



**CITY OF SUNNYVALE
REPORT
Planning Commission**

November 23, 2009

SUBJECT: **2009-0745:** Application for a project located at **1259 Birchwood Drive** in an M-S (Industrial & Service) Zoning District

Motion Use Permit to allow a fifth wireless telecommunications carrier to add three panel antennas and three microwave dishes on an existing monopole and associated ground equipment

REPORT IN BRIEF

Existing Site Conditions Industrial Building

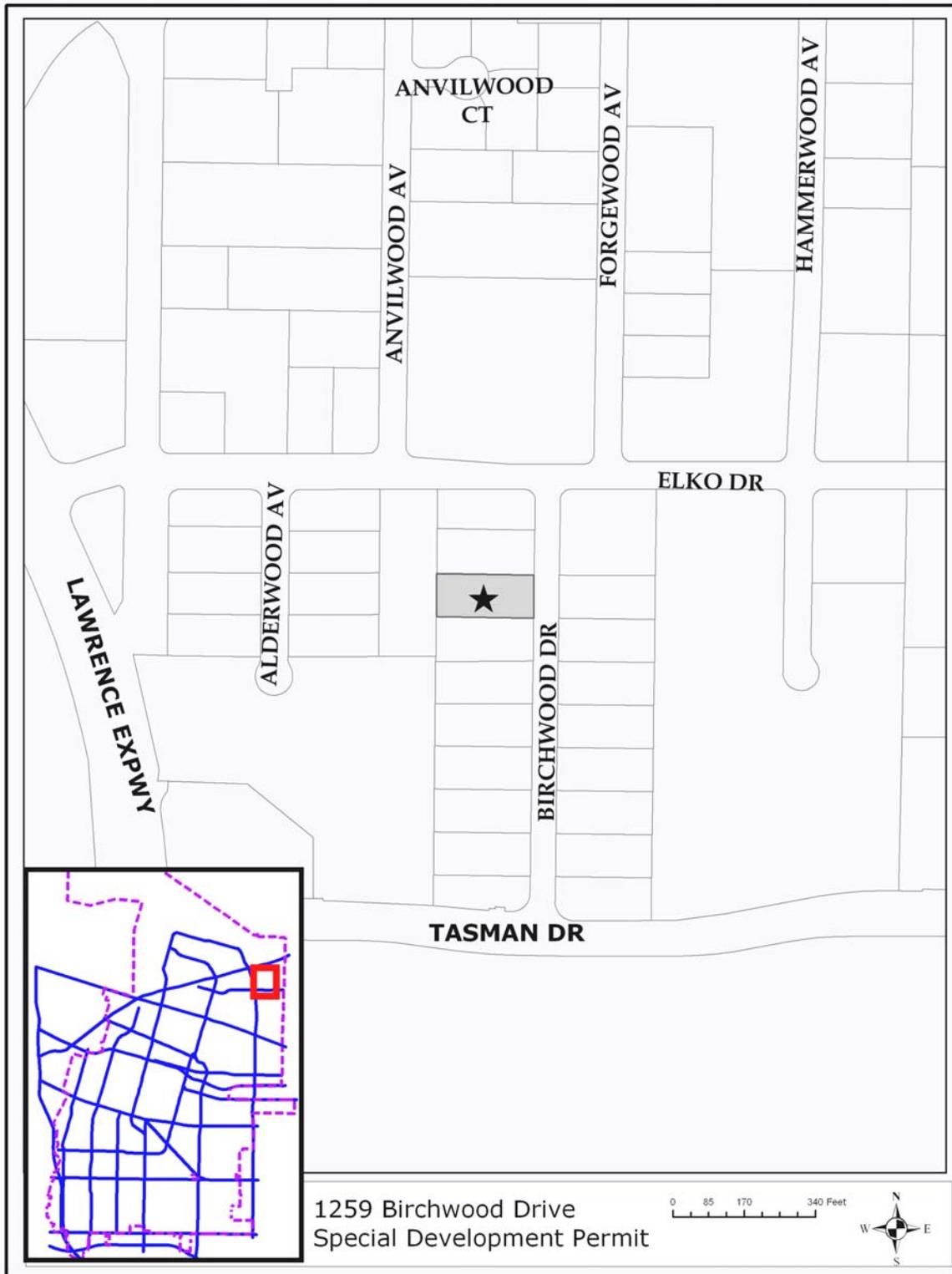
Surrounding Land Uses

| | |
|-------|------------|
| North | Industrial |
| South | Industrial |
| East | Industrial |
| West | Industrial |

Issues Visual impacts and compatibility with telecommunication design requirements

Environmental Status A Class 1 Categorical Exemption relieves this project from California Environmental Quality Act provisions and City Guidelines.

Staff Recommendation Approve with condition



PROJECT DATA TABLE

| | EXISTING | PROPOSED | REQUIRED/ PERMITTED |
|--|------------------------------------|-----------------|------------------------------------|
| General Plan | Industrial | Same | Industrial |
| Zoning District | M-S (Industrial and Service) | Same | M-S (Industrial and Service) |
| Lot Size (s.f.) | 23,896 | Same | 22,500 min. |
| Height of Monopole (ft.) | 90' | Same | 100' max. |
| Height of Industrial Building (ft.) | 33' | Same | 75' max. |
| Setbacks to Equipment Enclosure | | | |
| Front | 143' | Same | 15' min. |
| Left Side | 82' | Same | No min. (20' total) |
| Right Side | 0 | Same | Per Original UP |
| Rear | 52' | Same | No min. |

ANALYSIS**Description of Proposed Project**

The proposed project is a collocation of an additional telecommunications facility on an existing monopole located in the back of an existing industrial building. Three panel antennas and three microwave dishes will be mounted on the existing monopole, with fiber optic cables installed inside the pole. No modifications are proposed to the size of the pole. The project also includes ground equipment located within an existing enclosure.

According to the current regulations contained in Sunnyvale Municipal Code (SMC) Section 19.54.080, telecommunications projects in industrial zoning districts involving three or more facilities or carriers on a single site require a major Use Permit (UP). The proposed project will result in five telecommunications facilities on the existing monopole; therefore Planning Commission review is required for this project.

Background

Previous Actions on the Site: The existing monopole was constructed by Verizon in 1994 with an antenna array located at the top of the pole. Additional

carriers have subsequently installed new antennas, in which the Planning Commission required the equipment to be as snug as possible. The following table summarizes previous planning applications related to the subject site.

| File Number | Brief Description | Hearing/ Decision | Date |
|--------------------|---|-------------------------------------|-------------|
| 2004-0471 | Use Permit for a fourth carrier on existing monopole (Sprint). | Planning Commission/ Approved | 6/26/2004 |
| 2001-0321 | Use Permit for a third carrier on existing monopole (Metro PCS). | Planning Commission/ Approved | 6/09/2001 |
| 2001-0259 | Use Permit for a second carrier on existing monopole (Cingular). | Planning Commission/ Approved | 6/09/2001 |
| 1994-0038 | Use Permit for a new 90-tall monopole with antennas and ground equipment (Verizon). | Administrative Hearing/ Approved | 9/28/1994 |

Environmental Review

A Class 1 Categorical Exemption relieves this project from California Environmental Quality Act provisions and City Guidelines. Class 1 Categorical Exemptions include minor additions to existing facilities.

Use Permit

Site Layout: The site consists of an industrial building located at the center of the lot in between two parking areas. The project area is located directly behind the building towards the northwest corner of the site.

Pole Design: The applicant proposes to install three flush-mounted panel antennas on a new array just below existing antennas. RF heads will be placed behind the new antennas and will help boost the signal to the antennas. Two 1-foot diameter and one 2-foot diameter microwave dishes will be installed near the top of the pole, for a total of three dishes. Fiber optic cables will run inside the pole. No modifications are proposed to the size of the pole.

Ground Equipment: Associated ground equipment consisting of a cabinet will be installed inside the existing 14-foot tall enclosure, which is made of chain link with redwood slats. The new cabinet will be screened to full height by the existing enclosure. A new 2-foot tall GPS antenna will be mounted to the pole near the base of the enclosure. The GPS antenna will not exceed the height of existing equipment. No modifications are proposed to the existing enclosure. A permanent generator is not proposed at this time (Attachment B).

Landscaping: Landscaping is minimal on this site. No changes are proposed to the existing landscaping.

Parking/Circulation: No additional parking is required for the proposed use. The site can be accessed by the existing driveway from Birchwood Drive. The site will be visited once or twice a month by the service provider for general maintenance following completion of the construction.

Radio Frequency (RF) Emissions Exposure: The Federal Communications Commission (FCC) is the final authority on safety of telecommunications facilities. If the facility meets FCC standards, the City is not permitted to make additional judgments on health and safety issues. The applicant submitted a radio frequency (RF) exposure study conducted by Hammett & Edison, Inc. The study found that the individual exposure level for the Clearwire antennas will be 0.14% of the limit for general public exposure and 2.8% for all carriers on-site. The study also states that the microwave dishes make no significant contribution to the RF exposure. The project complies with Federal requirements (Attachment F).

Visual Impacts: Although the existing monopole is partially screened by existing building, the proposed project will minimally increase the visibility of the monopole along the street frontage and adjacent properties due to the new equipment installed on the pole (Attachment D). The site is located within an industrial area, which is not a visually sensitive area.

