verizon

PALO ALTO SMALL CELL
CITY CLUSTER 5/
VERIZON CLUSTER 6

PROJECT TEAM

APPLICANT:
VERIZON WIRELESS
575 LENNON LANE SUITE 125
WALNUT CREEK,CA 94598
CONTACT: JEREMY STROUP
PHONE:(925) 202-8654
EMAIL: jstroup@vinculums.com

LEASING CONTACT:
VINCULUMS SERVICES
575 LENNON LANE SUITE 125
WALNUT CREEK, CA 94598
CONTACT: JEREMY STROUP
PHONE:(925) 202-8654
EMAIL: jstroup@vinculums.com

A&E PROJECT MANAGER:
ZALZALI & ASSOCIATES INC.
dba ALL STATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PM: DEAN WALKER
PHONE: (714) 230-5714
EMAIL: dean@zalzali.com

CONSTRUCTION MANAGER:
VINCULUMS SERVICES
575 LENNON LANE SUITE 125
WALNUT CREEK,CA 94598
CONTACT: CURTIS GARDNER
PHONE: (510) 552-2944
EMAIL: cgardner@vinculums.com

ARBORIST CONTACT:
PROJECT ARBORIST
121 N 27TH STREET,
SAN JOSE, CA 95116
CONTACT: KATHERINE NAEGELE
PHONE: (408) 590-5976
EMAIL:Katherine@andersonstreecare.com

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

2019 TITLE 24, CALIFORNIA CODE OF REGULATIONS:
2019 CALIFORNIA BUILDING CODE
2019 CALIFORNIA ELECTRICAL CODE
2019 CALIFORNIA MECHANICAL CODE
2019 GREEN BUILDING CODE
2019 CALIFORNIA ENERGY CODE

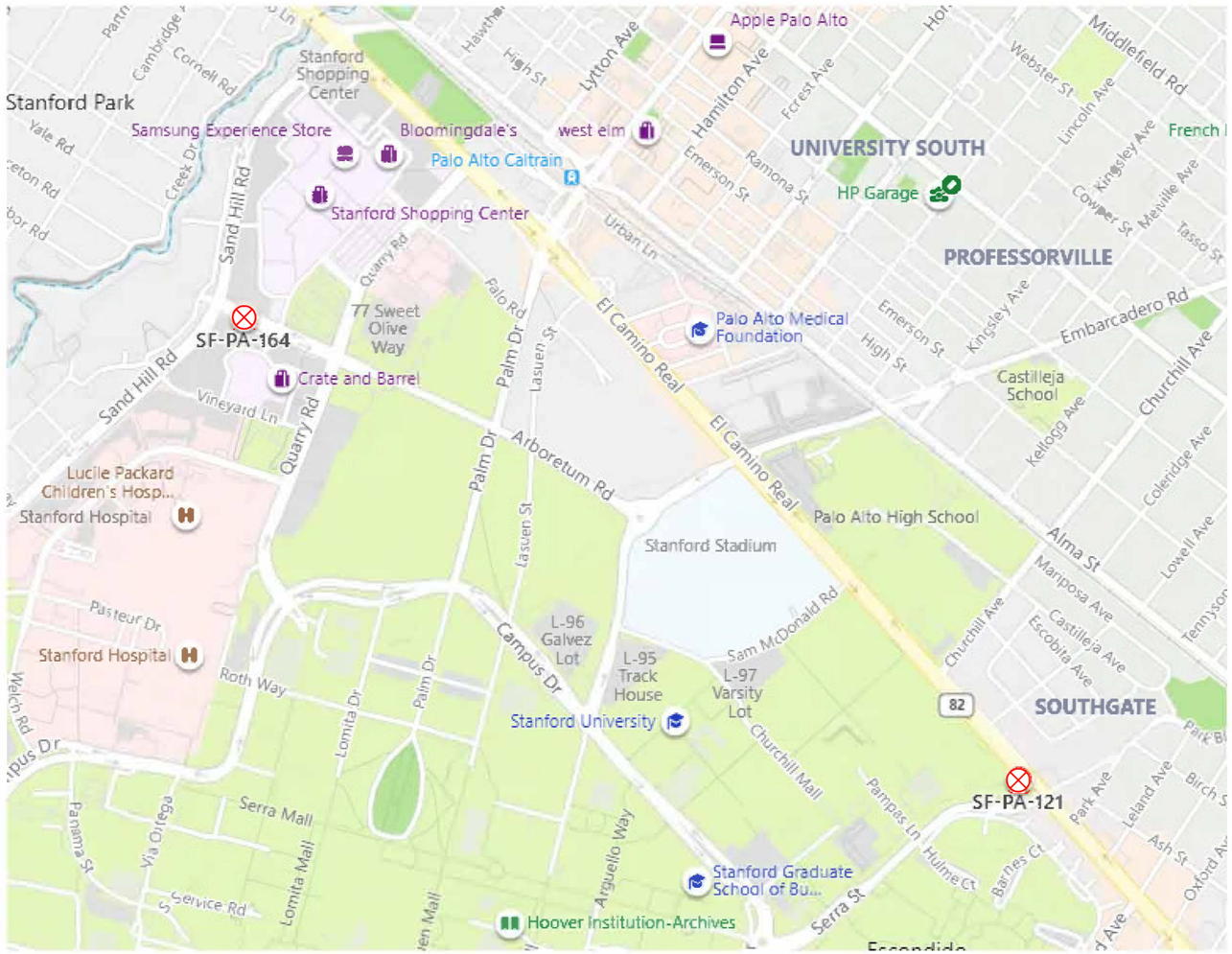
*AS AMENDED BY CITY OF PALO ALTO *(10/24/16)* AND MADE EFFECTIVE JANUARY 1ST, 2017 AS PER CITY OF PALO ALTO MUNICIPAL CODE ORDINANCE NUMBERS 5389, 5390, 5391, 5392, 5393, 5394, 5395, 5396, AND 5397.

GENERAL ORDER 95 (MAY 2018 EDITION)

SIGNATURE BLOCK

TITLE	SIGNATURE	DATE
CONSTRUCTION MANAGER		
RF ENGINEER		
REAL ESTATE		
SITE AQUISITION		
PROPERTY OWNER		
POLE OWNER		

VICINITY MAP



DRAWING INDEX

SHEET NO:	SHEET TITLE
CT-1	CLUSTER TITLE SHEET

NODE:	ADJACENT ADDRESS	TYPE
121	1664 EL CAMINO REAL	METAL STREET LIGHT
164	ARBORETUM ROAD	METAL STREET LIGHT

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

REGISTERED PROFESSIONAL ENGINEER
SAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

CLUSTER TITLE SHEET

CT-1

verizon

SITE ID: SF PALO ALTO 121

PROJECT NAME:	VZW PALO ALTO SMALL CELL
POLE#:	0157
LOCATION CODE:	425225
ADJACENT APN:	ACROSS FROM 124-25-044
SITE ADDRESS:	1691 EL CAMINO REAL PALO ALTO, 94306
COUNTY:	SANTA CLARA
SITE TYPE:	STREET LIGHT POLE
ROADWAY TYPE:	ARTERIAL
HISTORIC STATUS OR DISTRICT:	N/A

PROJECT DESCRIPTION

VERIZON WIRELESS PROPOSES TO INSTALL A NEW WIRELESS COMMUNICATION SITE ON A NEW/REPLACEMENT STREET LIGHT POLE. THE SCOPE WILL CONSIST OF THE FOLLOWING:

- ☐ REMOVE (1) EXISTING STREET LIGHT/POLE #167 IN THE CA-82 PUBLIC R.O.W.
- ☐ INSTALL (1) NEW 'EL CAMINO REAL' ROADWAY LIGHT POLE W/ LED LAMP IN PLACE OF REMOVED LIGHT POLE #167, PER LIGHTING STYLE PLACEMENT GUIDE
- ☐ RE-CONNECT CPA STREET LIGHT POWER TO NEW/REPLACEMENT STREET LIGHT
- ☐ INSTALL NEW POLE FOUNDATION

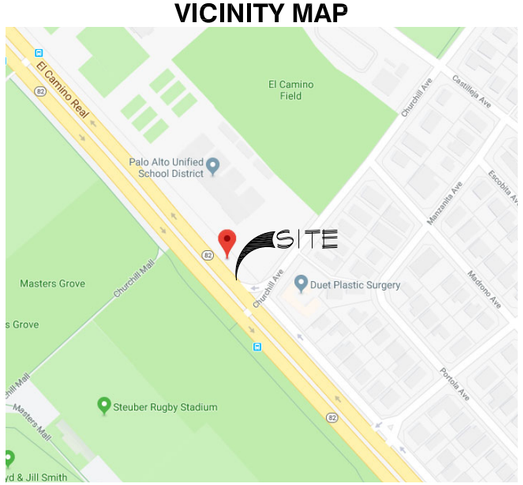
- ☐ INSTALL (3) NEW ERICSSON SM-6701 RADIO/ANTENNAS ATOP NEW POLE
- ☐ INSTALL (1) NEW NEMA 6P AC DISCONNECT WITHIN NEW U.G. POWER HANDHOLE
- ☐ INSTALL (1) NEW 5/8"Ø x10'L. GROUND ROD WITHIN NEW U.G. POWER HANDHOLE
- ☐ INSTALL NEW AC POWER CABLES FROM POC, TO DISCONNECT, TO RADIOS
- ☐ INSTALL NEW GROUND CABLES FROM DISCONNECT/RADIOS/POLE TO GROUND ROD
- ☐ INSTALL NEW FIBER CABLES FROM POC, TO DEMARC, TO RADIOS
- ☐ INSTALL NEW RF NOTICE AND EMERGENCY SHUT-DOWN SIGNAGE AS REQUIRED
- ☐ INSTALL NEW U.G. PATH FROM POWER POC TO NEW U.G. POWER HANDHOLE

** METAL SURFACES REQUIRING PAINT SHALL BE PAINTED WITH A KELLY MOORE PAINT COLOR AND CODE YET TO BE DETERMINED, BUT SHALL BE IN ACCORDANCE WITH CITY OF PALO ALTO CODE.

ADMINISTRATIVE REQUIREMENTS

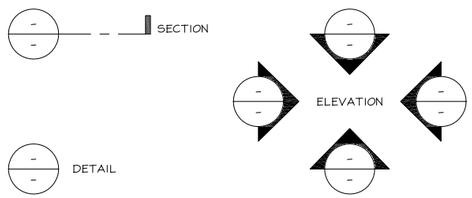
SUBCONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS & FIELD CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

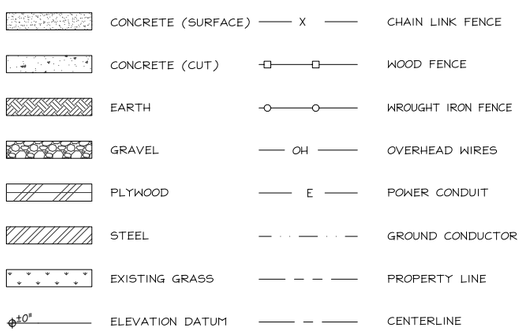
VICINITY MAP



SYMBOLS/ABBREVIATIONS LEGEND

ADD'L	ADDITIONAL
A.F.G.	ABOVE FINISHED GRADE
ANT.	ANTENNA
ASS'Y.	ASSEMBLY
ANG.	AMERICAN WIRE GAUGE
BLDG.	BUILDING
BTCW.	BARE TINNED COPPER WIRE
CLR.	CLEAR
CONC.	CONCRETE
CONN.	CONNECTION(OR)
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
DBL.	DOUBLE
D.F.	DOUGLAS FIR
DIA.	DIAMETER
DIM.	DIMENSION
EA.	EACH
ELEV	ELEVATION
EMT.	ELECTRICAL METALLIC TUBING
(E)	EXISTING
F.G.	FINISH GRADE
FT.(')	FOOT (FEET)
GA.	GAUGE
HT.	HEIGHT
IN.(")	INCH(ES)
LB.(#)	POUND(S)
L.F.	LINEAR FEET (FOOT)
L.	LONG(ITUDINAL)
MAX.	MAXIMUM
MFR.	MANUFACTURER
MIN.	MINIMUM
(N)	NEW
NTS	NOT TO SCALE
O.C.	ON CENTER
P.T.	PRESSURE TREATED
RAD.(R)	RADIUS
REQ'D	REQUIRED
RGS.	RIGID GALVANIZED STEEL
SCH.	SCHEDULE
SIM.	SIMILAR
SQ.	SQUARE
S.S.	STAINLESS STEEL
STD.	STANDARD
TEMP.	TEMPORARY
THK.	THICK(NESS)
TYP.	TYPICAL
U.G.	UNDER GROUND
U.L.	UNDERWRITERS LABORATORY
U.N.O.	UNLESS NOTED OTHERWISE
V.I.F.	VERIFY IN FIELD
W	WIDE (WIDTH)
w/	WITH
WD.	WOOD
W.P.	WEATHERPROOF





PROJECT TEAM

APPLICANT:
VERIZON WIRELESS
575 LENNON LANE SUITE 125
WALNUT CREEK,CA 94598
CONTACT: JEREMY STROUP
PHONE:(925) 202-8654
EMAIL:jstroup@qualtekwireless.com

A&E PROJECT MANAGER:
ZALZALI & ASSOCIATES INC.
dba ALL STATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PM: DEAN WALKER
PHONE: (714) 230-5714
EMAIL: dean@zalzali.com

LEASING CONTACT:
VINCULUMS SERVICES
575 LENNON LANE SUITE 125
WALNUT CREEK, CA 94598
CONTACT: JEREMY STROUP
PHONE:(925) 202-8654
EMAIL:jstroup@qualtekwireless.com

CONSTRUCTION MANAGER:
QUALTEK WIRELESS
1200 DEL PASO RD #150
SACRAMENTO, CA 95834
CONTACT: ROSA YANEZ
PHONE: (916) 247-5703
EMAIL: ryanez@qualtekwireless.com

ARBORIST CONTACT:
PROJECT ARBORIST
121 N 27TH STREET,
SAN JOSE, CA 95116
CONTACT: KATHERINE NAEGELE
PHONE: (408) 590-5976
EMAIL:Katherine@andersonstreecare.com

SITE INFORMATION

LATITUDE:
N 37° 25' 49.39"(37.430385)

LONGITUDE:
W 122° 9' 9.06"(-122.152517)

ELEVATION:
+53.24' AMSL

ZONING:
N/A

EXISTING OCCUPANCY:
N/A

OCCUPANCY CLASSIFICATION:
N/A

JURISDICTION:
CITY OF PALO ALTO

ASSESSORS PARCEL NUMBER:
ACROSS FROM 124-25-044

PROPERTY LEGAL DESCRIPTION:
N/A PUBLIC RIGHT OF WAY

ADA COMPLIANCE:
N/A

DIG ALERT

811 USA North
Know what's below. Call before you dig.
California and Nevada
Call Two Working Days Before You Dig!
811 / 800-227-2600

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS & (E) DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME IF USING 11"X17" PLOT, DRAWINGS WILL BE HALF SCALE.

DRAWING INDEX

SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
T-2	PHOTOSIMS
T-3	EME REPORT
T-4	EME REPORT
LS-1	SITE SURVEY
A-1	SITE PLAN
A-1.1	EXISTING UTILITY SITE PLAN
A-1.2	UTILITY PLAN (FOR REFERENCE)
A-1.3	LOCATION MAP
A-1.4	BORING/UNDERGROUND UTILITY PLAN
A-1.5	CITY STANDARDS & DETAILS
A-1.6	CITY STANDARDS & DETAILS
A-1.7	R.O.W SECTION
A-2	ENLARGED SITE PLAN
A-3	ELEVATIONS
A-3.1	ELEVATIONS
D-1	DETAILS
D-2	NOISE STUDY,FOUNDATION DETAILS, POLE DRAWING
D-3	LUMINAIRE DETAILS
E-1	ELECTRICAL/GROUNDING DIAGRAMS, NOTES, & PANEL SCHEDULE
E-2	ELECTRICAL PLAN
TCP-1	TRAFFIC CONTROL PLAN (BY OTHERS)
C-1	CALCS
C-2	CALCS
C-3	CALCS
C-4	CALCS
GN-1	GENERAL NOTES
GN-2	GENERAL NOTES
TPR-1	TREE PROTECTION REPORT
L-1	PALO ALTO TREE PROTECTION
L-2	PALO ALTO POLLUTION PREVENTION CHECKLIST
L-3	PALO ALTO EROSION CONTROL AND CONDUIT LOCATION DETAILS & NOTES
L-4	PALO ALTO TRENCHING & SIDEWALK STANDARD DRAWINGS

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

2019 TITLE 24, CALIFORNIA CODE OF REGULATIONS
2019 CALIFORNIA BUILDING CODE
2019 CALIFORNIA ELECTRICAL CODE
2019 CALIFORNIA MECHANICAL CODE
2019 GREEN BUILDING CODE
2019 CALIFORNIA ENERGY CODE

*AS AMENDED BY CITY OF PALO ALTO AND MADE EFFECTIVE JANUARY 1ST, 2020 AS PER CURRENT CITY OF PALO ALTO MUNICIPAL CODE ORDINANCES GENERAL ORDER 95 (v.2018)

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
NISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

verizon

3/15/21

SF Palo Alto 121

Adjacent to 1664 El Camino Real
Palo Alto, CA

Looking Northwest from El Camino Real

View #1

Applied Imagination 510 914-0500

verizon

3/15/21

SF Palo Alto 121

Adjacent to 1664 El Camino Real
Palo Alto, CA

Looking South from El Camino Real

View #2

Applied Imagination 510 914-0500

verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums

575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING

23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZAL
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE

PHOTOSIMS

SHEET NUMBER

T-2

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Verizon Wireless, a personal wireless telecommunications carrier, to evaluate its small cell (No. 425225 "SF Palo Alto 121") proposed to be sited in Palo Alto, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Executive Summary

Verizon proposes to install three small antennas on the municipal light pole sited in the public right-of-way near 1600 El Camino Real in Palo Alto. The proposed operation will comply with the FCC guidelines limiting public exposure to RF energy.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. A summary of the FCC's exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. The most restrictive limit for exposures of unlimited duration at several wireless service bands are as follows:

Wireless Service Band	Transmit Frequency	"Uncontrolled" Public Limit	Occupational Limit (5 times Public)
Microwave (point-to-point)	1–80 GHz	1.0 mW/cm^2	5.0 mW/cm^2
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550 MHz	1.0	5.0
BRS (Broadband Radio)	2,490	1.0	5.0
WCS (Wireless Communication)	2,305	1.0	5.0
AWS (Advanced Wireless)	2,110	1.0	5.0
PCS (Personal Communication)	1,930	1.0	5.0
Cellular	869	0.58	2.9
SMR (Specialized Mobile Radio)	854	0.57	2.85
700 MHz	716	0.48	2.4
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30–300	0.20	1.0

General Facility Requirements

Small cells typically consist of two distinct parts: the electronic transceivers (also called "radios" or "channels") that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The radios are typically mounted on the support pole or placed in a cabinet at ground level, and they are

connected to the antennas by coaxial cables. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above ground. The antennas are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. This means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas.

Computer Modeling Method

The FCC provides direction for determining compliance in its Office of Engineering and Technology Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated August 1997. Figure 2 describes the calculation methodologies, reflecting the facts that a directional antenna's radiation pattern is not fully formed at locations very close by (the "near-field" effect) and that at greater distances the power level from an energy source decreases with the square of the distance from it (the "inverse square law"). This methodology is an industry standard for evaluating RF exposure conditions and has been demonstrated through numerous field tests to be a conservative prediction of exposure levels.

Site and Facility Description

Based upon information provided by Verizon, it is proposed to install three 2-foot-tall Ericsson Model 6701 directional panels with integrated radios on a new light pole to replace the existing pole sited in the public right-of-way on the southwest side of El Camino Real in Palo Alto, about 200 feet northwest of its intersection with Serra Street. The antennas would be mounted around the pole at an effective height of about 32½ feet above ground and would be oriented toward 0°T, 120°T, and 240°T, together forming an omnidirectional pattern. The maximum effective radiated power proposed in any direction is 193 watts for 28 GHz service. There are reported no other wireless telecommunications base stations at the site or nearby.

Study Results

For a person anywhere at ground, the maximum RF exposure level due to the proposed Verizon operation is calculated to be 0.0037 mW/cm^2, which is 0.37% of the applicable public exposure limit. The maximum calculated level at any nearby building* is 0.28% of the public exposure limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels from the proposed operation.

* Located at least 150 feet away, based on the drawings.

Recommended Mitigation Measures

Due to their mounting location and height, the antennas would not be accessible to unauthorized persons, and so no measures are necessary to comply with the FCC public exposure guidelines. To prevent occupational exposures in excess of the FCC guidelines, it is recommended that appropriate RF safety training be provided to all workers who have access within 8 feet outward from the antennas. No access within 2 feet directly in front of the antennas should be allowed while they are in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. It is recommended that explanatory signs† be posted at the antennas and/or on the pole below the antennas, readily visible from any angle of approach.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that operation of the small cell proposed by Verizon Wireless near 1600 El Camino Real in Palo Alto, will comply with the prevailing standards for limiting public exposure to radio frequency energy and, therefore, will not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating small cells. Training authorized personnel and posting explanatory signs are recommended to establish compliance with FCC guidelines.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration No. E-21306, which expires on September 30, 2021. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

February 1, 2021

REGISTERED PROFESSIONAL ENGINEER
NEIL J OLIJ
No. E-21306
Exp. 9-30-2021
ELECTRICAL
STATE OF CALIFORNIA

Neil J. Olij, P.E.
707/996-5200

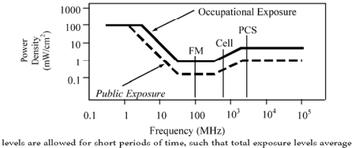
† Signs should comply with OET-65 color, symbol, and content recommendations. Contact information should be provided (*e.g.*, a telephone number) to arrange for access to restricted areas. The selection of language(s) is not an engineering matter, and guidelines from the landlord, local zoning or health authority, or appropriate professionals may be required.

FCC Radio Frequency Protection Guide

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent standard, developed by the Institute of Electrical and Electronics Engineers and approved as American National Standard ANSI/IEEE C95.1-2006, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," includes similar limits. These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive.

Frequency Applicable Range (MHz)	Electromagnetic Fields (f is frequency of emission in MHz) Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm^2)	
0.3 – 1.34	614	*614*	1.63	*1.63*	100	*100*
1.34 – 3.0	614	*823.8/f*	1.63	*2.19/f*	100	*180/f^2*
3.0 – 30	1842/f	*823.8/f*	4.89/f	*2.19/f*	900/f^2	*180/f^2*
30 – 300	61.4	*27.5*	0.163	*0.0729*	1.0	*0.2*
300 – 1,500	3.54$\sqrt{f}$	*1.59f*	$\sqrt{f}$/106	*$\sqrt{f}$/238*	f/300	*f/1500*
1,500 – 100,000	137	*61.4*	0.364	*0.163*	5.0	*1.0*



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has incorporated those formulas in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.

RFR.CALC™ Calculation Methodology

Assessment by Calculation of Compliance with FCC Exposure Guidelines

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The maximum permissible exposure limits adopted by the FCC (see Figure 1) apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits.

Near Field.
Prediction methods have been developed for the near field zone of panel (directional) and whip (omnidirectional) antennas, typical at wireless telecommunications base stations, as well as dish (aperture) antennas, typically used for microwave links. The antenna patterns are not fully formed in the near field at these antennas, and the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) gives suitable formulas for calculating power density within such zones.

For a panel or whip antenna, power density $S = \frac{180}{\theta_{BW}} \times \frac{0.1 \times P_{net}}{\pi \times D \times h}$, in mW/cm^2,

and for an aperture antenna, maximum power density $S_{max} = \frac{0.1 \times 16 \times \eta \times P_{net}}{\pi \times h^2}$, in mW/cm^2,

where θ_{BW} = half-power beamwidth of antenna, in degrees,
P_{net} = net power input to antenna, in watts,
D = distance from antenna, in meters,
h = aperture height of antenna, in meters, and
η = aperture efficiency (unitless, typically 0.5-0.8).

The factor of 0.1 in the numerators converts to the desired units of power density.

Far Field.
OET-65 gives this formula for calculating power density in the far field of an individual RF source:

power density $S = \frac{2.56 \times 1.64 \times 100 \times RFF^2 \times ERP}{4 \times \pi \times D^2}$, in mW/cm^2,

where ERP = total ERP (all polarizations), in kilowatts,
RFF = three-dimensional relative field factor toward point of calculation, and
D = distance from antenna effective height to point of calculation, in meters.

The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of 1.6 (1.6 x 1.6 = 2.56). The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 100 in the numerator converts to the desired units of power density. This formula is used in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program also allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WASSIM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

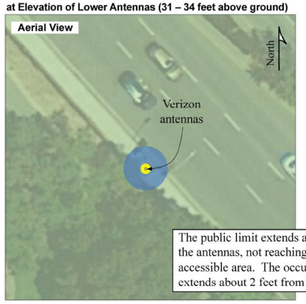
SHEET TITLE
EME REPORT

SHEET NUMBER
T-3

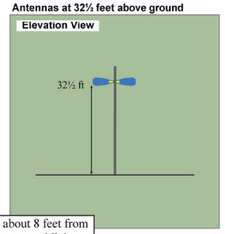
Verizon Wireless • Proposed Small Cell (No. 425225 "SF Palo Alto 121")
1600 El Camino Real • Palo Alto, California

Calculated RF Exposure Levels

at Elevation of Lower Antennas (31 – 34 feet above ground)

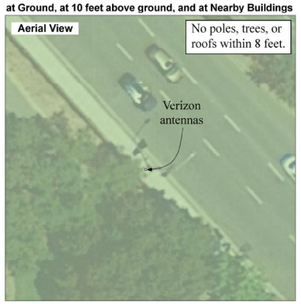


Antennas at 32½ feet above ground

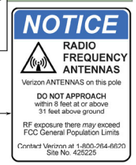


The public limit extends about 8 feet from the antennas, not reaching any publicly accessible area. The occupational limit extends about 2 feet from the antennas.

at Ground, at 10 feet above ground, and at Nearby Buildings



sign on pole at or below antennas



Legend:

- less than FCC Public Limit
- greater than FCC Public Limit less than FCC Occupational Limit
- greater than FCC Occupational Limit

Notes:

Calculations performed according to OET Bulletin No. 65, August 1997.

Base image from Google Maps.

FEET
10 0 10 20

HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO
©2021

(February 1, 2021) V1-Y8SU.1
Supplemental Figure

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

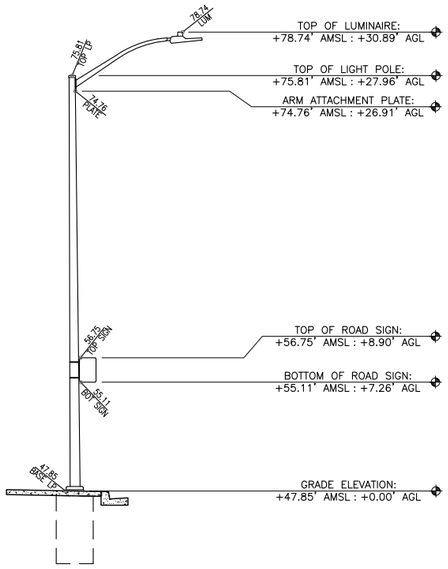
REGISTERED PROFESSIONAL ENGINEER
NISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
EME REPORT

SHEET NUMBER
T-4



2 LIGHT POLE ELEVATION

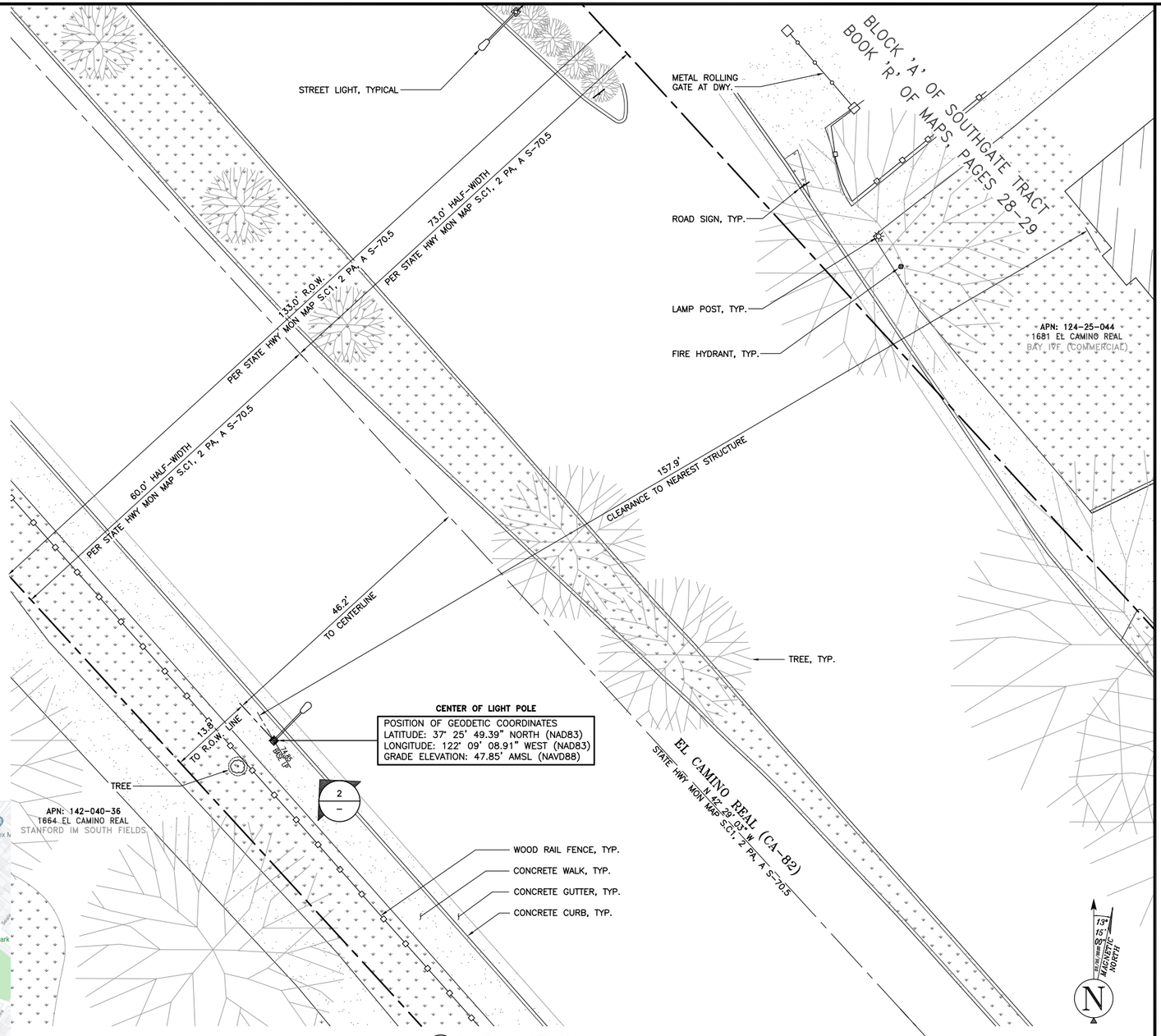
1 inch = 5ft.

0 2.5' 5' 10'

LEGEND

●	TREE	▭	U.G. UTILITY VAULT
-o-	UTILITY POLE	◎	FOUND MONUMENT
XXXX.X NG	SPOT ELEVATION	◆	GEODETIC MARKER
Ⓦ	WATER VALVE	▬▬	MASONRY WALL
BOL	BOLLARD	FL	FLOW LINE
TOP _	TOP OF ITEM	FC	FACE OF CURB
BOT _	BOTTOM OF ITEM	R.O.W.	RIGHT OF WAY
BLDG	TOP OF BUILDING	AP	ASPHALT
LP	LIGHT POLE	SW	SIDEWALK
———	LIMITS OF PROPERTY	— O/H —	OVERHEAD LINE
— x —	CHAIN LINK FENCE	——o——	METAL FENCE
——□——	WOOD FENCE	— · — · —	GRADE BREAK

VICINITY MAP



1 POLE LOCATION

1 inch = 10ft

0 5' 10' 20'

TITLE REPORT

NOT APPLICABLE (RIGHT-OF-WAY)

LEGAL DESCRIPTION

NOT APPLICABLE (RIGHT-OF-WAY)

ASSESSOR'S PARCEL NO.

NOT APPLICABLE (RIGHT-OF-WAY)

UTILITY NOTE:

SURVEYOR DOES NOT GUARANTEE THAT ALL UTILITIES ARE SHOWN OR THEIR LOCATIONS ARE DEFINITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND DEVELOPER TO CONTACT BLUE STAKE AND ANY OTHER INVOLVED AGENCIES TO LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION. REMOVAL, RELOCATION AND/ OR REPLACEMENT IS THE RESPONSIBILITY OF THE CONTRACTOR.

NOTES:

1. THIS IS NOT A BOUNDARY SURVEY. THIS IS A SPECIALIZED RIGHT OF WAY MAP. THE PROPERTY LINES AND EASEMENTS SHOWN HEREON ARE FROM RECORD INFORMATION AS NOTED HEREON. ALL STATES ENGINEERING & SURVEYING/ZALZALI & ASSOCIATES, INC. TRANSLATED THE TOPOGRAPHIC SURVEY TO RECORD INFORMATION USING MONUMENT(S)/LANDMARK(S) SHOWN HEREON. NO TITLE RESEARCH WAS PERFORMED BY ALL STATES ENGINEERING & SURVEYING/ZALZALI & ASSOCIATES, INC.

2. ANY CHANGES MADE TO THE INFORMATION ON THIS PLAN, WITHOUT THE WRITTEN CONSENT OF ALL STATES ENGINEERING & SURVEYING / ZALZALI & ASSOCIATES, INC. RELIEVES ALL STATES ENGINEERING & SURVEYING/ ZALZALI & ASSOCIATES, INC. OF ANY AND ALL LIABILITY.

3. THESE DRAWINGS & SPECIFICATIONS ARE THE PROPERTY & COPYRIGHT OF ALL STATES ENGINEERING & SURVEYING / ZALZALI & ASSOCIATES, INC. & SHALL NOT BE USED ON ANY OTHER WORK EXCEPT BY AGREEMENT WITH THE SURVEYOR. WRITTEN DIMENSIONS SHALL TAKE PREFERENCE OVER SCALED & SHALL BE VERIFIED ON THE JOB SITE. ANY DISCREPANCY SHALL BE BROUGHT TO THE NOTICE OF THE SURVEYOR PRIOR TO COMMENCEMENT OF ANY WORK.

4. THIS SITE IS PROPOSED TO BE DEVELOPED ON A STREET LIGHT POLE LOCATED OUTSIDE OF THE PUBLIC RIGHT OF WAY.

SURVEY DATE

03/25/2020

BASIS OF BEARING

BEARINGS SHOWN HEREON ARE BASED UPON U.S. STATE PLANE NAD83 COORDINATE SYSTEM CALIFORNIA STATE PLANE COORDINATE ZONE THREE, DETERMINED BY GPS OBSERVATIONS.

BENCHMARK

RTCM-REF 3270
NORTHING: 1970498.865
EASTING: 6082238.002
+248.11' (A.M.S.L.)

REFERENCE MAPS

- 633-M-50/51
- STATE HIGHWAY MONUNMENTS MAP S.C1, 2 PA, A S-70.5

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-102830
DRAWN BY:	NC
CHECKED BY:	BC/DW

REV	DATE	DESCRIPTION	
0	05/18/2020	FINAL SURVEY	NC
A	05/15/2020	PRELIMINARY DRAWING	NC

PROFESSIONAL LAND SURVEYOR
BRUCE T. CRAMTON
No. 9039
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121

PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL
PALO ALTO, 94306
LOCATION CODE: 425267

SHEET TITLE

SITE SURVEY

SHEET NUMBER

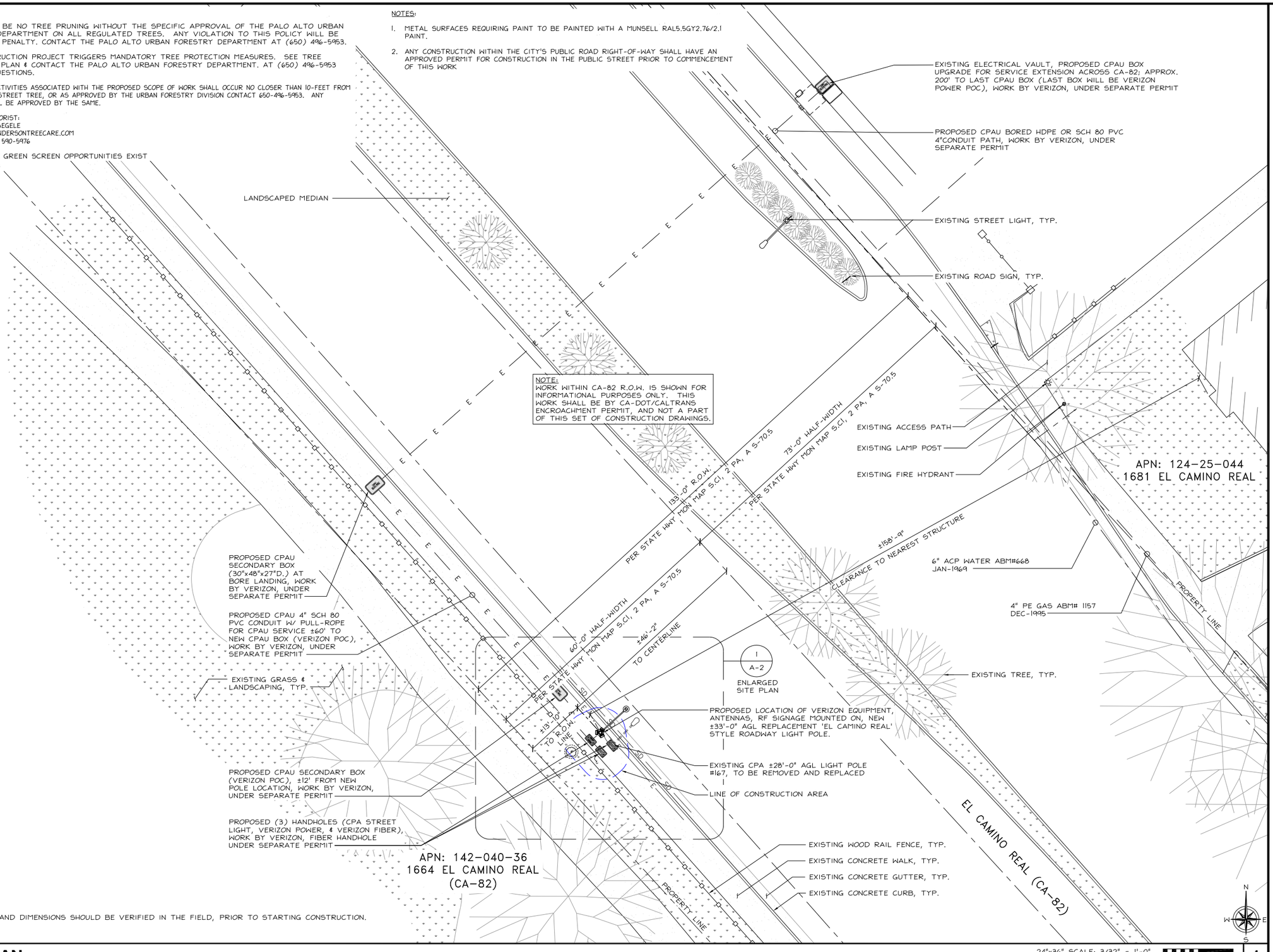
C-1

TREE NOTES:

1. THERE WILL BE NO TREE PRUNING WITHOUT THE SPECIFIC APPROVAL OF THE PALO ALTO URBAN FORESTRY DEPARTMENT ON ALL REGULATED TREES. ANY VIOLATION TO THIS POLICY WILL BE SUBJECT TO PENALTY. CONTACT THE PALO ALTO URBAN FORESTRY DEPARTMENT AT (650) 496-5953.
2. THIS CONSTRUCTION PROJECT TRIGGERS MANDATORY TREE PROTECTION MEASURES. SEE TREE PROTECTION PLAN & CONTACT THE PALO ALTO URBAN FORESTRY DEPARTMENT. AT (650) 496-5953 WITH ANY QUESTIONS.
3. EXCAVATION ACTIVITIES ASSOCIATED WITH THE PROPOSED SCOPE OF WORK SHALL OCCUR NO CLOSER THAN 10-FEET FROM THE EXISTING STREET TREE, OR AS APPROVED BY THE URBAN FORESTRY DIVISION CONTACT 650-496-5953. ANY CHANGES SHALL BE APPROVED BY THE SAME.
4. PROJECT ARBORIST:
   KATHERINE NAEGELE
   KATHERINE@ANDERSONTREECARE.COM
   PHONE: (408) 590-5976
5. NO FEASIBLE GREEN SCREEN OPPORTUNITIES EXIST

NOTES:

1. METAL SURFACES REQUIRING PAINT TO BE PAINTED WITH A MUNSELL RAL5.5GY2.76/2.1 PAINT.
2. ANY CONSTRUCTION WITHIN THE CITY'S PUBLIC ROAD RIGHT-OF-WAY SHALL HAVE AN APPROVED PERMIT FOR CONSTRUCTION IN THE PUBLIC STREET PRIOR TO COMMENCEMENT OF THIS WORK



NOTE:

ALL ITEMS AND DIMENSIONS SHOULD BE VERIFIED IN THE FIELD, PRIOR TO STARTING CONSTRUCTION.

SITE PLAN

24"x36" SCALE: 3/32" = 1'-0"
11"x17" SCALE: 3/64" = 1'-0"
8' 4' 0" 8'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

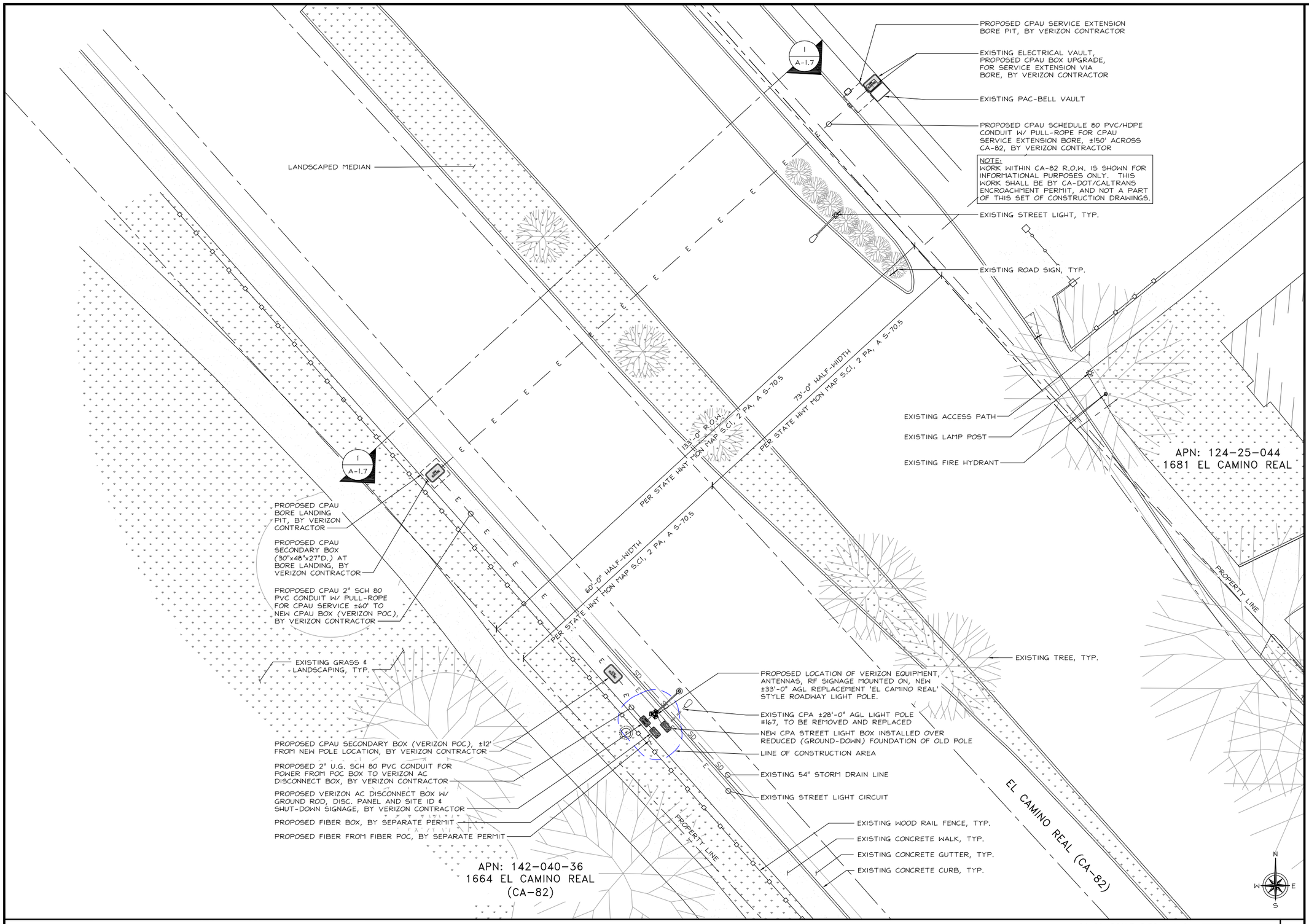
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
SITE PLAN

SHEET NUMBER
A-1



EXISTING UTILITY SITE PLAN

24"x36" SCALE: 3/32" = 1'-0"
11"x17" SCALE: 3/64" = 1'-0"
8' 4' 0" 8'

1

verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums

575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING

23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
HASSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121

PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
EXISTING UTILITY SITE PLAN

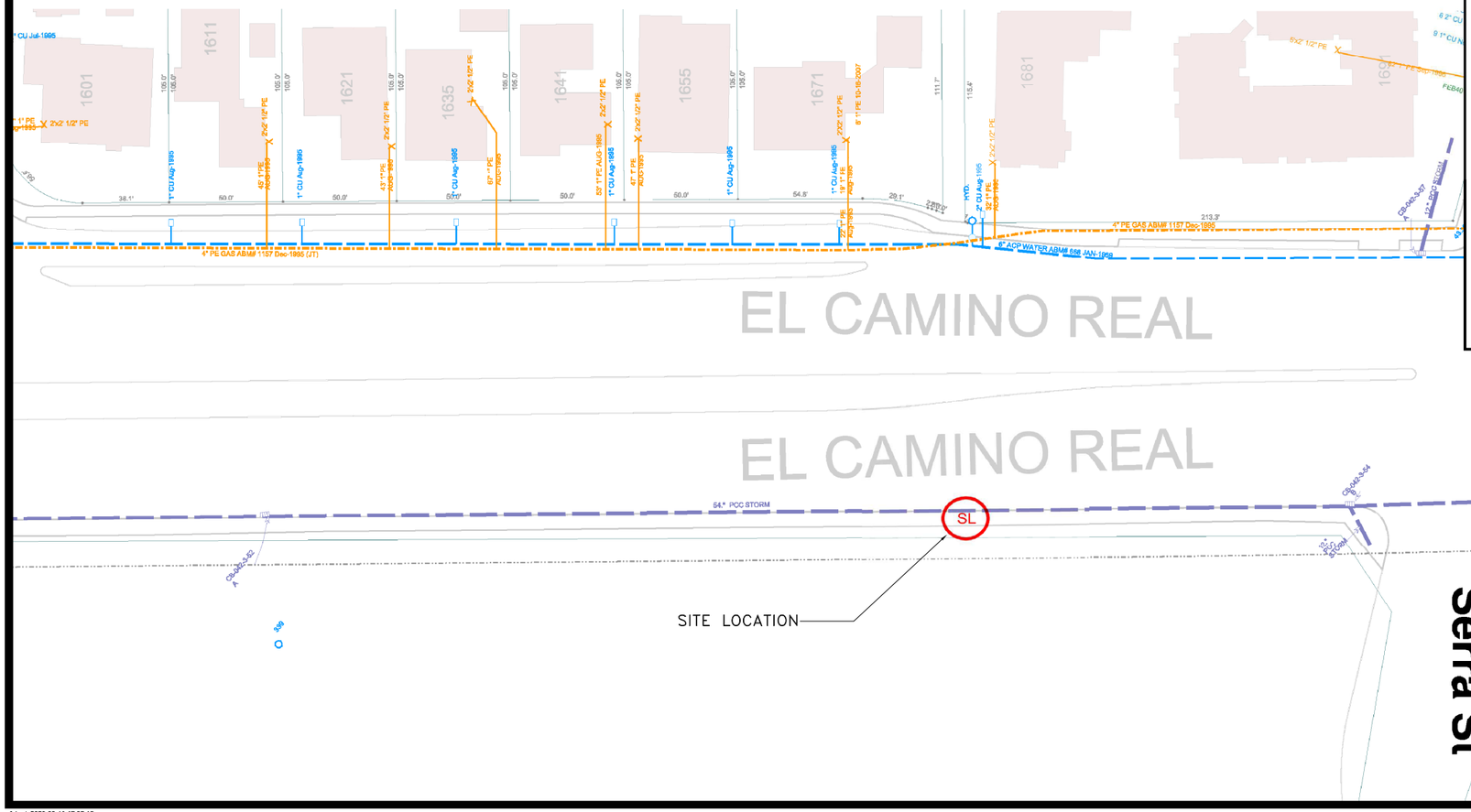
SHEET NUMBER
A-1.1

El Camino Real

In California and Nevada
CALL TWO WORKING DAYS
BEFORE YOU DIG
1-800-227-2600
UNDERGROUND SERVICE ALERT

THIS MAP IS PROVIDED FOR REFERENCE ONLY.
THE CITY OF PALO ALTO DOES NOT WARRANTY
THE ACCURACY OF THIS MAP

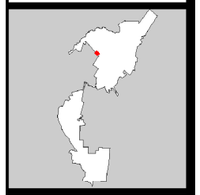
Park Blvd



Legend

- Assessment Parcel (AP)
- Building Roof Outline (BL)
- Address Label (AP)
- Curb Face (RF)
- Curb Edge (RF)
- Curb Edge, Rolled (RF)
- Pavement Edge (RF)
- Sidewalk Edge (RF)
- Road Centerline Small Text (TC)
- Easement Boundary Line (CG)
- Dimensions (AP)
- Easement Text (CG)
- Pipeline (SD)
- Catch Basin (SD)
- Manhole (SD)
- Pipe, Main (TB WT)
- Pipe, Service (TB WT)
- Crossing Casing (TB WT)NAD
- Hydrant (TB WT)
- Valve (TB WT):
  - Fire Service
  - Hydrant Branch
  - Main
  - Service
  - Buried Alive
- Meter, Main (TB WT)NAD
- Meter, Service (TB WT)NAD
- Well (TB WT)NAD
- Air Relief Valve (TB WT)
- Valve Blowoff (TB WT)
- Riser (TB GS)
- Pipe, Service (TB GS)
- Casing (TB GS)NAD
- Fence (TB UF)NAD
- Meter (TB GS):
  - Above Ground Service
  - Curb Service
- Pipe, Main (TB GS)
- Valve (TB GS):
  - Main
  - Service
  - Dead End-One Way
  - Emergency Shut Off Valve (ESV)
  - Buried Alive
- **Pipe, Lateral (TB WW)**
- **Pipe, Main (TB WW)**
- **Crossing Casing (TB WW)**
- **Cleanout, Lateral (TB WW)**
- **Structure, Main (TB WW):**
  - **Manhole**
  - **Cleanout**
  - **Lamp Hole**
  - **Flushing Inlet**
  - **Pipe cap**
  - **Concrete plug**
  - **Non-structural node**
- **Point Tap (TB WW)**
- **Text (TB WW)**

The City of Palo Alto



CPA WGW Utility Information
1600 El Camino Real
NODE 121
For Reference Use Only

This map is a product of the City of Palo Alto GIS

0' 50'

ofajard, 2020-03-18 17:05:15
New Base Map Req (\\cc-maps\Encompass\Admin\Persona\ofajard.mdb)

This document is a graphic representation only of best available sources.
The City of Palo Alto assumes no responsibility for any errors. ©1959 to 2016 City of Palo Alto

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

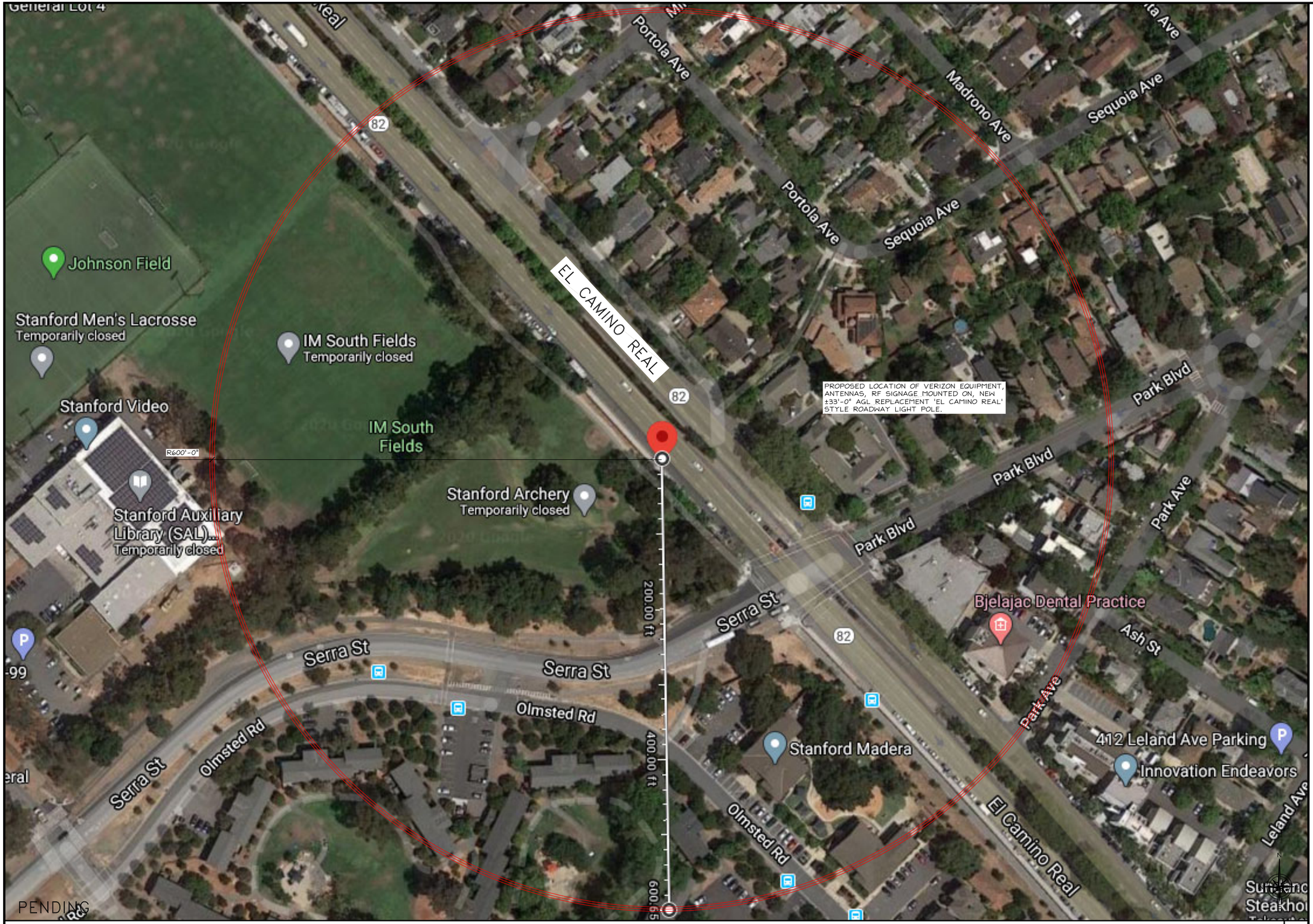
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
UTILITY PLAN
(FOR REFERENCE)

SHEET NUMBER
A-1.2



PENDING

EXISTING UTILITY SITE PLAN

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
NISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
LOCATION MAP

SHEET NUMBER
A-1.3

- ALL WORK SHALL COMPLY WITH THE CITY OF PALO ALTO 2018 STANDARD DRAWINGS AND SPECIFICATIONS BORING, TRENCHING, POTHOLING AND DEWATERING, SECTION 17
- THE LOCATION OF EXISTING UTILITY MAINS AND LATERAL LINES INCLUDING STORM DRAIN, SANITARY SEWER, WATER, GAS, UNDERGROUND ELECTRICAL AND COMMUNICATION CONDUITS CROSSING THE TRENCH EXCAVATION SHALL BE VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UNDERGROUND SERVICES ALERT (USA) AT 811 OR 800-642-2444 AT LEAST FIVE (5) WORKING DAYS PRIOR TO BEGINNING UNDERGROUND WORK SO THAT EXISTING UTILITIES CAN BE MARKED IN THE FIELD, UNLESS OTHERWISE STATED BY CITY CONTRACT.
- EXCAVATION SHALL BE SUPPORTED AND EXCAVATION OPERATIONS CONDUCTED IN ACCORDANCE WITH THE RULES OF THE CALIFORNIA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA). IF IN THE OPINION OF THE ENGINEER, THERE EXISTS A SITUATION OF IMMINENT DANGER TO THE WORKERS, THE ENGINEER MAY ORDER THE WORK STOPPED AND THE CONTRACTOR SHALL COMPLY WITH RULES OF THE CALIFORNIA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA).
- BACKFILL SHALL BE SAND OR GRANULAR MATERIAL FALLING WITHIN THE LIMITS DESCRIBED IN THE STANDARD DRAWING 401. AGGREGATE BASE, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE SHALL CONFORM TO THE REQUIREMENTS WITHIN THESE SPECIFICATIONS.
- THE CONTRACTOR SHALL INSTALL THE CONDUIT IN ACCORDANCE WITH THE APPROVED STREET WORK PERMIT. ALL CONDUITS SHALL BE INSTALLED UNDERGROUND USING DIRECTIONAL BORING METHOD. MICRO-TUNNELING OR OTHER METHODS SHALL BE APPROVED BY THE PUBLIC WORKS ENGINEERING DIVISION. THE CONDUITS SHALL BE INSTALLED WITH TRACER WIRE APPROVED BY THE ENGINEER PER CITY OF PALO ALTO UTILITIES DEPARTMENT WATER, GAS AND WASTEWATER UTILITY STANDARDS. REFER TO STANDARD DRAWING 402.
- TRENCHES SHALL NOT BE LEFT OPEN AT THE END OF THE DAY. ADEQUATE PROVISIONS SHALL BE MADE FOR THE PLACING OF TEMPORARY STEEL PLATES IN ADDITION TO BARRICADES, SIGNING AND LIGHTING. STOCKPILING OF EXCAVATED MATERIAL WITHIN THE PUBLIC RIGHT-OF-WAY SHALL NOT BE ALLOWED. A MAXIMUM OF THREE-HUNDRED (300) FEET OR ONE (1) CITY BLOCK OF TRENCH, WHICHEVER IS GREATER, MAY BE OPENED AT ONE TIME. FOR TEMPORARY PATCHING, A MINIMUM THICKNESS OF TWO (2) INCHES OF CUTBACK WILL BE USED.
- PRIOR TO EXCAVATION OF TRENCHING, POTHOLING OR SENDING/RECEIVING PITS, THE ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE SHALL BE CUT OR MILL TO A NEAT LINE FULL DEPTH WITH A SAW-CUTTING OR MILLING DEVICE APPROVED BY THE ENGINEER.
- BACKFILL MATERIAL SHALL BE COMPACTED TO 90 PERCENT MINIMUM RELATIVE COMPACTION EXCEPT THE TOP TWENTY-FOUR (24) INCHES, WHICH SHALL BE MECHANICALLY COMPACTED TO 95 PERCENT MINIMUM RELATIVE COMPACTION. MECHANICALLY COMPACTED LIFTS USING ALTERNATIVE EQUIPMENT, COMPLYING WITH MANUFACTURE'S SPECIFICATION, WILL REQUIRE THE APPROVAL OF THE ENGINEER. USE OF ALTERNATIVE COMPACTION EQUIPMENT SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ANY DAMAGE TO THE CONDUIT, SURROUNDING GROUND, OR EXISTING AND NEW IMPROVEMENTS.

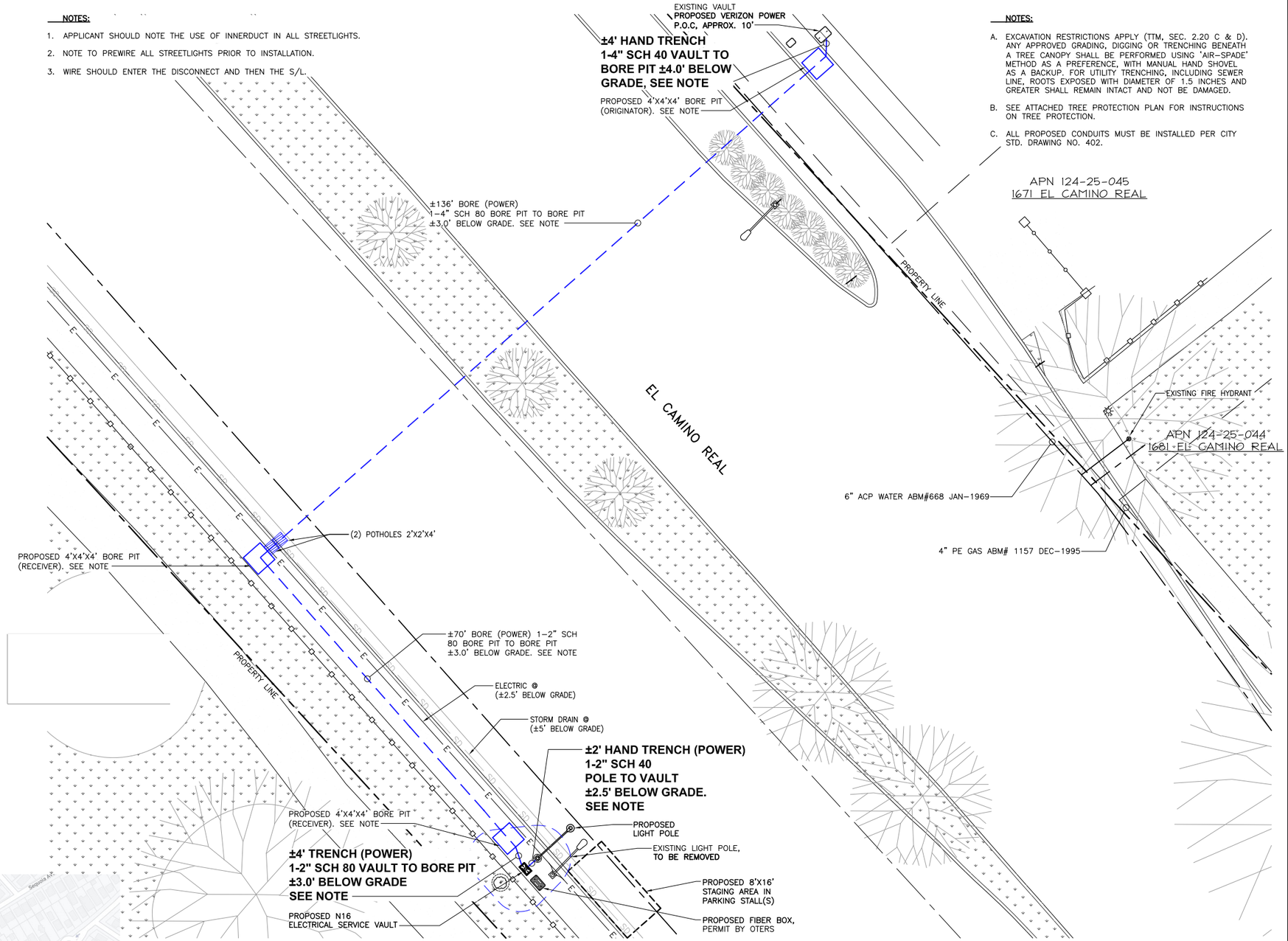
2 NOTES

Sawcutting & Asphalt/Concrete Removal

- ☐ Protect storm drain inlets during saw cutting.
- ☐ If saw cut slurry enters a catch basin, clean it up immediately.
- ☐ Shovel or vacuum saw cut slurry deposits and remove from the site. When making saw cuts, use as little water as possible. Sweep up, and properly dispose of all residues.

NOTES:

1. APPLICANT SHOULD NOTE THE USE OF INNERDUCT IN ALL STREETLIGHTS.
2. NOTE TO PREWIRE ALL STREETLIGHTS PRIOR TO INSTALLATION.
3. WIRE SHOULD ENTER THE DISCONNECT AND THEN THE S/L.



NOTES:

A. EXCAVATION RESTRICTIONS APPLY (TTM, SEC. 2.20 C & D). ANY APPROVED GRADING, DIGGING OR TRENCHING BENEATH A TREE CANOPY SHALL BE PERFORMED USING 'AIR-SPADE' METHOD AS A PREFERENCE, WITH MANUAL HAND SHOVEL AS A BACKUP. FOR UTILITY TRENCHING, INCLUDING SEWER LINE, ROOTS EXPOSED WITH DIAMETER OF 1.5 INCHES AND GREATER SHALL REMAIN INTACT AND NOT BE DAMAGED.

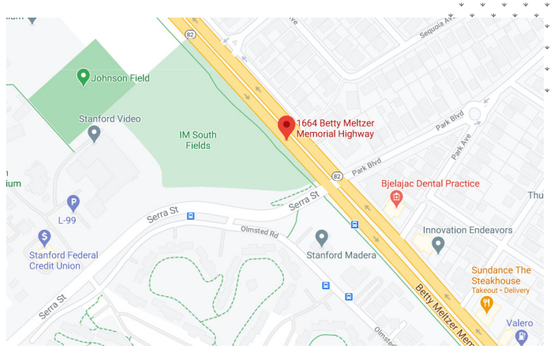
B. SEE ATTACHED TREE PROTECTION PLAN FOR INSTRUCTIONS ON TREE PROTECTION.

C. ALL PROPOSED CONDUITS MUST BE INSTALLED PER CITY STD. DRAWING NO. 402.

1 LIGHT POLE

1 inch = 10ft.

2' 1' 0" 2'



VICINITY MAP

PROJECT SPECIFIC PERMIT INFORMATION		
DESCRIPTION	QTY	UNIT
PLACE (1) 4" SCH 40 CONDUIT	214	LF
PLACE (1) 2" SCH 40 CONDUIT	2	LF
REMOVE AND RESTORE SOIL	224	FT³

811 USA North
Know what's below. Call before you dig.
California and Nevada
Call Two Working Days Before You Dig!
811 / 800-227-2600

N W E S

LEGEND

U.G. UTILITY VAULT	BOL	BOLLARD	FL	FLOW LINE	W WATER
MH MANHOLE	TOP _	TOP OF ITEM	EOP	EDGE OF PAVEMENT	SS SANITARY SEWER
UTILITY POLE	BOT _	BOTTOM OF ITEM	R.O.W.	RIGHT OF WAY	SD STORM DRAIN
XXXX.X SPOT ELEVATION	BLDG	TOP OF BUILDING	AP	ASPHALT	G GAS
W WATER VALVE	LP	LIGHT POLE	SW	SIDEWALK	C COMMUNICATION
FOUND MONUMENT	LIMITS OF PROPERTY		O/H	OVERHEAD LINE	E ELECTRIC
GEODETIC MARKER	x	CHAIN LINK FENCE		METAL FENCE	U UNKNOWN UTILITY
MASONRY WALL		WOOD FENCE		GRADE BREAK	IRR IRRIGATION

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	NC
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
0	01/19/2021	FINAL BORING PLAN	MG
A	10/12/2020	PRELIMINARY BORING PLAN	SS

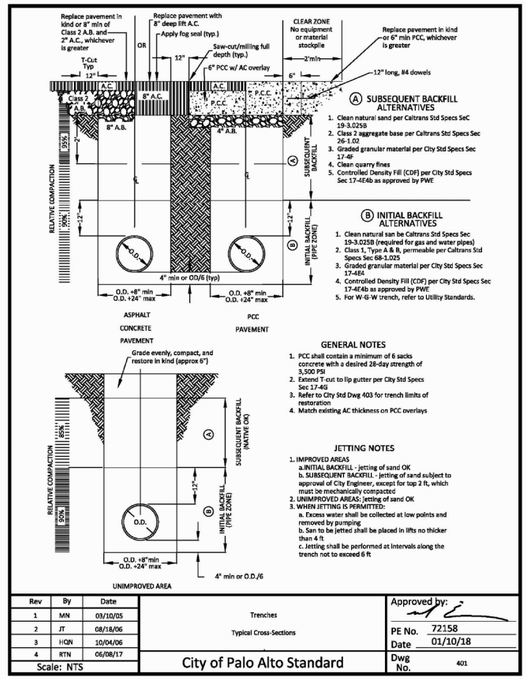
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

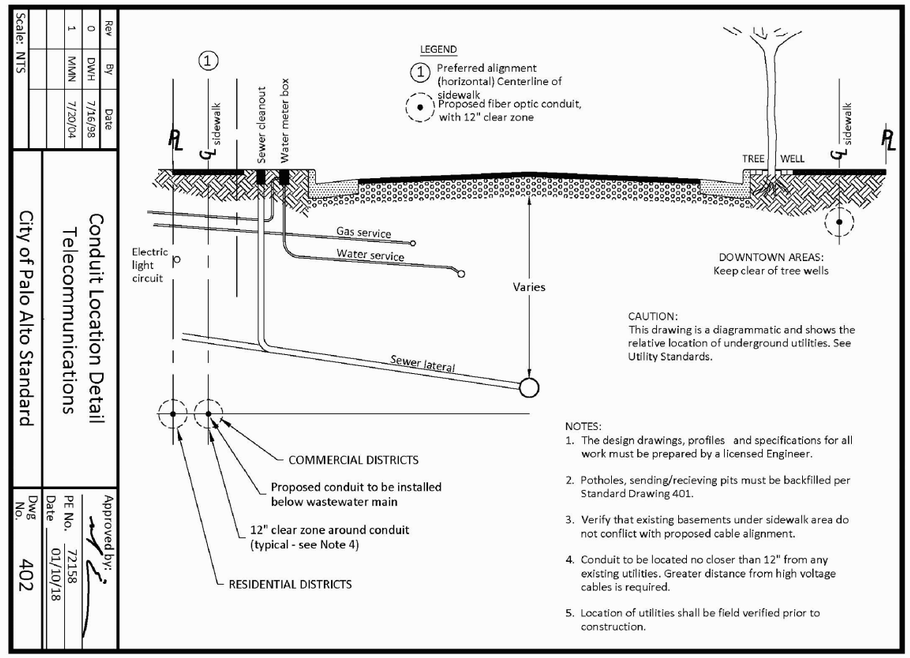
SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, CA 94306
LOCATION CODE: 425225

SHEET TITLE
BORING SITE PLAN

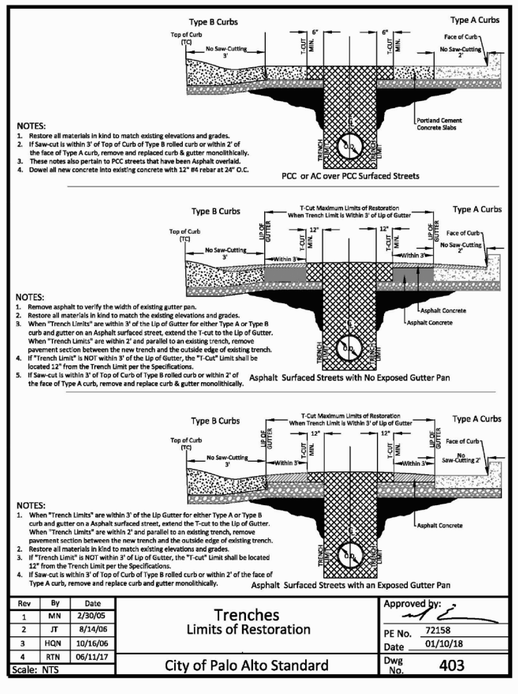
SHEET NUMBER
A-1.4



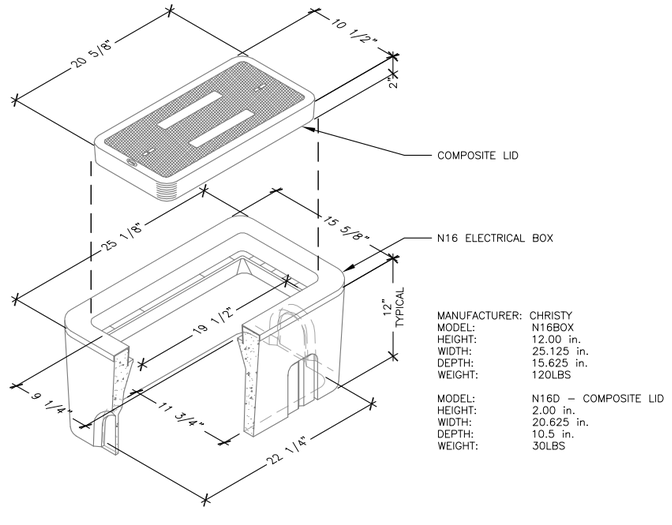
5 CITY STANDARD DWG 401
N.T.S.



