COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT

DATE: October 18, 2018

TO: Zoning Hearing Officer

FROM: Planning Staff

SUBJECT: Consideration of a Use Permit, pursuant to Section 6500 of the San Mateo County Zoning Regulations, to install a wireless telecommunication facility on an existing utility pole located in the public right-of-way in front of 2056 Santa Cruz Avenue in the West Menlo Park Community of San Mateo County.

County File Number: PLN 2018-00167 (AT&T/County of San Mateo)

PROPOSAL

The applicant proposes to install wireless telecommunication equipment on an existing joint utility pole located in the public right-of-way in front of 2056 Santa Cruz Avenue in the West Menlo Park Community of Unincorporated San Mateo County. The proposed project scope consists of the installation of one 3-foot canister antenna and mounting bracket attached to the top of the existing 38.5-foot tall wooden utility pole, along with ancillary pole-mounted equipment boxes. The new cylindrical antenna will be mounted at an effective height of 45.6 feet above ground level, maintaining an 11-foot separation from all power lines further down the utility pole.

RECOMMENDATION

That the Zoning Hearing Officer approve the Use Permit, PLN 2018-00167, by making the required findings and adopting the conditions of approval listed in Attachment A.

BACKGROUND

Report Prepared By: Bryan Albini, Project Planner, 650/363-1807

Applicant: Caitlin McLester, Modus for AT&T Wireless

Land Owner: Public Right-of-Way (San Mateo County Department of Public Works)

Pole Owner: Joint Pole Association (JPA)

Location: Utility Pole in the Public Right-of-Way fronting 2056 Santa Cruz Avenue.

APN: Right-of-Way adjacent to 074-091-120

Existing Zoning: R-1/S-72 (Single Family Residential/Minimum 5,000 sq. ft.)

General Plan Designation: Right-of-Way adjacent to 'Medium Density Residential Urban

Sphere-of-Influence: City of Menlo Park

Existing Land Use: Utility Pole in the Public Right-of-Way

Flood Zone: Zone X (area of minimal flood risk); FEMA Panel No. 06081C0312E; effective October 16, 2012

Environmental Evaluation: The project is categorically exempt under the provisions of Class 1, Section 15301, of the California Environmental Quality Act (CEQA) Guidelines for the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures.

Setting: The existing utility pole is located within the public right-of-way, on the west side of Santa Cruz Avenue in the Unincorporated West Menlo Park area. The surrounding area is an urbanized single-family residential neighborhood.

Chronology:

Date		Action
May 7, 2018	-	Project submittal by applicant.
August 30, 2018	-	Project deemed complete by Planning and Building Department.
October 18, 2018	-	Zoning Hearing Officer meeting.

DISCUSSION

A. KEY ISSUES

1. Compliance with the General Plan

Staff has determined that both projects comply with all applicable County General Plan policies, specifically:

Visual Quality Policies

Policy 4.21 (*Utility Structures*) requires minimizing adverse visual impacts generated by utility structures. The project site is located within the public right-of-way along a secondary arterial road in a single-family residential

area. The proposed antenna mount and support equipment located on the existing utility pole will extend the original height of the existing pole of 38.6 feet above ground level to 49.5 feet above ground level. The proposed new equipment and antenna will be fabricated of a non-reflective exterior finish that will mimic the exterior colors of the existing wooden utility pole (see Attachment D).

2. Compliance with Zoning Regulations

The proposed project area is located within the public right-of-way in the R-1/S-72 Zoning District. The zoning district standards, with the exception of height limits, are not applicable to the public right-of-way.

The maximum height allowed in the R-1/S-72 Zoning District is 36 feet. The proposed project will consist of one small cell antenna mounted at the top of the existing pole and ancillary equipment further below. The proposed antenna canister and mounting brackets will exceed the maximum height allowed in the R-1/S-72 Zoning District. General Order No. 95 (GO95), mandated by the California Public Utilities Commission requires all cellular antennas to be at least 6 feet from adjacent power supply lines, and the isolator units that affix the cables directly to the utility pole. The existing 38.6-foot pole exceeds the maximum height allowed in the zoning district, the mounting bracket would extend the antenna to a height of 49.5 feet in order to maintain the utility lines and isolator in the same location (34.16 feet above ground level) and comply with GO95 requirements. The existing utility pole will ultimately reach 49.5 feet above ground level with the micro cell canister installed. In this instance, State regulations supersede local regulations.

3. Compliance with the Wireless Telecommunication Facilities Ordinance

Staff has determined that the project complies with the applicable standards of the Wireless Telecommunication Facilities (WTF) Ordinance, as discussed below:

a. Development and Design Standards

Section 6512.2.A states that new wireless telecommunication facilities shall be prohibited in Sensitive Habitats, as defined by Policy 1.8 of the General Plan (Definition of Sensitive Habitats) for facilities proposed outside of the Coastal Zone, and by Policy 7.1 of the Local Coastal Program (Definition of Sensitive Habitats) for facilities proposed in the Coastal Zone, except when all of the following written findings are made by the reviewing authority: (1) There is no other feasible location(s) in the area; (2) There is no alternative facility configuration that would avoid impacts to environmentally sensitive habitat areas; (3) Prohibiting such facility would be inconsistent with federal law;

(4) Adverse impacts to the sensitive habitat are minimized to the maximum extent feasible; and (5) Unavoidable impacts are mitigated so that there is no loss in habitat quantity or biological productivity.

The proposed small cell wireless facility is not located in a Sensitive Habitat area, as defined by Policy 1.8 of the General Plan. The project is not located in the Coastal Zone.

