1.	**Location:**	**2235 Chestnut Street (APN: 005-0427-003-00)**
	Proposal:	To install a wireless communication facility consisting of 3 panel antennas and 1 microwave antenna behind window louvers on the existing building tower, and 1 utility cabinet on the rooftop of the three-story facility.
	Contact Person:	Cortel Clearwire, Michelle Weller
	Phone Number:	(925) 997-1312
	Owner:	West Grand-Adeline Associates, Francis Rush
	Case File Number:	**CM09-254**
	Planning Permits Required:	Major Conditional Use Permit to operate a new wireless communication facility within 100 feet of the boundary of a residential zone; Regular Design Review for new wireless antennas.
	General Plan:	Business Mix
	Zoning:	CIX-1 Commercial Industrial Mix 1 Zone; and S-19 Health and Safety Protection Overlay Zone
	Environmental Determination:	Exempt, Section 15301 of the State CEQA Guidelines: Existing Facilities (additions to existing structures); Section 15183 of the State CEQA Guidelines: Projects consistent with a Community plan, General Plan or Zoning
	Historic Status:	Potential Designated Historic Property (PDHP); Survey Rating: C3, Secondary Importance
	Service Delivery District:	1
	City Council District:	3
	Date Filed:	November 11, 2009
	Action to be Taken:	Decision based on staff report
	Finality of Decision:	*Appealable to City Council within 10 calendar days*
	For Further Information:	Contact case Planner **Mike Rivera** at **(510) 238-6417,** or by email at mrivera@oaklandnet.com

PROJECT SUMMARY

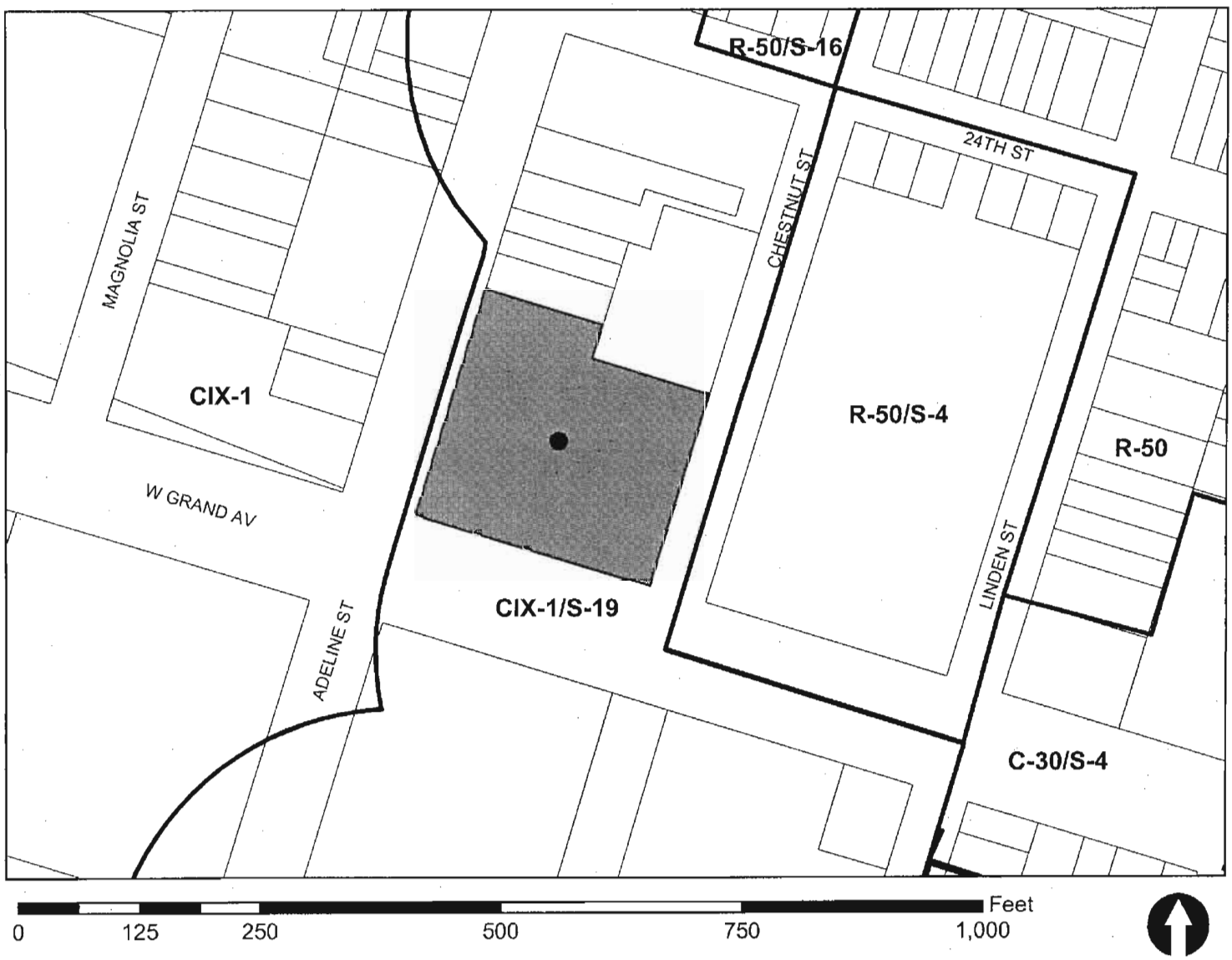
The applicant requests a Major Conditional Use Permit to install 3 concealed telecommunication panel antennas and 1 microwave antenna behind window louvers on the existing building tower, and 1 utility cabinet on the rooftop of the three-story industrial facility. Due to the number of existing antennas located on this building, this proposal is considered a Macro Telecommunication Facility. A Macro Facility is a wireless communication facility that is not included in the definition of Micro Facilities, Mini Facilities, Monopoles, or Lattice Towers. The site is located on West Grand Ave. between Adeline St. and Chestnut St.

Per Section 17.134.020(A)(3)(i) of the Oakland Planning Code, a Major Conditional Use Permit is required for a Telecommunications Facility located within one hundred (100) feet of the boundary of any residential zone. This site is within 100 feet of an R-50 zoned property located across Chestnut Street. The Planning Commission is the decision-making body for the proposed application. Staff recommends approval subject to the required findings **(Attachment A)** and conditions of approval **(Attachment B)**.

PROPERTY DESCRIPTION

The property includes a 107,880 square foot, three-story industrial facility with an open parking lot located on 1.29 acres parcel in West Oakland. The facility at 2235 Chestnut St. is bounded by West Grand Ave., Chestnut St. and Adeline St. The property is bounded to the north, west, and south by CIX-1 Zones and to the east by an R-50 Zone. The majority of the surrounding properties contain a mix of industrial, commercial and residential facilities. The building was constructed in 1923 as a utilitarian warehouse

CITY OF OAKLAND PLANNING COMMISSION



Case File: CM09-254
Applicant: Cortel Clearwire
Address: 2235 Chestnut Street
Zone: CIX-1/S-19

facility, and was originally utilized as a mattress factory. Subsequently, the warehouse facility closed for business, and later was converted to a mix of light industrial units and work-live units.

PROJECT DESCRIPTION

The proposal is to install a total of 4 antennas inside the existing building tower and 1 equipment cabinet on the rooftop of the three-story industrial facility. The proposal also includes the interior installation of conduits that will run vertically from the equipment cabinet to the top of the tower. The building tower, which measures about 60 feet high, is located on the west side of the three-story building facing Adeline Street. Access to the top of the tower is by an exterior metal ladder mounted on the east side of the tower. The proposal includes replacement of the existing wood window louvers with new fiberglass reinforced plastic louvers and painted to match the original brown color. The proposal includes photo simulations of the modified tower viewed from several street locations around the property. **(See Attachment E)**

On Sheet A-2 of the design plans, the proposal shows the location of the antennas and equipment cabinet. Sectors 1, 2, 3 and Sector C show the location of the antenna panels and the dish antenna located inside the building tower. The plan also shows the location of the equipment cabinet located to the east of the tower and on the building rooftop. Sectors 1, 2 and 3, including Sector C located to the north, east and south of the tower, show the proposed 4 antennas located behind the existing window louvers. On Sheets A-3 and A-4 of the elevation design plans, the proposal shows the location of the antenna panels and dish antenna (in dark dashed line) about 90 feet above finished grade. The elevation plan also shows the location of the existing antennas by two other telecommunication carriers, Metro PCS and Nextel. The antenna panels of the two other telecom carriers are mounted on the exterior walls of the building tower. **(See Attachment C)**

GENERAL PLAN ANALYSIS

The property is located in the Business Mix Land Use Classification as described in the Oakland General Plan. The intent of the Business Mix Land Use Classification is to create, preserve, and enhance areas of the City that are appropriate for a wide variety of business and related commercial and industrial establishments. The desired character and uses in these areas may accommodate a mix of businesses, such as light industrial, commercial and other uses of similar business character. The proposal to install wireless communication antennas at this property will provide the public access to a wide variety of services to meet daily and long-term needs. An enhanced telecommunications network is important to retain jobs for Oakland residents working in sectors such as service and retail trade. General Plan Objective I/C3 states that Oakland needs to serve a wide variety of commercial uses and provide personal and professional services. The proposal for a wireless communication facility will serve the needs of the surrounding businesses and residents alike, because of the demand for quality wireless communication service and internet use.

ZONING ANALYSIS

The property is located in the CIX-1 Commercial Industrial Mix 1 Zone. The intent of the CIX-1 zone is to create, preserve, and enhance the industrial areas of Oakland that are appropriate for a large variety of businesses and related commercial and industrial establishments. The intent of this zone is to accommodate existing industries and provide flexibility in order to anticipate new technologies. The property is also in the S-19 Overlay Zone. The intent of this overlay zone is to promote the public health, safety and welfare by ensuring that activities which use hazardous material substances or store hazardous materials, hazardous waste, or explosives locate in appropriate locations and develop in such a manner as not to be a serious threat to the environment, or to public health, particularly to residents living adjacent to industrial areas where these materials are commonly used, produced, or found.

Per Sections 17.73.02, 17.134.020(A)(3)(i) and 17.128.070(C) of the Oakland Planning Code, the proposal for a Telecommunication Facility (Macro) in the CIX-1 Zone requires a Major Conditional Use Permit if located within one hundred (100) feet of the boundary of any residential zone. The property at 2235 Chestnut St. is within 100 feet from the boundary of the R-50 Medium Density Residential Zone located east. In addition, the proposal is subject to additional Conditional Use Permit Criteria regarding special design review and community character findings. The purpose of the Major Conditional Use Permit is to analyze the operating characteristics or potential adverse effects on the surrounding areas.

Per Section 17.128.070 (B) of the Planning Code, the proposal for a Telecommunication Facility (Macro) also requires Design Review. The purpose of Design Review is to analyze projects that require special design treatment and consideration of relationship to the physical surroundings. Staff has analyzed the required design review findings and can justify approval of the proposed Telecommunication Facilities.

ENVIRONMENTAL DETERMINATION

The California Environmental Quality Act (CEQA) Guidelines lists the projects that qualify as Categorical Exemptions from environmental review. The development proposal is categorically exempt from the environmental review requirements pursuant to Section 15301(e) for additions to existing structures and Section 15183 for projects consistent with a Community Plan, General Plan or Zoning.

HISTORIC PRESERVATION

Policy 3.5 of the Historic Preservation Element of the Oakland General Plan states that for any additions or alterations to Heritage Properties or Potentially Designated Historic Properties that require discretionary City permits, the City needs to make a finding that: 1) The design matches or is compatible with, but not necessarily identical to, the properties existing or historical design; or 2) The proposed design comprehensively modifies and is at least equal in quality to the existing design and is compatible with the neighborhood; or 3) The existing design is undistinguished and does not warrant retention and the proposed design is compatible with the character of the neighborhood.

The property is considered a Potential Designated Historic Property (PDHP) with a Survey Rating of C-3, Secondary Importance. The proposal was referred to the City Historic Preservation Planner for review. The Historic Planner finds the potential impact of the proposal insignificant and supports the project because the antennas will be concealed from public view, and the project will preserve the historical significance of the building.

KEY ISSUES AND IMPACTS

Conditional Use Permit and Regular Design Review Findings

Planning Code Sections 17.73.02, 17.134.020(A)(3)(i) and 17.128.070(C) require a Major Conditional Use Permit for Telecommunication Facility (Macro) when located within one hundred (100) feet of the boundary of any residential zone. The proposal is within 100 feet of an R-50 Residential Zone located east across Chestnut St. Furthermore, per Section 17.128.070(B) of the Planning Code, the proposal requires additional Conditional Use Permit findings for special design review and community character findings. The purpose of the Conditional Use Permit and Design Review for Macro Facilities is to analyze the operating characteristics or potential adverse effects on the surrounding uses, and community character. Staff will evaluate these findings in this report. **(See Attachment A)**

Site Location Preferences

Planning Code Section 17.128.110 of the Telecommunication Regulations, states that new wireless facilities shall generally be located on the following properties or facilities in order of preference:

A. Collocated on an existing structure or facility with existing wireless antennas;
B. City owned properties or other public or quasi-public facilities;
C. Existing commercial or industrial structures in non-residential zones;
D. Existing commercial or industrial structures in residential zones;
E. Other non-residential uses in residential zones;
F. Residential uses in non-residential zones;
G. Residential uses in residential zones.

This regulation states that proposed facilities locating on an A, B or C ranked preference, do not require a site alternative analysis. In this case, the development proposal to collocate with other telecommunication facilities corresponds with the first site location preference (A) for placing the antennas with other existing wireless antennas located on the building tower (see elevation sheets A-3 & A-4). Staff believes that the location of the proposed antennas inside the building tower is more than preferable because the antennas will not be visible from public view. Therefore, a site alternative analysis will not be required.

Site Design Preferences

Per Planning Code, Section 17.128.120 of the Telecommunication Regulations states that new wireless facilities shall generally be designed in the following order of preference:

A. Building or structure mounted antennas concealed from view;
B. Building or structure mounted antennas set back from roof edge, not visible from public right-of-way;
C. Building or structure mounted antennas below roof line (façade mount, pole mount) visible from public right-of-way, painted to match existing structure;
D. Building or structure mounted antennas above roof line visible from public right-of-way;
E. Monopoles;
F. Towers.

This regulation states that proposed facilities designed to meet A or B ranked preference, do not require a site design alternative analysis. For facilities designed to meet C through F must submit a site design alternative analysis. A site design alternative analysis consists of written evidence showing the reason each higher preference design alternative can not be used. This evidence must be in sufficient detail for independent verification that can be obtained if required by the Zoning Manager. The evidence should indicate if the reason an alternative was rejected due to technical issues (e.g. inappropriate height or interference with other RF sources), or for other constrains (e.g. inability to provide utilities or construction impediments).

Staff finds the proposal to install the new antennas behind window louvers on the building tower fits with Site Design Preference (A). The 4 antennas are completely concealed from view because they are located inside the building tower. No part of the antennas or conduits will be visible from the building tower. The existing window louvers will be replaced with similar new fiberglass reinforced plastic louvers and painted to match with the other window louvers.

Radio Frequency Emissions Standards

Planning Code Section 17.128.130 of the Telecommunications Regulations, requires the applicant to submit the following verifications:

a. With the initial application submittal, a Radio Frequency (RF) emissions report shall be prepared by a licensed professional engineer or other expert, indicating that the proposed site will operate within the current acceptable thresholds as established by the Federal government or any such agency who may be subsequently authorized to established such standards.
b. Prior to commencement of construction, a RF emissions report indicating the baseline RF emissions condition at the proposed site.
c. Prior to final building permit sign-off, an RF emissions report indicating that the site is actually operating within the acceptable thresholds as established by the Federal government or any such agency who may be subsequently authorized to establish such standards.

The proposal includes a compliance study on Radio Frequency Emissions, dated March 25, 2010 **(See Attachment D)**. The report prepared by the project engineer, Sei Yuen Sylvan Wong, analyzes the proposal based on design plans submitted by ClearWire. In summary, the report concludes that the project development to install 4 antennas will comply with the set standards for limiting public exposure to Radio Frequency Emissions and will not cause significant impacts on the environment. To confirm that the applicant meets the Radio Frequency Emission Standards for "b" and "c" of Planning Code Section 17.128.130, staff recommends a condition of approval that requires the applicant to submit an RF Emissions Report prior to the start of construction indicating the baseline RF Emissions conditions at the site prior to installation of any new antennas. Staff also recommends another condition of approval that requires the applicant to submit a final RF Emissions Report prior to the final building permit sign-off stating that the facility is operating within the acceptable thresholds as established by the Federal Communication Commission. **(See Condition of Approval # 16)**

CONCLUSION

The development proposal to install 4 wireless communication antennas located behind replacement window louvers on the building tower is a compatible use for the area and creates access to telecommunication services and internet use to the general public, without creating impacts to the environment. Staff finds that the installation of the new antennas will not create a cumulative impact to the site because the antennas are concealed from public view, thus keeping with the design of the facility. The proposal also complies with the regulations set by the Federal Communication Commission. Therefore, staff determines the application meets the required findings for Conditional Use Permit **(See Attachment A)**, and recommends approval of the application by the Planning Commission, subject to the Conditions of Approval. **(See Attachment B)**

RECOMMENDATIONS

1. Affirm staff's environmental determination.

2. Approve Major Conditional Use Permit application CM09-254, subject to the attached findings and conditions of approval.

Prepared by:

Mike Rivera
Planner II

Approved by:

Scott Miller
Zoning Manager

Approved for forwarding to the
City Planning Commission:

for

Walter Cohen, Director
Community & Economic Development Agency

ATTACHMENTS

A. Findings
B. Conditions of Approval
C. Project Plans, submitted on March 9, 2010
D. Radio Frequency Emissions Report, dated March 25, 2010
E. Photo Simulations

ATTACHMENT A

Findings for Approval

The findings required granting your application for Major Conditional Use Permit and Design Review found in Sections 17.134.050, 17.128.070(C), 17.128.070(B) and 17.136.050(D) of the Oakland Zoning Regulations, and the reasons your proposal satisfy these findings, are as follows:

SECTION 17.134.050 –CONDITIONAL USE PERMIT FINDINGS

A. That the location, size, design, and operating characteristics of the proposed development will be compatible with, and will not adversely affect, the livability or appropriate development of abutting properties and the surrounding neighborhood, with consideration to be given to harmony in scale, bulk, coverage, and density; to the availability of civic facilities and utilities; to harmful effect, if any upon desirable neighborhood character; to the generation of traffic and the capacity of surrounding streets; and to any other relevant impact of the development.

The proposal to collocate wireless communication antennas inside the existing tower of a commercial building will not adversely affect the development of the surrounding neighborhood. The 4 antenna panels and related conduits will be located behind window louvers, thus concealing their visibility from public view and surrounding properties. The equipment cabinet mounted on the rooftop of the three-story building and next to the tower is setback from the edge of the building roof to minimize its visibility from distant locations. The proposal includes a Radio Frequency Emissions report and determines that the antennas comply with the regulations set by the Federal Communication Commission. To comply with Radio Frequency Standards, staff recommends the applicant submits an RF Emissions report prior to the start of construction indicating the baseline RF emissions conditions at the site prior to new antenna installation, and a final RF Emissions report prior to the final building permit sign-off stating that the facility is operating within the acceptable thresholds. (See Condition of Approval # 16)

B. That the location, design, and site planning of the proposed development will provide a convenient and functional living, working, shopping, or civic environment, and will be as attractive as the nature of the use and its location and setting warrant.

