

**Case File Number: PLN16451**

**April 19, 2017**

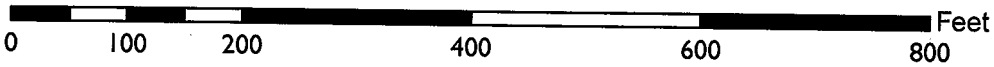
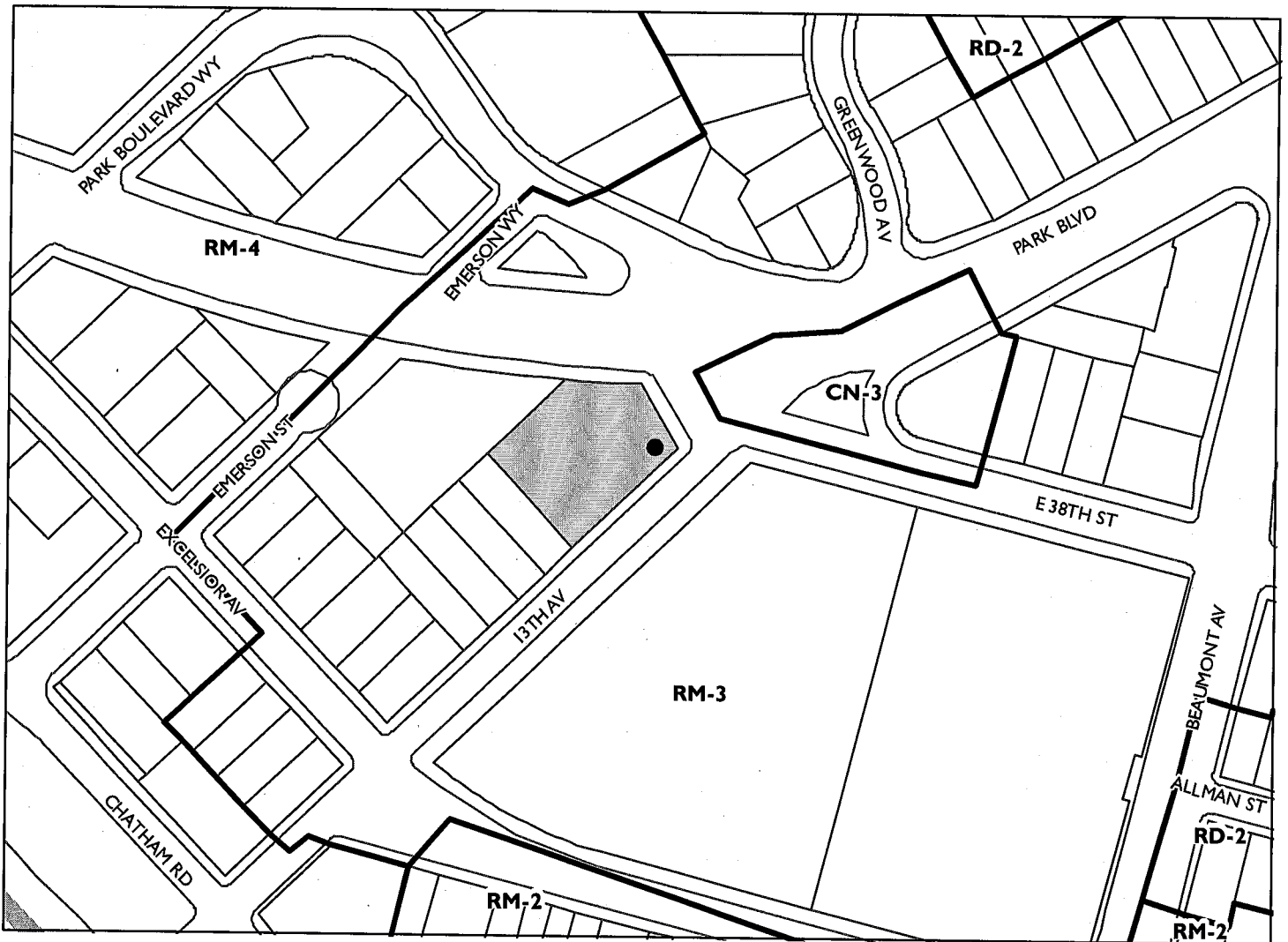
<b>Location:</b>	<b>3755 13<sup>th</sup> Avenue (See map on reverse)</b>
<b>Assessor Parcel Numbers:</b>	<b>(023-0479-006-02)</b>
<b>Proposal:</b>	Installation of an unmanned wireless telecommunication facility within the East Bay Alliance Church Bell Tower/Steeple. Facility will install three antennas along the three openings of the Bell Tower and associated equipment will be enclosed within the second floor of Bell Tower.
<b>Applicant:</b>	GTE Mobilnet of California d/b/a Verizon Wireless
<b>Contact Person/ Phone Number:</b>	Matthew Moore of Complete Wireless Consulting Inc. (916)247-3047
<b>Owner:</b>	East Bay Alliance Church
<b>Case File Number:</b>	<b>PLN16451</b>
<b>Planning Permits Required:</b>	Major Conditional Use Permit to establish a new Macro wireless telecommunications facility located within a residential zone (OMC Sec. 17.33.040(A), 17.134.020(A)(3)(i); Regular Design Review (non-residential) to install a wireless Macro Telecommunications Facility (17.136.050 (B)(2); Additional Findings for a Macro Facility (OMC Sec. 17.128.070(B)(C).
<b>General Plan:</b>	Mixed Housing Type Residential
<b>Zoning:</b>	RM-3 Mixed Housing Type Residential 3 Zone
<b>Environmental Determination:</b>	Exempt, Section Exempt, Section 15301 of the State CEQA Guidelines; minor additions and alterations to an existing PG&E utility pole; Section 15303, new construction or conversion of small structures; Section 15183, projects consistent with a community plan, general plan or zoning.
<b>Historic Status:</b>	Not A Historic Property
<b>City Council District:</b>	5
<b>Date Filed:</b>	December 21, 2016
<b>Finality of Decision:</b>	Appealable to City Council within 10 Days
<b>For Further Information:</b>	Contact case planner Jose M. Herrera-Preza at (510) 238-3808 or <a href="mailto:jherrera@oaklandnet.com">jherrera@oaklandnet.com</a>

**SUMMARY**

The project applicant (GTE Mobilnet of California) is proposing to install a wireless telecommunication facility within the Bell Tower/Steeple of the East Bay Alliance Church at 3755 13<sup>th</sup> Avenue. The project involves installation of three (3) antennas within the three openings of the Bell Tower behind a concealment shroud at 43' above the right-of-way and all associated equipment will be housed within the second floor of the bell tower. All telecommunications appurtenances will be screened from view of the public right-of-way.

A Major Conditional Use Permit and Regular Design Review is required for the installation of a new Macro Telecommunications Facility within a residential zone. The proposed antennas and

# CITY OF OAKLAND PLANNING COMMISSION



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Applicant: GTE Mobilnet of California,  
d/b/a Verizon Wireless, c/o Complete Wire  
Address: 3755 13th Avenue  
Zone: RM-3



associated equipment are designed to be concealed to the greatest extent possible to minimize visual impacts. As result, the proposed telecommunication facility is in an appropriate location and would not significantly increase negative visual impacts to adjacent neighboring residential properties. The proposed project meets all the required findings for approval of this project.

**TELECOMMUNICATIONS BACKGROUND**

**Limitations on Local Government Zoning Authority under the Telecommunications Act of 1996**

Section 704 of the Telecommunications Act of 1996 (TCA) provides federal standards for the siting of "Personal Wireless Services Facilities." "Personal Wireless Services" include all commercial mobile services (including personal communications services (PCS), cellular radio mobile services, and paging); unlicensed wireless services; and common carrier wireless exchange access services. Under Section 704, local zoning authority over personal wireless services is preserved such that the FCC is prevented from preempting local land use decisions; however, local government zoning decisions are still restricted by several provisions of federal law. Specifically:

- Under Section 253 of the TCA, no state or local regulation or other legal requirement can prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.
- Further, Section 704 of the TCA imposes limitations on what local and state governments can do. Section 704 prohibits any state and local government action which unreasonably discriminates among personal wireless providers. Local governments must ensure that its wireless ordinance does not contain requirements in the form of regulatory terms or fees which may have the "effect" of prohibiting the placement, construction, or modification of personal wireless services.
- Section 704 also preempts any local zoning regulation purporting to regulate the placement, construction and modification of personal wireless service facilities on the basis, either directly or indirectly, on the environmental effects of radio frequency emissions (RF) of such facilities, which otherwise comply with Federal Communications Commission (FCC) standards in this regard. (See 47 U.S.C. Section 332(c)(7)(B)(iv) (1996)). This means that local authorities may not regulate the siting or construction of personal wireless facilities based on RF standards that are more stringent than those promulgated by the FCC.
- Section 704 mandates that local governments act upon personal wireless service facility siting applications to place, construct, or modify a facility within a reasonable time (See 47 U.S.C.332(c)(7)(B)(ii) and FCC Shot Clock ruling setting forth "reasonable time" standards for applications deemed complete).

- Section 704 also mandates that the FCC provide technical support to local governments in order to encourage them to make property, rights-of-way, and easements under their jurisdiction available for the placement of new spectrum-based telecommunications services. This proceeding is currently at the comment stage.

For more information on the FCC's jurisdiction in this area, consult the following:

Competition & Infrastructure Policy Division (CIPD) of the Wireless Telecommunications Bureau, main division number: (202) 418-1310. <https://www.fcc.gov/general/competition-infrastructure-policy-division-wireless-telecommunications-bureau>

## **PROPERTY DESCRIPTION**

The property is located at the northwest corner of Parkway Blvd. and 13<sup>th</sup> Ave. within the East Bay Church Alliance property. The existing church is located along the northeast corner of the parcel adjacent to an open surface parking lot serving as church parking. The subject property is surrounded by civic, institutional and residential land uses.

## **PROJECT DESCRIPTION**

The applicant is proposing the following (Attachment A):

The applicant is proposing to install a telecommunication facility within the Bell Tower/Steeple of the East Bay Church Alliance (Attachment A). The project involves:

- Installation of three antennas with associated appurtenances mounted within the bell tower at a height of 43' above the right-of-way.
- Installation equipment cabinets and other equipment within the second floor of the Bell Tower.
- Concealment of the proposed antennas and associated appurtenances with a grey or brown to match the color of the church.

No portion of the telecommunication facilities will be located on the ground. The proposed antenna and associated equipment will not be accessible to the public.

## **GENERAL PLAN ANALYSIS**

The site is classified Mixed Housing Type Residential per the Oakland General Plan's Land Use and Transportation Element (LUTE). This classification is intended is to create, maintain, and enhance residential areas typically located near the City's major arterials and characterized by a mix of single family homes, townhouses, small multi-unit buildings, and neighborhood businesses where appropriate. The proposed unmanned wireless telecommunication facility, mounted within the East Bay Alliance Church Bell Tower will not adversely affect and detract from the characteristics of the neighborhood.

## **ZONING ANALYSIS**

The proposed telecommunication facility is located within the RM-3 Mixed Housing Type Residential 3 Zone. The intent of the RM-3 Zone is to create, maintain, and enhance residential areas characterized by a mix of single family homes, duplexes, townhouses, small multi-unit buildings at somewhat higher densities than in RM-2, and neighborhood businesses where appropriate. The installation of the telecommunications facility within a civic facility and adjacent to an institutional facility and screened to the greatest extent possible is a preferred method to establish these types of facilities.

Section 17.136.040 and 17.128.070 of the City of Oakland Planning Code requires a Major Design Review permit for Macro Telecommunication facilities that are attached to utility poles in the RM-3 Zone if the site is located within one hundred (100) feet of the boundary of any residential zone. Special findings are also required for Design Review approval to ensure that the facility is concealed to the greatest extent possible. The project design is discussed later in the Key Issues section of this report and the required findings for Major Design Review are listed and included in staff's evaluation later in this report.

## **ENVIRONMENTAL DETERMINATION**

The California Environmental Quality Act (CEQA) Guidelines lists the projects that qualify as categorical exemptions from environmental review. The proposed project is categorically exempt from the environmental review requirements pursuant to Section 15301; minor additions and alterations to an existing civic facility; Section 15303, new construction or conversion of small structures, and Section 15183, projects consistent with a community plan, general plan or zoning.

## **KEY ISSUES AND IMPACTS**

### **1. Conditional Use Permit**

Section 17.17.020 & 17.128.070 of the City of Oakland Planning Code requires a conditional use permit to modify a Macro Telecommunication facility in the RM-3 Zone and requires a Major Conditional use permit if located within a residential zone. The required findings for a major conditional use permit are attached and included in staff's evaluation as part of this report.