Section 6512.2.B: New wireless telecommunication facilities shall not be located in areas zoned Residential (R), unless the applicant demonstrates, by a preponderance of the evidence, that a review has been conducted of other options, and no other sites or combination of sites allows feasible service or adequate capacity and coverage. This review shall include, but is not limited to, identification of alternative site(s) within 2.5 miles of the proposed facility.

The proposed facility will be located on an existing joint utility pole within the public right-of-way of a residential area. The applicant chose the proposed location to adequately provide AT&T Wireless voice and data coverage to the surrounding area where currently there exists a gap in service coverage. The area surrounding the proposed site consists of single-family residential parcels adjacent to residential districts in the City of Menlo Park. Small cell facilities such as the facility currently proposed are not designed to increase the coverage area but to assist with off-loading traffic demands from the macro site network. This form of network flexibility increases data speeds and decreases dropped calls. The site specific constraints, requires that each node location be placed strategically where service is needed for a specific community.

In the AT&T Site Analysis (see Attachment E), the applicant has identified and researched alternative sites within the service area. The radius of the coverage map provided by the applicant is below the 2.5 mile radius because the function of small cell technology requires the sites to be in closer proximity to each other than typical macro cell systems. Because of this, a larger radius would not identify feasible alternative locations. Five alternative sites were identified and considered for viability. These sites were considered ineligible due to coverage issues or an inability to satisfy GO95 standards for utility line and equipment separation or for visibility issues (lack of screening vegetation).

Of the locations evaluated for the placement of the proposed facility, the project site selected was the least intrusive option that would fill the gap in coverage to provide adequate wireless and data service.

Section 6512.2.C: New wireless telecommunication facilities shall not be located in areas where co-location on existing facilities would provide equivalent coverage with less environmental impact.

The cell canister technology proposed by the applicant is the least environmentally impactful wireless technology currently available and in compliance with all Federal Communications Commission (FCC) standards (see Attachment F). The antennas will not be mounted on a building with the lowest point of the antenna at more than 30 feet from ground level, well below the exposure limits recommended by radio frequency (RF) microwave safety standards used by the FCC.

Section 6512.2.D: Except where aesthetically inappropriate, new wireless telecommunication facilities must be constructed so as to accommodate co-location, and must be made available for co-location unless technologically infeasible.

This proposed facility will be a pole-top mounted facility and, thus cannot be located per PG&E GO95 requirements. The applicant does not expect future co-locations given the present equipment configuration.

Sections 6512.2.E and F: Seek to minimize and mitigate visual impacts from public views by siting new facilities outside of the public view, using natural vegetation for screening, painting equipment to blend with existing landscaping, and designing the facility to blend in with the surrounding environment.

The proposed facilities include one cell antenna canister mounted at a height of 49.5 feet above grade, on an existing joint utility pole located in the public right-of-way. The antenna shall be painted a non-reflective color to match the utility pole. The equipment boxes shall also be painted a non-reflective color to match the utility pole as recommended in Condition of Approval No. 4 (see Attachment A) to reduce visual impacts and to blend in with the existing equipment. No trees or vegetation are proposed for removal.

Section 6512.2.G: The exteriors of wireless telecommunication facilities shall be constructed of non-reflective materials.

The proposed facility will be constructed of non-reflective materials.

Section 6512.2.H: The wireless telecommunication facility shall comply with all the requirements of the underlying zoning district(s), including, but not limited to, setbacks, Design Review in the DR district(s), Architectural Review in designated Scenic

Corridors, and Coastal Development Permit regulations in the CZ or CD zones.

As discussed in Section 2, Compliance with the Zoning Regulations, the existing joint utility pole, where the proposed facility will be located, is situated in the public right-of-way and is not subject to the R-1/S-72 Zoning District development standards for setbacks; compliance with height standards is further discussed below. Design Review, Architectural Review, and Coastal Development regulations are not applicable in this area.

Section 6512.2.I.2: States that new equipment located on existing facilities in the public right-of-way in any Residential (R) District shall be allowed to exceed the maximum height for structures allowed in that district by 10% of the height of the existing facility, or by 5 feet, whichever is less.

The cellular equipment proposed for this wireless telecommunication facility will not be in compliance with this section. The height of the proposed facility has been designed to comply with the State's safety requirements for minimum clearance between co-located equipment and active utility lines (CPUC GO95).

Section 6512.2.J: In any Residential (R) district, accessory buildings in support of the operation of the wireless telecommunication facility may be constructed, provided that they comply with the provisions of Sections 6410 through 6411 regarding accessory buildings, except that the building coverage and floor area maximums shall apply to buildings in aggregate, rather than individually. If an accessory building, not used in support of a wireless telecommunication facility, already exists on a parcel, no accessory building in support of the operation of the wireless telecommunication facility may be constructed absent removal of the existing accessory building. If an accessory building(s) in support of the operation of the wireless telecommunication facility is constructed on a parcel, no other accessory buildings, not used in support of a wireless telecommunication facility, shall be constructed until the accessory building(s) in support of the operation of that wireless telecommunication facility is (are) removed.

No accessory buildings will be constructed.

Section 6512.2.K: In any Residential (R) district, ground-mounted towers, spires, and similar structures may be built and used provided that they shall not cover, in combination with any accessory building(s), shelter(s), or cabinet(s), or other above-ground equipment used in support of the operation of the

wireless telecommunication facility, more than 15% in area of the lot nor an area greater than 1,600 sq. ft. Buildings, shelters, and cabinets shall be grouped. Towers, spires, and poles shall also be grouped, to the extent feasible for the technology.

No new structures will be built or used in support of the operation of the wireless telecommunication facilities.

Section 6512.2.L: Diesel generators shall not be installed as an emergency power source unless the use of electricity, natural gas, solar, wind, or other renewable energy sources are not feasible. If a diesel generator is proposed, the applicant shall provide written documentation as to why the installation of options, such as electricity, natural gas, solar, wind, or other renewable energy sources, are not feasible.