Compliance with Development Standards/Guidelines: As previously discussed, the project complies with Federal requirements for RF exposure. The project is also subject to the Sunnyvale wireless telecommunications regulations contained in SMC Section 19.54. The proposed project meets applicable height and setback requirements for the zoning district.

In addition, the Code requires that the facility be designed with sensitivity to the surrounding area. The following design standards apply to this project:

19.54.40 (b) - All facilities shall be designed to minimize the visual impact to the greatest extent feasible, considering technological requirements, by means of placement, screening, and camouflage, to be compatible with existing architectural elements and building materials, and other site characteristics. The applicant shall use the smallest and least visible antennas possible to accomplish the owner/operator's coverage objectives.

- The design of the three proposed panel antennas and three microwave dishes on separate arrays allows the equipment to be mounted as snug against the pole as possible. Therefore, the visual impact of the added equipment will be minimal.

19.54.40 (c) - SMC 19.54.040 - Colors and materials for facilities shall be chosen to minimize visibility. Facilities shall be painted or textured using colors to match or blend with the primary background

- The applicant proposes to paint all new pole equipment to match the existing monopole.

19.54.40 (j) – All monopoles and lattice towers shall be designed to be the minimum functional height and width required to support the proposed antenna installation.

- The proposed project will not modify the height or width of the existing monopole. The visual change is limited to the new antennas and microwave dishes.

19.54.40 (l) - In order of preference, ancillary support equipment for facilities shall be located either within a building, in a rear yard or on a screened roofs top area. Support equipment pads, cabinets, shelters and buildings require architectural, landscape, color, or other camouflage treatment for minimal visual impact.

- All proposed ground equipment will be located within the existing enclosure, which is fully screened from the street frontage by the existing building.

Fiscal Impact

No fiscal impacts other than normal fees and taxes are expected.

Public Contact

At the time of the staff report, no comments were received from the public.

| Notice of Public Hearing | Staff Report | Agenda |
|--|---|---|
| <ul style="list-style-type: none"> • Published in the <i>Sun</i> newspaper • Posted on the site • 34 notices mailed to the property owners and tenants adjacent to the project site | <ul style="list-style-type: none"> • Posted on the City of Sunnyvale's web site • Provided at the Reference Section of the City of Sunnyvale's Public Library | <ul style="list-style-type: none"> • Posted on the City's official notice bulletin board • Posted on the City of Sunnyvale's web site |

Conclusion

Findings and General Plan Goals: Staff was able to make the required Findings based on the justifications for the Use Permit. Recommended Findings and General Plan Goals are located in Attachment A.

Conditions of Approval: Recommended Conditions of Approval are located in Attachment B.

Alternatives

1. Approve the Use Permit with the attached conditions.
2. Approve the Use Permit with modified conditions.
3. Deny the Use Permit.

Recommendation

Alternative 1.

Prepared by:

Noren Caliva
Project Planner

Reviewed by:

Steve Lynch
Senior Planner

Attachments:

- A. Recommended Findings
- B. Recommended Conditions of Approval
- C. Site and Architectural Plans
- D. Photosimulations
- E. Letter from the Applicant & Use Permit Justifications
- F. RF Study

Recommended Findings – Use Permit

Goals and Policies that relate to this project are:

Telecommunications Policy Goal B: *Promote universal access to telecommunications services for all Sunnyvale citizens.*

Land Use and Transportation Element Action Statement N1.1 – *Limit the intrusion of incompatible uses and inappropriate development into city neighborhoods.*

Land Use and Transportation Element Policy N1.3 – *Support a full spectrum of conveniently located commercial public and quasi-public uses that add to the positive image of the city.*

1. The proposed use attains the objectives and purposes of the General Plan of the City of Sunnyvale. *[Finding met]*

The proposed project will increase telecommunications coverage, while meeting federal emissions requirements for human exposure. In addition, the project would utilize an existing monopole and would eliminate the need to build a new telecommunications facility elsewhere in the City.

2. The proposed use ensures that the general appearance of proposed structures, or the uses to be made of the property to which the application refers, will not impair either the orderly development of, or the existing uses being made of, adjacent properties. *[Finding met]*

Although the added pole equipment will be visible from the street frontage, the visual impact of the addition will be minimal. The proposed facility is located at the back of an existing property in an industrial zone, which is not considered a visually sensitive area. There are no nearby residential developments. All proposed ground equipment will be located inside an existing enclosure and will not be visible from the street frontage. In addition, the RF emissions resulting from the project are substantially below federal limits.

Standard Requirements

The following is a list of standard requirements. This list is intended to assist the applicant and public in understanding basic related requirements, and is not intended as an exhaustive list. These requirements cannot be waived or modified.

- A. **Testing Within 15 Days:** The applicant shall test any wireless telecommunications site installed in the City of Sunnyvale within 15 days of operating the tower. The test shall confirm that any Emergency 911 wireless call made through the wireless telecommunications site shall provide Enhanced 911 capability (including phase 2 information when available from the caller's device) and direct the call to the City of Sunnyvale Department of Public Safety dispatcher, ensuring phase 2 information is transferred. If the call is to be directed elsewhere pursuant to State and Federal law the applicant shall ensure that the Enhanced 911 information transfers to that dispatch center. This capability shall be routinely tested to ensure compliance as long as the approved wireless telecommunications site is in service.
- B. **Permit Expiration:** The Use Permit for the use shall expire if the use is discontinued for a period of one year or more.
- C. **Permit Lapse if not Exercised (Ordinance 2895-09):** The Use Permit shall be valid for three (3) years from the date of approval by the final review authority (as adopted by City Council on April 21, 2009, RTC 09-094). Extensions of time may be considered, for a maximum of two one year extensions, if applied for and approved prior to the expiration of the permit approval. If the approval is not exercised within this time frame, the permit is null and void.
- D. **Building Permits:** Obtain Building Permits.
- E. **Certification:** Before January 31 of each even numbered year following the issuance of any authorizing establishment of a wireless telecommunication facility, an authorized representative for each wireless carrier providing service in the City of Sunnyvale shall provide written certification to the City executed under penalty of perjury that (i) each facility is being operated in accordance with the approved local and federal permits and includes test results that confirm the facility meets city noise requirements and federal RF emissions standards; (ii) each facility complies with the then-current general and design standards and is in compliance with the approved plans; (iii) whether the facility is currently being used by the owner or operator; and (iv) the basic contact and site information supplied by the owner or operator is current.
- F. **Renewal:** Every owner or operator of a wireless telecommunication facility shall renew the facility permit at least every ten (10) years from the date of initial approval. If a permit or other entitlement for use is not

renewed, it shall automatically become null and void without notice or hearing ten (10) years after it is issued, or upon cessation of use for more than a year and a day, whichever comes first. Unless a new use permit or entitlement of use is issued, within one hundred twenty (120) days after a permit becomes null and void all improvements, including foundations and appurtenant ground wires, shall be removed from the property and the site restored to its original pre-installation condition within one hundred eighty (180) days of non-renewal or abandonment.

- G. **Comply with Applicable Regulations:** The facility must comply with any and all applicable regulations and standards promulgated or imposed by any state or federal agency, including but not limited to the Federal Communications Commission and Federal Aviation Agency.
- H. **RF Emissions:** Certification must be provided that the proposed facility will at all times comply with all applicable health requirements and standards pertaining to RF emissions.
- I. **RF Emissions Studies:** The applicant shall submit to the Director of Community Development Radio Frequency Emissions at least two reports of field measurements showing: 1.) The ambient level of RF emissions before construction of the facility and 2.) The actual level of emissions after the facility is in place and operating at or near full capacity.
- J. **Business License:** The owner or operator of the facility shall obtain and maintain current at all times a business license as issued by the city.
- K. **Maintain Current Information:** The owner or operator shall maintain, at all times, a sign mounted on the outside fence showing the operator name, site number and emergency contact telephone number. The owner or operator of the facility shall also submit and maintain current at all times basic contact and site information on a form to be supplied by the city. The applicant shall notify city of any changes to the information submitted within thirty (30) days of any change, including change of the name or legal status of the owner or operator. This information shall include, but is not limited to the following:
 - i. Identity, including name, address and telephone number, and legal status of the owner of the facility including official identification numbers and FCC certification, and if different from the owner, the identity and legal status of the person or entity responsible for operating the facility.
 - ii. Name, address and telephone number of a local contact person for emergencies.
 - iii. Type of service provided.

