CITY OF CAMBRIDGE
MASSACHUSETTS
BOARD OF ZONING APPEAL
831 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139
617 349-6100

BZA APPLICATION FORM

Plan No: BZA-017209-2019

GENERAL INFORMATION

The undersigned hereby petitions the Board of Zoning Appeal for the following:

Special Permit : √ **Variance :** _____ **Appeal :** _____

PETITIONER : New Cingular Wireless PCS, LLC ("AT&T") - C/O Brown Rudnick LLP, Michael R. Dolan

PETITIONER'S ADDRESS : 10 Memorial Boulevard Providence, RI 02903

LOCATION OF PROPERTY : 64 Linnaean St Cambridge, MA 02138

TYPE OF OCCUPANCY : Wireless Commuunications Services **ZONING DISTRICT :** Residence C-2 Zone

REASON FOR PETITION :

Additions

DESCRIPTION OF PETITIONER'S PROPOSAL :

AT&T has Transmission Equipment mounted on the existing building at the 56' AGL antenna centerline mark. AT&T is seeking to modify its facility as follows: install 3 new panel antennas (2 behind the screen wall concealing the equipment and 1 on the façade of the penthouse for a total of 12 panel antennas; install 6 additional remote radio units and collocate other Transmission Equipment to the Facility; modifying the existing concealment platform structure; shift existing equipment on the existing platform; shift the locations of some of the existing panel antennas; and install a proposed concealment structure to conceal the existing and proposed antennas on the façade of the existing penthouse on the roof of the Building, all as per supporting statements and plans submitted herewith.

SECTIONS OF ZONING ORDINANCE CITED :

Article 4.000 Section 4.32(g)(1) (Telecommunication Facility).

Article 4.000 Section 4.40 (Footnote 49) (Telecommunication Facility).

Article 10.000 Section 10.40 (Special Permit).

Original Signature(s) : Michael R. Dolan

(Petitioner(s) / Owner)

Michael R. Dolan, Esq.

(Print Name)

Address : Brown Rudnick LLP
10 Memorial Boulevard
Providence, RI 02903

Tel. No. : 401-276-2610

E-Mail Address : mdolan@brownrudnick.com

Date : October 31, 2019

BZA APPLICATION FORM - OWNERSHIP INFORMATION

To be completed by OWNER, signed before a notary and returned to The Secretary of the Board of Zoning Appeals.

I/We Zachary M. Gingo, Associate Dean, on behalf of President + Fellows of Harvard College
(OWNER)

Address: Massachusetts Hall / Cambridge, MA 02138

State that I/We own the property located at 64 Linnaen St,

which is the subject of this zoning application.

The record title of this property is in the name of President and Fellows of Harvard College

*Pursuant to a deed of duly recorded in the date 10/2/99 (Certificate of merger, recorded), Middlesex South County Registry of Deeds at Book 30780, Page 242; or

Middlesex Registry District of Land Court, Certificate No. _____

Book _____ Page _____.

Z G M. S

*SIGNATURE BY LAND OWNER OR AUTHORIZED TRUSTEE, OFFICER OR AGENT**

Written evidence of Agent's standing to represent petitioner may be requested.

Commonwealth of Massachusetts, County of Middlesex

The above-name Zachary M. Gingo personally appeared before me, this 7th of August, 2019, and made oath that the above statement is true.

Denise Medeiros Notary

My commission expires May 10, 2024 (Notary Seal).

- If ownership is not shown in recorded deed, e.g. if by court order, recent deed, or inheritance, please include documentation.

DENISE F. MEDEIROS
MY COMMISSION EXPIRES MAY 10, 2024
NOTARY PUBLIC COMMONWEALTH OF MASSACHUSETTS

BZA APPLICATION FORM

DIMENSIONAL INFORMATION

APPLICANT: Brown Rudnick LLP **PRESENT USE/OCCUPANCY:** mixed use

LOCATION: 64 Linnaean St Cambridge, MA 02138 **ZONE:** Residence C-2 Zone

PHONE: _____ **REQUESTED USE/OCCUPANCY:** no change

		EXISTING CONDITIONS	*REQUESTED CONDITIONS*	*ORDINANCE REQUIREMENTS* [1]	
TOTAL GROSS FLOOR AREA:		na	no change	na	(max.)
LOT AREA:		na	no change	na	(min.)
RATIO OF GROSS FLOOR AREA TO LOT AREA: [2]		na	no change	na	(max.)
LOT AREA FOR EACH DWELLING UNIT:		na	no change	na	(min.)
SIZE OF LOT:	WIDTH	na	no change	na	(min.)
	DEPTH	na	no change	na	
SETBACKS IN FEET:	FRONT	na	no change	na	(min.)
	REAR	na	no change	na	(min.)
	LEFT SIDE	na	no change	na	(min.)
	RIGHT SIDE	na	no change	na	(min.)
SIZE OF BLDG.:	HEIGHT	49'	no change	na	(max.)
	LENGTH	na	no change	na	
	WIDTH	na	no change	na	
RATIO OF USABLE OPEN SPACE TO LOT AREA: [3]		na	no change	na	(min.)
NO. OF DWELLING UNITS:		na	no change	na	(max.)
NO. OF PARKING SPACES:		na	no change	na	(min./max)
NO. OF LOADING AREAS:		na	no change	na	(min.)
DISTANCE TO NEAREST BLDG. ON SAME LOT:		na	no change	na	(min.)

Describe where applicable, other occupancies on same lot, the size of adjacent buildings on same lot, and type of construction proposed, e.g.; wood frame, concrete, brick, steel, etc.

This application is for a modification of AT&T's existing wireless communications services facility located on the existing building known as Gilbert Hall on the property. There are other buildings on the property as well which are not subject to this project.

1. SEE CAMBRIDGE ZONING ORDINANCE ARTICLE 5.000, SECTION 5.30 (DISTRICT OF DIMENSIONAL REGULATIONS).
2. TOTAL GROSS FLOOR AREA (INCLUDING BASEMENT 7'-0" IN HEIGHT AND ATTIC AREAS GREATER THAN 5') DIVIDED BY LOT AREA.
3. OPEN SPACE SHALL NOT INCLUDE PARKING AREAS, WALKWAYS OR DRIVEWAYS AND SHALL HAVE A MINIMUM DIMENSION OF 15'.

BZA APPLICATION FORM

SUPPORTING STATEMENT FOR A SPECIAL PERMIT

Please describe in complete detail how you meet each of the following criteria referring to the property and proposed changes or uses which are requested in your application. Attach sheets with additional information for special permits which have additional criteria, e.g.; fast food permits, comprehensive permits, etc., which must be met.

Granting the Special Permit requested for 64 Linnaean St Cambridge, MA 02138 (location) would not be a detriment to the public interest because:

A) Requirements of the Ordinance can or will be met for the following reasons:

The proposed modifications do not significantly expand the existing use and the new antennas and equipment will be mounted in a manner similar to the existing equipment. By modifying an existing installation, the need to construct an additional facility in the immediate area is eliminated.

B) Traffic generated or patterns of access or egress would not cause congestion hazard, or substantial change in established neighborhood character for the following reasons:

AT&T's Facility is unmanned and there will be no increase in the amount of traffic to and from the site as a result of the proposed modification. Maintenance visits to the existing facility average one or two per month.

C) The continued operation of or the development of adjacent uses as permitted in the Zoning Ordinance would not be adversely affected by the nature of the proposed use for the following reasons:

The modifications to AT&T's existing facility will be located on the roof of the building as is AT&T's existing facility. The additional antennas and equipment will be installed in a manner similar to the existing antennas and equipment, including painting to match surfaces to which they are attached and concealing behind existing screen wall.

D) Nuisance or hazard would not be created to the detriment of the health, safety and/or welfare of the occupant of the proposed use or the citizens of the City for the following reasons:

The facility will continue to be passive in nature and will not produce smoke, odors, waste, unreasonable noise or significant amounts of traffic.

E) For other reasons, the proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the intent or purpose of this ordinance for the following reasons:

The proposed modifications will allow AT&T to continue to provide adequate wireless communications servives to this area of Cambridge, and will allow the City satisfy its obligations under the Spectrum Act.

MAURA HEALEY
ATTORNEY GENERAL

THE COMMONWEALTH OF MASSACHUSETTS
OFFICE OF THE ATTORNEY GENERAL
CENTRAL MASSACHUSETTS DIVISION
10 MECHANIC STREET, SUITE 301
WORCESTER, MA 01608

(508) 792-7600
(508) 795-1991 fax
www.mass.gov/ago

February 17, 2015

Dorothy A. Powers, Town Clerk
Town of Westwood
580 High Street
Westwood, MA 02090

RE: Westwood Special Town Meeting of November 17, 2014 - Case # 7455
Warrant Articles # 11, 12, 13, 14, 15 and 16 (Zoning)
Warrant Article # 7, 17 and 18 (General)

Dear Ms. Powers:

Articles 7 and 18 – We take no action on Articles 7 and 18 because they are votes to accept the provisions of local option statutes. Such votes do not require review and approval by the Attorney General.

Article 14 – We retain Article 14 (Street Access Special Permit) for further review and will issue our decision by our deadline of March 9, 2015.

Articles 11, 12, 13, 15, 16, and 17 – We approve these Articles from the November 17, 2014 Westwood Special Town Meeting. Our comments on Article 13 are detailed below.

Article 13 – Article 13 amends Section 7.3 of the Town's Zoning Bylaw, "Environmental Impact and Design Review." In part the amendments make the EIDR by-law applicable to the "construction, installation or alteration of a Minor Wireless Communication Facility pursuant Section 9.4 of [the zoning] bylaw."

Section 6409 of the Middle Class Tax Relief and Job Creation Act of 2012 requires that "[A] state or local government *may not deny, and shall approve*, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station." (emphasis added). The Act defines "eligible facilities request" as any request for modification of an existing wireless tower or base station that involves: 1) collocation of new transmission equipment; 2) removal of transmission equipment; or 3) replacement of transmission equipment. The Act applies "[n]otwithstanding section 704 of the Telecommunications Act of 1996." The Act's requirement that a local government "may not deny, and shall approve, any eligible facilities request" means that a request for modification to an existing facility that does not substantially change the physical dimensions of the tower or base station must be approved. Such qualifying requests also cannot

be subject to a discretionary special permit. The Town must apply the EIDR by-law consistent with these requirements.

Article 13 also amends Section 7.3.3, "Exempt Uses" to clarify the application of the EIDR by-law to protected uses under G.L. c. 40A, Section 3, as follows (emphasis supplied):

> In cases where M.G.L. Chapter 40A, Section 3 provides certain exemptions from zoning restrictions for uses protected thereunder, review and approval pursuant to this Section shall be limited consistent with those statutory provisions and on other matters shall be advisory only. For all uses exempt under M.G.L. Chapter 40A, Section 3, the Planning Board shall make determinations of compliance with dimensional and parking requirements of this Bylaw, including requirements related to setbacks, building height, building coverage, **impervious surface,** parking and circulation, buffers, **screening, landscaping, lighting, and stormwater management.**

This text must be applied consistent with the protections given to agricultural, religious, educational, child care, and solar energy systems under G.L. c. 40A, § 3.

First, G.L. c. 40A, § 3 requires that, to the extent the use of land or structures constitutes commercial agriculture, the Town cannot require a special permit for, unreasonably regulate, or prohibit such activities: (1) on land zoned for agriculture; (2) on land that is greater than five acres in size; and (3) on land of 2 acres or more if the sale of products from the agricultural use generates $1,000 per acre or more of gross sales. We urge the Town to consult closely with Town Counsel when applying the new text in the EIDR by-law to agricultural uses to ensure that the Town complies with G.L. c. 40A, § 3.

Second, for religious, educational, and child care uses, G.L. c. 40A, § 3 allows the Town to impose only reasonable regulations in eight areas: the bulk and height of structures, yard size, lot area, setbacks, open space, parking and building coverage requirements. Nothing in G.L. c. 40A, § 3 allows the Town to impose requirements regarding impervious surface, screening, landscaping, lighting, and stormwater management on religious, educational, and child care uses. Because the text in underline and bold above conflicts with the G.L. c. 40A, § 3 protections for religious, educational, and child care uses, the Town cannot apply this text to such uses. We urge the Town to consult closely with Town Counsel when applying the new text in the EIDR by-law to religious, educational, and child care uses to ensure that the Town complies with G.L. c. 40A, § 3.[1]

[1] During the course of our review we received correspondence from a Town resident urging us to disapprove the amendment to Section 7.3.3 on the basis that the EIDR is in reality special permit review process, and thus violates G.L. c. 40A, § 3. We appreciate this correspondence and it has aided us in our review. However, we are unable to conclude that the EIDR is in reality a special permit requirement, and cannot disapprove the text under the Attorney General's standard of review of by-laws under G.L. c. 40, § 32.

Note: **Pursuant to G.L. c. 40, § 32, neither general nor zoning by-laws take effect unless the Town has first satisfied the posting/publishing requirements of that statute. Once this statutory duty is fulfilled, (1) general by-laws and amendments take effect on the date these posting and publishing requirements are satisfied unless a later effective date is prescribed in the by-law, and (2) zoning by-laws and amendments are deemed to have taken effect from the date they were approved by the Town Meeting, unless a later effective date is prescribed in the by-law.**

MAURA HEALEY
ATTORNEY GENERAL

Margaret J. Hurley

by: Margaret J. Hurley, Assistant Attorney General
Chief, Central Massachusetts Division
Director, Municipal Law Unit
Ten Mechanic Street, Suite 301
Worcester, MA 01608
(508) 792-7600 x 4402

cc: Town Counsel Thomas P. McCusker

JW

CITY OF CAMBRIDGE
MASSACHUSETTS
BOARD OF ZONING APPEAL
831 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139
617 349-6100

2016 MAR 28 PM 4:15

CITY CLERK
CAMBRIDGE, MASSACHUSETTS

CASE NO: BZA-009402-2016 Residence C-2 Zone

LOCATION: 64 Linnaean St
Cambridge, MA 02138

PETITIONER: New Cingular Wireless PCS, LLC d/b/a AT&T Mobility C/O Timothy Greene

PETITION: Special Permit: This application is a eligible facilities request pursuant to Section 6409 of the Middle Class Tax Relief and Job Creation Act of 2012, 47 U.S.C. 1455; or in the alternative, for a special permit under the zoning ordinance as cited above, if and to the extent necessary, all rights reserved.AT&T will be replacing 3 antennas currently installed on site. 2 of the antennas are located behind existing stealth material and not visible to the public. AT&T will also be adding and upgrading telecommunications equipment as part of nationwide network upgrades.

VIOLATION : President and Fellows of Harvard University

Article	4.000	Section	4.32.G.1 (Telecommunications Facility)
Article	4.000	Section	4.40 (Footnote 49) (Telecommunications Facility)
Article	10.000	Section	10.40 (Special Permit
Article	6409	Section	Middle Class Tax Relief and Job Creation Act

DATE OF PUBLIC NOTICE: February 25, 2016 and March 03, 2016

DATE OF PUBLIC HEARING: March 10, 2016;

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Page: 1 of 5 08/04/2016 01:47 PM

MEMBERS OF THE BOARD:

CONSTANTINE ALEXANDER - CHAIR	✓
BRENDAN SULLIVAN - VICE-CHAIR	✓
THOMAS SCOTT	
JANET O. GREEN	

ASSOCIATE MEMBERS:

DOUGLAS MYERS	
SLATER W. ANDERSON	✓
ANDREA A. HICKEY	
ALISON HAMMER	
JIM MONTEVERDE	✓
GEORGE BEST	
LAURA WERNICK	✓

Book 30780 Page 742

Members of the Board of Zoning Appeal heard testimony and viewed materials submitted regarding the above request for relief from the requirements of the Cambridge Zoning Ordinance. The Board is familiar with the location of the petitioner's property, the layout and other characteristics as well as the surrounding district.

Tierra Search

Case No. BZA-009402-2016
Location: 64 Linnaean Street
Petitioner: New Cingular Wireless PCS, LLC – d/b/a AT&T Mobility

On March 10, 2016, Petitioner's attorney Brian Grossman appeared before the Board of Zoning Appeal requesting a special permit for an eligible facilities request pursuant to Section 6409 of the Middle Class Tax Relief and Job Creation Act of 2012, 47 U.S.C. 1455, or in the alternative, for a special permit under the Cambridge Zoning Ordinance ("Ordinance") if and to the extent necessary, all rights reserved, where the petitioner proposes to replace three antennas currently installed on site, where two of the antennas would be located behind existing stealth material and not be visible to the public and to add and upgrade telecommunications equipment. The Petitioner requested relief under Article 4, Section 4.32.G.1 and Article 10, Section 10.40 of the Ordinance and Section 6409 of the Middle Class Tax Relief & Job Creation Act. The Petitioner submitted application materials including information about the project, plans, and photographs.

Mr. Grossman stated that as part of a nationwide program, the proposal was to upgrade the existing telecommunication facility at the site. He stated that three existing antennas would be replaced with three new antennas of a similar dimension. He stated that two of the antennas would be installed behind a screen wall and so not be visible. He stated that the third antenna would be mounted on existing brackets and be painted to match the façade on which it would be mounted. He stated that equipment would also be installed, but would not be visible to the public. He stated that the proposed installation was consistent with the requirements of Section 6409 of the Middle Class Tax Relief & Job Creation Act.

The Chair asked if anyone wished to be heard on the matter, no one indicated such. The Chair read a letter of support from the Planning Board.

Mr. Grossman also stated that he wished to put on the record that the petitioner continued to object the Board's sixth condition (see below) as being preempted by the Telecommunications Act as well as being an inappropriate condition under 6409 and the FCC order.

After discussion, the Chair moved that the Board grant the special permit in order to replace three antennas and to add and upgrade telecommunications equipment based on the finding that the requirements of the Ordinance could not be met without a special permit. The Chair moved that the Board find that traffic generated or patterns of access or egress would not cause congestion, hazard, or substantial change in established neighborhood character. The Chair moved that the Board find that the continued operation or development of adjacent uses as permitted by the Ordinance would not be adversely affected by what was proposed. The Chair moved that the Board find that no nuisance or hazard would be created to the detriment of the health, safety, and welfare of

the occupant of the proposed use or the citizens of the City. The Chair moved that the Board find that the proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the intent and purpose of the Ordinance. The Chair moved that the Board find that the proposed modification to the existing telecommunication facility did not substantially change the physical dimensions of the existing wireless tower or base station within the meaning of Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012, also known as The Spectrum Act. The Chair moved that the Board grant the special permit under the Ordinance subject to and provided that the petitioner comply with the following conditions:

1. that the work proceed in accordance with the plans submitted by the petitioner as initialed by the Chair,
2. that upon completion of the work, the physical appearance, and visual impact of the proposed work be consistent with the photo simulations submitted by the petitioner and initialed by the Chair,
3. that the petitioner at all times maintain the proposed work so that its physical appearance and visual impact remain consistent with the photo simulations previously referred to,
4. that should the petitioner cease to utilize the equipment for a continuous period of six months or more, it promptly thereafter remove such equipment and restore the building on which it is located to its prior condition and appearance to the extent reasonably practicable,
5. that the petitioner continue to be in compliance with all conditions imposed by this Board with regard to previous special permits granted to the petitioner with regard to this site, and
6. Inasmuch as the health effects of the transmission of electromagnetic energy waves is a matter of ongoing societal concern and scientific study, the Special Permit is also subject to the following conditions:
    A. that the petitioner shall file with the Inspectional Services Department each report it files with the federal authorities regarding electromagnetic energy wave emissions emanating from all of the petitioner's equipment on the site. Each such report shall be filed with the Inspectional Services Department no later than ten business days after the report has been filed with the federal authorities. Failure to timely file any such report with the Inspectional Services Department shall ipso facto terminate the Special Permit granted tonight.
    B. that in the event that at any time federal authorities notify the petitioner that its equipment on the site, including, but not limited to the special permit granted tonight, fails to comply with the requirements of law or governmental regulations, whether with regard to the emissions of electromagnetic energy waves or otherwise, the petitioner, within ten business days of receipt of such notification of such failure, shall file with the Inspectional Services Department a report disclosing in

reasonable detail that such failure has occurred and the basis for such claimed failure. The special permit shall ipso facto terminate if any of the petitioner's federal licenses are suspended, revoked, or terminated.

C. that to the extent a special permit has terminated pursuant to the foregoing paragraphs A and B, the petitioner may apply to this Board for a new special permit provided that the public notice containing such application discloses in reasonable detail that the application has been filed because of a termination of the special permit pursuant to paragraphs A or B above. Any such new application shall not be deemed a repetitive petition and therefore will not be subject to the two-year period during which repetitive petitions may not be filed.

D. that within ten business days after receipt of a Building Permit for installation of equipment subject to this petition, the petitioner shall file with the Inspectional Services Department a sworn Affidavit of the person in charge of the installation of equipment by the petitioner of the geographical area that includes Cambridge. Stating that A, he or she has such responsibility, and B that the equipment being installed pursuant to the special permit will comply with all federal safety rules and will be situated and maintained in locations with appropriate barricades and other protections, such that individuals, including nearby residents and occupants of nearby structures, will be sufficiently protected from excessive radiofrequency radiation under federal law.

The five member Board voted unanimously in favor of granting the special permit (Alexander, Sullivan, Anderson, Monteverde, and Wernick) with the above conditions. Therefore, the special permit is granted.

The Board based its decision upon all the information presented, the above findings and upon the following:

1) The meeting of the requirements of the Ordinance;
2) Traffic generated or patterns of access or egress would not cause congestion, hazard, or substantial change in the established neighborhood character;
3) The continued operation of or the development of adjacent uses as permitted in the Ordinance would not be adversely affected by the nature of the proposed uses;
4) Nuisance or hazard would not be created to the detriment of the health, safety and /or welfare of the occupants of the proposed use;
5) The proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the Ordinance, and in fact would be a significant improvement to the structure and benefit the neighborhood, and;
6) The new use or building construction is not inconsistent with the Urban Design Objectives set forth in Section 19.30 of the Cambridge Zoning Ordinance.

The Board of Zoning Appeal is empowered to waive local zoning regulations only. This decision therefore does not relieve the petitioner in any way from the duty to comply with local ordinances and regulations of the other local agencies, including, but not limited to the Historical Commission, License Commission and/or compliance with requirements pursuant to the Building Code and other applicable codes.

Constantine Alexander, Chair

Attest: A true and correct copy of decision filed with the offices of the City Clerk and Planning Board on 3/28/16 by Maria Pacheco, Clerk.

Twenty days have elapsed since the filing of this decision.

No appeal has been filed ✓.

Appeal has been filed and dismissed or denied.

Date: AUG. 4, 2016 Donna P. Lopez City Clerk.

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City of Cambridge

MASSACHUSETTS

BOARD OF ZONING APPEAL

831 Mass Avenue, Cambridge, MA.
(617) 349-6100

CASE NO: 10065

LOCATION: 64 Linnaean Street Residence C-2 Zone
Cambridge, MA

PETITIONER: New Cingular Wireless PCS, LLC – D/B/A AT&T Mobility
C/o Francis Kelley, Sai Communications

PETITION: Special Permit: To alter the Telecommunications Facility approved by a Special Permit on 2/10/10, Case 9874 with the addition of three antenans.

VIOLATION: Art. 4.000, Sec. 4.32.G.1 (Footnote 49) (Telecommunication Facility). Art. 10.000, Sec. 10.40 (Special Permit). Art. 19.000, Sec. 19.31.1 (Urban Design Objectives).

DATE OF PUBLIC NOTICE: February 11 & 18, 2011

DATE OF PUBLIC HEARING: March 3, 2011

MEMBERS OF THE BOARD:

BRENDAN SULLIVAN - CHAIR ✓
CONSTANTINE ALEXANDER – VICE-CHAIR ✓
TIMOTHY HUGHES
THOMAS SCOTT ✓

ASSOCIATE MEMBERS:

CHRISTOPHER CHAN
MAHMOOD R. FIROUZBAKHT ✓
DOUGLAS MYERS
SLATER W. ANDERSON
TAD HEUER ✓

30 780/242

Members of the Board of Zoning Appeal heard testimony and viewed materials submitted regarding the above request for relief from the requirements of the Cambridge Zoning Ordinance. The Board is familiar with the location of the petitioner's property, the layout and other characteristics as well as the surrounding district.

Case No. 10065
Location: 64 Linnaean Street
Petitioner: New Cingular Wireless, DBA AT&T Mobility c/o Francis Kelley

On March 3, 2011, Petitioner Francis Kelley appeared before the Board of Zoning Appeal requesting a special permit in order to alter the telecommunications facility approved by special permit #9874 on 2/11/10 with the addition of three antennas. The Petitioner requested relief from Article 4, Section 4.32.G.1 of the Cambridge Zoning Ordinance ("Ordinance"). The Petitioner submitted application materials including information about the project, plans, and photographs.

Mr. Kelley stated that the proposed site contained a previously special permited facility of three sets of two antennas. He stated that the proposal was to add three more antennas to keep up with rising demand and the coming 4G technology. He stated that the petitioner was properly licensed and that, because the facility was on the Harvard Campus, residential uses did not predominate in the vicinity.

The Chair asked if anyone wished to be heard on the matter, no one indicated such.

After discussion, the Chair moved that the Board grant the special permit for relief in order to alter the telecommunications facility approved by special permit #9874 on 2/11/10 with the addition of three antennas based on the finding that the requirements of the Ordinance were met. The Chair moved that the Board find that the traffic generated or patterns of access or egress would not cause congestion, hazard or substantial change in the established neighborhood character. The Chair moved that the Board find that the continued operation or development of adjacent uses as permitted in the Ordinance would not be adversely affected by the nature of the proposed use. The Chair moved that the Board find that there would not be any nuisance or hazard created to the detriment of the health, safety, or welfare of the occupant of the proposed use or the citizens of the city. The Chair moved that the Board find that the proposed use would not impair the integrity of the district in which it was located. The Chair moved that the Board find that the visual impact of the proposed work would be minimal, having only a slightly wider antenna on the existing mount and having the two existing antennas mounted with each other. The Chair moved that the Board find that the facility is located on the campus of Harvard University and that the signal would cover an important section of that campus allowing for the use of cell phones as part of an alert system to communicate with students. The Chair moved that the Board find that the installation would also allow for an upgrade of the signal to AT&T's 4G system known at LTE, allowing increased speed and capacity for data transmission, which is important to students and other residents who utilize AT&T's network. The Chair moved that the Board find that increased

data capacity would take a load off the network and so reduce the possibility that calls on the emergency alert system would fail. The Chair moved that the Board find that the Petitioner was a licensed FCC carrier and that the license was in the file. The Chair moved that the Board find that, as in the previous case, a non-residential use predominates in the vicinity of the proposed location. The Chair moved that the Board find that the proposed use is not inconsistent with the urban design objective set forth in Section 19.30 of the Ordinance. The Chair moved that the Board grant the special permit on the following conditions:

1. that the work proceed in accordance with the plans and photo simulations submitted by the Petitioner and initialed by the Chair, with one new antenna mounted inside an existing screen wall that currently houses two antennas, with a second antenna mounted inside a false chimney that currently houses two antennas, and with a third antenna façade mounted on an existing mount that has one antenna, with the existing antenna relocated on a dual mount that allows both antennas to be mounted next to each other,
2. that should the facility be abandoned or not used for a period of six months, the facilities be removed and the building be restored to its prior condition to the maximum extent possible, and
3. that the petitioner maintain the facility so that the visual impact is no different from what is shown in the photo simulations.
4. The Petitioner may replace or repair the facilities provided that the replaced facilities fit the same footprint as the existing, and that the visual impact is no different from and no more adverse than those shown in the above photo simulations.

The five member Board voted unanimously in favor of granting the special permit (Sullivan, Alexander, Heuer, Scott, and Firouzbakht) with the above conditions. Therefore, the special permit is granted.

The Board based its decision upon all the information presented, the above findings and upon the following:

1) The meeting of the requirements of the Ordinance;
2) Traffic generated or patterns of access or egress would not cause congestion, hazard, or substantial change in the established neighborhood character;
3) The continued operation of or the development of adjacent uses as permitted in the Ordinance would not be adversely affected by the nature of the proposed uses;
4) Nuisance or hazard would not be created to the detriment of the health, safety and /or welfare of the occupants of the proposed use;
5) The proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the Ordinance, and in fact would be a significant improvement to the structure and benefit the neighborhood, and;

6) The new use or building construction is not inconsistent with the Urban Design Objectives set forth in Section 19.30 of the Cambridge Zoning Ordinance.

The Board of Zoning Appeal is empowered to waive local zoning regulations only. This decision therefore does not relieve the petitioner in any way from the duty to comply with local ordinances and regulations of the other local agencies, including, but not limited to the Historical Commission, License Commission and/or compliance with requirements pursuant to the Building Code and other applicable codes.

Brendan Sullivan, Chair

Attest: A true and correct copy of decision filed with the offices of the City Clerk and Planning Board on 4-5-11 by Maria Pacheco, Clerk.

Twenty days have elapsed since the filing of this decision.

No appeal has been filed ✓.

Appeal has been filed and dismissed or denied.

Date: April 27, 2011 D. Margaret Drury City Clerk.

City of Cambridge

MASSACHUSETTS

BOARD OF ZONING APPEAL

831 Mass Avenue, Cambridge, MA.
(617) 349-6100

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Page: 1 of 5 03/08/2010 11:47 AM

NOTICE OF DECISION

DECISION FILED WITH THE OFFICE OF THE CITY CLERK ON FEB 10 2010

Any person aggrieved by a decision of the Board of Zoning Appeal may appeal to the Superior Court or Land Court. Appeals, if any, shall be made pursuant to Section 17, Chapter 40A, Massachusetts General Laws and shall be filed within twenty calendar days from the above date, and a copy thereof shall be filed with the Cambridge City Clerk's office by that same date.

PREMISES: 64 Linnaean Street
Cambridge, MA

PETITIONER: New Cingular Wireless PCS, LLC
C/o Arthur P. Kreiger, Esq.

PETITION: Special Permit: To install two (2) panel antennas mounted inside a fiberglass screen wall enclosure penthouse extension, two panel antennas mounted inside a false chimney, two (2) façade-mounted antennas painted to match the existing penthouse, equipment cabinets on the roof, electric and telephone utilities.

DECISION: GRANTED W/ CONDITIONS

CASE NO: 9874

***For full details, please refer to the decision available at Inspectional Services Dept.**

Return to:
Michael Zhang
Anderson & Kreiger LLP

City of Cambridge

MASSACHUSETTS

BOARD OF ZONING APPEAL

831 Mass Avenue, Cambridge, MA.
(617) 349-6100

2010 FEB 10 A 8:53

CASE NO: 9874

Residence C-2 Zone

LOCATION: 64 Linnaean Street
Cambridge, MA

PETITIONER: New Cingular Wireless PCS, LLC - C/o Arthur P. Kreiger, Esq.

PETITION: Special Permit: To install two (2) panel antennas mounted inside a fiberglass screen wall enclosure penthouse extension, two panel antennas mounted inside a false chimney, two (2) façade-mounted antennas painted to match the existing penthouse equipment cabinets on the roof, electric and telephone utilities.

VIOLATIONS: Art. 4.000, Sec. 4.32.G.1 (Footnote 49) (Telecommunication Facility). Art. 1.000, Sec. 1.30 (Preamble). Art. 19.000, Sec. 19.31.1 (Urban Design Objectives). Art. 10.000, Sec. 10.43 (Special Permit).

DATE OF PUBLIC NOTICE: December 24 & 31, 2009

DATE OF PUBLIC HEARING: January 14, 2010

MEMBERS OF THE BOARD:

CONSTANTINE ALEXANDER - CHAIR	✓
TIMOTHY HUGHES –VICE CHAIR	✓
BRENDAN SULLIVAN	
THOMAS SCOTT	✓

ASSOCIATE MEMBERS:

CHRISTOPHER CHAN	
MAHMOOD R. FIROUZBAKHT	
DOUGLAS MYERS	✓
SLATER W. ANDERSON	
TAD HEUER	✓

Members of the Board of Zoning Appeal heard testimony and viewed materials submitted regarding the above request for relief from the requirements of the Cambridge Zoning Ordinance. The Board is familiar with the location of the petitioner's property, the layout and other characteristics as well as the surrounding district.

Case No. 9874
Location: 64 Linnaean Street
Petitioner: New Cingular Wireless PCS, LLC c/o Arthur Kreiger, Esq.

On January 14, 2010, Petitioner's attorney Arthur Kreiger appeared before the Board of Zoning Appeal requesting a special permit in order to install two panel antennas mounted inside a fiberglass screen wall enclosure penthouse extension, two panel antennas mounted inside a false chimney, and two facade mounted antennas painted to match the existing penthouse equipment cabinets on the roof, electrical and telephone utilities. The Petitioner requested relief from Article 4, Section 4.32.G.1 and Article 10, Section 10.43 of the Cambridge Zoning Ordinance ("Ordinance"). The Petitioner submitted application materials including information about the project, plans, and photographs.

Mr. Kreiger stated that recently, during an emergency, Harvard had sent an emergency test message, which failed to reach many intended recipients in the Quad. He stated that it has been determined that an insufficiently strong signal was the reason for the failure. He stated that Harvard had erected a temporary antenna and now sought this special permit for a permanent antenna. He explained how the installation was designed to be visually unobtrusive. He stated that it was largely in a non-residential area, being surrounded by the university.

The Chair read a letter of support from the Planning Board. The Chair asked if anyone wished to be heard on the matter, no one indicated such.

After discussion, the Chair moved that the Board grant the special permit for relief in order to install two panel antennas mounted inside a fiberglass screen wall enclosure penthouse extension, two panel antennas mounted inside a false chimney, and two facade mounted antennas painted to match the existing penthouse equipment cabinets on the roof, electrical and telephone utilities based on the finding that the requirements of the Ordinance can be met. The Chair moved that the Board find that non-residential uses predominate in the vicinity of the proposed location, in that, with the exception of one street; the area is mostly institutional uses. The Chair moved that the Board find that a telecommunication facility is not inconsistent with the character that prevails in the surrounding neighborhood and is not visible from non-institutional uses. The Chair moved that the Board find that most of the visual impact is directed toward the institutional use and does not impact the residential nature of the neighborhood. The Chair moved that the Board find that the petitioner is a licensed FCC carrier. The Chair moved that the Board find that the visual impact of the elements of the proposed facility are limited by making the new structures being visually consistent with what appears on the building already. The Chair moved that the Board find that this telecommunications antenna will not cause congestion, hazard or substantial

change in established neighborhood character, because these visually disguised additions to top of a dormitory structure have no impact and create no hazard or congestion or change in established neighborhood character. The Chair moved that the Board find that the continued operation of adjacent uses would not be adversely affected by the relief being sought. The Chair moved that the Board find that there would be no nuisance or hazard created to the detriment of the health, safety or welfare of the occupants or citizens of the city. The Chair moved that the Board find that safety would be enhanced with respect to Harvard University students and visitors on this part of the quad by virtue of this telecommunications coverage. The Chair moved that the Board find that the purpose of the proposal is to improve communications for safety reasons. The Chair moved that the Board find that the proposed use would not impair the integrity of the district or adjoining districts or derogate from the intent or purpose of the Ordinance. The Chair moved that the Board find that the neighborhood would not be adversely impacted and that the safety of those persons in or about the quad would be enhanced by the erection of this telecommunication facility. The Chair moved that the Board grant the special permit on the following conditions:

1. that the work proceed in accordance with plans submitted by the petitioner, prepared by Dewberry-Goodkind, Inc, dated 11/19/09, being sheets T-1, Z-1, Z-2, Z-3 and Z-4, with the first page being initialed by the Chair,
2. that the work proceed consistent with photo simulations submitted by the petitioner, prepared by Dewberry, being five pages, the first of which is initialed by the Chair,
3. that the work proceed in a manner as indicated on the plans to minimize the visual impact of the proposed new facilities by blending, to the maximum extent possible, with the existing structure and by securing the cables as tightly as possible to the facade in order to minimize the visual intrusiveness,
4. that should this facility be abandoned and not used for any period of six months the facilities be removed and the building be restored to its prior condition, to the maximum extent possible, and
5. that the petitioner may replace or repair the facilities, providing that the replaced facilities fit the same footprint as the existing one, and that visual impact is no different and no more adverse than those shown in the above referenced photo simulations.

The five member Board voted unanimously in favor of granting the special permit (Alexander, Hughes, Scott, Heuer, and Myers) with the above conditions. Therefore, the special permit is granted.

The Board based its decision upon all the information presented, the above findings and upon the following:

1) The meeting of the requirements of the Ordinance;
2) Traffic generated or patterns of access or egress would not cause congestion, hazard, or substantial change in the established neighborhood character;
3) The continued operation of or the development of adjacent uses as permitted in the Ordinance would not be adversely affected by the nature of the proposed uses;
4) Nuisance or hazard would not be created to the detriment of the health, safety and /or welfare of the occupants of the proposed use;
5) The proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the Ordinance, and in fact would be a significant improvement to the structure and benefit the neighborhood, and;
6) The new use or building construction is not inconsistent with the Urban Design Objectives set forth in Section 19.30 of the Cambridge Zoning Ordinance.

The Board of Zoning Appeal is empowered to waive local zoning regulations only. This decision therefore does not relieve the petitioner in any way from the duty to comply with local ordinances and regulations of the other local agencies, including, but not limited to the Historical Commission, License Commission and/or compliance with requirements pursuant to the Building Code and other applicable codes.

Constantine Alexander, Chair

Attest: A true and correct copy of decision filed with the offices of the City Clerk and Planning Board on 3/10/10 by Maria Pacheco, Clerk.

Twenty days have elapsed since the filing of this decision.

No appeal has been filed ✓.

Appeal has been filed and dismissed or denied.

Date: MARCH 8, 2010 D. Margaret Drury, City Clerk.

PUBLIC NOTICE

Federal Communications Commission
445 12th St., S.W.
Washington, D.C. 20554

News Media Information 202 / 418-0500
Internet: http://www.fcc.gov
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WIRELESS TELECOMMUNICATIONS BUREAU OFFERS GUIDANCE ON INTERPRETATION OF SECTION 6409(a) OF THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012

DA 12-2047
January 25, 2013

On February 22, 2012, the Middle Class Tax Relief and Job Creation Act of 2012 (Tax Act)[1] became law. Section 6409(a) of the Tax Act provides that a state or local government "may not deny, and shall approve" any request for collocation, removal, or replacement of transmission equipment on an existing wireless tower or base station, provided this action does not substantially change the physical dimensions of the tower or base station.[2] The full text of Section 6409(a) is reproduced in the Appendix to this Public Notice.

To date, the Commission has not received any formal petition to interpret or apply the provisions of Section 6409(a). We also are unaware of any judicial precedent interpreting or applying its terms. The Wireless Telecommunications Bureau has, however, received informal inquiries from service providers, facilities owners, and state and local governments seeking guidance as to how Section 6409(a) should be applied. In order to assist interested parties, this Public Notice summarizes the Bureau's understanding of Section 6409(a) in response to several of the most frequently asked questions.[3]

What does it mean to "substantially change the physical dimensions" of a tower or base station?

Section 6409(a) does not define what constitutes a "substantial[] change" in the dimensions of a tower or base station. In a similar context, under the *Nationwide Collocation Agreement* with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers, the Commission has applied a four-prong test to determine whether a collocation will effect a "substantial increase in the size of [a] tower."[4] A proposed collocation that does not involve a substantial increase in

[1] Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112-96, H.R. 3630, 126 Stat. 156 (enacted Feb. 22, 2012) (Tax Act).

[2] *Id.*, § 6409(a).

[3] Although we offer this interpretive guidance to assist parties in understanding their obligations under Section 6409(a), *see, e.g., Truckers United for Safety v. Federal Highway Administration*, 139 F.3d 934 (D.C.Cir. 1998), the Commission remains free to exercise its discretion to interpret Section 6409(a) either by exercising its rulemaking authority or through adjudication. With two exceptions not relevant here, the Tax Act expressly grants the Commission authority to "implement and enforce" this and other provisions of Title VI of that Act "as if this title is a part of the Communications Act of 1934 (47 U.S.C. 151 et seq.)." Tax Act § 6003.

[4] 47 C.F.R. Part 1, App. B, Nationwide Programmatic Agreement for the Collocation of Wireless Antennas, § I.C (*Nationwide Collocation Agreement*).

size is ordinarily excluded from the Commission's required historic preservation review under Section 106 of the National Historic Preservation Act (NHPA).[5] The Commission later adopted the same definition in the *2009 Declaratory Ruling* to determine whether an application will be treated as a collocation when applying Section 332(c)(7) of the Communications Act of 1934.[6] The Commission has also applied a similar definition to determine whether a modification of an existing registered tower requires public notice for purposes of environmental review.[7]

Under Section I.C of the *Nationwide Collocation Agreement*, a "substantial increase in the size of the tower" occurs if:

> 1) [t]he mounting of the proposed antenna on the tower would increase the existing height of the tower by more than 10%, or by the height of one additional antenna array with separation from the nearest existing antenna not to exceed twenty feet, whichever is greater, except that the mounting of the proposed antenna may exceed the size limits set forth in this paragraph if necessary to avoid interference with existing antennas; or
>
> 2) [t]he mounting of the proposed antenna would involve the installation of more than the standard number of new equipment cabinets for the technology involved, not to exceed four, or more than one new equipment shelter; or
>
> 3) [t]he mounting of the proposed antenna would involve adding an appurtenance to the body of the tower that would protrude from the edge of the tower more than twenty feet, or more than the width of the tower structure at the level of the appurtenance, whichever is greater, except that the mounting of the proposed antenna may exceed the size limits set forth in this paragraph if necessary to shelter the antenna from inclement weather or to connect the antenna to the tower via cable; or
>
> 4) [t]he mounting of the proposed antenna would involve excavation outside the current tower site, defined as the current boundaries of the leased or owned property surrounding the tower and any access or utility easements currently related to the site.

Although Congress did not adopt the Commission's terminology of "substantial increase in size" in Section 6409(a), we believe that the policy reasons for excluding from Section 6409(a) collocations that substantially change the physical dimensions of a structure are closely analogous to those that animated the Commission in the *Nationwide Collocation Agreement* and subsequent proceedings. In light of the Commission's prior findings, the Bureau believes it is appropriate to look to the existing definition of "substantial increase in size" to determine whether the collocation, removal, or replacement of equipment

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[5] *See* 16 U.S.C. § 470f, *see also* 47 C.F.R. § 1.1307(a)(4) (requiring applicants to determine whether proposed facilities may affect properties that are listed, or are eligible for listing, in the National Register of Historic Places).

[6] *See* Petition for Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Preempt Under Section 253 State and Local Ordinances that Classify All Wireless Siting Proposals as Requiring a Variance, WT Docket No. 08-165, *Declaratory Ruling*, 24 FCC Rcd. 13994, 14012, para. 46 & n.146 (2009) (*2009 Declaratory Ruling*), *recon. denied*, 25 FCC Rcd. 11157 (2010), *pet. for review denied sub nom. City of Arlington, Texas v. FCC*, 668 F.3d 229 (5th Cir.), *cert. granted*, 113 S.Ct. 524 (2012); 47 U.S.C. § 332(c)(7).

[7] *See* 47 C.F.R. § 17.4(c)(1)(B); National Environmental Policy Act Compliance for Proposed Tower Registrations, WT Docket No. 08-61, *Order on Remand*, 26 FCC Rcd. 16700, 16720-21, para. 53 (2011).

on a wireless tower or base station substantially changes the physical dimensions of the underlying structure within the meaning of Section 6409(a).

What is a "wireless tower or base station"?

