City of Brisbane
Planning Commission Agenda Report

TO: Planning Commission For the Meeting of 3/11/10

FROM: Tim Tune, Senior Planner, via William Prince, Community Development Director

SUBJECT: **2850 Bayshore Boulevard (north of Main Street/Linda Vista Drive);** Use Permit UP-16-09 and Variance V-3-09, Telecommunications Facility Including 8 Panel Antennas on 12 Ft. Tall Extension of PG&E Transmission Tower; Alex Morin for T-Mobile, applicant; Pacific Gas & Electric Company, owner; SBE 135-41-9A Parcel 3

REQUEST: The applicant proposes to install 8 antennas atop the existing western high-voltage transmission tower north of the intersection of Main Street and Linda Vista Drive. These panel antennas, each approximately 4 2/3 ft. tall, 1 ft. wide and 3 in. thick, would be attached to a new 12 ft. tall and approximately 4 ft. wide extension of the original tower, replacing a previous 8 ft. tall extension, resulting in a total height of approximately 101.6 ft. The antennas would face northeast, southeast, southwest and northwest. Eight tower mounted amplifiers (TMAs), each approximately 1 ft. tall, 9 in. wide and 3 in. thick, would be mounted just below the antennas. The existing antennas, owned by Metro PCS, would be relocated to the new extension at a slightly lower height than before (approved per Use Permit UP-3-01). A 17 ft. by 17 ft. area enclosed by a 6 ft. tall solid wood fence, large enough to contain 4 equipment cabinets and a GPS antenna, would be located 30 ft. northeast of the tower. The facility would connect to existing utilities via conduit to an existing power pole 80 ft. to the northwest and an existing telephone pole 140 ft. to the southwest. The proposal requires Use Permit and Variance approval from the Planning Commission, because the new extension would exceed 70 ft. in height.

RECOMMENDATION: Conditionally approve Use Permit UP-16-09 and Variance V-3-09 per the agenda report via adoption of Resolution UP-16-09/V-3-09, with Exhibit A containing the findings and conditions of approval.

ENVIRONMENTAL DETERMINATION: Additions to existing structures are categorically exempt from the provisions of the California Environmental Quality Act per Section 15301(e) of the State CEQA Guidelines. Minor structures appurtenant to existing industrial facilities are categorically exempt from the provisions of the California Environmental Quality Act per Section 15311 of the State CEQA Guidelines. The exceptions to these categorical exemptions referenced in Section 15300.2 do not apply.

Applicable Code Sections: Per BMC Section 17.32.032.G, wireless telecommunications facilities shall comply with the following development and operational standards:

1. Facilities shall be sited to minimize views from the public right-of-way and screened by buildings and/or trees where possible.
2. Facilities shall not create an overconcentration of poles or visible equipment so as to avoid excessive visual impacts in localized areas.
3. The height of antennae and support structures shall be limited to the minimum necessary to provide adequate coverage, while avoiding the proliferation of additional facilities. However, an antenna or its support structure shall not exceed 70 feet in height, unless a variance from this limitation is granted by the Planning Commission pursuant to Chapter 17.46 of this Title.
4. Where an equipment building accompanies the structure, it shall be designed, colored and textured to match adjacent buildings or screened from view. Landscaping may be required to screen views of the facility from the public right-of-way.
5. Underground vaults may be required in order to mitigate physical, aesthetic, or safety considerations which cannot otherwise be mitigated.
6. All facilities shall be designed to prevent unauthorized access.
7. All new wireless telecommunication facilities shall be designed and operated in conformance with applicable American National Standards Institute (ANSI) standards and in compliance with all applicable Federal Communications Commission (FCC) standards.
8. Support structures shall be either galvanized steel or painted to blend with their surroundings. Permitted dishes and antennae shall be galvanized steel or painted to match the existing building or support structure.

ANALYSIS AND FINDINGS: Per Brisbane Municipal Code Sections 17.32.032.D.1.f, 17.32.032.D.3, 17.32.032.F and 17.32.032.G.3, expansion of an existing telecommunications facility support structure over 70 ft. in height requires Use Permit and Variance approval by the Planning Commission.

Use Permit: In order to approve the Use Permit, the Planning Commission must determine whether the proposal is consistent with the general plan and whether the use applied for, under the circumstances, will not be detrimental to the health, safety, morals, comfort and general welfare of persons residing or working in the neighborhood, nor will it be injurious or detrimental to property or improvements in the neighborhood or the general welfare of the City per BMC Section 17.40.060.

General/Specific Plan Consistency— The General Plan's Subregional Commercial-Retail-Office land use designation for the Northwest Bayshore subarea allows semi-public facilities. Consistent with that subarea's Policy 318, the project will not impact conserved habitat. The

PG&E property is a "planned parcel" (Management Unit 1-11-01) under the San Bruno Mountain Area Habitat Conservation Plan. The Plan Operator (San Mateo County) previously determined that no habitat is located within the vicinity of the existing tower. A condition of approval is recommended to require that the project be subject to HCP Site Activity Review by the County prior to any grading or construction.

Consistent with Policy 322, the proposal will not conflict with remediation of contaminated soils and groundwater on the Martin Service Center site to the northwest. Based upon the Remedial Action Plan approved by the California Environmental Protection Agency's Department of Toxic Substances Control (DTSC), it appears that no construction activity is proposed within the area containing polynuclear aromatic hydrocarbon contamination from an oil gasification plant that operated to the northwest between 1906 and 1913. Nonetheless, the area is subject to DTSC land use restrictions, and all excavation work must comply with DTSC requirements.

Note that General Plan Policy 144 states, "Recognize that there are facilities in the City the safety of which is regulated by County, State or Federal agencies." The subject use is regulated by the Federal Communications Commission, as referenced in BMC Section 17.32.032.G.7 (see above).

Not Detrimental or Injurious to Neighborhood or City—The visual impact of the proposed antennas on the new extension, which will increase the height of the existing tower by less than 4%, should not be significant. The applicant has prepared photosimulations to illustrate how the proposal will look from the south (up Linda Vista Drive) and the southeast (along Main Street). From the closest residential units, the antennas will be seen against the backdrop of the sky. As one moves farther away and higher up the mountain, the backdrop shifts to the hillsides of McLaren Park and ultimately to the developed areas of Visitacion Valley. The antennas may be obliquely visible from short stretches of Guadalupe Canyon Parkway, a distance of more than 1,500 ft. away. The antennas will be painted to match the existing tower. The ground-mounted equipment will be screened by a solid wood fence.

Per BMC Section 17.32.032.C.1.c, the proposed facility is more than 600 ft. from any residential district within the City as defined by BMC Section 17.32.032.B.1. The proposed antennas are less than 600 ft. from the residences on Main Street and Linda Vista Drive and in Midway Village, but note that that distance was chosen based upon aesthetics (according to the 12/15/03 City Council Minutes), without any specific scientific basis.

The Federal Communications Commission (FCC) has exclusive jurisdiction over radio frequency electromagnetic energy (RF) emissions under the Telecommunications Act of 1996. The FCC has adopted and enforces maximum permissible exposure limits. Federal law does not allow cities to prohibit wireless communications facilities on the basis of potential environmental effects of radio frequency emissions if the facility complies with FCC regulations. Per BMC Section 17.32.032.G.7, the proposed facilities are required to comply with applicable American National Standards Institute and FCC standards.

According to the submitted consulting engineer's statement, the proposed facility is conservatively projected to generate 0.028% of the public exposure limit at the ground. Note that the proposed antennas' additional height reduces exposure levels at the ground. The combined effect of the proposed T-Mobile antennas with the existing Metro PCS antennas is calculated to be 0.051% of the limit for public exposure at ground level and 0.066% at the second floor of the nearest residence. According to the statement, there is no compounding effect from simultaneous exposure to power line and radio frequency fields.

Variance: In order to grant the Variance per BMC Section 17.46.010, the Planning Commission must find that, because of special circumstances applicable to the property, such as its size, shape, topography, location or surroundings, the strict application of the Zoning Ordinance would deprive the property of privileges enjoyed by other properties in the vicinity and same zoning district. In addition, any approval must be subject to such conditions as necessary to assure that the variance will not constitute a grant of special privilege inconsistent with the limitations upon other properties in the vicinity and same zoning district.

Special Circumstances Applicable to Subject Property—The Municipal Code encourages "co-location of equipment…mounted on…existing structures…" "…which will not adversely impact surrounding uses and properties and is compatible with the community" (BMC Sections 17.32.032.D.1.c & d and 17.32.032.A). The subject site is part of PG&E's Martin Service Center & Substation complex. The subject tower is among the first of a series of towers runs from the substation up San Bruno Mountain toward the south. It is located near the lowest elevations in surrounding area. Because "the antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above the ground" (page 2, Statement of Hammet & Edison, Inc.), extending the height of the tower is necessary to provide a wider service area (as high as portions of Bay Ridge Drive and Guadalupe Canyon Parkway), especially since there is already an existing set of antennas on the tower. Although there are existing towers at higher elevations on the Mountain, to use these would potentially mean disturbing native habitat to access the site and install ground-mounted equipment to service the antennas. Co-location of antennas on the existing PG&E towers requires that the equipment be separated from the PG&E high voltage power lines by at least 10 ft. and that the different carriers' antennas by separated by at least 4 ft., dictating the minimum height of the highest antenna.

Privileges Enjoyed by Others in the Vicinity Deprived to Subject Property--The Planning Commission previously approved Use Permit UP-3-01 to extend the height of the subject tower up to 97.7 ft. for Metro PCS's 6 existing antennas. The Planning Commission similarly approved UP-18-04 to allow Sprint Nextel to install 6 antennas atop the adjoining tower to the east, increasing its total height up to 103.4 ft.

Conditions Necessary to Prevent a Grant of Special Privilege—The standard conditions of approval are recommended, consistent with BMC Section 17.32.032.G.

ATTACHMENTS:

Draft Resolution with Findings and Conditions of Approval
Applicant's Statement
Aerial Photo
Applicant's Plans and Photosimulations
Applicant's Existing and Future Coverage Maps
Consulting Engineers' Statement
City's Wireless Communications Exclusion Zones Map

draft

RESOLUTION UP-16-09/V-3-09

A RESOLUTION OF THE PLANNING COMMISSION OF BRISBANE CONDITIONALLY APPROVING USE PERMIT UP-16-09 AND VARIANCE V-3-09 TO PERMIT A TELECOMMUNICATIONS FACILITY AT 2850 BAYSHORE BOULEVARD

WHEREAS, Alex Morin, the applicant, applied to the City of Brisbane for Use Permit and Variance approval to attach 8 panel antennas atop an extension of the existing western PG&E transmission tower north of the intersection of Main Street and Linda Vista Drive, such applications being identified as UP-16-09 and V-3-09; and

WHEREAS, on March 11, 2010, the Planning Commission conducted a hearing of the applications, at which time any person interested in the matter was given an opportunity to be heard; and

WHEREAS, the Planning Commission reviewed and considered the agenda report relating to said applications, the plans and photographs, the written and oral evidence presented to the Planning Commission in support of and in opposition to the applications; and

WHEREAS, the Planning Commission finds that the proposed project is categorically exempt from the provisions of the California Environmental Quality Act; and

WHEREAS, the Planning Commission of the City of Brisbane hereby makes the findings attached herein as Exhibit A in connection with the Use Permit.

NOW THEREFORE, based upon the findings set forth hereinabove, the Planning Commission of the City of Brisbane, at its meeting of March 11, 2010, did resolve as follows:

> Use Permit Application UP-16-09 and Variance V-3-09 are approved per the conditions of approval attached herein as Exhibit A.

ADOPTED this eleventh day of March, 2010, by the following vote:

AYES:
NOES:
ABSENT:

_____
THERESA MATURO
Chairperson

ATTEST:

_____
WILLIAM PRINCE, Community Development Director

EXHIBIT A

Action Taken: Conditionally approve Use Permit UP-16-09 and Variance V-3-09 per the agenda report with attachments, via adoption of Resolution UP-16-09/V-3-09.

Findings:

Use Permit

1. Approval of the use permit is consistent with the general plan and any applicable specific plan adopted by the city council, in particular General Plan Policies 144, 318 & 322.

2. The establishment, maintenance and operation of the use applied for, under the circumstances, will not be detrimental to the health, safety, morals, comfort and general welfare of persons residing or working in the neighborhood, nor will it be injurious or detrimental to property or improvements in the neighborhood or the general welfare of the Cit, as detailed in the agenda report.

3. The proposed project on the subject property (HCP Administrative Parcel 1-12-01) complies with the terms of the San Bruno Mountain Area Habitat Conservation Plan Agreement and Section 10(a) Permit, given the conditions of approval.

Variance

1. The variance shall be subject to such conditions as will assure that the adjustment hereby authorized shall not constitute a grant of special privilege inconsistent with the limitations upon other properties in the vicinity and district in which the subject property is located, as listed below.

2. Because of special circumstances applicable to subject property, specifically its low elevation relative to the surrounding hillsides, which limits service coverage unless the height of the existing tower can be increased to allow co-location by another carrier, the strict application of this title is found to deprive subject property of privileges enjoyed by other properties in the vicinity and under identical zone classification, namely the previous tower extensions approved by the Planning Commission for Metro PCS and Sprint Nextel.

Conditions of Approval:

A. Application for a Building Permit (via submittal of 4 sets of plans and payment of plan check fees) for the subject facilities shall be made and the project shall be completed to the satisfaction of the Building Official at final inspection prior to permanent operation of the facilities.

B. The proposed antennas and tower extension shall be galvanized steel or painted gray to match the existing tower structure.

(continued)

C. The antennas shall comply with the PG&E's requirements for separation from the high voltage power lines.

D. Prior to issuance of a Building Permit, the applicant shall obtain HCP Site Activity Review approval by San Mateo County.

E. All excavation work shall comply with the requirements of the California Environmental Protection Agency's Department of Toxic Substances Control.