The proposal to install 4 wireless communication antenna panels inside the commercial building tower will create a convenient and functional working environment. The development will provide high speed internet and quality landline wireless phone services to the general public. The antennas will be located behind window louvers on the building tower, thus minimizing any physical impact to the architecture of the commercial building.

C. That the proposed development will enhance the successful operation of the surrounding area in its basic community functions, or will provide an essential service to the community or region.

The proposal will provide wireless communication services to surrounding residential and commercial users. The location of the antennas is designed to cover distant areas such as Hwy. 880 and Hwy. 980, thus improving services to all users including emergency officials.

D. That the proposal conforms with all applicable Regular Design Review criteria set forth in Section 17.136.050 of the Oakland Planning Code.

The proposal is located in the CIX-1 and conforms to the applicable design review findings in section 17.128.070(B) for Macro Facilities. See design review findings listed below.

E. That the proposal conforms in all significant respects with the Oakland General Plan and with any other applicable plan or development control map which has been adopted by the City Council.

The proposal is located in the Business Mix Land Use Classification of the Oakland General Plan. The intent of the Business Mix Land Use Classification is to create, preserve, and enhance areas of the City that are appropriate for a wide variety of business, related commercial and industrial establishments, and other uses of similar business character. The proposal will provide services to a wide range of commercial and residential users as the quality and use of high speed internet and wireless phone services is in high demand. The development is compatible with the building because the antennas and related equipment will be concealed from public view.

SECTION 17.128.070 (C)–CONDITIONAL USE PERMIT CRITERIA FOR MACRO FACILITIES

1. The project must meet the special design review criteria listed in subsection B of this section.

   The proposal conforms to the design review criteria for Macro Facilities as described in section 17.128.070 (B). See design review findings listed below.

2. The proposed project must not disrupt the overall community character.

   The proposal will not disrupt the characteristics of the commercial and industrial mix zone. The collocation of the wireless antennas and related equipment will not be visible because the structures are located inside the building tower and setback from the edge of the building roof. Therefore, the development will be concealed from public view.

SECTION 17.128.070 (B)–DESIGN REVIEW CRITERIA FOR MACRO FACILITIES

1. Antennas should be painted and/or textured to match the existing structure.

   The proposal to install 4 antennas behind window louvers on the building tower and equipment cabinet on the rooftop of the three-story commercial building will not contrast with the building. The replacement of the existing window louvers with a fiberglass material will be painted to match the other existing louvers.

2. Antennas mounted on architecturally significant structures or significant architectural detail of the building should be covered by appropriate casings which are manufactured to match existing architectural features found in the building.

   The installation of the antennas and related equipment will not be mounted on the exterior of this architecturally significant building. Instead, the antennas will be installed behind window louvers on the building tower; and the equipment cabinet will be mounted on the rooftop of the three-story building. Therefore, the proposal does not require the installation of casings to cover the antennas or related equipment.

3. Where feasible, antennas can be placed directly above, below or incorporated with vertical design elements of a building to help in camouflaging.

The antennas will be located inside the building tower; therefore, the antennas do not need to be camouflaged.

4. Equipment shelters or cabinets shall be screened from the public view by using landscaping, or materials and colors consistent with surrounding backdrop or placed underground, inside existing facilities or behind screening fences.

   The proposal includes the installation of an equipment cabinet located on the rooftop of the three-story building and to the exterior rear side of the building tower. Staff finds that the equipment cabinet does not need screening because it is setback from the edge of the building parapet, and will not be visible from public view.

5. Equipment shelters or cabinets shall be consistent with the general character of the area.

   The location of the equipment cabinet is located on the rooftop of the three-story building. The cabinet measures 6 square feet in area, and 4.5 feet high. The structure will not disrupt the characteristics of the residential neighborhood.

6. For antennas attached to the roof, maintain a 1:1 ratio (example: ten feet high antenna requires ten feet setback from façade) for equipment setback; screen the antennas to match existing air conditioning units, stairs, or elevator towers; avoid placing roof mounted antennas in direct line with significant view corridors.

   The installation of the antennas is located inside the building tower, and will be screened by replacement window louvers. The installation of the equipment cabinet will be set back from the edge of the building roof. The 3 foot high parapet wall will also serve as a screening mechanism to avoid direct line visibility from significant view corridors.

7. That all reasonable means of reducing public access to the antennas and equipment has been made, including, but not limited to, placement in or on buildings or structures, fencing, anti-climbing measures and anti-tampering devices.

   The location of the wireless communication antennas and equipment cabinet are located within the interior of the building tower, and on the rooftop of the three-story building. Access to the rooftop requires a key for the security door. Access to the top of the building tower also requires access from an exterior latter that is locked from access.

SECTION 17.136.050 (D)–DESIGN REVIEW FINDINGS FOR POTENTIAL DESIGNATED HISTORIC PROPERTIES THAT ARE NOT LOCAL REGISTER PROPERTIES

1. The design matches or is compatible with, but not necessarily identical to, the property's existing or historical design; **or**

   The proposed antennas will be located inside the building tower, and will be screened by window louvers from public view. The proposal includes replacement of four of the existing wood windows louvers with new fiberglass plastic louvers. The new louvers will be painted to match the original brown color. The proposal is supported by the Historic Planner, because the antennas will be concealed and the new replacement window louvers will match to the original design and color, thus preserving the historical significance of the building.

2. The proposed design comprehensively modifies and is at least equal in quality to the existing design and is compatible with the character of the neighborhood; **or**

3. The existing design is undistinguished and does not warrant retention and the proposed design is compatible with the character of the neighborhood.

FINDINGS

ATTACHMENT B

Conditions of approval

1. **Approved Use**

Ongoing

a) The project shall be constructed and operated in accordance with the authorized use as described in the application materials, and the *revised* design review plans dated **February 2, 2010** and submitted to the City on **March 9, 2010**, and as amended by the following conditions. Any additional uses or facilities other than those approved with this permit, as described in the project description and the approved plans, will require a separate application and approval. Any deviation from the approved drawings, Conditions of Approval or use shall required prior written approval from the Director of City Planning or designee.

b) This action by the **Planning Commission** ("this Approval") includes the approvals set forth below. This Approval includes the installation of 4 wireless communication antennas and 1 equipment cabinet located inside the building tower, and on the rooftop of the three-story building located at 2235 Chestnut Street.

2. **Effective Date, Expiration, Extensions and Extinguishment**

Ongoing

Unless a different termination date is prescribed, this Approval shall expire **two (2) years** from the approval date, unless within such period all necessary permits for construction or alteration have been issued, or the authorized activities have commenced in the case of a permit not involving construction or alteration. Upon written request and payment of appropriate fees submitted no later than the expiration date of this permit, the Director of City Planning or designee may grant a one-year extension of this date, with additional extensions subject to approval by the approving body. Expiration of any necessary building permit for this project may invalidate this Approval if the said extension period has also expired.

3. **Scope of This Approval; Major and Minor Changes**

Ongoing

The project is approved pursuant to the **Planning Code** only. Minor changes to approved plans may be approved administratively by the Director of City Planning or designee. Major changes to the approved plans shall be reviewed by the Director of City Planning or designee to determine whether such changes require submittal and approval of a revision to the approved project by the approving body or a new, completely independent permit.

4. **Conformance with other Requirements**

Prior to issuance of a demolition, grading, P-job, or other construction related permit

a) The project applicant shall comply with all other applicable federal, state, regional and/or local laws/codes, requirements, regulations, and guidelines, including but not limited to those imposed by the City's Building Services Division, the City's Fire Marshal, and the City's Public Works Agency. Compliance with other applicable requirements may require changes to the approved use and/or plans. These changes shall be processed in accordance with the procedures contained in Condition of Approval #3.

b) The applicant shall submit approved building plans for project-specific needs related to fire protection to the Fire Services Division for review and approval, including, but not limited to automatic extinguishing systems, water supply improvements and hydrants, fire department access, elevated walking pathways, safety railings, emergency lighting and vegetation management for preventing fires.

5. **Conformance to Approved Plans; Modification of Conditions or Revocation**
   Ongoing
   a) Site shall be kept in a blight/nuisance-free condition. Any existing blight or nuisance shall be abated within 60-90 days of approval, unless an earlier date is specified elsewhere.

   b) The City of Oakland reserves the right at any time during construction to require certification by a licensed professional that the as-built project conforms to all applicable zoning requirements, including but not limited to approved maximum heights and minimum setbacks. Failure to construct the project in accordance with approved plans may result in remedial reconstruction, permit revocation, permit modification, stop work, permit suspension or other corrective action.

   c) Violation of any term, **conditions of approval** or **project description** relating to the Approvals is unlawful, prohibited, and a violation of the Oakland Municipal Code. The City of Oakland reserves the right to initiate civil and/or criminal enforcement and/or abatement proceedings, or after notice and public hearing, to revoke the Approvals or alter these **conditions of approval** if it is found that there is violation of any of the **conditions of approval** or the provisions of the Planning Code or Municipal Code, or the project operates as or causes a public nuisance. This provision is not intended to, nor does it, limit in any manner whatsoever the ability of the City to take appropriate enforcement actions. The project applicant shall be responsible for paying fees in accordance with the City's Master Fee Schedule for inspections conducted by the City or a City-designated third-party to investigate alleged violations of the Conditions of Approval.

6. **Signed Copy of the Conditions of Approval**
   With submittal of a demolition, grading, and building permit
   A copy of the approval letter and **Conditions of Approval** shall be signed by the property owner, notarized, and submitted with each set of permit plans to the appropriate City agency for this project.

7. **Indemnification**
   Ongoing
   a. To the maximum extent permitted by law, the applicant shall defend (with counsel acceptable to the City), indemnify, and hold harmless the City of Oakland, the Oakland City Council, the City of Oakland Redevelopment Agency, the Oakland City Planning Commission and its respective agents, officers, and employees (hereafter collectively called City) from any liability, damages, claim, judgment, loss (direct or indirect)action, causes of action, or proceeding (including legal costs, attorneys' fees, expert witness or consultant fees, City Attorney or staff time, expenses or costs) (collectively called "Action") against the City to attack, set aside, void or annul, (1) an approval by the City relating to a development-related application or subdivision or (2) implementation of an approved development-related project. The City may elect, in its sole discretion, to participate in the defense of said Action and the applicant shall reimburse the City for its reasonable legal costs and attorneys' fees.
   b. Within ten (10) calendar days of the filing of any Action as specified in subsection A above, the applicant shall execute a Letter Agreement with the City, acceptable to the Office of the City Attorney, which memorializes the above obligations. These obligations and the Letter of Agreement shall survive termination, extinguishment or invalidation of the approval. Failure to timely execute the Letter Agreement does not relieve the applicant of any of the obligations contained in this condition or other requirements or conditions of approval that may be imposed by the City.

8. **Compliance with Conditions of Approval**
Ongoing
The project applicant shall be responsible for compliance with the recommendations in any submitted and approved technical report and all the Conditions of Approval set forth below at its sole cost and expense, and subject to review and approval of the City of Oakland.

9. **Severability**
Ongoing
Approval of the project would not have been granted but for the applicability and validity of each and every one of the specified **conditions of approval**, and if one or more of such **conditions of approval** is found to be invalid by a court of competent jurisdiction this Approval would not have been granted without requiring other valid **conditions of approval** consistent with achieving the same purpose and intent of such Approval.

10. **Job Site Plans**
Ongoing throughout demolition, grading, and/or construction
At least one (1) copy of the stamped approved plans, along with the Approval Letter and Conditions of Approval, shall be available for review by City officials and project developer at the job site at all times.

11. **Special Inspector/Inspections, Independent Technical Review, Project Coordination and Management**
Prior to issuance of a demolition, grading, and/or construction permit
The project applicant may be required to pay for on-call third-party special inspector(s)/inspections as needed during the times of extensive or specialized plancheck review or construction. The project applicant may also be required to cover the full costs of independent technical review and other types of peer review, monitoring and inspection, including without limitation, third party plan check fees, including inspections of violations of Conditions of Approval. The project applicant shall establish a deposit with the Building Services Division, as directed by the Building Official, Director of City Planning or designee.

12. **Noise Control**
Ongoing throughout demolition, grading, and/or construction
To reduce noise impacts due to construction, the project applicant shall require construction contractors to implement a site-specific noise reduction program, subject to the Planning and Zoning Division and the Building Services Division review and approval, which includes the following measures:

a) Equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).

b) Except as provided herein, Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used, if such jackets are commercially available and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.

c) Stationary noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the City to provide equivalent noise reduction.

d) The noisiest phases of construction shall be limited to less than 10 days at a time. Exceptions may be allowed if the City determines an extension is necessary and all available noise reduction controls are implemented.

13. Noise Complaint Procedures

Ongoing throughout demolition, grading, and/or construction

Prior to the issuance of each building permit, along with the submission of construction documents, the project applicant shall submit to the Building Services Division a list of measures to respond to and track complaints pertaining to construction noise. These measures shall include:

a) A procedure and phone numbers for notifying the Building Services Division staff and Oakland Police Department; (during regular construction hours and off-hours).

b) A sign posted on-site pertaining with permitted construction days and hours and complaint procedures and who to notify in the event of a problem. The sign shall also include a listing of both the City and construction contractor's telephone numbers (during regular construction hours and off-hours).

c) The designation of an on-site construction complaint and enforcement manager for the project.

d) Notification of neighbors and occupants within 300 feet of the project construction area at least 30 days in advance of extreme noise generating activities about the estimated duration of the activity; and

e) A preconstruction meeting shall be held with the job inspectors and the general contractor/on-site project manager to confirm that noise measures and practices (including construction hours, neighborhood notification, posted signs, etc.) are completed.

14. Operational Noise-General

Ongoing.

Noise levels from the activity, property, or any mechanical equipment on site shall comply with the performance standards of Section 17.120 of the Oakland Planning Code and Section 8.18 of the Oakland Municipal Code. If noise levels exceed these standards, the activity causing the noise shall be abated until appropriate noise reduction measures have been installed and compliance verified by the Planning and Zoning Division and Building Services.

15. Lighting Plan

Prior to the issuance of an electrical or building permit

The proposed lighting fixtures shall be adequately shielded to a point below the light bulb and reflector and that prevent unnecessary glare onto adjacent properties. Plans shall be submitted to the Planning and Zoning Division and the Electrical Services Division of the Public Works Agency for review and approval. All lighting shall be architecturally integrated into the site.

SPECIFIC PROJECT CONDITIONS

16. Radio Frequency (RF) Emissions

a. Prior to issuance of a building permit.

The applicant shall submit a certified RF Emissions report to the City indicating the baseline RF Emissions condition at the site.

b. ***Prior to the issuance of a final building permit sign off.***
The applicant shall submit a certified RF Emissions report to the City indicating that the site is actually operating within the acceptable thresholds as established by the regulatory Federal government or any such agency who may be subsequently authorized to establish such standard.

17. Sinking Fund for Facility Removal or Abandonment.
Prior to issuance of a building permit.
The applicant shall provide proof of the establishment of a sinking fund to cover the cost of removing the facility if it is abandoned within a prescribed period. The word "abandoned" shall mean a facility that has not been operational for a six (6) month period, except where nonoperation is the result of maintenance of renovation activity pursuant to valid City permits. The sinking fund shall be established to cover a two-year period, at a financial institution approved by the City's Office of Budget and Finance. The sinking fund payment shall be determined by the Office of Budget and Finance and shall be adequate to defray expenses associated with the removal of the telecommunication facility.

18. Encroachment Permits
Prior to issuance of a demolition, grading or building permit
The applicant shall obtain any encroachment permits, waiver of damages or other approvals required by the Building Services Division, for any privately constructed public improvements, or any permanent or temporary elements located in the public right of way. This shall include telecommunication equipment, overhead wires, underground trenching, etc.

APPROVED BY:

City Planning Commission:_____(date)_____(vote)

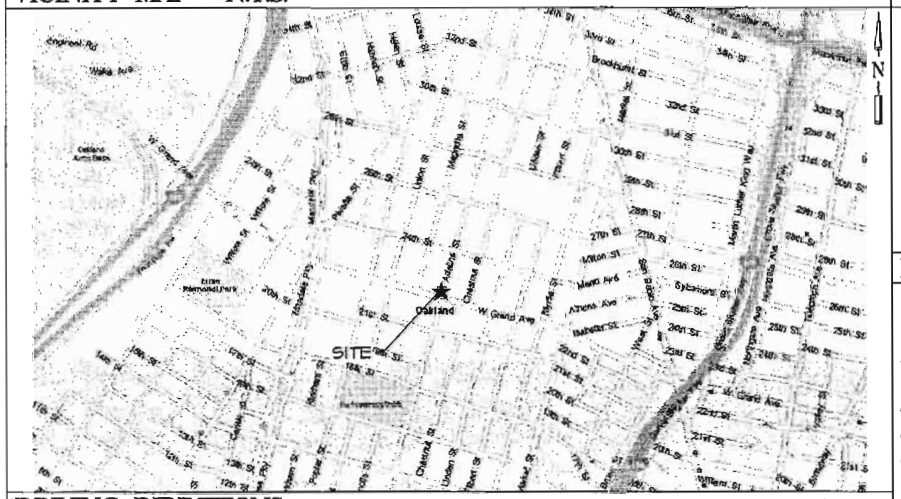
clearwire®

WEST GRAND - ADELINE
CA-SFO0135A
2200 ADELINE ST, OAKLAND, CA

SIGNATURE BLOCK

ZONING MANAGER	DATE
SITE ACQ. MANAGER	DATE
RF MANAGER	DATE
MICROWAVE MANAGER	DATE
CONSTRUCTION MANAGER	DATE
CLEARWIRE CONSTRUCTION MANAGER	DATE

VICINITY MAP - N.T.S.