A "tower" is defined in the *Nationwide Collocation Agreement* as "any structure built for the sole or primary purpose of supporting FCC-licensed antennas and their associated facilities."[8] The Commission has described a "base station" as consisting of "radio transceivers, antennas, coaxial cable, a regular and backup power supply, and other associated electronics."[9] Section 6409(a) applies to the collocation, removal, or replacement of equipment on a wireless tower or base station. In this context, we believe it is reasonable to interpret a "base station" to include a structure that currently supports or houses an antenna, transceiver, or other associated equipment that constitutes part of a base station.[10] Moreover, given the absence of any limiting statutory language, we believe a "base station" encompasses such equipment in any technological configuration, including distributed antenna systems and small cells.

Section 6409(a) by its terms applies to any "wireless" tower or base station. By contrast, the scope of Section 332(c)(7) extends only to facilities used for "personal wireless services" as defined in that section.[11] Given Congress's decision not to use the pre-existing definition from another statutory provision relating to wireless siting, we believe the scope of a "wireless" tower or base station under Section 6409(a) is not intended to be limited to facilities that support "personal wireless services" under Section 332(c)(7).

May a state or local government require an application for an action covered under Section 6409(a)?

Section 6409(a) states that a state or local government "may not deny, and shall approve, any eligible facilities request...." It does not say that a state or local government may not require an application to be filed. The provision that a state or local government must approve and may not deny a request to take a covered action, in the Bureau's view, implies that the relevant government entity may require the filing of an application for administrative approval.

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[8] *See Nationwide Collocation Agreement*, § I.B.

[9] *See* Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, WT Docket No. 10-133, *Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, Fifteenth Report*, 26 FCC Rcd. 9664, 9481, para. 308 (2011).

[10] *See also* 47 C.F.R. Part 1, App. C, Nationwide Programmatic Agreement Regarding the Section 106 National Historic Preservation Act Review Process, § II.A.14 (defining "tower" to include "the on-site fencing, equipment, switches, wiring, cabling, power sources, shelters, or cabinets associated with that Tower but not installed as part of an Antenna as defined herein").

[11] 47 U.S.C. § 332(c)(7)(A). "Personal wireless services" is in turn defined to mean "commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services." *Id.* § 332(c)(7)(C)(1).

Is there a time limit within which an application must be approved?

Section 6409(a) does not specify any period of time for approving an application. However, the statute clearly contemplates an administrative process that invariably ends in approval of a covered application. We believe the time period for processing these applications should be commensurate with the nature of the review.

In the *2009 Declaratory Ruling*, the Commission found that 90 days is a presumptively reasonable period of time to process collocation applications.[12] In light of the requirement of Section 6409(a) that the reviewing authority "may not deny, and shall approve" a covered request, we believe that 90 days should be the maximum presumptively reasonable period of time for reviewing such applications, whether for "personal wireless services" or other wireless facilities.

Wireless Telecommunications Bureau contact: Maria Kirby at (202) 418-1476 or by email: Maria.Kirby@fcc.gov.

-FCC-

For more news and information about the Federal Communications Commission please visit: www.fcc.gov

[12] *See 2009 Declaratory Ruling*, 24 FCC Rcd. at 14012-13, paras. 46-47.

APPENDIX

SEC. 6409. WIRELESS FACILITIES DEPLOYMENT.

(a) FACILITY MODIFICATIONS.

(1) IN GENERAL. Notwithstanding section 704 of the Telecommunications Act of 1996 (Public Law 104–104) or any other provision of law, a State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station.

(2) ELIGIBLE FACILITIES REQUEST. For purposes of this subsection, the term ''eligible facilities request'' means any request for modification of an existing wireless tower or base station that involves —
(A) collocation of new transmission equipment;
(B) removal of transmission equipment; or
(C) replacement of transmission equipment.

(3) APPLICABILITY OF ENVIRONMENTAL LAWS. Nothing in paragraph (1) shall be construed to relieve the Commission from the requirements of the National Historic Preservation Act or the National Environmental Policy Act of 1969.

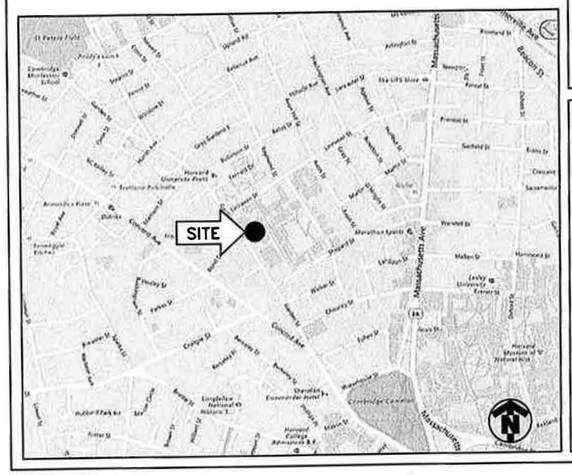
SHEET INDEX

DRIVING DIRECTIONS

DEPART FROM AT&T, 550 COCHITUATE RD FRAMINGHAM, MA 01701:

1. DEPART RT–30 W / COCHITUATE RD TOWARD BURR ST
2. TURN BACK ON RT–30 E / COCHITUATE RD
3. TURN RIGHT ONTO SPEEN ST
4. GULF ON THE CORNER
5. TAKE RAMP LEFT FOR RT–9 EAST TOWARD BOSTON
6. PASS SHELL ON THE LEFT IN 2.8 MI
7. KEEP LEFT ONTO RT–9 / WORCESTER ST
8. PASS SUNOCO IN 2.5 MI
9. TURN RIGHT ONTO S HUNTINGTON AVE
10. CITGO ON THE CORNER
11. BEAR LEFT ONTO HEATH ST
12. AT ROUNDABOUT, TAKE 1ST EXIT
13. TURN RIGHT ONTO RT–28 S / COLUMBUS AVE
14. TURN RIGHT TO STAY ON RT–28 S / BLUE HILL AVE
15. TURN BACK ON OLD RD
16. TURN LEFT ONTO ELLINGTON ST.

LOCATION MAP



at&t

SITE NAME

CAMBRIDGE LINNAEAN ST GILBERT HALL

PROJECT

LTE 4C/5C

SITE ID

MA2268

FA SITE NUMBER

10133905

PACE ID

MRCTB024596/MRCTB024721

SITE ADDRESS

64 LINNAEAN STREET
CAMBRIDGE, MA 02138

STRUCTURE TYPE

ROOFTOP

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN MASSACHUSETTS, CALL DIG SAFE SYSTEM, INC.
TOLL FREE: 1-888-344-7233 OR www.digsafe.com
MASSACHUSETTS STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

PROJECT TEAM

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01862
TEL: (978) 608-8400
PROJECT MANAGER

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
ENGINEER

SCOPE OF WORK:

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- ADD GROUND ISOLATION WHERE NEEDED.

TOWER SCOPE
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) RRUS–B14 4478
- INSTALL (3) 4426 B66
- RELOCATE EXISTING EQUIPMENT ON AT&T EQUIPMENT PLATFORM TO ACCOMMODATE NEW ALPHA AND BETA SECTOR ANTENNAS
- MODIFY EXISTING CONCEALMENT PLATFORM STRUCTURE TO ACCOMMODATE NEW ALPHA AND BETA SECTOR ANTENNAS

GROUND SCOPE
- ADD (1) XMU.

PROJECT SUMMARY

SITE NAME:	CAMBRIDGE LINNAEAN ST GILBERT HALL	
FA SITE NO.:	10133905	
PACE ID:	MRCTB024596/MRCTB024721	
SITE ID:	MA2268	
SITE ADDRESS:	64 LINNAEAN STREET CAMBRIDGE, MA 02138	
COUNTY:	MIDDLESEX	
SITE COORDINATES:		
LATITUDE:	42.3814417° N	(NAD 83)
LONGITUDE:	71.1257917° W	(NAD 83)
GROUND ELEVATION:	±84'	(AMSL)
ANTENNA RAD:	±56'	(AGL)
PROPERTY OWNER:	PRESIDENT AND FELLOWS OF HARVARD COLLEGE C/O HARVARD REALESTATE, INC. HOLYOKE CENTER, ROOM 1000 135 MASSACHUSETTS AVE CAMBRIDGE, MA 02138	
APPLICANT:	AT&T MOBILITY 550 COCHITUATE ROAD FARMINGHAM, MA 01701	
PROJECT MANAGER:	EMPIRE TELECOM 16 ESQUIRE ROAD BILLERICA, MA 01862	
CONTACT:	DAVE COOPER (978) 608–8404	
ENGINEER:	INFINIGY 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205	
CONTACT:	ALEX WELLER (518) 690–0790	
BUILDING CODE:	MA BUILDING CODE (9TH EDITION) UNIFORM BUILDING CODE BUILDING OFFICIALS & CODE ADMINISTRATORS UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES	
ELECTRICAL CODE:	NATIONAL ELECTRICAL CODE (LATEST EDITION)	

ENGINEER'S LICENSE

CERTIFICATION STATEMENT:

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MASSACHUSETTS.

LICENSED ENGINEER – STATE OF MASSACHUSETTS

APPROVALS

CONSTRUCTION MGR.	DATE
AT&T PROJECT MGR.	DATE
SITE ACQ.	DATE
SITE OWNER	NAME/COMPANY: TITLE: DATE

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

COMMONWEALTH OF MASSACHUSETTS
JOHN S. STEVENS
CIVIL
DEC 27 2018
REGISTERED PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IN VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

No.	Submittal / Revision	App'd	Date
2	REVISED FOR CONSTRUCTION	BMM	12/27/18
1	ISSUED FOR CONSTRUCTION	ASW	05/23/18

Drawn: RCD Date: 03/20/18
Designed: ASW Date: 03/20/18
Checked: ASW Date: 03/20/18

Project Number: 484-001

Project Title:
CAMBRIDGE LINNAEAN ST GILBERT HALL
FA# 10133905
MA2268
616 BLUE HILL AVENUE
DORCHESTER, MA 02121

Prepared For:
EMPIRE telecom

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Drawing Scale: AS NOTED
Date: 12/27/18

Drawing Title
TITLE SHEET

Drawing Number
T1

GENERAL CONSTRUCTION NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   GENERAL CONTRACTOR
   SUBCONTRACTOR – CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR AND SUBCONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR AND SUBCONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ARCHIETCT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS. THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE SPACE FOR APPROVAL BY THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINE.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. SUBCONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. SUBCONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. SUBCONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND SUBCONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR AND SUBCONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ARCHITECT/ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ARCHITECT/ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. SUBCONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. SUBCONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION OF AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING." IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
35. SUBCONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF SUBCONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
36. SUBCONTRACTOR SHALL REMOVED ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
37. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
38. NO WHITE STROBE LIGHTS ARE PERMITTED. ANY REQUIRED LIGHTING MUST MEET FAA STANDARDS AND REQUIREMENTS.
39. ALL COAXIAL CABLE INSTALLATIONS TO FOLLOW MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
40. NO SIGNIFICANT NOISE, SMOKE, DUST OR VIBRATIONS WILL RESULT FROM THIS FACILITY. (DISREGARD THIS NOTE IF THIS SITE HAS A GENERATOR)
41. NO ADDITIONAL PARKING TO BE PROPOSED. EXISTING ACCESS AND PARKING TO REMAIN, UNLESS NOTED OTHERWISE.
42. NO LANDSCAPING IS PROPOSED AT THIS SITE, UNLESS NOTED OTHERWISE.

ELECTRICAL NOTES:

1. ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ANY/ALL ELECTRICAL WORK INDICATED. ANY/ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH DRAWINGS AND ANY/ALL APPLICABLE SPECIFICATIONS. IF ANY PROBLEMS ARE ENCOUNTERED BY COMPLYING WITH THESE REQUIREMENTS, CONTRACTOR SHALL NOTIFY 'CONSTRUCTION MANAGER' AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK, UNTIL THE 'CONSTRUCTION MANAGER' HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.
2. ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATION INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. ALL EXISTING CONDITIONS OF ELECTRICAL EQUIP., LIGHT FIXTURES, ETC., THAT ARE PART OF THE FINAL SYSTEM, SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTING OF HIS BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND ALL CODES AND LOCAL ORDINANCES OF THE LOCAL POWER & TELEPHONE COMPANIES HAVING JURISDICTION AND SHALL INCLUDE BUT NOT BE LIMITED TO:
   C – NATIONAL FIRE CODES
   A. UL – UNDERWRITERS LABORATORIES
   B. NEC – NATIONAL ELECTRICAL CODE
   C. NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
   D. OSHA – OCCUPATIONAL SAFETY AND HEALTH ACT
   E. SBC – STANDARD BUILDING CODE
4. DO NOT SCALE ELECTRICAL DRAWINGS; REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, AND CONFIRM WITH CONSTRUCTION MANAGER' ANY SIZES AND LOCATIONS WHEN NEEDED.
5. EXISTING SERVICES: CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE OWNER.
6. CONTRACTOR SHALL PAY FOR ANY/ALL PERMITS, FEES, INSPECTIONS, AND TESTING. CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO THE WORK BEGINNING OR ORDERING EQUIPMENT.
7. THE TERM "PROVIDE" USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.
8. CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS, SUCH AS THE: LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS' CONFIRMATION, ETC... ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.
9. MINIMUM WIRE SIZE SHALL BE #12 AWG, NOT INCLUDING CONTROL WIRING, UNLESS NOTED OTHERWISE. ALL CONDUCTORS SHALL BE COPPER WITH THWN INSULATION.
10. OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
11. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF THE CONSTRUCTION. CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
12. ELECTRICAL SYSTEM SHALL BE AS COMPLETELY AND EFFECTIVELY GROUNDED, AS REQUIRED BY SPECIFICATIONS, SET FORTY BY AT&T.
13. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY OPERATIVE AND SUBJECT TO REGULATORY INSPECTION & APPROVAL BY CONSTRUCTION MANAGER.
14. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.
15. CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE.
16. THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OR THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN.
17. ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK.
18. PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS AS INDICATED.
19. DITCHING AND BACK FILL: CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION, BACKFILLING AND COMPACTION. REFER TO 'FOUNDATION, EXCAVATION, AND BACKFILLING NOTES.'
20. MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW AND SHALL APPEAR ON THE LIST OF U.L. APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NEC, NEMA, AND IECE.
21. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURERS CATALOG INFORMATION OF ANY/ALL LIGHTING FIXTURES, SWITCHES, AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
22. ANY CUTTING OR PATCHING DEEMED NECESSARY FOR ELECTRICAL WORK IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY AND SHALL BE INCLUDED IN THE COST FOR WORK AND PERFORMED TO THE SATISFACTION OF THE 'CONSTRUCTION MANAGER' UPON FINAL ACCEPTANCE.
23. THE ELECTRICAL CONTRACTOR SHALL LABEL AL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
24. DISCONNECT SWITCHES SHALL BE H.P. RATED HEAVY–DUTY, QUICK–MADE AND QUICK–BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.
25. ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI–OXIDE COMPOUND SUCH AS "NO–OXIDE A" BY DEARBORNE CHEMICAL CO. COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED COPPER SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED – NO SUBSTITUTIONS.
26. RACEWAYS: CONDUIT SHALL BE SCHEDULE 40 PVC MEETING OR EXCEEDING NEMA TC2 – 1990. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS – 200 LBS TEST POLYETHYLENE CORD. ALL CONDUIT BENDS SHALL BE A MINIMUM OF 2 FT. RADIUS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL–6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADING RIGID CONDUIT. COAT ALL THREADS WITH 'BRITE ZINC' OR 'GOLD CALV.'
27. SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.
28. CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE THWN INSULATION, 800 VOLT, COLOR CODED. USE SOLID CONDUCTORS FOR WIRE UP TO AND INCLUDING NO. 8 AWG. USE STRANDED CONDUCTORS FOR WIRE ABOVE NO. 8 AWG.
29. CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST–ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.
30. SERVICES: 240/120V, SINGLE PHASE, 3 WIRE CONNECTION AVAILABLE FROM UTILITY COMPANY. OWNER OR OWNERS AGENT WILL APPLY FOR POWER.
31. TELEPHONE SERVICE: CONTRACTOR SHALL PROVIDE EMPTY CONDUITS WITH PULL STRINGS AS INDICATED ON DRAWINGS.
32. ELECTRICAL AND TELCO RACEWAYS TO BE BURIED A MINIMUM OF 2' DEPTH.
33. CONTRACTOR SHALL PLACE TWO LENGTHS OF WARNING TAPE AT A DEPTH OF 12" BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL AND TELCO SERVICE CONDUITS. CAUTION TAPE TO READ "CAUTION BURIED ELECTRIC" OR "BURIED TELECOMM."
34. ALL BOLTS SHALL BE STAINLESS STEEL

GROUNDING NOTES:

1. COMPRESSION CONNECTIONS (2), 2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P," "A," "N," "I") WITH 1" LETTERS.
3. ALL HARDWARE 18–8 STAINLESS STEEL, INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI–OXIDANT COMPOUND BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR LARGER.
4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI–OXIDANT COMPOUND BEFORE MATING.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE.
6. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
7. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUNDING BAR TO AN EXISTING TOWER, THE SUBCONTRACTOR SHALL OBTAIN APPROVAL FROM THE TOWER OWNER PRIOR TO MOUNTING THE GROUNDING BAR TO THE TOWER.
8. ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER.

FOUNDATION, EXCAVATION, & BACKFILL NOTES:

1. ALL FINAL GRADED SLOPES SHALL BE A MAXIMUM OF 3 HORIZONTAL TO 1 VERTICAL.
2. ALL EXCAVATIONS PREPARED FOR PLACEMENT OF CONCRETE SHALL BE OF UNDISTURBED SOILS, SUBSTANTIALLY HORIZONTAL, AND FREE FROM ANY LOOSE, UNSUITABLE MATERIAL OR FROZEN SOILS, AND WITHOUT THE PRESENCE OF POUNDING WATER. DEWATERING FOR EXCESS GROUND WATER SHALL BE PROVIDED WHEN REQUIRED. COMPACTION OF SOILS UNDER CONCRETE PAD FOUNDATIONS SHALL NOT BE LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR THE SOIL IN ACCORDANCE WITH ASTM D1557.
3. CONCRETE FOUNDATIONS SHALL NOT BE PLACED ON ORGANIC OR UNSUITABLE MATERIAL. IF INADEQUATE BEARING CAPACITY IS REACHED AT THE DESIGNED EXCAVATION DEPTH, THE UNSATISFACTORY SOIL SHALL BE EXCAVATED TO ITS FULL DEPTH AND EITHER BE REPLACED WITH MECHANICALLY COMPACTED GRANULAR MATERIAL OR THE EXCAVATION SHALL BE FILLED WITH CONCRETE OF THE SAME TYPE SPECIFIED FOR THE FOUNDATION. CRUSHED STONE MAY BE USED TO STABILIZE THE BOTTOM OF THE EXCAVATION. ANY STONE SUB BASE MATERIAL, IF USED, SHALL NOT SUBSTITUTE FOR REQUIRED THICKNESS OF CONCRETE.
4. ALL EXCAVATIONS SHALL BE CLEAN OF UNSUITABLE MATERIAL SUCH AS VEGETATION, TRASH, DEBRIS, AND SO FORTH PRIOR TO BACK FILLING. BACK FILL SHALL CONSIST OF APPROVED MATERIALS SUCH AS EARTH, LOAM, SANDY CLAY, SAND AND GRAVEL, OR SOFT SHALE, FREE FROM CLODS OR LARGE STONES OVER 2 1/2 MAX DIMENSIONS. ALL BACK FILL SHALL BE PLACED IN COMPACTED LAYERS.
5. ALL FILL MATERIALS AND FOUNDATION BACK FILL SHALL BE PLACED IN MAXIMUM 6" THICK LIFTS BEFORE COMPACTION. EACH LIFT SHALL BE WETTED IF REQUIRED AND COMPACTED TO NOT LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR SOIL IN ACCORDANCE WITH ASTM D1557
6. NEWLY PLACED CONCRETE FOUNDATIONS SHALL CURE A MINIMUM OF 72 HOURS PRIOR TO BACK FILLING.
7. FINISHED GRADING SHALL BE SLOPED TO PROVIDE POSITIVE DRAINAGE AND PREVENT STANDING WATER. THE FINAL (FINISH) ELEVATION OF SLAB FOUNDATIONS SHALL SLOPE AWAY IN ALL DIRECTIONS FROM THE CENTER. FINISH GRADE OF CONCRETE PADS SHALL BE A MAXIMUM OF 4 INCHES ABOVE FINAL FINISH GRADE ELEVATIONS. PROVIDE SURFACE FILL GRAVEL TO ESTABLISH SPECIFIED ELEVATIONS WHERE REQUIRED.
8. NEWLY GRADED SURFACE AREAS TO RECEIVE GRAVEL SHALL BE COVERED WITH GEOTEXTILE FABRIC TYPE: TYPAR–3401 AS MANUFACTURED BY "CONSTRUCTION MATERIAL 1–800–239–3841" OR AN APPROVED EQUIVALENT, SHOWN ON PLANS. THE GEOTEXTILE FABRIC SHALL BE BLACK IN COLOR TO CONTROL THE RECURRENCE OF VEGETATIVE GROWTH AND EXTEND TO WITHIN 1 FOOT OUTSIDE THE SITE FENCING OR ELECTRICAL GROUNDING SYSTEM PERIMETER WHICHEVER IS GREATER. ALL FABRIC SHALL BE COVERED WITH A MINIMUM OF 4" DEEP COMPACTED STONE OR GRAVEL AS SPECIFIED. I.E. FDOT TYPE NO.57 FOR FENCED COMPOUND; FDOT TYPE NO. 67 FOR ACCESS DRIVE AREA.
9. IN ALL AREAS TO RECEIVE FILL, REMOVE ALL VEGETATION, TOPSOIL, DEBRIS, WET AND UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE. PLOW STRIP OR BREAK UP SLOPED SURFACES STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL SUCH THAT FILL MATERIAL WILL BIND WITH EXISTING/PREPARED SOIL SURFACE.

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Drawing Title
GENERAL NOTES

Drawing Number
C1

10. WHEN SUBGRADE OR PREPARED GROUND SURFACE HAS A DENSITY LESS THAN THAT REQUIRED FOR THE FILL MATERIAL, SCARIFY THE GROUND SURFACE TO DEPTH REQUIRED, PULVERIZE, MOISTURE-CONDITION AND/OR AERATE THE SOILS AND RE-COMPACT TO THE REQUIRED DENSITY PRIOR TO PLACEMENT OR FILLS.
11. IN AREAS WHICH EXISTING GRAVEL SURFACING IS REMOVED OR DISTURBED DURING CONSTRUCTION OPERATIONS, REPLACE GRAVEL SURFACING TO MATCH ADJACENT GRAVEL SURFACING AND RESTORED TO THE SAME THICKNESS AND COMPACTION AS SPECIFIED. ALL RESTORED GRAVEL SURFACING SHALL BE FREE FROM CORRUGATIONS AND WAVES.
12. EXISTING GRAVEL SURFACING MAY BE EXCAVATED SEPARATELY AND REUSED WITH THE CONDITION THAT ANY UNFAVORABLE AMOUNTS OF ORGANIC MATTER, OR OTHER DELETERIOUS MATERIALS ARE REMOVED PRIOR TO REUSE. FURNISH ANY ADDITIONAL GRAVEL RESURFACING MATERIAL AS NEEDED TO PROVIDE A FULL DEPTH COMPACTED SURFACE THROUGHOUT SITE.
13. GRAVEL SUB SURFACE SHALL BE PREPARED TO REQUIRED COMPACTION AND SUBGRADE ELEVATIONS BEFORE GRAVEL SURFACING IS PLACED AND/OR RESTORED. ANY LOOSE OR DISTURBED MATERIALS SHALL BE THOROUGHLY COMPACTED AND ANY DEPRESSIONS IN THE SUBGRADE SHALL BE FILLED AND COMPACTED WITH APPROVED SELECTED MATERIAL. GRAVEL SURFACING MATERIAL SHALL NOT BE USED FOR FILLING DEPRESSIONS IN THE SUBGRADE.
14. PROTECT EXISTING GRAVEL SURFACING AND SUBGRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE. USE PLANKING 'MATTS' OR OTHER SUITABLE PROTECTION DESIGNED TO SPREAD EQUIPMENT LOADS AS MAY BE NECESSARY. REPAIR ANY DAMAGE TO EXISTING GRAVEL SURFACING OR SUB GRADE WHERE SUCH DAMAGE IS DUE TO THE CONTRACTORS OPERATIONS.
15. DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES RESULTING FROM CONTRACTORS NEGLIGENCE SHALL BE REPAIRED AND/OR REPLACED TO THE OWNERS SATISFACTION AT NO ADDITIONAL COST TO THE CONTRACT.
16. ALL SUITABLE BORROW MATERIAL FOR BACK FILL OF THE SITE SHALL BE INCLUDED IN THE BID. EXCESS TOPSOIL AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF OFF SITE AT LOCATIONS APPROVED BY GOVERNING AGENCIES AT NO ADDITIONAL COST TO THE CONTRACT.

ENVIRONMENTAL NOTES:

1. ALL WORK PERFORMED SHALL BE DONE IN ACCORDANCE WITH ISSUED PERMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF FINES AND PROPER CLEAN UP FOR AREAS IN VIOLATION.
2. CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS DURING CONSTRUCTION FOR PROTECTION OF ADJACENT PROPERTIES, ROADWAYS AND WATERWAYS AND SHALL BE MAINTAINED IN PLACE THROUGH FINAL JURISDICTIONAL INSPECTION & RELEASE OF SITE.
3. CONTRACTOR SHALL INSTALL/CONSTRUCT ALL NECESSARY SEDIMENT/SILT CONTROL FENCING AND PROTECTIVE MEASURES WITHIN THE LIMITS OF SITE DISTURBANCE PRIOR TO CONSTRUCTION.
4. NO SEDIMENT SHALL BE ALLOWED TO EXIT THE PROPERTY. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE MEASURES FOR CONTROLLING EROSION. ADDITIONAL SEDIMENT CONTROL FENCING MAY BE REQUIRED IN ANY AREAS SUBJECT TO EROSION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTIONS AND ANY REPAIRS OF ALL SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT REMOVAL AS NECESSARY.
6. CLEARING OF VEGETATION AND TREE REMOVAL SHALL BE ONLY AS PERMITTED AND BE HELD TO A MINIMUM. ONLY TREES NECESSARY FOR CONSTRUCTION OF THE FACILITIES SHALL BE REMOVED.
7. SEEDING AND MULCHING AND/OR SODDING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE PROJECT FACILITIES AFFECTING LAND DISTURBANCE.
8. CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED BY LOCAL, COUNTY AND STATE CODES AND ORDINANCES TO PROTECT EMBANKMENTS FROM SOIL LOSS AND TO PREVENT ACCUMULATION OF SOIL AND SILT IN STREAMS AND DRAINAGE PATHS LEAVING THE CONSTRUCTION AREA. THIS MAY INCLUDE SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS, AND CHECK DAMS.
9. RIP RAP OF SIZES INDICATED SHALL CONSIST OF CLEAN, HARD, SOUND, DURABLE, UNIFORM IN QUALITY STONE FREE OF ANY DETRIMENTAL QUANTITY OF SOFT, FRIABLE, THIN, ELONGATED OR LAMINATED PIECES, DISINTEGRATED MATERIAL, ORGANIC MATTER, OIL, ALKALI, OR OTHER DELETERIOUS SUBSTANCES.

CONCRETE MASONRY NOTES:

1. CONCRETE MASONRY UNITS SHALL BE MEDIUM WEIGHT UNITS CONFORMING TO ASTM C90, GRADE N-1, (F'M=1,500 PSI). MEDIUM WEIGHT (115).
2. MORTAR SHALL BE TYPE "S" (MINIMUM 1,800 PSI AT 28 DAYS).
3. GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI AT 28 DAYS.
4. ALL CELLS CONTAINING REINFORCING STEEL OR EMBEDDED ITEMS AND ALL CELLS IN RETAINING WALLS AND WALLS BELOW GRADE SHALL BE SOLID GROUTED.
5. ALL HORIZONTAL REINFORCING STEEL SHALL BE PLACED IN BOND BEAM OR LINTEL BEAM UNITS.
6. WHEN GROUTING IS STOPPED FOR ONE HOUR OR LONGER, HORIZONTAL CONSTRUCTION JOINTS SHALL BE FORMED BY STOPPING THE GROUT POUR 1-1/2" BELOW TOP OF THE UPPERMOST UNIT.
7. ALL BOND BEAM BLOCK SHALL BE "DEEP CUT" UNITS.
8. PROVIDE INSPECTION AND CLEAN-OUT HOLES AT BASE OF VERTICAL CELLS HAVING GROUT LIFTS IN EXCESS OF 4'-0" OF HEIGHT.
9. ALL GROUT SHALL BE CONSOLIDATED WITH A MECHANICAL VIBRATOR.
10. CEMENT SHALL BE AS SPECIFIED FOR CONCRETE.
11. REINFORCING BARS – SEE NOTES UNDER "REINFORCING STEEL" FOR REQUIREMENTS.
31. PROVIDE ONE BAR DIAMETER (A MINIMUM OF 1/2") GROUT BETWEEN MAIN REINFORCING AND MASONRY UNITS.
32. LOW LIFT CONSTRUCTION, MAXIMUM GROUT POUR HEIGHT IS 4 FEET.
33. LIFT GROUTED CONSTRUCTION MAY BE USED IN CONFORMANCE WITH PROJECT SPECIFICATIONS AND SECTION 2104.6.1 OF CURRENT BUILDING CODE.
34. ALL CELLS IN CONCRETE BLOCKS SHALL BE FILLED SOLID WITH GROUT, EXCEPT AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.
35. CELLS SHALL BE IN VERTICAL ALIGNMENT, DOWELS IN FOOTINGS SHALL BE SET TO ALIGN WITH CORES CONTAINING REINFORCING STEEL.
36. REFER TO ARCHITECTURAL DRAWINGS FOR SURFACE AND HEIGHT OF UNITS, LAYING PATTERN AND JOINT TYPE.
37. SAND SHALL BE CLEAN, SHARP AND WELL GRADED, FREE FROM INJURIOUS AMOUNTS OF DUST, LUMPS, SHALE, ALKAU OR ORGANIC MATERIAL.
38. BRICK SHALL CONFORM TO ASTM C-62 AND SHALL BE GRADE MW OR BETTER.

STRUCTURAL CONCRETE NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI-301-10
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH fc'=2,500 PSI AT 28 DAYS UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

CONCRETE CAST AGAINST EARTH	3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:	
#6 AND LARGER	2 IN.
#5 AND SMALLER & WWF	1-1/2 IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER, NOR CAST AGAINST THE GROUND:	
SLAB AND WALL	3/4 IN.
BEAMS AND COLUMNS	1-1/2 IN.

5. A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE U.N.O. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. HOLES TO RECEIVE EXPANSION/WEDGE ANCHORS SHALL BE 1/8" LARGER IN DIAMETER THAN THE ANCHOR BOLD, DOWEL OR ROD AND SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. LOCATE AND AVOID CUTTING EXISTING REBAR WHEN DRILLING HOLES IN ELEVATED CONCRETE SLABS.
7. USE AND INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER ICBO & MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURES.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION. STEEL SECTIONS SHALL BE IN ACCORDANCE WITH ASTM AS INDICATED BELOW:
   W-SHAPES: ASTM A992, 50 KSI
   ANGLES, BARS CHANNELS: ASTM A36, 36 KSI
   HSS SECTIONS: ASTM 500, 46 KSI
   PIPE SECTIONS: ASTM A53-E, 35 KSI
2. ALL EXTERIOR EXPOSED STEEL AND HARDWARE SHALL BE HOT DIPPED GALVANIZED.
3. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION." PAINTED SURFACES SHALL BE TOUCHED UP.
4. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE 3/4" Ø CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
5. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" Ø ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
6. FIELD MODIFICATIONS ARE TO BE COATED WITH ZINC ENRICHED PAINT.

SITE WORK & DRAINAGE:

PART 1 – GENERAL

CLEARING, GRUBBING, STRIPPING, EROSION CONTROL, SURVEY, LAYOUT, SUBGRADE PREPARATION AND FINISH GRADING AS REQUIRED TO COMPLETE THE PROPOSED WORK SHOWN IN THESE PLANS.

1.1 REFERENCES:
A. DOT (STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR WAY CONSTRUCTION – CURRENT EDITION)
B. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
C. OSHA (OCCUPATION SAFETY AND HEALTH ADMINISTRATION)

1.2 INSPECTION AND TESTING:
A. FIELD TESTING OF EARTHWORK COMPACTION AND CONCRETE CYLINDERS
B. ALL WORK SHALL BE INSPECTED AND RELEASED BY THE GENERAL CONTRACTOR WHO SHALL CARRY OUT THE GENERAL INSPECTION OF THE WORK WITH SPECIFIC CONCERN TO PROPER PERFORMANCE OF THE WORK AS SPECIFIED AND/OR CALLED FOR ON THE DRAWINGS. IT IS THE SUBCONTRACTOR'S RESPONSIBILITY TO REQUEST TIMELY INSPECTIONS PRIOR TO PROCEEDING WITH FURTHER WORK THAT WOULD MAKE PARTS OF WORK INACCESSIBLE OR DIFFICULT TO INSPECT.

1.3 SITE MAINTENANCE AND PROTECTION:
A. PROVIDE ALL NECESSARY JOB SITE MAINTENANCE FROM COMMENCEMENT OF WORK UNTIL COMPLETION OF THE SUBCONTRACT.
B. AVOID DAMAGE TO THE SITE AND TO EXISTING FACILITIES, STRUCTURES, TREES, AND SHRUBS DESIGNATED TO REMAIN. TAKE PROTECTIVE MEASURES TO PREVENT EXISTING FACILITIES THAT ARE NOT DESIGNATED FOR REMOVAL FROM BEING DAMAGED BY THE WORK.
C. KEEP SITE FREE OF ALL PONDING WATER.
D. PROVIDE EROSION CONTROL MEASURES IN ACCORDANCE WITH STATE DOT AND EPA REQUIREMENTS.
E. PROVIDE AND MAINTAIN ALL TEMPORARY FENCING, BARRICADES, WARNING SIGNALS AND SIMILAR DEVICES NECESSARY TO PROTECT AGAINST THEFT FROM PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION. REMOVE ALL SUCH DEVICES UPON COMPLETION OF THE WORK.
F. EXISTING UTILITIES: DO NOT INTERRUPT EXISTING UTILITIES SERVING FACILITIES OCCUPIED BY THE OWNER OR OTHERS, EXCEPT WHEN PERMITTED IN WRITING BY THE ENGINEER, AND THEN ONLY AFTER ACCEPTABLE TEMPORARY UTILITY SERVICES HAVE BEEN PROVIDED.

PROVIDE A MINIMUM 48-HOUR NOTICE TO THE ENGINEER AND RECEIVE WRITTEN NOTICE TO PROCEED BEFORE INTERRUPTING ANY UTILITY SERVICE.

PART 2 – PRODUCTS

2.1 SUITABLE BACKFILL: ASTM D2321 (CLASS I, II, III, OR IVA) FREE FROM FROZEN LUMPS, REFUSE, STONES OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
2.2 NON-POROUS GRANULAR EMBANKMENT AND BACKFILL: ASTM D2321 (CLASS III, IVA OR IVB) COARSE AGGREGATE. FREE FROM FROZEN LUMPS, REFUSE, STONES, OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
2.3 POROUS GRANULAR EMBANKMENT AND BACKFILL: ASTM D2321 (CLASS IA, IB, OR II) COARSE AGGREGATE FREE FROM FROZEN LUMPS, REFUSE, STONES, OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
2.4 SELECT STRUCTURAL FILL: GRANULAR FILL MATERIAL MEETING THE REQUIREMENTS OF ASTM E850-95. FOR USE AROUND AND UNDER STRUCTURES WHERE STRUCTURAL FILL MATERIAL ARE REQUIRED.
2.5 GRANULAR BEDDING AND TRENCH BACKFILL: WELL-GRADED SAND MEETING THE GRADATION REQUIREMENTS OF ASTM D2487 (SE OR SW-SM).
2.6 COARSE AGGREGATE FOR ACCESS ROAD SUB BASE COURSE SHALL CONFORM TO ASTM D2940.
2.7 UNSUITABLE MATERIAL: AND MODERATELY PLASTIC SILTS AND CLAYS (LL>45). MATERIAL CONTAINING REFUSE, FROZEN LUMPS, DEMOLISHED BITUMINOUS MATERIAL, VEGETATIVE MATTER, WOOD, STONES IN EXCESS OF 3 INCHES IN ANY DIMENSION, AND DEBRIS AS DETERMINED BY THE CONSTRUCTION MANAGER. TYPICAL THESE WILL BE SOILS CLASSIFIED BY ASTM AS PT, MH, CH, OH, ML, AND OL.
2.8 GEOTEXTILE FABRIC: MIRAFI 500X OR APPROVED EQUAL.
2.9 PLASTIC MARKING TAPE: SHALL BE ACID AND ALKALI RESISTANT POLYETHYLENE FILM SPECIFICALLY MANUFACTURED FOR MARKING AND LOCATING UNDERGROUND UTILITIES, 6 INCHES WIDE WITH A MINIMUM THICKNESS OF 0.004 INCH. TAPE SHALL HAVE MINIMUM STRENGTH OF 1500 PSI IN BOTH DIRECTIONS AND MANUFACTURED WITH INTEGRAL CONDUCTORS, FOIL BACKING OR OTHER MEANS TO ENABLE DETECTION BY A METAL DETECTOR WHEN BURIED UP TO 3 FEET DEEP. THE METALLIC CORE OF THE TAPE SHALL BE ENCASED IN A PROTECTIVE JACKET OR PROVIDED WITH OTHER MEANS TO PROTECT IT FROM CORROSION. TAPE COLOR SHALL BE RED FOR ELECTRIC UTILITIES AND ORANGE FOR TELECOMMUNICATION UTILITIES.

PART 2 – EXECUTION

3.1 GENERAL:
A. BEFORE STARTING GENERAL SITE PREPARATION ACTIVITIES, INSTALL EROSION AND SEDIMENT CONTROL MEASURES. THE WORK AREA SHALL BE CONSTRUCTED AND MAINTAINED IN SUCH A CONDITION THAT IN THE EVENT OF RAIN THE SITE WILL BE DRAINED AT ANY TIME.
B. BEFORE ALL SURVEY, LAYOUT, STAKING, AND MARKING, ESTABLISH AND MAINTAIN ALL LINES, GRADES, ELEVATIONS AND BENCHMARKS NEEDED FOR EXECUTION OF THE WORK.
C. CLEAR AND GRUB THE AREA WITHIN THE LIMITS OF THE SITE. REMOVE TREES, BRUSH, STUMPS, RUBBISH AND OTHER DEBRIS AND VEGETATION RESTING ON OR PROTRUDING THROUGH THE SURFACE OF THE SITE AREA TO BE CLEARED.
   1. REMOVE THE FOLLOWING MATERIALS TO A DEPTH OF NO LESS THAN 12 INCHES BELOW THE ORIGINAL GROUND SURFACE: ROOTS, STUMPS, AND OTHER DEBRIS, BRUSH, AND REFUSE EMBEDDED IN OR PROTRUDING THROUGH THE GROUND SURFACE, RAKE, DISK OR PLOW THE AREA TO A DEPTH OF NO LESS THAN 6 INCHES, AND REMOVE TO A DEPTH OF 12 INCHES ALL ROOTS AND OTHER DEBRIS THEREBY EXPOSED.
   2. REMOVE TOPSOIL MATERIAL COMPLETELY FROM THE SURFACE UNTIL THE SOIL NO LONGER MEETS THE DEFINITION OF TOPSOIL. AVOID MIXING TOPSOIL WITH SUBSOIL OR OTHER UNDESIRABLE MATERIALS.
   3. EXCEPT WHERE EXCAVATION TO GREATER DEPTH IS INDICATED, FILL DEPRESSIONS RESULTING FROM CLEARING, GRUBBING, AND DEMOLITION WORK COMPLETELY WITH SUITABLE FILL.
D. REMOVE FROM THE SITE AND DISPOSE IN AN AUTHORIZED LANDFILL ALL DEBRIS RESULTING FROM CLEARING AND GRUBBING OPERATIONS. BURNING WILL NOT BE PERMITTED.
E. PRIOR TO EXCAVATING, THOROUGHLY EXAMINE THE AREA TO BE EXCAVATED AND/OR TRENCHED TO VERIFY THE LOCATIONS OF FEATURES INDICATED ON THE DRAWINGS AND TO ASCERTAIN THE EXISTENCE AND LOCATION OF ANY STRUCTURE, UNDERGROUND STRUCTURE, OR OTHER ITEM NOT SHOWN THAT MIGHT INTERFERE WITH THE PROPOSED CONSTRUCTION. NOTIFY THE CONSTRUCTION MANAGER OF ANY OBSTRUCTIONS THAT WILL PREVENT ACCOMPLISHMENT OF THE WORK AS INDICATED ON THE DRAWINGS.
F. SEPARATE AND STOCK PILE AL EXCAVATED MATERIALS SUITABLE FOR BACKFILL. ALL EXCESS EXCAVATED AND UNSUITABLE MATERIALS SHALL BE DISPOSED OF OFF-SITE IN A LEGAL MANNER.

3.2 BACKFILL:
A. AS SOON AS PRACTICAL, AFTER COMPLETING CONSTRUCTION OF THE RELATED STRUCTURE, INCLUDING EXPIRATION OF THE SPECIFIED MINIMUM CURING PERIOD FOR CAST-IN-PLACE CONCRETE, BACKFILL THE EXCAVATION WITH APPROVED MATERIAL TO RESTORE THE REQUIRED FINISHED GRADE.
B. PRIOR TO PLACING BACKFILL AROUND STRUCTURES, ALL FORMS SHALL BE REMOVED AND THE EXCAVATION CLEANED OF ALL TRASH, DEBRIS, AND UNSUITABLE MATERIALS.
C. BACKFILL BY PLACING AND COMPACTING SUITABLE BACKFILL MATERIAL OR SELECT GRANULAR BACKFILL MATERIAL WHEN REQUIRED IN UNIFORM HORIZONTAL LAYERS OF NO GREATER THAN 8-INCHES LOOSE THICKNESS AND COMPACTED. WHERE HAND OPERATED COMPACTORS ARE USED, THE FILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 4 INCHES IN LOOSE DEPTH AND COMPACTED.
D. WHENEVER THE DENSITY TESTING INDICATES THAT THE CONTRACTOR HAS NOT OBTAINED THE SPECIFIED DENSITY, THE SUCCEEDING LAYER SHALL NOT BE PLACED UNTIL THE SPECIFICATION REQUIREMENTS ARE MET UNLESS OTHERWISE AUTHORIZED BY THE GEOTECHNICAL ENGINEER. THE CONTRACTOR SHALL TAKE WHATEVER APPROPRIATE ACTION IS NECESSARY , SUCH AS DISKING AND DRYING, ADDING WATER, OR INCREASING THE COMPACTIVE EFFORT TO MEET THE MINIMUM COMPACTION REQUIREMENTS.
E. THOROUGHLY COMPACT EACH LAYER OF BACKFILL TO A MINIMUM 95% OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 698.

3.3 TRENCH EXCAVATION:
A. UTILITY TRENCHES SHALL BE EXCAVATED TO THE LINES AND GRADES SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE GENERAL CONTRACTOR. PROVIDE SHORING, SHEETING AND BRACING AS REQUIRED TO PREVENT CAVING OR SLOUGHING OF THE TRENCH WALLS.
B. EXTEND THE TRENCH WIDTH A MINIMUM OF 6 INCHES BEYOND THE OUTSIDE EDGE OF THE OUTERMOST CONDUIT.
C. WHEN SOFT YIELDING, OR OTHERWISE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, BACKFILL AT THE REQUIRED TRENCH TO A DEPTH OF NO LESS THAN 12 INCHES BELOW THE REQUIRED ELEVATION AND BACKFILL WITH GRANULAR BEDDING MATERIAL.