F. The facilities shall be designed and operated in conformance with applicable American National Standards Institute (ANSI) standards and in compliance with all applicable Federal Communications Commission (FCC) standards.

G. Minor modifications may be approved by the Planning Director in conformance will all requirements of the Municipal Code.

H. The facilities shall be removed, if the facilities are abandoned or if the Use Permit is revoked and becomes void.

I. The Use Permit shall run concurrently with the term of the applicant's lease and shall automatically lapse upon the expiration or earlier termination of the lease.

December 13, 2009

City of Brisbane
Planning Department
50 Park Place Drive
Brisbane, CA 94005

RE: New wireless telecommunications facility- 3150 Geneva Ave

T-Mobile proposes to install a new wireless telecommunications facility on an existing PGE transmission tower. The antennas will be mounted on a 5ft extension to the 97'8" tower. The equipment cabinets will be located approximately 30ft north of the tower within a wood fenced compound.

There is currently one other wireless carrier at the top of the subject transmission tower. The T-Mobile antennas will be mounted above the existing antennas. The adjacent tower has two other wireless carrier's antennas mounted to the top of it. The elevation of the T-Mobile tower will match the adjacent tower once construction is completed.

Alternative Sites Considered-

Several other locations were considered in determining that the selected PGE transmission tower was the best candidate.

PGE towers east of Linda Vista- This location was eliminated as a candidate for a number of reasons. Visual impacts to the open space district, long and extremely cost prohibitive power runs from Linda Vista to the towers and zoning restrictions prohibiting the established of wireless facilities at those locations.

Utility poles- Several utility poles were reviewed as potential candidates. These locations were eliminated due to lack of height. The poles were not tall enough to provide a clear line of sight to enough of the area to provide an adequate signal to T-Mobile customers. Several sites would have to have been constructed in residential areas to meet the coverage objective.

17.40.060 Municipal Code-

The proposed project will not be detrimental to the health, safety, comfort and general welfare of the persons residing or working in the neighborhood of said proposed use, nor will it be injurious or detrimental to property and improvements in the neighborhood or the general welfare of the city.

The proposed T-Mobile facility is located in a PGE substation that is largely surrounded by other industrial uses. The site will be maintained to the FCC mandated standards for health and safety as well as any conditions imposed by the City in reviewing the project.

17.32.032 Municipal Code-

The proposed wireless facility does not meet the City's height limits established for wireless facilities on existing structures within Industrial zoned districts. See Variance request below for project justification.

All other guidelines pertaining to the establishment of wireless facilities shall be met.

Variance Findings-

WHAT SPECIAL CIRCUMSTANCES, SUCH AS SIZE OR TOPOGRAPHY OF THE PROPERTY, OR ITS LOCATION OR SURROUNDINGS, APPLY TO YOUR SITE?

The subject property is a large PGE substation in an industrial area on the boundary between Brisbane, San Francisco and Daly City. There are a number of large buildings, warehouses, transmission towers and other assorted electrical transmission structures and support equipment located on the property.

The transmission towers provide a clear line of sight to much of the surrounding businesses, roadways and homes in the area which is essential to providing a high level of service to wireless customers in the area.

HOW DO THESE SPECIAL CIRCUMSTANCES IMPACT YOUR SITE WHEN THE ZONING ORDINANCE IS APPLIED TO THE SITE?

The zoning ordinance establishes a 70ft height limit for wireless telecommunications facilities. The proposed T-Mobile site would exceed the height limit; however, it would match the existing height of the wireless facility on the adjacent transmission tower. The subject property is also a large piece of land which is owned and operated by PGE as a substation.

WHAT PRIVILEGES ENJOYED BY OTHER PROPERTIES IN THE VICINITY AND SAME ZONING DISTRICT WOULD YOU BE DEPRIVED OF WHEN THE ZONING ORDINANCE IS APPLIED TO YOUR SITE, GIVEN ITS SPECIAL CIRCUMSTANCES?

There are currently three wireless telecommunications facilities located on the two previously discussed transmission towers. All three wireless facilities currently exceed the height limit established by the zoning ordinance. The establishment of a fourth facility between the two towers would balance the appearance of the two towers by establishing the same height for both towers.

WHAT CONDITIONS OF APPROVAL COULD BE ATTACHED TO THE VARIANCE TO ASSURE THAT YOU COMPLY WITH THE INTENT OF THE ZONING ORDINANCE AND OTHER APPLICABLE REGULATIONS?

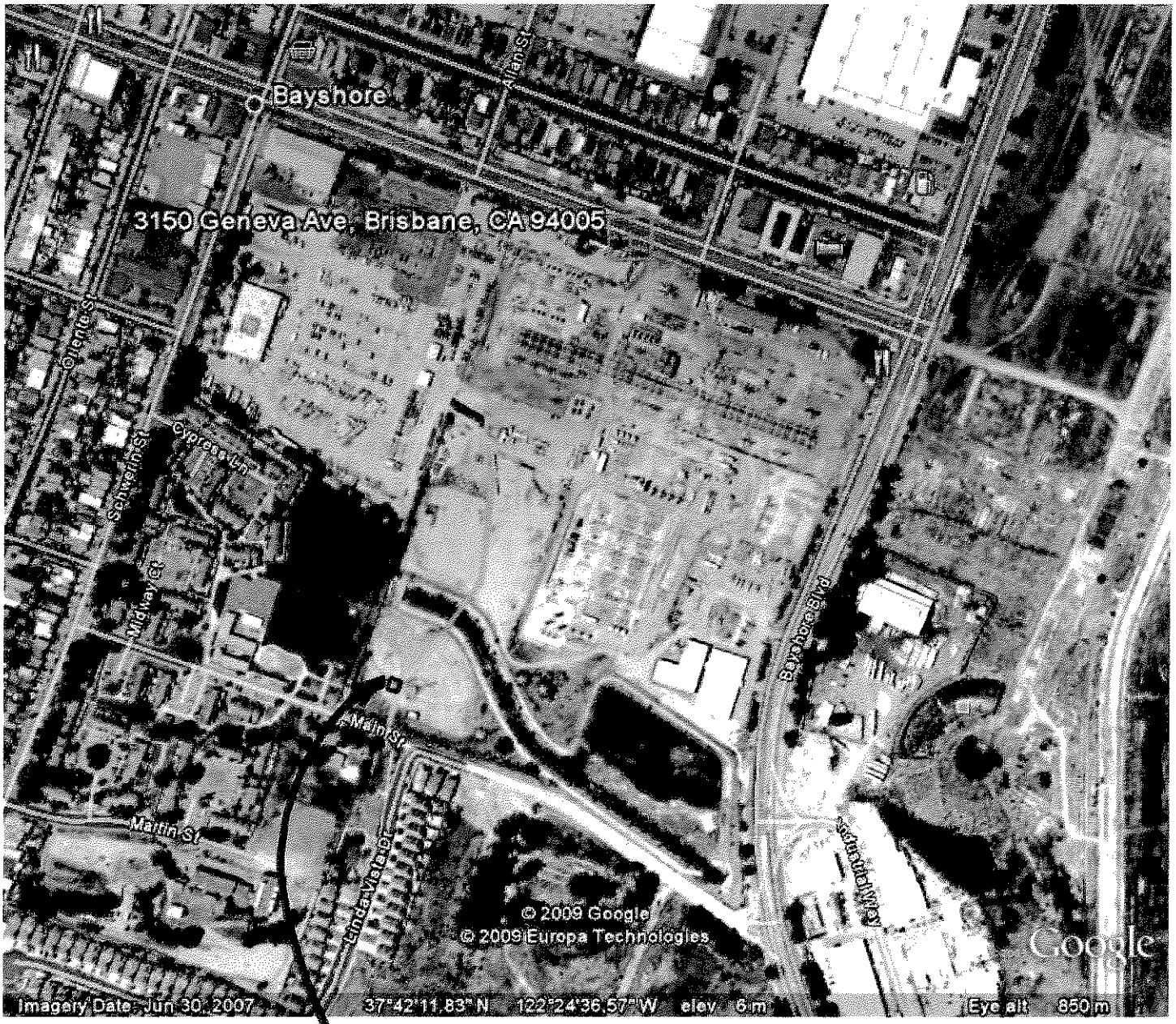
The approval could be conditioned to require that T-Mobile safely maintain the wireless telecommunications facility as well as its appearance to ensure that it meets all FCC as well as aesthetic standards.

Please do not hesitate to contact me with any questions regarding this application at 530.219.8903 or alex.morin@cortel-llc.com.

Sincerely,

Alex Morin
Planner-Agent for T-Mobile
1888 Golden Gate #20
San Francisco, CA 94115

T-Mobile
1855 Gateway Blvd 9th floor
Concord, CA 94520



Proposed Location

T-MOBILE WEST CORPORATION

T-Mobile®

1855 GATEWAY BLVD 9TH FLOOR
CONCORD, CA 94520

PG&E MARTIN SUBSTATION

SF43550E

PROJECT DESCRIPTION

A (P) UNMANNED TELECOMMUNICATION FACILITY CONSISTING OF A (P) 17'X17' LICENSE AREA W/ (4) (P) EQUIPMENT CABINETS & (8) (P) T-MOBILE ANTENNAS ATTACHED TO A (P) 12' TOWER EXTENSION TO REPLACE AN (E) 8' EXTENSION ON AN (E) PG&E TOWER. ALSO RELOCATING (E) ANTENNAS BY OTHERS TO THE (P) 12' TOWER EXTENSION

PROJECT INFORMATION

SITE NAME:	PG&E MARTIN SUBSTATION	SITE #:	SF43550E
COUNTY:	SAN MATEO	JURISDICTION:	CITY OF BRISBANE
APN:	-	POWER:	PG&E
SITE ADDRESS:	MAIN ST & LINDA VISTA DRIVE BRISBANE, CA 94014	TELEPHONE:	AT&T
CURRENT ZONING:	MI		
CONSTRUCTION TYPE:	II		
OCCUPANCY TYPE:	U		
PROPERTY OWNER:	PG&E 77 BEALE ST SAN FRANCISCO, CA 94105 ATTN: RICHARD SARTINI (415) 308-9400		
APPLICANT:	T-MOBILE 1855 GATEWAY BLVD 9TH FLOOR CONCORD, CA 94520-3200		
LEASING CONTACT:	ATTN: ALEX DRNER (415) 501-3194		
ZONING CONTACT:	ATTN: ALEX MORIN (530) 219-8903		
CONSTRUCTION CONTACT:	ATTN: CHRISTOPHER ROBINSON (510) 823-6418		
LATITUDE:	N 37° 42' 07.13" NAD 83		
LONGITUDE:	W 122° 24' 43.55" NAD 83		
AMSL	420.1'		

PG&E INFORMATION

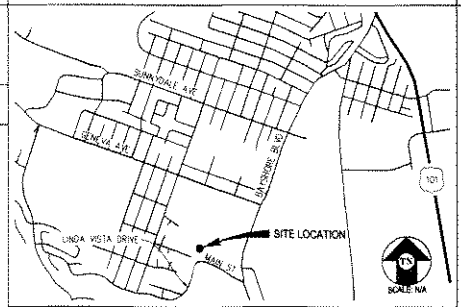
TOWER INFO:

TOWER SAP#:	40674011
TOWER#:	0/2
LINE NAME:	MARTIN-DALY CITY #1/ 115kV
PROJECT#:	2009-10 NEW SITE

PG&E CONTACT INFO:

LAND AGENT CONTACT:	SHARI HOLLAND (415) 973-3353 E-MAIL: SHH6@PGE.COM
PROJECT MANAGER:	RICHARD SARTINI MOBILE: (415) 308-9400 E-MAIL: RRSR@PGE.COM
ADDRESS:	245 MARKET ST MAIL CODE N1B3 SAN FRANCISCO, CA 94105

VICINITY MAP



DRIVING DIRECTIONS

FROM: 1855 GATEWAY BLVD, CONCORD, CA 94520-3200
TO: MAIN ST & LINDA VISTA DRIVE, BRISBANE, CA 94014

1.	START OUT GOING SOUTHEAST ON GATEWAY BLVD.	0.0 MI
2.	TURN SLIGHT RIGHT ONTO CLAYTON RD.	0.3 MI
3.	MERGE ONTO CA-242 S.	1.0 MI
4.	MERGE ONTO I-680 S VIA THE EXIT ON THE LEFT TOWARD OAKLAND/SAN JOSE.	3.5 MI
5.	MERGE ONTO CA-24 W TOWARD OAKLAND/LAFAYLTTE	13.6 MI
6.	MERGE ONTO I-580 W TOWARD SAN FRANCISCO	1.5 MI
7.	MERGE ONTO I-80 W VIA THE EXIT ON THE LEFT TOWARD SAN FRANCISCO (PORTIONS TOLL).	8.5 MI
8.	I-80 W BECOMES US-101 S	3.4 MI
9.	TAKE THE THIRD STREET EXIT TOWARD CCW PALACE/BRISBANE/3COM PARK/GENEVA AVE.	0.3 MI
10.	TAKE THE BAYSHORE BLVD SOUTH RAMP.	0.0 MI
11.	TURN SLIGHT RIGHT ONTO BAY SHORE BLVD	1.2 MI
12.	TURN RIGHT ONTO MAIN ST	0.2 MI

END AT: MAIN ST & LINDA VISTA DR

ESTIMATED TIME: 43 MINUTES ESTIMATED DISTANCE 33.81 MILES

CODE COMPLIANCE

ALL WORK & MATERIALS SHALL BE PERFORMED & 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:

1. 2007 CALIFORNIA ADMINISTRATIVE CODE (INCL. TITLES 24 & 25)
2. 2007 CALIFORNIA BUILDING CODE
3. 2007 CALIFORNIA ELECTRICAL CODE
4. 2007 CALIFORNIA MECHANICAL CODE
5. 2007 CALIFORNIA PLUMBING CODE
6. 2007 CALIFORNIA FIRE CODE
7. LOCAL BUILDING CODES
8. CITY/COUNTY ORDINANCES
9. ANSI/EIA-TIA-222-G