No generators will be installed at the project sites.

b. Performance Standards

The proposed projects meet the required standards of Section 6512.3 (Performance Standards for New Wireless Telecommunication Facilities that are Not Co-Location Facilities) for lighting, licensing, provision of a permanent power source, timely removal of the facility, and visual resource protection. There is no lighting proposed, proper licenses will be obtained from both the Federal Communications Commission (FCC) and the California Public Utilities Commission (CPUC), power for the facilities will be provided by PG&E, visual impacts will be minimal (see Attachment D), and conditions of approval will require maintenance and/or removal of the facilities when they are no longer in operation. Furthermore, road access to the proposed project sites is existing and no noise in excess of San Mateo County's Noise Ordinance will be produced.

4. Compliance with Use Permit Findings

For the use permit under review by the Zoning Hearing Officer, staff has made the following findings:

a. That the establishment, maintenance, and/or conducting of the use will not, under the circumstances of this particular case, be detrimental to the public welfare or injurious to property or improvement in said neighborhood.

Cellular communication facilities, such as the one proposed here, require the submittal and review of radio frequency (RF) report to ensure that the RF emissions from the proposed antenna does not exceed the Federal Communications Commission's public exposure

limits. The applicant submitted radio frequency reports prepared by Hammett & Edison, Inc., Consulting Engineers, dated March 20, 2018, confirming that the proposed facility will comply with prevailing standards for limiting public exposure to radio frequency energy and, thus, will not cause significant impact to the environment (See Attachment F). The report, based on worst-case predictive modeling, found that for a person anywhere at ground level, the maximum RF exposure level due to the proposed AT&T operation is calculated to be 0.0051 mW/cm², which is 0.61% of the applicable public exposure limit at this site. The worst-case emitted power density may exceed the FCC's general public limit within approximately 10 feet of AT&T's proposed antennas at the antenna face level (49.5 feet above ground level). At the nearest walking/working surfaces to the AT&T antennas, the maximum power density generated by the AT&T antennas is approximately 0.61 percent of the FCC's general public limit. Due to the location of the mounted antenna canister above the utility pole, it will not be accessible to the general public and therefore no mitigation measures are necessary to comply with FCC public exposure guidelines. To comply with occupational exposure limitations, staff has included Condition of Approval No. 15 (see Attachment A) for the posting of explanatory warning signs at the antennas and/or on the pole below the antennas, readily visible from any angle of approach to persons who may need to work in the vicinity (see Attachment A).

Planning Case No.	Approximate Location	Ground Floor Radio Frequency Exposure	Occupational Limit Radio Frequency Exposure
PLN 2018-00167	2056 Santa Cruz Avenue	0.61%	0.95%

With the discussion above, staff has determined that the proposed project will not have a negative environmental, health, or visual impact on persons or property within the project vicinity.

b. That this telecommunication facility is necessary for the public health safety, convenience, or welfare of the community.

Staff has determined that installation of a cellular facility at this location will allow for increased clarity, range, and capacity of the existing cellular network and will enhance services for the public. The proposed facility is the least intrusive option available to expand AT&T's network capacity and service coverage in this area of service

B. ENVIRONMENTAL REVIEW

These projects are categorically exempt to Section 15301, Class 1, of the California Environmental Quality Act (CEQA) Guidelines for the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or

private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination.

C. REVIEWING AGENCIES

San Mateo County Building Inspection Section
San Mateo County Department of Public Works

ATTACHMENTS

A. Recommended Findings and Conditions of Approval
B. Vicinity Map
C. Project Plans
D. Photo Simulations
E. Site Selection Consideration Map
F. Radio Frequency – Electromagnetic Energy Jurisdictional Report prepared by Hammett & Edison, Inc., Consulting Engineers, dated March 20, 2018.

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Attachment A

County of San Mateo
Planning and Building Department

RECOMMENDED FINDINGS AND CONDITIONS OF APPROVAL

Permit or Project File Number: PLN 2018-00167 Hearing Date: October 18, 2018

Prepared By: Bryan Albini, Project Planner For Adoption By: Zoning Hearing Officer

RECOMMENDED FINDINGS

Regarding the Environmental Review, Find:

1. That this project is categorically exempt from environmental review, per Class 2, Section 15302, of the California Environmental Quality Act (CEQA) Guidelines for the replacement or reconstruction of existing utility systems and/or facilities involving negligible or no expansion of capacity.

Regarding the Use Permits, Find:

2. That the establishment, maintenance, and/or conducting of the uses will not, under the circumstances of these particular cases, be detrimental to the public welfare or injurious to the property or improvements in said neighborhood because the projects will meet current Federal Communications Commission (FCC) standards as shown in the radio frequency radiation reports and have been conditioned to maintain valid FCC and California Public Utilities Commission (CPUC) licenses.

3. That the telecommunication facility is necessary for the public health, safety, convenience, or welfare of the community in that installing cellular facilities at this location will provide increased and improved cellular coverage in the area for residents, commuters, and emergency personnel.

RECOMMENDED CONDITIONS OF APPROVAL

Current Planning Section

1. This approval applies only to the proposal documents, and plans described in this report and submitted to and approved by the Zoning Hearing Officer on May 07, 2018. Minor revision or modifications may be approved by the Community Development Director if they are consistent with the intent of and in substantial with this approval.

2. This use permit shall be for the proposed project only. Any change or change in intensity of use shall require an amendment to the applicable use permit. Amendments to these use permits require an application for amendment, payment of applicable fees, and consideration at a public hearing.

