Staff Report to the Zoning Administrator

Application Number: 171173

Applicant: Aaron Salars for Verizon Wireless
Owner: Right-of-way
APN: No APN Specified

Agenda Date: May 18, 2018
Agenda Item #: 4
Time: After 9:00 a.m.

Project Description: Proposal to construct a wireless communication microcell facility on an existing utility pole to include: replacement of the pole with a new 34-foot tall wood pole, electric meter, disconnect switch, two remote radio units, antenna and associated equipment. This project is located in the Parks, Recreation and Open Space zone district and is categorically exempt (Section 15303, Class 3) from further review under CEQA.

Location: The project is on a utility pole located within a public right-of-way of Soquel Drive and near 5505 Soquel Drive, the nearest parcel being 037-071-41, in Soquel.

Supervisorial District: First District (District Supervisor: John Leopold)

Permits Required: Commercial Development Permit

Staff Recommendation:

- Determine that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.
- Approval of Application 171173, based on the attached findings and conditions.

Exhibits

A. Categorical Exemption (CEQA determination)
B. Findings
C. Conditions
D. Project plans
E. Assessor's, Location, Zoning and General Plan Maps
F. Applicant Materials, including Radio Frequency Exposure Report
G. Visual Simulations

Parcel Information

Parcel Size: N/A	Right-of-way
Existing Land Use - Parcel:	Right-of-way
Existing Land Use - Surrounding:	Residential, Commercial, & Public Recreation
Project Access:	Soquel Drive

Planning Area:	Soquel
Land Use Designation:	O-R (Parks, Recreation and Open Space)
Zone District:	PR (Parks, Recreation and Open Space)
Coastal Zone:	__ Inside X Outside
Appealable to Calif. Coastal Comm.	__ Yes X No

Environmental Information

Geologic Hazards:	Not mapped/no physical evidence on site
Soils:	N/A
Fire Hazard:	Not a mapped constraint
Slopes:	0 to 15%
Env. Sen. Habitat:	Not mapped/no physical evidence on site
Grading:	No grading proposed
Tree Removal:	No trees proposed to be removed
Scenic:	Not a mapped resource
Drainage:	No change to existing drainage
Archeology:	Not mapped/no physical evidence on site

Services Information

Urban Services Line:	X Inside __ Outside
Rural Services Line:	__ Inside X Outside
Water Supply:	Soquel Creek Water District
Sewage Disposal:	Santa Cruz Sanitation District
Fire District:	Central Fire Protection District
Drainage District:	Flood Control District 5

Project Setting

The project site is located on the north side of Soquel Drive, on a sidewalk nearby a Quik Stop gas station and convenience store, a bus stop, and an undeveloped parcel owned by the County of Santa Cruz. Directly across Soquel Drive, a four-lane arterial roadway, is a cul-de-sac development of single-family homes. To the east is a church and more residential properties. To the west are multi- and single-family properties.

The portion of Soquel Drive adjacent to the project site is flanked by striped bicycle lanes and has a center turn lane for vehicles and a planted island. Due to the bicycle lanes, on-street vehicle parking is not permitted on either side of Soquel Drive in the vicinity of the project site.

The proposed wireless facility is to be sited at the location of an existing utility pole on the sidewalk on the northern side of Soquel Drive. The proposed location is entirely within a public right-of-way. The closest residence is across Soquel Drive, approximately 115 feet away.

Proposed Installation

The applicant proposes to replace the existing 31-foot tall utility pole with a 34-foot tall utility pole, with the existing guy wire replaced as a part of the reinstallation of the utility pole. A "cantenna," which is an antenna placed within a cylindrical container, would be placed at the top of the pole, resulting in an overall height of 36 feet 3 inches (see Sheet A.3 of Exhibit D). A shroud would be provided to camouflage the antenna, with the intent being to make the cantenna appear to be a part of the utility. The equipment supporting the wireless facility would all be located on the side of the pole and would be painted to match the pole color.

Zoning & General Plan Consistency

Pursuant to County Code Section 13.10.661(A), all new wireless communication facilities are required to obtain a Commercial Development Permit considered at a public hearing. The proposed wireless communication facility is located within the Soquel Drive right-of-way where the zoning of the adjacent parcel extends to the centerline of the road. The zoning of the adjacent parcel and the project site is PR (Parks, Recreation and Open Space) and the area is designated O-R (Parks, Recreation and Open Space) by the General Plan. The PR zone district is not a zone district where wireless communication facilities are prohibited or restricted. The project must, however, comply with County Code Sections 13.10.661 through 13.10.667. The applicable ordinances are reviewed below.

Applicable Wireless Regulations

For a facility such as this one that is located in the right-of-way and not within a prohibited or restricted zone district, the two main areas of the County's authority are: visual impacts and compliance with Federal Communications Commission (FCC) Non-ionizing electromagnetic radiation (NIER)/radio-frequency (RF) radiation exposure standards.

County Code 13.10.661(F) requires wireless communication facilities to be sited in the least visually obtrusive location that is technically feasible. As indicated in Section 13.10.663(B)(5) of the County Code, microcells mounted on utility poles are encouraged as a means of mitigating visual impacts of wireless communication facilities. The project meets this guideline. In addition to being located on a utility pole, a shroud to camouflage the antenna is included as is a requirement that the equipment be painted to match the pole. Together, these will reduce the visual impact of the project.

Equipment bulk associated with the facility has been reduced as compared to the original project proposal by replacing the proposed pedestal electric meter with a meter located on the pole, the elimination of the "Charles Box" (a bulky piece of equipment), and the removal of a ground-mounted box. Given these considerations, the project is anticipated to visually appear to be a part of the existing electrical and telephone infrastructure which lines Soquel Drive.

County Code Section 13.10.661(D) requires compliance with FCC Regulations. FCC compliance is determined through the submittal of a NIER/RF report by a registered engineer. The submitted report concludes that the installation would result in an exposure of 1.9% of the FCC exposure maximum at ground level. Staff requested that the project engineer evaluate the exposure level for a future scenario where a two-story residence is constructed on the adjacent vacant parcel. The exposure level

at the second floor of this scenario would be 5% of the FCC exposure limit. Given this, the project complies with the both the FCC and County requirements relative to NIER/RF exposure. Section 47 USC 332(c)(7)(iv) of the Telecommunications Act of 1996 prohibits jurisdictions from regulating the placement, construction, or modification of Wireless Communications Facilities based on the environmental effects of RF emissions if these emissions comply with FCC standards.

Design Review

The proposed wireless communication facility complies with the requirements of the County Design Review Ordinance, in that the proposed project will incorporate site and architectural design features to minimize the project's visual impact. The project is sited on a utility pole and will visually appear to be a part of the existing electrical and telephone infrastructure. In addition, the project includes camouflaging the facility by painting equipment to match the color of the utility pole, reducing the bulk and size of equipment to the extent that is feasible, and providing a shroud at the base of the cantenna to blend the cantenna to the massing and color of the utility pole. Together, these efforts will reduce the visual impact of the proposed development on surrounding land uses and the natural landscape.

CEQA Exemption

Environmental review has not been required for the proposed project per the requirements of the California Environmental Quality Act (CEQA). The project is exempt per Section 15303, Class 3 - New Construction or Conversion of Small Structure, and is attached as Exhibit "A". This section allows construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures. The exemption applies to the installation of water main, sewage, electrical, gas, and other utility extensions.

Conclusion

As proposed and conditioned, the project is consistent with all applicable codes and policies of the Zoning Ordinance and General Plan/LCP. Please see Exhibit "B" ("Findings") for a complete listing of findings and evidence related to the above discussion.

Staff Recommendation

- Determine that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.

- **APPROVAL** of Application Number **171173,** based on the attached findings and conditions.

Supplementary reports and information referred to in this report are on file and available for viewing at the Santa Cruz County Planning Department, and are hereby made a part of the administrative record for the proposed project.

The County Code and General Plan, as well as hearing agendas and additional information are available online at: www.co.santa-cruz.ca.us

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CALIFORNIA ENVIRONMENTAL QUALITY ACT
NOTICE OF EXEMPTION

The Santa Cruz County Planning Department has reviewed the project described below and has determined that it is exempt from the provisions of CEQA as specified in Sections 15061 - 15332 of CEQA for the reason(s) which have been specified in this document.

Application Number: 171173
Assessor Parcel Number: No APN Specified
Project Location: Public Right-of-Way

Project Description: Proposal to construct a new wireless communication facility mounted upon a new utility pole and ground mounted equipment shelter located within a public right of way.

Person or Agency Proposing Project: Aaron Salars for Verizon Wireless

Contact Phone Number: (707) 933-9633

A. _____ The proposed activity is not a project under CEQA Guidelines Section 15378.
B. _____ The proposed activity is not subject to CEQA as specified under CEQA Guidelines Section 15060 (c).
C. _____ **Ministerial Project** involving only the use of fixed standards or objective measurements without personal judgment.
D. _____ **Statutory Exemption** other than a Ministerial Project (CEQA Guidelines Section 15260 to 15285).

E. __X__ **Categorical Exemption**

Specify type: Class 3 - New Construction or Conversion of Small Structure (Section 15303)

F. Reasons why the project is exempt:

Type 3 exemption consists of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures. The exemption applies to the installation of water main, sewage, electrical, gas, and other utility extensions. The construction of the proposed wireless communication facility is within the purview of the this exemption and is not anticipated to generate any environmental impacts. In addition, none of the conditions described in Section 15300.2 apply to this project.

In addition, none of the conditions described in Section 15300.2 apply to this project.

_____ Date: _____
Annette Olson, Project Planner

EXHIBIT A

Wireless Communication Facility Use Permit Findings

1. That either: (1) the development of the proposed wireless communications facility as conditioned will not significantly affect any designated visual resources, environmentally sensitive habitat resources (as defined in the Santa Cruz County General Plan/LCP Sections 5.1, 5.10, and 8.6.6.), and/or other significant County resources, including agricultural, open space, and community character resources; or (2) there are no other environmentally equivalent and/or superior and technically feasible alternatives to the proposed wireless communications facility as conditioned (including alternative locations and/or designs) with less visual and/or other resource impacts and the proposed facility has been modified by condition and/or project design to minimize and mitigate its visual and other resource impacts.

This finding can be made, in that the location and design of the proposed wireless facility would not result in a significant visual impact to the character of the area. The proposed facility is to be co-located on a utility pole within a public right-of-way. County Code Section 13.10.660(D) expands the notion of "co-location" to mean "placing new wireless communication facilities/antennas upon existing or new P.G.& E. or other utility towers or poles (e.g., "microcell" sites)." The co-location of wireless facilities on utility poles, such as is proposed with this application, is encouraged under SCCC 13.10.661(G).

The proposed wireless communication facility is not mapped within any designated scenic corridor and will not be visible from Highway 1, the closest mapped scenic corridor from the site. Although the wireless communication facility and equipment will not significantly affect any designated visual resources, the project is conditioned to be painted to match the color of the utility pole, minimize size and bulk of associated equipment as is feasible, and to retain the shroud at the base of the cantenna. These measures minimize visual impacts.

2. That the site is adequate for the development of the proposed wireless communications facility and, for sites located in one of the prohibited and/or restricted areas set forth in SCCC 13.10.661(B) and (C), that the applicant has demonstrated that there are not environmentally equivalent or superior and technically feasible: (1) alternative sites outside the prohibited and restricted areas; and/or (2) alternative designs for the proposed facility as conditioned.

This finding can be made, in that the PR zone district is not a prohibited or restricted zone district for wireless communication facilities. Further, the location of the proposed wireless co-located facility and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the directive of Public Utilities Code Section 7901.

3. That the subject property upon which the wireless communications facility is to be built is in compliance with all rules and regulations pertaining to zoning uses, subdivisions and any other applicable provisions of this title and that all zoning violation abatement costs, if any, have been paid.

This finding can be made, in that the proposed wireless facility is in compliance with the

requirements of the County Code and General Plan designation. The wireless facility is proposed to be installed on a new utility pole located within the right-of-way where the zoning is PR. PR is not a restricted or prohibited zone district for wireless communication facilities.

4. The proposed wireless communication facility as conditioned will not create a hazard for aircraft in flight.

This finding can be made, in that the proposed wireless small cell communication facility will not be located within the Watsonville Municipal Airport approach zone; therefore, the project is not subject to the adopted airport safety regulations for the Watsonville Municipal Airport. Additionally, the maximum height of the project (approximately 36 feet) will be located well-below the aircraft travel path.

5. The proposed wireless communication facility as conditioned is in compliance with all FCC and California PUC standards and requirements.

This finding can be made, in that the radio frequency exposure levels were evaluated by Hammett and Edison, Inc., based on the operation of the proposed antenna equipment. The analysis was conducted as required by the Wireless Communications Ordinance, and is attached as Exhibit F. The proposed levels are within FCC prescribed limits. The maximum level of proposed radio frequency exposure does not exceed 1.9 percent of the most restrictive public limit at ground level. The maximum exposure at the second-floor elevation is projected to be approximately 5 percent of the most restrictive public exposure limit established by the FCC.

6. For wireless communication facilities in the coastal zone, the proposed wireless communication facility as conditioned is consistent with the applicable requirements of the Local Coastal Program.

The project site is not located within the Coastal Zone.

Development Permit Findings

1. That the proposed location of the project and the conditions under which it would be operated or maintained will not be detrimental to the health, safety, or welfare of persons residing or working in the neighborhood or the general public, and will not result in inefficient or wasteful use of energy, and will not be materially injurious to properties or improvements in the vicinity.

This finding can be made, the installation will comply with prevailing building technology, the California Building Code, and the County Building ordinance to insure the optimum in safety and the conservation of energy and resources. The proposed wireless use will not deprive adjacent properties or the neighborhood of light, air, or open space. In addition, the project will not be materially injurious to properties or improvements in the vicinity.

The radio frequency exposure levels were evaluated by Hammett and Edison, Inc., based on the operation of the proposed antenna equipment. The analysis was conducted as required by the Wireless Communications Ordinance and is attached as Exhibit F. This report evaluates projected emission levels. The existing and proposed levels are within FCC prescribed limits. The maximum level of both existing and proposed equipment does not exceed 1.9 percent of the most restrictive public limit at ground level. The maximum exposure on the nearest second-floor elevation from any nearby building is projected to be approximately 5 percent of the most restrictive public exposure limit established by the Federal Communications Commission (see follow-up email from Rajat Mathur, P.E., Exhibit F).

The location of the proposed wireless facility has been evaluated by the Department of Public Works, Encroachment for compliance with their standards. Given the project's location mounted on a utility pole, it will not obstruct drivers' line of sight or adversely impact vehicles. An encroachment permit is required as a Condition of Approval.

2. That the proposed location of the project and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the zone district in which the site is located.

This finding can be made, in that the project is proposed to be located on a replacement utility located within the right-of-way in an area zoned PR (Parks, Recreation and Open Space). PR is not a restricted or prohibited zone district for wireless facilities. As indicated in County Code 13.10.665, the co-location of the proposed facility on the utility pole is a preferred design to that of the construction of a new free standing wireless facility in that it will reduce ground disturbance and visual impacts to public views.

The project complies with the requirements of the County's wireless communication facility ordinance (13.10.660 et seq.). Relevant to this project are the sections of the ordinance pertaining to FCC NIER/RF exposure limits and visual impacts. As noted in Finding 1 above, the applicant provided a report by Hammett and Edison, Inc., documenting that the project would result in an exposure level far below the FCC's maximum exposure limit. The visual impact of the project has been minimized by installing it on a utility pole and camouflaging the antenna with a shroud and painting the equipment located on the pole to match the pole. This will ensure that the visual

character of the area is preserved as required by County Code 13.10.663(A)(1) and that the project will comply with County Code 13.10.663(B)((4)5) which support exterior finish colors that make equipment visually recede and camouflaging to mitigate visual impacts.

3. That the proposed use is consistent with all elements of the County General Plan and with any specific plan which has been adopted for the area.

This finding can be made, in that the proposed wireless facility is consistent with the use requirements specified for the O-R (Parks, Recreation and Open Space) land use designation in the County General Plan.

The proposed wireless communication facility is compatible with adjacent uses in that the wireless communications facility was subject to Design Review and its design is consistent with the design review standards, as specified in Policy 8.5.2 (Commercial Compatibility With Other Uses). The bulk and mass of the project has been reduced from the original proposal by eliminating and reducing the size of equipment. This will limit the visual impact of the project. Further, the antenna will be camouflaged by a shroud and the equipment will be painted to blend in with the color of the utility pole.

The proposed WCF will be consistent with the character of the neighborhood as specified in General Plan Policy 8.1.2 (Design Review Ordinance), in that the proposed wireless facility will comply with the design criteria and has been sited and designed to be visually compatible with the neighborhood. The project has been conditioned to ensure the facility is maintained in good condition and will continue to blend with the existing utilities infrastructure.

The project site is not located within an adopted specific plan area.

4. That the proposed use will not overload utilities and will not generate more than the acceptable level of traffic on the streets in the vicinity.

This finding can be made, in that the proposed wireless communication facility is to be constructed on a new utility pole located within a public right-of-way. The project will not result in adverse impacts to existing utilities, and electric service is readily available at the proposed location. Upon installation of the proposed wireless facility, the site may require periodic maintenance; the occasional maintenance is not expected to adversely impact existing roads or intersections in the surrounding area. Given the small size of the facility, its utility demand (electricity) will not overload utilities.

5. That the proposed project will complement and harmonize with the existing and proposed land uses in the vicinity and will be compatible with the physical design aspects, land use intensities, and dwelling unit densities of the neighborhood.