ALONG WITH ANY OTHER APPLICABLE LOCAL & STATE LAWS AND REGULATIONS

HANDICAP REQUIREMENTS

THIS FACILITY IS UNMANNED & NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS & REQUIREMENTS ARE NOT REQUIRED IN ACCORDANCE WITH CALIFORNIA STATE ADMINISTRATIVE CODE, TITLE 24 PART 2, SECTION 1105B.3.4.2, EXCEPTION 1

SHEET INDEX

SHEET	DESCRIPTION	REV.
T-1	TITLE SHEET	-
LS-1	SURVEY	-
A-1	OVERALL SITE PLAN	-
A-2	SITE PLAN	-
A-3	EQUIPMENT PLAN & DETAIL	-
A-4	ANTENNA PLAN & DETAIL	-
A-5	ELEVATION	-
A-6	ELEVATION	-

APPROVAL

RF

LEASING

ZONING

CONSTRUCTION

T-MOBILE

PG&E

PG&E MARTIN SUBSTATION

SF43550E

MAIN ST & LINDA VISTA DRIVE
BRISBANE, CA 94014

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	11-10-09	ZD 90%	-
	11-17-09	ZD 100%	-
1	12-10-09	ZD 100%	DL
	-	-	-
	-	-	-
	-	-	-

DRAWN BY: C. CODY
CHECKED BY: S. ARMITAGE
APPROVED BY: B. McCOMB
DATE: 12/10/09

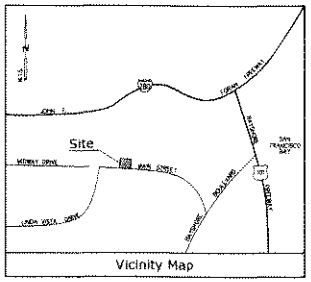
Streamline Engineering
CIVIL DESIGN CORP.
11765 Atwood Rd, Suite 20 Auburn, CA 95603
Contact: Larry Hoskins 916-824-1488
E-Mail: larry@streamlineeng.com Fax: 530-823-8783

T-MOBILE WEST CORPORATION
T-Mobile®
1855 GATEWAY BLVD 9TH FLOOR
CONCORD, CA 94520

SHEET TITLE:
TITLE

SHEET NUMBER:
T-1

H.2.13.



Vicinity Map

Title Report

THIS SURVEY WAS COMPLETED WITHOUT THE BENEFIT OF A TITLE REPORT
PREPARED BY:
ORDER NO.:
DATED:

Legal Description

PORTION OF LOT A-1 OF TRACT MAP, IN DALY CITY, COUNTY OF SAN MATEO, STATE OF CALIFORNIA, FILED IN BOOK 76, PAGE 12, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

Assessor's Parcel No.

NOT AVAILABLE

Easements

NOT AVAILABLE

Access Easement/Lease Area

TO BE DETERMINED

Geographic Coordinates at Existing Tower

NAD 83/NAVD 88 LATITUDE 37° 42' 01.17" LONGITUDE -122° 24' 43.17"
ELEVATION = 201 FEET ABOVE MEAN SEA LEVEL

CERTIFICATION:
THE LATITUDE AND LONGITUDE SHOWN ABOVE ARE ACCURATE TO WITHIN +/- 15 FEET HORIZONTALLY AND THAT THE ELEVATIONS SHOWN ABOVE ARE ACCURATE TO WITHIN +/- 3 FEET VERTICALLY. THE HORIZONTAL DATUM (GEOGRAPHIC COORDINATES) IS IN TERMS OF THE NORTH AMERICAN DATUM OF 1983 (NAD 83) AND IS EXPRESSED IN DEGREES (°), MINUTES (') AND SECONDS (") TO THE NEAREST HUNDREDTH OF A SECOND. THE VERTICAL DATUM (ELEVATIONS) IS IN TERMS OF THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) AND IS DETERMINED TO THE NEAREST TENTH OF A FOOT.

Basis of Bearings

THE STATE PLANE COORDINATE SYSTEM OF 1983 (NAD 83) CALIFORNIA ZONE 3

Bench Mark

THE CALIFORNIA SPATIAL REFERENCE CENTER CORS "SBRN", ELEVATION = 101.42 FEET (NAVD 88)

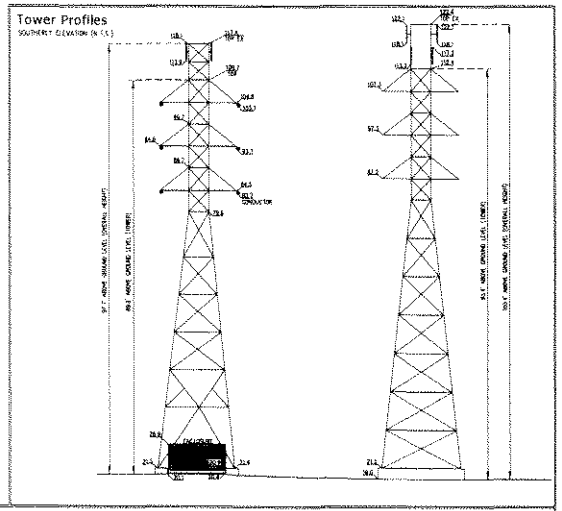
Date of Survey

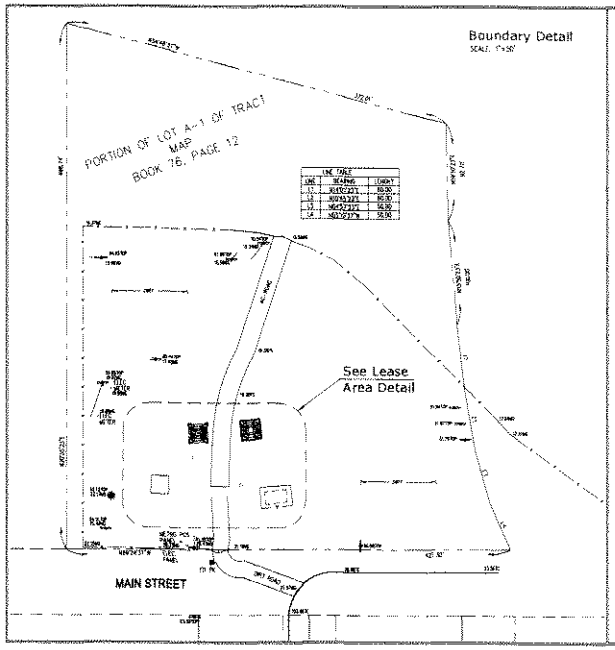
JULY 17, 2009

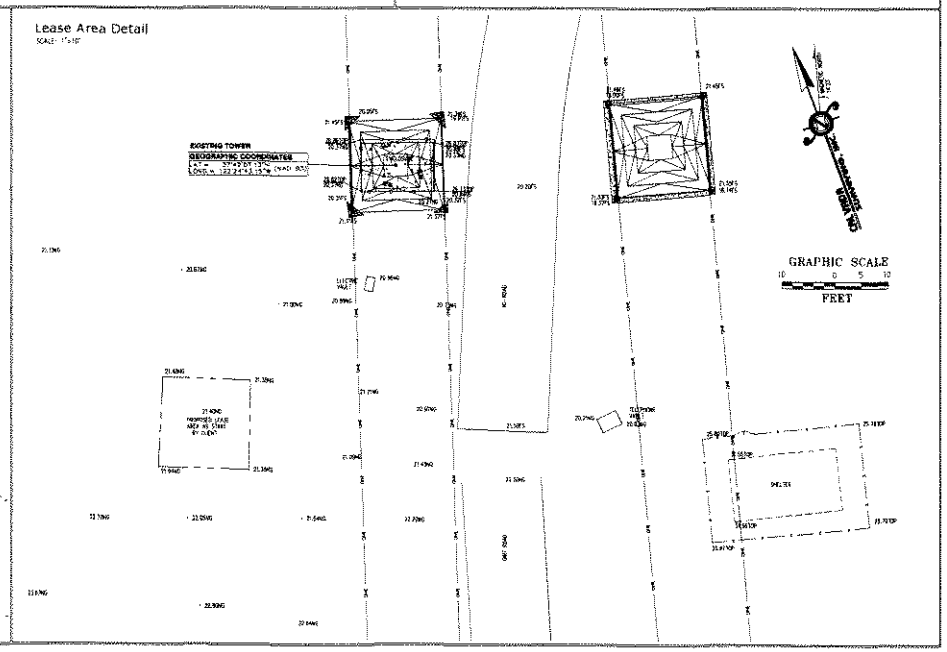
Legal

TS	TRACK SURFACE		WOOD FENCE
NG	NATURAL GROUND		CHAIN LINK FENCE
	POWER POLE	TOP	TOP OF STRUCTURE
	POWER POLE/TRANSFORMER		PROPERTY LINE
	RETAINING/BLOCK WALL		FOUND MONUMENT
	CONCRETE PAVEMENT		GATE
	WELL		SUN WHEEL
TC	TOP OF CURB		

OVERHEAD ELECTRIC LINE







T · · Mobile · ·
Stick Together®
1755 CREEKSIDE OAKS, SUITE 190
SACRAMENTO, CA 95833

PLANS PREPARED BY:
Streamline Engineering and Design, Inc.
11788 Atwood Rd, Suite 20 Auburn, CA 95603
Contact: Larry Houghtby Phone: 916-275-4189
E-Mail: larry@streamlineeng.com Fax: 530-823-8793

CONSULTANT:
CALVADA SURVEYING, INC.
411 Jersey Dr., Suite 206, Lorena, CA 92060
Phone: 951-280-9980 Fax: 951-280-9748
Toll Free: 800-CALVADA www.calvada.com
JOB NO. 09492

NO.	DATE:	DESCRIPTION:	BY:
	07/27/09	PRELIMINARY	HP
1	10/22/09	UPDATED TOWER PROFILE	RG

SITE INFORMATION:

SF435520E

PGE TOWER 2

MAIN STREET AND LINDA VISTA DRIVE
DALY CITY, CA 94014
SAN MATEO COUNTY

SEAL:

SHEET TITLE:

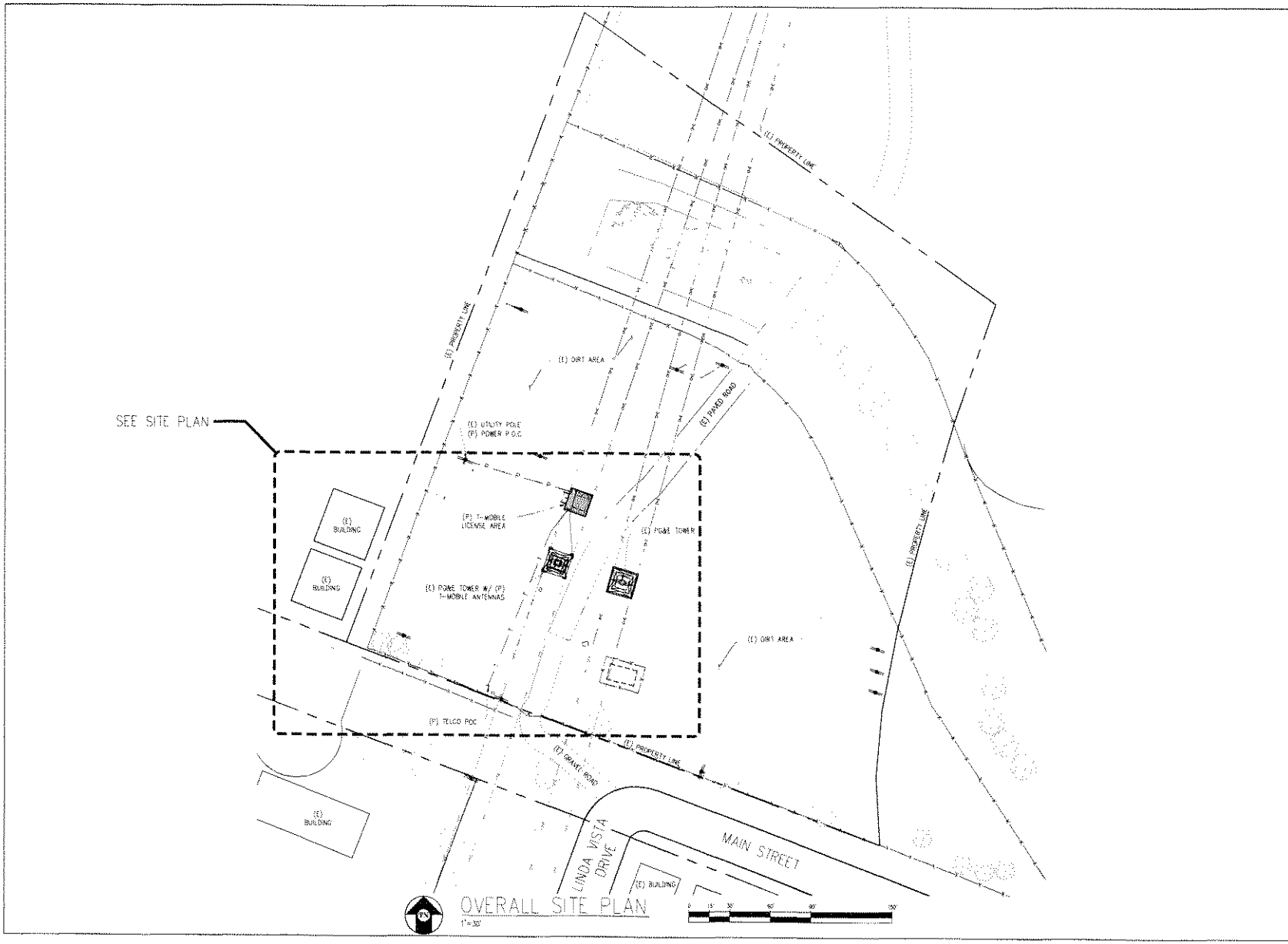
TOPOGRAPHIC SURVEY

SHEET NUMBER:

LS-1

SHEET 1 OF 1

H.2.14.