3.4 TRENCH BACKFILL:
A. PROVIDE GRANULAR BEDDING MATERIAL IN ACCORDANCE WITH THE DRAWINGS AND THE UTILITY REQUIREMENTS.
B. NOTIFY THE GENERAL CONTRACTOR 24 HOURS IN ADVANCE OF BACKFILLING.
C. CONDUCT UTILITY CHECK TESTS BEFORE BACKFILLING. BACKFILL AND COMPACT TRENCH BEFORE ACCEPTANCE TESTING.
D. PLACE GRANULAR TRENCH BACKFILL UNIFORMLY ON BOTH SIDES OF THE CONDUITS IN 6-INCH UNCOMPACTED LIFTS UNTIL 12 INCHES OVER THE CONDUITS. SOLIDLY RAM AND TAMP BACKFILL INTO SPACE AROUND CONDUITS.
E. PROTECT CONDUIT FROM LATERAL MOVEMENT, IMPACT DAMAGE, OR UNBALANCED LOADING.
F. ABOVE THE CONDUIT EMBEDMENT ZONE, PLACE AND COMPACT SATISFACTORY BACKFILL MATERIAL IN 8-INCH MAXIMUM LOOSE THICKNESS LIFTS TO RESTORE THE REQUIRED FINISHED SURFACE GRADE.
G. COMPACT FINAL TRENCH BACKFILL TO A DENSITY EQUAL TO OR GREATER THAN THAT OF THE EXISTING UNDISTURBED MATERIAL IMMEDIATELY ADJACENT TO THE TRENCH BUT NO LESS THAN A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 698.

3.5 FINISH GRADING:
A. PERFORM ALL GRADING TO PROVIDE POSITIVE DRAINAGE AWAY FROM STRUCTURES AND SMOOTH, EVEN SURFACE DRAINAGE OF THE ENTIRE AREA WITHIN THE IMITS OF CONSTRUCTION. GRADING SHALL BE COMPATIBLE WITH ALL SURROUNDING TOPOGRAPHY AND STRUCTURES.
B. UTILIZE SATISFACTORY FILL MATERIAL RESULTING FROM THE EXCAVATION WORK IN THE CONSTRUCTION OF FILLS, EMBANKMENTS AND FOR REPLACEMENT OF REMOVED UNSUITABLE MATERIALS.
C. ACHIEVE FINISHED GRADE BY PLACING A MINIMUM OF 4 INCHES OF 1/2" – 3/4" CRUSHED STONE ON TOP SOIL STABILIZER FABRIC.
D. REPAIR ALL ACCESS ROADS AND SURROUNDING AREAS USED DURING THE CORSE OF THIS WORK TO THEIR ORIGINAL CONDITION.

3.7 ASPHALT PAVING ROAD:
A. DIVISION 600 – KDOT FLEXIBLE PAVEMENT. (UPDATE PER LOCAL DOT)
B. SECTION 403 – MODOT ASPHALT CONCRETE PAVEMENT.

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COMMONWEALTH OF MASSACHUSETTS
JOHN S. STEVENS
No. 49647
REGISTERED PROFESSIONAL ENGINEER
DEC 27 2018

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No.	Submittal / Revision	App'd	Date
2	REVISED FOR CONSTRUCTION	BMM	12/27/18
1	ISSUED FOR CONSTRUCTION	ASW	05/23/18

Drawn: RSD Date: 03/20/18
Designed: ASW Date: 03/20/18
Checked: ASW Date: 03/20/18

Project Number: 484-001

Project Title:
CAMBRIDGE
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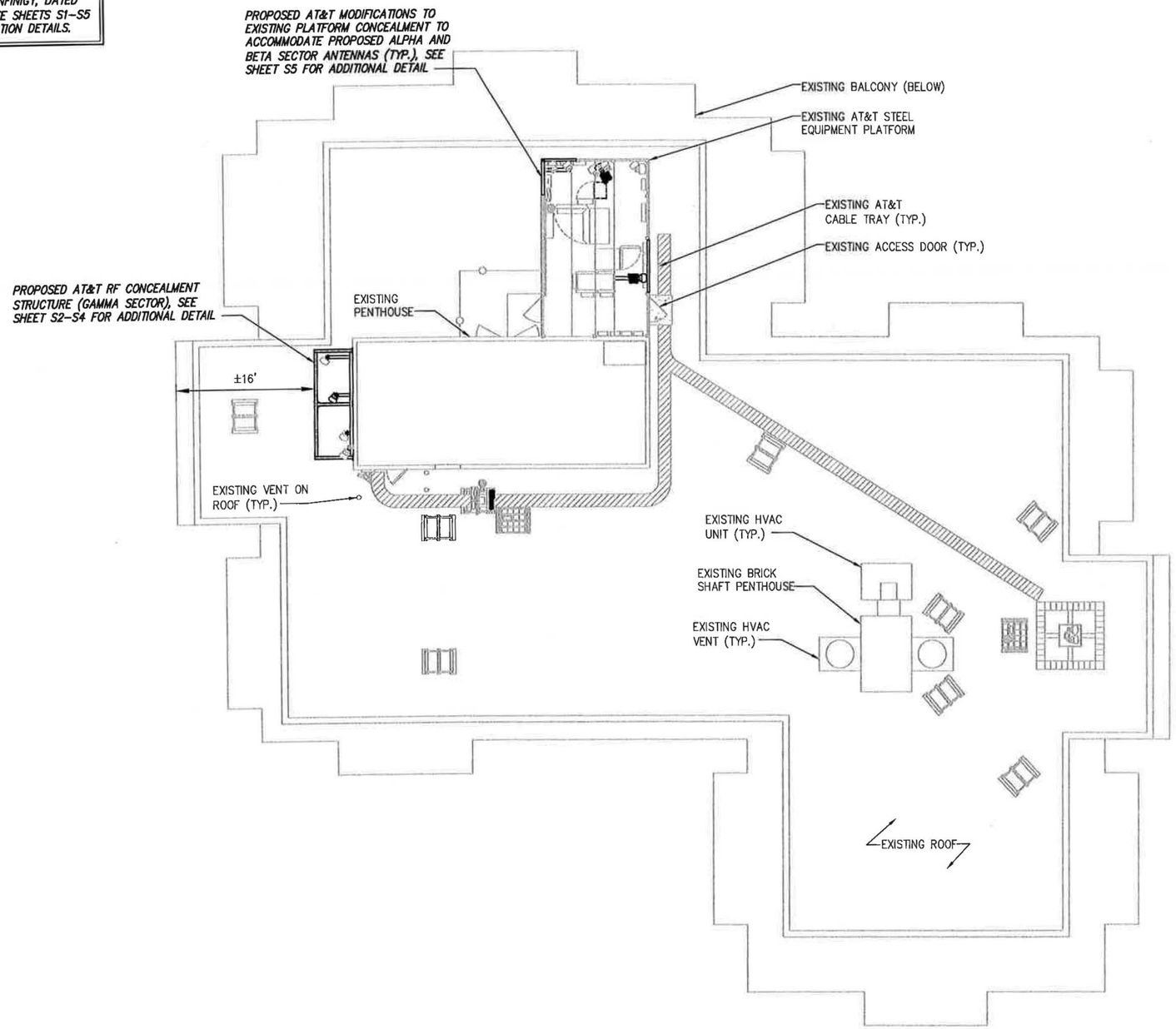
Drawing Scale: AS NOTED
Date: 12/27/18

Drawing Title
GENERAL NOTES

Drawing Number
C2

NOTE:
FOR ADDITIONAL STRUCTURAL INFORMATION, SEE 'POST MOD STRUCTURAL ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 5/23/18 & 12/07/18. SEE SHEETS S1–S5 FOR ADDITIONAL MODIFICATION DETAILS.



1 OVERALL SITE PLAN
SCALE: AS NOTED

NOTES:
1. EXISTING CONDITIONS INFORMATION BASED ON INFORMATION PROVIDED TO INFINIGY.
2. ROUTE ALL PROPOSED CABLING ON EXISTING CABLE LADDER. ACTUAL ROUTE ON DRAWINGS MAY VARY FROM FIELD LOCATION OF EXISTING CABLE LADDER.
3. INSTALLER SHALL PROVIDE ALL NECESSARY CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETED INSTALLATION AND SHALL COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. INSTALLER SHALL PROVIDE ALL STRAIN RELIEF FOR ALL CABLE ASSEMBLIES ROUTING TO THE ANTENNAS. UTILIZATION OF HOISTING GRIPS ON ALL DC POWER AND FIBER OPTIC CABLES SHALL BE UTILIZED.

GRAPHIC SCALE:
15' 7.5' 0 7.5' 15'
SCALE (11x17): 1" = 15'–0"
SCALE (22x34): 1" = 7'–6"

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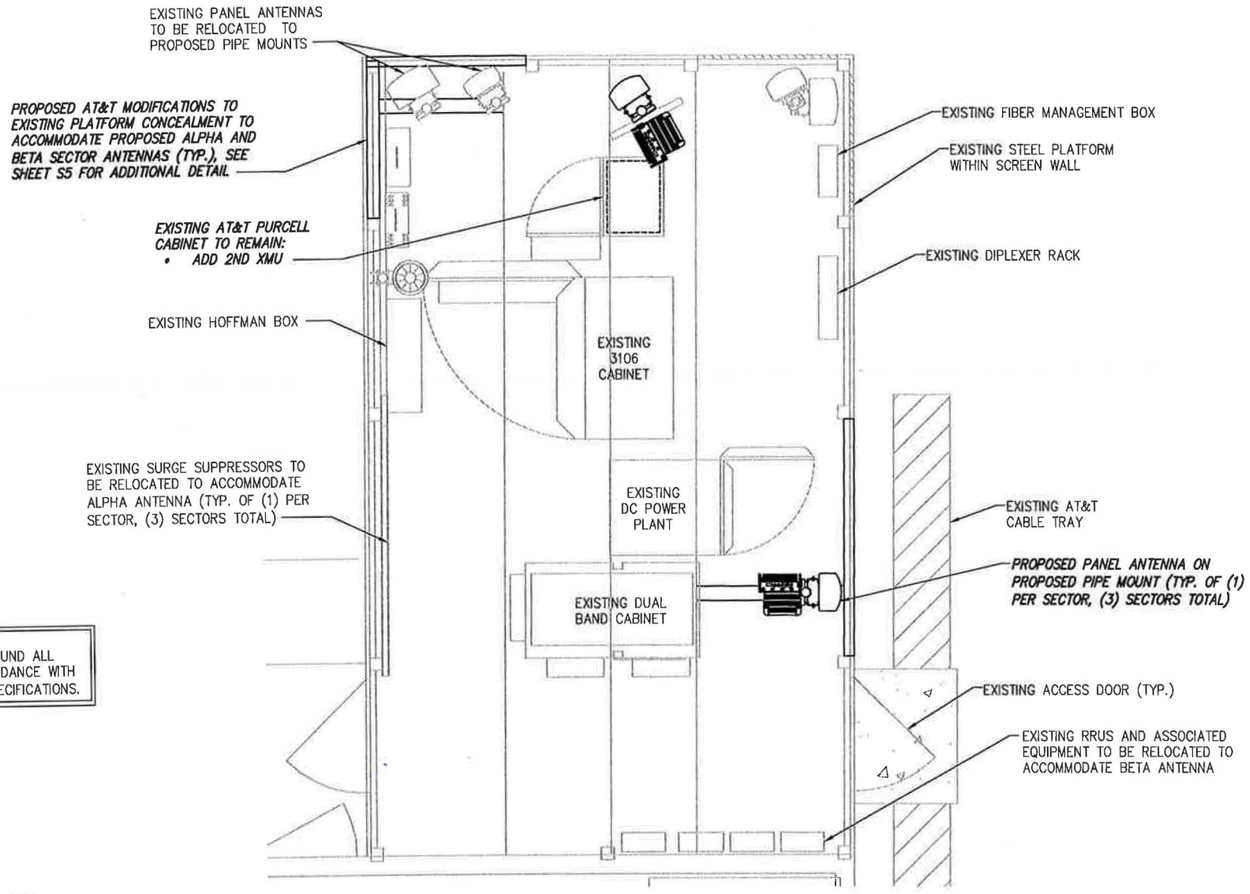
Date: 12/27/18

Drawing Title
COMPOUND PLAN

Drawing Number
C3



NOTES:
CONTRACTOR TO GROUND ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

1 ENLARGED EQUIPMENT PLAN
SCALE: AS NOTED

CALLED NORTH

GRAPHIC SCALE:
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

SYMBOL	
⊗	COPPER GROUND ROD
▸	CONNECT PER MANUFACTURER SPECS
■	CADWELD CONNECTION
•	MECHANICAL CONNECTION
▬	GROUND BAR
———	ELECTRICAL CONDUIT
———	GROUND WIRE
———	DC/FIBER LINE

NOTES:
1. EXISTING CONDITIONS INFORMATION BASED ON INFORMATION PROVIDED TO INFINIGY.
2. THESE DRAWINGS DO NOT REFLECT ADEQUACY OF EXISTING OR PROPOSED ANTENNA MOUNTS, MOUNT CONNECTIONS, OR CABLE ATTACHMENTS. INFINIGY DOES NOT ACCEPT LIABILITY FOR ANY OF THESE STRUCTURAL ELEMENTS.
3. ROUTE ALL PROPOSED CABLING ON EXISTING CABLE LADDER. ACTUAL ROUTE ON DRAWINGS MAY VARY FROM FIELD LOCATION OF EXISTING CABLE LADDER.
4. INSTALLER SHALL PROVIDE ALL NECESSARY CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETED INSTALLATION AND SHALL COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION REQUIREMENTS.
5. INSTALLER SHALL PROVIDE ALL STRAIN RELIEF FOR ALL CABLE ASSEMBLIES ROUTING TO THE ANTENNAS. UTILIZATION OF HOISTING GRIPS ON ALL DC POWER AND FIBER OPTIC CABLES SHALL BE UTILIZED.

ABBREVIATIONS:

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

NOTE:
INFINIGY ENGINEERING HAS NOT CONDUCTED AN ELECTRICAL LOAD STUDY FOR THIS SITE. CONTRACTOR IS TO VERIFY EXISTING ELECTRICAL LOADS PRIOR TO CONSTRUCTION TO ENSURE THERE IS AMPLE SERVICE AVAILABLE TO ACCOMMODATE THE EXISTING AND PROPOSED EQUIPMENT.

ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.), AND APPLICABLE LOCAL CODES.
2. GROUNDING SHALL COMPLY WITH THE ARTICLE 250 OF NATIONAL ELECTRICAL CODE.
3. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
4. ALL WIRES SHALL BE AWG MIN #12 THHN COPPER UNLESS NOTED.
5. CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT UNLESS NOTED OTHERWISE.
6. LABEL AT&T SERVICE DISCONNECTS WITH SWITCH AND PANEL WITH ENGRAVED LAMACOID LABELS, LETTERS 1" IN HEIGHT.
7. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
8. ENGAGE AN INDEPENDENT TESTING FIRM TO TEST AND VERIFY THAT RESISTANCE DOES NOT EXCEED 5 OHMS TO GROUND. TEST GROUND RING RESISTANCE PRIOR TO MAKING FINAL GROUND CONNECTIONS TO INFRASTRUCTURE AND EQUIPMENT. GROUNDING AND OTHER OPERATIONAL TESTING SHALL BE WITNESSED BY AT&TS REPRESENTATIVE.
9. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE REQUIRED SO THAT CONDUIT BENDS DO NOT EXCEED 360 DEGREES.
10. OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO AT&T REPRESENTATIVE.
11. SCHEDULE AND ATTEND INSPECTIONS RELATED TO ELECTRICAL WORK REQUIRED BY JURISDICTION HAVING AUTHORITY. CORRECT AND PAY FOR ANY WORK REQUIRED TO PASS ANY FAILED INSPECTION.
12. REDLINED AS-BUILTS ARE TO BE DELIVERED TO AN AT&T REPRESENTATIVE.
13. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
14. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
15. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER AND SHALL BE SUBJECT TO APPROVAL BY AN AT&T REPRESENTATIVE.
16. CONDUCT A PRE-CONSTRUCTION SITE VISIT AND VERIFY EXISTING SITE CONDITIONS AFFECTING THIS WORK. REPORT ANY OMISSIONS OR DISCREPANCIES FOR CLARIFICATION PRIOR TO THE START OF CONSTRUCTION.
17. PROJECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE, REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
18. REMOVE DEBRIS ON A DAILY BASIS. DEBRIS NOT REMOVED IN A TIMELY FASHION WILL BE REMOVED BY OTHERS AND THE RESPONSIBLE SUBCONTRACTOR SHALL BE CHARGED ACCORDINGLY. REMOVAL OF DEBRIS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. DEBRIS SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF LEGALLY.
19. UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
20. PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
21. DOCUMENT GROUND RING INSTALLATION AND CONNECTIONS TO IT WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PRESENT PHOTO ARCHIVE A SITE "PUNCH LIST" WALK TO AT&T'S REPRESENTATIVE.
22. ALL ABOVE GRADE CONDUIT TO BE RIGID METALLIC.

GROUNDING NOTES:

1. ALL DOWN CONDUCTORS AND GROUND RING AND CONDUCTOR SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNO. ALL CONNECTIONS TO GROUND RING SHALL BE EXOTHERMICALLY WELDED. CONDUCTOR SHALL BE A MINIMUM DEPTH BELOW GRADE OF 30 INCHES OR TO THE LEDGE. MINIMUM BEND RADIUS SHALL BE 8 INCHES. CONDUCTOR SHALL BE AT LEAST 24 INCHES FROM ANY FOUNDATION, UNO.
2. WHERE MECHANICAL CONDUCTOR CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION-TYPE CLAMPS OR SPLIT-BOLT TYPE CONNECTORS SHALL BE USED.
3. GRIND OFF GALVANIZING IN AFFECTED AREA. EXOTHERMICALLY WELD #2 CONDUCTOR AT 6 INCHES ABOVE GRADE R FOUNDATION, WHICHEVER IS HIGHER. COLD-GALY AFTER. EXOTHERMICALLY WELD OTHER END TO THE GROUND.
4. GROUND CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE ENCASED IN ¾" PVC CONDUIT TO GRADE. MOUNT PVC WITH GALVANIZED "C" CLAMPS. SEAL TOP ENDS.
5. FOLLOWING COMPLETION OF WORK, CONDUCT GROUND TEST. SUBMIT WRITTEN TEST TO CONSTRUCTION MANAGER AND PROJECT MANAGER.
6. ALL GROUNDING WORK SHALL COMPLY WITH CARRIER(S) STANDARDS.
7. GROUNDING REQUIREMENTS SHOWN ON THIS PLAN ARE FOR ITEMS THAT ARE LOCATED NEAR GRADE LEVEL AND THAT NEED TO BE TIED TO THE BELOW GRADE GROUND RING.
8. UNLESS NOTED OTHERWISE, ALL GROUNDING SHALL BE IN ACCORDANCE WITH AT&T'S SSEQ DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES", AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING". ALL GROUNDING SHALL ALSO COMPLY WITH ALL STATE AND LOCAL CODES, AND THE NATIONAL ELECTRICAL CODE (NEC).
9. UNLESS NOTED OTHERWISE, ALL GROUNDING CONNECTIONS SHALL BE MADE BY AN EXOTHERMIC WELD.
10. RESISTANCE TO EARTH TESTING IS REQUIRED PER AT&T STANDARDS ON ALL NEW SITES.

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DEC 27 2018

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Designed: ASW Date: 03/20/18
Checked: ASW Date: 03/20/18

Project Number: 484-001

Project Title:
CAMBRIDGE
LINNAEAN ST
GILBERT HALL
FA# 10133905
MA2268
616 BLUE HILL AVENUE
DORCHESTER, MA 02121

Prepared For:
EMPIRE telecom

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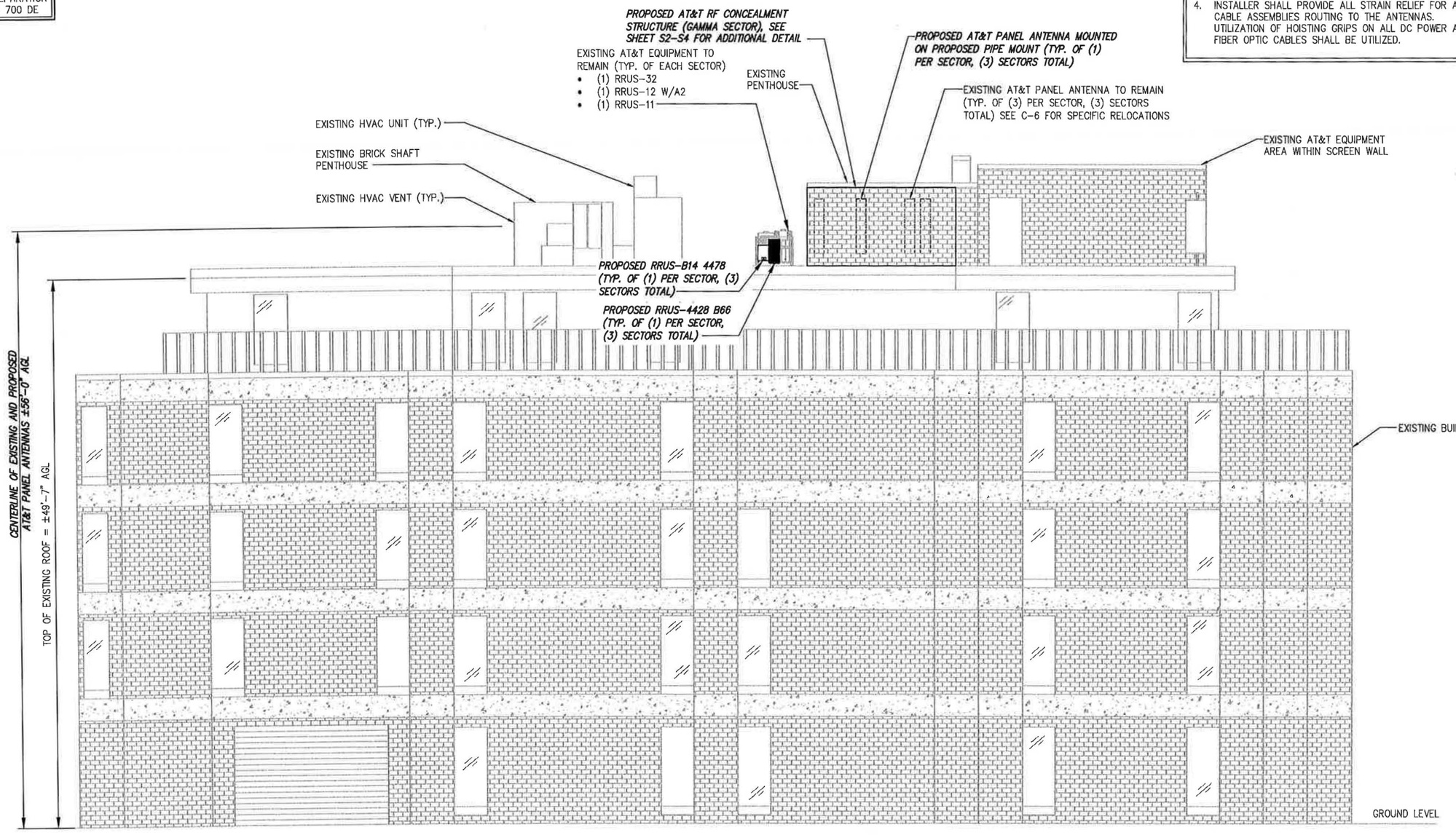
Drawing Title
EQUIPMENT SITE PLAN

Drawing Number
C4

NOTE:
FOR ADDITIONAL STRUCTURAL INFORMATION, SEE 'POST MOD STRUCTURAL ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 5/23/18 & 12/07/18. SEE SHEETS S1-S5 FOR ADDITIONAL MODIFICATION DETAILS.

NOTE:
- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
- 6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE

NOTES:
1. EXISTING CONDITIONS INFORMATION BASED ON INFORMATION PROVIDED TO INFINIGY.
2. ROUTE ALL PROPOSED CABLING ON EXISTING CABLE LADDER. ACTUAL ROUTE ON DRAWINGS MAY VARY FROM FIELD LOCATION OF EXISTING CABLE LADDER.
3. INSTALLER SHALL PROVIDE ALL NECESSARY CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETED INSTALLATION AND SHALL COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. INSTALLER SHALL PROVIDE ALL STRAIN RELIEF FOR ALL CABLE ASSEMBLIES ROUTING TO THE ANTENNAS. UTILIZATION OF HOISTING GRIPS ON ALL DC POWER AND FIBER OPTIC CABLES SHALL BE UTILIZED.



1 ELEVATION VIEW
NOT TO SCALE

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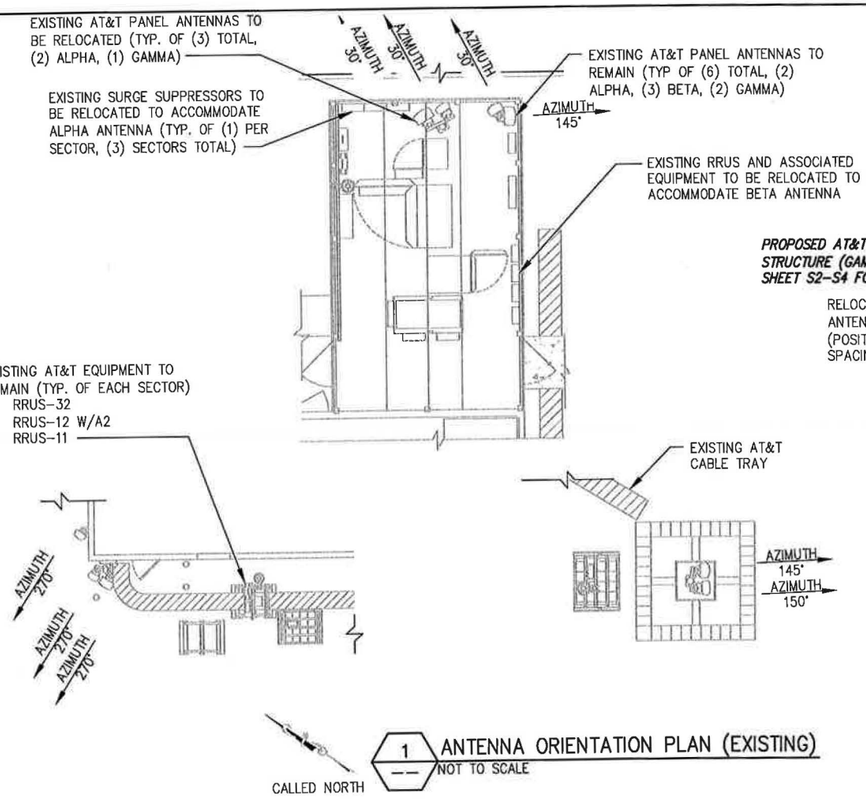
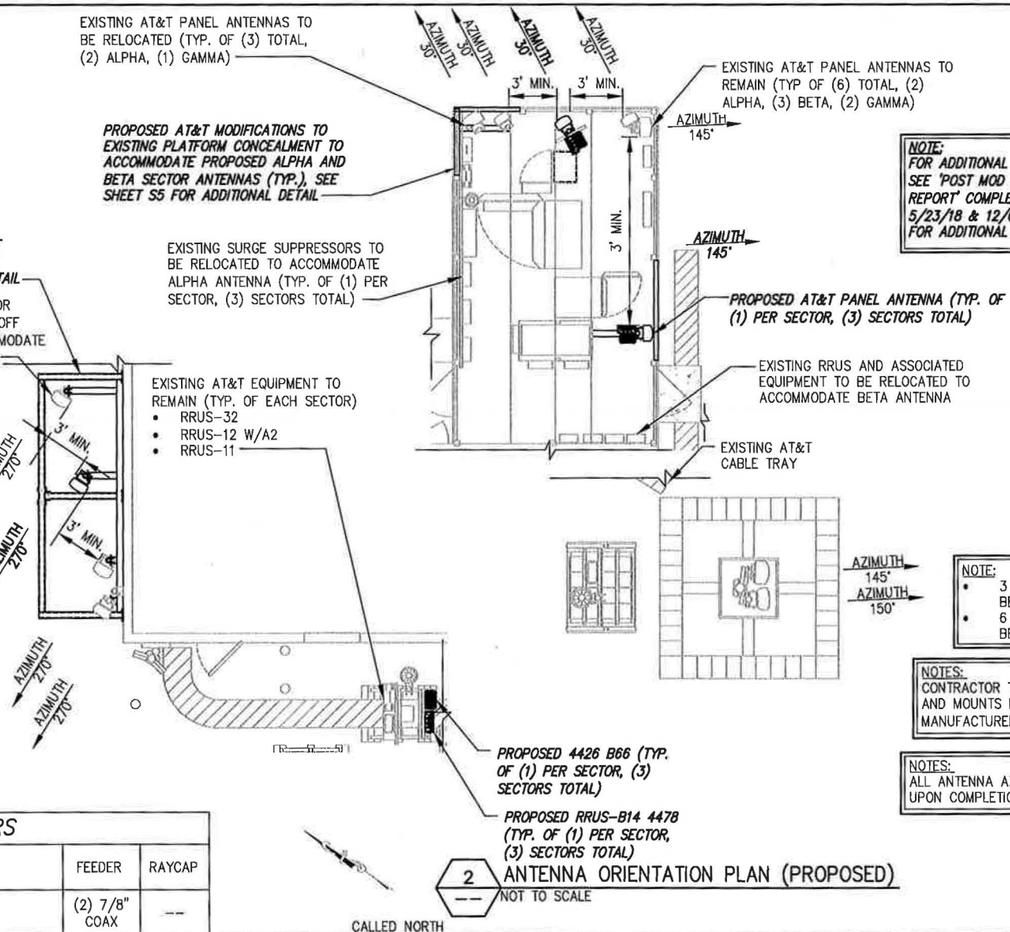
Drawing Title
ELEVATION VIEW

Drawing Number
C5



1 ANTENNA ORIENTATION PLAN (EXISTING)
NOT TO SCALE



2 ANTENNA ORIENTATION PLAN (PROPOSED)
NOT TO SCALE

NOTE:
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NOTE:
- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
- 6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE

NOTES:
CONTRACTOR TO GROUND ALL EQUIPMENT AND MOUNTS IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

NOTES:
ALL ANTENNA AZIMUTHS MUST BE CORRECT UPON COMPLETION OF CONSTRUCTION

EXISTING AND PROPOSED ANTENNA, TMA AND DIPLEXER MODEL NUMBERS

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/DUPLEXER	RRU	FEEDER	RAYCAP
ALPHA	EXISTING	UMTS 850	742-264	±56'	30°	(1) TT19-08BP111-001	--	(2) 7/8" COAX	--
	EXISTING	LTE WCS	SBNHH-1D65A	±56'	30°	(1) TT19-08BP111-001	(E) (1) RRUS-32	(2) 7/8" COAX	(1) SURGE SUPPRESSOR (1) DC6 SQUID
	PROPOSED	***LTE 700/AWS***	***800-10964***	***±56'***	***30°***	--	***(P) (1) B14 4478 (P) (1) B66 4426***	--	
	EXISTING	LTE 700/1900	OPA-65R-LCUU-H4	±56'	30°	--	(E) (1) RRUS-11 (E) (1) RRUS-12+RRUS-A2	--	
BETA	EXISTING	LTE 700/1900	OPA-65R-LCUU-H4	±56'	145°	--	(E) (1) RRUS-11 (E) (1) RRUS-12+RRUS-A2	--	--
	PROPOSED	***LTE 700/AWS***	***800-10964***	***±56'***	***145°***	--	***(P) (1) B14 4478 (P) (1) B66 4426***	--	(1) SURGE SUPPRESSOR (1) DC6 SQUID
	EXISTING	LTE WCS	SBNHH-1D65A	±56'	145°	(1) TT19-08BP111-001	(E) (1) RRUS-32	(2) 7/8" COAX	
	EXISTING	UMTS 850	742-264	±56'	150°	(1) TT19-08BP111-001	--	(2) 7/8" COAX	
GAMMA	EXISTING	UMTS 850	742-264	±56'	270°	(1) TT19-08BP111-001	--	(2) 7/8" COAX	--
	EXISTING	LTE WCS	SBNHH-1D65A	±56'	270°	(1) TT19-08BP111-001	(E) (1) RRUS-32	(2) 7/8" COAX	(1) SURGE SUPPRESSOR (1) DC6 SQUID
	PROPOSED	***LTE 700/AWS***	***800-10964***	***±56'***	***270°***	--	***(P) (1) B14 4478 (P) (1) B66 4426***	--	
	EXISTING	LTE 700/1900	OPA-65R-LCUU-H4	±56'	270°	--	(E) (1) RRUS-11 (E) (1) RRUS-12+RRUS-A2	--	

PROPOSED RRU AND CABLE SCHEDULE

SECTOR	FIBER TRUNK	SINGLE FIBER	DC 3-PAIR	DC 1-PAIR	RRU'S
ALPHA	EXISTING	***(2) 5 METER***	EXISTING	***(2) #8 AWG, 15'***	(E) (1) RRUS-32 (E) (1) RRUS-11 (E) (1) RRUS-12+RRUS-A2 ***(P) (1) B14 4478 (P) (1) B66 4426***
BETA		***(2) 5 METER***		***(2) #8 AWG, 15'***	(E) (1) RRUS-32 (E) (1) RRUS-11 (E) (1) RRUS-12+RRUS-A2 ***(P) (1) B14 4478 (P) (1) B66 4426***
GAMMA		***(2) 5 METER***		***(2) #8 AWG, 15'***	(E) (1) RRUS-32 (E) (1) RRUS-11 (E) (1) RRUS-12+RRUS-A2 ***(P) (1) B14 4478 (P) (1) B66 4426***

3 RF EQUIPMENT SCHEDULE
NOT TO SCALE

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LINNAEAN ST
GILBERT HALL
FA# 10133905
MA2268
616 BLUE HILL AVENUE
DORCHESTER, MA 02121

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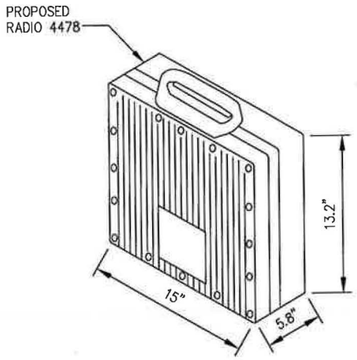
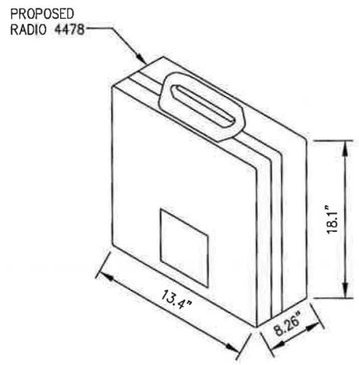
Drawing Title
EQUIPMENT DETAILS

Drawing Number
C6



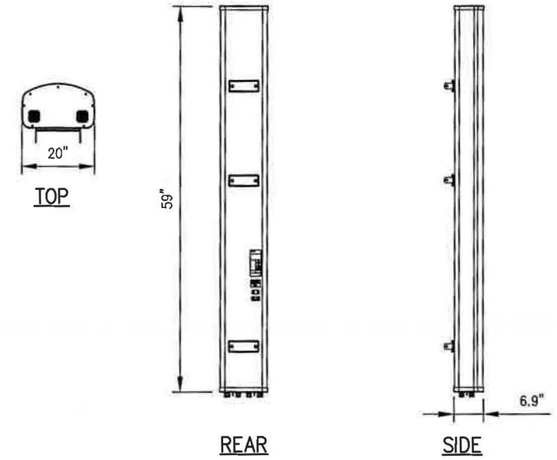
RADIO 4426-B66 SPECIFICATIONS
- HxWxD, (INCHES) : 15"x13.2"x5.8"
- WEIGHT (LBS) : 48.5
- COLOR : GRAY

1 ERICSSON 4426-B66 DETAIL
NOT TO SCALE



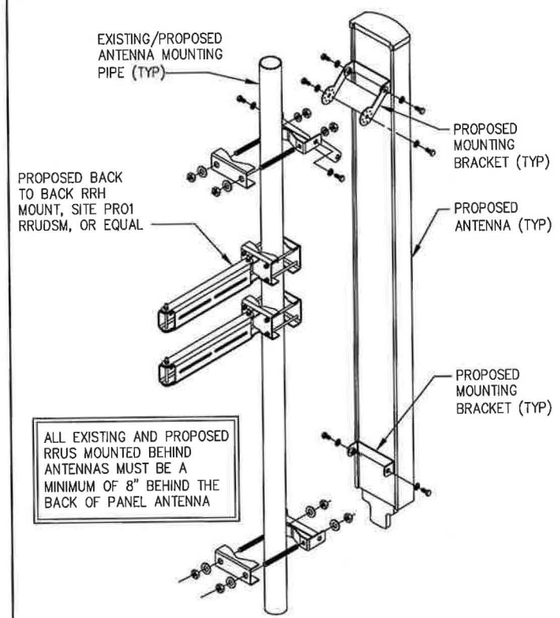
RADIO 4478-B14 SPECIFICATIONS
- HxWxD, (INCHES) : 18.1"x13.4"x8.26"
- WEIGHT (LBS) : 59.5
- COLOR : GRAY

2 ERICSSON RADIO 4478 DETAIL
NOT TO SCALE

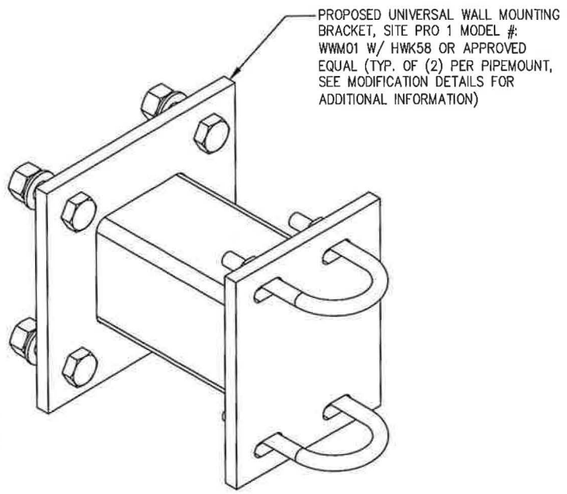


KATHRIEN MODEL NO.:	800-10964
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	59"x20"x6.9"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	83.8 LBS
CONNECTOR:	(6) 7-16 DIN FEMALE

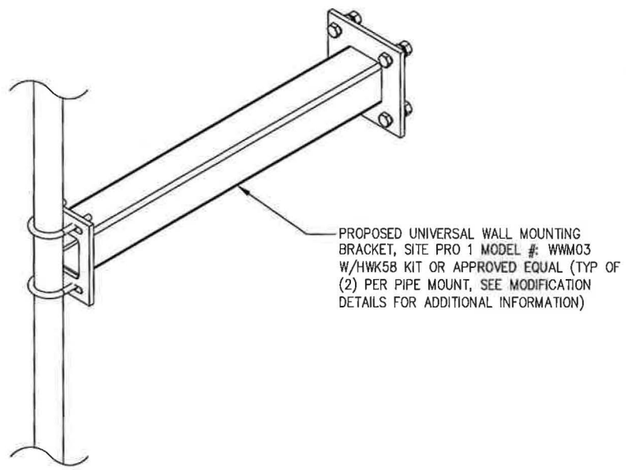
3 ANTENNA DETAIL
NOT TO SCALE



4 ANTENNA MOUNT DETAIL
NOT TO SCALE

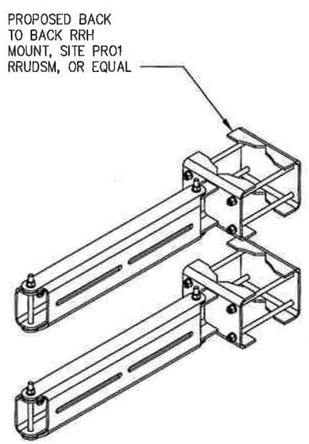


5 WALL MOUNT DETAIL
NOT TO SCALE



6 3' STAND OFF DETAIL
NOT TO SCALE

ALL EXISTING AND PROPOSED RRUS MOUNTED BEHIND ANTENNAS MUST BE A MINIMUM OF 8" BEHIND THE BACK OF PANEL ANTENNA



7 RRH MOUNT DETAIL
NOT TO SCALE

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Drawing Scale: AS NOTED
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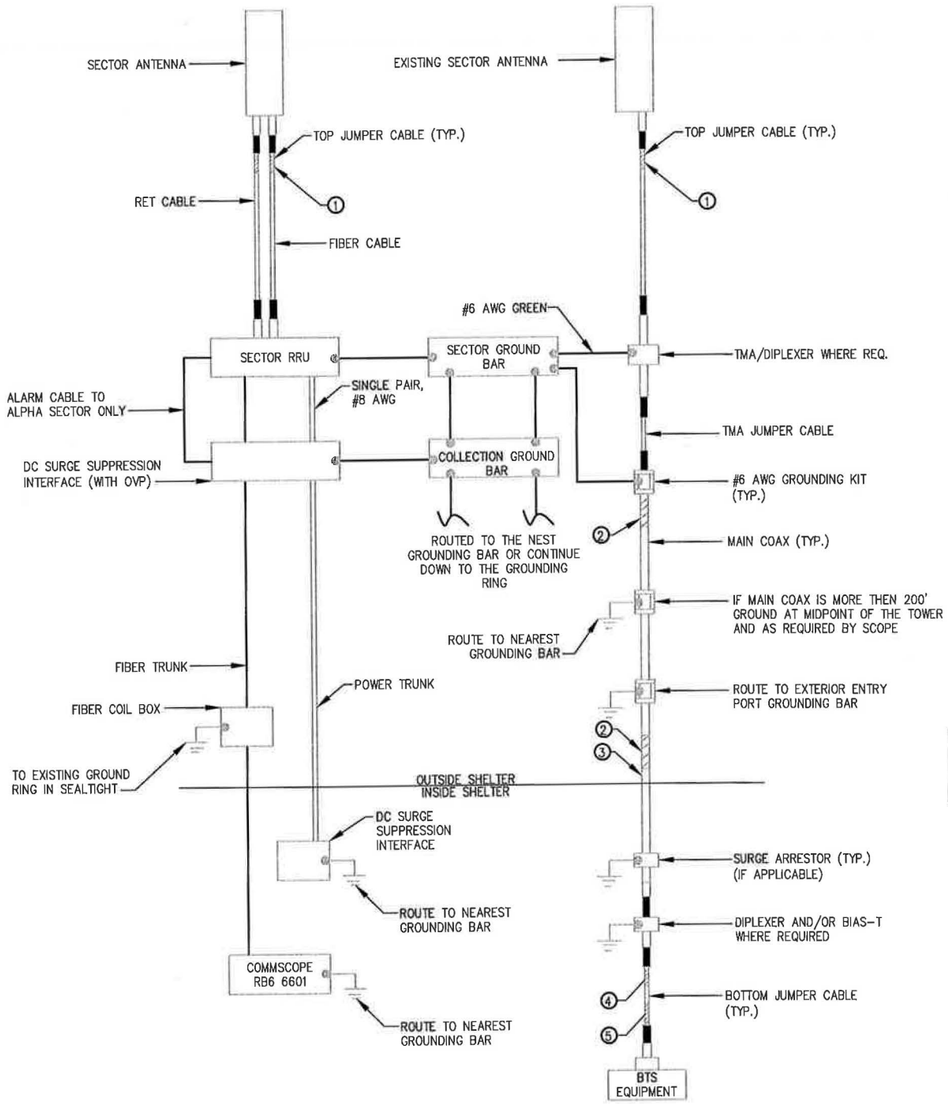
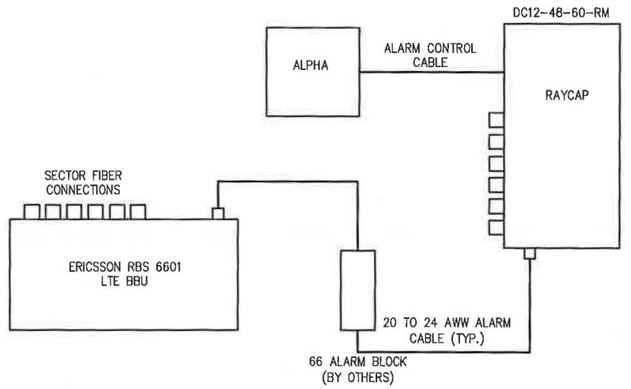
Drawing Title
EQUIPMENT DETAILS

Drawing Number
C7

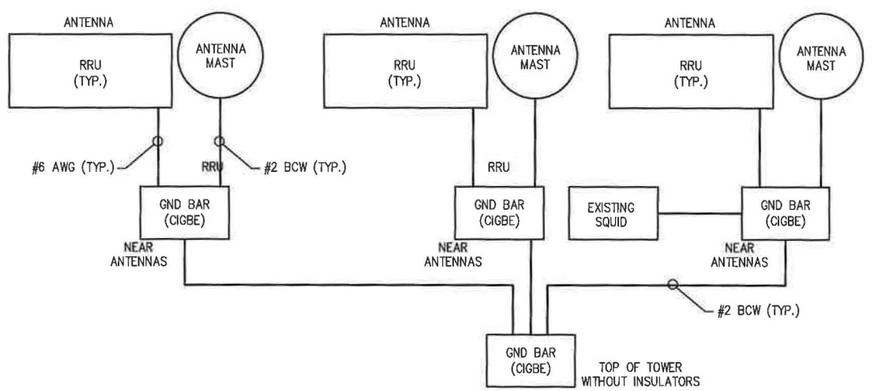
	CABLE MARKING LOCATIONS TABLE
NO.	LOCATIONS
①	EACH TOP JUMPER SHALL BE COLOR CODED WITH ONE (1) SET OF 3" WIDE BANDS
②	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP OF THE JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING
③	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER
④	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER
⑤	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER



1 CABLE MARKING LOCATIONS DIAGRAM
SCALE: NOT TO SCALE



2 ALARM BLOCK CONNECTIONS
SCALE: NOT TO SCALE



3 SCHEMATIC DIAGRAM GROUNDING SYSTEM
SCALE: NOT TO SCALE

COAX COLOR CODING & IDENTIFICATION NOTES:

1. SECTOR ORIENTATION/ AZIMUTH WILL VARY FROM REGION AND IS SITE SPECIFIC. REFER TO RF REPORT FOR EACH SITE TO DETERMINE THE ANTENNA LOCATION AND FUNCTION OF EACH TOWER SECTOR FACE.
2. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE EXCEPT IN LOCATIONS WHERE ENVIRONMENTAL CONDITIONS CAUSE PHYSICAL DAMAGE, THEN PHYSICAL TAGS ARE PREFERRED.
3. THE STANDARD IS BASED ON EIGHT COLORED TAPES– RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE AND VIOLET. THESE TAPES MUST BE 3/4" WIDE AND UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR SUBCONTRACTOR ON SITE.
4. USING COLOR BANDS ON THE CABLES MARK ALL RF CABLE BY SECTOR AND NUMBER AS SHOWN ON "CABLE MARKING COLOR CONVENTION TABLE".
5. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN GSM/3G TDMA IS ENCOUNTERED, THE SUBCONTRACTOR SHALL REMOVE THE COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING AND TAGGING STANDARD THAT IS OUTLINED IN THE CURRENT VERSION OF THE STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
6. ALL COLOR CODE TAPE SHALL BE 3M–35 AND SHALL BE A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID ANY UNRAVELING.
7. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM IF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE IN BETWEEN EACH COLOR.
8. ALL COLOR CODES SHALL BE INSTALLED AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE TO SIDE.
9. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE GSM TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING TAGS:

WHEN USING THE ALTERNATIVE LABELING METHOD, EACH RF CABLE SHALL BE IDENTIFIED WITH A METAL ID TAG MADE OF STAINLESS STEEL OR BRASS. THE TAG SHALL BE 1" 1–1/2" IN DIAMETER WITH ¼" STAMPED LETTERS AND NUMBERS INDICATING THE SECTOR, ANTENNA POSITION, AND CABLE NUMBER. THE ID MARKING LOCATIONS SHOULD BE AS PER "CABLE MARKING LOCATIONS TABLE". THE TAG SHOULD BE ATTACHED WITH CORROSION PROOF WIRE AROUND THE CABLE AT THE SAME LOCATIONS AS DEFINED ABOVE. THE TAG SHOULD BE LABELED AS SHOWN ON THE "GSM AND UMTS LINE TAG" DETAIL.