As proposed, the project has been designed to complement the surrounding land uses in the vicinity and will result in a project which is compatible with the physical design aspects of the neighborhood. Soquel Drive is lined with electrical and telephone infrastructure. The project is designed to appear to be a part of that existing infrastructure. The proposed utility pole mounted wireless facility is considered to be a co-location which is preferred to that of the installation of a

new ground-mounted facility per County Code 13.10.663(A)(2). The proposed facility's antenna is designed to appear as an extension of the utility pole. The equipment mounted on the side of the utility pole will be camouflaged (painted) to blend with the color and design of the utility pole. Camouflage shall be maintained in perpetuity. Given these considerations, the project is anticipated to harmonize with the existing and any future land uses relative to its physical design aspect. The project does not propose to construct any dwelling units.

6. The proposed development project is consistent with the Design Standards and Guidelines (sections 13.11.070 through 13.11.076), and any other applicable requirements of this chapter.

This finding can be made, in that the proposed wireless facility mounted on a new wood utility pole will be of an appropriate scale and type of design that will not reduce or visually impact any designated visual resources. The installation is designed to appear to be a part of the existing utility infrastructure. The project will be camouflaged so that the antennas appear to be an extension of the utility pole and the equipment on the side of the pole will be painted to match the utility pole. These efforts will minimize the visual impact of the project.

Conditions of Approval

Exhibit D: Project plans, 11 sheets, prepared by On Air LLC, revised to 2/23/18.

I. This permit authorizes the construction of a utility pole-mounted wireless communication facility as indicated on the approved Exhibit "D" for this permit. This approval does not confer legal status on any existing structure(s) or existing use(s) on the subject property that are not specifically authorized by this permit. It is the permit-holder's responsibility to receive authorization from the pole-owner for the replacement of the pole and installation of the wireless facility. Prior to exercising any rights granted by this permit including, without limitation, any construction or site disturbance, the applicant/owner shall:

A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.

B. Obtain a Building Permit from the Santa Cruz County Building Official.

1. Any outstanding balance due to the Planning Department must be paid prior to making a Building Permit application. Applications for Building Permits will not be accepted or processed while there is an outstanding balance due.

C. Obtain an Encroachment Permit from the Department of Public Works.

D. Obtain any other Federal, State, JPA or other approvals, as required.

II. Prior to issuance of a Building Permit the applicant/owner shall:

A. Submit final architectural plans for review and approval by the Planning Department. The final plans shall be in substantial compliance with the plans marked Exhibit "D" on file with the Planning Department. Any changes from the approved Exhibit "D" for this development permit on the plans submitted for the Building Permit must be clearly called out and labeled by standard architectural methods to indicate such changes. Any changes that are not properly called out and labeled will not be authorized by any Building Permit that is issued for the proposed development. The final plans shall include the following additional information:

1. A copy of the text of these conditions of approval incorporated into the full size sheets of the architectural plan set.

2. One elevation shall indicate materials and colors as they were approved by this Discretionary Application. If specific materials and colors have not been approved with this Discretionary Application, in addition to showing the materials and colors on the elevation, the applicant shall supply a color and material sheet in 8 1/2" x 11" format for Planning Department review and approval.

a. Equipment shall be shown as painted to match the utility pole.

EXHIBIT C

b. The shroud shall cover the antenna and extend beyond the top of the pole. No gap between the top of the pole and the shroud is allowed. The intent of the shroud is to make the antenna appear to be a part of the utility pole.
c. The guy wire shall have a plastic cover.
d. A safety plan, including signage, shall be submitted.

3. Details showing compliance with fire department requirements. If the proposed structure(s) are located within the State Responsibility Area (SRA) the requirements of the Wildland-Urban Interface code (WUI), California Building Code Chapter 7A, shall apply.

B. Meet all requirements and pay any applicable plan check fee of the Central Fire Protection District.

III. All construction shall be performed according to the approved plans for the Building Permit. Prior to final building inspection, the applicant/owner must meet the following conditions:

A. All site improvements shown on the final approved Building Permit plans shall be installed.

B. All inspections required by the building permit shall be completed to the satisfaction of the County Building Official.

C. Pursuant to Sections 16.40.040 and 16.42.080 of the County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this development, any artifact or other evidence of an historic archaeological resource or a Native American cultural site is discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the Sheriff-Coroner if the discovery contains human remains, or the Planning Director if the discovery contains no human remains. The procedures established in Sections 16.40.040 and 16.42.080, shall be observed.

IV. Operational Conditions

A. In the event that future County inspections of the subject property disclose noncompliance with any Conditions of this approval or any violation of the County Code, the owner shall pay to the County the full cost of such County inspections, including any follow-up inspections and/or necessary enforcement actions, up to and including permit revocation.

B. No expansion of equipment will be allowed to extend beyond the approved camouflaging.

C. The use of temporary generators to power the wireless communication facility is not allowed.

EXHIBIT C

D. Lighting at the site is prohibited and signage shall be limited to Federal safety requirements at the minimum size allowed.

E. The exterior finish and materials of the wireless communication facility must be maintained on an annual basis to continue to blend with the existing utilities infrastructure. Additional paint and/or replacement materials shall be installed as necessary to blend the wireless communication facility with the existing utilities infrastructure.

F. Graffiti and or other vandalism of the site shall be removed and or repaired immediately upon the permittee or owner becoming aware of it. No graffiti or other vandalism shall remain or be unrepaired for longer than 30 days.

G. Unless otherwise approved by an encroachment permit, during installation and maintenance of the wireless facility and associated equipment, the right-of-way shall be kept clear of all construction materials and vehicles.

H. The operator of the wireless communication facility must submit within 90 days of commencement of normal operations (or within 90 days of any major modification of power output of the facility) a written report to the Santa Cruz County Planning Department documenting the measurements and findings with respect to compliance with the established Federal Communications Commission (FCC) Non-Ionizing Electromagnetic Radiation (NEIR) exposure standard. The wireless communication facility must remain in continued compliance with the NEIR standard established by the FCC at all times. Failure to submit required reports or to remain in continued compliance with the NEIR standard established by the FCC will be a violation of the terms of this permit.

I. If, as a result of future scientific studies and alterations of FCC standards resulting from those studies, substantial evidence is presented to Santa Cruz County that radio frequency transmissions may pose a hazard to human health and/or safety, the Santa Cruz County Planning Department shall set a public hearing and in its sole discretion, may revoke or modify the conditions of this permit.

J. If future technological advances would allow for reduced visual impacts resulting from the proposed telecommunication facility, the operator of the wireless communication facility must make those modifications which would allow for reduced visual impact of the proposed facility as part of the normal replacement schedule. If, in the future, the facility is no longer needed, the operator of the wireless communication facility must abandon the facility and be responsible for the removal of all permanent structures and the restoration of the site as needed to re-establish the area consistent with the character of the surrounding natural landscape.

K. Any modification in the type of equipment shall be reviewed and acted on by the Planning Department staff. The County may deny the modification or amend the approved conditions at that time, or the Planning Director may refer it for public

hearing before the Zoning Administrator.

L. Transfer of Ownership: In the event that the original permittee sells its interest in the permitted wireless communications facility, the succeeding carrier shall assume all responsibilities concerning the project and shall be held responsible to the County for maintaining consistency with all project conditions of approval, including proof of liability insurance. Within 30-days of a transfer of ownership, the succeeding carrier shall provide a new contact name to the Planning Department.

M. Replace the electric meter with a smaller meter within six months of its availability, pending authorization of the smaller meter by PG&E.

V. As a condition of this development approval, the holder of this development approval ("Development Approval Holder"), is required to defend, indemnify, and hold harmless the COUNTY, its officers, employees, and agents, from and against any claim (including attorneys' fees), against the COUNTY, it officers, employees, and agents to attack, set aside, void, or annul this development approval of the COUNTY or any subsequent amendment of this development approval which is requested by the Development Approval Holder.

A. COUNTY shall promptly notify the Development Approval Holder of any claim, action, or proceeding against which the COUNTY seeks to be defended, indemnified, or held harmless. COUNTY shall cooperate fully in such defense. If COUNTY fails to notify the Development Approval Holder within sixty (60) days of any such claim, action, or proceeding, or fails to cooperate fully in the defense thereof, the Development Approval Holder shall not thereafter be responsible to defend, indemnify, or hold harmless the COUNTY if such failure to notify or cooperate was significantly prejudicial to the Development Approval Holder.

B. Nothing contained herein shall prohibit the COUNTY from participating in the defense of any claim, action, or proceeding if both of the following occur:

1. COUNTY bears its own attorney's fees and costs; and

2. COUNTY defends the action in good faith.

C. Settlement. The Development Approval Holder shall not be required to pay or perform any settlement unless such Development Approval Holder has approved the settlement. When representing the County, the Development Approval Holder shall not enter into any stipulation or settlement modifying or affecting the interpretation or validity of any of the terms or conditions of the development approval without the prior written consent of the County.

D. Successors Bound. "Development Approval Holder" shall include the applicant and the successor'(s) in interest, transferee(s), and assign(s) of the applicant.

Director at the request of the applicant or staff in accordance with Chapter 18.10 of the County Code.

Please note: This permit expires three years from the effective date listed below unless a building permit (or permits) is obtained for the primary structure described in the development permit (does not include demolition, temporary power pole or other site preparation permits, or accessory structures unless these are the primary subject of the development permit). Failure to exercise the building permit and to complete all of the construction under the building permit, resulting in the expiration of the building permit, will void the development permit, unless there are special circumstances as determined by the Planning Director.

Approval Date: _____

Effective Date: _____

Expiration Date: _____

_____
Jocelyn Drake
Deputy Zoning Administrator

Appeals: Any property owner, or other person aggrieved, or any other person whose interests are adversely affected by any act or determination of the Zoning Administrator, may appeal the act or determination to the Planning Commission in accordance with chapter 18.10 of the Santa Cruz County Code.

EXHIBIT C

SOQUEL DR SC1

(NEAR) 5505 SOQUEL DRIVE
SOQUEL, CA 95073

PROJECT #20161468222
PEOPLESOFT LOCATION #425591

SITE INFORMATION

PSL #:	425591
OWNER:	PACIFIC GAS & ELECTRIC 245 MARKET STREET SAN FRANCISCO, CA 94110 CONTACT: KATHLEEN STEFANI T 415.631.0850
APPLICANT:	VERIZON WIRELESS 2785 MITCHELL DRIVE, SUITE 9 WALNUT CREEK, CA 94598
AGENT:	ON AIR LLC 465 FIRST ST. WEST SUITE 101 SONOMA, CA 95476 TEL (707) 938-9633
APN ADJACENCY:	37-101-58
SITE ADDRESS:	(NEAR) 5505 SOQUEL DRIVE SOQUEL, CA 95073
COUNTY:	SANTA CRUZ COUNTY
ELEVATION:	121' AMSL
ZONING:	PUBLIC ROW
ZONING JURISDICTION:	SANTA CRUZ COUNTY

VICINITY MAP

CODE COMPLIANCE

CONSTRUCTION WORKS AND MATERIALS MUST COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY LOCAL JURISDICTION, INCLUDING BUT NOT LIMITED TO:

- CALIFORNIA CODE OF REGULATIONS
- 2016 CALIFORNIA BUILDING CODE
- 2016 CALIFORNIA MECHANICAL CODE
- 2016 CALIFORNIA PLUMBING CODE
- 2016 CALIFORNIA ELECTRIC CODE
- 2016 GREEN CODE
- 2016 EDITION OF TITLE 24 ENERGY STANDARDS
- ANY LOCAL BUILDING CODE AMENDMENTS TO THE ABOVE
- CITY / COUNTY ORDINANCES
- 2016 CALIFORNIA FIRE CODES WITH ALL LOCAL AMENDMENTS
- GO 95 REGULATIONS

DRIVING DIRECTIONS

DIRECTIONS FROM VERIZON WIRELESS RF MARKET OFFICE:

1. Depart Mitchell Dr toward N Wiget Ln
2. Turn left onto N Wiget Ln Turn right onto Ygnacio Valley Rd
3. Take ramp left for I-680 South toward San Jose
4. At exit 12, take ramp right for Mission Blvd West toward Warm Springs District
5. Take ramp left for I-30 South toward San Jose
6. Road name changes to CA-17 S
7. At exit 18, take ramp right for CA-1 South toward Monterey / Watsonville
8. At exit 437, take ramp right and follow signs for Bay Ave / Porter St
9. Turn left onto Bay Ave / Porter St
10. Turn right onto S Main St
11. Turn right onto E Walnut St Turn right onto Soquel Dr Arrive at Soquel Dr
12. The last intersection is Horizon Way
13. 5505 Soquel Dr, Soquel, CA 95073

PROJECT TEAM

ON AIR, LLC

ON AIR LLC
465 FIRST ST. WEST
SUITE 101
SONOMA, CA 95476

PROJECT MGR: AARON SALARS
MOBILE: (707) 320.7248
OFFICE: (707) 933.9633
EMAIL: aaronsalars@comcast.net

CONSTRUCTION MANAGER: MOHAMMAD A. BASSER
MOBILE: (510) 414.7073

SITE ACQUISITION MGR: AARON SALARS
MOBILE: (707) 320.7248
OFFICE: (707) 933.9633
EMAIL: aaronsalars@comcast.net

ARCHITECT/ENGINEER
PROJECT MANAGER: RODNEY BARNES
MERIDIAN MANAGEMENT, INC.
MOBILE: (707) 592-5624
EMAIL: rodney@meridian.management

VERIZON WIRELESS
VERIZON WIRELESS
2785 MITCHELL DRIVE
BUILDING 9
WALNUT CREEK, CA 94598

HANDICAP REQUIREMENTS

FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED IN ACCORDANCE WITH CALIFORNIA ADMINISTRATIVE STATE CODE PART 2, TITLE 24, CHAPTER 11B, SECTION 11038.

USA NORTH 811
Call Us Before You Dig

PROJECT DESCRIPTION

THIS IS AN UNMANNED TELECOMMUNICATIONS FACILITY FOR THE VERIZON WIRELESS NETWORK CONSISTING OF THE INSTALLATION AND OPERATION OF AN ANTENNA AND ASSOCIATED EQUIPMENT ON AN REPLACEMENT WOOD POLE IN THE PUBLIC RIGHT-OF-WAY.

SCOPE OF WORK

1. INSTALL NEW TELECOMMUNICATIONS EQUIPMENT BOXES ON A NEW 40' HT. REPLACEMENT WOOD POLE (54' ABOVE GROUND). EQUIPMENT TO BE INSTALLED ON A GOPS COMPLIANT STANDOFF BRACKET.
2. EQUIPMENT CONSISTS OF (1) POWER METER, (1) DISCONNECT SWITCH, (1) FIBER DEMARC BOX, (1) GROUND BUSS BAR, (2) AWS/PCS DIPLEXERS SHROUD, (2) RRUS AND (1) PANEL ANTENNA IN CANTENNA HOUSINGS.
3. INSTALL POLE STEPS AS REQUIRED.
4. ALL EQUIPMENT TO BE PAINTED SHERWIN WILLIAMS MESA BROWN.
5. UTILITY LINES BETWEEN EXISTING POINT OF CONNECTION AND POLE TO BE UNDERGROUNDED OR OVERHEAD

DRAWING INDEX

SHEET NO:	SHEET TITLE
T.1	TITLE SHEET
T.2	GENERAL NOTES, LEGENDS, AND ABBREVIATIONS
C.1	SITE SURVEY
C.2	SITE SURVEY
A.1	OVERALL SITE PLAN
A.2	POLE PLAN ENLARGEMENTS
A.3	ELEVATIONS
A.4	ELEVATIONS
A.5	EQUIPMENT SPECIFICATIONS
A.6	EQUIPMENT SPECIFICATIONS
E.1	ELECTRICAL SPECS, NOTES, LEGENDS, AND ABBREVIATIONS
E.2	ELECTRICAL GROUNDING DIAGRAMS
E.3	ELECTRICAL SINGLE LINE DIAGRAM, AND DETAILS

ADMINISTRATIVE REQUIREMENTS

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

verizon

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

Meridian Management LLC
2928 Bella Drive
Concord, CA 94519
(707) 592-5624
www.meridian.management

Project Architect:

ON AIR
465 First St. West, Suite 101
Sonoma, CA 95476
Phone: 707-938-9633
Fax: 707-938-9639

Site Agent:

100% Construction Drawings

Drawing Phase:

SOQUEL DR SC1
(near) 5505 Soquel Drive
Soquel, CA 95073

PSL# 425591

Site Name:

Professional Seal:

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08	02/22/18	Const. Dwgs 100%

Project No.:

Date: 02/23/18 Job No.:

Scale: AS SHOWN CAD File:

Designed By: JG Checked: RB

TITLE SHEET

Sheet Title:

T.1

Sheet No.:

EXHIBIT D

GENERAL NOTES

GENERAL CONSTRUCTION NOTES

GENERAL NOTES FOR EXISTING CELL SITES

APPLICABLE CODES, REGULATIONS AND STANDARDS

GENERAL TRENCHING NOTES

GENERAL GROUNDING NOTES

GENERAL CONDUIT NOTES

TYPICAL R.O.W. POLE CONSTRUCTION NOTES

LEGEND

(N) ANTENNA
EXISTING ANTENNA
GROUND ROD
GROUND BUS BAR
MECHANICAL GRND. CONN.
GROUND ACCESS WELL
ELECTRIC BOX
TELEPHONE BOX
LIGHT POLE
FND. MONUMENT
SPOT ELEVATION
SET POINT
REVISION
GRID REFERENCE
DETAIL REFERENCE
ELEVATION REFERENCE
SECTION REFERENCE

GROUT OR PLASTER
(E) BRICK
(E) MASONRY
CONCRETE
EARTH
GRAVEL
PLYWOOD
SAND
WOOD CONT.
WOOD BLOCKING
STEEL
CENTERLINE
PROPERTY/LEASE LINE
MATCH LINE
WORK POINT
GROUND CONDUCTOR
COAXIAL CABLE
OVERHEAD SERVICE CONDUCTORS
CHAIN LINK FENCING
OVERHEAD TELEPHONE/OVERHEAD POWER
OVERHEAD TELEPHONE LINE
OVERHEAD POWER LINE
POWER RUN

TELCO RUN
POWER/TELCO RUN
GROUND #2 CONDUCTOR
GROUNDING CONDUCTOR
CONDUIT UNDERGROUND
FUSE, SIZE AND TYPE AS INDICATED.
SAFETY SWITCH
MANUAL TRANSFER SWITCH
LIGHTING FIXTURES
EMERGENCY LIGHTING
5/8" X 10'-0" CU. GND ROD 30" MIN. BELOW GRADE.