PG&E MARTIN SUBSTATION

SF43550E

MAIN ST & LINDA VISTA DRIVE
BRISBANE, CA 94014

ISSUE STATUS

Δ	DATE	DESCRIPTION	BY
	11-10-09	ZD 90%	-
	11-17-09	ZD 100%	-
1	12-10-09	ZD 100%	CL
	-	-	-
	-	-	-
	-	-	-

DRAWN BY: C. CODY
CHECKED BY: S. ARMITAGE
APPROVED BY: B. McCOMB
DATE: 12/10/09

Streamline Engineering and Design, Inc.
11708 Atwood Rd, Suite 20 Auburn, CA 95603
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E-Mail: larry@streamlineeng.com Fax: 530-823-8783

T-MOBILE WEST CORPORATION
T-Mobile
1855 GATEWAY BLVD 9TH FLOOR
CONCORD, CA 94520

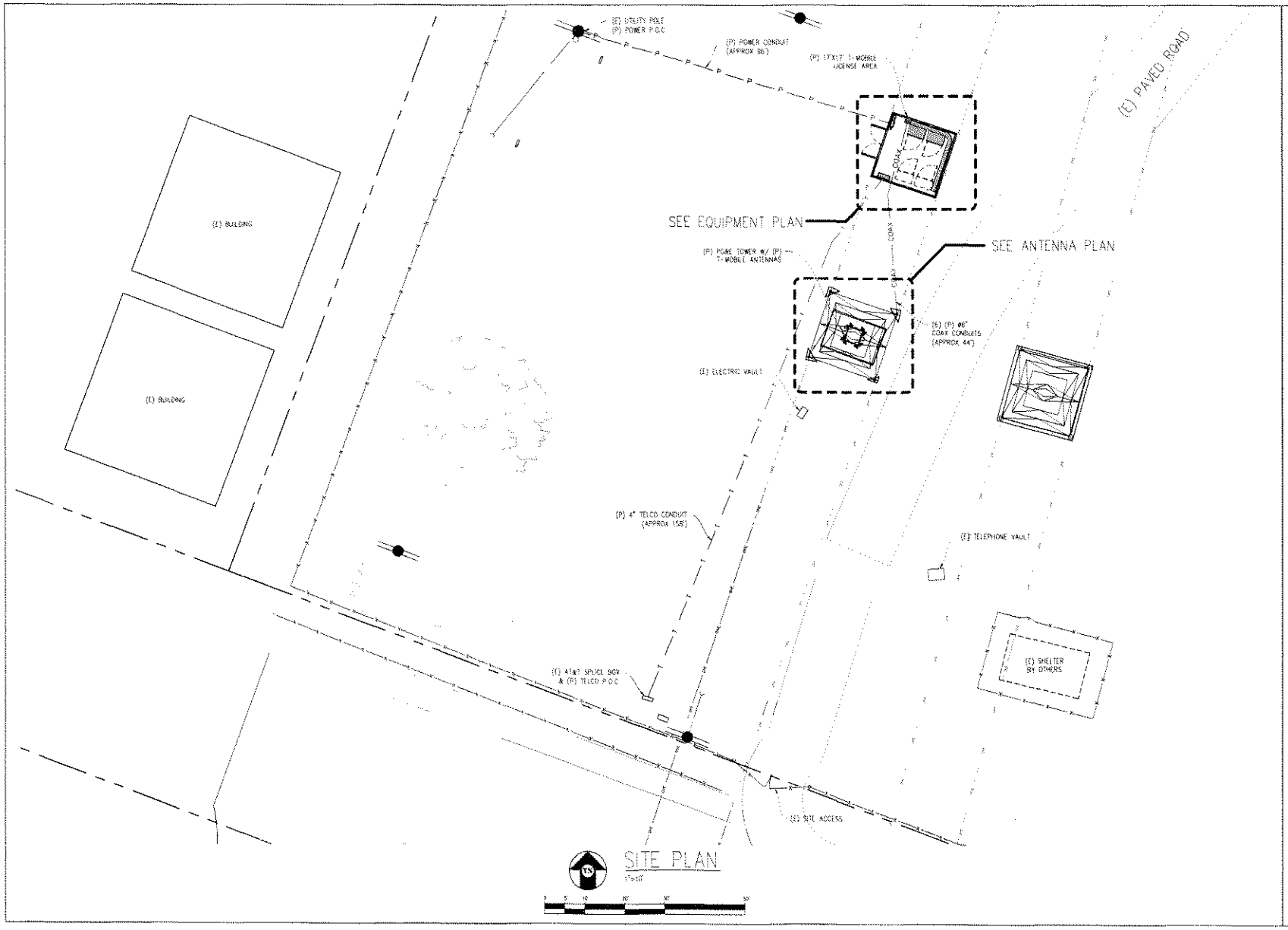
SHEET TITLE:
OVERALL SITE PLAN

SHEET NUMBER:
A-1

H.2.15.

OVERALL SITE PLAN

1"=30'



PG&E MARTIN SUBSTATION

SF43550E

MAIN ST & LINDA VISTA DRIVE
BRISBANE, CA 94014

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	11-10-09	ZD 90%	
	11-17-09	ZD 100%	
△2	12-10-09	ZD 100%	C.

DRAWN BY: C. CODY
CHECKED BY: S. ARMITAGE
APPROVED BY: B. McCOMB
DATE: 12/10/09

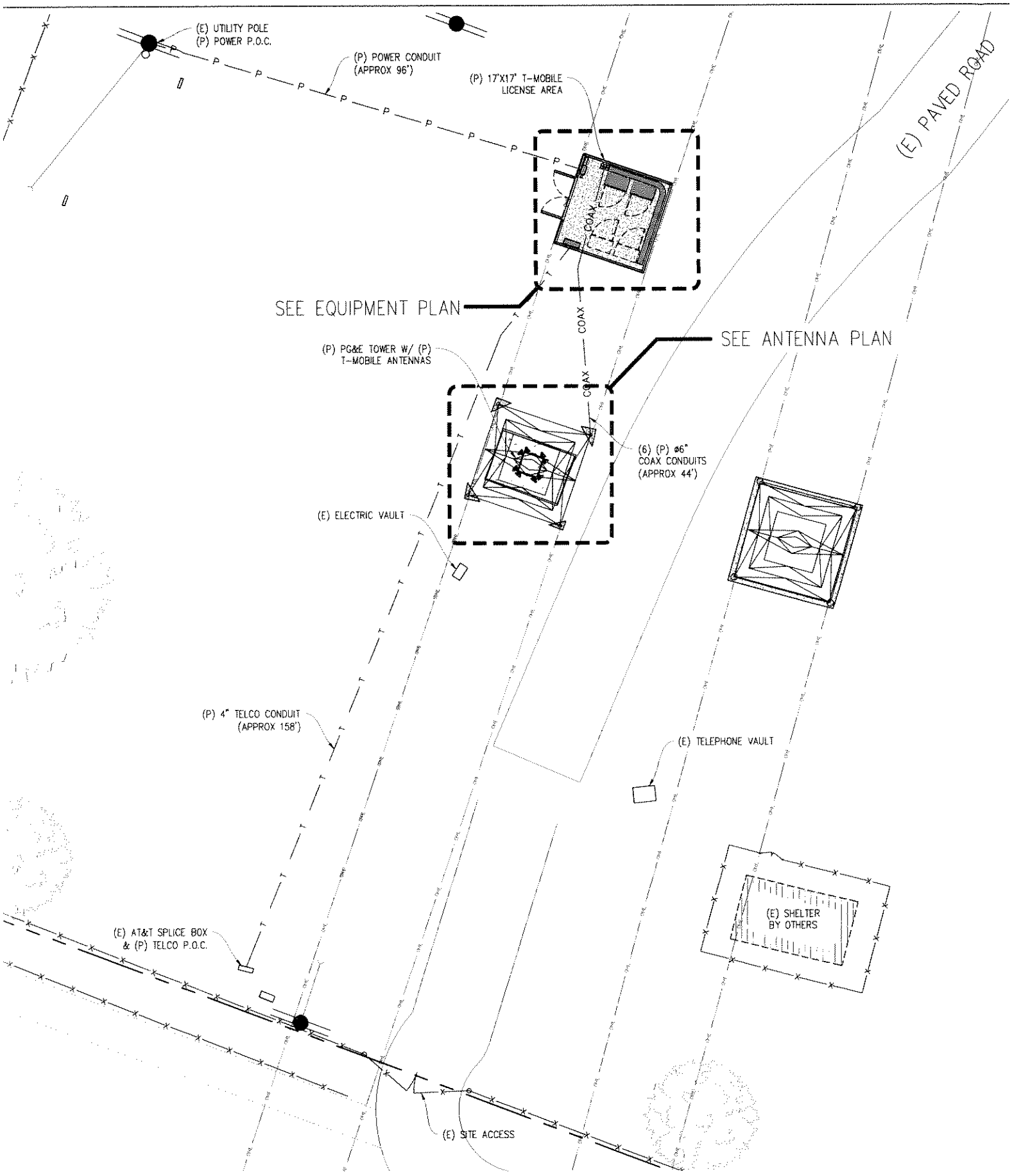
Structure Engineering
and Design West, Inc.
11768 Atwood Rd, Suite 20 Auburn, CA 95603
Contact: Larry Houghtby Phone: 916-274-1180
E-Mail: larry@structureengineering.com Fax: 530-823-0183

T-MOBILE WEST CORPORATION
T-Mobile
1855 GATEWAY BLVD 9TH FLOOR
CONCORD, CA 94520

SHEET TITLE:
SITE PLAN

SHEET NUMBER:
A-2

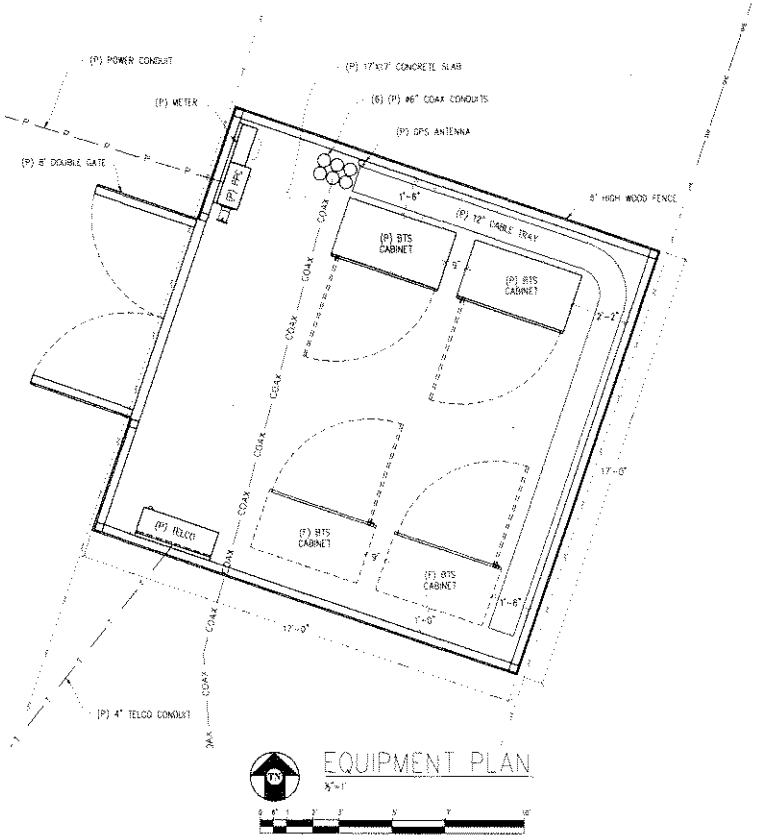
H.2.17

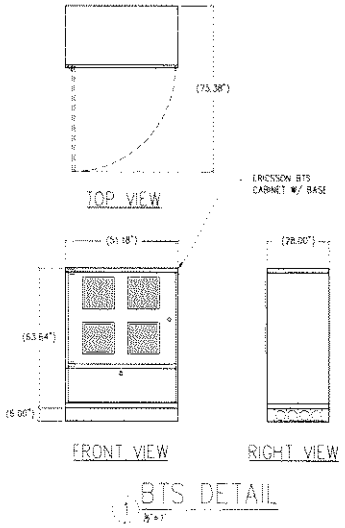


SITE PLAN

1"=10'

0 5' 10' 20' 30' 50'





PG&E MARTIN SUBSTATION

SF43550E

MAINNT & LINDA VISTA DRIVE
BRISBANE, CA 94014

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	11-10-09	ZD 90%	
	11-17-09	ZD 100%	
△1	12-10-09	ZD 100%	CL

DRAWN BY: C. CODY
CHECKED BY: S. ARMITAGE
APPROVED BY: B. McCOMB
DATE: 12/10/09

Streamline Engineering and Design, Inc.
11766 Atwood Rd. Suite 20 Auburn, CA 95603
Contact: Larry Wheeler, Phone: 916-347-1180
E-Mail: larry@streamlineeng.com Fax: 530-823-4783

T-MOBILE WEST CORPORATION
T-Mobile
1855 GATEWAY BLVD 9TH FLOOR
CONCORD, CA 94520

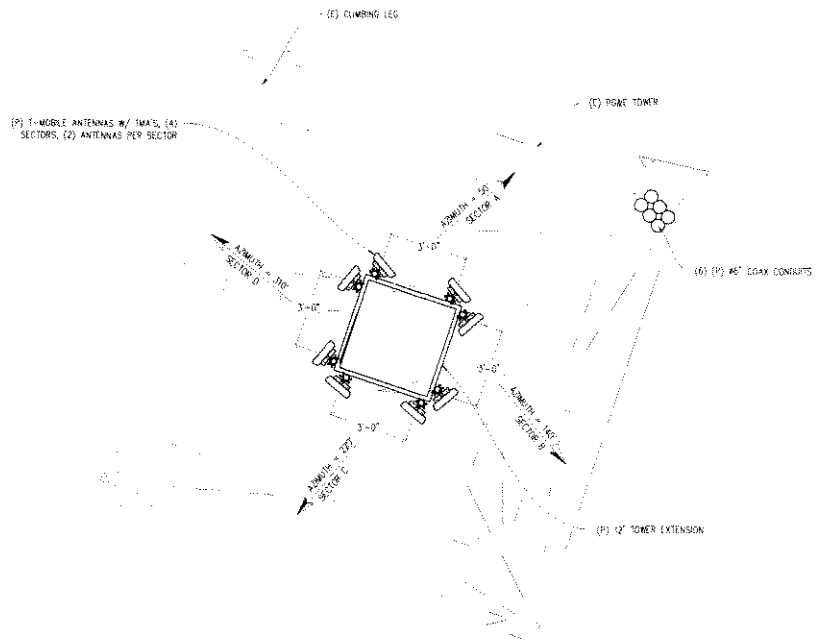
SHEET TITLE:
EQUIPMENT PLAN & DETAIL

SHEET NUMBER:
A-3

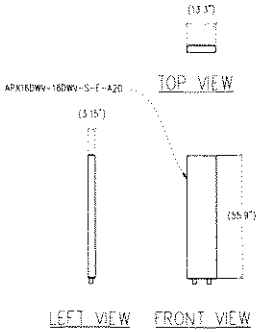
H.2.14.

