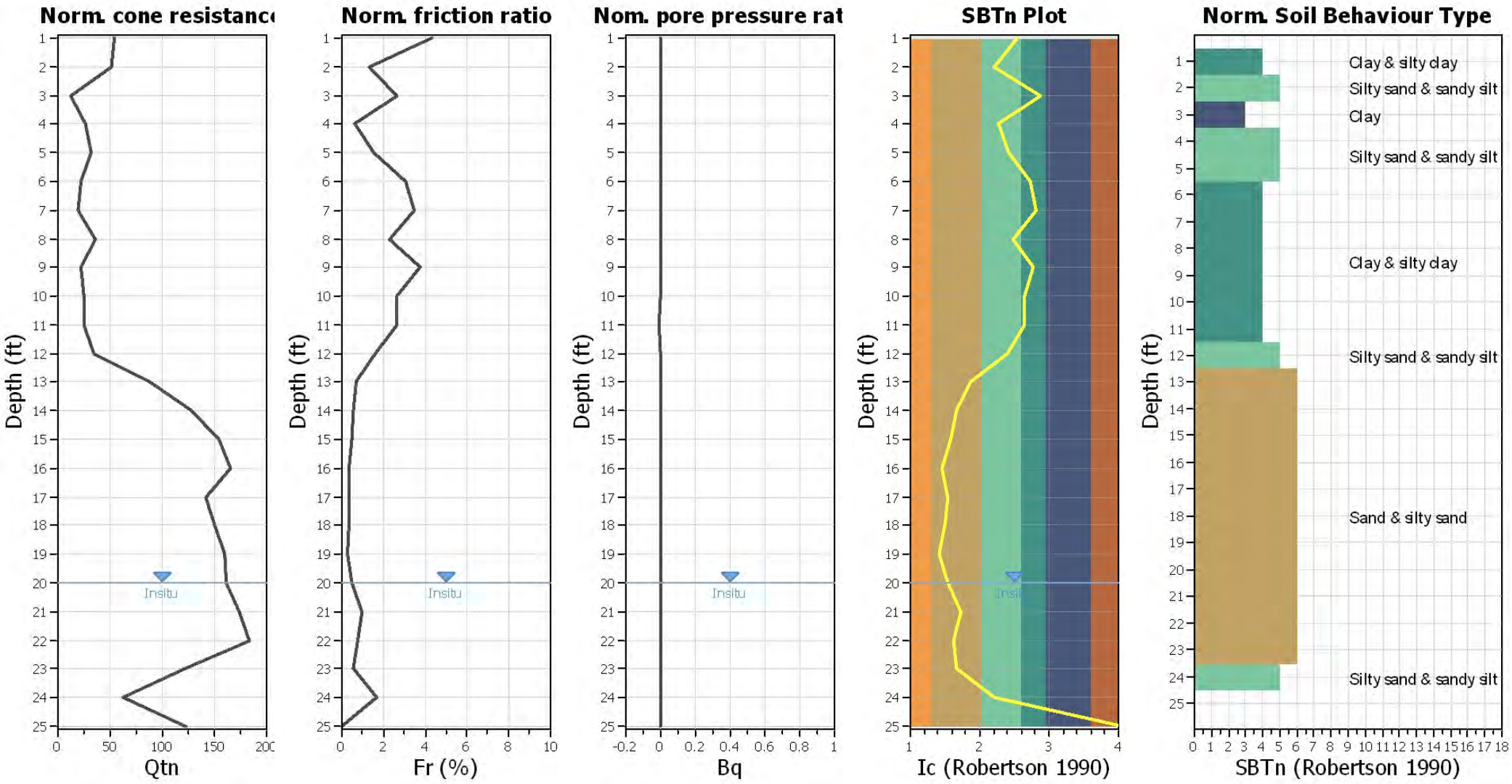
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



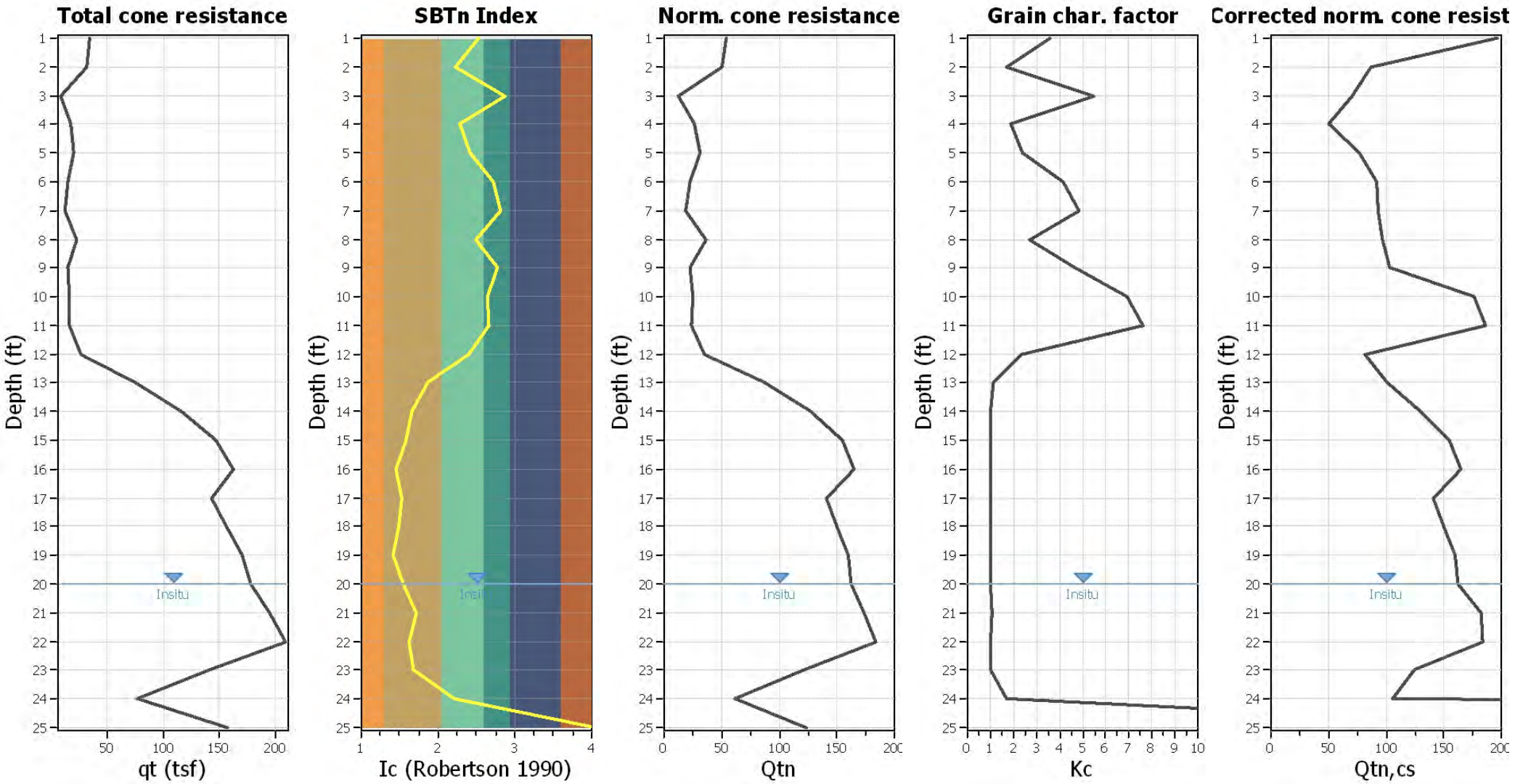
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

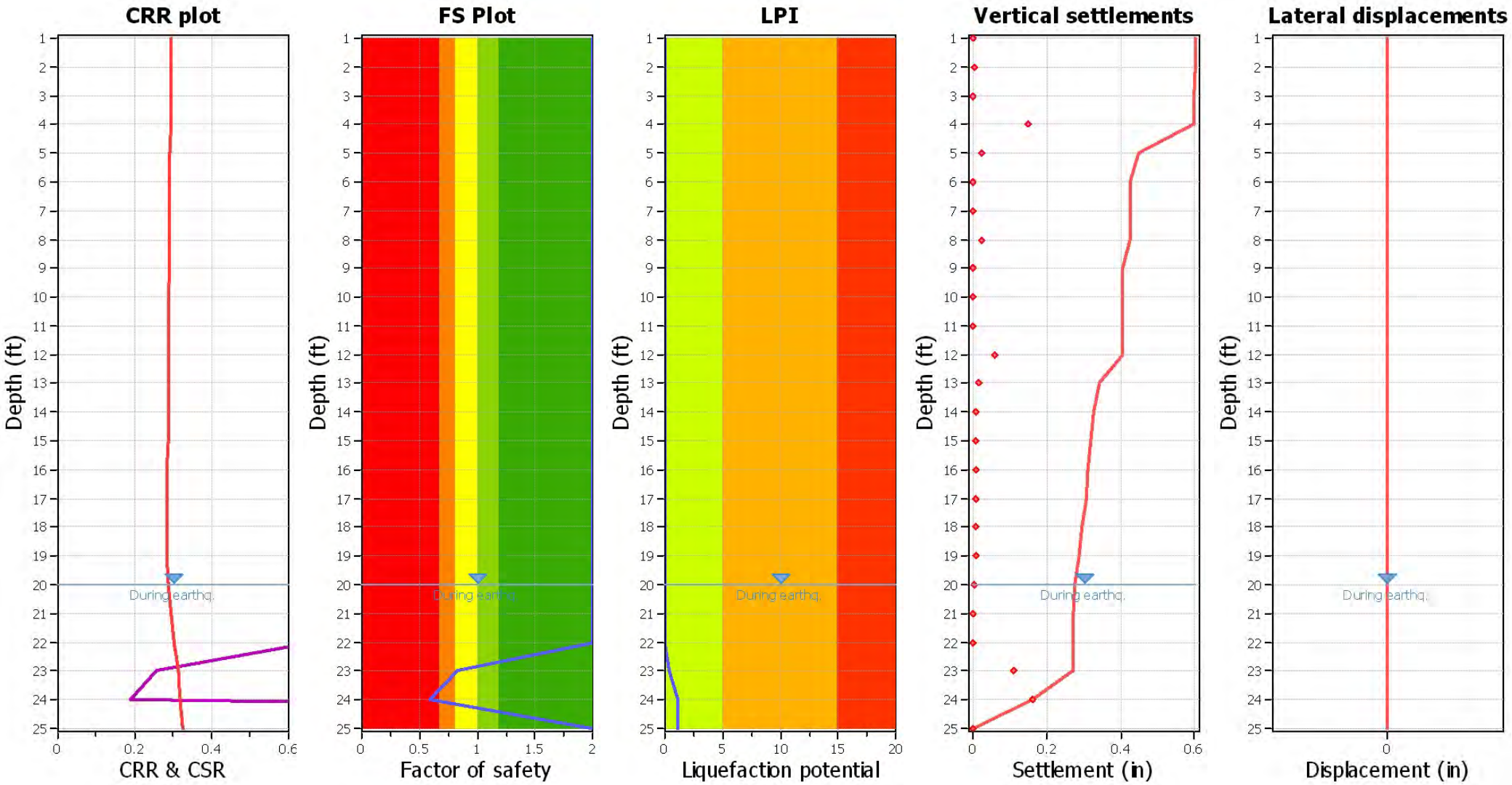
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

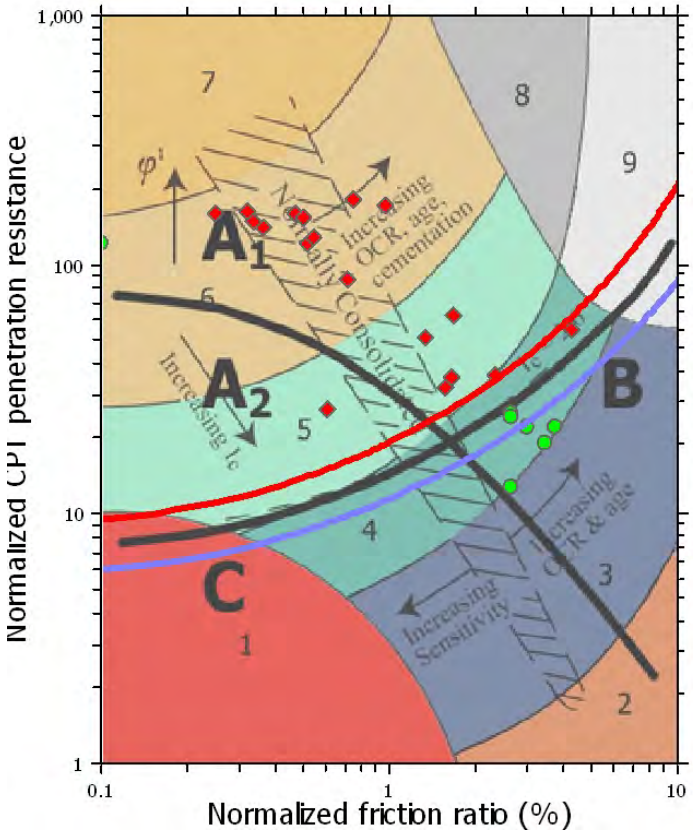
F.S. color scheme

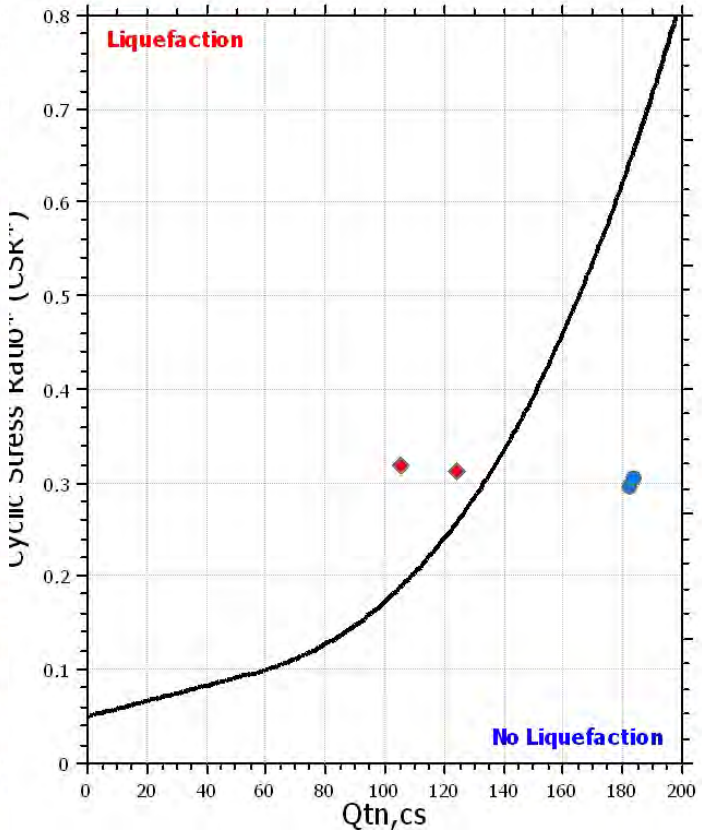
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