### **Project Site**

Section 17.128.110 of the City of Oakland Telecommunication Regulations requires that new wireless facilities shall generally be located on designated properties or facilities in the following ranked order of preference:

- A. Co-located 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 (excluding all HBX Zones and the D-CE3 and D-C-4 Zones).
- D. Existing commercial or industrial structures in residential zones, HBX Zones, or the D-CE-3 or D-CE-4 Zones.

- E. Other non-residential uses in residential zones, HBX Zones, or the D-CE-3 or D-CE-4 Zones.
- F. Residential uses in non-residential zones (excluding all HBX Zones and the D-CE-3 and D-CE-4 Zones).
- G. Residential uses in residential zones, HBX Zones, or the D-CE-3 or D-CE-4 Zones.

Facilities sited on an A, B or C ranked preferences do not require a site alternatives analysis. Since the proposed project involves the installation of a new macro facility within a civic activity in a residential zone, the proposed project meets preferences E, and a site alternatives analysis is required. The applicant has provided site alternatives analysis (Attachment B) where at least 7 different sites were evaluated and based on aesthetics and coverage this site was selected.

**Alternative Site Analysis:**

The project is located along an a significant street between Highway 13 and Interstate 580 within an area with existing residential, civic, institutional and commercial structures. The applicant considered alternative sites on buildings and other utility poles in this area but none of these sites are as desirable from a service coverage perspective or from an aesthetics perspective to minimize visual impacts.

Staff has reviewed the applicant's alternative sites analysis and determined that the site selected conforms to the telecommunication regulation requirements. In addition, staff agrees that no other sites are more suitable.

**Project Design**

Section 17.128.120 of the City of Oakland Telecommunications Regulations requires that new wireless facilities shall generally be designed in the following order of preference:

- A. Building or structure mounted antennas completely 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 (facade 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.

Facilities designed to meet an A and B ranked preference do not require a site design alternatives analysis. Facilities designed to meet a C through F ranked preference, inclusive, must submit a site design alternatives analysis as part of the required application materials. The site design alternatives analysis shall, at a minimum, consist of:

Written evidence indicating why each higher preference design alternative cannot be used. Such evidence shall be in sufficient detail that independent verification could be obtained if required by the City of Oakland Zoning Manager. Evidence should indicate if the reason an alternative was rejected was technical (e.g. incorrect height,

interference from existing RF sources, inability to cover required area) or for other concerns (e.g. inability to provide utilities, construction or structural impediments).

The proposed project meets preference A since it will be entirely located within an existing building; therefore a site design alternatives analysis is not required.

**Project Radio Frequency Emissions Standards**

Section 17.128.130 of the City of Oakland Telecommunication Regulations requires that the applicant submit the following verifications including requests for modifications to existing facilities:

- a. The telecommunications regulations require that the applicant submit written documentation demonstrating that the emission from the proposed project are within the limits set by the Federal Communications Commission.
- b. 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.

In the analysis prepared by Hammett & Edison, Inc. (Attachment C), the proposed project was evaluated for compliance with appropriate guidelines limiting human exposure to radio frequency electromagnetic fields. According to the report, the project will comply with the prevailing standards for limiting public exposure to radio frequency energy, and therefore, the proposed site will operate within the current acceptable thresholds as established by the Federal government or any such agency that may be subsequently authorized to establish such standards. The RF emissions report, states that the proposed project will not cause a significant impact on the environment. Additionally, staff recommends that, prior to the final building permit sign off, the applicant submit a certified RF emissions report stating that the facility is operating within acceptable thresholds established by the regulatory federal agency.

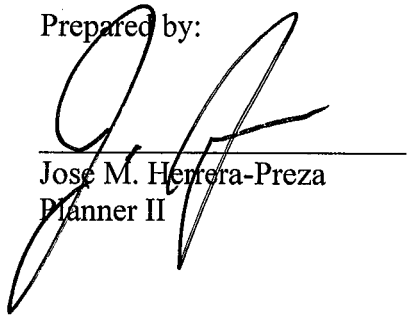
**CONCLUSION**

The proposed project meets all of the required findings for approval. The proposal will provide an essential telecommunication service to the community and the City of Oakland at large. It will also be available to emergency services such as police, fire department and emergency response teams. Staff believes that the proposal is designed to meet the established zoning and telecommunication regulations and recommends supporting the Major Design Review application.

**RECOMMENDATIONS:**

- 1. Affirm staff's environmental determination
- 2. Approve the Major Conditional Use Permit and Design Review application, subject to the attached findings and conditions of approval.

Prepared by:



Jose M. Herrera-Preza  
Planner II

Reviewed by:



Neil Gray (Acting)  
Scott Miller  
Zoning Manager

Approved for forwarding to the  
City Planning Commission



Darin Ranelletti, Interim Director  
Planning and Building Department

**ATTACHMENTS:**

- A. Project Plans & Photo simulations
- B. Site & Design Alternative Analysis
- C. Hammett & Edison, Inc., Consulting Engineering RF Emissions Report

**FINDINGS FOR APPROVAL****FINDINGS FOR APPROVAL:**

This proposal meets all the required findings under 17.134.050, General Use Permit Criteria; Section 17.128.070(C), Conditional Use Permit Criteria for Macro Facilities; Section 17.136.050.(B), Non-Residential Design Review criteria 17.128.070(B), Design Review Criteria for Macro Facilities and all the required findings under Section 17.128.070(B), of the telecommunication facilities (Macro) Design Review criteria and as set forth below: Required findings are shown in **bold** type; reasons your proposal satisfies them are shown in normal type.

**SECTION 17.134.050 – GENERAL USE PERMIT CRITERIA:**

**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 will establish a Macro wireless telecommunications facility consisting of three antennas and associated appurtenances mounted within the façade of the church bell tower and associated equipment along the second floor of the tower. The new antennas would be completely screened from public view behind a concealment shroud within the bell tower arches. The proposed facility is sited within a church along a busy street surrounded by other civic and institutional activities and therefore would not adversely affect the nearby residential properties. The purpose of the project is to enhance wireless telecommunications in the area in the least intrusive manner possible.

**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 proposed unmanned telecommunications facility within a large church located along a busy street will increase service without generating negative functional or aesthetic impacts to the area. The setting of the facility within a non-residential facility within a residential zone and given that the facility provides an opportunity to conceal the antennas as opposed to simply attaching them to the exterior of the steeple. Furthermore allowing the antennas at a higher elevation allows for a broader signal reach thereby improving the functionality of the facility.

**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 proposed facility will enhance the successful operation of the surrounding area in its basic community function and will provide an essential service to the community or region. This will be achieved by improving the functional use of the site by providing a regional

telecommunication facility for the community and will be available to police, fire, public safety organizations and the general public.

**D. That the proposal conforms to all applicable design review criteria set forth in the design review procedure at Section 17.136.070.**

The proposal conforms with all significant aspects of the design review criteria set forth in Chapter 17.136 of the Oakland Planning Code, as outlined below.

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

The project is consistent with the following Policy of the Oakland General Plan's Land Use & Transportation Element (adopted 1998):

***Policy N9.9 Respecting Architectural Integrity***

*City encourages that new development respects the architectural integrity of a building's original style. The proposed development will have no effect on the existing buildings on site.*

**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 project meets the required design review criteria for this application.

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

The proposal will add three new antennas within the church bell tower behind proposed RF screens which will improve site conditions and thus the neighborhood.

**17.136.050(B) – NONRESIDENTIAL DESIGN REVIEW CRITERIA:**

**1. That the proposal will help achieve or maintain a group of facilities which are well related to one another and which, when taken together, will result in a well-composed design, with consideration given to site, landscape, bulk, height, arrangement, texture, materials, colors, and appurtenances; the relation of these factors to other facilities in the vicinity; and the relation of the proposal to the total setting as seen from key points in the surrounding area. Only elements of design which have some significant relationship to outside appearance shall be considered, except as otherwise provided in Section 17.136.060;**

The proposal to install three telecommunication antennas within a church bell tower 43' above the right-of-way with the associated equipment within the second floor of the bell tower will minimize visual impacts. Given the unique composition of the civic building and proposal to paint the RF screens to match the church, the facility will blend in with existing bell tower structure. In addition, the facility is located approximately adjacent to civic and intuitional facilities near the intersection of two arterial streets. Finally, the proposed antennas and appurtenances will be located high up



on the building and oriented toward the street away from the residential structures. Therefore, the proposal will have minimal visual impacts from public views.

**2. That the proposed design will be of a quality and character which harmonizes with, and serves to protect the value of, private and public investments in the area;**

The proposal improves wireless telecommunication service in the residential area. The facility will be concealed behind RF screens painted white or gray color to blend in with the existing bell tower and be compatible with the surrounding area and have minimal visual impacts on public views and protect the value of private and public investments in the area. Service will also be available to emergency services such as police, fire department and emergency response teams.

**3. That the proposed design conforms in all significant respects with the Oakland General Plan and with any applicable design review guidelines or criteria, district plan, or development control map which have been adopted by the Planning Commission or City Council.**

The site is classified as Mixed Housing Type Residential per the Oakland General Plan's Land Use and Transportation Element (LUTE). This classification is intended to create, maintain, and enhance residential areas typically located near the City's major arterials and characterized by a mix of single family homes, townhouses, small multi-unit buildings, and neighborhood businesses where appropriate.

Section 17.128.120 of the City of Oakland Telecommunications Regulations describes the design criteria for wireless facilities. In general, these facilities should either be concealed from view or not visible from the public right of way. The proposed antennas and associated equipment with an existing building and concealed from public view with minimal impacts to the existing building is consistent telecommunication regulation requirements, in an appropriate location, and of an appropriate design that would not significantly increase negative visual impacts to adjacent neighboring residential properties

**17.128.070(B) DESIGN REVIEW CRITERIA FOR MACRO FACILITIES**

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

The proposed antennas and related equipment will be located behind RF screens painted white or gray to match the church's color.

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

The proposed antenna and equipment will be mounted onto an architecturally significant structure of the church but will maintain the height, shape and form. The in-fill of the arches will be minimized by an RF screen intended to maintain the profile of the open arches.

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

The proposed antennas will be placed within the church bell tower and screened behind RF shrouds.

**4. Equipment shelters or cabinets shall be screened from the public view by using landscaping, or materials and colors consistent with surrounding backdrop:**

The proposed equipment shelters will be located on the second floor of the bell tower, which is a solid mass of the tower and contains no window openings, therefore will have no visual impacts.

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

The proposed equipment shelters will be located on the second floor of the bell tower, which is a solid mass of the tower and contains no window openings, therefore will have no visual impacts

**6. For antennas attached to the roof, maintain a 1:1 ratio 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.**

N/A

**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.**

None of the equipment will be accessible to the public due to its location.

**STANDARD CONDITIONS:**

**1. Approved Use**

The project shall be constructed and operated in accordance with the authorized use as described in the approved application materials, and the approved plans dated **December 6, 2016** and submitted on **December 21, 2016** as amended by the following conditions of approval and mitigation measures, if applicable (“Conditions of Approval” or “Conditions”).

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

This Approval shall become effective immediately, unless the Approval is appealable, in which case the Approval shall become effective in ten calendar days unless an appeal is filed. Unless a different termination date is prescribed, this Approval shall expire **two years** from the Approval date, or from the date of the final decision in the event of an appeal, 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 Approval, 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 or other construction-related permit for this project may invalidate this Approval if said Approval has also expired. If litigation is filed challenging this Approval, or its implementation, then the time period stated above for obtaining necessary permits for construction or alteration and/or commencement of authorized activities is automatically extended for the duration of the litigation.

**3. Compliance with Other Requirements**

The project applicant shall comply with all other applicable federal, state, regional, and local laws/codes, requirements, regulations, and guidelines, including but not limited to those imposed by the City’s Bureau of Building, Fire Marshal, and Public Works Department. 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 #4.

**4. Minor and Major Changes**

- a. Minor changes to the approved project, plans, Conditions, facilities, or use may be approved administratively by the Director of City Planning
- b. Major changes to the approved project, plans, Conditions, facilities, or use shall be reviewed by the Director of City Planning to determine whether such changes require submittal and approval of a revision to the Approval by the original approving body or a new independent permit/approval. Major revisions shall be reviewed in accordance with the procedures required for the original permit/approval. A new independent permit/approval shall be reviewed in accordance with the procedures required for the new permit/approval.