DRIVING DIRECTIONS

FROM: CLEARWIRE REGIONAL OFFICE
2999 OAK ROAD, SUITE 110
WALNUT CREEK, CA 94597

TO: WEST GRAND - ADELINE
2200 ADELINE ST
OAKLAND, CA

DISTANCE: 17.9 MILES

DEPART 2999 OAK RD, WALNUT CREEK CA ON OAK RD (SOUTH-EAST)
TAKE LOCAL ROAD(S) (RIGHT) ONTO TREAT BLVD
TAKE LOCAL ROAD(S) (RIGHT) ONTO N MAIN ST
TAKE RAMP (RIGHT) ONTO I-680 (SINCLAIR FWY) FOR 1.4 MI TOWARDS I-680 / OAKLAND / SAN JOSE
TAKE RAMP (RIGHT) ONTO SR-24 (GROVE SHAFTER FWY) FOR 14.1 MI TOWARDS CA-24 / OAKLAND / LAFAYETTE
ROAD NAME CHANGES TO I-980 (GROVE SHAFTER FWY)
TURN RIGHT ONTO RAMP FOR 0.3 MI TOWARDS 27TH STREET / WEST GRAND AVE
BEAR RIGHT (SOUTH) ONTO NORTHGATE AVE
TURN RIGHT (WEST) ONTO W GRAND AVE
ARRIVE AT 2200 ADELINE ST, OAKLAND, CA

CODE COMPLIANCE

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

- CALIFORNIA ADMINISTRATIVE CODE (INCL TITLE 24 & 25)
- 2007 CALIFORNIA BUILDING CODE
- CITY/COUNTY ORDINANCES
- BUILDING OFFICIALS AND CODE ADMINISTRATORS (BOCA)
- 2007 CALIFORNIA MECHANICAL CODE
- ANSI/EIA-222-F LIFE SAFETY CODE NFPA-101
- 2007 CALIFORNIA PLUMBING CODE
- 2007 CALIFORNIA ELECTRICAL CODE
- LOCAL BUILDING CODE

BUILDING/SITE DATA LEGEND

LATITUDE:	37°48'57.65" N (NAD 83)
LONGITUDE:	122°17'01.02" W (NAD 83)
A.P.N.:	009-0427-003
ZONING:	COMMERCIAL
OCCUPANCY:	U, UNMANNED
CONSTRUCTION TYPE:	V-B
CONSTRUCTION AREA:	50 SQ. FT.
ADA REQ.:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. ADA ACCESS NOT REQUIRED.
TITLE 24 REQ.:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. TITLE 24 IS EXEMPT.

PROJECT DESCRIPTION

INSTALLATION OF A WIRELESS COMMUNICATIONS FACILITY, INCLUDING THE INSTALLATION OF (1) EQUIPMENT CABINET, (1) INTERNET SERVICES EXCHANGE POINT, AND (3) PANEL ANTENNAS

PROJECT SUMMARY

PROPERTY OWNER:
WEST GRAND-ADELINE ASSOCIATES
CONTACT: FRANCIS RUSH
PHONE: (510) 763-7165

APPLICANT:
CLEARWIRE CORP.
4400 CARILLON PT
KIRKLAND, WA

LEASING MANAGER:
CORTEL, LLC
CONTACT: JOHN MERRITT
PHONE: (805) 886-0733

ZONING MANAGER:
CORTEL, LLC
CONTACT: MICHELLE WELLER
PHONE: (925) 997-1312

CONSULTANT:
TRK ENGINEERING LTD.
#201 - 17688 66TH AVE
SURREY, BC V3S 7X1, CANADA
CONTACT: RICK PARSONS
PHONE: (604) 574-6432

CONSTRUCTION MANAGER:
CORTEL, LLC
CONTACT: CHRISTOPHER ROBINSON
PHONE: (510) 823-6418

SHEET INDEX

REV	DWG	NAME
2	T-1	TITLE SHEET
2	A-1	SITE PLAN
2	A-2	PARTIAL ROOF PLANS
2	A-3	NORTH AND SOUTH ELEVATIONS
2	A-4	EAST AND WEST ELEVATIONS
2	A-5	EQUIPMENT DETAILS
2	A-6	ANTENNA DETAILS

RECEIVED
MAR 09 2010
CITY PLANNING COMMISSION
ZONING DIVISION

clearwire
4400 CARILLON PT. KIRKLAND, WA

Cortel, LLC

TRK ENGINEERING
#201 - 17688 66TH AVE
SURREY, BC V3S 7X1, CANADA
TEL: (604) 574-6432
FAX: (604) 574-6431
TOLL FREE: 1-877-848-4045
EMAIL: mail@trkeng.com
WEB: www.trkeng.com

PROJECT NO: 0940-006
DRAWN BY: A.P.
CHECKED BY: P.A.
CAD FILE: 0940-006TI

SUBMITTALS

3	FEB 03/10	REVISED PER CITY
1	OCT 14/09	REVISED EQUIPMENT LOCATION
0	SEP 10/09	30% REV 0
A	AUG 24/09	30% REV A

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY AT NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO THE CLIENT NAMED IS STRICTLY PROHIBITED.

AIR SEAL

SITE
WEST GRAND - ADELINE
CA-SFO0135A
2200 ADELINE ST
OAKLAND, CA

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

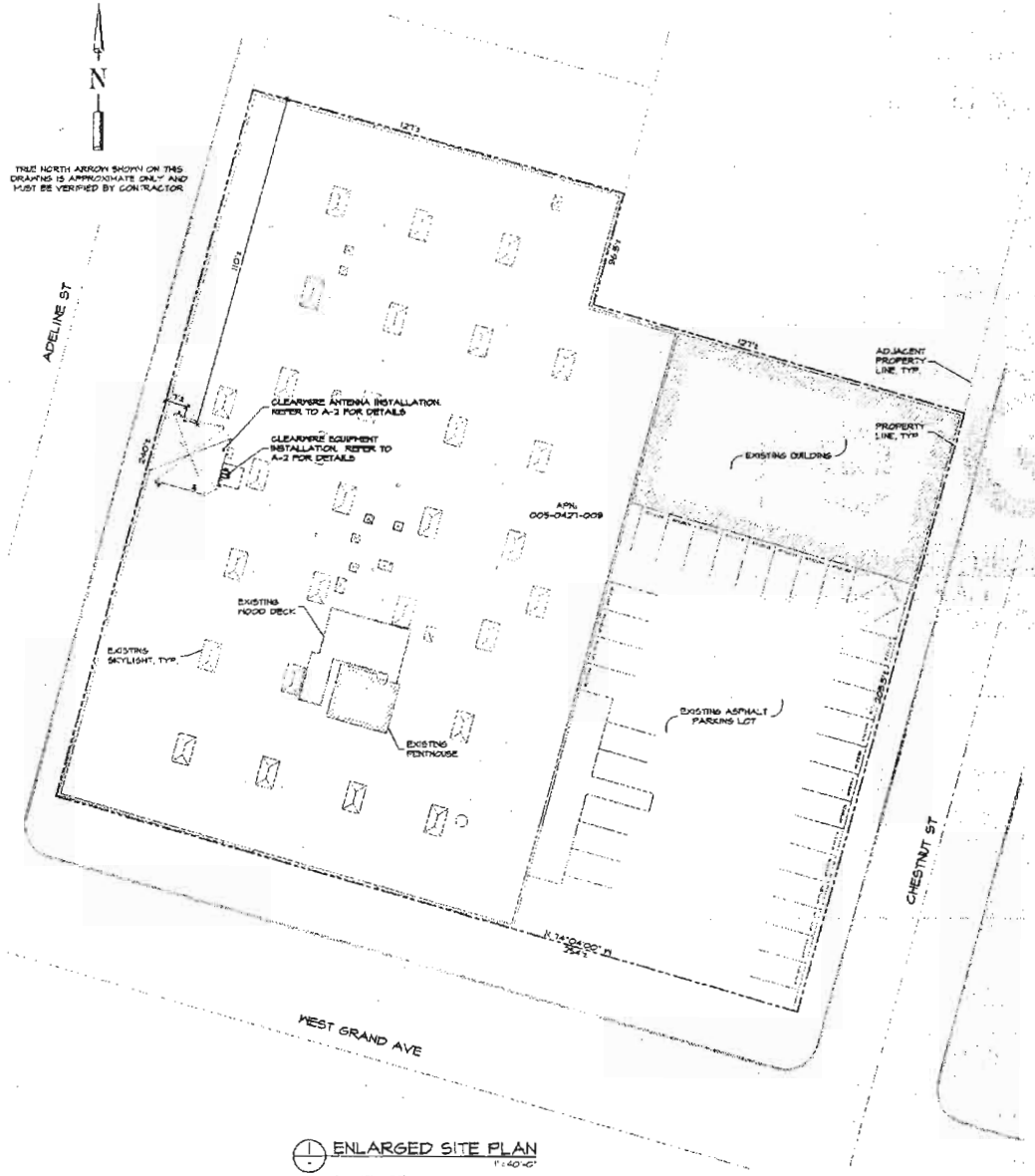
ATTACHMENT C

NOTES:

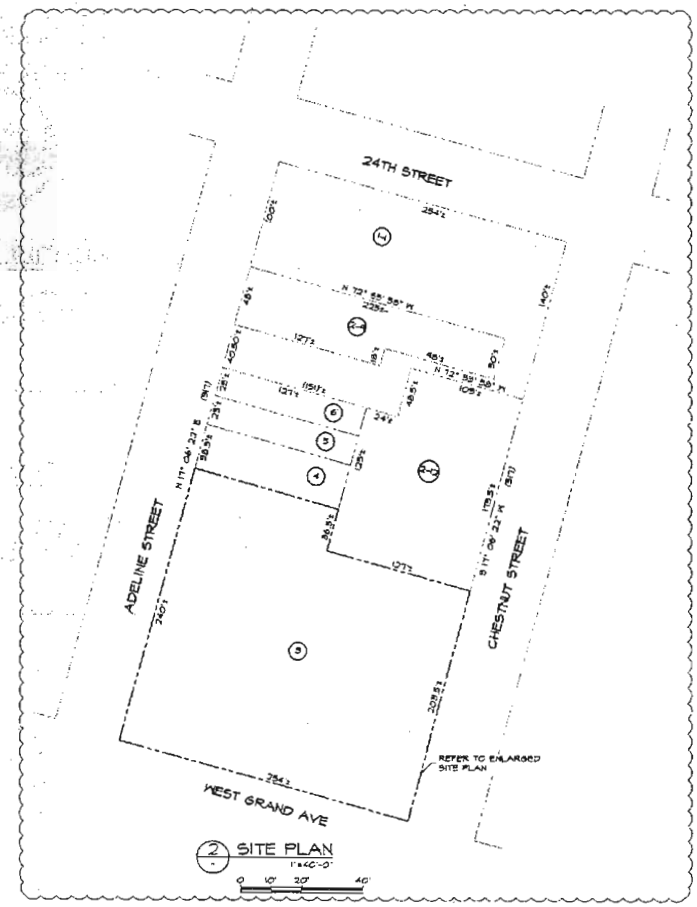
1. SITE PLAN INFORMATION WAS OBTAINED FROM A DRAWING PREPARED BY DAVID EVANS AND ASSOCIATES, INC., DATED APRIL 14, 2000 AND CITY OF OAKLAND CONTENT MAP. THIS DRAWING DOES NOT REPRESENT A SURVEY. ALL DIMENSIONS ARE APPROXIMATE ONLY.

N

TRUE NORTH ARROW SHOWN ON THIS DRAWING IS APPROXIMATE ONLY AND MUST BE VERIFIED BY CONTRACTOR.



1 ENLARGED SITE PLAN
1" = 40'-0"
0 10' 20' 40'



2 SITE PLAN
1" = 40'-0"
0 10' 20' 40'

clearwire
4400 CARILLON PT. KIRKLAND, WA

Cortel, LLC

TRK ENGINEERING
#201 - 17688 66TH AVE
SURREY, BC V3S 7X1 CANADA
TEL: (604) 574-6452
FAX: (604) 574-6451
TOLL FREE: 1-877-545-4045
EMAIL: mail@trkeng.com
WEB: www.trkeng.com

PROJECT NO:	0440-006
DRAWN BY:	A.T.
CHECKED BY:	P.A.
CAD FILE:	0440-006A1

SUBMITTALS

2	FEB 03/10	REVISED PER CITY
1	OCT 14/09	REVISED EQUIPMENT LOCATION
0	SEP 10/09	ZDN REV 0
A	AUG 24/09	ZDN REV A

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AHJ SEAL

SITE

WEST GRAND - ADELINE
CA-SF00135A
2200 ADELINE ST
OAKLAND, CA

SHEET TITLE

SITE PLAN

SHEET NUMBER

A-1

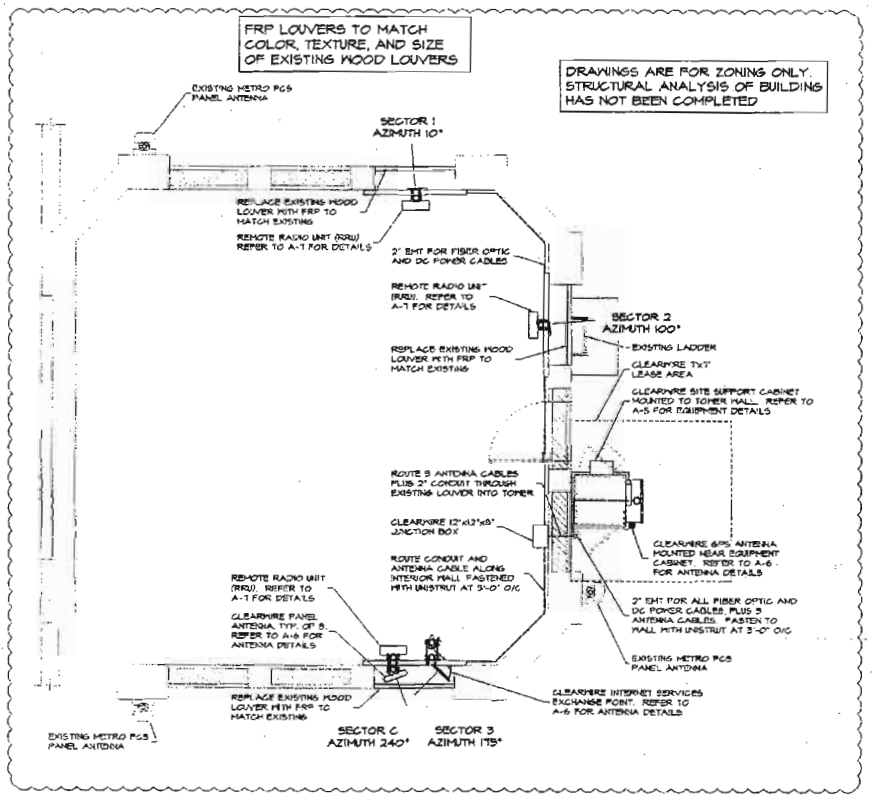
INTERNET SERVICES EXCHANGE POINT INFORMATION					
SECTOR	AZIMUTH	DISH SIZE	ANTENNA	QUANTITY	RAD CENTER
C	240°	1'-0" DIA	ANDREW	1	41'-0"±

PANEL ANTENNA INFORMATION				
SECTOR	AZIMUTH	ANTENNA	QUANTITY	RAD CENTER
1	10°	KATHREIN	1	66'-0"±
2	100°	KATHREIN	1	66'-0"±
3	175°	KATHREIN	1	66'-0"±

GPS ANTENNA LOCATION OPTIONS: (1) EQUIPMENT CABINET, (2) ANTENNA MAST, (3) SUPPORT POST, FIELD VERIFY

LABEL MARKINGS SHALL BE PLACED:
A. WITHIN 12" OF CABLE AT BOTH ENDS.
B. AT NEAR TOWER GROUND BAR.
C. EITHER PRIOR TO ENTRY INTO CABINET OR AT CABLE SUPPORT BRIDGE.

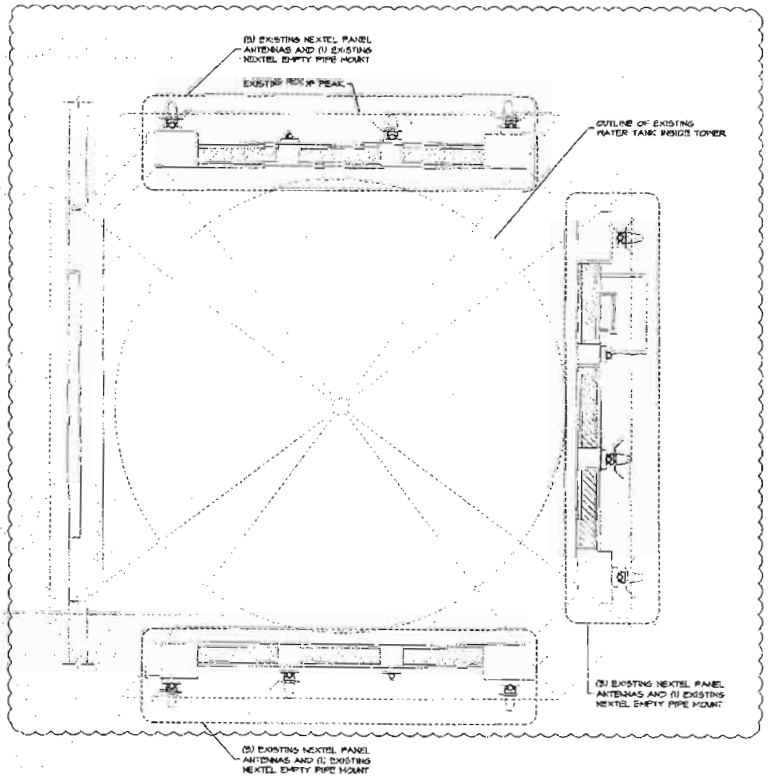
TRUE NORTH ARROW SHOWN ON THIS DRAWING IS APPROXIMATE ONLY AND MUST BE VERIFIED BY CONTRACTOR



1 PARTIAL ROOF PLAN (SHOWN BELOW NEXTEL ANTENNAS)

3/16"=1'-0"

0 1' 2' 4'



2 PARTIAL ROOF PLAN (FROM TOP)

3/16"=1'-0"

0 1' 2' 4'

clearwire
4400 CARILLON PT. KIRKLAND, WA

Cortel, LLC

TRK ENGINEERING
#201 - 17686 66TH AVE
SURREY, BC V3S 7X1 CANADA
TEL: (604) 574-6-82
FAX: (604) 574-6451
TOLL FREE: 1-877-545-4045
EMAIL: mail@trkeng.com
WEB: www.trkeng.com

PROJECT NO: 0840-006

DRAWN BY: A.F.

CHECKED BY: P.A.

CAD FILE: 0840-006A2

SUBMITTALS

2	FEB 02/10	REVISED PER CITY
1	OCT 19/09	REVISED EQUIPMENT LOCATION
0	SEP 10/09	ZON REV 0
A	AUG 24/09	ZON REV A

THIS INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO THE CLIENT NAMED IS STRICTLY PROHIBITED.