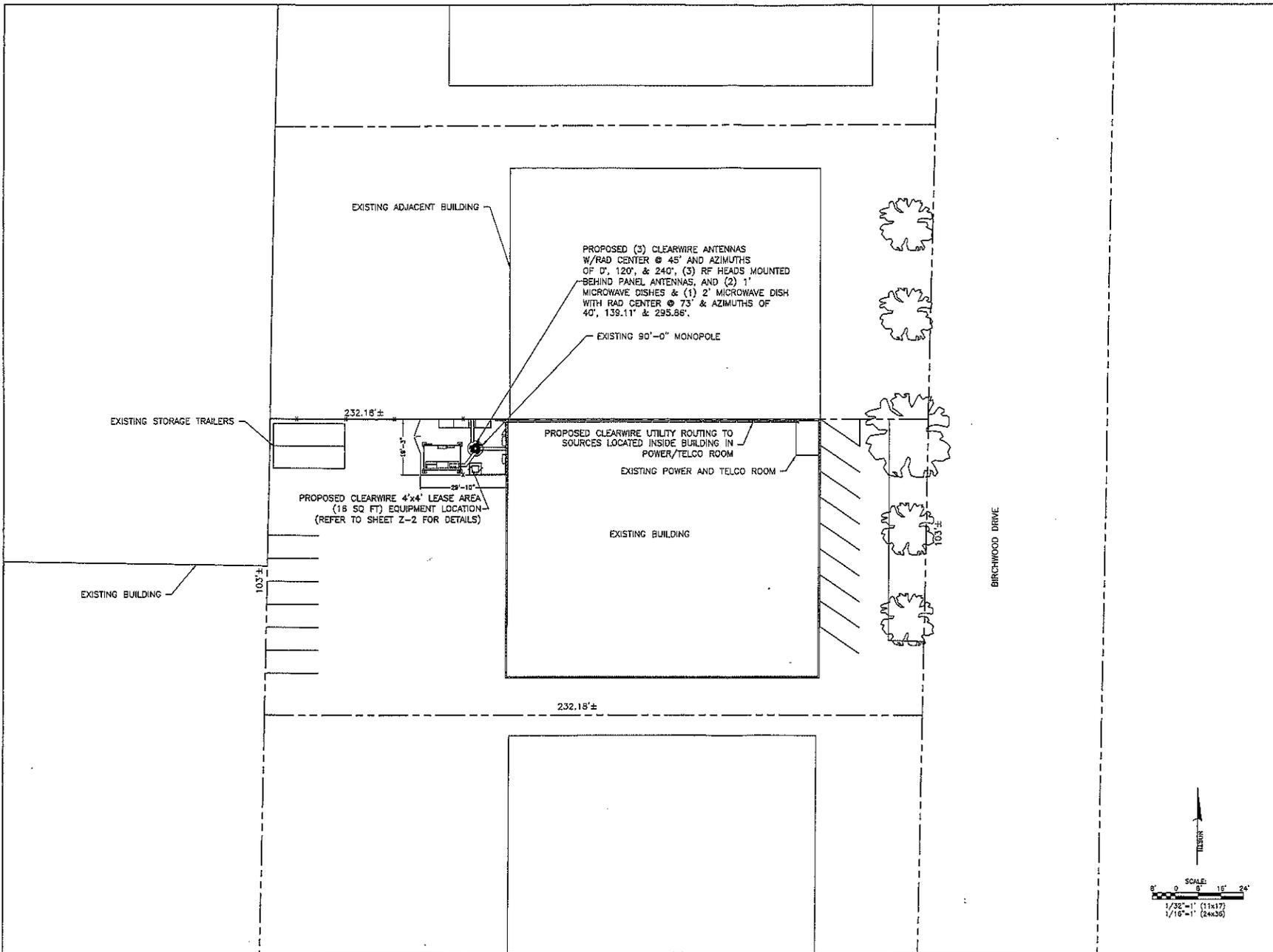
- L. **Good Repair:** All facilities and related equipment, including lighting, fences, shields, cabinets, and poles, shall be maintained in good repair, free from trash, debris, litter and graffiti and other forms of vandalism, and any damage from any cause shall be repaired as soon as reasonably possible so as to minimize occurrences of dangerous conditions or visual blight. Graffiti shall be removed from any facility or equipment as soon as practicable, and in no instance more than forty-eight (48) hours from the time of notification by the city.
- M. **Minimize Noise:** The facility shall be operated in such a manner so as to minimize any possible disruption caused by noise. A permanent generator is not approved as part of this project.
- N. **Responsibility to Maintain:** The owner or operator of the facility shall routinely and regularly inspect each site to ensure compliance with the standards set forth in the Telecommunications Ordinance.
- O. **Hold Harmless:** The wireless telecommunication facility provider shall defend, indemnify, and hold harmless the city or any of its boards, commissions, agents, officers, and employees from any claim, action or proceeding against the city, its boards, commission, agents, officers, or employees to attack, set aside, void, or annul, the approval of the project when such claim or action is brought within the time period provided for in applicable state and/or local statutes. The city shall promptly notify the provider(s) of any such claim, action or proceeding. The city shall have the option of coordinating in the defense. Nothing contained in this stipulation shall prohibit the city from participating in a defense of any claim, action, or proceeding if the city bears its own attorney's fees and costs, and the city defends the action in good faith.
- P. **Liability:** Facility lessors shall be strictly liable for any and all sudden and accidental pollution and gradual pollution resulting from their use within the city. This liability shall include cleanup, intentional injury or damage to persons or property. Additionally, lessors shall be responsible for any sanctions, fines, or other monetary costs imposed as a result of the release of pollutants from their operations. Pollutants include any solid, liquid, gaseous or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acids, alkalis, chemicals, and waste. Waste includes materials to be recycled, reconditioned or reclaimed.
- Q. **No Interference with City Communication Systems:** The facility operator shall be strictly liable for interference caused by the facility with city communication systems. The operator shall be responsible for all labor and equipment costs for determining the source of the interference, all costs associated with eliminating the interference, (including but not limited to filtering, installing cavities, installing directional antennas, powering down systems, and engineering analysis), and all costs arising from third party claims against the city attributable to the interference.

- R. **No Threat to Public Health:** The facility shall not be sited or operated in such a manner that it poses, either by itself or in combination with other such facilities, a potential threat to public health. To that end, the subject facility and the combination of on-site facilities shall not produce at any time power densities in any inhabited area that exceed the FCC's Maximum Permissible Exposure (MPE) limits for electric and magnetic field strength and power density for transmitters or any more restrictive standard subsequently adopted or promulgated by the federal government.

Recommended Conditions of Approval

In addition to complying with all applicable City, County, State and Federal Statutes, Codes, Ordinances, Resolutions and Regulations, Permittee expressly accepts and agrees to comply with the following conditions of approval of this Permit:

1. **Project Conformance:** Project shall be in conformance with the plans approved at the public hearing(s). Minor changes may be approved by the Director of Community Development, major changes may be approved at a public hearing.
2. **Execute Permit Document:** Execute a Use Permit document prior to issuance of the building permit.
3. **Conditions of Approval on Plans:** The Conditions of Approval shall be reproduced on a page of the plans submitted for a Building permit for this project.
4. **Pole Design:** All new antennas, RF heads and microwave dishes shall be painted to match the existing monopole.
5. **Microwave Dishes:** All new microwave dishes shall be snug against the pole as much as physically feasible, as shown in the approved plans.
6. **Ground Equipment:** All new equipment inside the ground enclosure shall not exceed the height of existing equipment.
7. **Tree Removal:** No trees shall be removed as part of this application.
8. **Fiber Optic Cables:** Fiber optic cables shall be utilized and placed inside the pole.



clearwire
wireless broadband

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Brookfield, OH 44403
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Fax: 330-448-4337
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DYNATEK
PROJ. NO.: 7337

DRAWN BY: L.L.

CHECKED BY: Z.M.

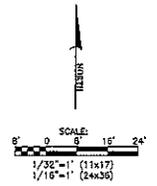
| SUBMITTALS | |
|------------|---------------------------|
| 4 | 10/13/09 LETTER REVISIONS |
| 3 | 9/04/09 CROWN REVISIONS |
| 2 | 8/24/09 2D FINAL |
| 1 | 7/30/09 REDLINE COMMENTS |
| 0 | 7/24/09 ISSUED FOR REVIEW |

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CC LAWRENCE
EAST
(CA-SJC0046a)
(CROWN#: 815226)
1259 BIRCHWOOD DRIVE
SUNNYVALE, CA 94086

SHEET TITLE:
OVERALL
SITE PLAN

SHEET NUMBER:
Z-1



OVERALL SITE PLAN

1

ATTACHMENT C

PAGE 2 of 5

SUBMITTALS

| | | |
|---|----------|-------------------|
| 4 | 10/13/09 | LETTER REVISIONS |
| 3 | 9/16/09 | CROWN REVISIONS |
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THE INFORMATION CONTAINED IN THIS SET OF DRAWINGS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO CLIENT NAME IS STRICTLY PROHIBITED.