3. This permit shall be valid for ten (10) years until October 18, 2028. If the applicant seeks to renew this permit, renewal shall be applied for six (6) months prior to expiration with the Planning and Building Department and shall be accompanied by the renewal application and fee applicable at that time. Renewal of these permits shall be considered at a public hearing.

4. The applicant shall paint the antenna, conduit, and equipment boxes a non-reflective brown to match the utility pole. Color verification will be confirmed by the Current Planning Section prior to a final inspection for the building permit.

5. During project construction, the applicant shall, pursuant to Chapter 4.100 of the San Mateo County Ordinance Code, minimize the transport and discharge of stormwater runoff from the construction site into storm drain systems by:

    a. Stabilizing all denuded areas and maintaining erosion control measures continuously between October 1 and April 30. Stabilizing shall include both proactive measures, such as the placement of hay bales or coir netting, and passive measures, such as revegetating disturbed areas with plants propagated from seed collected in the immediate area.

    b. Storing, handling, and disposing of construction materials and wastes properly, so as to prevent their contact with stormwater.

    c. Controlling and preventing the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, and non-stormwater discharges, to storm drains and watercourses.

    d. Avoiding cleaning, fueling, or maintaining vehicles on-site, except in a designated area where wash water is contained and treated.

    e. Delineating with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.

    f. Protecting adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.

    g. Performing clearing and earth-moving activities only during dry weather.

    h. Limiting and timing application of pesticides and fertilizers to prevent polluted runoff.

i. Limiting construction access routes and stabilizing designated access points.

j. Avoiding tracking dirt or other materials off-site; cleaning off-site paved areas and sidewalks using dry sweeping methods.

k. The contractor shall train and provide instruction to all employees and subcontractors regarding the construction Best Management Practices.

6. This permit does not allow for the removal of any trees. Any tree removal will require a separate permitting process.

7. The applicant shall not enter into a contract with the landowner or lessee which reserves for one company exclusive use of the structures on this site for telecommunication facilities.

8. The wireless telecommunication facility shall not be lighted or marked unless required by the Federal Communications Commission (FCC) or the Federal Aviation Administration (FAA).

9. The applicant shall file, receive, and maintain all necessary licenses and registrations from the Federal Communications Commission (FCC), the California Public Utilities Commission (CPUC), and any other applicable regulatory bodies prior to initiating the operation of these facilities. The applicant shall supply the Planning and Building Department with evidence of each of these licenses and registrations. If any required license is ever revoked, the applicant shall inform the Planning and Building Department of the revocation within ten (10) days of receiving notice of such revocation.

10. Once a use permit is obtained, the applicant shall obtain an encroachment permit and build in accordance with the approved plans.

11. The project's final inspection approval shall be dependent upon the applicant obtaining a permanent and operable power connection from the applicable energy provider.

12. The wireless telecommunications facility and all equipment associated with it shall be removed in its entirety by the applicant within 90 days if the FCC and/or CPUC license and registration are revoked or the facility is abandoned or no longer needed, and the sites shall be restored to blend with the surrounding area. The owner and/or operator of the wireless telecommunication facilities shall notify the Planning Department upon abandonment of the facility. Restoration shall be completed within two (2) months of the removal of the facility.

13. The wireless telecommunications facility shall be maintained by the permittee(s) and subsequent owners in a manner that implements visual resource protection requirements of Sections 6512.2.E and F above (e.g., landscape maintenance

and painting), as well as all other applicable zoning standards and permit conditions.

14. Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property shall be limited to the hours from 7:00 a.m. to 6:00 p.m., weekdays and 9:00 a.m. to 5:00 p.m., Saturdays. Said activities are prohibited on Sundays, Thanksgiving, and Christmas (San Mateo Ordinance Code Section 4.88.360).

15. If technically practical and without creating any interruption in commercial service caused by electronic magnetic interference (EMI), floor space, tower space, and/or rack space for equipment in a wireless telecommunication facility shall be made available to the County for public safety communication use.

16. To reduce the impact of construction activities within the public right-of-way and/or on neighboring properties, the applicant shall ensure that no construction-related vehicles impede through traffic along Santa Cruz Avenue or other public right-of-ways.

17. To reduce the impact of potential traffic hazards from service visits to the facility, the applicant shall ensure that no vehicles related to the service and/or maintenance of the cellular facility impede through traffic along Santa Cruz Avenue or other public right-of-ways.

18. Explanatory signs are required to be posted at the antennas and/or on the poles below the antennas, readily visible from any angle of approach to persons who might need to work within the project area.

19. The facility shall be maintained in good working condition and to the visual standards established at the time of approval over the life of this permit. The facility and surrounding area shall remain free from trash, debris, litter, graffiti, and other forms of vandalism. Any damage shall be repaired as soon as is practicable, and in no instance more than ten calendar days from the time of notification by the County or after discovery by the permit holder.

<u>Department of Public Works</u>

20. No proposed construction work within the public right-of-way shall begin until County requirements for the issuance of an encroachment permit, including review of the plans, have been met and an encroachment permit issued. The applicant shall contact a Department of Public Works inspector 48 hours prior to commencing work in the public right-of-way.