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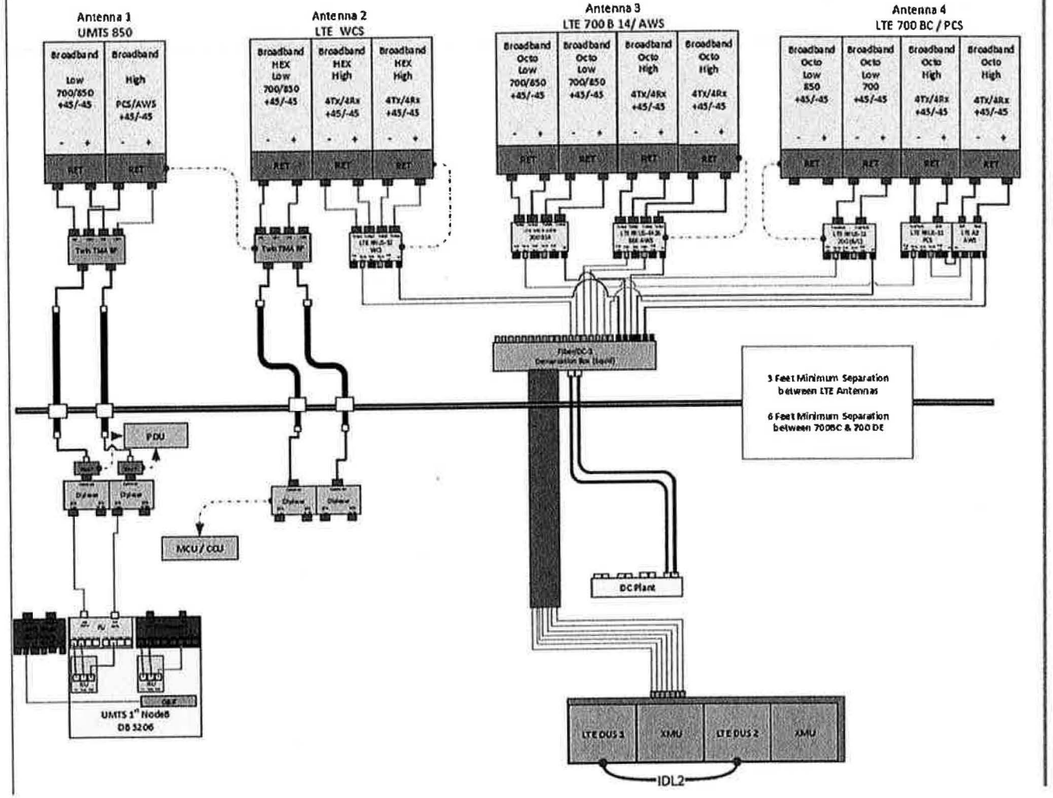
Drawing Title
SCHEMATICS, DIAGRAMS & NOTES

Drawing Number
C8



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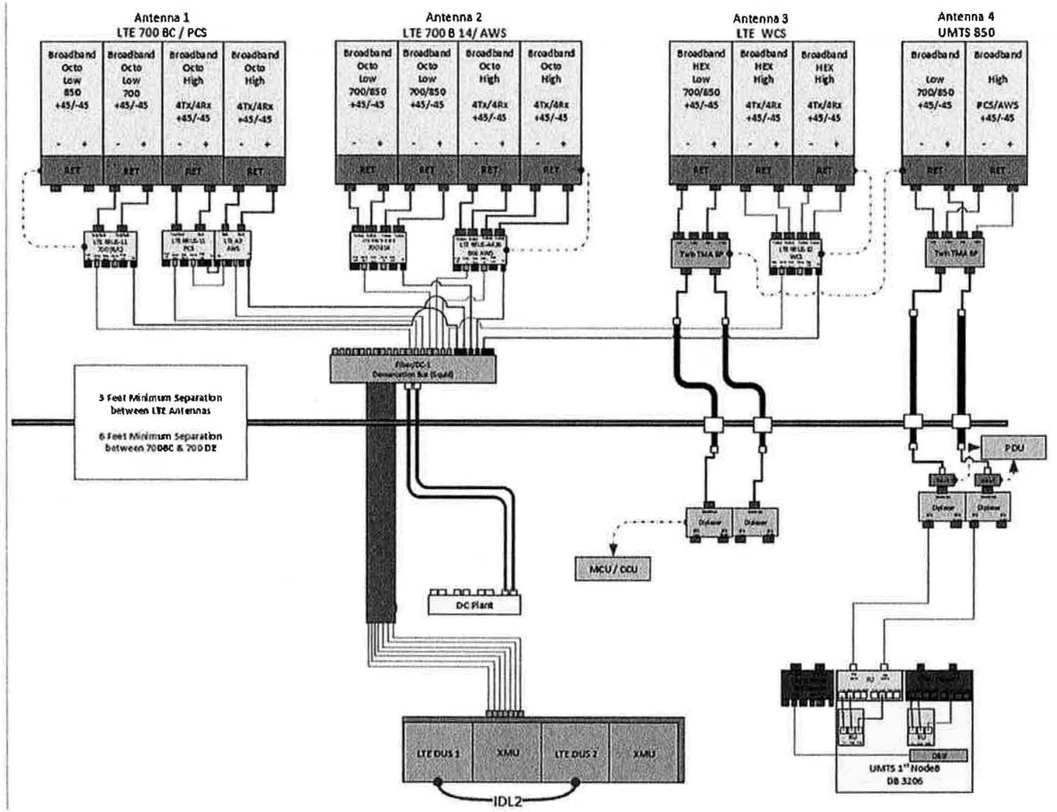

BETA

1 PLUMBING DIAGRAM
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CONTRACTOR TO REFER TO LATEST RFDS PROVIDED BY AT&T FOR FINAL CONFIGURATION.

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No.	Submittal / Revision	App'd	Date
2	REVISED FOR CONSTRUCTION	BMM	12/27/18
1	ISSUED FOR CONSTRUCTION	ASW	05/23/18

Drawn: BCD Date: 03/20/18
Designed: ASW Date: 03/20/18
Checked: ASW Date: 03/20/18

Project Number:
484-001

Project Title:
CAMBRIDGE
LINNAEAN ST
GILBERT HALL
FA# 10133905
MA2268

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Prepared For:
EMPIRE telecom

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Date:
12/27/18

Drawing Title
PLUMBING DIAGRAM

Drawing Number
C9

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE - HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE - HY150, U.N.O.
   - CONCRETE REBAR: ADHESIVE - RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE

SIZE	ULTIMATE TORQUE STRENGTH	RECOMMENDED MAXIMUM INSTALLATION TORQUE
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER

	RANGE	RECOMMENDED
EDGE DISTANCE - CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE - CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH - CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
   - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

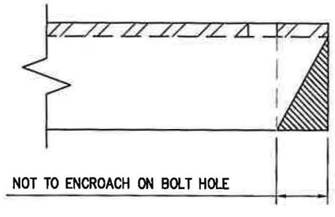
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



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DEC 27 2018

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No.	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	JRJ	12/6/18

Drawn: BE Date: 12/6/18
Designed: RDA Date: 12/6/18
Checked: NRO Date: 12/6/18

Project Number: 484-001

Project Title:
FA# 10133905
MA2268
CAMBRIDGE LINNAENA ST
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Prepared For:
EMPIRE telecom

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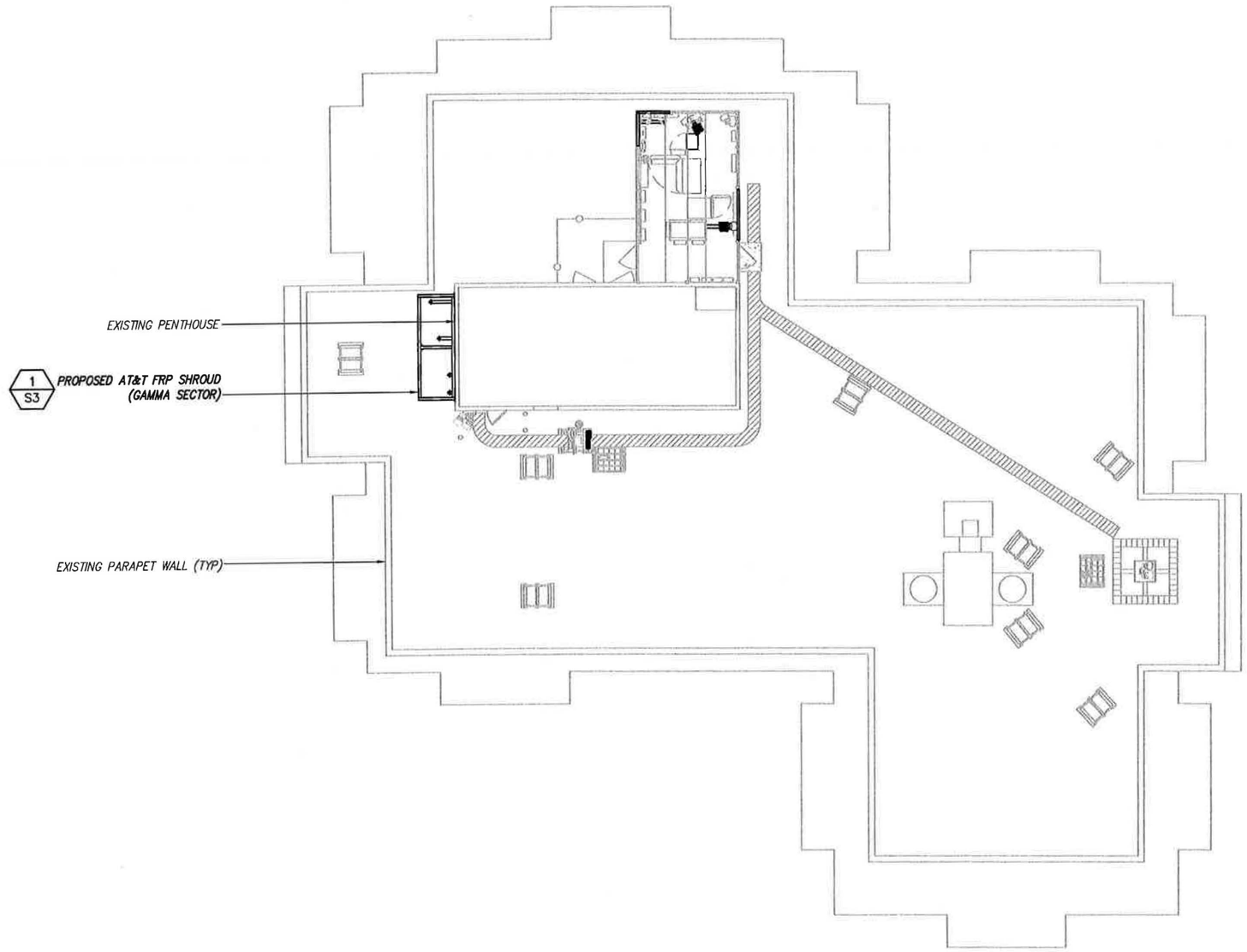
Drawing Title
GENERAL NOTES

Drawing Number
S1



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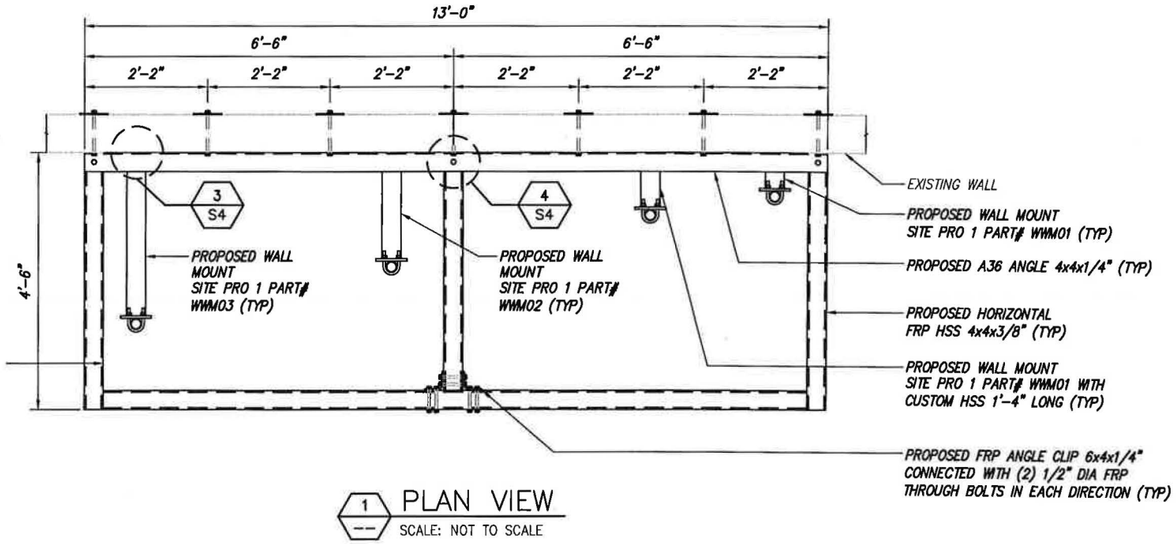
12/6/18

Drawing Title

ROOF PLAN

Drawing Number

S2



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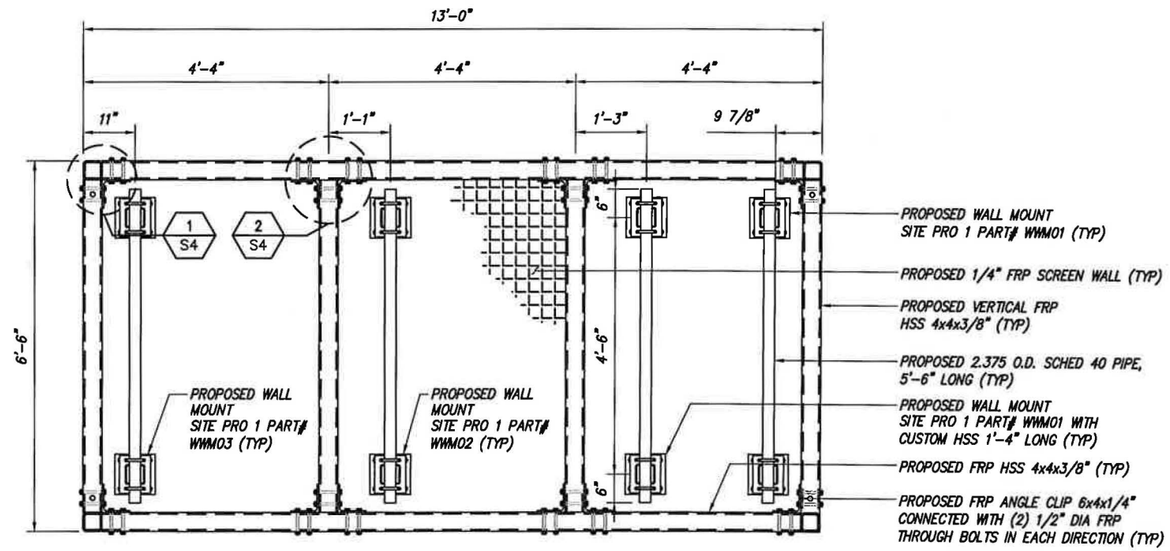

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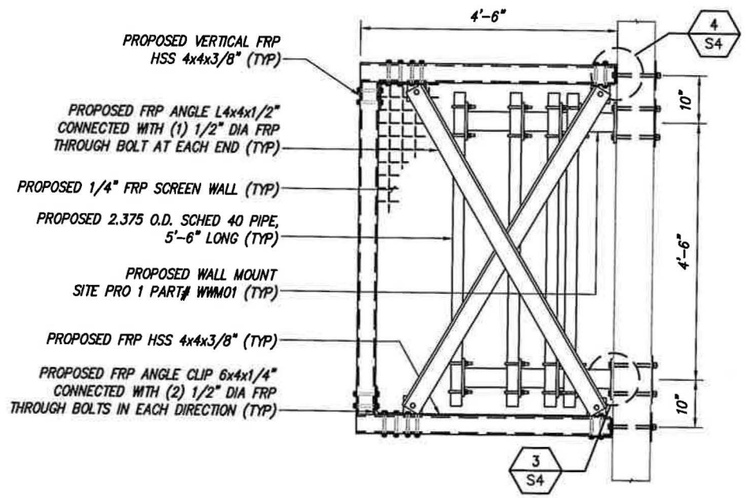

3 SIDE VIEW
SCALE: NOT TO SCALE

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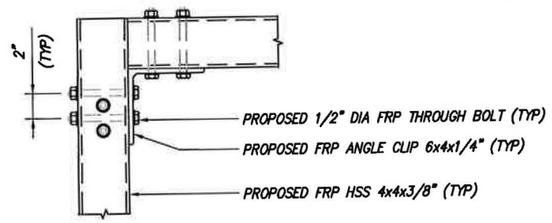
Drawing Title
FRP SHROUD DESIGN

Drawing Number
S3



1 TYPICAL HSS CONNECTION
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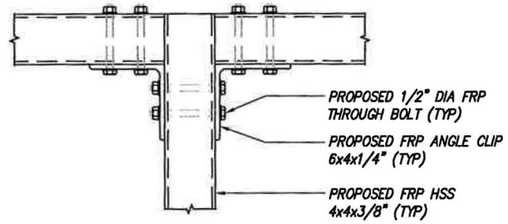

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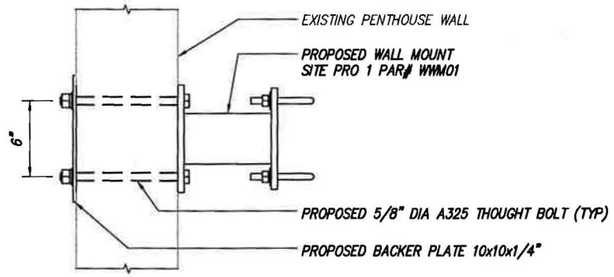

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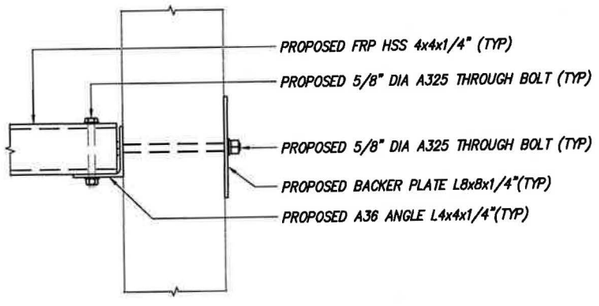

4 ANGLE TO WALL CONNECTION
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Prepared For:
EMPIRE telecom

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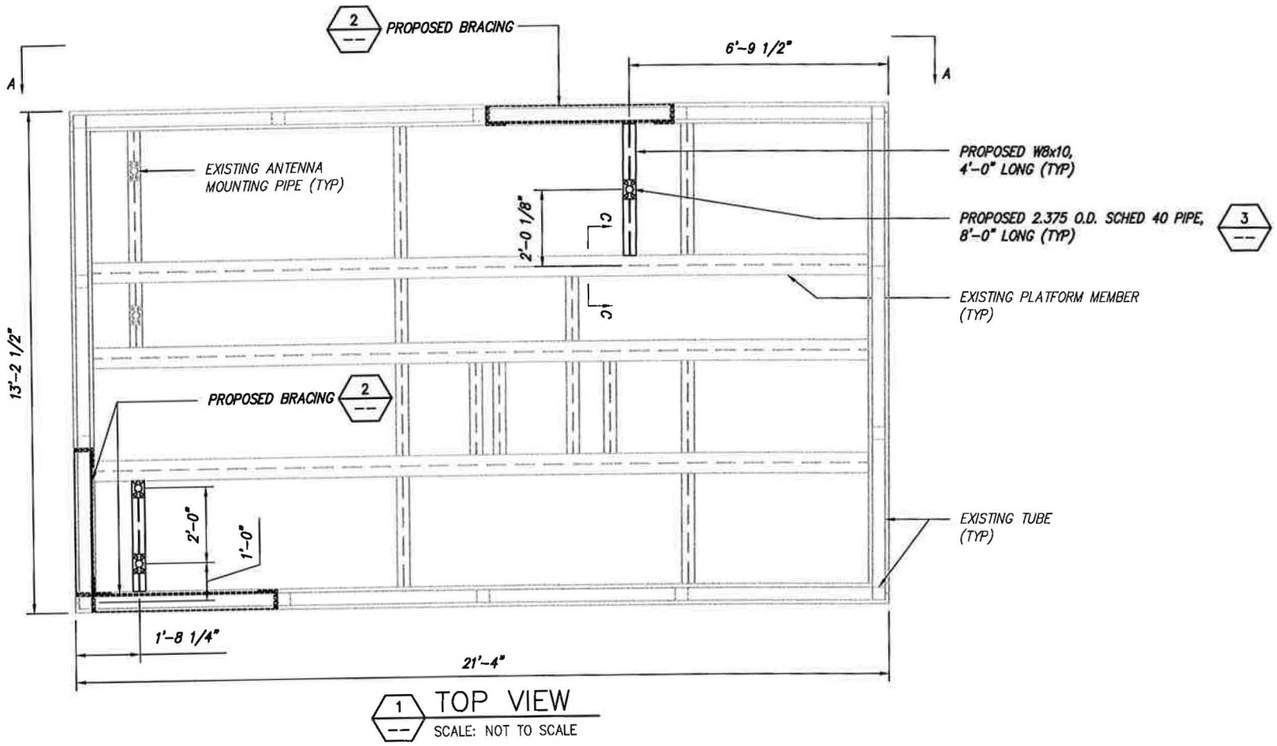
Drawing Title
CONNECTION DETAILS

Drawing Number
S4



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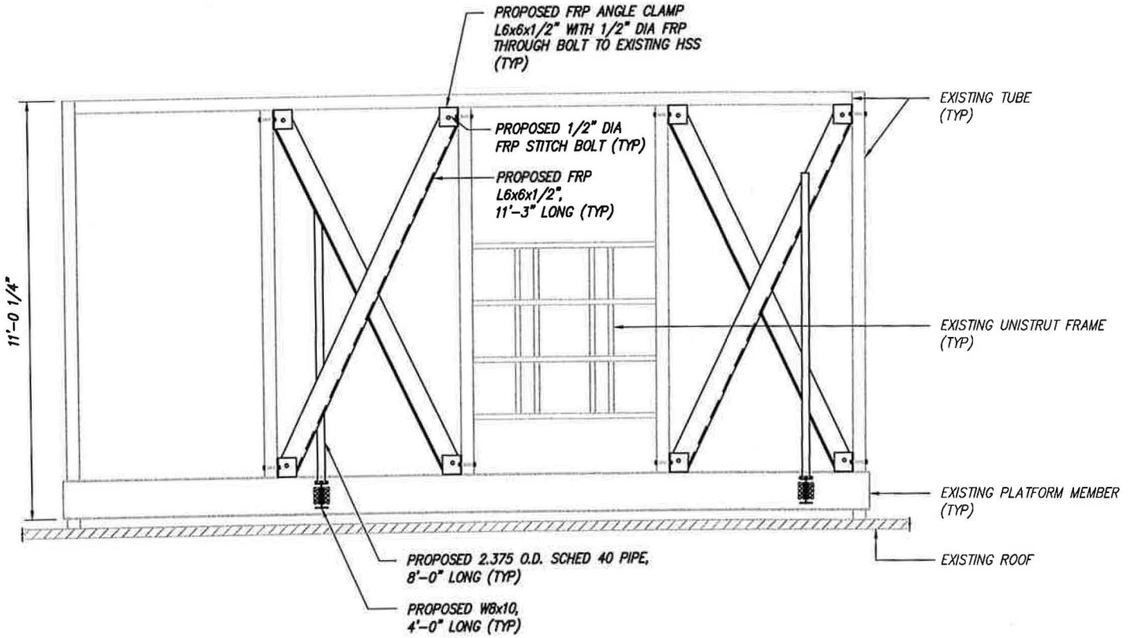

2 SECTION A–A
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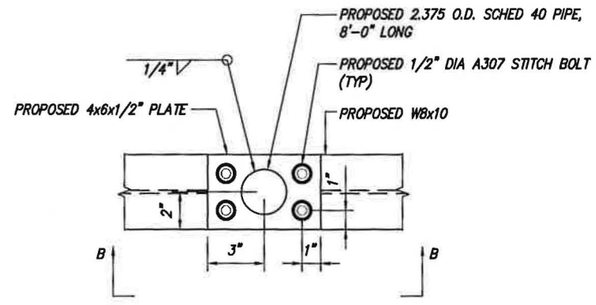
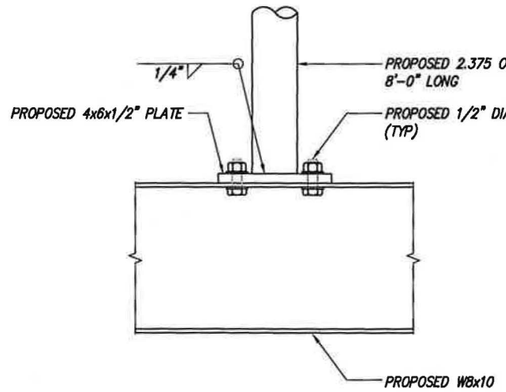
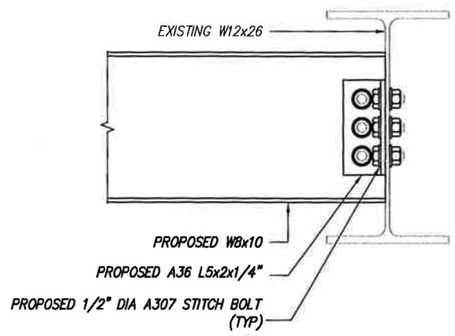


3 PLATE CONNECTION DETAIL
SCALE: NOT TO SCALE



4 SECTION B–B
SCALE: NOT TO SCALE



5 SECTION C–C
SCALE: NOT TO SCALE

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Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

COMMONWEALTH OF MASSACHUSETTS
JOHN S. STEVENS
CIVIL
NO. 49564
REGISTERED PROFESSIONAL ENGINEER
DEC 24 2018

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No.	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	JRJ	12/6/18

Drawn: BE Date: 12/6/18
Designed: BBA Date: 12/6/18
Checked: NRO Date: 12/6/18

Project Number:
484-001

Project Title:
FA# 10133905
MA2268
CAMBRIDGE LINNAENA ST
GILBERT HALL
64 LINNAEAN STREET
CAMBRIDGE, MA 02138

Prepared For:
EMPIRE telecom

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Drawing Scale:
AS NOTED
Date:
12/6/18

Drawing Title
PLATFORM MOD

Drawing Number
S5

CITY OF CAMBRIDGE
MASSACHUSETTS
BOARD OF ZONING APPEAL
831 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139
617 349-6100

2019 NOV -4 PM 2:11

OFFICE OF THE CITY CLERK
CAMBRIDGE, MASSACHUSETTS

BZA APPLICATION FORM

Plan No: BZA-017209-2019

GENERAL INFORMATION

The undersigned hereby petitions the Board of Zoning Appeal for the following:

Special Permit : √ **Variance :** _____ **Appeal :** _____

PETITIONER : New Cingular Wireless PCS, LLC ("AT&T") - C/O Brown Rudnick LLP, Michael R. Dolan

PETITIONER'S ADDRESS : 10 Memorial Boulevard Providence, RI 02903

LOCATION OF PROPERTY : 64 Linnaean St Cambridge, MA 02138

TYPE OF OCCUPANCY : Wireless Commuunications Services **ZONING DISTRICT :** Residence C-2 Zone

REASON FOR PETITION :

Additions

DESCRIPTION OF PETITIONER'S PROPOSAL :

AT&T has Transmission Equipment mounted on the existing building at the 56' AGL antenna centerline mark. AT&T is seeking to modify its facility as follows: install 3 new panel antennas (2 behind the screen wall concealing the equipment and 1 on the façade of the penthouse for a total of 12 panel antennas; install 6 additional remote radio units and collocate other Transmission Equipment to the Facility; modifying the existing concealment platform structure; shift existing equipment on the existing platform; shift the locations of some of the existing panel antennas; and install a proposed concealment structure to conceal the existing and proposed antennas on the façade of the existing penthouse on the roof of the Building, all as per supporting statements and plans submitted herewith.

SECTIONS OF ZONING ORDINANCE CITED :

Article 4.000 Section 4.32(g)(1) (Telecommunication Facility).

Article 4.000 Section 4.40 (Footnote 49) (Telecommunication Facility).

Article 10.000 Section 10.40 (Special Permit).

Original Signature(s) : Michael R. Dolan

(Petitioner(s) / Owner)

Michael R. Dolan, Esq.

(Print Name)

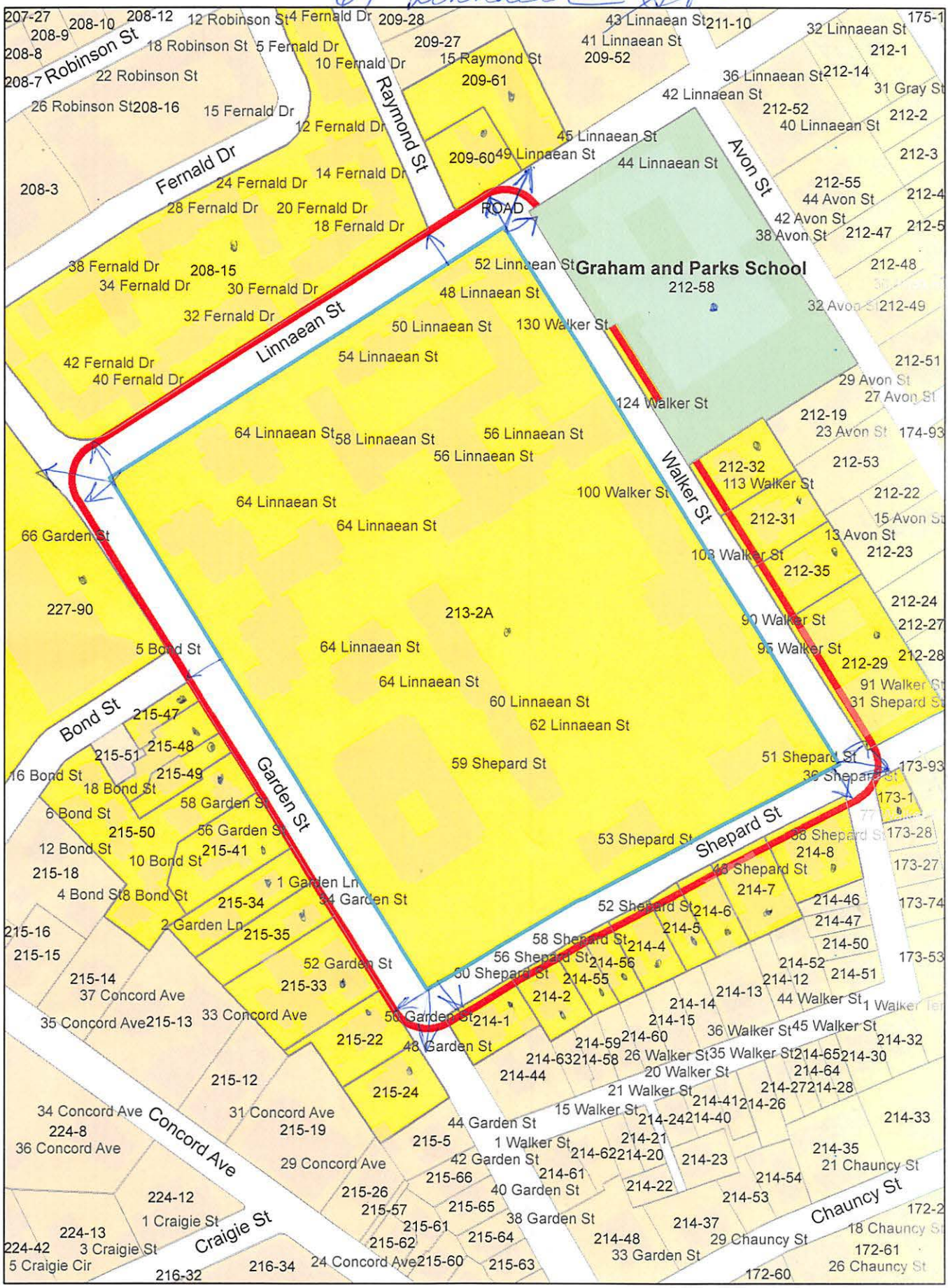
Address : Brown Rudnick LLP
10 Memorial Boulevard
Providence, RI 02903

Tel. No. : 401-276-2610

E-Mail Address : mdolan@brownrudnick.com

Date : October 31, 2019

64 Linnaean St.



64 Linnaean St. 194

Petitioner

173-1
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36 SHEPARD ST
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213-2A
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1350 MASSACHUSETTS AVE
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214-6
RADCLIFFE COLLEGE
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48 SHEPARD ST
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214-7
CHANG, HWEI LI
46 SHEPARD ST., #4
CAMBRIDGE, MA 02138-1520

214-7
YIP, CHI-MAN
46 SHEPARD ST 24
CAMBRIDGE, MA 02138

214-7
UNTERBERG, THOMAS E.
46 SHEPARD ST., #43
CAMBRIDGE, MA 02138

214-7
SHERMAN, MICHAEL
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CAMBRIDGE, MA 02138-1521

214-7
SMITH, ELLEN ROSS
46 SHEPARD ST., UNIT #21
CAMBRIDGE, MA 02138-1520

215-33
PRESTON, IOANA
52 GARDEN ST. UNIT#5
CAMBRIDGE, MA 02138

215-33
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214-4
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CAMBRIDGE, MA 02138-1523

214-1
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214-7
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214-7
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C/O NADIA COHER
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214-7
SCHOENLE, RAPHAEL
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214-7
STEFANESCU, ADA & IRINA STEFANESCU
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214-7
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215-33
KARLS, ANDREA B.
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215-33
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214-7
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214-7
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214-7
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CAMBRIDGE, MA 02139

214-5
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215-33
PITTMAN, ASHLEY G.
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CAMBRIDGE, MA 02140

215-33
SAPP, CHRISTOPHER & KATHERINE SAPP
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215-33
MEEK, THOMAS B. III & CATHERINE YOON
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64 Linnaean St.

294

215-33
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24652 HUTCHINSON RD
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215-41
LITTLE, HOWARD FORBES &
JANE SNEDDON LITTLE
56 GARDEN ST
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215-50
CARTER, SHIRLEY CHALMERS
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215-33
CONDIT, WALTER L. & KATHLEEN CAPLE
52 GARDEN ST., UNIT #3
CAMBRIDGE, MA 02138

215-33
SCHOFIELD-BODT, DANIEL A.
52 GARDEN ST., #9
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215-33
VAN DAM, STEVEN
97 BURLINGTON ST.
LEXINGTON, MA 02420

215-33
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259 SYDNEY ST
CAMBRIDGE, MA 02139

215-33
CARRIGO, DANIELLE
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CAMBRIDGE, MA 02138

215-33
BRIGHT, JOHN D. & JUDITH A. COPPOLA
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MAURER, VIRGINIA M. & SZEZESNY J. KAMINSKI
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215-33
GUO, XIALING
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215-33
NAKHOSTEEN, JOSEPH B.
52 GARDEN ST. UNIT #38
CAMBRIDGE, MA 02138

215-33
JOHNSTON, CAROLYN
52 GARDEN ST., UNIT #39
CAMBRIDGE, MA 02138

215-33
REED, SUSAN E.
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CAMBRIDGE, MA 02138

215-33
MILLSTEIN, CHARLES B.
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215-33
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TR. MAUREEN E. AHERN REV TRUST
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215-35
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215-50
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215-50
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215-50
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215-50
TOSATTI, VALENTINO & QIUYU WANG
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PETERS, MARY LINTON & STEPHEN PETERS
50-1 GARDEN ST
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215-22
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215-33
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215-33
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26 CHATHAM ST., #3
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MCDERMOTT, KATHLEEN
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215-33
ERULKAR, ANNABEL
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NEW YORK, NY 10017

64 Linnaean St.

394

215-33
HEMOND, BRIAN D.T.
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215-33
MANCUSO, BRIAN
52 GARDEN ST. UNIT#43
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215-33
SUNFLOWER X., LLC
54 ELLERY ST., #2
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215-33
MAUZY, MARTHA H.
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CAMBRIDGE, MA 02138

215-33
YAMASHIRO, JASON LUSTIG &
MIYOSHI YAMASHIRO
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215-34
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214-1
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214-7
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214-7
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215-50
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214-56
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215-33
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215-33
KUSHELL, DESIREE & ELLIOT KUSHELL,
TRS THE KUSHELL FAM REV TRUST
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215-33
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227-90 /208-15 - 212-29-31-35
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215-33
WANG, LEI & TODD CASE
52 GARDEN ST., #40
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215-33
GREWAL, DAVID S. & DANIELA L. CAMMACK
52 GARDEN STREET #49
CAMBRIDGE, MA 02138

215-33
ROBINSON, ARTHUR L. &
MARY ANN B ANN E. ROBINSON
52 GARDEN ST UNIT B1
CAMBRIDGE, MA 02138.

215-34
NEVILLE, JAMES P., TRUSTEE THE JAMES P.
NEVILLE 2016 FAM TR
2 GARDEN LN., #2
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214-7
SHEPARD 46, LLC
C/O ANNE R. HRABCHAK
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215-47
ROTHSCHILD, JACQUELINE D.,
TRS THE JACQUELINE DURY ROTHSCHILD TR
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64 Linnaean St. 4094

215-49
LADJEVARDI, GOLNAZ A,
TRS THE ALPHA-ALPHA TRUST RESTATEMENT
58A GARDEN ST
CAMBRIDGE, MA 02138

215-50
HINARD, JOSEPHINE M.
12 BOND STREET
CAMBRIDGE, MA 02138

215-50
QUINN, THOMAS M.
10 BOND STREET, UNIT K
CAMBRIDGE, MA 02138

215-50
TRAVERS, JEFFREY R. & EVA F. TRAVERS
8 BOND ST
CAMBRIDGE, MA 02138

215-50
PORCIELLO, VALERIE J., &
JENNIFER A. MUSUMANO
18 BOND ST
CAMBRIDGE, MA 02138-2308

209-61
CAMBRIDGE HOUSING AUTHORITY
675 MASSACHUSETTS AVE
CAMBRIDGE, MA 02139

209-60
VALIMAHOMED, SALIM A. & MAURISSE T. GRAY
49 LINNAEAN ST
CAMBRIDGE, MA 02138

212-32
PRESIDENT & FELLOWS OF HARVARD COLLEGE C/O
HARVARD REAL ESTATE SERVICES
1350 MASS AVENUE
HOLYOKE CTR., ROOM 1017
CAMBRIDGE, MA 02138

215-48
HOUGHTON, BRUCE E.,
TRS ABIGAIL J. HOUGHTON
58B GARDEN ST
CAMBRIDGE, MA 02138

212-58
CITY OF CAMBRIDGE
C/O NANCY GLOWA
CITY SOLICITOR

212-58
CAMBRIDGE CITY OF SCHOOL DEPT.
159 THORNDIKE ST
CAMBRIDGE, MA 02141

212-58
CITY OF CAMBRIDGE
C/O LOUIE DEPASQUALE
CITY MANAGER

214-2
POOL JEREMY D. & GAIL POOL
8345 NW 66 ST. #C5524
MIAMI, FL 33166-7896

INFINIGY

FROM ZERO TO INFINIGY

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Post Mod Structural Analysis Report

March 25, 2019

Site Name	MA2268
FA Number	10133905
PACE Number	MRCTB024596/ MRCTB024721
PTN Number	2101A0BTP0/ 2101A0BTZE
Client	Empire
Proposed Carrier	AT&T
Infinigy Job Number	484-001
Site Location	64 Linnaean Street Cambridge, MA 02138 42° 17' 03.25" N NAD83 71° 09' 20.85" W NAD83
Structure Type	FRP Enclosure
Structural Usage Ratio	**80.3%**
Overall Result	**Pass**
Note	**See appended documents for structural modifications.**

Upon reviewing the results of this analysis, it is our opinion that the post modification structure meets the specified TIA and ASCE code requirements. The rooftop mounts are therefore deemed adequate to support the existing and proposed loading as listed in this report.