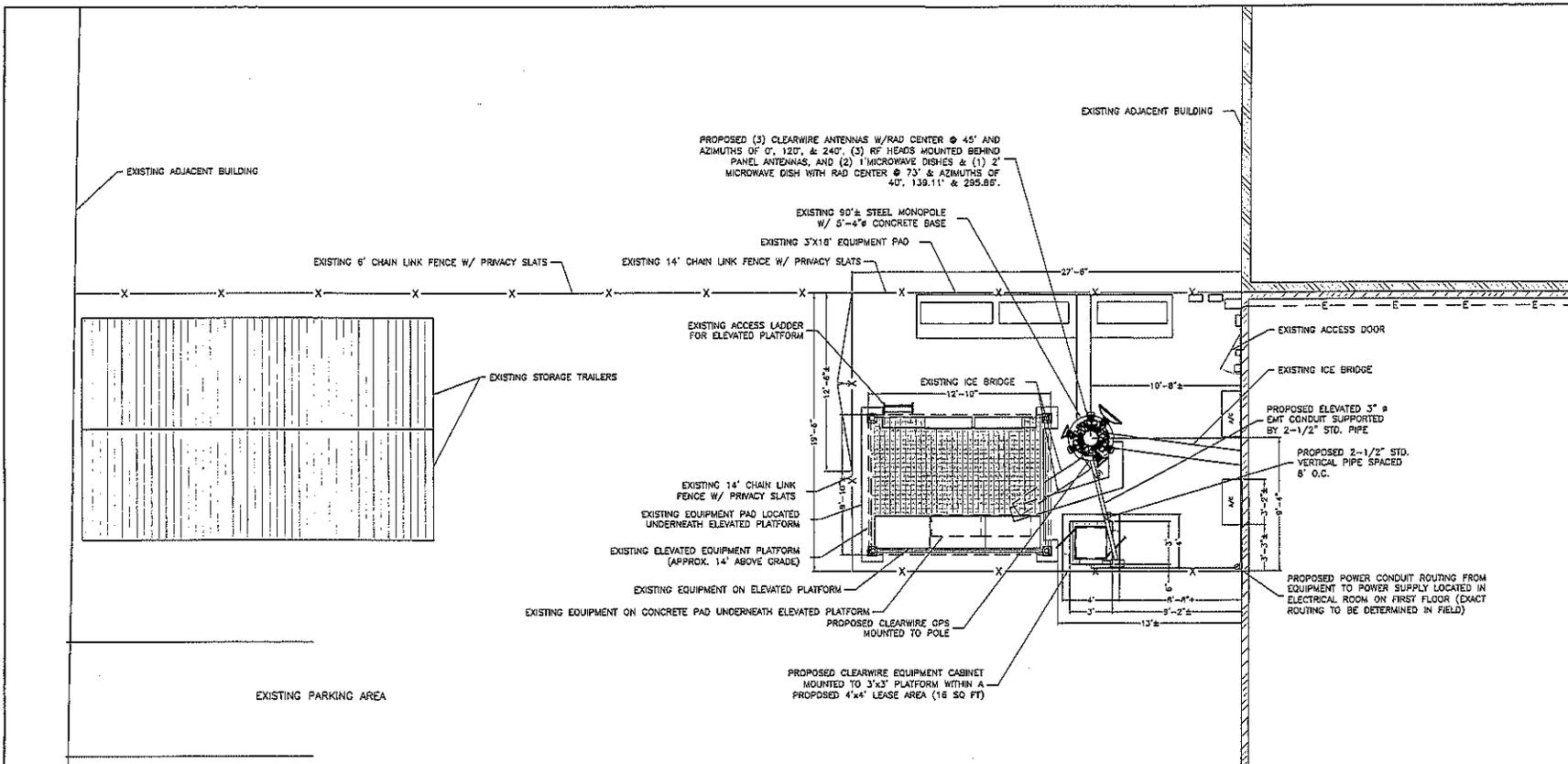
CC LAWRENCE
EAST
(CA-SJC0046a)
(CROWN#: 815226)
1259 BIRCHWOOD DRIVE
SUNNYVALE, CA 95086

SHEET TITLE
ENLARGED
SITE PLAN

SHEET NUMBER:

Z-23

ATTACHMENT
Page
of
5



EQUIPMENT SPECIFICATIONS:

CABINET-SITS/DDR:

OVERALL DIMENSION: 54"Hx45"Wx27"D;
FOOTPRINT: 25.5"Wx28"D
WEIGHT W/BATTERIES: 550 lbs.

ANTENNAS:

(1) PER SECTOR
DIMENSION: 42"Hx12.7"Wx2.8"D
WEIGHT: 35 lbs.

RRU/RF HEAD:

MOTOROLA MODEL
(1) PER SECTOR (MOUNTED BEHIND ANTENNA)
DIMENSION: 26"Hx9"Wx9"D
WEIGHT: 25 lbs.

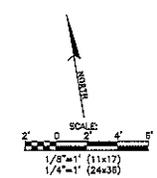
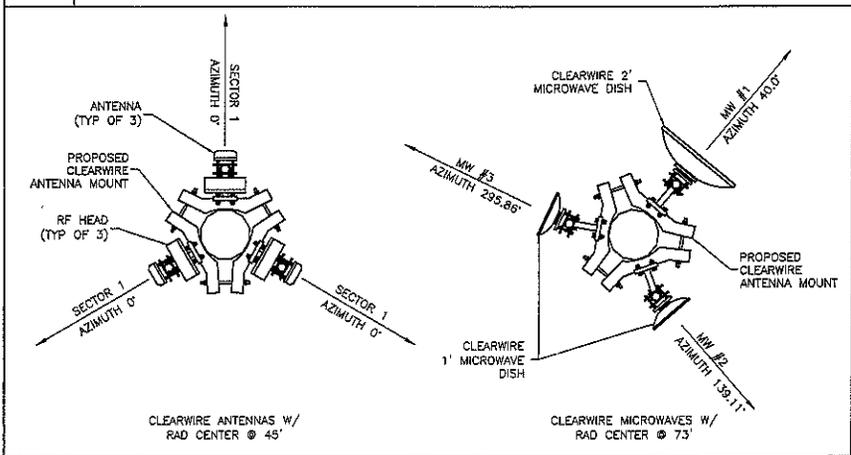
HUAWEI MODEL
(1) PER SECTOR (MOUNTED BEHIND ANTENNA)
DIMENSION: 18.9"Hx14"Wx4.7"D
WEIGHT: 44 lbs.

MICROWAVE:

(2) PLUS PER SITE (VARIES)
DIMENSION: 1' TO 2.5' DIAMETER

GPS:

(1) PER SITE



1 ANTENNA LAYOUT

2 ENLARGED SITE PLAN

EQUIPMENT SPECIFICATIONS:

CABINET-RTS/DOB:

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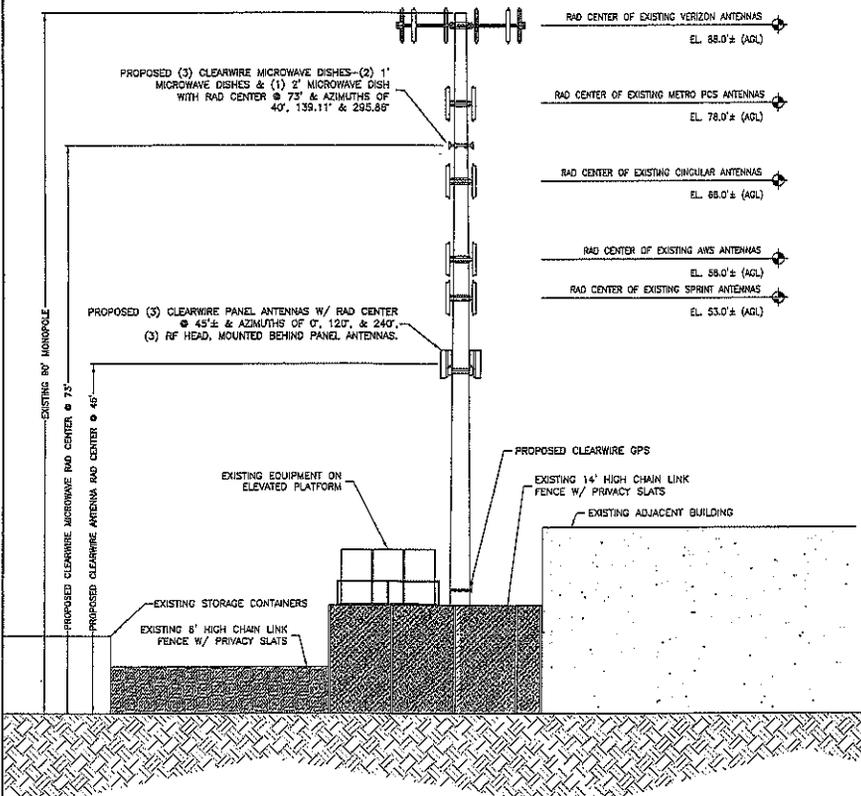
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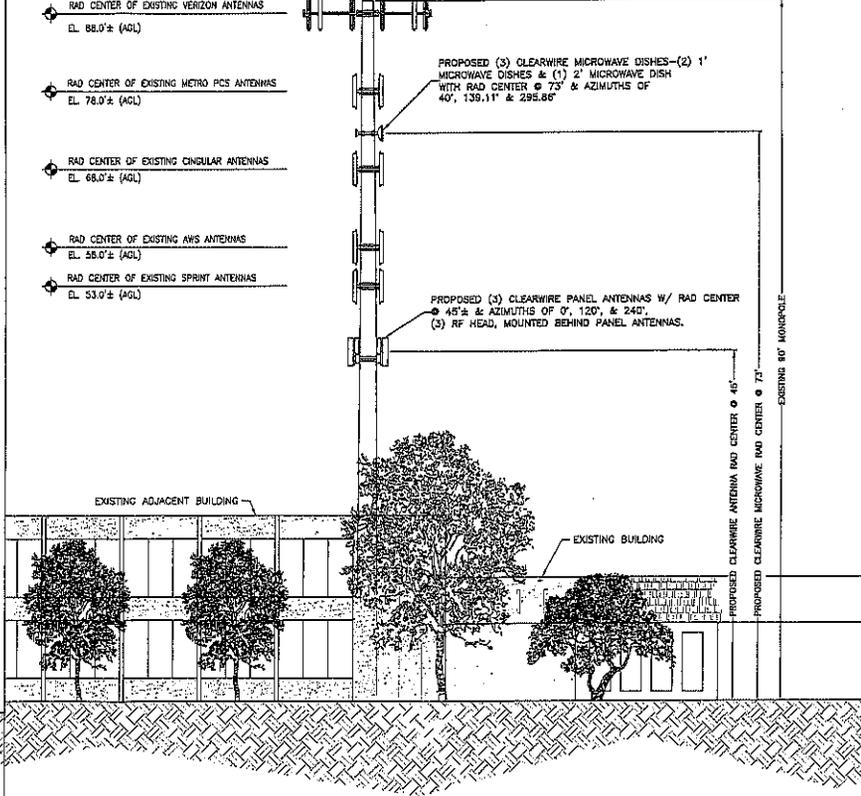
(2) PLUS PER SITE (VARIES)
DIMENSION: 1' TO 2.5' DIAMETER