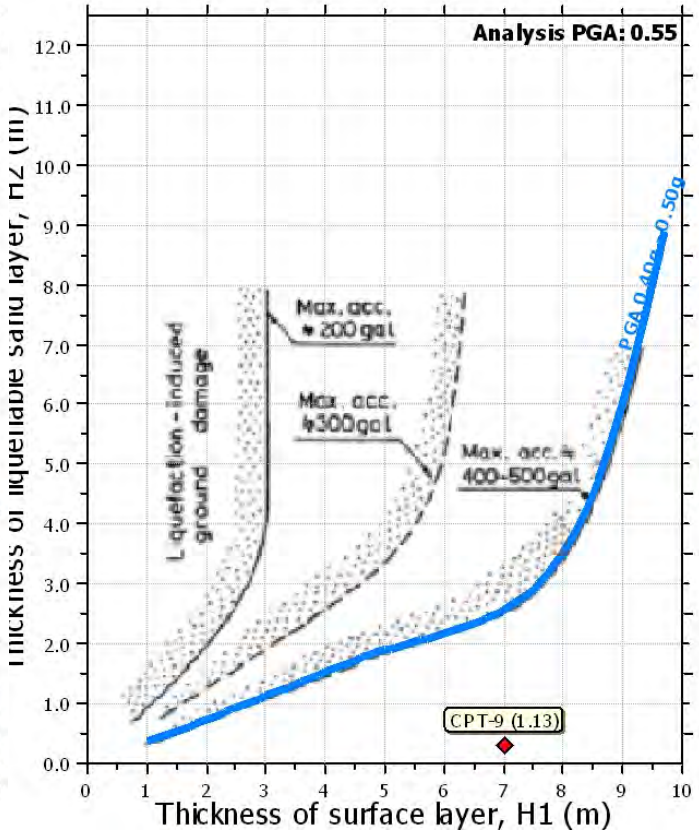
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



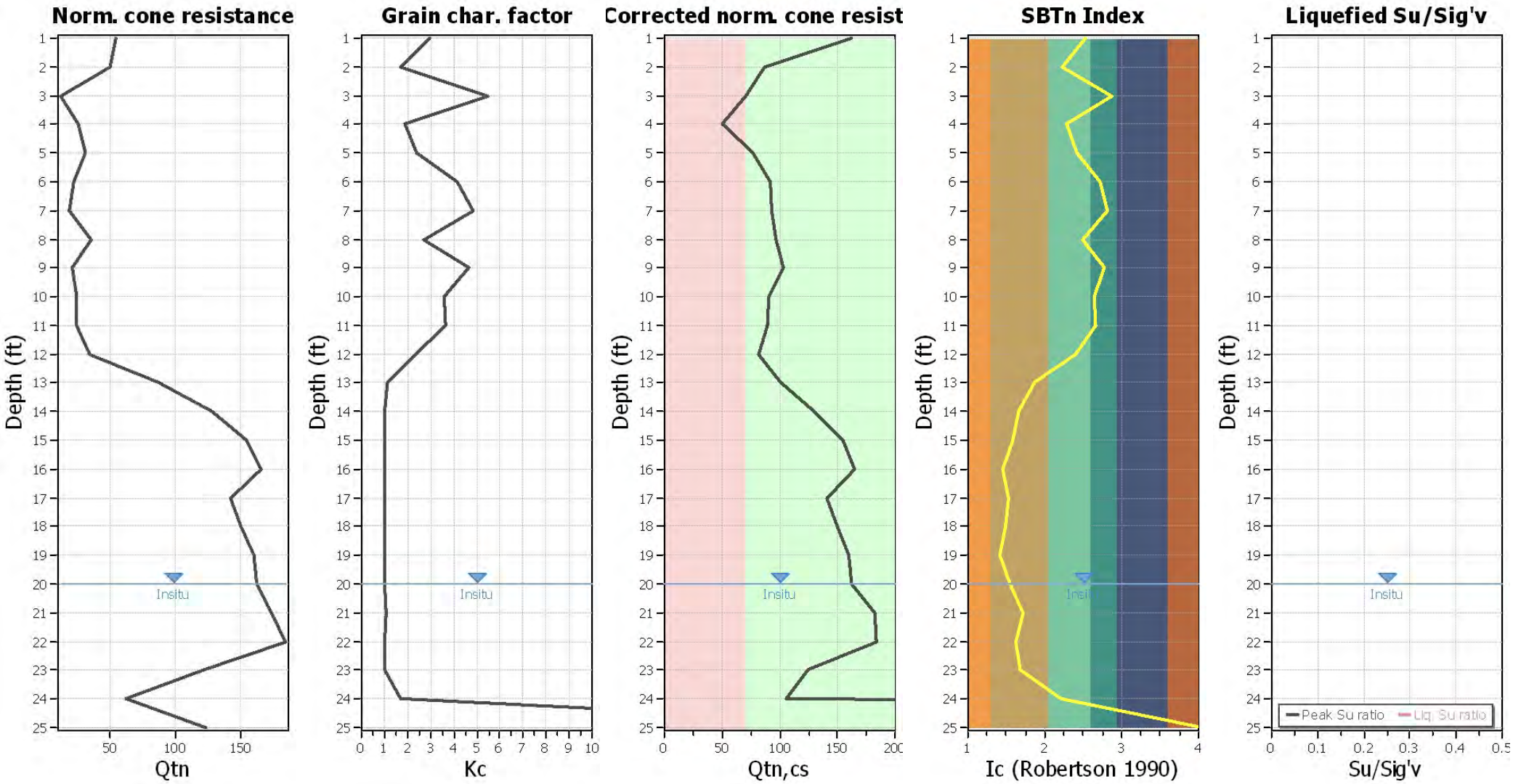




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

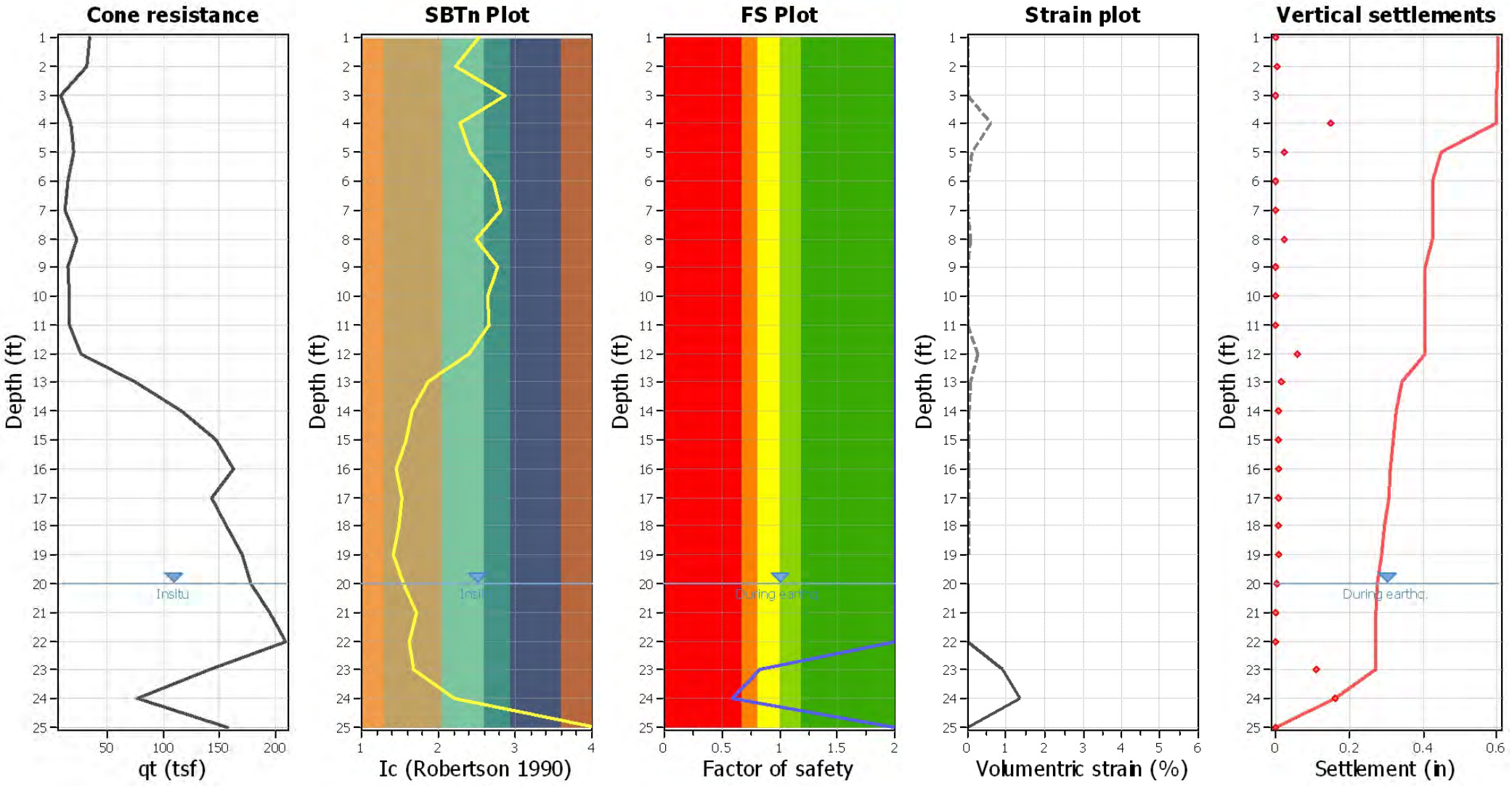
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	2.54	54.59	2.96	161.77	42	760	0.29	0.003	0.00	8.63	0.00	0.000
2.00	2.22	50.82	1.71	86.89	20	472	0.29	0.016	0.02	8.63	0.01	0.003
3.00	2.88	12.82	5.46	70.06	0	0	0.29	0.000	0.00	10.85	0.00	0.000
4.00	2.28	26.49	1.88	49.91	12	266	0.29	0.445	0.85	8.63	0.62	0.149
5.00	2.42	31.93	2.40	76.63	19	384	0.29	0.136	0.14	8.63	0.10	0.025
6.00	2.72	22.28	4.14	92.30	0	0	0.29	0.000	0.00	0.00	0.00	0.000
7.00	2.81	19.35	4.83	93.56	0	0	0.29	0.000	0.00	0.00	0.00	0.000
8.00	2.48	36.03	2.69	97.01	25	469	0.29	0.173	0.13	8.63	0.09	0.022
9.00	2.78	22.20	4.63	102.68	0	0	0.29	0.000	0.00	0.00	0.00	0.000
10.00	2.64	25.46	3.57	90.90	0	0	0.29	0.000	0.00	0.00	0.00	0.000
11.00	2.65	24.45	3.67	89.71	0	0	0.29	0.000	0.00	10.85	0.00	0.000
12.00	2.40	35.29	2.30	81.22	20	483	0.29	0.399	0.40	8.63	0.25	0.060
13.00	1.87	86.95	1.16	100.90	20	702	0.29	0.114	0.11	8.63	0.07	0.017
14.00	1.67	127.67	1.02	129.58	24	856	0.29	0.075	0.06	8.63	0.04	0.009
15.00	1.58	154.26	1.00	154.26	28	967	0.29	0.063	0.04	8.63	0.02	0.006
16.00	1.45	164.58	1.00	164.58	28	913	0.28	0.080	0.05	8.63	0.03	0.007
17.00	1.53	141.38	1.00	141.38	25	895	0.28	0.094	0.07	8.63	0.04	0.010
18.00	1.49	149.43	1.00	149.43	26	927	0.28	0.095	0.07	8.63	0.04	0.009
19.00	1.41	159.33	1.00	159.33	27	909	0.28	0.109	0.08	8.63	0.04	0.010

Total estimated settlement: 0.33

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	161.74	2.00	0.00	0.67	0.00	21.00	182.58	2.00	0.00	0.65	0.00
22.00	183.85	2.00	0.00	0.63	0.00	23.00	124.15	0.83	0.91	0.62	0.11
24.00	105.33	0.59	1.34	0.60	0.16	25.00	3264.49	2.00	0.00	0.58	0.00