CHEMICAL GROUND ROD
CADWELD CONNECTION
MECHANICAL CONNECTION
HALO GROUND CONNECTION
CIRCUIT BREAKER
UTILITY METER BASE
TRANSFORMER
STEPDOWN TRANSFORMER
RECEPTACLE
TOGGLE SWITCH
POLE
(N) POLE MOUNTED XFMR
(E) POLE MOUNTED XFMR
(N) PAD MOUNTED XFMR
(E) PAD MOUNTED XFMR

ABBREVIATIONS

verizon✓

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

MM

Meridian Management LLC
Concord, CA

Project Architect:

ON AIR

Site Agent:

100% Construction Drawings

Drawing Phase:

SOQUEL DR SC1
(near) 5505 Soquel Drive
Soquel, CA 95073

PSL# 425591

Site Name:

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07	12/04/17	Const. Dwgs 100%
08	02/23/18	Const. Dwgs 100%

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Designed By: JG Checked: RB

GENERAL NOTES, LEGENDS, AND ABBREVIATIONS

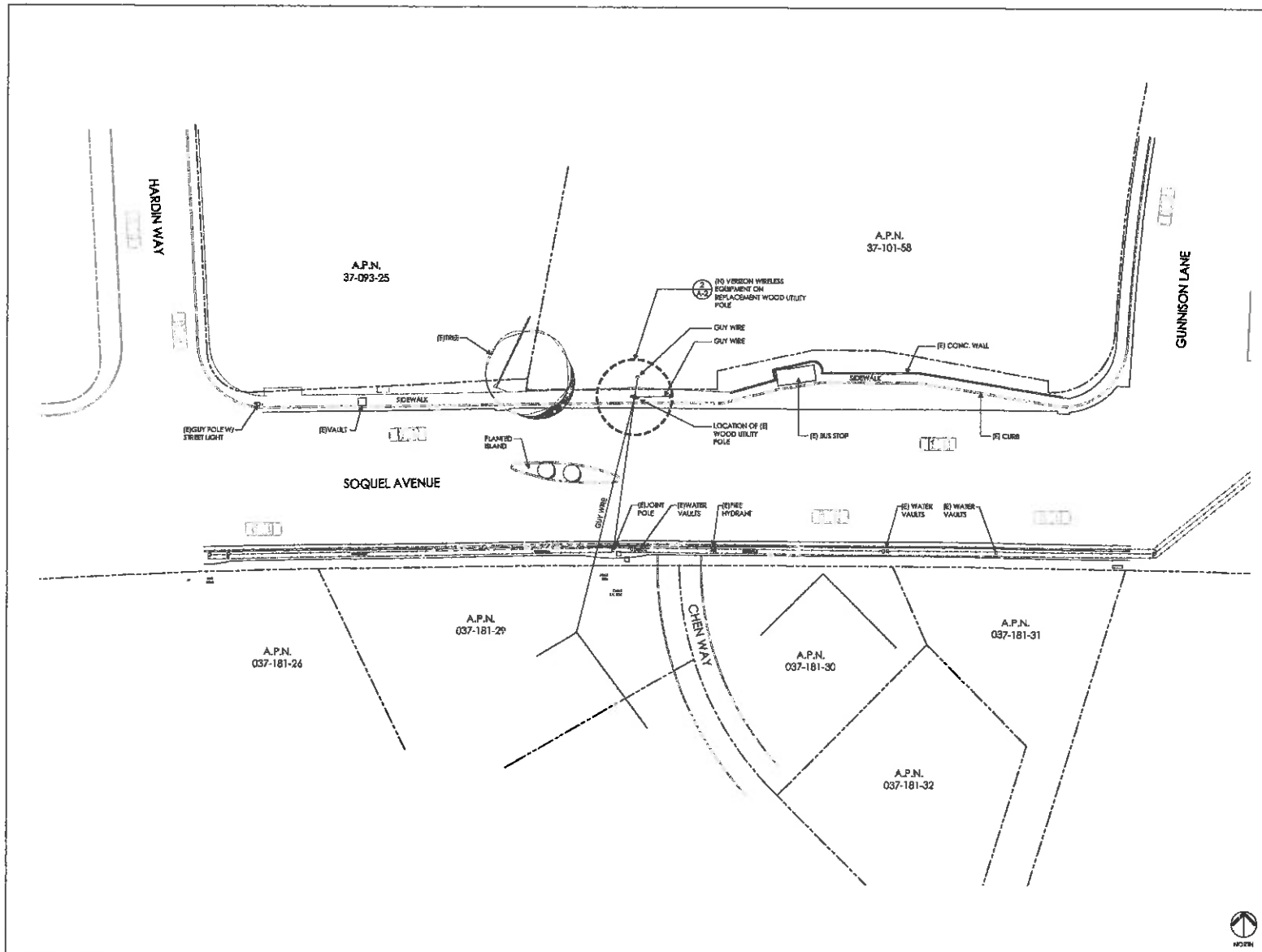
Sheet Title:

T.2

Sheet No.:

EXHIBIT D

EXHIBIT D



OVERALL SITE PLAN

SCALE 1" = 30'

verizon

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

MM

Project Architect:

ON AIR

Site Agent:

100% Construction Drawings
(E) LIGHT POLE
Drawing Phase:

SOQUEL DR SC1
(near) 5505 Soquel Drive
Soquel, CA 95073

PSL# 425591

Site Name:

Professional Seal:

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Project No.: V-12-CA2039

Date: 02/23/18 Job No.:

Scale: AS SHOWN CAD File:

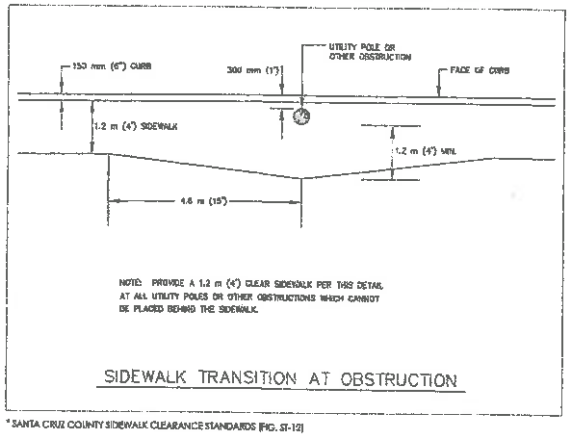
Designed By: JG Checked: RB

OVERALL SITE PLAN
Sheet Title:

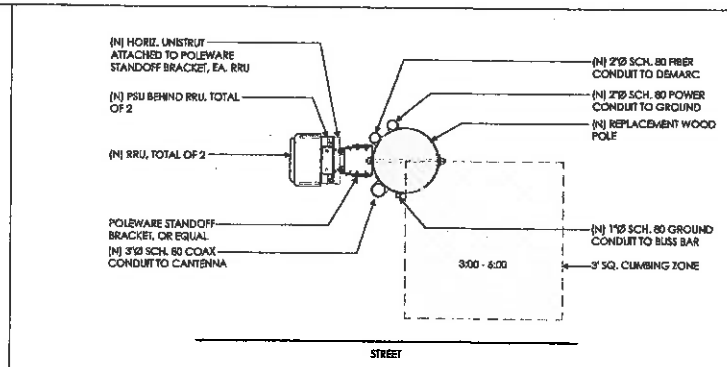
A.1
Sheet No.:

19

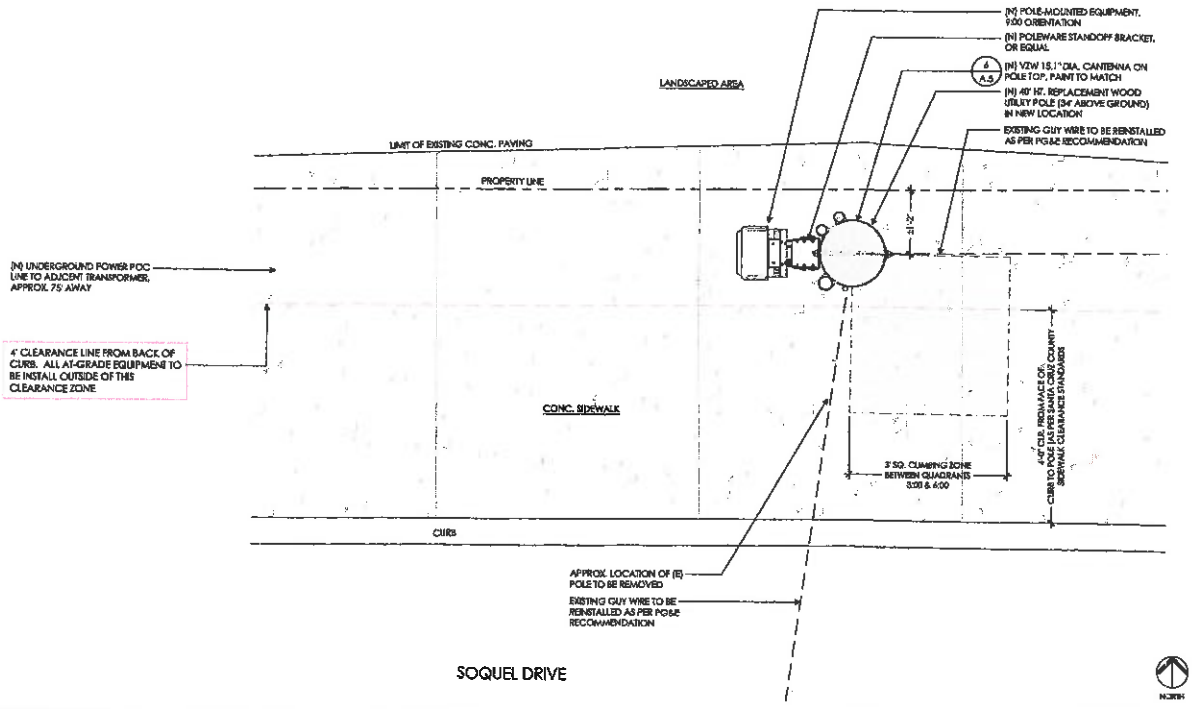
EXHIBIT D



* SANTA CRUZ COUNTY SIDEWALK CLEARANCE STANDARDS (FIG. ST-12)



POLE PLAN ENLARGEMENT — SCALE: NOT TO SCALE — 1



POLE PLAN ENLARGEMENTS — SCALE: 1" = 1'-0" — 2

verizon

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

Project Architect:

ON AIR

Site Agent:

100% Construction Drawings

[E] LIGHT POLE

Drawing Phase:

SOQUEL DR SC1
(near) 5505 Soquel Drive
Soquel, CA 95073

PSL# 426591

Site Name:

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07	1?/04/17	Const. Dwgs 100%
08	02/22/18	Const. Dwgs 100%

Project No.: V-12-CA-2039

Date: 02/23/18 Job No.:

Scale: AS SHOWN CAD File:

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POLE PLAN ENLARGEMENT

Sheet Title:

A.2

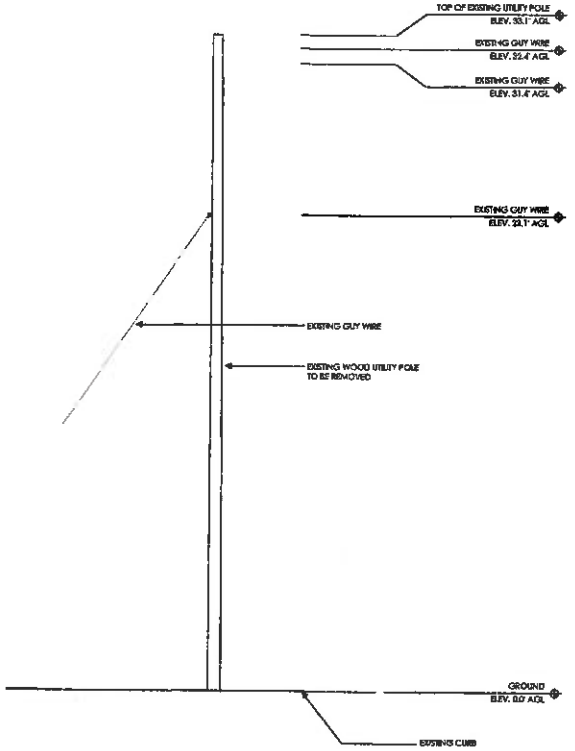
Sheet No.:

EXHIBIT D

21

SCALE NOTE:

IF DIMENSIONS SHOWN ON PLAN DO NOT SCALE CORRECTLY, CHECK FOR REDUCTION OR ENLARGEMENT FROM ORIGINAL PLANS.



SOUTH ELEVATION - EXISTING

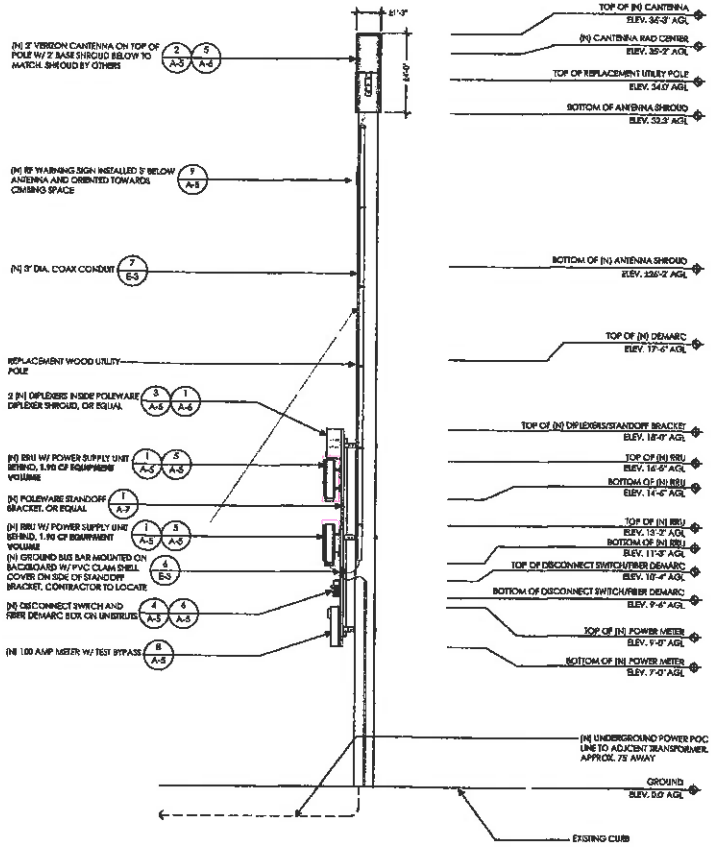
SCALE 3/8" = 1'-0"

1

(N) VERIZON EQUIPMENT TO BE MOUNTED IN THE 9:00 QUADRANT.
POLE STEPS REQUIRED FROM 8.5' TO COMMUNICATIONS ZONE. STEPS SHOULD BE USABLE WHEN INSTALLED WITHIN CLIMBING SPACE

EQUIPMENT SYSTEM:

ALL NEW COMPONENTS TO BE SHOP-PAINT SHERWIN WILLIAMS MESA BROWN



SOUTH ELEVATION - PROPOSED

SCALE 1/8" = 1'-0"

2

(N) RRU W/ POWER SUPPLY UNIT BEHIND, 1.90 CF

verizon

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

Project Architect:

ON AIR

Site Agent:

100% Construction Drawings

Drawing Phase:

SOQUEL DR SC1
(near) 5505 Soquel Drive
Soquel, CA 95073

PSL# 425591

Site Name:

Professional Seal:

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07	12/04/17	Constr. Docs 100%
08	02/23/18	Constr. Docs 100%

Project No.:

Date: 02/23/18 Job No.:

Scale: AS SHOWN CAD File:

Designed By: JG Checked: RB

ELEVATIONS

Sheet Title:

A.3

Sheet No.:

EXHIBIT D

SCALE NOTE:

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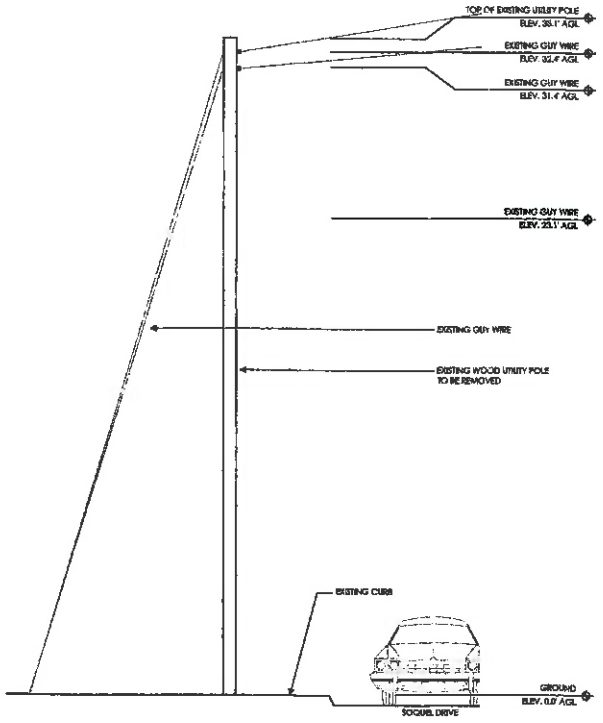
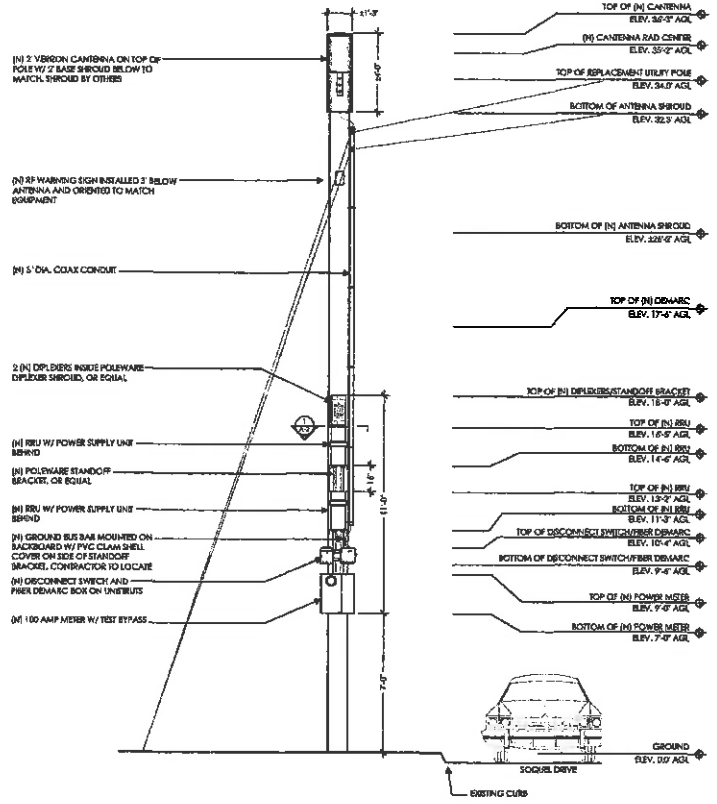