GPS:

(1) PER SITE



SOUTH ELEVATION



EAST ELEVATION

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CC LAWRENCE
EAST
(CA-SJC0046a)
(CROWN#: 815226)
1259 BIRCHWOOD DRIVE
SUNNYVALE, CA 94089

SHEET TITLE: ELEVATION

SHEET NUMBER: Z-3

ATTACHMENT Page 4 of 5 C

EQUIPMENT SPECIFICATIONS:

CABINET-RIS/DOB:

OVERALL DIMENSION: 54"X45"X27"D;
 FOOTPRINT: 28.5"X25"X2"
 WEIGHT W/BATTERIES: 550 lbs.

MICROWAVE:

(2) PLUS PER SITE (VARIES)
 DIMENSION: 1' TO 2.5' DIAMETER

ANTENNAS:

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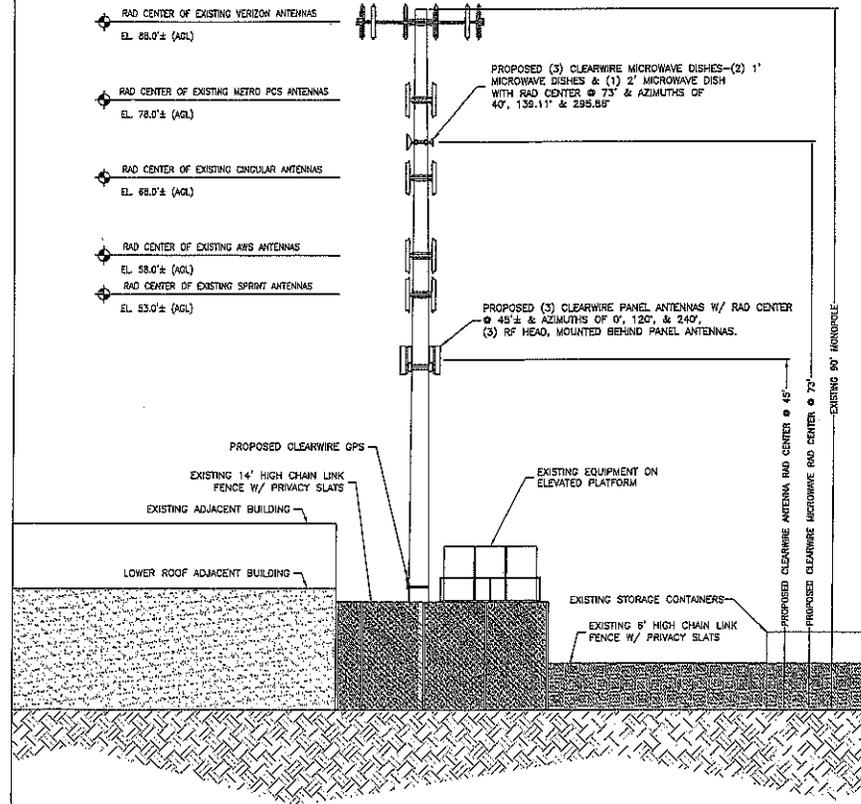
GPS:

(1) PER SITE

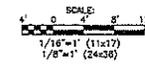
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NOTE:
 CLEARWIRE FIBER OPTIC CABLES RUN INSIDE EXISTING MONOPOLE



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DYNATEK PROJ. NO.: 7337

DRAWN BY: L.L.

CHECKED BY: Z.M.

SUBMITTALS

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 (CA-SJC0046a)
 (CROWN#: 815226)
 1259 BIRCHWOOD DRIVE
 SUNNYVALE, CA 94089

SHEET TITLE:

ELEVATION

SHEET NUMBER:

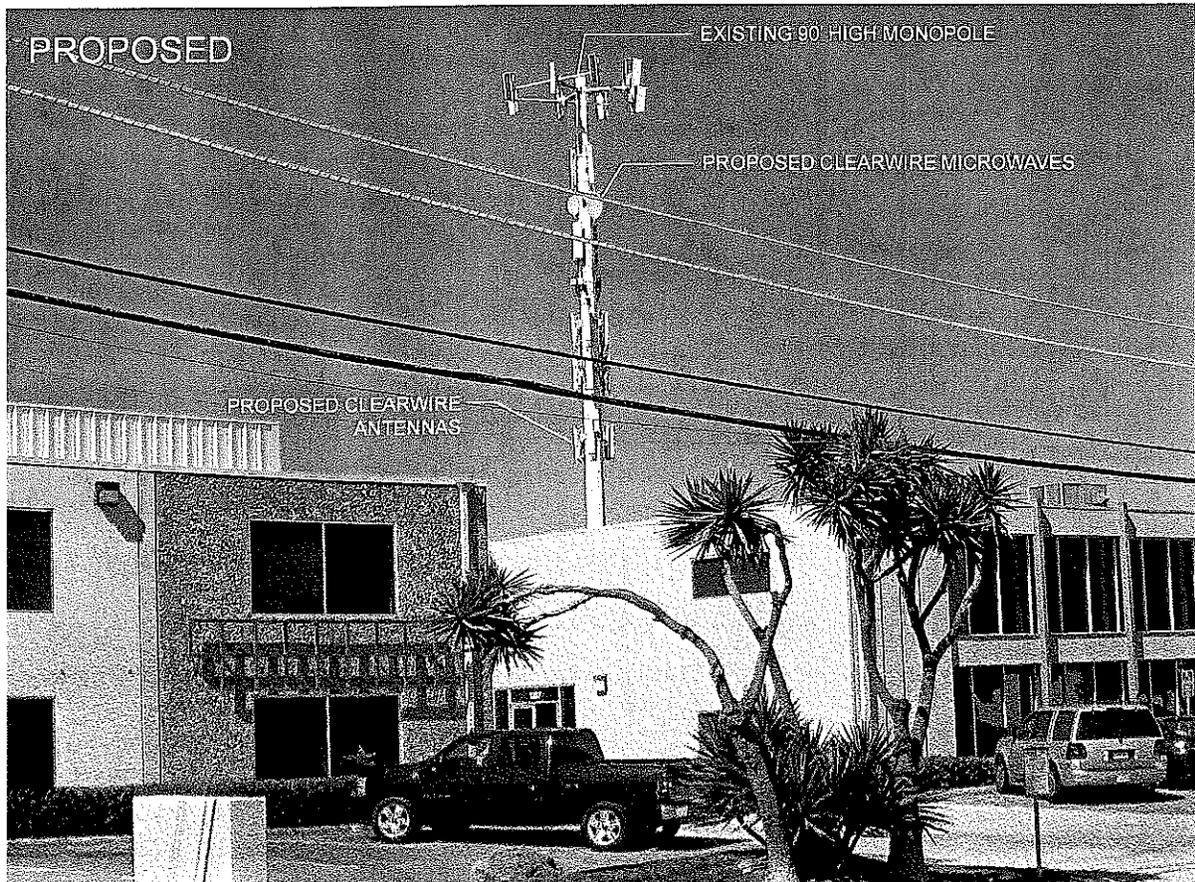
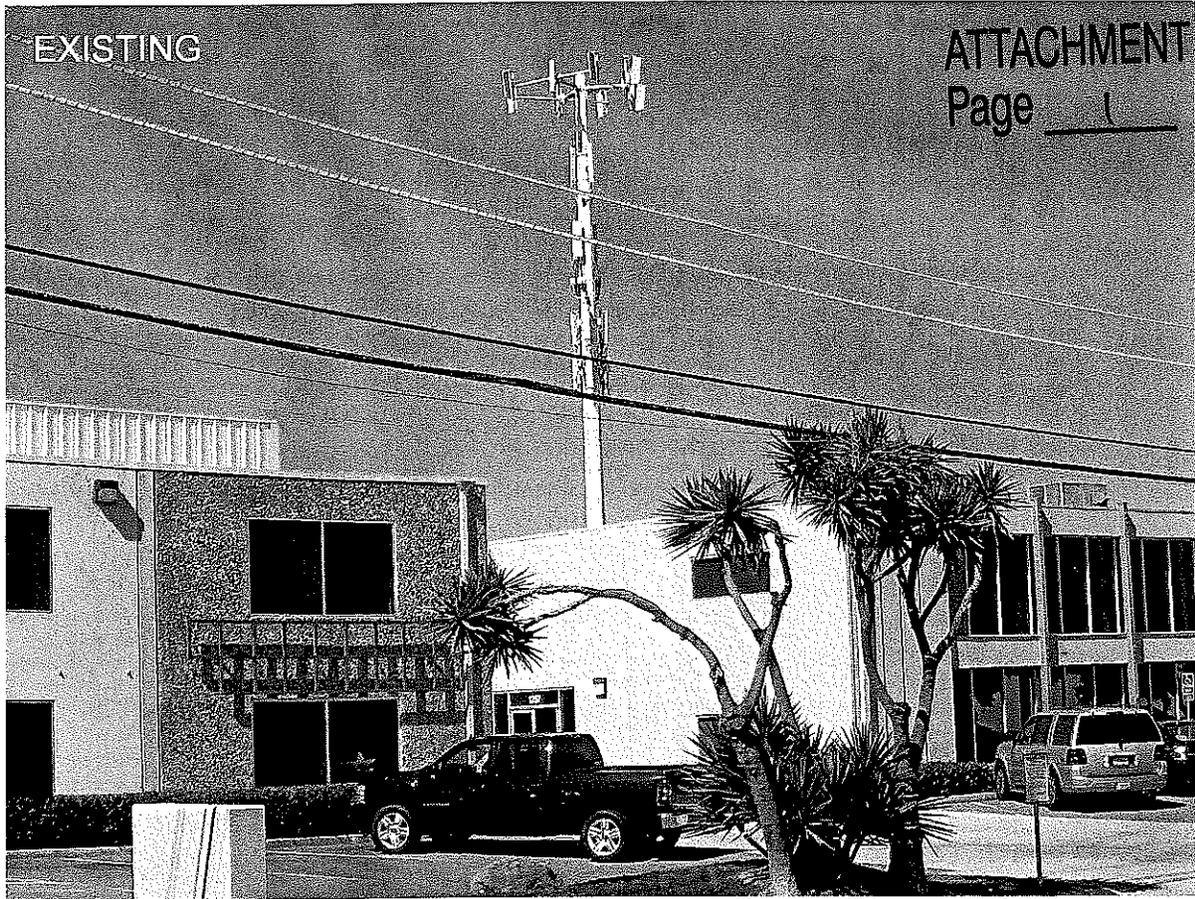
Z-4