Total estimated settlement: 0.27

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

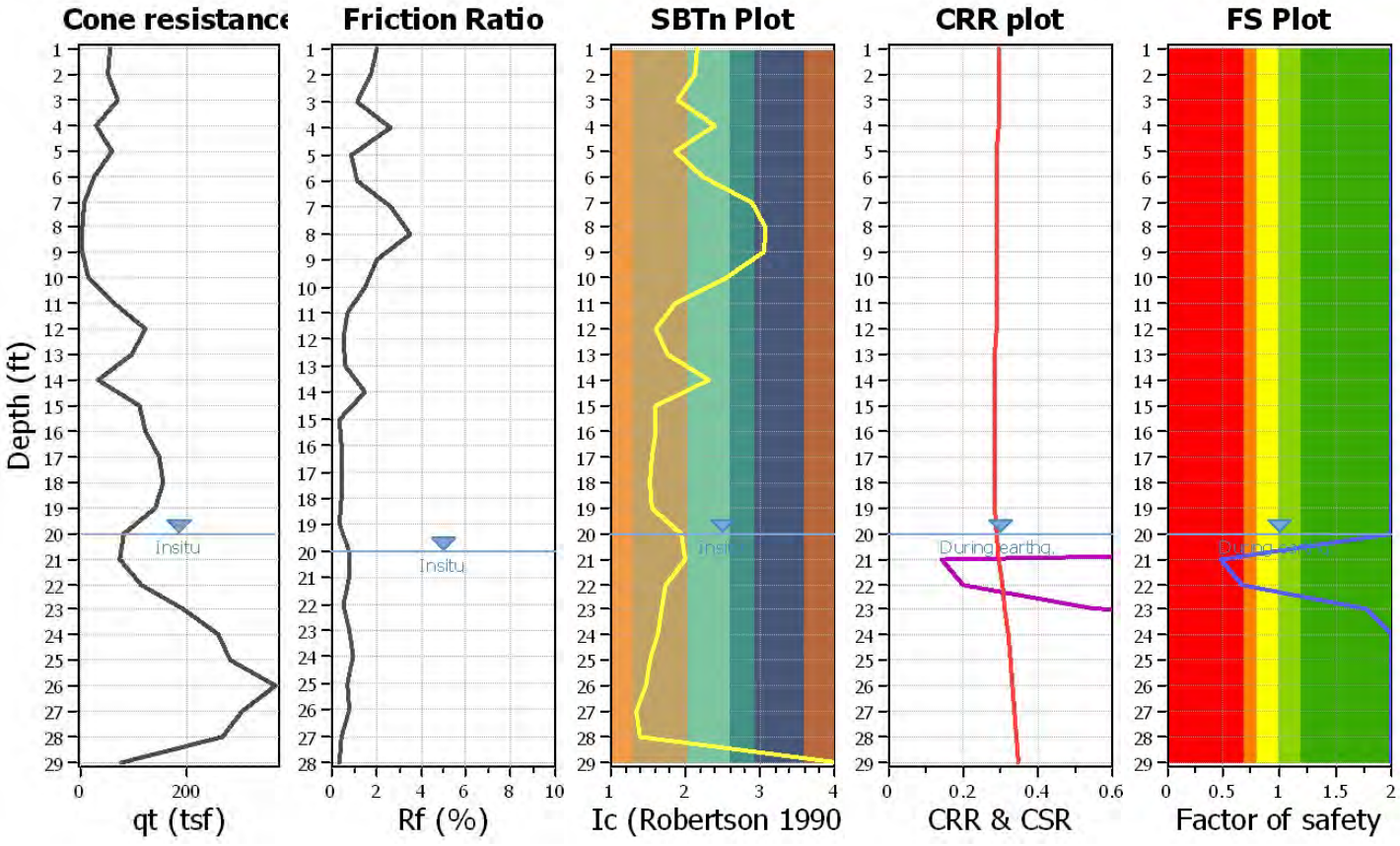
LIQUEFACTION ANALYSIS REPORT

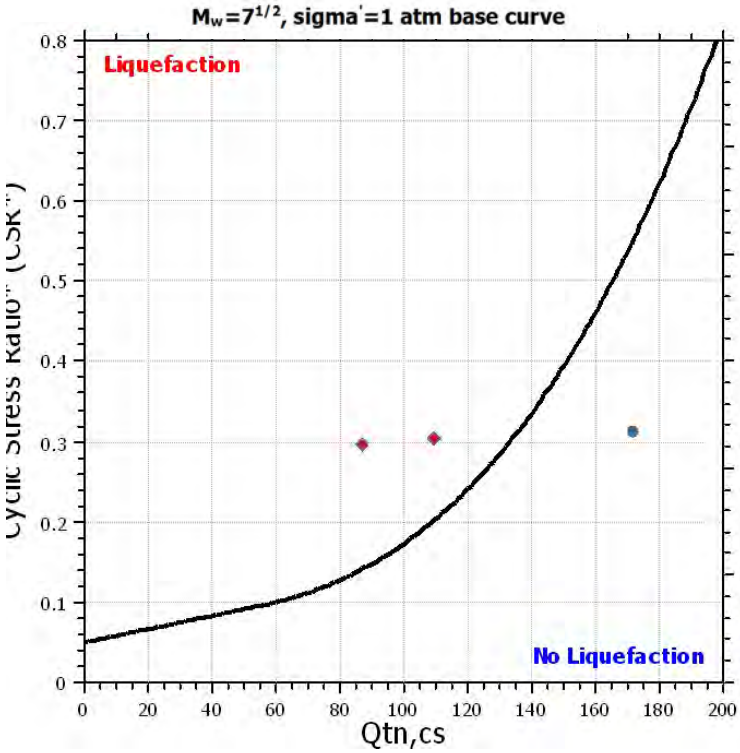
Project title : Ganahl SJC **Location :**

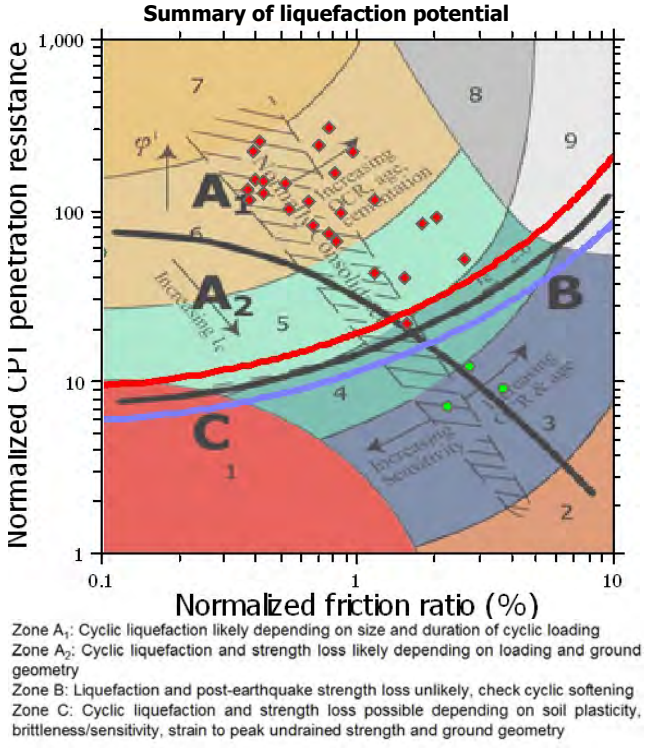
CPT file : CPT-10

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

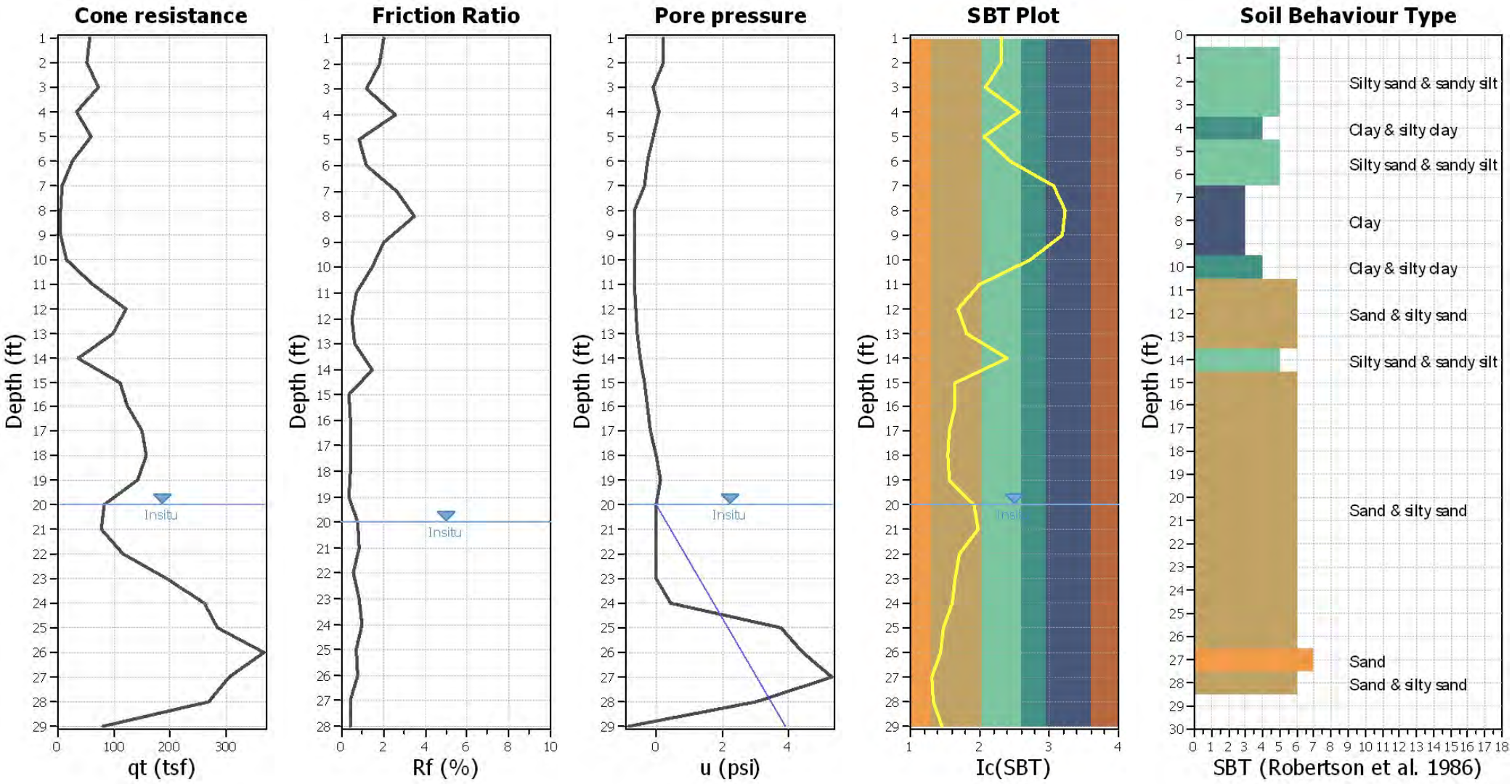






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



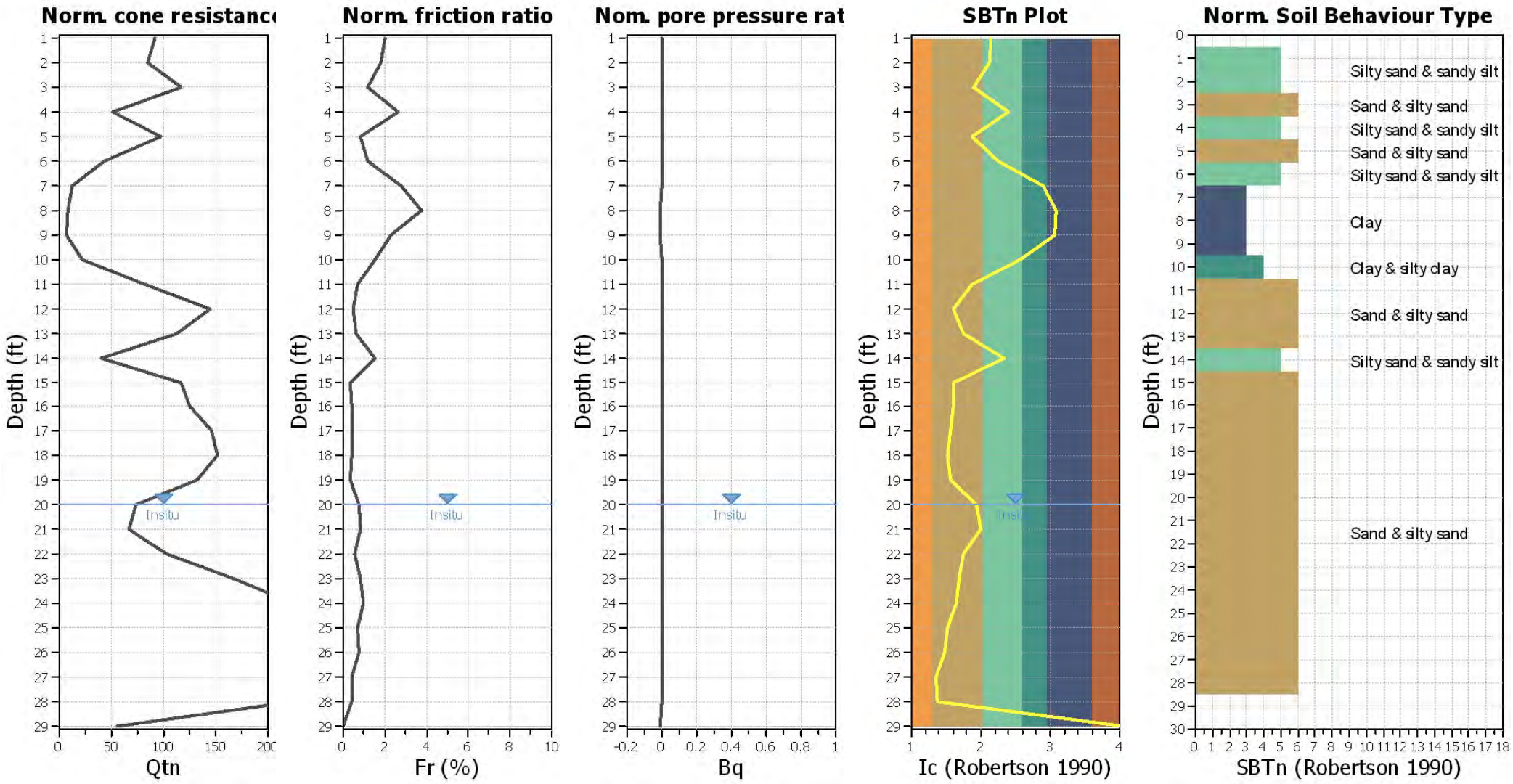
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