WEST ELEVATION - EXISTING

SCALE 3/8" = 1'-0" 1



WEST ELEVATION - PROPOSED

SCALE 3/8" = 1'-0" 2

verizon

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

Project Architect:

ON AIR

Site Agent:

100% Construction Drawings

Drawing Phase:

SOQUEL DR SC1
(near) 5505 Soquel Drive
Soquel, CA 95073

FSL# 425591

Site Name:

Professional Seal

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07	12/04/17	Constr. Dwgs 100%
08	02/23/18	Constr. Dwgs 100%

Project No.: V-12-CA2039

Date: 02/23/18 Job No.:

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ELEVATIONS

Sheet Title:

A.4

Sheet No.:

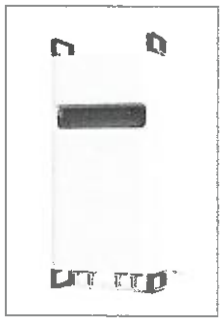
EXHIBIT D

HEIGHT: 27.2 INCHES

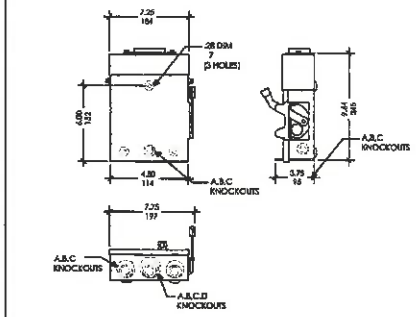
WIDTH: 12.1 INCHES

LENGTH: 7.0 INCHES

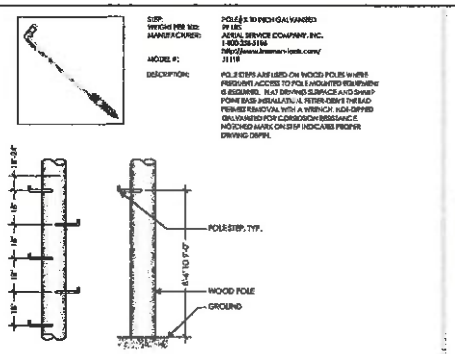
WEIGHT: 53 LBS (EXCLUDES MOUNTING HARDWARE)



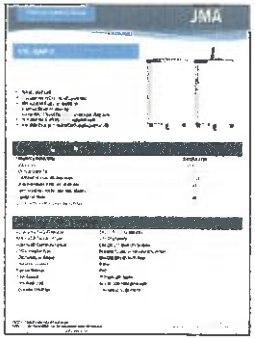
RRU | 1



DISCONNECT SWITCH | 4



POLE STEPS | 7



CANTENNA | 2

UNIT: ERICSSON PSU AC 08

HEIGHT: 2.72 INCHES

WIDTH: 10.79 INCHES

DEPTH: 7.0 INCHES

WEIGHT: 11.46 LBS

(USED FOR 8RUS32)

POWER SUPPLY UNIT (PSU AC 08) | 5

UNIT: 100 AMP METER W/ TEST BYPASS

HEIGHT: 24 INCHES

WIDTH: 25 INCHES

DEPTH: 4-5/8 INCHES

ELECTRIC METER | 8

SCALE: N.T.S.

UNIT: COMMSCOPE CBC1923T-43I0

HEIGHT: 8.31 INCHES

WIDTH: 2.48 INCHES

DEPTH: 7.0 INCHES

WEIGHT: 4.4 LBS

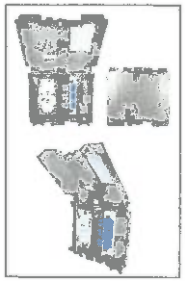
DIPLEXER | 3

UNIT: FIBER DEMARC ENCLOSURE BOX

HEIGHT: 8.54 INCHES

WIDTH: 10 INCHES

DEPTH: 2.58 INCHES



FIBER DEMARC BOX | 6

NOTE:
NEW PHENOLIC SIGN ATTACHED TO INSIDE PANEL

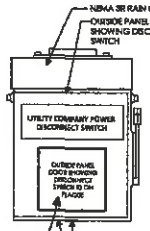
NORMAL SHUT-DOWN PROTOCOLS:

1. Call 800-254-6820 NOC 24 HRS prior to schedule a shutdown day and time.
2. Give NOC the Node number _____.
3. On scheduled day of shutdown, pull the disconnect handle to the "OFF" position.
4. Call NOC when work is completed.

EMERGENCY SHUT-DOWN PROTOCOLS:

1. Call 800-254-6820 NOC immediately.
2. Give NOC the Node number _____.
3. Pull the disconnect handle to the "OFF" position.
4. Call NOC when work is completed.

CONTRACTOR NOTE:
SITE ID WILL BE SWITCH #, SITE #, AND SITE NAME



DISCONNECT SIGNAGE | 8

ON WOOD POLES - SIGN ON ALUMINUM WITH SS SCREW TO THE POLE'S BELOW ANTENNA
ON METAL POLES - ADHESIVE VINYL OR PLACARD STRAPPED WITH SS TIES
ON CONCRETE / COMPOSITE - PLACARD STRAPPED WITH SS TIES

SIGN PLACEMENT:
AFFIX TO THE STRUCTURE 3-4' BELOW THE COMMERCIAL RF ANTENNA(S)

SIZE APPROX. 8" x 5"

CONTRACTOR NOTE:
SITE ID WILL BE SWITCH #, SITE #, AND SITE NAME

RF WARNING SIGNAGE | 9

verizon

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

Project Architect:

ON AIR

Site Agent:

100% Construction Drawings

Drawing Phase:

SOQUEL DR SC1
(near) 5505 Soquel Drive
Soquel, CA 95073

PSL# 425591

Site Name:

Professional Seal:

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07	12/04/17	Const. Drgs 100%
08	02/23/18	Const. Drgs 100%

Project No.:

Date: 02/23/18 Job No.:

Scale: AS SHOWN CAD File:

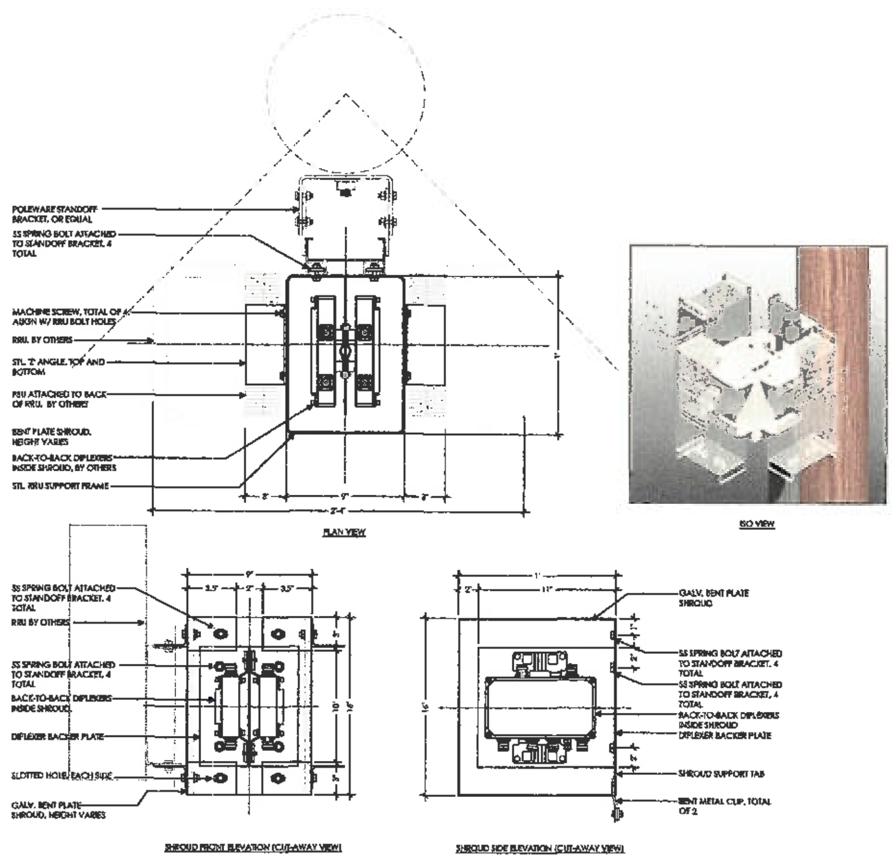
Designed By: JG Checked: RB

EQUIPMENT SPECIFICATIONS

Sheet Title:

A.5

Sheet No.:



NOTE:

1. COMBINER SHROUD MODEL #PW-RRS-16L-002-SP AS MFG. BY POLEWARE, LLC, (475) 215-5119, OR EQUAL
2. ALL COMPONENTS TO BE SHOP PRIMED PAINTED
3. UNISTRUT COMPONENTS TO BE MFG BY UNISTRUT CORPORATION, 1140 W. THORNDALE AVE. ITASCA IL 60143, (800) 468-9510.
4. CUSTOMER TO SPECIFY SHROUD HEIGHT AT TIME OF ORDERING.

* SPECIFY BRACKET FOR 2 RRUs AT TIME OF ORDERING

RRU / DIPLEXER BRACKET

SCALE: NOT TO SCALE | 5

verizon

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

MM

Meridian Management LLC
Project Architect:

ON AIR

Site Agent:

100% Construction Drawings

Drawing Phase:

SOQUEL DR SC1
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07	12/04/17	Constr. Dwgs 100%
08	02/23/18	Constr. Dwgs 100%

Project No.: V-12-CA2039

Date: 02/23/18 Job No.:

Scale: AS SHOWN CAD File:

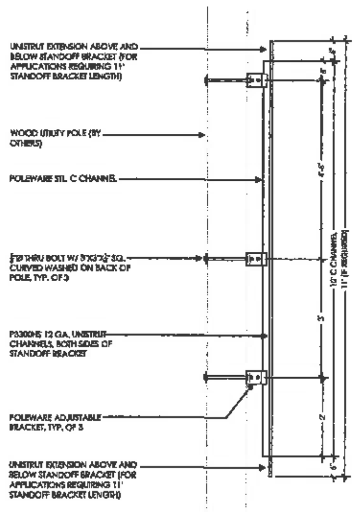
Designed By: JG Checked: RB

EQUIPMENT SPECIFICATIONS

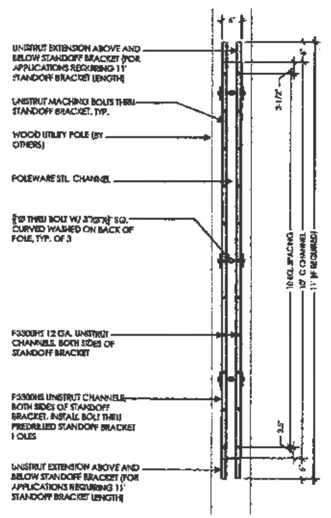
Sheet Title:

Sheet No.: A.6

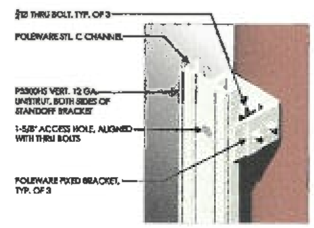
EXHIBIT D



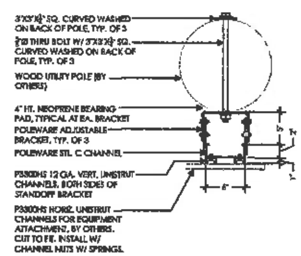
STANDOFF BRACKET SIDE ELEVATION



STANDOFF BRACKET FRONT ELEVATION



STANDOFF BRACKET BRACKET ISO



STANDOFF BRACKET PLAN

NOTE:

1. STANDOFF BRACKET MODEL #PW-SOB-10L-ADJ-SP AS MFG. BY POLEWARE, LLC. (478) 215-5119, OR EQUAL
2. ALL COMPONENTS TO BE SHOP PRIMED PAINTED
3. UNISTRUT COMPONENTS TO BE MFG BY UNISTRUT CORPORATION, 1140 W. THORNDALE AVE., ITASCA IL 60143, (800) 468-9510.
4. HORIZONTAL UNISTRUTS (P3300HS) FOR EQUIPMENT INSTALLATION NOT INCLUDED
5. ADJUSTABLE BRACKETS FOR SLANTED POLES AVAILABLE BY SPECIAL ORDER

STANDOFF BRACKET

SCALE: NOT TO SCALE | 1

verizon

Client:
Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Project Architect:
MM — Meridian Management LLC

Site Agent:
ON AIR

Drawing Phase:
100% Construction Drawings

Site Name:
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Rev.	Date	Description
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Project No.: V-12-CA2039
Date: 02/23/18 Job No.:
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Designed By: JG Checked: RB

Sheet Title: EQUIPMENT SPECIFICATIONS

Sheet No.: A.7

EXHIBIT D

EXHIBIT D

1. GENERAL REQUIREMENTS

A. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF THE NATIONAL ELECTRIC CODE AND ALL STATE AND LOCAL CODES. NOTHING IN THESE PLANS OR SPECIFICATIONS SHALL BE CONSTRUED AS TO PERMIT WORK NOT CONFORMING TO THE MOST STRINGENT OF THESE CODES. SHOULD CHANGES BE NECESSARY IN THE DRAWINGS OR SPECIFICATIONS TO MAKE THE WORK COMPLY WITH THESE REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING AND CEASE WORK ON PARTS OF THE CONTRACT WHICH ARE AFFECTED.

B. THE CONTRACTOR SHALL MAKE A SITE VISIT PRIOR TO BIDDING AND CONSTRUCTION TO VERIFY ALL EXISTING CONDITIONS AND SHALL NOTIFY THE ARCHITECT IMMEDIATELY UPON DISCOVERY OF ANY DISCREPANCIES. THE CONTRACTOR ASSUMES ALL LIABILITY FOR FAILURE TO COMPLY WITH THIS PROVISION.

C. THE EXTENT OF THE WORK IS INDICATED BY THE DRAWINGS, SCHEDULES, AND SPECIFICATIONS AND IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT. THE WORK SHALL CONSIST OF FURNISHING ALL LABOR, EQUIPMENT, MATERIALS AND SUPPLIES NECESSARY FOR A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM. THE WORK SHALL ALSO INCLUDE THE COMPLETION OF ALL ELECTRICAL WORK NOT MENTIONED OR SHOWN WHICH ARE NECESSARY FOR SUCCESSFUL OPERATION OF ALL SYSTEMS.

D. THE CONTRACTOR SHALL PREPARE A BID FOR A COMPLETE AND OPERATIONAL SYSTEM, WHICH INCLUDES THE COST FOR MATERIAL AND LABOR.

E. WORKMANSHIP AND NEAT APPEARANCE SHALL BE AS IMPORTANT AS THE OPERATION. DEFECTIVE OR DAMAGED MATERIALS SHALL BE REPLACED OR REPAIRED PRIOR TO FINAL ACCEPTANCE IN A MANNER ACCEPTABLE TO OWNER AND ARCHITECT/ENGINEER.

F. COMPLETE THE ENTIRE INSTALLATION AS SOON AS THE PROGRESS OF THE WORK WILL PERMIT. ARRANGE ANY OUTAGE OF SERVICE WITH THE OWNER AND BUILDING MANAGER IN ADVANCE. MINIMIZE DOWNTIME ON THE BUILDING ELECTRICAL SYSTEM.

G. THE ENTIRE ELECTRICAL SYSTEM INSTALLED UNDER THIS CONTRACT SHALL BE DELIVERED IN PROPER WORKING ORDER. REPLACE, WITHOUT ADDITIONAL COST TO THE OWNER, ANY DEFECTIVE MATERIAL AND EQUIPMENT WITHIN ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

H. ANY ERROR, OMISSION OR DESIGN DISCREPANCY ON THE DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR CLARIFICATION OR CORRECTION BEFORE CONSTRUCTION.

I. "PROVIDE": INDICATES THAT ALL ITEMS ARE TO BE FURNISHED, INSTALLED AND CONNECTED IN PLACE.

J. CONTRACTOR SHALL SECURE ALL NECESSARY BUILDING PERMITS AND PAY ALL REQUIRED FEES.

2. EQUIPMENT LOCATION

A. THE DRAWINGS INDICATE DIAGRAMMATICALLY THE DESIRED LOCATIONS OR ARRANGEMENTS OF CONDUIT RUNS, OUTLETS, EQUIPMENT, ETC., AND ARE TO BE FOLLOWED AS CLOSELY AS POSSIBLE. PROPER JUDGMENT MUST BE EXERCISED IN EXECUTING THE WORK SO AS TO SECURE THE BEST POSSIBLE INSTALLATION IN THE AVAILABLE SPACE AND TO OVERCOME LOCAL DIFFICULTIES DUE TO SPACE LIMITATIONS OR INTERFERENCE OF STRUCTURE CONDITIONS ENCOUNTERED.