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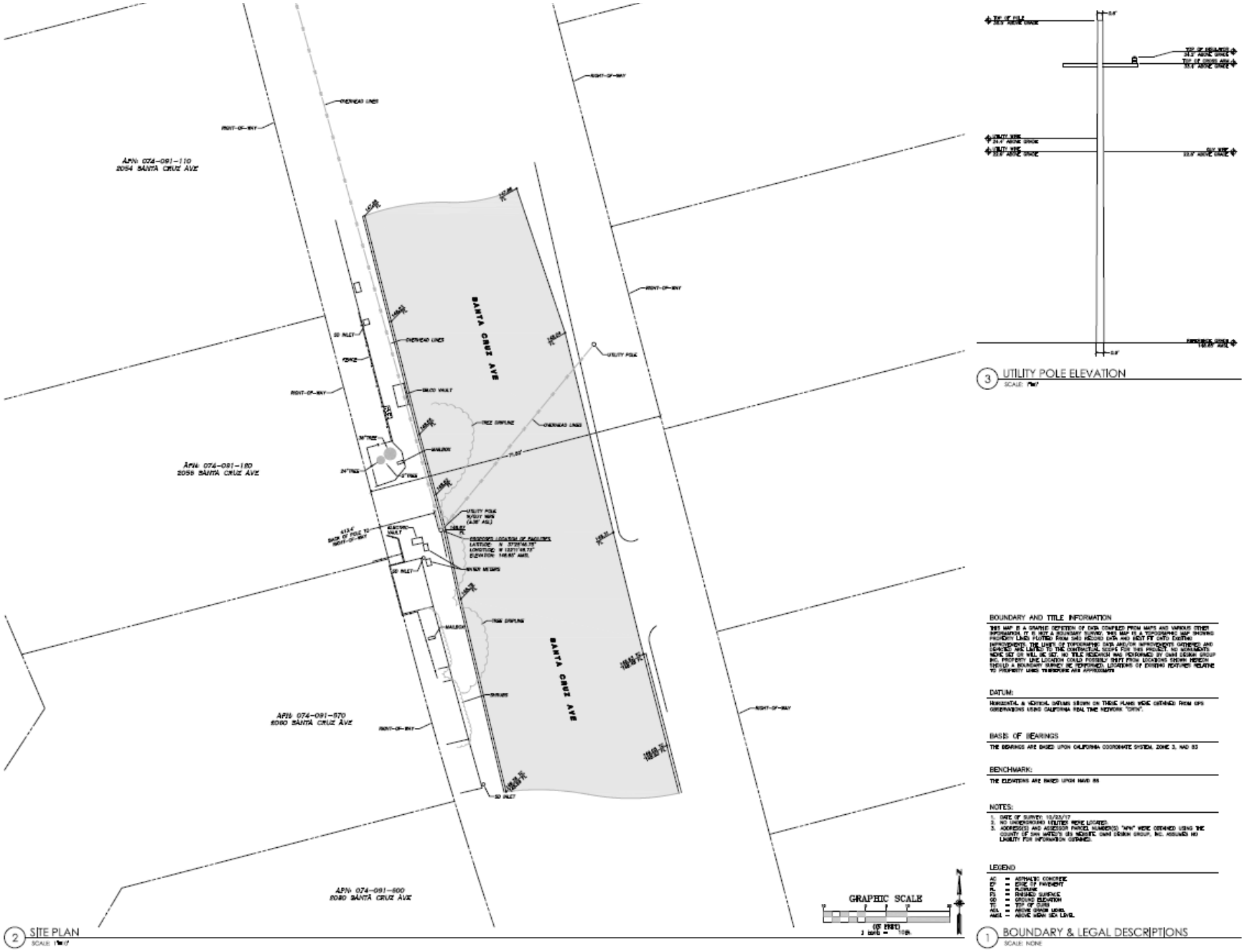
San Mateo County Zoning Hearing Officer Meeting