NOT USED

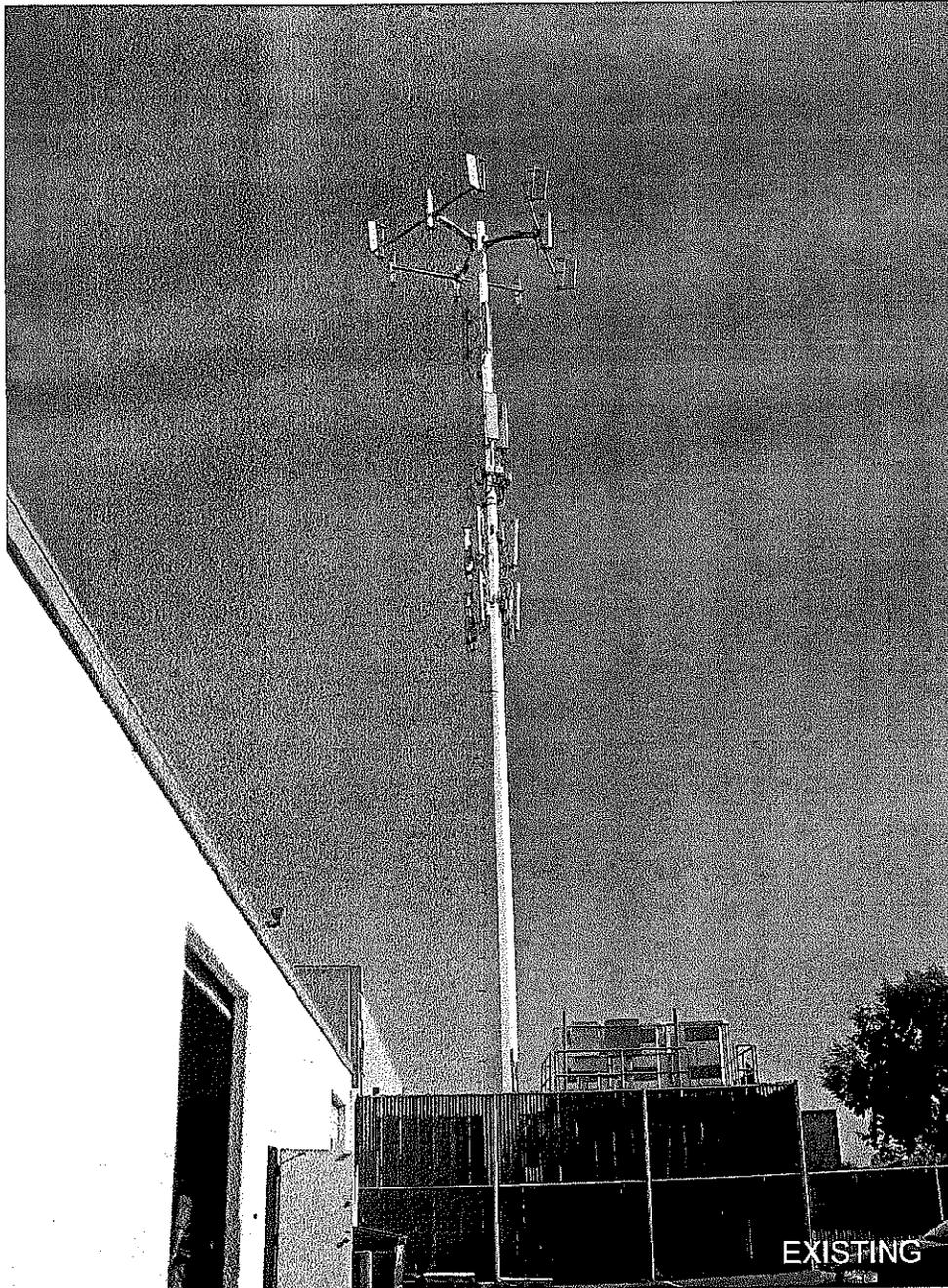
2 NORTH ELEVATION

1

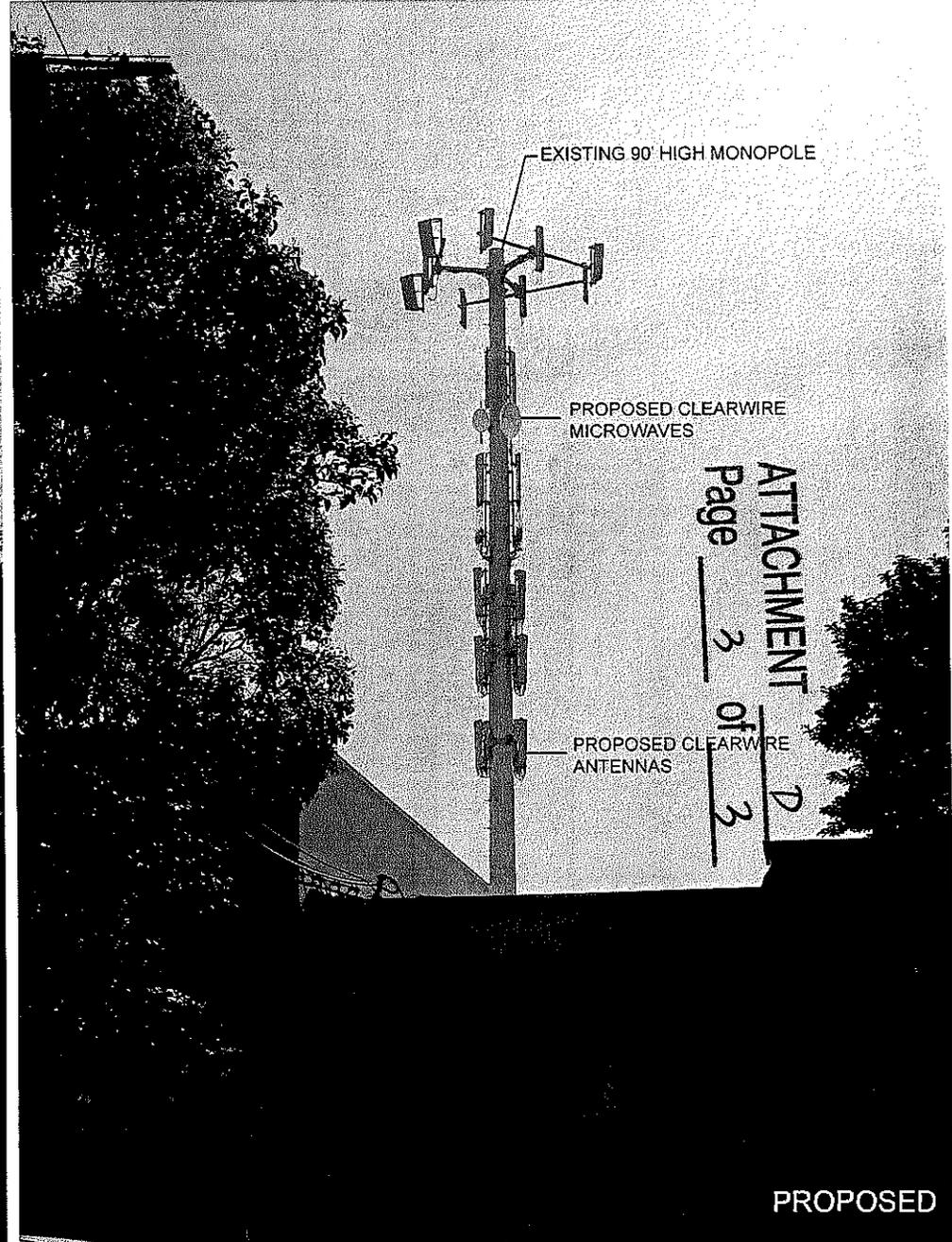
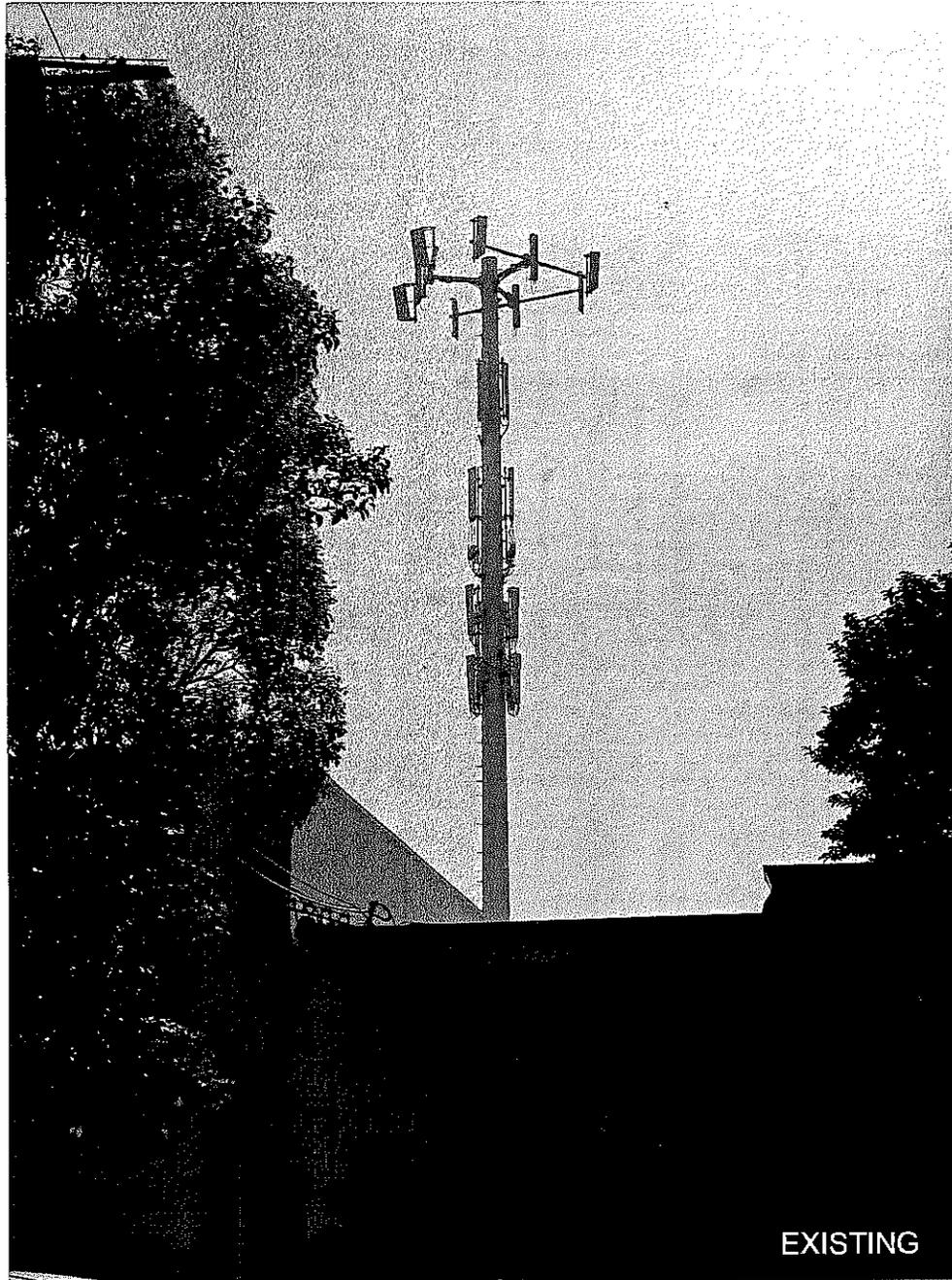
ATTACHMENT
 Page 5 of 5



Photosimulation of the proposed antennas and microwave dishes as seen looking northwest from Birchwood Drive.



Photosimulation of the proposed antenna and equipment installation as seen looking south towards Tasman Drive.



Photosimulation of the proposed antenna and microwave dishes as seen looking west towards Alderwood Avenue.



August 31, 2009

City of Sunnyvale
Planning Division
456 W. Olive Avenue
Sunnyvale, CA 94088

RE: **ClearWire Site CA-SJC0046:** Application for a Major Use Permit for a Wireless Communications Facility at 1259 Birchwood Drive, Sunnyvale, CA 94089, APN 104-29-003

This letter is hereby submitted in conjunction with an application for a major use permit for an unmanned wireless communications facility located on and under an existing 90'-tall monopole at a property located at 1259 Birchwood Drive in the City of Sunnyvale. The proposed facility is part of a wireless communications network for ClearWire Technologies.

I. Applicant Information

Lessee/Applicant

ClearWire Technologies
12657 Alcosta Blvd., Ste. 300
San Ramon, CA 94583
Attn: Gary Carpenter
Phone: (808) 741-7200

Agent for Applicant

Bell + Associates (Attn: Gordon Bell)
4020 Sierra Springs Drive
Pollock Pines, CA 95726
Phone: (530) 647-1932
Fax: (805) 456-3958
Email: gbell61639@aol.com

Property Owner

Birchwood Properties LLC/ERC Concepts Co.
PO Box 62019
Sunnyvale, CA 94088

II. Project Description

Project Location

The proposed project is located at 1259 Birchwood Drive in the City of Sunnyvale. The *proposed communications* facility will be located on and under an existing 90'-tall monopole. The project site is located on Assessor's Parcel 104-29-003. Geographic coordinates (NAD 83) for the proposed facility are Latitude: 37°24' 20.53"; Longitude: -122° 59' 35.39", at an elevation of approximately 11' AMSL (above mean sea level). The aerial photo below shows project location and surrounding land uses.

Fig. 1. Aerial Photo Showing Project Location and Surrounding Land Uses



Project Components

The proposed project would consist of the installation of antennas and radio equipment on and under an existing 90'-tall monopole as shown on the attached plans. The proposed project components would consist of the following elements to be contained within a 16 (4' x 4') square foot lease area:

- Radio equipment cabinet (approx. 2' x 2') to be installed on a 3' x 3' steel platform on the existing elevated platform
- Three (3) panel antennas and two (2) microwave dishes to be installed at an antenna centerline of approximately 45' above ground level