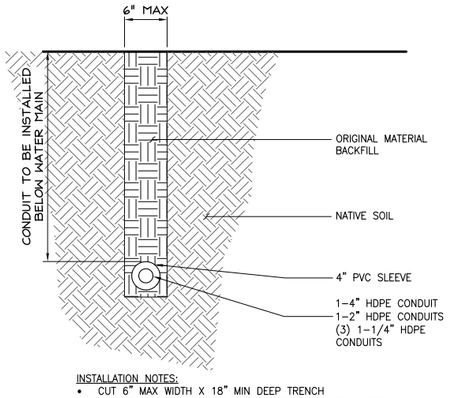
3 CITY STANDARD DWG 402
N.T.S.



4 CITY STANDARD DWG 403
N.T.S.



2 CHRISTY N16 ELECTRICAL BOX
N.T.S.



1 IN DIRT – PRIVATE
N.T.S.

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	NC
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
0	01/19/2021	FINAL BORING PLAN	MG
A	10/12/2020	PRELIMINARY BORING PLAN	SS

REGISTERED PROFESSIONAL ENGINEER
WISAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, CA 94306
LOCATION CODE: 425225

SHEET TITLE
CITY STANDARDS & DETAILS

SHEET NUMBER
A-1.5

- Grade fills over 6-inches or impervious overlay shall incorporate an approved permanent aeration system, permeable material or other approved mitigation.
- Grade cuts exceeding 4-inches shall incorporate retaining walls or an appropriate transition equivalent.

C. Trenching, Excavation and Equipment Use

Trenching, excavation or boring activity within the TPZ is restricted to the following activities, conditions and requirements if approved by the *City Arborist*. *(See Restriction Zones for Excavation, Trenching or Boring Near Regulated Trees, Image 2.20-1 through 2.20-3)*. Mitigating measures shall include prior notification to and direct supervision by the *project arborist*.

1. Notification. Contractor shall notify the *project arborist* a minimum of 24 hours in advance of the activity in the TPZ.
2. Root Severance. Roots that are encountered shall be cut to sound wood and repaired (*see Root Injury, Section 2.25 A-1*). Roots 2-inches and greater must remain injury free.
3. Excavation. Any approved excavation, demolition or extraction of material shall be performed with equipment sitting outside the TPZ. Methods permitted are by hand digging, hydraulic or pneumatic air excavation technology. Avoid excavation within the TPZ during hot, dry weather.
   - If excavation or *trenching* for drainage, utilities, irrigation lines, etc., it is the duty of the contractor to tunnel under any roots 2-inches in diameter and greater.
   - Prior to excavation for foundation/footings/walls, grading or *trenching* within the TPZ, roots shall first be severed cleanly 1-foot outside the TPZ and to the depth of the future excavation. The trench must then be hand dug and roots pruned with a saw, sawzall, narrow trencher with sharp blades or other approved root pruning equipment.
4. Heavy Equipment. Use of backhoes, steel tread tractors or any heavy vehicles within the TPZ is prohibited unless approved by the *City Arborist*. If allowed, a protective *root buffer* (*see Root Buffer and Damage to Trees, Section 2.25.A-1*) is required. The protective buffer shall consist of a base course of tree chips spread over the root area to a minimum of 6-inch depth, layered by 3/4-inch quarry gravel to stabilize 3/4-inch plywood on top. This buffer within the TPZ shall be maintained throughout the entire construction process.
   - Structural design. If injurious activity or interference with roots greater than 2-inches will occur within the TPZ, plans shall specify a design of special foundation, footing, walls, concrete slab or pavement designs subject to *City Arborist* approval. Discontinuous foundations such as concrete pier and structural grade beam must maintain natural grade (not to exceed a 4-inch cut), to minimize root loss and allow the tree to use the existing soil.

notes:

Required Practices

- Basement excavations shall be designed outside the TPZ of all *protected* and *designated trees* (*see Excavation, Section 2.20-3*) and shall not be harmful to other mature or neighboring property trees.

D. Tunneling & Directional Drilling

If *trenching* or pipe installation has been approved within the TPZ, then the trench shall be either cut by hand, air-spade, hydraulic vac-on excavation or, by mechanically boring the tunnel under the roots with a horizontal directional drill and hydraulic or pneumatic air excavation technology. In all cases, install the utility pipe immediately, backfill with soil and soak within the same day. Installation of private utility improvements shall be tunnel bored beneath the tree and roots per *Trenching Tunneling & Distance Matrix* in Table 2-1.

TABLE 2-1
Trenching & Tunneling Distance

TRENCHING DISTANCE

When the Tree Diameter At 4.5 Ft Is:	Trenching will be Replaced with Boring at this Minimum Distance (10x tree dia.) from the Face of the Tree in any Direction:
6-9" Measured At 6" à	6-9'
10-14" Measured At 54" à	10-14'
15-19" Measured At 54" à	15-19'
Over 19" Measured At 54" à	20' +

DEPTH OF TUNNELING

Tree Diameter	Depth of Tunneling
9" Or Less Measured At 6" à	2.5'
10-14" Measured At 54" à	3.0'
15-19" Measured At 54" à	3.5'
More Than 19" Measured At 54" Depth of Tunnel à	4.0'

Bore Pits Shall Be Located At A Minimum Distance As Specified By The Trenching Distance Table Above.

1. Public Utilities
   Underground public utility improvements or repairs shall be performed in accordance with the *Utility Standards for Excavation, Trenching or Boring, Section 02200.309*; and per *Restriction Zones Near Regulated Trees* (*see Images 2.20-1 through 2.20-3*).
2. Street Trees
   Exclusions for *street trees* in the publicly owned right-of-way (ROW).
   - *Street Trees* that are in conflict with utility infrastructure where the conflict cannot be resolved may be removed if approved by Public Works Operations (e.g., a tree planted directly on top of a damaged sewer lateral.)

notes:

Required Practices

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	NC
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
0	01/19/2021	FINAL BORING PLAN	MG
A	10/12/2020	PRELIMINARY BORING PLAN	SS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

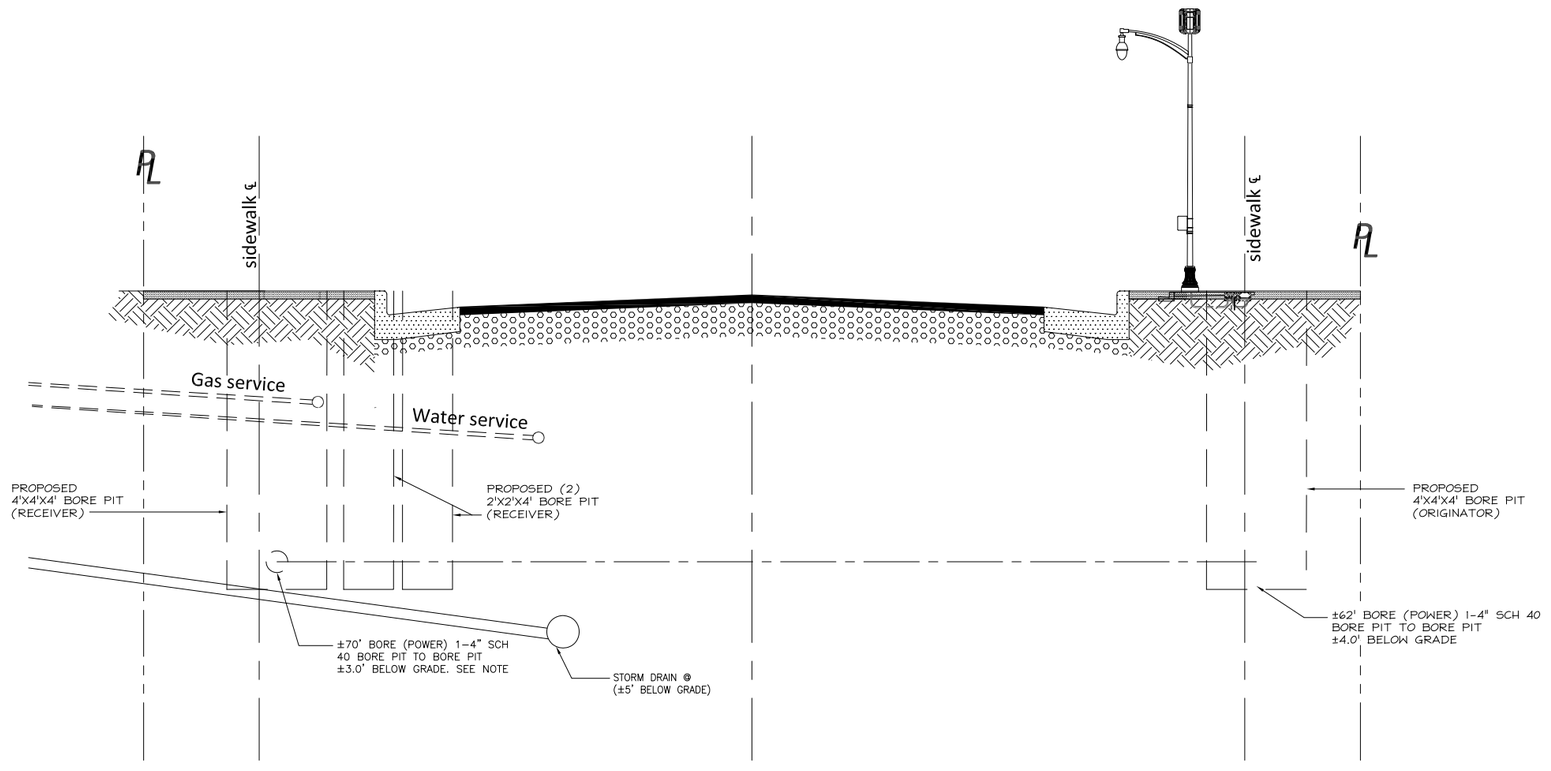
SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, CA 94306
LOCATION CODE: 425225

SHEET TITLE
CITY STANDARDS & DETAILS

SHEET NUMBER
A-1.6

1. ALL WORK SHALL COMPLY WITH THE CITY OF PALO ALTO 2018 STANDARD DRAWINGS AND SPECIFICATIONS BORING, TRENCHING, POTHOLING AND DEWATERING, SECTION 17
2. THE LOCATION OF EXISTING UTILITY MAINS AND LATERAL LINES INCLUDING STORM DRAIN, SANITARY SEWER, WATER, GAS, UNDERGROUND ELECTRICAL AND COMMUNICATION CONDUITS CROSSING THE TRENCH EXCAVATION SHALL BE VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UNDERGROUND SERVICES ALERT (USA) AT 811 OR 800-642-2444 AT LEAST FIVE (5) WORKING DAYS PRIOR TO BEGINNING UNDERGROUND WORK SO THAT EXISTING UTILITIES CAN BE MARKED IN THE FIELD, UNLESS OTHERWISE STATED BY CITY CONTRACT.
3. EXCAVATION SHALL BE SUPPORTED AND EXCAVATION OPERATIONS CONDUCTED IN ACCORDANCE WITH THE RULES OF THE CALIFORNIA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA). IF IN THE OPINION OF THE ENGINEER, THERE EXISTS A SITUATION OF IMMINENT DANGER TO THE WORKERS, THE ENGINEER MAY ORDER THE WORK STOPPED AND THE CONTRACTOR SHALL COMPLY WITH RULES OF THE CALIFORNIA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA).
4. BACKFILL SHALL BE SAND OR GRANULAR MATERIAL FALLING WITHIN THE LIMITS DESCRIBED IN THE STANDARD DRAWING 401. AGGREGATE BASE, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE SHALL CONFORM TO THE REQUIREMENTS WITHIN THESE SPECIFICATIONS.
5. THE CONTRACTOR SHALL INSTALL THE CONDUIT IN ACCORDANCE WITH THE APPROVED STREET WORK PERMIT. ALL CONDUITS SHALL BE INSTALLED UNDERGROUND USING DIRECTIONAL BORING METHOD. MICRO-TUNNELING OR OTHER METHODS SHALL BE APPROVED BY THE PUBLIC WORKS ENGINEERING DIVISION. THE CONDUITS SHALL BE INSTALLED WITH TRACER WIRE APPROVED BY THE ENGINEER PER CITY OF PALO ALTO UTILITIES DEPARTMENT WATER, GAS AND WASTEWATER UTILITY STANDARDS. REFER TO STANDARD DRAWING 402.
6. TRENCHES SHALL NOT BE LEFT OPEN AT THE END OF THE DAY. ADEQUATE PROVISIONS SHALL BE MADE FOR THE PLACING OF TEMPORARY STEEL PLATES IN ADDITION TO BARRICADES, SIGNING AND LIGHTING. STOCKPILING OF EXCAVATED MATERIAL WITHIN THE PUBLIC RIGHT-OF-WAY SHALL NOT BE ALLOWED. A MAXIMUM OF THREE-HUNDRED (300) FEET OR ONE (1) CITY BLOCK OF TRENCH, WHICHEVER IS GREATER, MAY BE OPENED AT ONE TIME. FOR TEMPORARY PATCHING, A MINIMUM THICKNESS OF TWO (2) INCHES OF CUTBACK WILL BE USED.
7. PRIOR TO EXCAVATION OF TRENCHING, POTHOLING OR SENDING/RECEIVING PITS, THE ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE SHALL BE CUT OR MILL TO A NEAT LINE FULL DEPTH WITH A SAW-CUTTING OR MILLING DEVICE APPROVED BY THE ENGINEER.
8. BACKFILL MATERIAL SHALL BE COMPACTED TO 90 PERCENT MINIMUM RELATIVE COMPACTION EXCEPT THE TOP TWENTY-FOUR (24) INCHES, WHICH SHALL BE MECHANICALLY COMPACTED TO 95 PERCENT MINIMUM RELATIVE COMPACTION. MECHANICALLY COMPACTED LIFTS USING ALTERNATIVE EQUIPMENT, COMPLYING WITH MANUFACTURE'S SPECIFICATION, WILL REQUIRE THE APPROVAL OF THE ENGINEER. USE OF ALTERNATIVE COMPACTION EQUIPMENT SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ANY DAMAGE TO THE CONDUIT, SURROUNDING GROUND, OR EXISTING AND NEW IMPROVEMENTS.

(2) NOTES



(1) R.O.W SECTION
NTS

Sawcutting & Asphalt/Concrete Removal

- ☐ Protect storm drain inlets during saw cutting.
- ☐ If saw cut slurry enters a catch basin, clean it up immediately.
- ☐ Shovel or vacuum saw cut slurry deposits and remove from the site. When making saw cuts, use as little water as possible. Sweep up, and properly dispose of all residues.

811 USA North
Know what's below. Call before you dig.
California and Nevada
Call Two Working Days Before You Dig!
811 / 800-227-2600

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WASAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

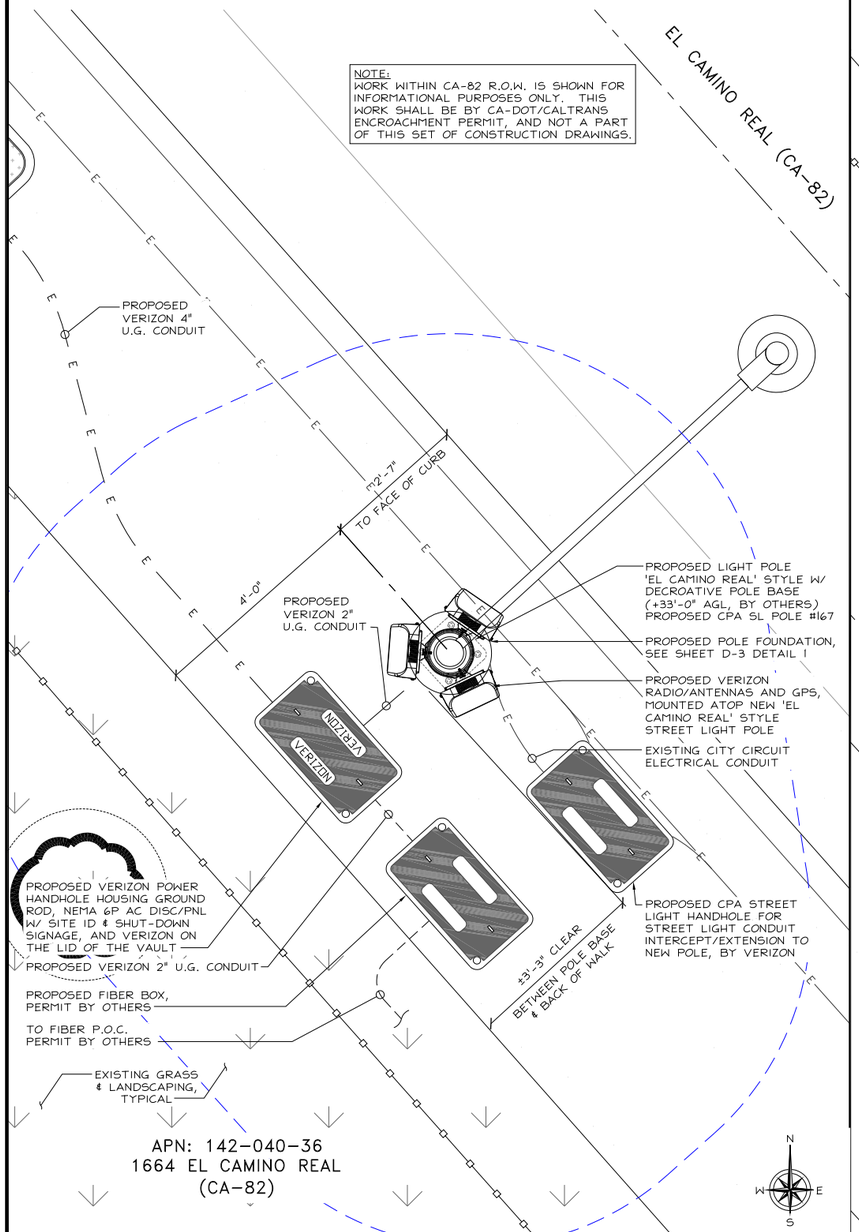
SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
R.O.W. SECTION

SHEET NUMBER
A-1.7

NOTES:

1. METAL SURFACES REQUIRING PAINT TO BE PAINTED RAL #7022.
2. THE CONTRACTOR MAY BE REQUIRED TO SUBMIT A LOGISTICS PLAN TO THE PUBLIC WORKS DEPARTMENT PRIOR TO COMMENCING WORK THAT ADDRESSES ALL IMPACTS TO THE CITY'S RIGHT-OF-WAY, INCLUDING, BUT NOT LIMITED TO: PEDESTRIAN CONTROL, TRAFFIC CONTROL, TRUCK ROUTES, MATERIAL DELIVERIES, CONTRACTOR'S PARKING, CONCRETE POURS, CRANE LIFTS, WORK HOURS, NOISE CONTROL, DUST CONTROL, STORM WATER POLLUTION PREVENTION, CONTRACTOR'S CONTACT, NOTICING OF AFFECTED SURROUNDING PROPERTIES , AND SCHEDULE OF WORK. THE REQUIREMENT TO SUBMIT A LOGISTICS PLAN WILL BE DEPENDENT ON THE NUMBER OF APPLICATIONS PUBLIC WORKS ENGINEERING RECEIVES WITHIN CLOSE PROXIMITY TO HELP MITIGATE AND CONTROL THE IMPACT TO THE PUBLIC-RIGHT-OF-WAY. IF NECESSARY, PUBLIC WORKS MAY REQUIRE A LOGISTICS PLAN DURING CONSTRUCTION.
3. TREES MAY NOT BE PLANTED WITHIN 10 FEET OF EXISTING WATER, GAS OR WASTEWATER MAINS/SERVICES OR METERS; LESSER DISTANCES REQUIRE A PERMANENT IMPERMEABLE ROOT-BARRIER A MINIMUM OF 3' HORIZONTAL FROM WATER, GAS AND WASTEWATER SERVICES/MAINS/METERS.



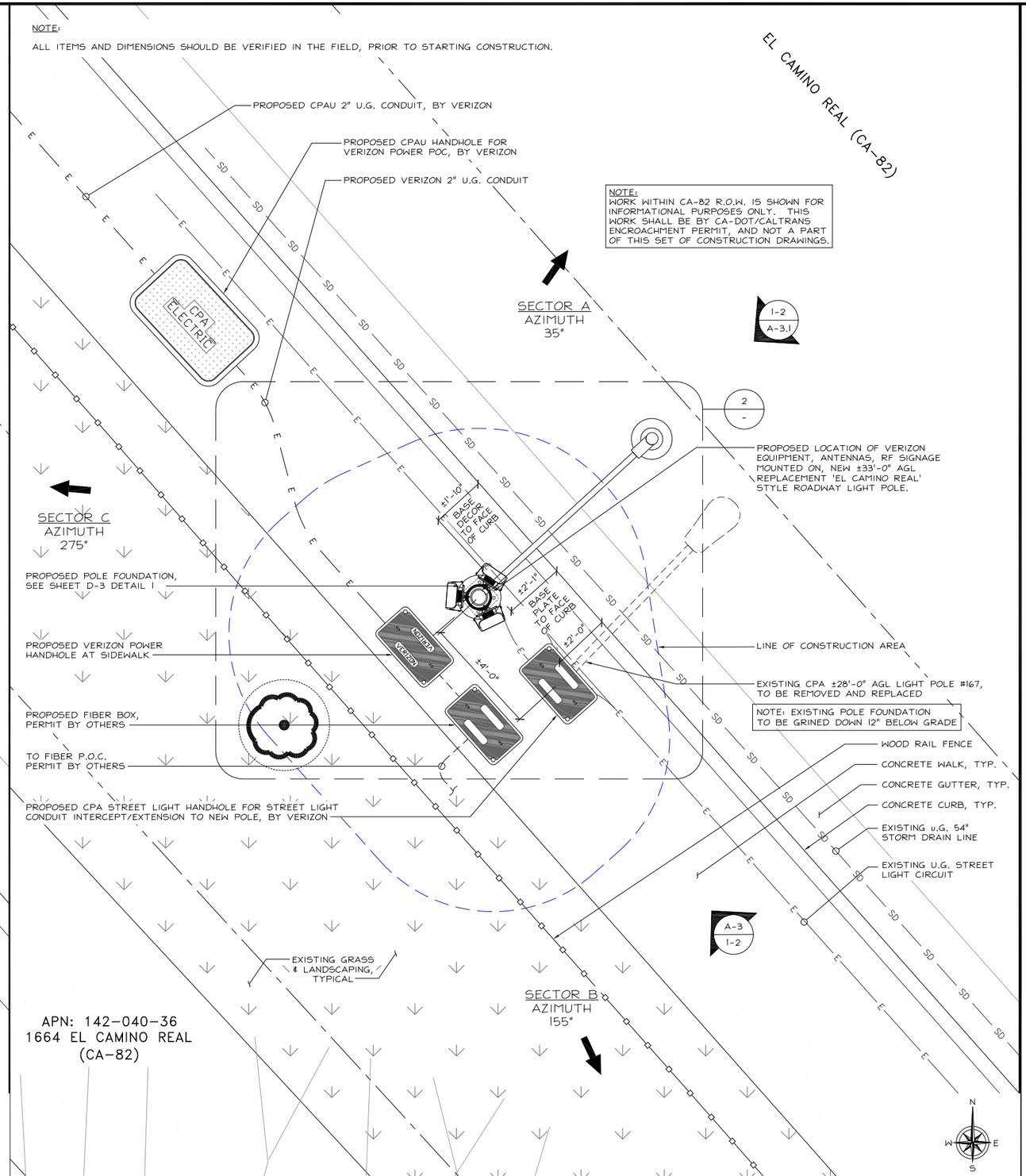
ENLARGED SITE PLAN

24"x36" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"
1' 6" 0" 1'

2

NOTE:

ALL ITEMS AND DIMENSIONS SHOULD BE VERIFIED IN THE FIELD, PRIOR TO STARTING CONSTRUCTION.



ENLARGED SITE PLAN

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA 5L WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

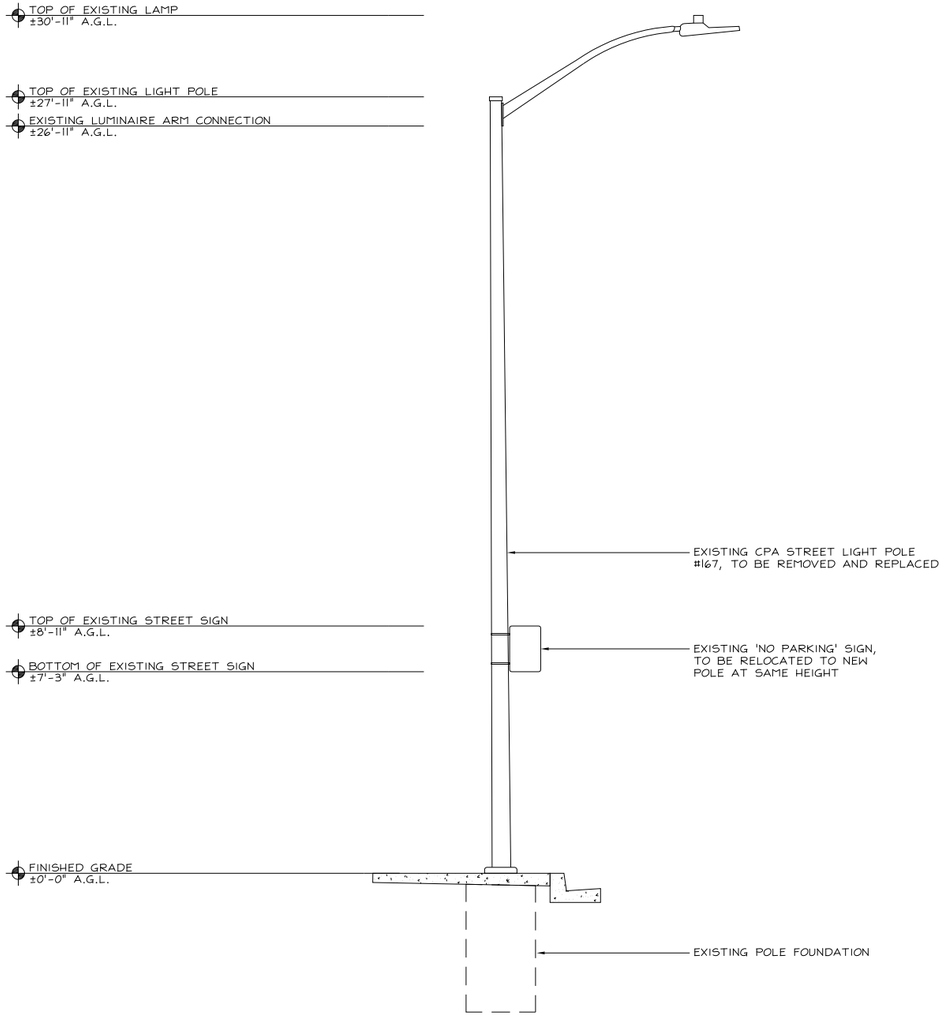
REGISTERED PROFESSIONAL ENGINEER
HOSSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
ENLARGED SITE PLAN

SHEET NUMBER
A-2



EXISTING NORTHEAST ELEVATION

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

2' 1' 0" 2'

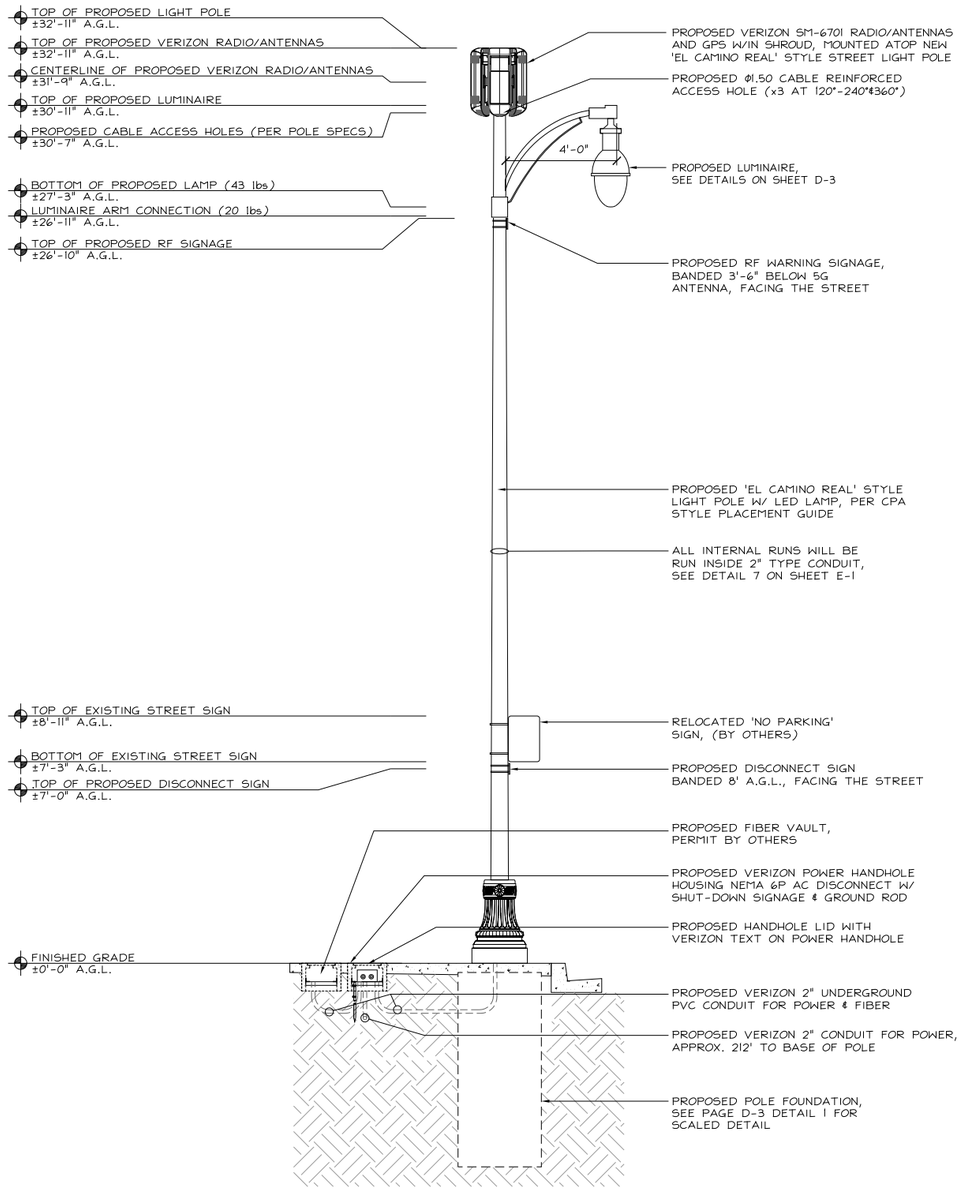
2

NOTES:

1. NEW GALVANIZED LIGHT POLE TO BE PAINTED WITH RAL #7022 PAINT.
2. NEW RADIOS AND HARDWARE TO BE PAINTED RAL #7022 OR WRAPPED AS ALLOWED BY THE MANUFACTURER.
3. ALL CABLE/WIRE BETWEEN THE POLE ACCESS HOLE AND THE SHROUD GROMMET HOLE WILL RUN TROUGH 1.5" CONDUIT PAINTED/COLORED TO MATCH POLE COLOR.

TOTAL ANETNNA/SHROUD VOLUME (CU. FT.)

MODEL	TOTAL	TOTAL VOLUME (CU. FT.)
6701 WITH SHROUD	3	±2.55



PROPOSED NORTHEAST ELEVATION

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

2' 1' 0" 2'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

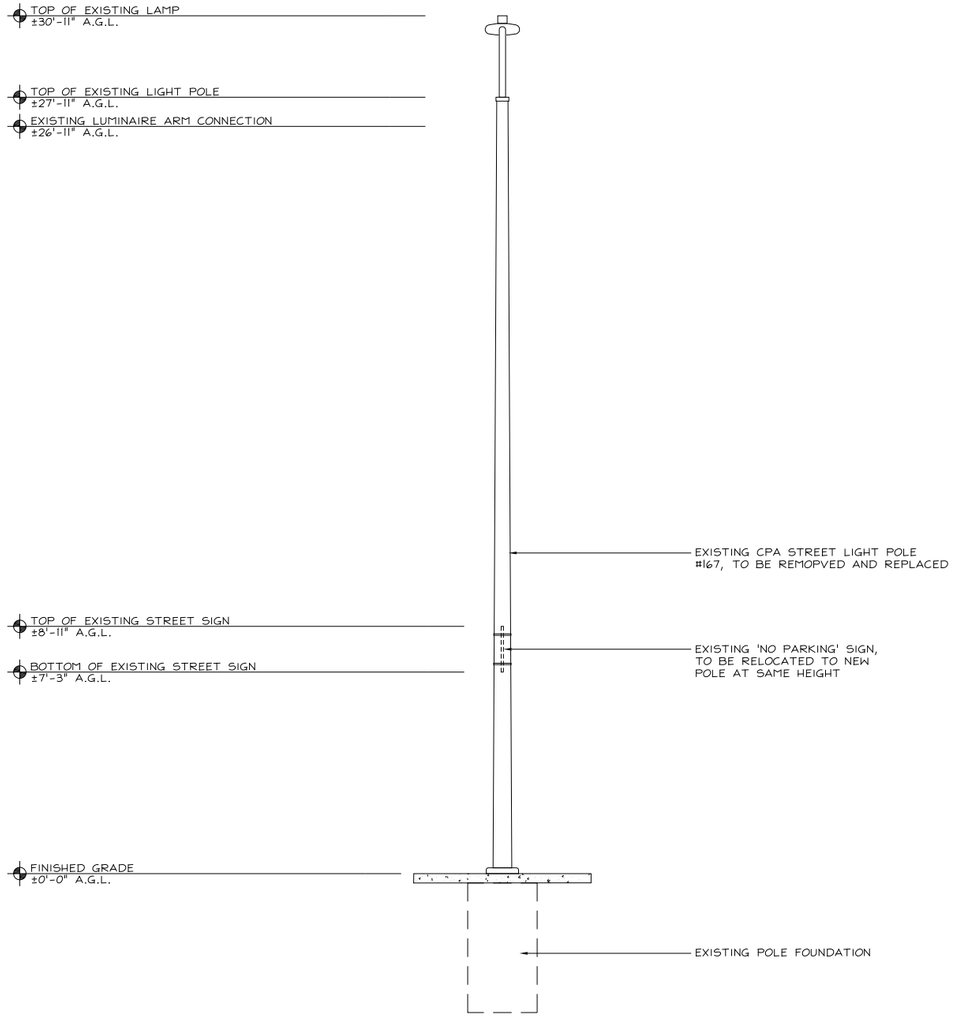
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
ELEVATIONS

SHEET NUMBER
A-3



EXISTING SOUTHEAST ELEVATION

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

2' 1' 0" 2'

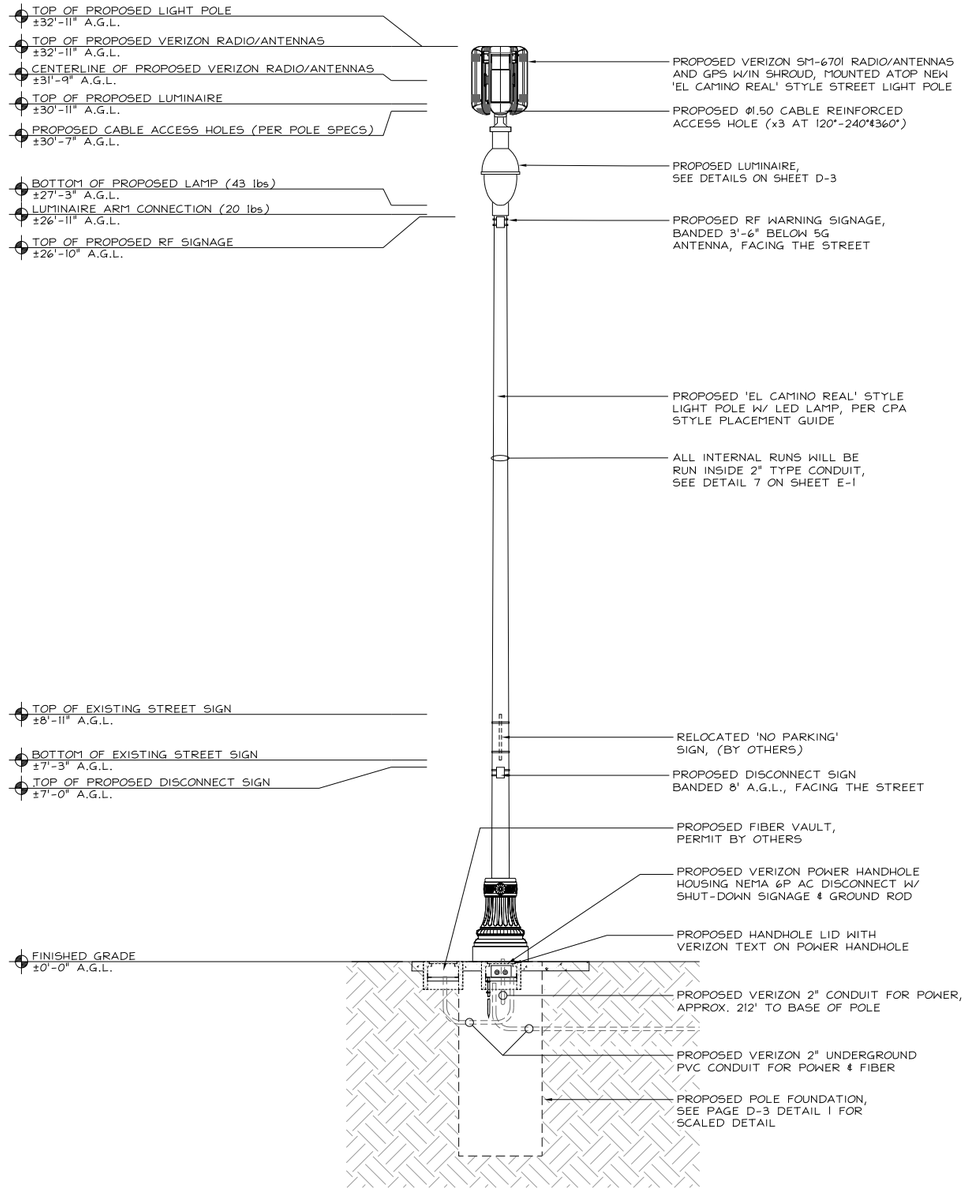
2

NOTES:

1. NEW GALVANIZED LIGHT POLE TO BE PAINTED WITH RAL #7022.
2. NEW RADIOS AND HARDWARE TO BE PAINTED RAL #7022 OR WRAPPED AS ALLOWED BY THE MANUFACTURER.
3. ALL CABLE/WIRE BETWEEN THE POLE ACCESS HOLE AND THE SHROUD GROMMET HOLE WILL RUN TROUGH 1.5" CONDUIT PAINTED/COLORED TO MATCH POLE COLOR.

TOTAL ANETNNA/SHROUD VOLUME (CU. FT.)

MODEL	TOTAL	TOTAL VOLUME (CU. FT.)
6701 WITH SHROUD	3	±2.55



PROPOSED SOUTHEAST ELEVATION

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

2' 1' 0" 2'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
NISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

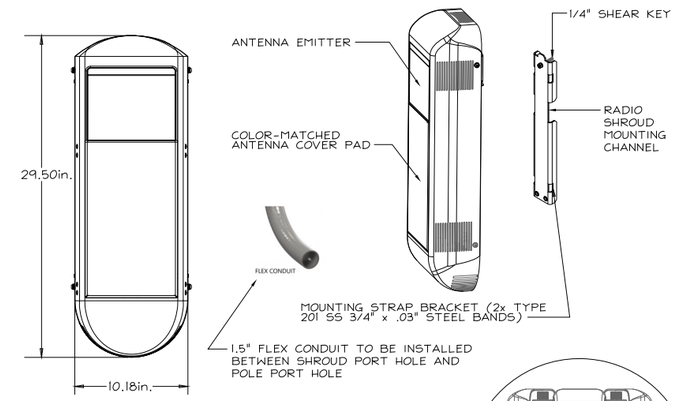
SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
ELEVATIONS

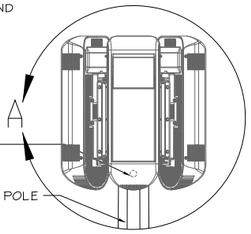
SHEET NUMBER
A-3.1

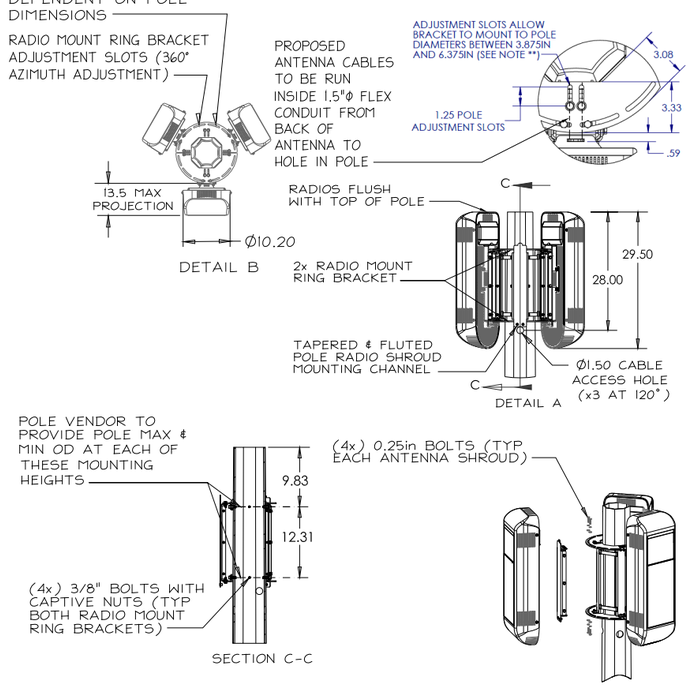
ERICSSON 6701 POLE ATTACHMENT SHROUD (OR APPROVED EQUAL)

NOTES:
1. FULL SHROUD PAINTABLE TO MATCH COLOR OF EXISTING STRUCTURE.
2. COLOR-MATCHED 3M FILM TO BE APPLIED TO ANTENNA EMITTER FACE.
3. SHROUD DRY WEIGHT = 18 LBS.
4. TOTAL WEIGHT INCLUDING ANTENNA = 49LBS.
5. ANTENNA/SHROUD VOLUME = 0.85 CU.FT. (EACH)



DETAIL A (SECTOR 1 RADIO HIDDEN FOR CLARITY)





SM6701 SHROUD & MOUNTING DETAILS

24"x36" SCALE: NTS
11"x17" SCALE: NTS

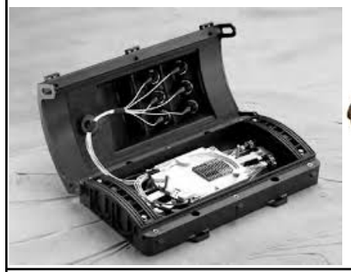
7

PREFORMED LINE PRODUCTS

COYOTE TERMINAL CLOSURE (FIBER DEMARCATION UNIT)

- DIMENSIONS: 18.76"L x 9.70"W x 5.13"D
- WEIGHT: N/A

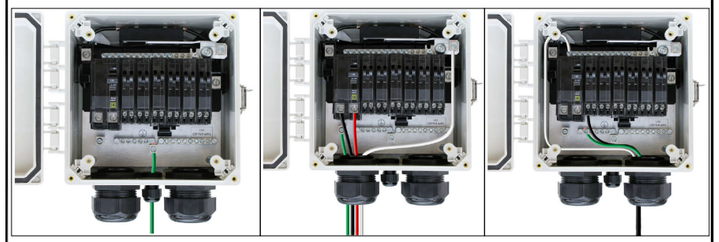
OR VERIZON APPROVED EQUAL



FIBER DEMARCATION UNIT

24"x36" SCALE: NTS
11"x17" SCALE: NTS

6

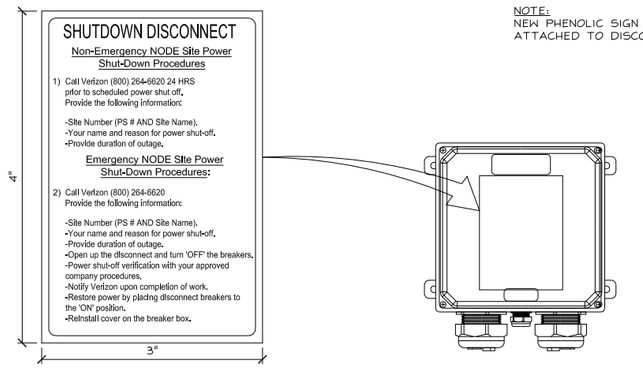


GROUND | AC POWER "IN" | AC POWER "OUT"

AC POWER DISCONNECT WIRE DIAGRAM

5

NOTE:
NEW PHENOLIC SIGN TO BE ATTACHED TO DISCONNECT



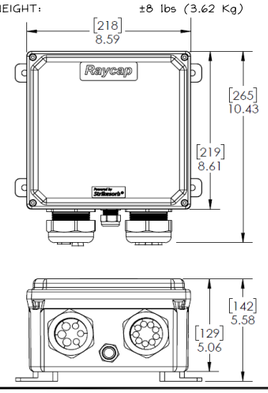
SHUTDOWN SIGN ON DISCONNECT

24"x36" SCALE: NTS
11"x17" SCALE: NTS

4

Raycap RSCAC-1333-PH-240 AC POWER DISCONNECT (OR APPROVED EQUAL)

- DIMENSIONS: 10.43"L x 8.59"W x 5.06"D
- WEIGHT: ±8 lbs (3.62 Kg)



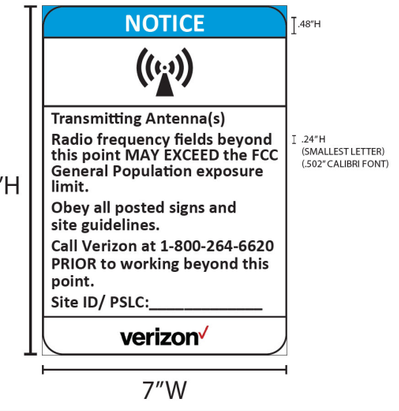
RSCAC-1333-PH-240

NEMA 6P AC POWER DISNNECT

24"x36" SCALE: NTS
11"x17" SCALE: NTS

3

CONTRACTOR NOTE:
- SITE ID WILL BE SWITCH #, SITE # AND SITE NAME.
- NODE NUMBER WILL BE MARKET#-NODE.B#-SMALL CELL NAME.



NOTE:
INSTALL EME NOTICE SIGN 3' BELOW STREET MACRO UNITS.

GO95 RF SIGNAGE

24"x36" SCALE: NTS
11"x17" SCALE: NTS

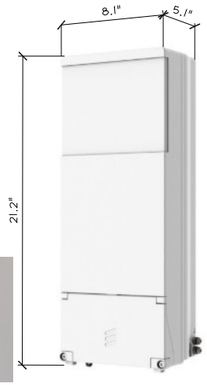
2

ERICSSON STREET MACRO 6701

- DIMENSION W/ PROTRUDING ITEMS INCL GPS ANT: 21.2"H x 8.1"W x 5.1"D
- TOTAL RADIO AREA (CU. IN.): 875.77 CU. IN.
- WEIGHT: ±31 lbs

RADIO AREA (CU. FT.)			
RADIO MODEL	TOTAL RADIO(S)	TOTAL RADIO AREA (CU. IN.)	TOTAL RADIO AREA (CU. FT.)
MACRO 6701	1	875.77 CU. IN.	0.51 CU. FT.

NEW GPS ATTACHED ON TOP OF SM 6701 (PRE INSTALLED BY MANUFACTURER) (1) TOTAL (MAX. MEASUREMENTS WILL NOT EXCEED)



STREET MACRO 6701

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
DETAILS

SHEET NUMBER
D-1

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Verizon Wireless, a wireless telecommunications carrier, to evaluate three small cells proposed to be sited in Palo Alto, California, for compliance with municipal limits on sound levels from the installations.

Executive Summary

Verizon proposes to install antennas and equipment on three light poles sited in the public right-of-way in Palo Alto. Noise from the proposed operations will comply with the City's pertinent noise limits.

Prevailing Standard

Palo Alto adopted Resolution No. 9825 (April 15, 2019) "Resolution of the Council of the City of Palo Alto Adopting Objective Aesthetic, Noise, and Related Standards for Wireless Communication Facilities in the Public Rights of Way," which sets limits on noise at residential areas for wireless facilities installed in public rights-of-way. Noise at the nearest residential property line is limited to an increase of 5 dB over existing ambient levels, if the ambient noise level would remain below 60 dBA L_{dn}, or to an increase of 3 dB, otherwise. The composite "day-night" average L_{dn} incorporates a 10 dB penalty during nighttime hours (10 pm to 7 am), to reflect typical residential conditions, where noise is more readily heard at night. By definition, sound from a continuous noise source will be 6.4 dB higher when expressed in L_{dn}.

It is noted that the amended language also references Chapter 9.10 of the Code, which had set a more relaxed increase of 15 dB increase for such WCF sitings, assessed at 25 feet from the pole. It is assumed for this study that the minimum reference ambient level is 40 dBA, as defined in Chapter 9.10.

A summary of noise assessment and calculation methodologies is shown in Figure 1.

General Facility Requirements

Small cells typically consist of two distinct parts: the electronic transceivers (also called "radios"), that are connected to traditional wired telephone lines, and the antennas that send wireless signals created by the radios out to be received by individual subscriber units. The radios are typically mounted on the support pole or placed in a cabinet at the base of the pole, and are connected to the antennas by cables. Some radios require fans to cool the electronics inside. Some radios are integrated with the antennas as a single unit.

Site & Facility Description

According to information provided by Verizon, that carrier proposes to install a cylindrical antenna and two Ericsson Model 4402 radio units within a shroud on top of the light pole in the public right-of-way at each of the three locations listed in Table 1, and three Ericsson Model 6701 antennas, with integrated radios, within shrouds below the light arm on the pole.

Study Results

Ericsson reports that the maximum noise level from any one Model 4402 radio is 40.9 dBA,* and that the maximum noise level from three Model 6701 units is 39.6 dBA,* both at a reference distance of 5 feet. The cylindrical antenna is passively cooled, generating no noise.

At a distance of 6¼ feet, the calculated noise level from the simultaneous operation of this combined equipment would result in an increase not exceeding 5 dB above the minimum allowed ambient level of 40 dBA; the increase above the ambient would be less than 5 dB for any siting of the equipment beyond this distance. If the existing ambient were determined to be above 40 dBA statutory minimum, then the calculated increase due to the Verizon operation would, by definition, decrease. **All of the proposed small cells in Table 1 meet this distance requirement.**

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that operation of these Verizon Wireless small cells proposed in Palo Alto will, under the conditions noted above, comply with the municipal standards limiting acoustic noise emission levels.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2021. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

December 16, 2020

REGISTERED PROFESSIONAL ENGINEER · WILLIAM F. HAMMETT · E-13026 · M-20676 · Exp. 6-30-2021 · ELECTRICAL MECHANICAL · STATE OF CALIFORNIA

William F. Hammett, P.E.
707/996-5200

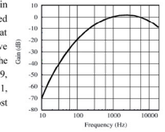
* Adjusted value based on manufacturer data, to reflect record high temperature of 107°F in Palo Alto.

Small Cell No.	Approximate Address	Nearest Residential Property
425225 "SF Palo Alto 121"	1600 El Camino Real (CA-82)	120 feet
425266 "SF Palo Alto 162"	158-164 Quarry Road	1,130 feet
425268 "SF Palo Alto 164"	Arboretum Road	200 feet

Table 1. Proposed Verizon small cells

Noise Level Calculation Methodology

Most municipalities and other agencies specify noise limits in units of dBA, which is intended to mimic the reduced receptivity of the human ear to Sound Pressure ("L_P") at particularly low or high frequencies. This frequency-sensitive filter shape, shown in the graph to the right as defined in the International Electrotechnical Commission Standard No. 179, the American National Standards Institute Standard No. 5.1, and various other standards, is also incorporated into most calibrated field test equipment for measuring noise levels.



30 dBA	library
40 dBA	rural background
50 dBA	office space
60 dBA	conversation
70 dBA	car radio
80 dBA	traffic corner
90 dBA	lawnmower

The dBA units of measure are referenced to a pressure of 20 μPa (micropascals), which is the threshold of normal hearing. Although noise levels vary greatly by location and noise source, representative levels are shown in the box to the left.

Manufacturers of many types of equipment, such as air conditioners, generators, and telecommunications devices, often test their products in various configurations to determine the acoustical emissions at certain distances. This data, normally expressed in dBA at a known reference distance, can be used to determine the corresponding sound pressure level at any particular distance, such as at a nearby building or property line. The sound pressure drops as the square of the increase in distance, according to the formula:

$$L_P = L_K + 20 \log(D_K/D_P).$$

where L_P is the sound pressure level at distance D_P and L_K is the known sound pressure level at distance D_K.

Individual sound pressure levels at a particular point from several different noise sources cannot be combined directly in units of dBA. Rather, the units need to be converted to scalar sound intensity units in order to be added together, then converted back to decibel units, according to the formula:

where L_T is the total sound pressure level and L_1, L_2, etc are individual sound pressure levels.

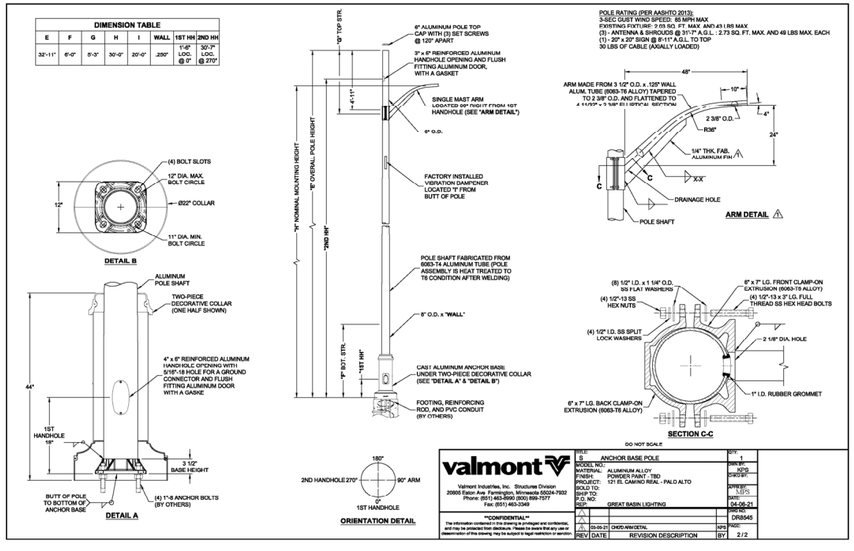
$$L_T = 10 \log \left(10^{L1/10} + 10^{L2/10} + \ldots\right),$$

Certain equipment installations may include the placement of barriers and/or absorptive materials to reduce transmission of noise beyond the site. Noise Reduction Coefficients ("NRC") are published for many different materials, expressed as unitless power factors, with 0 being perfect reflection and 1 being perfect absorption. Unpainted concrete block, for instance, can have an NRC as high as 0.35. However, a barrier's effectiveness depends on its specific configuration, as well as the materials used and their surface treatment.

NOISE STUDY

24"x36" SCALE: NTS
11"x17" SCALE: NTS

2



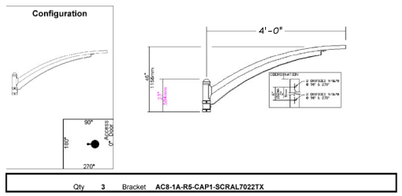
POLE SPECS

24"x36" SCALE: NTS
11"x17" SCALE: NTS

3

#3142 / 1600.06

Palo Alto – El Camino Real



Qty 3 Bracket AC8-1A-R5-CAP1-SCRAL7022TX

Description of Components:

Arm: Shall be made from spun and tapered aluminum 6063-T4, tempered to T6 after welding. The tapered arm is formed into a vertically oriented ellipse of 4" (102mm) by 2 7/8" (73mm) welded onto a plate and mechanically assembled to central adaptor. The bracket end is of 2 3/8" (60mm) O.D.

Decorative Element: Flat made of bent aluminum, 2" (51mm) wide, 0.375" (10mm) thick, mechanically assembled.

Central Adaptor: Made of cast 356 aluminum, complete with a top decorative cap. Slip-fits 9" (229mm) over a 4" (102mm) outside diameter pole or tenon. Mechanically fastened to the pole or tenon.

Bracket Options: (CAP1),Optional Pole Cap

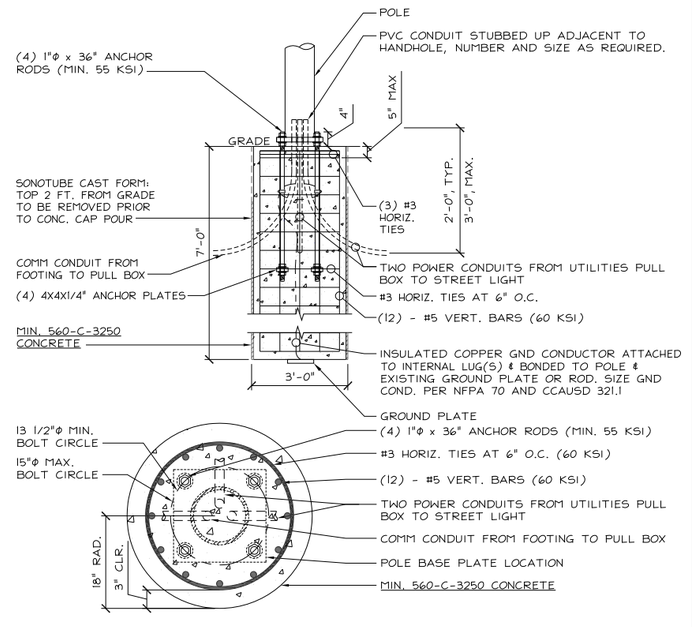
Note: The AC8 bracket meets the AASHTO 2001 standard specifications for structural support for luminaires.

Bracket Properties (Weight and EPA): 32 lbs (14.5 kg), 3.87 ft²

Lumec
08-01-2018 Page 3 / 6

PHILIPS LUMEC

NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.



FOUNDATION DETAIL

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums

575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING

23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER · WASAM ZALZALI · 71655 · CIVIL · STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
NOISE STUDY,
FOUNDATION DETAILS,
POLE DRAWINGS

SHEET NUMBER
D-3

JAM SERVICES, INC.

Submittal Cover Letter

Date: June 12, 2018

Contractor name: Phoenix Electric

Project name: City of Palo- Downtown Improvements

Customer PO# 767-02

JAM SO# 54798

Please see the enclosed set of submittals for the materials to be supplied on the above-mentioned project; these are for APPROVAL. The material will remain ON HOLD pending the receipt of signed approved submittals. Please note standard factory lead times will apply upon release.

Submittal page#	Item Description	Spec Section	Check if Deviation	Request for information
2-5	LED Luminaires	N/A		

*Per the factory, there is a smaller scale version. However, this version maxes out at 55 watts, and the specified version is 135w. Please advise.

If you have any questions please let me know.

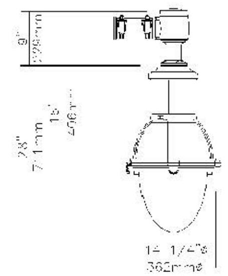
Thank you,
Samantha Douglas
Project Administration
JAM Services, Inc.

958 E. AIRWAY BLVD • LIVERMORE, CALIFORNIA • 94551
PHONE: (925) 455-5267 • FAX: (925) 455-5271

RNS20 (Reference=L23638-3)

QTY [19]

LEDGINE



EPA: 2.03 sqft / weight: 43 lb (19.5 kg)
Note: 3D image may not represent color or option selected.
Logos above include link, click to access.

Qty	1	Luminaire	**RNS20-55W32LED4K-T-ACDR-LE3-120-DMG-SMB-RC-BKTX**

Description of Components:

Hood: Cast 356.1 aluminum dome, mechanically assembled on the housing, c/w a watertight grommet, mechanically assembled to the bracket with four bolts 3/8-16 UNC. This suspension system permits for a full rotation of the luminaire in 90 degree increments.

Housing: In a round shape, this housing is made of 356.1 aluminum, complete with a weatherproof door giving a tool-free access to the ballast, mechanically assembled. This suspension system permits for a full rotation of the luminaire in 90 degree increments.

Access-Mechanism: A gravity die cast 356 aluminum frame with latch and hinge. The mechanism shall offer tool-free access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofing.

Light Engine: LEDgine composed of 4 main components: **Heat Sink / LED Module / Optical System / Driver**
Electrical components are RoHS compliant.

Heat Sink: Made of cast aluminum optimising the LEDs efficiency and life. Product does not use any cooling device with moving parts (only passive cooling device).

Globe: (ACDR), Made of one-piece seamless injection-molded impact-resistant (DR) acrylic having an inner prismatic surface. Complete with a semi-prismatic house side shield and external glare softening prisms. The globe is mechanically assembled and sealed onto the lower part of the heat sink.

LED Module: LED type Philips Lumileds LUXEON T. Composed of 32 high-performance white LEDs. Color temperature as per ANSI/NEMA bin Neutral White, 4000 Kelvin nominal (3985K +/- 275K or 3710K to 4260K), CRI 70 Min. 75 Typical.

RNS20 (Reference=L23638-3)

Optical System: (LE3), IES type III (asymmetrical). Composed of high-performance optical grade PMMA acrylic refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. Optical system is rated IP66. Performance shall be tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance. Street side indicated.

Driver: High power factor of 90% minimum. Electronic driver, operating range 50/60 Hz. **Auto-adjusting universal voltage input from 120 to 277 VAC rated for both application line to line or line to neutral, Class I**, THD of 20% max. Maximum ambient operating temperature from -40F(-40C) to 130F(55C) degrees. **Driver comes with dimming compatible 0-10 volts.**

The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built-in driver surge protection of 2.5kV (min).

Driver Options: (DMG), Dimming compatible 0-10 volts. For applicable warranty, certification and operation guide see *"Philips Lumec dimmable luminaire specification document for unapproved device installed by other"*. To get document, click on this link: Specification document or go on web site on this address: http://www.lumec.com/Lumec3DV2/PdfWebLink/Philips Lumec dimmable luminaire specification document for unapproved device installed by other.pdf

Surge Protector: Surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid-State Street Lighting Consortium) model specification for LED roadway luminaires electrical immunity requirements for High Test Level 10kV / 10kA.

Adaptor: (SMB), Made of cast 356 aluminum, complete with a block connector, mechanically assembled to the bracket. Can be mounted on a 1.66"(42mm) to 2.38"(60mm) outside diameter bracket arm tubing that slip fits 6.5" (165mm) long inside the adaptor, permits an adjustment of ± 5°.

Luminaire Options: (RC), Receptacle for a twist-lock photoelectric cell or a shorting cap. Use of photocell or shorting cap is required to ensure proper illumination.

RNS20 (Reference=L23638-3)

Miscellaneous

Description of Components:

Wiring: Gauge (#14) TEW/AWM 1015 or 1230 wires, 6" (152mm) minimum exceeding from luminaire.

Hardware: All exposed screws shall be complete with Ceramic primer-seal basecoat to reduce seizing of the parts and offers a high resistance to corrosion. All seals and sealing devices are made and/or lined with EPDM and/or silicone and/or rubber.

Finish: Color to be **black textured RAL9005TX (BKTX)** and in accordance with the AAMA 2603 standard. Application of polyester powder coat paint (4 mils/100 microns) with ± 1 mils/24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D2244 standard, as well as luster retention in keeping with the ASTM D523 standard and humidity proof in accordance with the ASTM D2247 standard.

The surface treatment achieves a minimum of 2000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard.

LED products manufacturing standard: The electronic components sensitive to electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340-5-1 and ANSI/ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

Quality Control: The manufacturer must provide a written confirmation of its ISO 9001-2008 and ISO 14001-2004 International Quality Standards Certification.

Certification: The manufacturer will have to supply a copy of approval products certificate, CSA or UL.

Vibration Resistance: The RNS20 meets the **ANSI C136.31-2001**, American National Standard for Roadway Luminaire Vibration specifications for normal applications. (Tested for 1.5G over 100 000 cycles)

Web site information details: Click on any specific information details you need:

Paint finish / Warranties / ISO 9001-2008 Certification / ISO 14001-2004 Certification

RNS20 (Reference=L23638-3)

LED light engine technical information for RNS20-30

LED Philips Lumileds Luxeon T, CRI 70, CCT 4000K (3985K +/- 275K or 3710K to 4260K)

System (LED + driver) rated life = 100,000 hrs [1]

LED Module	Typical delivered lumens	Typical system wattage [2] (W)	Typical current @ 120 V (A)	Typical current @ 208 V (A)	Typical current @ 240 V (A)	Typical current @ 277 V (A)	LED current (mA)	HID Replacement [3]	Luminaire Efficacy Rating (Lm/W)	BUG rating
24W16LED4K-T-LE2	3040	28	0.25	0.15	0.13	0.12	530	70-100	107	B1-U2-G1
24W16LED4K-T-LE3	3017	28	0.25	0.15	0.13	0.12	530	70-100	106	B1-U2-G1
24W16LED4K-T-LE4	3032	28	0.25	0.15	0.13	0.12	530	70-100	107	B1-U2-G1
24W16LED4K-T-LE5	3050	28	0.25	0.15	0.13	0.12	530	70-100	107	B2-U2-G2
30W16LED4K-T-LE2	3825	37	0.32	0.19	0.17	0.15	700	70-100	103	B1-U2-G1
30W16LED4K-T-LE3	3796	37	0.32	0.19	0.17	0.15	700	70-100	103	B1-U2-G1
30W16LED4K-T-LE4	3815	37	0.32	0.19	0.17	0.15	700	70-100	103	B1-U2-G1
30W16LED4K-T-LE5	3837	37	0.32	0.19	0.17	0.15	700	70-100	104	B3-U3-G3
35W32LED4K-T-LE2	4236	36	0.31	0.19	0.17	0.16	350	70-100	118	B1-U3-G1
35W32LED4K-T-LE3	4175	36	0.31	0.19	0.17	0.16	350	70-100	116	B1-U2-G1
35W32LED4K-T-LE4	4225	36	0.31	0.19	0.17	0.16	350	70-100	117	B1-U2-G1
35W32LED4K-T-LE5	4249	36	0.31	0.19	0.17	0.16	350	70-100	118	B3-U3-G3
55W32LED4K-T-LE2	5945	53	0.47	0.27	0.24	0.22	530	100-150	111	B1-U3-G1
55W32LED4K-T-LE3	5900	53	0.47	0.27	0.24	0.22	530	100-150	110	B1-U3-G2
55W32LED4K-T-LE4	5900	53	0.47	0.27	0.24	0.22	530	100-150	111	B1-U3-G2
55W32LED4K-T-LE5	5994	53	0.47	0.27	0.24	0.22	530	100-150	113	B3-U3-G3

1 L70 = 100,000 hrs (at ambient temperature = 25°C).
2 System wattage or total luminaire wattage includes the LED module and the LED driver.
3 Note. These guidelines show typical replacements for the HID wattage ranges shown. Replacements should always be confirmed with a photometric layout.
Note: Due to rapid and continuous advances in LED technology, LED luminaire data is subject to change without notice and at the discretion of Philips.

verizon✓
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
LUMINAIRE DETAILS

SHEET NUMBER
D-4

- CARLON HAL-FREE RISER-GARD, HJ4X4C-2000:

Technical Info:

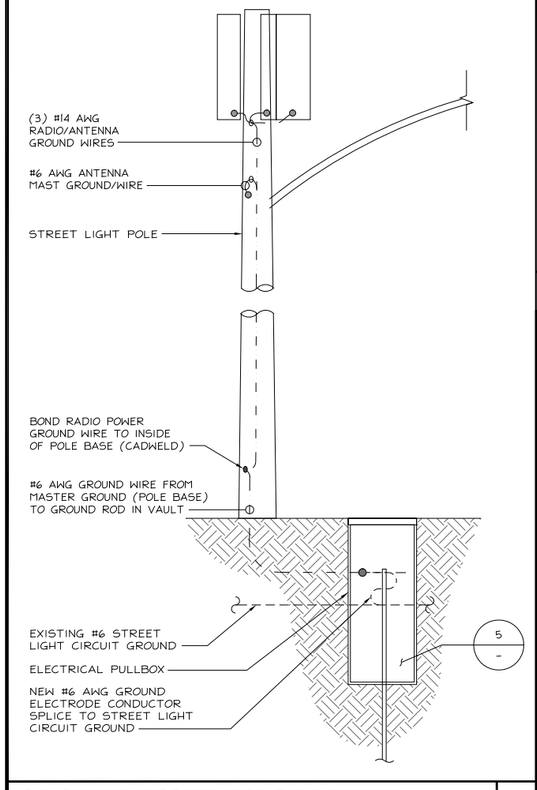
UL Listed to 2024	Test Method	Maximum Value
Maximum Flame Propagation	UL 2024	3'6"
Maximum Air Temperature	UL 2024	387°F

- Storage and Handling -4°F to 150°F
- No UV protection (not suitable for outdoor use)
- Do NOT store outside

	Color	Part No.	Nom. I.D.	Nom. O.D.	Pull Tape	Reel Size	Reel Type	Reel Length (feet)	Reel Weight (lbs.)	Wt. per 100 ft. (lbs.)
2"	White	HJ4X4C-2000	2.000	2.425	900 lb.	82" x 41"	W	2000	375	20.8

W = Wood

CARLON RISER-GARD | 7

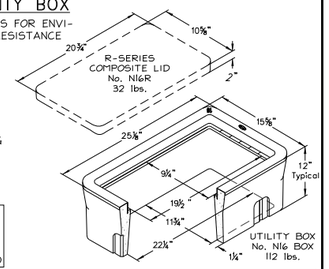


GROUND RISER DIAGRAM | 7

OLDCASTLE N16 UTILITY BOX

- EXCEEDS ASTM-D1693 STANDARDS FOR ENVIRONMENTAL STRESS CRACKING RESISTANCE
- ETCHED POLYPROPYLENE FACE
- FACE ANCHORED IN CONCRETE
- ULTRA-VIOLET INHIBITOR

A HIGH DENSITY REINFORCED CONCRETE BOX WITH NON-SETTING SHOULDERS POSITIONED TO MAINTAIN GRADE AND FACILITATE BACK FILLING. APPROXIMATE DIMENSIONS AND WEIGHT SHOWN.