B. IN THE EVENT CHANGES IN THE INDICATED LOCATIONS OR ARRANGEMENTS ARE NECESSARY, DUE TO FIELD CONDITIONS IN THE BUILDING CONSTRUCTION OR REARRANGEMENT OF FURNISHINGS OR EQUIPMENT, SUCH CHANGES SHALL BE MADE WITHOUT COST, PROVIDING THE CHANGE IS ORDERED BEFORE THE CONDUIT RUNS, ETC., AND WORK DIRECTLY CONNECTED TO THE SAME IS INSTALLED AND NO EXTRA MATERIALS ARE REQUIRED.

C. LIGHTING FIXTURES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS ONLY. COORDINATE THE FIXTURE LOCATION WITH MECHANICAL EQUIPMENT TO AVOID INTERFERENCE.

D. COORDINATE THE WORK OF THIS SECTION WITH THAT OF ALL OTHER TRADES. WHERE CONFLICTS OCCUR, CONSULT WITH THE RESPECTIVE CONTRACTOR AND COME TO AGREEMENT AS TO CHANGES NECESSARY. OBTAIN WRITTEN ACCEPTANCE FROM ARCHITECT/ENGINEER FOR THE (N) CHANGES BEFORE PROCEEDING.

3. SHOP DRAWINGS

A. SUBMIT SHOP DRAWINGS TO THE ARCHITECT FOR APPROVAL WITHIN 35 DAYS OF AWARD OF CONTRACT. SHOP DRAWINGS SHALL BE SUBMITTED IN A COMPLETE BOUND MANUAL INCLUDING LIGHT FIXTURES, SERVICE METERING, TRANSFER SWITCH, PANELBOARD, AND DISCONNECT SWITCHES. THE CONTRACTOR SHALL VERIFY DIMENSIONS OF EQUIPMENT TO INSURE THAT THEY FIT IN THE DESIGNATED AREA AND COMPLY WITH REQUIREMENTS OF ALL APPLICABLE CODES FOR REQUIRED WORKING CLEARANCES ABOUT ELECTRICAL EQUIPMENT PRIOR TO SUBMITTING SHOP DRAWINGS FOR APPROVAL. DEPARTURE FROM THE ABOVE WILL RESULT IN RE-SUBMITTAL AND DELAYS.

4. SUBSTITUTIONS

A. NO SUBSTITUTIONS ARE ALLOWED.

5. TESTS

A. BEFORE FINAL ACCEPTANCE OF WORK, THE CONTRACTOR SHALL INSURE THAT ALL EQUIPMENT, SYSTEMS, FIXTURES, ETC., ARE WORKING SATISFACTORILY AND TO THE INTENT OF THE DRAWINGS.

6. PERMITS

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING OUT AND PAYING FOR ALL THE REQUIRED PERMITS, INSPECTION AND EXAMINATION WITHOUT ADDITIONAL EXPENSE TO THE OWNER.

7. GROUNDING

A. THE CONTRACTOR SHALL PROVIDE A COMPLETE, AND APPROVED GROUNDING SYSTEM INCLUDING ELECTRODES, ELECTRODE CONDUCTOR, BONDING CONDUCTORS, AND EQUIPMENT CONDUCTORS AS REQUIRED BY ARTICLE 250 OF NATIONAL ELECTRICAL CODE.

B. CONDUITS CONNECTED TO EQUIPMENT AND DEVICES SHALL BE METALLICALLY JOINED TOGETHER TO PROVIDE EFFECTIVE ELECTRICAL CONTINUITY.

C. FEEDERS AND BRANCH CIRCUIT WIRING INSTALLED IN A NONMETALLIC CONDUIT SHALL INCLUDE A CODE SIZED GROUNDING CONDUCTOR HAVING GREEN INSULATION. THE GROUND CONDUCTOR SHALL BE PROPERLY CONNECTED AT BOTH ENDS TO MAINTAIN ELECTRICAL CONTINUITY.

D. REFER TO GROUND BUS DETAILS. PROVIDE NEW GROUND SYSTEM COMPLETE WITH CONDUCTORS, GROUND ROD AND DESCRIBED TERMINATIONS.

E. ALL GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2 UNLESS NOTED OTHERWISE.

F. ALL NON-DIRECT BURIED TELEPHONE EQUIPMENT GROUND CONDUCTORS SHALL BE #2 STRANDED, THHN (GREEN) INSULATION.

G. ALL GROUND CONNECTIONS SHALL BE MADE WITH "HYGROUND" COMPRESSION SYSTEM BURNDY CONNECTORS EXCEPT WHERE NOTED OTHERWISE.

H. PAINT AT ALL GROUND CONNECTIONS SHALL BE REMOVED.

I. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 5 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE OWNER FOR FUTURE INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE. SUBMIT TEST REPORTS AND FURNISH TO VERIZON ONE COMPLETE SET OF PRINTS SHOWING "INSTALLED WORK".

8. UTILITY SERVICE

A. TELEPHONE AND ELECTRICAL METERING FACILITIES SHALL CONFORM TO THE REQUIREMENTS OF THE SERVING UTILITY COMPANIES. CONTRACTOR SHALL VERIFY SERVICE LOCATIONS AND REQUIREMENTS. SERVICE INFORMATION WILL BE FURNISHED BY THE SERVING UTILITIES.

B. CONFORM TO ALL REQUIREMENTS OF THE SERVING UTILITY COMPANIES.

9. PRODUCTS

A. ALL MATERIALS SHALL BE NEW, CONFORMING WITH THE NEC, ANSI, NEMA, AND THEY SHALL BE U.L. LISTED AND LABELED.

B. CONDUIT:

1. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR. RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2 LAPPED WRAPPED WITH HUNTS WRAP PROCESS NO. 3.
2. ELECTRICAL METALLIC TUBING SHALL HAVE U.L. LABEL, FITTINGS SHALL BE COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
3. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE. SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
4. CONDUIT RUNS MAY BE SURFACE MOUNTED IN CEILING OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH ARCHITECT PRIOR TO INSTALLING.
5. ALL UNDERGROUND CONDUITS SHALL BE PVC SCHEDULE 40 (UNLESS NOTED OTHERWISE) AT A MINIMUM DEPTH OF 24" BELOW GRADE.
6. ALL CONDUIT ONLY (C.O.) SHALL HAVE PULL ROPE.
7. CONDUITS RUN ON ROOFS SHALL BE INSTALLED ON 4 X 4 REDCHANNEL SLEEPERS, 6'-0" ON CENTER, SET IN NON-HARDENING MASTIC.

C. ALL WIRE AND CABLE SHALL BE COPPER, 600 VOLT, #12 AWG MINIMUM UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED. TYPE THHN INSULATION USED UNLESS CONDUCTORS INSTALLED IN CONDUIT EXPOSED TO WEATHER, IN WHICH CASE TYPE THWN INSULATION SHALL BE USED.

D. PROVIDE GALVANIZED COATED STEEL BOXES AND ACCESSORIES SIZED PER CODE TO ACCOMMODATE ALL DEVICES AND WIRING.

E. DUPLEX RECEPTACLES SHALL BE SPECIFICATION GRADE WITH WHITE FINISH (UNLESS NOTED BY ARCHITECT/ENGINEER), 20 AMP, 125 VOLT, THREE WIRE GROUNDING TYPE, NEMA 5-20R. MOUNT RECEPTACLE AT +12" ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED ON DRAWINGS OR IN DETAILS. WEATHERPROOF RECEPTACLES SHALL BE GROUND FAULT INTERRUPTER TYPE WITH SIERRA #WPD-8 LPI COVERPLATES.

F. TOGGLE SWITCHES SHALL BE 20 AMP, 120 VOLT AC, SPECIFICATION GRADE WHITE (UNLESS NOTED OTHERWISE) FINISH. MOUNT SWITCHES AT +48" ABOVE FINISHED FLOOR.

G. PANELBOARDS SHALL BE DEAD FRONT SAFETY TYPE WITH ANTI-BURN SOLDERLESS COMPRESSION APPROVED FOR COPPER CONDUCTORS, COPPER BUS BARS, FULL SIZED NEUTRAL BUS, GROUND BUS AND EQUIPPED WITH QUICK-MAKE QUICK-BREAK BOLT-IN TYPE THERMAL MAGNETIC CIRCUIT BREAKERS. MOUNT TOP OF THE PANELBOARDS AT 6'-8" ABOVE FINISHED FLOOR. PROVIDE TYPEWRITTEN CIRCUIT DIRECTORY.

H. ALL CIRCUIT BREAKERS, MAGNETIC STARTERS AND OTHER ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED.

I. GROUND RODS SHALL BE COPPER CLAD STEEL, 5/8" ROUND AND 10' LONG, COPPERWELD OR APPROVED EQUAL.

10. INSTALLATION

A. PROVIDE SUPPORTING DEVICES FOR ALL ELECTRICAL EQUIPMENT, FIXTURES, BOXES, PANEL, ETC., SUPPORT LUMINAIRES FROM UNDERSIDE OF STRUCTURAL CEILING, EQUIPMENT SHALL BE BRACED TO WITHSTAND HORIZONTAL FORCES IN ACCORDANCE WITH STATE AND LOCAL CODE REQUIREMENTS. PROVIDE PRIOR ALIGNMENT AND LEVELING OF ALL DEVICES AND FIXTURES.

B. CUTTING, PATCHING, CHASES, OPENINGS: PROVIDE LAYOUT IN ADVANCE TO ELIMINATE UNNECESSARY CUTTING OR DRILLING OF WALLS, FLOORS CEILINGS, AND ROOFS. ANY DAMAGE TO BUILDING STRUCTURE OR EQUIPMENT SHALL BE REPAIRED BY THE CONTRACTOR. OBTAIN PERMISSION FROM THE ARCHITECT/ENGINEER BEFORE CORING.

C. IN DRILLING HOLES INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC., IT MUST BE CLEARLY UNDERSTOOD THAT TENDONS AND/OR REINFORCING STEEL WILL NOT BE DRILLED INTO, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES.

D. LOCATION OF TENDONS AND/OR REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND THEREFORE, MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT VIA X-RAY OR OTHER DEVICES THAT CAN ACCURATELY LOCATE THE REINFORCING AND/OR STEEL TENDONS.

E. PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH THE REQUIREMENTS OF THE C.B.C.

11. PROJECT CLOSEOUT

A. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO PROJECT MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.

B. PROVIDE PROJECT MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS AND CIRCUITS.

C. ALL BROCHURES, OPERATING MANUALS, CATALOG, SHOP DRAWINGS, ETC., SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.

ELECTRICAL SPECIFICATIONS | 1

1. SERVICE POWER SHALL BE 100A, 1Ø, 3W, 120/208 OR 120/240V.
2. UTILITY RECEPTACLE IS A GFCI DUPLEX OUTLET INSTALLED IN THE DEADFRONT OF PPC.
3. NOT USED
4. PROVIDE A MIN. 36" WORK CLEARANCE IN FRONT OF PANELS/SERVICE EQUIP.
5. ALL BREAKERS IN THE ELEC. PANEL ARE RATED 10,000 RMS SYMMETRICAL AMPS. 240V MAX. 75° C.
6. ALL WIRING SHALL BE COPPER 75° C U.N.O.
7. CONDUIT REQUIREMENTS (TYP., U.N.O.): UNDERGROUND: PVC (SCHED 40 OR 80) INDOOR: EMT (RGS IN TRAFFIC AREAS) OUTDOOR (ABOVE GRADE): RGS.
8. APPLETON EMERGENCY GENERATOR PLUG AT 36" A.F.F. CONTRACTOR TO VERIFY EXACT LOCATION WITH LANDLORD AND UTILITY COORDINATOR.
9. PLACE "TRUETAPE" AND PULL ROPE IN THE CONDUITS AS REQUIRED.

A	AMPERE	ELEC	ELECTRICAL	MFR	MANUFACTURER	SAF	SAFETY
ACCA	ANTENNA CABLE COVER ASSEMBLY	EMT	ELECTRICAL METALLIC TUBING	MIN	MINIMUM	SDBC	SOFT DRAWN BARE COPPER
		ENCL	ENCLOSURE	MLO	MAIN LUGS ONLY	SEC	SECONDARY
AIC	AMPERE INTERRUPTING CAPACITY	EXIST	EXISTING	MTD	MOUNTED	S/N	SOLID NEUTRAL
		F/C	FACTOR	MTG	MOUNTING	SURF	SURFACE
APPROX	APPROXIMATELY	F/A	FIRE ALARM	MTS	MANUAL TRANSFER SWITCH	SW	SWITCH
AT	AMPERE TRIP	FLUOR	FLUORESCENT	N	NEUTRAL	TEL	TELEPHONE
AWG	AMERICAN WIRE GAGE	FT	FOOT/FEET	(N)	NEW	TYP	TYPICAL
BATT	BATTERY	FU	FUSE	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.	U/G	UNDERGROUND
BD	BOARD	G	GROUND			UL	UNDERWRITERS LABORATORY INC.
BR	BRANCH	GEN	GENERATOR	OH	OVERHEAD		
BRKR	BREAKER	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	P	POLE	U.N.O.	UNLESS NOTED OTHERWISE
BTCW	BARE TINNED COPPER WIRE			PCS	PERSONAL COMMUNICATION SYSTEM	V	VOLT
BTS	BASE TRANSMISSION SYSTEM	GND	GROUNDING			VAC	VOLT ALTERNATING CURRENT
C	CONDUIT	GPS	GLOBAL POSITIONING SYSTEM	PH	PHASE	W	WATT OR WIRE
CAB	CABINET	GR	GROWTH	PNLBD	PANELBOARD	W/	WITH
CB	CIRCUIT BREAKER	HDBC	HARD DRAWN COPPER WIRE	PPC	POWER PROTECTION CABINET	W/O	WITHOUT
CKT	CIRCUIT	HPS	HIGH PRESSURE SODIUM	PRC	PRIMARY RADIO CABINET	XFER	TRANSFER
CONT	CONTINUOUS	LG	LENGTH	PRI	PRIMARY	XFMR	TRANSFORMER
DEM	DEMAND	LPS	LOW PRESSURE SODIUM	PWR	POWER	XLPE	CROSS-LINK POLYETHYLENE
(E)	EXISTING	MAX	MAXIMUM	RCPT	RECEPTACLE		
EGR	EMERGENCY GEN. RECEPTACLE	MECH	MECHANICAL	RGS	RIGID GALVANIZED STEEL		

	OVERHEAD TELEPHONE/OVERHEAD POWER		LIGHTING FIXTURE, 1/175W, METAL HALIDE, HUBBELL CAT #MC-0175H-334
	OVERHEAD TELEPHONE LINE		5/8" X 10'-0" CU. GND ROD 30" MIN. BELOW GRADE.
	OVERHEAD POWER LINE		5/8" X 10'-0" CU. GND ROD IN TEST WELL 30" MIN. BELOW GRADE.
E	POWER RUN		CHEMICAL GROUND ROD (XIT GROUND ROD)
	TELCO RUN		CADWELD CONNECTION
T/E	POWER/TELCO RUN		MECHANICAL CONNECTION
	GROUNDING CONDUCTOR		HALO GROUND CONNECTION
	GROUNDING CONDUCTOR		CIRCUIT BREAKER
	CONDUIT UNDERGROUND		UTILITY METER BASE
	FUSE, SIZE AND TYPE AS INDICATED.		TRANSFORMER
	SAFETY SWITCH, 2P-240V-60A W/60A FUSES, NEMA 3R ENCLOSURES, SQ D CATALOG NO. H222NRB		POLE
	MANUAL TRANSFER SWITCH, 2P-240V-200A, NO FUSE, NEMA 3R ENCLOSURE		(N) POLE MOUNTED XFMR
			(E) POLE MOUNTED XFMR

GENERAL LEGEND | 4

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Meridian Management LLC

Project Architect:

ON AIR

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100% Construction Drawings

Drawing Phase:

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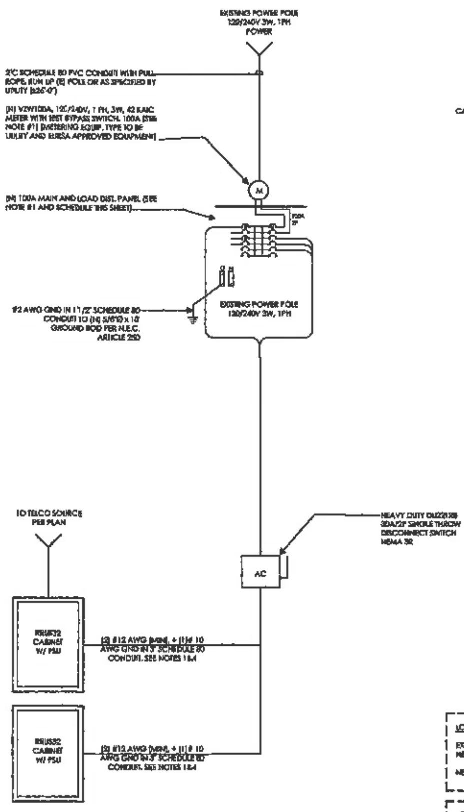
Designed By: JC Checked: RB

ELECTRICAL SPECIFICATIONS, NOTES, LEGEND, ABBREVIATIONS

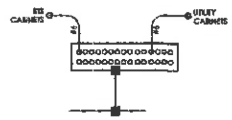
Sheet Title:

E.1

Sheet No.:



SINGLE LINE DIAGRAM



BUSS DIAGRAM

LOAD CALCULATIONS - VERIZON WIRELESS

EXISTING LOAD: 0 AMPS
NEW LOAD: 6.17 AMPS MAX.