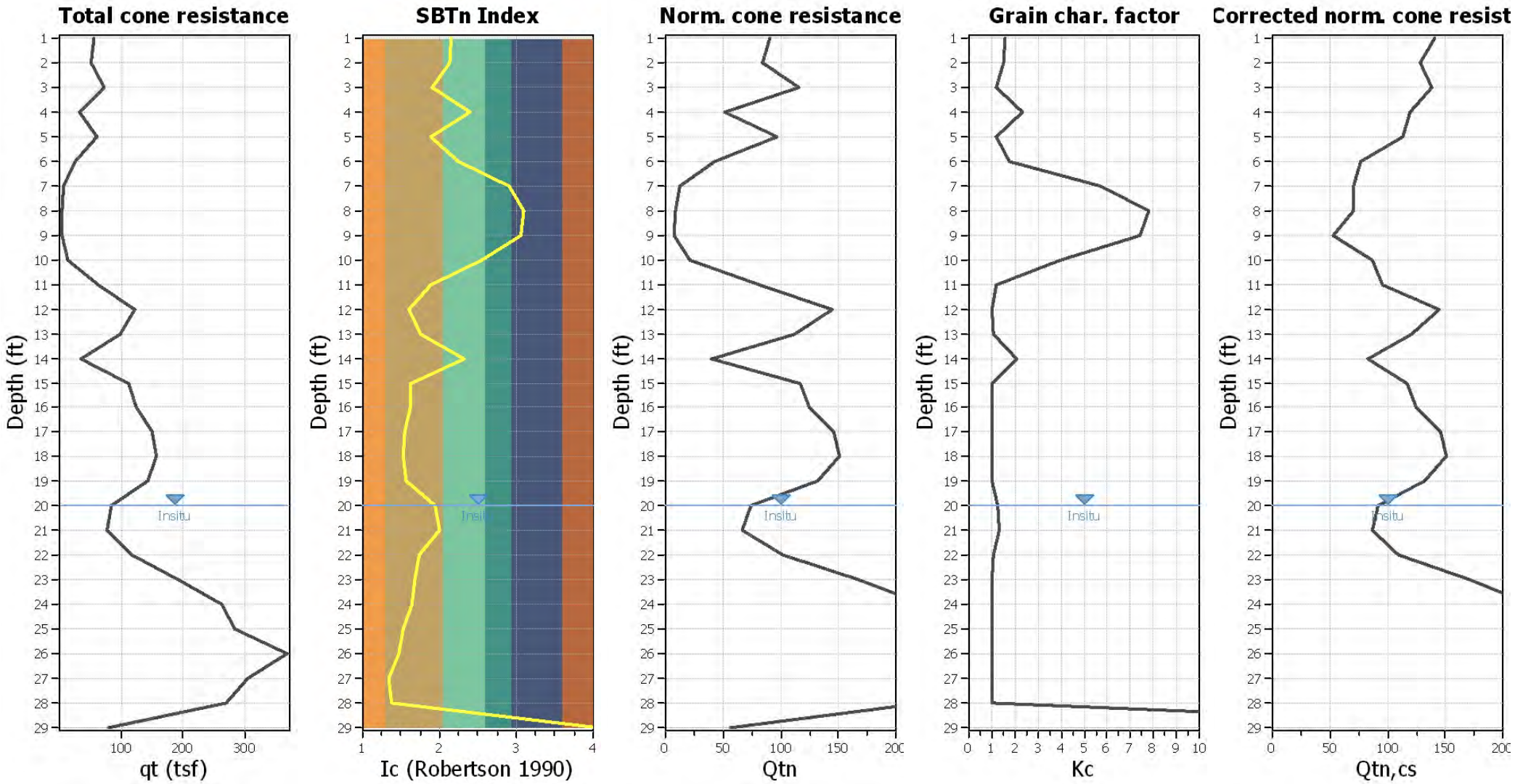
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

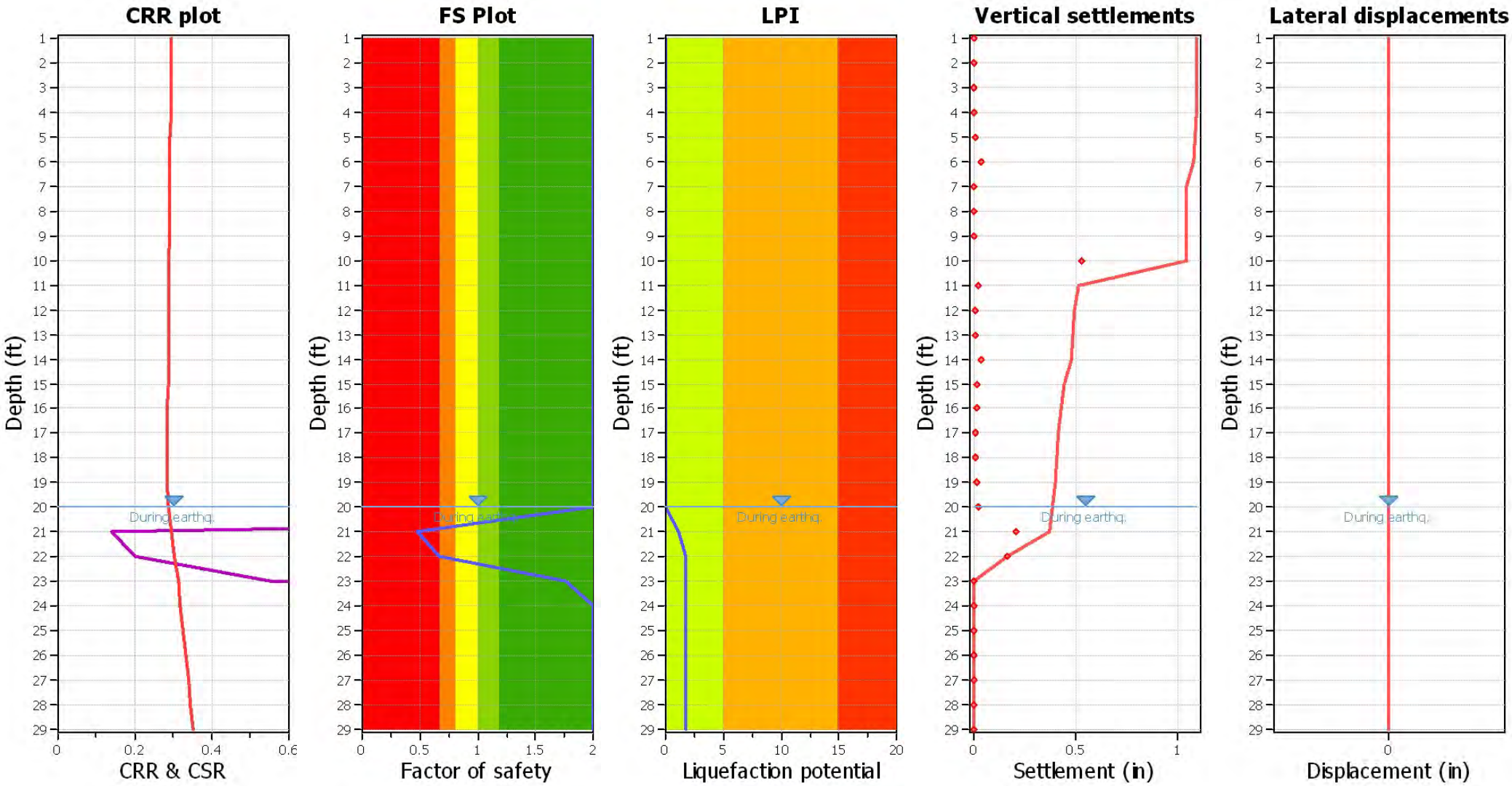
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

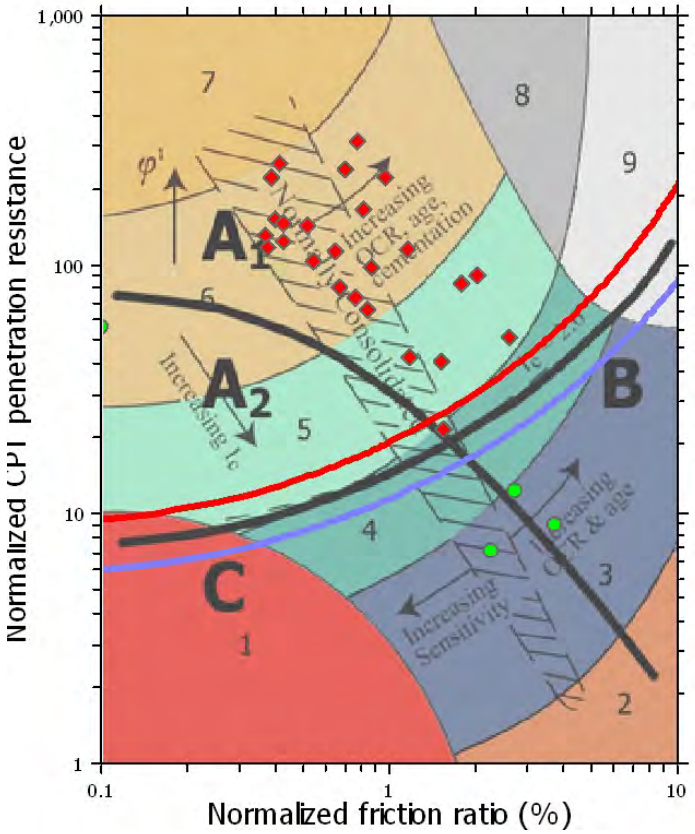
F.S. color scheme

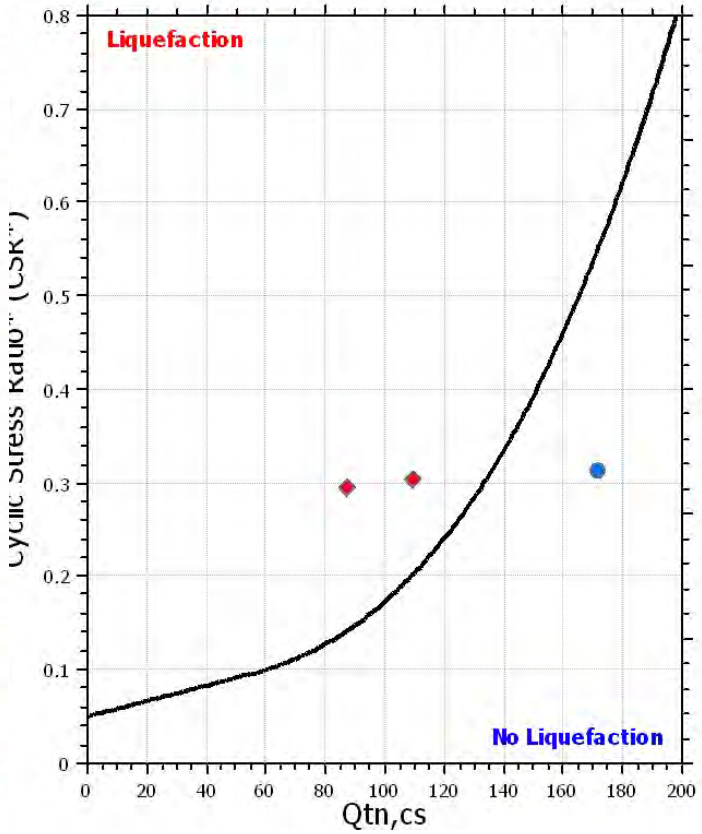
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

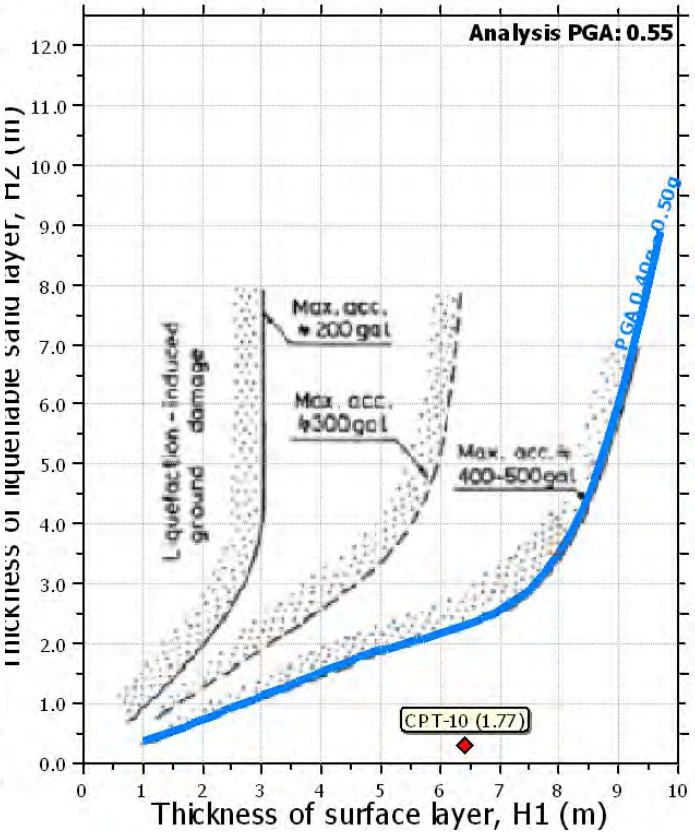
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