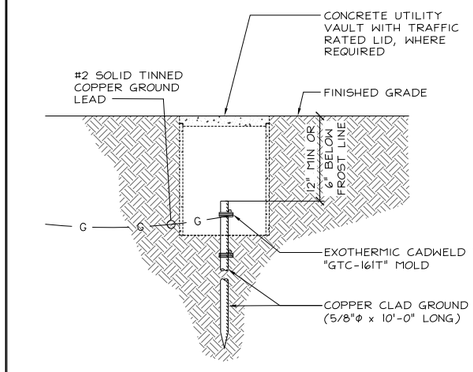


NOTE:
SPECIFICATION OF THIS VAULT MANUFACTURER AND MODEL ARE SUBJECT TO REPLACEMENT WITH APPROVED EQUIVALENT VAULT/LID

OLDCASTLE ORDER CODE	ITEM	APPROXIMATE SHIP'G. WEIGHT	DESCRIPTION
N16BOX	BOX	112 lbs.	N16 ELECTRICAL BOX (11-3/4"x22-1/4") - 20 PER PALLET
N16R	LID	32 lbs.	R-SERIES COMPOSITE LID WITH POLYPROPYLENE RING (ORDER N90 BOLT DOWN KIT SEPARATELY)
FL16T	LID	13 lbs.	FIBRELYTE LID, NON-CONCRETE BOLT DOWN (ORDER N90 BOLT-DOWN KIT SEPARATELY)
N16J	LID	36 lbs.	CAST IRON LID BOLT DOWN (ORDER N90 BOLT-DOWN KIT SEPARATELY)
B16-61D	COVER	28 lbs.	STEEL CHECKER PLATE COVER
N16-61J	COVER	28 lbs.	STEEL CHECKER PLATE COVER (ORDER N90 BOLT-DOWN KIT SEPARATELY)
B16X12	EXTENSION	113 lbs.	12" REINFORCED CONCRETE BOX EXTENSION - 20 PER PALLET
B30SL	SLAB	52 lbs.	REINFORCED CONCRETE SLAB (16"x28")

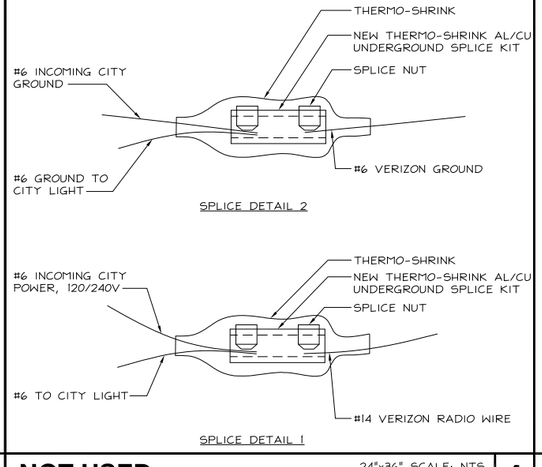
N16 U.G. UTILITY BOX | 6

24"x36" SCALE: NTS
11"x17" SCALE: NTS



GROUND WELL/ROD | 5

24"x36" SCALE: NTS
11"x17" SCALE: NTS



NOT USED | 4

24"x36" SCALE: NTS
11"x17" SCALE: NTS

PANEL SCHEDULE | 2

PANEL 'A'

SITE NAME:
P-64 - SF **PALO ALTO 121**

PANEL DESIGNATION:
AC PANEL 'A'

VOLTAGE: 120/240 V
PHASE: 1
WIRE: 3
MAIN BREAKER: 60 AMP
BUSS RATING: 60 AMP
LOCATION: UG VAULT

CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	SERVICE LOAD VA	USAGE FACTOR	PHASE A VA	PHASE B VA	PHASE A VA	PHASE B VA	USAGE FACTOR	SERVICE LOAD VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	MAIN	60	2	ON			0		250		1.25	200	ON	2	15	ERICSSON SM-6701 #3	2
3								0		250	1.25	200					4
5	ERICSSON SM-6701 #1	15	2	ON	200	1.25	250		313		1.25	250	ON	2	15	ERICSSON 4402 #1	6
7					200	1.25		250		313	1.25	250					8
9	**ERICSSON SM-6701 #2**	15	2	ON	200	1.25	250		313		1.25	250	ON	2	15	ERICSSON 4402 #2	10
11					200	1.25		250		313	1.25	250					12

CONTRACTOR SHALL LABEL PANEL WITH CARRIER I.D., SERVICE RATING, AND FEED SOURCE

PHASE A TOTAL VA	1375
PHASE B TOTAL VA	1375
TOTAL KVA	2.75
TOTAL AMPS	11.46

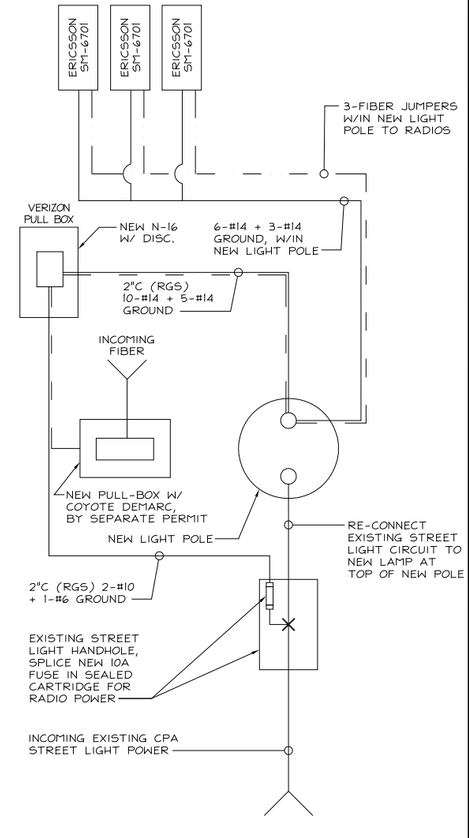
NOTES:
1. ALL LOADS CALCED AS LCL/MCL LOADS (OK TO DESIGN TO 100% CAPACITY)
2. UNUSED BREAKER POSITIONS SHALL REMAIN COVERED W/ MFR. COVER
3. ALL EQUIPMENT/BREAKERS SHALL BEAR A LABEL FOR I.D. & RATING

ELECTRICAL NOTE:

1. ALL WORK SHALL COMP;Y TO THE CURRENT EDITION OF THE CALIFORNIA ELECTRICAL CODE, CALIFORNIA BUILDING CODE, NATIONAL ELECTRICAL CODE, ALL APPLICABLE REGULATIONS GOVERNING NON-JPA UTILITY POLES (G.O. 95), AND ALL APPLICABLE LOCAL CODES.
2. ALL WORK SHALL COMPLY WITH VERIZON CARRIER CONSTRUCTION STANDARDS FOR SMALL CELL INSTALLATION.
3. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND ALL APPLICABLE LOCAL CODES.
4. AC PANEL SHALL HAVE A 'MAIN' BREAKER AFFIXED TO BOTH POLES OF THE MAIN LUG BUSS AND FED THROUGH LOAD SIDE TO PROVIDE SINGLE SHUT-OFF SWITCH FOR ALL SMALL CELL POWER ON AC PANEL.
5. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT. SHALL BE SINGLE CONDUCTOR (#14 AWG AND LARGER), 600V, OIL RESISTANT. THWN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED.
6. REFER TO PANEL SCHEDULE (2/-) AND ONE-LINE DIAGRAM (1/-) FOR CIRCUIT ARRANGEMENT & WIRING CONNECTION.
7. SUBCONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY BEFORE THE START OF CONSTRUCTION. POWER AND TELEPHONE CONDUIT SHALL BE PROVIDED AND INSTALLED PER UTILITY REQUIREMENTS.
8. SUBCONTRACTOR SHALL PROVIDE 20 AMP, SINGLE PHASE, 120/240 (OR 120/208) VAC, 60HZ SERVICE FOR VERIZON SITE.

ELECTRICAL NOTES | 3

ONE-LINE DIAGRAM | 1



verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

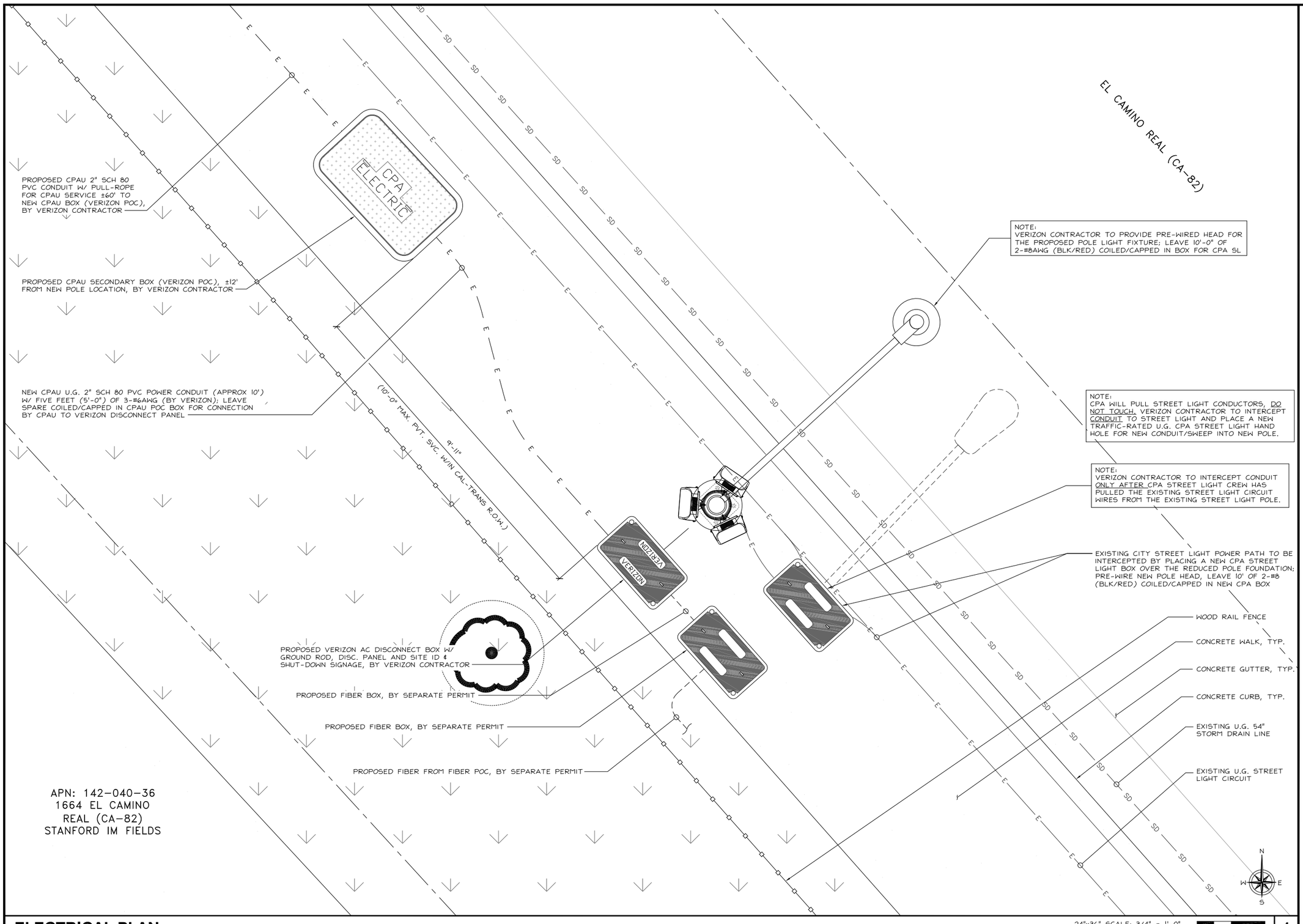
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
ELECTRICAL/GROUNDING DIAGRAMS, NOTES, & PANEL SCHEDULE

SHEET NUMBER
E-1



APN: 142-040-36
1664 EL CAMINO REAL (CA-82)
STANFORD IM FIELDS

ELECTRICAL PLAN

24"x36" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"
1' 6" 0" 1'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

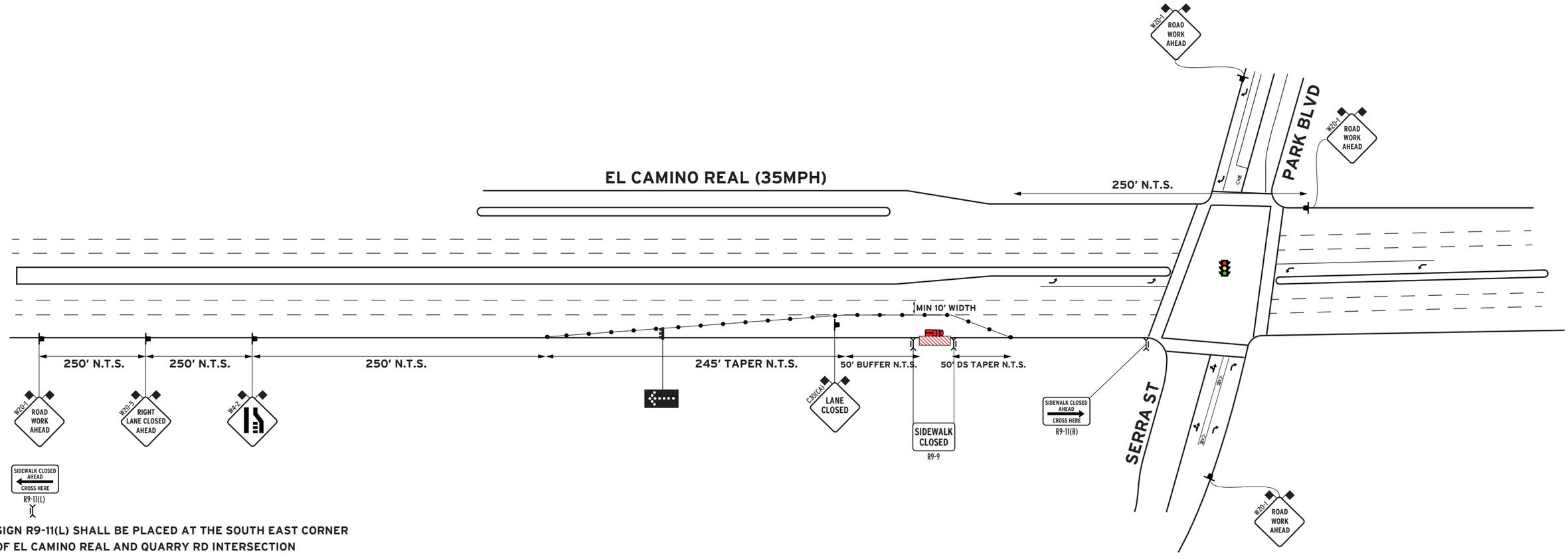
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
ELECTRICAL PLAN

SHEET NUMBER
E-2



SIGN R9-11(L) SHALL BE PLACED AT THE SOUTH EAST CORNER OF EL CAMINO REAL AND QUARRY RD INTERSECTION

LEGEND:

- CHANNELIZING DEVICE WITH CLIP-ON SIGN
- CHANNELIZING DEVICE
- SIGN
- WORK ZONE
- DIRECTION OF TRAFFIC
- TYPE 1 BARRICADE
- TYPE 1 BARRICADE W/SIGN
- TYPE 3 BARRICADE
- TYPE 3 BARRICADE W/SIGN
- K-RAIL/WATER FILLED BARRIERS
- TEMP RAISED MARKERS
- ARROW BOARD MARKER
- PEDESTRIAN BARRICADES
- CERTIFIED FLAGGER
- CRASH BARRELS
- MESSAGE BOARD (PCMS)
- FLASHING ARROWBOARD
- CRASH ATTENUATORS
- FLASHING BEACON/BARRICADE LIGHT

PLAN 1
TEMP TRAFFIC CONTROL PLAN

NOTES

- Traffic control shall conform with the most current CAMUTCD part 6 and/or Caltrans Standards
- One lane of traffic in each direction and all high volume turning lanes shall be maintained at all times on all streets at a minimum lane width of 10 feet.
- Contractor shall notify local authorities once signs are posted.
- All advanced warning signs shall be equipped with 2 (18" orange flags)
- Certified Traffic Control Workers shall have Type II vests, work shoes, and hard hats.
- Temporary no parking signs shall be placed a min of 72 hrs prior of work.
- Driveways shall be monitored and maintained at all times during work hours.
- Distance between sign and work area will be determined on speed limit.
- Roadway shall not be opened until safe for public use. All open trenches must be plated or - backfilled prior to public usage.
- All Devices shall be removed when no longer required.

MUTCD TABLE 6C-1 — MEANING OF LETTER CODES ON TYPICAL APPLICATION DIAGRAMS

ROAD TYPE	DISTANCE BETWEEN SIGNS A	B	C
Urban (Low Speed) - 25 mph or less	100 ft	100 ft	100 ft
Urban (Low Speed) + 25 to 40 mph	250 ft	250 ft	250 ft
Urban (High Speed) + 40 mph	350 ft	350 ft	350 ft
Rural	500 ft	500 ft	500 ft
Expressway / Freeway	1,000 ft	1,500 ft	2,640 ft

COMPASS:

SCALE: NOT TO SCALE

DATE REQSTD: 5/4/20

DATE COMPLTD: 5/7/20

PROJECT LOCATION: 1600 EL CAMINO REAL, PALO ALTO, CA

PO# SF PALO ALTO 121

PAGE# 1/1

REQUEST BY:
YVONNE WASHINGTON
VINCULUMS
925-999-5523
YWASHINGTON@VINCULUMS.COM

B.A.T.S.
AFTER HOURS EMERGENCY
510-299-5666
Drawn By:
DREW PATEL
CSLB# 917034
Office: 510-657-2543
Fax: 510-657-2544
44800 Industrial Drive Fremont, CA 94538
WWW.BATSTRAFFICSOLUTIONS.COM
B.A.T.S. TRAFFIC SOLUTIONS

Vinculums
575 Lennon Lane #125
Walnut Creek, CA 94598
(925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 Bircher Dr.
Lake Forest, CA
(949) 273-0996

VERIZON
PALO ALTO_121

All States Engineering & Surveying
Project No: 64 – CLUSTER-6 \ PALO ALTO_121

Structural Analysis Report

ROW Adjacent to 1664 El Camino Real (CA-82), Palo Alto, 94306
Proposed 33'- 0" AGL 'Downtown' Style Aluminum Light Pole & Foundation

REGISTERED PROFESSIONAL ENGINEER WISSAM ZALZALI C 71655 CIVIL STATE OF CALIFORNIA

Rev. #	Reason for Revision	Total # of Sheets	Prepared By	Checked By	Approved /Accepted	Date
2	Updated Pole Specs	21	LeT	LeT	WZ	4/19/2021

	Quantity/Type /Shape	Strength (min.)	Dimensions	Thickness /Depth	Capacity Utilization	
Pole Shaft	Aluminum / 8-sided tapered	25 ksi*	5.65"Φ at top 10.0"Φ at bottom	0.219"	47.2%	PASS
Anchor Bolts	4	36 ksi	1" Φ	-	46.0 %	PASS
Base Plate	1	36 ksi	13.6" Cast Base	-	ADEQUATE	
Foundation	*Circular Caisson*	*3.25 ksi*	*36"Dia.*	*7'-0"***	ADEQUATE	

* Pole grade is 6063-T6 per provided specs.
Required depth of caisson (Unrestrained** at G/L) - This analysis was performed without a soil report, and minimum soil properties from IBC-18 were used. Required pole foundation embedment depth may change with a soil report from the proposed pole location.

Professional Engineering Firm
ARCHITECTURAL . CIVIL . STRUCTURAL . ELECTRICAL . GEOTECHNICAL . SURVEYING
www.allstatesengineering.com

Steel Decorated Pole
Palo Alto
PALO ALTO_121

ALLSTATES ENGINEERING & SURVEYING

Project Description:
All States Engineering & Surveying (ASES) is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the metal pole.
The purpose of the analysis is to determine acceptability of the pole stress level. Based on our analysis we have determined the metal pole stress level for the structure and anchorage, under the following load case:

LC: Proposed Pole + Proposed Equipment
(Please see page 5 for details)

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

Structural Analysis Parameters:
This analysis has been performed in accordance with AASHTO 2013 guidelines.

- Wind Speed: ***85 mph per AASHTO 2013***
- Exposure Category: ***C***
- Risk Category: ***II***
- Topographical: ***1***
- Crest Height = ***0***
- Ice Thickness = ***0 in***
- Min. Soil Lateral Bearing = ***100 psf/ft*2 = 200 psf/ft per CBC & IBC 1806.3.4***
- Min. Soil Bearing = ***1500 psf***

We at *All States Engineering & Surveying* appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects, please give us a call.

ATC Hazards by Location

Search Information

Address:	1664 El Camino Real, Palo Alto, CA 94306, USA
Coordinates:	37.430475, -122.1524438
Elevation:	49 ft
Timestamp:	2020-12-04T18:10:34.720Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D-default

Basic Parameters

Name	Value	Description
S_S	1.775	MCE_R ground motion (period=0.2s)
S_1	0.637	MCE_R ground motion (period=1.0s)
S_{MS}	2.13	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.42	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.915	Coefficient of risk (0.2s)
CR_1	0.9	Coefficient of risk (1.0s)
PGA	0.73	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.877	Site modified peak ground acceleration

T_L	12	Long-period transition period (s)
SsRT	2.057	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.248	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.775	Factored deterministic acceleration value (0.2s)
S1RT	0.82	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.912	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.637	Factored deterministic acceleration value (1.0s)
PGAd	0.73	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

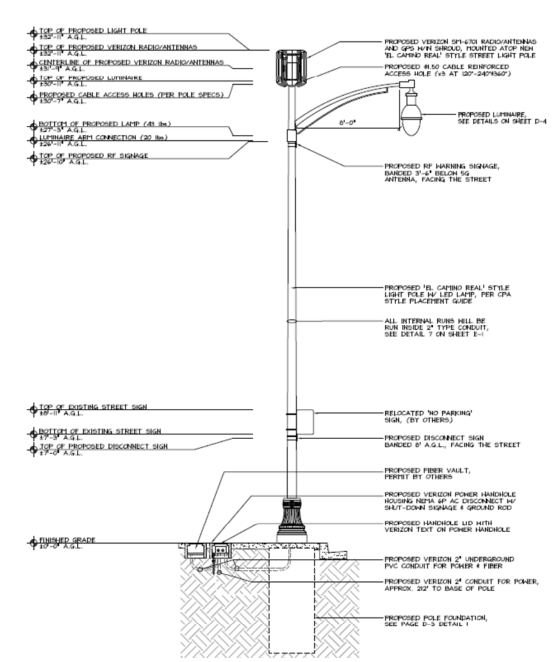
While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

ALLSTATES ENGINEERING & SURVEYING
PROJECT : PALO ALTO_121
CLIENT : 102 - Sequoia VZW Bakersfield
DESIGN BY :
REVIEW BY : LeT
DATE : 4/19/2021

Pole Wind & Seismic Analysis Based on AASHTO 2013 — **Proposed Elevation**

NOTES:
1. NEW GALVANIZED LIGHT POLE TO BE PAINTED WITH MUNSELL RAL5.5GY2.76/2.1 PAINT.
2. NEW RADIOS AND HARDWARE TO BE PAINTED MUNSELL RAL5.5GY2.76/2.1 OR WRAPPED AS ALLOWED BY THE MANUFACTURER.
3. ALL CABLE/WIRE BETWEEN THE POLE ACCESS HOLE AND THE SHROUD GROMMET HOLE WILL RUN TROUGH 1.5" CONDUIT PAINTED/COLORED TO MATCH POLE COLOR.

TOTAL ANETNNA/SHROUD VOLUME (CU. FT.)		
MODEL	TOTAL	TOTAL VOLUME (CU. FT.)
COMPTEK	3	±2.55



ALLSTATES ENGINEERING & SURVEYING
PROJECT : PALO ALTO_121
CLIENT : 102 - Sequoia VZW Bakersfield
DESIGN BY :
REVIEW BY : LeT
DATE : 4/19/2021

Pole Wind & Seismic Analysis Based on AASHTO 2013 — **Loading**

PROPOSED COMPONENTS

Rad Center	Component Type	QUANTITY	MOUNT TYPE
31'-9"	(N) Palo Alto_5G_with Shroud	3	Pole Mounted
9'-0"	(E) Street Sign	1	
-	(N) RF Signage	1	
-	(N) & (E) Conduit, Wire, & In-line Fuse	-	Inside Pole

WIND PRESSURE DERIVATION (AASHTO 2013)

		Value	Unit	Reference
Height of Pole	$h =$	33.0	ft	
Wind Speed	$V =$	85	mph	*(AASHTO 2013)*
Wind Exposure (B, C or D)		C		
Wind Directionality (Pole)	$K_d =$	0.95		*(AASHTO 2013, Table 3.8.5-1)*
Gust Effect Factor	$G =$	1.14		*(AASHTO 2013, Sec. 3.8.6)*
3-sec Gust Exponent	$\alpha =$	9.50		*(ASCE 7-16, Table 26.11-1)*
Atmospheric Height	$Z_g =$	900	ft	*(ASCE 7-16, Table 26.11-1)*
Vel. Pressure Coeff. (Min)	$K_{z\,min.} =$	0.84		*(ASCE 7-16, Table 29.10-1)*
Velocity Pressure Coeff.	$K_z = 2.0(z/Z_g)^{(2/\alpha)} =$	1.00		*(AASHTO 2013, Equation 3.8.4-1)*
Total Applied Shear	$V_u =$	1111	lbs	*(From TNX Report)*
Total Applied Moment	$M_u =$	17971	lb-ft	*(From TNX Report)*

CALCULATION OF WIND DRAG COEFFICIENTS (Cd) FROM AASTHO 2013, TABLE 3.8.7-1 $C_v =$ 1.00 For V<105 mph

Appurtenance	Height (in)	Width (in)	Depth (in)	d (ft)	C_vVd	C_d
(N) Palo Alto_5G_with Shroud	29.5	10.2	7.3	1.05	-	1.70
(E) Round Luminaire	2.9	88.0	-	0.24	20	0.50
(E) Round Pole	396	7.85	-	0.65	56	0.69

SEISMIC LOAD ANALYSIS (ASCE 7-16)

		Value	Unit	Reference
Total Pole Weight	$W = P_u =$	657	lbs	*[Approximate Wt. Including Pole With (N) Components]*
Spectral Response (Short)	$S_{DS} =$	1.775		*(ATC Hazards Design Maps Summary)*
Spectral Response (1 sec.)	$S_1 =$	0.637		*(ATC Hazards Design Maps Summary)*
Importance Factor	$I_e =$	1.0		*(ASCE 7-16, Section 15.4.1.1)*
Response Factor	$R =$	1.5		*(ASCE 7-16, Table 15.4-2)*
Seismic Response Coeff	$C_s = 0.044S_{DS}I =$	0.078		*(ASCE 7-16, Section 15.4-1)*
Seismic Response Coeff	$C_s = 0.8S_1/(R/I_e) =$	0.340		*(ASCE 7-16, Section 15.4-2)*
Seismic Response Coeff	$C_s = S_{DS}/(R/I_e) =$	1.183		*(ASCE 7-16, Section 12.8-2)*
Lateral Seismic Force	$V_u = MAX(C_s)W =$	1.183	*W	
Total Applied Shear	$V_u =$	777	lbs	
Total Applied Moment	$M_u = V_u(2/3h) =$	17104	lb-ft	

(Wind Loads Governing For Pole Shaft Capacity Check)

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER WISSAM ZALZALI 71655 CIVIL STATE OF CALIFORNIA

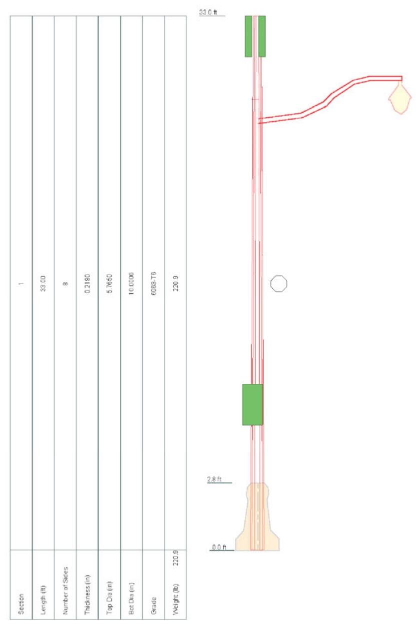
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
CALCS

SHEET NUMBER
C-1

07



DESIGNED APPURTENANCE LOADING

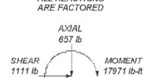
TYPE	ELEVATION	TYPE	ELEVATION
Palo Alto_5G_SFF w/ Antenna	31.75	Light Luminarie	29.125
Palo Alto_5G_SFF w/ Antenna	31.75	30"x30" Street Sign	9
Palo Alto_5G_SFF w/ Antenna	31.75	2PC Cast Alum. Huntington Clamshell	1.416
8' x 2.875" O.D. Light Pole Arm	29.125		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
6063-T6	25 ksi	30 ksi			

TOWER DESIGN NOTES

1. Tower is located in Santa Clara County, California.
2. Tower designed for Exposure C to the AASHTO 2013 Standard.
3. Tower designed for a 85 mph basic wind in accordance with the AASHTO 2013 Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 47.2%



ALL STATES ENGINEERING & SURVEYING 23675 Birtcher Drive Lake Forest, CA 92630 Phone: 949.273.0996 FAX: 949.606.7222	Palo Alto_Light Pole Project: PALO ALTO_121 Client: 64 - Vinculums_VZW Code: AASHTO 2013 Path:	Drawn by: tle Date: 04/19/21 App'd: Scale: NTS Dwg No. E-1

08

Steel Decorated Pole
Palo Alto
PALO ALTO_121

Tower Input Data

The tower is a monopole.
This tower is designed using the AASHTO 2013 standard.
The following design criteria apply:

Tower is located in Santa Clara County, California.
Basic wind speed of 85 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Deflections calculated using a wind speed of 60 mph.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	33.00-0.00	33.00		8	5.7650	10.0000	0.2190	0.8760	6063-T6 (25 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	6.0596	4.0324	16.3628	2.0187	3.1189	5.2464	33.5169	1.9653	1.4801	6.758
	10.6435	7.1116	89.7569	3.5603	5.4100	16.5909	183.8543	3.4661	3.2333	14.764

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 33.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Existing Cable Inside Pole	C	No	Yes	CaAa (Out Of Face)	30.75 - 0.50	1	No Ice	0.06	0.15

09

Steel Decorated Pole
Palo Alto
PALO ALTO_121

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Light Luminarie	A	From Leg	6.50 0.00 0.00	0.0000	29.13	No Ice	2.36	2.36	55.00
8' x 2.875" O.D. Light Pole Arm *	A	From Leg	4.00 0.00 1.75	0.0000	29.13	No Ice	1.92	0.06	65.00
Palo Alto_5G_SFF w/ Antenna	C	From Leg	0.25 0.25 0.00	0.0000	31.75	No Ice	2.54	1.87	49.00
Palo Alto_5G_SFF w/ Antenna	B	From Leg	0.25 0.25 0.00	0.0000	31.75	No Ice	2.54	1.87	49.00
Palo Alto_5G_SFF w/ Antenna *	C	From Leg	0.25 0.25 0.00	0.0000	31.75	No Ice	2.54	1.87	49.00
30"x30" Street Sign *	C	From Leg	0.00 0.00 0.00	0.0000	9.00	No Ice	7.50	0.05	5.00
2PC Cast Alum. Huntington Clamshell *	C	None		0.0000	1.42	No Ice	2.01	2.01	50.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 45 deg - No Ice
5	0.9 Dead+1.6 Wind 45 deg - No Ice
6	1.2 Dead+1.6 Wind 90 deg - No Ice
7	0.9 Dead+1.6 Wind 90 deg - No Ice
8	Dead+Wind 0 deg - Service
9	Dead+Wind 45 deg - Service
10	Dead+Wind 90 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft

10

Steel Decorated Pole
Palo Alto
PALO ALTO_121

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	33 - 0	Pole	Max Tension	2	0.00	0.00	-0.00
			Max. Compression	6	-654.71	-16036.66	1399.23
			Max. Mx	6	-654.71	-16036.66	1399.23
			Max. My	2	-654.49	-564.78	17962.33
			Max. Vy	6	1055.52	-16036.66	1399.23
			Max. Vx	2	-1034.13	-564.78	17962.33
			Max. Torque	7			480.56

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	6	656.93	-1054.15	67.82
	Max. H_x	1	547.44	-0.01	-0.22
	Max. H_z	3	492.70	-67.82	1032.64
	Max. M_x	2	17962.33	-67.82	1032.59
	Max. M_z	6	16036.69	-1054.15	67.82
	Max. Torsion	7	479.73	-1054.17	67.82
	Min. Vert	3	492.70	-67.82	1032.64
	Min. H_x	7	492.70	-1054.17	67.82
	Min. H_z	1	547.44	-0.01	-0.22
	Min. M_x	1	642.63	-0.01	-0.22
	Min. M_z	1	-42.40	-0.01	-0.22
	Min. Torsion	2	0.04	-67.82	1032.59

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	547.44	0.01	0.22	-642.63	42.40	-0.06
1.2 Dead+1.6 Wind 0 deg - No Ice	656.93	67.82	-1032.59	-17962.33	-564.78	-0.04
0.9 Dead+1.6 Wind 0 deg - No Ice	492.70	67.82	-1032.64	-17658.47	-576.61	-0.09
1.2 Dead+1.6 Wind 45 deg - No Ice	656.93	793.35	-778.16	-13368.42	-11759.99	-335.86
0.9 Dead+1.6 Wind 45 deg - No Ice	492.70	793.33	-778.14	-13091.49	-11707.69	-338.09
1.2 Dead+1.6 Wind 90 deg - No Ice	656.93	1054.15	-67.82	-1398.88	-16036.69	-476.78
0.9 Dead+1.6 Wind 90 deg - No Ice	492.70	1054.17	-67.82	-1194.38	-15960.10	-479.73
Dead+Wind 0 deg - Service	547.44	18.90	-287.60	-5415.12	-128.75	-0.07
Dead+Wind 45 deg - Service	547.44	220.99	-216.71	-4139.96	-3235.59	-94.49
Dead+Wind 90 deg - Service	547.44	293.55	-18.83	-818.02	-4419.72	-133.72

Compression Checks

11

Steel Decorated Pole
Palo Alto
PALO ALTO_121

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	33 - 0 (1)	TP10x5.765x0.219	33.00	33.00	111.2	7.1116	-654.49	113241.00	0.006

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	33 - 0 (1)	TP10x5.765x0.219	17971.25	38573.92	0.466	0.00	38573.92	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	33 - 0 (1)	TP10x5.765x0.219	1036.36	99206.40	0.010	0.01	80323.58	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	33 - 0 (1)	0.006	0.466	0.000	0.010	0.000	0.472 ✓	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$øP_{allow}$ lb	% Capacity	Pass Fail
L1	33 - 0	Pole	TP10x5.765x0.219	1	-654.49	113241.00	47.2	Pass
							Summary	
						Pole (L1)	47.2	Pass
						Base Plate	44.4	Pass
						RATING =	**47.2**	**Pass**

12

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	1
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/19/2021
Fastening point:			

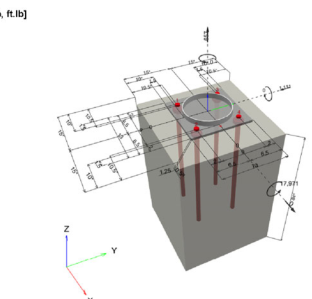
Specifier's comments:

1 Input data

Anchor type and diameter:	**Heavy Hex Head ASTM F 1554 GR. 36 1**
Item number:	not available
Effective embedment depth:	h_{ef} = 25.000 in.
Material:	ASTM F 1554
Evaluation Service Report:	Hilti Technical Data
Issued I Valid:	- | -
Proof:	Design Method ACI 318-08 / CIP
Stand-off installation:	without clamping (anchor); restraint level (anchor plate): 1.00; e_b = 1.250 in.; t = 0.500 in.
Anchor plate[R] :	l_x x l_y x t = 13.000 in. x 13.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Round HSS (AISC), HSS10X.188; (L x W x T) = 10.000 in. x 10.000 in. x 0.188 in.
Base material:	cracked concrete, , f_c' = 3,250 psi; h = 84.000 in.
Reinforcement:	tension: condition A, shear: condition B; anchor reinforcement: tension edge reinforcement: > No. 4 bar with stirrups
Seismic loads (cat. C, D, E, or F)	no

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, ft.lb]



Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
CALCS

SHEET NUMBER
C-2

Hilti PROFIS Engineering 3.0.69

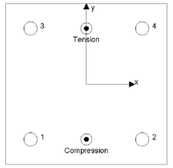
www.hilti.com

Company:	All State Eng. & Surveying	Page:	2
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/19/2021
Fastening point:			

1.1 Design results

Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 657; V_y = 0; V_z = -1,111; M_x = -17,871.000, M_y = 0.000, M_z = 0.000,	no	47

2 Load case/Resulting anchor forces



Anchor reactions [lb]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	-11,816	278	0	-278
2	-11,816	278	0	-278
3	12,145	278	0	-278
4	12,145	278	0	-278

max. concrete compressive strain: - [‰]
max. concrete compressive stress: - [psi]
resulting tension force in (x/y)=(0.000/4.500): 24,290 [lb]
resulting compression force in (x/y)=(0.000/-4.500): 23,633 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N_{ua} [lb]	Capacity ϕN_n [lb]	Utilization $\beta_N = N_{ua}/\phi N_n$	Status
Steel Strength*	12,145	26,361	47	OK
Pullout Strength*	12,145	27,318	45	OK
Concrete Breakout Failure**[1]	N/A	N/A	N/A	N/A
Concrete Side-Face Blowout, direction **	N/A	N/A	N/A	N/A

* highest loaded anchor **anchor group (anchors in tension)
[1] Tension Anchor Reinforcement has been selected!

3.1 Steel Strength

N_{sa} [lb]	ϕ	ϕN_{sa} [lb]	N_{ua} [lb]
35,148	0.750	26,361	12,145

3.2 Pullout Strength

N_p [lb]	$\Psi_{c,p}$	ϕ	ϕN_{pn} [lb]	N_{ua} [lb]
39,026	1.000	0.700	27,318	12,145

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	3
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/19/2021
Fastening point:			

4 Shear load

	Load V_{ua} [lb]	Capacity ϕV_n [lb]	Utilization $\beta_V = V_{ua}/\phi V_n$	Status
Steel Strength*	278	10,966	3	OK
Steel failure (with lever arm)*	278	774	36	OK
Pryout Strength**	1,111	72,399	2	OK
Concrete edge failure in direction y-**	1,111	17,287	7	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

V_{sa} [lb]	ϕ	ϕV_{sa} [lb]	V_{ua} [lb]
21,089	0.650	10,966	278

4.2 Steel failure (with lever arm)

l [in.]	α_M
2.000	1.00

$N_{ua}/\phi N_n$	1 - $N_{ua}/\phi N_n$	M_{ua}^g [ft.lb]	$M_s = M_{ua}^g$ (1 - $N_{ua}/\phi N_n$) [ft.lb]
0.461	0.539	368.152	198.539

$V_{ua}^g = \alpha_M * M_s / l_s$ [lb]	ϕ	ϕV_{sa}^M [lb]	V_{ua} [lb]
1,191	0.650	774	278

4.3 Pryout Strength

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$c_{a,min}$ [in.]	k_{cp}	c_{ac} [in.]	$\Psi_{ec,N}$	$\Psi_{ed,N}$	h_{ef} [in.]
900.00	441.00	10.500	2	∞	1.000	1.000	7.000

$e_{c,V}$ [in.]	$\Psi_{ec1,V}$	$e_{c2,V}$ [in.]	$\Psi_{ec2,V}$	$\Psi_{ed,N}$	k_{cp}
0.000	1.000	0.000	1.000	1.000	24

N_b [lb]	ϕ	ϕV_{cp} [lb]	V_{ua} [lb]
25,340	0.700	72,399	1,111

4.4 Concrete edge failure in direction y-

l_e [in.]	d_c [in.]	c_1 [in.]	A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]
8.000	1.000	10.500	472.50	496.12

$\Psi_{ec,V}$	$\Psi_{parallel,V}$	$e_{c,V}$ [in.]	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{h,V}$
0.900	1.000	0.000	1.000	1.400	1.000

V_b [lb]	ϕ	ϕV_{cbg} [lb]	V_{ua} [lb]
20,580	0.700	17,287	1,111

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	4
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/19/2021
Fastening point:			

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.461	0.039	0.9	46	OK

$\beta_{N,V} = \beta_N^\zeta + \beta_V^\zeta <= 1$

6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- ACI 318 does not specifically address anchor bending when a stand-off condition exists. PROFIS Engineering calculates a shear load corresponding to anchor bending when stand-off exists and includes the results as a shear Design Strength!
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- Attention! In case of compressive anchor forces a buckling check as well as the proof of the local load transfer into and within the base material (incl. punching) has to be done separately.
- The design of Anchor Reinforcement is beyond the scope of PROFIS Engineering. Refer to ACI 318-08, Part D.5.2.9 for information about Anchor Reinforcement.
- Anchor Reinforcement has been selected as a design option, calculations should be compared with PROFIS Engineering calculations.

Fastening meets the design criteria!

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	5
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/19/2021
Fastening point:			

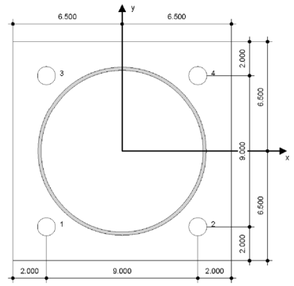
7 Installation data

Profile: Round HSS (AISC), HSS10X.188; (L x W x T) = 10.000 in. x 10.000 in. x 0.188 in.
Hole diameter in the fixture: d_f = 1.062 in.
Plate thickness (input): 0.500 in.
Recommended plate thickness: not calculated

Anchor type and diameter: Heavy Hex Head ASTM F 1554 GR. 36 1
Item number: not available

Maximum installation torque: -
Hole diameter in the base material: - in.
Hole depth in the base material: 25.000 in.
Minimum thickness of the base material: 26.172 in.

Hilti Heavy Hex Head headed stud anchor with 25 in embedment, 1, Steel galvanized, installation per instruction for use



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-4.500	-4.500	10.500	19.500	10.500	19.500
2	4.500	-4.500	19.500	10.500	10.500	19.500
3	-4.500	4.500	10.500	19.500	19.500	10.500
4	4.500	4.500	19.500	10.500	19.500	10.500

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	6
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/19/2021
Fastening point:			

8 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

All States Engineering & Surveying
Zalzali & Associates, Inc.
23675 Birtcher Drive
Lake Forest
CA 92630

Project Title: Lighht Pole Caisson Embedment Depth
Engineer:
Project ID: Palo Alto Light Pole
Project Descr:

Pole Footing Embedded in Soil

File: Caisson Depth.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24
Lic. # : KW-06009186 Zalzali & Associates Inc.

DESCRIPTION: Poposed Caisson embedment (soil values From IBC Table 1806.2 with lateral bearing load increase from IBC 1806.3.4)

Code References

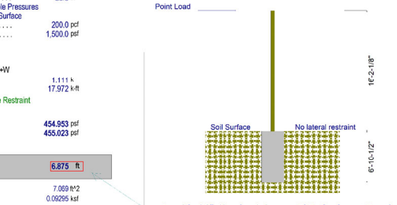
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Pole Footing Shape	Circular
Pole Footing Diameter	36.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	200.0 pcf
Max Passive	1,500.0 psf

Controlling Values

Governing Load Combination : +D+W	
Lateral Load	1.111 k
Moment	17.972 k-ft
NO Ground Surface Restraint	
Pressures at 1/3 Depth	
Actual	454.953 psf
Allowable	455.023 psf
Minimum Required Depth	**6.875 ft**
Footing Base Area	7.069 ft^2
Maximum Soil Pressure	0.09295 ksf



Provide 36" Circular Caisson x 7' Embedment Depth

Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (k/ft)		Vertical Load (k)
D : Dead Load	k		k/ft	0.0570 k
Lr : Roof Live	k		k/ft	k
L : Live	k		k/ft	k
S : Snow	k		k/ft	k
W : Wind	1.111 k		k/ft	k
E : Earthquake	k		k/ft	k
H : Lateral Earth	k		k/ft	k
Load distance above ground surface	16.175 ft	TOP of Load above ground surface	ft	
		BOTTOM of Load above ground surface	ft	

Load Combination Results

Load Combination	Forces @ Ground Surface Loads - (k)	Moments - (ft-k)	Required Depth - (ft)	Pressure at 1/3 Depth Actual - (psf)	Allow - (psf)	Soil Increase Factor
+D+W	1.111	17.972	6.88	455.0	455.0	1.000

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WASAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
CALCS

SHEET NUMBER
C-3

All States Engineering & Surveying
Zalzali & Associates, Inc.
23675 Birtcher Drive
Lake Forest
CA 92630

Project Title: Lighht Pole Caisson Embedment Depth
Engineer:
Project ID: Palo Alto Light Pole
Project Descr:

Concrete Caisson

File: Caisson Depth.ec5
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24
Lic. # : KW-06009166 Zalzali & Associates Inc.

DESCRIPTION: Design Concrete Caisson

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

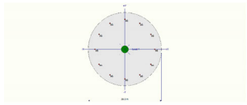
f'c : Concrete 28 day strength	=	3.250 ksi
E =	=	3,122.0 ksi
Density	=	150.0 pcf
β1	=	0.850
fy - Main Rebar	=	60.0 ksi
E - Main Rebar	=	29,000.0 ksi
Allow. Reinforcing Limits		ASTM A615 Bars Used
Min. Reinf.	=	0.250 %
Max. Reinf.	=	8.0 %

Overall Caisson Height = 7.0 ft
End Fixity Top Free, Bottom Fixed
Brace condition for deflection (buckling) along Caisson :
X-X (width) axis :
Fully braced against buckling ABOUT Y-Y Axis
Y-Y (depth) axis :
Fully braced against buckling ABOUT X-X Axis

Caisson Cross Section

Column Dimensions : 36.0in Diameter, Caisson Edge to Rebar Edge Cover = 3.0in

Column Reinforcing : 12 - #5 bars



Entered loads are factored per load combinations specified by user.

Applied Loads

Caisson self weight included : 7,422.01 lbs * Dead Load Factor
AXIAL LOADS . . .
Reaction from Pole: Axial Load at 7.0 ft above base, D = 0.6570 k
BENDING LOADS . . .
Reaction from Pole: Lat. Point Load at 7.0 ft creating Mx-x, W = 1.852 k
Reaction from Pole: Moment acting about X-X axisat 7.0 ft, W = 29.951 k-ft

DESIGN SUMMARY

Load Combination +0.90D+W+1.60H
Location of max.above base 6.953 ft
Maximum Stress Ratio 0.085 : 1
Ratio = (Pu^2+Mu^2)^.5 / (PhiPn^2+PhiMn^2)^.5
Pu = 7.271 k φ * Pn = 86.887 k
Mu-x = 29.864 k-ft Φ * Mn-x = -356.890 k-ft
Mu-y = 0.0 k-ft Φ * Mn-y = 0.0 k-ft
Mu Angle = 0.0 deg
Mu at Angle = 29.864 k-ft φMn at Angle = 350.522 k-ft
Pn & Mn values located at Pu-Mu vector intersection with capacity curve

Caisson Capacities . . .
Pnmax : Nominal Max. Compressive Axial Capacity 3,024.81 k
Pnmin : Nominal Min. Tension Axial Capacity k
φ Pn, max : Usable Compressive Axial Capacity 1,799.76 k
Φ Pn, min : Usable Tension Axial Capacity k

Maximum SERVICE Load Reactions . .
Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k
Top along X-X 0.0 k Bottom along X-X 1.111 k

Maximum SERVICE Load Deflections . . .
Along Y-Y -0.003479 in at 7.0 ft above base
for load combination : W Only
Along X-X 0.0 in at 0.0 ft above base
for load combination :

General Section Information . φ = 0.70 β = 0.850 θ = 0.850
ρ : % Reinforcing 0.3655 % Rebar % Ok
Reinforcing Area 3.720 in^2
Concrete Area 1,017.88 in^2

All States Engineering & Surveying
Zalzali & Associates, Inc.
23675 Birtcher Drive
Lake Forest
CA 92630

Project Title: Lighht Pole Caisson Embedment Depth
Engineer:
Project ID: Palo Alto Light Pole
Project Descr:

Concrete Caisson

File: Caisson Depth.ec5
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24
Lic. # : KW-06009166 Zalzali & Associates Inc.

DESCRIPTION: Design Concrete Caisson

Governing Load Combination Results

Governing Factored Load Combination	Moment X-X	Moment Y-Y	Dist. from base ft	Axial Load k Pu	φ * Pn	Bending Analysis k-ft δx	δx * Mux	δy	δy * Muy	Alpha (deg)	δ Mu	φ Mn	Utilization Ratio
+1.40D+1.60H			6.95	11.31	1,799.76					0.000			0.006
+1.20D+0.50Lr+L+W+1.60H	Actual		6.95	9.69	121.85	1.000	29.86			0.000	29.86	386.20	0.077
+0.90D+W+1.60H	Actual		6.95	7.27	86.89	1.000	29.86			0.000	29.86	350.52	0.085

Maximum Reactions

Note: Only non-zero reactions are listed.

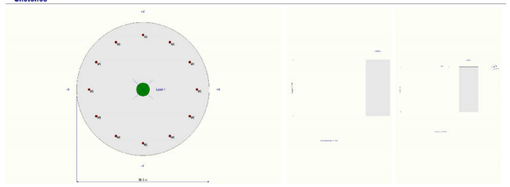
Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments @ Base	@ Top	k-ft	Mx - End Moments @ Base	@ Top
+D+H						8.079					
+D+0.60W+H				1.111		8.079	10.194				
+0.60D+0.60W+0.60H				1.111		4.847	10.194				

Maximum Moment Reactions

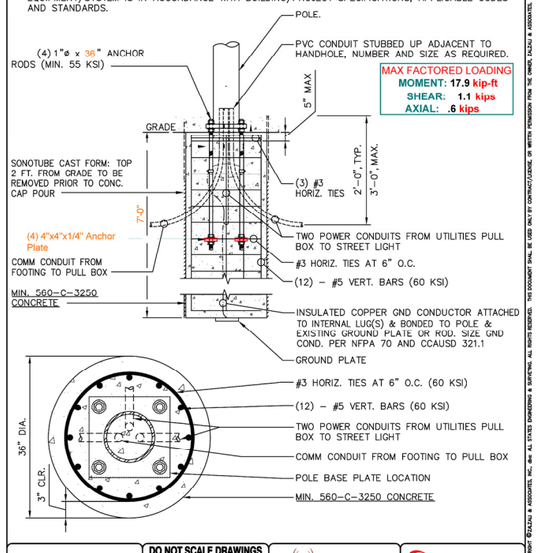
Note: Only non-zero reactions are listed.

Load Combination	Moment About X-X Axis @ Base	@ Top		Moment About Y-Y Axis @ Base	@ Top	
+D+H			k-ft			k-ft
+D+0.60W+H	10.194		k-ft			k-ft
+0.60D+0.60W+0.60H	10.194		k-ft			k-ft

Sketches



NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.



COPYRIGHT ZALZALI & ASSOCIATES, INC. dba ALL STATES ENGINEERING & SURVEYING. ALL RIGHTS RESERVED. THIS DOCUMENT SHALL BE USED ONLY BY OWNER/LESSEE, OR WITH PERMISSION FROM THE OWNER. ZALZALI & ASSOCIATES, INC.

FOUNDATION DETAIL	DO NOT SCALE DRAWINGS	ALLSTATES ENGINEERING & SURVEYING 23675 BIRTCHER DRIVE LAKE FOREST, CA 92630	Vinculums 575 LENNON LANE #125 WALNUT CREEK, CA 94598 OFFICE: (925) 482-8500

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID: P-334899
DRAWN BY: LS
CHECKED BY: DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
CALCS

SHEET NUMBER
C-4

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL BUILDING CODE, THE LATEST EDITION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.

2. CONTRACTOR SHALL CONSTRUCT SITE IN ACCORDANCE WITH THESE DRAWINGS AND CONSTRUCTION SPECIFICATIONS 80-T1196-1 REV H. THE SPECIFICATION IS THE RULING DOCUMENT AND ANY DISCREPANCIES BETWEEN THE SPECIFICATION AND THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION

3. CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK (ROOF FRAMING, ELECTRICAL SERVICE, LOCAL PLANNING CODES, ETC.) AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OF FIELD CONDITIONS

4. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT AND APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS. OWNER PROVIDED MATERIALS WILL INCLUDE THE FOLLOWING, UNLESS NOTED OTHERWISE:
   A) TRANSMITTER
   B) RF FILTER
   C) MFTS RACK
   D) AUXILIARY EQUIPMENT IN MFTS RACK
   E) PUMP ASSEMBLY
   F) HEAT EXCHANGER
   G) HOSE AND HOSE MANIFOLDS (ANY COPPER OR STEEL SECTIONS PROVIDE BY CONTRACTOR)
   H) UHF ANTENNA AND MOUNTING BRACKETS, GPS ANTENNAS AND KU ANTENNAS
   I) UHF COAX AND HANGERS
   K) 480-208 & 208-400 ELECTRICAL TRANSFORMERS (RE: E-2 FOR SPECIALIZED TRANSFORMERS PROVIDED BY CONTRACTOR)
   L) AUTOMATIC TRANSFER SWITCH AND GENERATOR
   M) EQUIPMENT SHELTER (SHELTERS FURNISHED IN FACTORY W/ HVAC EQUIPMENT AND ELECTRICAL DISTRIBUTION PANEL)
   N) INTEGRATED LOAD CENTER

5. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE WORK.

6. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

7. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.

8. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.

10. CONTRACTOR SHALL COORDINATE HIS WORK WITH THE SUPERINTENDENT OF BUILDINGS & GROUNDS AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS.

11. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.

12. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

13. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, PIPING ETC. AND IMMEDIATELY REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.

14. IN DRILLING HOLES INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC., MUST BE CLEARLY UNDERSTOOD THAT REINFORCING STEEL SHALL NOT BE DRILLED INTO, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES (UNLESS NOTED OTHERWISE). LOCATIONS OF REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT.

15. REPAIR ALL EXISTING WALL SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND IN WITH ADJACENT SURFACES.

16. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH U.L. LISTED AND FIRE CODE APPROVED MATERIALS.

17. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.

18. MINIMUM BEND RADIUS OF ANTENNA CABLES SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURERS RECOMMENDATIONS.

19. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO APPLICABLE REGULATORY AUTHORITIES

20. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION SHALL BE IN CONFORMANCE WITH JURISDICTIONAL OR STATE AND LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL AND COORDINATED WITH LOCAL REGULATORY AUTHORITIES.

21. ALL CONSTRUCTION IS TO ADHERE TO VERIZON'S INTEGRATED CONSTRUCTION STANDARDS UNLESS CALIFORNIA CODE IS MORE STRINGENT.

22. THE INTENT OF THE PLANS AND SPECIFICATIONS IS TO PERFORM THE CONSTRUCTION IN ACCORDANCE WITH THE CALIFORNIA BUILDING STANDARDS CODE, TITLES 19 AND 24, CALIFORNIA CODE OF REGULATIONS. SHOULD ANY CONDITIONS DEVELOP NOT COVERED BY THE APPROVED PLANS AND SPECIFICATIONS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS, A CHANGE ORDER DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY THE JURISDICTION BEFORE PROCEEDING WITH THE WORK.

SITE WORK NOTES

1. DO NOT EXCAVATE OR DISTURB BEYOND THE PROPERTY LINES OR LEASE LINES, UNLESS OTHERWISE NOTED.

2. DO NOT SCALE BUILDING DIMENSIONS FROM DRAWING.

3. SIZE, LOCATION AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-BUILT DRAWINGS BY GENERAL CONTRACTOR AND ISSUED TO ARCHITECT/ENGINEER AT COMPLETION OF PROJECT.

4. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS AND THEIR DIMENSIONS SHOWN ON PLANS HAVE. BEEN PLOTTED FROM AVAILABLE RECORDS. THE ENGINEER AND OWNER ASSUME NO RESPONSIBILITY WHATSOEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.

5. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT/ENGINEER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS/HER OWN RISK AND EXPENSE. CONTRACTOR SHALL CALL LOCAL DIGGER HOT LINE FOR UTILITY LOCATIONS 48 HOURS PRIOR TO START OF CONSTRUCTION.

6. ALL NEW AND EXISTING UTILITY STRUCTURES ON SITE AND IN AREAS TO BE DISTURBED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISH ELEVATIONS PRIOR TO FINAL INSPECTION OF WORK.

7. GRADING OF THE SITE WORK AREA IS TO BE SMOOTH AND CONTINUOUS IN SLOPE AND IS TO FEATHER INTO EXISTING GRADES AT THE GRADING LIMITS.

8. ALL TEMPORARY EXCAVATIONS FOR THE INSTALLATION OF FOUNDATIONS, UTILITIES, ETC., SHALL BE PROPERLY LAID BACK OR BRACED IN ACCORDANCE WITH CORRECT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.

9. STRUCTURAL FILLS SUPPORTING PAVEMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM STANDARD PROCTOR DRY DENSITY.

10. NEW GRADES NOT IN BUILDING AND DRIVEWAY IMPROVEMENT AREA TO BE ACHIEVED BY FILLING WITH APPROVED CLEAN FILL AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.

11. ALL FILL SHALL BE PLACED IN UNIFORM LIFTS. THE LIFTS THICKNESS SHOULD NOT EXCEED THAT WHICH CAN BE PROPERLY COMPACTED THROUGHOUT ITS ENTIRE DEPTH WITH THE EQUIPMENT AVAILABLE.

12. ANY FILLS PLACED ON EXISTING SLOPES THAT ARE STEEPER THAN 10 HORIZONTAL TO 1 VERTICAL SHALL BE PROPERLY BENCHED INTO THE EXISTING SLOPE AS DIRECTED BY A GEOTECHNICAL ENGINEER.

13. CONTRACTOR SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO PAPERS, TRASH, WEEDS, BRUSH OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.

14. ALL TREES AND SHRUBS WHICH ARE NOT IN DIRECT CONFLICT WITH THE IMPROVEMENTS SHALL BE PROTECTED BY THE GENERAL CONTRACTOR.

15. ALL SITE WORK SHALL BE CAREFULLY COORDINATED BY GENERAL CONTRACTOR WITH LOCAL UTILITY COMPANY, TELEPHONE COMPANY, AND ANY OTHER UTILITY COMPANIES HAVING JURISDICTION OVER THIS LOCATION.

ENVIRONMENTAL NOTES

1. ALL WORK PERFORMED SHALL BE DONE IN ACCORDANCE WITH ISSUED PERMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF FINES AND PROPER CLEAN UP FOR AREAS IN VIOLATION.

2. CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS DURING CONSTRUCTION FOR PROTECTION OF ADJACENT PROPERTIES, ROADWAYS AND WATERWAYS AND SHALL BE MAINTAINED IN PLACE THROUGH FINAL JURISDICTIONAL INSPECTION & RELEASE OF SITE.

3. CONTRACTOR SHALL INSTALL/CONSTRUCT ALL NECESSARY SEDIMENT/SILT CONTROL FENCING AND PROTECTIVE MEASURES WITHIN THE LIMITS OF SITE DISTURBANCE PRIOR TO CONSTRUCTION.

4. NO SEDIMENT SHALL BE ALLOWED TO EXIT THE PROPERTY. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE MEASURES FOR CONTROLLING EROSION. ADDITIONAL SEDIMENT CONTROL FENCING MAY BE REQUIRED IN ANY AREAS SUBJECT TO EROSION.

5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE ON THE SITE AT ALL TIMES WITH SILT AND EROSION CONTROL MEASURES MAINTAINED ON THE DOWNSTREAM SIDE OF SITE DRAINAGE. ANY DAMAGE TO ADJACENT PROPERTY AS A RESULT OF EROSION WILL BE CORRECTED AT THE CONTRACTORS EXPENSE.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTIONS AND ANY REPAIRS OF ALL SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT REMOVAL AS NECESSARY.

7. CLEARING OF VEGETATION AND TREE REMOVAL SHALL BE ONLY AS PERMITTED AND BE HELD TO A MINIMUM. ONLY TREES NECESSARY FOR CONSTRUCTION OF THE FACILITIES SHALL BE REMOVED.

8. SEEDING AND MULCHING AND/OR SODDING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE PROJECT FACILITIES AFFECTING LAND DISTURBANCE.

9. CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED BY LOCAL, COUNTY AND STATE CODES AND ORDINANCES TO PROTECT EMBANKMENTS FROM SOIL LOSS AND TO PREVENT ACCUMULATION OF SOIL AND SILT IN STREAMS AND DRAINAGE PATHS LEAVING THE CONSTRUCTION AREA. THIS MAY INCLUDE SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS, AND CHECK DAMS.

10. RIP RAP OF SIZES INDICATED SHALL CONSIST OF CLEAN, HARD, SOUND, DURABLE, UNIFORM IN QUALITY STONE FREE OF ANY DETRIMENTAL QUANTITY OF SOFT, FRIABLE, THIN, ELONGATED OR LAMINATED PIECES, DISINTEGRATED MATERIAL, ORGANIC MATTER, OIL, ALKALI, OR OTHER DELETERIOUS SUBSTANCES

GENERAL NOTES

1. THESE NOTES SHALL BE CONSIDERED A PART OF THE WRITTEN SPECIFICATIONS, CONTRACT AND CONSTRUCTION DOCUMENTS.

2. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THESE PLANS AND IN THE CONTRACT DOCUMENTS.

3. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR(S) SHALL VISIT THE JOB SITE(S) AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRM THAT THE WORK MAY BE ACCOMPLISHED PER THE CONTRACT DOCUMENTS. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO BID SUBMITTAL

4. THE CONTRACTOR SHALL RECEIVE WRITTEN AUTHORIZATION TO PROCEED ON ANY WORK NOT CLEARLY DEFINED OR IDENTIFIED IN THE CONTRACT AND CONSTRUCTION DOCUMENTS BEFORE STARTING ANY WORK.

5. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES, INCLUDING APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS.

6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. IF THESE RECOMMENDATIONS ARE IN CONFLICT WITH THE CONTRACT AND CONSTRUCTION DOCUMENTS AND/OR APPLICABLE CODES OR REGULATIONS, REVIEW AND RESOLVE THE CONFLICT WITH DIRECTION FROM THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO PROCEEDING.

7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATION OF ALL PORTIONS OF THE WORK UNDER THE CONTRACT INCLUDING CONTACT AND COORDINATION WITH THE IMPLEMENTATION ENGINEER AND WITH THE AUTHORIZED REPRESENTATIVE OF ANY OUTSIDE POLE OR PROPERTY OWNER.

8. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO PAVING, CURBS, VEGETATION, GALVANIZED SURFACE OR OTHER EXISTING ELEMENTS AND UPON COMPLETION OF THE WORK, REPAIR ANY DAMAGE THAT OCCURRED DURING CONSTRUCTION TO THE SATISFACTION OF VERIZON.

9. CONTRACTOR IS TO KEEP THE GENERAL AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH, AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. LEAVE PREMISES IN CLEAN CONDITION DAILY.

10. PLANS ARE INTENDED TO BE DIAGRAMMATIC ONLY AND SHOULD NOT BE SCALED UNLESS OTHERWISE NOTED. RELY ONLY ON ANNOTATED DIMENSIONS AND REQUEST INFORMATION IF ADDITIONAL DIMENSIONS ARE REQUIRED.

11. THE EXISTENCE AND LOCATION OF UTILITIES AND OTHER AGENCY'S FACILITIES WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. OTHER FACILITIES MAY EXIST. CONTRACTOR SHALL VERIFY LOCATIONS PRIOR TO START OF CONSTRUCTION AND USE EXTREME CARE AND PROTECTIVE MEASURES TO PREVENT DAMAGE TO THESE FACILITIES. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF UTILITIES OR OTHER AGENCY'S FACILITIES WITHIN THE LIMITS OF THE WORK, WHETHER THEY ARE INDENTIFIED IN THE CONTRACT DOCUMENTS OR NOT.

12. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (800) 227-2600, AT LEAST TWO WORKING DAYS PRIOR TO THE START OF ANY EXCAVATION.

DEFINITIONS

1. "TYPICAL" OR "TYP" MEANS THAT THIS ITEM IS SUBSTANTIALLY THE SAME ACROSS SIMILAR CONDITIONS. "TYP." SHALL BE UNDERSTOOD TO MEAN "TYPICAL WHERE OCCURS" AND SHALL NOT BE CONSIDERED AS WITHOUT EXCEPTION OR CONSIDERATION OF SPECIFIC CONDITIONS.

2. "SIMILAR" MEANS COMPARABLE TO CHARACTERISTICS FOR THE CONDITION NOTED. VERIFY DIMENSIONS AND ORIENTATION ON PLAN.

3. "AS REQUIRED" MEANS AS REQUIRED BY REGULATORY REQUIREMENTS, BY REFERENCED STANDARDS, BY EXISTING CONDITIONS, BY GENERALLY ACCEPTED CONSTRUCTION PRACTICE, OR BY THE CONTRACT DOCUMENTS.

4. "ALIGN" MEANS ACCURATELY LOCATE FINISH FACES OF MATERIALS IN THE SAME PLANE.

5. THE TERM "VERIFY" OR "V.I.F." SHALL BE UNDERSTOOD TO MEAN "VERIFY IN FIELD WITH ENGINEER" AND REQUIRES THAT THE CONTRACTOR CONFIRM INTENTION REGARDING NOTED CONDITION AND PROCEED ONLY AFTER RECEIVING DIRECTION.

6. WHERE THE WORDS "OR EQUAL" OR WORDS OF SIMILAR INTENT FOLLOW A MATERIAL SPECIFICATION, THEY SHALL BE UNDERSTOOD TO REQUIRE SIGNED APPROVAL OF ANY DEVIATION TO SAID SPECIFICATION PRIOR TO CONTRACTOR'S ORDERING OR INSTALLATION OF SUCH PROPOSED EQUAL PRODUCT.

7. FURNISH: SUPPLY ONLY, OTHERS TO INSTALL.
   INSTALL: INSTALL ITEMS FURNISHED BY OTHERS.
   PROVIDE: FURNISH AND INSTALL.

811 USA North
Know what's below. Call before you dig.
California and Nevada
Call Two Working Days Before You Dig!
811 / 800-227-2600

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
NISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1

ELECTRICAL NOTES

1. ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ANY/ALL ELECTRICAL WORK INDICATED. ANY/ALL CONSTRUCTION SHALL BE IN ACCORDANCE W/DRAWINGS AND ANY/ALL APPLICABLE SPECIFICATIONS. IF ANY PROBLEMS ARE ENCOUNTERED BY COMPLYING WITH THESE REQUIREMENTS, CONTRACTOR SHALL NOTIFY 'CONSTRUCTION MANAGER' AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK, UNTIL THE 'CONSTRUCTION MANAGER' HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.

2. ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATION INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. ALL EXISTING CONDITIONS OF ELECTRICAL EQUIP., LIGHT FIXTURES, ETC., THAT ARE PART OF THE FINAL SYSTEM, SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTING OF HIS BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM.