**5. Compliance with Conditions of Approval**

- a. The project applicant and property owner, including successors, (collectively referred to hereafter as the “project applicant” or “applicant”) shall be responsible for compliance with all the Conditions of Approval and any recommendations contained in any submitted and

approved technical report at his/her sole cost and expense, subject to review and approval by the City of Oakland.

- b. The City of Oakland reserves the right at any time during construction to require certification by a licensed professional at the project applicant's expense that the as-built project conforms to all applicable requirements, including but not limited to, approved maximum heights and minimum setbacks. Failure to construct the project in accordance with the Approval may result in remedial reconstruction, permit revocation, permit modification, stop work, permit suspension, or other corrective action.
- c. Violation of any term, Condition, or project description relating to the Approval 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 Approval or alter these Conditions if it is found that there is violation of any of the Conditions 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 Approval or Conditions.

**6. Signed Copy of the Approval/Conditions**

A copy of the Approval letter and Conditions shall be signed by the project applicant, attached to each set of permit plans submitted to the appropriate City agency for the project, and made available for review at the project job site at all times.

**7. Blight/Nuisances**

The project site shall be kept in a blight/nuisance-free condition. Any existing blight or nuisance shall be abated within 60 days of approval, unless an earlier date is specified elsewhere.

**8. Indemnification**

- a. To the maximum extent permitted by law, the project applicant shall defend (with counsel acceptable to the City), indemnify, and hold harmless the City of Oakland, the Oakland City Council, the Oakland Redevelopment Successor Agency, the Oakland City Planning Commission, and their respective agents, officers, employees, and volunteers (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 this Approval or implementation of this Approval. The City may elect, in its sole discretion, to participate in the defense of said Action and the project 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 project applicant shall execute a Joint Defense Letter of Agreement with the City, acceptable to the Office of the City Attorney, which memorializes the above obligations. These obligations and the Joint Defense Letter of Agreement shall survive termination, extinguishment, or invalidation of the Approval. Failure to timely execute the Letter of

Agreement does not relieve the project applicant of any of the obligations contained in this Condition or other requirements or Conditions of Approval that may be imposed by the City.

**9. Severability**

The Approval would not have been granted but for the applicability and validity of each and every one of the specified Conditions, and if one or more of such Conditions is found to be invalid by a court of competent jurisdiction this Approval would not have been granted without requiring other valid Conditions 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 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 special inspector(s)/inspections as needed during the times of extensive or specialized plan check review, or construction. The project applicant may also be required to cover the full costs of independent technical 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. Public Improvements**

The project applicant shall obtain all necessary permits/approvals, such as encroachment permits, obstruction permits, curb/gutter/sidewalk permits, and public improvement (“p-job”) permits from the City for work in the public right-of-way, including but not limited to, streets, curbs, gutters, sidewalks, utilities, and fire hydrants. Prior to any work in the public right-of-way, the applicant shall submit plans for review and approval by the Bureau of Planning, the Bureau of Building, and other City departments as required. Public improvements shall be designed and installed to the satisfaction of the City.

**13. Days/Hours of Construction Operation**

***Ongoing throughout demolition, grading, and/or construction***

The project applicant shall require construction contractors to limit standard construction activities as follows:

- a) Construction activities are limited to between 7:00 AM and 7:00 PM Monday through Friday, except that pile driving and/or other extreme noise generating activities greater than 90 dBA shall be limited to between 8:00 a.m. and 4:00 p.m. Monday through Friday.
- b) Any construction activity proposed to occur outside of the standard hours of 7:00 am to 7:00 pm Monday through Friday for special activities (such as concrete pouring which may require more continuous amounts of time) shall be evaluated on a case by case basis, with criteria including the proximity of residential uses and a consideration of resident’s preferences for whether the activity is acceptable if the

overall duration of construction is shortened and such construction activities shall only be allowed with the prior written authorization of the Building Services Division.

- c) Construction activity shall not occur on Saturdays, with the following possible exceptions:
  - i. Prior to the building being enclosed, requests for Saturday construction for special activities (such as concrete pouring which may require more continuous amounts of time), shall be evaluated on a case by case basis, with criteria including the proximity of residential uses and a consideration of resident's preferences for whether the activity is acceptable if the overall duration of construction is shortened. Such construction activities shall only be allowed on Saturdays with the prior written authorization of the Building Services Division.
  - ii. After the building is enclosed, requests for Saturday construction activities shall only be allowed on Saturdays with the prior written authorization of the Building Services Division, and only then within the interior of the building with the doors and windows closed.
- d) No extreme noise generating activities (greater than 90 dBA) shall be allowed on Saturdays, with no exceptions.
- e) No construction activity shall take place on Sundays or Federal holidays.
- f) Construction activities include but are not limited to: truck idling, moving equipment (including trucks, elevators, etc) or materials, deliveries, and construction meetings held on-site in a non-enclosed area.

#### **14. Radio Frequency Emissions**

##### ***Prior to the final building permit sign off.***

The applicant shall submit a certified RF emissions report stating the facility is operating within the acceptable standards established by the regulatory Federal Communications Commission.

#### **15. Screening of Bell Tower**

Requirement: The antennas shall be set in/recessed from all bell tower openings, and the RF screen shall be opaque and a contrasting color. The RF screen shall be to be placed behind the bell tower openings in order to preserve the shadow line of the bell tower openings.

When Required: Prior to a final inspection

Initial Approval: N/A

Monitoring/Inspection: Bureau of Building

#### **16. Operational**

##### **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.

#### **17. Possible District Undergrounding PG&E Pole**

##### **Ongoing**

Should the PG &E utility pole be voluntarily removed for purposes of district undergrounding or otherwise, the telecommunications facility can only be re-established by

applying for and receiving approval of a new application to the Oakland Planning Department as required by the regulations.

**Applicant Statement**

I have read and accept responsibility for the Conditions of Approval. I agree to abide by and conform to the Conditions of Approval, as well as to all provisions of the Oakland Planning Code and Oakland Municipal Code pertaining to the project.

\_\_\_\_\_  
Name of Project Applicant

\_\_\_\_\_  
Signature of Project Applicant

\_\_\_\_\_  
Date

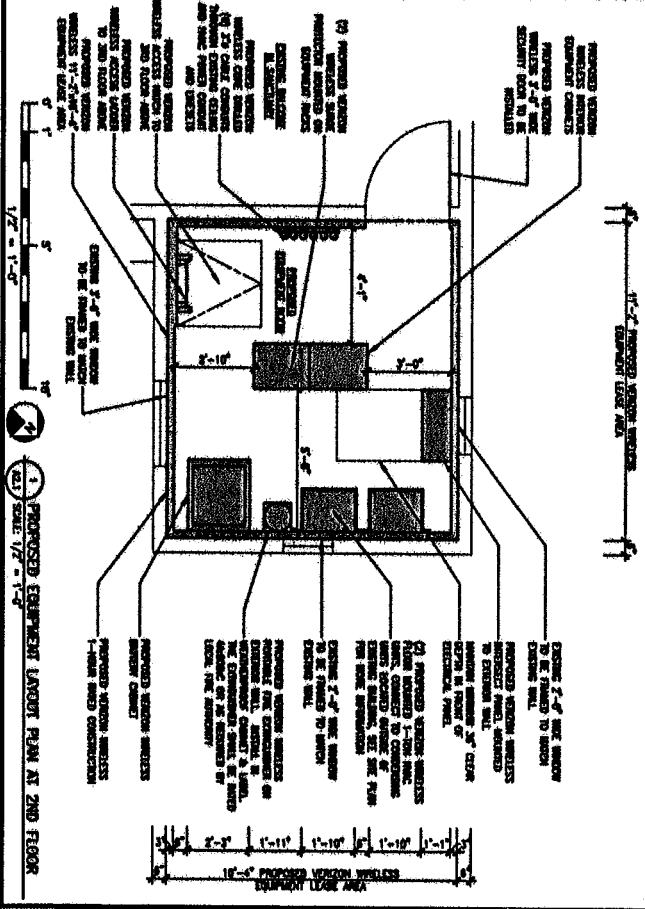
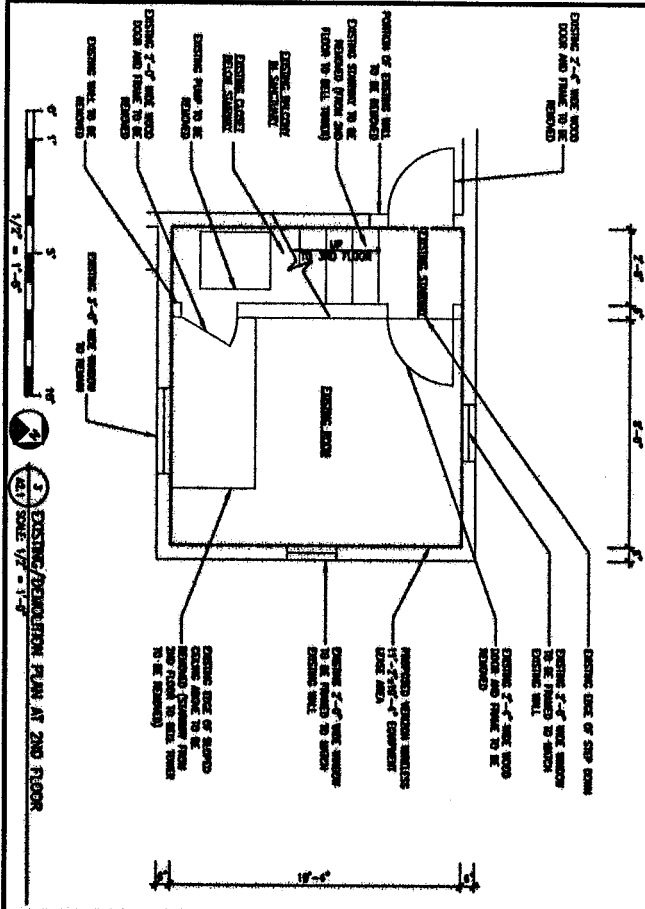
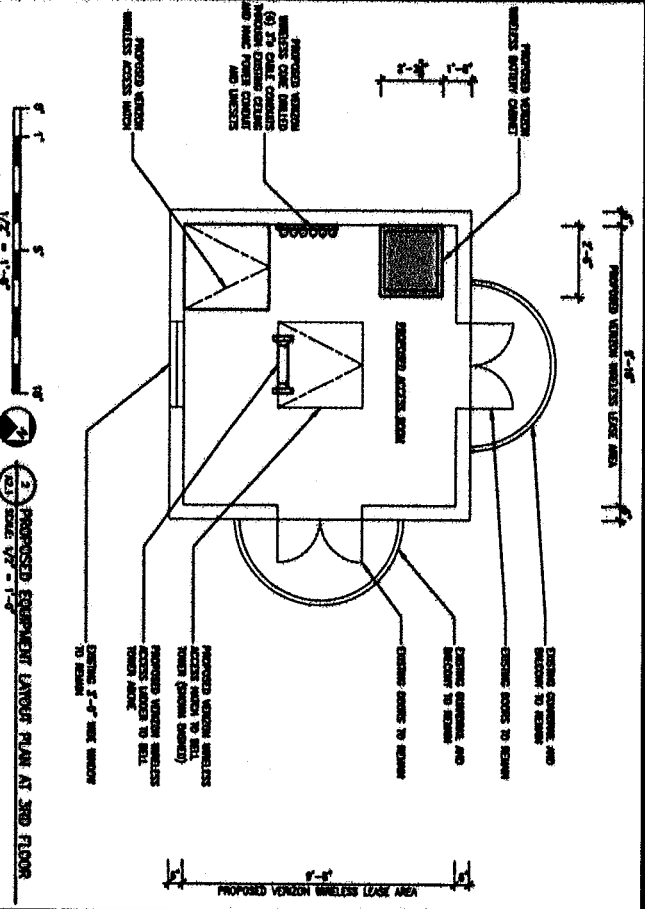
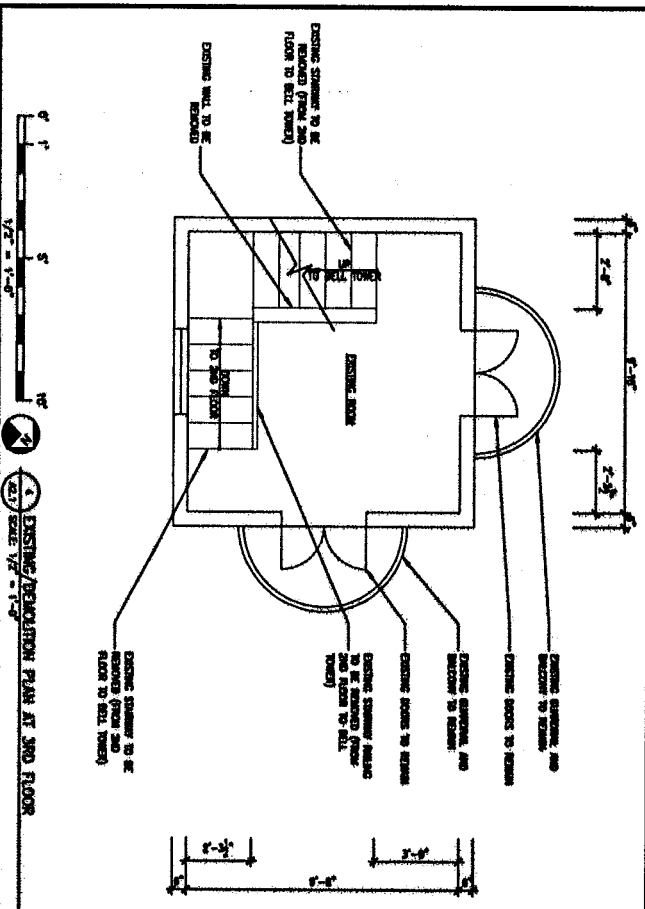