Brenden Archer
Project Engineer II

Contents

Introduction

Infinigy Engineering has been requested to perform a post modification structural analysis on the existing AT&T antenna supporting structures. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The antenna mounts were analyzed using RISA 3D v. 17.0.2 software.

Supporting Documentation

Construction Drawings	Infinigy Engineering Job #484-001, dated May 23, 2018
RFDS	AT&T RFDS ID #1736784, dated November 22, 2017
Previous Analysis	Hudson Design Group, dated May 10, 2017

Analysis Code Requirements

Wind Speed	99 mph (3-Second Gust, V_{asd})/ 128 mph (3-Second Gust, V_{ult})
Wind Speed w/ ice	50mph (3-Second Gust) w/ 1" ice
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2015 IBC / 2017 Massachusetts State Building Code, 9th Ed.
Structure Class	II
Exposure Category	B
Topographic Category	1
Calculated Crest Height	0 ft

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the post modification structure meets the specified TIA and ASCE code requirements. The rooftop mounts are therefore deemed adequate to support the existing and proposed loading as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

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Existing & Reserved Loading

Rad Center (ft)	Qty.	Appurtenance	Mount Type	Sector
56.0	1	Kathrein 742-264	Rooftop	Alpha
	1	Commscope SBNHH-1D65A		
	1	CCI OPA-65R-LCUU-H4		
	1	Ericsson RRUS-11		
	1	Ericsson RRUS-32		
	1	Ericsson RRUS-12 w/ A2		
	2	TT19-08BP111-001		
	2	Powerwave LGP21901		
	2	CM1007-DBPXBC-003		
	1	Raycap DC6-48-60-18-8F		
	1	Surge Suppresser		
	1	Kathrein 742-264		Beta
	1	Commscope SBNHH-1D65A		
	1	CCI OPA-65R-LCUU-H4		
	1	Ericsson RRUS-11		
	1	Ericsson RRUS-32		
	1	Ericsson RRUS-12 w/ A2		
	2	TT19-08BP111-001		
	2	Powerwave LGP21901		
	2	CM1007-DBPXBC-003		
	1	Raycap DC6-48-60-18-8F		
	1	Surge Suppresser		
	1	Kathrein 742-264		Gamma
	1	Commscope SBNHH-1D65A		
	1	CCI OPA-65R-LCUU-H4		
	1	Ericsson RRUS-11		
	1	Ericsson RRUS-32		
	1	Ericsson RRUS-12 w/ A2		
	2	TT19-08BP111-001		
	2	Powerwave LGP21901		
	2	CM1007-DBPXBC-003		
	1	Raycap DC6-48-60-18-8F		
	1	Surge Suppresser		

Proposed Loading

Rad Center (ft)	Qty.	Appurtenance	Mount Type	Sector
56.0	1	Kathrein 800-10964	--	Alpha
	1	Ericsson RRUS B14 4478		
	1	Ericsson RRUS-4426 B66		
	1	Kathrein 800-10964		Beta
	1	Ericsson RRUS B14 4478		
	1	Ericsson RRUS-4426 B66		
	1	Kathrein 800-10964		Gamma
	1	Ericsson RRUS B14 4478		
	1	Ericsson RRUS-4426 B66		

Final Loading Configuration

Rad Center (ft)	Qty.	Appurtenance	Mount Type	Sector
56.0	1	Kathrein 742-264	Rooftop	Alpha
	1	Commscope SBNHH-1D65A		
	1	Kathrein 800-10964		
	1	CCI OPA-65R-LCUU-H4		
	1	Ericsson RRUS B14 4478		
	1	Ericsson RRUS-11		
	1	Ericsson RRUS-32		
	1	Ericsson RRUS-4426 B66		
	1	Ericsson RRUS-12 w/ A2		
	2	TT19-08BP111-001		
	2	Powerwave LGP21901		
	2	CM1007-DBPXBC-003		
	1	Raycap DC6-48-60-18-8F		
	1	Surge Suppresser		
	1	Kathrein 742-264		Beta
	1	Commscope SBNHH-1D65A		
	1	Kathrein 800-10964		
	1	CCI OPA-65R-LCUU-H4		
	1	Ericsson RRUS B14 4478		
	1	Ericsson RRUS-11		
	1	Ericsson RRUS-32		
	1	Ericsson RRUS-4426 B66		
	1	Ericsson RRUS-12 w/ A2		
	2	TT19-08BP111-001		
	2	Powerwave LGP21901		
	2	CM1007-DBPXBC-003		
	1	Raycap DC6-48-60-18-8F		
	1	Surge Suppresser		
	1	Kathrein 742-264		Gamma
	1	Commscope SBNHH-1D65A		
	1	Kathrein 800-10964		
	1	CCI OPA-65R-LCUU-H4		
	1	Ericsson RRUS B14 4478		
	1	Ericsson RRUS-11		
	1	Ericsson RRUS-32		
	1	Ericsson RRUS-4426 B66		
	1	Ericsson RRUS-12 w/ A2		
	2	TT19-08BP111-001		
	2	Powerwave LGP21901		
	2	CM1007-DBPXBC-003		
	1	Raycap DC6-48-60-18-8F		
	1	Surge Suppresser		

Structure Usages

Mount Pipe	21.5%	Pass
Bracing	72.2%	Pass
Framing	80.3%	Pass
Result	**80.3%**	**Pass**

Anchor Bolt Reactions

Reaction Data	Design Reactions	Analysis Reactions	Result
Max Tension (kips)	20.34	1.39	6.8%
Max Shear (kips)	12.43	0.99	8.0%
Unity Check	--	--	14.8%

***Assumed (1) 5/8" A325 anchors bolts.**

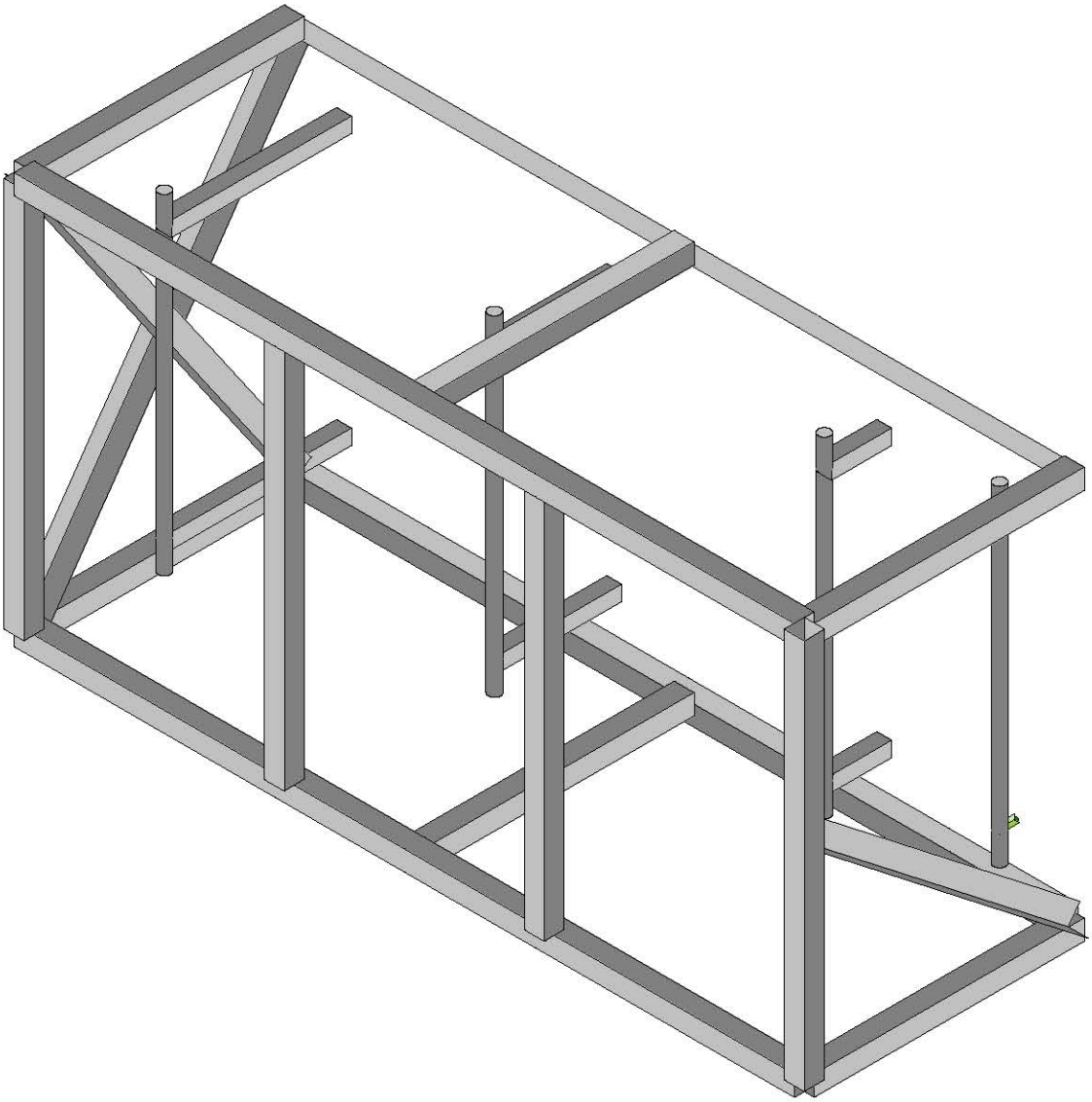
- Mount connection reactions are acceptable per rigorous structural analysis.

Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of "like new" and all members, connections, anchors, and masonry to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure's condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

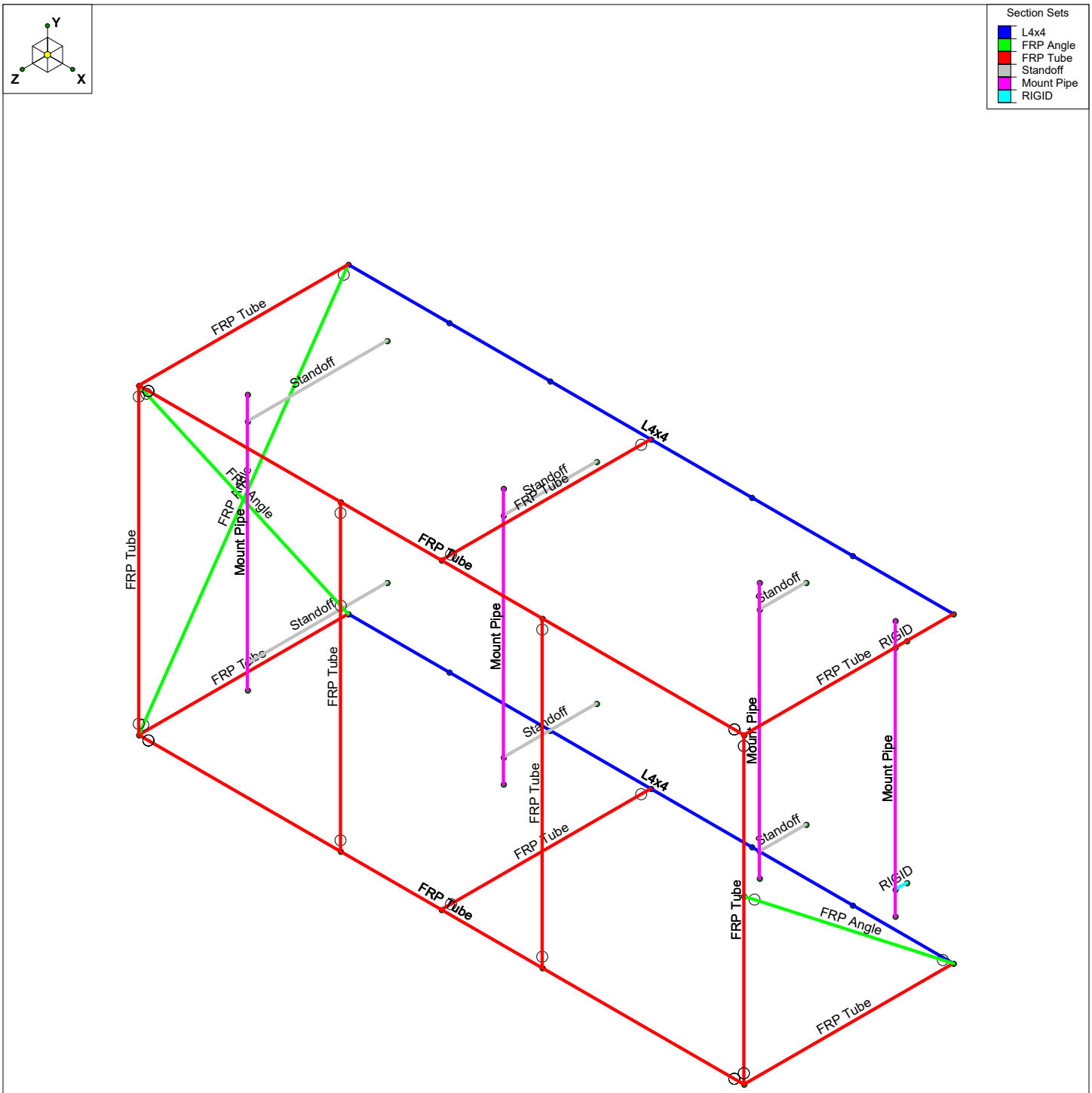
Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the rooftop mounted equipment and/or antenna supporting structures to be proposed or modified as shown in the referenced construction drawings. Applicable building element adequacy to support these structures is also evaluated when the applied forces increase significantly based on engineering judgment.



Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
BDA		Mar 25, 2019 at 3:29 PM
484-001		Gamma Design.r3d



Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
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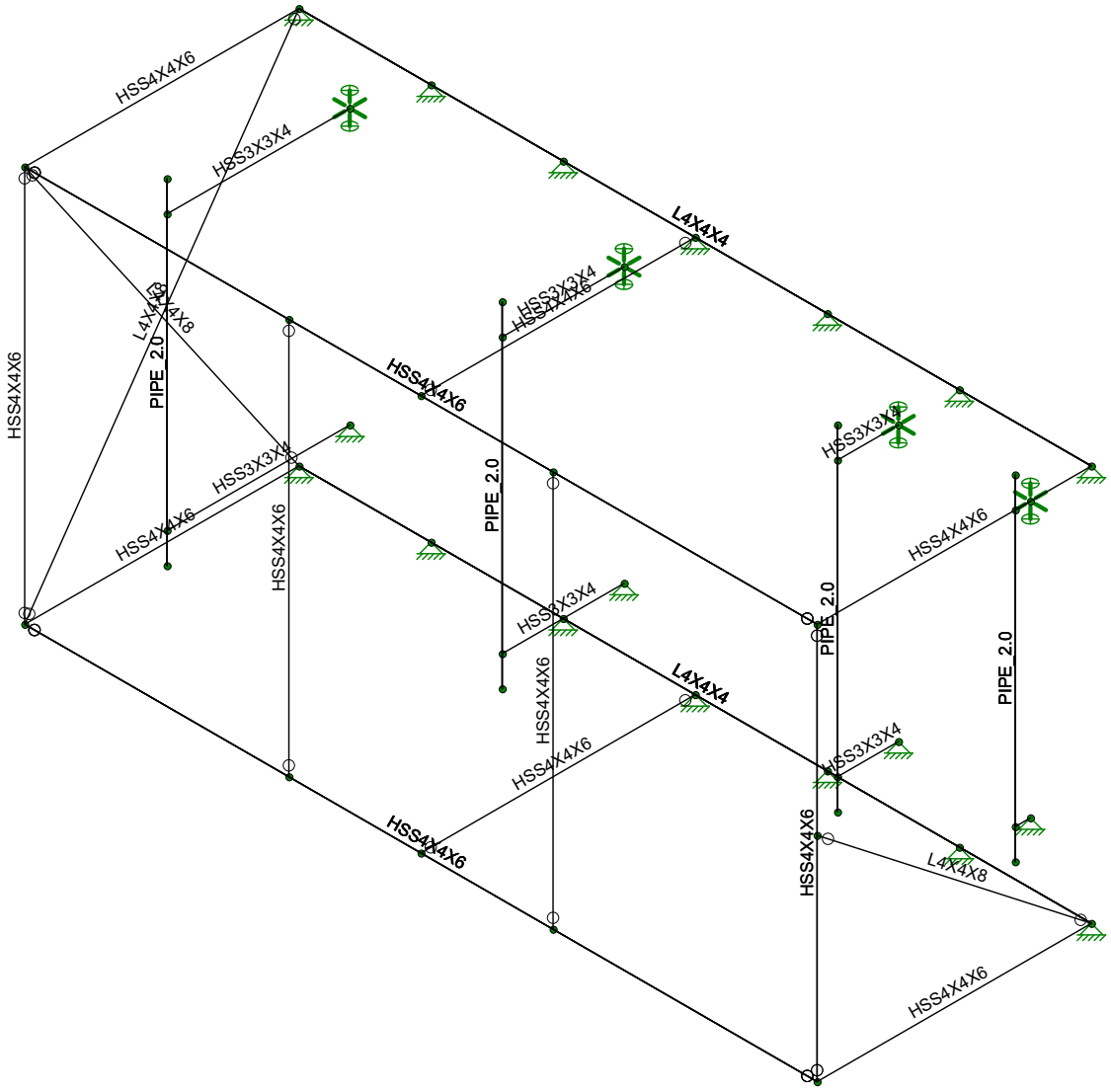

Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
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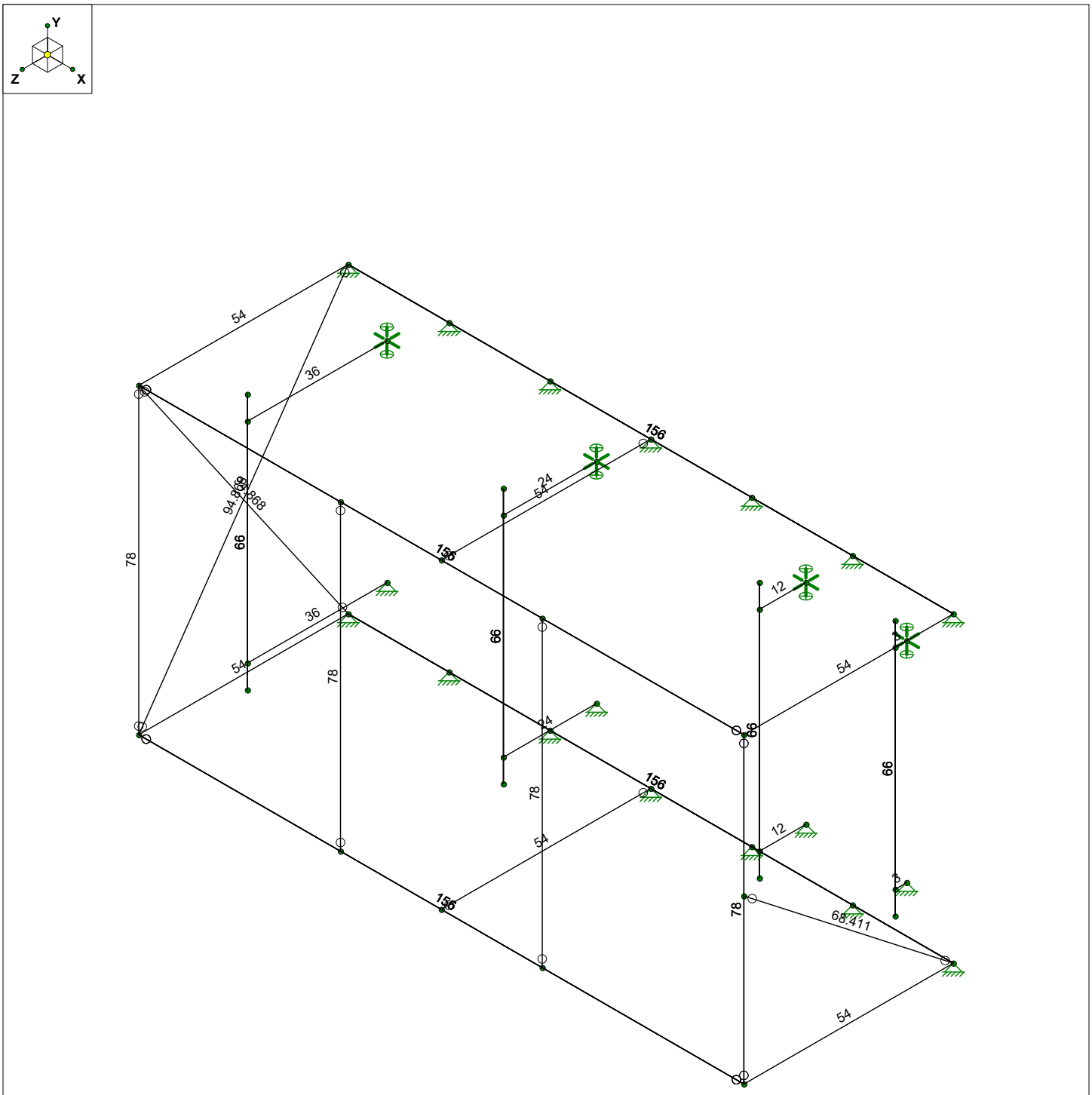
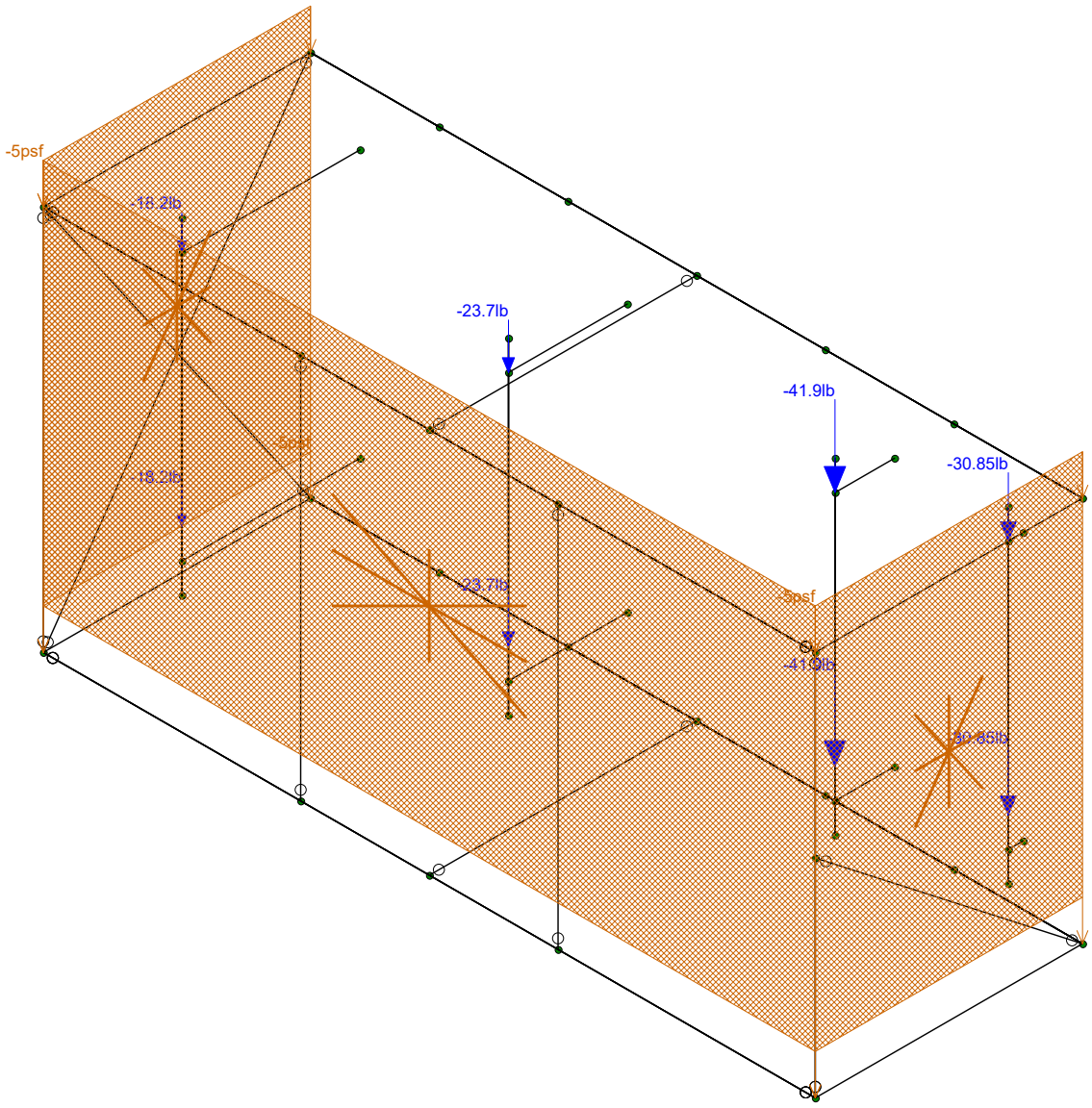
484-001		Gamma Design.r3d



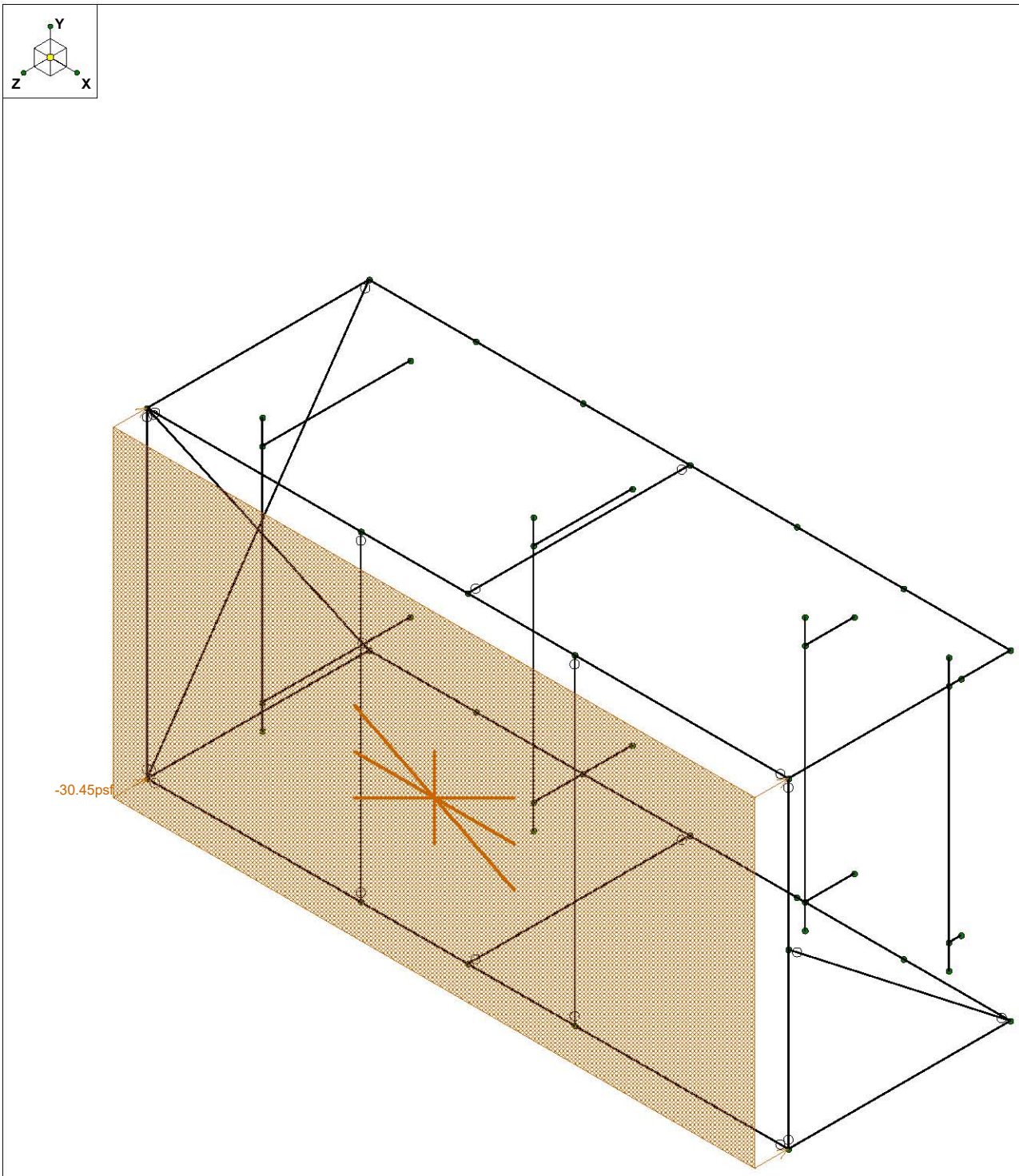
Member Length (in) Displayed
Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
BDA		Mar 25, 2019 at 3:33 PM
484-001		Gamma Design.r3d



Loads: BLC 1, Self Weight
Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
BDA		Mar 25, 2019 at 3:33 PM
484-001		Gamma Design.r3d



Loads: BLC 2, Wind Load AZI 000
Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
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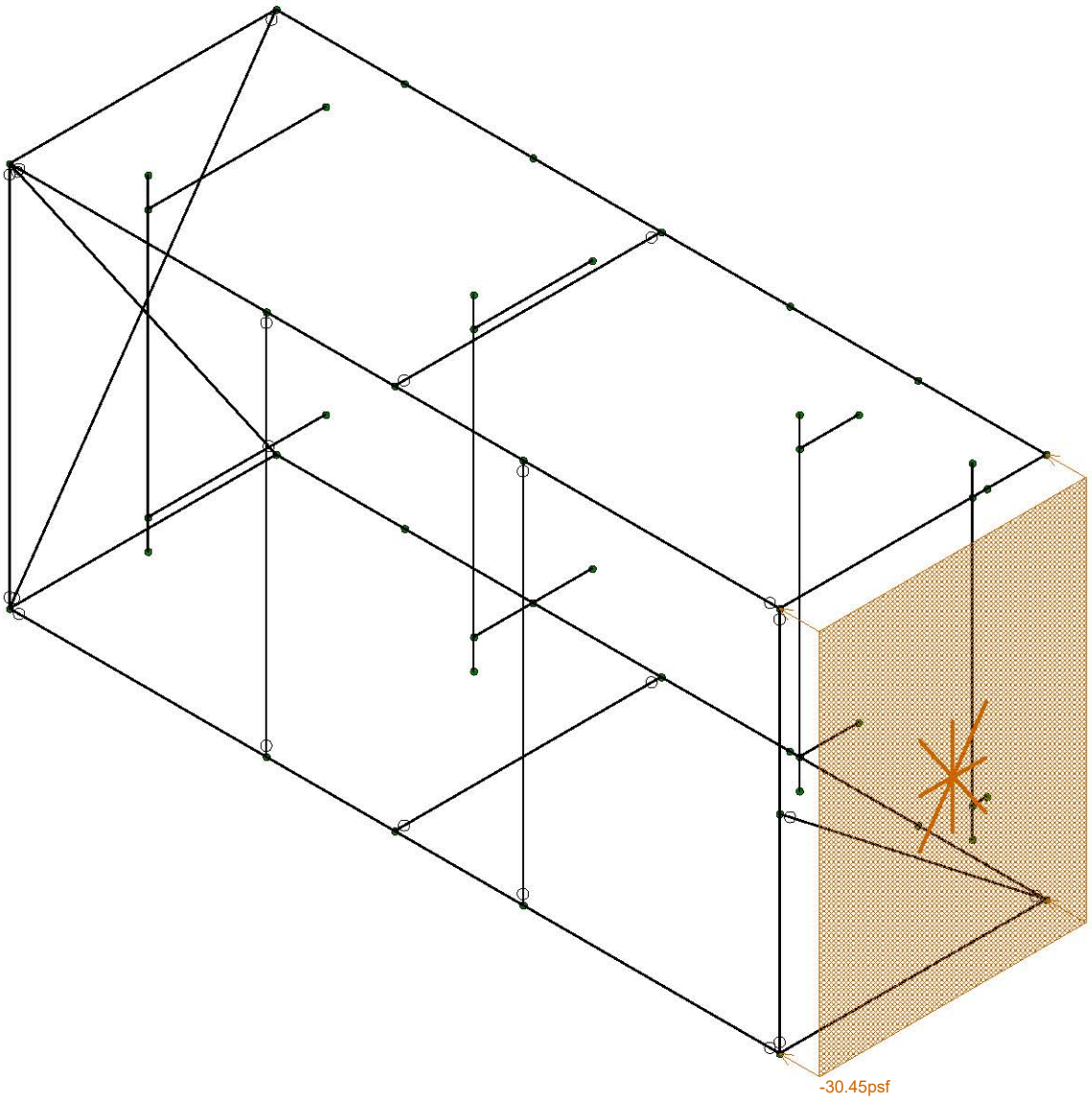
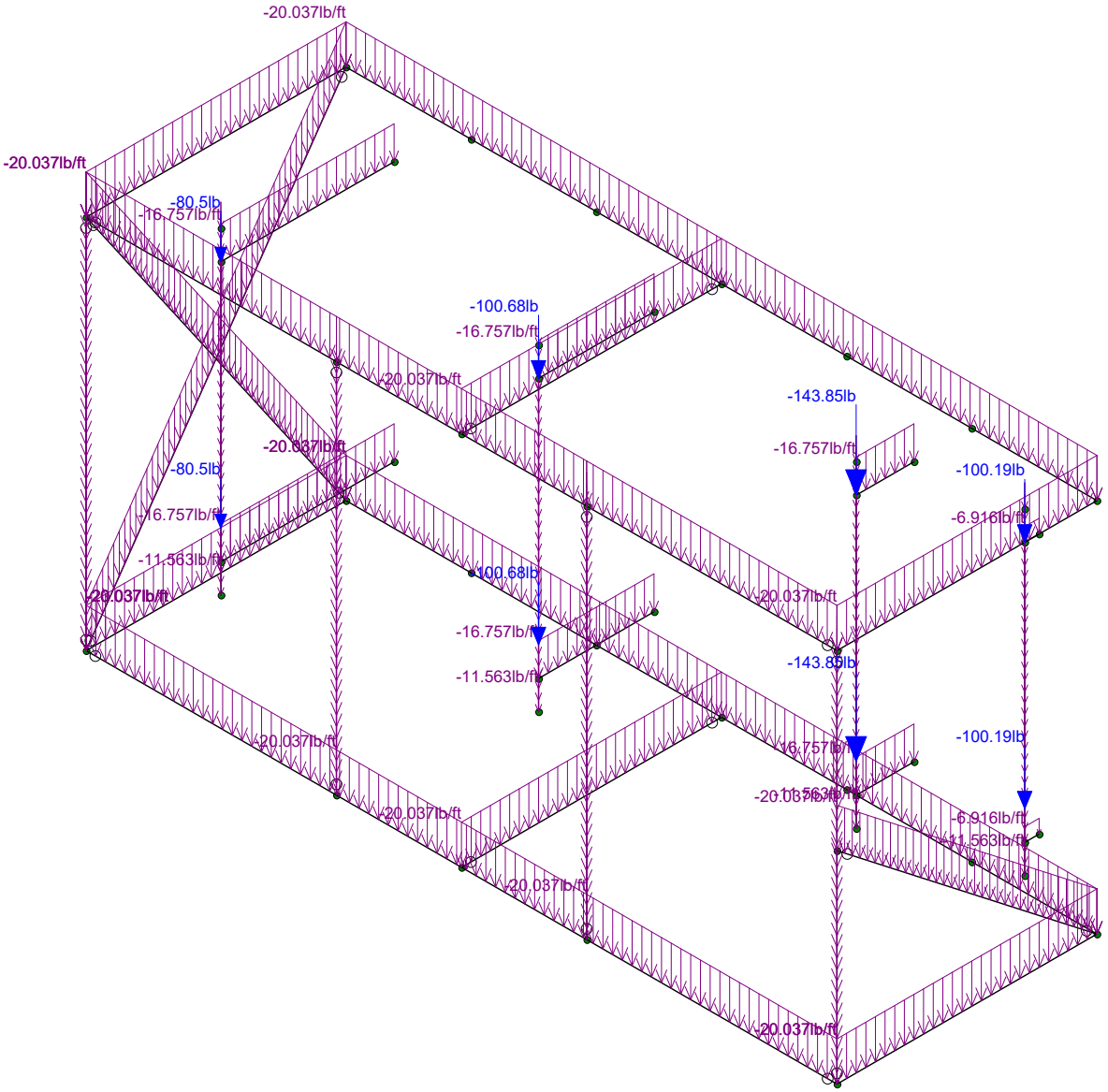
484-001		Gamma Design.r3d



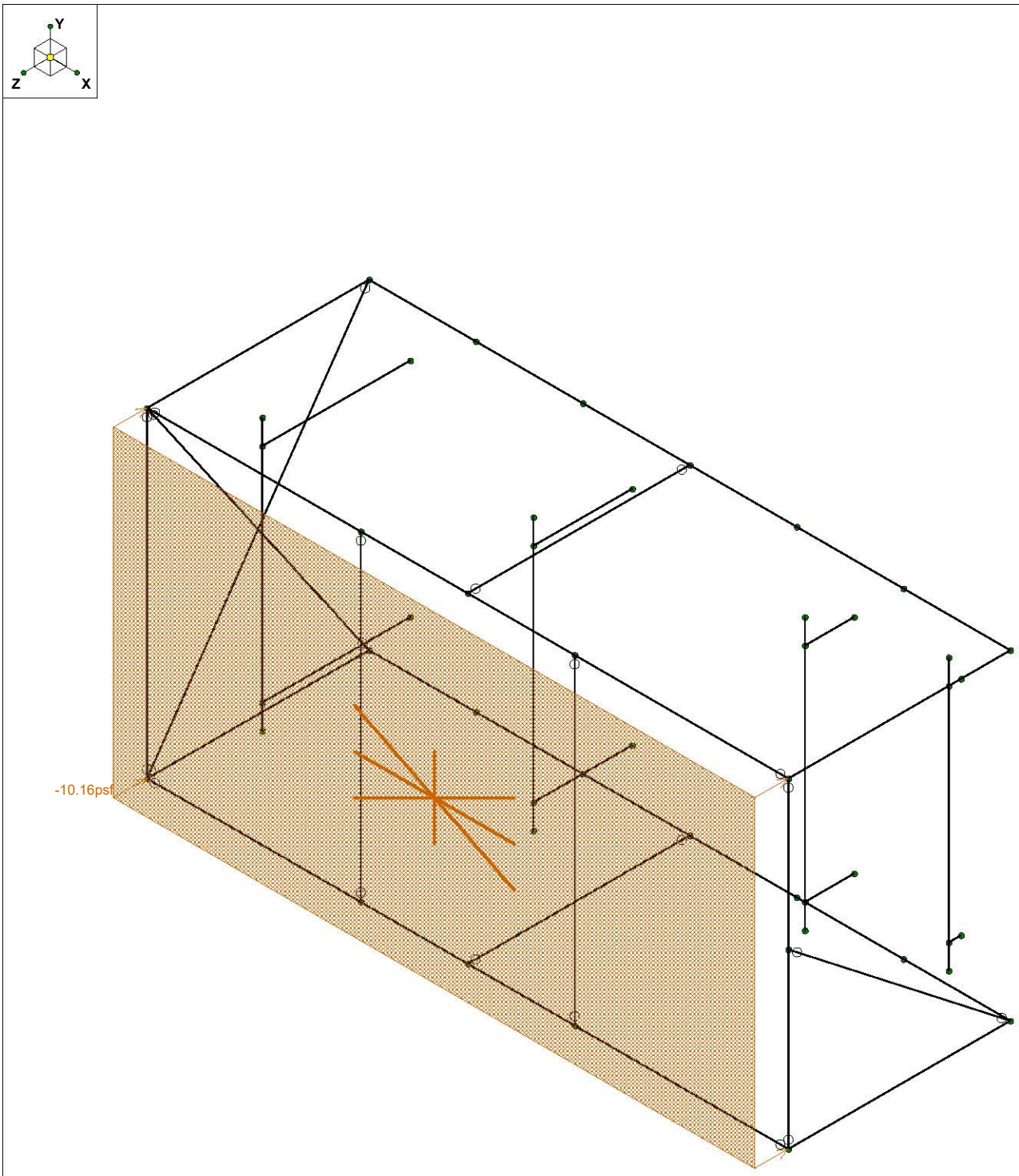
Loads: BLC 3, Wind Load AZI 090
Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
BDA		Mar 25, 2019 at 3:33 PM
484-001		Gamma Design.r3d



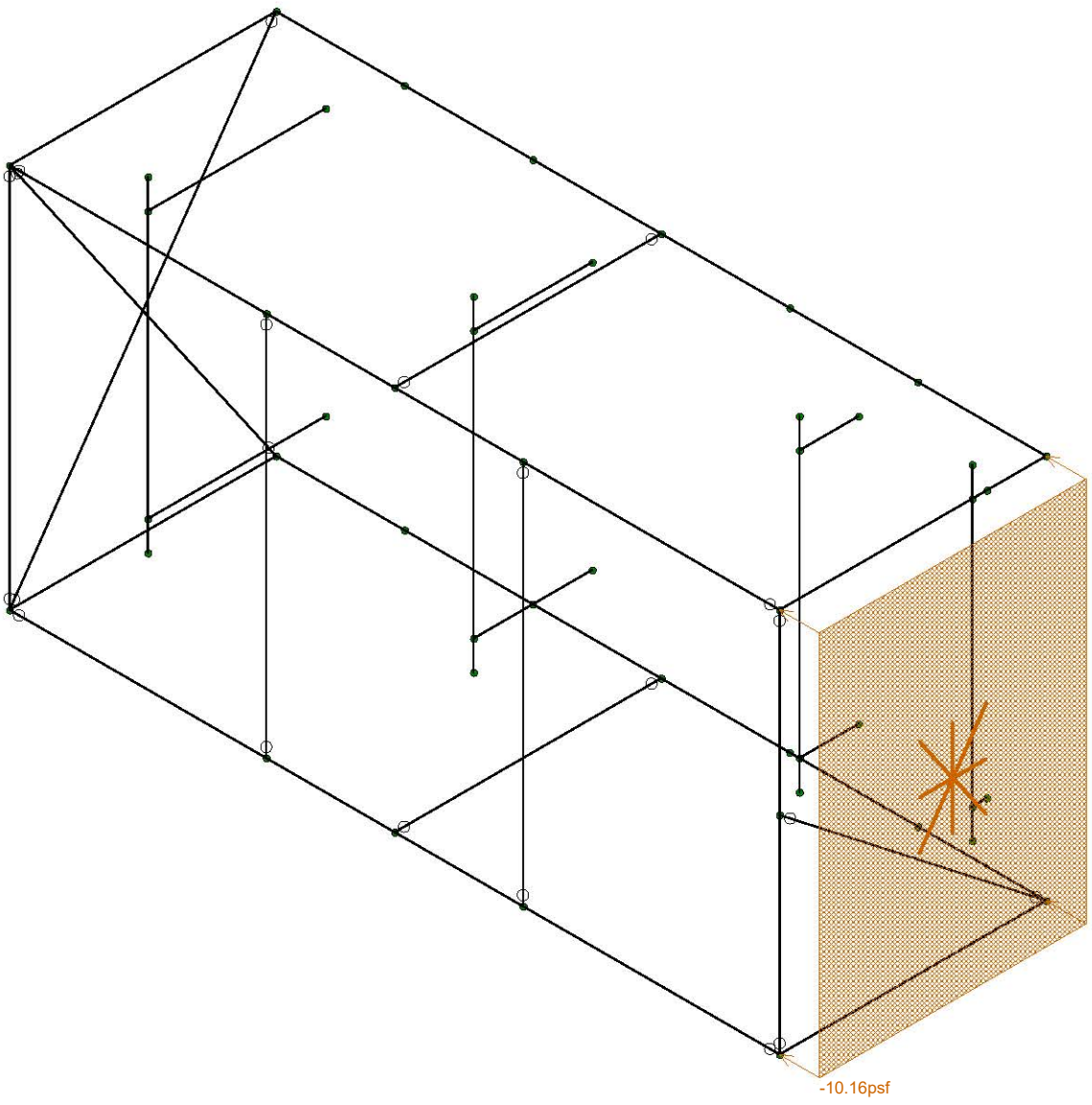
Loads: BLC 4, Ice Weight
Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
BDA		Mar 25, 2019 at 3:41 PM
484-001		Gamma Design.r3d