3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND ALL CODES AND LOCAL ORDINANCES OF THE LOCAL POWER & TELEPHONE COMPANIES HAVING JURISDICTION AND SHALL INCLUDE BUT NOT BE LIMITED TO:
   C - NATIONAL FIRE CODES
   A. UL - UNDERWRITERS LABORATORIES
   B. NEC - NATIONAL ELECTRICAL CODE
   C. NEMA - NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
   D. OSHA - OCCUPATIONAL SAFETY AND HEALTH ACT
   E. SBC - STANDARD BUILDING CODE

4. DO NOT SCALE ELECTRICAL DRAWINGS, REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, AND CONFIRM WITH 'CONSTRUCTION MANAGER' ANY SIZES AND LOCATIONS WHEN NEEDED.

5. EXISTING SERVICES: CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE OWNER.

6. CONTRACTOR SHALL PAY FOR ANY/ALL PERMITS, FEES, INSPECTIONS AND TESTING. CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO THE WORK BEGINNING OR ORDERING EQUIPMENT.

7. THE TERM "PROVIDE" USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.

8. CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS SUCH AS THE: LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS' CONFIRMATION, ETC... ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.

9. MINIMUM WIRE SIZE SHALL BE #12 AWG, NOT INCLUDING CONTROL WIRING, UNLESS NOTED OTHERWISE. ALL CONDUCTORS SHALL BE COPPER WITH THWN INSULATION.

10. OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.

11. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF THE CONSTRUCTION. CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.

12. ELECTRICAL SYSTEM SHALL BE AS COMPLETELY AND EFFECTIVELY GROUNDED, AS REQUIRED BY SPECIFICATIONS, SET FORTH BY VERIZON.

13. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY OPERATIVE AND SUBJECT TO REGULATORY INSPECTION AND APPROVAL BY CONSTRUCTION MANAGER.

14. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.

15. CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE.

16. THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OR THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN.

17. ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK.

18. PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS AS INDICATED.

19. DITCHING AND BACK FILL: CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION AND BACKFILLING AND COMPACTION. REFER TO NOTES AND REQUIREMENTS 'EXCAVATION, AND BACKFILLING.

20. MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW AND SHALL APPEAR ON THE LIST OF U.L. APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NEC, NEMA AND IECE.

21. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURES CATALOG INFORMATION OF ANY/ALL LIGHTING FIXTURES, SWITCHES AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.

22. ANY CUTTING OR PATCHING DEEMED NECESSARY FOR ELECTRICAL WORK IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY AND SHALL BE INCLUDED IN THE COST FOR WORK AND PERFORMED TO THE SATISFACTION OF THE 'CONSTRUCTION MANAGER' UPON FINAL ACCEPTANCE.

23. THE ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

24. DISCONNECT SWITCHES SHALL BE H.P. RATED HEAVY-DUTY, QUICK-MAKE AND QUICK-BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.

25. ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI-OXIDE COMPOUND SUCH AS "NO-OXIDE A" BY DEARBORNE CHEMICAL CO. COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED COPPER SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED - NO SUBSTITUTIONS.

26. RACEWAYS: CONDUIT SHALL BE SCHEDULE 40 PVC MEETING OR EXCEEDING NEMA TC2 - 1990. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS - 200 LBS TEST POLYETHYLENE CORD. ALL CONDUIT BENDS SHALL BE A MINIMUM OF 2 FT. RADIUS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL-6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT. COAT ALL THREADS WITH 'BRITE ZINC' OR 'GOLD GALV'.

27. SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.

28. CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE THWN INSULATION, 800 VOLT, COLOR CODED. USE SOLID CONDUCTORS FOR WIRE UP TO AND INCLUDING NO. 8 AWG. USE STRANDED CONDUCTORS FOR WIRE ABOVE NO. 8 AWG.

29. CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.

30. SERVICE: 240/120V, SINGLE PHASE, 3 WIRE CONNECTION AVAILABLE FROM UTILITY COMPANY. OWNER OR OWNERS AGENT WILL APPLY FOR POWER.

31. TELEPHONE SERVICE: CONTRACTOR SHALL PROVIDE EMPTY CONDUITS WITH PULL STRINGS AS INDICATED ON DRAWINGS.

32. ELECTRICAL AND TELCO RACEWAYS TO BE BURIED A MINIMUM OF 2' DEPTH.

33. CONTRACTOR SHALL PLACE TWO LENGTHS OF WARNING TAPE AT A DEPTH OF 12" BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL AND TELCO SERVICE CONDUITS. CAUTIONS TAPE TO READ "CAUTION BURIED ELECTRIC" OR "BURIED TELECOMM".

34. ALL BOLTS SHALL BE STAINLESS STEEL

GROUNDING NOTES

1. COMPRESSION CONNECTIONS (2), 2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.

2. EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH I" HIGH LETTERS.

3. ALL HARDWARE 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR LARGER.

4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.

5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE.

6. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

7. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUNDING BAR TO AN EXISTING TOWER,THE SUBCONTRACTOR SHALL OBTAIN APPROVAL FROM THE TOWER OWNER PRIOR TO MOUNTING THE GROUNDING BAR TO THE TOWER.

8. ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER.

ADDITIONAL NOTES:

9. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL GROUNDING INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.

10. GROUND ALL ANTENNA BASES, FRAMES, CABLE RUNS, AND OTHER METALLIC COMPONENTS USING #2 GROUND WIRES AND CONNECT TO SURFACE MOUNTED GROUND BUS BARS AS SHOWN. FOLLOW ANTENNA AND BTS MANUFACTURER'S PRACTICES FOR GROUNDING REQUIREMENTS. GROUND COAX SHIELD AT BOTH ENDS USING MANUFACTURERS PRACTICES. ALL UNDERGROUND WATER PIPES, METAL CONDUITS AND GROUNDS THAT ARE A PART OF THIS SYSTEM SHALL BE BONDED TOGETHER.

11. ALL GROUND CONNECTIONS SHALL BE #2 AWG U.N.O. ALL WIRES SHALL BE COPPER THHN/THWN. ALL GROUND WIRE SHALL BE SOLID TIN COATED OR STRANDED GREEN INSULATED WIRE.

12. CONTRACTOR TO VERIFY AND TEST GROUND TO SOURCE, 5 OHMS MAXIMUM. PROVIDE SUPPLEMENT GROUNDING RODS AS REQUIRED TO ACHIEVE SPECIFIED OHMS READING. GROUNDING AND OTHER OPTIONAL TESTING WILL BE WITNESSED BY THE VERIZON REPRESENTATIVE.

13. NOTIFY ARCHITECT/ENGINEER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.

14. BARE GROUNDING CONDUCTOR SHALL BE HARD DRAWN TINNED COPPER SIZES AS NOTED ON PLAN.

15. ALL HORIZONTALLY RUN GROUNDING CONDUCTORS SHALL BE INSTALLED MINIMUM 12" BELOW GRADE/FROST-LINE IN TRENCH, U.N.O., AND BACK FILL SHALL BE COMPACTED AS REQUIRED BY ARCHITECT.

16. ALL GROUND CONDUCTORS SHALL BE RUN AS STRAIGHT AND SHORT AS POSSIBLE, WITH A MINIMUM 12" BENDING RADIUS NOT LESS THAN 90 DEGREES.

17. ALL SUPPORT STRUCTURES, CABLE CHANNEL WAYS OR WIRE GUIDES SHALL BE BONDED TO GROUND SYSTEM AT A POINT NEAREST THE MAIN GROUNDING BUS "MGB" (OR DIRECTLY TO GROUND-RING).

18. ACCEPTABLE CONNECTIONS FOR GROUNDING SYSTEM SHALL BE:
   a. BURNDY, HY-GRADE U.L. LISTED CONNECTORS FOR INDOOR USE OR AS APPROVED BY VERIZON PROJECT MANAGER.
   b. CADWELD, EXOTHERMIC WELDS (WELDED CONNECTIONS).
   c. TWO -(2) HOLE TINNED COPPER COMPRESSION (LONG BARREL) FITTINGS (BUS BAR CONNECTIONS).

19. ALL CRIMPED CONNECTIONS SHALL HAVE EMBOSSED MANUFACTURER'S DIEMARK VISIBLE AT THE CRIMP (RESULTING FROM USE OF PROPER CRIMPING DEVICES).

20. PRIOR TO ANY LUG-BUSSBAR CONNECTIONS, THE BUSSBAR SHALL BE CLEANED BY USE OF "SCOTCH-BRITE' OR PLAIN STEEL WOOL AS TO REMOVE ALL SURFACE OXIDATION AND CONTAMINANTS. A COATING OF "NO-OX-ID" SHALL BE APPLIED TO THE CONNECTION SURFACES.

21. ALL CONNECTION HARDWARE SHALL BE TYPE 316 SS (NOT ATTRACTED TO MAGNETS).

22. THE GROUND RING SHALL BE INSTALLED 24" MINIMUM BEYOND ANY BUILDING DRIP LINE.

23. ELECTRICAL SERVICE EQUIPMENT GROUNDING SHALL COMPLY WITH NEC, ARTICLE 250-82 AND SHALL BOND ALL EXISTING AND NEW GROUNDING ELECTRODES. NEW GROUNDING ELECTRODE SHALL INCLUDE BUT NOT LIMITED TO GROUND RODS, GROUND RING IF SERVICE IS WITHIN THE RADIO EQUIPMENT LOCATION, BUILDING STEEL IF APPLICABLE, COLD WATER CONNECTIONS MUST BE MADE ON THE STREET SIDE OF MAIN SHUT-OFF VALVE.

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

"Hands On Tree Care"

Anderson's Tree Care Specialists, Inc.

P.O. Box 28 ● San Jose, CA 95109-0002
Tel: (408) 226-TREE (8733) ● Fax: (408) 281-8733 ● Lic #705171
www.andersonstreecare.com

ACCREDITED — TCIA TREE CARE INDUSTRY ASSOCIATION — QUALITY CONFIDENCE

5/13/2021

Jeremy Stroup
Real Estate Specialist III
Vinculums Services, LLC
10 Pasteur, Suite 100
Irvine, CA 92618
jstroup@vinculums.com
925-202-8654

Re: Tree Protection Measures at SF PALO ALTO 121 (1600 El Camino Real)

Dear Jeremy,

Cellular equipment will be mounted on a new metal light pole, #167, adjacent to the above address, with three new handholes in the sidewalk adjacent to the pole, connected to the pole by conduits installed via trenching. A CPAU secondary box is proposed in the sidewalk northwest of the pole. The new light pole will be installed about four feet northwest of the existing pole. I visually estimated distances between trees and project features onsite.

One private non-regulated tree is present just beyond the project area. A metal private fence also lies just beyond the project area. Because this fence is present, no tree protection fencing will be needed for tree #1. Trenching must be performed by hand. If any live roots are encountered during excavation, the recommendations in section 2.20 C apply:

C. Trenching, Excavation and Equipment Use

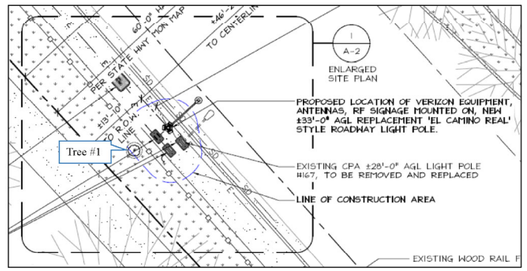
Trenching, excavation or boring activity within the TPZ is restricted to the following activities, conditions and requirements if approved by the *City Arborist*. *(See Restriction Zones for Excavation, Trenching or Boring Near Regulated Trees, Image 2.20-1 through 2.20-3).* Mitigating measures shall include prior notification to and direct supervision by the *project arborist*.

1. Notification. Contractor shall notify the *project arborist* a minimum of 24 hours in advance of the activity in the TPZ.
2. Root Severance. Roots that are encountered shall be cut to sound wood and repaired (*see Root Injury, Section 2.25 A-1*). Roots 2-inches and greater must remain injury free.
3. Excavation. Any approved excavation, demolition or extraction of material shall be performed with equipment sitting outside the TPZ. Methods permitted are by hand digging, hydraulic or pneumatic air excavation technology. Avoid excavation within the TPZ during hot, dry weather.
   - If excavation or *trenching* for drainage, utilities, irrigation lines, etc., it is the duty of the contractor to tunnel under any roots 2-inches in diameter and greater.
   - Prior to excavation for foundation/footings/walls, grading or *trenching* within the TPZ, roots shall first be severed cleanly 1-foot outside the TPZ and to the depth of the future excavation. The trench must then be hand dug and roots pruned with a saw, sawzall, narrow trencher with sharp blades or other approved root pruning equipment.
4. Heavy Equipment. Use of backhoes, steel tread tractors or any heavy vehicles within the TPZ is prohibited unless approved by the *City Arborist*. If allowed, a protective *root buffer* (*see Root Buffer and Damage to Trees, Section 2.25.A-1*) is required. The protective buffer shall consist of a base course of tree chips spread over the root area to a minimum of 6-inch depth, layered by 3/4-inch quarry gravel to stabilize 3/4-inch plywood on top. This buffer within the TPZ shall be maintained throughout the entire construction process.
   - Structural design. If injurious activity or interference with roots greater than 2-inches will occur within the TPZ, plans shall specify a design of special foundation, footing, walls, concrete slab or pavement designs subject to *City Arborist* approval. Discontinuous foundations such as concrete pier and structural grade beam must maintain natural grade (not to exceed a 4-inch cut), to minimize root loss and allow the tree to use the existing soil.

An amenity tree providing only limited screening could be installed on the private property, northwest of the pole, if desired by the City of Palo Alto and agreed to by the property owner. I have been informed by my client that all trees planted near 5G equipment must reach a mature height of 20 feet or less. City staff has specified a drought-tolerant tree. Given these constraints, I recommend a swamp myrtle (*Tristaniopsis laurina*).

Tree #	Species	Common Name	DBH[1] (in.)	Dripline[2] (ft. and in.)	Regulated Status
1	Quercus agrifolia	Coast live oak	7.0	5'10"	Non-regulated private tree

Tree map (scale roughly approximated, tree location approximate)



[1] Diameter at breast height, a standard arboricultural measurement. Breast height is defined as 54 inches above grade.
[2] Defined in the Palo Alto Tree Technical Manual as ten times the tree's DBH. Work within a tree's dripline may negatively impact it.

Image of tree #1

ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided to the consultant/appraiser is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.
2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other government regulations.
3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/appraiser can neither guarantee nor be responsible for the accuracy of information provided by others.
4. The consultant/appraiser shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
5. Loss, alteration, or reproduction of any part of this report invalidates the entire report.
6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of the consultant/appraiser.
7. Neither all nor any part of this report, nor any copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of the consultant/appraiser particularly as to value conclusions, identity of the consultant/appraiser, or any reference to any professional society or initialed designation conferred upon the consultant/appraiser as stated in his qualification.
8. This report and the values expressed herein represent the opinion of the consult/appraiser, and the consult/appraiser's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.
10. Unless expressed otherwise: 1) information in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in future.

Respectfully submitted,

Katherine Naegele
Consulting Arborist
Anderson's Tree Care Specialists, Inc.
A TCIA Accredited Company
Master of Forestry, UC Berkeley
ISA Certified Arborist #WE-9658A
ISA Tree Risk Assessment Qualified
American Society of Consulting Arborists, Member
Office: 408 226-8733
Cell: 650 209-0631

www.andersonstreecare.com

"Hands On Tree Care" Anderson's Tree Care Specialists, Inc. — ACCREDITED — QUALITY CONFIDENCE

verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums

575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING

23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER — WISSAM ZAZZALI — 71655 — CIVIL — STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
TREE PROTECTION REPORT

SHEET NUMBER
TPR-1

NOTE:
ANY CONSTRUCTION WITHIN THE CITY'S PUBLIC ROAD RIGHT-OF-WAY SHALL HAVE AN APPROVED PERMIT FOR CONSTRUCTION IN THE PUBLIC STREET PRIOR TO CEMMENCEMENT OF THIS WORK

City of Palo Alto

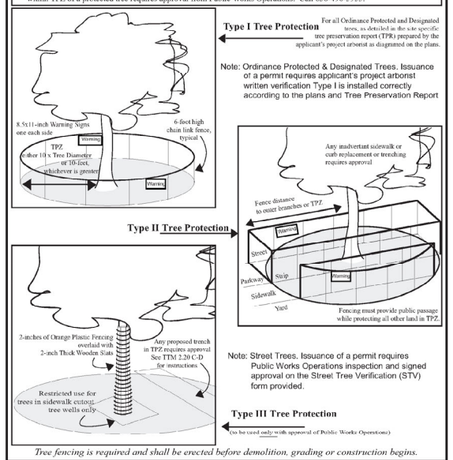
Tree Protection - It's Part of the Plan!

Make sure your crews and subs do the job right!

Fenced enclosures around trees are essential to protect them by keeping the foliage canopy and branching structure clear from contact by equipment, materials and activities, preserving roots and soil conditions in an intact and non-compacted state, and identifying the Tree Protection Zone (TPZ) in which no soil disturbance is permitted and activities are restricted, unless otherwise approved. **An approved tree protection report must be added to this sheet when project activity occurs within the TPZ of a regulated tree.**
For detailed information on Palo Alto's regulated trees and protection during development, review the **City Tree Technical Manual** (TTM) found at www.cityofpaloalto.org/trees/.

For written specifications associated with illustrations below, see Public Works Specifications Section 31
Detailed specifications are found in the Palo Alto Tree Technical Manual (TTM) (www.cityofpaloalto.org/trees/)

Tree Protection Zone (TPZ) shown in gray (radius of TPZ equals 10-times the diameter of the tree or 10-feet, whichever is greater)
- Restricted activity area – see Tree Technical Manual Sec 2.15(E).
- Restricted trenching area – see Tree Technical Manual Sec 2.20(C-D), any proposed trench or form work within TPZ of a protected tree requires approval from Public Works Operations. Call 650-496-5953.



Tree fencing is required and shall be erected before demolition, grading or construction begins.

Rev	By	Date
0	DWH	12/14/92
01	D.D.	08/04/04
02	D.D.	06/10/06

Scale: NTS

Tree Protection During Construction

City of Palo Alto Standard

Approved by: Dave Dockter
PE No. _____
Date 2006
Dwg No. 605

Table 2-2 Palo Alto Tree Technical Manual

CONTRACTOR & ARBORIST INSPECTION SCHEDULE

Reference: the Palo Alto Tree Technical Manual is available at www.cityofpaloalto.org/environment/

ALL CHECKED ITEMS APPLY TO THIS PROJECT:

1. ☑ **Inspection of Protective Tree Fencing**. For Public Trees, the Street Tree Verification Form shall be signed by the City Arborist. For Protected Trees, the project site arborist shall provide an initial Monthly Tree Activity Report form with a photograph verifying that he has conducted a field inspection of the trees and that the correct type of protective fencing is in place around the designated tree protection zone (TPZ) prior to issuance of a demolition, grading, or building permit. (See TTM, Verification of Tree Protection, Section 1.39).
2. ☑ **Pre-Construction Meeting**. Prior to commencement of construction, the applicant or contractor shall conduct a pre-construction meeting to discuss tree protection with the job site superintendent, grading operators, project site arborist, City Arborist, and, if a city maintained irrigation system is involved, the Parks Manager (Contact 650-496-6962).
3. ☑ **Inspection of Rough Grading or Trenching**. Contractor shall ensure the project site arborist performs an inspection during the course of rough grading or trenching adjacent to or within the TPZ to ensure trees will not be injured by compaction, cut or fill, drainage and trenching, and if required, inspect aeration systems, tree wells, drains and special paving. The contractor shall provide the project arborist at least 24 hours advance notice of such activity.
4. ☑ **Monthly Tree Activity Report Inspections**. The project site arborist shall perform a minimum monthly activity inspection to monitor and advise on conditions, tree health and retention or, ***immediately if there are any revisions to the approved plans or protection measures***. The Tree Technical Manual Monthly Tree Activity Report format shall be used and sent to the Planning Dept. landscape reviewr staff no later than 14 days after issuance of building permit date. Fax to (650) 329-2154. (See TTM, Monthly Tree Activity Inspection Report, Addendum 11 & section 1.17).
5. ☑ **Special activity within the Tree Protection Zone**. Work in the TPZ area (see also #7 below) requires the direct onsite supervision of the project arborist (see TTM, Trenching, Excavation & Equipment, Section 2.20 C).
6. ☐ **Landscape Architect Inspection**. For discretionary development projects, prior to temporary or final occupancy the applicant or contractor shall arrange for the Landscape Architect to perform an on site inspection of all plant stock, quality of the materials and planting (see TTM, Planting Quality, Section 5.20.1.A) and that the irrigation is functioning consistent with the approved construction plans. The Planning Dept. landscape reviewr staff shall be in receipt of written verification of Landscape Architect approval prior to scheduling the final inspection, unless otherwise approved.
7. ☐ **List Other** (please describe as called out in the site Tree Preservation Report, Sheet T-1, T-2, etc.)
   - * _____
   - * _____

Arborist Firm Data Here

City of Palo Alto Tree Technical Manual ADDENDUM 11

email:
RCA/ISA Certified Arborist #WE-000
Contract Cell #:

Monthly Tree Activity Report- *Construction Site*

Inspection Date: _____ **Inspection #** _____	**Site address:** _____ Palo Alto, CA	**Contractor- Main Site Contact Information**	#1: Job site superintendent Company: Email: Job site Office: Cell: Mail:
		Also present:	• _____ • _____
Distribution:	1. City of Palo Alto 2. Others	**Attn: Dave Dockter**	Dave.dockter@cityofpaloalto.org 650-329-2440

Provide the requested minimum information with each report, customize as necessary. To be completed by project site arborist. Send monthly to city arborist at above address until project completion. Use additional sheets as needed.

1. Assignment Activity (Demolition/grading/sewer/trenching/foundation/list relevant visits)
   a. Pre-construction meeting requirement with sub-contractors
   b. Inspect to verify that tree protection measures are in place
   c. Determine if field adjustments, watering or plan revisions may be needed
2. Field Observations (general site-wide and list by individual tree number)
   a. Tree Protection Fences (TPF) are …
   b. Trenching has/will occur …
3. Action Items (list site-wide, by tree number and date to be satisfied) and Date Due
   a. Tree Protection Fence (TPF) needs adjusting (tree #'s, x, x)
   b. Root zone buffer material (wood chips) can be installed next
   c. Schedule sewer trench, foundation dig with …
4. Photographs (use often)
5. Tree Location Map (mandatory 8.5 x 11 sheet)
6. Recommendations, notes or monitor items for project/staff'schedule
   •
7. Past visits (list carry-over items satisfied/still outstanding)
   •

Respectfully submitted,

Project site arborist
Consultant contact information (Include email, cell#, and mailing)
Cc:

Enter Date CPA Monthly Tree Activity Report: Type site address here Page #1 of 1

APPENDIX J

PALO ALTO
STREET TREE PROTECTION INSTRUCTIONS
–SECTION 31–

31-1 General
- **a.** **Tree protection has three primary functions**, 1) to keep the foliage canopy and branching structure clear from contact by equipment, materials and activities; 2) to preserve roots and soil conditions in an intact and non-compacted state and 3) to identify the Tree Protection Zone (TPZ) in which no soil disturbance is permitted and activities are restricted, unless otherwise approved.
- **b.** **The Tree Protection Zone (TPZ)** is a restricted area around the base of the tree with a radius of ten-times the diameter of the tree's trunk or ten feet, whichever is greater, enclosed by fencing.

31-2 Reference Documents
- **a.** **Detail 605** – Illustration of situations described below.
- **b.** **Tree Technical Manual (TTM) Forms** (http://www.cityofpaloalto.org/trees/)
  1. Trenching Restriction Zones (TTM, Section 2.20(C))
  2. Arborist Reporting Protocol (TTM, Section 6.30)
  3. Site Plan Requirements (TTM, Section 6.35)
  4. Tree Disclosure Statement (TTM, Appendix J)
- **c.** **Street Tree Verification (STV) Form** (http://www.cityofpaloalto.org/trees/forms)

31-3 Execution
- **a.** **Type I Tree Protection:** The fence shall enclose the entire TPZ of the tree(s) to be protected throughout the life of the construction project. In some parking areas, if fencing is located on paving or concrete that will not be demolished, then the posts may be supported by an appropriate grade level concrete base, if approved by Public Works Operations.
- **b.** **Type II Tree Protection:** For trees situated within a planting strip, only the planting strip and yard side of the TPZ shall be enclosed with the required chain link protective fencing in order to keep the sidewalk and street open for public use.
- **c.** **Type III Tree Protection:** To be used only with approval of Public Works Operations. Trees situated in a tree well or sidewalk planter pit, shall be wrapped with 2-inches of orange plastic fencing from the ground to the first branch and overlaid with 2-inch thick wooden slats bound securely (slats shall not be allowed to dig into the bark). During installation of the plastic fencing, caution shall be used to avoid damaging any branches. Major limbs may also require plastic fencing as directed by the City Arborist.
- **d.** **Size, type and area to be fenced.** All trees to be preserved shall be protected with six (6') foot high chain link fences. Fences are to be mounted on two-inch diameter galvanized iron posts, driven into the ground to a depth of at least 2-feet at no more than 10-foot spacing. Fencing shall extend to the outer branching, unless specifically approved on the STV Form.
- **e.** **'Warning' signs.** A warning sign shall be weather proof and prominently displayed on each fence at 20-foot intervals. The sign shall be minimum 8.5-inches x 11-inches and clearly state in half inch tall letters: "WARNING - Tree Protection Zone - This fence shall not be removed and is subject to a fine according to PAMC Section 8.10.110."
- **f.** **Duration**. Tree fencing shall be erected before demolition, grading or construction begins and remain in place until final inspection of the project, except for work specifically allowed in the TPZ. Work or soil disturbance in the TPZ requires approval by the project arborist or City Arborist (in the case of work around Street Trees). Excavations within the public right of way require a Street Work Permit from Public Works.
- **g.** **During construction**
  1. All neighbors' trees that overhang the project site shall be protected from impact of any kind.
  2. The applicant shall be responsible for the repair or replacement plus penalty of any publicly owned trees that are damaged during the course of construction, pursuant to Section 8.04.070 of the Palo Alto Municipal Code.
  3. The following tree preservation measures apply to all trees to be retained:
     - **a.** No storage of material, topsoil, vehicles or equipment shall be permitted within the TPZ.
     - **b.** The ground under and around the tree canopy area shall not be altered.
     - **c.** Trees to be retained shall be irrigated, aerated and maintained as necessary to ensure survival.

END OF SECTION

City of Palo Alto 2004 Standard Drawings and Specifications
Street Tree Verification of Protection, PWL Section 31 Revised 08/06

City of Palo Alto
Tree Department
Public Works Operations
PO Box 10250 Palo Alto, CA 94303
650/496-5953 FAX: 650/852-0289
treeprotection@CityofPaloAlto.org

Verification of Street Tree Protection

Applicant Instructions: Complete upper portion of this form. Mail or FAX this form along with signed Tree Disclosure Statement to Public Works Dept. Public Works Tree Staff will inspect and notify applicant.

APPLICATION DATE:	
ADDRESS/LOCATION OF STREET TREES TO BE PROTECTED:	
APPLICANT'S NAME:	
APPLICANT'S ADDRESS:	
APPLICANT'S TELEPHONE & FAX NUMBERS:	

This section to be filled out by City Tree Staff

1. The Street Trees at the above address(es) are adequately protected. The type of protection used is:	YES ☐ NO* ☐ * If NO, go to #2 below
Inspected by:	
Date of Inspection:	

2. The Street Trees at the above address are **NOT** adequately protected. The following modifications are required: Indicate how the required modifications were communicated to the applicant	_____ _____ _____ _____ _____ _____ _____

Subsequent Inspection

Street trees at above address were found to be adequately protected:	YES ☐ NO* ☐ * If NO, indicate in "Notes" below the disposition of case.
Inpsected by:	
Date of Inspection:	

Notes: List City street trees by species, site, condition and type of tree protection installed. Also note if pictures were taken. Use back of sheet if necessary.	

Return approved sheet to Applicant for demolition or building permit issuance.

S:PWD/OPS/Trco/DB/St.TrocProtect 5/17/06

---WARNING---
Tree Protection Zone

This fencing shall not be removed without City Arborist approval (650-496-5953)

Removal without permission is subject to a $500 fine per day*

Palo Alto Municipal Code Section 8.10.110

City of Palo Alto Tree Protection Instructions are located at http://www.city.palo-alto.ca.us/trees/technical-manual.html

SPECIAL INSPECTIONS **PLANNING DEPARTMENT**

TREE PROTECTION INSPECTIONS MANDATORY

PAMC 8.10 PROTECTED TREES. CONTRACTOR SHALL ENSURE PROJECT SITE ARBORIST IS PERFORMING REQUIRED TREE INSPECTION AND SITE MONITORING. PROVIDE WRITTEN MONTHLY TREE ACTIVITY REPORTS TO THE PLANNING DEPARTMENT LANDSCAPE REVIEW STAFF BEGINNING 14 DAYS AFTER BUILDING PERMIT ISSUANCE.

BUILDING PERMIT DATE: _____

DATE OF 1ST TREE ACTIVITY REPORT: _____

CITY STAFF: _____

REPORTING DETAILS OF THE MONTHLY TREE ACTIVITY REPORT SHALL CONFORM TO SHEET T-1 FORMAT. VERIFY THAT ALL TREE PROTECTION MEASURES ARE IMPLIMENTED AND WILL INCLUDE ALL CONTRACTOR ACTIVITY, SCHEDULED OR UNSCHEDULED, WITHIN A TREE PROTECTION ROOT ZONE. NON-COMPLIANCE IS SUBJECT TO VIOLATION OF PAMC 8.10.080. REFERENCE: PALO ALTO TREE TECHNICAL MANUAL, SECTION 2.00 AND ADDENDUM 11.

Apply Tree Protection Report on sheet(s) T-2

Use addtional "T" sheets as needed

City of Palo Alto
250 Hamilton Avenue, Palo Alto, CA 94301

Search: Advanced Browse By Topic
Home > Planning & Community Environment

TREE PROGRAMS

Home
City-owned Trees
Privately-owned Trees
About the Tree Ordinance
Title 8.10
Heritage Trees
Forms
Tree Technical Manual
FAQs
Contact Us
Resources

Tree Technical Manual

To purchase the Tree Technical Manual

June, 2001 First Edition

View by section:

- Table of Contents (PDF, 87KB)
- Intent and Purpose (PDF, 1.05MB)
- Introduction - Use of Manual (PDF, 1.05MB)
- Section 1.0 - Definitions (PDF, 96KB)
- Section 2.0 - Protection of Trees During Construction (PDF, 259KB)
- Section 3.0 - Removal, Replacement & Planting of Trees (PDF, 117KB)
- Section 4.0 - Hazardous Trees (PDF, 105KB)
- Section 5.0 - Tree Maintenance Guidelines (PDF, 110KB)
- Section 6.0 - Tree Reports (PDF, 84KB)

View ALL sections:

- Tree Technical Manual - Full (PDF, 1.84MB)

APPENDICES
A. Palo Alto Municipal Code Chapter 8.10, Tree Preservation & Management Regulations
B: Tree City - USA
C: ISA Hazard Evaluation Form
D: List of Inherent Failure Patterns for Selected Species (Reference source)
E: ISA Tree Pruning Guidelines (PDF, 1.85MB)
F: Tree Care Safety Standards, ANSI Z133.1-1994 (Reference source)
G: Pruning Performance Standards, ANSI A300-1995 (Reference source) H: Tree Planting Details, Diagram 504 & 505
I: Tree Disclosure Statement
J: Palo Alto Standard Tree Protection Instructions

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
PALO ALTO TREE PROTECTION

SHEET NUMBER
L-1

POLLUTION PREVENTION — IT'S PART OF THE PLAN

Construction projects are required to implement year-round stormwater BMPs, as they apply to your project.

Runoff from streets and other paved areas is a major source of pollution to San Francisco Bay. Construction activities can directly affect the health of the Bay unless contractors and crews plan ahead to keep construction dirt, debris, and other pollutants out of storm drains and local creeks. Following these guidelines will ensure your compliance with City of Palo Alto Ordinance requirements.






MATERIALS & WASTE MANAGEMENT

Non-Hazardous Materials

- ☐ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or when they are not in use.
- ☐ Use (but don't overuse) reclaimed water for dust control.
- ☐ Ensure dust control water doesn't leave site or discharge to storm drains.

Hazardous Materials

- ☐ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
- ☐ Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecast.
- ☐ Follow manufacturer's application instructions for hazardous materials and do not use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- ☐ Arrange for appropriate disposal of all hazardous wastes.

Waste Management

- ☐ Cover and maintain dumpsters. Check frequently for leaks. Place dumpsters under roofs or cover with tarps or plastic sheeting secured around the outside of the dumpster. A plastic liner is recommended to prevent leaks. Never clean out a dumpster by hosing it down on the construction site.
- ☐ Place portable toilets away from storm drains. Make sure they are in good working order. Check frequently for leaks.
- ☐ Dispose of all wastes and demolition debris properly. Recycle materials and wastes that can be recycled, including solvents, water-based paints, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation.
- ☐ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.
- ☐ Keep site clear of litter (e.g. lunch items, cigarette butts).
- ☐ Prevent litter from uncovered loads by covering loads that are being transported to and from site.

Construction Entrances and Perimeter

- ☐ Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site.
- ☐ Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking. Never hose down streets to clean up tracking.

EQUIPMENT MANAGEMENT & SPILL CONTROL

Maintenance and Parking

- ☐ Designate an area of the construction site, well away from streams or storm drain inlets and fitted with appropriate BMPs, for auto and equipment parking, and storage.
- ☐ Perform major maintenance, repair jobs, and vehicle and equipment washing off site.
- ☐ If refueling or vehicle maintenance must be done onsite, work in a bermed area away from storm drains and over a drip pan or drop cloths big enough to collect fluids. Recycle or dispose of fluids as hazardous waste.
- ☐ If vehicle or equipment cleaning must be done onsite, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or surface waters.
- ☐ Do not clean vehicle or equipment onsite using soaps, solvents, degreasers, or steam cleaning equipment, and do not use diesel oil to lubricate equipment or parts onsite.

Spill Prevention and Control

- ☐ Keep spill cleanup materials (e.g., rags, absorbents and cat litter) available at the construction site at all times.
- ☐ Maintain all vehicles and heavy equipment. Inspect frequently for and repair leaks. Use drip pans to catch leaks until repairs are made.
- ☐ Clean up leaks, drips and other spills immediately and dispose of cleanup materials properly.
- ☐ Use dry cleanup methods whenever possible (absorbent materials, cat litter and/or rags).
- ☐ Swoop up spilled dry materials immediately. Never attempt to "wash them away" with water, or bury them.
- ☐ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ☐ Report any hazardous materials spills immediately! Call City of Palo Alto Communications, **(650) 329-2413**. If the spill poses a significant hazard to human health and safety, property or the environment, you must report it to the State Office of Emergency Services. **(800) 852-7550 (24 hours).**

EARTHMOVING

Grading and Earthwork

- ☐ Schedule grading and excavation work during dry weather.
- ☐ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded fiber matrix) until vegetation is established.
- ☐ Remove existing vegetation only when absolutely necessary, plant temporary vegetation for erosion control on slopes or where construction is not immediately planned.
- ☐ Prevent sediment from migrating offsite and protect storm drain inlets, drainage courses and streams by installing and maintaining appropriate BMPs (e.g., silt fences, gravel bags, fiber rolls, temporary swales, etc.).
- ☐ Keep excavated soil on site and transfer it to dump trucks on site, not in the streets.

Contaminated Soils

- ☐ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
  - Unusual soil conditions, discoloration, or odor.
  - Abandoned underground tanks.
  - Abandoned wells.
  - Buried barrels, debris, or trash.
- ☐ If the above conditions are observed, document any signs of potential contamination and clearly mark them so they are not disturbed by construction activities.

Landscaping

- ☐ Protect stockpiled landscaping materials from wind and rain by storing them under tarps all year-round.
- ☐ Stack bagged material on pallets and under cover.
- ☐ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

CONCRETE MANAGEMENT & DEWATERING

Concrete Management

- ☐ Store both dry and wet materials under cover, protected from rainfall and runoff and away from storm drains or waterways. Store materials off the ground, on pallets. Protect dry materials from wind.
- ☐ Wash down exposed aggregate concrete only when the wash water can (1) flow onto a dirt area; (2) drain onto a bermed surface from which it can be pumped and disposed of properly; or (3) block any storm drain inlets and vacuum washwater from the gutter. If possible, sweep first.
- ☐ Wash out concrete equipment/trucks offsite or in a designated washout area, where the water will flow into a temporary waste pit, and make sure wash water does not leach into the underlying soil. (See CASQA Construction BMP Handbook for properly designed concrete washouts.)

Dewatering

- ☐ Reuse water for dust control, irrigation or another on-site purpose to the greatest extent possible.
- ☐ Be sure to obtain a Permit for Construction in the Public Street from Public Works Engineering before discharging water to a street, gutter, or storm drain. Call the Regional Water Quality Control Plant (RWQCP) at **(650) 329-2598** for an inspection prior to commencing discharge. Use filtration or diversion through a basin, tank, or sediment trap as required by the approved dewatering plan. Dewatering is not permitted from October to April.
- ☐ In areas of known contamination, testing is required prior to reuse or discharge of groundwater. Consult with the City inspector to determine what testing to do and to interpret results. Contaminated groundwater must be treated or hauled off-site for proper disposal.

PAVING/ASPHALT WORK

Paving

- ☐ Avoid paving and seal coating in wet weather or when rain is forecast, to prevent materials that have not cured from contacting stormwater runoff.
- ☐ Cover storm drain inlets and manholes when applying seal coat, slurry seal, fog seal, or similar materials.
- ☐ Collect and recycle or appropriately dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.

Sawcutting & Asphalt/Concrete Removal

- ☐ Protect storm drain inlets during saw cutting.
- ☐ If saw cut slurry enters a catch basin, clean it up immediately.
- ☐ Shovel or vacuum saw cut slurry deposits and remove from the site. When making saw cuts, use as little water as possible. Sweep up, and properly dispose of all residues.

PAINTING & PAINT REMOVAL

Painting Cleanup and Removal

- ☐ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or stream.
- ☐ For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm drain.
- ☐ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of excess liquids as hazardous waste.
- ☐ Sweep up or collect paint chips and dust from non-hazardous dry stripping and sand blasting into plastic drop cloths and dispose of as trash.
- ☐ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead, mercury, or tributyltin must be disposed of as hazardous waste. Lead based paint removal requires a state certified contractor.


STORM DRAIN POLLUTERS MAY BE LIABLE FOR FINES OF UP TO $10,000 PER DAY!

250 Hamilton Avenue
Palo Alto, CA 94301
650.329.2211
cityofpaloalto.org

CITY OF PALO ALTO

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
PALO ALTO POLLUTION PREVENTION CHECKLIST

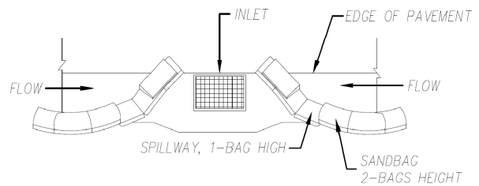
SHEET NUMBER
L-2

EROSION AND SEDIMENT CONTROL NOTES:

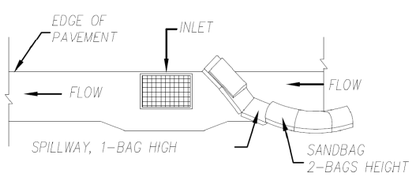
TEMPORARY EROSION/SEDIMENT CONTROL, PRIOR TO COMPLETION OF FINAL IMPROVEMENTS, SHALL BE PERFORMED BY THE CONTRACTOR OR QUALIFIED PERSON AS INDICATED BELOW:

1. ALL REQUIREMENTS OF THE CITY "LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS" MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF THE PROPOSED PUBLIC IMPROVEMENTS CONSISTENT WITH THE EROSION CONTROL PLAN AND/OR WATER POLLUTION CONTROL PLAN (WPCP), IF APPLICABLE.
2. FOR STORM DRAIN INLETS, PROVIDE A GRAVEL BAG SILT BASIN IMMEDIATELY UPSTREAM OF INLET AS INDICATED ON DETAILS.
3. THE CONTRACTOR OR QUALIFIED PERSON SHALL BE RESPONSIBLE FOR CLEANUP OF SILT AND MUD ON ADJACENT STREET(S) AND STORM DRAIN SYSTEM DUE TO CONSTRUCTION ACTIVITY.
4. THE CONTRACTOR SHALL REMOVE SILT AND DEBRIS AFTER EACH MAJOR RAINFALL.
5. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON.
6. THE CONTRACTOR SHALL RESTORE ALL EROSION/SEDIMENT CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER OR RESIDENT ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
7. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION/SEDIMENT CONTROL MEASURES AS MAY THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION/SEDIMENT CONTROL MEASURES AS MAY BE REQUIRED BY THE RESIDENT ENGINEER DUE TO UNFORESEEN CIRCUMSTANCES, WHICH MAY ARISE.
8. EROSION/SEDIMENT CONTROL MEASURES PROVIDED PER THE APPROVED IMPROVEMENT PLAN SHALL BE INCORPORATED HEREON. ALL EROSION/SEDIMENT CONTROL FOR INTERIM CONDITIONS SHALL BE DONE TO THE SATISFACTION OF THE RESIDENT ENGINEER.
9. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN RAIN IS IMMINENT.
10. THE CONTRACTOR SHALL ARRANGE FOR WEEKLY MEETINGS DURING OCTOBER 1ST TO APRIL 30TH FOR PROJECT TEAM (GENERAL CONTRACTOR, QUALIFIED PERSON, EROSION CONTROL SUBCONTRACTOR IF ANY, ENGINEER OF WORK, OWNER/DEVELOPER AND THE RESIDENT ENGINEER) TO EVALUATE THE ADEQUACY OF THE EROSION/SEDIMENT CONTROL MEASURES AND OTHER RELATED CONSTRUCTION ACTIVITIES.

STORM DRAIN INLET PROTECTION



TYPICAL PROTECTION FOR INLET WITH OPPOSING FLOW DIRECTIONS



TYPICAL PROTECTION FOR INLET WITH SINGLE FLOW DIRECTION

NOTES:

1. INTENDED FOR SHORT-TERM USE.
2. USE TO INHIBIT NON-STORM WATER FLOW.
3. ALLOW FOR PROPER MAINTENANCE AND CLEANUP.
4. BAGS MUST BE REMOVED AFTER ADJACENT OPERATION IS COMPLETED.
5. NOT APPLICABLE IN AREAS WITH HIGH SILTS AND CLAYS WITHOUT FILTER FABRIC.

NOTES:

1. CONTRACTOR TO POTHOLE ALL UTILITY CROSSINGS.
2. CONTRACTOR TO PLACE SANDBAGS AROUND ANY/ALL STORM DRAIN INLETS TO PREVENT CONTAMINATED WATER.
3. SPOILS PILE WILL BE COVERED AND CONTAINED AND STREET WILL BE SWEPT AND CLEANED AS NEEDED.
4. CONTRACTOR TO REPAIR DAMAGED PUBLIC IMPROVEMENTS TO THE CONTRACTOR TO REPAIR DAMAGED PUBLIC IMPROVEMENTS TO THE SATISFACTION OF THE CITY ENGINEER.
5. SIDEWALK TO BE REPLACED CURB & GUTTER TO BE PROTECTED IN PLACE. SIDEWALK TO BE REPLACED TO THE SATISFACTION OF THE CITY ENGINEER.
6. THE CONTRACTOR SHALL RESTORE THE ROADWAY BACK TO ITS ORIGINAL CONDITION SATISFACTORY TO THE CITY ENGINEER INCLUDING, BUT NOT LIMITED TO PAVING, STRIPING, BIKE LANES, PAVEMENT LEGENDS, SIGNS, AND TRAFFIC LOOP DETECTORS.
7. SIDEWALK SHALL BE RESTORED/REPLACED PER CITY STANDARD DRAWINGS.
8. PEDESTRIAN RAMP WILL NOT BE DISTURBED.PEDESTRIAN RAMP WILL NOT BE DISTURBED.

GENERAL CONTRACTOR NOTES:

1. STREET USE PERMIT SHALL BE OBTAINED BY CONTRACTOR PRIOR TO COMMENCING WORK.
2. ALL WORK TO BE CONDUCTED IN THE RIGHT OF WAY.
3. ALL DISTURBED LANDSCAPING SHALL BE REPLACED TO SIMILAR EXISTING CONDITION.
4. ANY SIDEWALK CLOSURE SHALL BE COORDINATED WITH THE CITY AND PROPER SIGNING WILL BE PLACED.
5. NO MATERIALS OR EQUIPMENT SHALL BE STORED ON PRIVATE PROPERTY OR BLOCK ACCESS TO PRIVATE PROPERTY.
6. CLEANUP OF SITE WILL BE COMPLETED EACH EVENING AND THE SITE WILL BE RETURNED TO EXISTING CONDITIONS AT THE COMPLETION OF CONSTRUCTION AT EACH SITE.

** CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR RESPONSIBLE FOR SAME.

R.O.W. GROUND CONSTRUCTION NOTES:

1. GROUND CONSTRUCTION TO REMOVE/CLEAN ALL DEBRIS, NAILS, STAPLES, GROUND CONSTRUCTION TO REMOVE/CLEAN ALL DEBRIS, NAILS, STAPLES, OR NON-USED VERTICALS OFF THE POLE.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MUNICIPAL, COUNTY, STATE, FEDERAL, GO95 AND GO128 STANDARDS AND REGULATIONS.
3. CALL USA 48 HOURS PRIOR TO EXCAVATING AT (800) 227-2600 OR 811.
4. ALL LANDSCAPING TO BE RESTORED TO ORIGINAL CONDITION OR BETTER.
5. ALL EQUIPMENT TO BE BONDED. ALL EQUIPMENT TO BE BONDED.
6. METERING CABINET REQUIRES 36" CLEARANCE AT DOOR OPENING.
7. CAULK CABINET BASE AT PAD.

CALIFORNIA STATE CODE COMPLIANCE:

ALL WORK AND MATERIALS SHALL BE PREFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

- CALIFORNIA ADMINISTRATIVE CODE (INCLUDING TITLES 24 & 25) 2016
- 2016 CALIFORNIA BUILDING CODES WHICH ADOPTS THE 2015 IBC, 2015 IMC, 2015 IPC AND THE 2014 NEC,AND SHALL INCLUDE 2016 CBC, CFC, CMC, CEC, CPC, CGBSC.
- BUILDING OFFICIALS & CODE ADMINISTRATORS (BOCA) CURRENT NATIONAL CODES
- ANSI/EIA-222-G (2009 - 2ND EDITION)
- NFPA-101 - LIFE SAFETY CODE / CAL-OSHA - TITLE 8 / FCR - TITLE 29
- LOCAL BUILDING CODE
- CITY/COUNTY ORDINANCES
- ACCESSIBILITY REQUIREMENTS:

** FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS REQUIREMENTS DO NOT APPLY IN ACCORDANCE WITH THE 2016 CALIFORNIA BUILDING CODE.

- FCC RF/EMF EXPOSURE/EMITTANCE COMPLIANCE:

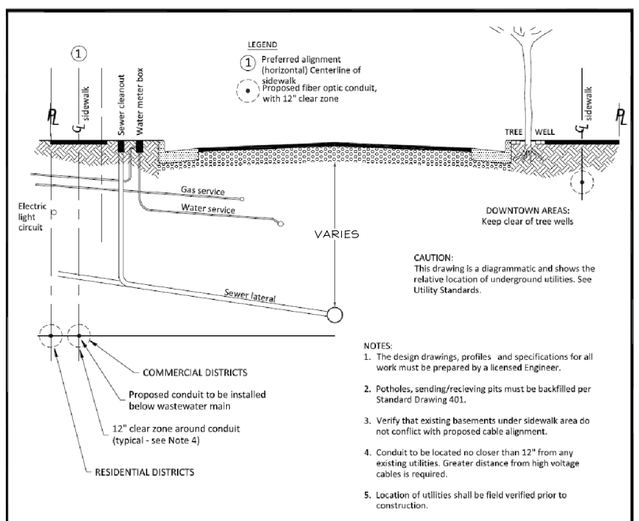
**FCC NOTE: THIS WIRELESS COMMUNICATION FACILITY COMPLIES WITH FEDERAL STANDARDS FOR RADIO FREQUENCY IN ACCORDANCE WITH THE TELECOMMUNICATION ACT OF 1996 AND SUBSEQUENT AMENDMENTS AND ANY OTHER REQUIREMENTS IMPOSED BY STATE OR FEDERAL REGULATORY AGENCIES.

CITY OF PALO ALTO UTILITIES ENGINEERING NOTES:

1. APPLICANT SHALL TAP ELECTRIC SERVICE TO THE SMALL CELL DISTRIBUTED ANTENNA SYSTEM FROM THE LOCATIONS JOINTLY IDENTIFIED DURING THE FIELD INVESTIGATION.
2. SERVICE VOLTAGE TO ALL THE PROPOSED LOCATIONS MAY NOT BE THE SAME. APPLICANT SHALL DESIGN THEIR SYSTEM TO OPERATE AT THE AVAILABLE VOLTAGE IN THE VICINITY.
3. IF BRAND NEW POLES NEED TO BE INSTALLED FOR APPLICANT'S SYSTEM THEN THE POLES MUST MATCH EXISTING POLES IN THE DOWN TOWN AREA.
4. AFTER EXCAVATION IS COMPLETED ON THE PUBLIC RIGHT OF WAY, EXISTING STREETS INCLUDING SIDEWALKS/ CURB/ GUTTER OR ANY DECORATIVE PATHS MUST BE BROUGHT TO ITS ORIGINAL CONDITION AND MUST BE APPROVED BY PUBLIC WORKS ENGINEERING DEPARTMENT'S INSPECTOR. POTHOLING MUST BE DONE AND ALL THE UTILITIES MUST BE IDENTIFIED PRIOR TO COMMENCING EXCAVATION.
5. EXCAVATION AND RESTORATION WORK MUST BE IN COMPLIANCE WITH PUBLIC WORKS ENGINEERING STANDARDS AND SPECIFICATIONS THAT ARE AVAILABLE ON THE FOLLOWING WEBSITE: http://www.cityofpaloalto.org/news/displaynews.asp?NewsID=1834&TargetID=145
6. APPLICANTS SHALL BE RESPONSIBLE FOR MAINTAINING THEIR SYSTEM INCLUDING SUBSTRUCTURE. IN CASE OF KNOCK DOWNS, THE CITY WILL RE-INSTALL ITS STREET LIGHTING POLES BUT NOT APPLICANT'S EQUIPMENT ON OR OFF THE POLE.
7. A FIELD MEETING IS RECOMMENDED WITH UTILITIES ENGINEERING PRIOR TO COMMENCING THE WORK.
8. PLANS SHALL INCLUDE A NOTE: CONTRACTOR TREE INSPECTION REQUIREMENTS: MODIFIED TYPE III TRUNK WRAPPING SHALL BE VERIFIED BY URBAN FORESTRY PRIOR TO ANY WORK IN THE VICINITY. FOR EACH TREE SITE WRAPPED FOR PROTECTION WITHIN 15' OF ANY WORK ZONE OR CONCRETE FORM SECTION, A BILLABLE TREE INSPECTION BY URBAN FORESTRY (650-496-5953, 24-HOUR ADVANCE IS REQUIRED) SHALL BE COMPLETED PRIOR TO DEMOLITION, DRILLING, EXCAVATING,FORMING OR STREET LIGHT ACTIVITY. CONTRACTOR SHALL ARRANGE PAYMENTS AT THE DEVELOPMENT CENTER, 285 HAMILTON AVE, PALO ALTO, CA.
9. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITIES DEPARTMENT 650/329-2413 OR 650/496-6982 IF THE EXISTING WATER, WASTEWATER OR GAS MAINS ARE DISTURBED OR DAMAGED. A QUALIFIED CONTRACTOR MAY PERFORM REPAIRS ON CITY WATER AND WASTEWATER MAINS UNDER THE DIRECT SUPERVISION OF THE WGW UTILITIES INSPECTOR. FOR WATER REPAIRSALL THE DISINFECTION REQUIREMENTS OF THE WGW UTILITY STANDARDS AND THESE CONDITIONS SHALL BE ADHERED TO. ALL REPAIRS TO THE CITY GAS SYSTEM MUST BE PERFORMED BY THE CITY OF PALO ALTO UTILITIES.
10. NO WATER VALVES OR OTHER FACILITIES OWNED BY UTILITIES DEPARTMENT SHALL BE OPERATED FOR ANY PURPOSE BY THE APPLICANT'S CONTRACTOR. ALL REQUIRED OPERATION WILL ONLY BE PERFORMED BY AUTHORIZED UTILITIES DEPARTMENT PERSONNEL. WATER VALVES MAY BE OPERATED BY THE CONTRACTOR UNDER THE DIRECT SUPERVISION OF THE WGW UTILITIES INSPECTOR. THE APPLICANT'S CONTRACTOR SHALL NOTIFY THE UTILITIES DEPARTMENT NOT LESS THAN FORTY-EIGHT (48) HOURS IN ADVANCE OF THE TIME THAT SUCH OPERATION IS REQUIRED.

NORMAL LOCATION OF UNDERGROUND UTILITIES NOTES:

1. LOCATION AND DEPTH OF EXISTING AND PROPOSED UTILITIES MUST BE PROVIDED BY THE SUBDIVIDER AND SHOWN ON ANY PLANS SUBMITTED TO THE DEPT. OF PUBLIC WORKS FOR APPROVAL.
2. CHANGES MAY BE PERMITTED BY THE DEPT. OF PUBLIC WORKS IN CASES OF CONFLICTING FACILITIES.
3. CONFLICTS BETWEEN UTILITY COMPANIES FACILITIES, EXISTING AND PROPOSED, MUST BE MUTUALLY RESOLVED BY THE UTILITY COMPANIES.
4. FOR COMMERCIAL SIDEWALKS, THE FIRE HYDRANT SHALL BE PLACED WITHIN THE SIDEWALK 1'-6" BEHIND FACE OF CURB.
5. MAXIMUM 2" DIAMETER GAS MAINS MAY BE PLACED IN JOINT UTILITIES TRENCH SUBJECT TO APPROVAL OF CITY ENGINEER (IN TRACTS).



Rev	By	Date
0	DWH	7/16/98
1	MMN	7/20/04

Scale: NTS

Conduit Location Detail
Telecommunications

City of Palo Alto Standard

Approved by:

PE No. 72158
Date 01/10/18
Dwg No. 402

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

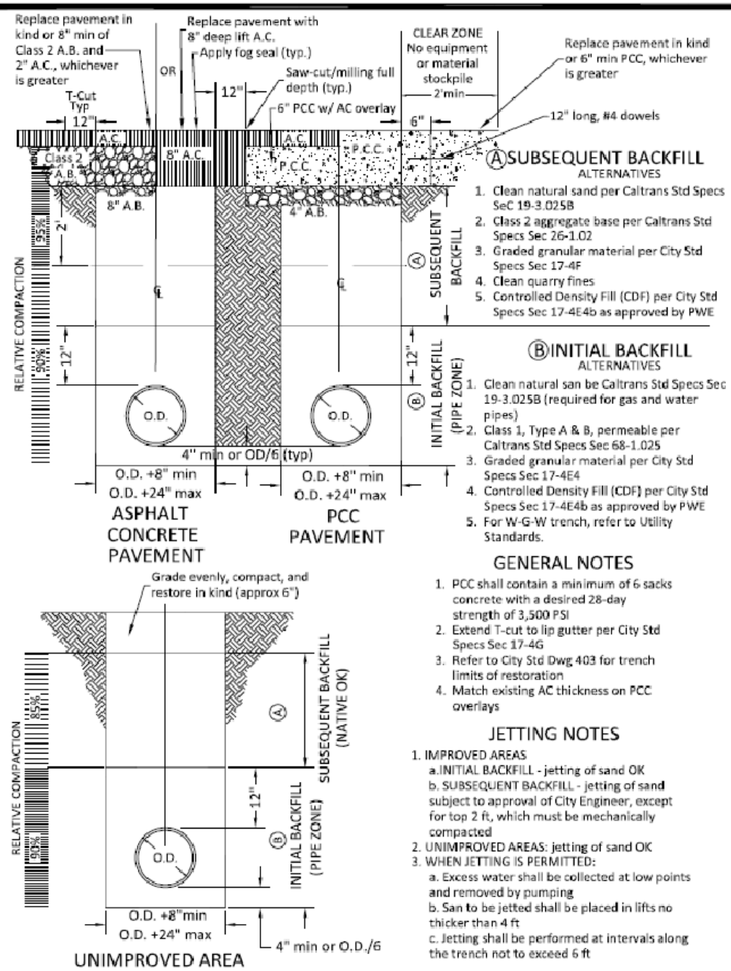
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
PALO ALTO EROSION CONTROL AND CONDUIT LOCATION DETAILS & NOTES

SHEET NUMBER
L-3



Ⓐ SUBSEQUENT BACKFILL ALTERNATIVES

1. Clean natural sand per Caltrans Std Specs SeC 19-3.025B
2. Class 2 aggregate base per Caltrans Std Specs Sec 26-1.02
3. Graded granular material per City Std Specs Sec 17-4F
4. Clean quarry fines
5. Controlled Density Fill (CDF) per City Std Specs Sec 17-4E4b as approved by PWE

Ⓑ INITIAL BACKFILL ALTERNATIVES

1. Clean natural san be Caltrans Std Specs Sec 19-3.025B (required for gas and water pipes)
2. Class 1, Type A & B, permeable per Caltrans Std Specs Sec 68-1.025
3. Graded granular material per City Std Specs Sec 17-4E4
4. Controlled Density Fill (CDF) per City Std Specs Sec 17-4E4b as approved by PWE
5. For W-G-W trench, refer to Utility Standards.

GENERAL NOTES

1. PCC shall contain a minimum of 6 sacks concrete with a desired 28-day strength of 3,500 PSI
2. Extend T-cut to lip gutter per City Std Specs Sec 17-4G
3. Refer to City Std Dwg 403 for trench limits of restoration
4. Match existing AC thickness on PCC overlays

UNIMPROVED AREA

JETTING NOTES

1. IMPROVED AREAS
   a. INITIAL BACKFILL - jetting of sand OK
   b. SUBSEQUENT BACKFILL - jetting of sand subject to approval of City Engineer, except for top 2 ft, which must be mechanically compacted
2. UNIMPROVED AREAS: jetting of sand OK
3. WHEN JETTING IS PERMITTED:
   a. Excess water shall be collected at low points and removed by pumping
   b. San to be jetted shall be placed in lifts no thicker than 4 ft
   c. Jetting shall be performed at intervals along the trench not to exceed 6 ft

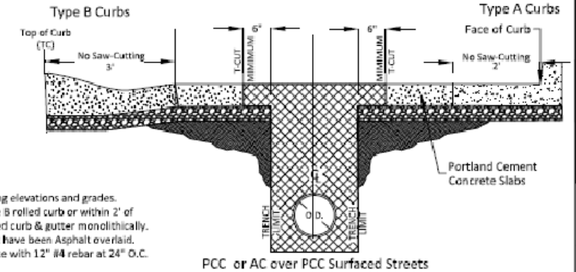
Rev	By	Date
1	MN	03/10/05
2	JT	08/18/06
3	HQN	10/04/06
4	RTN	06/08/17

Scale: NTS

Trenches
Typical Cross-Sections

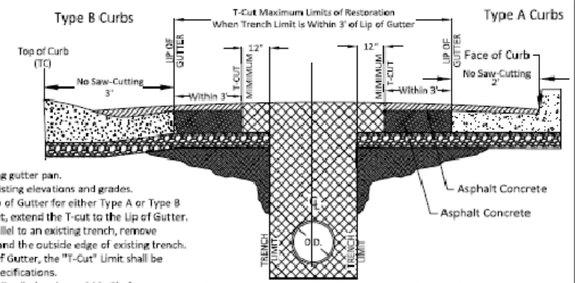
City of Palo Alto Standard

Approved by:
PE No. 72158
Date 01/10/18
Dwg No. 401



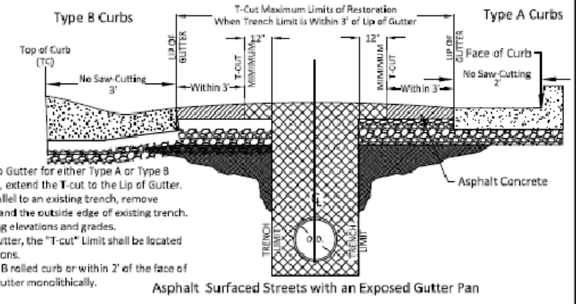
NOTES:
1. Restore all materials in kind to match existing elevations and grades.
2. If Saw-cut is within 3' of Top of Curb of Type B rolled curb or within 2' of the face of Type A curb, remove and replaced curb & gutter monolithically.
3. These notes also pertain to PCC streets that have been Asphalt overlaid.
4. Dowel all new concrete into existing concrete with 12" #4 rebar at 24" O.C.

PCC or AC over PCC Surfaced Streets



NOTES:
1. Remove asphalt to verify the width of existing gutter pan.
2. Restore all materials in kind to match the existing elevations and grades.
3. When "Trench Limits" are within 3' of the Lip of Gutter for either Type A or Type B curb and gutter on an Asphalt surfaced street, extend the T-cut to the Lip of Gutter. When "Trench Limits" are within 2' and parallel to an existing trench, remove pavement section between the new trench and the outside edge of existing trench.
4. If "Trench Limit" is NOT within 3' of the Lip of Gutter, the "T-Cut" Limit shall be located 12" from the Trench Limit per the Specifications.
5. If Saw-cut is within 3' of Top of Curb of Type B rolled curb or within 2' of the face of Type A curb, remove and replace curb & gutter monolithically.

Asphalt Surfaced Streets with No Exposed Gutter Pan



NOTES:
1. When "Trench Limits" are within 3' of the Lip Gutter for either Type A or Type B curb and gutter on a Asphalt surfaced street, extend the T-cut to the Lip of Gutter. When "Trench Limits" are within 2' and parallel to an existing trench, remove pavement section between the new trench and the outside edge of existing trench.
2. Restore all materials in kind to match existing elevations and grades.
3. If "Trench Limit" is NOT within 3' of Lip of Gutter, the "T-cut" Limit shall be located 12" from the Trench Limit per the Specifications.
4. If Saw-cut is within 3' of Top of Curb of Type B rolled curb or within 2' of the face of Type A curb, remove and replace curb and gutter monolithically.

Asphalt Surfaced Streets with an Exposed Gutter Pan

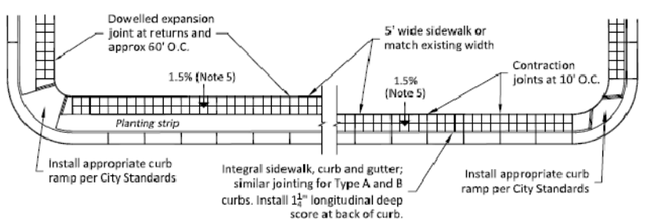
Rev	By	Date
1	MN	2/30/05
2	JT	8/14/06
3	HQN	10/16/06
4	RTN	06/11/17

Scale: NTS

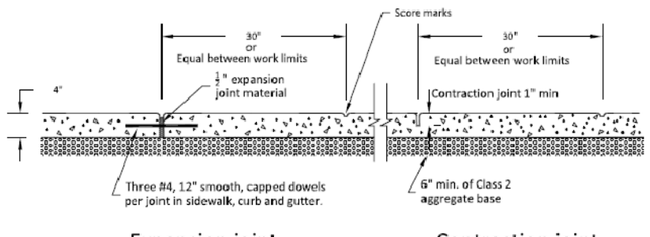
Trenches
Limits of Restoration

City of Palo Alto Standard

Approved by:
PE No. 72158
Date 01/10/18
Dwg No. 403



TYPICAL CITY BLOCK PLAN



LONGITUDINAL SECTIONS

SIDEWALK CONSTRUCTION NOTES:

1. SIDEWALKS TO BE MARKED IN 30" SQUARES.
2. EDGES TO HAVE 3/4" RADIUS.
3. SCORE MARKS SHALL NOT BE LESS THAN 3/8" DEEP; CONTRACTION JOINTS SHALL BE 1" IN MINIMUM DEPTH @ 10' O.C.
4. CONTRACTION JOINTS MAY BE SAW-CUT.
5. SIDEWALKS TO HAVE 1.5% SLOPE TO STREET.
6. ALL NEW SIDEWALKS SHALL BE DOWELED AT 2'-0" O.C. INTO EXISTING CONCRETE WITH #4 12" LONG DOWELS AND EMBEDDED 6".
7. SAW CUT WALK FULL DEPTH AND FULL WIDTH ON SCORE MARKS PERPENDICULAR TO THE CURB. NO SAWCUTTING ON LONGITUDINAL SCORE MARKS.
8. INSTALL LONGITUDINAL DEEP SCORE ALONG ENTIRE BACK OF CURB THAT IS MONOLITHIC WITH SIDEWALK.

Rev	By	Date
0	DWH	12/14/92
1	MN	01/29/02
2	HQN	01/04/07
3	RTN	08/10/17

Scale: NTS

Sidewalk Construction

City of Palo Alto Standard

Approved by:
PE No. 72158
Date 01/10/18
Dwg No. 141

City of Palo Alto Standard | Dwg No. 141

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334899
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
4	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
3	04/20/2021	UPDATED PER REDLINES	DW
2	04/06/2021	PER CPAU / CPA SL WALK	NC
1	01/19/2021	100% CD'S FOR SUBMITTAL	MG
0	10/08/2020	100% CD'S FOR REVIEW	MG
B	06/04/2020	95% CD'S FOR REDLINE	RF
A	04/10/2020	90% CD'S FOR REDLINE	NC

REGISTERED PROFESSIONAL ENGINEER
MASAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 121
PUBLIC R.O.W. ADJACENT TO:
1664 EL CAMINO REAL (CA-82)
PALO ALTO, 94306
LOCATION CODE: 425225

SHEET TITLE
PALO ALTO TRENCHING & SIDEWALK STD. DWGS.

SHEET NUMBER
L-4

verizon

SITE ID:	SF PALO ALTO 164
PROJECT NAME:	VZW PALO ALTO SMALL CELL
POLE#:	13/14
LOCATION CODE:	425268
ADJACENT APN:	142-03-039
SITE ADDRESS:	ARBORETUM RD., PALO ALTO, 94304
COUNTY:	SANTA CLARA
SITE TYPE:	STREET LIGHT POLE
ROADWAY TYPE:	ARTERIAL
HISTORIC STATUS OR DISTRICT:	N/A

PROJECT DESCRIPTION

VERIZON WIRELESS PROPOSES TO INSTALL A NEW WIRELESS COMMUNICATION SITE ON A NEW/REPLACEMENT STREET LIGHT POLE. THE SCOPE WILL CONSIST OF THE FOLLOWING:

- ☐ REMOVE (1) EXISTING STREET LIGHT/POLE #13/14 WITHIN ARBORETUM RD. PUBLIC R.O.W.
- ☐ INSTALL (1) NEW 'EL CAMINO REAL' ROADWAY LIGHTING POLE W/ LED LAMP IN
- ☐ PLACE OF REMOVED LIGHT/POLE #13/14, PER LIGHTING STYLE PLACEMENT GUIDE RE-CONNECT CPA STREET LIGHT POWER TO NEW/REPLACED STREET LIGHT
- ☐ INSTALL NEW POLE FOUNDATION

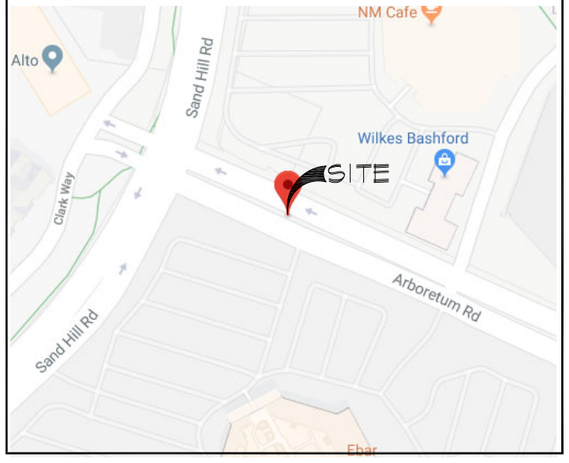
- ☐ INSTALL (2) NEW ERICSSON SM-6701 RADIO/ANTENNAS ATOP NEW POLE
- ☐ INSTALL (1) NEW COMMSCOPE VVSSP-360S-M CANISTER ANTENNA ATOP POLE
- ☐ INSTALL (2) NEW ERICSSON 4402 CBRS/LAA RADIO ATOP NEW POLE
- ☐ INSTALL (1) NEW DIPLEXER WITH IN CONCEALMENT MOUNT ATOP NEW POLE
- ☐ INSTALL (1) NEW NEMA 6P AC DISCONNECT WITHIN NEW U.G. POWER HANDHOLE
- ☐ INSTALL (1) NEW 5/8"Ø x10'L. GROUND ROD WITHIN U.G. POWER HANDHOLE
- ☐ INSTALL NEW AC POWER CABLES FROM POC, TO DISCONNECT, TO RADIOS
- ☐ INSTALL NEW GROUND CABLES FROM DISCONNECT/RADIOS/POLE TO GROUND ROD
- ☐ INSTALL NEW FIBER CABLES FROM DEMARC TO RADIOS
- ☐ INSTALL NEW RF NOTICE AND EMERGENCY SHUT-DOWN SIGNAGE AS REQUIRED
- ☐ INSTALL NEW U.G. PATH FROM POWER POC TO NEW U.G. POWER HANDHOLE

** ALL COMPONENTS EXTERNAL TO THE POLE SHALL HAVE AN INTEGRAL COLOR OR SHALL BE PAINTED TO MATCH THE COLOR AND/OR MATERIALS OF THE POLE.