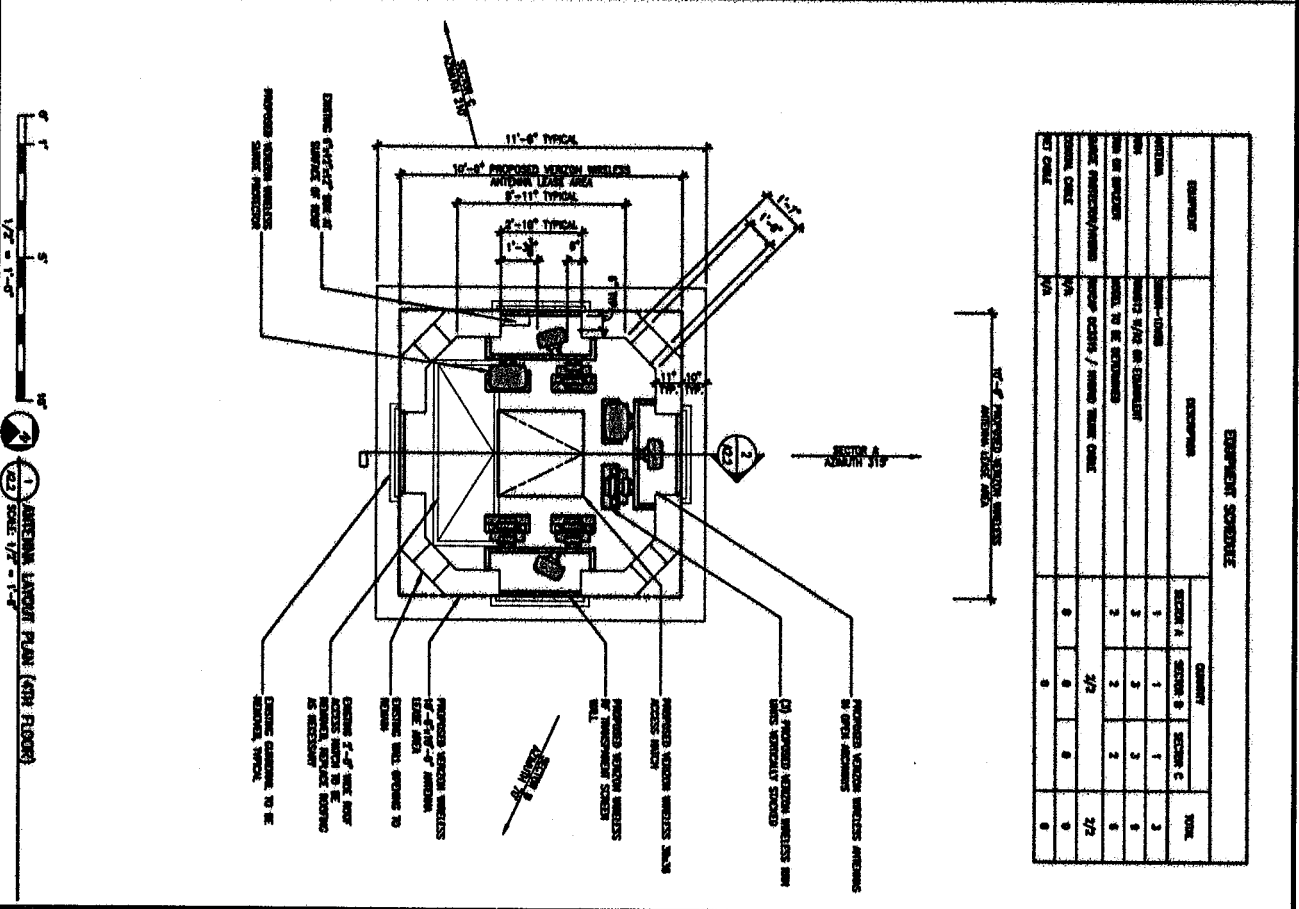
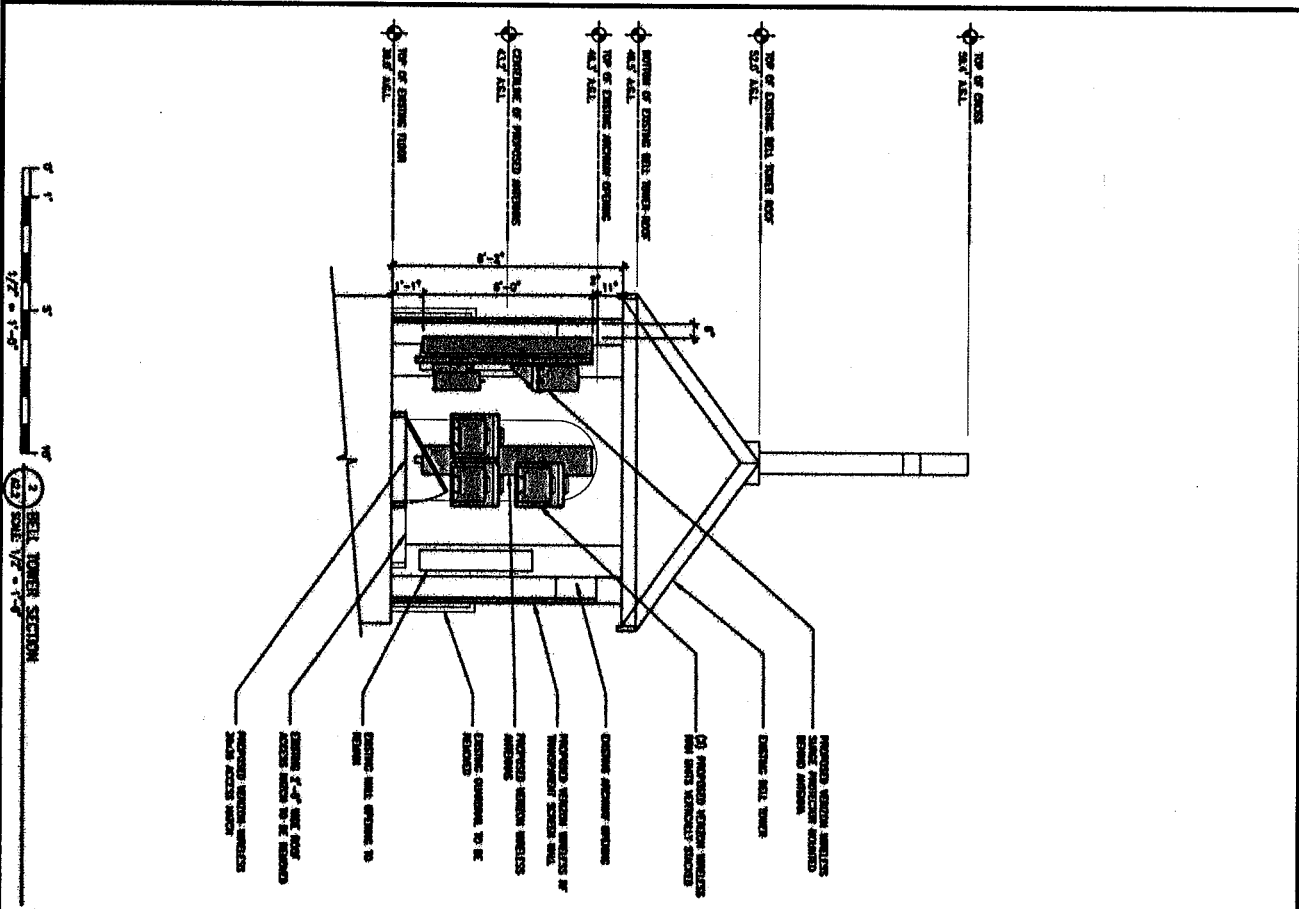








<p><b>A2.1</b></p>	<p><b>verizon</b> CROCKER GLEN 3755 13TH AVENUE OAKLAND, CA 94610</p>	<p><b>MST ARCHITECTS</b> 1123 Howe Park Drive, Sacramento, CA 95833 916.667.9610 www.MSTArchitects.com</p>	<p><b>COMPLETE</b> Architectural Services</p>
	<p>SHEET TITLE: <b>EXISTING/DEMOLITION &amp; EQUIPMENT LAYOUT PLANS</b></p>		



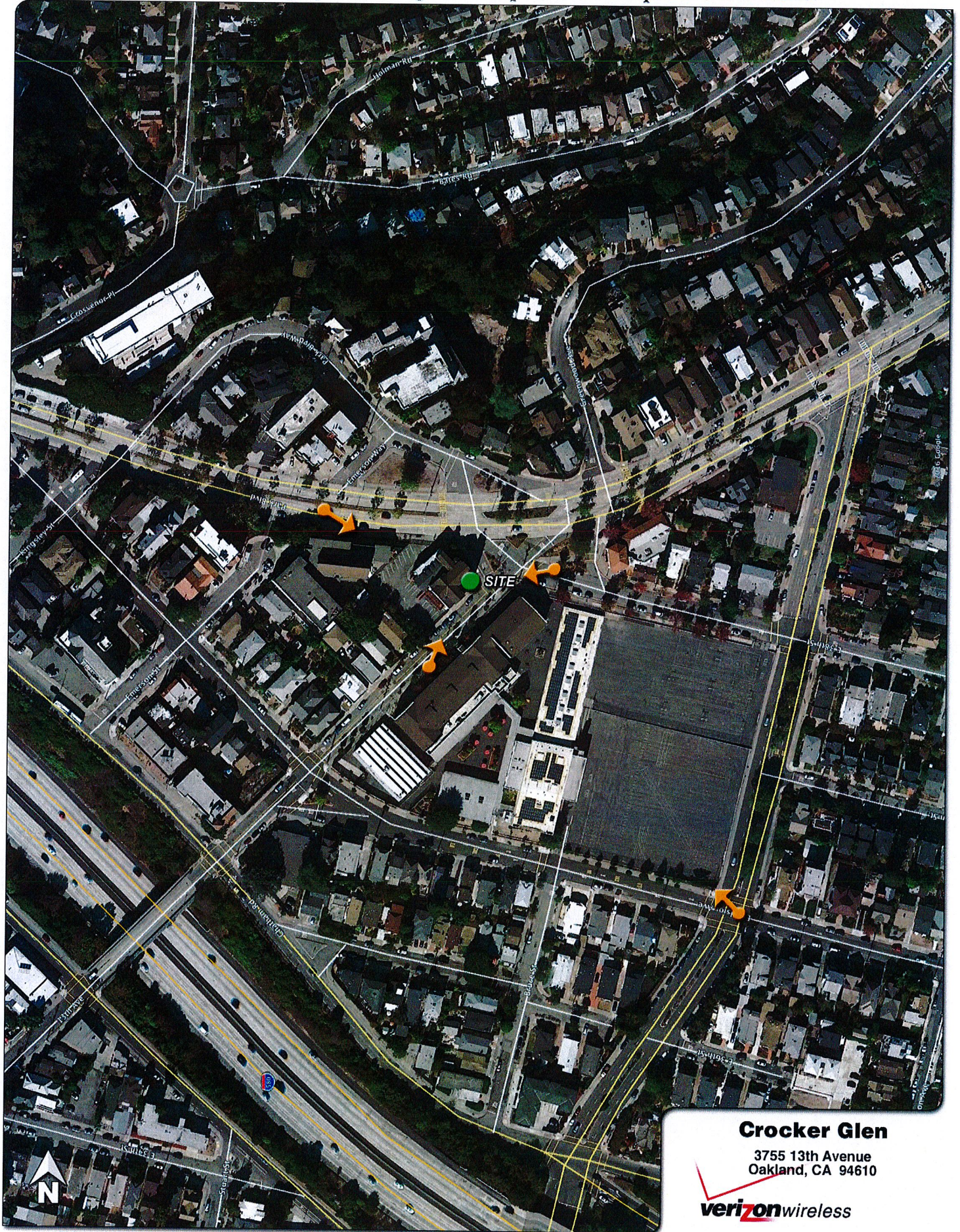
EQUIPMENT SCHEDULE						
EQUIPMENT	DESCRIPTION	QUANTITY	SECTION A	SECTION B	SECTION C	TOTAL
ANTENNA	WIRELESS ANTENNAS	1	1	1	1	3
WALL	WIRELESS ANTENNAS	2	2	2	2	6
WALL	TO BE REMOVED	2	2	2	2	6
WALL	TO BE REMOVED	2/2	2/2	2/2	2/2	3/2
WALL	TO BE REMOVED	2	2	2	2	6
WALL	TO BE REMOVED	2	2	2	2	6







Aerial photograph showing the viewpoints for the photosimulations.