Loads: BLC 5, Wind + Ice Load AZI 000
Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
BDA		Mar 25, 2019 at 3:33 PM
484-001		Gamma Design.r3d



Loads: BLC 6, Wind + Ice Load AZI 090
Envelope Only Solution

Infinigy Engineering, PLLC	MA2268 - Gamma	Final Configuration
BDA		Mar 25, 2019 at 3:34 PM
484-001		Gamma Design.r3d

Site Name:	MA2268
Client:	Empire
Carrier:	AT&T
Engineer:	BDA
Date:	3/25/2019

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Rooftop
Number of Sectors:	3
Structure Shape 1:	Flat

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	99	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	56.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
17.91	0.85	**30.45**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
4.56	0.85	**10.16**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (nominal 3-second gust)
Base Ice Thickness:	1.00	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
Kathrein 742-264	56.0	3	1.00	Flat	Flat	17.91	4.86	74.03	44.60	51.96	66.68
Commscope SBNHH-1D65A	56.0	3	1.00	Flat	Flat	17.91	5.96	90.70	59.59	67.37	82.92
Kathrein 800-10964	56.0	3	1.00	Flat	Flat	17.91	10.00	152.21	62.48	84.92	129.78
CCI OPA-65R-LCUU-H4	56.0	3	1.00	Flat	Flat	17.91	5.98	91.04	51.56	61.43	81.17
Ericsson RRUS-B14 4478	56.0	3	1.00	Flat	Flat	17.91	1.84	28.05	16.12	19.10	25.07
Ericsson RRUS-11	56.0	3	1.00	Flat	Flat	17.91	2.78	42.39	18.08	24.16	36.31
Ericsson RRUS-32	56.0	3	1.00	Flat	Flat	17.91	2.74	41.76	25.40	29.49	37.67
Ericsson RRUS-4426 B66	56.0	3	1.00	Flat	Flat	17.91	2.74	41.76	25.40	29.49	37.67
Ericsson RRUS-12	56.0	3	1.00	Flat	Flat	17.91	3.14	47.86	19.23	26.39	40.70
TT19-08BP111-001	56.0	1	1.00	Flat	Flat	17.91	0.20	3.05	4.57	4.19	3.43
Powerwave LGP21901	56.0	6	1.00	Flat	Flat	17.91	0.11	1.60	3.84	3.28	2.16
CM1007-DBPXBC-003	56.0	6	1.00	Flat	Flat	17.91	0.37	5.60	2.05	2.94	4.71
Raycap DC6-48-60-18-8F	56.0	3	1.00	Round	Round	17.91	1.21	18.45	18.45	18.45	18.45
Surge Sepresser	56.0	3	1.00	Flat	Flat	17.91	0.89	13.50	8.18	9.51	12.17
3106 Cabinet	56.0	1	1.00	Flat	Flat	17.91	27.39	417.05	244.36	287.53	373.88
Purcell Cabinet	56.0	1	1.00	Flat	Flat	17.91	27.32	415.95	404.62	407.45	413.11
DC Power Plant	56.0	1	1.00	Flat	Flat	17.91	43.20	657.73	274.05	369.97	561.81
Tyco Cabinet	56.0	1	1.00	Flat	Flat	17.91	43.20	657.73	274.05	369.97	561.81

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N2			L4x4	Beam	Single Angle	A36 Gr.36	Typical
2	M2	N3	N4		90	L4x4	Beam	Single Angle	A36 Gr.36	Typical
3	M3	N15	N16			FRP Tube	Beam	Tube	FRP	Typical
4	M4	N17A	N18A			FRP Tube	Beam	Tube	FRP	Typical
5	M5	N15	N1			FRP Tube	Beam	Tube	FRP	Typical
6	M6	N16	N2			FRP Tube	Beam	Tube	FRP	Typical
7	M7	N18A	N4			FRP Tube	Beam	Tube	FRP	Typical
8	M8	N17A	N3			FRP Tube	Beam	Tube	FRP	Typical
9	M9	N15	N17A			FRP Tube	Beam	Tube	FRP	Typical
10	M10	N16	N18A			FRP Tube	Beam	Tube	FRP	Typical
11	M11	N19	N20			FRP Tube	Beam	Tube	FRP	Typical
12	M12	N23	N24			FRP Tube	Beam	Tube	FRP	Typical
13	M13	N15	N3			FRP Angle	Beam	Single Angle	FRP	Typical
14	MP4	N25	N26			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
15	M16	N28	N24A			RIGID	None	None	RIGID	Typical
16	M17	N27	N23A			RIGID	None	None	RIGID	Typical
17	MP3	N31	N32			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
18	M19	N34	N30			Standoff	Beam	Tube	A53 Gr.B	Typical
19	M20	N33	N29			Standoff	Beam	Tube	A53 Gr.B	Typical
20	MP2	N37	N38			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
21	M22	N40	N36			Standoff	Beam	Tube	A53 Gr.B	Typical
22	M23	N39	N35			Standoff	Beam	Tube	A53 Gr.B	Typical
23	MP1	N43	N44			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
24	M25	N46	N42			Standoff	Beam	Tube	A53 Gr.B	Typical
25	M26	N45	N41			Standoff	Beam	Tube	A53 Gr.B	Typical
26	M28	N1	N17A			FRP Angle	Beam	Single Angle	FRP	Typical
27	M29	N48	N14		90	FRP Tube	Beam	Tube	FRP	Typical
28	M30	N47	N13			FRP Tube	Beam	Tube	FRP	Typical
29	M29A	N49	N2			FRP Angle	Beam	Single Angle	FRP	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		2	6	0
3	Total General		2	6	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	L4X4X4	2	312	.2
7	A53 Gr.B	HSS3X3X4	6	144	0
8	A53 Gr.B	PIPE_2.0	4	264	0
9	FRP	HSS4X4X6	12	948	.3
10	FRP	L4X4X8	3	258.1	0
11	Total HR Steel		27	1926.1	.7

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Self Weight	DL		-1			8		3	
2	Wind Load AZI 000	WLZ							1	
3	Wind Load AZI 090	WLX							1	
4	Ice Weight	OL1					8	29		
5	Wind + Ice Load AZI 000	OL2							1	
6	Wind + Ice Load AZI 090	OL3							1	
7	Service Live 1	LL								

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
8	Seismic Load AZI 000	ELZ								
9	Seismic Load AZI 090	ELX								
10	BLC 1 Transient Area Loads	None						100		
11	BLC 2 Transient Area Loads	None						40		
12	BLC 3 Transient Area Loads	None						11		
13	BLC 5 Transient Area Loads	None						40		
14	BLC 6 Transient Area Loads	None						11		

Load Combinations

	Description	S..	P...	S..	B..	Fa...	BLC	Fac...	BLC	Fa...	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...	B..	F...
1	1.4D	Y...	Y		DL	1.4																				
2	1.2D + 1.6W AZI 000	Y...	Y		DL	1.2	WLZ	1.6																		
3	1.2D + 1.6W AZI 030	Y...	Y		DL	1.2	WLZ	1.3...	W...	.8																
4	1.2D + 1.6W AZI 060	Y...	Y		DL	1.2	WLZ	.8	W...	1.3...																
5	1.2D + 1.6W AZI 090	Y...	Y		DL	1.2			W...	1.6																
6	1.2D + 1.6W AZI 120	Y...	Y		DL	1.2	WLZ	-.8	W...	1.3...																
7	1.2D + 1.6W AZI 150	Y...	Y		DL	1.2	WLZ	-1.3...	W...	.8																
8	1.2D + 1.6W AZI 180	Y...	Y		DL	1.2	WLZ	-1.6																		
9	1.2D + 1.6W AZI 210	Y...	Y		DL	1.2	WLZ	-1.3...	W...	-.8																
10	1.2D + 1.6W AZI 240	Y...	Y		DL	1.2	WLZ	-.8	W...	-1....																
11	1.2D + 1.6W AZI 270	Y...	Y		DL	1.2			W...	-1.6																
12	1.2D + 1.6W AZI 300	Y...	Y		DL	1.2	WLZ	.8	W...	-1....																
13	1.2D + 1.6W AZI 330	Y...	Y		DL	1.2	WLZ	1.3...	W...	-.8																
14	0.9D + 1.6W AZI 000	Y...	Y		DL	.9	WLZ	1.6																		
15	0.9D + 1.6W AZI 030	Y...	Y		DL	.9	WLZ	1.3...	W...	.8																
16	0.9D + 1.6W AZI 060	Y...	Y		DL	.9	WLZ	.8	W...	1.3...																
17	0.9D + 1.6W AZI 090	Y...	Y		DL	.9			W...	1.6																
18	0.9D + 1.6W AZI 120	Y...	Y		DL	.9	WLZ	-.8	W...	1.3...																
19	0.9D + 1.6W AZI 150	Y...	Y		DL	.9	WLZ	-1.3...	W...	.8																
20	0.9D + 1.6W AZI 180	Y...	Y		DL	.9	WLZ	-1.6																		
21	0.9D + 1.6W AZI 210	Y...	Y		DL	.9	WLZ	-1.3...	W...	-.8																
22	0.9D + 1.6W AZI 240	Y...	Y		DL	.9	WLZ	-.8	W...	-1....																
23	0.9D + 1.6W AZI 270	Y...	Y		DL	.9			W...	-1.6																
24	0.9D + 1.6W AZI 300	Y...	Y		DL	.9	WLZ	.8	W...	-1....																
25	0.9D + 1.6W AZI 330	Y...	Y		DL	.9	WLZ	1.3...	W...	-.8																
26	1.2D + 1.0Di	Y...	Y		DL	1.2	OL1	1																		
27	1.2D + 1.0Di + 1.0Wi AZI 000	Y...	Y		DL	1.2	OL1	1	OL2	1																
28	1.2D + 1.0Di + 1.0Wi AZI 030	Y...	Y		DL	1.2	OL1	1	OL2	.866	...	.5														
29	1.2D + 1.0Di + 1.0Wi AZI 060	Y...	Y		DL	1.2	OL1	1	OL2	.5	...	.8...														
30	1.2D + 1.0Di + 1.0Wi AZI 090	Y...	Y		DL	1.2	OL1	1			...	1														
31	1.2D + 1.0Di + 1.0Wi AZI 120	Y...	Y		DL	1.2	OL1	1	OL2	-.5	...	.8...														
32	1.2D + 1.0Di + 1.0Wi AZI 150	Y...	Y		DL	1.2	OL1	1	OL2	-.866	...	.5														
33	1.2D + 1.0Di + 1.0Wi AZI 180	Y...	Y		DL	1.2	OL1	1	OL2	-1																
34	1.2D + 1.0Di + 1.0Wi AZI 210	Y...	Y		DL	1.2	OL1	1	OL2	-.866	...	-.5														
35	1.2D + 1.0Di + 1.0Wi AZI 240	Y...	Y		DL	1.2	OL1	1	OL2	-.5	...	-....														
36	1.2D + 1.0Di + 1.0Wi AZI 270	Y...	Y		DL	1.2	OL1	1			...	-1														
37	1.2D + 1.0Di + 1.0Wi AZI 300	Y...	Y		DL	1.2	OL1	1	OL2	.5	...	-....														
38	1.2D + 1.0Di + 1.0Wi AZI 330	Y...	Y		DL	1.2	OL1	1	OL2	.866	...	-.5														
39	1.2D + 1.5L + 1.0WL (30 mph) AZI 000	Y...	Y		DL	1.2	LL	1.5	WLZ	.093																
40	1.2D + 1.5L + 1.0WL (30 mph) AZI 030	Y...	Y		DL	1.2	LL	1.5	WLZ	.081	...	.0...														
41	1.2D + 1.5L + 1.0WL (30 mph) AZI 060	Y...	Y		DL	1.2	LL	1.5	WLZ	.047	...	.0...														
42	1.2D + 1.5L + 1.0WL (30 mph) AZI 090	Y...	Y		DL	1.2	LL	1.5			...	.0...														
43	1.2D + 1.5L + 1.0WL (30 mph) AZI 120	Y...	Y		DL	1.2	LL	1.5	WLZ	-.047	...	.0...														
44	1.2D + 1.5L + 1.0WL (30 mph) AZI 150	Y...	Y		DL	1.2	LL	1.5	WLZ	-.081	...	.0...														
45	1.2D + 1.5L + 1.0WL (30 mph) AZI 180	Y...	Y		DL	1.2	LL	1.5	WLZ	-.093																

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	BLC	Fac...	BLC	Fa...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...	B...	F...
46	1.2D + 1.5L + 1.0WL (30 mph) AZI 210	Y...	Y		DL	1.2	LL	1.5	WLZ	-.081	...	-....														
47	1.2D + 1.5L + 1.0WL (30 mph) AZI 240	Y...	Y		DL	1.2	LL	1.5	WLZ	-.047	...	-....														
48	1.2D + 1.5L + 1.0WL (30 mph) AZI 270	Y...	Y		DL	1.2	LL	1.5			...	-....														
49	1.2D + 1.5L + 1.0WL (30 mph) AZI 300	Y...	Y		DL	1.2	LL	1.5	WLZ	.047	...	-....														
50	1.2D + 1.5L + 1.0WL (30 mph) AZI 330	Y...	Y		DL	1.2	LL	1.5	WLZ	.081	...	-....														

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	164.027	17	905.696	27	1080.317	29	0	50	0	50	0	50
2		min	-163.895	23	181.714	20	-298.215	22	0	1	0	1	0	1
3	N2	max	553.287	17	1394.414	27	985.62	12	0	50	0	50	0	50
4		min	-553.419	23	405.743	20	-359.94	18	0	1	0	1	0	1
5	N3	max	220.985	5	894.312	33	407.409	16	0	50	0	50	0	50
6		min	-221.155	11	196.647	14	-1090.507	35	0	1	0	1	0	1
7	N4	max	488.672	5	140.794	32	499.341	24	0	50	0	50	0	50
8		min	-488.501	11	30.701	24	-1072.644	6	0	1	0	1	0	1
9	N5	max	0	50	76.105	36	545.887	11	0	50	0	50	0	50
10		min	0	1	2.897	17	-545.868	5	0	1	0	1	0	1
11	N6	max	0	50	76.784	30	676.112	11	0	50	0	50	0	50
12		min	0	1	-.503	23	-676.145	5	0	1	0	1	0	1
13	N9	max	0	50	38.301	29	122.765	5	0	50	0	50	0	50
14		min	0	1	-5.47	22	-123.25	11	0	1	0	1	0	1
15	N10	max	0	50	38.789	36	151.962	5	0	50	0	50	0	50
16		min	0	1	-7.773	17	-151.509	23	0	1	0	1	0	1
17	N13	max	5.176	13	127.822	33	1244.871	14	0	50	0	50	0	50
18		min	-5.178	3	4.296	14	-1244.944	8	0	1	0	1	0	1
19	N14	max	6.28	13	127.859	33	1244.579	14	0	50	0	50	0	50
20		min	-6.282	3	4.299	14	-1245.309	8	0	1	0	1	0	1
21	N17	max	0	50	83.589	36	135.428	11	0	50	0	50	0	50
22		min	0	1	6.795	16	-134.935	5	0	1	0	1	0	1
23	N18	max	0	50	84.468	30	178.961	23	0	50	0	50	0	50
24		min	0	1	3.044	24	-179.421	5	0	1	0	1	0	1
25	N21	max	0	50	66.27	30	593.632	5	0	50	0	50	0	50
26		min	0	1	-2.027	23	-594.354	11	0	1	0	1	0	1
27	N22	max	0	50	67.457	36	784.992	5	0	50	0	50	0	50
28		min	0	1	-7.851	17	-784.254	11	0	1	0	1	0	1
29	N23A	max	0	50	181.212	38	20.147	38	0	50	0	50	0	50
30		min	0	1	36.158	14	4.039	14	0	1	0	1	0	1
31	N24A	max	0	50	183.17	38	-4.039	25	0	50	0	50	0	50
32		min	0	1	36.553	14	-20.147	26	0	1	0	1	0	1
33	N29	max	0	50	263.787	38	111.441	38	0	50	0	50	0	50
34		min	0	1	53.747	14	22.238	14	0	1	0	1	0	1
35	N30	max	0	50	264.418	38	-22.238	25	0	50	0	50	0	50
36		min	0	1	53.799	14	-111.441	26	0	1	0	1	0	1
37	N35	max	0	50	225.17	38	176.971	38	0	50	0	50	0	50
38		min	0	1	44.841	14	33.238	14	0	1	0	1	0	1
39	N36	max	0	50	226.455	38	-33.238	25	0	50	0	50	0	50
40		min	0	1	44.89	14	-176.971	26	0	1	0	1	0	1
41	N41	max	0	50	224.414	38	247.564	38	0	50	0	50	0	50
42		min	0	1	47.336	14	48.239	14	0	1	0	1	0	1
43	N42	max	0	50	227.092	38	-48.239	25	0	50	0	50	0	50
44		min	0	1	47.44	14	-247.564	26	0	1	0	1	0	1
45	Totals:	max	1425.06	17	5828.922	38	4116.84	14						
46		min	-1425.06	11	1488.471	14	-4116.84	8						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Che...	Loc[in]	LC	Shear Ch...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*P...	phi*M...	phi*M.....		Eqn
1	M10	HSS4X4X6	.803	42.25	31	.110	65.813	z	32	22323.681	30114	3.355	3.355	...	H1-1b
2	M29A	L4X4X8	.722	33.493	5	.053	0	z	5	10363.991	23625	1.066	2.125	...	H2-1
3	M3	HSS4X4X6	.501	78	27	.093	78	z	8	9231.832	30114	3.355	3.355	...	H1-1b
4	M4	HSS4X4X6	.500	78	27	.093	78	z	8	9231.832	30114	3.355	3.355	...	H1-1b
5	M2	L4X4X4	.371	156	5	.038	130	y	5	10984.277	62532	3.138	6.483	...	H2-1
6	M7	HSS4X4X6	.337	54	5	.062	54	z	5	26089.124	30114	3.355	3.355	...	H1-1b
7	M28	L4X4X8	.305	43.481	27	.011	0	y	30	5472.832	23625	1.066	1.931	...	H2-1
8	MP1	PIPE_2.0	.299	6.188	38	.026	6.188		38	22356.067	32130	1.872	1.872	1	H1-1b
9	M8	HSS4X4X6	.289	54	11	.028	0	z	11	26089.124	30114	3.355	3.355	...	H1-1b
10	M1	L4X4X4	.281	156	11	.030	131.625	z	11	10984.277	62532	3.138	6.47	...	H2-1
11	M6	HSS4X4X6	.256	54	11	.030	54	z	11	26089.124	30114	3.355	3.355	...	H1-1b
12	M11	HSS4X4X6	.240	39	8	.044	0	z	2	22323.681	30114	3.355	3.355	1	H1-1b
13	M12	HSS4X4X6	.240	39	8	.044	0	z	2	22323.681	30114	3.355	3.355	1	H1-1b
14	M5	HSS4X4X6	.234	54	5	.022	0	z	5	26089.124	30114	3.355	3.355	...	H1-1b
15	MP2	PIPE_2.0	.215	6.188	38	.018	6.188		38	22356.067	32130	1.872	1.872	1	H1-1b
16	M13	L4X4X8	.183	49.411	33	.010	94.868	y	36	5472.832	23625	1.066	1.932	...	H2-1
17	MP3	PIPE_2.0	.138	6.188	38	.012	6.188		38	22356.067	32130	1.872	1.872	1	H1-1b
18	M9	HSS4X4X6	.121	39	20	.023	65	z	25	22323.681	30114	3.355	3.355	1	H1-1b
19	M26	HSS3X3X4	.087	0	38	.011	36	y	38	72849.295	76860	6.51	6.51	...	H1-1b
20	M25	HSS3X3X4	.087	0	38	.011	36	y	38	72849.295	76860	6.51	6.51	...	H1-1b
21	M23	HSS3X3X4	.062	0	38	.011	24	y	38	75050.903	76860	6.51	6.51	...	H1-1b
22	M22	HSS3X3X4	.062	0	38	.011	24	y	38	75050.903	76860	6.51	6.51	...	H1-1b
23	M30	HSS4X4X6	.048	0	14	.029	0	y	33	26089.124	30114	3.355	3.355	...	H1-...
24	M29	HSS4X4X6	.048	0	14	.029	0	z	33	26089.124	30114	3.355	3.355	1	H1-...
25	M19	HSS3X3X4	.039	0	38	.013	12	y	38	76403.678	76860	6.51	6.51	...	H1-1b
26	M20	HSS3X3X4	.039	0	38	.013	12	y	38	76403.678	76860	6.51	6.51	...	H1-1b
27	MP4	PIPE_2.0	.028	6.188	38	.002	6.188		38	22356.067	32130	1.872	1.872	1	H1-1b

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	L4x4	L4X4X4	Beam	Single Angle	A36 Gr.36	Typical	1.93	3	3	.044
2	FRP Angle	L4X4X8	Beam	Single Angle	FRP	Typical	3.75	5.52	5.52	.322
3	FRP Tube	HSS4X4X6	Beam	Tube	FRP	Typical	4.78	10.3	10.3	17.5
4	Standoff	HSS3X3X4	Beam	Tube	A53 Gr.B	Typical	2.44	3.02	3.02	5.08
5	Mount Pipe	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction			
2	N2	Reaction	Reaction	Reaction			
3	N3	Reaction	Reaction	Reaction			
4	N4	Reaction	Reaction	Reaction			
5	N5	Reaction	Reaction	Reaction			
6	N6	Reaction	Reaction	Reaction			
7	N9	Reaction	Reaction	Reaction			
8	N10	Reaction	Reaction	Reaction			
9	N13	Reaction	Reaction	Reaction			
10	N14	Reaction	Reaction	Reaction			
11	N17	Reaction	Reaction	Reaction			
12	N18	Reaction	Reaction	Reaction			
13	N21	Reaction	Reaction	Reaction			
14	N22	Reaction	Reaction	Reaction			
15	N15						

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
16	N16						
17	N17A						
18	N18A						
19	N19						
20	N20						
21	N23						
22	N24						
23	N23A	Reaction	Reaction	Reaction			
24	N24A	Reaction	Reaction	Reaction		Reaction	
25	N25						
26	N26						
27	N27						
28	N28						
29	N29	Reaction	Reaction	Reaction			
30	N30	Reaction	Reaction	Reaction		Reaction	
31	N31						
32	N32						
33	N33						
34	N34						
35	N35	Reaction	Reaction	Reaction			
36	N36	Reaction	Reaction	Reaction		Reaction	
37	N37						
38	N38						
39	N39						
40	N40						
41	N41	Reaction	Reaction	Reaction			
42	N42	Reaction	Reaction	Reaction		Reaction	
43	N43						
44	N44						
45	N45						
46	N46						
47	N49						

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes				None
2	M2						Yes				None
3	M3	BenPIN	BenPIN				Yes	Default			None
4	M4	BenPIN	BenPIN				Yes	Default			None
5	M5						Yes				None
6	M6						Yes				None
7	M7						Yes				None
8	M8						Yes				None
9	M9	BenPIN	BenPIN				Yes				None
10	M10	BenPIN	BenPIN				Yes				None
11	M11	BenPIN	BenPIN				Yes				None
12	M12	BenPIN	BenPIN				Yes				None
13	M13	BenPIN	BenPIN				Yes				None
14	MP4						Yes				None
15	M16						Yes	** NA **			None
16	M17						Yes	** NA **			None
17	MP3						Yes				None
18	M19						Yes				None
19	M20						Yes				None
20	MP2						Yes				None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
21	M22						Yes				None
22	M23						Yes				None
23	MP1						Yes				None
24	M25						Yes				None
25	M26						Yes				None
26	M28	BenPIN	BenPIN				Yes	Default			None
27	M29	BenPIN	BenPIN				Yes	Default			None
28	M30	BenPIN	BenPIN				Yes				None
29	M29A	BenPIN	BenPIN				Yes				None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	M1	L4x4	156			Lbyy						Lateral
2	M2	L4x4	156			Lbyy						Lateral
3	M3	FRP Tube	156			Lbyy						Lateral
4	M4	FRP Tube	156			Lbyy						Lateral
5	M5	FRP Tube	54			Lbyy						Lateral
6	M6	FRP Tube	54			Lbyy						Lateral
7	M7	FRP Tube	54			Lbyy						Lateral
8	M8	FRP Tube	54			Lbyy						Lateral
9	M9	FRP Tube	78			Lbyy						Lateral
10	M10	FRP Tube	78			Lbyy						Lateral
11	M11	FRP Tube	78			Lbyy						Lateral
12	M12	FRP Tube	78			Lbyy						Lateral
13	M13	FRP Angle	94.868			Lbyy						Lateral
14	MP4	Mount Pipe	66			Lbyy						Lateral
15	MP3	Mount Pipe	66			Lbyy						Lateral
16	M19	Standoff	12									Lateral
17	M20	Standoff	12									Lateral
18	MP2	Mount Pipe	66			Lbyy						Lateral
19	M22	Standoff	24									Lateral
20	M23	Standoff	24									Lateral
21	MP1	Mount Pipe	66			Lbyy						Lateral
22	M25	Standoff	36									Lateral
23	M26	Standoff	36									Lateral
24	M28	FRP Angle	94.868			Lbyy						Lateral
25	M29	FRP Tube	54			Lbyy						Lateral
26	M30	FRP Tube	54			Lbyy						Lateral
27	M29A	FRP Angle	68.411			Lbyy						Lateral

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
No Data to Print ...			

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP1	Y	-18.2	12
2	MP2	Y	-23.7	12
3	MP3	Y	-41.9	12
4	MP4	Y	-30.85	12
5	MP1	Y	-18.2	60
6	MP2	Y	-23.7	60

Member Point Loads (BLC 1 : Self Weight) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
7	MP3	Y	-41.9	60
8	MP4	Y	-30.85	60

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP1	Y	-80.5	12
2	MP2	Y	-100.68	12
3	MP3	Y	-143.85	12
4	MP4	Y	-100.19	12
5	MP1	Y	-80.5	60
6	MP2	Y	-100.68	60
7	MP3	Y	-143.85	60
8	MP4	Y	-100.19	60

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
1	M1	Y	-20.037	-20.037	0	%100
2	M2	Y	-20.037	-20.037	0	%100
3	M3	Y	-20.037	-20.037	0	%100
4	M4	Y	-20.037	-20.037	0	%100
5	M5	Y	-20.037	-20.037	0	%100
6	M6	Y	-20.037	-20.037	0	%100
7	M7	Y	-20.037	-20.037	0	%100
8	M8	Y	-20.037	-20.037	0	%100
9	M9	Y	-20.037	-20.037	0	%100
10	M10	Y	-20.037	-20.037	0	%100
11	M11	Y	-20.037	-20.037	0	%100
12	M12	Y	-20.037	-20.037	0	%100
13	M13	Y	-20.037	-20.037	0	%100
14	MP4	Y	-11.563	-11.563	0	%100
15	M16	Y	-6.916	-6.916	0	%100
16	M17	Y	-6.916	-6.916	0	%100
17	MP3	Y	-11.563	-11.563	0	%100
18	M19	Y	-16.757	-16.757	0	%100
19	M20	Y	-16.757	-16.757	0	%100
20	MP2	Y	-11.563	-11.563	0	%100
21	M22	Y	-16.757	-16.757	0	%100
22	M23	Y	-16.757	-16.757	0	%100
23	MP1	Y	-11.563	-11.563	0	%100
24	M25	Y	-16.757	-16.757	0	%100
25	M26	Y	-16.757	-16.757	0	%100
26	M28	Y	-20.037	-20.037	0	%100
27	M29	Y	-20.037	-20.037	0	%100
28	M30	Y	-20.037	-20.037	0	%100
29	M29A	Y	-20.037	-20.037	0	%100

Member Distributed Loads (BLC 10 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
1	M5	Y	-32.732	-10.499	8.335	10.41
2	M5	Y	-10.499	.617	10.41	12.484
3	M5	Y	.617	.617	12.484	14.558
4	M5	Y	.617	.617	14.558	16.632
5	M5	Y	.617	.617	16.632	18.706
6	M5	Y	.617	-8.746	18.706	20.78

Member Distributed Loads (BLC 10 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
7	M5	Y	-8.746	-14.16	20.78	22.855
8	M5	Y	-14.16	-4.798	22.855	24.929
9	M5	Y	-4.798	.617	24.929	27.003
10	M5	Y	.617	-4.799	27.003	29.077
11	M5	Y	-4.799	-14.163	29.077	31.151
12	M5	Y	-14.163	-8.747	31.151	33.225
13	M5	Y	-8.747	.617	33.225	35.299
14	M5	Y	.617	.617	35.299	37.374
15	M5	Y	.617	.617	37.374	39.448
16	M5	Y	.617	.617	39.448	41.522
17	M5	Y	.617	-10.488	41.522	43.596
18	M5	Y	-10.488	-32.699	43.596	45.67
19	M8	Y	-32.699	-10.488	8.33	10.404
20	M8	Y	-10.488	.617	10.404	12.478
21	M8	Y	.617	.617	12.478	14.552
22	M8	Y	.617	.617	14.552	16.626
23	M8	Y	.617	.617	16.626	18.701
24	M8	Y	.617	-8.747	18.701	20.775
25	M8	Y	-8.747	-14.163	20.775	22.849
26	M8	Y	-14.163	-4.799	22.849	24.923
27	M8	Y	-4.799	.617	24.923	26.997
28	M8	Y	.617	-4.798	26.997	29.071
29	M8	Y	-4.798	-14.16	29.071	31.145
30	M8	Y	-14.16	-8.746	31.145	33.22
31	M8	Y	-8.746	.617	33.22	35.294
32	M8	Y	.617	.617	35.294	37.368
33	M8	Y	.617	.617	37.368	39.442
34	M8	Y	.617	.617	39.442	41.516
35	M8	Y	.617	-10.499	41.516	43.59
36	M8	Y	-10.499	-32.732	43.59	45.665
37	M9	Y	-1.223	-3.371	0	26
38	M9	Y	-3.371	-3.371	26	52
39	M9	Y	-3.371	-1.223	52	78
40	M13	Y	-1.412	-7.054	9.487	26.563
41	M13	Y	-7.054	-7.073	26.563	43.639
42	M13	Y	-7.073	-9.365	43.639	60.716
43	M13	Y	-9.365	-8.165	60.716	77.792
44	M13	Y	-8.165	-.427	77.792	94.868
45	M28	Y	-.435	-8.83	0	17.076
46	M28	Y	-8.83	-9.457	17.076	34.153
47	M28	Y	-9.457	-6.595	34.153	51.229
48	M28	Y	-6.595	-7.147	51.229	68.305
49	M28	Y	-7.147	-1.331	68.305	85.381
50	M3	Y	-2.934	-8.351	7.105e-15	13
51	M3	Y	-8.351	-11.059	13	26
52	M3	Y	-11.059	-8.351	26	39
53	M3	Y	-8.351	-5.642	39	52
54	M3	Y	-5.642	-8.351	52	65
55	M3	Y	-8.351	-11.059	65	78
56	M3	Y	-11.059	-8.351	78	91
57	M3	Y	-8.351	-5.642	91	104
58	M3	Y	-5.642	-8.351	104	117
59	M3	Y	-8.351	-11.059	117	130
60	M3	Y	-11.059	-8.351	130	143
61	M3	Y	-8.351	-2.934	143	156
62	M4	Y	-2.934	-8.351	1.776e-15	13
63	M4	Y	-8.351	-11.059	13	26

Member Distributed Loads (BLC 10 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
64	M4	Y	-11.059	-8.351	26	39
65	M4	Y	-8.351	-5.642	39	52
66	M4	Y	-5.642	-8.351	52	65
67	M4	Y	-8.351	-11.059	65	78
68	M4	Y	-11.059	-8.351	78	91
69	M4	Y	-8.351	-5.642	91	104
70	M4	Y	-5.642	-8.351	104	117
71	M4	Y	-8.351	-11.059	117	130
72	M4	Y	-11.059	-8.351	130	143
73	M4	Y	-8.351	-2.934	143	156
74	M9	Y	-3.385	-8.802	13	26
75	M9	Y	-8.802	-11.51	26	39
76	M9	Y	-11.51	-8.802	39	52
77	M9	Y	-8.802	-3.385	52	65
78	M10	Y	-3.385	-8.802	13	26
79	M10	Y	-8.802	-11.51	26	39
80	M10	Y	-11.51	-8.802	39	52
81	M10	Y	-8.802	-3.385	52	65
82	M11	Y	-6.771	-17.604	13	26
83	M11	Y	-17.604	-23.021	26	39
84	M11	Y	-23.021	-17.604	39	52
85	M11	Y	-17.604	-6.771	52	65
86	M12	Y	-6.771	-17.604	13	26
87	M12	Y	-17.604	-23.021	26	39
88	M12	Y	-23.021	-17.604	39	52
89	M12	Y	-17.604	-6.771	52	65
90	M6	Y	-6.315	-3.456	0	27
91	M6	Y	-3.456	-.596	27	54
92	M7	Y	.323	-8.648	10.8	32.4
93	M7	Y	-8.648	-18.913	32.4	54
94	M10	Y	-.165	-4.929	7.8	42.9
95	M10	Y	-4.929	-9.694	42.9	78
96	M29A	Y	-.773	-12.663	0	13.682
97	M29A	Y	-12.663	-21.028	13.682	27.364
98	M29A	Y	-21.028	-18.186	27.364	41.046
99	M29A	Y	-18.186	-8.362	41.046	54.728
100	M29A	Y	-8.362	-.773	54.728	68.411

Member Distributed Loads (BLC 11 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
1	M3	Z	-17.868	-50.856	1.776e-15	13
2	M3	Z	-50.856	-67.349	13	26
3	M3	Z	-67.349	-50.856	26	39
4	M3	Z	-50.856	-34.362	39	52
5	M3	Z	-34.362	-50.856	52	65
6	M3	Z	-50.856	-67.349	65	78
7	M3	Z	-67.349	-50.856	78	91
8	M3	Z	-50.856	-34.362	91	104
9	M3	Z	-34.362	-50.856	104	117
10	M3	Z	-50.856	-67.349	117	130
11	M3	Z	-67.349	-50.856	130	143
12	M3	Z	-50.856	-17.868	143	156
13	M4	Z	-17.868	-50.856	7.105e-15	13
14	M4	Z	-50.856	-67.349	13	26
15	M4	Z	-67.349	-50.856	26	39
16	M4	Z	-50.856	-34.362	39	52

Member Distributed Loads (BLC 11 : BLC 2 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
17	M4	Z	-34.362	-50.856	52	65
18	M4	Z	-50.856	-67.349	65	78
19	M4	Z	-67.349	-50.856	78	91
20	M4	Z	-50.856	-34.362	91	104
21	M4	Z	-34.362	-50.856	104	117
22	M4	Z	-50.856	-67.349	117	130
23	M4	Z	-67.349	-50.856	130	143
24	M4	Z	-50.856	-17.868	143	156
25	M9	Z	-20.617	-53.605	13	26
26	M9	Z	-53.605	-70.098	26	39
27	M9	Z	-70.098	-53.605	39	52
28	M9	Z	-53.605	-20.617	52	65
29	M10	Z	-20.617	-53.605	13	26
30	M10	Z	-53.605	-70.098	26	39
31	M10	Z	-70.098	-53.605	39	52
32	M10	Z	-53.605	-20.617	52	65
33	M11	Z	-41.234	-107.209	13	26
34	M11	Z	-107.209	-140.197	26	39
35	M11	Z	-140.197	-107.209	39	52
36	M11	Z	-107.209	-41.234	52	65
37	M12	Z	-41.234	-107.209	13	26
38	M12	Z	-107.209	-140.197	26	39
39	M12	Z	-140.197	-107.209	39	52
40	M12	Z	-107.209	-41.234	52	65

Member Distributed Loads (BLC 12 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
1	M6	X	-38.459	-21.044	0	27
2	M6	X	-21.044	-3.629	27	54
3	M7	X	1.976	-52.643	10.8	32.4
4	M7	X	-52.643	-115.168	32.4	54
5	M10	X	-.995	-30.029	7.8	42.9
6	M10	X	-30.029	-59.062	42.9	78
7	M29A	X	-4.706	-77.108	0	13.682
8	M29A	X	-77.108	-128.069	13.682	27.364
9	M29A	X	-128.069	-110.771	27.364	41.046
10	M29A	X	-110.771	-50.926	41.046	54.728
11	M29A	X	-50.926	-4.706	54.728	68.411

Member Distributed Loads (BLC 13 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
1	M3	Z	-5.962	-16.969	1.776e-15	13
2	M3	Z	-16.969	-22.472	13	26
3	M3	Z	-22.472	-16.969	26	39
4	M3	Z	-16.969	-11.465	39	52
5	M3	Z	-11.465	-16.969	52	65
6	M3	Z	-16.969	-22.472	65	78
7	M3	Z	-22.472	-16.969	78	91
8	M3	Z	-16.969	-11.465	91	104
9	M3	Z	-11.465	-16.969	104	117
10	M3	Z	-16.969	-22.472	117	130
11	M3	Z	-22.472	-16.969	130	143
12	M3	Z	-16.969	-5.962	143	156
13	M4	Z	-5.962	-16.969	7.105e-15	13
14	M4	Z	-16.969	-22.472	13	26
15	M4	Z	-22.472	-16.969	26	39

Member Distributed Loads (BLC 13 : BLC 5 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
16	M4	Z	-16.969	-11.465	39	52
17	M4	Z	-11.465	-16.969	52	65
18	M4	Z	-16.969	-22.472	65	78
19	M4	Z	-22.472	-16.969	78	91
20	M4	Z	-16.969	-11.465	91	104
21	M4	Z	-11.465	-16.969	104	117
22	M4	Z	-16.969	-22.472	117	130
23	M4	Z	-22.472	-16.969	130	143
24	M4	Z	-16.969	-5.962	143	156
25	M9	Z	-6.879	-17.886	13	26
26	M9	Z	-17.886	-23.389	26	39
27	M9	Z	-23.389	-17.886	39	52
28	M9	Z	-17.886	-6.879	52	65
29	M10	Z	-6.879	-17.886	13	26
30	M10	Z	-17.886	-23.389	26	39
31	M10	Z	-23.389	-17.886	39	52
32	M10	Z	-17.886	-6.879	52	65
33	M11	Z	-13.758	-35.772	13	26
34	M11	Z	-35.772	-46.778	26	39
35	M11	Z	-46.778	-35.772	39	52
36	M11	Z	-35.772	-13.758	52	65
37	M12	Z	-13.758	-35.772	13	26
38	M12	Z	-35.772	-46.778	26	39
39	M12	Z	-46.778	-35.772	39	52
40	M12	Z	-35.772	-13.758	52	65

Member Distributed Loads (BLC 14 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in...	End Location[in,...
1	M6	X	-12.832	-7.022	0	27
2	M6	X	-7.022	-1.211	27	54
3	M7	X	.659	-17.565	10.8	32.4
4	M7	X	-17.565	-38.427	32.4	54
5	M10	X	-.332	-10.019	7.8	42.9
6	M10	X	-10.019	-19.707	42.9	78
7	M29A	X	-1.57	-25.728	0	13.682
8	M29A	X	-25.728	-42.732	13.682	27.364
9	M29A	X	-42.732	-36.96	27.364	41.046
10	M29A	X	-36.96	-16.992	41.046	54.728
11	M29A	X	-16.992	-1.57	54.728	68.411

Member Area Loads (BLC 1 : Self Weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N1	N15	N17A	N3	Y	Two Way	-5
2	N17A	N15	N16	N18A	Y	Two Way	-5
3	N18A	N16	N2	N4	Y	Two Way	-5

Member Area Loads (BLC 2 : Wind Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N15	N17A	N18A	N16	Z	Two Way	-30.45

Member Area Loads (BLC 3 : Wind Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N16	N18A	N4	N2	X	Two Way	-30.45

Member Area Loads (BLC 5 : Wind + Ice Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N15	N17A	N18A	N16	Z	Two Way	-10.16

Member Area Loads (BLC 6 : Wind + Ice Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N16	N18A	N4	N2	X	Two Way	-10.16

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE – HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE – HY150, U.N.O.
   - CONCRETE REBAR: ADHESIVE – RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE

SIZE	ULTIMATE TORQUE STRENGTH	RECOMMENDED MAXIMUM INSTALLATION TORQUE
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER

	RANGE	RECOMMENDED
EDGE DISTANCE – CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE – CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH – CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
   - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

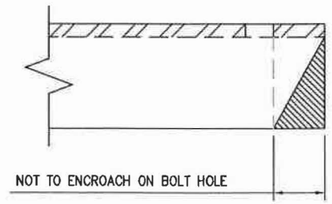
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