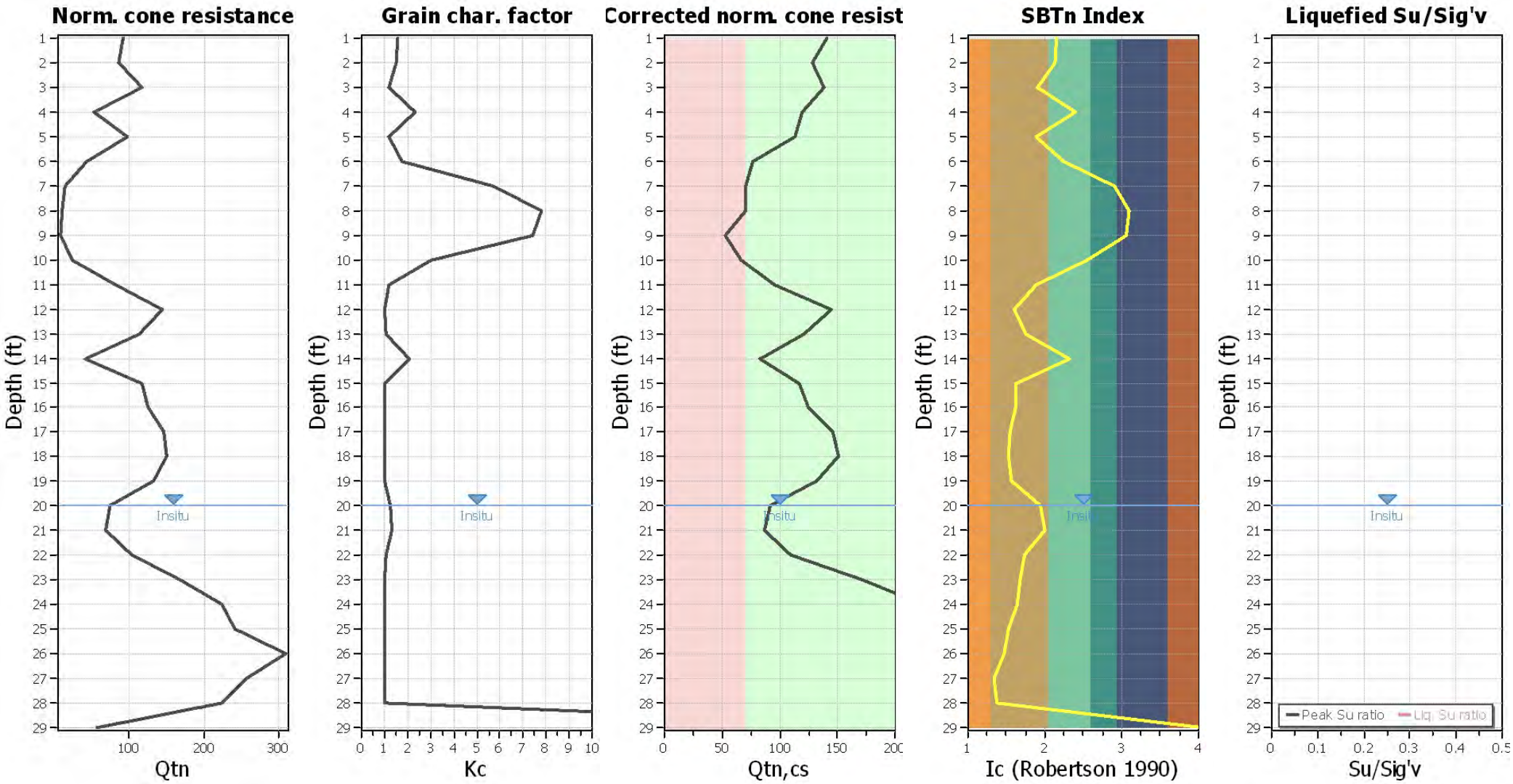




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

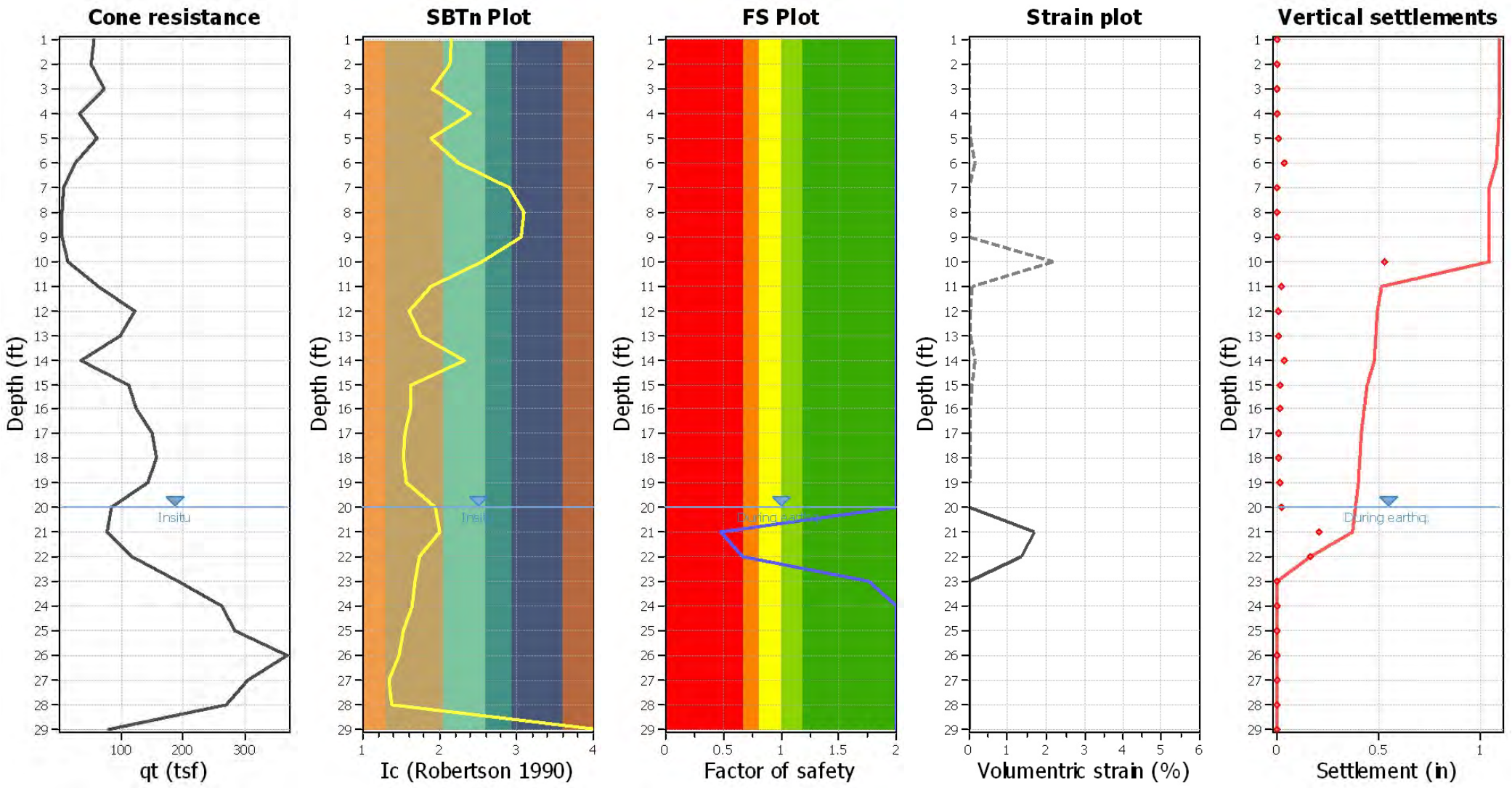
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	2.15	91.18	1.55	141.08	31	775	0.29	0.003	0.00	8.63	0.00	0.000
2.00	2.13	84.55	1.52	128.22	28	705	0.29	0.008	0.01	8.63	0.00	0.001
3.00	1.91	115.98	1.19	138.43	28	725	0.29	0.013	0.01	8.63	0.01	0.002
4.00	2.40	51.46	2.33	119.78	30	605	0.29	0.027	0.02	8.63	0.01	0.003
5.00	1.88	96.84	1.17	113.44	23	587	0.29	0.040	0.03	8.63	0.03	0.006
6.00	2.25	42.55	1.79	76.17	18	410	0.29	0.182	0.21	8.63	0.15	0.036
7.00	2.90	12.26	5.73	70.19	0	0	0.29	0.000	0.00	0.00	0.00	0.000
8.00	3.09	8.99	7.81	70.20	0	0	0.29	0.000	0.00	0.00	0.00	0.000
9.00	3.06	7.06	7.42	52.43	0	0	0.29	0.000	0.00	0.00	0.00	0.000
10.00	2.55	21.90	3.05	66.79	18	311	0.29	2.923	3.39	8.63	2.21	0.529
11.00	1.88	81.49	1.17	95.30	19	606	0.29	0.135	0.14	8.63	0.09	0.022
12.00	1.61	144.06	1.00	144.06	26	842	0.29	0.062	0.04	8.63	0.03	0.007
13.00	1.75	112.55	1.07	120.94	23	806	0.29	0.079	0.07	8.63	0.04	0.010
14.00	2.33	40.70	2.04	83.21	20	589	0.29	0.254	0.26	8.63	0.15	0.037
15.00	1.61	117.07	1.00	117.07	21	768	0.29	0.116	0.11	8.63	0.06	0.015
16.00	1.61	125.14	1.00	125.14	23	850	0.28	0.098	0.08	8.63	0.05	0.012
17.00	1.56	146.49	1.00	146.49	26	956	0.28	0.080	0.06	8.63	0.03	0.008
18.00	1.53	150.90	1.00	150.90	27	983	0.28	0.082	0.06	8.63	0.03	0.008
19.00	1.56	131.87	1.00	131.87	23	918	0.28	0.108	0.09	8.63	0.05	0.011

Total estimated settlement: 0.71

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	91.40	2.00	0.00	0.67	0.00	21.00	87.02	0.48	1.70	0.65	0.20
22.00	109.20	0.66	1.38	0.63	0.17	23.00	171.64	1.77	0.00	0.62	0.00
24.00	223.75	2.00	0.00	0.60	0.00	25.00	242.09	2.00	0.00	0.58	0.00
26.00	310.43	2.00	0.00	0.57	0.00	27.00	257.24	2.00	0.00	0.55	0.00
28.00	223.56	2.00	0.00	0.53	0.00	29.00	1496.40	2.00	0.00	0.52	0.00

Total estimated settlement: 0.37

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

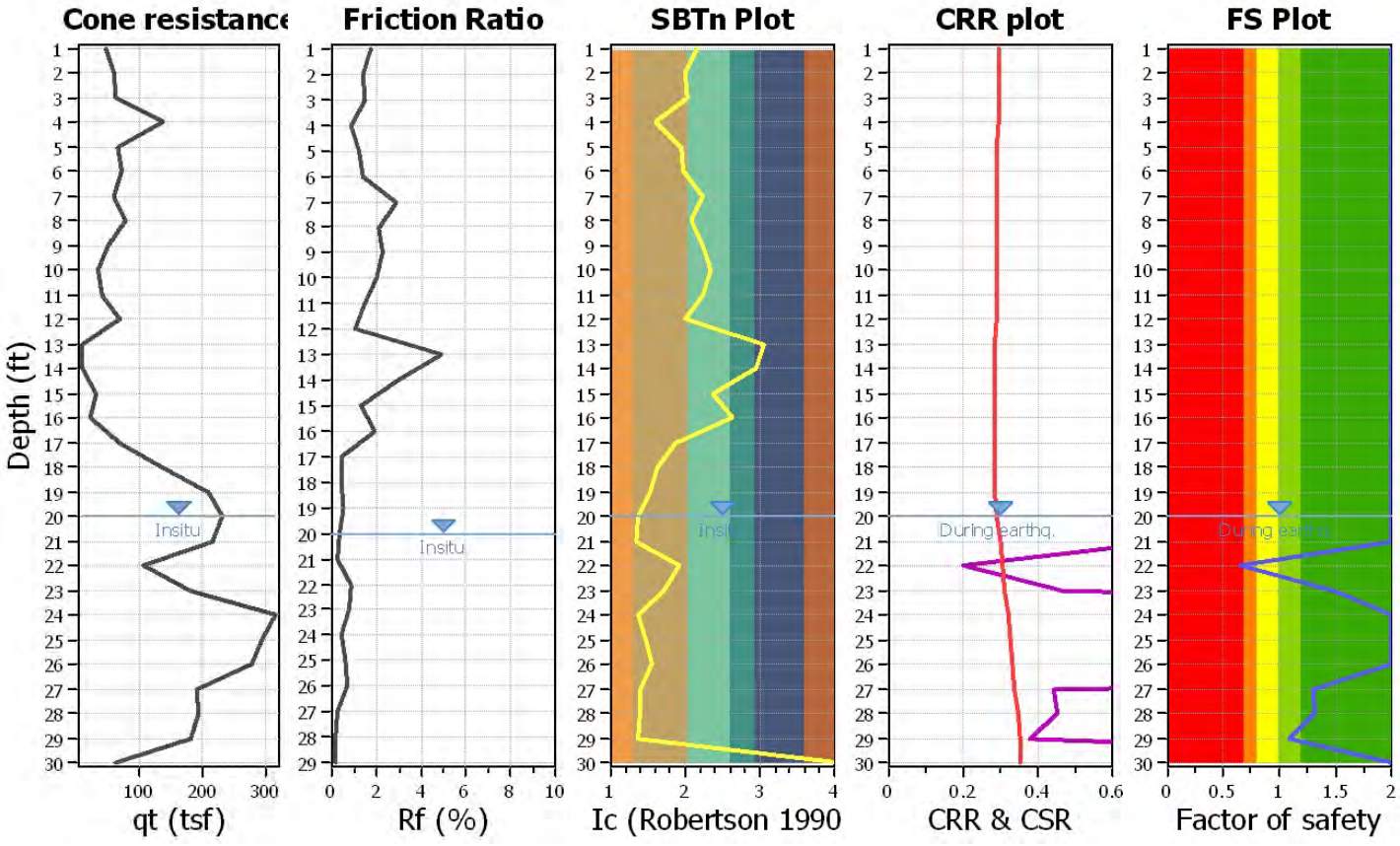
LIQUEFACTION ANALYSIS REPORT

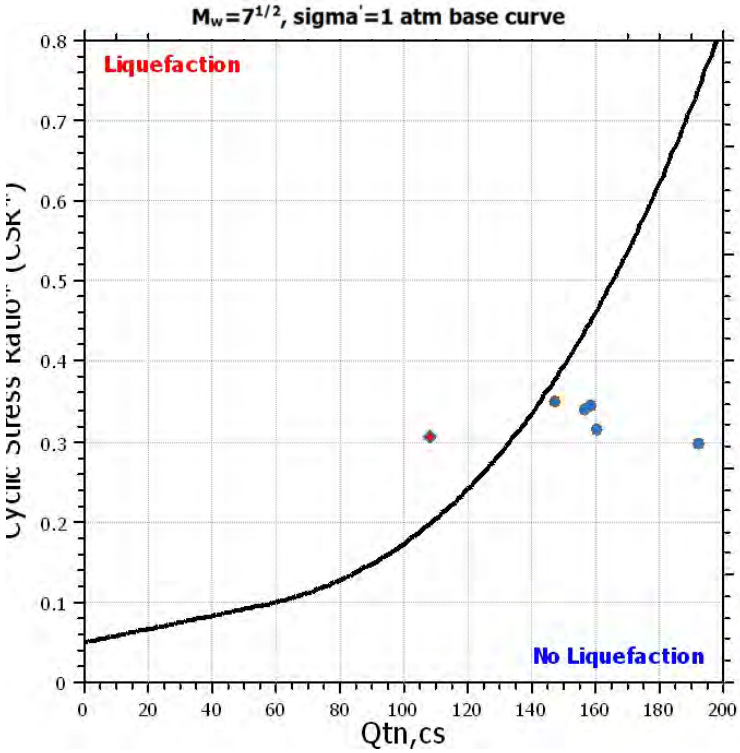
Project title : Ganahl SJC **Location :**

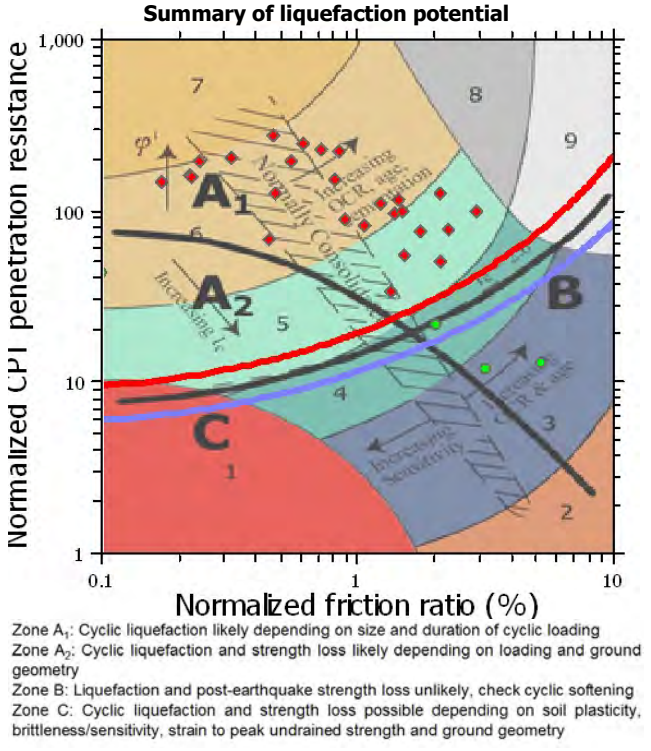
CPT file : CPT-11

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	20.00 ft	Fill height:	N/A	Limit depth applied:	Yes
Points to test:	Based on Ic value	Average results interval:	1	Fill weight:	N/A	Limit depth:	50.00 ft
Earthquake magnitude M_w:	6.70	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