ADMINISTRATIVE REQUIREMENTS

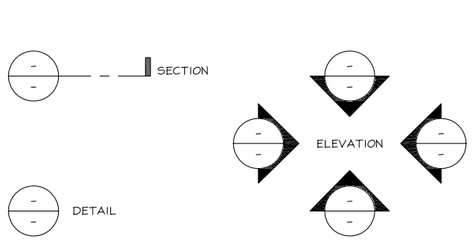
SUBCONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS & FIELD CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

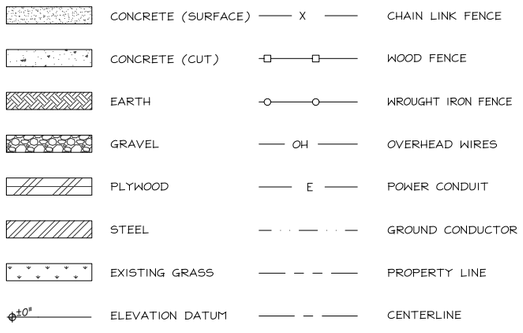
VICINITY MAP



SYMBOLS/ABBREVIATIONS LEGEND

ADD'L	ADDITIONAL	L.	LONG(ITUDINAL)
A.F.G.	ABOVE FINISHED GRADE	MAX.	MAXIMUM
ANT.	ANTENNA	MFR.	MANUFACTURER
ASS'Y.	ASSEMBLY	MIN.	MINIMUM
ANG.	AMERICAN WIRE GAUGE	(N)	NEW
BLDG.	BUILDING	NTS	NOT TO SCALE
BTCW.	BARE TINNED COPPER WIRE	O.C.	ON CENTER
CLR.	CLEAR	P.T.	PRESSURE TREATED
CONC.	CONCRETE	RAD.(R)	RADIUS
CONN.	CONNECTION(OR)	REQ'D	REQUIRED
CONST.	CONSTRUCTION	RGS.	RIGID GALVANIZED STEEL
CONT.	CONTINUOUS	SCH.	SCHEDULE
DBL.	DOUBLE	SIM.	SIMILAR
D.F.	DOUGLAS FIR	SQ.	SQUARE
DIA.	DIAMETER	S.S.	STAINLESS STEEL
DIM.	DIMENSION	STD.	STANDARD
EA.	EACH	TEMP.	TEMPORARY
ELEV	ELEVATION	THK.	THICK(NESS)
EMT.	ELECTRICAL METALLIC TUBING	TYP.	TYPICAL
(E)	EXISTING	U.G.	UNDER GROUND
F.G.	FINISH GRADE	U.L.	UNDERWRITERS LABORATORY
FT.(')	FOOT (FEET)	U.N.O.	UNLESS NOTED OTHERWISE
GA.	GAUGE	V.I.F.	VERIFY IN FIELD
HT.	HEIGHT	W	WIDE (WIDTH)
IN.(")	INCH(ES)	w/	WITH
LB.(#)	POUND(S)	WD.	WOOD
L.F.	LINEAR FEET (FOOT)	W.P.	WEATHERPROOF





PROJECT TEAM

APPLICANT:
VERIZON WIRELESS
575 LENNON LANE SUITE 125
WALNUT CREEK,CA 94598
CONTACT: JEREMY STROUP
PHONE:(925) 202-8654
EMAIL:jstroup@qualtekwireless.com

A&E PROJECT MANAGER:
ZALZALI & ASSOCIATES INC.
dba ALL STATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PM: DEAN WALKER
PHONE: (714) 230-5714
EMAIL: dean@zalzali.com

LEASING CONTACT:
VINCULUMS SERVICES
575 LENNON LANE SUITE 125
WALNUT CREEK, CA 94598
CONTACT: JEREMY STROUP
PHONE:(925) 202-8654
EMAIL:jstroup@qualtekwireless.com

CONSTRUCTION MANAGER:
QUALTEK WIRELESS
1200 DEL PASO RD #150
SACRAMENTO, CA 95834
CONTACT: ROSA YANEZ
PHONE: (916) 247-5703
EMAIL: ryanez@qualtekwireless.com

ARBORIST CONTACT:
PROJECT ARBORIST
121 N 27TH STREET,
SAN JOSE, CA 95116
CONTACT: KATHERINE NAEGELE
PHONE: (408) 590-5976
EMAIL:Katherine@andersonstreecare.com

SITE INFORMATION

LATITUDE:
N 37° 26' 25.44"(37.440400)

LONGITUDE:
W 122° 10' 24.99"(-122.173608)

ELEVATION:
+77.44' AMSL

ZONING:
CC

JURISDICTION:
CITY OF PALO ALTO

ASSESSORS PARCEL NUMBER:
ADJACENT TO 142-03-039

PROPERTY LEGAL DESCRIPTION:
N/A PUBLIC RIGHT OF WAY

ADA COMPLIANCE:
YES

DIG ALERT

811 USA North
Know what's below. Call before you dig.
California and Nevada
Call Two Working Days Before You Dig!
811 / 800-227-2600

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS & (E) DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME IF USING 11"X17" PLOT, DRAWINGS WILL BE HALF SCALE.

DRAWING INDEX

SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
T-2	PHOTOSIMS
T-3	EME REPORT
T-4	EME REPORT
LS-1	SITE SURVEY
A-1	SITE PLAN
A-1.1	EXISTING UTILITY SITE PLAN
A-1.2	UTILITY PLAN (FOR REFERENCE)
A-1.3	LOCATION MAP
A-1.4	BORING/UNDERGROUND UTILITY PLAN
A-1.5	CITY STANDARDS & DETAILS
A-1.6	CITY STANDARDS & DETAILS
A-1.7	R.O.W SECTION
A-2	ENLARGED SITE PLAN
A-3	ELEVATIONS
A-3.1	ELEVATIONS
D-1	DETAILS
D-2	FOUNDATION DETAIL
D-3	LUMINAIRE DETAILS
E-1	ELECTRICAL/GROUNDING DIAGRAMS, NOTES, & PANEL SCHEDULE
E-2	ELECTRICAL PLAN
TCP-1	TRAFFIC CONTROL PLAN (BY OTHERS)
C-1	CALCS
C-2	CALCS
C-3	CALCS
C-4	CALCS
GN-1	GENERAL NOTES
GN-2	GENERAL NOTES
TPR-1	TREE PROTECTION REPORT
L-1	PALO ALTO TREE PROTECTION
L-2	PALO ALTO POLLUTION PREVENTION CHECKLIST
L-3	PALO ALTO EROSION CONTROL AND CONDUIT LOCATION DETAILS & NOTES
L-4	PALO ALTO TRENCHING & SIDEWALK STANDARD DRAWINGS

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

2019 TITLE 24, CALIFORNIA CODE OF REGULATIONS

2019 CALIFORNIA BUILDING CODE

2019 CALIFORNIA ELECTRICAL CODE

2019 CALIFORNIA MECHANICAL CODE

2019 GREEN BUILDING CODE

2019 CALIFORNIA ENERGY CODE

*AS AMENDED BY CITY OF PALO ALTO AND MADE EFFECTIVE JANUARY 1ST, 2020 AS PER CURRENT CITY OF PALO ALTO MUNICIPAL CODE ORDINANCES GENERAL ORDER 95 (v.2018)

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WASAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

verizon

4/8/21

SF Palo Alto 164

Arboretum Road
Palo Alto, CA

Looking Northeast from Arboretum Road

View #1

Applied Imagination 510 914-0500

verizon

4/8/21

SF Palo Alto 164

Arboretum Road
Palo Alto, CA

Looking West from Arboretum Road

View #2

Applied Imagination 510 914-0500

verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums

575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES
ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY

23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
NISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE

PHOTOSIMS W/ SHROUD

SHEET NUMBER

T-2

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Verizon Wireless, a personal wireless telecommunications carrier, to evaluate its small cell (No. 425268 "SF Palo Alto 164") proposed to be sited in Palo Alto, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Executive Summary

Verizon proposes to install four small antennas on the municipal light pole sited in the public right-of-way along Arboretum Road in Palo Alto. The proposed operation will comply with the FCC guidelines limiting public exposure to RF energy.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. A summary of the FCC's exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. The most restrictive limit for exposures of unlimited duration at several wireless service bands are as follows:

Wireless Service Band	Transmit Frequency	"Uncontrolled" Public Limit	Occupational Limit (5 times Public)
Microwave (point-to-point)	1–80 GHz	1.0 mW/cm^2	5.0 mW/cm^2
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550 MHz	1.0	5.0
BRS (Broadband Radio)	2,490	1.0	5.0
WCS (Wireless Communication)	2,305	1.0	5.0
AWS (Advanced Wireless)	2,110	1.0	5.0
PCS (Personal Communication)	1,930	1.0	5.0
Cellular	869	0.58	2.9
SMR (Specialized Mobile Radio)	854	0.57	2.85
700 MHz	716	0.48	2.4
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30–300	0.20	1.0

General Facility Requirements

Small cells typically consist of two distinct parts: the electronic transceivers (also called "radios" or "channels") that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The radios are typically mounted on the support pole or placed in a cabinet at ground level, and they are

connected to the antennas by coaxial cables. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above ground. The antennas are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. This means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas.

Computer Modeling Method

The FCC provides direction for determining compliance in its Office of Engineering and Technology Bulletin No. 65, "Evaluating Compliance with FCC Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated August 1997. Figure 2 describes the calculation methodologies, reflecting the facts that a directional antenna's radiation pattern is not fully formed at locations very close by (the "near-field" effect) and that at greater distances the power level from an energy source decreases with the square of the distance from it (the "inverse square law"). This methodology is an industry standard for evaluating RF exposure conditions and has been demonstrated through numerous field tests to be a conservative prediction of exposure levels.

Site and Facility Description

Based upon information provided by Verizon, including drawings by All States Engineering & Surveying, dated June 9, 2020, it is proposed to install four 2-foot-tall antennas – one CommScope Model VVSSP-360S-M omnidirectional* cylindrical and three Ericsson Model 6701 directional panels with integrated radios – on a new light pole to replace the existing pole sited in the public right-of-way in the median of Arboretum Road, about 190 feet southeast of its intersection with Sand Hill Road in Palo Alto. The CommScope antenna would be mounted on top of the pole at an effective height of about 31 feet above ground and would employ up to 13° downtilt. The Ericsson antennas would be mounted around the pole below the light arm at an effective height of about 21 feet above ground and would be oriented toward 40°T, 160°T, and 280°T, together forming an omnidirectional* pattern. The maximum effective radiated power proposed in any direction is 308 watts, representing 57 watts for AWS service and 58 watts for PCS service from the CommScope antenna and 193 watts for 28 GHz service from the Ericsson antennas. There are reported no other wireless telecommunications base stations at the site or nearby.

* Assumed to be omnidirectional, although manufacturer's patterns show reduced power in certain directions.

Study Results

For a person anywhere at ground, the maximum RF exposure level due to the proposed Verizon operation is calculated to be 0.016 mW/cm^2, which is 1.6% of the applicable public exposure limit. The maximum calculated level at any nearby building† is 0.27% of the public exposure limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels from the proposed operation.

Recommended Mitigation Measures

Due to their mounting locations and heights, the antennas would not be accessible to unauthorized persons, and so no measures are necessary to comply with the FCC public exposure guidelines. To prevent occupational exposures in excess of the FCC guidelines, it is recommended that appropriate RF safety training be provided to all workers who have access within 8 feet outward from the antennas.‡ No access within 2 feet directly in front of the antennas should be allowed while they are in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. It is recommended that explanatory signs§ be posted at the antennas and/or on the pole below the antennas, readily visible from any angle of approach.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that operation of the small cell proposed by Verizon Wireless along Arboretum Road in Palo Alto, California, will comply with the prevailing standards for limiting public exposure to radio frequency energy and, therefore, will not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating small cells. Training authorized personnel and posting explanatory signs are recommended to establish compliance with FCC guidelines.

† Located at least 190 feet away, based on photographs from Google Maps.
‡ May include workers on the pole or on a lift to trim nearby trees.
§ Signs should comply with OET-65 color, symbol, and content recommendations. Contact information should be provided (*e.g.*, a telephone number) to arrange for access to restricted areas. The selection of language(s) is not an engineering matter, and guidelines from the landlord, local zoning or health authority, or appropriate professionals may be required.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration No. E-21306, which expires on September 30, 2021. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

REGISTERED PROFESSIONAL ENGINEER — NEIL J OLIJ — No. E-21306 — Exp. 9-30-2021 — ELECTRICAL — STATE OF CALIFORNIA

December 16, 2020

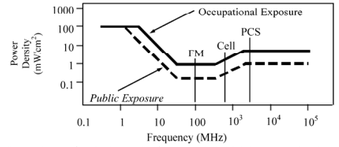
Neil J. Olij, P.E.
707/996-5200

FCC Radio Frequency Protection Guide

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent standard, developed by the Institute of Electrical and Electronics Engineers and approved as American National Standard ANSI/IEEE C95.1-2006, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," includes similar limits. These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive:

Frequency	Electromagnetic Fields (f is frequency of emission in MHz)					
	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm^2)	
Applicable Range (MHz)						
0.3 – 1.34	614	*614*	1.63	*1.63*	100	*100*
1.34 – 3.0	614	*823.8/f*	1.63	*2.19/f*	100	*180/f^2*
3.0 – 30	1842/ f	*823.8/f*	4.89/ f	*2.19/f*	900/ f^2	*180/f^2*
30 – 300	61.4	*27.5*	0.163	*0.0729*	1.0	*0.2*
300 – 1,500	3.54$\sqrt{f}$	*1.59$\sqrt{f}$*	$\sqrt{f}$/106	$\sqrt{f}$/*238*	f/300	*f/1500*
1,500 – 100,000	137	*61.4*	0.364	*0.163*	5.0	*1.0*



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has incorporated those formulas in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.

RFR.CALC™ Calculation Methodology

Assessment by Calculation of Compliance with FCC Exposure Guidelines

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The maximum permissible exposure limits adopted by the FCC (see Figure 1) apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits.

Near Field.
Prediction methods have been developed for the near field zone of panel (directional) and whip (omnidirectional) antennas, typical at wireless telecommunications base stations, as well as dish (aperture) antennas, typically used for microwave links. The antenna patterns are not fully formed in the near field at these antennas, and the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) gives suitable formulas for calculating power density within such zones.

For a panel or whip antenna, power density $S = \frac{180}{\theta_{BW}} \times \frac{0.1 \times P_{net}}{\pi \times D \times h}$, in mW/cm^2,

and for an aperture antenna, maximum power density $S_{max} = \frac{0.1 \times 16 \times \eta \times P_{net}}{\pi \times h^2}$, in mW/cm^2,

where θ_{BW} = half-power beamwidth of antenna, in degrees,
P_{net} = net power input to antenna, in watts,
D = distance from antenna, in meters,
h = aperture height of antenna, in meters, and
η = aperture efficiency (unitless, typically 0.5-0.8).

The factor of 0.1 in the numerators converts to the desired units of power density.

Far Field.
OET-65 gives this formula for calculating power density in the far field of an individual RF source:

power density $S = \frac{2.56 \times 1.64 \times 100 \times RFF^2 \times ERP}{4 \times \pi \times D^2}$, in mW/cm^2,

where ERP = total ERP (all polarizations), in kilowatts,
RFF = three-dimensional relative field factor toward point of calculation, and
D = distance from antenna effective height to point of calculation, in meters.

The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of 1.6 (1.6 x 1.6 = 2.56). The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 100 in the numerator converts to the desired units of power density. This formula is used in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program also allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER — WASSIM ZALZALI — 71655 — CIVIL — STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
EME REPORT

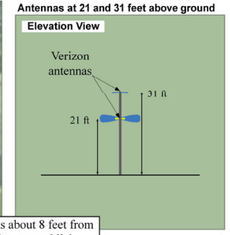
SHEET NUMBER
T-3

Verizon Wireless • Proposed Small Cell (No. 425268 "SF Palo Alto 164")
Arboretum Road • Palo Alto, California

Calculated RF Exposure Levels

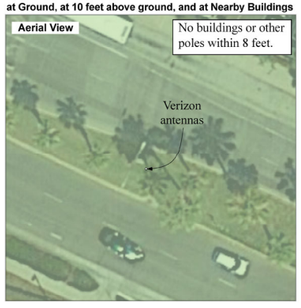
at Elevation of Lower Antennas (19½ – 22½ feet above ground)

Antennas at 21 and 31 feet above ground



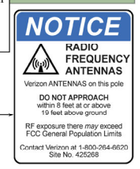
The public limit extends about 8 feet from the antennas, not reaching any publicly accessible area. The occupational limit extends about 2 feet from the antennas.

at Ground, at 10 feet above ground, and at Nearby Buildings



No buildings or other poles within 8 feet.

sign on pole at or below antennas



Legend:

- less than FCC Public Limit
- greater than FCC Public Limit less than FCC Occupational Limit
- greater than FCC Occupational Limit

Notes:

Calculations performed according to OET Bulletin No. 65, August 1997.

Base image from Google Maps.

FEET
10 0 10 20

HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO
©2020

(December 16, 2020) P82&V1-G1PT
Supplemental Figure

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

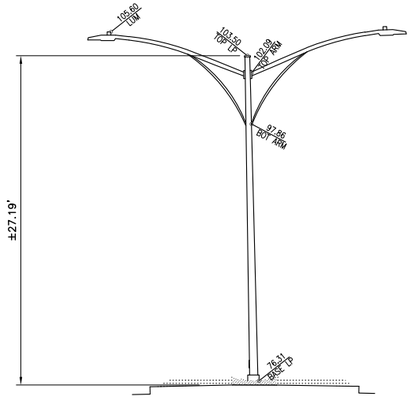
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
EME REPORT

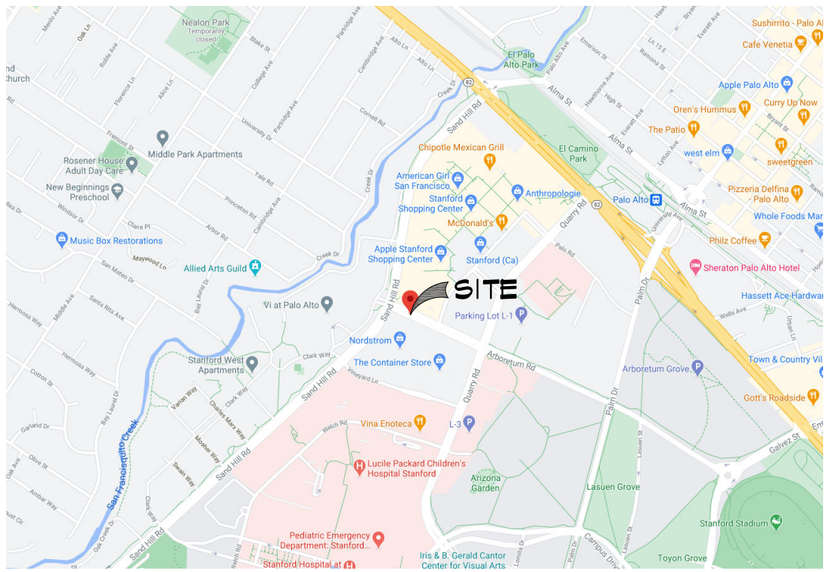
SHEET NUMBER
T-4



2 POLE ELEVATION
1 inch = 5ft.
0 2.5' 5' 10'

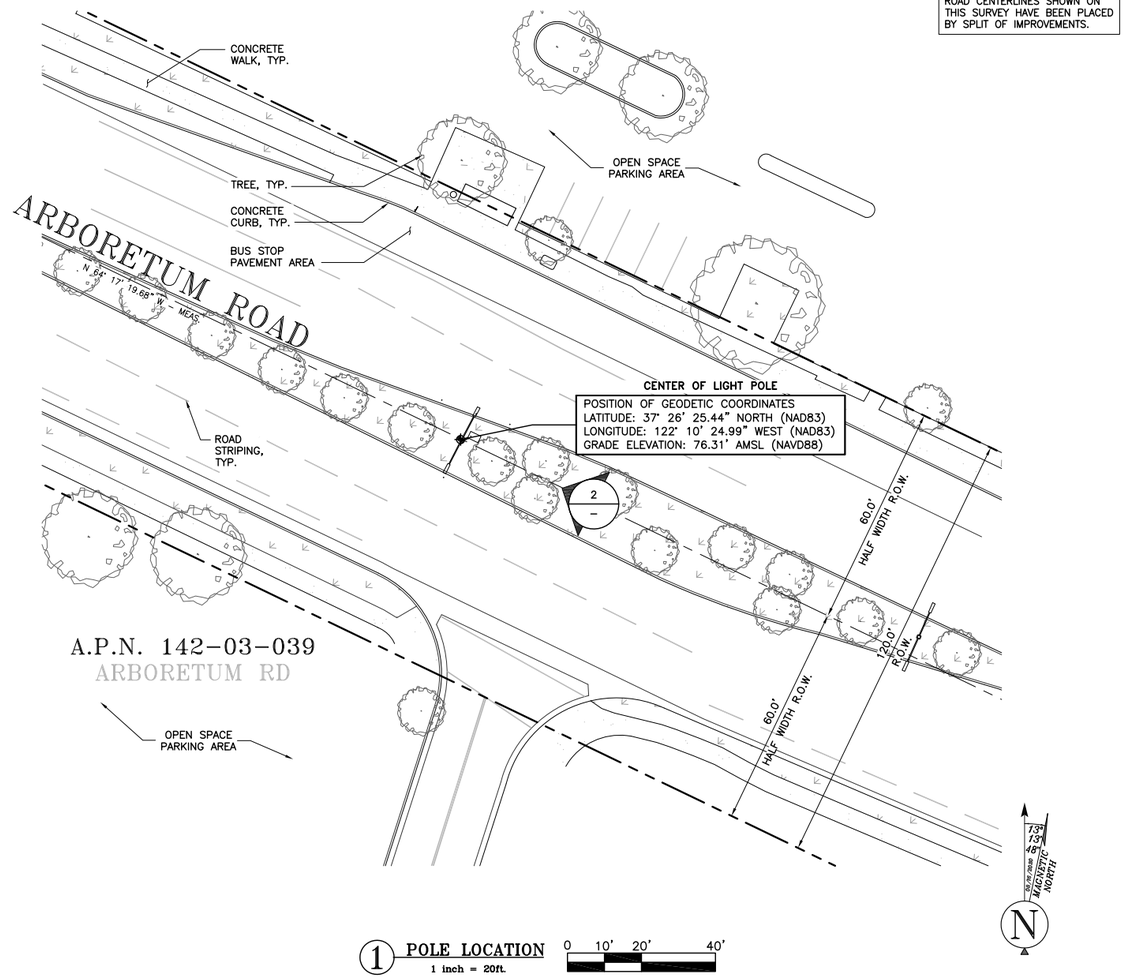
LEGEND

	TREE		U.G. UTILITY VAULT		LIMITS OF PROPERTY
	UTILITY POLE		FOUND MONUMENT	— x —	CHAIN LINK FENCE
	WATER VALVE		GEODETIC MARKER		WOOD FENCE
BOL	BOLLARD	FL	FLOW LINE	— O/H—	OVERHEAD LINE
TOP _	TOP OF ITEM	FC	FACE OF CURB		METAL FENCE
BOT _	BOTTOM OF ITEM	R.O.W.	RIGHT OF WAY		GRADE BREAK
BLDG	TOP OF BUILDING	AP	ASPHALT		SPOT ELEVATION
LP	LIGHT POLE	SW	SIDEWALK		MASONRY WALL



VICINITY MAP

RIGHT OF WAY NOTE:
ROAD CENTERLINES SHOWN ON THIS SURVEY HAVE BEEN PLACED BY SPLIT OF IMPROVEMENTS.



1 POLE LOCATION
1 inch = 20ft.
0 10' 20' 40'

TITLE REPORT
NOT APPLICABLE (RIGHT-OF-WAY)

LEGAL DESCRIPTION
NOT APPLICABLE (RIGHT-OF-WAY)

ASSESSOR'S PARCEL NO.
NOT APPLICABLE (RIGHT-OF-WAY)

UTILITY NOTE:
SURVEYOR DOES NOT GUARANTEE THAT ALL UTILITIES ARE SHOWN OR THEIR LOCATIONS ARE DEFINITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND DEVELOPER TO CONTACT BLUE STAKE AND ANY OTHER INVOLVED AGENCIES TO LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION. REMOVAL, RELOCATION AND/ OR REPLACEMENT IS THE RESPONSIBILITY OF THE CONTRACTOR.

NOTES:
1. THIS IS NOT A BOUNDARY SURVEY. THIS IS A SPECIALIZED RIGHT OF WAY MAP. THE PROPERTY LINES AND EASEMENTS SHOWN HEREON ARE FROM RECORD INFORMATION AS NOTED HEREON. ALL STATES ENGINEERING & SURVEYING/ZALZALI & ASSOCIATES, INC. TRANSLATED THE TOPOGRAPHIC SURVEY TO RECORD INFORMATION USING MONUMENT(S)/LANDMARK(S) SHOWN HEREON. NO TITLE RESEARCH WAS PERFORMED BY ALL STATES ENGINEERING & SURVEYING/ZALZALI & ASSOCIATES, INC.

2. ANY CHANGES MADE TO THE INFORMATION ON THIS PLAN, WITHOUT THE WRITTEN CONSENT OF ALL STATES ENGINEERING & SURVEYING / ZALZALI & ASSOCIATES, INC. RELIEVES ALL STATES ENGINEERING & SURVEYING/ ZALZALI & ASSOCIATES, INC. OF ANY AND ALL LIABILITY.

3. THESE DRAWINGS & SPECIFICATIONS ARE THE PROPERTY & COPYRIGHT OF ALL STATES ENGINEERING & SURVEYING / ZALZALI & ASSOCIATES, INC. & SHALL NOT BE USED ON ANY OTHER WORK EXCEPT BY AGREEMENT WITH THE SURVEYOR. WRITTEN DIMENSIONS SHALL TAKE PREFERENCE OVER SCALED & SHALL BE VERIFIED ON THE JOB SITE. ANY DISCREPANCY SHALL BE BROUGHT TO THE NOTICE OF THE SURVEYOR PRIOR TO COMMENCEMENT OF ANY WORK.

4. THIS SITE IS PROPOSED TO BE DEVELOPED ON A STREET LIGHT POLE LOCATED WITHIN THE PUBLIC RIGHT OF WAY.

SURVEY DATE
08/16/2020

BASIS OF BEARING
BEARINGS SHOWN HEREON ARE BASED UPON U.S. STATE PLANE NAD83 COORDINATE SYSTEM CALIFORNIA STATE PLANE COORDINATE ZONE THREE, DETERMINED BY GPS OBSERVATIONS.

BENCHMARK
RTCM-REF 3270
NORTHING: 1970498.865
EASTING: 6082238.002
+248.11' (A.M.S.L.)

REFERENCE MAPS
- 733-RS-43

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

SEQUOIA DEPLOYMENT SERVICES, INC.
1 SPECTRUM POINTE DRIVE, SUITE 130
LAKE FOREST, CA 92630

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT NO:	SF_PALO-ALTO_164
DRAWN BY:	MG
CHECKED BY:	BC/WZ/DW

REV	DATE	DESCRIPTION	
0	09/25/2020	DRAFT FINAL SURVEY	MA
A	09/25/2020	PRELIMINARY SURVEY	MG

PROFESSIONAL LAND SURVEYOR
BRUCE T. CRAMTOM
No. 9039
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF_PALO-ALTO_164
R.O.W. ADJACENT TO:
ARBORETUM RD
PALO ALTO, CA 94304
NEW BUILD-SMALL CELL

SHEET TITLE
SITE SURVEY

SHEET NUMBER
C-1

TREE NOTES:

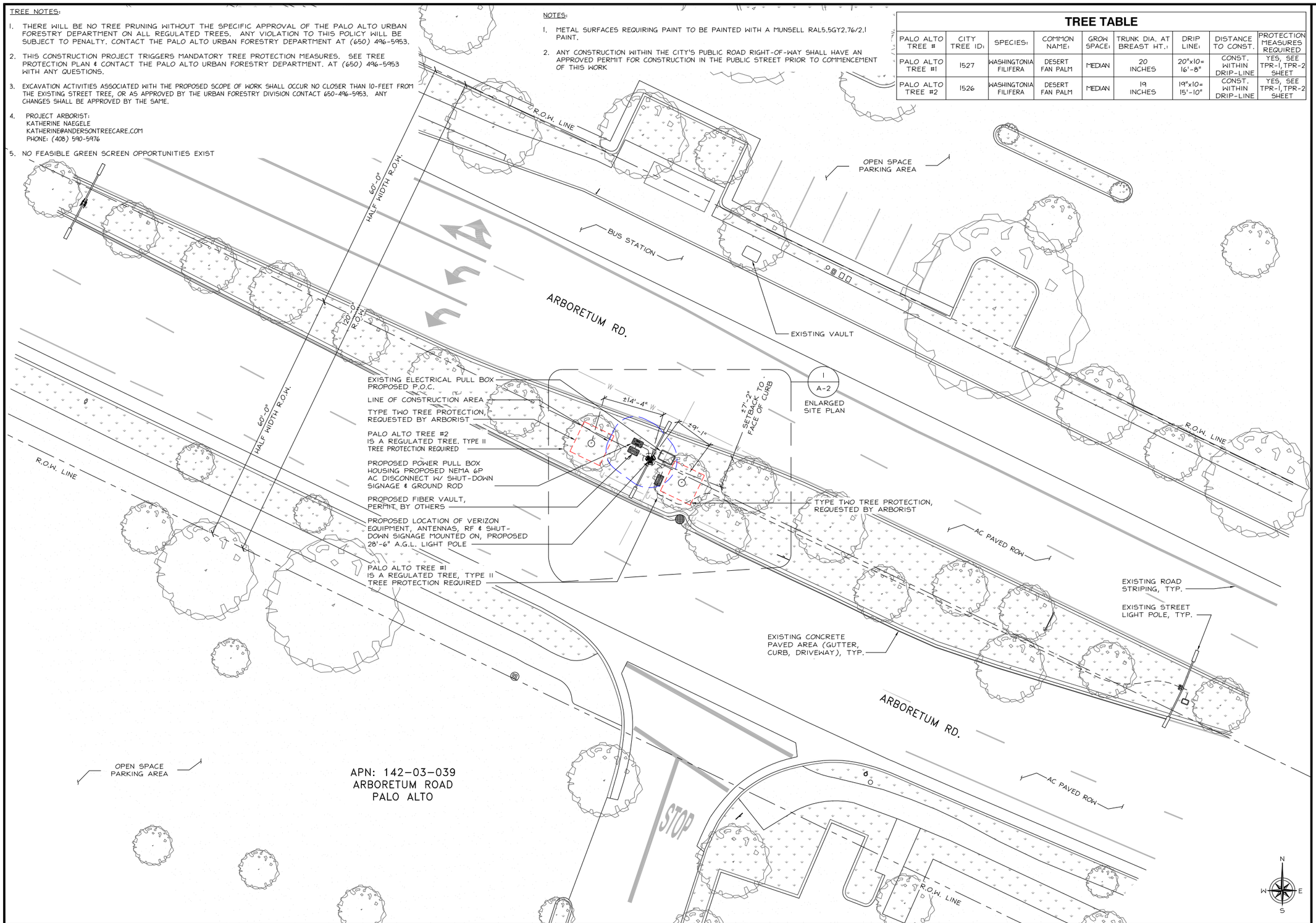
1. THERE WILL BE NO TREE PRUNING WITHOUT THE SPECIFIC APPROVAL OF THE PALO ALTO URBAN FORESTRY DEPARTMENT ON ALL REGULATED TREES. ANY VIOLATION TO THIS POLICY WILL BE SUBJECT TO PENALTY. CONTACT THE PALO ALTO URBAN FORESTRY DEPARTMENT AT (650) 496-5953.
2. THIS CONSTRUCTION PROJECT TRIGGERS MANDATORY TREE PROTECTION MEASURES. SEE TREE PROTECTION PLAN & CONTACT THE PALO ALTO URBAN FORESTRY DEPARTMENT. AT (650) 496-5953 WITH ANY QUESTIONS.
3. EXCAVATION ACTIVITIES ASSOCIATED WITH THE PROPOSED SCOPE OF WORK SHALL OCCUR NO CLOSER THAN 10-FEET FROM THE EXISTING STREET TREE, OR AS APPROVED BY THE URBAN FORESTRY DIVISION CONTACT 650-496-5953. ANY CHANGES SHALL BE APPROVED BY THE SAME.
4. PROJECT ARBORIST:
   KATHERINE NAEGELE
   KATHERINE@ANDERSONTREECARE.COM
   PHONE: (408) 590-5976
5. NO FEASIBLE GREEN SCREEN OPPORTUNITIES EXIST

NOTES:

1. METAL SURFACES REQUIRING PAINT TO BE PAINTED WITH A MUNSELL RAL5.5GY2.76/2.1 PAINT.
2. ANY CONSTRUCTION WITHIN THE CITY'S PUBLIC ROAD RIGHT-OF-WAY SHALL HAVE AN APPROVED PERMIT FOR CONSTRUCTION IN THE PUBLIC STREET PRIOR TO COMMENCEMENT OF THIS WORK

TREE TABLE

PALO ALTO TREE #	CITY TREE ID:	SPECIES:	COMMON NAME:	GROW SPACE:	TRUNK DIA. AT BREAST HT.:	DRIP LINE:	DISTANCE TO CONST.	PROTECTION MEASURES REQUIRED
PALO ALTO TREE #1	1527	WASHINGTONIA FILIFERA	DESERT FAN PALM	MEDIAN	20 INCHES	20"x10= 16'-8"	CONST. WITHIN DRIP-LINE	YES, SEE TPR-1, TPR-2 SHEET
PALO ALTO TREE #2	1526	WASHINGTONIA FILIFERA	DESERT FAN PALM	MEDIAN	19 INCHES	19"x10= 15'-10"	CONST. WITHIN DRIP-LINE	YES, SEE TPR-1, TPR-2 SHEET



SITE PLAN

24"x36" SCALE: 3/32" = 1'-0"
11"x17" SCALE: 3/64" = 1'-0"
8' 4' 0" 8'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

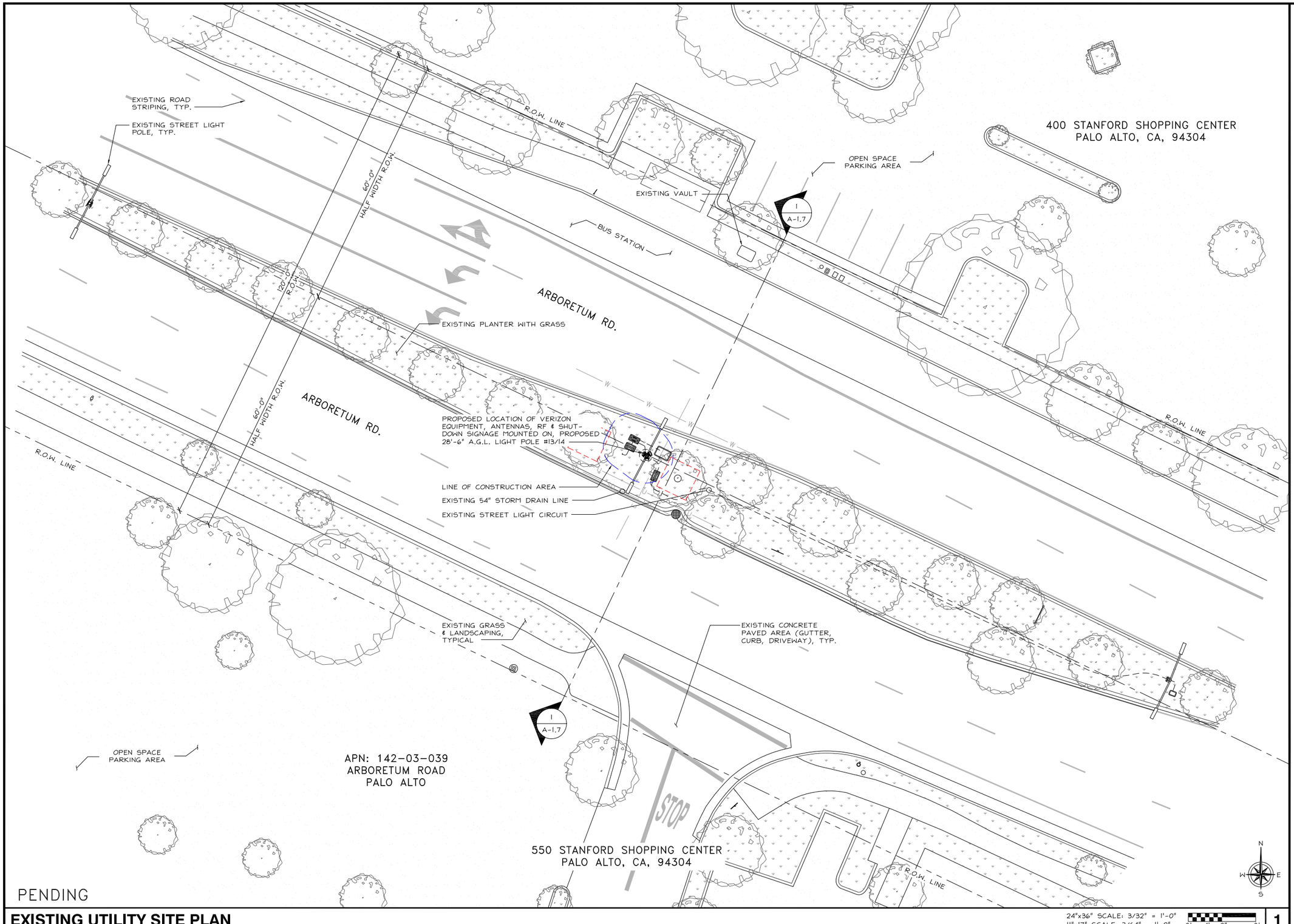
REGISTERED PROFESSIONAL ENGINEER
HASSAN ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
SITE PLAN

SHEET NUMBER
A-1



PENDING

EXISTING UTILITY SITE PLAN

24"x36" SCALE: 3/32" = 1'-0"
11"x17" SCALE: 3/64" = 1'-0"
8' 4' 0" 8'

1

verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums

575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY

23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

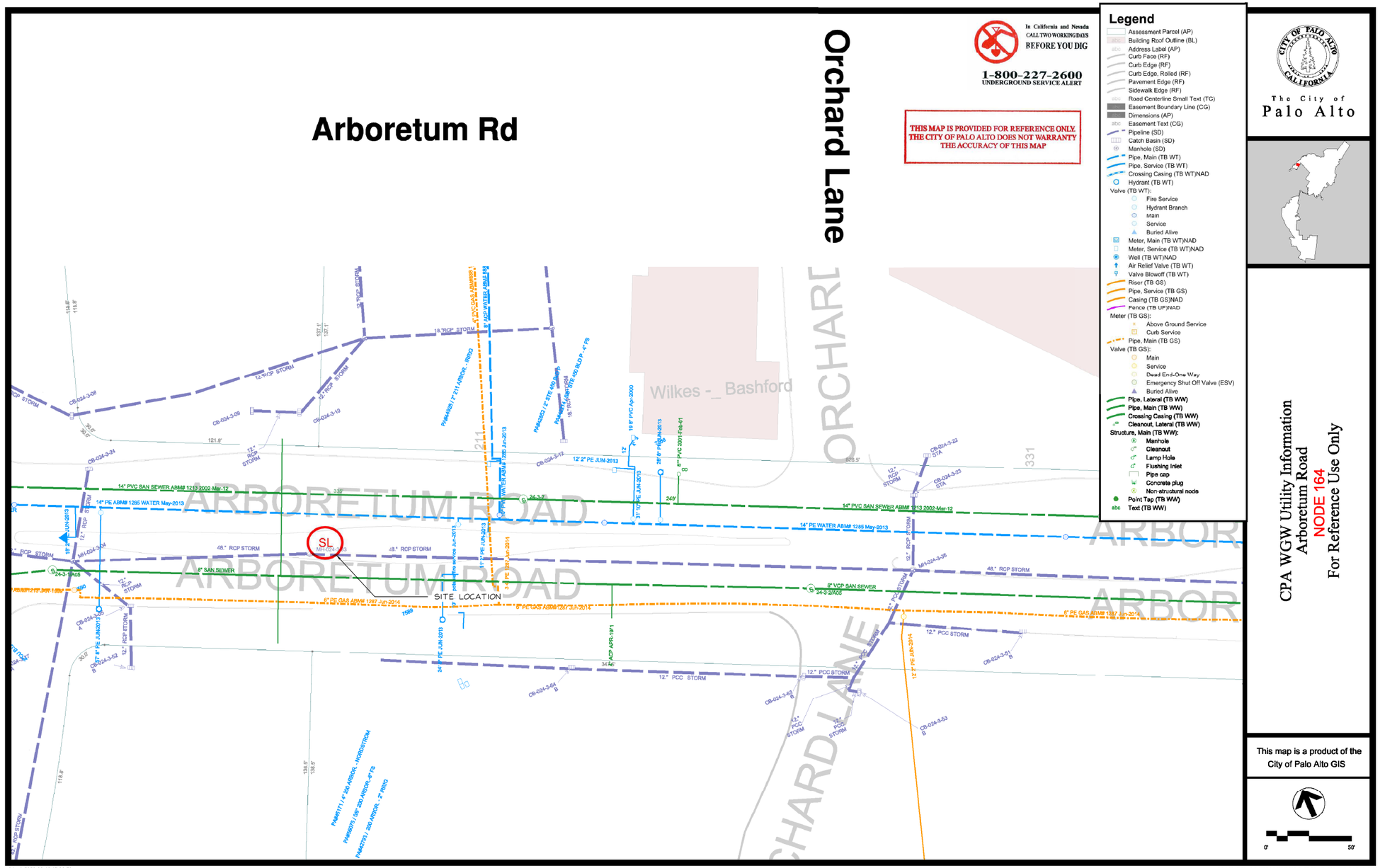
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
EXISTING UTILITY SITE PLAN

SHEET NUMBER
A-1.1



THIS MAP IS PROVIDED FOR REFERENCE ONLY. THE CITY OF PALO ALTO DOES NOT WARRANTY THE ACCURACY OF THIS MAP

In California and Nevada CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-227-2600
UNDERGROUND SERVICE ALERT

Legend

- Assessment Parcel (AP)
- Building Roof Outline (BL)
- Address Label (AP)
- Curb Face (RF)
- Curb Edge (RF)
- Curb Edge, Rolled (RF)
- Pavement Edge (RF)
- Sidewalk Edge (RF)
- Road Centerline Small Text (TC)
- Easement Boundary Line (CG)
- Dimensions (AP)
- Easement Text (CG)
- Pipeline (SD)
- Catch Basin (SD)
- Manhole (SD)
- Pipe, Main (TB WT)
- Pipe, Service (TB WT)
- Crossing Casing (TB WT)NAD
- Hydrant (TB WT)
- Valve (TB WT):
  - Fire Service
  - Hydrant Branch
  - main
  - Service
  - Buried Alive
- Meter, Main (TB WT)NAD
- Meter, Service (TB WT)NAD
- Well (TB WT)NAD
- Air Relief Valve (TB WT)
- Valve Blowoff (TB WT)
- Riser (TB GS)
- Pipe, Service (TB GS)
- Casing (TB GS)NAD
- Fence (TB UF)NAD
- Meter (TB GS):
  - Above Ground Service
  - Curb Service
- Pipe, Main (TB GS)
- Valve (TB GS):
  - Main
  - Service
  - Dead End-One Way
  - Emergency Shut Off Valve (ESV)
  - Buried Alive
- **Pipe, Lateral (TB WW)**
- **Pipe, Main (TB WW)**
- **Crossing Casing (TB WW)**
- **Cleanout, Lateral (TB WW)**
- **Structure, Main (TB WW):**
  - **Manhole**
  - **Cleanout**
  - **Lamp Hole**
  - **Flushing Inlet**
  - Pipe cap
  - Concrete plug
  - Non-structural node
- Point Tap (TB WW)
- abc Text (TB WW)

The City of Palo Alto

CPA WGW Utility Information
Arboretum Road
NODE 164
For Reference Use Only

This map is a product of the City of Palo Alto GIS

0' 50'

olajard, 2020-03-18 17:28:59
New Base Map Req (\\cc-maps\Encompass\Admin\Personal\olajard.mdb)

This document is a graphic representation only of best available sources. The City of Palo Alto assumes no responsibility for any errors. ©1989 to 2016 City of Palo Alto

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

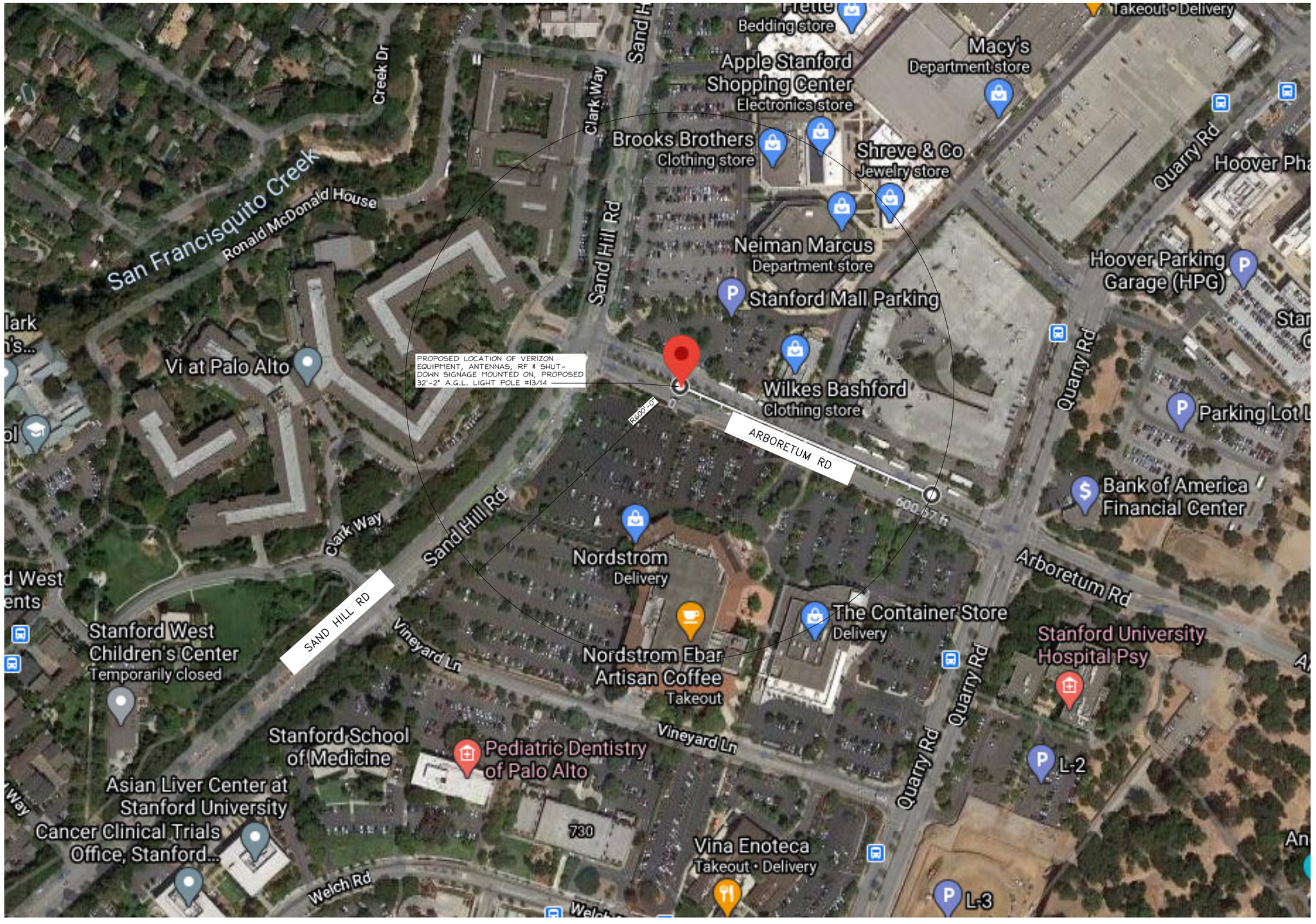
REGISTERED PROFESSIONAL ENGINEER
WASSIM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
UTILITY PLAN
(FOR REFERENCE)

SHEET NUMBER
A-1.2



verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
LOCATION MAP

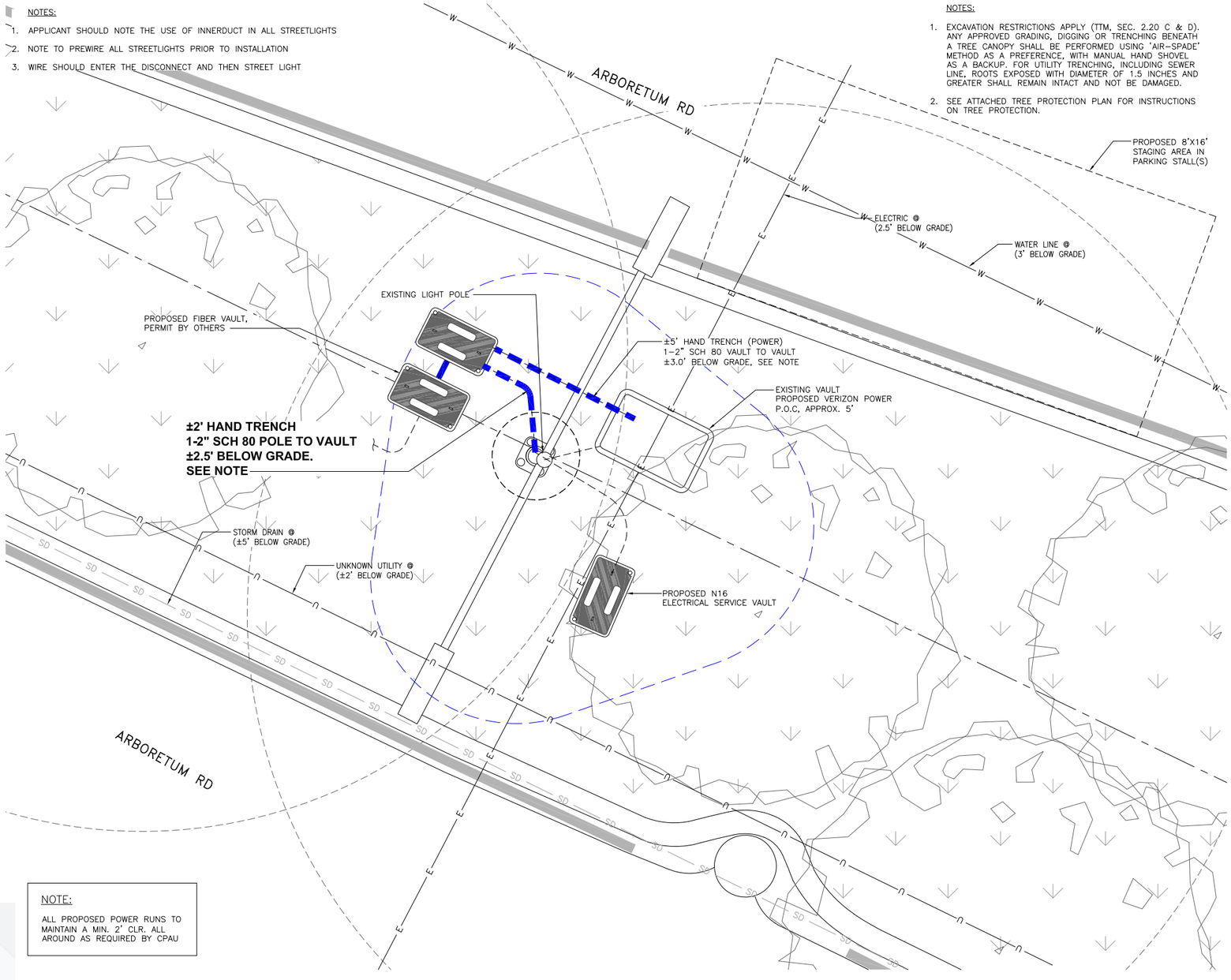
SHEET NUMBER
A-1.3

1. ALL WORK SHALL COMPLY WITH THE CITY OF PALO ALTO 2018 STANDARD DRAWINGS AND SPECIFICATIONS BORING, TRENCHING, POTHOLING AND DEWATERING, SECTION 17
2. THE LOCATION OF EXISTING UTILITY MAINS AND LATERAL LINES INCLUDING STORM DRAIN, SANITARY SEWER, WATER, GAS, UNDERGROUND ELECTRICAL AND COMMUNICATION CONDUITS CROSSING THE TRENCH EXCAVATION SHALL BE VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UNDERGROUND SERVICES ALERT (USA) AT 811 OR 800-642-2444 AT LEAST FIVE (5) WORKING DAYS PRIOR TO BEGINNING UNDERGROUND WORK SO THAT EXISTING UTILITIES CAN BE MARKED IN THE FIELD, UNLESS OTHERWISE STATED BY CITY CONTRACT.
3. EXCAVATION SHALL BE SUPPORTED AND EXCAVATION OPERATIONS CONDUCTED IN ACCORDANCE WITH THE RULES OF THE CALIFORNIA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA). IF IN THE OPINION OF THE ENGINEER, THERE EXISTS A SITUATION OF IMMINENT DANGER TO THE WORKERS, THE ENGINEER MAY ORDER THE WORK STOPPED AND THE CONTRACTOR SHALL COMPLY WITH RULES OF THE CALIFORNIA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA).
4. BACKFILL SHALL BE SAND OR GRANULAR MATERIAL FALLING WITHIN THE LIMITS DESCRIBED IN THE STANDARD DRAWING 401. AGGREGATE BASE, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE SHALL CONFORM TO THE REQUIREMENTS WITHIN THESE SPECIFICATIONS.
5. THE CONTRACTOR SHALL INSTALL THE CONDUIT IN ACCORDANCE WITH THE APPROVED STREET WORK PERMIT. ALL CONDUITS SHALL BE INSTALLED UNDERGROUND USING DIRECTIONAL BORING METHOD. MICRO-TUNNELING OR OTHER METHODS SHALL BE APPROVED BY THE PUBLIC WORKS ENGINEERING DIVISION. THE CONDUITS SHALL BE INSTALLED WITH TRACER WIRE APPROVED BY THE ENGINEER PER CITY OF PALO ALTO UTILITIES DEPARTMENT WATER, GAS AND WASTEWATER UTILITY STANDARDS. REFER TO STANDARD DRAWING 402.
6. TRENCHES SHALL NOT BE LEFT OPEN AT THE END OF THE DAY. ADEQUATE PROVISIONS SHALL BE MADE FOR THE PLACING OF TEMPORARY STEEL PLATES IN ADDITION TO BARRICADES, SIGNING AND LIGHTING. STOCKPILING OF EXCAVATED MATERIAL WITHIN THE PUBLIC RIGHT-OF-WAY SHALL NOT BE ALLOWED. A MAXIMUM OF THREE-HUNDRED (300) FEET OR ONE (1) CITY BLOCK OF TRENCH, WHICHEVER IS GREATER, MAY BE OPENED AT ONE TIME. FOR TEMPORARY PATCHING, A MINIMUM THICKNESS OF TWO (2) INCHES OF CUTBACK WILL BE USED.
7. PRIOR TO EXCAVATION OF TRENCHING, POTHOLING OR SENDING/RECEIVING PITS, THE ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE SHALL BE CUT OR MILL TO A NEAT LINE FULL DEPTH WITH A SAW-CUTTING OR MILLING DEVICE APPROVED BY THE ENGINEER.
8. BACKFILL MATERIAL SHALL BE COMPACTED TO 90 PERCENT MINIMUM RELATIVE COMPACTION EXCEPT THE TOP TWENTY-FOUR (24) INCHES, WHICH SHALL BE MECHANICALLY COMPACTED TO 95 PERCENT MINIMUM RELATIVE COMPACTION. MECHANICALLY COMPACTED LIFTS USING ALTERNATIVE EQUIPMENT, COMPLYING WITH MANUFACTURE'S SPECIFICATION, WILL REQUIRE THE APPROVAL OF THE ENGINEER. USE OF ALTERNATIVE COMPACTION EQUIPMENT SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ANY DAMAGE TO THE CONDUIT, SURROUNDING GROUND, OR EXISTING AND NEW IMPROVEMENTS.

(2) NOTES

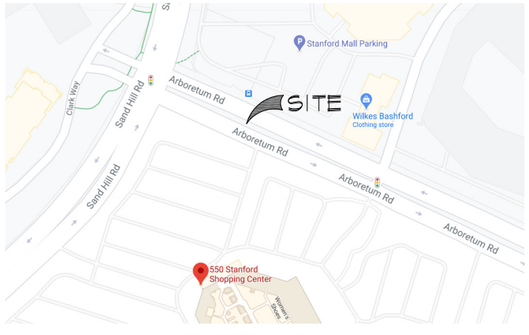
Sawcutting & Asphalt/Concrete Removal

- ☐ Protect storm drain inlets during saw cutting.
- ☐ If saw cut slurry enters a catch basin, clean it up immediately.
- ☐ Shovel or vacuum saw cut slurry deposits and remove from the site. When making saw cuts, use as little water as possible. Sweep up, and properly dispose of all residues.



NOTE:

ALL PROPOSED POWER RUNS TO MAINTAIN A MIN. 2' CLR. ALL AROUND AS REQUIRED BY CPAU



VICINITY MAP

PROJECT SPECIFIC PERMIT INFORMATION		
DESCRIPTION	QTY	UNIT
PLACE (1) 4" SCH 40 CONDUIT	4	LF
PLACE (1) 2" SCH 40 CONDUIT	2	LF
REMOVE AND RESTORE SOIL	0	FT³

811 USA North
Know what's below. Call before you dig.
California and Nevada
Call Two Working Days Before You Dig!
811 / 800-227-2600

(1) LIGHT POLE
1/2" = 1 ft.
2' 1' 0" 2'

LEGEND

U.G. UTILITY VAULT	BOL	BOLLARD	FL	FLOW LINE	W WATER
MANHOLE	TOP _	TOP OF ITEM	EOP	EDGE OF PAVEMENT	SS SANITARY SEWER
UTILITY POLE	BOT _	BOTTOM OF ITEM	R.O.W.	RIGHT OF WAY	SD STORM DRAIN
SPOT ELEVATION	BLDG	TOP OF BUILDING	AP	ASPHALT	G GAS
WATER VALVE	LP	LIGHT POLE	SW	SIDEWALK	C COMMUNICATION
FOUND MONUMENT	LIMITS OF PROPERTY		O/H	OVERHEAD LINE	E ELECTRIC
GEODETIC MARKER	CHAIN LINK FENCE		METAL FENCE		U UNKNOWN UTILITY
MASONRY WALL	WOOD FENCE		GRADE BREAK		IRR IRRIGATION

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334942
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
A	10/12/2020	PRELIMINARY BORING PLAN	SS

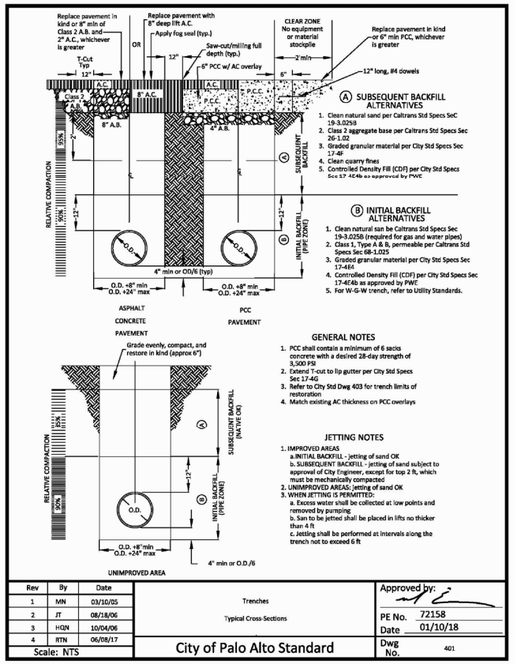
REGISTERED PROFESSIONAL ENGINEER WISAM ZALZALI 71655 CIVIL STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
PUBLIC R.O.W. ADJACENT TO:
ARBORETUM RD
PALO ALTO, CA 94304
LOCATION CODE: 425268

SHEET TITLE
BORING SITE PLAN

SHEET NUMBER
A-1.4



Rev	By	Date
1	MN	03/10/05
2	JT	08/18/06
3	HQN	10/04/06
4	RTN	06/08/17

Scale: NTS

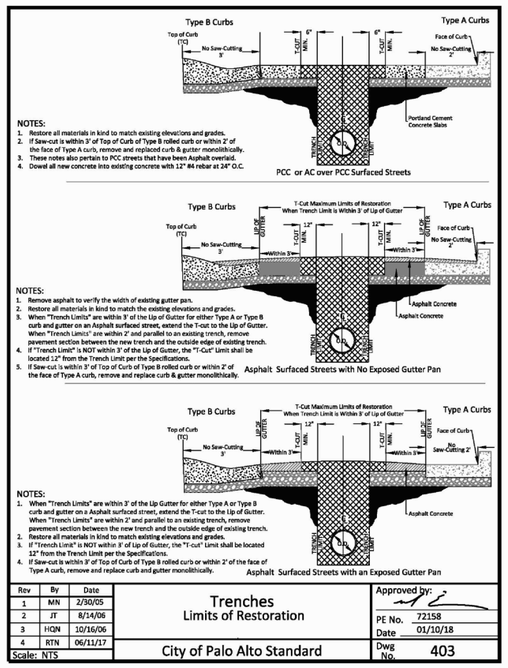
Trenches
Typical Cross-Sections

Approved by:
PE No. 72158
Date 01/10/18

City of Palo Alto Standard

Dwg No. 401

7 CITY STANDARD DWG 401
N.T.S.



Rev	By	Date
1	MN	2/30/05
2	JT	8/14/06
3	HQN	10/16/06
4	RTN	06/11/17

Scale: NTS

Trenches
Limits of Restoration

Approved by:
PE No. 72158
Date 01/10/18

City of Palo Alto Standard

Dwg No. 403

6 CITY STANDARD DWG 403
N.T.S.

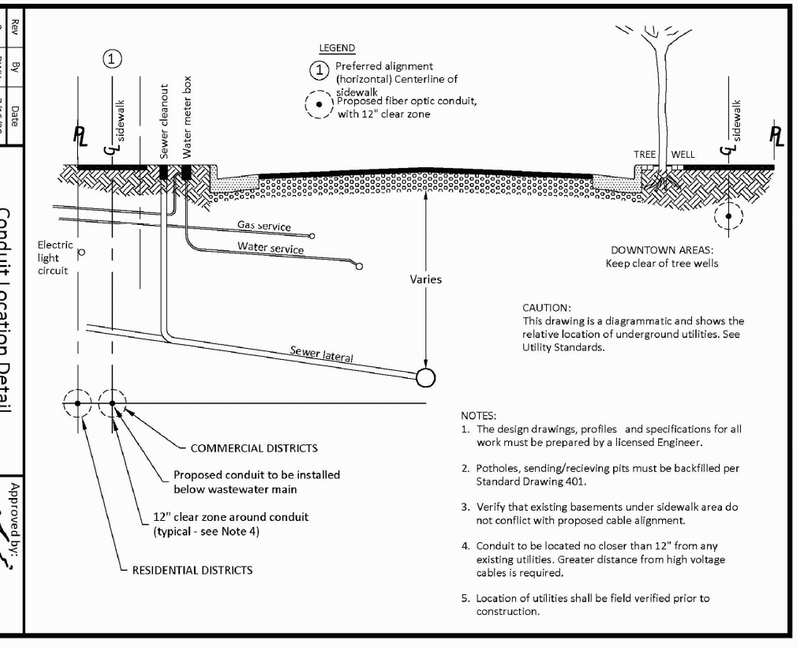
Rev	By	Date
0	DWH	7/16/98
1	MMN	7/20/04

Scale: NTS

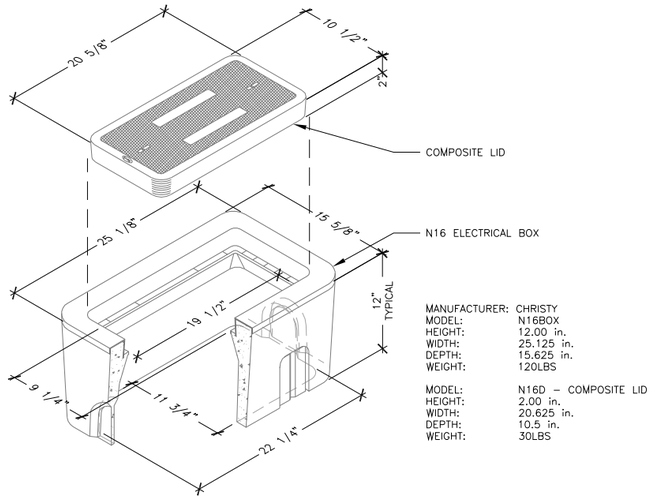
Conduit Location Detail
Telecommunications

City of Palo Alto Standard

Approved by:
PE No. 72158
Date 01/10/18
Dwg No. 402



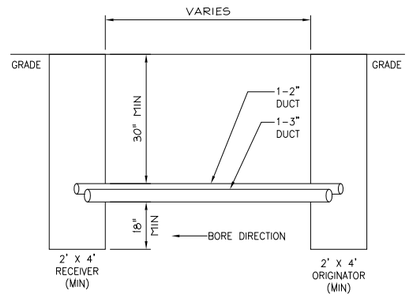
5 CITY STANDARD DWG 402
N.T.S.



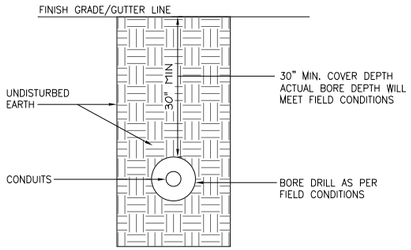
MANUFACTURER: CHRISTY
MODEL: N16BOX
HEIGHT: 12.00 in.
WIDTH: 25.125 in.
DEPTH: 15.625 in.
WEIGHT: 120LBS

MODEL: N16D – COMPOSITE LID
HEIGHT: 2.00 in.
WIDTH: 20.625 in.
DEPTH: 10.5 in.
WEIGHT: 30LBS

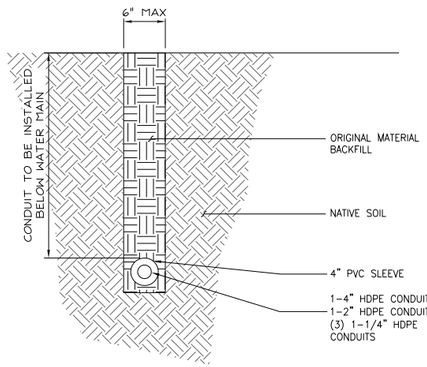
4 CHRISTY N16 ELECTRICAL BOX
N.T.S.



3 BORE PIT & RECEIVER PIT
N.T.S.



DIRECTION BORE MEHOD
2 CROSS SECTION – PRIVATE
N.T.S.



INSTALLATION NOTES:
- CUT 6" MAX WIDTH X 18" MIN DEEP TRENCH
- BACKFILL WITH THE ORIGINAL MATERIAL FROM THE TRENCH
- RESTORE SURFACE BACK TO ORIGINAL

1 IN DIRT – PRIVATE
N.T.S.

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334942
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
A	10/12/2020	PRELIMINARY BORING PLAN	SS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
PUBLIC R.O.W. ADJACENT TO:
ARBORETUM RD
PALO ALTO, CA 94304
LOCATION CODE: 425268

SHEET TITLE
CITY STANDARDS & DETAILS

SHEET NUMBER
A-1.5

- Grade fills over 6-inches or impervious overlay shall incorporate an approved permanent aeration system, permeable material or other approved mitigation.
- Grade cuts exceeding 4-inches shall incorporate retaining walls or an appropriate transition equivalent.

notes:

Required Practices

C. Trenching, Excavation and Equipment Use

Trenching, excavation or boring activity within the TPZ is restricted to the following activities, conditions and requirements if approved by the *City Arborist*. *(See Restriction Zones for Excavation, Trenching or Boring Near Regulated Trees, Image 2.20-1 through 2.20-3)*. Mitigating measures shall include prior notification to and direct supervision by the *project arborist*.

1. Notification. Contractor shall notify the *project arborist* a minimum of 24 hours in advance of the activity in the TPZ.
2. Root Severance. Roots that are encountered shall be cut to sound wood and repaired (*see Root Injury, Section 2.25 A-1*). Roots 2-inches and greater must remain injury free.
3. Excavation. Any approved excavation, demolition or extraction of material shall be performed with equipment sitting outside the TPZ. Methods permitted are by hand digging, hydraulic or pneumatic air excavation technology. Avoid excavation within the TPZ during hot, dry weather.
   - If excavation or *trenching* for drainage, utilities, irrigation lines, etc., it is the duty of the contractor to tunnel under any roots 2-inches in diameter and greater.
   - Prior to excavation for foundation/footings/walls, grading or *trenching* within the TPZ, roots shall first be severed cleanly 1-foot outside the TPZ and to the depth of the future excavation. The trench must then be hand dug and roots pruned with a saw, sawzall, narrow trencher with sharp blades or other approved root pruning equipment.
4. Heavy Equipment. Use of backhoes, steel tread tractors or any heavy vehicles within the TPZ is prohibited unless approved by the *City Arborist*. If allowed, a protective *root buffer* (*see Root Buffer and Damage to Trees, Section 2.25.A-1*) is required. The protective buffer shall consist of a base course of tree chips spread over the root area to a minimum of 6-inch depth, layered by 3/4-inch quarry gravel to stabilize 3/4-inch plywood on top. This buffer within the TPZ shall be maintained throughout the entire construction process.
   - Structural design. If injurious activity or interference with roots greater than 2-inches will occur within the TPZ, plans shall specify a design of special foundation, footing, walls, concrete slab or pavement designs subject to *City Arborist* approval. Discontinuous foundations such as concrete pier and structural grade beam must maintain natural grade (not to exceed a 4-inch cut), to minimize root loss and allow the tree to use the existing soil.

- Basement excavations shall be designed outside the TPZ of all *protected* and *designated trees* (*see Excavation, Section 2.20-3*) and shall not be harmful to other mature or neighboring property trees.

notes:

Required Practices

D. Tunneling & Directional Drilling

If *trenching* or pipe installation has been approved within the TPZ, then the trench shall be either cut by hand, air-spade, hydraulic vac-on excavation or, by mechanically boring the tunnel under the roots with a horizontal directional drill and hydraulic or pneumatic air excavation technology. In all cases, install the utility pipe immediately, backfill with soil and soak within the same day. Installation of private utility improvements shall be tunnel bored beneath the tree and roots per *Trenching Tunneling & Distance Matrix* in Table 2-1.