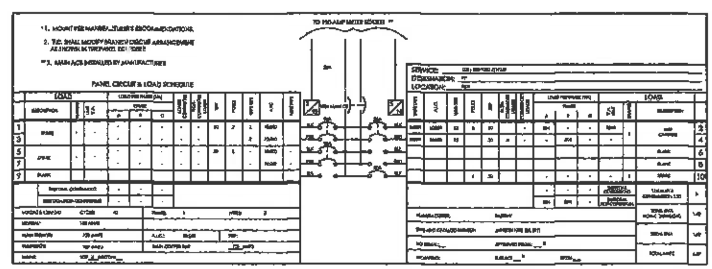
NEW TOTAL LOAD: 6.67 AMPS MAX.

POWER AND TELCO DESIGN IS BASED ON INITIAL SITE VISIT.

CONTRACTOR SHALL OBTAIN CURRENT UTILITY COORDINATOR PLANS PRIOR TO START OF CONSTRUCTION.

AVAILABLE FAULT CURRENT PER UTILITY.

NOTE: CONTRACTOR TO CHECK WITH UTILITY TO ENSURE ELEC. METER IS RACED FOR ACTUAL FAULT CURRENT.



PANEL SCHEDULE - PANEL " PP "

POWER AND TELCO NOTES:

1. POWER AND TELCO POINTS OF CONNECTION AND ANY EASEMENTS ARE PRELIMINARY AND SUBJECT TO CHANGE BY THE UTILITY COMPANIES.
2. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR FINAL AND EXACT WORK/MATERIALS REQUIREMENTS AND CONSTRUCT TO UTILITY ENGINEERING PLANS AND SPECIFICATIONS ONLY WHERE APPLICABLE PER PROJECT SCOPE OF WORK.
3. CONTRACTOR SHALL FURNISH AND INSTALL CONDUIT, PULL WIRES, CABLE PULL BOXES, CONCRETE ENCASEMENT OF CONDUIT, TRANSFORMER PAD, BARRIERS, POLE RISER TRENCHING, BACK FILL, AND UTILITY FEES, AND INCLUDE REQUIREMENTS IN SCOPE.
4. CONTRACTOR SHALL LABEL ALL MAIN DISCONNECT SWITCHES AS REQUIRED BY CODE.

NOTES:

1. SUBCONTRACTOR SHALL PROVIDE DIST. PANEL AND BREAKERS FOR POWER TO THE BTS UNITS AND THE BTS/UTILITY CABINET.
2. ALL SERVICE EQUIPMENT AND INSTALLATIONS SHALL COMPLY WITH THE N.E.C. AND UTILITY COMPANY AND LOCAL CODE REQUIREMENTS.
3. SUBCONTRACTOR SHALL PROVIDE ELECTRICAL SERVICE ENTRANCE EQUIPMENT WITH FAULT CURRENT RATINGS GREATER THAN THE AVAILABLE FAULT CURRENT FROM THE POWER UTILITY.
4. MAXIMUM ONE WAY CIRCUIT RUN NOT TO EXCEED 75 FEET.

GENERAL ELECTRICAL NOTES:

1. PROVIDE ALL ELECTRICAL WORK & MATERIALS AS SHOWN ON THE DWGS. AS CALLED FOR HEREIN, & AS IS NECESSARY TO FURNISH A COMPLETE INSTALLATION.
2. THE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ADOPTED CALIFORNIA ELECTRICAL CODE, STATE OF CALIFORNIA TITLE24, ALL OTHER APPLICABLE CODES AND ORDINANCES & THE REQUIREMENTS OF THE FIRE MARSHALL. ALL EQUIPMENT & WIRING SHALL BEAR THE APPROVAL STAMP OF UNDERWRITERS LABORATORY (UL) OR AN APPROVED TESTING LABORATORY. PAYMENT FOR ALL INSPECTION FEES AND PERMITS ARE PART OF THE CONTRACT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY AND GOOD CONDITION OF ALL MATERIALS & EQUIPMENT FOR THE ENTIRE INSTALLATION & UNIT COMPLETION OF WORK. ERECT & MAINTAIN APPROVED & SUITABLE BARRIERS, PROTECTIVE DEVICES & WARNING SIGNS. BE FULLY RESPONSIBLE FOR ANY LOSS OR INJURY TO PERSONS OR PROPERTY RESULTING FROM NEGLIGENCE AND/OR ENFORCEMENT OF ALL SAFETY PRECAUTIONS & WARNINGS.
4. COORDINATE THE ELECTRICAL INSTALLATION WITH ALL OTHER TRADES.
5. ALL SAW CUTTING, TRENCHING, BACK FILLING & PATCHING SHALL BE PART OF THIS CONTRACT.
6. FINALIZE ALL ELECTRICAL SERVICE ARRANGEMENTS, INCLUDING VERIFICATION OF LOCATIONS, DETAILS, COORDINATION OF THE INSTALLATION & PAYMENT OF ACCRUED CHARGES WITH LOCAL POWER COMPANY. VERIFY LOCATION FOR FACILITIES & DETAILS WITH POWER UTILITY. IN ADDITION TO THE REQUIREMENTS SHOWN IN THE CONTRACT DOCUMENTS, WORK SHALL COMPLY WITH CONSTRUCTION STANDARDS & SERVICE REQUIREMENTS OF THE RESPECTIVE UTILITIES, INCLUDING ANY SUPPLEMENTAL DWGS ISSUED & SHALL BE SUBJECT TO APPROVAL OF THESE UTILITIES.
7. ALL WIRING SHALL BE COPPER. INSULATION FOR BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE "THWN" CONDUCTORS LARGER AND #6 AWG MAY BE TYPE "THWN" OR "TWN".
8. PROVIDE CONDUIT SEALS FOR ALL CONDUITS PENETRATING WEATHERPROOFING OR WEATHERPROOF ENCLOSURE ENVELOPE. MASTIC SEAL ALL CONDUIT OPENING PENETRATIONS COMPLETELY WATERTIGHT.
9. UNLESS SHOWN OTHERWISE, FUSED DISCONNECT SWITCHES SHALL BE PROVIDED WITH LOW-PEAK, DUAL ELEMENT FUSES SIZED TO EQUIPMENT NAMEPLATE FUSE CURRENT RATING. MOTOR STARTERS SHALL BE PROVIDED WITH SIMILARLY SIZED FUSIBLE ELEMENTS, SWITCHES AND OTHER OUTDOOR EQUIPMENT SHALL BE RATED NEMA 3R AND/OR UL LISTED FOR WET ENVIRONMENT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TESTING THE GROUNDING SYSTEM AND ENSURING A 5 OHM OR LESS GROUNDING PATH. ADDITIONAL GROUND RODS AND/OR CHEMICAL ROD SYSTEM SHALL BE USED TO ACHIEVE THIS REQUIREMENT IF THE GIVEN DESIGN CANNOT BE MADE TO ACHIEVE THIS REQUIREMENT.

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Project No.: V-12-CA2039

Date: 02/23/18 Job No.:

Scale: AS SHOWN CAD File:

Designed By: JG Checked: RB

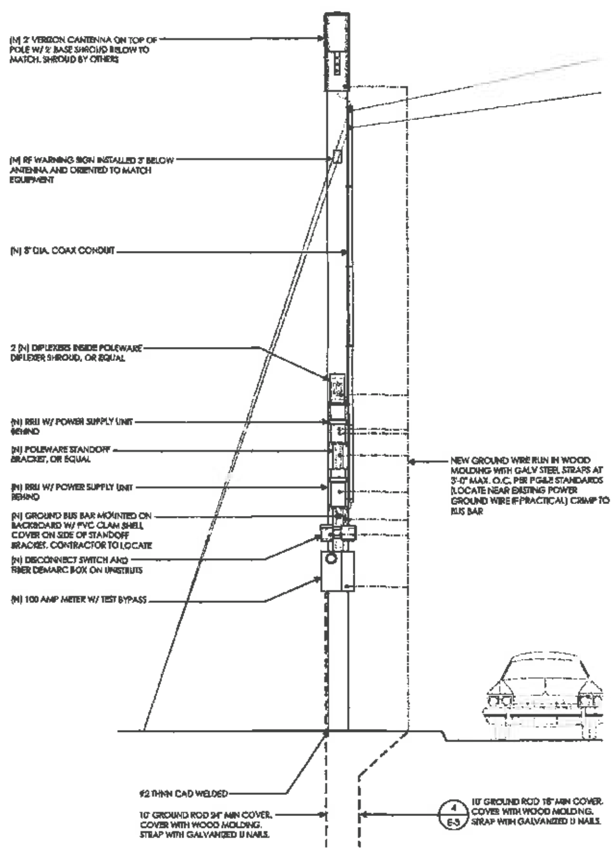
SINGLE LINE DIAGRAM
BUSS DIAGRAM
PANEL SCHEDULE

Sheet Title:

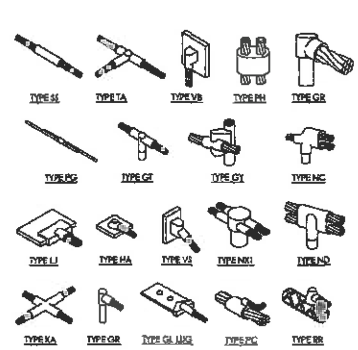
E.2

Sheet No.:

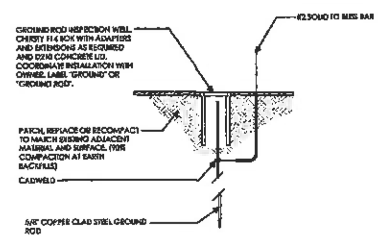
EXHIBIT D



POLE GROUNDING RISER DIAGRAM (TYP.) | 1

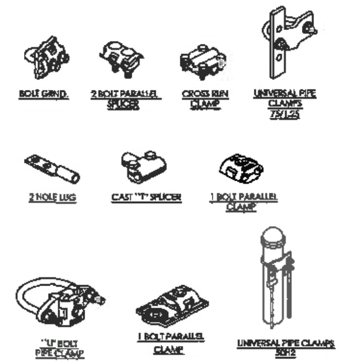


EXOTHERMIC WELD CONNECTION | 2

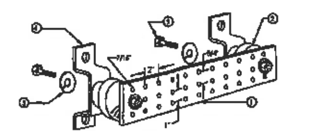


GROUND TEST WELL | SCALE N.T.S. | 3

NOT USED | 4



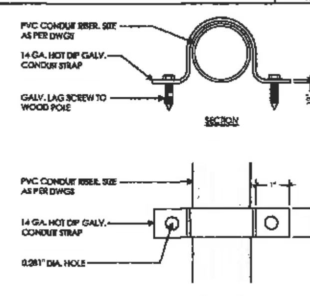
MECHANICAL CONNECTION | 5



NOTES:

1. GALVANIZED STEEL GROUND BAR, HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION. (ACTUAL GROUND BAR SIZE WILL VARY BASED ON NUMBER OF GROUND CONNECTIONS)
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR APPROVED EQUAL
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO., CAT. NO. 3015-8 OR APPROVED EQUAL
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO., CAT NO. A-6056 OR APPROVED EQUAL
5. 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO., CAT NO. 3012-1 OR APPROVED EQUAL
6. INSULATORS SHALL BE ELIMINATED WHEN BONDING DIRECTLY TO TOWER/MONOPINE STRUCTURE. CONNECTION TO TOWER/MONOPINE STRUCTURE SHALL BE PER MANUFACTURERS RECOMMENDATIONS.

BUSS BAR | SCALE N.T.S. | 6



POLE CONDUIT STRAP | SCALE N.T.S. | 7

verizon

Verizon Wireless
2785 Mitchell Drive, Suite 9
Walnut Creek, CA 94598

Client:

MM

Project Architect:

ON AIR

Site Agent:

100% Construction Drawings

Drawing Phase:

SOQUEL DR SC1
(near) 5505 Soquel Drive
Soquel, CA 95073

PSL# 425591

Site Name:

Professional Seal:

It is a violation of law for any person, unless they are acting under the direction of a licensed Professional Architect/Engineer, to alter this document.

Rev.	Date	Description
03	02/22/17	Constr. Dwgs 90%
04	03/15/17	Constr. Dwgs 100%
05	05/31/17	Constr. Dwgs 100%
06	11/16/17	Constr. Dwgs 90%
07	12/04/17	Constr. Dwgs 100%
08	02/23/18	Constr. Dwgs 100%

Project No.: V-12-CA2039

Date: 02/23/18 Job No.:

Scale: AS SHOWN CAD File:

Designed By: JG Checked: RB

ELECTRICAL DETAILS

Sheet Title:

E.3

Sheet No.:

EXHIBIT D

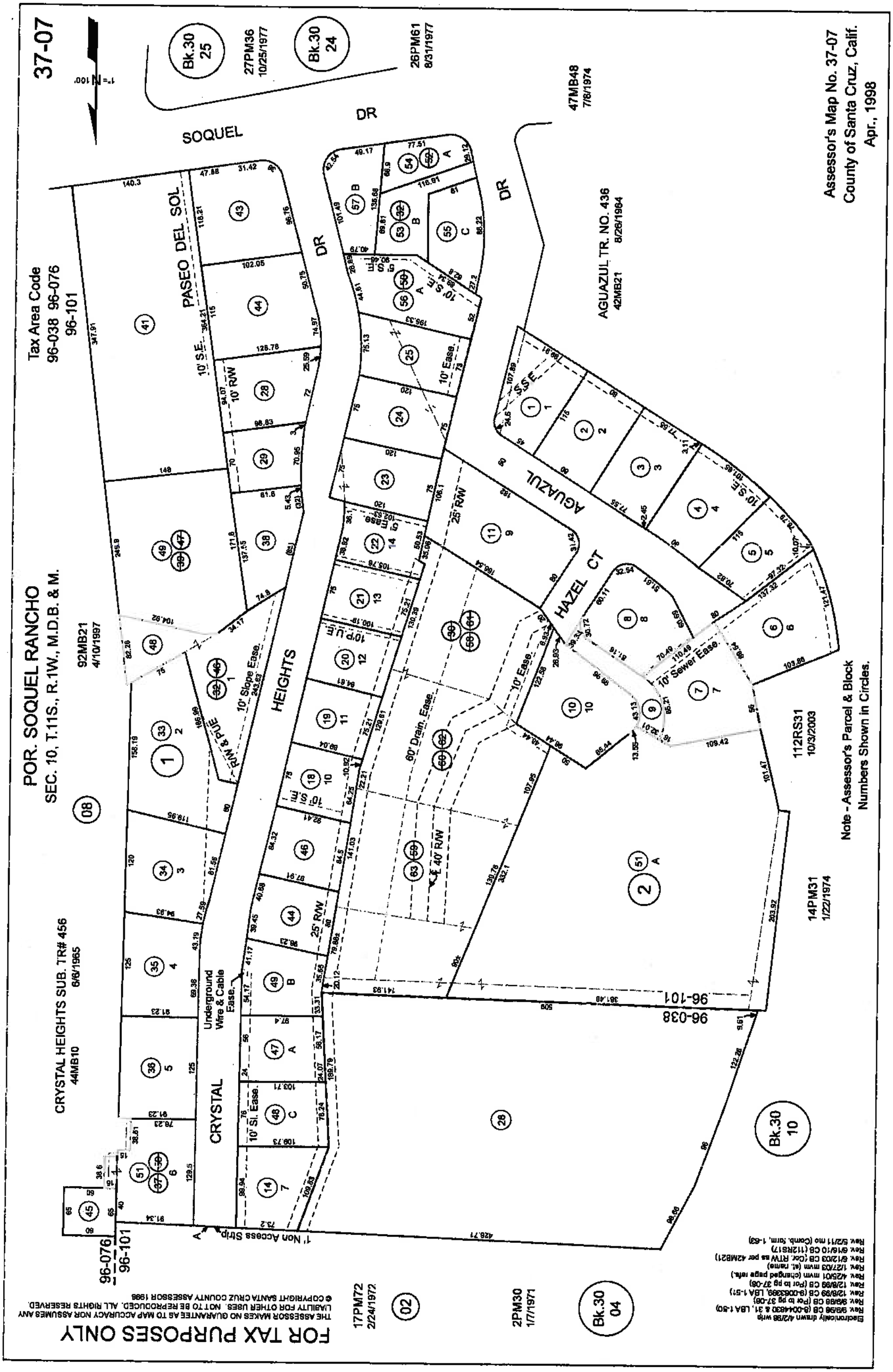

37-07
1" = 100'
SOQUEL DR
PASEO DEL SOL
HEIGHTS DR
CRYSTAL HEIGHTS
AGUAZUL DR
AGUAZUL CT
HAZEL CT
Tax Area Code
96-038 96-076
96-101
POR. SOQUEL RANCHO
SEC. 10, T.11S., R.1W., M.D.B. & M.
CRYSTAL HEIGHTS SUB. TR# 456
44MB10
6/8/1965
92MB21
4/10/1997
AGUAZUL TR. NO. 436
42MB21
8/26/1964
47MB48
7/8/1974
27PM36
10/25/1977
26PM61
8/31/1977
112RS31
10/3/2003
14PM31
1/22/1974
17PM72
2/24/1972
2PM30
1/7/1971
Bk.30 25
Bk.30 24
Bk.30 10
Bk.30 04
10' Slope Ease.
60' Drain. Ease.
10' Sewer Ease.
Underground Wire & Cable Ease.
1' Non Access Strip
25' R/W
40' R/W
Note - Assessor's Parcel & Block Numbers Shown in Circles.
Assessor's Map No. 37-07
County of Santa Cruz, Calif.
Apr., 1998
FOR TAX PURPOSES ONLY
THE ASSESSOR MAKES NO GUARANTEE AS TO MAP ACCURACY NOR ASSUMES ANY LIABILITY FOR OTHER USES. NOT TO BE REPRODUCED. ALL RIGHTS RESERVED.
© COPYRIGHT SANTA CRUZ COUNTY ASSESSOR 1986