AFE DEAL

SITE

WEST GRAND - ADELINE
CA-SF00135A
2200 ADELINE ST
OAKLAND, CA

SHEET TITLE

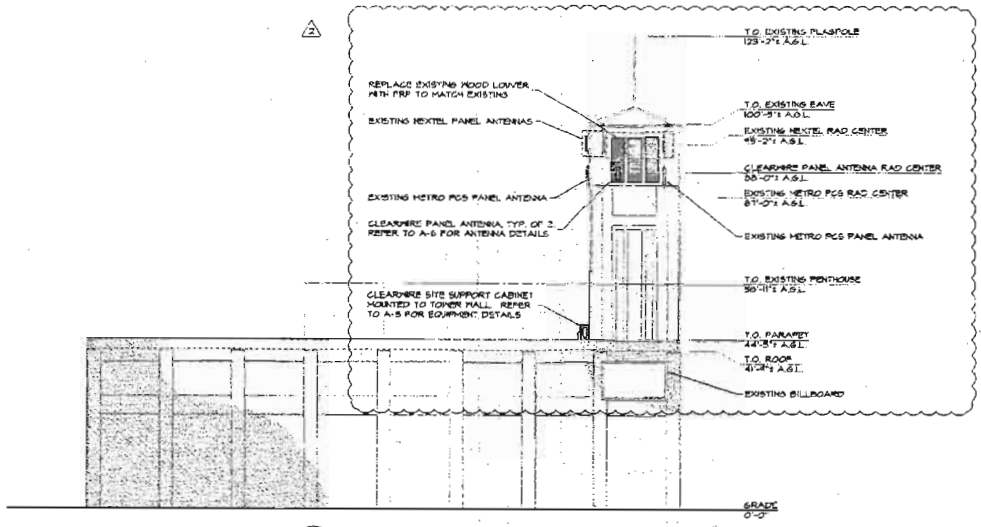
PARTIAL ROOF PLANS

SHEET NUMBER

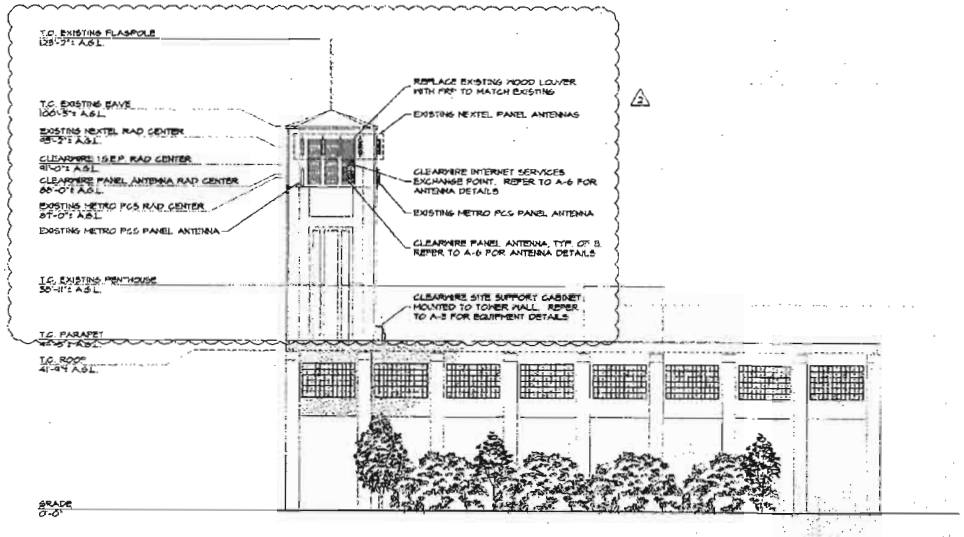
A-2

NOTES:

1. ELEVATION IS DIAGRAMMATIC ONLY.
2. PAINT CLEARWIRE ANTENNAS, MOUNTING HARDWARE, VISIBLE CABLE TRAY, ANTENNA CABLES AND CONDUITS TO MATCH EXISTING BUILDING COLOR.



1 NORTH ELEVATION
1/8"=1'-0"
0 8' 16' 32'



2 SOUTH ELEVATION
1/8"=1'-0"
0 8' 16' 32'

clearwire
4400 CARILLON PT. KIRKLAND, WA

Cortel, LLC

TRK ENGINEERING
#201 - 17880 66TH AVE
SURREY, BC V3S 7X6, CANADA
TEL: (604) 574-6431
FAX: (604) 574-6431
TOLL FREE: 1-877-545-4049
EMAIL: mail@trkeng.com
WEB: www.trkeng.com

PROJECT NO 0940-006

DRAWN BY: A.F.

CHECKED BY: P.A.

CAD FILE: 0940-006A3

SUBMITTALS

3	FEB 07/10	REVISED PER CITY
1	OCT 14/09	REVISED EQUIPMENT LOCATION
0	SEP 10/09	70% REV 0
A	AUG 24/09	25% REV A

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AFE SEAL

SITE

WEST GRAND - ADELINE
CA-SF00135A
2200 ADELINE ST
OAKLAND, CA

SHEET TITLE

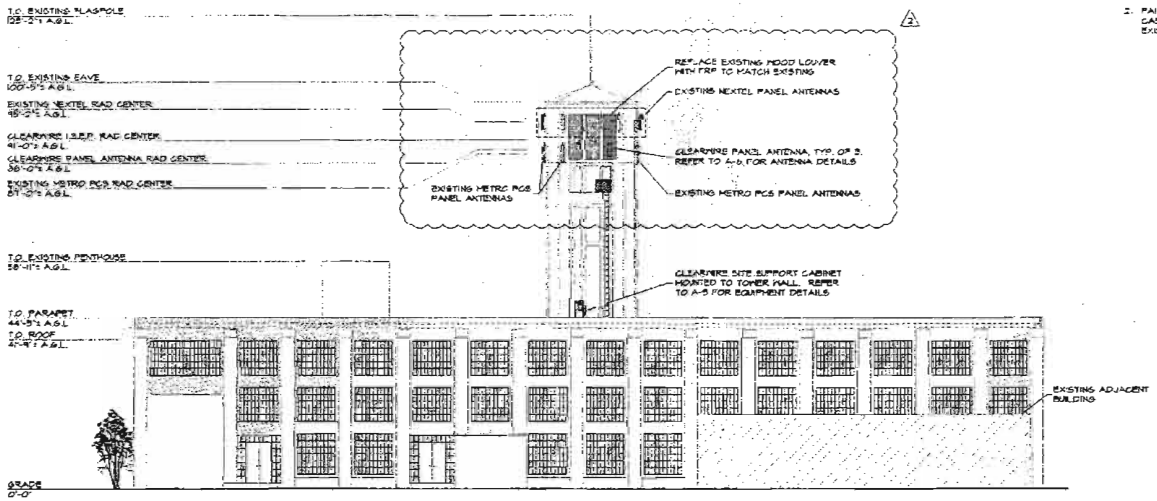
NORTH AND SOUTH ELEVATIONS

SHEET NUMBER

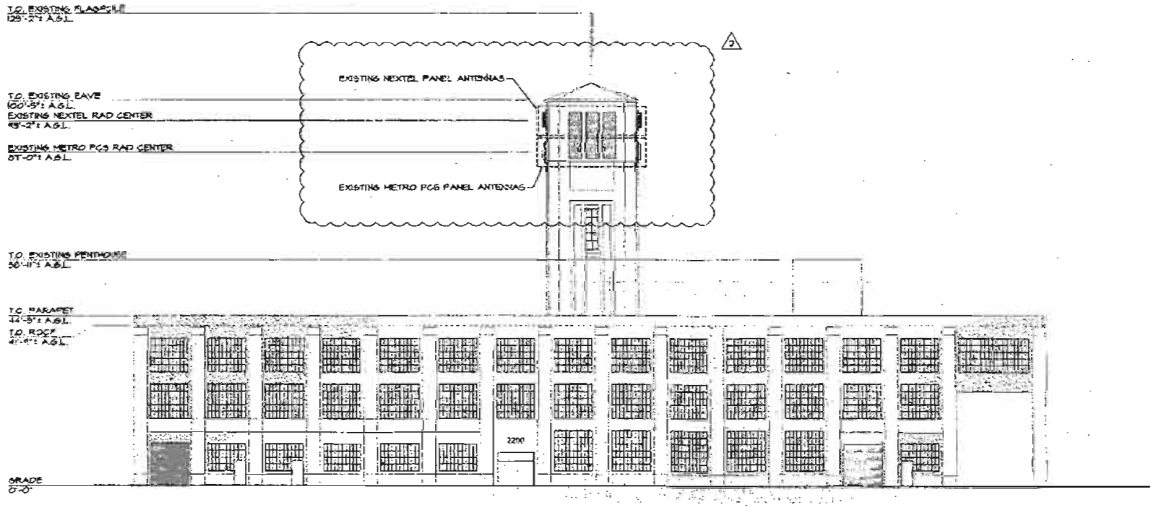
A-3

NOTES:

1. ELEVATION IS DIAGRAMMATIC ONLY.
2. PAINT CLEARWIRE ANTENNAS, MOUNTING HARDWARE, VISIBLE CABLE TRAY, ANTENNA CABLES AND CONDUITS TO MATCH EXISTING BUILDING COLOR.



1 EAST ELEVATION
1/32"=1'-0"
0 8' 16' 32'



2 WEST ELEVATION
1/32"=1'-0"
0 8' 16' 32'

clearwire
4400 CARILLON PT. KIRKLAND, WA

Cortel, LLC

TRK ENGINEERING
#201 - 17688 66TH AVE
SURREY, BC V3S 7X1 CANADA
TEL: (604) 574-6453
FAX: (604) 574-6451
TOLL FREE: 1-877-548-4045
EMAIL: mail@trkeng.com
WEB: www.trkeng.com

PROJECT NO: 0440-006

DRAWN BY: A.F.

CHECKED BY: P.A.

CAD FILE: 0440-006A4

SUBMITTALS

2	FEB 03/10	REVISED FOR CITY
1	OCT 14/09	REVISED EQUIPMENT LOCATION
0	SEP 10/09	ZDS REV 0
A	AUG 24/09	ZDS REV A

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AHJ SEAL

SITE

WEST GRAND - ADELINE
CA-SF00135A
2200 ADELINE ST
OAKLAND, CA

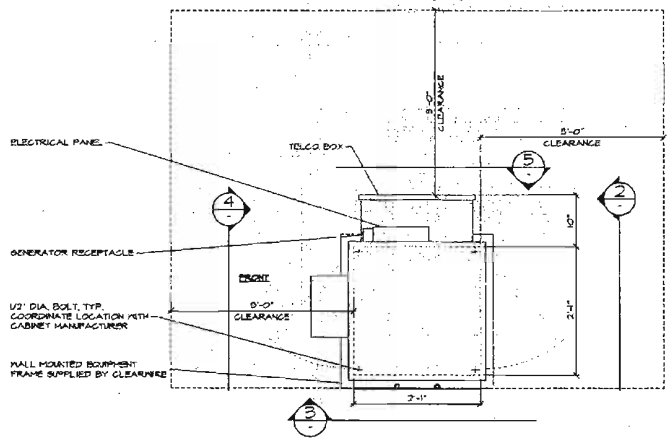
SHEET TITLE

EAST AND WEST ELEVATIONS

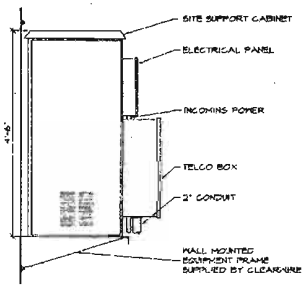
SHEET NUMBER

A-4

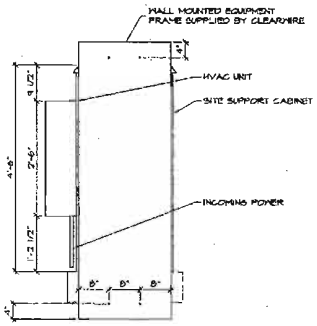
OUTDOOR	
OUTDOOR SITE SUPPORT CABINET WEIGHT = 550lbs	
CABINET DIMENSIONS	28"(W) x 24"(D) x 84.3"(H)
MIN. CLEARANCES	
CABINET REAR AND WALL	36"
CABINET RIGHT SIDE AND WALL	T.B.D.
CABINET LEFT SIDE AND WALL	36" FROM TELCO BOX
ABOVE CABINET	T.B.D.
IN FRONT OF CABINET	36"



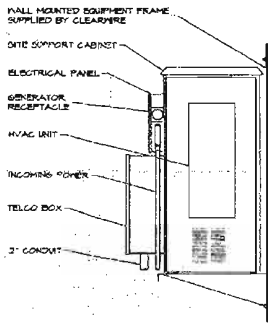
1 SSC EQUIPMENT LAYOUT
1/2"=1'-0"



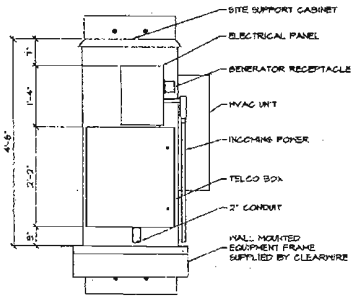
2 SSC EQUIPMENT ELEVATION
3/8"=1'-0"



3 SSC EQUIPMENT ELEVATION
3/8"=1'-0"



4 SSC EQUIPMENT ELEVATION
3/8"=1'-0"



5 SSC EQUIPMENT ELEVATION
3/8"=1'-0"

clearwire
4224 CARILLON PT. KIRKLAND, WA

Cortel, LLC

TRK ENGINEERING
#201 - 7686 96TH AVE
SURREY, BC V3S 7X1, CANADA
TEL: (604) 574-8452
FAX: (604) 574-6431
TOLL FREE: 1-877-348-4045
EMAIL: mail@trkeng.com
WEB: www.trkeng.com

PROJECT NO: 0440-006

DRAWN BY: A.H.

CHECKED BY: P.A.

CAD FILE: 0440-006A5

SUBMITTALS

2	FEB 02/10	REVISED PER CITY
1	DEC 11/09	REVISED EQUIPMENT LOCATION
0	SEP 10/09	ZDs REV 0
A	AUG 24/08	ZDs REV A

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SITE

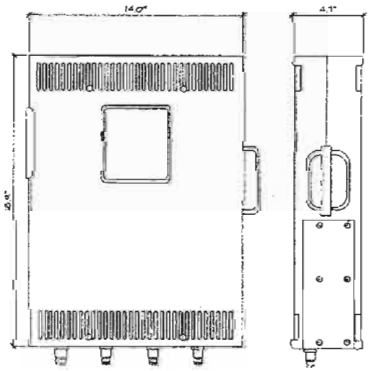
WEST GRAND - ADELINE
CA-SF00135A
2200 ADELINE ST
OAKLAND, CA

SHEET TITLE

EQUIPMENT DETAILS

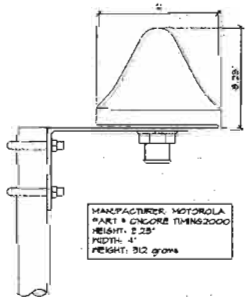
SHEET NUMBER

A-5



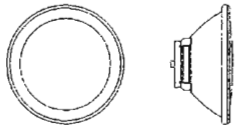
LENGTH: 18.4"
WIDTH: 14.0"
DEPTH: 4.1"
WEIGHT: 55 LBS (W/ SOLAR SHIELD AND MOUNTING BRACKETS)

1 RRU SPECIFICATION
N.T.S.



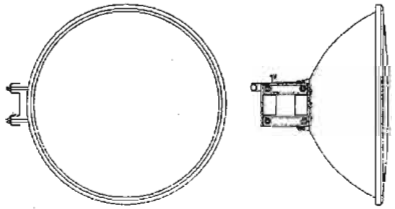
MANUFACTURER: MOTOROLA
PART # ONCORE TMNS2000
HEIGHT: 8.25"
WIDTH: 4"
WEIGHT: 312 grams

2 GPS SPECIFICATION
N.T.S.



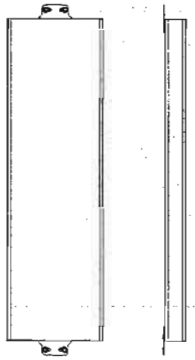
MANUFACTURER: ANDREW
DIAMETER: 19.9"
DEPTH: 8.1"
WEIGHT: 14.2 lbs

3 I.S.E.P. SPECIFICATION
N.T.S.



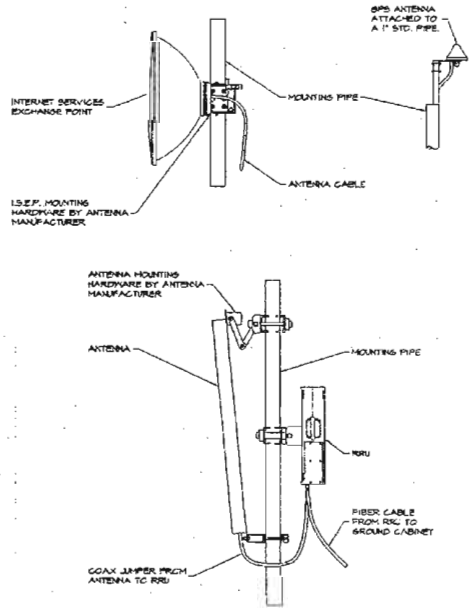
MANUFACTURER: ANDREW
DIAMETER: 26.1"
DEPTH: 19.2"
WEIGHT: 27 lbs

4 I.S.E.P. SPECIFICATION
N.T.S.



MANUFACTURER: KATHREIN
LENGTH: 45.9"
WIDTH: 12.1"
DEPTH: 5.4"
WEIGHT: 35 lbs

5 ANTENNA SPECIFICATION
N.T.S.



6 GENERIC ANTENNA MOUNTING DETAIL
N.T.S.

clearwire
4400 CARILLON PT. KIRKLAND, WA

Cortel, LLC

TRK ENGINEERING
#201 - 17688 66TH AVE
SURREY, BC V3S 7X1 CANADA
TEL: (604) 574-6433
FAX: (604) 574-6451
TOLL FREE: 1-877-545-4045
EMAIL: mail@trkeng.com
WEB: www.trkeng.com

PROJECT NO: 0940-006

DRAWN BY: A.F.

CHECKED BY: P.A.

CAD FILE: 0940-006A6

SUBMITTALS

2	FEB 07/10	REVISED PER CITY
1	OCT 14/09	REVISED EQUIPMENT LOCATION
0	SEP 15/09	ZDN REV 0
A	AUG 24/09	ZDN REV A

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT SUCH PRIVILEGE TO THE CLIENT NAMED IS STRICTLY PROHIBITED.

AHJ SEAL

SITE

WEST GRAND - ADELINE
CA-SF00135A
2200 ADELINE ST
OAKLAND, CA

SHEET TITLE

ANTENNA DETAILS

SHEET NUMBER

A-6

TRK ENGINEERING

FEDERAL COMMUNICATIONS COMMISSION (FCC) COMPLIANCE STUDY ON RADIO FREQUENCY ELECTROMAGNETIC FIELDS EXPOSURE

Prepared for:

clearwire
wireless broadband

CA-SFO0135A
WEST GRAND - ADELINE
2200 ADELINE ST
OAKLAND, CA

MARCH 25/10, REV. 1

ATTACHMENT D

SITE DESCRIPTION:

Carrier:	Clearwire wireless broadband
Site Address:	2200 Adeline St, Oakland, CA
Type of Service:	MMDS (Multichannel Multipoint Distribution Service)
Sectors:	10°, 100°, 175°
Antenna Type:	Kathrein 840 10054
Number of Antennas:	3
Frequencies *(GHz)*:	2.5 – 2.7
Maximum Power:	969 W ERP (per sector)
Antenna Height:	88'± *(radiation center AGL)*

Table 1. Clearwire RF summary

Clearwire is proposing to construct a wireless broadband facility on a tower on top of an existing building at the above address (Figure 1). Three panel antennas with horizontal beam width of 87° will be mounted inside the tower behind FRP screens. A site support cabinet will also be mounted onto the northeast corner at the base of the tower. Access to the facility is restricted to authorized personnel only.