TABLE 2-1
Trenching & Tunneling Distance

TRENCHING DISTANCE

When the Tree Diameter At 4.5 Ft Is:	Trenching will be Replaced with Boring at this Minimum Distance (10x tree dia.) from the Face of the Tree in any Direction:
6-9" Measured At 6" à	6-9'
10-14" Measured At 54" à	10-14'
15-19" Measured At 54" à	15-19'
Over 19" Measured At 54" à	20' +

DEPTH OF TUNNELING

Tree Diameter	Depth of Tunneling
9" Or Less Measured At 6" à	2.5'
10-14" Measured At 54" à	3.0'
15-19" Measured At 54" à	3.5'
More Than 19" Measured At 54" Depth of Tunnel à	4.0'

Bore Pits Shall Be Located At A Minimum Distance As Specified By The Trenching Distance Table Above.

1. Public Utilities
   Underground public utility improvements or repairs shall be performed in accordance with the *Utility Standards for Excavation, Trenching or Boring, Section 02200.309*; and per *Restriction Zones Near Regulated Trees* (*see Images 2.20-1 through 2.20-3*).
2. Street Trees
   Exclusions for *street trees* in the publicly owned right-of-way (ROW).
   - *Street Trees* that are in conflict with utility infrastructure where the conflict cannot be resolved may be removed if approved by Public Works Operations (e.g., a tree planted directly on top of a damaged sewer lateral.)

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

PROJECT ID:	P-334942
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
A	10/12/2020	PRELIMINARY BORING PLAN	SS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

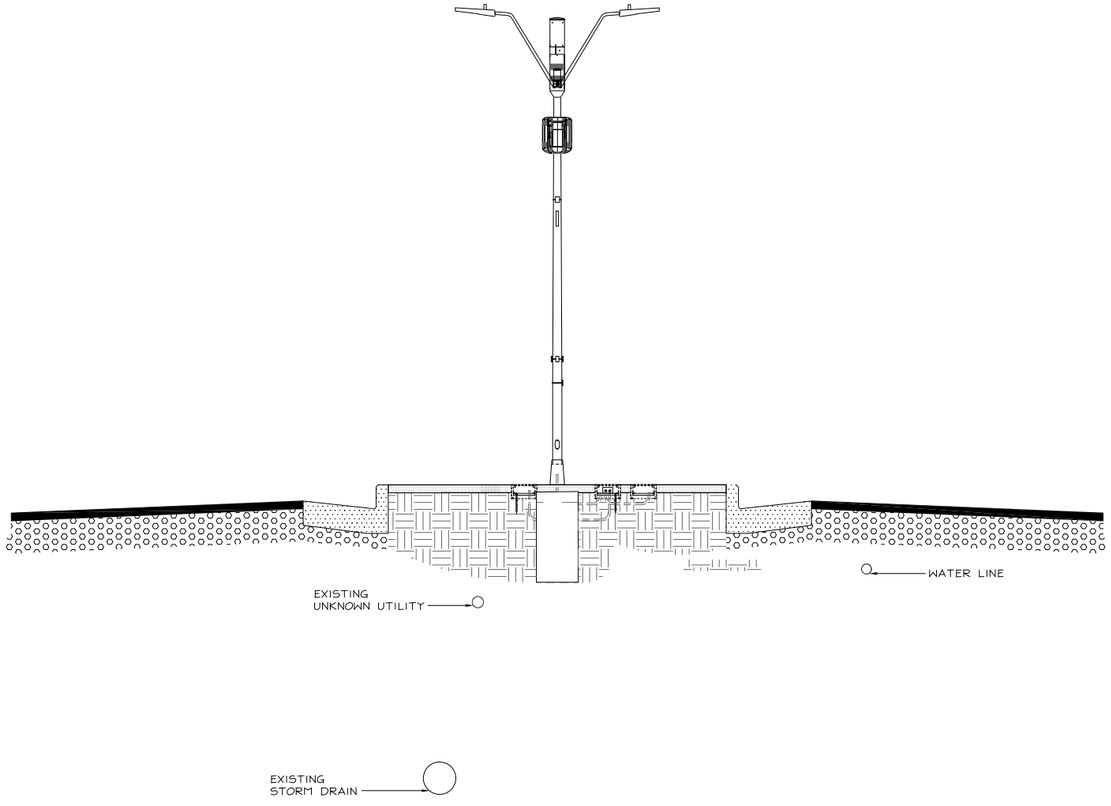
SF PALO ALTO 164
PUBLIC R.O.W. ADJACENT TO:
ARBORETUM RD
PALO ALTO, CA 94304
LOCATION CODE: 425268

SHEET TITLE
CITY STANDARDS & DETAILS

SHEET NUMBER
A-1.6

1. ALL WORK SHALL COMPLY WITH THE CITY OF PALO ALTO 2018 STANDARD DRAWINGS AND SPECIFICATIONS BORING, TRENCHING, POTHOLING AND DEWATERING, SECTION 17
2. THE LOCATION OF EXISTING UTILITY MAINS AND LATERAL LINES INCLUDING STORM DRAIN, SANITARY SEWER, WATER, GAS, UNDERGROUND ELECTRICAL AND COMMUNICATION CONDUITS CROSSING THE TRENCH EXCAVATION SHALL BE VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UNDERGROUND SERVICES ALERT (USA) AT 811 OR 800-642-2444 AT LEAST FIVE (5) WORKING DAYS PRIOR TO BEGINNING UNDERGROUND WORK SO THAT EXISTING UTILITIES CAN BE MARKED IN THE FIELD, UNLESS OTHERWISE STATED BY CITY CONTRACT.
3. EXCAVATION SHALL BE SUPPORTED AND EXCAVATION OPERATIONS CONDUCTED IN ACCORDANCE WITH THE RULES OF THE CALIFORNIA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA). IF IN THE OPINION OF THE ENGINEER, THERE EXISTS A SITUATION OF IMMINENT DANGER TO THE WORKERS, THE ENGINEER MAY ORDER THE WORK STOPPED AND THE CONTRACTOR SHALL COMPLY WITH RULES OF THE CALIFORNIA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA).
4. BACKFILL SHALL BE SAND OR GRANULAR MATERIAL FALLING WITHIN THE LIMITS DESCRIBED IN THE STANDARD DRAWING 401. AGGREGATE BASE, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE SHALL CONFORM TO THE REQUIREMENTS WITHIN THESE SPECIFICATIONS.
5. THE CONTRACTOR SHALL INSTALL THE CONDUIT IN ACCORDANCE WITH THE APPROVED STREET WORK PERMIT. ALL CONDUITS SHALL BE INSTALLED UNDERGROUND USING DIRECTIONAL BORING METHOD. MICRO-TUNNELING OR OTHER METHODS SHALL BE APPROVED BY THE PUBLIC WORKS ENGINEERING DIVISION. THE CONDUITS SHALL BE INSTALLED WITH TRACER WIRE APPROVED BY THE ENGINEER PER CITY OF PALO ALTO UTILITIES DEPARTMENT WATER, GAS AND WASTEWATER UTILITY STANDARDS. REFER TO STANDARD DRAWING 402.
6. TRENCHES SHALL NOT BE LEFT OPEN AT THE END OF THE DAY. ADEQUATE PROVISIONS SHALL BE MADE FOR THE PLACING OF TEMPORARY STEEL PLATES IN ADDITION TO BARRICADES, SIGNING AND LIGHTING. STOCKPILING OF EXCAVATED MATERIAL WITHIN THE PUBLIC RIGHT-OF-WAY SHALL NOT BE ALLOWED. A MAXIMUM OF THREE-HUNDRED (300) FEET OR ONE (1) CITY BLOCK OF TRENCH, WHICHEVER IS GREATER, MAY BE OPENED AT ONE TIME. FOR TEMPORARY PATCHING, A MINIMUM THICKNESS OF TWO (2) INCHES OF CUTBACK WILL BE USED.
7. PRIOR TO EXCAVATION OF TRENCHING, POTHOLING OR SENDING/RECEIVING PITS, THE ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE SHALL BE CUT OR MILL TO A NEAT LINE FULL DEPTH WITH A SAW-CUTTING OR MILLING DEVICE APPROVED BY THE ENGINEER.
8. BACKFILL MATERIAL SHALL BE COMPACTED TO 90 PERCENT MINIMUM RELATIVE COMPACTION EXCEPT THE TOP TWENTY-FOUR (24) INCHES, WHICH SHALL BE MECHANICALLY COMPACTED TO 95 PERCENT MINIMUM RELATIVE COMPACTION. MECHANICALLY COMPACTED LIFTS USING ALTERNATIVE EQUIPMENT, COMPLYING WITH MANUFACTURE'S SPECIFICATION, WILL REQUIRE THE APPROVAL OF THE ENGINEER. USE OF ALTERNATIVE COMPACTION EQUIPMENT SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ANY DAMAGE TO THE CONDUIT, SURROUNDING GROUND, OR EXISTING AND NEW IMPROVEMENTS.

2 NOTES



1 R.O.W SECTION
NTS

Sawcutting & Asphalt/Concrete Removal

- ☐ Protect storm drain inlets during saw cutting.
- ☐ If saw cut slurry enters a catch basin, clean it up immediately.
- ☐ Shovel or vacuum saw cut slurry deposits and remove from the site. When making saw cuts, use as little water as possible. Sweep up, and properly dispose of all residues.

811 USA North
Know what's below. Call before you dig.
California and Nevada
Call Two Working Days Before You Dig!
811 / 800-227-2600

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WASAM ZALZALI
71655
STATE OF CALIFORNIA
CIVIL

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

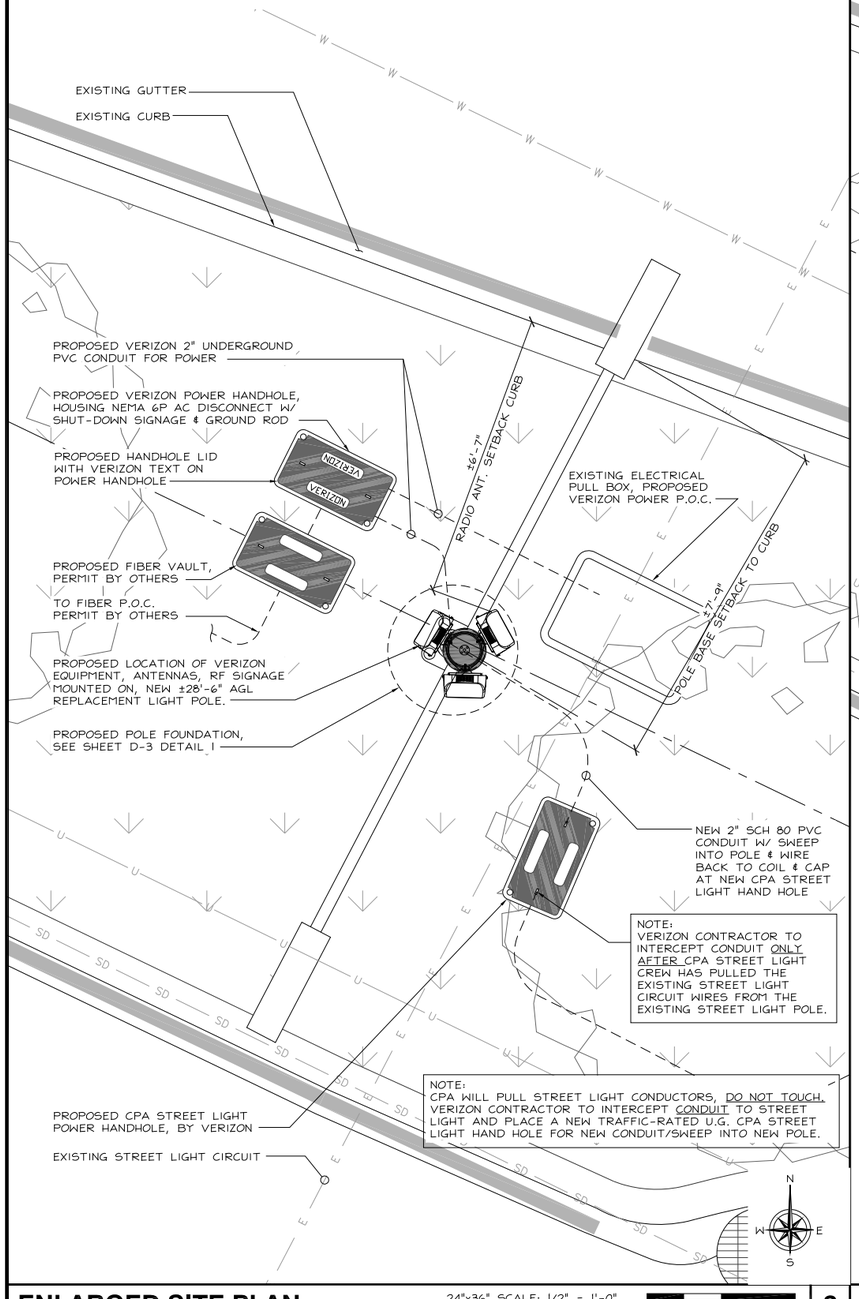
SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
R.O.W. SECTION

SHEET NUMBER
A-1.7

NOTES:

1. THE CONTRACTOR MAY BE REQUIRED TO SUBMIT A LOGISTICS PLAN TO THE PUBLIC WORKS DEPARTMENT PRIOR TO COMMENCING WORK THAT ADDRESSES ALL IMPACTS TO THE CITY'S RIGHT-OF-WAY, INCLUDING, BUT NOT LIMITED TO: PEDESTRIAN CONTROL, TRAFFIC CONTROL, TRUCK ROUTES, MATERIAL DELIVERIES, CONTRACTOR'S PARKING, CONCRETE POURS, CRANE LIFTS, WORK HOURS, NOISE CONTROL, DUST CONTROL, STORM WATER POLLUTION PREVENTION, CONTRACTOR'S CONTACT, NOTICING OF AFFECTED SURROUNDING PROPERTIES , AND SCHEDULE OF WORK. THE REQUIREMENT TO SUBMIT A LOGISTICS PLAN WILL BE DEPENDENT ON THE NUMBER OF APPLICATIONS PUBLIC WORKS ENGINEERING RECEIVES WITHIN CLOSE PROXIMITY TO HELP MITIGATE AND CONTROL THE IMPACT TO THE PUBLIC-RIGHT-OF-WAY. IF NECESSARY, PUBLIC WORKS MAY REQUIRE A LOGISTICS PLAN DURING CONSTRUCTION.
2. TREES MAY NOT BE PLANTED WITHIN 10 FEET OF EXISTING WATER, GAS OR WASTEWATER MAINS/SERVICES OR METERS; LESSER DISTANCES REQUIRE A PERMANENT IMPERMEABLE ROOT-BARRIER A MINIMUM OF 3' HORIZONTAL FROM WATER, GAS AND WASTEWATER SERVICES/MAINS/METERS.



ENLARGED SITE PLAN

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'

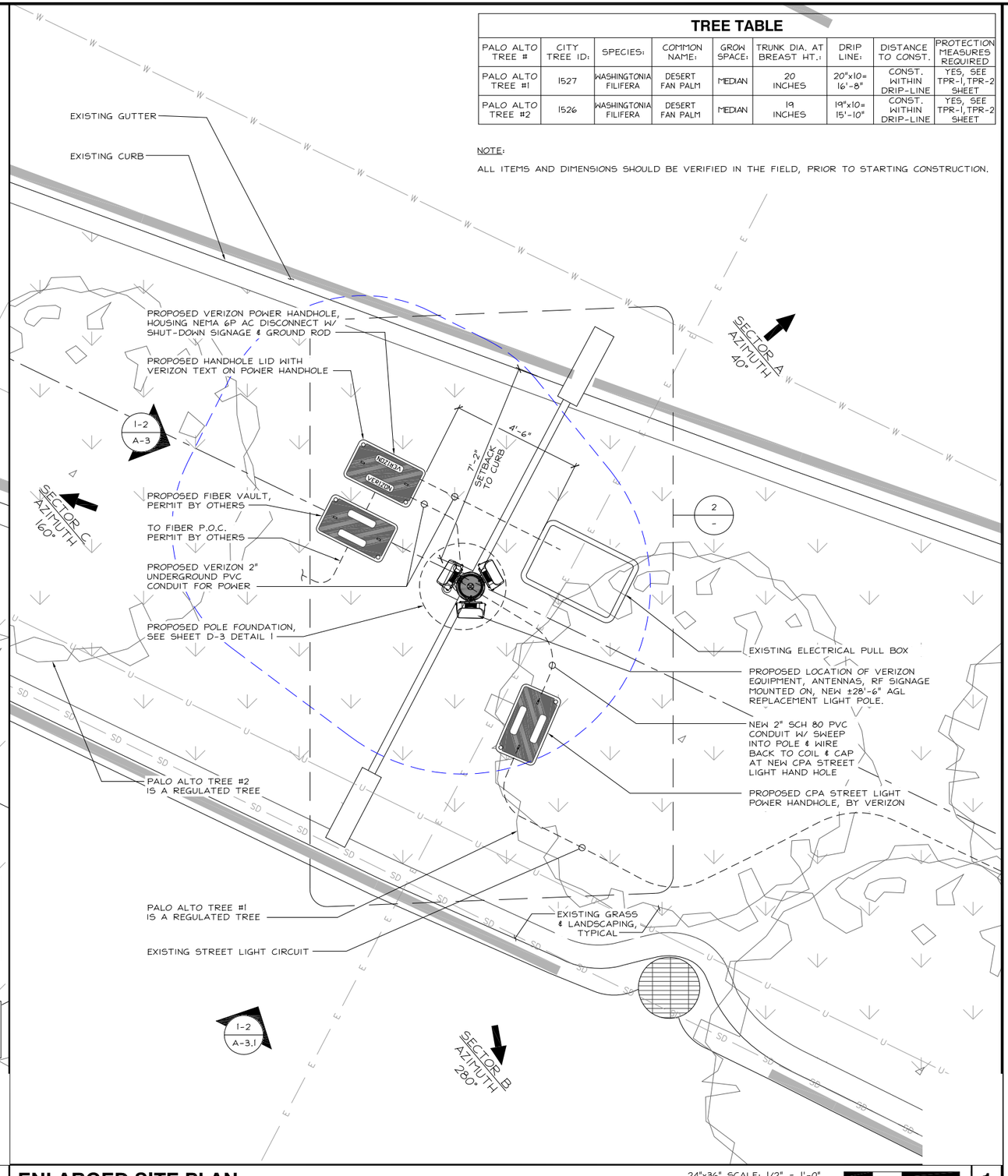
2

TREE TABLE

PALO ALTO TREE #	CITY TREE ID:	SPECIES:	COMMON NAME:	GROW SPACE:	TRUNK DIA. AT BREAST HT.:	DRIP LINE:	DISTANCE TO CONST.	PROTECTION MEASURES REQUIRED
PALO ALTO TREE #1	1527	WASHINGTONIA FILIFERA	DESERT FAN PALM	MEDIAN	20 INCHES	20"x10"= 16'-8"	CONST. WITHIN DRIP-LINE	YES, SEE TPR-1, TPR-2 SHEET
PALO ALTO TREE #2	1526	WASHINGTONIA FILIFERA	DESERT FAN PALM	MEDIAN	19 INCHES	19"x10"= 15'-10"	CONST. WITHIN DRIP-LINE	YES, SEE TPR-1, TPR-2 SHEET

NOTE:

ALL ITEMS AND DIMENSIONS SHOULD BE VERIFIED IN THE FIELD, PRIOR TO STARTING CONSTRUCTION.



ENLARGED SITE PLAN

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
ENLARGED SITE PLAN

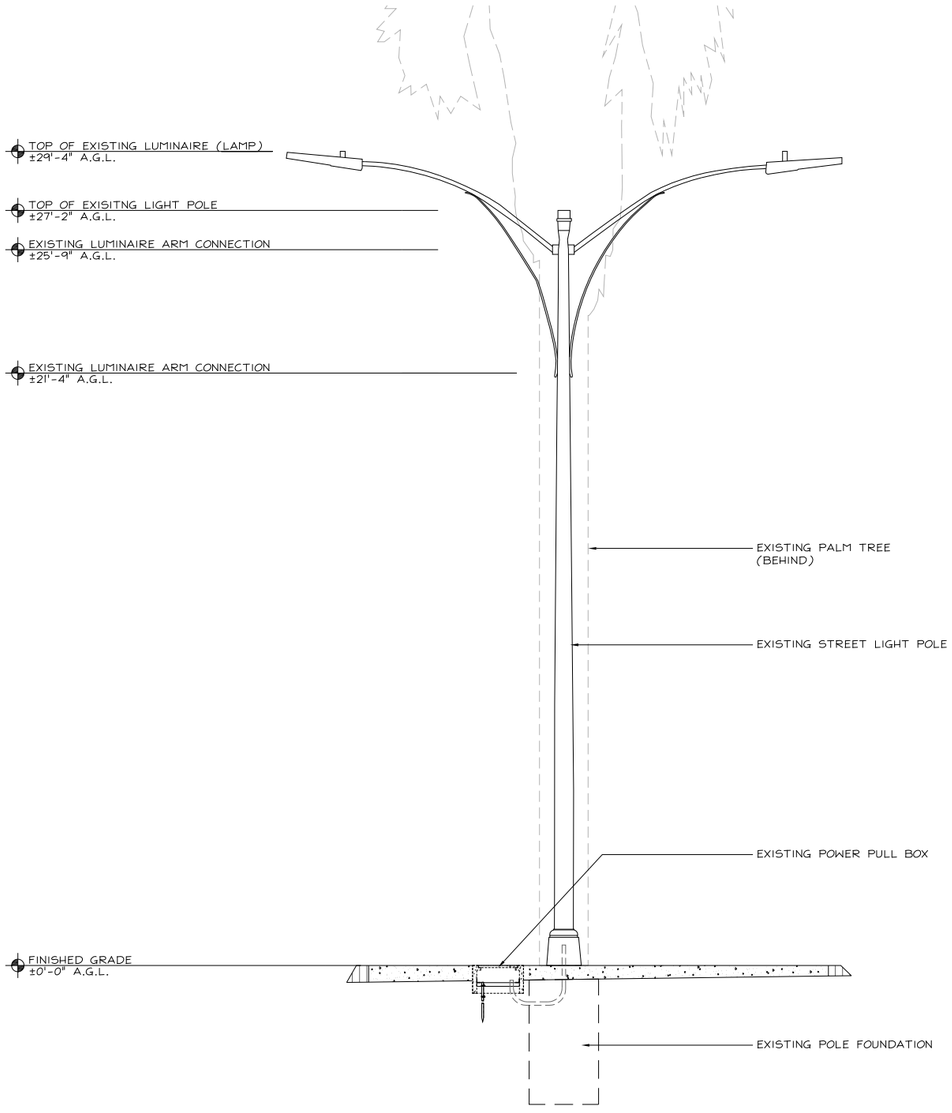
SHEET NUMBER
A-2

NOTES:

1. NEW GALVANIZED LIGHT POLE TO BE PAINTED WITH MUNSELL RAL5.5GY2.76/2.1 PAINT.
2. NEW RADIOS AND HARDWARE TO BE PAINTED MUNSELL RAL5.5GY2.76/2.1 OR WRAPPED AS ALLOWED BY THE MANUFACTURER.
3. ALL CABLE/WIRE BETWEEN THE POLE ACCESS HOLE AND THE SHROUD GROMMET HOLE WILL RUN TROUGH 1.5" CONDUIT PAINTED/COLORED TO MATCH POLE COLOR.

TOTAL ANETNNA/SHROUD VOLUME (CU. FT.)

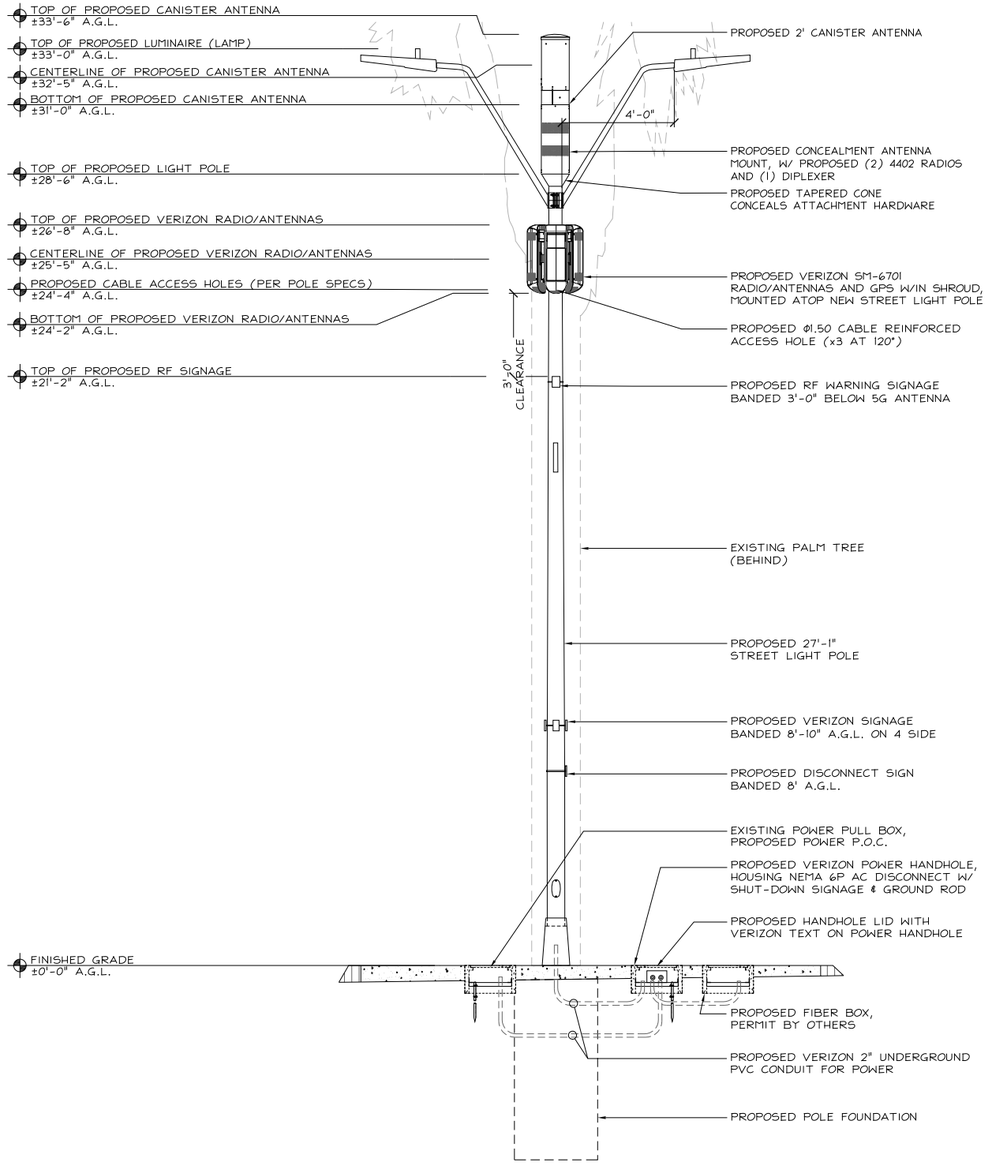
MODEL	TOTAL	TOTAL VOLUME (CU. FT.)
COMMSCOPE	1	±4.41
6701 W/ SHROUD	3	±2.55



EXISTING NORTHWEST ELEVATION

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'

2



PROPOSED NORTHWEST ELEVATION

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

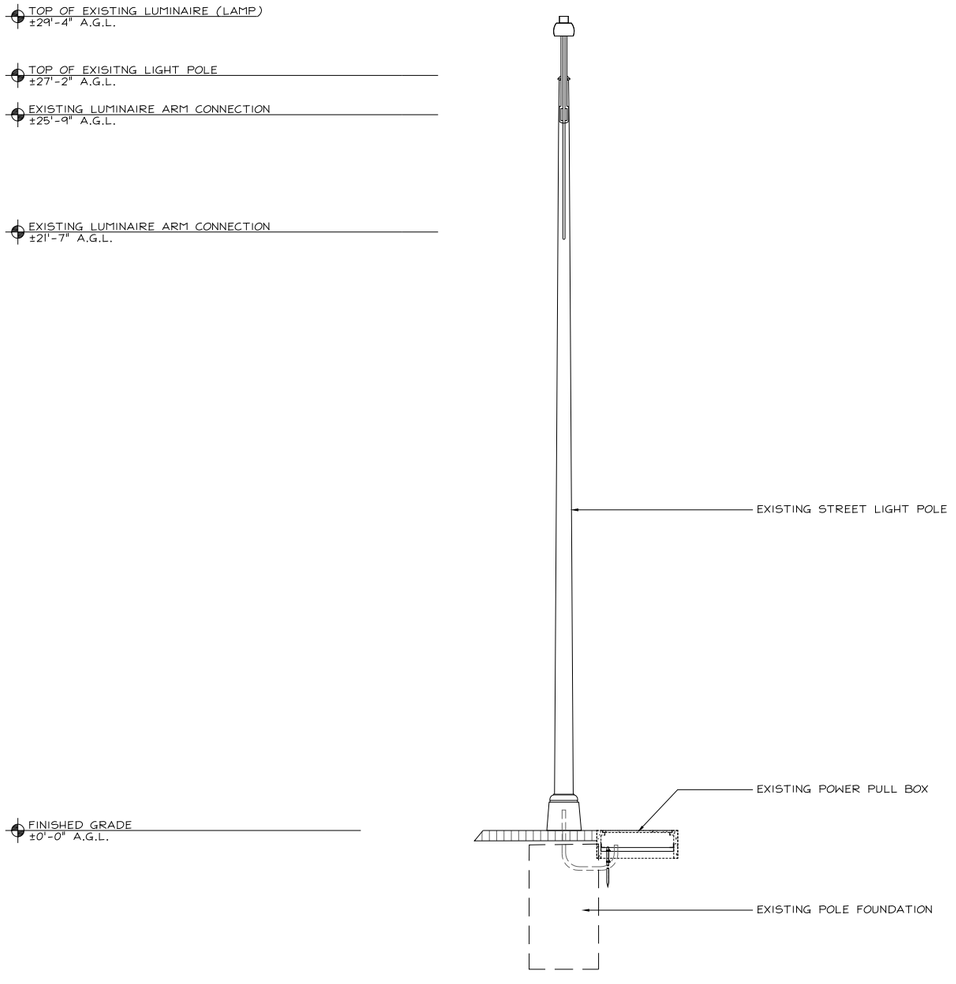
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
ELEVATIONS

SHEET NUMBER
A-3



EXISTING SOUTHWEST ELEVATION

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

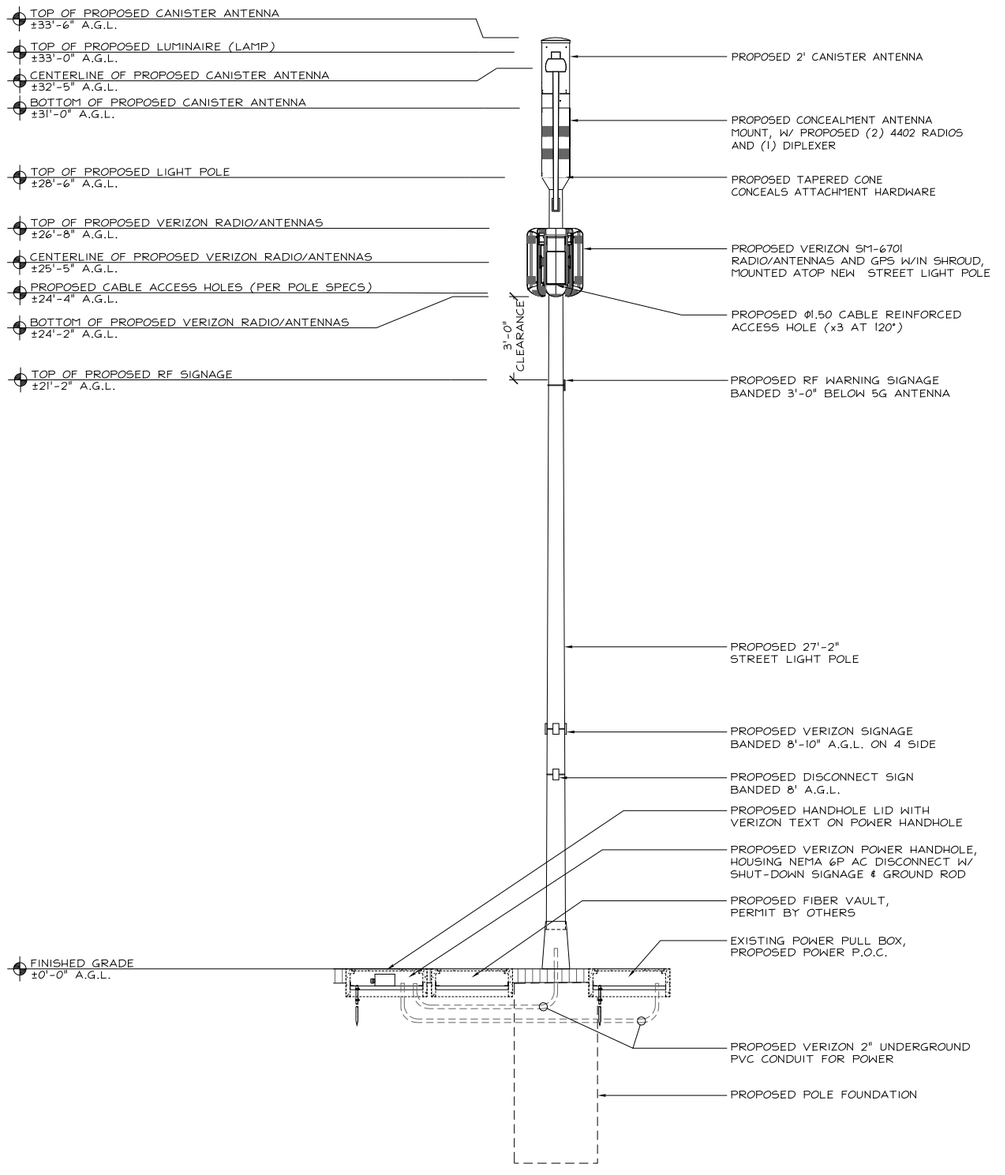
2 2' 1' 0" 2'

NOTES:

1. NEW GALVANIZED LIGHT POLE TO BE PAINTED WITH MUNSELL RAL5.5GY2.76/2.1 PAINT.
2. NEW RADIOS AND HARDWARE TO BE PAINTED MUNSELL RAL5.5GY2.76/2.1 OR WRAPPED AS ALLOWED BY THE MANUFACTURER.
3. ALL CABLE/WIRE BETWEEN THE POLE ACCESS HOLE AND THE SHROUD GROMMET HOLE WILL RUN TROUGH 1.5" CONDUIT PAINTED/COLORED TO MATCH POLE COLOR.

TOTAL ANETNNA/SHROUD VOLUME (CU. FT.)

MODEL	TOTAL	TOTAL VOLUME (CU. FT.)
COMMSCOPE	1	±4.41
6701 W/ SHROUD	3	±2.55



PROPOSED SOUTHWEST ELEVATION

24"x36" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

1 2' 1' 0" 2'

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

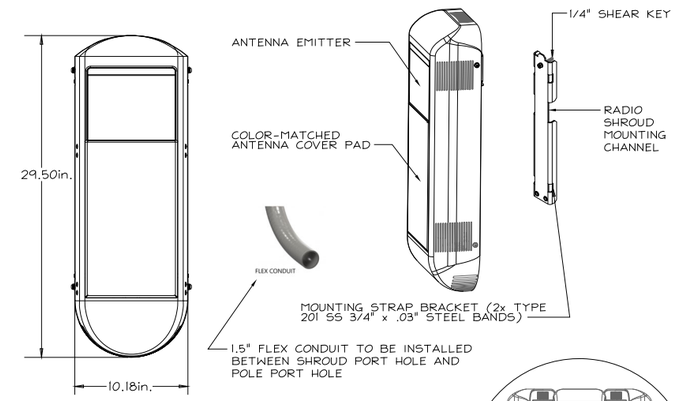
SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
ELEVATIONS

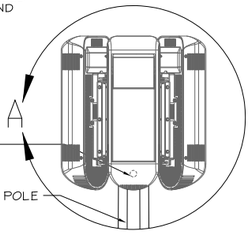
SHEET NUMBER
A-3.1

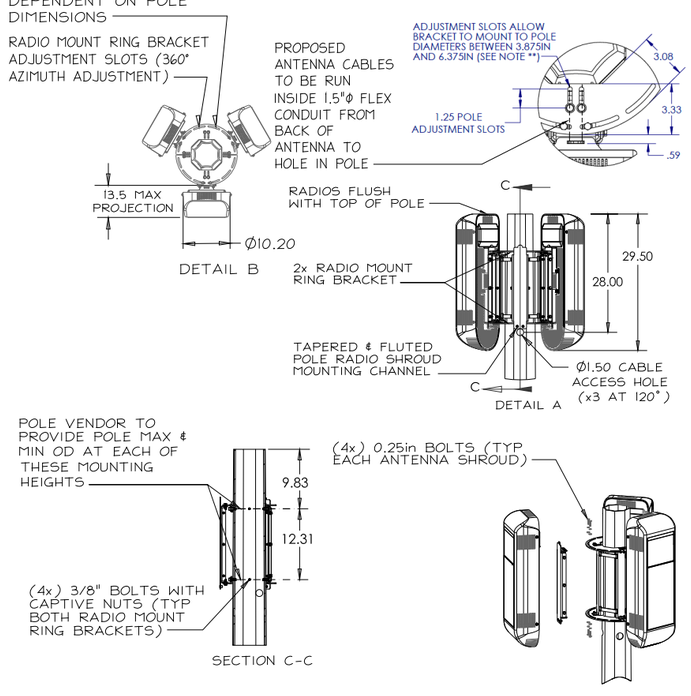
ERICSSON 6701 POLE ATTACHMENT SHROUD (OR APPROVED EQUAL)

NOTES:
1. FULL SHROUD PAINTABLE TO MATCH COLOR OF EXISTING STRUCTURE.
2. COLOR-MATCHED 3M FILM TO BE APPLIED TO ANTENNA EMITTER FACE.
3. SHROUD DRY WEIGHT = 18 LBS.
4. TOTAL WEIGHT INCLUDING ANTENNA = 49LBS.
5. ANTENNA/SHROUD VOLUME = 0.85 CU.FT. (EACH)



DETAIL A (SECTOR 1 RADIO HIDDEN FOR CLARITY)





SM6701 SHROUD & MOUNTING DETAILS

24"x36" SCALE: NTS
11"x17" SCALE: NTS

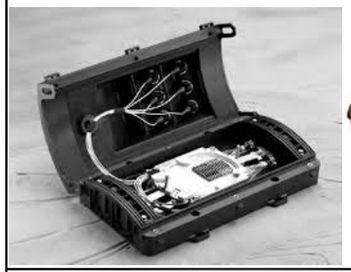
7

PREFORMED LINE PRODUCTS

COYOTE TERMINAL CLOSURE (FIBER DEMARCATION UNIT)

- DIMENSIONS: 18.76"L x 9.70"W x 5.13"D
- WEIGHT: N/A

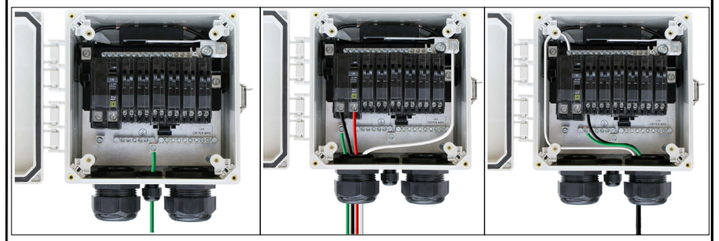
OR VERIZON APPROVED EQUAL



FIBER DEMARCATION UNIT

24"x36" SCALE: NTS
11"x17" SCALE: NTS

6

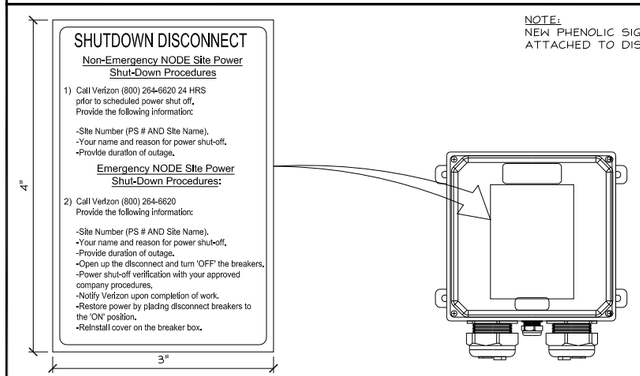


GROUND | AC POWER "IN" | AC POWER "OUT"

AC POWER DISCONNECT WIRE DIAGRAM

5

NOTE:
NEW PHENOLIC SIGN TO BE ATTACHED TO DISCONNECT



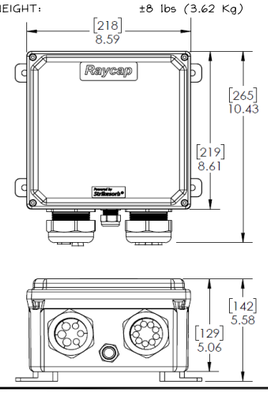
SHUTDOWN SIGN ON DISCONNECT

24"x36" SCALE: NTS
11"x17" SCALE: NTS

4

Raycap RSCAC-1333-PH-240 AC POWER DISCONNECT (OR APPROVED EQUAL)

- DIMENSIONS: 10.43"L x 8.59"W x 5.06"D
- WEIGHT: ±8 lbs (3.62 Kg)



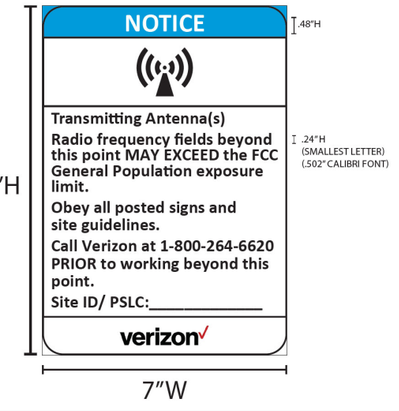
RSCAC-1333-PH-240

NEMA 6P AC POWER DISCONNECT

24"x36" SCALE: NTS
11"x17" SCALE: NTS

3

CONTRACTOR NOTE:
- SITE ID WILL BE SWITCH #, SITE # AND SITE NAME.
- NODE NUMBER WILL BE MARKET#-NODE.B#-SMALL CELL NAME.



NOTE:
INSTALL EME NOTICE SIGN 3' BELOW STREET MACRO UNITS.

GO95 RF SIGNAGE

24"x36" SCALE: NTS
11"x17" SCALE: NTS

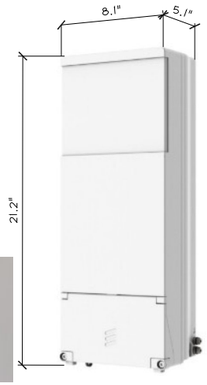
2

ERICSSON STREET MACRO 6701

- DIMENSION W/ PROTRUDING ITEMS INCL GPS ANT: 21.2"H x 8.1"W x 5.1"D
- TOTAL RADIO AREA (CU. IN.): 875.77 CU. IN.
- WEIGHT: ±31 lbs

RADIO AREA (CU. FT.)			
RADIO MODEL	TOTAL RADIO(S)	TOTAL RADIO AREA (CU. IN.)	TOTAL RADIO AREA (CU. FT.)
MACRO 6701	1	875.77 CU. IN.	0.51 CU. FT.

NEW GPS ATTACHED ON TOP OF SM 6701 (PRE INSTALLED BY MANUFACTURER) (1) TOTAL (MAX. MEASUREMENTS WILL NOT EXCEED)



STREET MACRO 6701

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
STATE OF CALIFORNIA
CIVIL

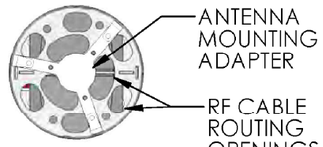
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

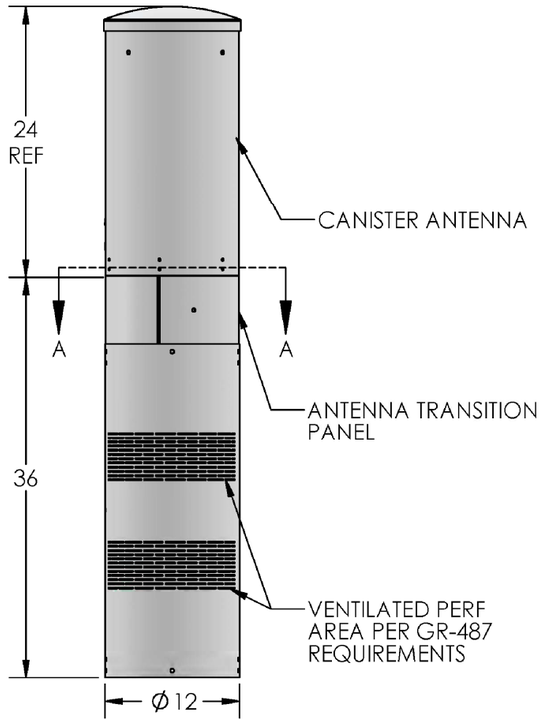
SHEET TITLE
DETAILS

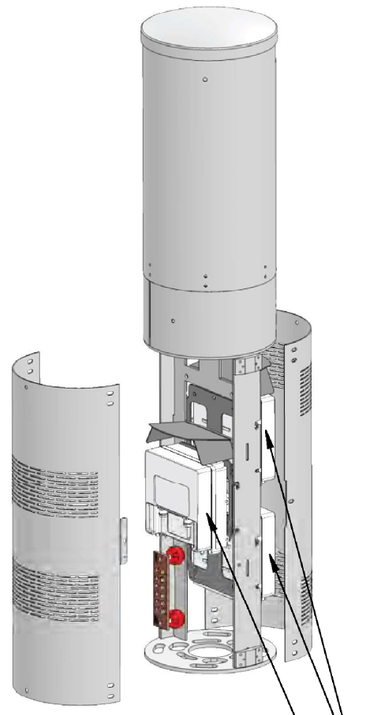
SHEET NUMBER
D-1

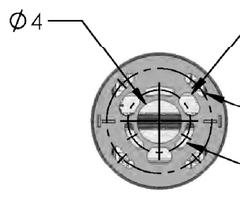
REVISIONS			
REV.	DESCRIPTION	BY	DATE
A	INITIAL RELEASE	MJP	02/12/2019



SECTION A-A







These drawings and specifications are the proprietary property of CommScope Inc. and may be used only for the specific purpose authorized in writing by CommScope Inc.

ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:

.X = ±	.12	ANGLES	±2°
.XX = ±	.06	FRACTIONS	±1/32
.XXX = ±	.031		

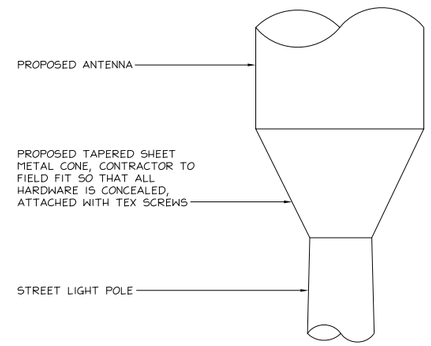
REMOVE BURRS AND BREAK EDGES .005

DO NOT SCALE THIS PRINT

DRAWN BY: MJP	SHEET: 1 of 1	PART NUMBER: SSC760236966E21x	
CHECKED BY:	SCALE:	DESCRIPTION: METRO CELL, SOLN - PT 12 IN, ERC	
DATE:	MATERIAL:	DRAWING TYPE:	
REVISION: A	FINISH:	COMMSCOPE®	
	WEIGHT:		

24"x36" SCALE: NTS
11"x17" SCALE: NTS | 4 | ERICSSON 4402 AWS/PCS RADIO

NOTE:
PAINT CONE TO MATCH AS REQUIRED BY JURISDICTION



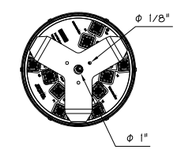
CONE DETAIL

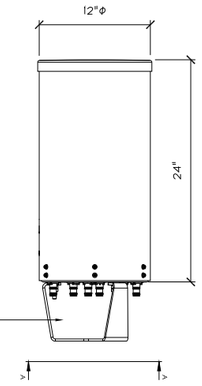
24"x36" SCALE: NTS
11"x17" SCALE: NTS | 3

COMMSCOPE® COMMSCOPE VVSSP-360S-M CANISTER ANTENNA

- DIMENSIONS: 24"H x 12"Φ
- WEIGHT: ±38.6 lbs (17.5 Kg)

VIEW A-A
BRACET NOT SHOWN





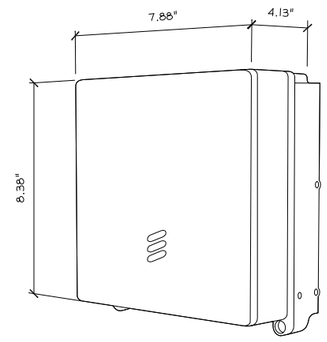
COMMSCOPE ANTENNA

24"x36" SCALE: NTS
11"x17" SCALE: NTS | 2

ERICSSON

ERICSSON 4402 AWS/PCS RADIO

- DIMENSIONS: 8.38"H x 7.88"W x 4.13"D
- WEIGHT: ±10.15 lbs (4.6 Kg)



ERICSSON 4402 AWS/PCS RADIO

24"x36" SCALE: NTS
11"x17" SCALE: NTS | 1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
DETAILS

SHEET NUMBER
D-2

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Verizon Wireless, a wireless telecommunications carrier, to evaluate three small cells proposed to be sited in Palo Alto, California, for compliance with municipal limits on sound levels from the installations.

Executive Summary

Verizon proposes to install antennas and equipment on three light poles sited in the public right-of-way in Palo Alto. Noise from the proposed operations will comply with the City's pertinent noise limits.

Prevailing Standard

Palo Alto adopted Resolution No. 9825 (April 15, 2019) "Resolution of the Council of the City of Palo Alto Adopting Objective Aesthetic, Noise, and Related Standards for Wireless Communication Facilities in the Public Rights of Way," which sets limits on noise at residential areas for wireless facilities installed in public rights-of-way. Noise at the nearest residential property line is limited to an increase of 5 dB over existing ambient levels, if the ambient noise level would remain below 60 dBA L_{dn}, or to an increase of 3 dB, otherwise. The composite "day-night" average L_{dn} incorporates a 10 dB penalty during nighttime hours (10 pm to 7 am), to reflect typical residential conditions, where noise is more readily heard at night. By definition, sound from a continuous noise source will be 6.4 dB higher when expressed in L_{dn}.

It is noted that the amended language also references Chapter 9.10 of the Code, which had set a more relaxed increase of 15 dB increase for such WCF sitings, assessed at 25 feet from the pole. It is assumed for this study that the minimum reference ambient level is 40 dBA, as defined in Chapter 9.10.

A summary of noise assessment and calculation methodologies is shown in Figure 1.

General Facility Requirements

Small cells typically consist of two distinct parts: the electronic transceivers (also called "radios"), that are connected to traditional wired telephone lines, and the antennas that send wireless signals created by the radios out to be received by individual subscriber units. The radios are typically mounted on the support pole or placed in a cabinet at the base of the pole, and are connected to the antennas by cables. Some radios require fans to cool the electronics inside. Some radios are integrated with the antennas as a single unit.

Site & Facility Description

According to information provided by Verizon, that carrier proposes to install a cylindrical antenna and two Ericsson Model 4402 radio units within a shroud on top of the light pole in the public right-of-way at each of the three locations listed in Table 1, and three Ericsson Model 6701 antennas, with integrated radios, within shrouds below the light arm on the pole.

Study Results

Ericsson reports that the maximum noise level from any one Model 4402 radio is 40.9 dBA,* and that the maximum noise level from three Model 6701 units is 39.6 dBA,* both at a reference distance of 5 feet. The cylindrical antenna is passively cooled, generating no noise.

At a distance of 6¼ feet, the calculated noise level from the simultaneous operation of this combined equipment would result in an increase not exceeding 5 dB above the minimum allowed ambient level of 40 dBA; the increase above the ambient would be less than 5 dB for any siting of the equipment beyond this distance. If the existing ambient were determined to be above 40 dBA statutory minimum, then the calculated increase due to the Verizon operation would, by definition, decrease. **All of the proposed small cells in Table 1 meet this distance requirement.**

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that operation of these Verizon Wireless small cells proposed in Palo Alto will, under the conditions noted above, comply with the municipal standards limiting acoustic noise emission levels.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2021. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

December 16, 2020

William F. Hammett, P.E.
707/996-5200

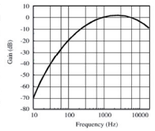
* Adjusted value based on manufacturer data, to reflect record high temperature of 107°F in Palo Alto.

Small Cell No.	Approximate Address	Nearest Residential Property
425225 "SF Palo Alto 121"	1600 El Camino Real (CA-82)	120 feet
425266 "SF Palo Alto 162"	158-164 Quarry Road	1,130 feet
425268 "SF Palo Alto 164"	Arboretum Road	200 feet

Table 1. Proposed Verizon small cells

Noise Level Calculation Methodology

Most municipalities and other agencies specify noise limits in units of dBA, which is intended to mimic the reduced receptivity of the human ear to Sound Pressure ("L_P") at particularly low or high frequencies. This frequency-sensitive filter shape, shown in the graph to the right as defined in the International Electrotechnical Commission Standard No. 179, the American National Standards Institute Standard No. 5.1, and various other standards, is also incorporated into most calibrated field test equipment for measuring noise levels.



30 dBA	library
40 dBA	rural background
50 dBA	office space
60 dBA	conversation
70 dBA	car radio
80 dBA	traffic corner
90 dBA	lawnmower

The dBA units of measure are referenced to a pressure of 20 μPa (micropascals), which is the threshold of normal hearing. Although noise levels vary greatly by location and noise source, representative levels are shown in the box to the left.

Manufacturers of many types of equipment, such as air conditioners, generators, and telecommunications devices, often test their products in various configurations to determine the acoustical emissions at certain distances. This data, normally expressed in dBA at a known reference distance, can be used to determine the corresponding sound pressure level at any particular distance, such as at a nearby building or property line. The sound pressure drops as the square of the increase in distance, according to the formula:

$$L_P = L_K + 20 \log(D_K/D_P),$$

where L_P is the sound pressure level at distance D_P and L_K is the known sound pressure level at distance D_K.

Individual sound pressure levels at a particular point from several different noise sources cannot be combined directly in units of dBA. Rather, the units need to be converted to scalar sound intensity units in order to be added together, then converted back to decibel units, according to the formula:

where L_T is the total sound pressure level and L_1, L_2, etc are individual sound pressure levels.

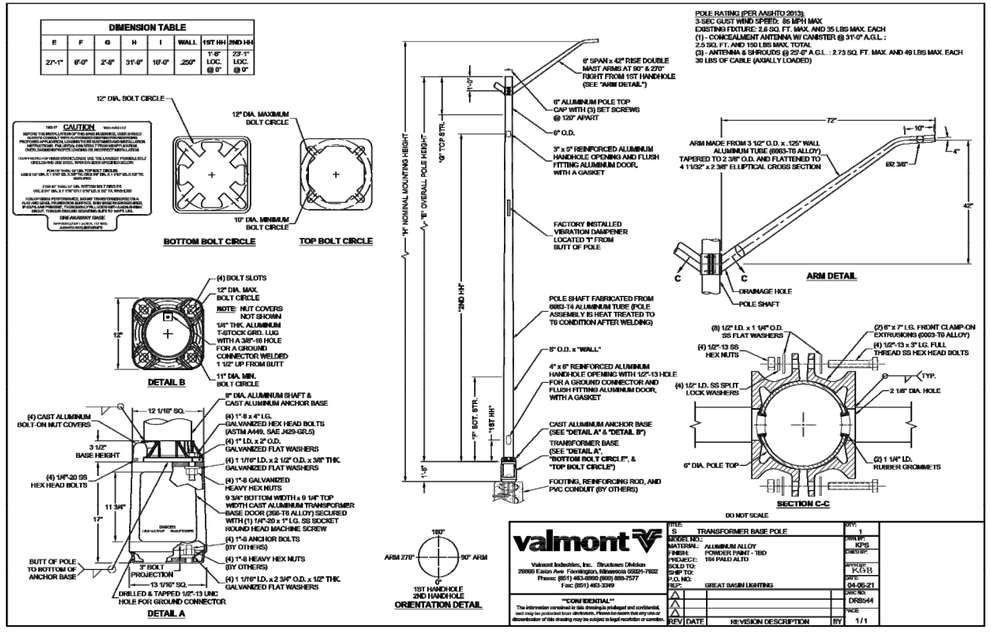
$$L_T = 10 \log (10^{L_1/10} + 10^{L_2/10} + \ldots),$$

Certain equipment installations may include the placement of barriers and/or absorptive materials to reduce transmission of noise beyond the site. Noise Reduction Coefficients ("NRC") are published for many different materials, expressed as unitless power factors, with 0 being perfect reflection and 1 being perfect absorption. Unpainted concrete block, for instance, can have an NRC as high as 0.35. However, a barrier's effectiveness depends on its specific configuration, as well as the materials used and their surface treatment.

NOISE STUDY

24"x36" SCALE: NTS
11"x17" SCALE: NTS

2

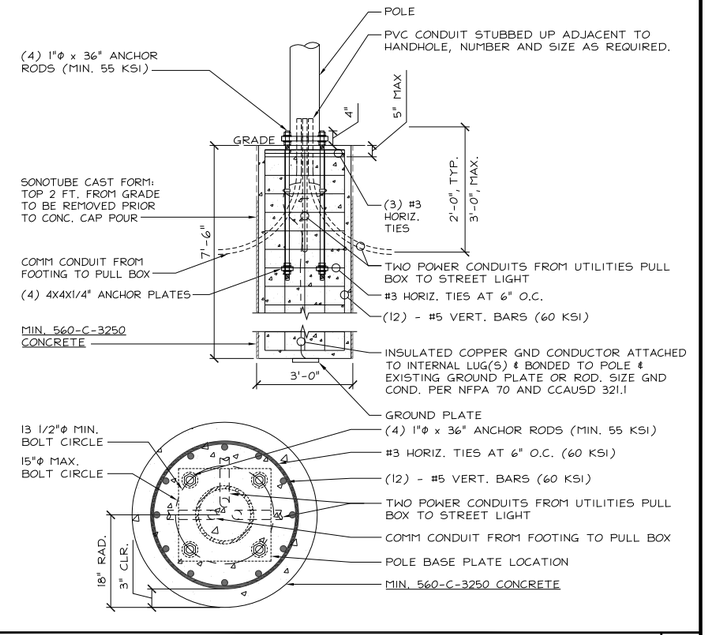


POLE SPECS

24"x36" SCALE: NTS
11"x17" SCALE: NTS

3

NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.



FOUNDATION DETAIL

24"x36" SCALE: NTS
11"x17" SCALE: NTS

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
NOISE STUDY,
FOUNDATION DETAILS,
POLE DRAWINGS

SHEET NUMBER
D-3

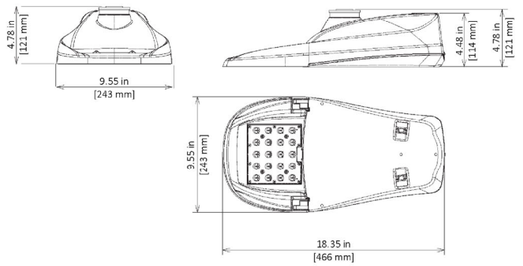
LEOTEK
LITE-ON GROUP

Project
Type
Catalog No.

GreenCobra™ Jr. LED Street Light
GCJ G-Series Specification Data Sheet

Luminaire Data

Weight 7.7 lbs [3.5 kg]
EPA 0.39 ft²



Ordering Information
Sample Catalog No. GCJ1 20G MV NW 2 GY 580

Product	LED No. & Type	Voltage	Color Temperature	Distribution	Finish	Drive Current Code[1]	Options
GCJ1 350mA to 700mA	**20G**	**MV** 120-277V	**WW** 3000K	**2** Type 2	**GY** Gray	**350**[3] 350mA	**FDC**[4] Fixed Drive Current
			NW 4000K	**3** Type 3	**DB** Dark Bronze	**580**[2] 580mA	**LPCR** Less Photocontrol Receptacle
GCJ2 700mA to 1A			**CW** 5000K		**BK** Black	**700** 700mA	**PCR7**[5] ANSI 7-wire Photo-control Receptacle
						1A[3] 1A	**PCR7-CR**[6] Control Ready 7-wire PC Receptacle
							WL Utility Wattage Label
							4B 4-Bolt Mounting Bracket
							RWG Rubber Wildlife Guard-
							CF[7] Coastal Paint Finish

Notes:
1 Specified drive current code is the factory set maximum drive current. Field adjustable current selector enables standard dimming to lower wattage drive currents only. Consult factory if wattage limits require a special drive current.
2 350mA and 580mA drive current available with GCJ1 only.
3 1A drive current available with GCJ2 only.
4 Non-field adjustable, fixed drive current. Specify required drive current. Not available with PCR7-CR option.
5 Field adjustable current selector included to enable standard dimming to lower wattage drive currents only. Field changeable connectors included to enable connection to PCR7 (wireless node dimming is disabled by default)
6 Control-ready wiring at factory for wireless node dimming. Default maximum drive current (700mA or 1A) must be specified.
7 Specify the CF Option if the luminaire is installed within one mile of a saltwater coastline in order for the finish to be covered by warranty.
8 Flush mounted house side shield. Shield cuts light off at 1/2 mounting height behind luminaire.
9 Flush mounted cul-de-sac shield. Shield cuts light off at 1/2 mounting height behind luminaire and 1-1/2 mounting height on either side of luminaire.
10 Specify Color (GY, DB, BK)

Accessories*	
HSSGCJ[8]	House Side Shield, Snap-On*
CSSGCJ[9]	Cul-De-Sac Side Shield, Snap-On*
SPB[10]	Square Pole Horizontal Arm Bracket
RPB[10]	Round Pole Horizontal Arm Bracket
PTB[10]	Pole Top Tenon Horizontal Arm Bracket
WB[10]	Wall Horizontal Arm Bracket
BSK	Bird Deterrent Spider Kit
LLPC	Long-Life Twist Lock Photocontrol
SC	Twist Lock Shorting Cap

*Unless specified for field installation, Shields and Shorting Caps are shipped installed. All other options are shipped separately.

© 2020 Leotek Electronics USA. GCJ G-Series_Specification_Sheet_08-31-20. Specifications subject to change without notice.

LEOTEK
LITE-ON GROUP

GreenCobra™ Jr. LED Street Light
GCJ G-Series Specification Data Sheet

Luminaire Specifications

Housing
Die cast aluminum housing with universal two-bolt slip fitter mounts to 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter mast arm. One-piece aluminum housing provides passive heat-sinking of the LEDs and has upper surfaces that shed precipitation. Four-bolt mounting bracket is available. Mounting provisions meet 3G vibration per ANSI C136.31-2010 Normal Application, Bridge & Overpass. Mounting has leveling adjustment from ± 5° in 2.5° steps. Electrical components are accessed without tools via die cast aluminum door with stainless steel quick-release latches. Provided standard with removable polycarbonate wild life guard. For additional protection, optional rubber wildlife guard (RWG) which conforms snugly to the mast arm is offered.

Light Emitting Diodes
LEDs produce minimun 90% of initial intensity at 60,000 hours hours of life per IES recommended lumen maintenance life projection based on 6 times the duration ofthe collected LM-80 data. For details on IESNA Position on LED Product Lifetime Prediction, PS-10-18. LEDs have correlated color temperature of 3000K (WW), 4000K (NW), or 5000K (CW) and 70 CRI minimum. LEDs are ROHS compliant, 100% mercury and lead free.

Field Adjustability
LED lumen output can be changed in the field to adjust drive current for local conditions (not available with PCR7-CR option). The specified driver current will be the factory set output. Field adjustments can be made with the output selector included in the fixture. Field adjustable range shown in performance data table.

Quality Control
Every luminaire is performance tested before and after a 2-hour burn-in period. Assembled in the USA.

Optical Systems
Micro-lens optical systems produce IESNA Type 2 or Type 3 distributions and are fully sealed to maintain an IP66 rating. Luminaire produces 0% total lumens above 90° (BUG Rating, U=0). Optional house side shield cuts light off at 1/2 mounting height behind luminaire. Cul-de-sac shield provides back and side light control for end of cul-de-sac applications. Both shields are field installable without tools.

Electrical
Rated life of electrical components is 100,000 hours. Uses isolated power supply that is 1-10V dimmable. Power supply is wired with quick-disconnect terminals. Power supply features a minimum power factor of .90 and <20% Total Harmonic Distortion (THD). EMC meets or exceeds FCC CFR Part 15. Terminal block accommodates 6 to 14 gauge wire. Surge protection complies with IEEE/ANSI C62.41 Category C High, 20kV/10kA.

Controls
3-Wire photocontrol receptacle is standard. ANSI C136.41 7-wire (PCR7) photocontrol receptacles are available. All photocontrol receptacles have tool-less rotatable bases. Wireless control module is provided by others.

Finish
Housing receives a durable, fade-resistant polyester powder coat finish. Finish tested to withstand 3000 hours in salt spray exposure per ASTM B117. Finish tested 500 hours in UV exposure per ASTM G154 and meets ASTM D523 gloss retention. Coastal Finish meets G85 test standard.

Listings/Ratings/Labels
Luminaires are UL listed for use in wet locations in the United States and Canada. DesignLights Consortium™ qualified 120-277V product. International Dark Sky Association listed. Luminaire is qualified to operate at ambient temperatures of -40°C to 40°C.

Photometry
Luminaires photometrics are tested by certified independent testing laboratories in accordance with IES LM-79 testing procedures. IES files for all CCTs are available at leotek.com.

Warranty
10-year limited warranty is standard on luminaire and components. See Leotek.com for warranty details.

Vandal Resistance
Housing and optics rated to IK10

Performance Data: 4000K (NW) and 5000K (CW)
All data nominal. IES files for all CCTs are available at leotek.com.

Product	Drive Current (mA)	System Wattage (W)	Delivered Lumens (Lm)[1]	Efficacy (Lm/W)	Type 2 BUG Rating	Type 3 BUG Rating
GCJ1	350	24	2400	100	B1 U0 G1	B1 U0 G1
	580	38	3700	97	B1 U0 G1	B1 U0 G1
	700	48	4400	92	B1 U0 G1	B1 U0 G1
GCJ2	700	48	4400	92	B1 U0 G1	B1 U0 G1
	1A	74	5900	80	B1 U0 G2	B2 U0 G2

Performance Data: 3000K (WW)
All data nominal. IES files for all CCTs are available at leotek.com.

Product	Drive Current (mA)	System Wattage (W)	Delivered Lumens (Lm)[1]	Efficacy (Lm/W)	Type 2 BUG Rating	Type 3 BUG Rating
GCJ1	350	24	2400	100	B1 U0 G1	B1 U0 G1
	580	38	3650	96	B1 U0 G1	B1 U0 G1
	700	48	4300	90	B1 U0 G1	B1 U0 G1
GCJ2	700	48	4300	90	B1 U0 G1	B1 U0 G1
	1A	74	5700	77	B1 U0 G1	B2 U0 G2

Notes:
1 Nominal lumens. Normal tolerance ± 10% due to factors including distribution type, LED bin variance, and ambient temperatures.
2 Not all versions DLC qualified. Consult qualified product list at www.designlights.org for latest product listing.

© 2020 Leotek Electronics USA. GCJ G-Series_Specification_Sheet_08-31-20. Specifications subject to change without notice.

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
NISAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
LUMINAIRE DETAILS

SHEET NUMBER
D-4

- CARLON HAL-FREE RISER-GARD, HJ4X4C-2000:

Technical Info:

UL Listed to 2024	Test Method	Maximum Value
Maximum Flame Propagation	UL 2024	3'6"
Maximum Air Temperature	UL 2024	387°F

- Storage and Handling -4°F to 150°F
- No UV protection (not suitable for outdoor use)
- Do NOT store outside

	Color	Part No.	Nom. I.D.	Nom. O.D.	Pull Tape	Reel Size	Reel Type	Reel Length (feet)	Reel Weight (lbs.)	Wt. per 100 ft. (lbs.)
2"	White	HJ4X4C-2000	2.000	2.425	900 lb.	82" x 41"	W	2000	375	20.8

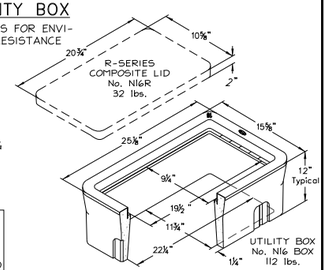
W = Wood

OLDCASTLE N16 UTILITY BOX

- EXCEEDS ASTM-D1693 STANDARDS FOR ENVIRONMENTAL STRESS CRACKING RESISTANCE
- ETCHED POLYPROPYLENE FACE
- FACE ANCHORED IN CONCRETE
- ULTRA-VIOLET INHIBITOR

A HIGH DENSITY REINFORCED CONCRETE BOX WITH NON-SETTING SHOULDERS POSITIONED TO MAINTAIN GRADE AND FACILITATE BACK FILLING. APPROXIMATE DIMENSIONS AND WEIGHT SHOWN.