SECTOR	RF CONFIGURATION										
	COAX			ANTENNA							
	#	LENGTH	SIZE	MODEL	#	TMA	MDT	EDT	RET	RAD	AZIMUTH
ALPHA	4	160'	1⅝" AVA	APX16DWV-16DWV-S-E-A20	2	2	0'	2'	YES	99'-3"	50'
BETA	4	160'	1⅝" AVA	APX16DWV-16DWV-S-E-A20	2	2	0'	2'	YES	99'-3"	140'
GAMMA	4	160'	1⅝" AVA	APX16DWV-16DWV-S-E-A20	2	2	0'	2'	YES	99'-3"	220'
DELTA	4	160'	1⅝" AVA	APX16DWV-16DWV-S-E-A20	2	2	0'	2'	NO	99'-3"	310'

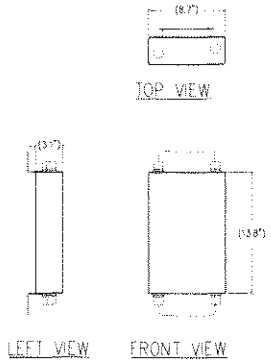
NOTE: CONTRACTOR TO VERIFY LATEST RF DESIGN



ANTENNA PLAN
1/8"=1'



1 ANTENNA DETAIL
1/2"=1'



2 TMA DETAIL
1"=6"

PG&E MARTIN SUBSTATION

SF43550E

MAIN ST & LINDA VISTA DRIVE
BRISBANE, CA 94014

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	11-10-09	ZD 90%	
	11-17-09	ZD 100%	-
1	12-10-09	ZD 100%	CL
	-	-	-
	-	-	-
	-	-	-

DRAWN BY: C. CODY
CHECKED BY: S. ARMITAGE
APPROVED BY: B. McCOMB
DATE: 12/10/09

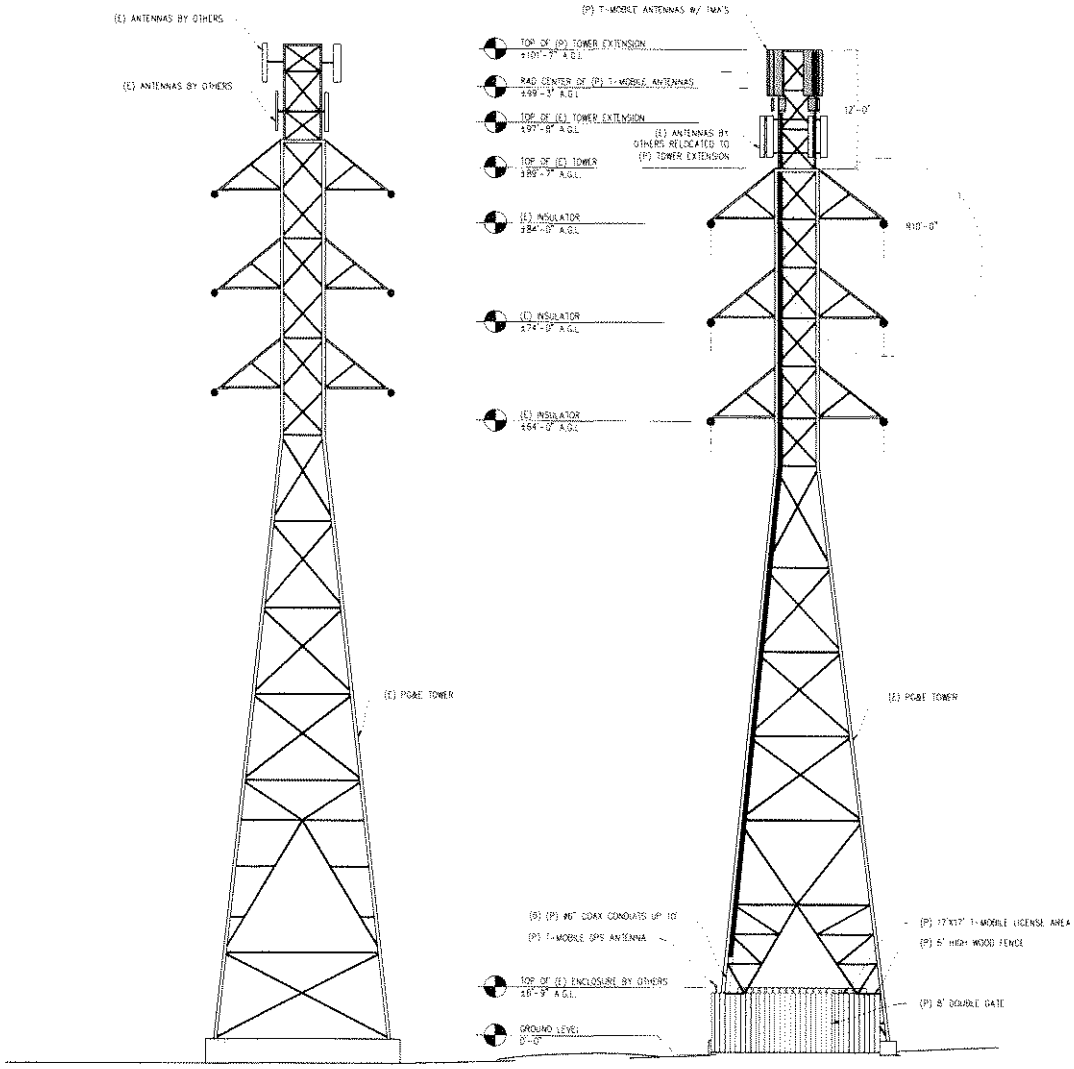
Streamline Engineering
Design Build
11768 Atwood Rd, Suite 20 Auburn, CA 95603
Contact: Larry Haughey Phone: 916-251-1160
E-Mail: larry@streamlineengineering.com Fax: 916-523-9763

T-MOBILE WEST CORPORATION
T-Mobile
1855 GATEWAY BLVD 9TH FLOOR
CONCORD, CA 94520

SHEET TITLE:
ANTENNA PLAN & DETAIL

SHEET NUMBER:
A-4

H.2.20.



NORTHEAST ELEVATION

PG&E MARTIN SUBSTATION

SF43550E

MAIN ST & LINDA VISTA DRIVE
BRISBANE, CA 94014

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	11-10-09	ZD 90%	-
	11-17-09	ZD 100%	-
1	12-10-09	ZD 100%	CL
	-	-	-
	-	-	-
	-	-	-

DRAWN BY: C. CODY
CHECKED BY: S. ARMITAGE
APPROVED BY: B. McCOMB
DATE: 12/10/09

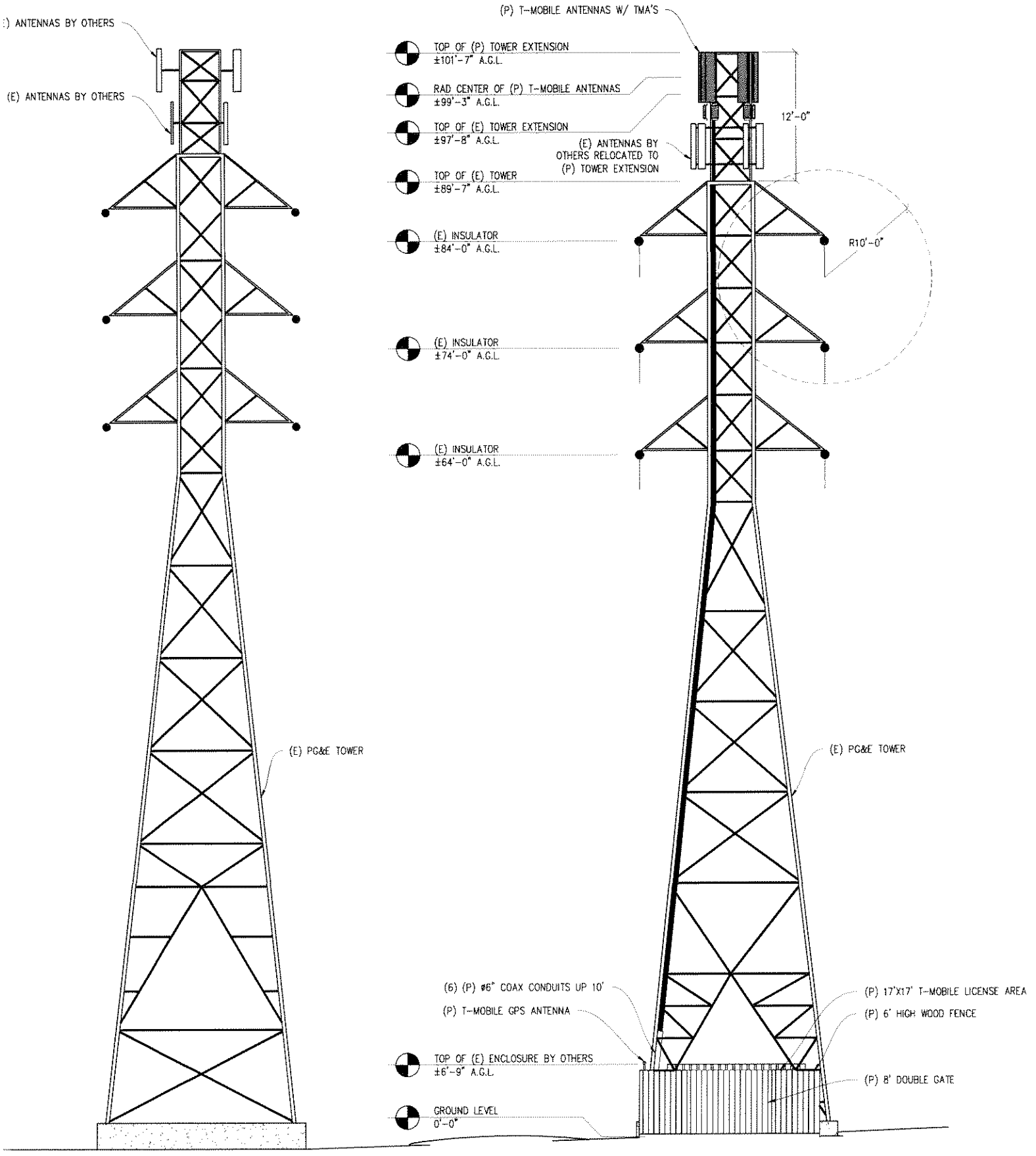
Streamline Engineering
CIVIL DESIGN, INC.
11758 Atwood Rd, Suite 20 Auburn, CA 95603
Contact: Larry Haughey Phone: 916-274-1160
E-Mail: larry@streamlineengineering.com Fax: 916-274-1163