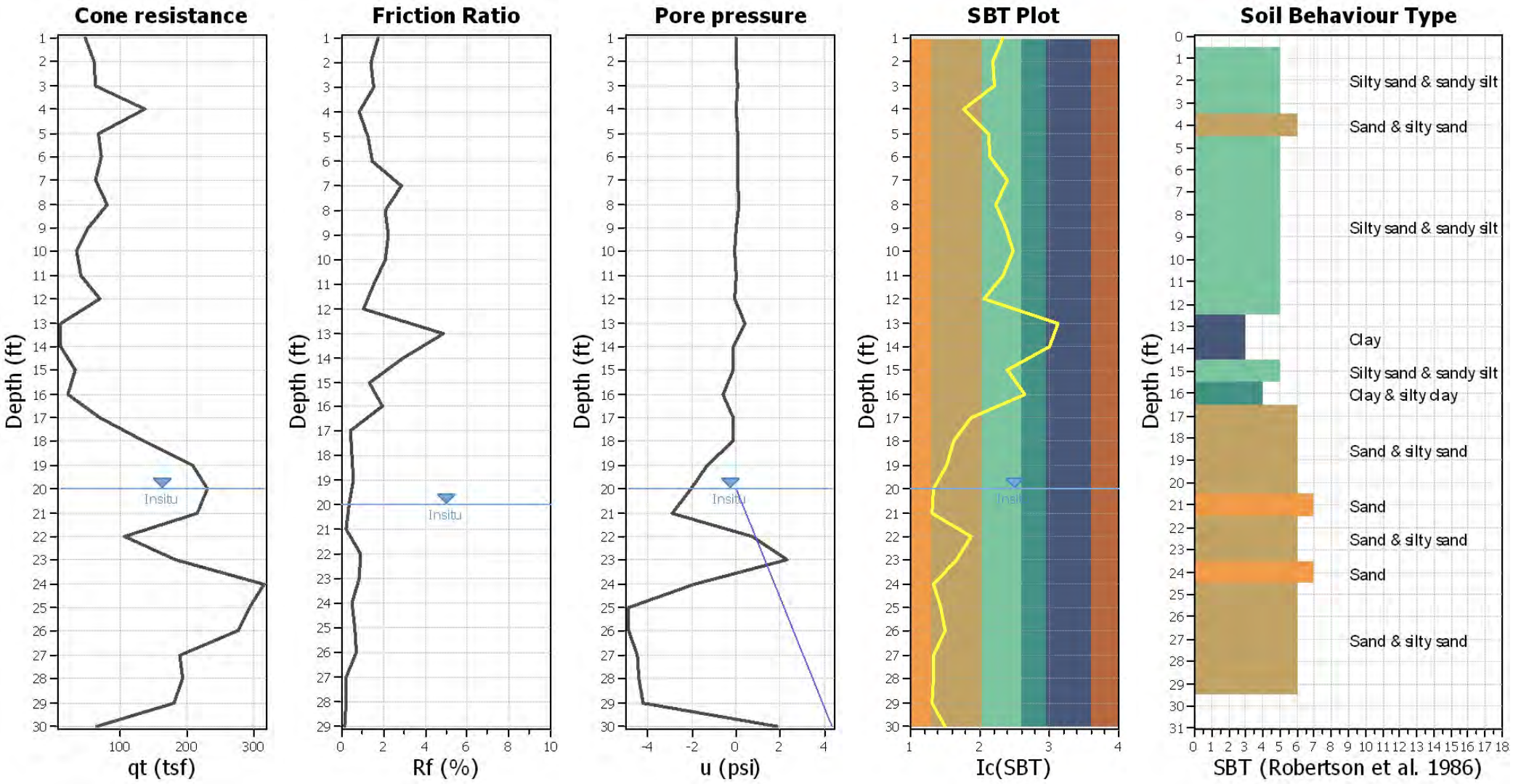






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plc



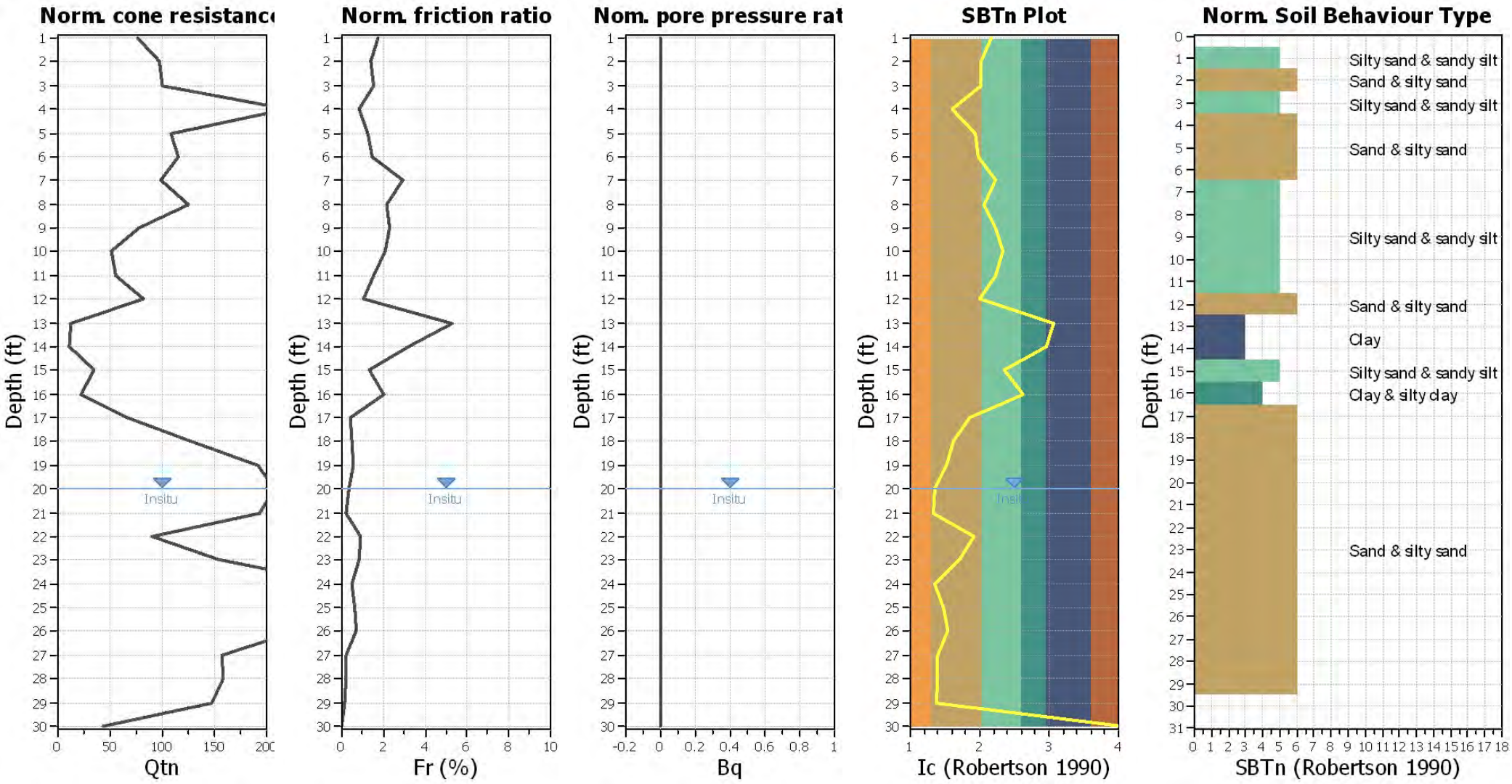
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



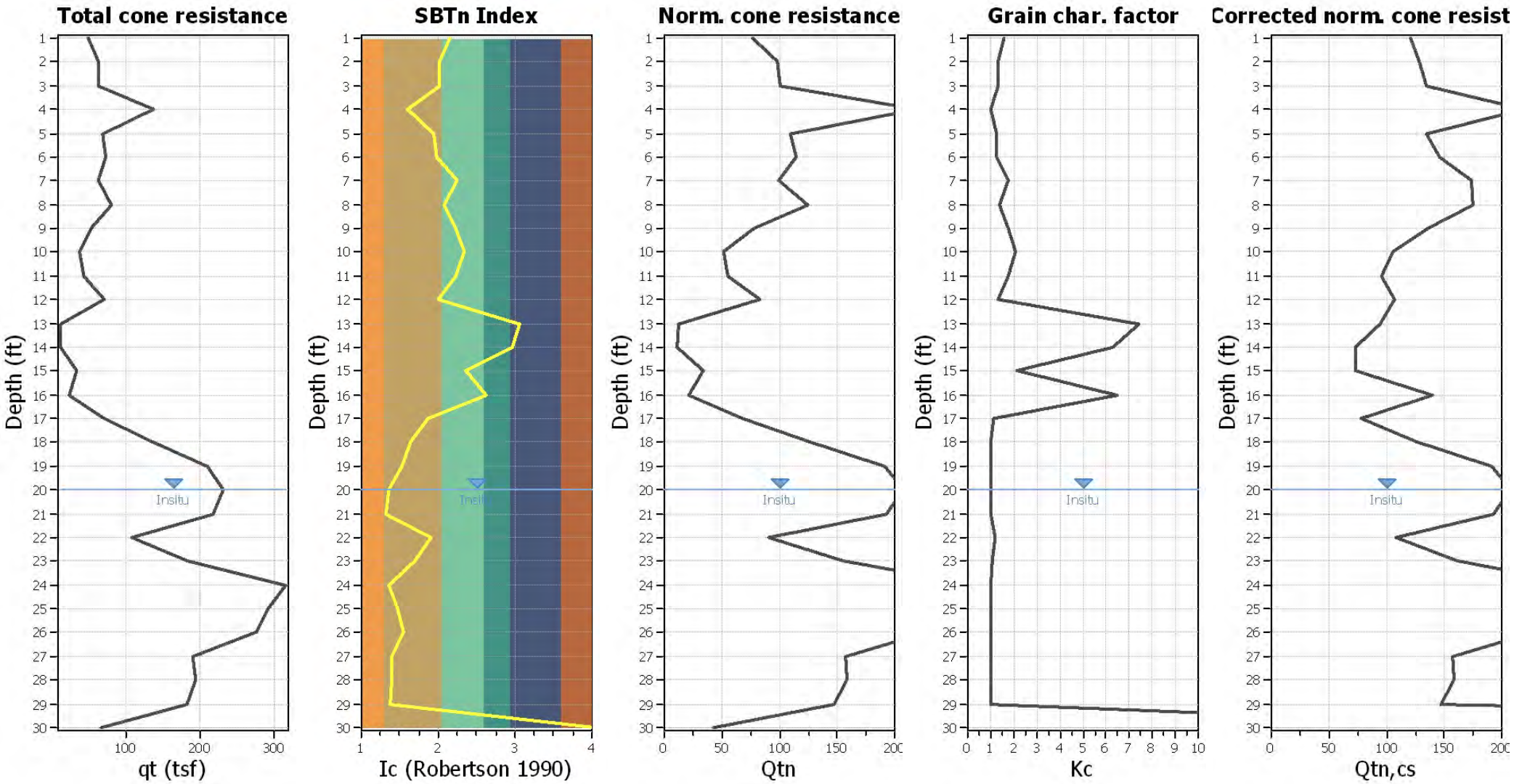
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

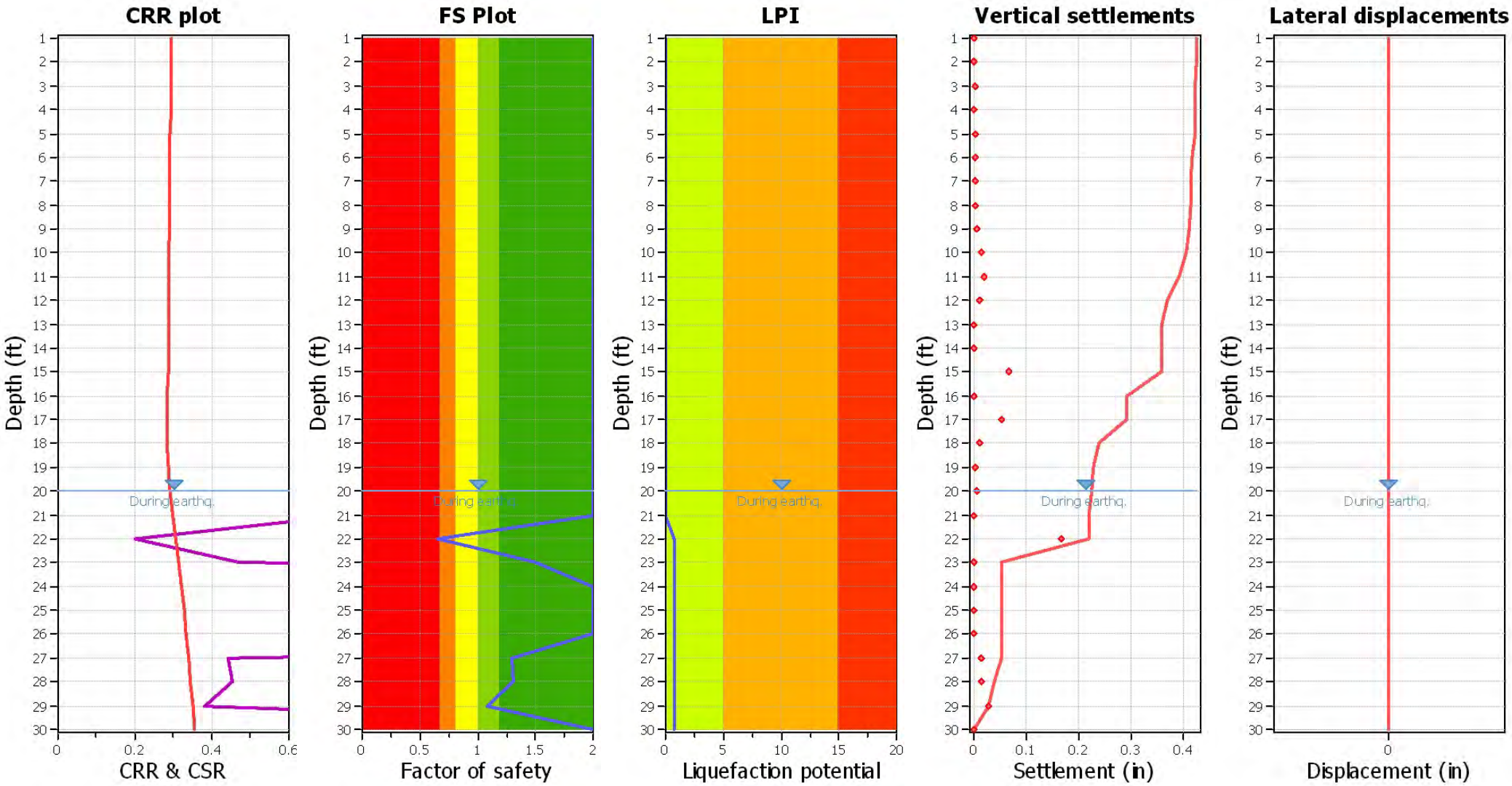
Liquefaction analysis overall plots (intermediate resi