NOTE:
SPECIFICATION OF THIS VAULT MANUFACTURER AND MODEL ARE SUBJECT TO REPLACEMENT WITH APPROVED EQUIVALENT VAULT/LID



OLDCASTLE ORDER CODE	ITEM	APPROXIMATE SHIP'G. WEIGHT	DESCRIPTION
N16BOX	BOX	112 lbs.	N16 ELECTRICAL BOX (11-3/4"x22-1/4") - 20 PER PALLET
N16R	LID	32 lbs.	R-SERIES COMPOSITE LID WITH POLYPROPYLENE RING (ORDER N90 BOLT DOWN KIT SEPARATELY)
FL16T	LID	13 lbs.	FIBRELYTE LID, NON-CONCRETE BOLT DOWN (ORDER N90 BOLT-DOWN KIT SEPARATELY)
N16J	LID	36 lbs.	CAST IRON LID BOLT DOWN (ORDER N90 BOLT-DOWN KIT SEPARATELY)
B16-61D	COVER	28 lbs.	STEEL CHECKER PLATE COVER
N16-61J	COVER	28 lbs.	STEEL CHECKER PLATE COVER (ORDER N90 BOLT-DOWN KIT SEPARATELY)
B16X12	EXTENSION	113 lbs.	12" REINFORCED CONCRETE BOX EXTENSION - 20 PER PALLET
B30SL	SLAB	52 lbs.	REINFORCED CONCRETE SLAB (16"x28")

PANEL 'A'

SITE NAME:
P-64 - SF PALO ALTO 039

PANEL DESIGNATION:
AC PANEL 'A'

VOLTAGE: 120/240 V
PHASE: 1
WIRE: 3
MAIN BREAKER: 60 AMP
BUSS RATING: 60 AMP
LOCATION: UG VAULT

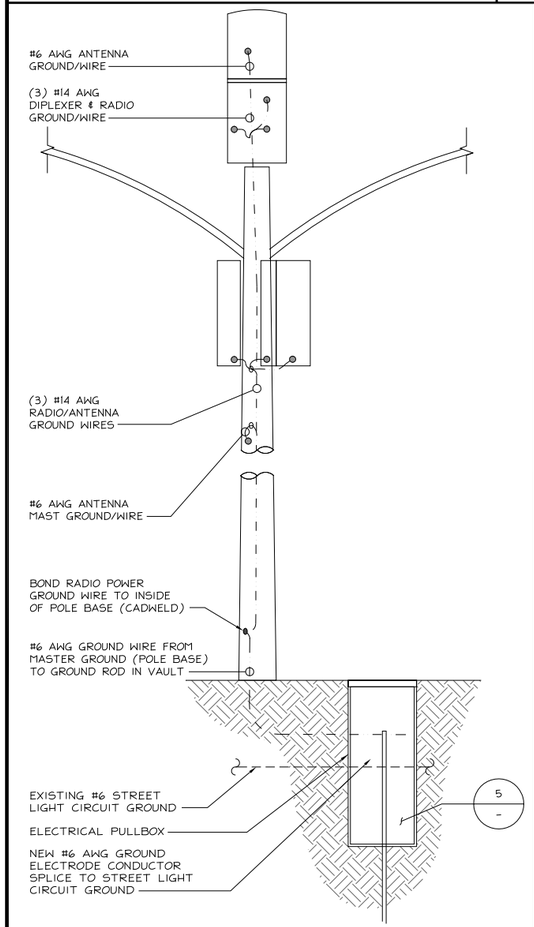
CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	SERVICE LOAD VA	USAGE FACTOR	PHASE A VA	PHASE B VA	PHASE A VA	PHASE B VA	USAGE FACTOR	SERVICE LOAD VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	MAIN	60	2	ON			0		250		1.25	200	ON	2	15	ERICSSON SM-6701 #3	2
3								0		250	1.25	200					4
5	ERICSSON SM-6701 #1	15	2	ON	200	1.25	250		313		1.25	250	ON	2	15	ERICSSON 4402 #1	6
7					200	1.25		250		313	1.25	250					8
9	**ERICSSON SM-6701 #2**	15	2	ON	200	1.25	250		313		1.25	250	ON	2	15	ERICSSON 4402 #2	10
11					200	1.25		250		313	1.25	250					12

CONTRACTOR SHALL LABEL PANEL WITH CARRIER I.D., SERVICE RATING, AND FEED SOURCE

PHASE A TOTAL VA	1375
PHASE B TOTAL VA	1375
TOTAL KVA	2.75
TOTAL AMPS	11.46

NOTES:
1. ALL LOADS CALCED AS LCL/MCL LOADS (OK TO DESIGN TO 100% CAPACITY)
2. UNUSED BREAKER POSITIONS SHALL REMAIN COVERED W/ MFR. COVER
3. ALL EQUIPMENT/BREAKERS SHALL BEAR A LABEL FOR I.D. & RATING

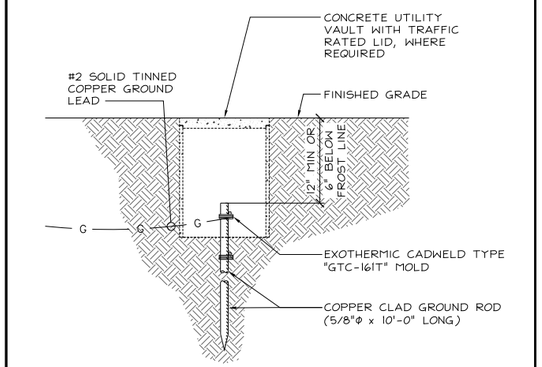
CARLON RISER-GARD | 7



GROUND RISER DIAGRAM | 7

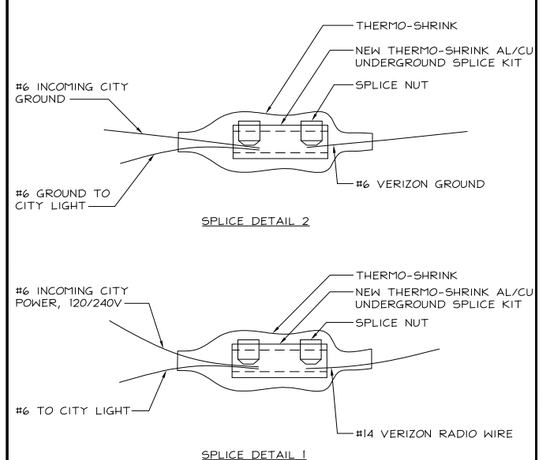
N16 U.G. UTILITY BOX | 6

24"x36" SCALE: NTS
11"x17" SCALE: NTS



GROUND WELL/ROD | 5

24"x36" SCALE: NTS
11"x17" SCALE: NTS



NOT USED | 4

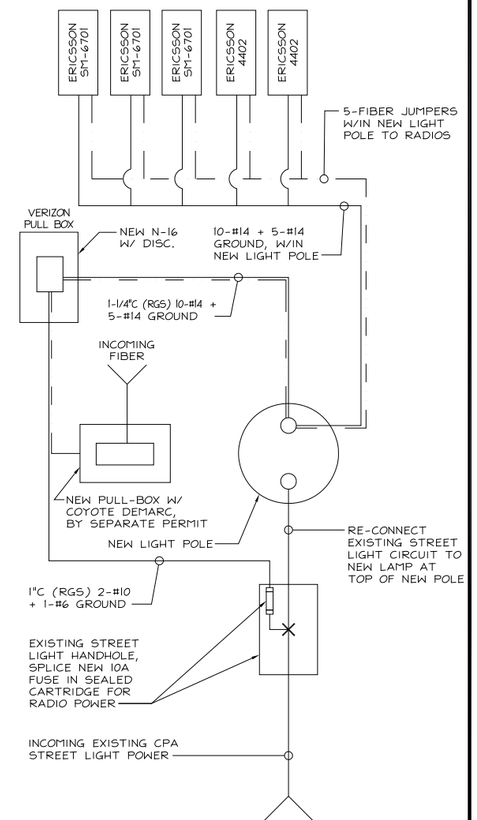
24"x36" SCALE: NTS
11"x17" SCALE: NTS

PANEL SCHEDULE | 2

ELECTRICAL NOTE:

1. ALL WORK SHALL COMP;Y TO THE CURRENT EDITION OF THE CALIFORNIA ELECTRICAL CODE, CALIFORNIA BUILDING CODE, NATIONAL ELECTRICAL CODE, ALL APPLICABLE REGULATIONS GOVERNING NON-JPA UTILITY POLES (G.O. 95), AND ALL APPLICABLE LOCAL CODES.
2. ALL WORK SHALL COMPLY WITH VERIZON CARRIER CONSTRUCTION STANDARDS FOR SMALL CELL INSTALLATION.
3. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND ALL APPLICABLE LOCAL CODES.
4. AC PANEL SHALL HAVE A 'MAIN' BREAKER AFFIXED TO BOTH POLES OF THE MAIN LUG BUSS AND FED THROUGH LOAD SIDE TO PROVIDE SINGLE SHUT-OFF SWITCH FOR ALL SMALL CELL POWER ON AC PANEL.
5. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT. SHALL BE SINGLE CONDUCTOR (#14 AWG AND LARGER), 600V, OIL RESISTANT. THWN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED.
6. REFER TO PANEL SCHEDULE (2/-) AND ONE-LINE DIAGRAM (1/-) FOR CIRCUIT ARRANGEMENT & WIRING CONNECTION.
7. SUBCONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY BEFORE THE START OF CONSTRUCTION. POWER AND TELEPHONE CONDUIT SHALL BE PROVIDED AND INSTALLED PER UTILITY REQUIREMENTS.
8. SUBCONTRACTOR SHALL PROVIDE 20 AMP, SINGLE PHASE, 120/240 (OR 120/208) VAC, 60HZ SERVICE FOR VERIZON SITE.

ELECTRICAL NOTES | 3



ONE-LINE DIAGRAM | 1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

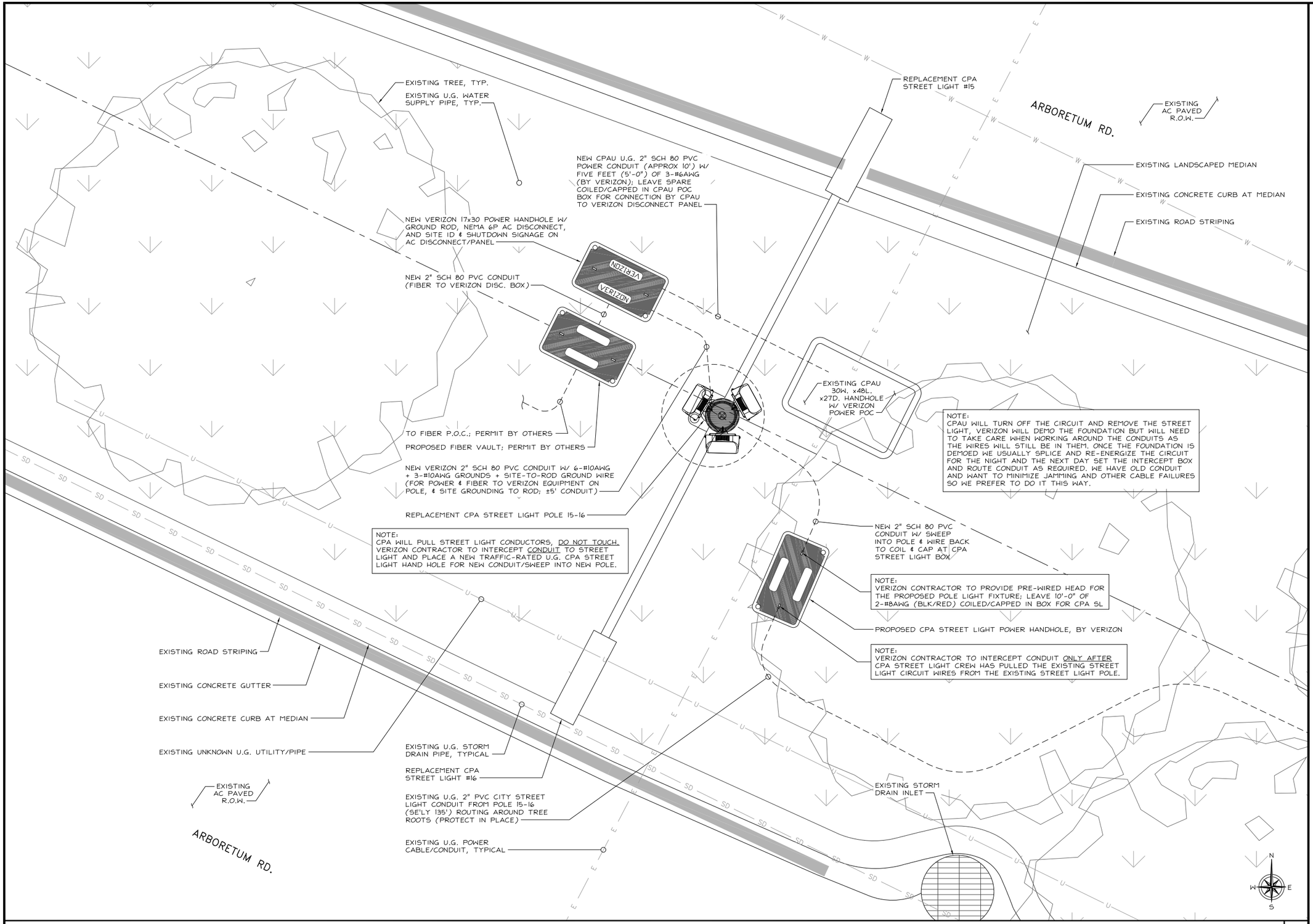
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
ELECTRICAL/GROUNDING DIAGRAMS, NOTES, & PANEL SCHEDULE

SHEET NUMBER
E-1



ELECTRICAL PLAN

24"x36" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"
1' 6" 0" 1'

1

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

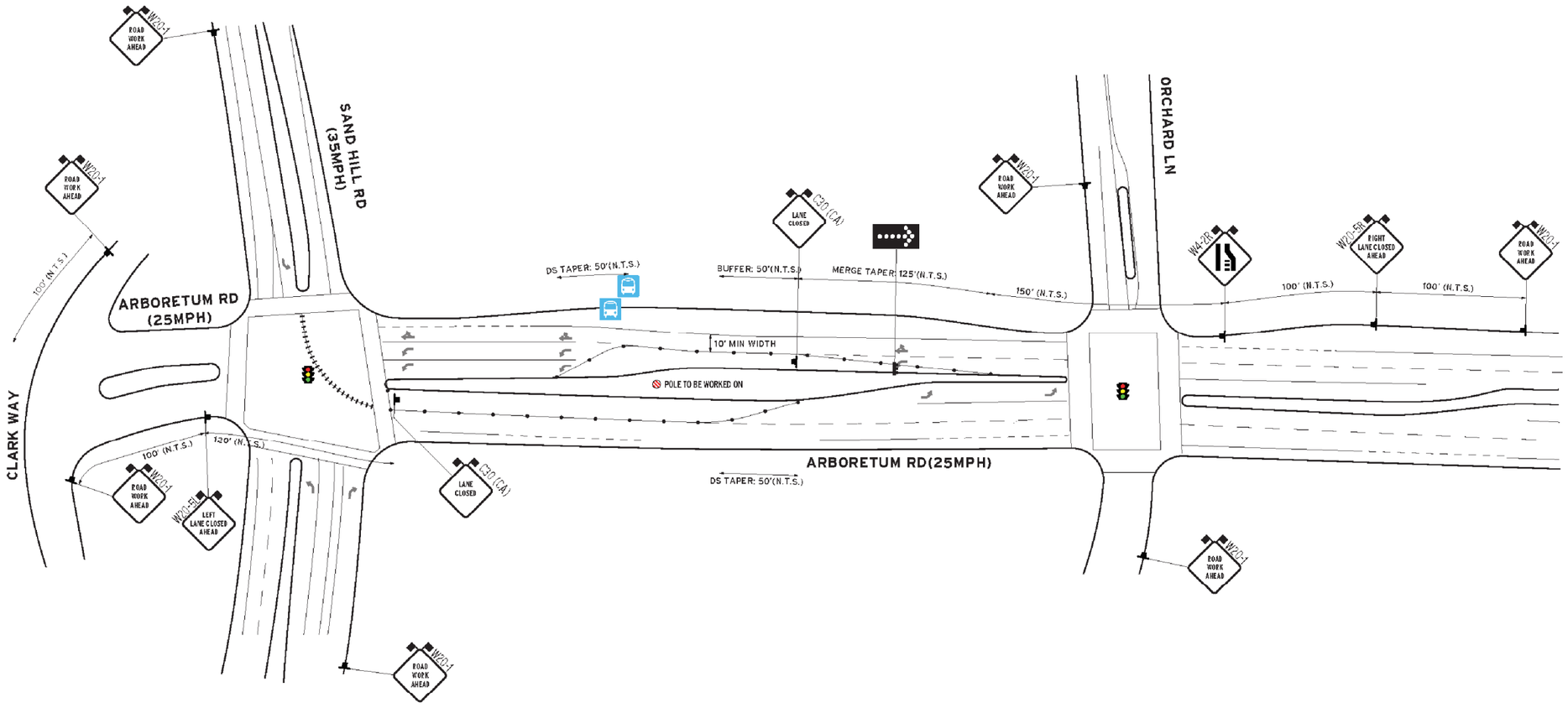
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
ELECTRICAL PLAN

SHEET NUMBER
E-2



LEGEND:

- CHANNELIZING DEVICE
- TRAFFIC CONE W/CLIP ON SIGN
- SIGN
- WORK ZONE
- DIRECTION OF TRAFFIC
- TYPE 1 BARRICADE
- TYPE 1 BARRICADE W/SIGN
- TYPE 3 BARRICADE
- TYPE 3 BARRICADE W/SIGN
- CERTIFIED FLAGGER
- TEMPORARY ADA RAMP
- TEMPORARY RAISED PAVEMENT MARKERS
- MESSAGE BOARD (PCMS)
- FLASHING ARROWBOARD
- TEMP NO PARKING SIGNS
- FLASHING BEACON/BARRICADE LIGHT
- K-RAIL/WATER FILLED BARRIER
- PEDESTRIAN BARRICADE

PLAN 1
TEMP TRAFFIC CONTROL PLAN

NOTES

- Traffic control shall conform with the most current CAMUTCD part 6 and/or Caltrans Standards
- One lane of traffic in each direction and all high volume turning lanes shall be maintained at all times on all streets at a minimum lane width of 10 feet.
- Contractor shall notify local authorities once signs are posted.
- All advanced warning signs shall be equipped with 2 (18" orange flags)
- Certified Traffic Control Workers shall have Type II vests, work shoes, and hard hats.
- Temporary no parking signs shall be placed a min of 72 hrs prior of work.
- Driveways shall be monitored and maintained at all times during work hours.
- Distance between sign and work area will be determined on speed limit.
- Roadway shall not be opened until safe for public use. All open trenches must be plated or backfilled prior to public usage.
- All Devices shall be removed when no longer required.

MUTCD TABLE 6C-1 — MEANING OF LETTER CODES ON TYPICAL APPLICATION DIAGRAMS

ROAD TYPE	DISTANCE BETWEEN SIGNS A	B	C
Urban (Low Speed) - 25 mph or less	100 ft	100 ft	100 ft
Urban (Low Speed) = 25 to 40 mph	250 ft	250 ft	250 ft
Urban (High Speed) = 40 mph	350 ft	350 ft	350 ft
Rural	500 ft	500 ft	500 ft
Expressway / Freeway	1,000 ft	1,500 ft	2,640 ft

COMPASS:

SCALE: NOT TO SCALE

DATE REQSTD: 4-13-20

DATE COMPLTD: 4-29-20

PROJECT LOCATION: ARBORETUM RD PALO ALTO

JOB# SF PALO ALTO 164

PAGE# 1/1

REQUEST BY:
YVONNE WASHINGTON
VINCULUMS SERVICES
510-677-1963
YWASHINGTON@VINCULUMS.COM

B.A.T.S. TRAFFIC SOLUTIONS
AFTER HOURS EMERGENCY 510-299-5666
44800 Industrial Drive Fremont, CA 94538
WWW.BATSTRAFFICSOLUTIONS.COM
Drawn By: Andie Tonnu CSLB# 917034 Office: 510-657-2643 Fax: 510-657-2544

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
TRAFFIC CONTROL PLAN

SHEET NUMBER
TCP-1

Vinculums

575 Lennon Lane #125
Walnut Creek, CA 94598
(925) 482-8500

ALLSTATES ENGINEERING & SURVEYING

23675 Birtcher Dr.
Lake Forest, CA
(949) 273-0996

VERIZON
PALO ALTO_164

All States Engineering & Surveying
Project No: 64 – CLUSTER-6 \ PALO ALTO_164

Structural Analysis Report

ROW Adjacent to Arboretum Rd., Palo Alto, 94304
Proposed 28'- 6" AGL Aluminium Double-Arm Light Pole & Foundation

Rev. #	Reason for Revision	Total # of Sheets	Prepared By	Checked By	Approved /Accepted	Date
2	Updated Pole Specs	24	LeT	LeT	WZ	4/20/2021

	Quantity/Type /Shape	Strength (min.)	Dimensions	Thickness /Depth	Capacity Utilization	
Pole Shaft	Steel / 8-sided tapered	25 ksi*	6.0"Φ at top 8.0"Φ at bottom	0.25"	70.8 %	PASS
Anchor Bolts	4	A449	1" Φ	-	78 %	PASS
Base Plate Pedestal	1	-	-	-	ADEQUATE	
Foundation	*Circular Caisson*	*3.25 ksi*	*36"Dia.*	*7'-6"***	ADEQUATE	

* Pole grade is 6063-T6 per provided specs.
Required depth of caisson (Unrestrained** at G/L) - This analysis was performed without a soil report, and minimum soil properties from IBC-18 were used. Required pole foundation embedment depth may change with a soil report from the proposed pole location.

Professional Engineering Firm
ARCHITECTURAL . CIVIL . STRUCTURAL . ELECTRICAL . GEOTECHNICAL . SURVEYING
www.allstatesengineering.com

Steel Decorated Pole
Palo Alto
PALO ALTO_164

ALLSTATES ENGINEERING & SURVEYING

Project Description:
All States Engineering & Surveying (ASES) is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the metal pole.
The purpose of the analysis is to determine acceptability of the pole stress level. Based on our analysis we have determined the metal pole stress level for the structure and anchorage, under the following load case:

LC: Proposed Pole + Proposed Equipment
(Please see page 5 for details)

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

Structural Analysis Parameters:
This analysis has been performed in accordance with AASHTO 2013 guidelines.

- Wind Speed: ***85 mph per AASHTO 2013***
- Exposure Category: ***C***
- Risk Category: ***II***
- Topographical: ***1***
- Crest Height = ***0***
- Ice Thickness = ***0 in***
- Min. Soil Lateral Bearing = ***100 psf/ft*2 = 200 psf/ft per CBC & IBC 1806.3.4***
- Min. Soil Bearing = ***1500 psf***

We at *All States Engineering & Surveying* appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects, please give us a call.

ATC Hazards by Location

Search Information

Address:	Arboretum Rd, Palo Alto, CA 94304, USA
Coordinates:	37.438972, -122.1694949
Elevation:	77 ft
Timestamp:	2020-12-07T22:27:38.781Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D-default

Basic Parameters

Name	Value	Description
S_S	1.791	MCE_R ground motion (period=0.2s)
S_1	0.663	MCE_R ground motion (period=1.0s)
S_{MS}	2.15	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.433	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.91	Coefficient of risk (0.2s)
CR_1	0.896	Coefficient of risk (1.0s)
PGA	0.737	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.885	Site modified peak ground acceleration

T_L	12	Long-period transition period (s)
SsRT	2.104	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.312	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.791	Factored deterministic acceleration value (0.2s)
S1RT	0.844	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.942	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.663	Factored deterministic acceleration value (1.0s)
PGAd	0.737	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

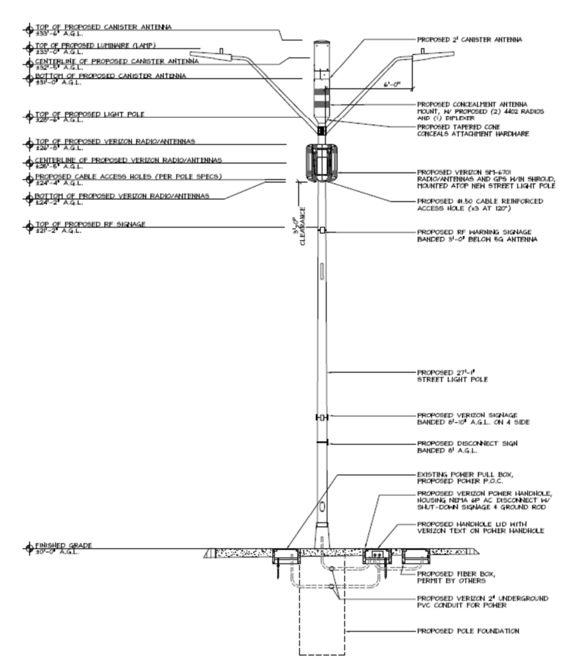
ALLSTATES ENGINEERING & SURVEYING

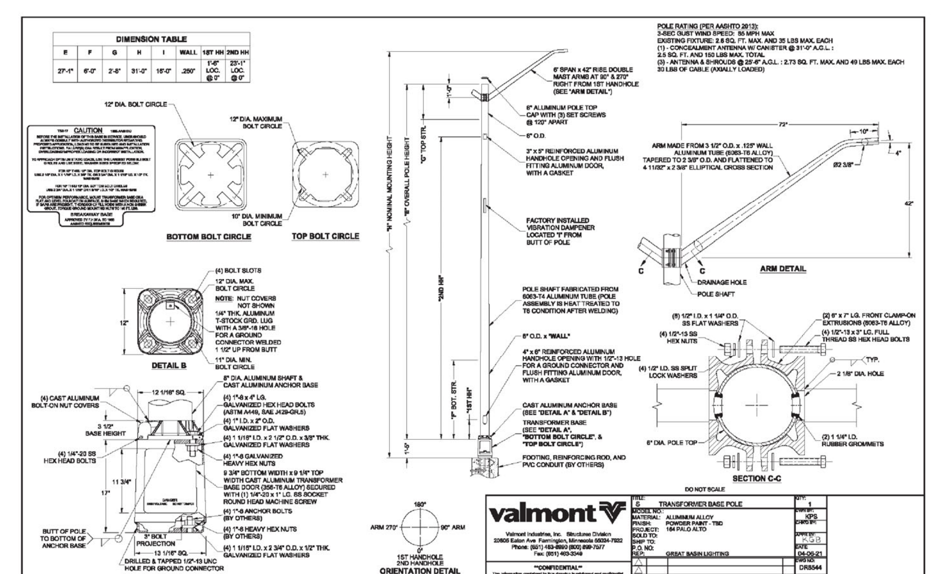
PROJECT :	PALO ALTO_164	DESIGN BY :	
CLIENT :	102 - Sequoia VZW Bakersfield	REVIEW BY :	LeT
		DATE :	4/20/2021

Pole Wind & Seismic Analysis Based on AASHTO 2013 — **Proposed Elevation**

NOTES:
1. NEW GALVANIZED LIGHT POLE TO BE PAINTED WITH MUNSELL RAL5.5GY2.76/2.1 PAINT.
2. NEW RADIOS AND HARDWARE TO BE PAINTED MUNSELL RAL5.5GY2.76/2.1 OR WRAPPED AS ALLOWED BY THE MANUFACTURER.
3. ALL CABLE/WIRE BETWEEN THE POLE ACCESS HOLE AND THE SHROUD GROMMET HOLE WILL RUN TROUGH 1.5" CONDUIT PAINTED/COLORED TO MATCH POLE COLOR.

TOTAL ANETNNA/SHROUD VOLUME (CU. FT.)		
MODEL	TOTAL	TOTAL VOLUME (CU. FT.)
COMMSCOPE	1	±4.41
COMTEK	3	±2.55





verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums

575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY

23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
CALCS

SHEET NUMBER
C-1

ALLSTATES ENGINEERING & SURVEYING

PROJECT : PALO ALTO_164
CLIENT : 102 - Sequoia VZW Bakersfield

DESIGN BY :
REVIEW BY : LeT
DATE : 4/20/2021

Pole Wind & Seismic Analysis Based on AASHTO 2013 — Loading

PROPOSED COMPONENTS

Rad Center	Component Type	QUANTITY	MOUNT TYPE
30'-11"	(N) Canister Antenna w/ Shroud	1	Top Mounted Pole
25'-5"	(N) Palo Alto_5G_SFF w/ Antenna	3	Pole Mounted
8'-11"	(E) / (N) Sign - Max 30"x30" EPA	1	
-	(N) RF Signage	-	
-	(N) & (E) Conduit, Wire, & In-line Fuse	-	Inside Pole

WIND PRESSURE DERIVATION (AASHTO 2013)

Height of Pole	h =	27.1	ft	
Wind Speed	V =	85	mph	*(AASHTO 2013)*
Wind Exposure (B, C or D)		C		
Wind Directionality (Pole)	K_d =	0.95		*(AASHTO 2013, Table 3.8.5-1)*
Gust Effect Factor	G =	1.14		*(AASHTO 2013, Sec. 3.8.6)*
3-sec Gust Exponent	α =	9.50		*(ASCE 7-16, Table 26.11-1)*
Atmospheric Height	Z_g =	900	ft	*(ASCE 7-16, Table 26.11-1)*
Vel. Pressure Coeff. (Min)	$K_{z\,min}$ =	0.84		*(ASCE 7-16, Table 29.10-1)*
Velocity Pressure Coeff.	$K_z = 2.0(z/z_g)^{2/\alpha}$ =	0.96		*(AASHTO 2013, Equation 3.8.4-1)*
Wind Force @ Pole top	$F_w = 0.00256K_zK_dGV^2(C_eA)$ =	19.2	psf *C_eA	*(Wind Pressure Input For O-Calc Analysis)*
Total Applied Shear	V_u =	928	lbs	*(From TNX Report)*
Total Applied Moment	M_u =	19648	lb-ft	*(From TNX Report)*

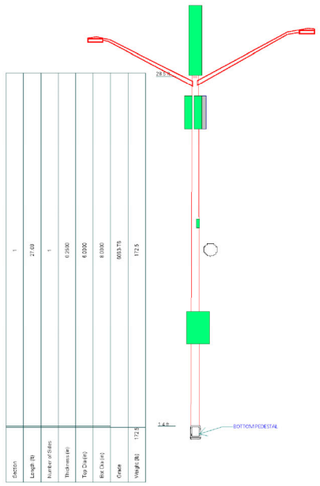
CALCULATION OF WIND DRAG COEFFICIENTS (Cd) FROM AASHTO 2013, TABLE 3.8.7-1 — C_u = 1.00 For V<=105 mph

Appurtenance	Height (in)	Width (in)	Depth (in)	d (ft)	C_uVd	C_d
(N) Canister Antenna w/ Shroud	65.0	12.0	-	1.00	85	**0.45**
(N) Palo Alto_5G_SFF w/ Antenna	29.5	10.2	7.3	1.05	-	**1.70**
(E) Round Luminaire	2.9	88.0	-	0.24	20	**0.50**
(E) Round Pole	325	7.85	-	0.65	56	**0.69**

SEISMIC LOAD ANALYSIS (ASCE 7-16)

Total Pole Weight	W = P_u =	811	lbs	*[Approximate Wt. Including Pole Wtih (N) Components]*
Spectral Response (Short)	S_{DS} =	1.791		*(ATC Hazards Design Maps Summary)*
Spectral Response (1 sec.)	S_1 =	0.650		*(ATC Hazards Design Maps Summary)*
Importance Factor	I_e =	1.0		*(ASCE 7-16, Section 15.4.1.1)*
Response Factor	R =	1.5		*(ASCE 7-16, Table 15.4-2)*
Seismic Response Coeff	$C_s = 0.044S_{DS}I$ =	0.079		*(ASCE 7-16, Section 15.4-1)*
Seismic Response Coeff	$C_s = 0.8S_1/(R/I_e)$ =	0.347		*(ASCE 7-16, Section 15.4-2)*
Seismic Response Coeff	$C_s = S_{DS}/(R/I_e)$ =	1.194		*(ASCE 7-16, Section 12.8-2)*
Lateral Seismic Force	$V_u = MAX(C_s)W$ =	1.194	*W	
Total Applied Shear	V_u =	968	lbs	
Total Applied Moment	$M_u = V_u(1/2h)$ =	13113	lb-ft	

(Wind Loads Governing For Pole Shaft Capacity Check)



ALL REACTIONS ARE FACTORED
AXIAL 811 lb
SHEAR 928 lb
MOMENT 19648 lb-ft
TORQUE 34 lb-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Light Luminaire	22.99ft	Palo Alto_5G_SFF w/ Antenna	25.41ft
Light Luminaire	32.99ft	Palo Alto_5G_SFF w/ Antenna	35.41ft
8' x 2.875" O.D. Light Pole Arm	22.99ft	Palo Alto_5G_SFF w/ Antenna	25.41ft
8' x 2.875" O.D. Light Pole Arm	30.99ft	FCC RF Notice Signage	16.91ft
12"Dia. x0.5" Shroud w/ Antenna	30.99ft	30"x30" Street Sign	8.91ft

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
6063-T6	25 ksi	30 ksi			

TOWER DESIGN NOTES

1. Tower is located in Santa Clara County, California.
2. Tower designed for Exposure C to the AASHTO 2013 Standard.
3. Tower designed for a 85 mph basic wind in accordance with the AASHTO 2013 Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 78%

ALLSTATES ENGINEERING & SURVEYING 23675 Birtcher Drive Lake Forest, CA 92630 Phone: 949.273.0888 FAX: 949.606.7222	To: Palo Alto_Light Pole Project: PALO ALTO_162 Client: 64 - Vinculums, VZW — Drawn by: tle — Appr'd: Code: AASHTO 2013 — Date: 04/20/21 — Scale: NTS Path: — Dwg No: E-1

Steel Decorated Pole
Palo Alto
PALO ALTO_164

ALLSTATES ENGINEERING & SURVEYING

Tower Input Data

The tower is a monopole.
This tower is designed using the AASHTO 2013 standard.
The following design criteria apply:
- Tower is located in Santa Clara County, California.
- Basic wind speed of 85 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Deflections calculated using a wind speed of 60 mph.

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	28.50-1.42	27.08		Round	6.0000	8.0000	0.2500		6063-T6 (25 ksi)

Tapered Pole Properties

Section	Tip Dia.	Area	I	r	C	I/C	J	It/Q	w	w/t
	in	in²	in⁴	in	in	in³	in⁴	in²	in	
L1	6.0000	4.5160	18.6992	2.0349	3.0000	6.2331	37.3985	2.2567	0.0000	0
	8.0000	6.0868	45.7464	2.7415	4.0000	11.4366	91.4928	3.0416	0.0000	0

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft²	in					in	in	in
L1 20.50-1.42				1	1	1			

Monopole Base Plate Data

Base Plate Data

Base plate is square	
Base plate is grouted	
Anchor bolt grade	A449
Anchor bolt size	1.0000 in
Number of bolts	4
Bolt circle diameter	12.0000 in
Outer diameter	13.5000 in
Inner diameter	8.0000 in

Steel Decorated Pole
Palo Alto
PALO ALTO_164

ALLSTATES ENGINEERING & SURVEYING

Tower Mast Reaction Summary

Load Combination	Vertical	Shear$_x$	Shear$_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	675.86	-0.03	-0.09	27.39	-10.11	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	811.02	-128.36	-919.35	-19456.64	2315.17	-5.67
0.9 Dead+1.6 Wind 0 deg - No Ice	608.26	-128.36	-919.31	-19178.71	2285.34	-5.40
1.2 Dead+1.6 Wind 45 deg - No Ice	811.02	559.35	-559.35	-12107.65	-12156.53	20.20
0.9 Dead+1.6 Wind 45 deg - No Ice	608.27	559.34	-559.34	-11937.41	-11973.22	20.43
1.2 Dead+1.6 Wind 90 deg - No Ice	811.02	919.35	128.36	2363.90	-19505.49	34.15
0.9 Dead+1.6 Wind 90 deg - No Ice	608.27	919.39	128.37	2321.24	-19216.26	34.21
Dead+Wind 0 deg - Service	675.85	35.76	206.80	8899.03	632.80	6.43
Dead+Wind 45 deg - Service	675.85	184.36	-184.37	-3705.58	-3746.06	5.71
Dead+Wind 90 deg - Service	675.85	296.58	35.76	672.99	-5938.53	7.64

Bolt Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension	Actual Allowable Ratio Bolt Compression	Actual Allowable Ratio Plate Stress	Actual Allowable Ratio Stiffener Stress	Controlling Condition	Ratio
in		in	lb	lb	ksi	ksi		
1.0000	4	1.0000	19446.41 53014.38 0.37	19850.00 88003.86 0.23	25.274 32.400 0.78		Plate	0.78 ✔

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	KI/r	A	F_a	ϕP_n	Ratio P_u / ϕP_n
	ft		ft	ft		in²	lb	lb	
L1	28.499 - 1.416 (1)	TP8x6x0.25	27.08	27.08	118.5	6.0868	-807.17	81929.50	0.010

Pole Bending Design Data

Section No.	Elevation	Size	M_u	ϕM_n	Ratio M_u / ϕM_n	M_{ux}	ϕM_{nx}	Ratio M_{ux} / ϕM_{nx}
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
L1	28.499 - 1.416 (1)	TP8x6x0.25	19648.17	28164.08	0.698	0.00	28164.08	0.000

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID: 2447782
DRAWN BY: LS
CHECKED BY: DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
CALCS

SHEET NUMBER
C-2

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
Existing Cable Inside Pole	C	No	Yes	CaAa (Out Of Face)	29.92 - 1.42	1	No Ice	0.06	0.15

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
Light Luminarie	A	From Leg	6.50 0.00 0.00	0.0000	32.92	No Ice	2.36	2.36	55.00
Light Luminarie	C	From Leg	6.50 0.00 0.00	0.0000	32.92	No Ice	2.36	2.36	55.00
8' x 2.875" O.D. Light Pole Arm	A	From Leg	4.00 0.00 1.75	0.0000	30.92	No Ice	1.92	0.06	65.00
8' x 2.875" O.D. Light Pole Arm	C	From Leg	4.00 0.00 1.75	0.0000	30.92	No Ice	1.92	0.06	65.00
FCC RF Notice Signage	C	From Leg	0.00 0.00 0.00	0.0000	16.92	No Ice	0.33	0.01	0.20
* Palo Alto_5G_SFF w/ Antenna	C	From Leg	0.25 0.25 0.00	0.0000	25.42	No Ice	2.54	1.87	49.00
Palo Alto_5G_SFF w/ Antenna	B	From Leg	0.25 0.25 0.00	0.0000	25.42	No Ice	2.54	1.87	49.00
Palo Alto_5G_SFF w/ Antenna	D	From Leg	0.25 0.25 0.00	0.0000	25.42	No Ice	2.54	1.87	49.00
* 30"x30" Street Sign	C	From Leg	0.00 0.00 0.00	0.0000	8.92	No Ice	7.50	0.05	5.00
* 12"Dia. x0.5" Shroud w/ Antenna	C	None		0.0000	30.92	No Ice	3.06	3.06	107.10

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 45 deg - No Ice
5	0.9 Dead+1.6 Wind 45 deg - No Ice
6	1.2 Dead+1.6 Wind 90 deg - No Ice
7	0.9 Dead+1.6 Wind 90 deg - No Ice
8	Dead+Wind 0 deg - Service
9	Dead+Wind 45 deg - Service
10	Dead+Wind 90 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	28.499 - 1.416	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-808.16	-12156.55	12107.63
			Max. Mx	6	-807.17	-19505.48	-2363.95
			Max. My	2	-807.19	2315.18	19456.64
			Max. Vy	6	922.67	-19505.48	-2363.95
			Max. Vx	2	-922.66	2315.18	19456.64
			Max. Torque	7			-34.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	4	811.02	-559.35	559.35
	Max. H_x	2	811.02	128.36	919.35
	Max. H_z	2	811.02	128.36	919.35
	Max. M_x	2	19456.64	128.36	919.35
	Max. M_z	6	19505.49	-919.35	-128.36
	Max. Torsion	2	5.67	128.36	919.35
	Min. Vert	3	608.26	128.36	919.31
	Min. H_x	7	608.27	-919.39	-128.37
	Min. H_z	7	608.27	-919.39	-128.37
	Min. M_x	6	-2363.90	-919.35	-128.36
	Min. M_z	2	-2315.17	128.36	919.35
	Min. Torsion	7	-34.21	-919.39	-128.37

Steel Decorated Pole
Palo Alto
PALO ALTO_164

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	28.499 - 1.416 (1)	TP8x6x0.25	931.61	68476.90	0.014	34.19	42887.25	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{M_{uv}}{\phi M_{nv}}$	Ratio $\frac{M_{ua}}{\phi M_{na}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	28.499 - 1.416 (1)	0.010	0.698	0.000	0.014	0.001	0.708 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass / Fail
L1	28.499 - 1.416	Pole	TP8x6x0.25	1	-807.17	81929.50	70.8	Pass
						Summary		
						Pole (L1)	70.8	Pass
						Bolt	78.0	Pass
						RATING =	**78.0**	**Pass**

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	1
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/20/2021
Fastening point:			

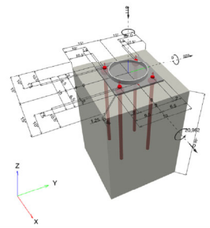
Specifier's comments:

1 Input data

Anchor type and diameter:	**Heavy Hex Head ASTM F 1554 GR. 36 1**
Item number:	not available
Effective embedment depth:	h_{ef} = 25.000 in.
Material:	ASTM F 1554
Evaluation Service Report:	Hilti Technical Data
Issued I Valid:	- | -
Proof:	Design Method ACI 318-08 / CIP
Stand-off installation:	without clamping (anchor); restraint level (anchor plate): 1.00; e_b = 1.250 in.; t = 0.500 in.
Anchor plate[2]:	l_x x l_y x t = 13.000 in. x 13.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Round HSS (AISC); HSS10X.188; (L x W x T) = 10.000 in. x 10.000 in. x 0.188 in.
Base material:	cracked concrete, , f'_c = 3,250 psi; h = 90.000 in.
Reinforcement:	tension: condition A, shear: condition B; anchor reinforcement: tension edge reinforcement: > No. 4 bar with stirrups
Seismic loads (cat. C, D, E, or F)	no

[2] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, ft.lb]



Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	2
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/20/2021
Fastening point:			

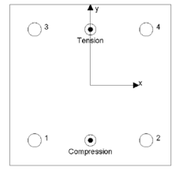
1.1 Design results

Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = -8.11; V_x = 0; V_y = 928; M_x = 20,902.000, M_y = 0.000, M_z = 0.000,	no	54

2 Load case/Resulting anchor forces

Anchor reactions [lb]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	-14,177	232	0	232
2	-14,177	232	0	232
3	13,772	232	0	232
4	13,772	232	0	232



max. concrete compressive strain:	- [‰]
max. concrete compressive stress:	- [psi]
resulting tension force in (x/y)=(0.000/4.500):	27,544 [lb]
resulting compression force in (x/y)=(0.000/-4.500):	28,355 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi$ N_n	Status
Steel Strength*	-14,177	26,361	54	OK
Pullout Strength*	13,772	27,318	51	OK
Concrete Breakout Failure**[1]	N/A	N/A	N/A	N/A
Concrete Side-Face Blowout, direction **	N/A	N/A	N/A	N/A

* highest loaded anchor **anchor group (anchors in tension)
[1] Tension Anchor Reinforcement has been selected!

3.1 Steel Strength

N_{sa} [lb]	ϕ	ϕN_{sa} [lb]	N_{ua} [lb]
35,148	0.750	26,361	-14,177

The steel proof was done for the highest absolute force per anchor - in this case compression loading. Please be aware that buckling should be verified separately

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

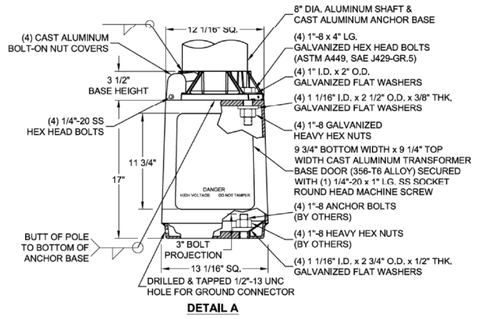
Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	3
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/20/2021
Fastening point:			

3.2 Pullout Strength

N_p [lb]	$\Psi_{c,p}$	ϕ	ϕN_{pn} [lb]	N_{ua} [lb]
39,026	1.000	0.700	27,318	13,772



DETAIL A

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	4
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/20/2021
Fastening point:			

4 Shear load

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi$ V_n	Status
Steel Strength*	232	10,966	3	OK
Steel failure (with lever arm)*	232	664	35	OK
Pryout Strength**	928	72,399	2	OK
Concrete edge failure in direction y+**	928	17,287	6	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

V_{sa} [lb]	ϕ	ϕ V_{sa} [lb]	V_{ua} [lb]
21,089	0.650	10,966	232

4.2 Steel failure (with lever arm)

l [in.]	α_M		
2.000	1.00		
$N_{ua}/\phi N_n$	$1 - N_{ua}/\phi N_n$	M^0_{sa} [ft.lb]	$M_s = M^0_s (1 - N_{ua}/\phi N_n)$ [ft.lb]
0.538	0.462	368.152	170.153
$V^M_{ua} = \alpha_M * M_s / l_s$ [lb]		ϕ	ϕV^M_{sa} [lb]	V_{ua} [lb]
1,021		0.650	664	232

4.3 Pryout Strength

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$c_{a,min}$ [in.]	k_{cp}	c_{ac} [in.]	$\Psi_{ec,N}$	$\Psi_{ed,N}$	h_{ef} [in.]
900.00	441.00	10.500	2	∞	1.000	1.000	7.000
$e_{c1,V}$ [in.]	$\Psi_{ec1,V}$	$e_{c2,V}$ [in.]	$\Psi_{ec2,V}$	$\Psi_{ed,N}$	k_{cp}		
0.000	1.000	0.000	1.000	1.000	24		
N_p [lb]	ϕ	ϕV_{cp} [lb]	V_{ua} [lb]				
25,340	0.700	72,399	928				

4.4 Concrete edge failure in direction y+

l_e [in.]	d_a [in.]	c_1 [in.]	A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]
8.000	1.000	10.500	472.50	496.13
$\Psi_{ec1,V}$	$\Psi_{parallel,V}$	$e_{c2,V}$ [in.]	$\Psi_{ec2,V}$	$\Psi_{h,V}$	$\Psi_{ed,V}$
0.900	1.000	0.000	1.000	1.400	1.000
V_b [lb]	ϕ	ϕV_{cp} [lb]	V_{ua} [lb]		
20,580	0.700	17,287	928		

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	5
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/20/2021
Fastening point:			

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.538	0.350	5/3	53	OK

$\beta_{N,V} = \beta_N^\zeta + \beta_V^\zeta <= 1$

6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- ACI 318 does not specifically address anchor bending when a stand-off condition exists. PROFIS Engineering calculates a shear load corresponding to anchor bending when stand-off exists and includes the results as a shear Design Strength!
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- Attention! In case of compressive anchor forces a buckling check as well as the proof of the local load transfer into and within the base material (incl. punching) has to be done separately.
- The design of Anchor Reinforcement is beyond the scope of PROFIS Engineering. Refer to ACI 318-08, Part D.5.2.9 for information about Anchor Reinforcement.
- Anchor Reinforcement has been selected as a design option, calculations should be compared with PROFIS Engineering calculations.

Fastening meets the design criteria!

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
CALCS

SHEET NUMBER
C-3

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	6
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/20/2021
Fastening point:			

7 Installation data

Profile: Round HSS (AISC), HSS10X.188; (L x W x T) = 10.000 in. x 10.000 in. x 0.188 in.

Hole diameter in the fixture: d_f = 1.062 in.

Plate thickness (input): 0.500 in.

Recommended plate thickness: not calculated

Anchor type and diameter: Heavy Hex Head ASTM F 1554 GR. 36 1

Item number: not available

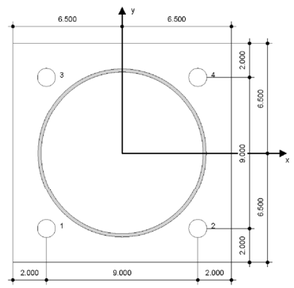
Maximum installation torque: -

Hole diameter in the base material: - in.

Hole depth in the base material: 25.000 in.

Minimum thickness of the base material: 26.172 in.

Hilti Heavy Hex Head headed stud anchor with 25 in embedment, 1, Steel galvanized, installation per instruction for use



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-4.500	-4.500	10.500	19.500	10.500	19.500
2	4.500	-4.500	19.500	10.500	10.500	19.500
3	-4.500	4.500	10.500	19.500	19.500	10.500
4	4.500	4.500	10.500	10.500	10.500	10.500

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Hilti PROFIS Engineering 3.0.69

www.hilti.com

Company:	All State Eng. & Surveying	Page:	7
Address:	23675 Birtcher Dr. Lake Forest, CA 92630	Specifier:	
Phone I Fax:	9492730996 |	E-Mail:	
Design:	Concrete - Sep 9, 2020 (2)	Date:	4/20/2021
Fastening point:			

8 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering (c) 2003-2021 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

All States Engineering & Surveying
Zalzali & Associates, Inc.
23675 Birtcher Drive
Lake Forest
CA 92630

Project Title: Lighht Pole Caisson Embedment Depth
Engineer:
Project ID: Palo Alto Light Pole
Project Descr:

File: Caisson Depth.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.3.24
Zalzali & Associates Inc.

Pole Footing Embedded in Soil

Lic. # : KW-06009186

DESCRIPTION: Poposed Caisson embedment (soil values From IBC Table 1806.2 with lateral bearing load increase from IBC 1806.3.4)

Code References

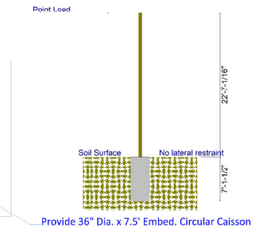
Calculations per IBC 2018 1807.3, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Pole Footing Shape	Circular
Pole Footing Diameter	36.0 in
Calculate Min. Depth for Allowable Pressures	
No Lateral Restraint at Ground Surface	
Allow Passive	200.0 pcf
Max Passive	1,500.0 psf

Controlling Values

Governing Load Combination :	+D+W
Lateral Load	0.9280 k
Moment	20.964 k-ft
NO Ground Surface Restraint	
Pressures at 1/3 Depth	
Actual	466.277 psf
Allowable	467.155 psf
Minimum Required Depth	7.125 ft
Footing Base Area	7.069 ft^2
Maximum Soil Pressure	0.1147 ksf



Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (k/ft)		Vertical Load (k)	
D : Dead Load	k		k/ft	0.8110	k
Lr : Roof Live	k		k/ft		k
L : Live	k		k/ft		k
S : Snow	k		k/ft		k
W : Wind	0.9280 k		k/ft		k
E : Earthquake	k		k/ft		k
H : Lateral Earth	k		k/ft		k
Load distance above ground surface	22.590 ft	TOP of Load above ground surface	ft		
		BOTTOM of Load above ground surface	ft		

Load Combination Results

Load Combination	Forces @ Ground Surface Loads - (k)	Moments - (ft-k)	Required Depth - (ft)	Pressure at 1/3 Depth Actual - (psf)	Allow - (psf)	Soil Increase Factor
+D+W	0.928	20.964	7.13	466.3	467.2	1.000

All States Engineering & Surveying
Zalzali & Associates, Inc.
23675 Birtcher Drive
Lake Forest
CA 92630

Project Title: Lighht Pole Caisson Embedment Depth
Engineer:
Project ID: Palo Alto Light Pole
Project Descr:

File: Caisson Depth.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.3.24
Zalzali & Associates Inc.

Concrete Caisson

Lic. # : KW-06009186

DESCRIPTION: Design Concrete Caisson

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

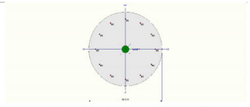
f'c : Concrete 28 day strength	=	3.250 ksi
E =	=	3,122.0 ksi
Density	=	150.0 pcf
β	=	0.850
fy - Main Rebar	=	60.0 ksi
E - Main Rebar	=	29,000.0 ksi
Allow. Reinforcing Limits	ASTM A615 Bars Used	
Min. Reinf.	=	0.250 %
Max. Reinf.	=	8.0 %

Overall Caisson Height = 7.50 ft
End Fixity Top Free, Bottom Fixed
Brace condition for deflection (buckling) along Caisson :
X-X (width) axis :
Fully braced against buckling ABOUT Y-Y Axis
Y-Y (depth) axis :
Fully braced against buckling ABOUT X-X Axis

Caisson Cross Section

Column Dimensions : 36.0in Diameter, Caisson Edge to Rebar Edge Cover = 3.0in

Column Reinforcing : 12 - #5 bars



Entered loads are factored per load combinations specified by user.

Applied Loads

Caisson self weight included : 7,952.16 lbs * Dead Load Factor AXIAL LOADS . . .
Reaction from Pole: Axial Load at 7.50 ft above base, D = 0.8110 k
BENDING LOADS . . .
Reaction from Pole: Lat. Point Load at 7.0 ft creating Mx-x, W = 1.546 k
Reaction from Pole: Moment acting about X-X axisat 7.50 ft, W = 34.936 k-ft

DESIGN SUMMARY

Load Combination +0.90D+W+1.60H
Location of max.above base 7.450 ft

Maximum Stress Ratio **0.103 : 1**
Ratio = (Pu^2+Mu^2)^.5 / (PhiPn^2+PhiMn^2)^.5

Pu =	7.887 k	φ * Pn =	75.063 k
Mu-x =	34.936 k-ft	φ * Mn-x =	-344.155 k-ft
Mu-y =	0.0 k-ft	φ * Mn-y =	0.0 k-ft
Mu Angle =	0.0 deg		
Mu at Angle =	34.936 k-ft	φMn at Angle =	337.730 k-ft

Pn & Mn values located at Pu-Mu vector intersection with capacity curve

Caisson Capacities . . .

Pnmax : Nominal Max. Compressive Axial Capacity	3,024.81 k
Pnmin : Nominal Min. Tension Axial Capacity	k
φ Pn, max : Usable Compressive Axial Capacity	1,799.76 k
φ Pn, min : Usable Tension Axial Capacity	k

Maximum SERVICE Load Reactions . .
Top along Y-Y 0.0 k Bottom along Y-Y 0.0 k
Top along X-X 0.0 k Bottom along X-X 0.9276 k

Maximum SERVICE Load Deflections . . .
Along Y-Y -0.005245 in at 7.50 ft above base for load combination : W Only
Along X-X 0.0 in at 0.0 ft above base for load combination :

General Section Information . φ = 0.70 β = 0.850 θ = 0.850
ρ : % Reinforcing 0.3655 % Rebar % Ok
Reinforcing Area 3.720 in^2
Concrete Area 1,017.88 in^2

All States Engineering & Surveying
Zalzali & Associates, Inc.
23675 Birtcher Drive
Lake Forest
CA 92630

Project Title: Lighht Pole Caisson Embedment Depth
Engineer:
Project ID: Palo Alto Light Pole
Project Descr:

File: Caisson Depth.ec6
Software copyright ENERCALC, INC. 1983-2020, Build:12.20.3.24
Zalzali & Associates Inc.

Concrete

Lic. # : KW-06009186

DESCRIPTION: Design Concrete Caisson

Governing Load Combination Results

Governing Factored Load Combination	Moment X-X	Moment Y-Y	Dist from base ft	Axial Load Pu k	φ * Pn	Bending Analysis k-ft δx	δx * Mux	δy	δy * Muy	Alpha (deg)	δ Mu	φ Mn	Utilization Ratio
+1.40D+1.60H			7.45	12.27	1,799.76					0.000			0.007
+1.20D+0.50Lr+L+W+1.60H	Actual		7.45	10.52	110.28	1.000	34.94			0.000	34.94	374.91	0.093
+0.90D+W+1.60H	Actual		7.45	7.89	75.06	1.000	34.94			0.000	34.94	337.73	0.103

Maximum Reactions

Note: Only non-zero reactions are listed.

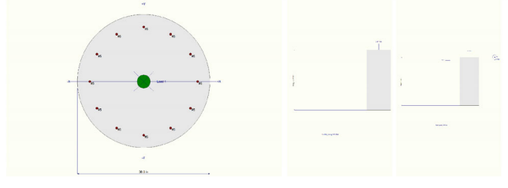
Load Combination	X-X Axis Reaction @ Base k	@ Top k	Y-Y Axis Reaction @ Base k	@ Top k	Axial Reaction @ Base k	Mx - End Moments @ Base k-ft	@ Top k-ft	My - End Moments @ Base k-ft	@ Top k-ft
•D+H					8.753				
•D+0.60W+H			0.928		8.753	14.468			
+0.60D+0.60W+0.60H			0.928		5.258	14.468			

Maximum Moment Reactions

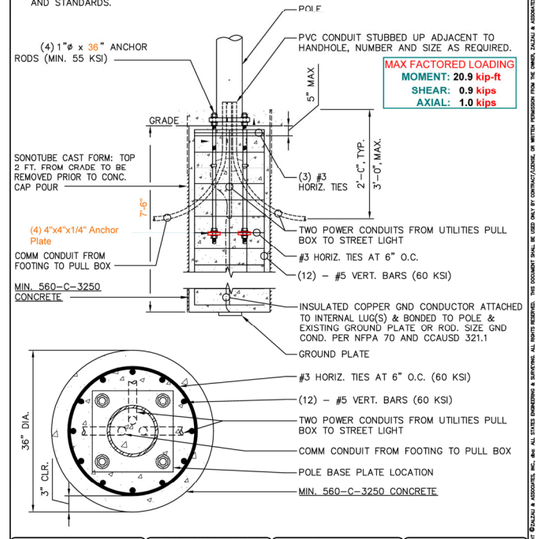
Note: Only non-zero reactions are listed.

Load Combination	Moment About X-X Axis @ Base k-ft	@ Top k-ft	Moment About Y-Y Axis @ Base k-ft	@ Top k-ft
•D+H				
•D+0.60W+H	14.468			
+0.60D+0.60W+0.60H	14.468			

Sketches



NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.



FOUNDATION DETAIL

DO NOT SCALE DRAWINGS
THIS DRAWING IS NOT TO SCALE. SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

ALLSTATES ENGINEERING & SURVEYING
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

COPYRIGHT © ALL STATES ENGINEERING & SURVEYING, INC. dba ALL STATES ENGINEERING & SURVEYING, ALL RIGHTS RESERVED. THIS DOCUMENT SHALL BE USED ONLY BY EMPLOYEES/AGENTS OF ALL STATES ENGINEERING & SURVEYING, INC. AND SHALL NOT BE REPRODUCED, CHANGED, OR COPIED IN ANY FORM OR MANNER WHATSOEVER NOR SHALL IT BE ASSIGNED TO ANY THIRD PARTY WITHOUT FIRST OBTAINING THE EXPRESS WRITTEN PERMISSION FROM THE OWNER, ZALZALI & ASSOCIATES, INC.

verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WASAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
CALCS

SHEET NUMBER
C-4

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL BUILDING CODE, THE LATEST EDITION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.

2. CONTRACTOR SHALL CONSTRUCT SITE IN ACCORDANCE WITH THESE DRAWINGS AND CONSTRUCTION SPECIFICATIONS 80-T1196-1 REV H. THE SPECIFICATION IS THE RULING DOCUMENT AND ANY DISCREPANCIES BETWEEN THE SPECIFICATION AND THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION

3. CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK (ROOF FRAMING, ELECTRICAL SERVICE, LOCAL PLANNING CODES, ETC.) AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OF FIELD CONDITIONS

4. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT AND APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS. OWNER PROVIDED MATERIALS WILL INCLUDE THE FOLLOWING, UNLESS NOTED OTHERWISE:
   A) TRANSMITTER
   B) RF FILTER
   C) MFTS RACK
   D) AUXILIARY EQUIPMENT IN MFTS RACK
   E) PUMP ASSEMBLY
   F) HEAT EXCHANGER
   G) HOSE AND HOSE MANIFOLDS (ANY COPPER OR STEEL SECTIONS PROVIDE BY CONTRACTOR)
   H) UHF ANTENNA AND MOUNTING BRACKETS, GPS ANTENNAS AND KU ANTENNAS
   I) UHF COAX AND HANGERS
   K) 480-208 & 208-400 ELECTRICAL TRANSFORMERS (RE: E-2 FOR SPECIALIZED TRANSFORMERS PROVIDED BY CONTRACTOR)
   L) AUTOMATIC TRANSFER SWITCH AND GENERATOR
   M) EQUIPMENT SHELTER (SHELTERS FURNISHED IN FACTORY W/ HVAC EQUIPMENT AND ELECTRICAL DISTRIBUTION PANEL)
   N) INTEGRATED LOAD CENTER

5. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE WORK.

6. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

7. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.

8. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.

10. CONTRACTOR SHALL COORDINATE HIS WORK WITH THE SUPERINTENDENT OF BUILDINGS & GROUNDS AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS.

11. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.

12. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

13. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, PIPING ETC. AND IMMEDIATELY REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.

14. IN DRILLING HOLES INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC., MUST BE CLEARLY UNDERSTOOD THAT REINFORCING STEEL SHALL NOT BE DRILLED INTO, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES (UNLESS NOTED OTHERWISE). LOCATIONS OF REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT.

15. REPAIR ALL EXISTING WALL SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND IN WITH ADJACENT SURFACES.

16. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH U.L. LISTED AND FIRE CODE APPROVED MATERIALS.

17. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.

18. MINIMUM BEND RADIUS OF ANTENNA CABLES SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURERS RECOMMENDATIONS.

19. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO APPLICABLE REGULATORY AUTHORITIES

20. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION SHALL BE IN CONFORMANCE WITH JURISDICTIONAL OR STATE AND LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL AND COORDINATED WITH LOCAL REGULATORY AUTHORITIES.

21. ALL CONSTRUCTION IS TO ADHERE TO VERIZON'S INTEGRATED CONSTRUCTION STANDARDS UNLESS CALIFORNIA CODE IS MORE STRINGENT.

22. THE INTENT OF THE PLANS AND SPECIFICATIONS IS TO PERFORM THE CONSTRUCTION IN ACCORDANCE WITH THE CALIFORNIA BUILDING STANDARDS CODE, TITLES 19 AND 24, CALIFORNIA CODE OF REGULATIONS. SHOULD ANY CONDITIONS DEVELOP NOT COVERED BY THE APPROVED PLANS AND SPECIFICATIONS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS, A CHANGE ORDER DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY THE JURISDICTION BEFORE PROCEEDING WITH THE WORK.

SITE WORK NOTES

1. DO NOT EXCAVATE OR DISTURB BEYOND THE PROPERTY LINES OR LEASE LINES, UNLESS OTHERWISE NOTED.

2. DO NOT SCALE BUILDING DIMENSIONS FROM DRAWING.

3. SIZE, LOCATION AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-BUILT DRAWINGS BY GENERAL CONTRACTOR AND ISSUED TO ARCHITECT/ENGINEER AT COMPLETION OF PROJECT.

4. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ENGINEER AND OWNER ASSUME NO RESPONSIBILITY WHATSOEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.

5. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT/ENGINEER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS/HER OWN RISK AND EXPENSE. CONTRACTOR SHALL CALL LOCAL DIGGER HOT LINE FOR UTILITY LOCATIONS 48 HOURS PRIOR TO START OF CONSTRUCTION.

6. ALL NEW AND EXISTING UTILITY STRUCTURES ON SITE AND IN AREAS TO BE DISTURBED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISH ELEVATIONS PRIOR TO FINAL INSPECTION OF WORK.

7. GRADING OF THE SITE WORK AREA IS TO BE SMOOTH AND CONTINUOUS IN SLOPE AND IS TO FEATHER INTO EXISTING GRADES AT THE GRADING LIMITS.

8. ALL TEMPORARY EXCAVATIONS FOR THE INSTALLATION OF FOUNDATIONS, UTILITIES, ETC., SHALL BE PROPERLY LAID BACK OR BRACED IN ACCORDANCE WITH CORRECT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.

9. STRUCTURAL FILLS SUPPORTING PAVEMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM STANDARD PROCTOR DRY DENSITY.

10. NEW GRADES NOT IN BUILDING AND DRIVEWAY IMPROVEMENT AREA TO BE ACHIEVED BY FILLING WITH APPROVED CLEAN FILL AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.

11. ALL FILL SHALL BE PLACED IN UNIFORM LIFTS. THE LIFTS THICKNESS SHOULD NOT EXCEED THAT WHICH CAN BE PROPERLY COMPACTED THROUGHOUT ITS ENTIRE DEPTH WITH THE EQUIPMENT AVAILABLE.

12. ANY FILLS PLACED ON EXISTING SLOPES THAT ARE STEEPER THAN 10 HORIZONTAL TO 1 VERTICAL SHALL BE PROPERLY BENCHED INTO THE EXISTING SLOPE AS DIRECTED BY A GEOTECHNICAL ENGINEER.

13. CONTRACTOR SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO PAPERS, TRASH, WEEDS, BRUSH OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.

14. ALL TREES AND SHRUBS WHICH ARE NOT IN DIRECT CONFLICT WITH THE IMPROVEMENTS SHALL BE PROTECTED BY THE GENERAL CONTRACTOR.

15. ALL SITE WORK SHALL BE CAREFULLY COORDINATED BY GENERAL CONTRACTOR WITH LOCAL UTILITY COMPANY, TELEPHONE COMPANY, AND ANY OTHER UTILITY COMPANIES HAVING JURISDICTION OVER THIS LOCATION.

ENVIRONMENTAL NOTES

1. ALL WORK PERFORMED SHALL BE DONE IN ACCORDANCE WITH ISSUED PERMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF FINES AND PROPER CLEAN UP FOR AREAS IN VIOLATION.

2. CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS DURING CONSTRUCTION FOR PROTECTION OF ADJACENT PROPERTIES, ROADWAYS AND WATERWAYS AND SHALL BE MAINTAINED IN PLACE THROUGH FINAL JURISDICTIONAL INSPECTION & RELEASE OF SITE.

3. CONTRACTOR SHALL INSTALL/CONSTRUCT ALL NECESSARY SEDIMENT/SILT CONTROL FENCING AND PROTECTIVE MEASURES WITHIN THE LIMITS OF SITE DISTURBANCE PRIOR TO CONSTRUCTION.

4. NO SEDIMENT SHALL BE ALLOWED TO EXIT THE PROPERTY. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE MEASURES FOR CONTROLLING EROSION. ADDITIONAL SEDIMENT CONTROL FENCING MAY BE REQUIRED IN ANY AREAS SUBJECT TO EROSION.

5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE ON THE SITE AT ALL TIMES WITH SILT AND EROSION CONTROL MEASURES MAINTAINED ON THE DOWNSTREAM SIDE OF SITE DRAINAGE. ANY DAMAGE TO ADJACENT PROPERTY AS A RESULT OF EROSION WILL BE CORRECTED AT THE CONTRACTORS EXPENSE.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTIONS AND ANY REPAIRS OF ALL SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT REMOVAL AS NECESSARY.

7. CLEARING OF VEGETATION AND TREE REMOVAL SHALL BE ONLY AS PERMITTED AND BE HELD TO A MINIMUM. ONLY TREES NECESSARY FOR CONSTRUCTION OF THE FACILITIES SHALL BE REMOVED.

8. SEEDING AND MULCHING AND/OR SODDING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE PROJECT FACILITIES AFFECTING LAND DISTURBANCE.

9. CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED BY LOCAL, COUNTY AND STATE CODES AND ORDINANCES TO PROTECT EMBANKMENTS FROM SOIL LOSS AND TO PREVENT ACCUMULATION OF SOIL AND SILT IN STREAMS AND DRAINAGE PATHS LEAVING THE CONSTRUCTION AREA. THIS MAY INCLUDE SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS, AND CHECK DAMS.

10. RIP RAP OF SIZES INDICATED SHALL CONSIST OF CLEAN, HARD, SOUND, DURABLE, UNIFORM IN QUALITY STONE FREE OF ANY DETRIMENTAL QUANTITY OF SOFT, FRIABLE, THIN, ELONGATED OR LAMINATED PIECES, DISINTEGRATED MATERIAL, ORGANIC MATTER, OIL, ALKALI, OR OTHER DELETERIOUS SUBSTANCES

GENERAL NOTES

1. THESE NOTES SHALL BE CONSIDERED A PART OF THE WRITTEN SPECIFICATIONS, CONTRACT AND CONSTRUCTION DOCUMENTS.

2. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THESE PLANS AND IN THE CONTRACT DOCUMENTS.

3. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR(S) SHALL VISIT THE JOB SITE(S) AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRM THAT THE WORK MAY BE ACCOMPLISHED PER THE CONTRACT DOCUMENTS. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO BID SUBMITTAL

4. THE CONTRACTOR SHALL RECEIVE WRITTEN AUTHORIZATION TO PROCEED ON ANY WORK NOT CLEARLY DEFINED OR IDENTIFIED IN THE CONTRACT AND CONSTRUCTION DOCUMENTS BEFORE STARTING ANY WORK.

5. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES, INCLUDING APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS.

6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. IF THESE RECOMMENDATIONS ARE IN CONFLICT WITH THE CONTRACT AND CONSTRUCTION DOCUMENTS AND/OR APPLICABLE CODES OR REGULATIONS, REVIEW AND RESOLVE THE CONFLICT WITH DIRECTION FROM THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO PROCEEDING.

7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATION OF ALL PORTIONS OF THE WORK UNDER THE CONTRACT INCLUDING CONTACT AND COORDINATION WITH THE IMPLEMENTATION ENGINEER AND WITH THE AUTHORIZED REPRESENTATIVE OF ANY OUTSIDE POLE OR PROPERTY OWNER.

8. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO PAVING, CURBS, VEGETATION, GALVANIZED SURFACE OR OTHER EXISTING ELEMENTS AND UPON COMPLETION OF THE WORK, REPAIR ANY DAMAGE THAT OCCURRED DURING CONSTRUCTION TO THE SATISFACTION OF VERIZON.

9. CONTRACTOR IS TO KEEP THE GENERAL AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH, AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. LEAVE PREMISES IN CLEAN CONDITION DAILY.

10. PLANS ARE INTENDED TO BE DIAGRAMMATIC ONLY AND SHOULD NOT BE SCALED UNLESS OTHERWISE NOTED. RELY ONLY ON ANNOTATED DIMENSIONS AND REQUEST INFORMATION IF ADDITIONAL DIMENSIONS ARE REQUIRED.

11. THE EXISTENCE AND LOCATION OF UTILITIES AND OTHER AGENCY'S FACILITIES WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. OTHER FACILITIES MAY EXIST. CONTRACTOR SHALL VERIFY LOCATIONS PRIOR TO START OF CONSTRUCTION AND USE EXTREME CARE AND PROTECTIVE MEASURES TO PREVENT DAMAGE TO THESE FACILITIES. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF UTILITIES OR OTHER AGENCY'S FACILITIES WITHIN THE LIMITS OF THE WORK, WHETHER THEY ARE INDENTIFIED IN THE CONTRACT DOCUMENTS OR NOT.

12. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (800) 227-2600, AT LEAST TWO WORKING DAYS PRIOR TO THE START OF ANY EXCAVATION.