T-MOBILE WEST CORPORATION
T-Mobile
1855 GATEWAY BLVD 9TH FLOOR
CONCORD, CA 94520

SHEET TITLE:
ELEVATION

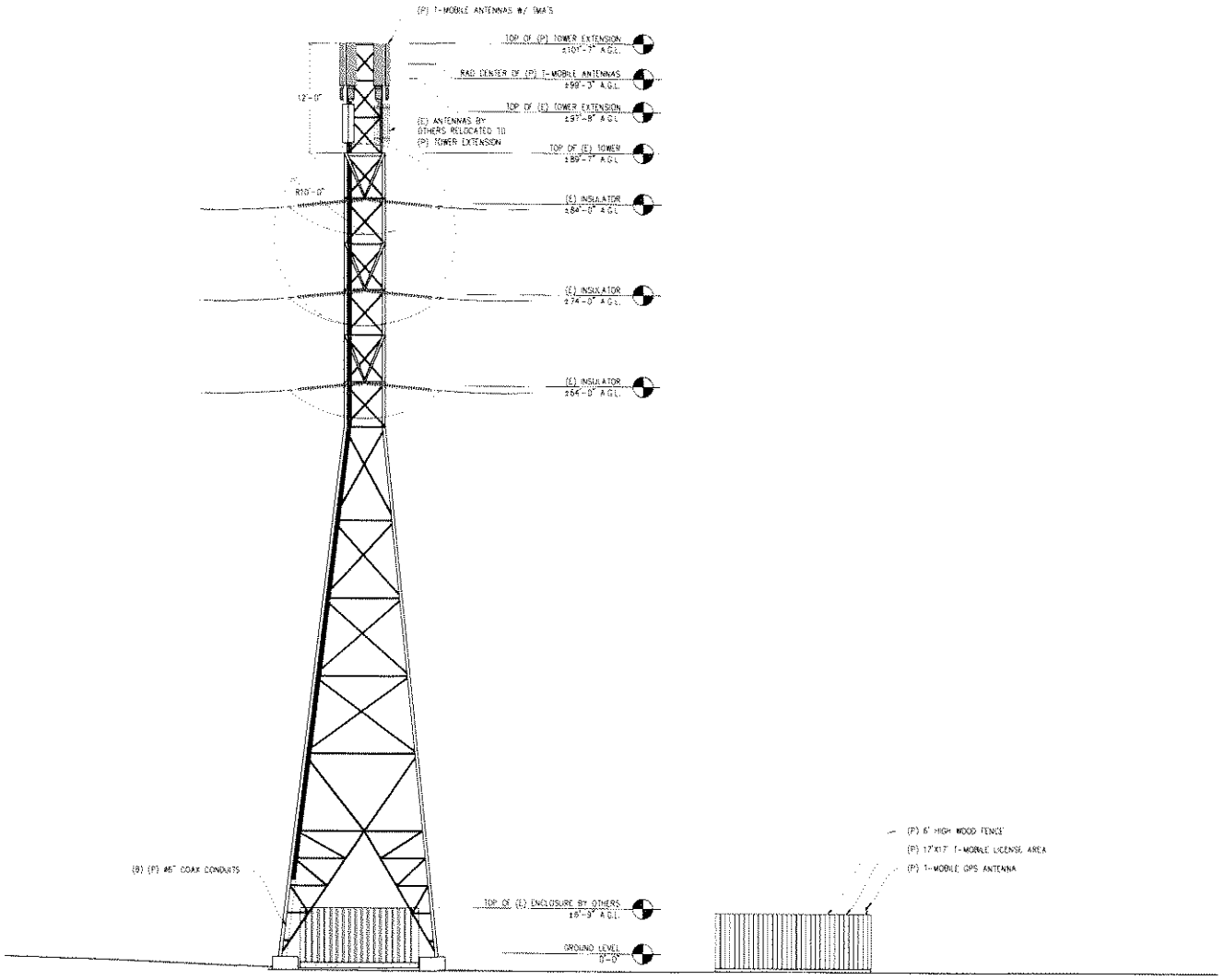
SHEET NUMBER:
A-5

H.2.21.



NORTHEAST ELEVATION

3/16"=1'



SOUTHEAST ELEVATION

3/8"=1'

PG&E MARTIN SUBSTATION

SF43550E

MAIN ST & LINDA VISTA DRIVE
BRISBANE, CA 94014

ISSUE STATUS

△	DATE	DESCRIPTION	BY
	11-10-09	ZD 90%	-
	11-17-09	ZD 100%	-
1	12-10-09	ZD 100%	CL
	-	-	-
	-	-	-
	-	-	-
	-	-	-

DRAWN BY: C. CODY
CHECKED BY: S. ARMITAGE
APPROVED BY: B. McCOMB
DATE: 12/10/09

Streamline Engineering and Design, Inc.
11768 Atwood Rd, Suite 20 Auburn, CA 95603
Cross-Country Planning Phone: 916-625-4188
E-Mail: larry@streamlineeng.com Fax: 530-823-8783

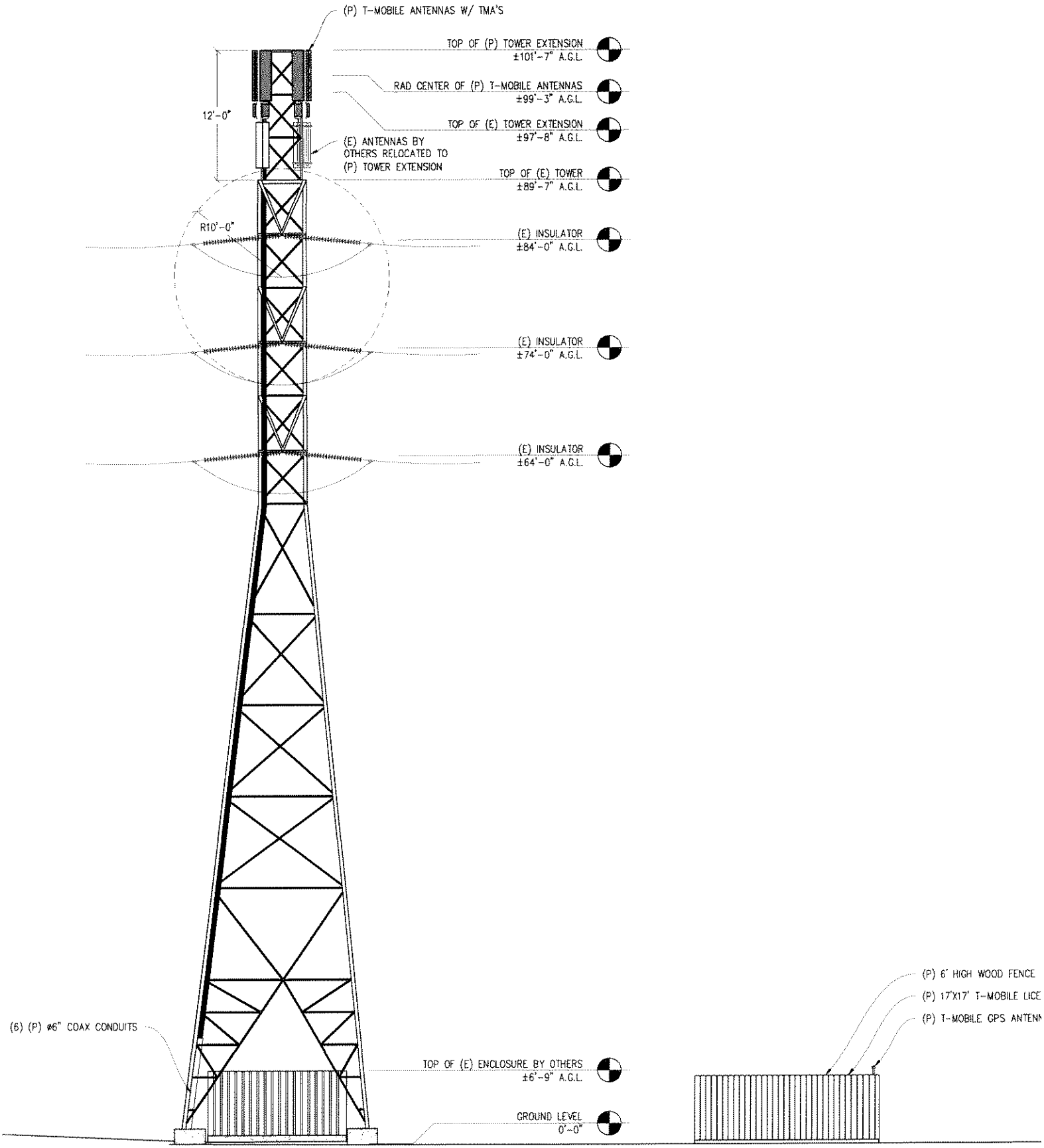
T-MOBILE WEST CORPORATION
T-Mobile

1855 GATEWAY BLVD 9TH FLOOR
CONCORD, CA 94520

SHEET TITLE:
ELEVATION

SHEET NUMBER:
A-6

H.2.23

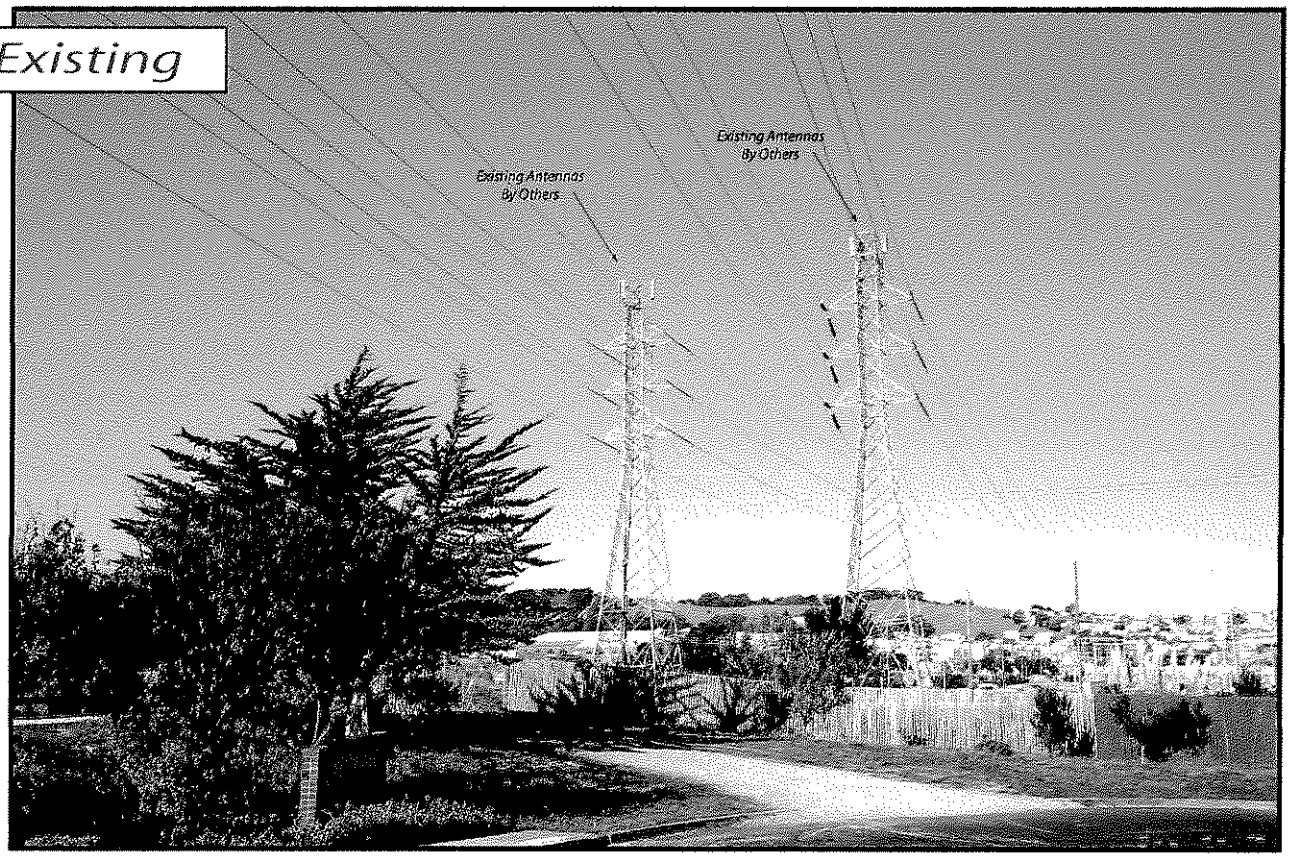


SOUTHEAST ELEVATION

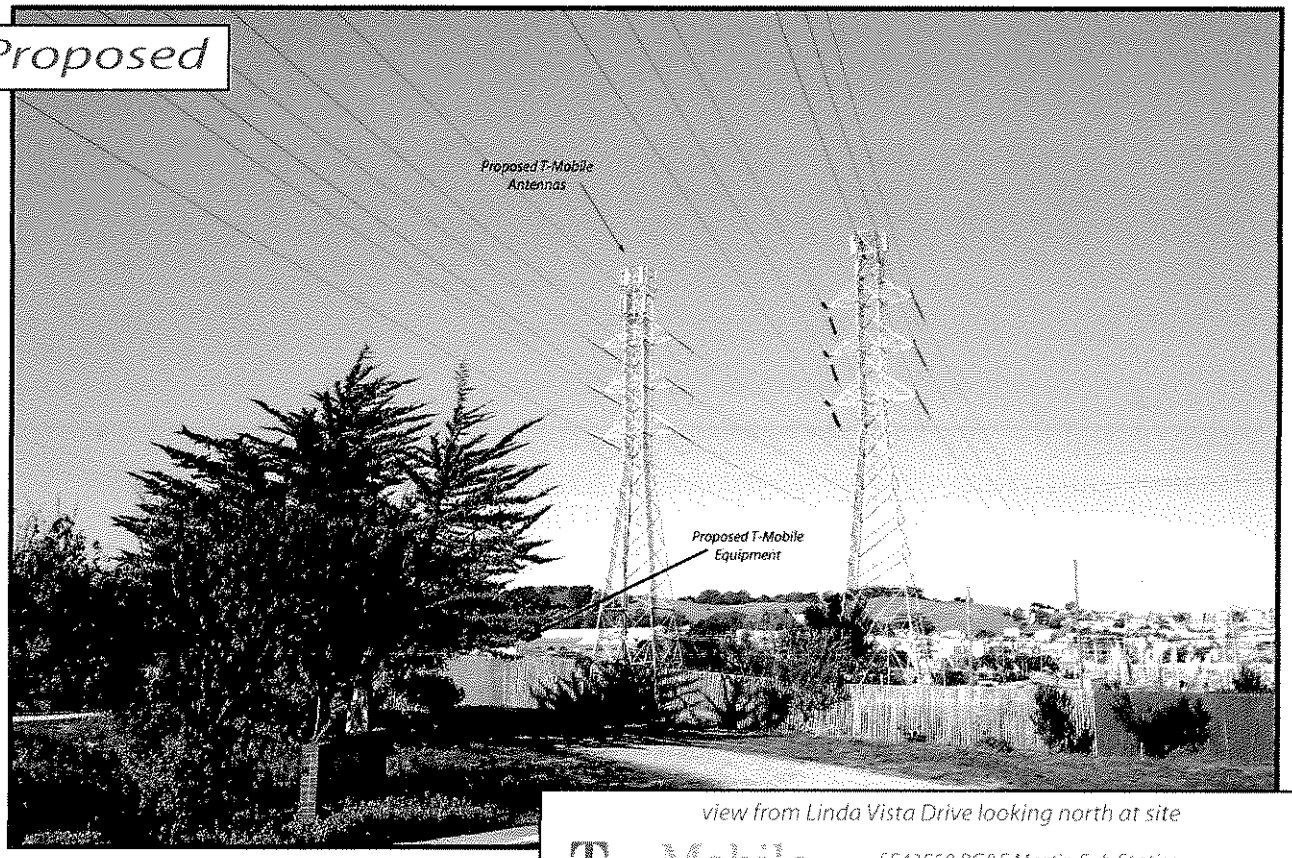
3/16"=1'