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

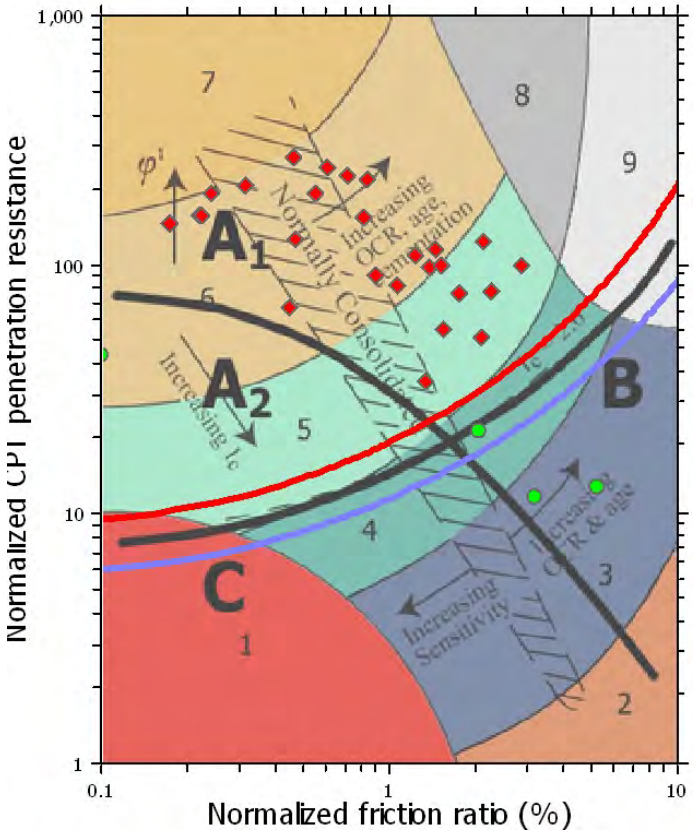
F.S. color scheme

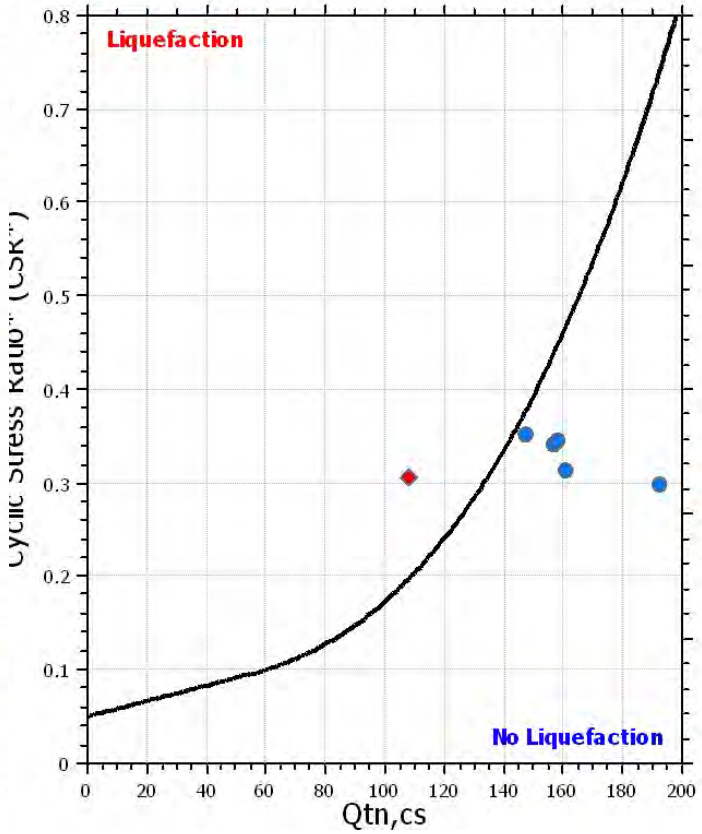
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

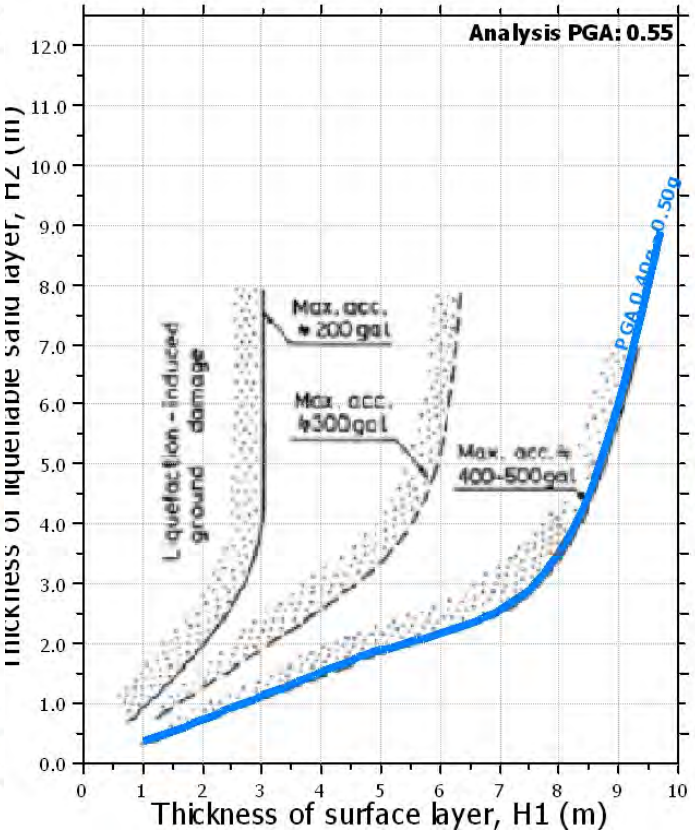
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



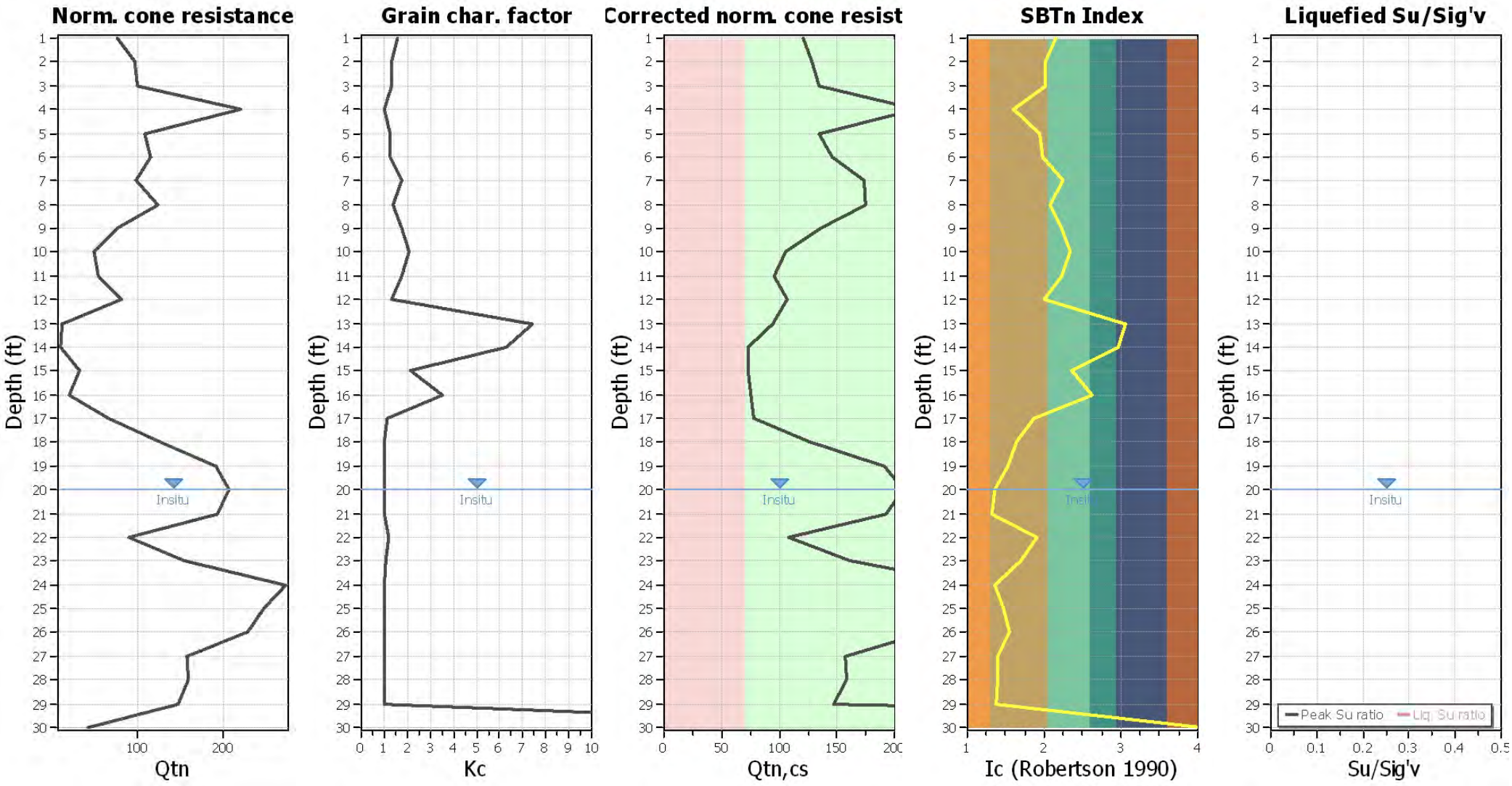




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

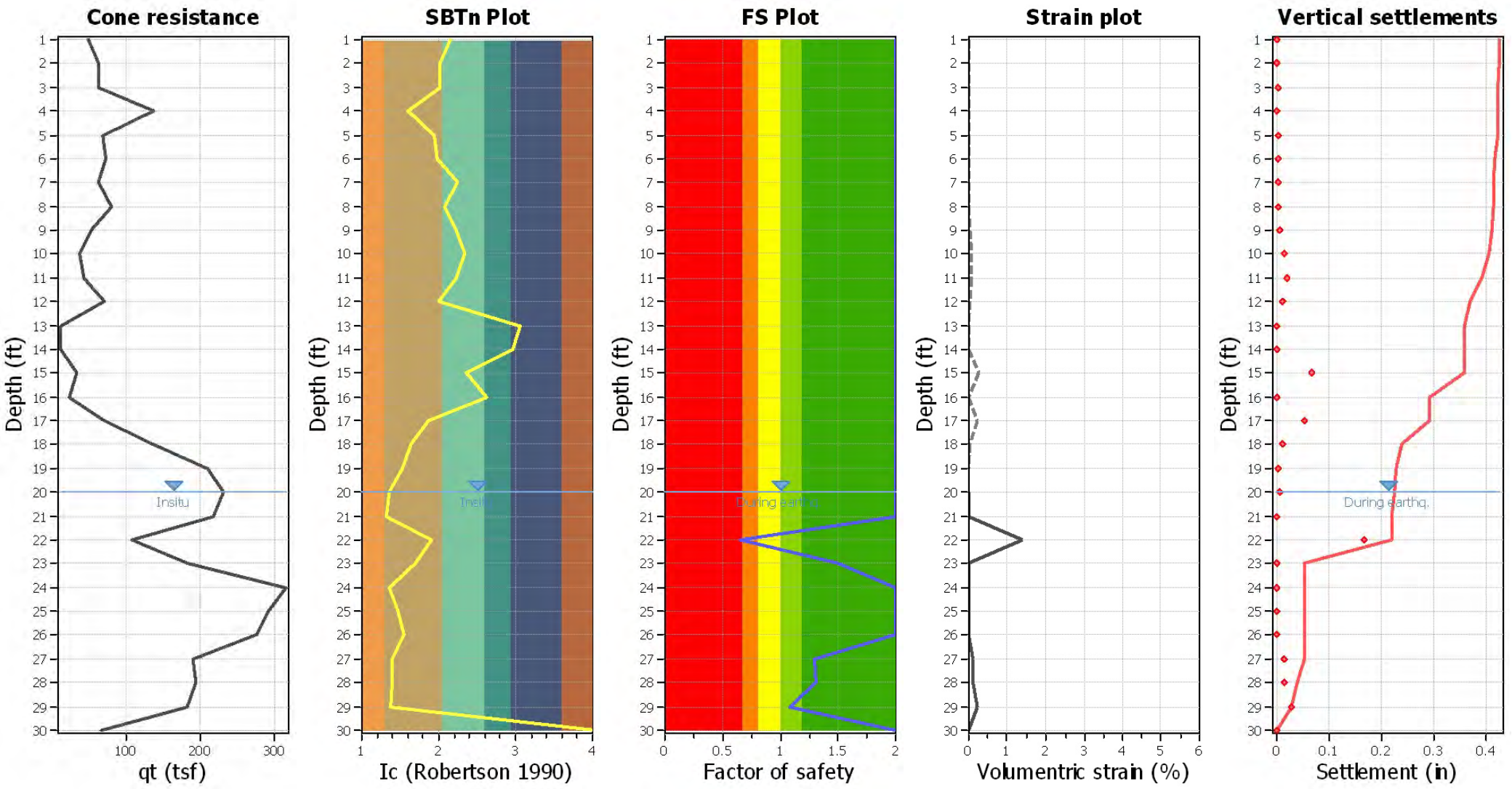
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	1	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	50.00 ft