DEFINITIONS

1. "TYPICAL" OR "TYP" MEANS THAT THIS ITEM IS SUBSTANTIALLY THE SAME ACROSS SIMILAR CONDITIONS. "TYP." SHALL BE UNDERSTOOD TO MEAN "TYPICAL WHERE OCCURS" AND SHALL NOT BE CONSIDERED AS WITHOUT EXCEPTION OR CONSIDERATION OF SPECIFIC CONDITIONS.

2. "SIMILAR" MEANS COMPARABLE TO CHARACTERISTICS FOR THE CONDITION NOTED. VERIFY DIMENSIONS AND ORIENTATION ON PLAN.

3. "AS REQUIRED" MEANS AS REQUIRED BY REGULATORY REQUIREMENTS, BY REFERENCED STANDARDS, BY EXISTING CONDITIONS, BY GENERALLY ACCEPTED CONSTRUCTION PRACTICE, OR BY THE CONTRACT DOCUMENTS.

4. "ALIGN" MEANS ACCURATELY LOCATE FINISH FACES OF MATERIALS IN THE SAME PLANE.

5. THE TERM "VERIFY" OR "V.I.F." SHALL BE UNDERSTOOD TO MEAN "VERIFY IN FIELD WITH ENGINEER" AND REQUIRES THAT THE CONTRACTOR CONFIRM INTENTION REGARDING NOTED CONDITION AND PROCEED ONLY AFTER RECEIVING DIRECTION.

6. WHERE THE WORDS "OR EQUAL" OR WORDS OF SIMILAR INTENT FOLLOW A MATERIAL SPECIFICATION, THEY SHALL BE UNDERSTOOD TO REQUIRE SIGNED APPROVAL OF ANY DEVIATION TO SAID SPECIFICATION PRIOR TO CONTRACTOR'S ORDERING OR INSTALLATION OF SUCH PROPOSED EQUAL PRODUCT.

7. FURNISH: SUPPLY ONLY, OTHERS TO INSTALL.
   INSTALL: INSTALL ITEMS FURNISHED BY OTHERS.
   PROVIDE: FURNISH AND INSTALL.

811 USA North
Know what's below. Call before you dig.
California and Nevada
Call Two Working Days Before You Dig!
811 / 800-227-2600

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
NISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1

ELECTRICAL NOTES

1. ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ANY/ALL ELECTRICAL WORK INDICATED. ANY/ALL CONSTRUCTION SHALL BE IN ACCORDANCE W/DRAWINGS AND ANY/ALL APPLICABLE SPECIFICATIONS. IF ANY PROBLEMS ARE ENCOUNTERED BY COMPLYING WITH THESE REQUIREMENTS, CONTRACTOR SHALL NOTIFY 'CONSTRUCTION MANAGER' AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK, UNTIL THE 'CONSTRUCTION MANAGER' HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.

2. ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATION INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. ALL EXISTING CONDITIONS OF ELECTRICAL EQUIP., LIGHT FIXTURES, ETC., THAT ARE PART OF THE FINAL SYSTEM, SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTING OF HIS BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM.

3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND ALL CODES AND LOCAL ORDINANCES OF THE LOCAL POWER & TELEPHONE COMPANIES HAVING JURISDICTION AND SHALL INCLUDE BUT NOT BE LIMITED TO:
   C - NATIONAL FIRE CODES
   A. UL - UNDERWRITERS LABORATORIES
   B. NEC - NATIONAL ELECTRICAL CODE
   C. NEMA - NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
   D. OSHA - OCCUPATIONAL SAFETY AND HEALTH ACT
   E. SBC - STANDARD BUILDING CODE

4. DO NOT SCALE ELECTRICAL DRAWINGS, REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, AND CONFIRM WITH 'CONSTRUCTION MANAGER' ANY SIZES AND LOCATIONS WHEN NEEDED.

5. EXISTING SERVICES: CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE OWNER.

6. CONTRACTOR SHALL PAY FOR ANY/ALL PERMITS, FEES, INSPECTIONS AND TESTING. CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO THE WORK BEGINNING OR ORDERING EQUIPMENT.

7. THE TERM "PROVIDE" USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.

8. CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS SUCH AS THE: LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS' CONFIRMATION, ETC... ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.

9. MINIMUM WIRE SIZE SHALL BE #12 AWG, NOT INCLUDING CONTROL WIRING, UNLESS NOTED OTHERWISE. ALL CONDUCTORS SHALL BE COPPER WITH THWN INSULATION.

10. OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.

11. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF THE CONSTRUCTION. CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.

12. ELECTRICAL SYSTEM SHALL BE AS COMPLETELY AND EFFECTIVELY GROUNDED, AS REQUIRED BY SPECIFICATIONS, SET FORTH BY VERIZON.

13. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY OPERATIVE AND SUBJECT TO REGULATORY INSPECTION AND APPROVAL BY CONSTRUCTION MANAGER.

14. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.

15. CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE.

16. THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OR THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN.

17. ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK.

18. PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS AS INDICATED.

19. DITCHING AND BACK FILL: CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION AND BACKFILLING AND COMPACTION. REFER TO NOTES AND REQUIREMENTS 'EXCAVATION, AND BACKFILLING.

20. MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW AND SHALL APPEAR ON THE LIST OF U.L. APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NEC, NEMA AND IECE.

21. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURES CATALOG INFORMATION OF ANY/ALL LIGHTING FIXTURES, SWITCHES AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.

22. ANY CUTTING OR PATCHING DEEMED NECESSARY FOR ELECTRICAL WORK IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY AND SHALL BE INCLUDED IN THE COST FOR WORK AND PERFORMED TO THE SATISFACTION OF THE 'CONSTRUCTION MANAGER' UPON FINAL ACCEPTANCE.

23. THE ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

24. DISCONNECT SWITCHES SHALL BE H.P. RATED HEAVY-DUTY, QUICK-MAKE AND QUICK-BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.

25. ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI-OXIDE COMPOUND SUCH AS "NO-OXIDE A" BY DEARBORNE CHEMICAL CO. COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED COPPER SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED - NO SUBSTITUTIONS.

26. RACEWAYS: CONDUIT SHALL BE SCHEDULE 40 PVC MEETING OR EXCEEDING NEMA TC2 - 1990. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS - 200 LBS TEST POLYETHYLENE CORD. ALL CONDUIT BENDS SHALL BE A MINIMUM OF 2 FT. RADIUS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL-6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT. COAT ALL THREADS WITH 'BRITE ZINC' OR 'GOLD GALV'.

27. SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.

28. CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE THWN INSULATION, 800 VOLT, COLOR CODED. USE SOLID CONDUCTORS FOR WIRE UP TO AND INCLUDING NO. 8 AWG. USE STRANDED CONDUCTORS FOR WIRE ABOVE NO. 8 AWG.

29. CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.

30. SERVICE: 240/120V, SINGLE PHASE, 3 WIRE CONNECTION AVAILABLE FROM UTILITY COMPANY. OWNER OR OWNERS AGENT WILL APPLY FOR POWER.

31. TELEPHONE SERVICE: CONTRACTOR SHALL PROVIDE EMPTY CONDUITS WITH PULL STRINGS AS INDICATED ON DRAWINGS.

32. ELECTRICAL AND TELCO RACEWAYS TO BE BURIED A MINIMUM OF 2' DEPTH.

33. CONTRACTOR SHALL PLACE TWO LENGTHS OF WARNING TAPE AT A DEPTH OF 12" BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL AND TELCO SERVICE CONDUITS. CAUTIONS TAPE TO READ "CAUTION BURIED ELECTRIC" OR "BURIED TELECOMM".

34. ALL BOLTS SHALL BE STAINLESS STEEL

GROUNDING NOTES

1. COMPRESSION CONNECTIONS (2), 2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.

2. EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH 1" HIGH LETTERS.

3. ALL HARDWARE 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR LARGER.

4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.

5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE.

6. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

7. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUNDING BAR TO AN EXISTING TOWER,THE SUBCONTRACTOR SHALL OBTAIN APPROVAL FROM THE TOWER OWNER PRIOR TO MOUNTING THE GROUNDING BAR TO THE TOWER.

8. ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER.

ADDITIONAL NOTES:

9. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL GROUNDING INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.

10. GROUND ALL ANTENNA BASES, FRAMES, CABLE RUNS, AND OTHER METALLIC COMPONENTS USING #2 GROUND WIRES AND CONNECT TO SURFACE MOUNTED GROUND BUS BARS AS SHOWN. FOLLOW ANTENNA AND BTS MANUFACTURER'S PRACTICES FOR GROUNDING REQUIREMENTS. GROUND COAX SHIELD AT BOTH ENDS USING MANUFACTURERS PRACTICES. ALL UNDERGROUND WATER PIPES, METAL CONDUITS AND GROUNDS THAT ARE A PART OF THIS SYSTEM SHALL BE BONDED TOGETHER.

11. ALL GROUND CONNECTIONS SHALL BE #2 AWG U.N.O. ALL WIRES SHALL BE COPPER THHN/THWN. ALL GROUND WIRE SHALL BE SOLID TIN COATED OR STRANDED GREEN INSULATED WIRE.

12. CONTRACTOR TO VERIFY AND TEST GROUND TO SOURCE, 5 OHMS MAXIMUM. PROVIDE SUPPLEMENT GROUNDING RODS AS REQUIRED TO ACHIEVE SPECIFIED OHMS READING. GROUNDING AND OTHER OPTIONAL TESTING WILL BE WITNESSED BY THE VERIZON REPRESENTATIVE.

13. NOTIFY ARCHITECT/ENGINEER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.

14. BARE GROUNDING CONDUCTOR SHALL BE HARD DRAWN TINNED COPPER SIZES AS NOTED ON PLAN.

15. ALL HORIZONTALLY RUN GROUNDING CONDUCTORS SHALL BE INSTALLED MINIMUM 12" BELOW GRADE/FROST-LINE IN TRENCH, U.N.O., AND BACK FILL SHALL BE COMPACTED AS REQUIRED BY ARCHITECT.

16. ALL GROUND CONDUCTORS SHALL BE RUN AS STRAIGHT AND SHORT AS POSSIBLE, WITH A MINIMUM 12" BENDING RADIUS NOT LESS THAN 90 DEGREES.

17. ALL SUPPORT STRUCTURES, CABLE CHANNEL WAYS OR WIRE GUIDES SHALL BE BONDED TO GROUND SYSTEM AT A POINT NEAREST THE MAIN GROUNDING BUS "MGB" (OR DIRECTLY TO GROUND-RING).

18. ACCEPTABLE CONNECTIONS FOR GROUNDING SYSTEM SHALL BE:
   a. BURNDY, HY-GRADE U.L. LISTED CONNECTORS FOR INDOOR USE OR AS APPROVED BY VERIZON PROJECT MANAGER.
   b. CADWELD, EXOTHERMIC WELDS (WELDED CONNECTIONS).
   c. TWO -(2) HOLE TINNED COPPER COMPRESSION (LONG BARREL) FITTINGS (BUS BAR CONNECTIONS).

19. ALL CRIMPED CONNECTIONS SHALL HAVE EMBOSSED MANUFACTURER'S DIEMARK VISIBLE AT THE CRIMP (RESULTING FROM USE OF PROPER CRIMPING DEVICES).

20. PRIOR TO ANY LUG-BUSSBAR CONNECTIONS, THE BUSSBAR SHALL BE CLEANED BY USE OF "SCOTCH-BRITE' OR PLAIN STEEL WOOL AS TO REMOVE ALL SURFACE OXIDATION AND CONTAMINANTS. A COATING OF "NO-OX-ID" SHALL BE APPLIED TO THE CONNECTION SURFACES.

21. ALL CONNECTION HARDWARE SHALL BE TYPE 316 SS (NOT ATTRACTED TO MAGNETS).

22. THE GROUND RING SHALL BE INSTALLED 24" MINIMUM BEYOND ANY BUILDING DRIP LINE.

23. ELECTRICAL SERVICE EQUIPMENT GROUNDING SHALL COMPLY WITH NEC, ARTICLE 250-82 AND SHALL BOND ALL EXISTING AND NEW GROUNDING ELECTRODES. NEW GROUNDING ELECTRODE SHALL INCLUDE BUT NOT LIMITED TO GROUND RODS, GROUND RING IF SERVICE IS WITHIN THE RADIO EQUIPMENT LOCATION, BUILDING STEEL IF APPLICABLE, COLD WATER CONNECTIONS MUST BE MADE ON THE STREET SIDE OF MAIN SHUT-OFF VALVE.

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
HASAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

"Hands On Tree Care"
ANDERSON'S Tree Care Specialists, Inc.
P.O. Box 2B • San Jose, CA 95109-0002
Tel: (408) 226-TREE (8733) • Fax: (408) 281-8733 • Lic #705171
www.andersonstreecare.com

5/13/2021

Jeremy Stroup
Real Estate Specialist III
Vinculums Services, LLC
10 Pasteur, Suite 100
Irvine, CA 92618
jstroup@vinculums.com
925-202-8654

Re: Tree Protection Measures at SF PALO ALTO 164 (Median at 313-331 Arboretum Rd., dual pole #13/14)

Dear Jeremy,

Cellular equipment will be mounted on a new metal light pole, #13/14, in the median adjacent to the above address. The new pole will be in approximately the same location as the existing pole, with three new handholes adjacent to the pole, connected to the pole by conduits installed via trenching. I visually estimated distances between trees and project features onsite.

Two Street Trees, both Mexican fan palms (*Washingtonia robusta*) overhang the construction area. Type II Tree Protection is required for both: the planting strip shall be enclosed from the light pole, to the outside edge of the tree's dripline. Install 5-6' high chain link fencing mounted on 2-inch diameter galvanized iron posts, driven into the ground to a depth of at least 2 feet at no more than 10-foot spacing. Trenching must be performed by hand. If any live roots are encountered during excavation, the recommendations in section 2.20 C apply:

C. Trenching, Excavation and Equipment Use

Trenching, excavation or boring activity within the TPZ is restricted to the following activities, conditions and requirements if approved by the *City Arborist*. *(See Restriction Zones for Excavation, Trenching or Boring Near Regulated Trees, Image 2.20-1 through 2.20-3)*. Mitigating measures shall include prior notification to and direct supervision by the *project arborist*.

1. Notification. Contractor shall notify the *project arborist* a minimum of 24 hours in advance of the activity in the TPZ.
2. Root Severance. Roots that are encountered shall be cut to sound wood and repaired (*see Root Injury, Section 2.25 A-1*). Roots 2-inches and greater must remain injury free.
3. Excavation. Any approved excavation, demolition or extraction of material shall be performed with equipment sitting outside the TPZ. Methods permitted are by hand digging, hydraulic or pneumatic air excavation technology. Avoid excavation within the TPZ during hot, dry weather.
   - If excavation or *trenching* for drainage, utilities, irrigation lines, etc., it is the duty of the contractor to tunnel under any roots 2-inches in diameter and greater.
   - Prior to excavation for foundation/footings/walls, grading or *trenching* within the TPZ, roots shall first be severed cleanly 1-foot outside the TPZ and to the depth of the future excavation. The trench must then be hand dug and roots pruned with a saw, sawzall, narrow trencher with sharp blades or other approved root pruning equipment.
4. Heavy Equipment. Use of backhoes, steel tread tractors or any heavy vehicles within the TPZ is prohibited unless approved by the *City Arborist*. If allowed, a protective *root buffer* (*see Root Buffer and Damage to Trees, Section 2.25.A-1*) is required. The protective buffer shall consist of a base course of tree chips spread over the root area to a minimum of 6-inch depth, layered by 3/4-inch quarry gravel to stabilize 3/4-inch plywood on top. This buffer within the TPZ shall be maintained throughout the entire construction process.
   - Structural design. If injurious activity or interference with roots greater than 2-inches will occur within the TPZ, plans shall specify a design of special foundation, footing, walls, concrete slab or pavement designs subject to *City Arborist* approval. Discontinuous foundations such as concrete pier and structural grade beam must maintain natural grade (not to exceed a 4-inch cut), to minimize root loss and allow the tree to use the existing soil.

No amenity trees are recommended at this site, as they would conflict aesthetically with the existing palms.

Tree Map

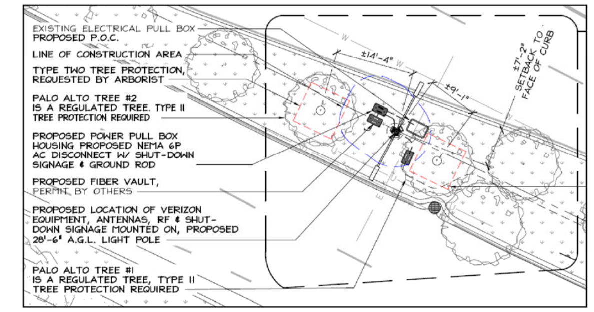


Image 1: area around existing light pole

ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided to the consultant/appraiser is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.
2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other government regulations.
3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/appraiser can neither guarantee nor be responsible for the accuracy of information provided by others.
4. The consultant/appraiser shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
5. Loss, alteration, or reproduction of any part of this report invalidates the entire report.
6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of the consultant/appraiser.
7. Neither all nor any part of this report, nor any copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of the consultant/appraiser particularly as to value conclusions, identity of the consultant/appraiser, or any reference to any professional society or initialed designation conferred upon the consultant/appraiser as stated in his qualification.
8. This report and the values expressed herein represent the opinion of the consult/appraiser, and the consult/appraiser's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.
10. Unless expressed otherwise: 1) information in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in future.

Respectfully submitted,

Katherine Naegele
Consulting Arborist
Anderson's Tree Care Specialists, Inc.
A TCIA Accredited Company
Master of Forestry, UC Berkeley
ISA Certified Arborist #WE-9658A
ISA Tree Risk Assessment Qualified
American Society of Consulting Arborists, Member
Office: 408 226-8733
Cell: 650 209-0631

www.andersonstreecare.com

"Hands On Tree Care" ANDERSON'S Tree Care Specialists, Inc.

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
TREE PROTECTION REPORT

SHEET NUMBER
TPR-1

NOTE:
ANY CONSTRUCTION WITHIN THE CITY'S PUBLIC ROAD RIGHT-OF-WAY SHALL HAVE AN APPROVED PERMIT FOR CONSTRUCTION IN THE PUBLIC STREET PRIOR TO CEMMENCEMENT OF THIS WORK

City of Palo Alto

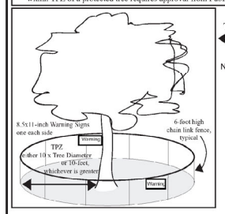
Tree Protection - It's Part of the Plan!

Make sure your crews and subs do the job right!

Fenced enclosures around trees are essential to protect them by keeping the foliage canopy and branching structure clear from contact by equipment, materials and activities, preserving roots and soil conditions in an intact and non-compacted state, and identifying the Tree Protection Zone (TPZ) in which no soil disturbance is permitted and activities are restricted, unless otherwise approved. **An approved tree protection report must be added to this sheet when project activity occurs within the TPZ of a regulated tree.**
For detailed information on Palo Alto's regulated trees and protection during development, review the **City Tree Technical Manual** (TTM) found at www.cityofpaloalto.org/trees/.

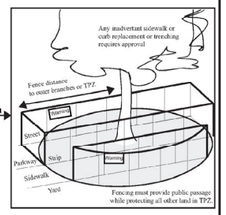
For written specifications associated with illustrations below, see Public Works Specifications Section 31
Detailed specifications are found in the Palo Alto Tree Technical Manual (TTM) (www.cityofpaloalto.org/trees/)

Tree Protection Zone (TPZ) shown in gray (radius of TPZ equals 10-times the diameter of the tree or 10-feet, whichever is greater)
- Restricted activity area – see Tree Technical Manual Sec 2.15(E).
- Restricted trenching area – see Tree Technical Manual Sec 2.20(C-D), any proposed trench or form work within TPZ of a protected tree requires approval from Public Works Operations. Call 650-496-5953.

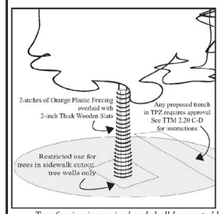


Type I Tree Protection — For all Ordinance Protected and Designated trees, as detailed in the site specific tree preservation report (TPR) prepared by the applicant's project arborist as diagramed on the plans.

Note: Ordinance Protected & Designated Trees. Issuance of a permit requires applicant's project arborist written verification Type I is installed correctly according to the plans and Tree Preservation Report



Type II Tree Protection



Note: Street Trees. Issuance of a permit requires Public Works Operations inspection and signed approval on the Street Tree Verification (STV) form provided.

Type III Tree Protection
(to be used only with approval of Public Works Operations)

Tree fencing is required and shall be erected before demolition, grading or construction begins.

Rev	By	Date
0	DWH	12/14/92
01	D.D.	08/04/04
02	D.D.	06/10/06

Scale: NTS

Tree Protection During Construction

City of Palo Alto Standard

Approved by: Dave Dockter
PE No.
Date 2006
Dwg No. 605

Table 2-2 Palo Alto Tree Technical Manual

CONTRACTOR & ARBORIST INSPECTION SCHEDULE

Reference: the Palo Alto Tree Technical Manual is available at www.cityofpaloalto.org/environment/

ALL CHECKED ITEMS APPLY TO THIS PROJECT:

1. ☑ **Inspection of Protective Tree Fencing**. For Public Trees, the Street Tree Verification Form shall be signed by the City Arborist. For Protected Trees, the project site arborist shall provide an initial Monthly Tree Activity Report form with a photograph verifying that he has conducted a field inspection of the trees and that the correct type of protective fencing is in place around the designated tree protection zone (TPZ) prior to issuance of a demolition, grading, or building permit. (See TTM, Verification of Tree Protection, Section 1.39).
2. ☑ **Pre-Construction Meeting**. Prior to commencement of construction, the applicant or contractor shall conduct a pre-construction meeting to discuss tree protection with the job site superintendent, grading operators, project site arborist, City Arborist, and, if a city maintained irrigation system is involved, the Parks Manager (Contact 650-496-6962).
3. ☑ **Inspection of Rough Grading or Trenching**. Contractor shall ensure the project site arborist performs an inspection during the course of rough grading or trenching adjacent to or within the TPZ to ensure trees will not be injured by compaction, cut or fill, drainage and trenching, and if required, inspect aeration systems, tree wells, drains and special paving. The contractor shall provide the project arborist at least 24 hours advance notice of such activity.
4. ☑ **Monthly Tree Activity Report Inspections**. The project site arborist shall perform a minimum monthly activity inspection to monitor and advise on conditions, tree health and retention or, ***immediately if there are any revisions to the approved plans or protection measures***. The Tree Technical Manual Monthly Tree Activity Report format shall be used and sent to the Planning Dept. landscape reviewr staff no later than 14 days after issuance of building permit date. Fax to (650) 329-2154. (See TTM, Monthly Tree Activity Inspection Report, Addendum 11 & section 1.17).
5. ☑ **Special activity within the Tree Protection Zone**. Work in the TPZ area (see also #7 below) requires the direct onsite supervision of the project arborist (see TTM, Trenching, Excavation & Equipment, Section 2.20 C).
6. ☐ **Landscape Architect Inspection**. For discretionary development projects, prior to temporary or final occupancy the applicant or contractor shall arrange for the Landscape Architect to perform an on site inspection of all plant stock, quality of the materials and planting (see TTM, Planting Quality, Section 5.20.1.A) and that the irrigation is functioning consistent with the approved construction plans. The Planning Dept. landscape reviewr staff shall be in receipt of written verification of Landscape Architect approval prior to scheduling the final inspection, unless otherwise approved.
7. ☐ **List Other** (please describe as called out in the site Tree Preservation Report, Sheet T-1, T-2, etc.)
   - * _____
   - * _____

City of Palo Alto Tree Technical Manual — ADDENDUM 11

Arborist Firm Data Here — email: RCA/ISA Certified Arborist #WE-000 Contract Cell #:

Monthly Tree Activity Report- *Construction Site*

Inspection Date: _____ **Inspection #**_____	**Site address:** _____ Palo Alto, CA	**Contractor- Main Site Contact Information**	#1: Job site superintendent Company: Email: Job site Office: Cell: Mail:
		Also present:	* _____ * _____
Distribution:	1. City of Palo Alto 2. Others	**Attn: Dave Dockter**	Dave.dockter@cityofpaloalto.org 650-329-2440

Provide the requested minimum information with each report, customize as necessary. To be completed by project site arborist. Send monthly to city arborist at above address until project completion. Use additional sheets as needed.

1. Assignment Activity (Demolition/grading/sewer/trenching/foundation/list relevant visits)
   a. Pre-construction meeting requirement with sub-contractors
   b. Inspect to verify that tree protection measures are in place
   c. Determine if field adjustments, watering or plan revisions may be needed
2. Field Observations (general site-wide and list by individual tree number)
   a. Tree Protection Fences (TPF) are …
   b. Trenching has/will occur …
3. Action Items (list site-wide, by tree number and date to be satisfied) and Date Due
   a. Tree Protection Fence (TPF) needs adjusting (tree #'s, x, x)
   b. Root zone buffer material (wood chips) can be installed next
   c. Schedule sewer trench, foundation dig with …
4. Photographs (use often)
5. Tree Location Map (mandatory 8.5 x 11 sheet)
6. Recommendations, notes or monitor items for project/staff/schedule
   •
7. Past visits (list carry-over items satisfied/still outstanding)
   •

Respectfully submitted,

Project site arborist
Consultant contact information (Include email, cell#, and mailing)
Cc:

Enter Date — CPA Monthly Tree Activity Report: Type site address here — Page #1 of 1

City of Palo Alto
250 Hamilton Avenue, Palo Alto, CA 94301

Search: Advanced — Browse By Topic
Home > Planning & Community Environment

Home
City-owned Trees
Privately-owned Trees
About the Tree Ordinance
Title 8.10
Heritage Trees
Forms
Tree Technical Manual
FAQs
Contact Us
Resources

Tree Technical Manual

To purchase the Tree Technical Manual

June, 2001 First Edition

View by section:

- Table of Contents (PDF, 87KB)
- Intent and Purpose (PDF, 1.05MB)
- Introduction - Use of Manual (PDF, 1.05MB)
- Section 1.0 - Definitions (PDF, 96KB)
- Section 2.0 - Protection of Trees During Construction (PDF, 259KB)
- Section 3.0 - Removal, Replacement & Planting of Trees (PDF, 117KB)
- Section 4.0 - Hazardous Trees (PDF, 105KB)
- Section 5.0 - Tree Maintenance Guidelines (PDF, 110KB)
- Section 6.0 - Tree Reports (PDF, 84KB)

View ALL sections:

- Tree Technical Manual - Full (PDF, 1.84MB)

APPENDICES
A: Palo Alto Municipal Code Chapter 8.10, Tree Preservation & Management Regulations
B: Tree City - USA
C: ISA Hazard Evaluation Form
D: List of Inherent Failure Patterns for Selected Species (Reference source)
E: ISA Tree Pruning Guidelines (PDF, 1.85MB)
F: Tree Care Safety Standards, ANSI Z133.1-1994 (Reference source)
G: Pruning Performance Standards, ANSI A300-1995 (Reference source) H: Tree Planting Details, Diagram 504 & 505
I: Tree Disclosure Statement
J: Palo Alto Standard Tree Protection Instructions

APPENDIX J

PALO ALTO
STREET TREE PROTECTION INSTRUCTIONS
–SECTION 31–

31-1 General
- **a.** **Tree protection has three primary functions**, 1) to keep the foliage canopy and branching structure clear from contact by equipment, materials and activities; 2) to preserve roots and soil conditions in an intact and non-compacted state and 3) to identify the Tree Protection Zone (TPZ) in which no soil disturbance is permitted and activities are restricted, unless otherwise approved.
- **b.** **The Tree Protection Zone (TPZ)** is a restricted area around the base of the tree with a radius of ten-times the diameter of the tree's trunk or ten feet, whichever is greater, enclosed by fencing.

31-2 Reference Documents
- **a.** **Detail 605** – Illustration of situations described below.
- **b.** **Tree Technical Manual (TTM) Forms** (http://www.cityofpaloalto.org/trees/)
  1. Trenching Restriction Zones (TTM, Section 2.20(C))
  2. Arborist Reporting Protocol (TTM, Section 6.30)
  3. Site Plan Requirements (TTM, Section 6.35)
  4. Tree Disclosure Statement (TTM, Appendix J)
- **c.** **Street Tree Verification (STV) Form** (http://www.cityofpaloalto.org/trees/forms)

31-3 Execution
- **a.** **Type I Tree Protection:** The fence shall enclose the entire TPZ of the tree(s) to be protected throughout the life of the construction project. In some parking areas, if fencing is located on paving or concrete that will not be demolished, then the posts may be supported by an appropriate grade level concrete base, if approved by Public Works Operations.
- **b.** **Type II Tree Protection:** For trees situated within a planting strip, only the planting strip and yard side of the TPZ shall be enclosed with the required chain link protective fencing in order to keep the sidewalk and street open for public use.
- **c.** **Type III Tree Protection:** To be used only with approval of Public Works Operations. Trees situated in a tree well or sidewalk planter pit, shall be wrapped with 2-inches of orange plastic fencing from the ground to the first branch and overlaid with 2-inch thick wooden slats bound securely (slats shall not be allowed to dig into the bark). During installation of the plastic fencing, caution shall be used to avoid damaging any branches. Major limbs may also require plastic fencing as directed by the City Arborist.
- **d.** **Size, type and area to be fenced.** All trees to be preserved shall be protected with six (6') foot high chain link fences. Fences are to be mounted on two-inch diameter galvanized iron posts, driven into the ground to a depth of at least 2-feet at no more than 10-foot spacing. Fencing shall extend to the outer branching, unless specifically approved on the STV Form.
- **e.** **'Warning' signs.** A warning sign shall be weather proof and prominently displayed on each fence at 20-foot intervals. The sign shall be minimum 8.5-inches x 11-inches and clearly state in half inch tall letters: "WARNING - Tree Protection Zone - This fence shall not be removed and is subject to a fine according to PAMC Section 8.10.110."
- **f.** **Duration**. Tree fencing shall be erected before demolition, grading or construction begins and remain in place until final inspection of the project, except for work specifically allowed in the TPZ. Work or soil disturbance in the TPZ requires approval by the project arborist or City Arborist (in the case of work around Street Trees). Excavations within the public right of way require a Street Work Permit from Public Works.
- **g.** **During construction**
  1. All neighbors' trees that overhang the project site shall be protected from impact of any kind.
  2. The applicant shall be responsible for the repair or replacement plus penalty of any publicly owned trees that are damaged during the course of construction, pursuant to Section 8.04.070 of the Palo Alto Municipal Code.
  3. The following tree preservation measures apply to all trees to be retained:
     - **a.** No storage of material, topsoil, vehicles or equipment shall be permitted within the TPZ.
     - **b.** The ground under and around the tree canopy area shall not be altered.
     - **c.** Trees to be retained shall be irrigated, aerated and maintained as necessary to ensure survival.

END OF SECTION

City of Palo Alto 2004 Standard Drawings and Specifications
Street Tree Verification of Protection, PWE, Section 31 — Revised 08/06

City of Palo Alto
Tree Department
Public Works Operations
PO Box 10250 Palo Alto, CA 94303
650/496-5953 FAX: 650/852-0289
treeprotection@CityofPaloAlto.org

Verification of Street Tree Protection

Applicant Instructions: Complete upper portion of this form. Mail or FAX this form along with signed Tree Disclosure Statement to Public Works Dept. Public Works Tree Staff will inspect and notify applicant.

APPLICATION DATE:	
ADDRESS/LOCATION OF STREET TREES TO BE PROTECTED:	
APPLICANT'S NAME:	
APPLICANT'S ADDRESS:	
APPLICANT'S TELEPHONE & FAX NUMBERS:	

This section to be filled out by City Tree Staff

1. The Street Trees at the above address(es) are adequately protected. The type of protection used is:	YES ☐ NO* ☐ * If NO, go to #2 below
Inspected by:	
Date of Inspection:	

2. The Street Trees at the above address are **NOT** adequately protected. The following modifications are required:	
Indicate how the required modifications were communicated to the applicant	

Subsequent Inspection

Street trees at above address were found to be adequately protected:	YES ☐ NO* ☐ * If NO, indicate in "Notes" below the disposition of case.
Inpsected by:	
Date of Inspection:	

Notes: List City street trees by species, site, condition and type of tree protection installed. Also note if pictures were taken. Use back of sheet if necessary.	

Return approved sheet to Applicant for demolition or building permit issuance.

S:PWD/OPS/Tree/DB/St.TreeProtect — 5/17/06

---WARNING---
Tree Protection Zone

This fencing shall not be removed without City Arborist approval (650-496-5953)

Removal without permission is subject to a $500 fine per day*

Palo Alto Municipal Code Section 8.10.110

City of Palo Alto Tree Protection Instructions are located at http://www.city.palo-alto.ca.us/trees/technical-manual.html

SPECIAL INSPECTIONS — **PLANNING DEPARTMENT**

TREE PROTECTION INSPECTIONS MANDATORY

PAMC 8.10 PROTECTED TREES. CONTRACTOR SHALL ENSURE PROJECT SITE ARBORIST IS PERFORMING REQUIRED TREE INSPECTION AND SITE MONITORING. PROVIDE WRITTEN MONTHLY TREE ACTIVITY REPORTS TO THE PLANNING DEPARTMENT LANDSCAPE REVIEW STAFF BEGINNING 14 DAYS AFTER BUILDING PERMIT ISSUANCE.

BUILDING PERMIT DATE: _____

DATE OF 1ST TREE ACTIVITY REPORT: _____

CITY STAFF: _____

REPORTING DETAILS OF THE MONTHLY TREE ACTIVITY REPORT SHALL CONFORM TO SHEET T-1 FORMAT. VERIFY THAT ALL TREE PROTECTION MEASURES ARE IMPLIMENTED AND WILL INCLUDE ALL CONTRACTOR ACTIVITY, SCHEDULED OR UNSCHEDULED, WITHIN A TREE PROTECTION ROOT ZONE. NON-COMPLIANCE IS SUBJECT TO VIOLATION OF PAMC 8.10.080. REFERENCE: PALO ALTO TREE TECHNICAL MANUAL, SECTION 2.00 AND ADDENDUM 11.

Apply Tree Protection Report on sheet(s) T-2

Use addtional "T" sheets as needed

verizon

2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums

575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY

23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER — WISSAM ZALZALI — 71655 — CIVIL — STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
PALO ALTO TREE PROTECTION

SHEET NUMBER
L-1

POLLUTION PREVENTION — IT'S PART OF THE PLAN

Construction projects are required to implement year-round stormwater BMPs, as they apply to your project.

Runoff from streets and other paved areas is a major source of pollution to San Francisco Bay. Construction activities can directly affect the health of the Bay unless contractors and crews plan ahead to keep construction dirt, debris, and other pollutants out of storm drains and local creeks. Following these guidelines will ensure your compliance with City of Palo Alto Ordinance requirements.






MATERIALS & WASTE MANAGEMENT

Non-Hazardous Materials

- ☐ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or when they are not in use.
- ☐ Use (but don't overuse) reclaimed water for dust control.
- ☐ Ensure dust control water doesn't leave site or discharge to storm drains.

Hazardous Materials

- ☐ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
- ☐ Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecast.
- ☐ Follow manufacturer's application instructions for hazardous materials and do not use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- ☐ Arrange for appropriate disposal of all hazardous wastes.

Waste Management

- ☐ Cover and maintain dumpsters. Check frequently for leaks. Place dumpsters under roofs or cover with tarps or plastic sheeting secured around the outside of the dumpster. A plastic liner is recommended to prevent leaks. Never clean out a dumpster by hosing it down on the construction site.
- ☐ Place portable toilets away from storm drains. Make sure they are in good working order. Check frequently for leaks.
- ☐ Dispose of all wastes and demolition debris properly. Recycle materials and wastes that can be recycled, including solvents, water-based paints, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation.
- ☐ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.
- ☐ Keep site clear of litter (e.g. lunch items, cigarette butts).
- ☐ Prevent litter from uncovered loads by covering loads that are being transported to and from site.

Construction Entrances and Perimeter

- ☐ Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site.
- ☐ Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking. Never hose down streets to clean up tracking.

EQUIPMENT MANAGEMENT & SPILL CONTROL

Maintenance and Parking

- ☐ Designate an area of the construction site, well away from streams or storm drain inlets and fitted with appropriate BMPs, for auto and equipment parking, and storage.
- ☐ Perform major maintenance, repair jobs, and vehicle and equipment washing off site.
- ☐ If refueling or vehicle maintenance must be done onsite, work in a bermed area away from storm drains and over a drip pan or drop cloths big enough to collect fluids. Recycle or dispose of fluids as hazardous waste.
- ☐ If vehicle or equipment cleaning must be done onsite, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or surface waters.
- ☐ Do not clean vehicle or equipment onsite using soaps, solvents, degreasers, or steam cleaning equipment, and do not use diesel oil to lubricate equipment or parts onsite.

Spill Prevention and Control

- ☐ Keep spill cleanup materials (e.g., rags, absorbents and cat litter) available at the construction site at all times.
- ☐ Maintain all vehicles and heavy equipment. Inspect frequently for and repair leaks. Use drip pans to catch leaks until repairs are made.
- ☐ Clean up leaks, drips and other spills immediately and dispose of cleanup materials properly.
- ☐ Use dry cleanup methods whenever possible (absorbent materials, cat litter and/or rags).
- ☐ Swoop up spilled dry materials immediately. Never attempt to "wash them away" with water, or bury them.
- ☐ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ☐ Report any hazardous materials spills immediately! Call City of Palo Alto Communications, **(650) 329-2413**. If the spill poses a significant hazard to human health and safety, property or the environment, you must report it to the State Office of Emergency Services. **(800) 852-7550 (24 hours).**

EARTHMOVING

Grading and Earthwork

- ☐ Schedule grading and excavation work during dry weather.
- ☐ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded fiber matrix) until vegetation is established.
- ☐ Remove existing vegetation only when absolutely necessary, plant temporary vegetation for erosion control on slopes or where construction is not immediately planned.
- ☐ Prevent sediment from migrating offsite and protect storm drain inlets, drainage courses and streams by installing and maintaining appropriate BMPs (e.g., silt fences, gravel bags, fiber rolls, temporary swales, etc.).
- ☐ Keep excavated soil on site and transfer it to dump trucks on site, not in the streets.

Contaminated Soils

- ☐ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
  - Unusual soil conditions, discoloration, or odor.
  - Abandoned underground tanks.
  - Abandoned wells.
  - Buried barrels, debris, or trash.
- ☐ If the above conditions are observed, document any signs of potential contamination and clearly mark them so they are not disturbed by construction activities.

Landscaping

- ☐ Protect stockpiled landscaping materials from wind and rain by storing them under tarps all year-round.
- ☐ Stack bagged material on pallets and under cover.
- ☐ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

CONCRETE MANAGEMENT & DEWATERING

Concrete Management

- ☐ Store both dry and wet materials under cover, protected from rainfall and runoff and away from storm drains or waterways. Store materials off the ground, on pallets. Protect dry materials from wind.
- ☐ Wash down exposed aggregate concrete only when the wash water can (1) flow onto a dirt area; (2) drain onto a bermed surface from which it can be pumped and disposed of properly; or (3) block any storm drain inlets and vacuum washwater from the gutter. If possible, sweep first.
- ☐ Wash out concrete equipment/trucks offsite or in a designated washout area, where the water will flow into a temporary waste pit, and make sure wash water does not leach into the underlying soil. (See CASQA Construction BMP Handbook for properly designed concrete washouts.)

Dewatering

- ☐ Reuse water for dust control, irrigation or another on-site purpose to the greatest extent possible.
- ☐ Be sure to obtain a Permit for Construction in the Public Street from Public Works Engineering before discharging water to a street, gutter, or storm drain. Call the Regional Water Quality Control Plant (RWQCP) at **(650) 329-2598** for an inspection prior to commencing discharge. Use filtration or diversion through a basin, tank, or sediment trap as required by the approved dewatering plan. Dewatering is not permitted from October to April.
- ☐ In areas of known contamination, testing is required prior to reuse or discharge of groundwater. Consult with the City inspector to determine what testing to do and to interpret results. Contaminated groundwater must be treated or hauled off-site for proper disposal.

PAVING/ASPHALT WORK

Paving

- ☐ Avoid paving and seal coating in wet weather or when rain is forecast, to prevent materials that have not cured from contacting stormwater runoff.
- ☐ Cover storm drain inlets and manholes when applying seal coat, slurry seal, fog seal, or similar materials.
- ☐ Collect and recycle or appropriately dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.

Sawcutting & Asphalt/Concrete Removal

- ☐ Protect storm drain inlets during saw cutting.
- ☐ If saw cut slurry enters a catch basin, clean it up immediately.
- ☐ Shovel or vacuum saw cut slurry deposits and remove from the site. When making saw cuts, use as little water as possible. Sweep up, and properly dispose of all residues.

PAINTING & PAINT REMOVAL

Painting Cleanup and Removal

- ☐ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or stream.
- ☐ For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm drain.
- ☐ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of excess liquids as hazardous waste.
- ☐ Sweep up or collect paint chips and dust from non-hazardous dry stripping and sand blasting into plastic drop cloths and dispose of as trash.
- ☐ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead, mercury, or tributyltin must be disposed of as hazardous waste. Lead based paint removal requires a state certified contractor.


STORM DRAIN POLLUTERS MAY BE LIABLE FOR FINES OF UP TO $10,000 PER DAY!

250 Hamilton Avenue
Palo Alto, CA 94301
650.329.2211
cityofpaloalto.org

CITY OF PALO ALTO

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
PALO ALTO POLLUTION PREVENTION CHECKLIST

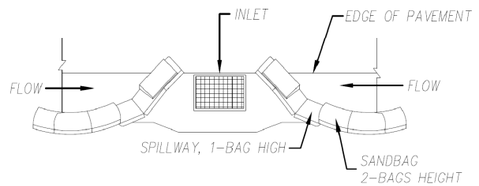
SHEET NUMBER
L-2

EROSION AND SEDIMENT CONTROL NOTES:

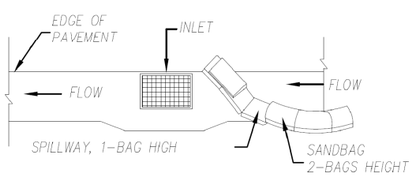
TEMPORARY EROSION/SEDIMENT CONTROL, PRIOR TO COMPLETION OF FINAL IMPROVEMENTS, SHALL BE PERFORMED BY THE CONTRACTOR OR QUALIFIED PERSON AS INDICATED BELOW:

1. ALL REQUIREMENTS OF THE CITY "LAND DEVELOPMENT MANUAL, STORM WATER STANDARDS" MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF THE PROPOSED PUBLIC IMPROVEMENTS CONSISTENT WITH THE EROSION CONTROL PLAN AND/OR WATER POLLUTION CONTROL PLAN (WPCP), IF APPLICABLE.
2. FOR STORM DRAIN INLETS, PROVIDE A GRAVEL BAG SILT BASIN IMMEDIATELY UPSTREAM OF INLET AS INDICATED ON DETAILS.
3. THE CONTRACTOR OR QUALIFIED PERSON SHALL BE RESPONSIBLE FOR CLEANUP OF SILT AND MUD ON ADJACENT STREET(S) AND STORM DRAIN SYSTEM DUE TO CONSTRUCTION ACTIVITY.
4. THE CONTRACTOR SHALL REMOVE SILT AND DEBRIS AFTER EACH MAJOR RAINFALL.
5. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON.
6. THE CONTRACTOR SHALL RESTORE ALL EROSION/SEDIMENT CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE CITY ENGINEER OR RESIDENT ENGINEER AFTER EACH RUN-OFF PRODUCING RAINFALL.
7. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION/SEDIMENT CONTROL MEASURES AS MAY THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION/SEDIMENT CONTROL MEASURES AS MAY BE REQUIRED BY THE RESIDENT ENGINEER DUE TO UNFORESEEN CIRCUMSTANCES, WHICH MAY ARISE.
8. EROSION/SEDIMENT CONTROL MEASURES PROVIDED PER THE APPROVED IMPROVEMENT PLAN SHALL BE INCORPORATED HEREON. ALL EROSION/SEDIMENT CONTROL FOR INTERIM CONDITIONS SHALL BE DONE TO THE SATISFACTION OF THE RESIDENT ENGINEER.
9. ALL REMOVABLE PROTECTIVE DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN RAIN IS IMMINENT.
10. THE CONTRACTOR SHALL ARRANGE FOR WEEKLY MEETINGS DURING OCTOBER 1ST TO APRIL 30TH FOR PROJECT TEAM (GENERAL CONTRACTOR, QUALIFIED PERSON, EROSION CONTROL SUBCONTRACTOR IF ANY, ENGINEER OF WORK, OWNER/DEVELOPER AND THE RESIDENT ENGINEER) TO EVALUATE THE ADEQUACY OF THE EROSION/SEDIMENT CONTROL MEASURES AND OTHER RELATED CONSTRUCTION ACTIVITIES.

STORM DRAIN INLET PROTECTION



TYPICAL PROTECTION FOR INLET WITH OPPOSING FLOW DIRECTIONS



TYPICAL PROTECTION FOR INLET WITH SINGLE FLOW DIRECTION

NOTES:

1. INTENDED FOR SHORT-TERM USE.
2. USE TO INHIBIT NON-STORM WATER FLOW.
3. ALLOW FOR PROPER MAINTENANCE AND CLEANUP.
4. BAGS MUST BE REMOVED AFTER ADJACENT OPERATION IS COMPLETED.
5. NOT APPLICABLE IN AREAS WITH HIGH SILTS AND CLAYS WITHOUT FILTER FABRIC.

NOTES:

1. CONTRACTOR TO POTHOLE ALL UTILITY CROSSINGS.
2. CONTRACTOR TO PLACE SANDBAGS AROUND ANY/ALL STORM DRAIN INLETS TO PREVENT CONTAMINATED WATER.
3. SPOILS PILE WILL BE COVERED AND CONTAINED AND STREET WILL BE SWEPT AND CLEANED AS NEEDED.
4. CONTRACTOR TO REPAIR DAMAGED PUBLIC IMPROVEMENTS TO THE CONTRACTOR TO REPAIR DAMAGED PUBLIC IMPROVEMENTS TO THE SATISFACTION OF THE CITY ENGINEER.
5. SIDEWALK TO BE REPLACED CURB & GUTTER TO BE PROTECTED IN PLACE. SIDEWALK TO BE REPLACED TO THE SATISFACTION OF THE CITY ENGINEER.
6. THE CONTRACTOR SHALL RESTORE THE ROADWAY BACK TO ITS ORIGINAL CONDITION SATISFACTORY TO THE CITY ENGINEER INCLUDING, BUT NOT LIMITED TO PAVING, STRIPING, BIKE LANES, PAVEMENT LEGENDS, SIGNS, AND TRAFFIC LOOP DETECTORS.
7. SIDEWALK SHALL BE RESTORED/REPLACED PER CITY STANDARD DRAWINGS.
8. PEDESTRIAN RAMP WILL NOT BE DISTURBED.PEDESTRIAN RAMP WILL NOT BE DISTURBED.

GENERAL CONTRACTOR NOTES:

1. STREET USE PERMIT SHALL BE OBTAINED BY CONTRACTOR PRIOR TO COMMENCING WORK.
2. ALL WORK TO BE CONDUCTED IN THE RIGHT OF WAY.
3. ALL DISTURBED LANDSCAPING SHALL BE REPLACED TO SIMILAR EXISTING CONDITION.
4. ANY SIDEWALK CLOSURE SHALL BE COORDINATED WITH THE CITY AND PROPER SIGNING WILL BE PLACED.
5. NO MATERIALS OR EQUIPMENT SHALL BE STORED ON PRIVATE PROPERTY OR BLOCK ACCESS TO PRIVATE PROPERTY.
6. CLEANUP OF SITE WILL BE COMPLETED EACH EVENING AND THE SITE WILL BE RETURNED TO EXISTING CONDITIONS AT THE COMPLETION OF CONSTRUCTION AT EACH SITE.

** CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR RESPONSIBLE FOR SAME.

R.O.W. GROUND CONSTRUCTION NOTES:

1. GROUND CONSTRUCTION TO REMOVE/CLEAN ALL DEBRIS, NAILS, STAPLES, GROUND CONSTRUCTION TO REMOVE/CLEAN ALL DEBRIS, NAILS, STAPLES, OR NON-USED VERTICALS OFF THE POLE.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MUNICIPAL, COUNTY, STATE, FEDERAL, GO95 AND GO128 STANDARDS AND REGULATIONS.
3. CALL USA 48 HOURS PRIOR TO EXCAVATING AT (800) 227-2600 OR 811.
4. ALL LANDSCAPING TO BE RESTORED TO ORIGINAL CONDITION OR BETTER.
5. ALL EQUIPMENT TO BE BONDED. ALL EQUIPMENT TO BE BONDED.
6. METERING CABINET REQUIRES 36" CLEARANCE AT DOOR OPENING.
7. CAULK CABINET BASE AT PAD.

CALIFORNIA STATE CODE COMPLIANCE:

ALL WORK AND MATERIALS SHALL BE PREFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

- CALIFORNIA ADMINISTRATIVE CODE (INCLUDING TITLES 24 & 25) 2016
- 2016 CALIFORNIA BUILDING CODES WHICH ADOPTS THE 2015 IBC, 2015 IMC, 2015 IPC AND THE 2014 NEC,AND SHALL INCLUDE 2016 CBC, CFC, CMC, CEC, CPC, CGBSC.
- BUILDING OFFICIALS & CODE ADMINISTRATORS (BOCA) CURRENT NATIONAL CODES
- ANSI/EIA-222-G (2009 - 2ND EDITION)
- NFPA-101 - LIFE SAFETY CODE / CAL-OSHA - TITLE 8 / FCR - TITLE 29
- LOCAL BUILDING CODE
- CITY/COUNTY ORDINANCES
- ACCESSIBILITY REQUIREMENTS:

** FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS REQUIREMENTS DO NOT APPLY IN ACCORDANCE WITH THE 2016 CALIFORNIA BUILDING CODE.

- FCC RF/EMF EXPOSURE/EMITTANCE COMPLIANCE:

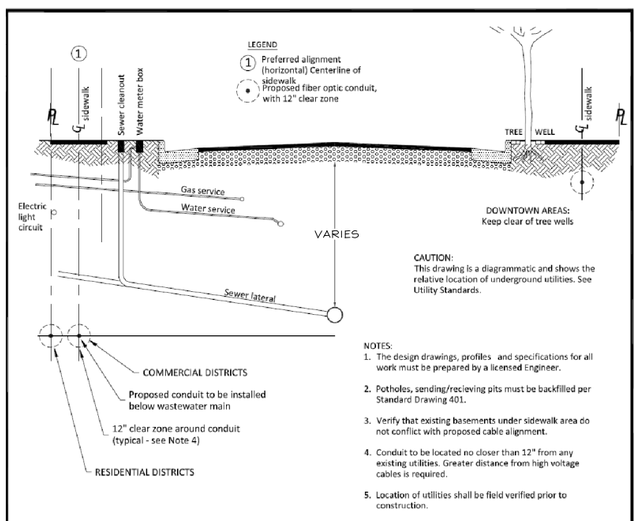
**FCC NOTE: THIS WIRELESS COMMUNICATION FACILITY COMPLIES WITH FEDERAL STANDARDS FOR RADIO FREQUENCY IN ACCORDANCE WITH THE TELECOMMUNICATION ACT OF 1996 AND SUBSEQUENT AMENDMENTS AND ANY OTHER REQUIREMENTS IMPOSED BY STATE OR FEDERAL REGULATORY AGENCIES.

CITY OF PALO ALTO UTILITIES ENGINEERING NOTES:

1. APPLICANT SHALL TAP ELECTRIC SERVICE TO THE SMALL CELL DISTRIBUTED ANTENNA SYSTEM FROM THE LOCATIONS JOINTLY IDENTIFIED DURING THE FIELD INVESTIGATION.
2. SERVICE VOLTAGE TO ALL THE PROPOSED LOCATIONS MAY NOT BE THE SAME. APPLICANT SHALL DESIGN THEIR SYSTEM TO OPERATE AT THE AVAILABLE VOLTAGE IN THE VICINITY.
3. IF BRAND NEW POLES NEED TO BE INSTALLED FOR APPLICANT'S SYSTEM THEN THE POLES MUST MATCH EXISTING POLES IN THE DOWN TOWN AREA.
4. AFTER EXCAVATION IS COMPLETED ON THE PUBLIC RIGHT OF WAY, EXISTING STREETS INCLUDING SIDEWALKS/ CURB/ GUTTER OR ANY DECORATIVE PATHS MUST BE BROUGHT TO ITS ORIGINAL CONDITION AND MUST BE APPROVED BY PUBLIC WORKS ENGINEERING DEPARTMENT'S INSPECTOR. POTHOLING MUST BE DONE AND ALL THE UTILITIES MUST BE IDENTIFIED PRIOR TO COMMENCING EXCAVATION.
5. EXCAVATION AND RESTORATION WORK MUST BE IN COMPLIANCE WITH PUBLIC WORKS ENGINEERING STANDARDS AND SPECIFICATIONS THAT ARE AVAILABLE ON THE FOLLOWING WEBSITE: http://www.cityofpaloalto.org/news/displaynews.asp?NewsID=1834&TargetID=145
6. APPLICANTS SHALL BE RESPONSIBLE FOR MAINTAINING THEIR SYSTEM INCLUDING SUBSTRUCTURE. IN CASE OF KNOCK DOWNS, THE CITY WILL RE-INSTALL ITS STREET LIGHTING POLES BUT NOT APPLICANT'S EQUIPMENT ON OR OFF THE POLE.
7. A FIELD MEETING IS RECOMMENDED WITH UTILITIES ENGINEERING PRIOR TO COMMENCING THE WORK.
8. PLANS SHALL INCLUDE A NOTE: CONTRACTOR TREE INSPECTION REQUIREMENTS: MODIFIED TYPE III TRUNK WRAPPING SHALL BE VERIFIED BY URBAN FORESTRY PRIOR TO ANY WORK IN THE VICINITY. FOR EACH TREE SITE WRAPPED FOR PROTECTION WITHIN 15' OF ANY WORK ZONE OR CONCRETE FORM SECTION, A BILLABLE TREE INSPECTION BY URBAN FORESTRY (650-496-5953, 24-HOUR ADVANCE IS REQUIRED) SHALL BE COMPLETED PRIOR TO DEMOLITION, DRILLING, EXCAVATING,FORMING OR STREET LIGHT ACTIVITY. CONTRACTOR SHALL ARRANGE PAYMENTS AT THE DEVELOPMENT CENTER, 285 HAMILTON AVE, PALO ALTO, CA.
9. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITIES DEPARTMENT 650/329-2413 OR 650/496-6982 IF THE EXISTING WATER, WASTEWATER OR GAS MAINS ARE DISTURBED OR DAMAGED. A QUALIFIED CONTRACTOR MAY PERFORM REPAIRS ON CITY WATER AND WASTEWATER MAINS UNDER THE DIRECT SUPERVISION OF THE WGW UTILITIES INSPECTOR. FOR WATER REPAIRSALL THE DISINFECTION REQUIREMENTS OF THE WGW UTILITY STANDARDS AND THESE CONDITIONS SHALL BE ADHERED TO. ALL REPAIRS TO THE CITY GAS SYSTEM MUST BE PERFORMED BY THE CITY OF PALO ALTO UTILITIES.
10. NO WATER VALVES OR OTHER FACILITIES OWNED BY UTILITIES DEPARTMENT SHALL BE OPERATED FOR ANY PURPOSE BY THE APPLICANT'S CONTRACTOR. ALL REQUIRED OPERATION WILL ONLY BE PERFORMED BY AUTHORIZED UTILITIES DEPARTMENT PERSONNEL. WATER VALVES MAY BE OPERATED BY THE CONTRACTOR UNDER THE DIRECT SUPERVISION OF THE WGW UTILITIES INSPECTOR. THE APPLICANT'S CONTRACTOR SHALL NOTIFY THE UTILITIES DEPARTMENT NOT LESS THAN FORTY-EIGHT (48) HOURS IN ADVANCE OF THE TIME THAT SUCH OPERATION IS REQUIRED.

NORMAL LOCATION OF UNDERGROUND UTILITIES NOTES:

1. LOCATION AND DEPTH OF EXISTING AND PROPOSED UTILITIES MUST BE PROVIDED BY THE SUBDIVIDER AND SHOWN ON ANY PLANS SUBMITTED TO THE DEPT. OF PUBLIC WORKS FOR APPROVAL.
2. CHANGES MAY BE PERMITTED BY THE DEPT. OF PUBLIC WORKS IN CASES OF CONFLICTING FACILITIES.
3. CONFLICTS BETWEEN UTILITY COMPANIES FACILITIES, EXISTING AND PROPOSED, MUST BE MUTUALLY RESOLVED BY THE UTILITY COMPANIES.
4. FOR COMMERCIAL SIDEWALKS, THE FIRE HYDRANT SHALL BE PLACED WITHIN THE SIDEWALK 1'-6" BEHIND FACE OF CURB.
5. MAXIMUM 2" DIAMETER GAS MAINS MAY BE PLACED IN JOINT UTILITIES TRENCH SUBJECT TO APPROVAL OF CITY ENGINEER (IN TRACTS).



Rev	By	Date
0	DWH	7/16/98
1	MMN	7/20/04
Scale: NTS		

Conduit Location Detail
Telecommunications

City of Palo Alto Standard

Approved by:
PE No. 72158
Date 01/10/18
Dwg No. 402

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

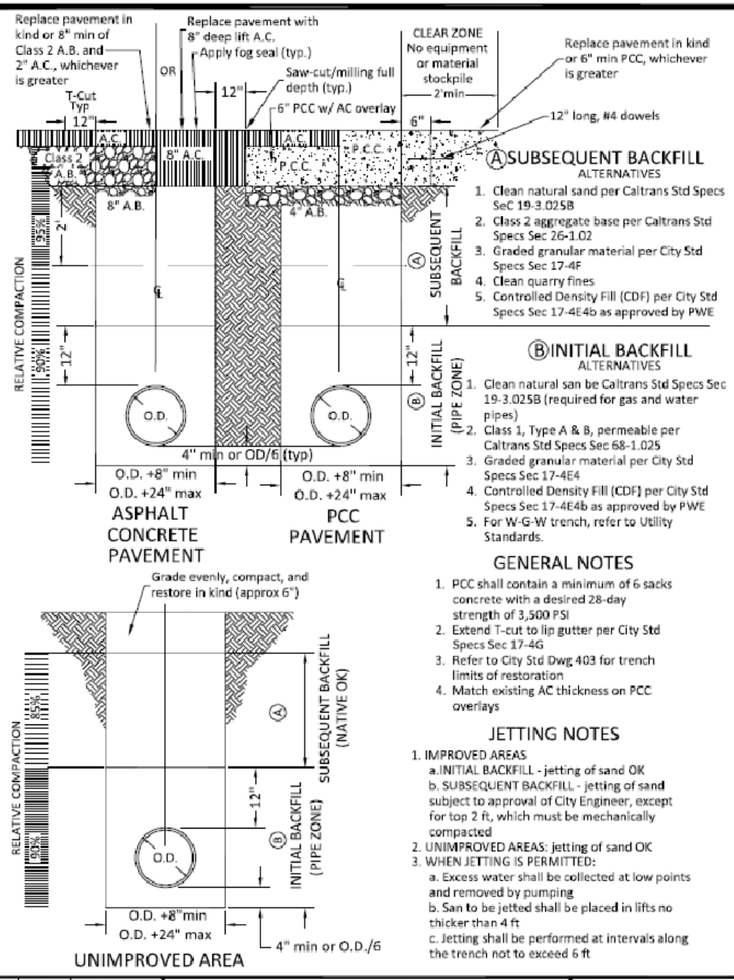
REGISTERED PROFESSIONAL ENGINEER
WISSAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
PALO ALTO EROSION CONTROL AND CONDUIT LOCATION DETAILS & NOTES

SHEET NUMBER
L-3



(A) SUBSEQUENT BACKFILL ALTERNATIVES

1. Clean natural sand per Caltrans Std Specs SeC 19-3.025B
2. Class 2 aggregate base per Caltrans Std Specs Sec 26-1.02
3. Graded granular material per City Std Specs Sec 17-4F
4. Clean quarry fines
5. Controlled Density Fill (CDF) per City Std Specs Sec 17-4E4b as approved by PWE

(B) INITIAL BACKFILL ALTERNATIVES

1. Clean natural san be Caltrans Std Specs Sec 19-3.025B (required for gas and water pipes)
2. Class 1, Type A & B, permeable per Caltrans Std Specs Sec 68-1.025
3. Graded granular material per City Std Specs Sec 17-4E4
4. Controlled Density Fill (CDF) per City Std Specs Sec 17-4E4b as approved by PWE
5. For W-G-W trench, refer to Utility Standards.

GENERAL NOTES

1. PCC shall contain a minimum of 6 sacks concrete with a desired 28-day strength of 3,500 PSI
2. Extend T-cut to lip gutter per City Std Specs Sec 17-4G
3. Refer to City Std Dwg 403 for trench limits of restoration
4. Match existing AC thickness on PCC overlays

JETTING NOTES

1. IMPROVED AREAS
   a. INITIAL BACKFILL - jetting of sand OK
   b. SUBSEQUENT BACKFILL - jetting of sand subject to approval of City Engineer, except for top 2 ft, which must be mechanically compacted
2. UNIMPROVED AREAS: jetting of sand OK
3. WHEN JETTING IS PERMITTED:
   a. Excess water shall be collected at low points and removed by pumping
   b. San to be jetted shall be placed in lifts no thicker than 4 ft
   c. Jetting shall be performed at intervals along the trench not to exceed 6 ft

Rev	By	Date
1	MN	03/10/05
2	JT	08/18/06
3	HQN	10/04/06
4	RTN	06/08/17

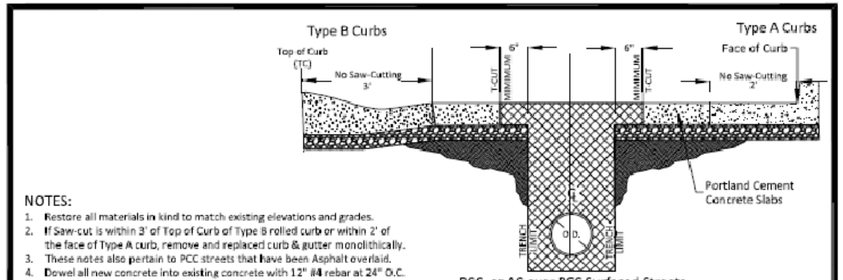
Scale: NTS

Trenches
Typical Cross-Sections

Approved by:
PE No. 72158
Date 01/10/18

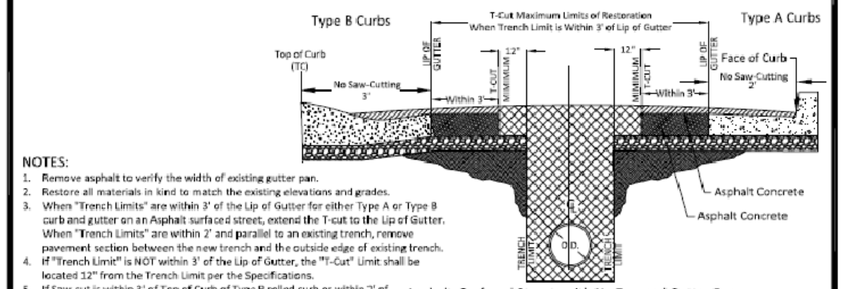
City of Palo Alto Standard

Dwg No. 401



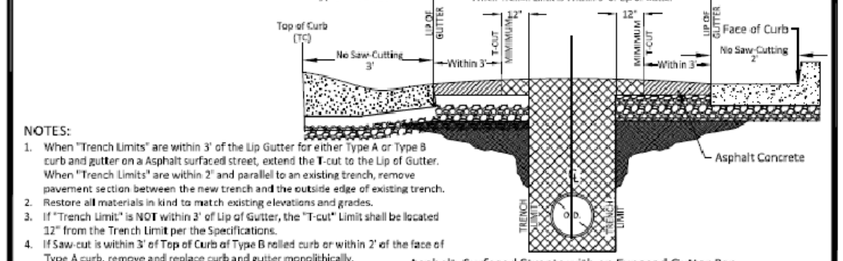
NOTES:
1. Restore all materials in kind to match existing elevations and grades.
2. If Saw-cut is within 3' of Top of Curb of Type B rolled curb or within 2' of the face of Type A curb, remove and replaced curb & gutter monolithically.
3. These notes also pertain to PCC streets that have been Asphalt overlaid.
4. Dowel all new concrete into existing concrete with 12" #4 rebar at 24" O.C.

PCC or AC over PCC Surfaced Streets



NOTES:
1. Remove asphalt to verify the width of existing gutter pan.
2. Restore all materials in kind to match the existing elevations and grades.
3. When "Trench Limits" are within 3' of the Lip of Gutter for either Type A or Type B curb and gutter on an Asphalt surfaced street, extend the T-cut to the Lip of Gutter. When "Trench Limits" are within 2' and parallel to an existing trench, remove pavement section between the new trench and the outside edge of existing trench.
4. If "Trench Limit" is NOT within 3' of the Lip of Gutter, the "T-Cut" Limit shall be located 12" from the Trench Limit per the Specifications.
5. If Saw-cut is within 3' of Top of Curb of Type B rolled curb or within 2' of the face of Type A curb, remove and replace curb & gutter monolithically.

Asphalt Surfaced Streets with No Exposed Gutter Pan



NOTES:
1. When "Trench Limits" are within 3' of the Lip Gutter for either Type A or Type B curb and gutter on a Asphalt surfaced street, extend the T-cut to the Lip of Gutter. When "Trench Limits" are within 2' and parallel to an existing trench, remove pavement section between the new trench and the outside edge of existing trench.
2. Restore all materials in kind to match existing elevations and grades.
3. If "Trench Limit" is NOT within 3' of Lip of Gutter, the "T-cut" Limit shall be located 12" from the Trench Limit per the Specifications.
4. If Saw-cut is within 3' of Top of Curb of Type B rolled curb or within 2' of the face of Type A curb, remove and replace curb and gutter monolithically.

Asphalt Surfaced Streets with an Exposed Gutter Pan

Rev	By	Date
1	MN	2/30/05
2	JT	8/14/06
3	HQN	10/16/06
4	RTN	06/11/17

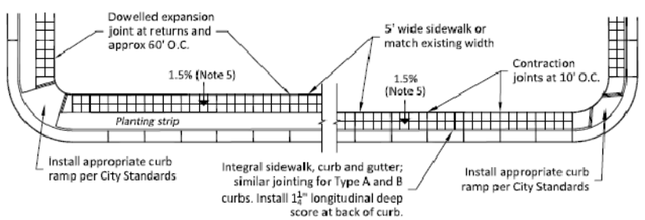
Scale: NTS

Trenches
Limits of Restoration

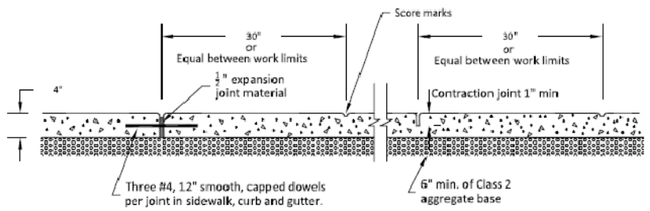
Approved by:
PE No. 72158
Date 01/10/18

City of Palo Alto Standard

Dwg No. 403



TYPICAL CITY BLOCK PLAN



LONGITUDINAL SECTIONS

SIDEWALK CONSTRUCTION NOTES:

1. SIDEWALKS TO BE MARKED IN 30" SQUARES.
2. EDGES TO HAVE 3/4" RADIUS.
3. SCORE MARKS SHALL NOT BE LESS THAN 3/8" DEEP; CONTRACTION JOINTS SHALL BE 1" IN MINIMUM DEPTH @ 10' O.C.
4. CONTRACTION JOINTS MAY BE SAW-CUT.
5. SIDEWALKS TO HAVE 1.5% SLOPE TO STREET.
6. ALL NEW SIDEWALKS SHALL BE DOWELED AT 2'-0" O.C. INTO EXISTING CONCRETE WITH #4 12" LONG DOWELS AND EMBEDDED 6".
7. SAW CUT WALK FULL DEPTH AND FULL WIDTH ON SCORE MARKS PERPENDICULAR TO THE CURB. NO SAWCUTTING ON LONGITUDINAL SCORE MARKS.
8. INSTALL LONGITUDINAL DEEP SCORE ALONG ENTIRE BACK OF CURB THAT IS MONOLITHIC WITH SIDEWALK.

Rev	By	Date
0	DWH	12/14/92
1	MN	01/29/02
2	HQN	01/04/07
3	RTN	08/10/17

Scale: NTS

Sidewalk Construction

Approved by:
PE No. 72158
Date 01/10/18

City of Palo Alto Standard

Dwg No. 141

City of Palo Alto Standard | Dwg No. 141

verizon
2785 MITCHELL DRIVE, SUITE 9
WALNUT CREEK, CA 94598

Vinculums
575 LENNON LANE #125
WALNUT CREEK, CA 94598
OFFICE: (925) 482-8500

ALL STATES ENGINEERING & SURVEYING
A ZALZALI & ASSOCIATES COMPANY
23675 BIRTCHER DRIVE
LAKE FOREST, CA 92630
PHONE: (949) 273-0996

PROJECT ID:	2447782
DRAWN BY:	LS
CHECKED BY:	DW

REV	DATE	DESCRIPTION	
3	06/10/2021	UPDATE MAST ARM PER REQUEST	MG
2	04/21/2021	CLIENT REDLINES	MG
1	04/06/2021	PER CPAU / CPA SL WALK	NC
0	01/19/2020	100% CD'S FOR SUBMITTAL	MG
B	06/09/2020	95% CD'S FOR REDLINE	RF
A	12/11/2017	90% CD'S FOR REDLINE	LS

REGISTERED PROFESSIONAL ENGINEER
WASAM ZALZALI
71655
CIVIL
STATE OF CALIFORNIA

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SF PALO ALTO 164
LIC R.O.W. ADJACENT TO:
ARBORETUM RD.,
PALO ALTO, 94304
LOCATION CODE: 425268

SHEET TITLE
PALO ALTO TRENCHING & SIDEWALK STD. DWGS.

SHEET NUMBER
L-4