H.2.24

Existing



Proposed



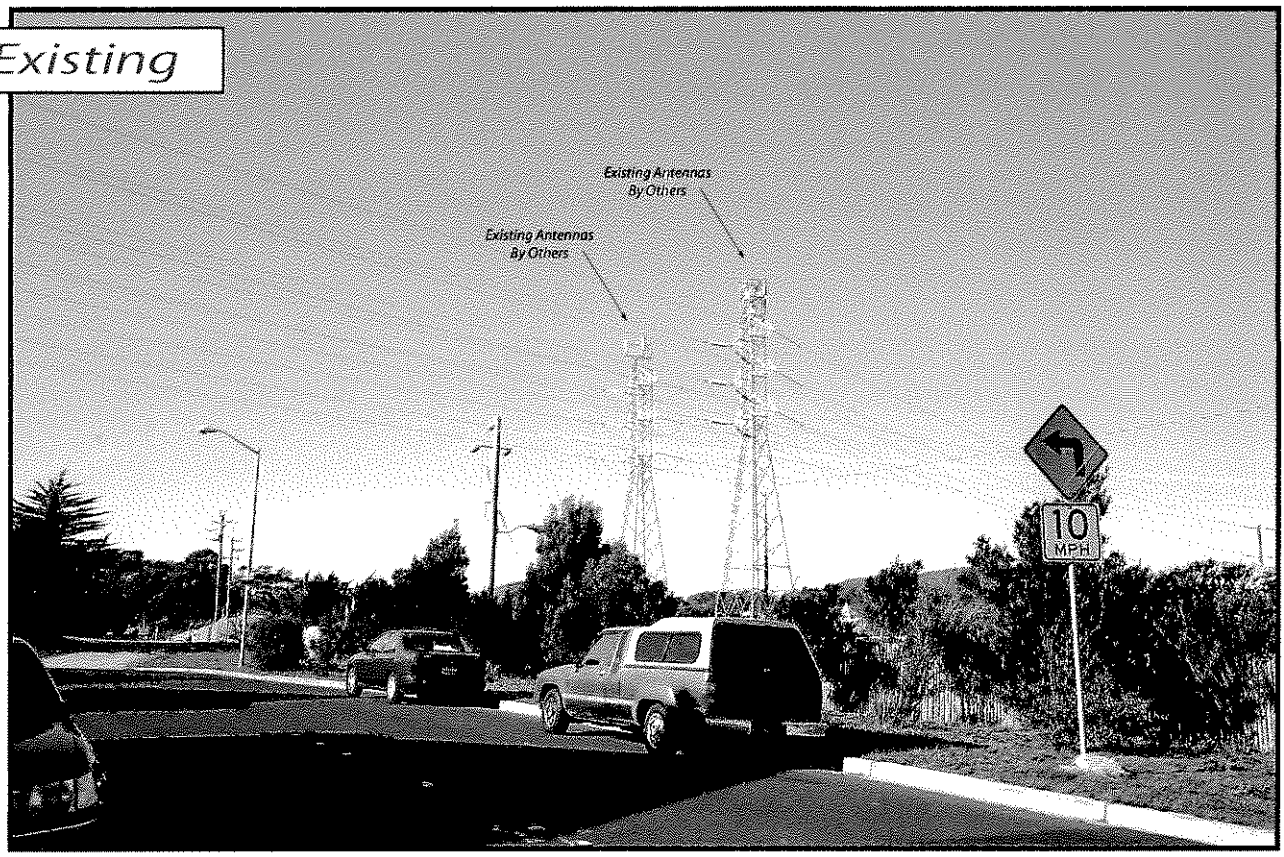
view from Linda Vista Drive looking north at site

T · Mobile

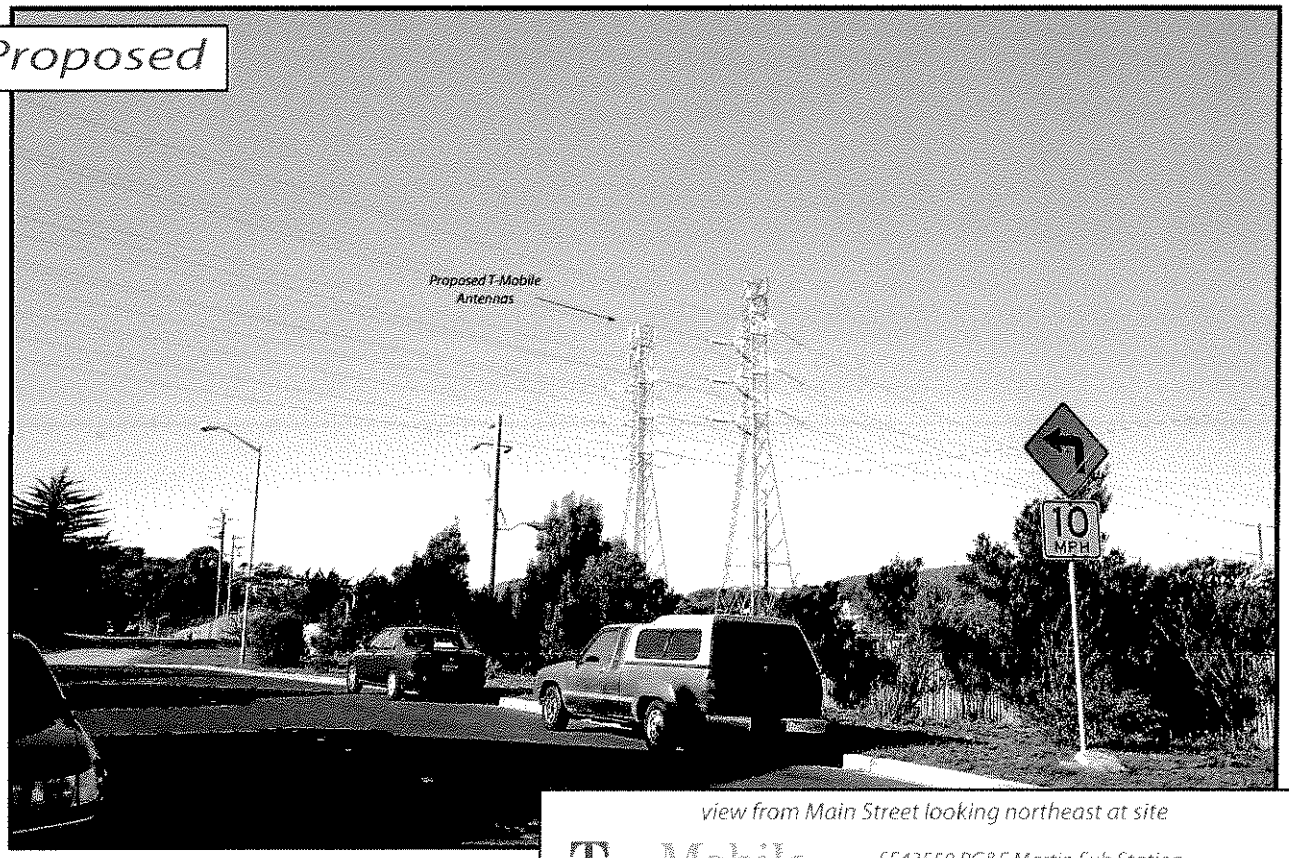
SF43550 PG&E Martin Sub Station
Main Street & Linda Vista Drive, Brisbane, CA

AdvanceSim
Photo Simulation Solutions
Contact: 925.202.8907

Existing



Proposed



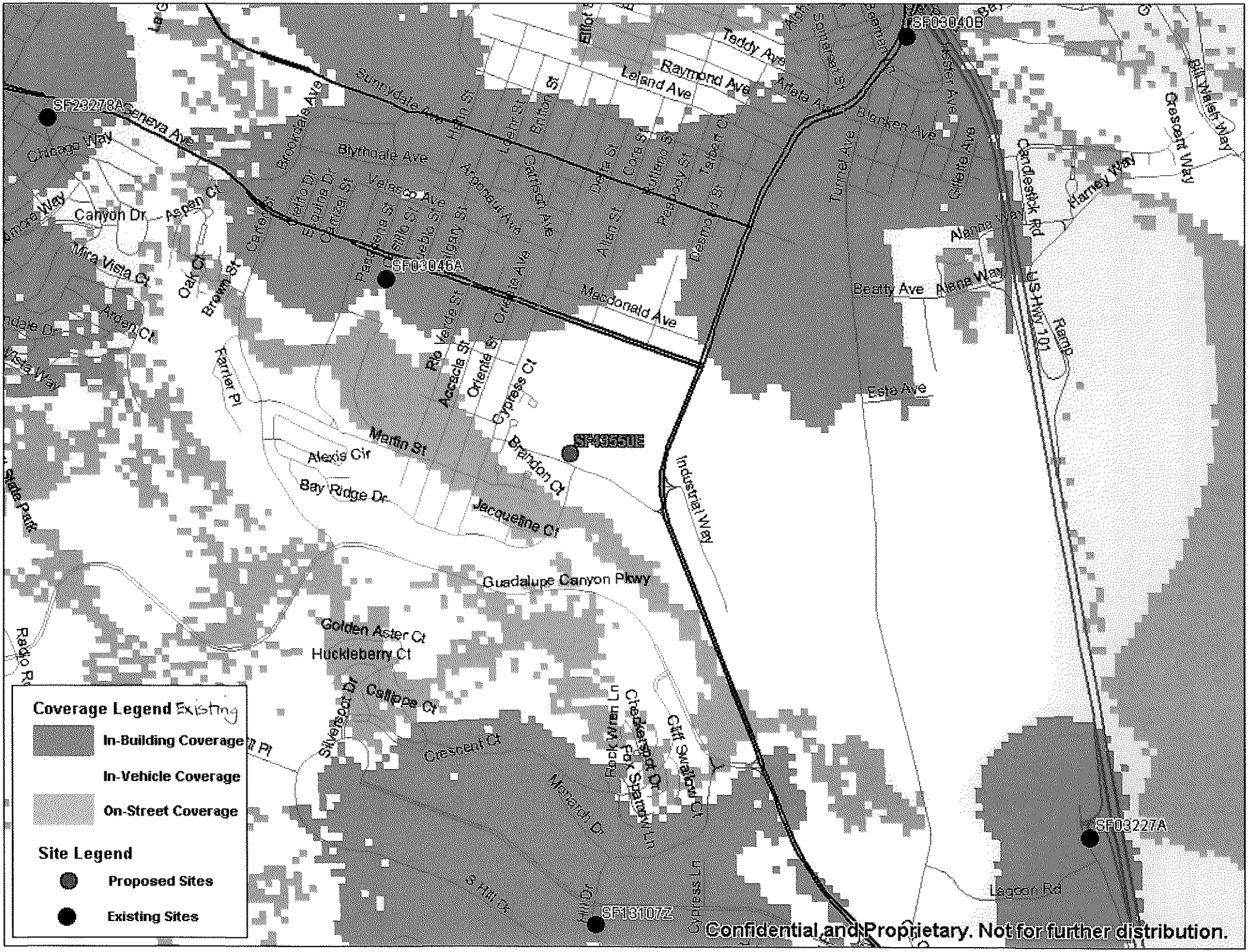
view from Main Street looking northeast at site