EXHIBIT E 1

Parcel Location Map

Santa Cruz County Planning Department

Parcel Number
037-071-41
Apr. 30, 2018

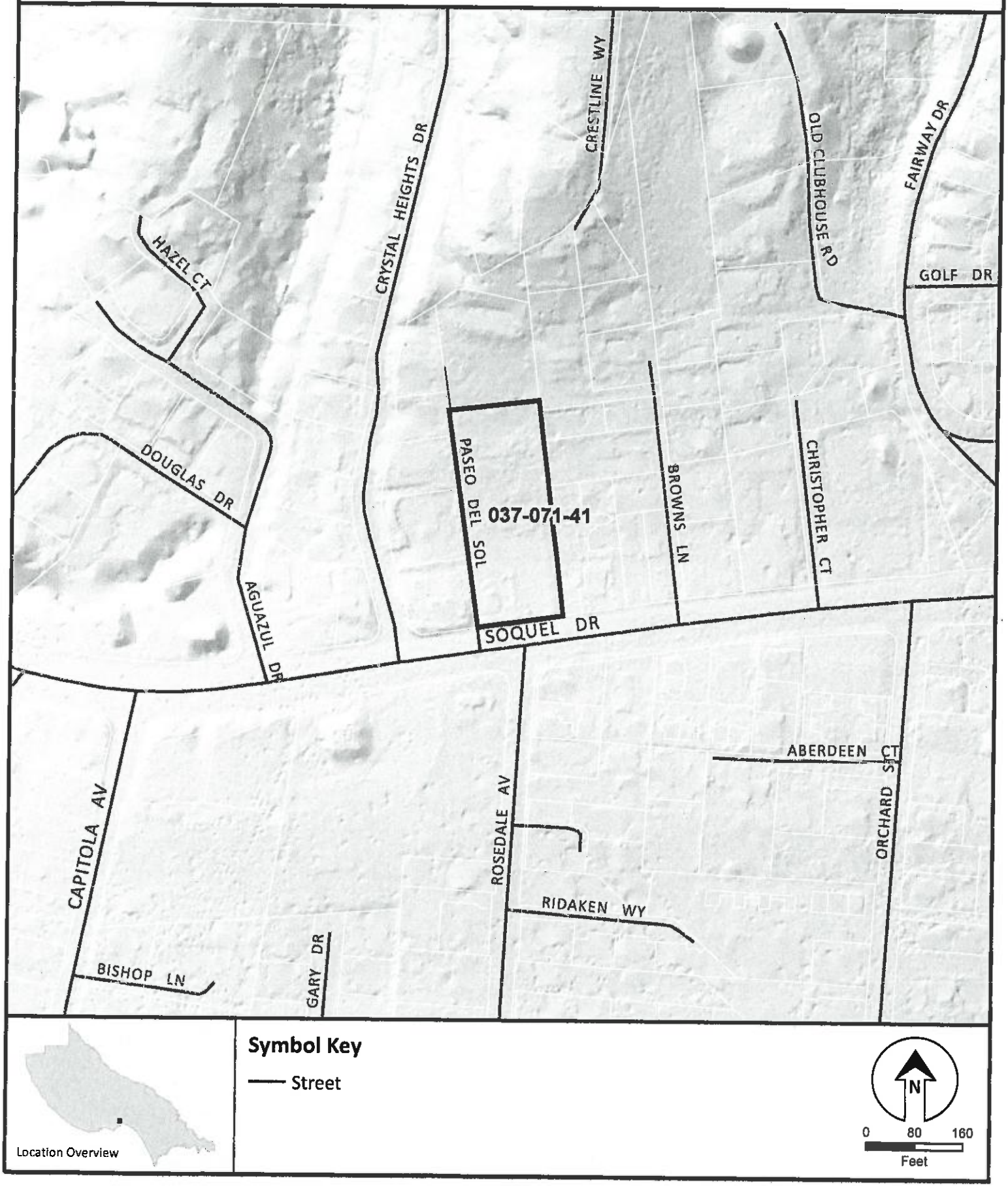
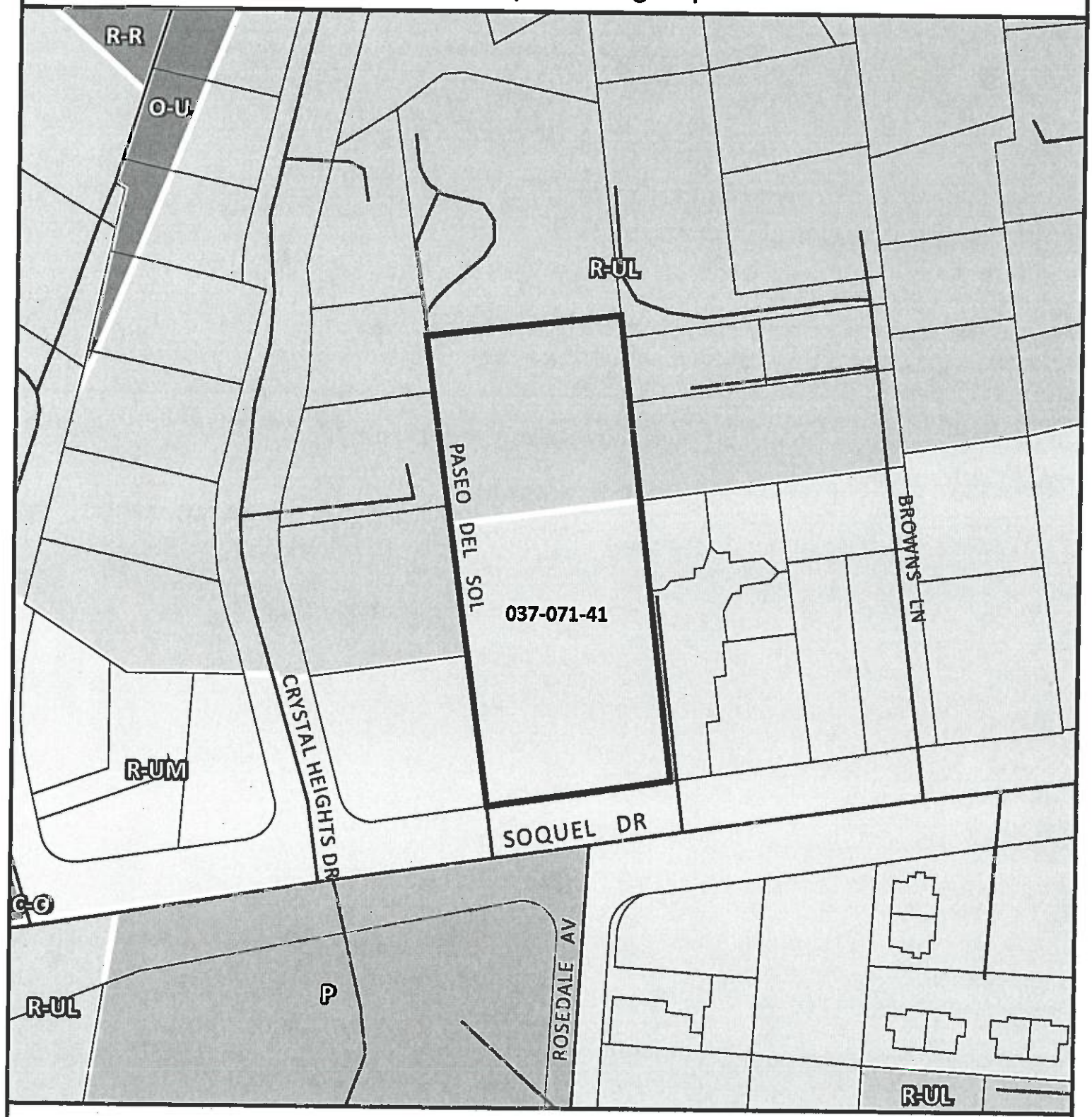


EXHIBIT E 1

Parcel General Plan Map

Santa Cruz County Planning Department

Parcel Number
037-071-41
Apr. 30, 2018



General Plan

- C-O - Commercial-Office
- P - Public Facilites
- R-R - Residential-Rural
- R-UL - Residential - Urban Low Density
- R-UM - Residential - Urban Medium Density
- O-U - Urban Open Space

N

0 40 80
Feet

EXHIBIT E

Parcel Zoning Map

Santa Cruz County Planning Department

Parcel Number
037-071-41
Apr. 30, 2018

Zoning

- (PF) Public & Community Facilities
- (SU) Special Use
- (R-1) Single-Family Residential
- (RA) Residential Agricultural
- (RM) Residential Multi-Family

N

0 40 80
Feet

EXHIBIT E

PROJECT DESCRIPTION

Verizon Wireless "Soquel Dr SC1"

Background Information

A new Verizon Wireless ("VZW") small cell facility is required to serve the general area where Soquel Drive and Hardin Way intersect. The geographic range for this facility is extremely small and not meant to cover a large area. Vehicular traffic and nearby commercial and residential areas near this intersection along make it a critical location for capacity offload.

The nearest Verizon Wireless macro facilities are:

1. Capitola (.43 miles southeast)
2. Aptos (1.23 miles east)
3. Old Clubhouse Road (0.54 miles north)

Small Cell Technology

This proposed facility is considered a "small cell" or microcell facility. Most jurisdictions are familiar with macro (or major) facilities, which can include as many as twelve antennas on a pole as tall as 150 feet. Macro facilities are meant to cover large geographic areas and are more appropriately sited in rural locations.

However, with the proliferation of smartphones and the many features they provide (web browsing, music and video streaming, messaging, email etc.), it is now important for wireless carriers to address this need for more network capacity. This is achieved by building smaller facilities (both in height and equipment) near areas of high demand, like shopping malls, music venues and in this case, near intersections.

Coverage Objective

The area we wish to improve in Soquel with these two Small Cells is Soquel Dr. between approximately Capitola Ave and Monterey Ave and the surrounding neighborhoods to the north and south. Small Cells are small coverage targeted

Verizon Wireless Cell Site Necessity Case – Soquel Rd SC1 & SC2

Prepared by Verizon Wireless
RF Engineering

Introduction:

There are two main drivers that prompt the creation of a cell site project, coverage and/or capacity. Most sites provide a mixture of both, but increasingly some sites are pure capacity.

Coverage is the need for expanded service often requested by our customers or emergency services personnel. While this initially meant providing coverage in vehicles, as usage patterns have shifted this now means improving coverage inside of buildings and in residential areas.

Capacity is the need for more bandwidth of service. In the simplest form this means a cell site can handle a limited number of voice calls, data mega bytes, or total number of active users. When any one of these limits are met or exceeded the user experience within the coverage area of that cell quickly starts to degrade during the busier hours of use.

Coverage is best shown in coverage maps. We use tools that take into account terrain, vegetation, building types, and cell site specifics to show predictions of the existing coverage and what we expect to see with a given cell site. The prediction models make some assumptions such as that the antennas are above the nearby ground clutter (Buildings and vegetation). Once the antennas fall below the ground clutter the models become inaccurate and cannot tell that specific trees or buildings are blocking the RF signal. Due to this, modeling of tower height requirements is frequently not accurate and misleading.

Capacity is best shown in graphs of usage growth and projected exhaustion. We utilize sophisticated programs to model current usage growth and project it into the future to determine when additional capacity will be required. The algorithms that predict capacity growth output numbers are not easily explained. Since it takes 2-3 years on average to complete a cell site project, we have to be looking about 3 years into the future to meet future customer demand.

While data capacity may not seem urgent, beginning in 2014 voice traffic began to migrate from the older 3G voice technology to 4G VoLTE (Voice over IP). This will add additional load to the 4G data network. Since voice is delay sensitive, exhaustion of the data network can cause degradation of voice calls including 911 calls.

"Why do you need a site here?"

A good capacity cell will be close to the user population and have the traffic evenly spread around the site. When we cannot get a location that accomplishes being close to the customers and central to the usage, we end up having to build additional cells to meet the demands for service. Capacity sites are generally lower in height than a coverage site with a full cell needing to be above the ground clutter (buildings, trees, & etc.) and a small cell being one that is at or below the ground clutter.

Where our customers use their wireless devices continues to evolve. While we once needed to cover highways and business districts, we are seeing increasing issues with high growth in residential areas. Current statistics show that about 1 of 3 households in the United States no longer have a landline phone. To serve this need we have to increase the cells we have in or very near residential areas.

Need Case for: Soquel Rd SC1 & SC2

Summary: Coverage Maps and Utilization Graphs for the area on Soquel Dr.

The area we wish to improve in Soquel with these two Small Cells is Soquel Dr. between approximately Capitola Ave and Monterey Ave and the surrounding neighborhoods to the north and south. Small Cells are small coverage targeted cells with low visual impact.

The following plots show poor signal strength along Soquel Dr. In addition, the currently serving cell site, Capitola is projected to exhaust sometime in the 4th quarter of 2017. The last slide is a graph of Forward Data Volume showing the trend line rising. When it reaches the red limit line, the site will exhaust and users will experience slow data rates and blocked calls.

EXHIBIT F

Need Case for: Soquel Rd SC1 & SC2

Existing Coverage

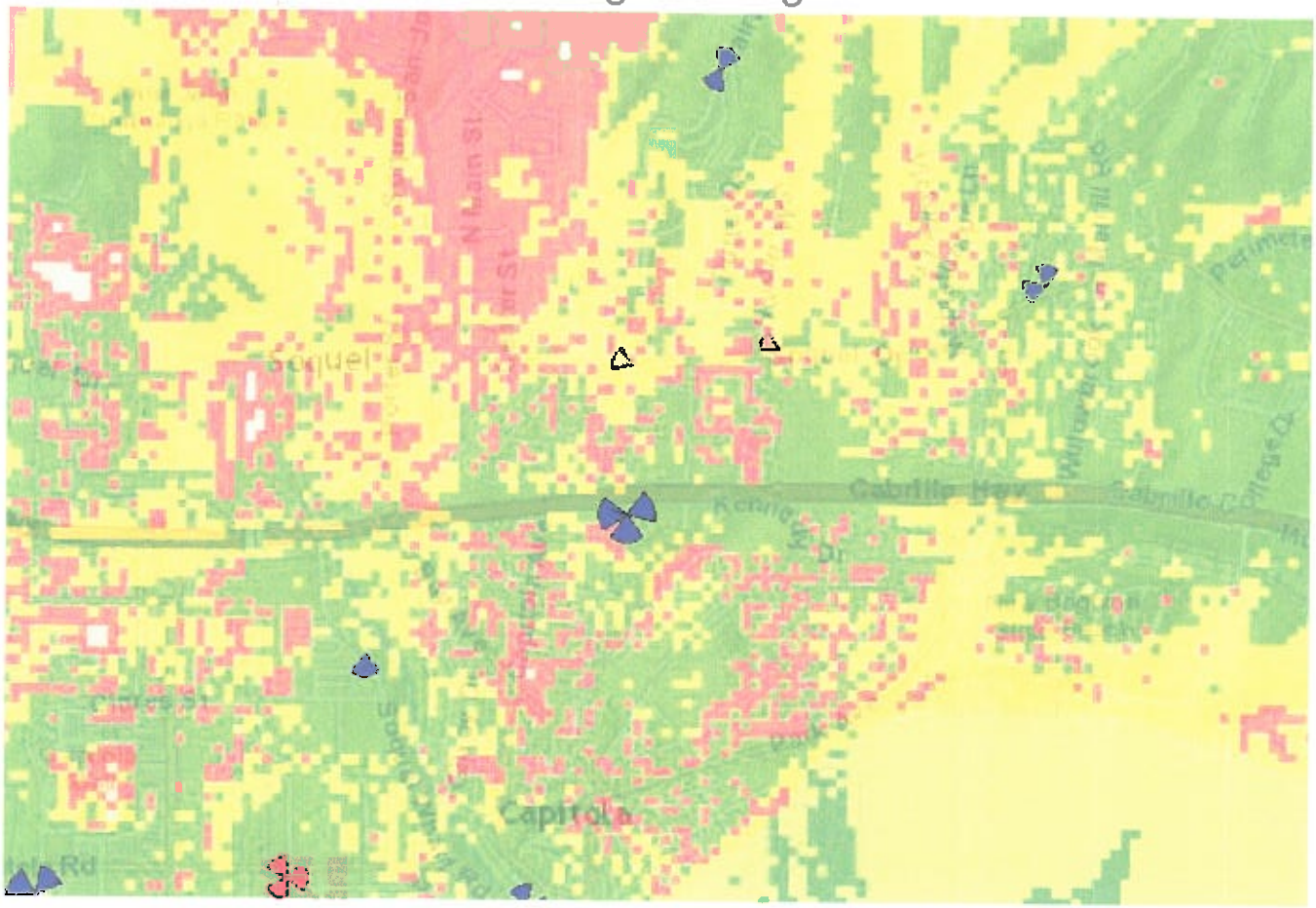
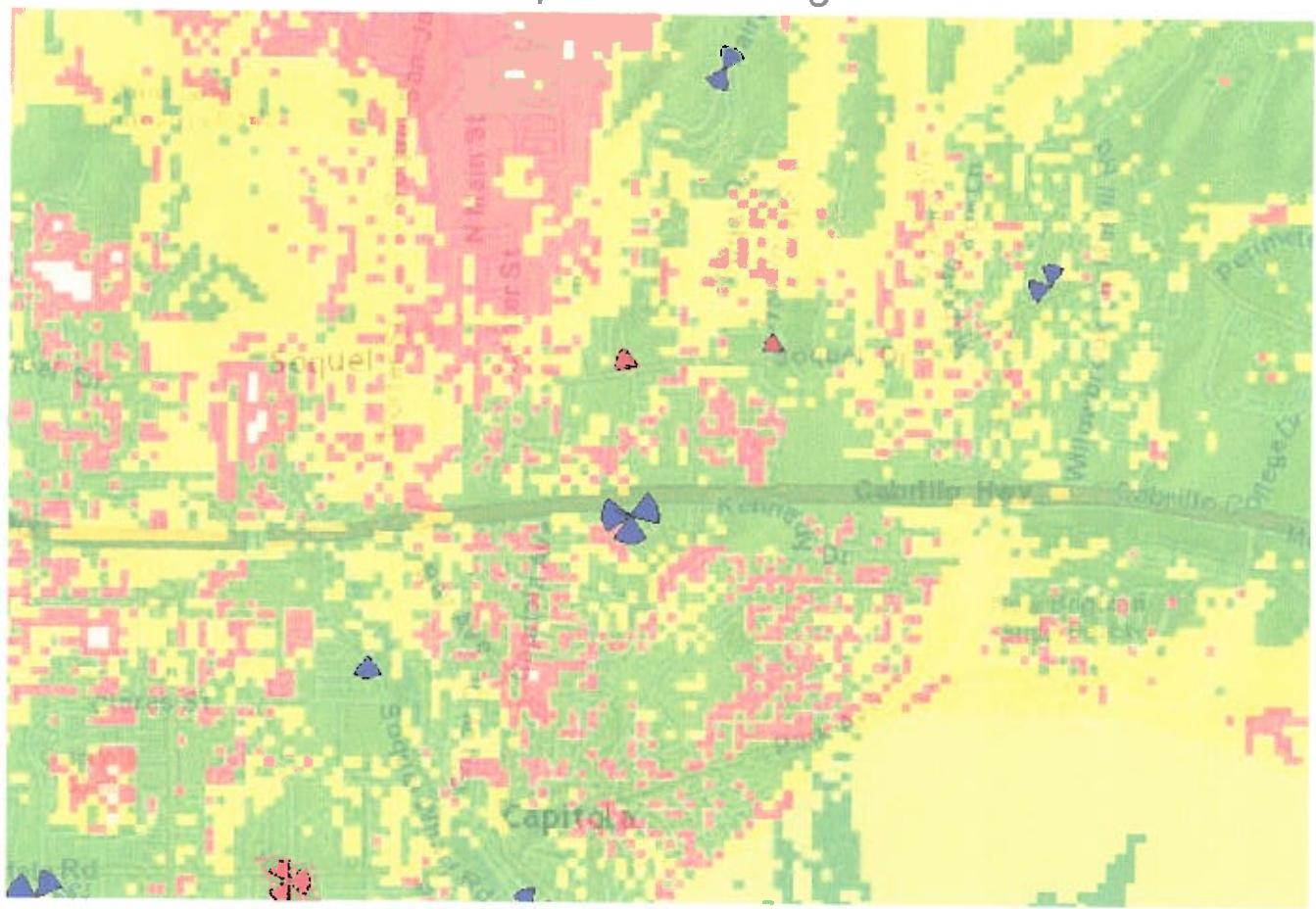