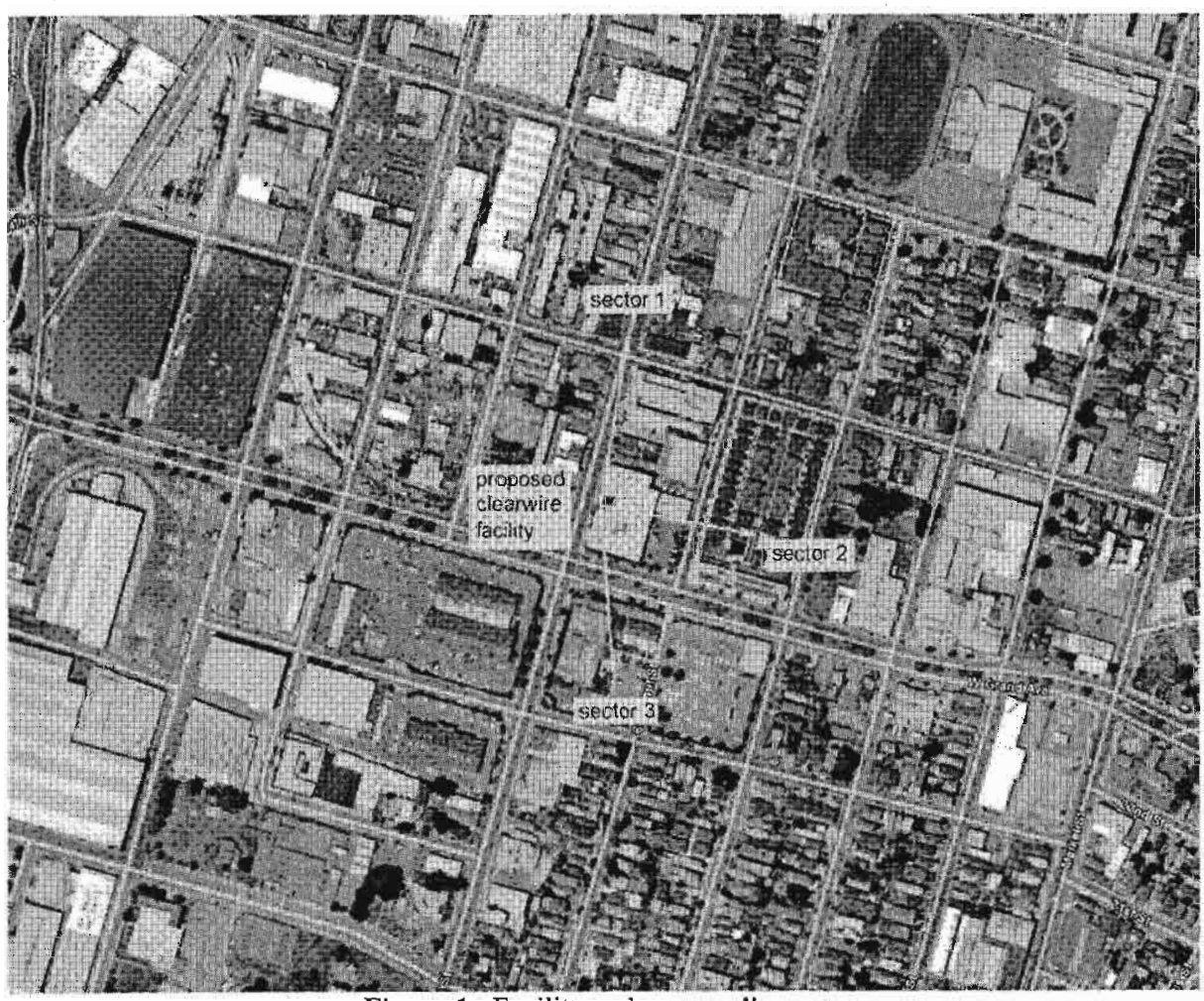


Figure 1. Facility and surrounding area

Clearwire also proposes to install a dish antenna or Internet Service Exchange Point (ISEP) above the sector 3 antenna. The RF power outside the main beam of the ISEP antenna is insignificant compared to the panel antennas (see calculations in Appendix A).

There are two other existing wireless facilities co-locating on the same tower. The RF summaries for the facilities are shown in the following Tables.

Carrier:	Nextel
Type of Service:	ESMR (850 MHz)
Antenna Quantity:	9 (3 per sector),
Antenna Type:	Decibel DB844H65E-XY, DB844H35E-SY
Maximum Power:	500 W *(Maximum ERP per sector)*
Antenna Height:	95'-2"± *(Radiation center AGL)*

Table 2. Nextel RF summary

Carrier:	metroPCS
Type of Service:	1900 MHz CDMA *(Broadband PCS)*
Antenna Type:	Kathrein 800 10504
Number of Antennas:	3 (1 per sector)
Maximum Power:	500 W *(Maximum ERP per sector)*
Antenna Height:	87'± *(Radiation center AGL)*

Table 3. metroPCS RF summary

PROTOCOL:

This study, and the calculations performed therein, is based on OET Bulletin 65[1] which adopts ANSI C95.1-1992 and NCRP standards. In particular, equation 10 from section 2 of the guideline is used as a model (in conjunction with known antenna radiation patterns) for calculating the power density at different points of interest. This information will be used to judge the RF exposure level incident upon the general population, and any employee present in the area. It should be noted that ground reflection of RF waves has been taken into account.

FCC'S MAXIMUM PERMISSIBLE EXPOSURE (MPE) LIMIT:

In order to evaluate the RF exposure level, the power densities at different locations of interest have been examined. Equation 10 from Bulletin 65 is reproduced here as equation 1:

$$S = \frac{33.4 F^2 ERP}{R^2} \qquad (1)$$

Where:
S = *Power density [$\mu W/cm^2$]*
ERP = *Effective radiated power [W]*
R = *Distance [m]*
F = *Relative field factor (relative numeric gain)*

[1] Cleveland, Robert F, et al. Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. OET Bulletin 65, Edition 97-01, August 1997.

Scenario 1: *Standing near the facility on street level*

The RF exposure level of a six-foot tall person standing on street level close to the building is evaluated. For the worst-case scenario, we assume that all the antennas are transmitting the maximum number of channels at the same time, with each channel at its maximum power level. In addition, the azimuths of the antennas of all carriers are assumed to be in the direction of the studied location. Please refer to scenario 1 in appendix A for the complete geometry and analysis. The highest exposure location is found to be approximately 142' from a proposed Clearwire antenna. The calculations of maximum cumulative power density are summarized in Table 4.

Service	Max. ERP	F^2	R (m)	S (μW/cm²) (from eq. 1)	MPE %
clearwire panel	969 W	-14 dB (0.0398)	50.0	0.5152	0.0515
clearwire ISEP	100 W	-42 dB (0.0001)	50.5	0.0013	0.0001
Nextel	500W	-11 dB (0.0794)	51.1	0.5078	0.0876
metroPCS	500 W	-25 dB (0.0032)	49.8	0.0215	0.0022
Total					0.1414

Table 4. Worst-case predicted power density values for scenario 1.

The Maximum Permissible Exposure (MPE) limit for 1900 MHz and 2500 MHz facilities[2] for general population/uncontrolled exposure is 1000 μW/cm² and 580 μW/cm² for 850 MHz facilities[3]. The maximum cumulative power density for the proposed antennas is calculated to be 0.14% of the MPE limit.

Scenario 2: *Nearby building rooftops*

There are buildings in the surrounding area. The RF exposure levels on nearby rooftops are evaluated. We assume again, all antennas are transmitting with maximum power level. The highest exposure location is on the rooftop of the nearest building east of the proposed facility. Please refer to scenario 2 in appendix A for the analysis. The calculations for the maximum possible power density are shown in Table 5.

Service	Max. ERP	F^2	R (m)	S (μW/cm²) (from eq. 1)	MPE %
clearwire panel	969 W	-21 dB (0.0079)	50.0	0.1023	0.0102
Nextel	500 W	-8 dB (0.1585)	50.9	1.0217	0.1762
metroPCS	500 W	-30 dB (0.0010)	49.9	0.0067	0.0007
Total					0.1871

Table 5. Worst-case predicted power density values for scenario 2.

The maximum cumulative power density for the Clearwire antennas is calculated to be 0.19% of the MPE limit. There is a relatively low level of RF energy directed either above or below the horizontal plane of the antennas, and there are no locations in the surrounding areas near the facility that will have RF exposure levels close to the MPE limit.

[2] Ibid., page 67.
[3] Ibid., page 67.

Scenario 3: *Facility rooftop*

Only authorized or trained persons will be permitted to access the rooftop and the antennas. The radiation center of the antennas is approximately 46'-3" from the roof deck. There are locations where a six-foot tall person may be exposed partially within the main beam path of an antenna. In this situation, the occupational/controlled exposure limits will apply, as long as the exposed person has been made fully aware of the potential for the exposure.

The RF exposure level of different locations on the rooftop is evaluated. Please refer to scenario 3 in appendix A for the analysis. The highest exposure location on the facility rooftop is approximately 70' in front of the proposed Clearwire antenna. The calculations for the maximum possible power density are shown in Table 6.

Service	Max. ERP	F^2	R (m)	S ($\mu W/cm^2$) (from eq. 1)	MPE %
clearwire panel	969 W	-14 dB (0.0398)	24.5	2.1460	0.0429
clearwire ISEP	100 W	-42 dB (0.0001)	25.0	0.0005	0.0000
Nextel	500 W	-17 dB (0.0200)	25.7	0.5057	0.0101
metroPCS	500 W	-25 dB (0.0032)	24.9	0.0862	0.0017
Total					0.0547

Table 6. Worst-case predicted power density values for scenario 3.

The maximum power density for an antenna is calculated to be 0.06% of the occupational MPE limit.

Conclusion:

Under "worst-case" conditions, the calculations shown above predict that the maximum possible RF exposure is 0.19% of the MPE limit for general population/uncontrolled exposure. There will be less RF exposure on the ground level or nearby buildings as a person moves away from the site. Therefore, the proposed Clearwire facility will comply with the general population/uncontrolled limit.

For occupational/controlled exposure to trained persons or transient workers working on the rooftop, the maximum possible RF exposure is 0.06% of the MPE limit. RF exposure warning signage should be posted near the rooftop access and near the antennas. This will make trained persons or transient workers fully aware of the potential for RF exposure when there is a necessity to work near the antennas, and allow them to exercise control over their exposure that is within the occupational/controlled limit.

FCC COMPLIANCE:

The general population/uncontrolled exposure near the antennas, including persons on the street level, in nearby open areas, and inside or on existing nearby buildings will have RF exposure much lower than the "worst-case" scenario, which is only a small percentage of the MPE limit.

As for trained persons or transient workers, they will be made fully aware of the potential for RF exposure and can choose to exercise control over their exposure that is within the occupational/controlled limits.

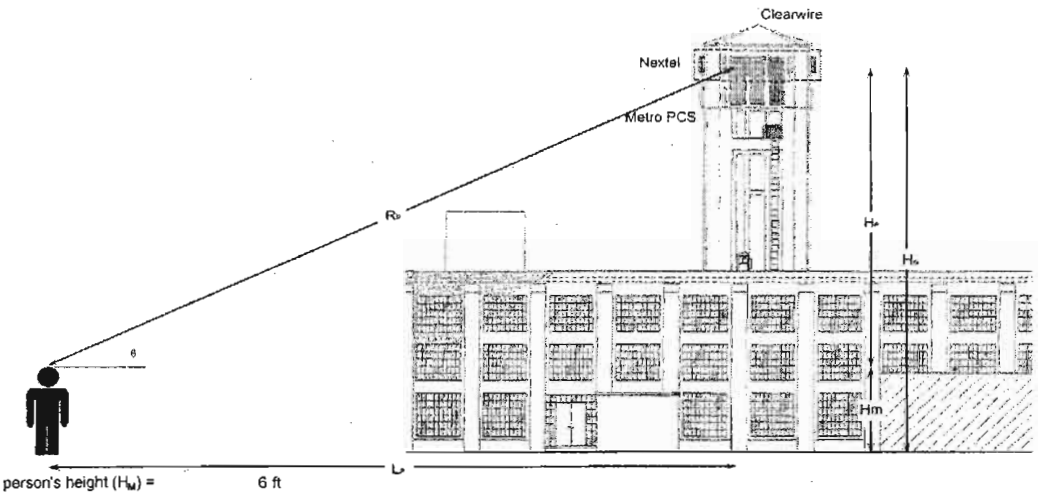
REGISTERED PROFESSIONAL ENGINEER
SEI YUEN SYLVAN WONG
16850
EXP. 12/31/10
ELECTRICAL
STATE OF CALIFORNIA

March 25, 2010

Sei Yuen Sylvan Wong, PE
California PE Reg. No. E 16850

APPENDIX A

Scenario 1: Surrounding Area of the Facility



person's height (H_M) = 6 ft

Location 1

Horizontal distance from rooftop, L_P is 14 ft at Θ= 80 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	82.00	969.0	Θ = 80 °	-36 dB (0.0003)	25.4	0.0150	0.0015
clearwire ISEP	91.00	85.00	969.0	Θ = 80 °	-57 dB (0.0000)	26.3	0.0000	0.0000
Nextel	95.17	89.17	500.0	Θ = 81 °	-23 dB (0.0050)	27.5	0.1104	0.0190
metroPCS	87.00	81.00	500.0	Θ = 80 °	-25 dB (0.0032)	25.1	0.0848	0.0085
						Total		0.0290

Location 2

Horizontal distance from rooftop, L_P is 47 ft at Θ= 60 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	82.00	969.0	Θ = 60 °	-32 dB (0.0006)	28.9	0.0233	0.0023
clearwire ISEP	91.00	85.00	969.0	Θ = 61 °	-46 dB (0.0000)	29.7	0.0000	0.0000
Nextel	95.17	89.17	500.0	Θ = 62 °	-19 dB (0.0126)	30.8	0.2218	0.0382
metroPCS	87.00	81.00	500.0	Θ = 60 °	-24 dB (0.0040)	28.6	0.0817	0.0082
						Total		0.0487

Location 3:

Horizontal distance from rooftop, L_P is 82 ft at Θ= 45 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	82.00	969.0	Θ = 45 °	-30 dB (0.0010)	35.4	0.0258	0.0026
clearwire ISEP	91.00	85.00	969.0	Θ = 46 °	-42 dB (0.0001)	36.0	0.0025	0.0003
Nextel	95.17	89.17	500.0	Θ = 47 °	-17 dB (0.0200)	36.9	0.2453	0.0423
metroPCS	87.00	81.00	500.0	Θ = 45 °	-26 dB (0.0025)	35.1	0.0339	0.0034
						Total		0.0486

Location 4:

Horizontal distance from rooftop, L_P is 142 ft at Θ= 30 °

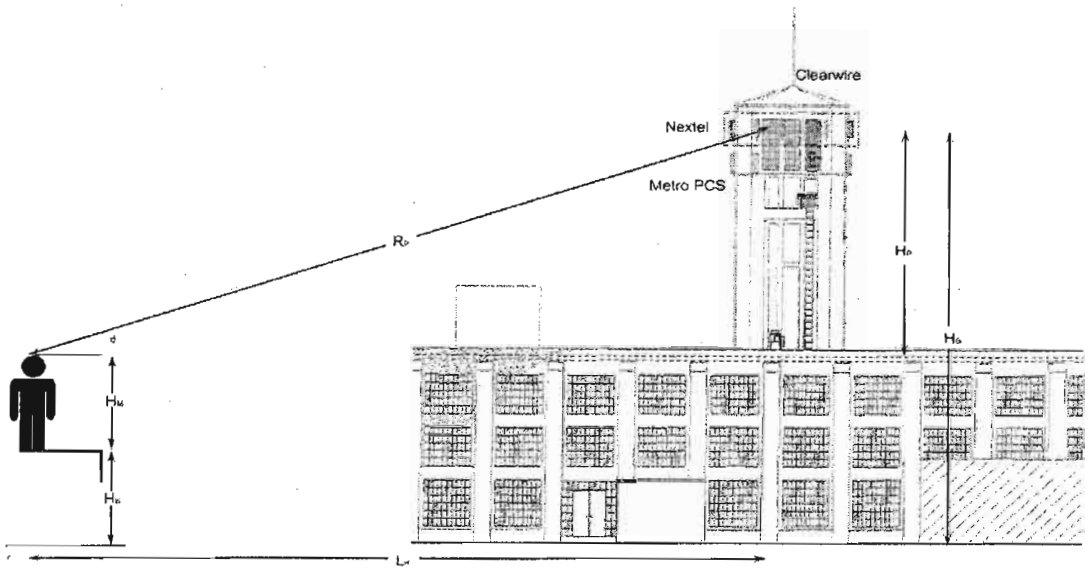
Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	82.00	969.0	Θ = 30 °	-14 dB (0.0398)	50.0	0.5152	0.0515
clearwire ISEP	91.00	85.00	969.0	Θ = 31 °	-42 dB (0.0001)	50.5	0.0013	0.0001
Nextel	95.17	89.17	500.0	Θ = 32 °	-11 dB (0.0794)	51.1	0.5078	0.0876
metroPCS	87.00	81.00	500.0	Θ = 30 °	-25 dB (0.0032)	49.8	0.0215	0.0022
						Total		0.1414

Location 5:

Horizontal distance from rooftop, L_P is 306 ft at Θ= 15 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	82.00	969.0	Θ = 15 °	-13 dB (0.0501)	96.6	0.1738	0.0174
clearwire ISEP	91.00	85.00	969.0	Θ = 16 °	-36 dB (0.0003)	96.8	0.0010	0.0001
Nextel	95.17	89.17	500.0	Θ = 16 °	-17 dB (0.0200)	97.2	0.0354	0.0061
metroPCS	87.00	81.00	500.0	Θ = 15 °	-16 dB (0.0251)	96.5	0.0450	0.0045
						Total		0.0281

Scenario 2: Nearby Buildings/Rooftop



person's height (H_M) = 6 ft

Location 1: Nearest rooftop surface within Sector 1

H_B= 12.0 ft

Horizontal distance from rooftop, L_P is 210 ft at Θ= 18 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	70.00	969.0	Θ = 18 °	-18 dB (0.0158)	67.5	0.1122	0.0112
Nextel	95.17	77.17	500.0	Θ = 20 °	-13 dB (0.0501)	68.2	0.1799	0.0310
metroPCS	87.00	69.00	500.0	Θ = 18 °	-18 dB (0.0158)	67.4	0.0581	0.0058
						Total		0.0480