- One (1) GPS antenna to be mounted on the proposed outdoor equipment cabinet

- Associated fiber/coax cable to be run from the radio cabinet to the antennas inside the existing monopole. Power would be pulled from existing electrical service for the electrical room on the first floor.
- A generator is not proposed as part of the project.

Access would be provided by an existing driveway from Birchwood Drive.

Collocation/Existing Carriers

The existing monopole is owned by Crown Castle and already supports four existing communications facilities (Verizon, AT&T, T-Mobile, and Metro PCS) and may be capable of handling additional antennas should other wireless communications companies be interested in collocation on the monopole. The tower is owned by a tower company which sole interest is to promote collocation on their tower.

Network Technology

Clearwire offers a robust suite of advanced voice, high-speed Internet services to consumers and businesses. The company is building the first Mobile WiMax 4G network in the San Francisco Bay area bringing together an unprecedented combination of speed and mobility. Clearwire is licensed by the FCC to operate the Mobile WiMax Network in the 2.5-2.7GHz frequency range in San Francisco market. Clearwire will be using microwave backhaul for the Mobile WiMax network.

The Clearwire network is designed upon utilization of microwave backhaul throughout the network of hundreds of sites in the Bay area. This is a 100 percent backhaul solution, with no hardline connections within the system. What this means is that the majority of the sites transport a signal to at least three other sites with "hubs" located at the center of some of the rings to transport an initial signal. Because sites are inextricably linked by these microwave connections, it is imperative that the MW dishes obtain maximum height over the surrounding clutter and topography to ensure a point-to-point connection with other sites in the system.

In terms of Clearwire's relationship to other carriers and their networks, it should be known that Clearwire is a subsidiary of Sprint/Nextel (Sprint owns 51%), but the systems are not integrated. Clearwire's network is an entirely new network. Eventually, Clearwire's subscribers may have roaming agreements with Sprint/Nextel where Clearwire is not present, but the systems are not integrated to support each other. Because of the ownership relationship, Clearwire's footprint is very similar to Sprint's in the Bay area because we know that it is possible to utilize Sprint/Nextel's shelters, mounting brackets, coax cable trays, etc. with the appropriate collocation agreement with Sprint/Nextel. We also know we're more likely to have willing landlords were Sprint/Nextel is already located.