Owner/Applicant: JOINT POLE ASSOCIATION/MODUS

Attachment: B

File Numbers: PLN2018-00167

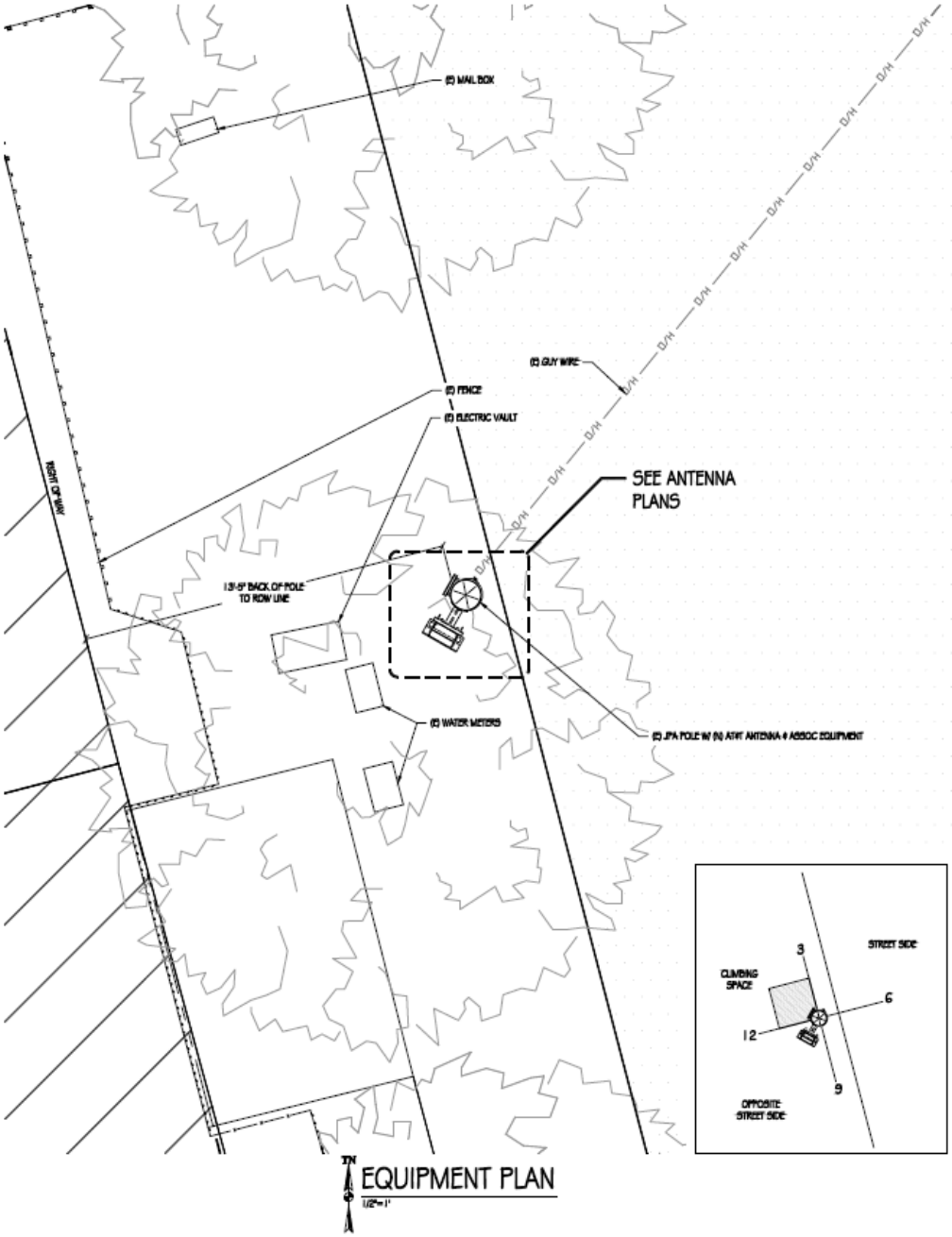


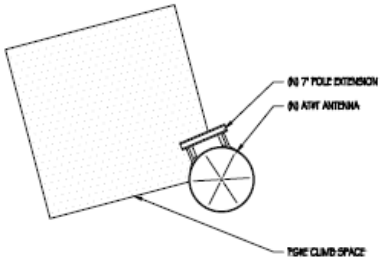
San Mateo County Zoning Hearing Officer Meeting

Owner/Applicant: JOINT POLE ASSOCIATION/MODUS

Attachment: C

File Numbers: PLN2018-00167





ANTENNA PLAN
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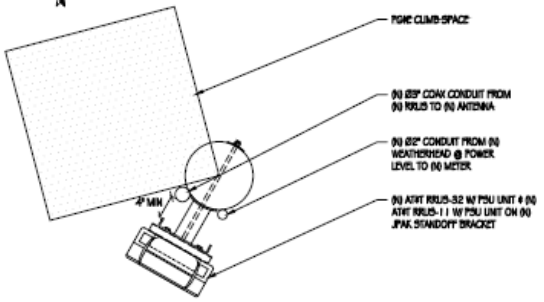

RRU PLAN
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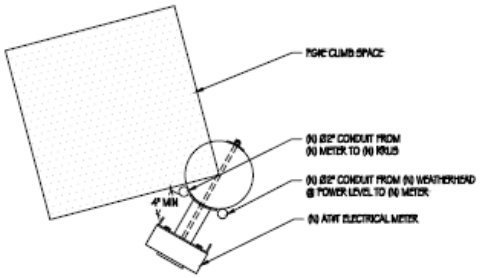
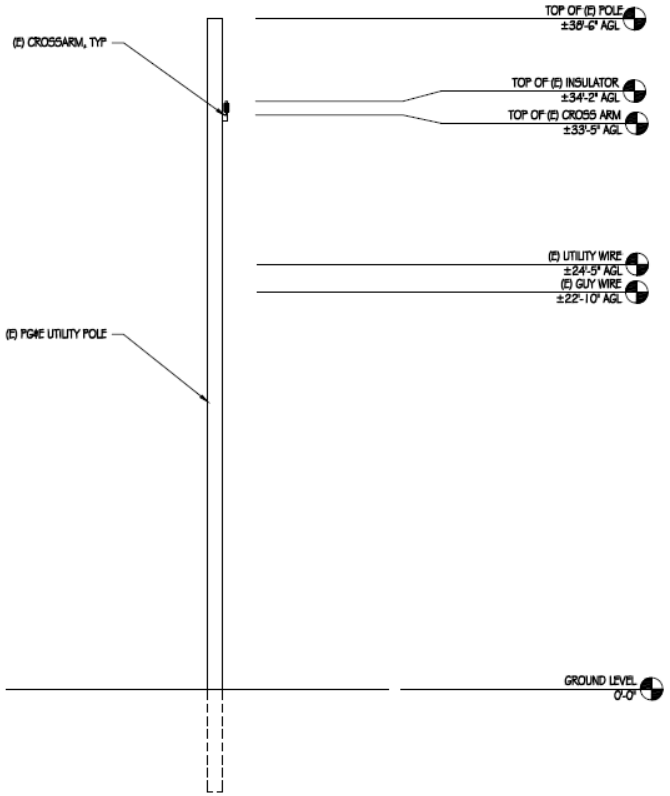


ELECTRICAL METER PLAN
1"=1'