Location 2: Rooftop surface within Sector 1

H_B= 15.0 ft

Horizontal distance from rooftop, L_P is 300 ft at Θ= 13 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	67.00	969.0	Θ = 13 °	-14 dB (0.0398)	93.7	0.1467	0.0147
Nextel	95.17	74.17	500.0	Θ = 14 °	-11 dB (0.0794)	94.2	0.1494	0.0258
metroPCS	87.00	66.00	500.0	Θ = 12 °	-19 dB (0.0126)	93.7	0.0240	0.0024
						Total		0.0429

Location 3: Nearest rooftop surface within Sector 2

H_B= 20.0 ft

Horizontal distance from rooftop, L_P is 152 ft at Θ= 22 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	62.00	969.0	Θ = 22 °	-21 dB (0.0079)	50.0	0.1023	0.0102
Nextel	95.17	69.17	500.0	Θ = 24 °	-8 dB (0.1585)	50.9	1.0217	0.1762
metroPCS	87.00	61.00	500.0	Θ = 22 °	-30 dB (0.0010)	49.9	0.0067	0.0007
						Total		0.1871

Location 4: Rooftop surface within Sector 2

H_B= 20.0 ft

Horizontal distance from rooftop, L_P is 305 ft at Θ= 11 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	62.00	969.0	Θ = 11 °	-14 dB (0.0398)	94.9	0.1430	0.0143
Nextel	95.17	69.17	500.0	Θ = 13 °	-7 dB (0.1995)	95.3	0.3668	0.0632
metroPCS	87.00	61.00	500.0	Θ = 11 °	-18 dB (0.0158)	94.8	0.0294	0.0029
						Total		0.0804

Location 5: Nearest rooftop surface within Sector 3

H_B= 22.0 ft

Horizontal distance from rooftop, L_P is 286 ft at Θ= 12 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (μW/cm2)	MPE%
clearwire panel	88.00	60.00	969.0	Θ = 12 °	-14 dB (0.0398)	89.1	0.1623	0.0162
clearwire panel	91.00	85.00	969.0	Θ = 17 °	-37 dB (0.0002)	91.0	0.0008	0.0001
Nextel	95.17	67.17	500.0	Θ = 13 °	-10 dB (0.1000)	89.6	0.2080	0.0359
metroPCS	87.00	59.00	500.0	Θ = 12 °	-19 dB (0.0126)	89.0	0.0266	0.0027
						Total		0.0549

Scenario 3: Facility Rooftop

Location 1: Sector 2

Location on rooftop, L_P is 7 ft at Θ= 80 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (µW/cm2)	MPE%
clearwire panel	46.25	40.25	969.0	Θ = 80 °	-36 dB (0.0003)	12.5	0.0621	0.0012
clearwire ISEP	49.25	43.25	100.0	Θ = 81 °	-57 dB (0.0000)	13.4	0.0000	0.0000
Nextel	53.42	47.42	500.0	Θ = 81 °	-24 dB (0.0040)	14.6	0.3134	0.0063
metroPCS	48.25	42.25	500.0	Θ = 80 °	-25 dB (0.0032)	13.1	0.3114	0.0062
						Total		0.0137

Location 2: Sector 2

Location on rooftop, L_P is 23 ft at Θ= 60 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (µW/cm2)	MPE%
clearwire panel	46.25	40.25	969.0	Θ = 60 °	-32 dB (0.0006)	14.2	0.0963	0.0019
clearwire ISEP	49.25	43.25	100.0	Θ = 62 °	-47 dB (0.0000)	15.0	0.0000	0.0000
Nextel	53.42	47.42	500.0	Θ = 64 °	-20 dB (0.0100)	16.1	0.6443	0.0129
metroPCS	48.25	42.25	500.0	Θ = 61 °	-24 dB (0.0040)	14.7	0.3091	0.0062
						Total		0.0210

Location 3: Sector 2

Location on rooftop, L_P is 40 ft at Θ= 45 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (µW/cm2)	MPE%
clearwire panel	46.25	40.25	969.0	Θ = 45 °	-30 dB (0.0010)	17.4	0.1069	0.0021
clearwire ISEP	49.25	43.25	100.0	Θ = 47 °	-42 dB (0.0001)	18.0	0.0010	0.0000
Nextel	53.42	47.42	500.0	Θ = 50 °	-17 dB (0.0200)	19.0	0.9252	0.0185
metroPCS	48.25	42.25	500.0	Θ = 46 °	-26 dB (0.0025)	17.8	0.1318	0.0026
						Total		0.0232

Location 4: Sector 3

Location on rooftop, L_P is 70 ft at Θ= 30 °

Service Provider	Height H_G, ft	Height H_P, ft	Max. ERP	Angle Θ	F^2	R_P(m)	S (µW/cm2)	MPE%
clearwire panel	46.25	40.25	969.0	Θ = 30 °	-14 dB (0.0398)	24.5	2.1460	0.0429
clearwire ISEP	49.25	43.25	100.0	Θ = 32 °	-42 dB (0.0001)	25.0	0.0005	0.0000
Nextel	53.42	47.42	500.0	Θ = 34 °	-17 dB (0.0200)	25.7	0.5057	0.0101
metroPCS	48.25	42.25	500.0	Θ = 31 °	-25 dB (0.0032)	24.9	0.0862	0.0017
						Total		0.0547

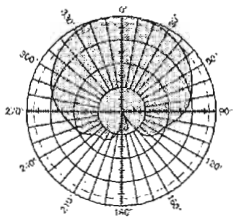
KATHREIN
SCALA DIVISION

840 10054

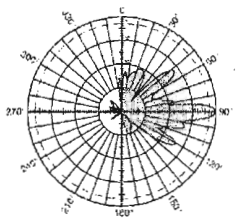
87° XX-pol Panel Antenna
2496–2690 MHz

Kathrein Scala's XX-polarized adjustable electrical downtilt antennas offer the carrier the ability to tailor sites for optimum performance. Using variable downtilt, only a few models need be procured to accommodate the needs of widely varying conditions. Remotely controlled downtilt is available as a retrofitable option.

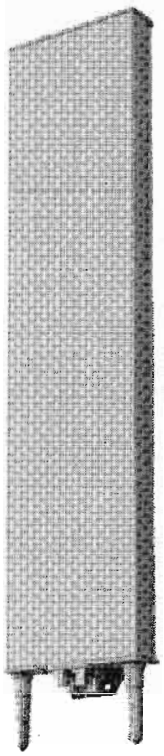
- 0–10° electrical downtilt range.
- DC Grounded metallic parts for impulse suppression.
- No moving electrical connections.
- Optional remote downtilt control.

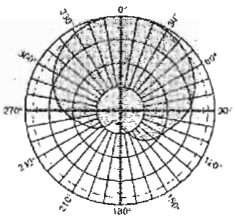


Horizontal pattern
±45°- polarization
0° electrical downtilt

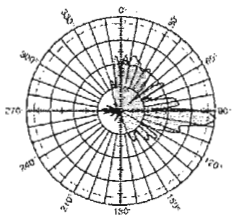


Vertical pattern
±45°- polarization
0° electrical downtilt

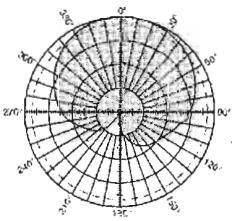




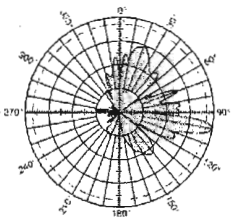
Horizontal pattern
±45°- polarization
5° electrical downtilt



Vertical pattern
±45°- polarization
5° electrical downtilt



Horizontal pattern
±45°- polarization
10° electrical downtilt



Vertical pattern
±45°- polarization
10° electrical downtilt

Specifications:

Frequency range	2496–2690 MHz
Gain	2 x 16 dBi
Impedance	50 ohms
VSWR	< 1.5:1
Intermodulation (2x20w)	IM3:< -150 dBc
Polarization	+45° and -45°
Front-to-back ratio	>23 dB typical
Maximum input power	300 watts (at 50°C)
+45° and -45° polarization horizontal beamwidth	87 degrees at midband (half power)
+45° and -45° polarization vertical beamwidth	7 degrees at midband (half power)
Electrical downtilt continously adjustable	0–10 degrees
Connector	4 x 7-16 DIN female
Sidelobe suppression for first sidelobe above horizon	0° 4° 8° 10° 15 15 15 15 dB (typical)
Null fill	> -1 dBi to 12° below horizon (typical) (17 dB below 16 dBi main beam)
Isolation	>30 dB
Weight	30 lb (13.6 kg)
Dimensions	42 x 12.7 x 2.8 inches (1067 x 323 x 71 mm)
Equivalent flat plate area	4.8 ft² (0.45 m²)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	48 x 13.3 x 5.1 inches (1220 x 337 x 130 mm)
Shipping weight	34 lb (15.4 kg)
Mounting	Fixed and tilt-mount options are available for 2 to 5.7 inch (50 to 145 mm) OD masts.

See reverse for order information.

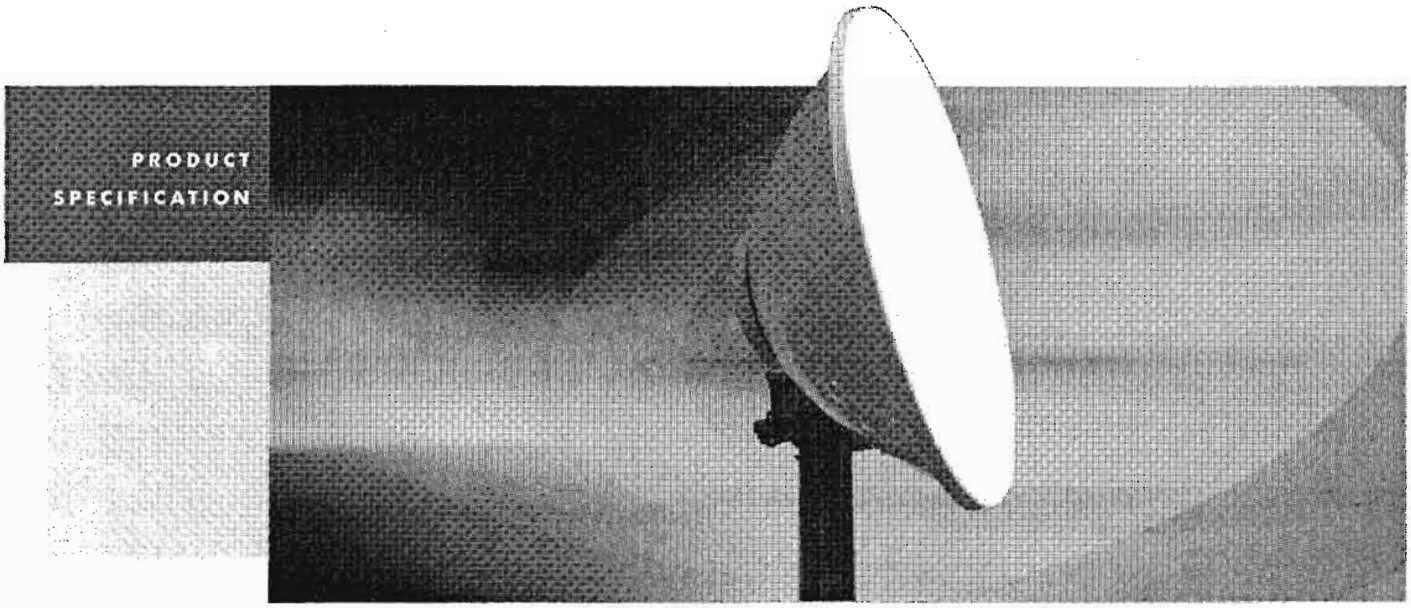
* Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

TÜV RoHS Lead-Free

11098-A

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

ANDREW®



ValuLine® III Next Generation Antennas VHLP2

SPECIFICATIONS

	VHLP2-7W	VHLP2-10W	VHLP2-11	VHLP2-13	VHLP2-15	VHLP2-18	VHLP2-23	VHLP2-26	VHLP2-28	VHLP2-32	VHLP2-38
Frequency Band, GHz	7.125–8.5	10.55–10.68	10.7–11.7	12.70–13.25	14.25–15.35	17.7–19.7	21.2–23.6	24.25–26.5	27.5–29.5	31.8–33.4	37.0–40.0
Bottom Band Gain, dBi	29.5	33.7	34.0	35.6	36.5	38.3	39.8	40.8	41.8	43.4	44.6
Mid Band Gain, dBi	30.7	33.8	34.4	35.8	36.8	38.7	40.4	41.2	42.2	43.7	45.2
Top Band Gain, dBi	31.9	34.3	35.0	36.0	37.2	39.1	41.0	41.8	42.7	44.0	45.8
Beamwidth, degrees	4.7	3.7	3.3	2.7	2.5	2.1	1.7	1.5	1.3	1.0	0.9
Front/Back, dB	57	56	60	62	65	67	66	68	68	61	66
XPD, dB	32	30	30	30	30	30	30	30	30	30	30
Return Loss, dB	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7
Regulatory Compliance											
ETSI Class	R1 C3	R1 C2	R1 C3	R1 C3	R2 C3	R2 C3	R3 C3	R4 C3	R4 C3	R5 C3B	R5 C3B
FCC Part 101	N/A	CAT A*	CAT B	N/A	N/A	CAT A	CAT A	CAT A	N/A	N/A	CAT A
Brazil Anatel	N/A	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2
Canada SRSP	N/A	310.5	N/A	312.7B	314.5A	Note 1	Note 2	N/A	N/A	N/A	338.6A
Andrew RPE Number	7075A	7085B, 7086B*	7083A	7004	7008	7012A	7016A	7020A	7024A	7028	7032A

Note 1: Meets Canada SRSP 317.8A, 318.5, 318.8
Note 2: Meets Canada SRSP 312.2A, 321.8B

** Use for FCC band (10.5–10.7 GHz)*

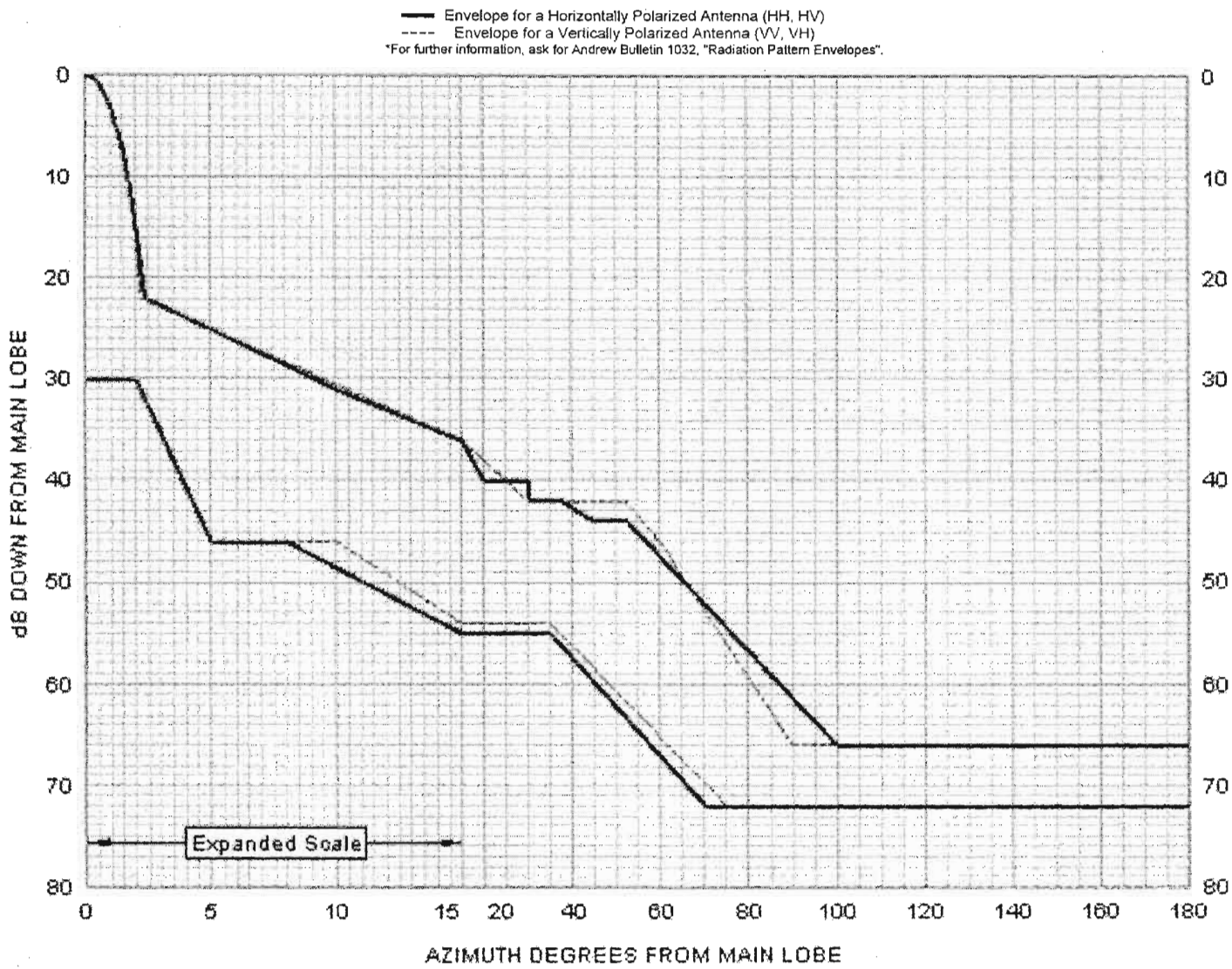
One Company. A World of Solutions.

VHLP2-23 - Radiation Pattern Envelope

ANDREW

ANDREW
RPE: 7016

Engineering Approved:
25 October 2004



DB844H65E-XY

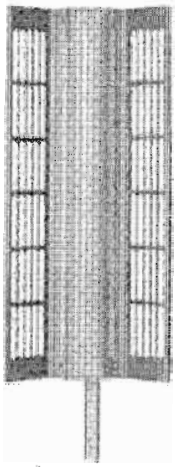
Directed Dipole Antenna

Decibel®
Base Station Antennas

- Excellent azimuth roll-off, 15-20% reduction in cell to cell overlap
- Superior front to back ratio
- Low profile, low wind load for easy zoning
- Outstanding field record, with thousands of units deployed, world wide

ELECTRICAL

Frequency (MHz) :	806 - 896	870 - 960
Polarization :	Vertical	Vertical
Gain (dBd/dBi) :	13.1/15.2	13.3/15.4
Azimuth BW (Deg.):	65	65
Elevation BW (Deg.):	15	15
Beam Tilt (Deg.):	0	0
USLS* (dB) :	15	15
Front-To-Back Ratio* (dB) :	40	40
VSWR :	<1.5:1	<1.5:1
Max. Input Power (Watts) :	500	500
Impedance (Ohms) :	50	50
Lightning Protection :	DC Ground	DC Ground



MECHANICAL

Weight :	9.0 kg (20 lb)
Dimensions (LxWxD) :	1,219 x 521 x 229 mm (48 x 20.5 x 9 in)
Max. Wind Area :	0.40 m² (4.3 ft²)
Max. Wind Load (@ 100 mph) :	1,071.9 N (241 lbf)
Max. Wind Speed :	201 km/h (125 mph)
Hardware Material :	Galvanized Steel
Connector Type :	7-16 DIN - Female (1, Back)
Color :	Light Gray
Standard Mounting Hardware :	DB380
Standard Downtilt Mounting Hardware :	DB5083

Andrew Corporation
2601 Telecom Parkway
Richardson, Texas U.S.A 75082-3521
Tel: 214.631.0310

Fax: 214.631.4706
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

* - Indicates Typical

6/21/2006

dbtech@andrew.com

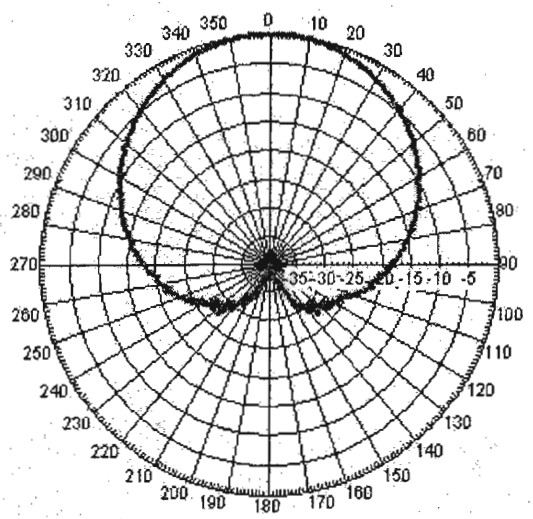
Information correct at date of issue but may be subject to change without notice.