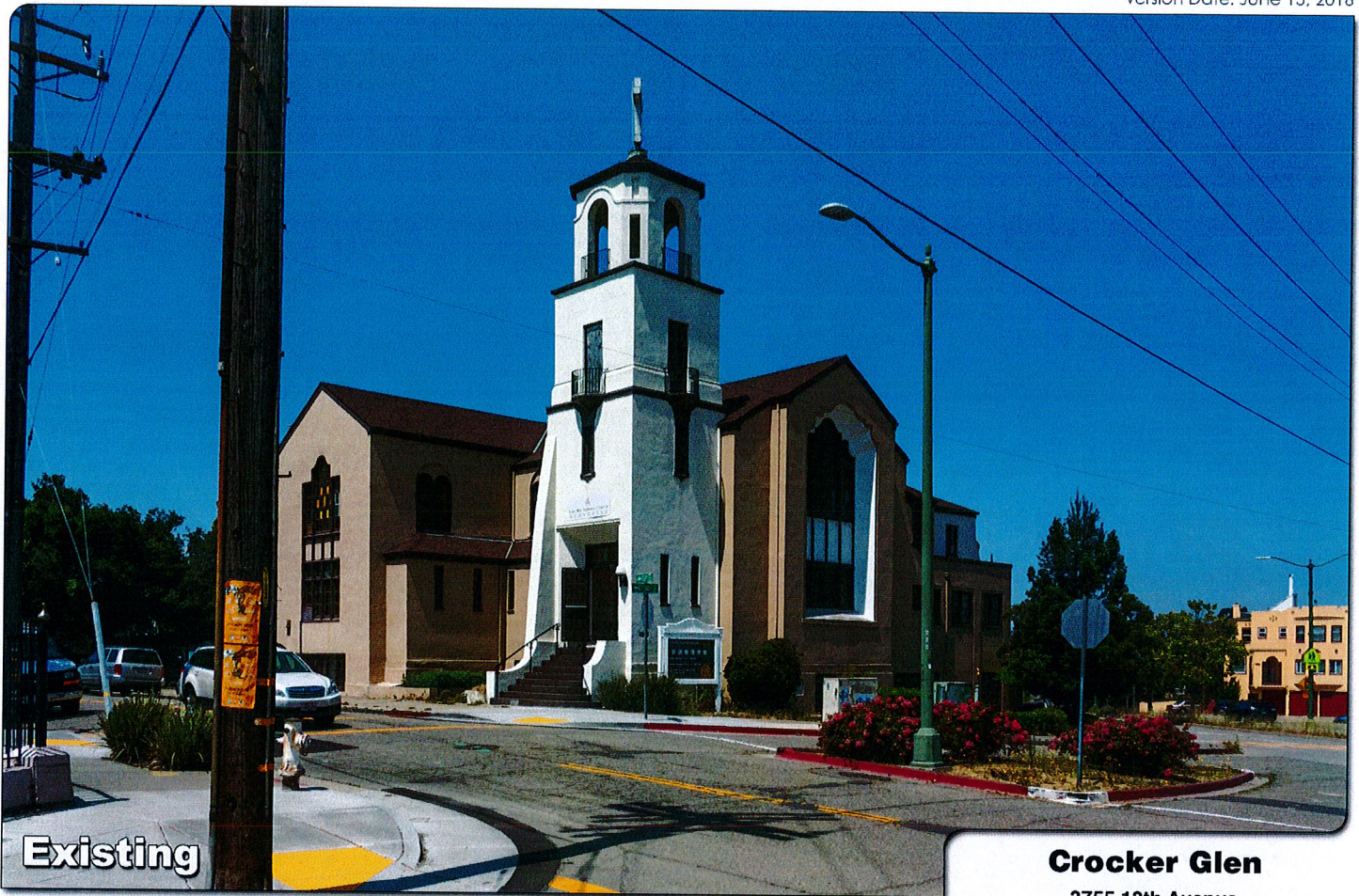


**Crocker Glen**

3755 13th Avenue  
Oakland, CA 94610





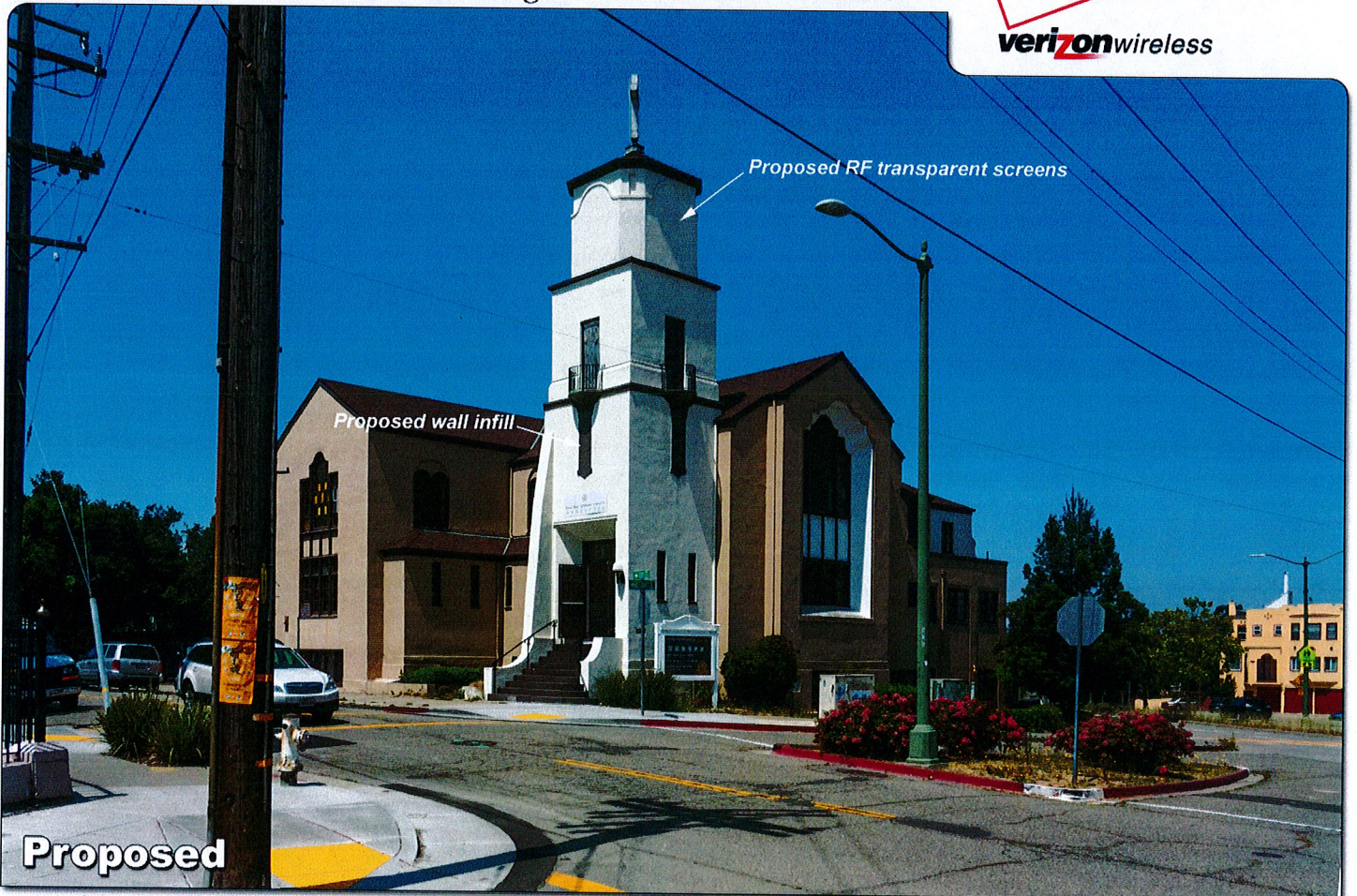


**Existing**

Photosimulation of the view looking west from across 13th Ave.

**Crocker Glen**

3755 13th Avenue  
Oakland, CA 94610



**Proposed**





**Existing**

Photosimulation of the view looking north from across 13th Ave.

**Crocker Glen**

3755 13th Avenue  
Oakland, CA 94610



*Proposed RF transparent screens*

**Proposed**





**Existing**

Photosimulation of the view looking southeast along Park Blvd.

**Crocker Glen**

3755 13th Avenue  
Oakland, CA 94610

**verizon**wireless



**Proposed**





**Existing**

Photosimulation of the view looking northwest from Excelsior Ave.

**Crocker Glen**

3755 13th Avenue  
Oakland, CA 94610

**verizon**wireless



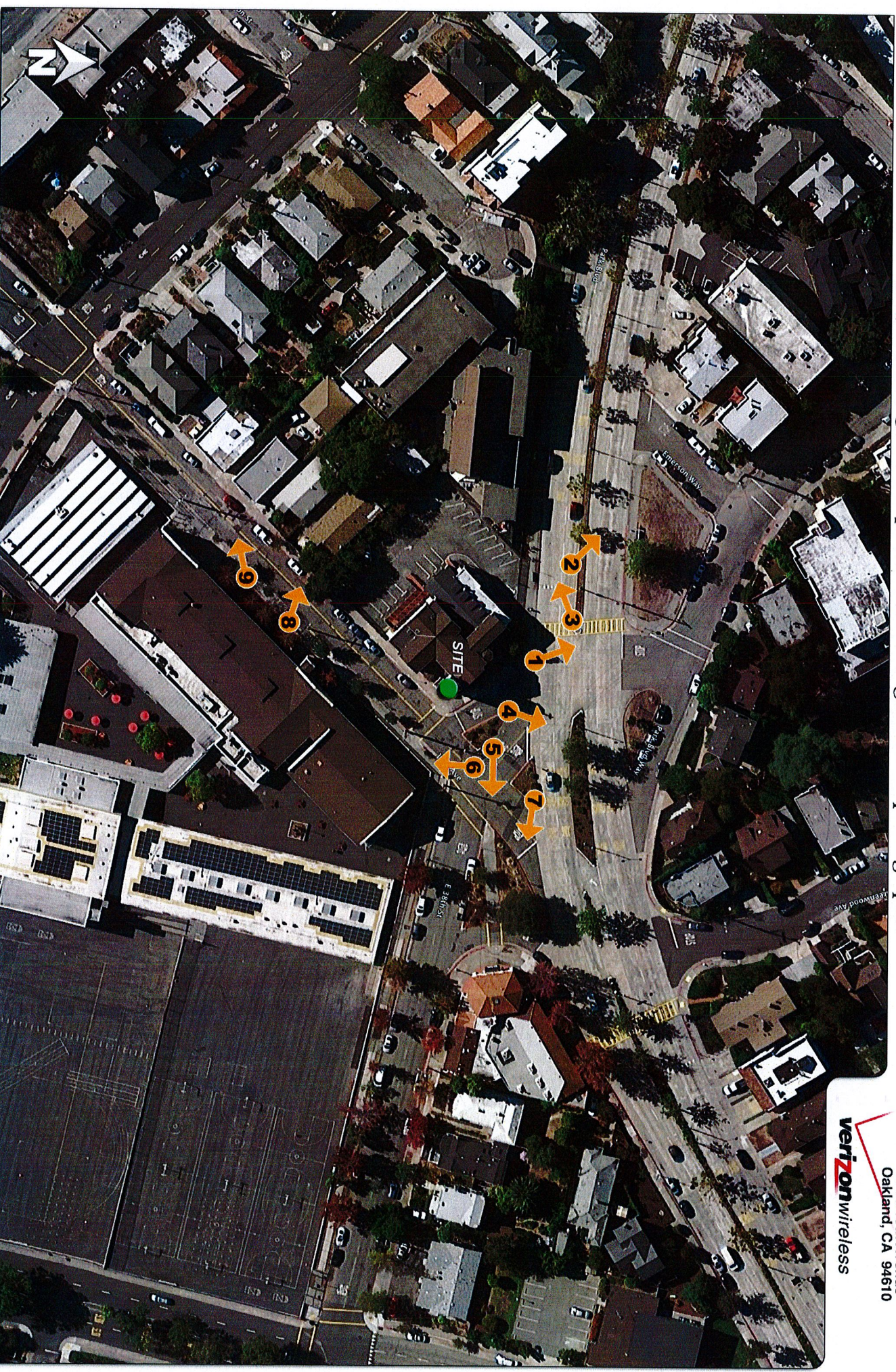
Proposed RF transparent screens

**Proposed**



Aerial photograph showing the viewpoints for the neighborhood photographs.