San Mateo County Zoning Hearing Officer Meeting

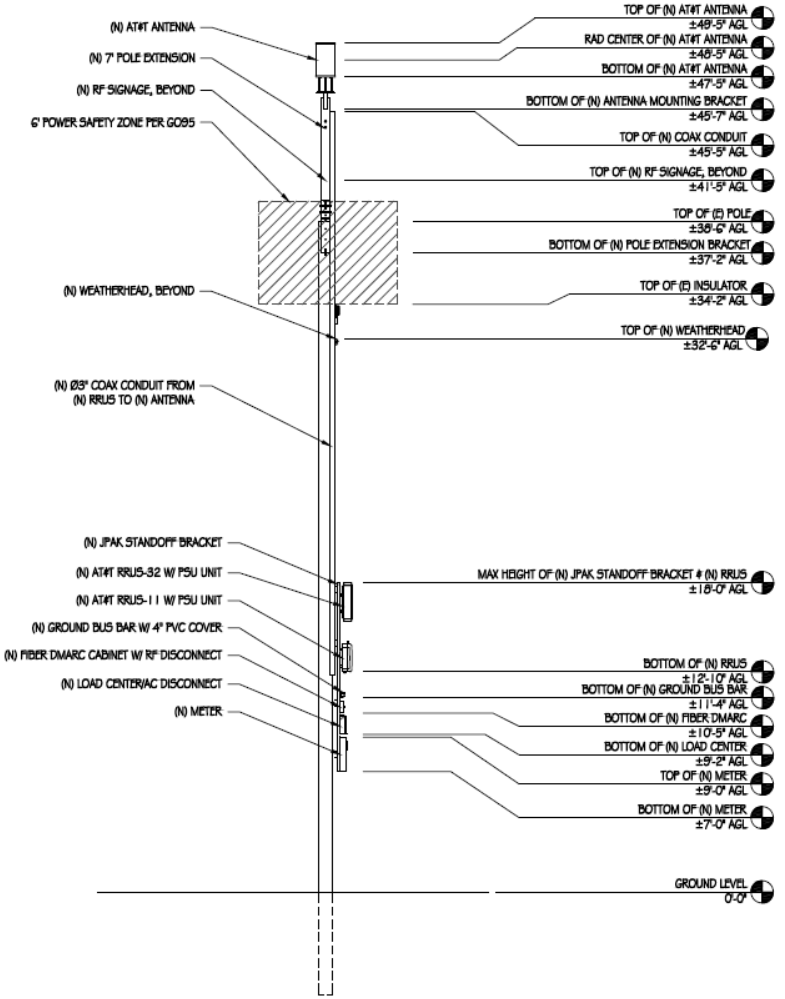
Owner/Applicant: JOINT POLE ASSOCIATION/MODUS Attachment: C

File Numbers: PLN2018-00167



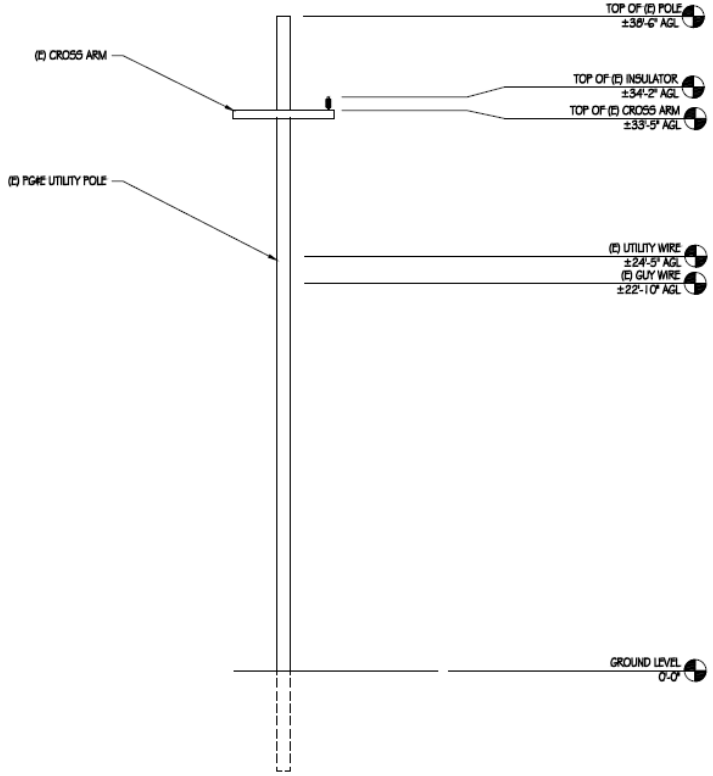
EXISTING NORTHWEST ELEVATION

1/4"=1'-0"



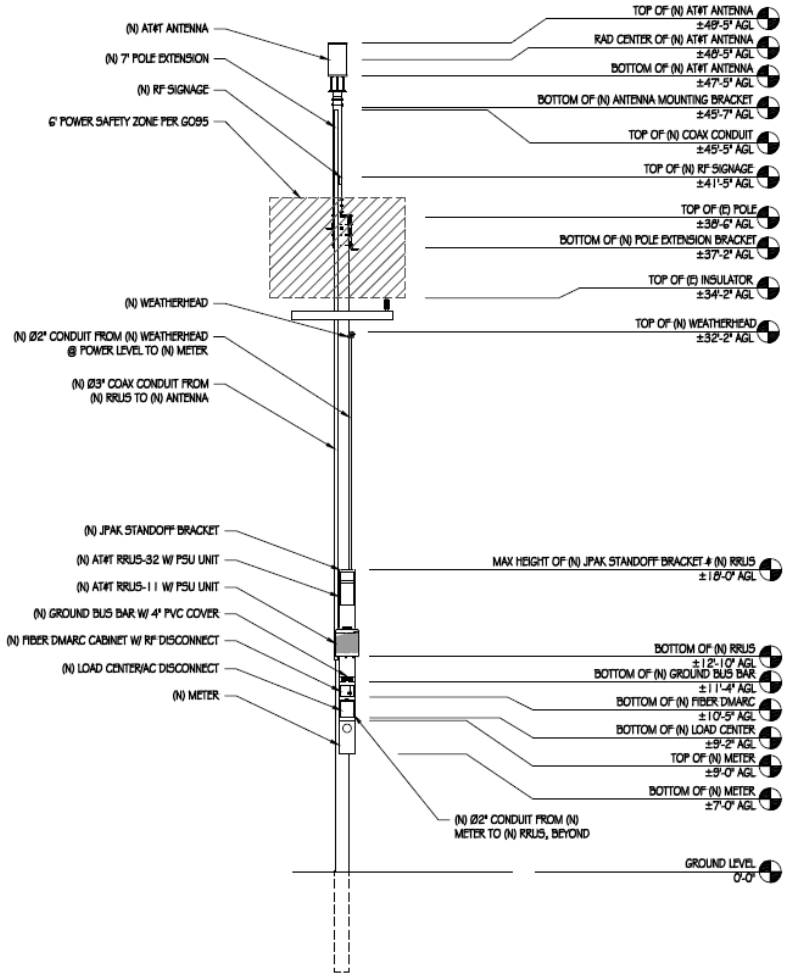
NEW NORTHWEST ELEVATION

1/4"=1'-0"