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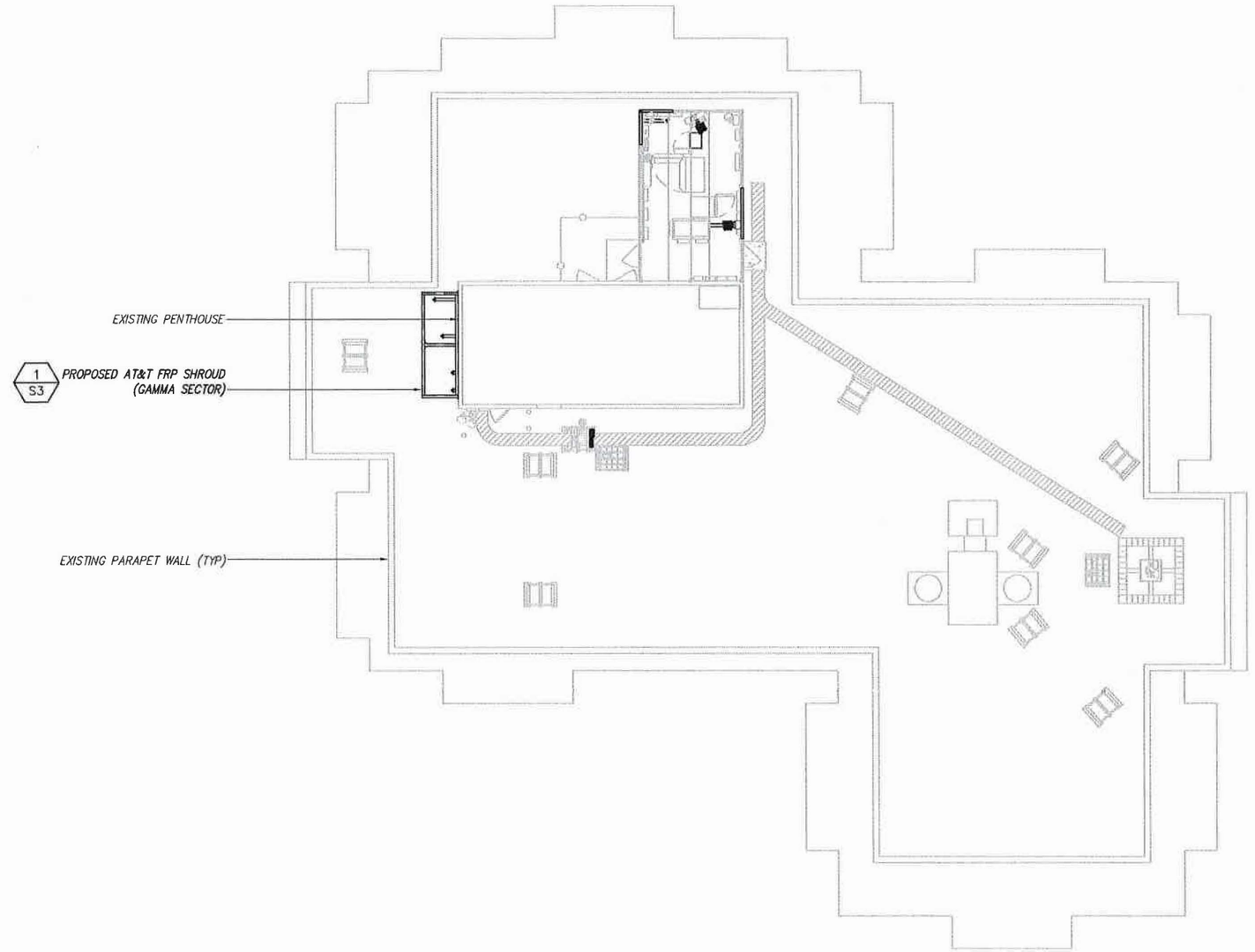
Drawing Title
GENERAL NOTES

Drawing Number
S1



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COMMONWEALTH OF MASSACHUSETTS
JOSEPH R. JOHNSTON
CIVIL
No. 30390
REGISTERED PROFESSIONAL ENGINEER
MAR 25 2019

Joseph R. Johnston

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No	Submittal / Revision	Apv'd	Date
1	ISSUED FOR CONSTRUCTION	JRJ	3/25/19
0	ISSUED FOR CONSTRUCTION	JRJ	12/6/18

Drawn: BE Date: 12/6/18
Designed: BDA Date: 12/6/18
Checked: NRO Date: 12/6/18

Project Number:
484-001

Project Title:

FA# 10133905
MA2268

CAMBRIDGE LINNAENA ST
GILBERT HALL

64 LINNAEAN STREET
CAMBRIDGE, MA 02138

Prepared For:
EMPIRE telecom

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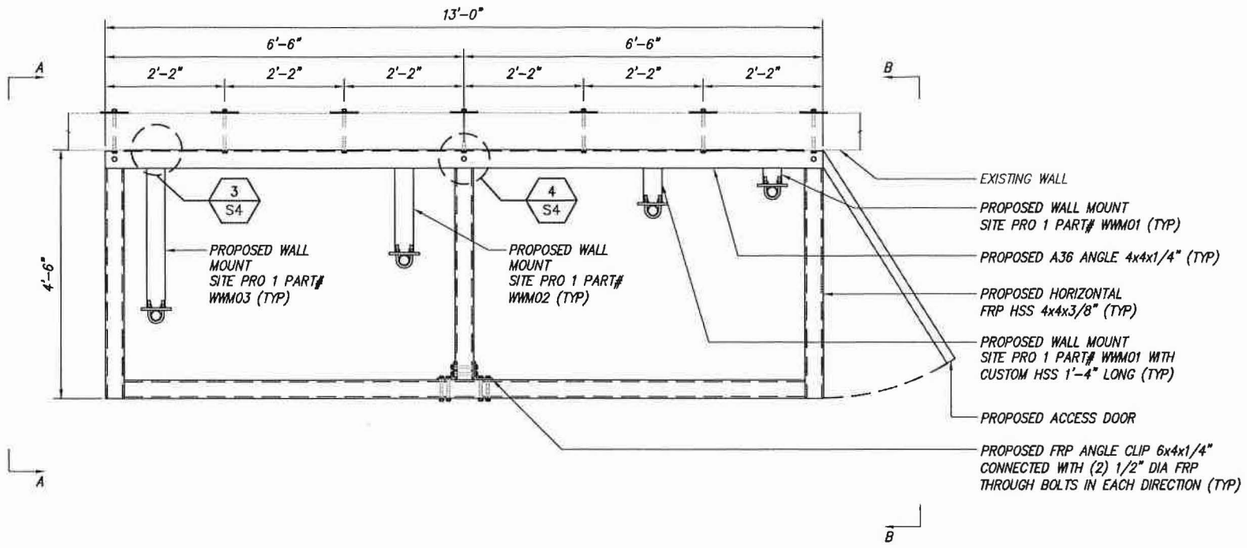
03/25/19

Drawing Title

ROOF PLAN

Drawing Number

S2



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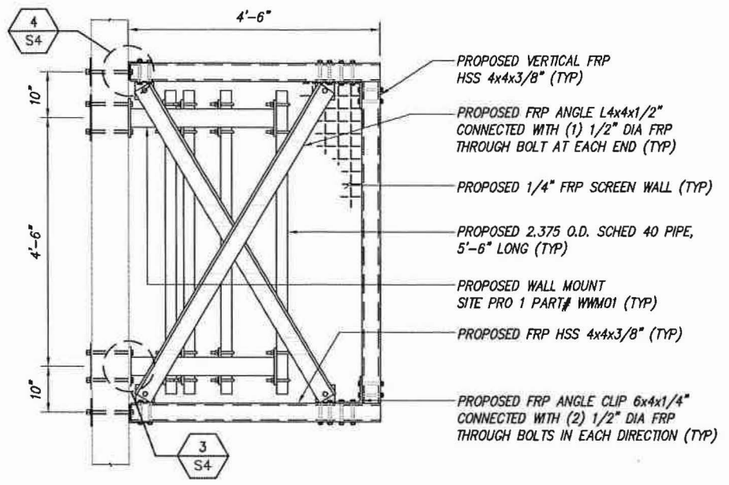

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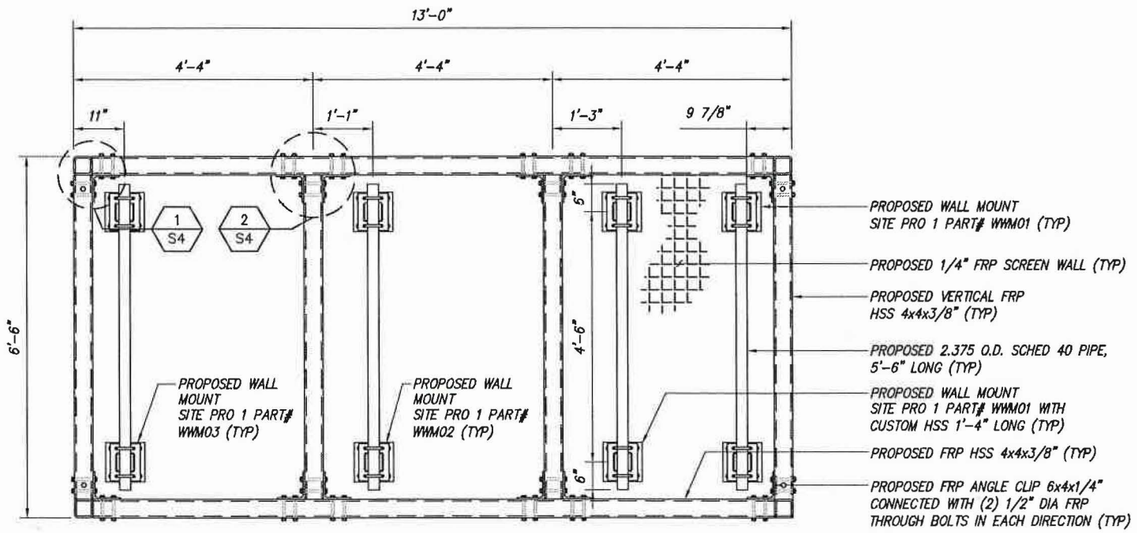

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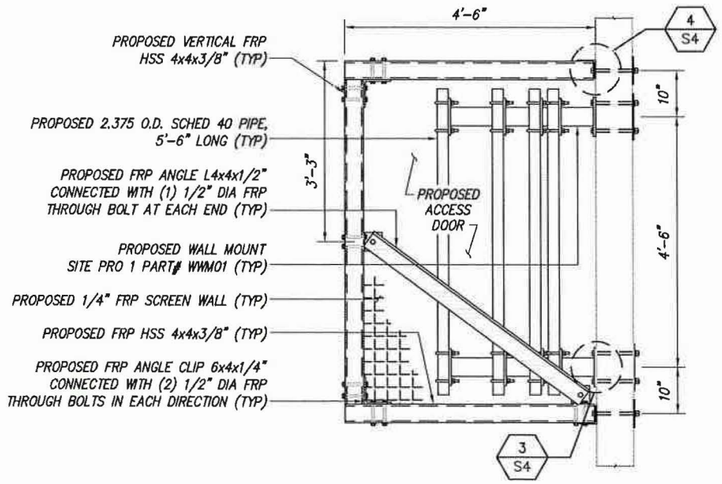

4 SECTION B–B
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INFINIGY
1033 Watervliet Shaker Rd
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at&t

COMMONWEALTH OF MASSACHUSETTS
JOSEPH R. JOHNSTON
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No. 39081
REGISTERED
PROFESSIONAL ENGINEER
MAY 3, 2019

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GILBERT HALL
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CAMBRIDGE, MA 02138

Prepared For:
EMPIRE telecom

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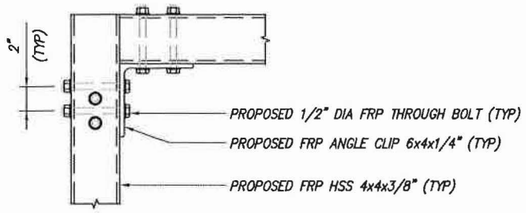
Drawing Title
FRP SHROUD DESIGN

Drawing Number
S3



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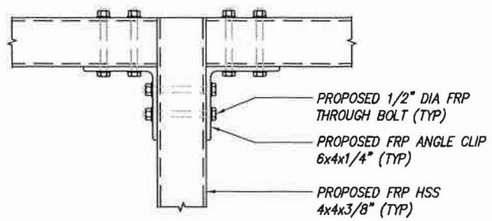

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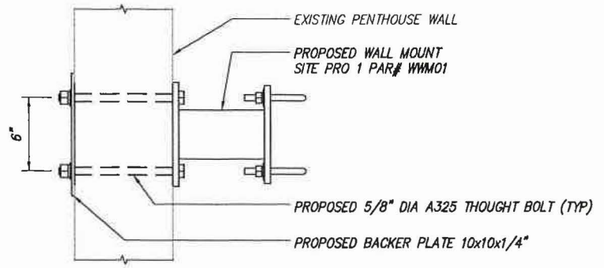

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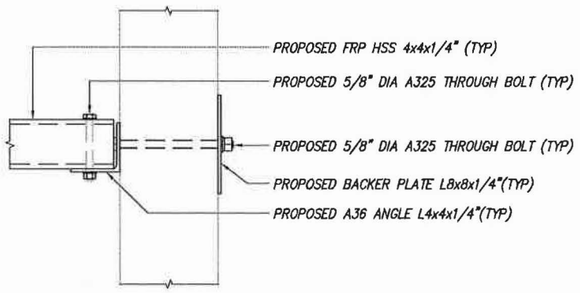

4 ANGLE TO WALL CONNECTION
SCALE: NOT TO SCALE

INFINIGY
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COMMONWEALTH OF MASSACHUSETTS
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MAR. 25, 2019
Joseph R Johnston

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Date:
03/25/19

Drawing Title
CONNECTION DETAILS

Drawing Number
S4

brownrudnick

Michael R. Dolan, Esq.
direct dial: 401-276-2610
mdolan@brownrudnick.com

October 1, 2019

VIA FEDERAL EXPRESS

City of Cambridge
Board of Zoning Appeal
831 Massachusetts Avenue
Cambridge, MA 02139

RE: Request of New Cingular Wireless PCS, LLC ("AT&T") for Administrative Review of an Eligible Facilities Request to Modify Transmission Equipment on the existing 49' 7" above ground level ("AGL") building (the "Building") located at 64 Linnaean Street, Cambridge MA 02141 (Assessor's Parcel Identification Map 213, Lot 2A), pursuant to Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012 (the "Spectrum Act") and Special Permit pursuant to: Article 4, Section 4.32.g.1; Article 4, Section 4.40 (Footnote 49); and Article 10, Section 10.40 of the City of Cambridge Zoning Ordinance; Massachusetts General Laws, Ch 40A, Section 9; the Telecommunications Act of 1996 (the "TCA"), and the Spectrum Act, all rights reserved.

Dear Honorable Members of the Cambridge Board of Zoning Appeals:

On behalf of AT&T, while reserving all rights, we are pleased to submit this Eligible Facilities Request and Special Permit Application to the City of Cambridge Board of Zoning Appeals (the "Board") in support of AT&T's request to add, remove, modify and replace Transmission Equipment on the existing Building located at 64 Linnaean Street, Cambridge, MA 02138 (Assessor's Parcel Identification Map 213, Lot 2A) (the "Site"). Capitalized terms not defined herein shall have the same meaning as provided in the Spectrum Act and Regulations (defined below).

As noted on the attached plans (the "Plans"), the Building is owned by the President and Fellows of Harvard College and AT&T currently has Transmission Equipment mounted on the Building at the 56' AGL antenna centerline mark, concealed by screen walls, and/or painted to match the color of the penthouse, with electronic equipment partially concealed by a screen wall on the roof of the Building (the "Facility"). AT&T's Facility currently includes nine (9) existing panel antennas. Three (3) panel antennas are mounted on the corner of an existing penthouse on the roof of the Building, painted to match the color of the facades to which they are attached. Four (4) panel antennas are mounted behind and are concealed by, an existing screen wall (faux brick) which surrounds AT&T's equipment platform on the roof of the Building. Two (2) panel antennas are concealed within an existing faux brick chimney on the roof of the Building. As

depicted on the Plans, AT&T is seeking to: install three (3) new panel antennas (two (2) behind the screen wall concealing the equipment and one (1) on the façade of the penthouse for a total of 12 panel antennas (net gain of three (3) antennas); install six (6) additional remote radio units and collocate other Transmission Equipment to the Facility; modify the existing concealment platform structure to accommodate new antennas; shift existing equipment on the existing platform to accommodate the additional antennas; shift the locations of some of the existing panel antennas behind the existing screen wall around the equipment and on the façade of the penthouse; and install a proposed concealment structure to conceal the existing and proposed antennas on the façade of the existing penthouse on the roof of the Building.

AT&T's Facility has and continues to comply with all applicable terms and conditions of the Cambridge Zoning Ordinance (the "Ordinance"). As the replacement antennas of the Facility will be mounted at the same antenna centerline heights as, and will be painted to match, AT&T's existing antennas, there will be no undue adverse impacts upon historic resources, scenic views, residential property values or man-made resources and the aesthetic qualities of the City of are preserved. The Facility is passive in nature and does not generate unreasonable noise, odors, smoke, waste, or significant amounts of traffic. This is an unmanned facility and does not have negative effects upon adjoining lots. The Facility has and will continue to comply with all applicable federal, state and local laws, regulations and guidelines, including applicable radio frequency emissions standards.

AT&T, while reserving all rights, respectfully requests, to the extent necessary, that a special permit be granted so that the antennas may be installed to reflect the proposed modification as reflected on the Plans submitted herewith.

ELIGIBLE FACILITIES REQUEST

On behalf of AT&T, while reserving all rights, we seek approval of the site modifications as depicted on the Plans as an Eligible Facilities Request. As you may know, Section 6409(a) of the "Spectrum Act" (copy attached) mandates that state and local governments *"may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station."* [emphasis added]. Under Section 6409(a)(2)(A)-(C), an Eligible Facilities Request is any request to modify a Tower or Base Station that involves "collocations of new Transmission Equipment," "removal," or "replacement" of Transmission Equipment.

Federal law now preempts many of the permit application requirements that the City of Cambridge may previously have required from an applicant and provides for a limited, administrative review of AT&T's Eligible Facilities Request application. This Eligible Facilities Request involves an effort to collocate, remove, modify, or replace Transmission Equipment on and adjacent to an existing Building used by an FCC licensed wireless carrier. The existing Building is a Structure that is 49' 7" AGL supporting wireless Transmission Equipment. AT&T

seeks administrative approval for the proposed modifications which is clearly an Eligible Facilities Request which does not substantially change the physical dimensions of the Building pursuant to Section 6409 of the Spectrum Act. AT&T proposes to: install three (3) additional panel antennas (one (1) per sector) at the same 56' AGL centerline mounting heights as its existing panel antennas; collocate remote radio units and surge arrestors; and collocate cables, fiber and other Transmission Equipment as illustrated on Plans submitted herewith.

The equipment identified on the Plans submitted as part of this Eligible Facilities Request application that will be collocated or replaced is Transmission Equipment pursuant to the FCC definition. The FCC has defined Transmission Equipment as "any equipment that facilitates transmission for any Commission-licensed or authorized wireless communication service, including, but not limited to, radio transceivers, antennas and other relevant equipment associated with and necessary to their operation, including coaxial or fiber-optic cable, and regular and back-up power supply. This definition includes equipment used in any technological configuration associated with any Commission-authorized wireless transmission, licensed or unlicensed, terrestrial or satellite, including commercial mobile, private mobile, broadcast and public safety services, as well as fixed wireless services such as microwave backhaul or fixed broadband."

As you may also know, the FCC adopted a Report and Order, In re: Acceleration of Broadband Deployment by Improving Wireless Facilities Siting Policies, FCC Docket No.13-238, Report and Order No. 14-153 (October 17, 2014) Final Rule codified at 47 CFR Parts 1 and 17 promulgating regulations (the "Regulations") interpreting and implementing the provisions of the Spectrum Act, which Regulations became effective on April 8, 2015 (with certain provisions effective on May 18, 2015). The Regulations determined that any modification to a Base Station that meets the following six criteria does not substantially change the physical dimensions of the existing Building and, therefore, is an Eligible Facilities Request which must be granted:

1. The modifications do not increase the height of the Building by more than ten feet (10') from an existing antenna array or ten percent (10%), whichever is greater.

2. The modifications do not protrude from the edge of the Tower by more than six feet (6').

3. The modifications do not involve the installation of more than the standard number of equipment cabinets for the technology involved, not to exceed four.

4. The modifications do not entail any excavation or deployment outside of the Site.

5. The modifications do not defeat any existing concealment elements of the Tower.

6. The modifications comply with prior conditions of approval of the Base Station, unless the non-compliance is due to an increase in height, increase in width, addition of equipment cabinets, or new excavation that does not exceed the corresponding "substantial change" thresholds in numbers 1-4 above.

As evidenced on the Plans, this Eligible Facilities Request satisfies each of the six review criteria enumerated by the FCC in the Regulations. In accordance with the Spectrum Act and the Regulations, AT&T's proposed modifications will not increase the height of the Building nor protrude from the edge of the Building by more than six feet (6'). In fact, the antennas will not protrude from the facades of the existing penthouse on the roof of the Building by less than five feet (5'). AT&T does not propose excavating outside of the Site and is not adding any additional equipment cabinets. Lastly, AT&T's modifications do not defeat any concealment elements because the antenna modifications will be located on the Building at the same centerline mounting heights and in substantially the same manner as AT&T's existing antennas. AT&T's modifications to the Transmission Equipment at the Building contained in this Eligible Facilities Request fully conform to Section 6409(a) of the Spectrum Act.

While the Ordinance may provide that a special permit or other zoning relief is required for modifications and colocations, such a discretionary process is contrary to the guidance issued by the FCC in its Public Notice (the "Public Notice") dated January 25, 2013 and the Massachusetts Office of the Attorney General (the "Attorney General") in response letters to municipalities granting approvals of bylaw amendments.

In its Public Notice, the FCC determined that the relevant government entity may require the filing of an application for "administrative approval" only. Additionally, pursuant to Section 1.40001(c)(1) of the Regulations, "when an applicant asserts in writing that a request for a modification is covered by this section, a State or local government may require the applicant to provide documentation or information only to the extent reasonably related to determining whether the request meets the requirements of this section." The Regulations provide that applicants are not required to justify a need for the facility. Further, the Regulations also require that local governmental approvals must be granted for eligible facilities requests within 60 days of the date that the application is submitted. Clearly, this review may not be subject to a discretionary special permit process with the associated public hearing and appeal period provisions. Likewise, the Attorney General has issued a number of letters to municipalities reflecting that same opinion and warning municipalities that such qualifying requests under Section 6409 cannot be subject to a discretionary special permit process. We are confident that you will agree that AT&T's proposed modifications do not substantially change the physical dimensions of the Eligible Support Structure or Base Station at the Site, as enumerated in the Regulations.

SPECIAL PERMIT

10.43 Criteria.

Special permits will normally be granted where specific provisions of this Ordinance are met, except when particulars of the location or use, not generally true of the district or of the uses permitted in it, would cause granting of such permit to be to the detriment of the public interest because:

(a) It appears that requirements of this Ordinance cannot or will not be met, or

AT&T's modifications to its existing wireless communications facility will continue to comply with all applicable sections of the Ordinance as the new antennas will be located in substantially the same manner as the existing antennas, will not increase the height of the Building, and will all be enclosed by concealment structures.

(b) traffic generated or patterns of access or egress would cause congestion, hazard, or substantial change in established neighborhood character, or

AT&T's modifications to its existing wireless communications facility will not result in any substantial change in the character of the neighborhood as there will be no increase in the amount of traffic to and from the Site, or any changes to existing patterns of access or egress to the Site.

(c) the continued operation of or the development of adjacent uses as permitted in the Zoning Ordinance would be adversely affected by the nature of the proposed use, or

The continued operation of or the development of adjacent uses will not be adversely affected by AT&T's modifications because AT&T's facility will continue to be a passive use and will not produce any smoke, odors, waste, glare, dust, or unreasonable amounts of traffic.

(d) nuisance or hazard would be created to the detriment of the health, safety and/or welfare of the occupant of the proposed use or the citizens of the City, or

AT&T's modifications to its existing wireless communications facility will not result in any nuisance or hazard to the detriment of the health, safety, or welfare of the citizens of the City because AT&T's facility will continue to be a passive use and will not produce any smoke, odors, waste, glare, dust, or unreasonable amounts of traffic. As evidenced by the MPE Study submitted herewith, AT&T's

facility will continue to comply with all applicable regulations and guidelines pertaining to radio frequency emissions.

(e) for other reasons, the proposed use would impair the integrity of the district or adjoining district, or otherwise derogate from the intent and purpose of this Ordinance, and

The proposed modifications to the existing wireless facility are in harmony with the purposes of the Ordinance because by modifying an existing wireless facility on an existing Building in a manner which does not increase the height of the Building or expand its footprint, potential visual impacts are minimized. Also, the proposed modifications will not produce any smoke, odors, waste, glare or traffic. The Facility will have no negative impact on natural or undeveloped areas, wildlife, flora or endangered species. Consistent with the Ordinance, the Facility will continue to function as a wireless communications services facility within a local, regional, and national communications system. This system operates under licenses from the FCC, and AT&T is mandated and authorized to provide adequate service to the general public. The proposed modifications will comply with all applicable regulations, standards and guidelines with respect to radiofrequency emissions.

The facility will benefit those living and working in, and traveling through the area by providing enhanced wireless telecommunication services. The facility will not adversely impact adjacent properties and neighborhoods as the existing facility is located on an existing Building. The modification of the facility will not be a threat to public health, safety and welfare. In fact, Applicant submits that the facility aids in public safety by providing and improving wireless communications services to the residents, businesses, commuters, and emergency personnel utilizing wireless communications in the immediate vicinity and along the nearby roads. Consistent with the Ordinance, the facility will continue to function as a wireless communications services facility within a local, regional, and national communications system. This system operates under license from the FCC, and AT&T is mandated and authorized to provide adequate service to the general public. The facility will not generate any objectionable noise, odor, fumes, glare, smoke, or dust or require additional lighting or signage. The facility will have no negative impact on property values in the area. This is an unmanned facility and will have minimal negative effect on the adjoining lots.

(f) the new use or building construction is inconsistent with the Urban Design Objectives set forth in Section 19.30.

AT&T's facility will not be inconsistent with the Citywide Urban Design Objectives of Section 19.30 of the Ordinance because AT&T's modifications will

not result in an increase in the height of the Building or any alteration of existing setbacks on the Site. AT&T's modifications will not result in any increase in traffic to or from the Site and will not adversely impact upon pedestrians or bicyclists and, as AT&T's facility will continue to be unmanned, it will have no impact on parking on Site or the surrounding area. AT&T's new additional antennas will be located on the Building in a substantially similar manner as the existing antennas and will all be enclosed by concealment structures. AT&T's facility will not produce any waste and noise levels on Site will not increase as a result of AT&T's modifications, nor will there be any additional exterior lighting as a result of AT&T's modification.

AT&T's facility operates using standard electric and telephone services. As the facility is unmanned, it requires no water or sewer services, and City infrastructure will not be overburdened.

THE TELECOMMUNICATIONS ACT OF 1996 - THE TCA

The Federal TCA provides that: no laws or actions by any local government or planning or zoning board may prohibit, or have the effect of prohibiting, the placement, construction, or modification of communications towers, antennas, or other wireless facilities in any particular geographic area, see 47 U.S.C. §332(c)(7)(B)(i); local government or planning or zoning boards may not unreasonably discriminate among providers of functionally equivalent services, see 47 U.S.C. §332(c)(7)(B)(i); health concerns may not be considered so long as the emissions comply with the applicable standards of the FCC, see 47 U.S.C. §332(c)(7)(B)(iv); and, decisions must be rendered within a reasonable period of time, see 47 U.S.C. §332(c)(7)(B)(ii) and the FCC's Declaratory Ruling commonly referred to as the "Shot Clock".

CONCLUSION

AT&T is committed to working cooperatively with the City of Cambridge, and all jurisdictions around the country, to secure expeditious approval of requests to modify existing personal wireless service facilities. We respectfully request that the Board review AT&T's proposed modifications and determine that the modifications do not "substantially change the physical dimensions of the Base Station" pursuant to Section 6409 of the Spectrum Act, or in the alternative, to the extent necessary, grant a special permit pursuant to: Article 4, Section 4.32.g.1; Article 4, Section 4.40 (Footnote 49); and Article 10, Section 10.40 of the City of Cambridge Zoning Ordinance; Massachusetts General Laws, Ch 40A, Section 9; the TCA, all rights reserved.

AT&T respectfully requests that the Board approve this Eligible Facilities Request, or in the alternative, all rights reserved, a Special Permit. Please do not hesitate to contact me should there be any questions.

Respectfully,

BROWN RUDNICK LLP

Michael R. Dolan, Esq.

brownrudnick

ATTACHMENTS

1. Application Form
2. Letter of Authorization
3. FCC Licenses
4. Plans
5. FCC Public Notice
6. FCC Regulations
7. Photographs and Simulations
8. Structural Report
9. MPE Study
10. Representative Letter from the Attorney General

47 USC 1455

Middle Class Tax Relief and Job Creation Act of 2012

SEC. 6409. WIRELESS FACILITIES DEPLOYMENT

(a) FACILITY MODIFICATION.—

(1) IN GENERAL.—Notwithstanding section 704 of the Telecommunications Act of 1996 (Public Law 104–104) or any other provision of law, a State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station.

(2) ELIGIBLE FACILITIES REQUEST.—For purposes this subsection, the term ''eligible facilities request'' means any request for modification of an existing wireless tower or base station that involves –
(A) collocation of new transmission equipment;
(B) removal of transmission equipment; or
(C) replacement of transmission equipment.

(3) APPLICABILITY OF ENVIRONMENTAL LAWS. Nothing in paragraph (1) shall be construed to relieve the Commission from the requirements of the National Historic Preservation Act or the National Environmental Policy Act of 1969.

BR

ADDENDUM "A"

The Regulations provide that "substantial change" means a modification that changes the physical dimensions of an eligible support structure that meets any of the following criteria. Included below are comments in bold to demonstrate that the modification is NOT a substantial change.

For Buildings, the modification increases the height of the structure by more than 10% or more than twenty (20) feet, whichever is greater;

As depicted on the Plans, AT&T's proposed modifications will not increase the height of the Building at all.

For towers, the modification involves adding an appurtenance to the body of the structure that would protrude from the edge of the structure by more than six (6) feet;

As depicted on the Plans, AT&T's Transmission Equipment will not protrude from the edge of the Building.

For any eligible support structure, the modification involves installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets;

As depicted on the Plans, AT&T does not propose to add any additional equipment cabinets as a part of this project.

The modification entails any excavation or deployment outside the current site;

AT&T does not propose any excavation or deployment outside the current site.

The modification would defeat the concealment elements of the building; or

As depicted on the Plans, AT&T's modification will be substantially similar to the existing transmission equipment on the Building.

The modification does not comply with conditions associated with the siting approval of the construction or modification of the eligible support structure or base station equipment, provided however that this limitation does not apply to any modification that is non-compliant only in a manner that would not exceed the thresholds identified in § 1.40001(b)(7)(i) through (iv).

AT&T is not aware of any noncompliance and respectfully asserts that the proposed modifications are consistent with all applicable terms of prior approvals for the wireless facility (see copies of special permits attached).

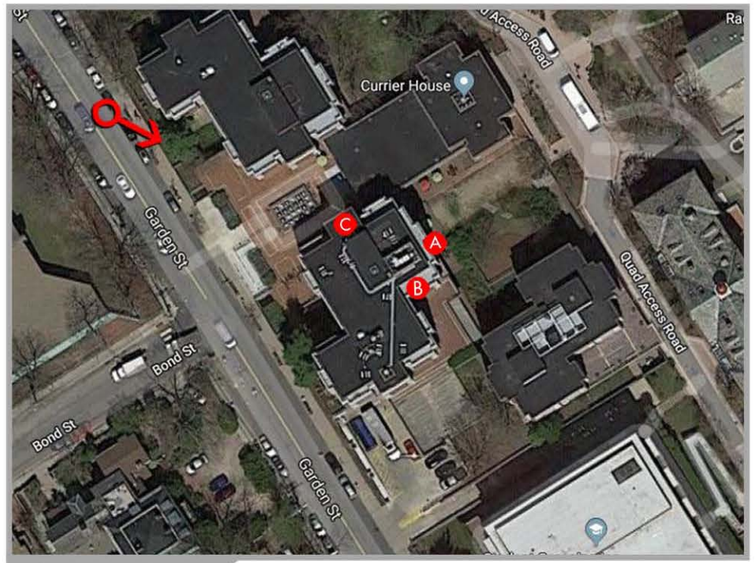
INFINIGY
THE SOLUTIONS ARE ENDLESS

MA2268

CAMBRIDGE LINNAEAN ST GILBERT HALL

64 LINNAEAN STREET CAMBRIDGE, MA 02138

AT&T



LOCATION

@2016 Google Maps

EXISTING

PROPOSED

VIEW 1 | LOOKING SOUTHEAST

INFINIGY
THE SOLUTIONS ARE ENDLESS

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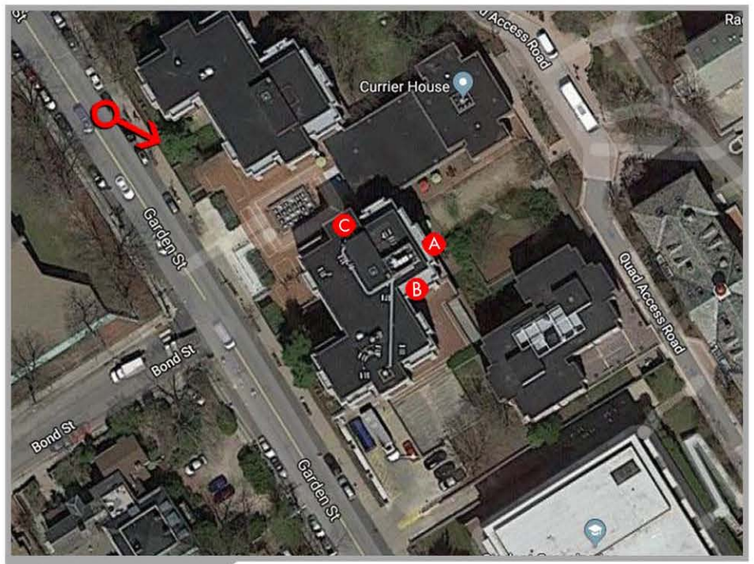

LOCATION

@2016 Google Maps

EXISTING

PROPOSED

VIEW 2 | LOOKING SOUTHEAST

INFINIGY
THE SOLUTIONS ARE ENDLESS

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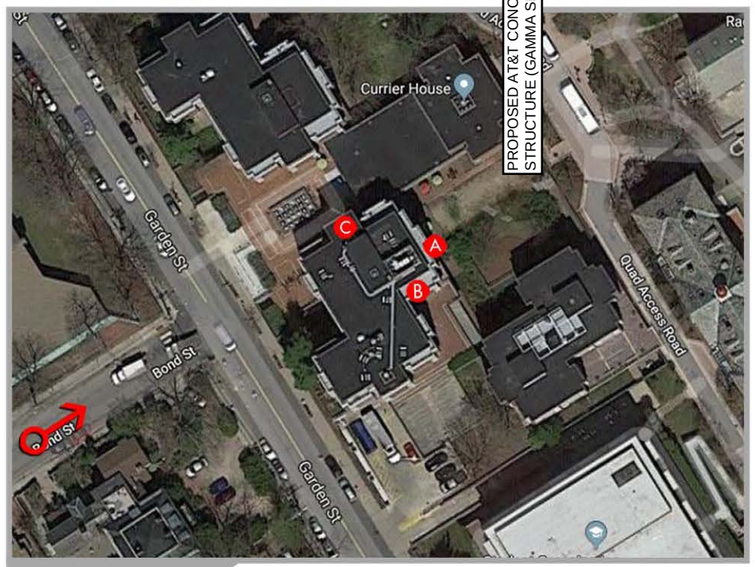


LOCATION

@2016 Google Maps

EXISTING

PROPOSED

VIEW 3 | LOOKING NORTHEAST

INFINIGY
THE SOLUTIONS ARE ENDLESS

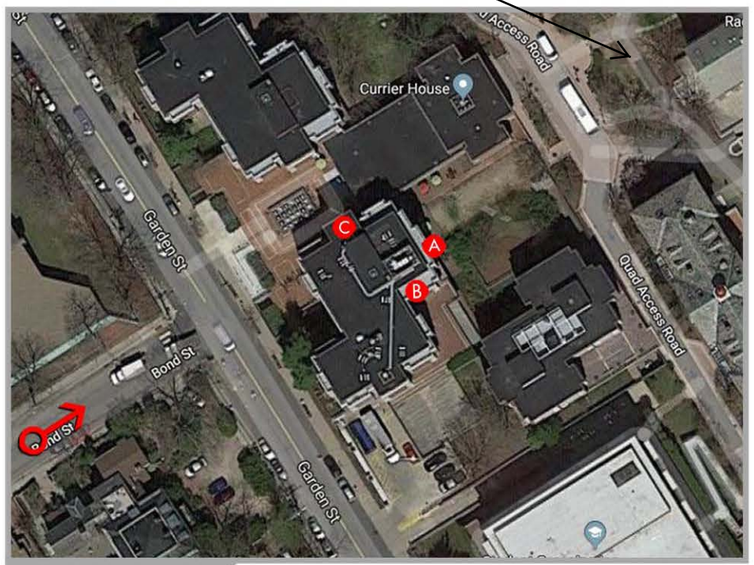
PROPOSED AT&T CONCEALMENT STRUCTURE (GAMMA SECTOR)

MA2268

CAMBRIDGE LINNAEAN ST GILBERT HALL

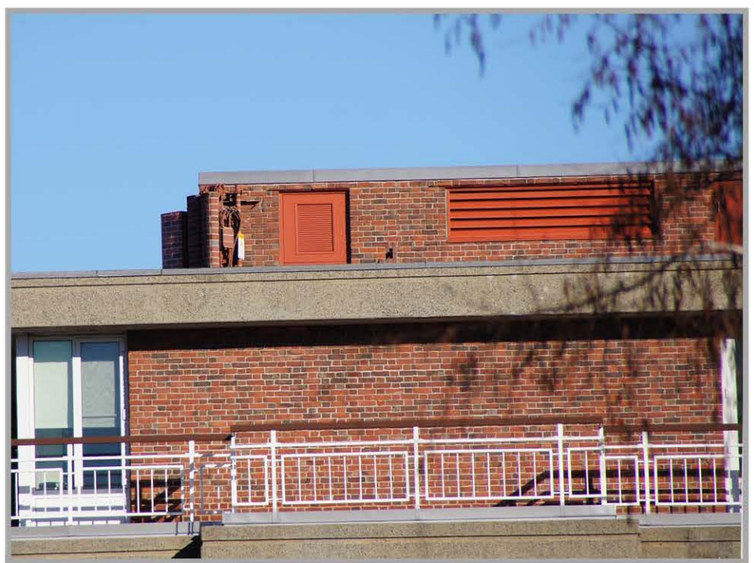
64 LINNAEAN STREET CAMBRIDGE, MA 02138

AT&T



LOCATION

@2016 Google Maps



EXISTING

PROPOSED

VIEW 4 | LOOKING NORTHEAST

AT&T's FCC Licenses

From: MCNANY, ESTHER
To: Christina Wallis
Cc: Scott Pike; Lauren Groppi; BIDON-LEWIS, RACHELLE; Carolyn Seeley; New England Compliance
Subject: RE: FA 10133905 / MA2268 - LTE 4C, 5C - FCC Licenses?
Date: Thursday, August 15, 2019 12:58:13 PM
Attachments: image001.png
image002.png

Call Signs

Select	Site Compliance	Call Sign	Radio Service	Market	Region	Entity Type
		KNKA226	Cellular License	BOSTON, MA - A	NORTHEAST	mobility
		KNLF216	PCS Broadband Auction 4, 5	BOSTON-PROVIDENCE - CW-A11	NORTHEAST	mobility
		WPOI214	PCS Broadband Auction 4, 5	BOSTON-PROVIDENCE - CW-A7	NORTHEAST	mobility
		KNLF954	PCS Broadband Auction 4, 5	BOSTON, MA- CW-D	NORTHEAST	mobility
		WQQE234-NE	Public Safety Broadband Nationwide Licen	NW- SP	SPECTRUM LEASING	mobility
		WQJU427	700 MHz Lower Band (Blocks A, B, E)	BOSTON-LOWELL-BROCKTON-LAWRENCE-HAVERHILL, MA-NH- WY-B	NORTHEAST	mobility
		WQTZ616	700 MHz Lower Band (Blocks A, B, E)	BOSTON-WORCESTER-LAWRENCE-LOWELL-BROCKTON, MA-NH-RI-VT- WY-E	NORTHEAST	mobility
		WPWU950	700 MHz Lower Band (Blocks C, D)	BOSTON-LOWELL-BROCKTON-LAWRENCE-HAVERHILL, MA-NH- WZ-C	NORTHEAST	mobility
		WPZA235	700 MHz Lower Band (Blocks C, D)	NORTHEAST - WZ-D	NORTHEAST	mobility
		WQVN675	AWS (1710-1755 MHz and 2110-2155 MHz)	BOSTON-WORCESTER-LAWRENCE-LOWELL-BROCKTON, MA-NH-RI-VT- AT-J	NORTHEAST	mobility
		KNLB297	Wireless Communications Service License	NORTHEAST- WS-D	NORTHEAST	mobility
		WPQL634	Wireless Communications Service License	NORTHEAST- WS-C7	NORTHEAST	mobility
		KNLB210	Wireless Communications Service License	BOSTON- WS-A	NORTHEAST	mobility
		KNLB200	Wireless Communications Service License	BOSTON- WS-B	NORTHEAST	mobility

Esther McNany
Manager Network Compliance
Wireless Engineering, Construction & Operations
(mobile) 860-729-1690 | em668m@att.com

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MOBILIZING **YOUR** WORLD

From: Christina Wallis <cwallis@empiretelecomm.com>
Sent: Thursday, August 15, 2019 7:19 AM
To: MCNANY, ESTHER <em668m@att.com>
Cc: Scott Pike <spike@empiretelecomm.com>; Lauren Groppi <lgroppi@empiretelecomm.com>; BIDON-LEWIS, RACHELLE <rb9471@att.com>; Carolyn Seeley <cseeley@empiretelecomm.com>; New England Compliance <newenglandcompliance@empiretelecomm.com>
Subject: FA 10133905 / MA2268 - LTE 4C, 5C - FCC Licenses?

Good Morning Esther,

SAQ has requested the FCC licenses for FA 10133905 / MA2268. Can you please send us the Call Signs for this site so they can look up the FCC licenses up on the website.

Thank you,
Christina Wallis
Compliance Specialist
16 Esquire Road, Billerica, MA 01862
Cell: (978) 405-4786
cwallis@empiretelecomm.com
newenglandcompliance@empiretelecomm.com

EMPIRE telecom
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DONALD L. HAES, JR., CHP, CLSO

Radiation Safety Specialist

PO Box 198, Hampstead, NH 03841 603-303-9959 Email: donald_haes_chp@comcast.net

August 12, 2019

RE: Installation of a panel antennas and associated equipment for the upgrade to the existing AT&T Mobility PWS facility mounted on the rooftop of the building at 64 Linnaean Street Cambridge, MA.

PURPOSE

I have reviewed the information pertinent to the proposed installation at the above location. To determine regulatory compliance, theoretical calculations of maximal radio-frequency (RF) fields have been prepared. The physical conditions are that AT&T Mobility proposes to perform the following changes to their existing personal wireless services (PWS) equipment on the rooftop of the building at 64 Linnaean Street Cambridge, MA (See Figure 2): Exchange three (3) panel antennas and three (3) remote radio head units with three (3) new panel antennas and nine (9) remote radio head units.

This report considers the contributions of the proposed AT&T Mobility PWS transmitters operating at their proposed FCC licensed capacity. The calculated values of RF fields are presented as a percent of current Maximum Permissible Exposures (%MPE) as adopted by the Federal Communications Commission (FCC),[i,ii] and those established by the Massachusetts Department of Public Health (MDPH).[iii]

SUMMARY

Theoretical RF field calculations data indicate the summation of the proposed AT&T Mobility PWS RF contributions would be within the established RF exposure guidelines; see Figures 3a, 3b, and 3c. This includes all publicly accessible areas, and the surrounding neighborhood in general. RF field levels within the building would be below guidelines for RF exposure as well; see Table 3. The results support compliance with the pertinent sections of the Massachusetts Department of Public Health regulations regarding PWS facilities, and the FCC's guidelines for RF exposure.

Based on the results of the theoretical RF fields I have calculated, it is my expert opinion that this facility would continue to comply with all regulatory guidelines for RF exposure with the proposed AT&T Mobility antenna and transmitter installations.

Note: The analyses, conclusions and professional opinions are based upon the precise parameters and conditions of this particular site; **AT&T PWS facility mounted on the rooftop of the building at 64 Linnaean Street Cambridge, MA**. Utilization of these analyses, conclusions and professional opinions for any personal wireless services installation, existing or proposed, other than the aforementioned has not been sanctioned by the author, and therefore should not be accepted as evidence of regulatory compliance.

EXPOSURE LIMITS AND GUIDELINES

RF exposure guidelines enforced by the FCC were established by the American National Standards Institute (ANSI)[iv] and the National Council on Radiation Protection and Measurement (NCRP).[v] The RF exposure guidelines are listed for RF workers and members of the public. The applicable FCC RF exposure guidelines for the public are listed in Table 1 and depicted in Figure 1. All listed values are intended to be averaged over any contiguous 30-minute period.