DB844H65E-XY

Directed Dipole Antenna

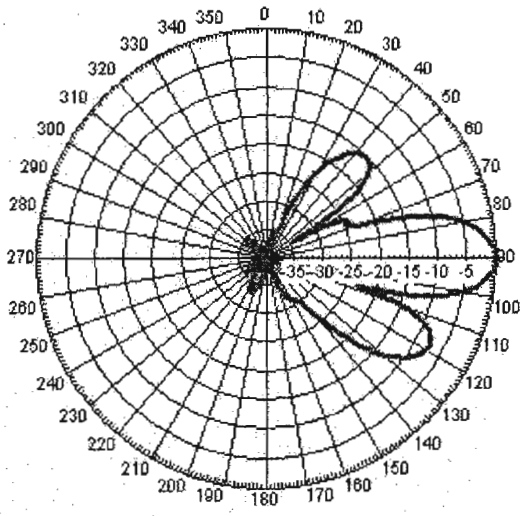
Decibel®
Base Station Antennas

AZIMUTH PATTERN



Freq: 835 MHz, Tilt: 0

ELEVATION PATTERN



Freq: 835 MHz, Tilt: 0

Andrew Corporation
2601 Telecom Parkway
Richardson, Texas U.S.A 75082-3521
Tel: 214.631.0310

Fax: 214.631.4706
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

* - Indicates Typical

6/21/2006

dbtech@andrew.com

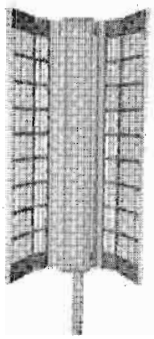
Information correct at date of issue but may be subject to change without notice.

Product Specifications

ANDREW®
A CommScope Company

DB844H35E-SY

Directed Dipole™ Antenna, 870–960 MHz, 35° horizontal beamwidth, fixed electrical tilt



- Excellent azimuth pattern shaping, 15–20 percent reduction in cell-to-cell overlap
- Superior front-to-back ratio
- Low profile for ease of zoning approval
- Outstanding field record—thousands of units deployed worldwide

CHARACTERISTICS

General Specifications

Antenna Type	Directed Dipole™
Brand	Directed Dipole™
Operating Frequency Band	870 – 960 MHz

Electrical Specifications

Frequency Band, MHz	**870–960**
Beamwidth, Horizontal, degrees	35
Gain, dBd	15.5
Gain, dBi	17.6
Beamwidth, Vertical, degrees	15.0
Beam Tilt, degrees	0
Upper Sidelobe Suppression (USLS), typical, dB	15
Front-to-Back Ratio at 180°, dB	40
VSWR | Return Loss, db	1.5:1 | 14.0
Intermodulation Products, 5th Order, 2 x 20 W, dBc	-150
Input Power, maximum, watts	500
Polarization	Vertical
Impedance, ohms	50
Lightning Protection	dc Ground

www.commscope.com/andrew

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Product Specifications

DB844H35E-SY

Mechanical Specifications

Color	Light gray
Connector Interface	7-16 DIN Female
Connector Location	Back
Connector Quantity	1
Wind Loading, maximum	947.5 N @ 100 mph 213.0 lbf @ 100 mph
Wind Speed, maximum	201.2 km/h | 125.0 mph

Dimensions

Depth	317.5 mm | 12.5 in
Length	1219.2 mm | 48.0 in
Width	609.6 mm | 24.0 in
Net Weight	12.7 kg | 28.0 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2002/95/EC	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)

Included Products

DB5083

Downtilt Mounting Kit for 4.5 in (114.3 mm) OD round members

DB380

Pipe Mounting Kit for 4.5 in (114.3 mm) OD round members

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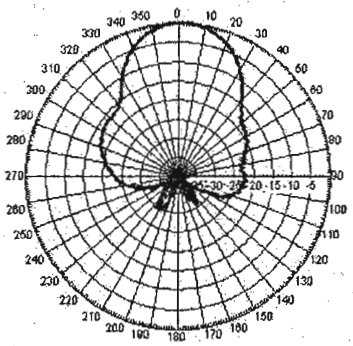
Product Specifications

DB844H35E-SY

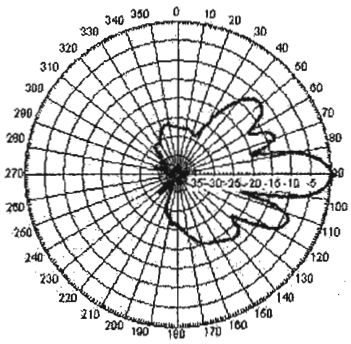
ANDREW®
A CommScope Company

Horizontal Pattern



Freq: 910 MHz, Tilt: 0

Vertical Pattern



Freq: 910 MHz, Tilt: 0

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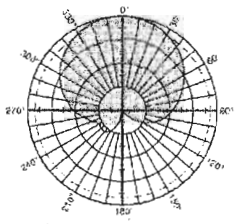
KATHREIN
SCALA DIVISION

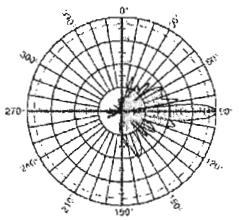
800 10504
65° Panel Antenna
Enhanced Sidelobe Suppression

Kathrein panels for AWS feature:

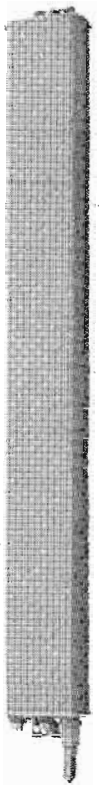
- Heavy-duty construction using the highest quality materials: UV resistant pulltruded fiberglass radomes, stainless steel fasteners and hardware, rigid aluminum reflectors, and low loss coaxial cable power divider harness, all contributing to long, trouble free service life.
- Superior electrical specifications including low VSWR, wide bandwidth, flat frequency response, and superb intermodulation performance.
- Precision continuously adjustable electrical downtilt controls, manual control as standard equipment, with remote control available as an option.
- Will accomodate future 3G / UMTS applications.



Horizontal pattern
±45°- polarization



Vertical pattern
±45°- polarization
0°–15° electrical downtilt



General specifications:

Frequency range	1710–2200 MHz
VSWR	<1.5:1
Impedance	50 ohms
Intermodulation (2x20w)	IM3: <-153 dBc
Polarization	+45° and -45°
Connector	2 x 7-16 DIN female
Isolation	>30 dB
Maximum input power	300 watts (at 50°C) per input
Weight	17.6 lb (8 kg)
Dimensions	54.1 x 6.1 x 2.7 inches (1374 x 155 x 69 mm)
Equivalent flat plate area	3.18 ft² (0.295 m²)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	65.2 x 6.8 x 3.6 inches (1655 x 172 x 92 mm)
Shipping weight	22 lb (10 kg)
Mounting	Fixed and tilt mount options are available for 2 to 4.6 inch (50 to 115 mm) OD masts.

See reverse for order information.

Specifications:	**1710–1880 MHz**	**1850–1990 MHz**	**1920–2170 MHz**	**2000–2200 MHz**
Gain	17.5 dBi	17.6 dBi	17.7 dBi	17.8 dBi
Front-to-back ratio (180° ±30°)	≥28 dB (co-polar)	≥28 dB (co-polar)	≥28 dB (co-polar)	≥28 dB (co-polar)
Horizontal beamwidth	68° (half-power)	66° (half-power)	64° (half-power)	62° (half-power)
Vertical beamwidth	7.9° (half-power)	7.5° (half-power)	7.2° (half-power)	7° (half-power)
Electrical downtilt continuously adjustable	0°–15° (manual or optional remote control)	0°–15°	0°–15°	0°–15°
Sidelobe suppression	0° 5° 10° 15° T	0° 5° 10° 15° T	0° 5° 10° 15° T	0° 5° 10° 15° T
first sidelobe above main beam	≥17 20 18 17 dB	≥16 20 18 17 dB	≥16 20 18 17 dB	≥15 20 18 15 dB
within 0°–20° sector above horizon	≥16 18 18 16 dB	≥16 18 17 16 dB	≥15 18 17 16 dB	≥15 16 16 15 dB
Cross polar ratio				
Main direction 0°	22 dB (typical)	22 dB (typical)	24 dB (typical)	26 dB (typical)
Sector ±60°	≥10 dB	≥10 dB	≥10 dB	≥10 dB
Null-fill at 0° tilt	21 dB	20 dB	19 dB	18 dB

*Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

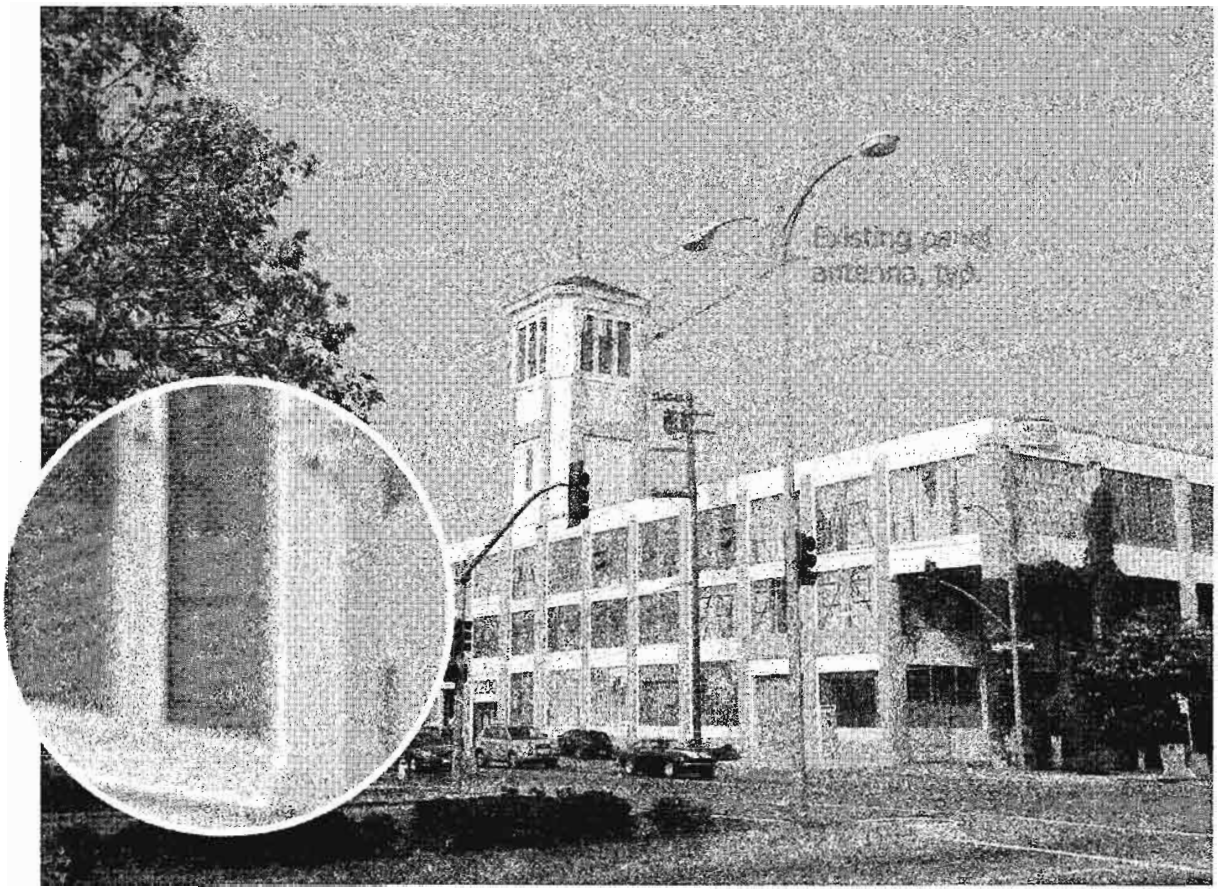
RoHS
Lead-Free

11019-A
936.3148/a

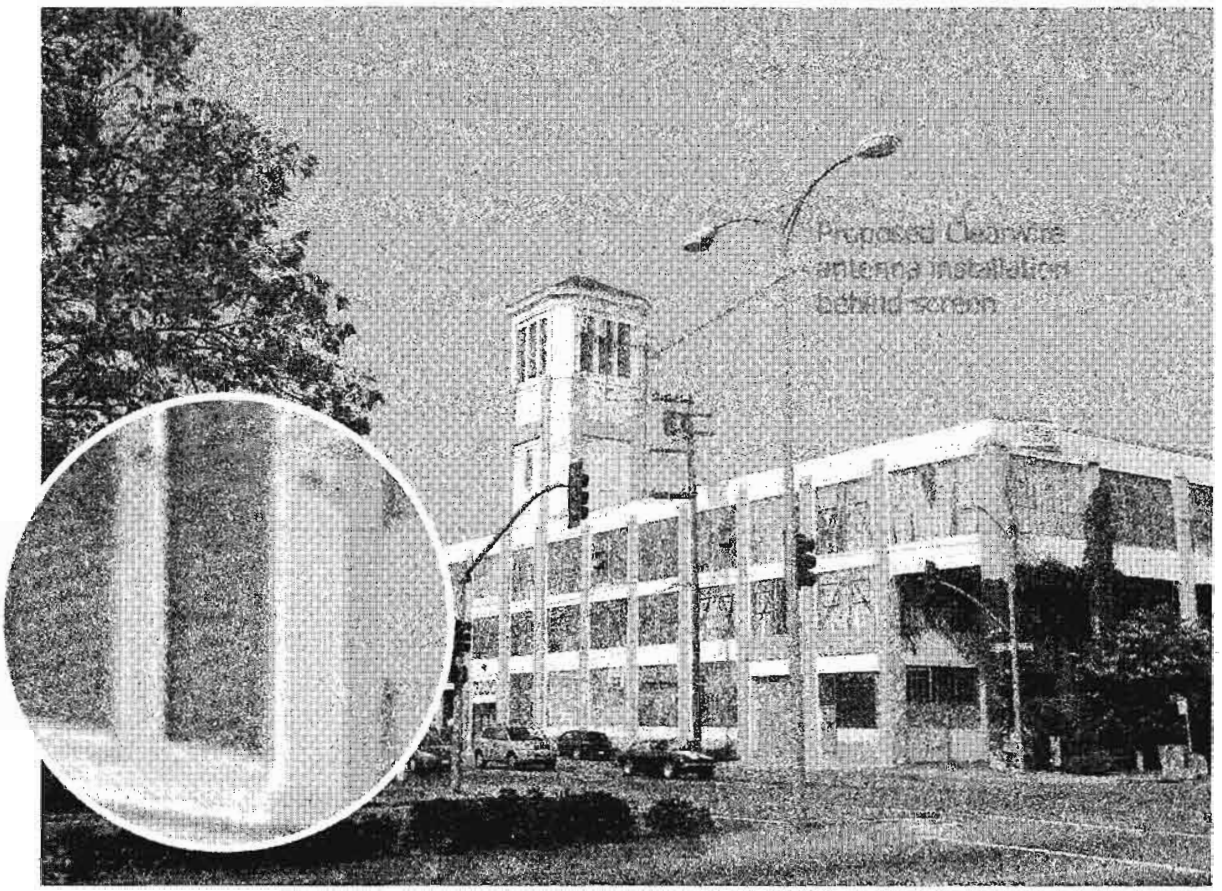
Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

Existing

March 1, 2010



Proposed



South Elevation - Nothing Visible
(From Adeline St)