EXISTING SOUTHWEST ELEVATION

1/4"=1'-0"



NEW SOUTHWEST ELEVATION

1/4"=1'-0"

at&t

CRAN_RSFR_SAJO1_017
ROW adjacent to Santa Cruz Ave, Menlo Park, CA 94025

Photo simulation as seen looking south across Santa Cruz Avenue

San Mateo County Zoning Hearing Officer Meeting

Owner/Applicant: JOINT POLE ASSOCIATION/MODUS Attachment: D

File Numbers: PLN2018-00167

2056 Santa Cruz Ave- SAJO1_017

*All poles along Alameda de las Pulgas are steel light poles. There is no Lease Agreement in place between AT&T and the County of San Mateo and so these are not viable candidates

AT&T Mobility • Proposed DAS Node (Site No. CRAN_RSFR_SAJO1_017)
2056 Santa Cruz Avenue • Menlo Park, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of AT&T Mobility, a personal wireless telecommunications carrier, to evaluate the addition of Node No. CRAN_RSFR_SAJO1_017 to be added to the AT&T distributed antenna system ("DAS") in Menlo Park, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Executive Summary

AT&T proposes to install an omnidirectional cylindrical antenna on a utility pole sited in the public right-of-way at 2056 Santa Cruz Avenue in Menlo Park. 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)	5,000–80,000 MHz	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	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	2.35	0.47
[most restrictive frequency range]	30–300	1.00	0.20

Power line frequencies (60 Hz) are well below the applicable range of these standards, and there is considered to be no compounding effect from simultaneous exposure to power line and radio frequency fields.

General Facility Requirements

Wireless nodes typically consist of two distinct parts: the electronic transceivers (also called "radios" or "channels") that are connected to a central "hub" (which in turn are connected to the traditional wired telephone lines), and the passive antenna(s) that send the wireless signals created by the radios

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

Computer Modeling Method

The FCC provides direction for determining compliance in its Office of Engineering and Technology Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated August 1997. Figure 2 attached 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 AT&T, including drawings by Precision Design & Drafting, Inc., dated January 5, 2018, it is proposed to install one KMW Model FX-OM2L10H2, 2-foot tall, omnidirectional cylindrical antenna, on an extension above the top of the existing utility pole sited in the public right-of-way in front of the residence located at 2056 Santa Cruz Avenue in Menlo Park. The antenna would employ up to 2° downtilt and would be mounted at an effective height of about 47 feet above ground. The maximum effective radiated power in any direction would be 880 watts, representing simultaneous operation at 740 watts for PCS and 140 watts for 700 MHz service. There are reported no other wireless telecommunications base stations at this site or nearby.

Study Results

For a person anywhere at ground, the maximum RF exposure level due to the proposed AT&T operation is calculated to be 0.0051 mW/cm^2, which is 0.61% of the applicable public exposure limit. The maximum calculated cumulative level at the second-floor elevation of any nearby building is 0.95% of the public exposure limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels from the proposed operation.

Recommended Mitigation Measures

Due to its mounting location and height, the AT&T antenna would not be accessible to the general public, 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 be provided to all authorized personnel who have access to the antenna. No access within 5 feet at the same height as the antenna, such as might occur during certain maintenance activities on the pole, should be allowed while the node is in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. It is recommended that an explanatory sign* 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 node proposed by AT&T Mobility at 2056 Santa Cruz Avenue in Menlo Park, 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 nodes.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration No. E-18063, which expires on June 30, 2019. 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.

Rajat Mathur, P.E.
707/996-5200

March 20, 2018

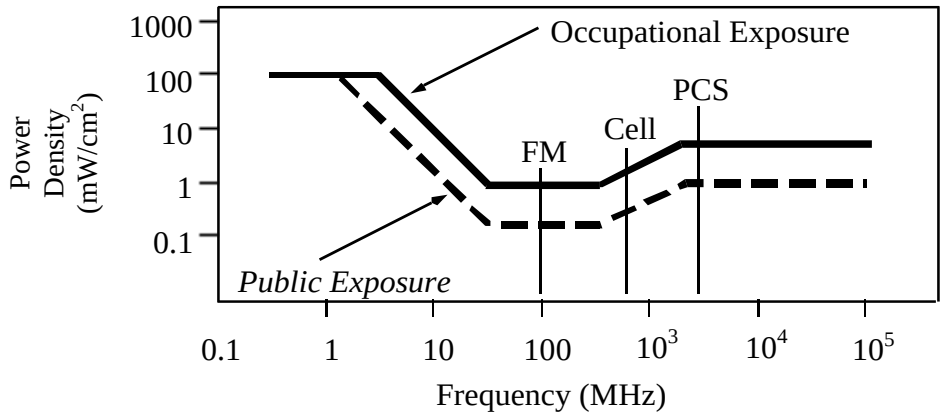
* Signs should comply with OET-65 color, symbol, and content recommendations. Contact information should be provided (*e.g.*, a telephone number) to arrange for access to restricted areas. The selection of language(s) is not an engineering matter, and guidance from the landlord, local zoning or health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

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.