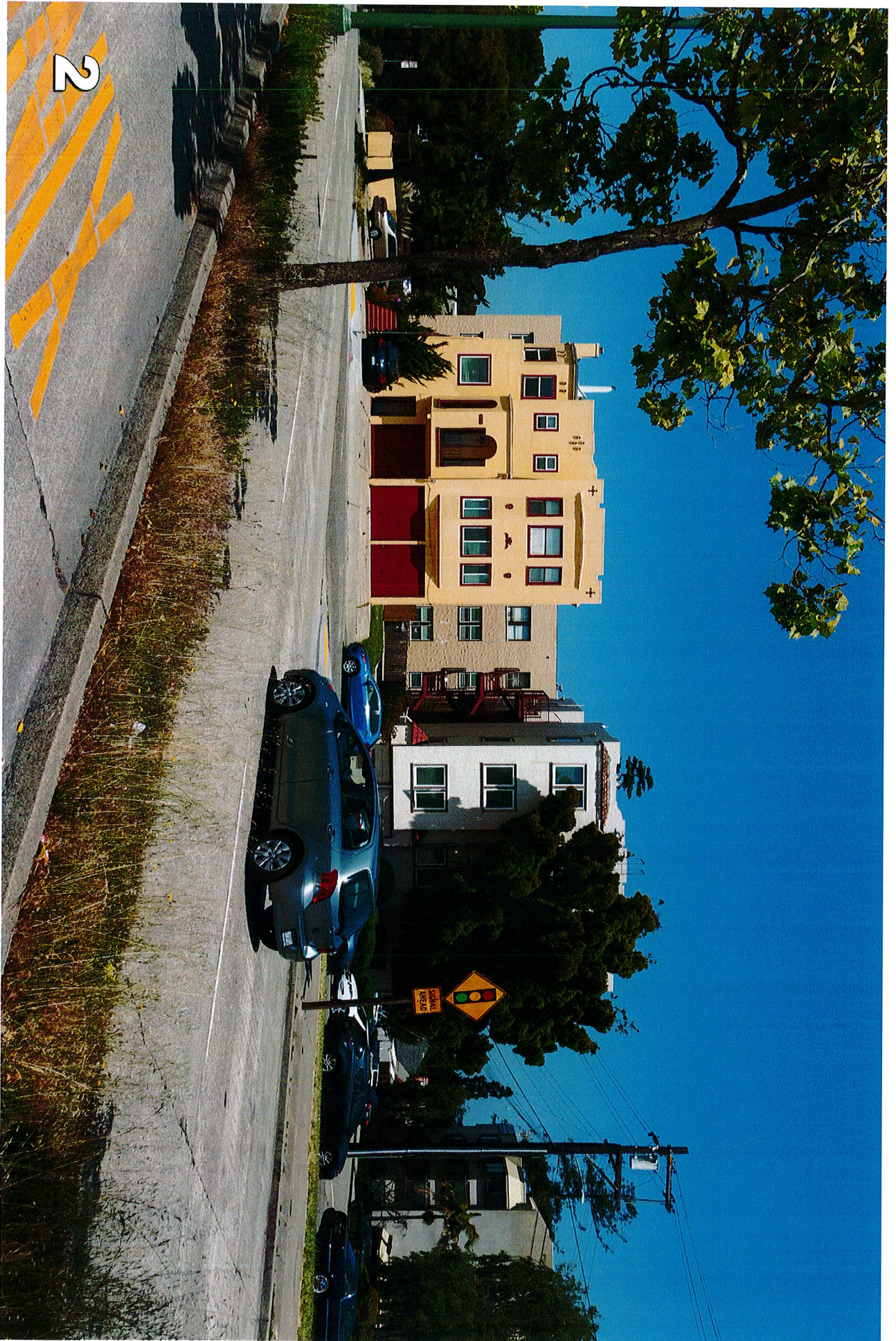
**Crocker Glen**  
3755 13th Avenue  
Oakland, CA 94610  
**verizon**wireless











2







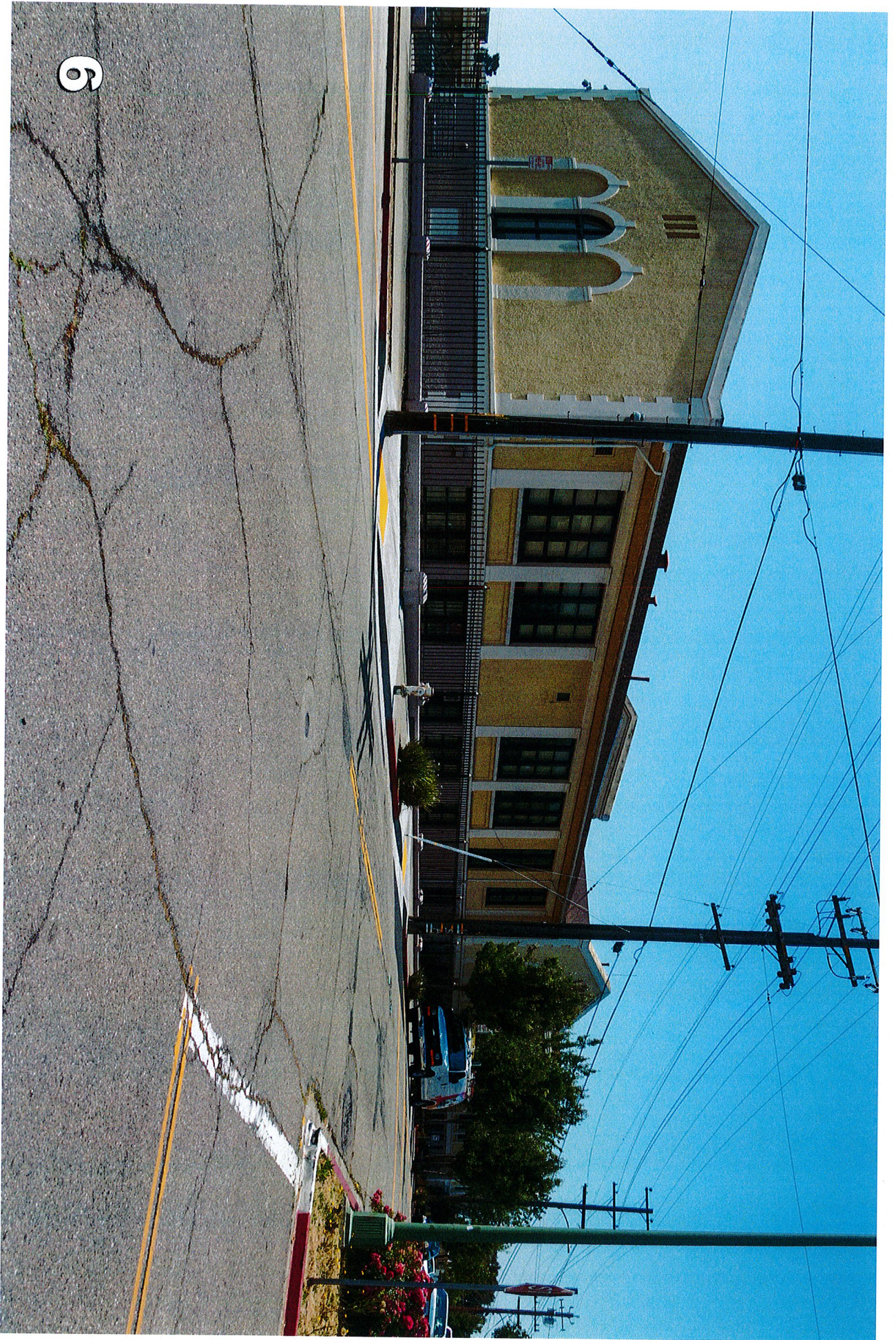






5









7









6



## ALTERNATIVE SITES ANALYSIS VERIZON WIRELESS

**Site Name:** Crocker Glen  
**Location:** 3755 13th Avenue, Oakland, CA 94610  
**APN:** 023-0479-006-02

Section 17.128.110 identifies the most preferred site locations and designs as set forth by the City of Oakland. Verizon begins its process by identifying a search area and a required centerline height. Verizon then looks to local codes and general plans to identify the values significant to the local community for the siting and locating of wireless facilities.

In addition to the abovementioned location and height attributes, each proposed site must meet certain minimum requirements, such as the following:

- A willing landlord,
- Feasible construction,
- Road access,
- Available telephone and electrical utilities,
- Satisfaction of coverage objectives, and
- Compliance with local zoning requirements.





a. Co-located on an existing structure or facility with existing wireless antennas.

During the candidate review process, Verizon first looked for collocation opportunities within the search ring. This particular search ring does not provide feasible collocation opportunities to fulfill Verizon’s coverage objectives because the buildings are all two story buildings or shorter, and though multiple PG&E candidates were considered, it was determined that they were not viable candidates for collocation.

1. PGE Colo #1 (LL: Arnold/Reese) – 1363 Bates Rd., Oakland, CA; APN: 024-0532-062: The parcel is zoned residential and is surrounded by similarly zoned parcels. There are site access issues, as the PG&E tower resides in the property owner’s backyard on sloped terrain. Also, this parcel is very small, not allowing the ample space to meet zoning setback requirements.
2. PGE Colo #2 (LL: Jones) – 1097 Wellington St., Oakland, CA; APN: 024-0608-053-02: CWC investigated this tower colo with PG&E and confirm that the legs of the tower reside on two separate parcels. The adjacent parcel is not available, as the property owner was not interested in giving up her parking spot under the tower.
3. PGE Substation – 3701 Park Blvd. Way, Oakland, CA; APN: 023-0474-010: This candidate was initially explored and abandoned due to foreseen planning challenges deriving from the fact that the building is deemed historic by the City of Oakland and the design would have been at eye level with neighboring residents. Despite another carrier currently collocated on the rooftop, PG&E discouraged collocation due to its historic status and updated security protocols for this substation. Verizon explored other areas of the property for a new build opportunity, but PG&E responded that no other ground space is available at this site.

b. City-owned properties or other public or quasi-public facilities.

The search ring is located in the center of residentially zoned areas. This particular service area does not have public or quasi-public facilities available that meet Verizon’s coverage objectives. Please see the above discussion of PG&E candidates that were found to be infeasible for collocation.

c. Existing commercial or industrial structures in non-residential zones (excluding all HBX Zones and the D-CE-3 and D-CE-4 Zones).

Capacity and coverage demands grow as more and more consumers rely on only their smartphones and move away from landlines, making search rings more difficult to place in areas that would be strictly for non-residential or commercial uses. As stated above, the search ring is located in the center of residential zones. Please see the above discussion of PG&E candidates that were found to be infeasible for collocation.



- d. Existing commercial or industrial structures in residential zones, HBX Zones or the D-CE-3 or D-CE-4 Zones).

There are no candidates within the search ring that fall into this category and are feasible for either colocations of new, freestanding facilities.

*Other rooftop facilities that were investigated:*

1. John C. Sue Bypass Trust – 3810 Park Blvd., Oakland, CA; APN: 024-0530-011: CWC discussed the project with the LL and he conveyed that he is not interested in offering his rooftop for this site. There is no available ground space on this parcel.
2. Heldman/Moyer – 4226 Park Blvd., Oakland, CA; APN: 024-0539-045: RF rejected this candidate in the Windshield Summary, as it is too close to the future new build, “Glenview”.