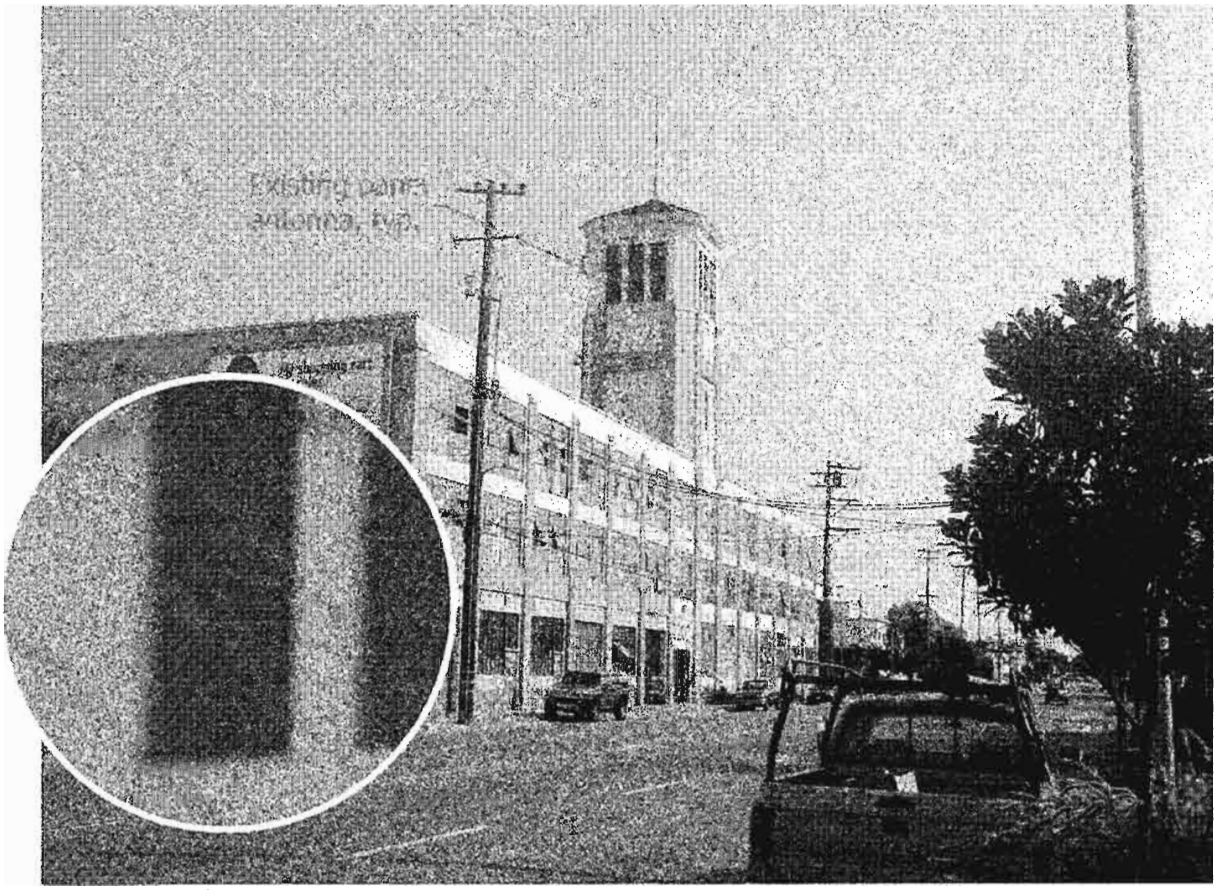
CA-SFO0135A
West Grand - Adeline

TRK ENGINEERING

ATTACHMENT E

Existing

March 1, 2010



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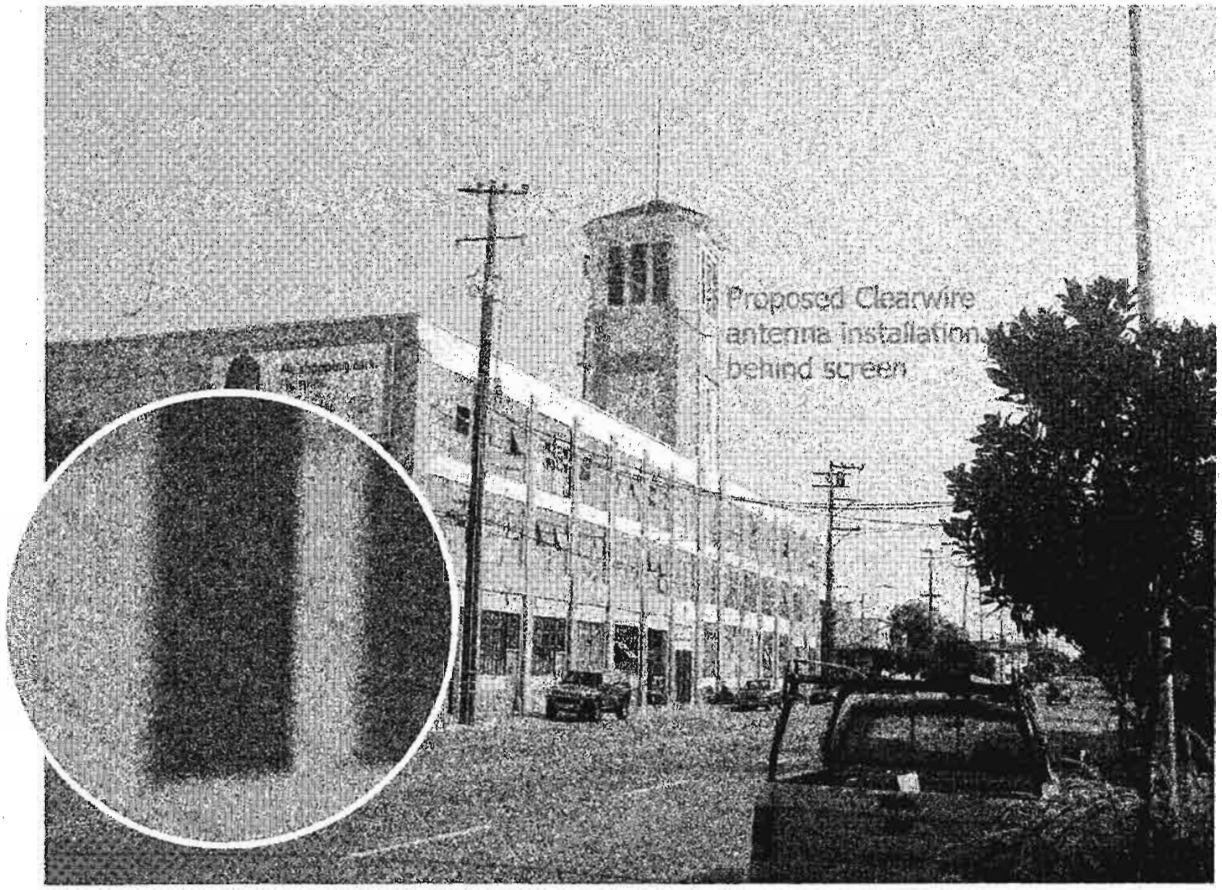


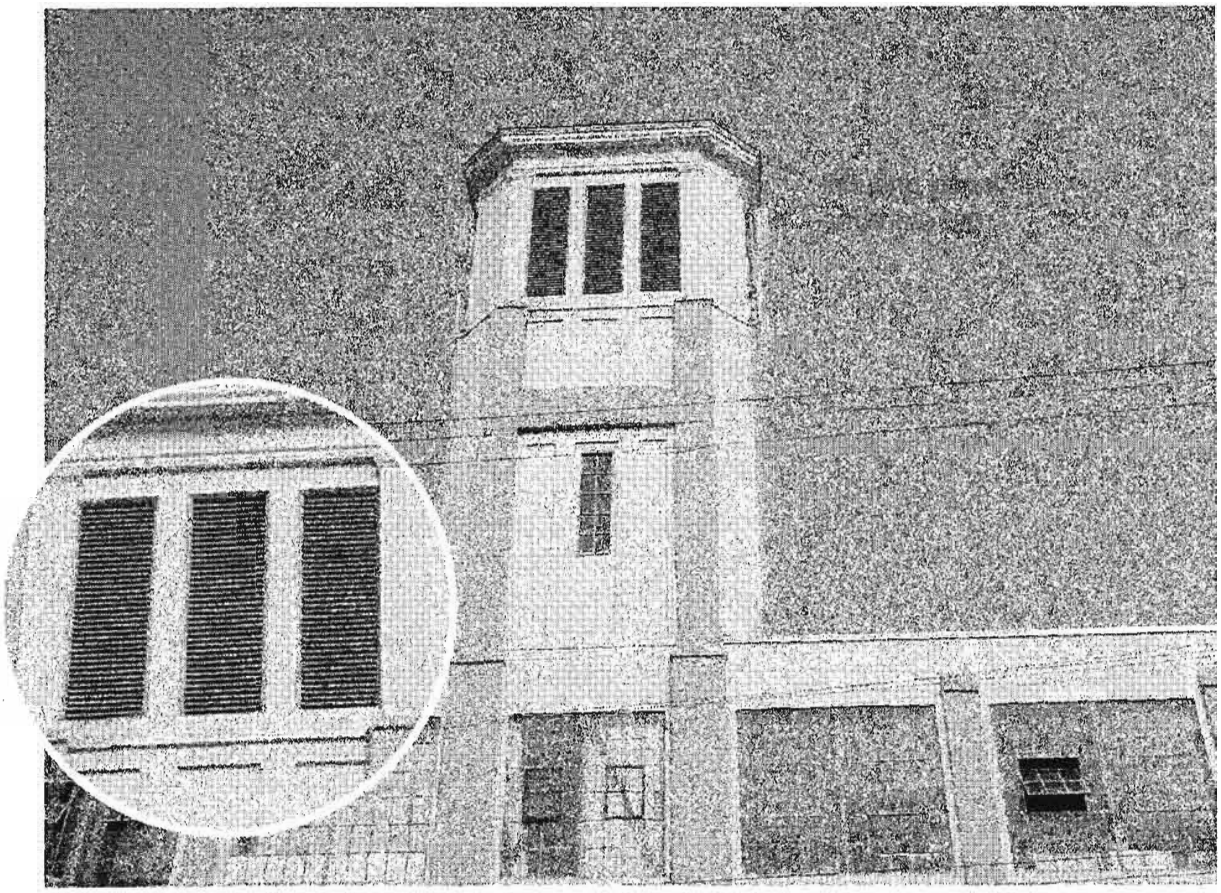
North Elevation - Nothing Visible
(From Adeline St)

CA-SFO0135A
West Grand - Adeline

TRK ENGINEERING

Existing

March 1, 2010



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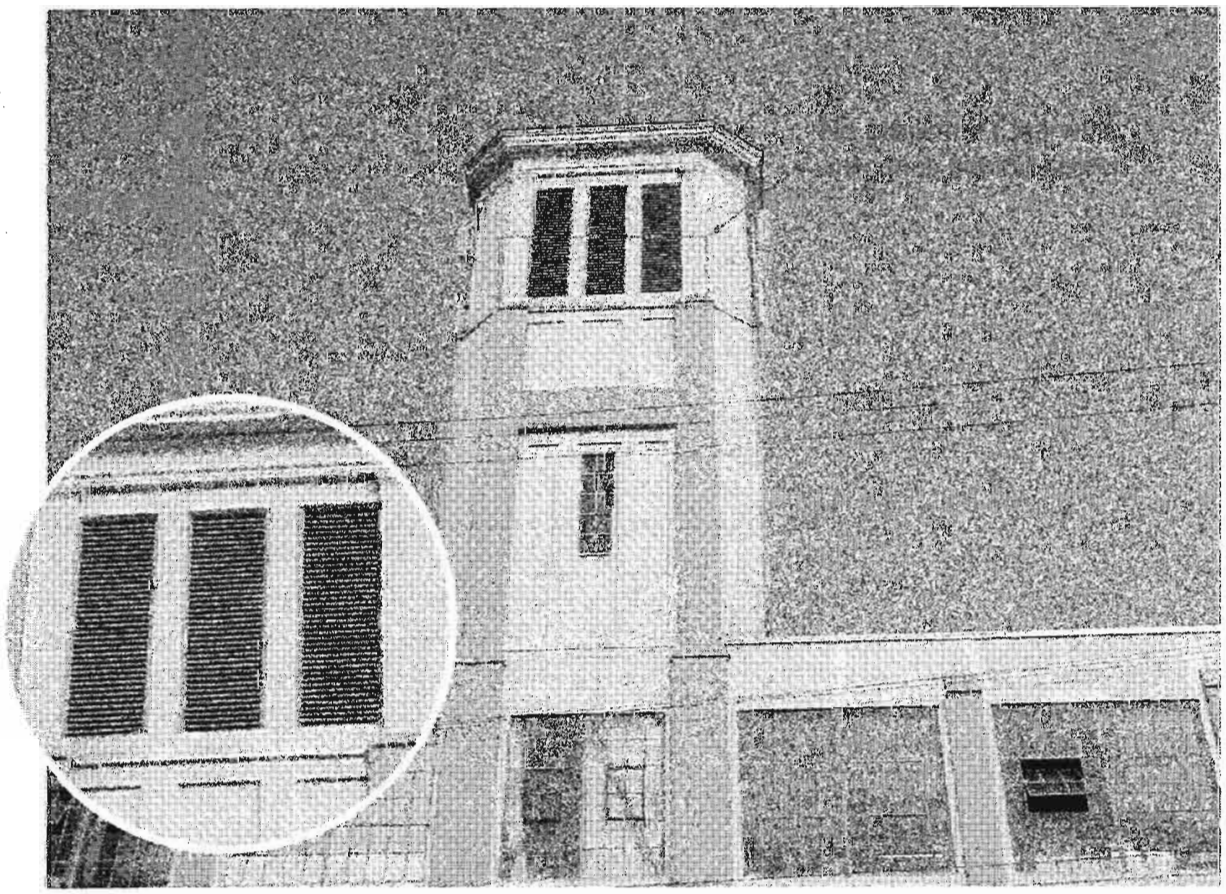


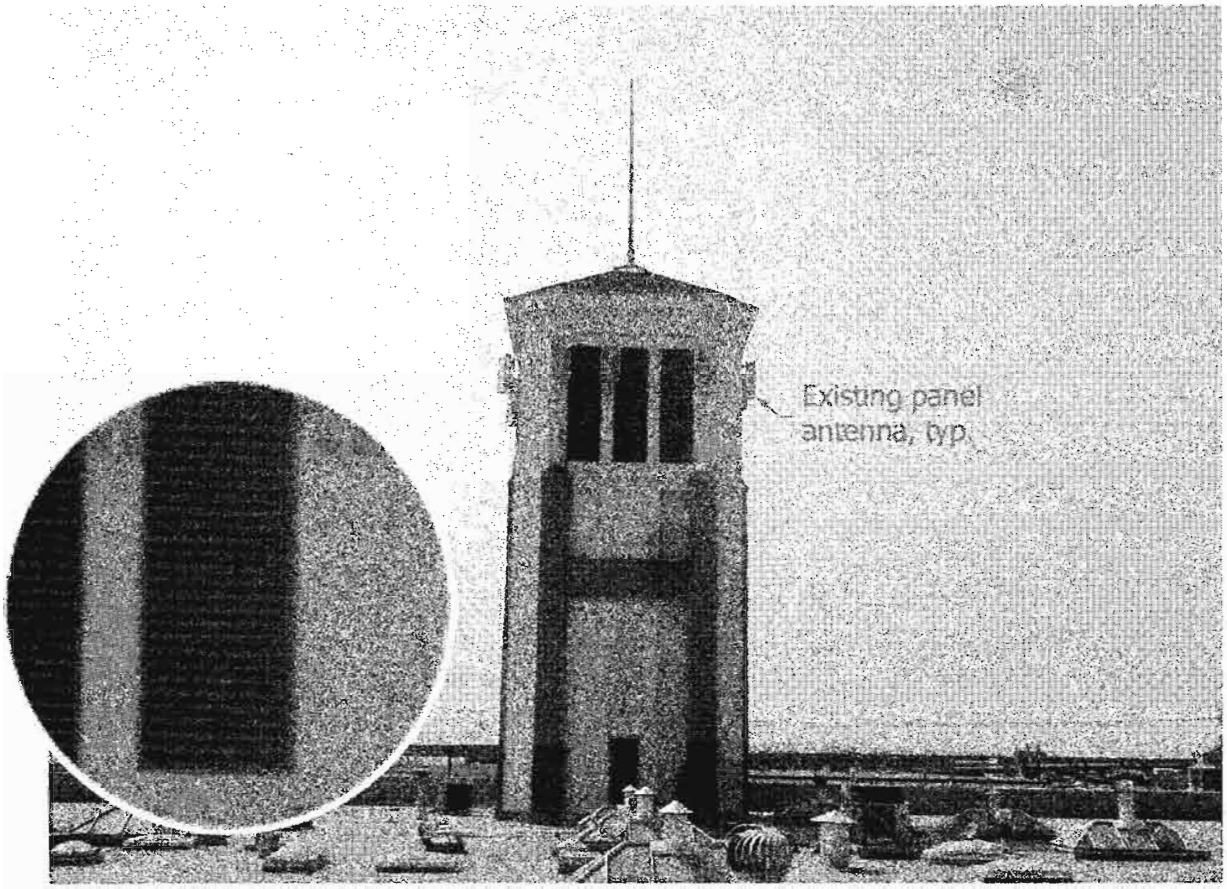
West Elevation - Nothing Visible
(From Adeline St)

CA-SFO0135A
West Grand - Adeline

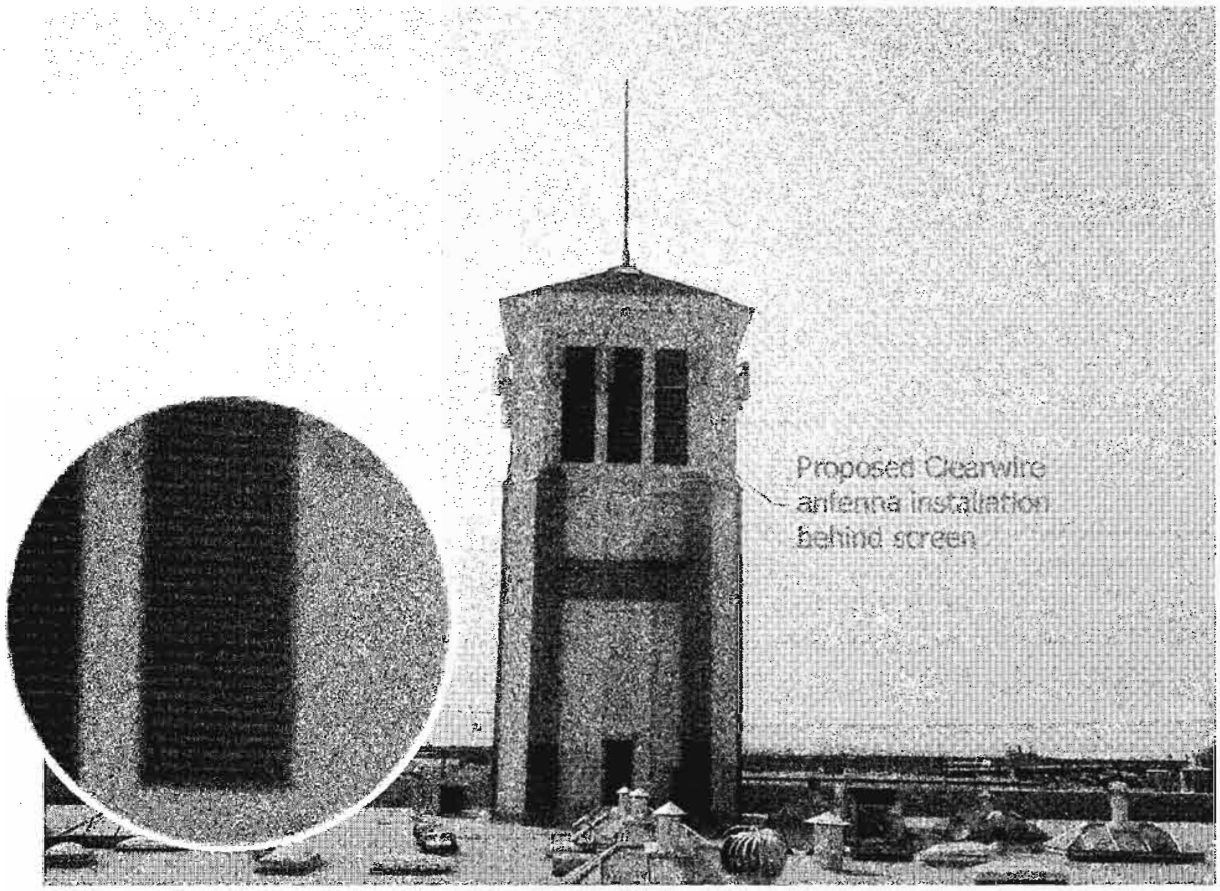
TRK ENGINEERING

Existing

March 1, 2010



Proposed



East Elevation - Nothing Visible
(From Rooftop)

CA-SFO0135A
West Grand - Adeline

TRK ENGINEERING