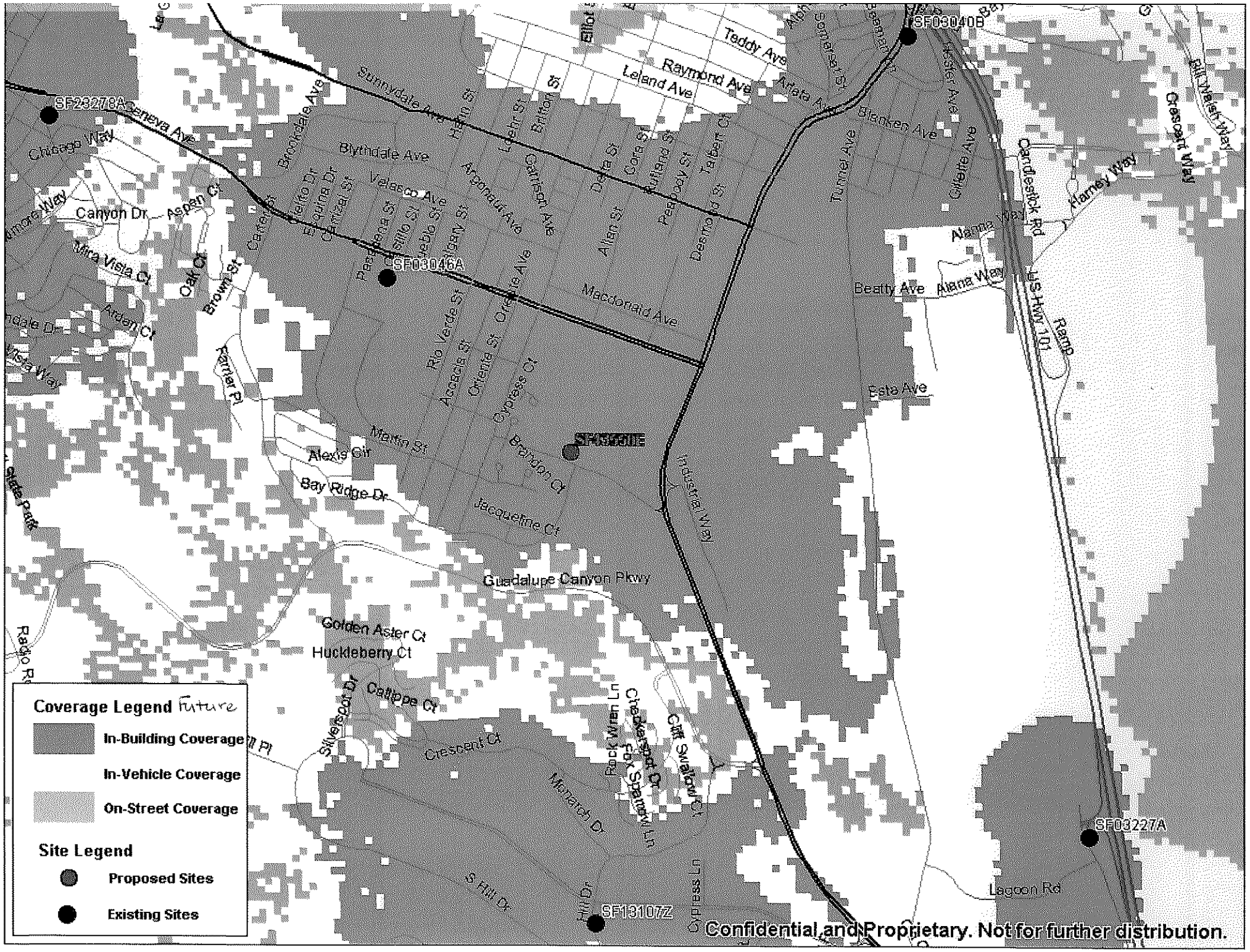
T · ·Mobile·

SF43550 PG&E Martin Sub Station
Main Street & Linda Vista Drive, Brisbane, CA

AdvanceSim
Photo Simulation Solutions
Contact: 925 - 202 8507

H.2.26.




Coverage Legend
Future
In-Building Coverage
In-Vehicle Coverage
On-Street Coverage
Site Legend
Proposed Sites
Existing Sites
SF23278A
SF03040B
SF03046A
SF03227A
SF13107Z
Teddy Ave
Raymond Ave
Leland Ave
Sunnydale Ave
Geneva Ave
Chicago Way
Blythdale Ave
Valencia Ave
Canyon Dr
Aspen Ct
Mira Vista Ct
Oak Ct
Brown St
Macdonald Ave
Beatty Ave
Alana Way
Estia Ave
Harney Way
Crescent Way
Bill Walsh Way
Candlestick Rd
Blanken Ave
Gillette Ave
Turner Ave
Bernal Ave
Allen St
Delta St
Cora St
Rutland St
Peabody St
Talbert Ct
Argonaut Ave
Gaffney St
Rio Verde St
Acacia St
Cypress Ct
Brandon Ct
Jacqueline Ct
Alexis Cir
Bay Ridge Dr
Guadalupe Canyon Pkwy
Golden Aster Ct
Huckleberry Ct
Calliope Ct
Silverboat Dr
Crescent Ct
Menarch Ct
Rock Wren Ln
Fox Sparrow Ln
Cliff Swallow Ct
Cliffness Ln
S Hill Dr
Industrial Way
Lagoon Rd
US Hwy 101
Ramp
Confidential and Proprietary. Not for further distribution.

T-Mobile West Corp. • Proposed Base Station (Site No. SF43550)
Main Street and Linda Vista Drive • Brisbane, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of T-Mobile West Corp., a personal wireless telecommunications carrier, to evaluate the base station (Site No. SF43550) proposed to be located at Main Street and Linda Vista Drive in Brisbane, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. In Docket 93-62, effective October 15, 1997, the FCC adopted the human exposure limits for field strength and power density recommended in Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent standard, developed by the Institute of Electrical and Electronics Engineers and approved as American National Standard ANSI/IEEE C95.1-2006, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," includes similar exposure limits. A summary of the FCC's exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

The most restrictive FCC limit for exposures of unlimited duration to radio frequency energy for several personal wireless services are as follows:

Personal Wireless Service	Approx. Frequency	Occupational Limit	Public Limit
Broadband Radio ("BRS")	2,600 MHz	5.00 mW/cm^2	1.00 mW/cm^2
Advanced Wireless ("AWS")	2,100	5.00	1.00
Personal Communication ("PCS")	1,950	5.00	1.00
Cellular Telephone	870	2.90	0.58
Specialized Mobile Radio ("SMR")	855	2.85	0.57
Long Term Evolution ("LTE")	700	2.33	0.47
[most restrictive frequency range]	30–300	1.00	0.20

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

General Facility Requirements

Base stations typically consist of two distinct parts: the electronic transceivers (also called "radios" or "channels") that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The transceivers are often located at ground level and are connected to the antennas by coaxial cables about 1 inch thick. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above ground. The antennas are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Along with the low power of such facilities, this means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas.

Computer Modeling Method

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

Site and Facility Description

Based upon information provided by T-Mobile, including drawings by Streamline Engineering and Design, Inc., dated November 4, 2009, it is proposed to mount eight RFS Model APX16DWV-16DWV directional panel PCS antennas on a 12-foot extension above an existing 89$^1/_2$-foot PG&E power line tower on PG&E property near the intersection of Main Street and Linda Vista Drive in Brisbane. The antennas would be mounted with no downtilt at an effective height of about 99$^1/_2$ feet above ground and would be oriented in pairs toward 50°T, 140°T, 220°T, and 310°T, to provide service in all directions. The maximum effective radiated power in any direction would be 1,760 watts, representing the simultaneous operation of four channels at 440 watts each.

Presently mounted on the tower are similar antennas for use by MetroPCS, another wireless telecommunications carrier. For the limited purposes of this study, it is assumed that MetroPCS has installed Kathrein Model 742-213 antennas at an effective height of about 93$^1/_2$ feet above ground and operates at a maximum effective radiated power of 1,890 watts, representing the simultaneous

operation of six channels at 315 watts each.

Study Results

For a person anywhere at ground, the maximum ambient RF exposure level due to the proposed T-Mobile operation by itself is calculated to be 0.00028 mW/cm^2, which is 0.028% of the applicable public limit. The maximum calculated cumulative level at ground, for the simultaneous operation of both carriers, is 0.051% of the public exposure limit; the maximum calculated cumulative level at the second-floor elevation of any nearby building* is 0.066% 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.

No Recommended Mitigation Measures

Due to their mounting location, the T-Mobile antennas would not be accessible to the general public, and so no mitigation measures are necessary to comply with the FCC public exposure guidelines. It is presumed that PG&E already takes adequate precautions to ensure that there is no unauthorized access to its tower. To prevent exposures in excess of the occupational limit by authorized PG&E workers, it is expected that they will adhere to appropriate safety protocols adopted by that company.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the base station proposed by T-Mobile West Corp. at Main Street and Linda Vista Drive in Brisbane, California, will comply with the prevailing standards for limiting public exposure to radio frequency energy and, therefore, will not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating base stations.

---

* Located at least 120 feet away, based on aerial photographs from Google Maps.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2011. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

November 23, 2009

REGISTERED PROFESSIONAL ENGINEER
WILLIAM F. HAMMETT
E-13026
M-20676
Exp. 6-30-2011
ELECTRICAL
MECHANICAL
STATE OF CALIFORNIA

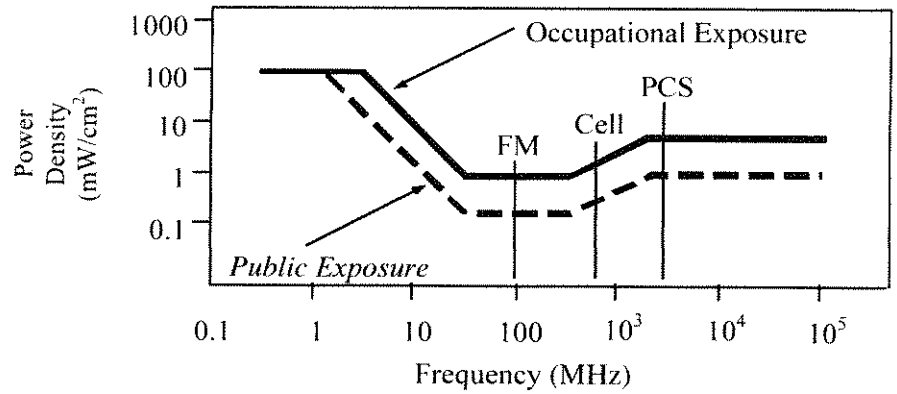
William F. Hammett, P.E.

FCC Radio Frequency Protection Guide

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

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

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



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

RFR.CALC™ Calculation Methodology

Assessment by Calculation of Compliance with FCC Exposure Guidelines

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

Near Field.

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

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

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

where θ_{BW} = half-power beamwidth of the antenna, in degrees, and
P_{net} = net power input to the antenna, in watts,
D = distance from antenna, in meters,
h = aperture height of the antenna, in meters, and
η = aperture efficiency (unitless, typically 0.5-0.8).

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

Far Field.

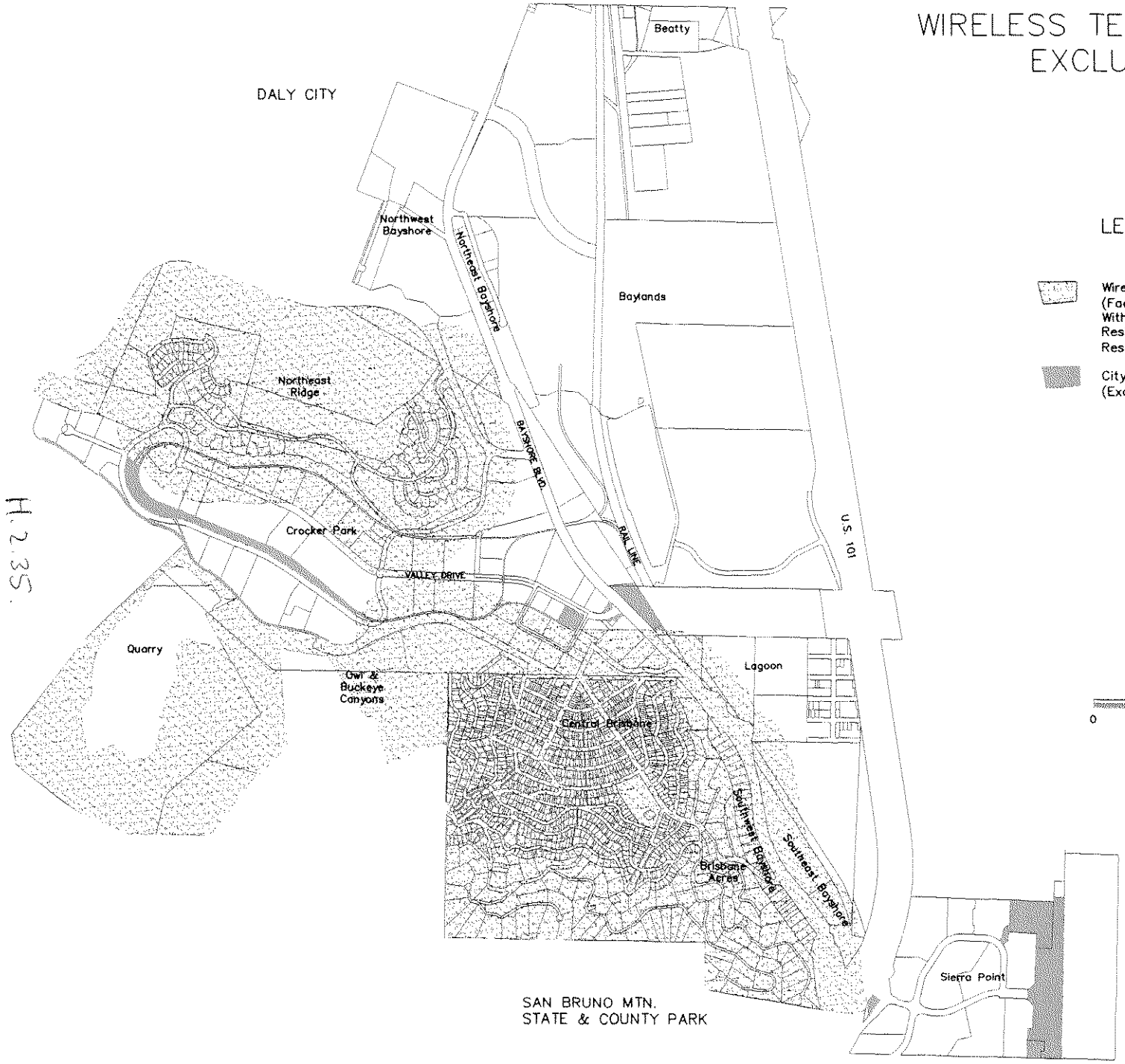
OET-65 gives this formula for calculating power density in the far field of an individual RF source:

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

where ERP = total ERP (all polarizations), in kilowatts,
RFF = relative field factor at the direction to the actual point of calculation, and
D = distance from the center of radiation to the point of calculation, in meters.

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

WIRELESS TELECOMMUNICATIONS EXCLUSION ZONES



LEGEND

- Wireless Telecommunications Exclusion Zone (Facilities Not Allowed Within Open Space Areas or Within 600 ft. of Northeast Ridge or Central Brisbane Residential Districts, or 600 ft. of Southwest Bayshore Residences)
- City or Redevelopment Agency Owned (Excluding Roadways)

SCALE

0 1000 2000 FT

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Map Prepared: January 2010

H.2.35.