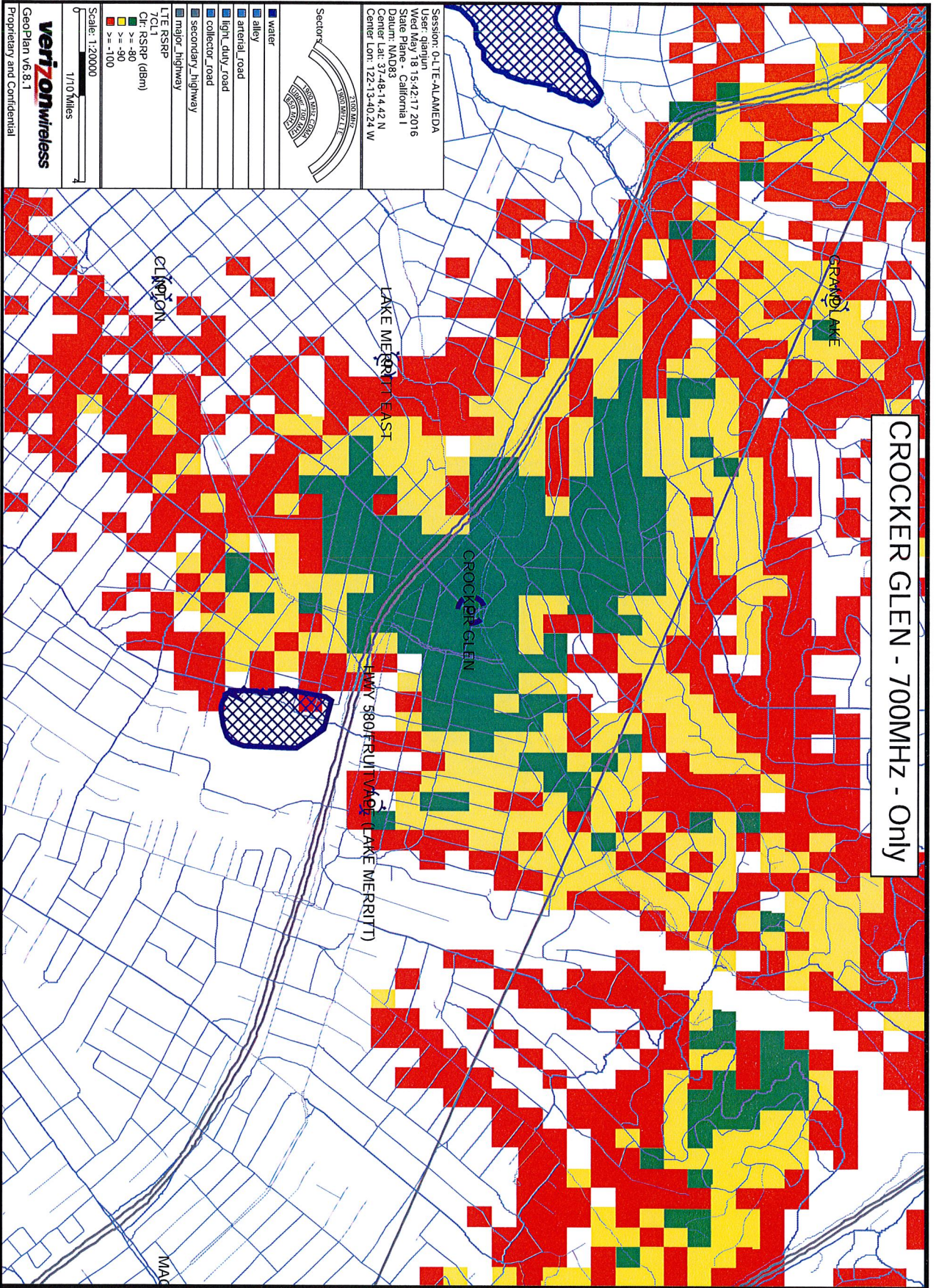
*Other candidates investigated but not presented:*

1. Freedheim – 3630 Park Blvd., Oakland, CA; APN: 023-0476-001-01: Parcel is very small and the existing one-story structure is not feasible for a rooftop colo. Additionally, the zoning code does not allow for the required tower height that meets the RF objective.
2. Marshall – 3600 Pak Blvd., Oakland, CA; APN: 023-0476-021-01: Parcel is very small and the existing one-story structure is not feasible for a rooftop colo. Existing structure is vacated gas station. Additionally, the zoning code does not allow for the required tower height that meets the RF objective.

The Proposed Facility location and design represents a thorough and responsible investigation of alternative sites and co-location possibilities performed over the last few months. After an exhaustive review of the available properties and the applicable zoning law, Verizon has determined that the proposed site is the best available location for a wireless telecommunications facility to meet the coverage objective.

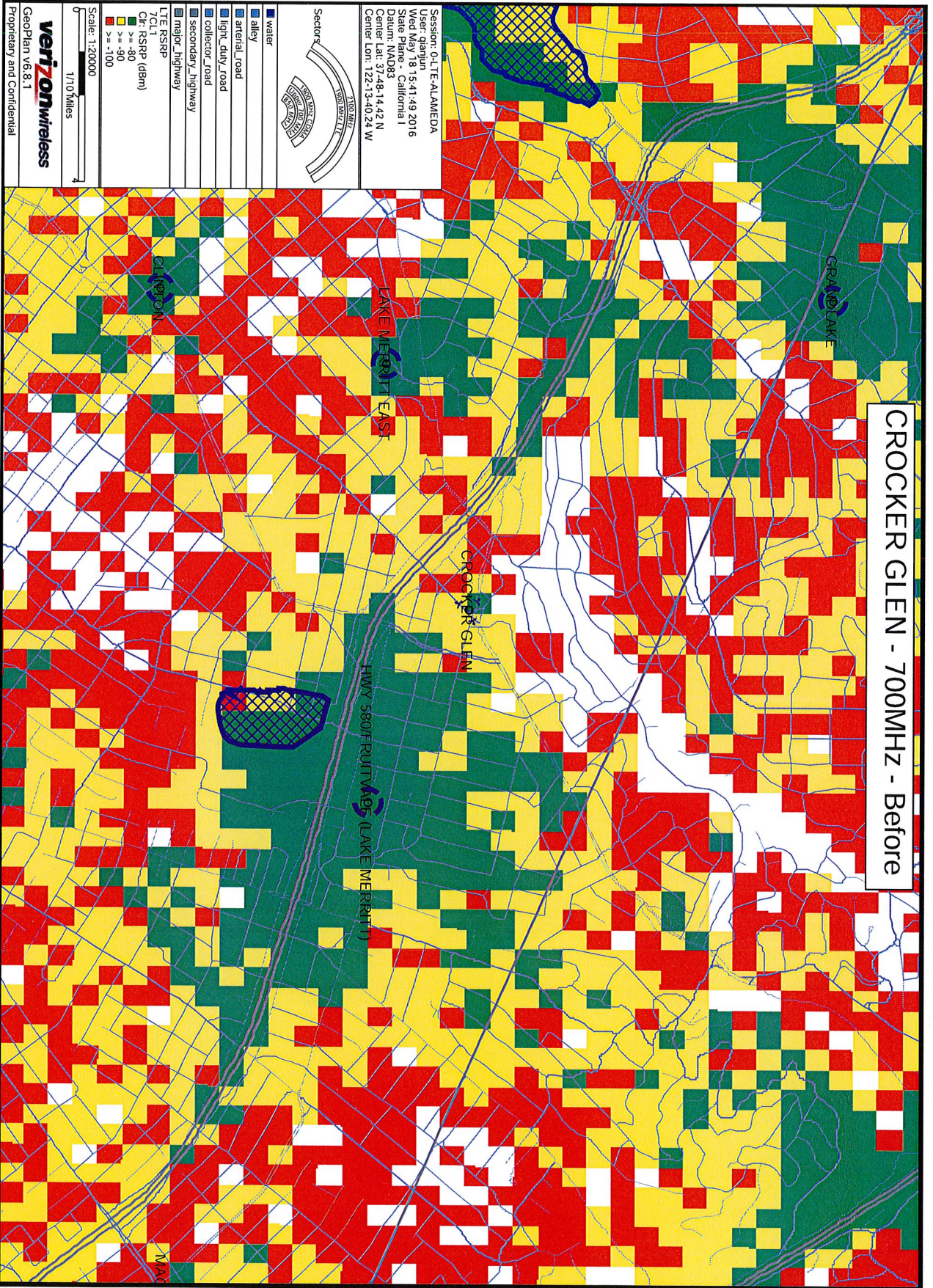


# CROCKER GLEN - 700MHZ - Only





# CROCKER GLEN - 700MHZ - Before



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 User: qianjun  
 Wed May 18 15:41:49 2016  
 State Plane - California I  
 Datum: NAD83  
 Center Lat: 37-48-14.42 N  
 Center Lon: 122-13-40.24 W

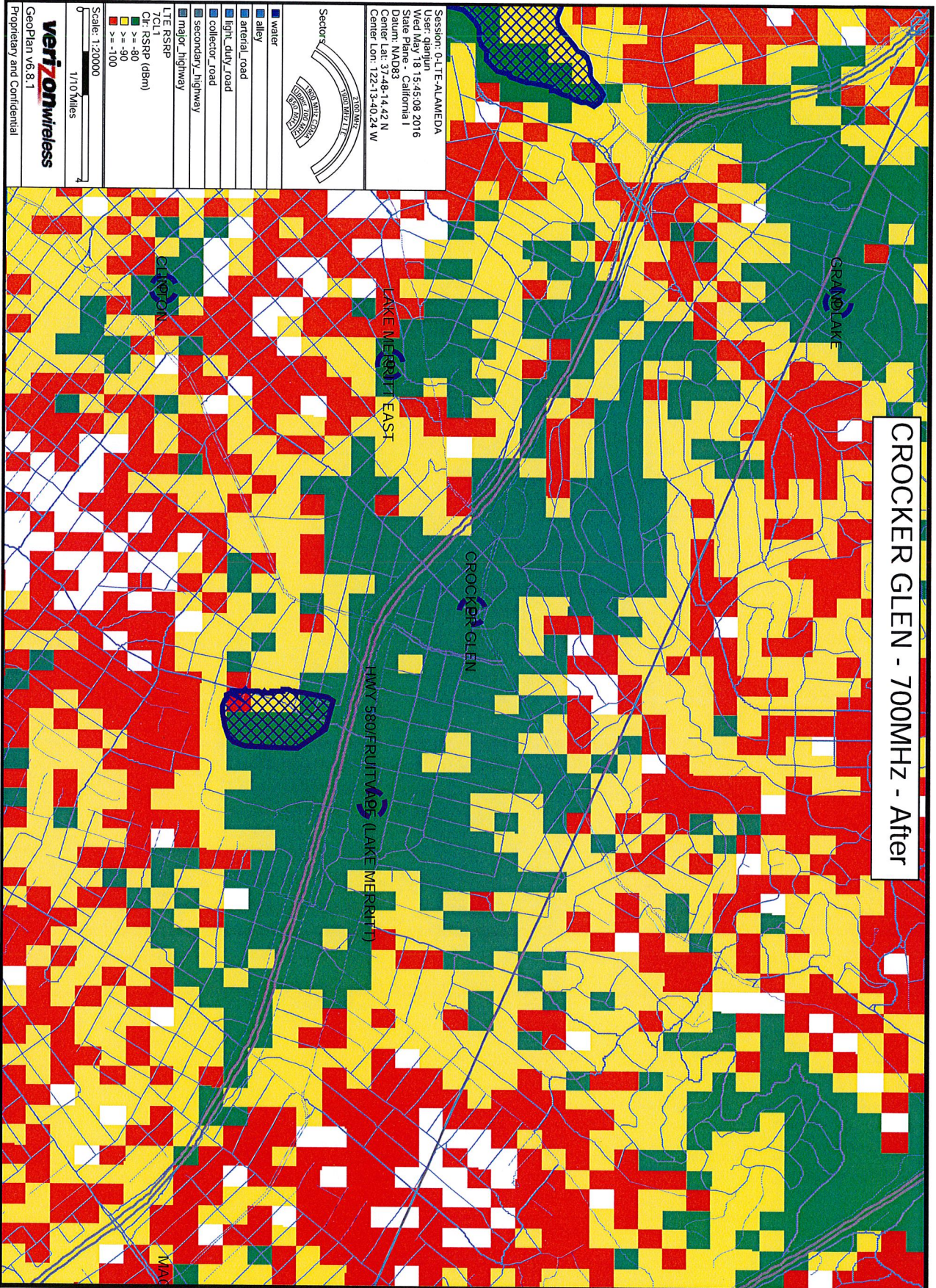


- Sectors:
- water
  - alley
  - arterial\_road
  - light\_duty\_road
  - collector\_road
  - secondary\_highway
  - major\_highway
- LTE RSSP  
 7CL1  
 CR: RSSP (dBm)  
 ■ >= -80  
 ■ >= -90  
 ■ >= -100

Scale: 1:20000  
 1/10 Miles  
**verizonwireless**  
 Geoplan v6.8.1  
 Proprietary and Confidential



# CROCKER GLEN - 700MHZ - After



Session: 0-LTE-ALAMEDA  
 User: qianjun  
 Wed May 18 15:45:08 2016  
 State Plane - California I  
 Datum: NAD83  
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 Center Lon: 122.13-40.24 W



- water
- alley
- arterial\_road
- light\_duty\_road
- collector\_road
- secondary\_highway
- major\_highway
- LTE RSRP
- 7CL1
- Clr: RSRP (dbm)
- >= 80
- >= 90
- >= 100

Scale: 1:20000  
 1/10 Miles

**verizon**wireless  
 GeoPlan v6.8.1  
 Proprietary and Confidential



**Verizon Wireless • Proposed Base Station (Site No. 288245 “Crocker Glen”)  
3755 13th Avenue • Oakland, California**

**Statement of Hammett & Edison, Inc., Consulting Engineers**

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Verizon Wireless, a personal wireless telecommunications carrier, to evaluate the base station (Site No. 288245 “Crocker Glen”) proposed to be located at 3755 13th Avenue in Oakland, California, for compliance with appropriate guidelines limiting human exposure to radio frequency (“RF”) electromagnetic fields.