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
1.00	2.16	76.57	1.57	120.51	27	661	0.29	0.004	0.00	8.63	0.00	0.001
2.00	2.01	97.62	1.31	128.30	27	698	0.29	0.008	0.01	8.63	0.00	0.001
3.00	2.03	100.21	1.34	134.12	28	732	0.29	0.013	0.01	8.63	0.01	0.001
4.00	1.61	219.40	1.00	219.40	40	942	0.29	0.012	0.01	8.63	0.00	0.001
5.00	1.94	108.92	1.23	134.28	27	715	0.29	0.026	0.02	8.63	0.01	0.003
6.00	1.97	115.02	1.27	145.77	30	785	0.29	0.028	0.02	8.63	0.01	0.003
7.00	2.24	98.82	1.76	174.11	40	940	0.29	0.025	0.01	8.63	0.01	0.002
8.00	2.07	124.69	1.40	174.66	37	973	0.29	0.028	0.01	8.63	0.01	0.002
9.00	2.23	77.57	1.75	135.55	31	770	0.29	0.055	0.03	8.63	0.02	0.005
10.00	2.34	50.95	2.08	106.22	25	610	0.29	0.129	0.10	8.63	0.06	0.015
11.00	2.23	54.87	1.74	95.48	22	624	0.29	0.143	0.13	8.63	0.08	0.020
12.00	1.99	82.50	1.29	106.58	22	766	0.29	0.089	0.08	8.63	0.05	0.012
13.00	3.06	12.72	7.44	94.61	0	0	0.29	0.000	0.00	10.85	0.00	0.000
14.00	2.96	11.70	6.27	73.38	0	0	0.29	0.000	0.00	10.85	0.00	0.000
15.00	2.36	34.22	2.15	73.44	18	561	0.29	0.412	0.48	8.63	0.28	0.067
16.00	2.63	21.56	3.50	75.49	0	0	0.28	0.000	0.00	10.85	0.00	0.000
17.00	1.86	67.32	1.15	77.64	15	652	0.28	0.286	0.39	8.63	0.22	0.053
18.00	1.63	126.33	1.00	126.33	23	953	0.28	0.094	0.08	8.63	0.04	0.010
19.00	1.53	191.65	1.00	191.65	34	1299	0.29	0.051	0.03	8.63	0.01	0.004

Total estimated settlement: 0.20

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.00	206.93	2.00	0.00	0.67	0.00	21.00	192.58	2.00	0.00	0.65	0.00
22.00	108.36	0.65	1.39	0.63	0.17	23.00	160.82	1.49	0.00	0.62	0.00
24.00	271.66	2.00	0.00	0.60	0.00	25.00	246.77	2.00	0.00	0.58	0.00
26.00	228.84	2.00	0.00	0.57	0.00	27.00	157.13	1.30	0.12	0.55	0.01
28.00	158.64	1.31	0.11	0.53	0.01	29.00	147.65	1.08	0.22	0.52	0.03
30.00	1149.07	2.00	0.00	0.50	0.00						

Total estimated settlement: 0.22

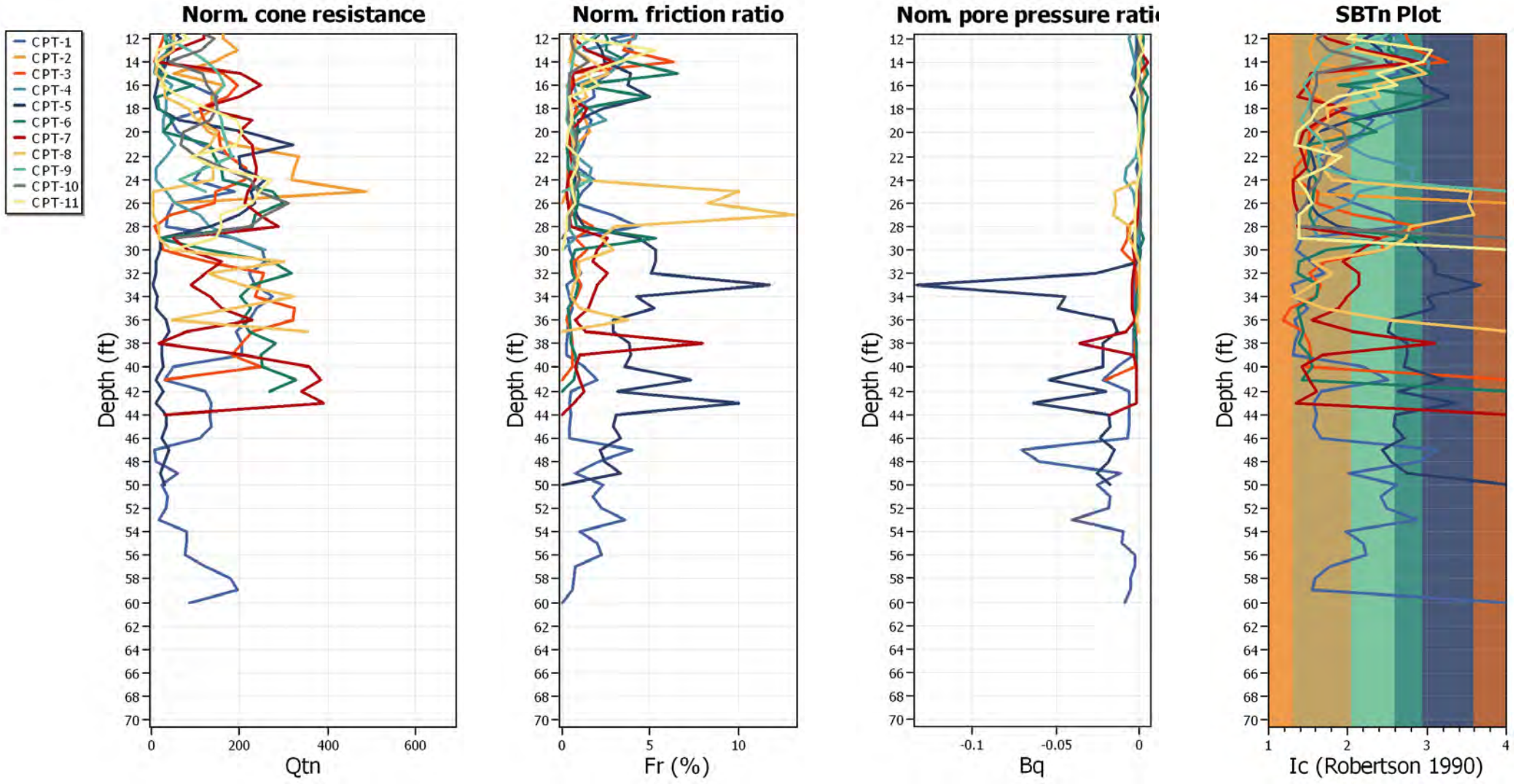
Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

Project: Ganahl SJC

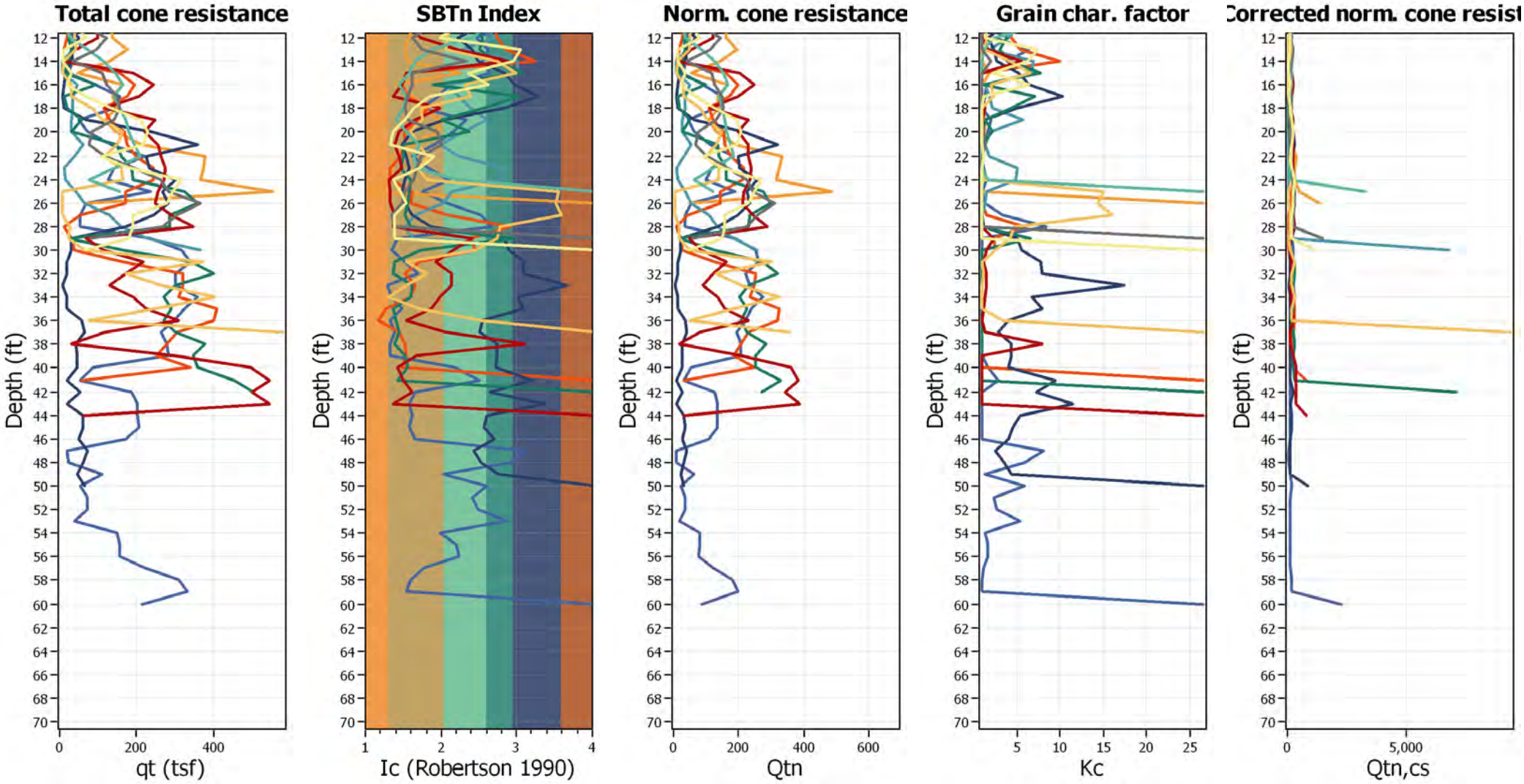
Overlay Normalized Plots



Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

Project: Ganahl SJC

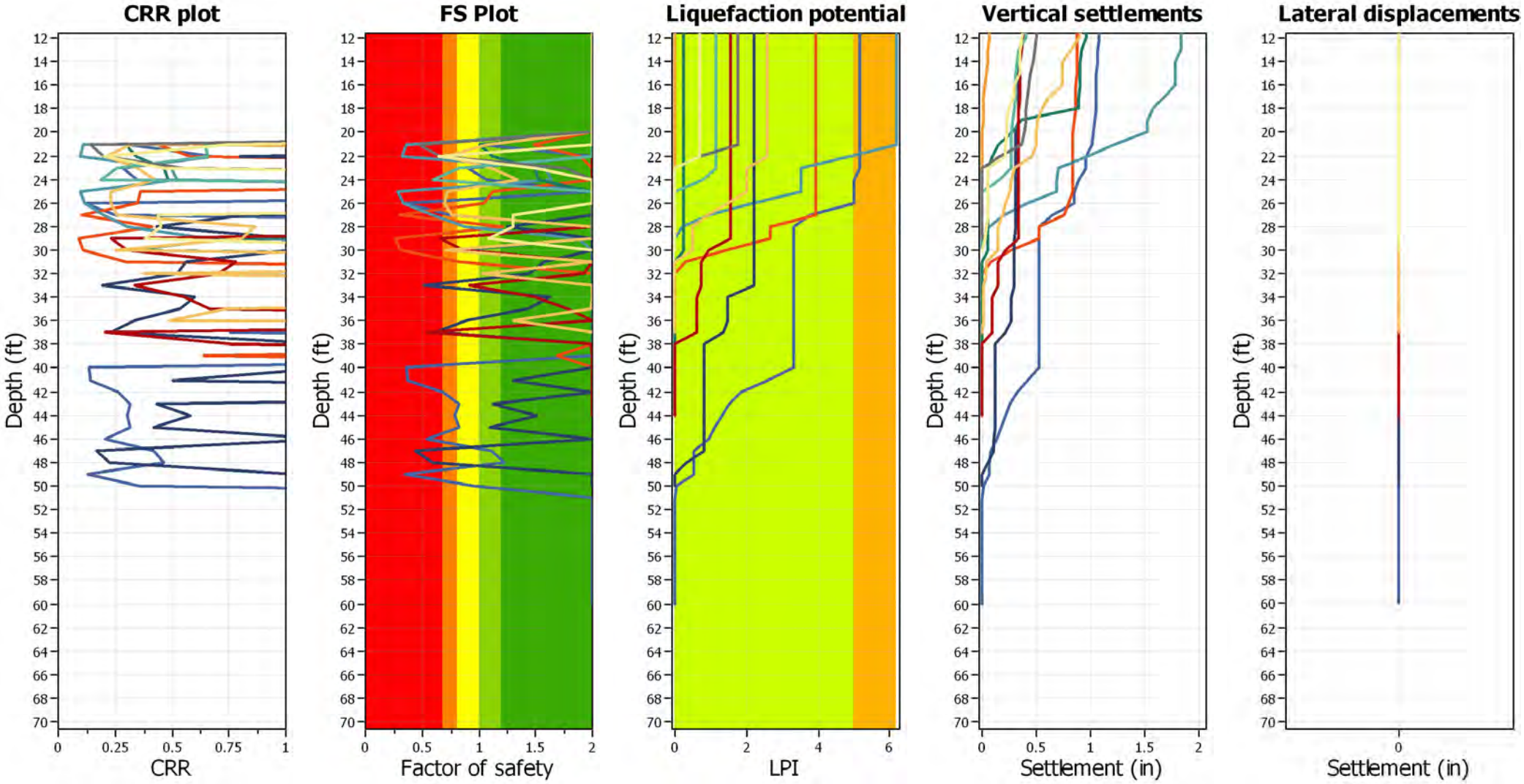
Overlay Intermediate Results



Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

Project: Ganahl SJC

Overlay Cyclic Liquefaction Plots



Willdan Geotechnical
1515 S. Sunkist St., Suite E
Anaheim, CA 92806

Project: Ganahl SJC

Overlay Strength Loss Plots