Public services such as fire and law enforcement are not required given that the facilities are designed to be vandalism resistant (located on a rooftop and on the monopole) and are uninhabitable. The project does not require school or transit facilities, as it is an unmanned wireless communications facility.

Operations

The site is an unmanned facility that will not generate any noise, dust, or odors. It is expected that a service technician may visit the site for routine maintenance once every month to two months if needed. Ample parking is available in the existing parking lot.

III. Land Use

Zoning

The project parcel is zoned MS, Industrial. The project site is bounded on the west, north, south, and east by existing industrial uses.

Environmental Setting

The project is located on a relatively level, completely disturbed industrial parcel that is occupied by a concrete tilt-up building with multiple tenants, and the existing multi-tenant telecom facility. There are no sensitive resources onsite given the disturbed nature of the parcel. Some ornamental landscaping exists along the property's eastern boundary. No vegetation will be disturbed as a result of this project. There are no scenic vistas in close proximity to the project site.

IV. Conclusion

In conclusion, the proposed project is a compatible use with the surrounding land uses as proven by the fact that an existing facility is located on the parcel which is in an industrial area. The proposed project will provide valuable communications services to area residents and businesses. Should you have any questions regarding this application, please feel free to call me at (530) 647-1932.

Sincerely,

Bell + Associates
Gordon J. Bell
Gordon J. Bell
Principal

Encl.



USE PERMIT/SPECIAL DEVELOPMENT PERMIT JUSTIFICATIONS

One of the two following findings must be made in order to approve a Use Permit or Special Development Permit application.

The Sunnyvale Municipal code states that at least one of the following two justifications must be met before granting the Use Permit or Special Development Permit. Please provide us information on how your project meets **at least one** of the following criteria.

1. The proposed use attains the objectives and purposes of the General Plan of the City of Sunnyvale as the project ...

OR

2. The proposed use ensures that the general appearance of proposed structures, or the uses to be made of the property to which the application refers, will not impair either the orderly development of, or the existing uses being made of, adjacent properties as ...

The proposed project is an addition to an existing multi-tenant telecommunications facility that consists of an existing monopole and equipment compound. The addition of antennas to this 91-foot tall monopole will not change the overall appearance of the pole, and the proposed equipment will not be visible from surrounding areas. As the site is industrial in nature, and the project is a passive use which will not take up additional ground space, it will not have an impact on existing operations on site.

If you need assistance in answering either of these justifications, contact the Planning Division staff at the One-Stop Permit Center.

**Clearwire, LLC • Proposed Base Station (Site No. CA-SJC0046)
 1259 Birchwood Drive • Sunnyvale, California**

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Clearwire, LLC, a personal wireless service provider, to evaluate the base station (Site No. CA-SJC0046) proposed to be located at 1259 Birchwood Drive in Sunnyvale, California, for compliance with appropriate guidelines limiting human exposure to radio frequency (“RF”) electromagnetic fields.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission (“FCC”) evaluate its actions for possible significant impact on the environment. In Docket 93-62, effective October 15, 1997, the FCC adopted the human exposure limits for field strength and power density recommended in 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. 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:

| Personal Wireless Service | Approx. Frequency | Occupational Limit | Public Limit |
|------------------------------------|-------------------|-------------------------|-------------------------|
| Broadband Radio (“BRS”) | 2,600 MHz | 5.00 mW/cm ² | 1.00 mW/cm ² |
| Advanced Wireless (“AWS”) | 2,100 | 5.00 | 1.00 |
| Personal Communication (“PCS”) | 1,950 | 5.00 | 1.00 |
| Cellular Telephone | 870 | 2.90 | 0.58 |
| Specialized Mobile Radio (“SMR”) | 855 | 2.85 | 0.57 |
| Long Term Evolution (“LTE”) | 700 | 2.33 | 0.47 |
| [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 about 1 inch thick. Because of the short wavelength of the frequencies assigned by the FCC for

**Clearwire, LLC • Proposed Base Station (Site No. CA-SJC0046)
1259 Birchwood Drive • Sunnyvale, California**

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. Along with the low power of such facilities, 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 Clearwire, including drawings by Dyna Limited, dated July 24, 2009, it is proposed to mount three Argus Model LLPX310R directional panel antennas on an existing 90-foot pole sited behind the two-story building located at 1259 Birchwood Drive in Sunnyvale. The antennas would be mounted with 2° downtilt at an effective height of about 43 feet above ground and would be oriented at about 120° spacing, to provide service in all directions. The maximum effective radiated power in any direction would be 970 watts. Also proposed to be located with the antennas are three microwave "dish" antennas, for interconnection of this site with others in the Clearwire network.

Presently installed on the same pole are similar antennas for use by AT&T Mobility, MetroPCS, Sprint Nextel, T-Mobile, and Verizon Wireless, other wireless telecommunications carriers. For the limited purposes of this study, it is assumed that the transmitting facilities of those carriers are as follows:

| Carrier | Service | Maximum ERP | Antenna Model | Height |
|---------------|----------|-------------|--------------------|--------|
| AT&T | PCS | 1,500 watts | } Kathrein 742-265 | 58 ft |
| | Cellular | 1,500 | | |
| Metro | PCS | 1,890 | Kathrein 742-213 | 78 |
| Sprint Nextel | PCS | 1,500 | Andrew RR90-17 | 53 |
| T-Mobile | PCS | 2,000 | } TMBX-6516-R2M | 68 |
| | AWS | 770 | | |
| Verizon | PCS | 1,500 | } Andrew 731DG65 | 88 |
| | Cellular | 1,500 | | |



Clearwire, LLC • Proposed Base Station (Site No. CA-SJC0046)
1259 Birchwood Drive • Sunnyvale, California

Study Results

For a person anywhere at ground, the maximum ambient RF exposure level due to the proposed Clearwire operation by itself would be 0.0014 mW/cm², which is 0.14% of the applicable public limit. The maximum calculated cumulative level at ground, for the simultaneous operation of all six carriers, is 1.9% of the applicable public limit; the maximum calculated cumulative level at any nearby building is 2.8% of the applicable public limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels. The microwave antennas would be in point-to-point service and are so directional that they make no significant contribution to RF exposure conditions at ground level.

No Recommended Mitigation Measures

Due to their mounting locations, the Clearwire antennas would not be accessible to the general public, and so no mitigation measures are necessary to comply with the FCC public exposure guidelines. It is assumed that Clearwire and the other carriers will, as FCC licensees, take adequate steps to ensure that their employees or contractors comply with FCC occupational exposure guidelines whenever work is required near the antennas themselves.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the base station proposed by Clearwire, LLC at 1259 Birchwood Drive in Sunnyvale, 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.



Clearwire, LLC • Proposed Base Station (Site No. CA-SJC0046)
1259 Birchwood Drive • Sunnyvale, California

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, 2011. 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

William F. Hammett, P.E.

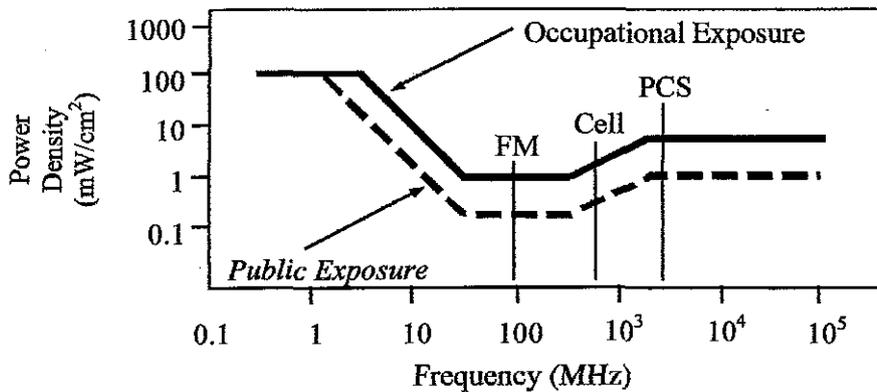
August 13, 2009

FCC Radio Frequency Protection Guide

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

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

| Frequency Applicable Range (MHz) | Electromagnetic Fields (f is frequency of emission in MHz) | | | | | |
|---|--|----------------|-------------------------------------|---------------|--|--------------------------|
| | Electric Field Strength (V/m) | | Magnetic Field Strength (A/m) | | Equivalent Far-Field Power Density (mW/cm ²) | |
| 0.3 – 1.34 | 614 | <i>614</i> | 1.63 | <i>1.63</i> | 100 | <i>100</i> |
| 1.34 – 3.0 | 614 | <i>823.8/f</i> | 1.63 | <i>2.19/f</i> | 100 | <i>180/f²</i> |
| 3.0 – 30 | 1842/f | <i>823.8/f</i> | 4.89/f | <i>2.19/f</i> | 900/f ² | <i>180/f²</i> |
| 30 – 300 | 61.4 | <i>27.5</i> | 0.163 | <i>0.0729</i> | 1.0 | <i>0.2</i> |
| 300 – 1,500 | 3.54√f | <i>1.59√f</i> | √f/106 | <i>√f/238</i> | f/300 | <i>f/1500</i> |
| 1,500 – 100,000 | 137 | <i>61.4</i> | 0.364 | <i>0.163</i> | 5.0 | <i>1.0</i> |



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.

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/cm²,

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/cm²,

- 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.