**Executive Summary**

Verizon proposes to install directional panel antennas in the bell tower at the East Bay Alliance Church, located at 3755 13th Avenue in Oakland. The proposed operation will comply with the FCC guidelines limiting public exposure to RF energy.

**Prevailing Exposure Standards**

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

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

**General Facility Requirements**

Base stations typically consist of two distinct parts: the electronic transceivers (also called “radios” or “channels”) that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The transceivers are often located at ground level and are connected to the antennas by coaxial cables. A small antenna for reception of GPS signals is also required, mounted with a clear view of the sky. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the



**Verizon Wireless • Proposed Base Station (Site No. 288245 “Crocker Glen”)  
3755 13th Avenue • Oakland, California**

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

### **Computer Modeling Method**

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

### **Site and Facility Description**

Based upon information provided by Verizon, including zoning drawings by MST Architects, Inc., dated May 17, 2016, it is proposed to install three Andrew Model SBNHH-1D45B directional panel antennas behind new view screens to be installed in the bell tower of the two-story East Bay Alliance Church, located at 3755 13th Avenue in Oakland. The antennas would employ up to 6° downtilt, would be mounted at an effective height of about 43 feet above ground, 8 feet above the sanctuary roof peak, and would be oriented toward 70°T, 210°T, and 315°T. The maximum effective radiated power in any direction would be 19,460 watts, representing simultaneous operation at 9,000 watts for AWS, 8,280 watts for PCS, and 2,180 watts for 700 MHz service. There are reported no other wireless telecommunications base stations at the site or nearby.

### **Study Results**

For a person anywhere at ground, the maximum RF exposure level due to the proposed Verizon operation is calculated to be 0.049 mW/cm<sup>2</sup>, which is 5.4% of the applicable public exposure limit. The maximum calculated level at any nearby building is 7.5% of the public exposure limit. It should be noted that these results include several “worst-case” assumptions and therefore are expected to overstate actual power density levels from the proposed operation.

### **Recommended Mitigation Measures**

It is recommended that the bell tower access hatch be kept locked, so that the Verizon antennas are not accessible to unauthorized persons. To prevent occupational exposures in excess of the FCC



**Verizon Wireless • Proposed Base Station (Site No. 288245 “Crocker Glen”)  
3755 13th Avenue • Oakland, California**

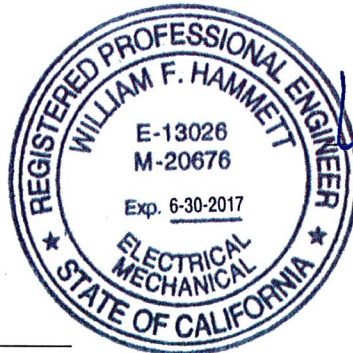
guidelines, it is recommended that appropriate RF safety training, to include review of personal monitor use and lockout/tagout procedures, be provided to all authorized personnel who have access to the structure, including employees and contractors of Verizon and of the Church. No access within 20 feet directly in front of the Verizon antennas themselves, such as might occur during certain maintenance activities, should be allowed while the base station is in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. It is recommended that explanatory signs\* be posted at the bell tower access hatch and on the tower at or below the antennas, as shown in Figure 3, readily visible from any angle of approach to persons who might need to work within that distance.

**Conclusion**

Based on the information and analysis above, it is the undersigned’s professional opinion that operation of the base station proposed by Verizon Wireless at 3755 13th Avenue in Oakland, California, can comply with the prevailing standards for limiting human exposure to radio frequency energy and, therefore, need not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating base stations. Locking the bell tower access hatch is recommended to establish compliance with public exposure limits; training authorized personnel and posting explanatory signs are recommended to establish compliance with occupational exposure limits.

**Authorship**

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2017. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.



*William F. Hammett*

**William F. Hammett, P.E.**

707/996-5200

June 14, 2016

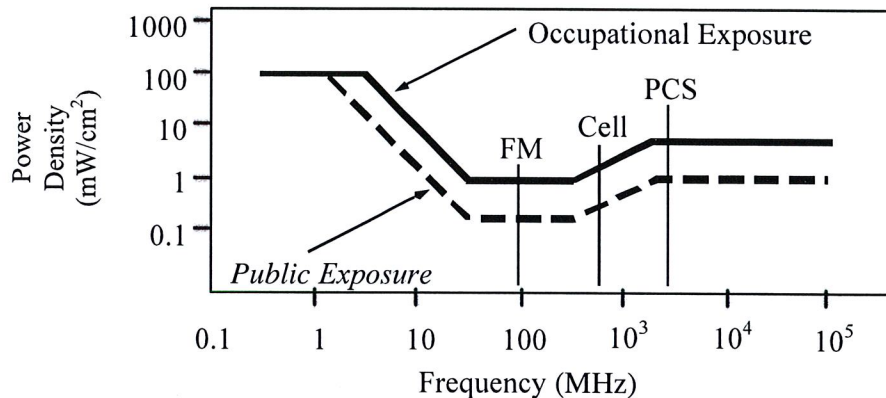
\* Signs should comply with OET-65 color, symbol, and content recommendations. Contact information should be provided (e.g., a telephone number) to arrange for access to restricted areas. The selection of language(s) is not an engineering matter, and guidance from the landlord, local zoning or health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

## FCC Radio Frequency Protection Guide

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

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

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



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required to obtain more accurate projections.





## RFR.CALC™ Calculation Methodology

### Assessment by Calculation of Compliance with FCC Exposure Guidelines

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

#### Near Field.

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

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

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

where  $\theta_{BW}$  = half-power beamwidth of the antenna, in degrees, and

$P_{net}$  = net power input to the antenna, in watts,

$D$  = distance from antenna, in meters,

$h$  = aperture height of the antenna, in meters, and

$\eta$  = aperture efficiency (unitless, typically 0.5-0.8).

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

#### Far Field.

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

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

where ERP = total ERP (all polarizations), in kilowatts,

RFF = relative field factor at the direction to the actual point of calculation, and

$D$  = distance from the center of radiation to the point of calculation, in meters.

The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of 1.6 (1.6 x 1.6 = 2.56). The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 100 in the numerator converts to the desired units of power density. This formula has been built into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radiation sources. The program also allows for the description of uneven terrain in the vicinity, to obtain more accurate projections.

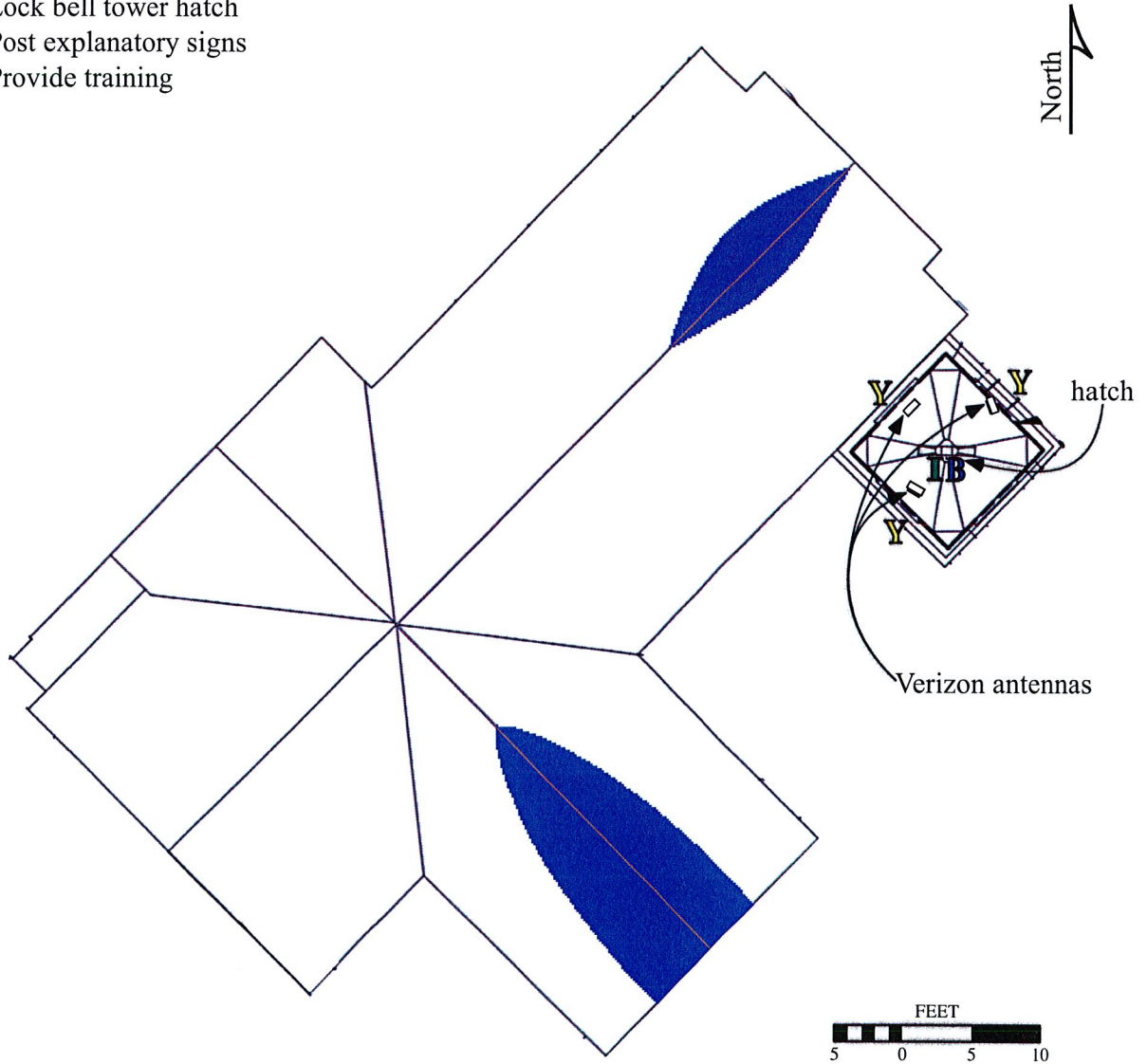


**Verizon Wireless • Proposed Base Station (Site No. 288245 “Crocker Glen”)  
3755 13th Avenue • Oakland, California**

**Calculated RF Exposure Levels on Roof**

**Recommended Mitigation Measures**

- Lock bell tower hatch
- Post explanatory signs
- Provide training



Notes: See text.  
 Base drawing from MST Architects, Inc., dated May 17, 2016.  
 Calculations performed according to OET Bulletin 65, August 1997.

<b>Legend:</b>	Less Than Public	Exceeds Public	Exceeds Occupational	Exceeds 10x Occupational
Shaded color	blank			
Boundary marking	N/A			
Sign type	<b>I</b> - Green INFORMATION	<b>B</b> - Blue NOTICE	<b>Y</b> - Yellow CAUTION	<b>O</b> - Orange WARNING