EXHIBIT 1

Need Case for: Soquel Rd SC1 & SC2

Proposed Coverage



Need Case for: Soquel Rd SC1 & SC2

236. Site: 31274 CAPITOLA

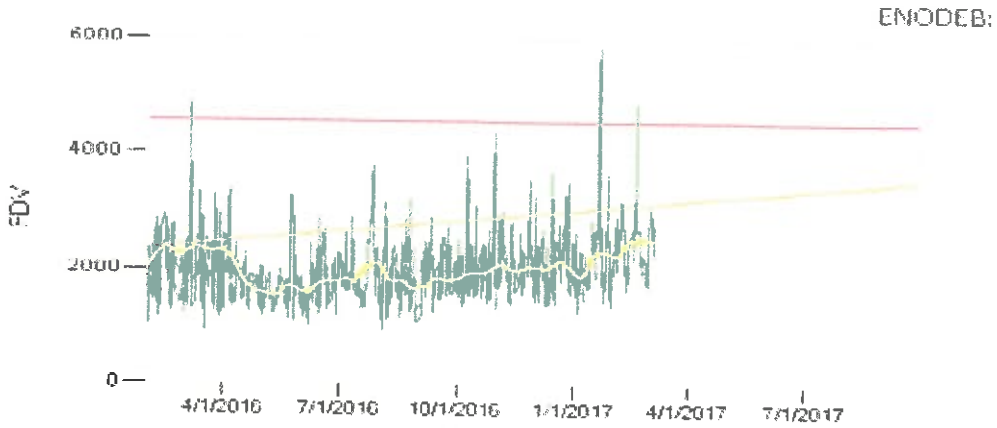


EXHIBIT F

Verizon Wireless • Proposed Base Station (Site No. 425591 "Soquel Drive SC1")
5505 Soquel Drive • Soquel, California

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 the base station (Site No. 425591 "Soquel Drive SC1") proposed to be located at 5505 Soquel Drive in Soquel, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Executive Summary

Verizon proposes to install a cylindrical antenna on top of the utility pole sited in the public right-of-way near 5505 Soquel Drive in Soquel. 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 FCC limit for exposures of unlimited duration to radio frequency energy for several personal wireless services are as follows:

Wireless Service	Frequency Band	Occupational Limit	Public Limit
Microwave (Point-to-Point)	5–80 GHz	5.00 mW/cm^2	1.00 mW/cm^2
WiFi (and unlicensed uses)	2–6	5.00	1.00
BRS (Broadband Radio)	2,600 MHz	5.00	1.00
WCS (Wireless Communication)	2,300	5.00	1.00
AWS (Advanced Wireless)	2,100	5.00	1.00
PCS (Personal Communication)	1,950	5.00	1.00
Cellular	870	2.90	0.58
SMR (Specialized Mobile Radio)	855	2.85	0.57
700 MHz	700	2.40	0.48
[most restrictive frequency range]	30–300	1.00	0.20

General Facility Requirements

Base stations 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 transceivers are often located at ground level and are connected to the antennas by coaxial cables. A small antenna for reception of GPS signals is also required, mounted with a clear view of the sky.

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"). The conservative nature of this method for evaluating exposure conditions has been verified by numerous field tests.

Site and Facility Description

Based upon information provided by Verizon, including construction drawings by Meridian Management, LLC, dated March 15, 2017, it is proposed to install one JMA Wireless Model CYL-QAP-2-H omnidirectional antenna on top of a 28-foot utility pole to replace the existing 33-foot pole sited in the public right-of-way on the north side of Soquel Drive, opposite the intersection with Chen Way. The antenna would employ no downtilt and would be mounted at an effective height of about 29½ feet above ground. The maximum effective radiated power in any direction would be 2,100 watts, representing simultaneous operation at 1,120 watts for AWS and 980 watts for PCS 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 0.019 mW/cm^2, which is 1.9% of the applicable public exposure limit. The maximum calculated level at the second-floor elevation of any nearby building* is 3.4% 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.

* Including the residences located at least 100 feet away, based on photographs from Google Maps.

Recommended Mitigation Measures

Due to its mounting location and height, the antenna would not be accessible to unauthorized persons, and so no mitigation 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, to include review of personal monitor use and lockout/tagout procedures, be provided to all authorized personnel who have access to the antenna, including employees and contractors of Verizon and of the utility companies. No access within 7 feet directly in front of the antenna itself should be allowed while it is 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 antenna and/or on the pole below the antenna, readily visible from any angle of approach to persons who might need to work within that distance.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that operation of the base station proposed by Verizon Wireless at 5505 Soquel Drive in Soquel, 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 base stations. Training authorized personnel and posting explanatory signs are recommended to establish compliance with occupational exposure limits.

† 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 guidance from the landlord, local zoning or health authority, or appropriate professionals may be required. Signage may also need to comply with the requirements of California Public Utilities Commission General Order No. 95.

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, 2017. 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.

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

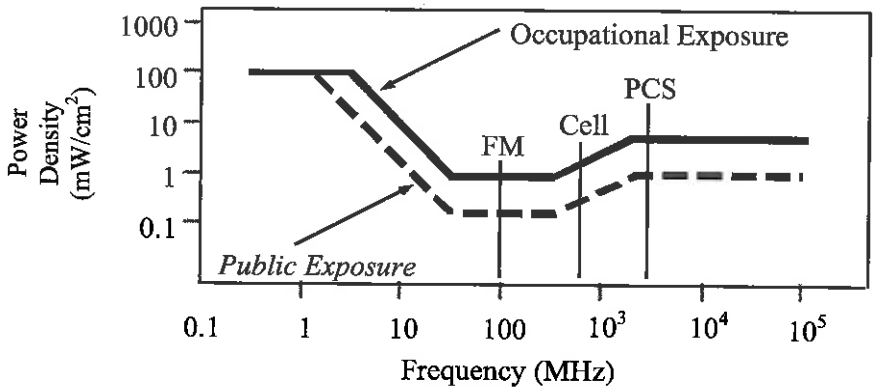
May 12, 2017

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)					
Applicable Range (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	$3.54\sqrt{f}$	*$1.59\sqrt{f}$*	$\sqrt{f}/106$	*$\sqrt{f}/238$*	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 built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required 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 the antenna, in degrees, and
P_{net} = net power input to the antenna, in watts,
D = distance from antenna, in meters,
h = aperture height of the 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:

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

where ERP = total ERP (all polarizations), in kilowatts,
RFF = relative field factor at the direction to the actual point of calculation, and
D = distance from the center of radiation to the 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 has been built into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radiation sources. The program also allows for the description of uneven terrain in the vicinity, to obtain more accurate projections.

Hi Aaron,

Thank you for forwarding us the comments from the County of Santa Cruz regarding our reports for proposed Verizon sites Soquel Dr SC1 (near 5505 Soquel Drive) and Soquel Dr SC2 (near 3010 Paseo Del Sol). There are reported no other wireless base stations close (within about 100 feet) to the proposed sites, and so there is no cumulative/overall RF exposure assessment in our reports. Note that the two proposed sites themselves are about 1,500 feet apart, and the impact of one on the other would be negligible.

The maximum calculated RF exposure level at the second-floor elevation of a hypothetical building at APN 37-101-58, due to the operation of the proposed facility at Soquel Dr SC1, would be 5.0% of the FCC public limit, about 20 times below that limit. The maximum calculated RF exposure level at the second-floor elevation of a hypothetical building at APN 37-071-41, due to the operation of the proposed facility at Soquel Dr SC2, would be 4.4% of the FCC public limit, about 22 times below that limit. For both calculations, we assumed that the hypothetical building would be at the property line closest to the proposed facility.

Please let me know if you have any other questions.

Thanks,
Raj

Rajat Mathur, P.E.
Hammett & Edison, Inc.
rmathur@h-e.com
707/996-5200

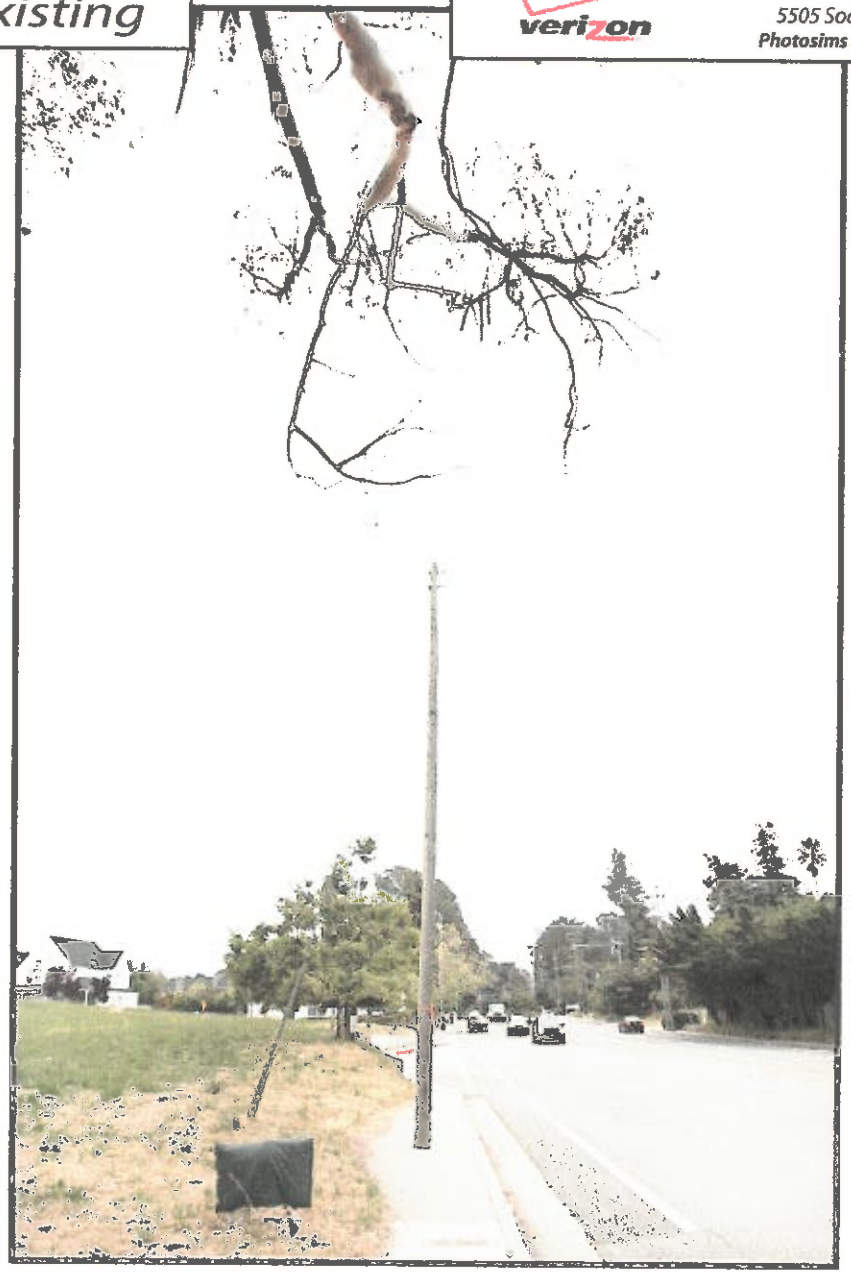
EXHIBIT F.

view from Soquel Drive looking east at site

verizon

425591 Soquel Drive SC1
5505 Soquel Drive, Soquel, CA
Photosims Produced on 6-14-2017

Existing



Proposed

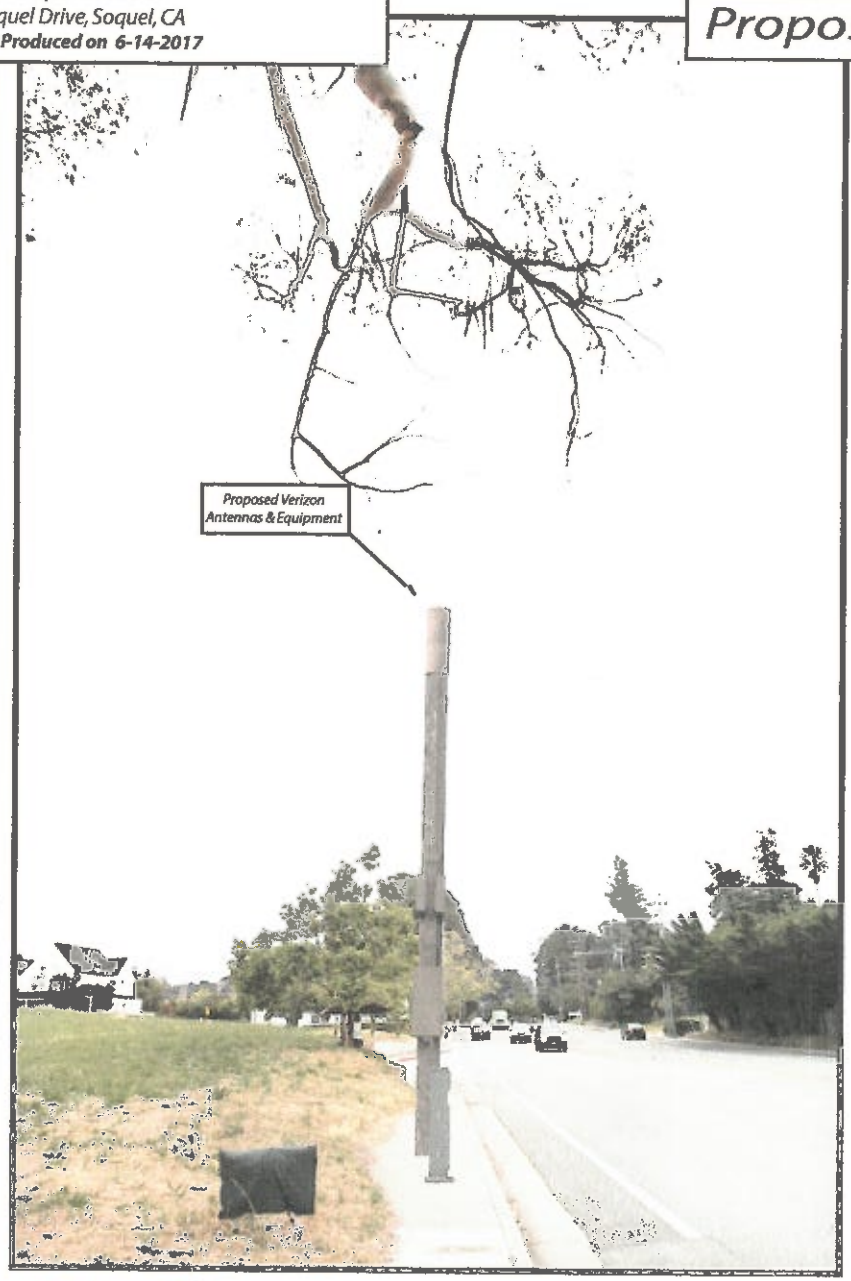


EXHIBIT G