Table 1: Maximum Permissible Exposure (MPE) Values in Public Areas

Frequency Bands	Electric Fields	Magnetic Fields	Equivalent Power Density
0.3 – 1.34 MHz	614 (V/m)	1.63 (A/m)	(100) mW/cm^2
1.34 - 30 MHz	824/f (V/m)	2.19/f (A/m)	(100) mW/cm^2
30 - 300 MHz	27.5 (V/m)	0.073 (A/m)	0.2 mW/cm^2
300 - 1500 MHz	--	--	f/1500 mW/cm^2
1500 - 100,000	--	--	1.0 mW/cm^2

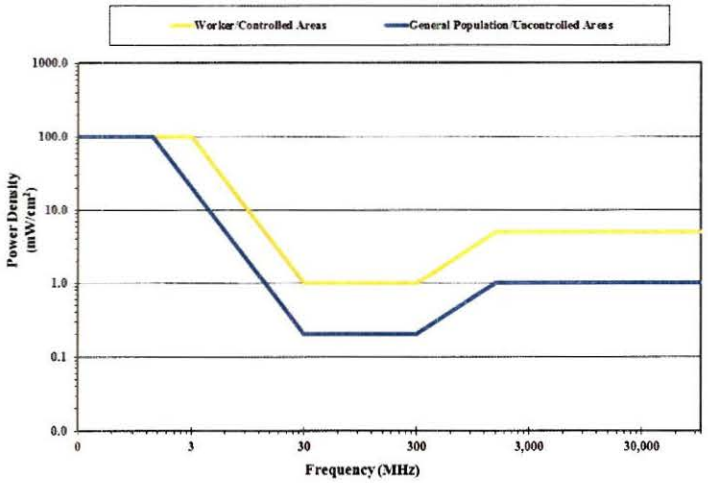


Figure 1: FCC Limits for Maximum Permissible Exposure (MPE)

NOTE: FCC 5% Rule – At multiple transmitter sites, actions necessary to bring the area into compliance with the RF exposure guidelines are the shared responsibility of all licensees whose transmitters produce RF field levels in excess of 5% of the applicable FCC MPEs.

Table 2: Proposed Radio and Antenna Inventory for AT&T Mobility PWS Facility Building at 64 Linnaean Street Cambridge, MA

Remote Radio Head Unit (RRH or RRU) See Appendix A Data			**Antenna See Appendix B for Radiation Patterns**					
Model	Frequency (MHz)[†]/ Technology	# Tx X Output Power (watts)[‡]	Number / Port	Manufacturer/ Model	Gain (dBd)	**ERP** (watts)[⁂]	Centerline Height / Azimuth ('AGL / º)	Electrical / Mechanical Down-Tilt (º)
Sector A								
RRUS-11	849 / UMTS	1 X 20	1-1	Kathrein / 742-264	12.05	641	56' @ 30º	0º
RRUS-32 (B29)	719 / LTE-700	4 X 20	2-1	CCI / SBNHH-1D65A	13.6	1833	56' @ 30º	0º
RRUS-32	2350 / WCS	4 X 7.5	2-3		15.6	1089	56' @ 30º	0º
RRUS-4478 (B14)	*777 / LTE-700*	*2 X 40*	*3-1*	*Kathrein / 800-10964*	*12.53*	*1432*	*56' @ 30º*	*0º*
RRUS-32 (B66)	*2170 / AWS*	*4 X 25*	*3-3*		*15.3*	*3388*	*56' @ 30º*	*0º*
RRUS-11	719 / LTE-700	2 X 20	4-1	CCI / OPA-65R-LCUU	12.85	771	56' @ 30º	0º
RRUS-12	1948 / PCS	2 X 40	4-3		14.85	2444	56' @ 30º	0º
Sector B								
RRUS-11	849 / UMTS	1 X 20	1-1	Kathrein / 742-264	12.05	641	56' @ 145º	0º
RRUS-32 (B29)	719 / LTE-700	4 X 20	2-1	CCI / SBNHH-1D65A	13.6	1833	56' @ 145º	0º
RRUS-32	2350 / WCS	4 X 7.5	2-3		15.6	1089	56' @ 145º	0º
RRUS-4478 (B14)	*777 / LTE-700*	*2 X 40*	*3-1*	*Kathrein / 800-10964*	*12.53*	*1432*	*56' @ 145º*	*0º*
RRUS-32 (B66)	*2170 / AWS*	*4 X 25*	*3-3*		*15.3*	*3388*	*56' @ 145º*	*0º*
RRUS-11	719 / LTE-700	2 X 20	4-1	CCI / OPA-65R-LCUU	12.85	771	56' @ 145º	0º
RRUS-12	1948 / PCS	2 X 40	4-3		14.85	2444	56' @ 150º	0º

Sector C								
RRUS-11	849 / UMTS	1 X 20	1-1	Kathrein / 742-264	12.05	641	56' @ 270°	0°
RRUS-32 (B29)	719 / LTE-700	4 X 20	2-1	CCI / SBNHH-1D65A	13.6	1833	56' @ 270°	0°
RRUS-32	2350 / WCS	4 X 7.5	2-3		15.6	1089	56' @ 270°	0°
RRUS-4478 (B14)	777 / LTE-700	2 X 40	3-1	Kathrein / 800-10964	*12.53*	*1432*	56' @ 270°	*0°*
RRUS-32 (B66)	2170 / AWS	4 X 25	3-3		*15.3*	*3388*	56' @ 270°	*0°*
RRUS-11	719 / LTE-700	2 X 20	4-1	CCI / OPA-65R-LCUU	12.85	771	56' @ 270°	0°
RRUS-12	1948 / PCS	2 X 40	4-3		14.85	2444	56' @ 270°	0°

Table Notes

† Transmitter (Tx) Frequency: Central transmit frequency used to account for multiple channels.

‡ Maximum rated output power (per channel).

⁂ **ERP**: Effective Radiated Power is the directional (RF) power (in watts) that would have to be radiated by a half-wave dipole antenna to give the same radiation intensity as the actual source at a distant receiver located in the direction of the antenna's strongest beam (main lobe).
ERP measures the combination of the power emitted by the transmitter and the ability of the antenna to direct that power in a given direction. It is equal to the input power to the antenna multiplied by the gain of the antenna. (Source Wiki).

Personal Wireless Services (PWS) Technologies

AWS: Advanced Wireless Services
LTE: Long Term Evolution (a.k.a. "4G")
PCS: Personal Communication System
UMTS: Universal Mobile Telecommunications Services
WCS: Wireless Communication Service

THEORETICAL RF FIELD CALCULATIONS - GROUND LEVELS

METHODOLOGY

These calculations are based on what are called "worst-case" estimates. That is, the estimates assume 100% use of all transmitters simultaneously, and assume the surrounding area is a flat plane.

Figure 2: Building at 64 Linnaean Street, Cambridge, MA
(Picture courtesy Google Maps©2019 and may not represent current conditions)

The calculations are based on the following information:

1. Effective Radiated Power (ERP) (See Table 2 and Appendix A data).
2. Antenna height (centerline, above ground level (AGL)).
   Trigonometry was used to determine the resultant "RANGE", and the antenna depression angle.
3. Antenna vertical radiation patterns; the source of the negative gain (G) values. See Appendix B. "Directional" antennas are designed to focus the RF signal, resulting in "patterns" of signal loss and gain. Antenna vertical radiation patterns display the loss of signal strength relative to the direction of propagation due to elevation angle changes.

The magnitude of the RF field (the power density (S)) from an isotropic RF source is calculated making use of the power density formula as outlined in FCC's OET Bulletin 65, Edition 97-01: [vi]

$$\mathbf{S = \frac{P \cdot G}{4 \cdot \pi \cdot R^2}}$$

Where:
- P → Power to antenna (watts)
- G → Gain of antenna
- R → Distance (range) from antenna source to point of intersection with the ground (feet)
- R^2 = (Height)^2 + (Horizontal distance)^2

Since: P · G = EIRP (Effective Isotropic Radiated Power), and for the situation of off-axis power density calculations, apply the negative elevation gain (G^E) value from the vertical radiation patterns with the following formula:

$$\mathbf{S = \frac{EIRP \cdot G^E}{4 \cdot \pi \cdot R^2}}$$

Ground reflections may add in-phase with the direct wave, and essentially double the electric field intensity. Because power density is proportional to the *square* of the electric field, the power density may quadruple, that is, increase by a factor of four (4).

Since ERP is routinely used, convert ERP into EIRP by multiplying by the factor of 1.64 (the gain of a ½-wave dipole relative to an isotropic radiator).

$$\mathbf{S = \frac{4 \cdot (ERP \cdot 1.64) \cdot G^E}{4 \cdot \pi \cdot R^2} = \frac{ERP \cdot 1.64 \cdot G^E}{\pi \cdot R^2} = \frac{0.522 \cdot ERP \cdot G^E}{R^2}}$$

To calculate the % MPE, use the formula:

$$\mathbf{\%\ MPE = \frac{S}{MPE} \cdot 100}$$

Note that any loss along the horizontal direction was neglected which means the results would be the maximum values in any direction. The resultant values are thus conservative in that they over predict actual resultant power densities. The data used to prepare the theoretical RF field calculations are outlined in Table 2. The results of the theoretical Cumulative Maximum Percent MPE - vs. - Distance calculations are shown in Figures 3a,3b, and 3c, as plotted against linear distance from the base of the building along the A sector (305°), B sector (125°), and c sectors (215°).

OBSERVATIONS IN CONSIDERATION WITH FCC RULES §1.1307(B) & §1.1310

Will it be physically possible to stand next to or touch any omnidirectional antenna and/or stand in front of a directional antenna?

NO; access to the rooftop is restricted, and the site will adhere to existing RF safety guidelines regarding the transmitting antennas, including appropriate signage.

RESULTS

The results of the %MPE calculations for the summation of the proposed AT&T Mobility RF emissions are depicted in Figure 3 as plotted against linear distance from the base of the building along the A sector (30°), B sector (145°+150°), and C sectors (270°). The values have been calculated for a height of six feet above ground level in accordance with regulatory rationale. Values for 16' AGL have also been calculated as in my previous reports. A logarithmic scale was used to plot the calculated values in order to compare with the MPE of 100%, which is so much larger that it would be off the page in a linear plot.

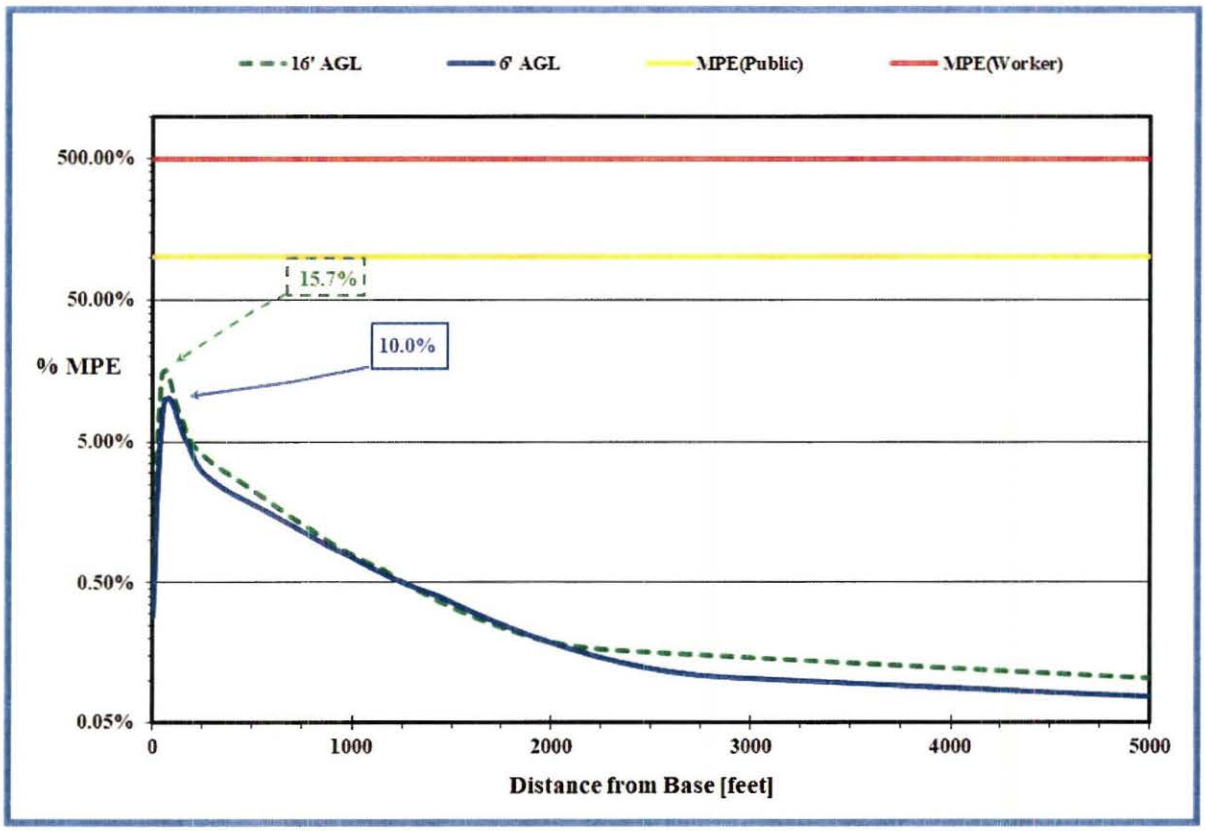


Figure 3a: Theoretical Cumulative Maximum Percent MPE - vs. - Distance
AT&T Mobility PWS RF Emissions Along Any Sector
64 Linnaean Street, Cambridge, MA

THEORETICAL RF FIELD CALCULATIONS - WITHIN THE BUILDING (UNDER THE ANTENNAS)

METHODOLOGY

In addition to intensity losses at angles away from the main beam (90° down), there are losses due to attenuation by building materials. A good approximation of these losses is -10 dB, or a factor of 1/10 ($10^{(-10/10)} = 0.1$). Thus, a modified equation to use for the area below the antennas is as follows:

$$S = \frac{4 \cdot [ERP \cdot 1.64] \cdot G^{(\text{antenna loss})} \cdot G^{(\text{building materials loss})}}{4 \cdot \pi \cdot R^2}$$

The calculations using the equation above were repeated for the locations 10' below each antenna sector using the data in Table 2. The results are listed in Table 3 below.

Table 3: Transmitter and Antenna Data and Supporting Parameters for Exposure Guidelines Calculations AT&T Mobility PWS Facility at 64 Linnaean Street Cambridge, MA

Frequency (MHz)†/ Technology	Antenna Number	Manufacturer/ Model	**ERP** (watts)	Gain (dBd) at 90°	Total % MPE 10' Below
Sector A					
849 / UMTS	1	Kathrein / 742-264	641	-40.80	0.72% MPE Or 139 Times Below FCC Exposure Guidelines
719 / LTE-700	2	CCI / SBNHH-1D65A	1833	-36.55	
2350 / WCS			1089	-39.43	
777 / LTE-700	*3*	*Kathrein / 800-10964*	*1432*	*-33.20*	
2170 / AWS			*3388*	*-25.15*	
719 / LTE-700	4	CCI / OPA-65R-LCUU	771	-46.38	
1948 / PCS			2444	-50.22	
Sector B					
849 / UMTS	1	Kathrein / 742-264	641	-40.80	0.72% MPE Or 139 Times Below FCC Exposure Guidelines
719 / LTE-700	2	CCI / SBNHH-1D65A	1833	-36.55	
849 / LTE-850			1089	-39.43	
2350 / WCS	3	*Kathrein / 800-10964*	*1432*	*-33.20*	
777 / LTE-700			*3388*	*-25.15*	
2170 / AWS	4	CCI / OPA-65R-LCUU	771	-46.38	
719 / LTE-700			2444	-50.22	
Sector C					
849 / UMTS	1	Kathrein / 742-264	641	-40.80	0.72% MPE Or 139 Times Below FCC Exposure Guidelines
719 / LTE-700	2	CCI / SBNHH-1D65A	1833	-36.55	
2350 / WCS			1089	-39.43	
777 / LTE-700	*3*	*Kathrein / 800-10964*	*1432*	*-33.20*	
2170 / AWS			*3388*	*-25.15*	
719 / LTE-700	4	CCI / OPA-65R-LCUU	771	-46.38	
1948 / PCS			2444	-50.22	

CONCLUSION

Theoretical RF field calculations data indicate the summation of the proposed AT&T Mobility PWS RF contributions would be within the established RF exposure guidelines; see Figures 3a, 3b, and 3c. This includes all publicly accessible areas, and the surrounding neighborhood in general. RF field levels within the building would be below guidelines for RF exposure as well; see Table 3. The results support compliance with the pertinent sections of the Massachusetts Department of Public Health regulations regarding PWS facilities, and the FCC's guidelines for RF exposure.

The number and duration of calls passing through PWS facilities cannot be accurately predicted. Thus, to estimate the highest RF fields possible from operation of these installations, the maximal amount of usage was considered. Even in this so-called "worst-case," the resultant increase in RF field levels are far below established levels considered safe.

Based on the results of the theoretical RF fields I have calculated, it is my expert opinion that this facility would continue to comply with all regulatory guidelines for RF exposure with the proposed AT&T Mobility antenna and transmitter installations.

Feel free to contact me if you have any questions.

Sincerely,

Donald L. Haes, Jr.
Certified Health Physicist

DONALD L. HAES, JR., CHP, CLSO
Radiation Safety Specialist
PO Box 198, Hampstead, NH 03841 617-680-6262 Email: donald_haes_chp@comcast.net

STATEMENT OF CERTIFICATION

1. I certify to the best of my knowledge and belief, the statements of fact contained in this report are true and correct.

2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are personal, unbiased professional analyses, opinions and conclusions.

3. I have no present or prospective interest in the property that is the subject of this report and I have no personal interest or bias with respect to the parties involved.

4. My compensation is not contingent upon the reporting of a predetermined energy level or direction in energy level that favors the cause of the client, the amount of energy level estimate, the attainment of a stipulated result, or the occurrence of a subsequent event.

5. This assignment was not based on a requested minimum environmental energy level or specific power density.

6. My compensation is not contingent on an action or event resulting from the analyses, opinions, or conclusions in, or the use of, this report.

7. The consultant has accepted this assessment assignment having the knowledge and experience necessary to complete the assignment competently.

8. My analyses, opinions, and conclusions were developed and this report has been prepared, in conformity with the *American Board of Health Physics* (ABHP) statements of standards of professional responsibility for Certified Health Physicists.

Date: August 12, 2019

Donald L. Haes, Jr.
Certified Health Physicist

DONALD L. HAES, JR., CHP, CLSO

Radiation Safety Specialist

PO Box 198, Hampstead, NH 03841 617-680-6262 Email: donald_haes_chp@comcast.net

SUMMARY OF QUALIFICATIONS

- **Academic Training -**
  - Graduated from Chelmsford High School, Chelmsford, MA; June 1973.
  - Completed Naval Nuclear Naval Nuclear Power School, 6-12/1976.
  - Completed Naval Nuclear Reactor Plant Mechanical Operator and Engineering Laboratory Technician (ELT) schools and qualifications, Prototype Training Unit, Knolls Atomic Power Laboratory, Windsor, Connecticut, 1-9/1977.
  - Graduated Magna Cum Laude from University of Lowell with a Bachelor of Science Degree in *Radiological Health Physics*; 5/1987.
  - Graduated from University of Lowell with a Master of Science Degree in *Radiological Sciences and Protection*; 5/1988.

- **Certification -**
  - Board Certified by the American Board of Health Physics 1994; renewed 1998, 2002, 2006, 2010, 2014, and 2018. Expiration 12/31/2022.
  - Board Certified by the Board of Laser Safety 2008; renewed 2011, 2014, 2017. Expiration 12/31/2020.

- **Employment History -**
  - Consulting Health Physicist; Ionizing/Nonionizing Radiation, 1988 - present.
  - Radiation, RF and Laser Safety Officer; BAE Systems, 2005–2018 (retired).
  - Assistant Radiation Safety Officer; MIT, 1988 – 2005 (retired).
  - Radiopharmaceutical Production Supervisor - DuPont/NEN, 1981 – 1988 (retired).
  - United States Navy; Nuclear Power Qualifications, 1975 – 1981 (Honorably Discharged).

- **Professional Societies -**
  - Health Physics Society [HPS].
  - American Academy of Health Physics [AAHP]
  - Institute of Electrical and Electronics Engineers [IEEE];
  - International Committee on Electromagnetic Safety [ICES] (ANSI C95 series).
  - Laser Institute of America [LIA].
  - Board of Laser Safety [BLS].
  - American National Standards Institute Accredited Standards Committee [ASC Z136].
  - Committee on Man and Radiation [COMAR].

APPENDIX A

SPECIFIC REMOTE RADIO HEAD UNITS

RRUS 11

2x10 W or 1x20 W Maximum nominal output power 2x20 W or 1x40 W (1x30 W), 2x30 W, 2x40 W(1) require license keys(2) Number of carriers Without license key: one carrier With license keys: up to four carriers

1920 to 1980 MHz uplink
2110 to 2170 MHz downlink
B1 for WCDMA and LTE
1850 to 1910 MHz uplink
1930 to 1990 MHz downlink
B2 for WCDMA and LTE
1710 to 1755 MHz uplink
2110 to 2155 MHz downlink
B4 for WCDMA and LTE
824 to 849 MHz uplink
869 to 894 MHz downlink
B5 for WCDMA and LTE
2,500 to 2,570 MHz uplink
2,620 to 2,690 MHz downlink
B7 for LTE
699 to 715 MHz uplink
729 to 745 MHz downlink
B12 for LTE (3)
832 to 862 MHz uplink
791 to 821 MHz downlink
B20 for LTE
1850 to 1915 MHz uplink
1930 to 1995 MHz downlink
B25 for LTE
1850 to 1910 MHz uplink
1930 to 1990 MHz downlink
B25 for CDMA
Frequency
817 MHz to 824 MHz uplink
862 MHz to 869 MHz downlink
B26A for CDMA and LTE

RRUS 32

EUT information
Product name RRUS 32A Band 66A Transceiver
Model RRUS 32A B66A
Part number KRC 161 601/1
Revision R1A
Serial Number D16S140661
Antenna Ports 4 TX/RX Ports
IBW LTE: 70 MHz, WCDMA: 45 MHz
FDD 400MHz
Frequency TX (DL) LTE: 2110 – 2180 MHz
TX (DL) WCDMA: 2110 – 2155 MHz
RX (UL) LTE: 1710 – 1780 MHz
RX (UL) WCDMA: 1710 – 1755 MHz
Nominal O/P per Antenna Port Single Carrier: 1 x 30 W (44.77 dBm)
Multi-Carrier: 2 x 15 W (41.76 dBm)
Multi-Carrier: 3 x 10 W (40 dBm)
Multi-Carrier: 4 x 7.5 W (38.75 dBm)
Accuracy (Nominal): +/- 0.1 PPM
Nominal Voltage: -48 VDC @ 20A
RAT: LTE: SC, MC

WCDMA: SC, MC
Multi RAT (W + L) MC
Modulation: LTE: QPSK, 16 QAM, 64 QAM
WCDMA: QPSK, 16 QAM, 64 QAM
Channel Bandwidth: LTE: 5, 10, 15, 20 MHz
WCDMA: 4.2 to 5 MHz
Maximum Combined OBW per Port: 70 MHz
Digital Interface CPRI: 2.5 Gbps / 5 Gbps / 10 Gbps (Data 1, Data 2)
Channel Raster: 100 kHz for LTE, 200 kHz for WCDMA
Multi-carrier: Single Antenna, Tx Diversity, MIMO closed loop (4x2 MIMO and 4-way receiver diversity for LTE)
Operating Temperature: -40 to 55°C
Total Power based on IBW: 4 x 30W
Supported Carrier Configurations: LTE: BW(MHz) = 5, 10,15 (1-4); BW= 20 (1-3)
MSR Maximum Carrier Configurations 70 MHz

RRUS 4478

DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	Radio 4478 B5
PART NUMBER	KRC 161 689/1 KRC 161 689/3[2]
IC Model Name	AS161689
SERIAL NUMBER	B440820312
HARDWARE VERSION	R2A
SOFTWARE VERSION	CXP9013268%15_R78AN+
TRANSMITTER OPERATING RANGE	869 - 894 MHz
MODULATIONS	WCDMA: QPSK, 16QAM, 64QAM LTE & NR: QPSK, 16QAM, 64QAM, 256QAM
ITU DESIGNATION OF EMISSION	WCDMA: 4M19F9W
	LTE 1,4 MHz BW channel: 1M11W7D
	LTE 3 MHz BW channel: 2M70W7D
	LTE 5 MHz BW channel: 4M50W7D
	LTE 10 MHz BW channel: 8M98W7D
	LTE 20 MHz BW channel: 18M9W7D[3]
	NB IoT SA: 224KW7D
	NR 5 MHz BW channel: 4M47W7D
	NR 10 MHz BW channel: 9M29W7D
OUTPUT POWER (RMS) (W or dBm)	4 ports, 40W per port
	NB-IoT SA 1 x 20W (per port)
FCC ID	TA8AKRC161689
IC ID	287AB-AS161689
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	Base station radio

[1] LTE carriers 10MHz and above supports NB IoT

[2] KRC 161 689/3 is the test object, both variants are electrically equivalent, with only mechanical differences in the enclosure.

[3] Carrier aggregation 2 x 10MHz

Signature _____
Audun Helle

Date 2019-03-25

No responsibility will be accepted by TÜV SÜD Product Service UK Limited as to the accuracy of the information declared in this document by the manufacturer.

Description of the test object

Equipment:	Radio equipment Radio 4478 B14 Product number KRC 161 669/3 FCC ID: TA8AKRC161669-3
Hardware revision state:	RIB
Tested configuration:	Single RAT LTE
Frequency bands: 3GPP B7:	TX: 758 - 768 MHz RX: 788 - 798 MHz
IBW:	10 MHz
Output power:	Max 40 W/ antenna port
Antenna ports:	4 TX/ 4 RX ports
Antenna:	No dedicated antenna, handled during licensing
RF configurations:	Single and multi-carrier, 1-2 carriers/ port TX Diversity, 2x2 MIMO, 4x4 MIMO, Contiguous Spectrum (CS), Carrier Aggregation (CA)
Channel bandwidths:	5 MHz and 10 MHz
Modulations:	QPSK, 16QAM, 64QAM and 256QAM
RF power Tolerance:	+0.6/ -2.0 dB
CPR] speed	Up to 10.1 Gbit]s

The information above is supplied by the manufacturer.

RRUS 12 (E2 B29)

2014-01-20 3P08658-F27

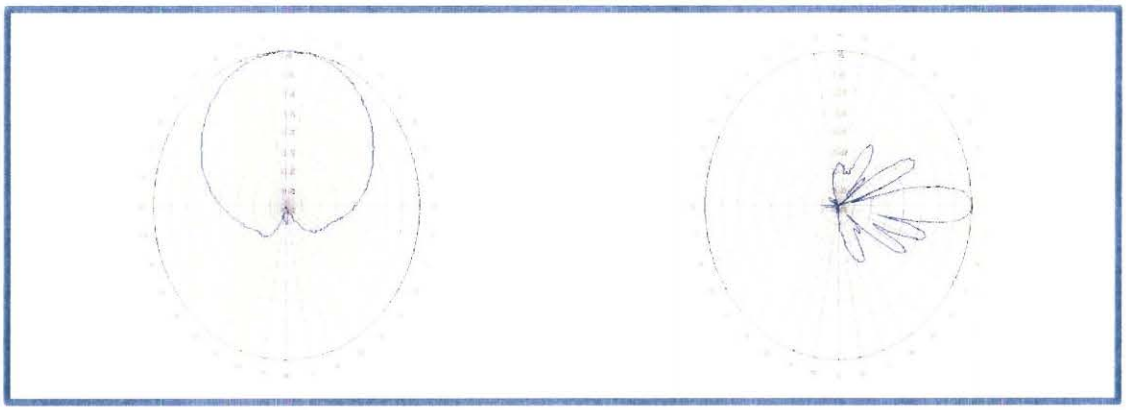
Description of the test object

Equipment:	Product name: RRUS E2 B29 Product number: KRC 161 408/1, RIA FCC ID TA8AKRC161408-1 IC 287AB-AS1614081 IC MODEL NO: AS1614081
Tested configuration:	LTE single RAT
Frequency bands:	TX: 717 - 728 MHz RX: N/A
Antenna ports:	2 TX ports
RF configuration:	Single carrier, multi carrier and MIMO mode 2x2
Nominal output power per antenna port:	Single carrier: Ix 46.0 dBm (l x 40W) Multi carrier: 2x 43.0 dBm (2 x 20W)
Antenna:	No dedicated antenna, handled during licensing
Channel bandwidths:	3 MHz, 5 MHz and 10 MHz
Modulations:	QPSK, 16QAM and 64QAM
Nominal supply voltage:	-48VDC

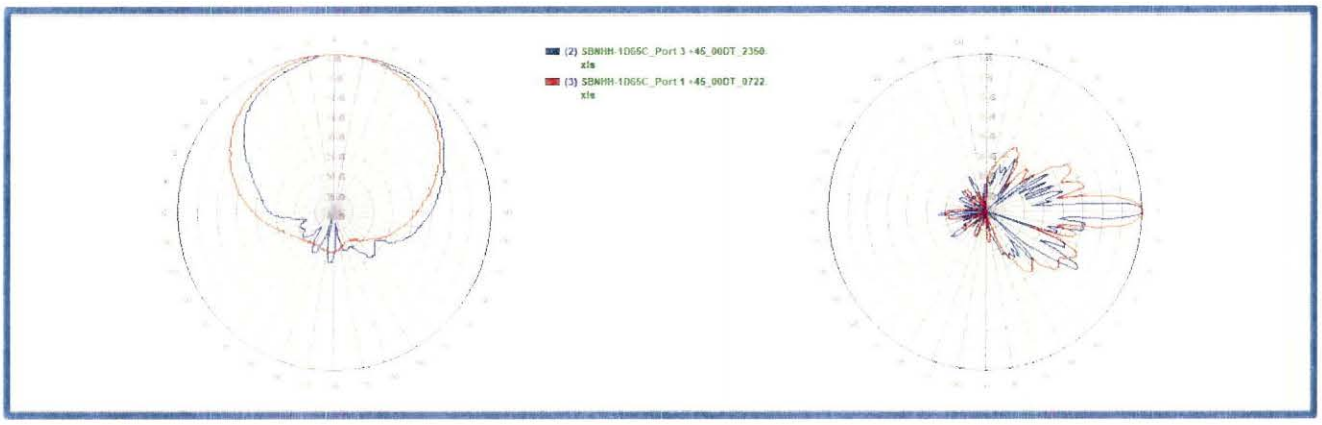
APPENDIX B

ANTENNA SPECIFIC RADIATION PATTERNS
(FOR EACH PROPOSED ANTENNA FREQUENCY BAND)

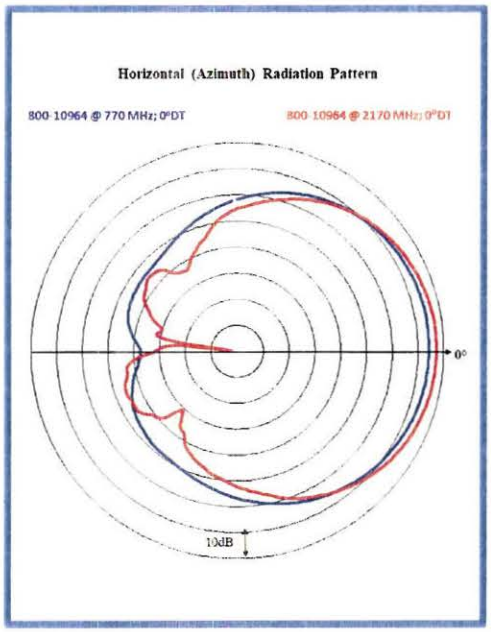
ANTENNA #1: (EXISTING)
KATHREIN 742-264

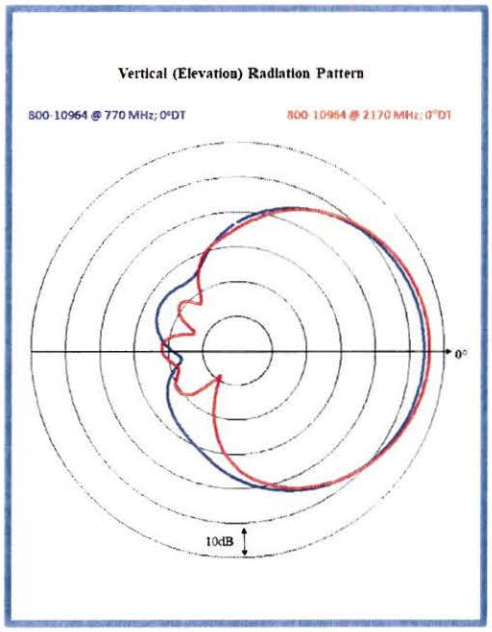


ANTENNA #2: (EXISTING)
CCI SBNHH-165DA

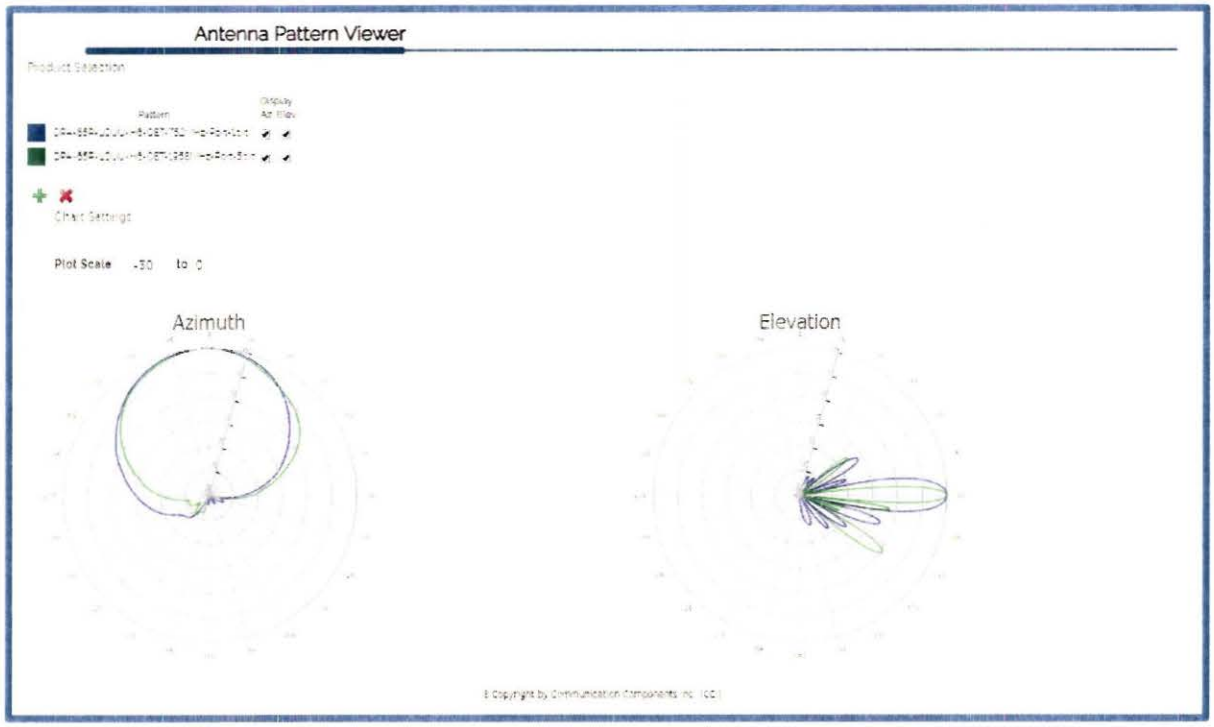


ANTENNA #3: (*PROPOSED*)
KATHREIN 800-10964





ANTENNA #4: (EXISTING)
CCI OPA-65R-LCUU-H4



ENDNOTES

[i]. Federal Register, Federal Communications Commission Rules; *Radiofrequency radiation; environmental effects evaluation guidelines* Volume 1, No. 153, 41006-41199, August 7, 1996. (47 CFR Part 1; Federal Communications Commission).

[ii]. Telecommunications Act of 1996, 47 USC; Second Session of the 104th Congress of the United States of America, January 3, 1996.

[iii]. 105 CMR 122.000: Massachusetts Department of Public Health, *Non-Ionizing Radiation Limits for: The General Public from Non-Occupational Exposure to Electromagnetic Fields, Employees from Occupational Exposure to Electromagnetic Fields, and Exposure from Microwave Ovens.*

[iv]. ANSI/IEEE C95.1-1999: American National Standard, *Safety levels with respect to human exposure to radio frequency electromagnetic fields, from 3 kHz to 300 GHz* **(Updated in 2018).**

[v]. National Council on Radiation Protection and Measurements (NCRP); *Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields*, NCRP Report 86, 1986.

[vi]. OET Bulletin 65: Federal Communications Commission Office of Engineering and Technology, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*; Edition 97-01, August 1999.

Subpart CC—State and Local Review of Applications for Wireless Service Facility Modification

§1.40001 Wireless Facility Modifications.

(a) Purpose. These rules implement section 6409 of the Spectrum Act (codified at 47 U.S.C. 1455), which requires a State or local government to approve any eligible facilities request for a modification of an existing tower or base station that does not substantially change the physical dimensions of such tower or base station.

(b) Definitions. Terms used in this section have the following meanings.

(1) Base station. A structure or equipment at a fixed location that enables Commission-licensed or authorized wireless communications between user equipment and a communications network. The term does not encompass a tower as defined in this subpart or any equipment associated with a tower.

(i) The term includes, but is not limited to, equipment associated with wireless communications services such as private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul.

(ii) The term includes, but is not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, regular and backup power supplies, and comparable equipment, regardless of technological configuration (including Distributed Antenna Systems and small-cell networks).

(iii) The term includes any structure other than a tower that, at the time the relevant application is filed with the State or local government under this section, supports or houses equipment described in paragraphs (b)(1)(i) through (ii) of this section that has been reviewed and approved under the applicable zoning or siting process, or under another State or local regulatory review process, even if the structure was not built for the sole or primary purpose of providing such support.

(iv) The term does not include any structure that, at the time the relevant application is filed with the State or local government under this section, does not support or house equipment described in paragraphs (b)(1)(i)-(ii) of this section.

(2) Collocation. The mounting or installation of transmission equipment on an eligible support structure for the purpose of transmitting and/or receiving radio frequency signals for communications purposes.

(3) Eligible facilities request. Any request for modification of an existing tower or base station that does not substantially change the physical dimensions of such tower or base station, involving:

(i) Collocation of new transmission equipment;

(ii) Removal of transmission equipment; or

(iii) Replacement of transmission equipment.

(4) Eligible support structure. Any tower or base station as defined in this section, provided that it is existing at the time the relevant application is filed with the State or local government under this section.

(5) Existing. A constructed tower or base station is existing for purposes of this section if it has been reviewed and approved under the applicable zoning or siting process, or under another State or local regulatory review process, provided that a tower that has not been reviewed and approved because it was not in a zoned area when it was built, but was lawfully constructed, is existing for purposes of this definition.

(6) Site. For towers other than towers in the public rights-of-way, the current boundaries of the leased or owned property surrounding the tower and any access or utility easements currently related to the site, and, for other eligible support structures, further restricted to that area in proximity to the structure and to other transmission equipment already deployed on the ground.

(7) Substantial change. A modification substantially changes the physical dimensions of an eligible support structure if it meets any of the following criteria:

(i) For towers other than towers in the public rights-of-way, it increases the height of the tower by more than 10% or by the height of one additional antenna array with separation from the nearest existing antenna not to exceed twenty feet, whichever is greater; for other eligible support structures, it increases the height of the structure by more than 10% or more than ten feet, whichever is greater;

(A) Changes in height should be measured from the original support structure in cases where deployments are or will be separated horizontally, such as on buildings' rooftops; in other circumstances, changes in height should be measured from the dimensions of the tower or base station, inclusive of originally approved appurtenances and any modifications that were approved prior to the passage of the Spectrum Act.

(ii) For towers other than towers in the public rights-of-way, it involves adding an appurtenance to the body of the tower that would protrude from the edge of the tower more than twenty feet, or more than the width of the tower structure at the level of the appurtenance, whichever is greater; for other eligible support structures, it involves adding an appurtenance to the body of the structure that would protrude from the edge of the structure by more than six feet;

(iii) For any eligible support structure, it involves installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets; or, for towers in the public rights-of-way and base stations, it involves installation of any new equipment cabinets on the ground if there are no pre-existing ground cabinets associated with the structure, or else involves installation of ground cabinets that are more than 10% larger in height or overall volume than any other ground cabinets associated with the structure;

(iv) It entails any excavation or deployment outside the current site;

(v) It would defeat the concealment elements of the eligible support structure; or

(vi) It does not comply with conditions associated with the siting approval of the construction or modification of the eligible support structure or base station equipment, provided however that this limitation does not apply to any modification that is non-compliant only in a manner that would not exceed the thresholds identified in §1.40001(b)(7)(i) through (iv).

(8) Transmission equipment. Equipment that facilitates transmission for any Commission-licensed or authorized wireless communication service, including, but not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, and regular and backup power supply. The term includes equipment associated with wireless communications services including, but not limited to, private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul.

(9) Tower. Any structure built for the sole or primary purpose of supporting any Commission-licensed or authorized antennas and their associated facilities, including structures that are constructed for wireless communications services including, but not limited to, private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul, and the associated site.

(c) Review of applications. A State or local government may not deny and shall approve any eligible facilities request for modification of an eligible support structure that does not substantially change the physical dimensions of such structure.

(1) Documentation requirement for review. When an applicant asserts in writing that a request for modification is covered by this section, a State or local government may require the applicant to provide documentation or information only to the extent reasonably related to determining whether the request meets the requirements of this section. A State or local government may not require an applicant to submit any other documentation, including but not limited to documentation intended to illustrate the need for such wireless facilities or to justify the business decision to modify such wireless facilities.

(2) Timeframe for review. Within 60 days of the date on which an applicant submits a request seeking approval under this section, the State or local government shall approve the application unless it determines that the application is not covered by this section.

(3) Tolling of the timeframe for review. The 60-day period begins to run when the application is filed, and may be tolled only by mutual agreement or in cases where the reviewing State or local government determines that the application is incomplete. The timeframe for review is not tolled by a moratorium on the review of applications.

(i) To toll the timeframe for incompleteness, the reviewing State or local government must provide written notice to the applicant within 30 days of receipt of the application, clearly and

specifically delineating all missing documents or information. Such delineated information is limited to documents or information meeting the standard under paragraph (c)(1) of this section.

(ii) The timeframe for review begins running again when the applicant makes a supplemental submission in response to the State or local government's notice of incompleteness.

(iii) Following a supplemental submission, the State or local government will have 10 days to notify the applicant that the supplemental submission did not provide the information identified in the original notice delineating missing information. The timeframe is tolled in the case of second or subsequent notices pursuant to the procedures identified in this paragraph (c)(3). Second or subsequent notices of incompleteness may not specify missing documents or information that were not delineated in the original notice of incompleteness.

(4) Failure to act. In the event the reviewing State or local government fails to approve or deny a request seeking approval under this section within the timeframe for review (accounting for any tolling), the request shall be deemed granted. The deemed grant does not become effective until the applicant notifies the applicable reviewing authority in writing after the review period has expired (accounting for any tolling) that the application has been deemed granted.

(5) Remedies. Applicants and reviewing authorities may bring claims related to Section 6409(a) to any court of competent jurisdiction.

[80 FR 1269, Jan. 8, 2015]