CITY OF CAMBRIDGE

BOARD OF ZONING APPEAL

831 Massachusetts Avenue, Cambridge MA 02139

617-349-6100

2024 OCT 29 PM 2:41

OFFICE OF THE CITY CLERK
CAMBRIDGE, MASSACHUSETTS

BZA Application Form

BZA Number: 1140206

General Information

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

Special Permit: ___X___ Variance: _____ Appeal: _____

PETITIONER: President and Fellows of Harvard College

PETITIONER'S ADDRESS: 750 W. Center St. Ste 301, W. Bridgewater, MA 02379

LOCATION OF PROPERTY: 1350 Massachusetts Ave , Cambridge, MA

TYPE OF OCCUPANCY: Telecommunications **ZONING DISTRICT:** Residence C Zone

REASON FOR PETITION:

/Telecommunication Facility (antenna)/

DESCRIPTION OF PETITIONER'S PROPOSAL:

Replace 2 existing antennas with 2 new antennas in nearly the same locations, replace 6 remote radio heads with 10 new remote radio heads in nearly the same locations, replace certain cabling with new cables, add diplexers, and remove and replace certain equipment in AT&T's existing rooftop equipment shelter.

SECTIONS OF ZONING ORDINANCE CITED:

Article: 4.000 Section: 4.32.g.1 & Sec. 4.40 (Footnote 49) (Telecommunication Facility).
Article: 10.000 Section: 10.40 (Special Permit).
Article: 6409 Section: Federal Middle Class Tax Relief Act (Spectrum Act).

Original Signature(s): _____

(Petitioner (s) / Owner)

Allison Conwell

(Print Name)

Address: 750 W. Center St. ste 301 W. Bridgewater, MA 02379
Tel. No. 215-588-7035
E-Mail Address: aconwell@clinellc.com

Date: 10-23-24

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 President and Fellows of Harvard College
(OWNER)

Address: 1350 Massachusetts Avenue, Suite 940, Cambridge, MA 02138

State that I/We own the property located at 1350 Massachusetts Avenue, Cambridge, MA 02138 which is the subject of this zoning application.

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

*Pursuant to a deed of duly recorded in the date 12/22/2004, Middlesex South County Registry of Deeds at Book 44353, Page 481; or

Middlesex Registry District of Land Court, Certificate No. _____

Book _____ Page _____.

*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 Kristen Hurston personally appeared before me, this 11 of 9, 2024, and made oath that the above statement is true.

Erika M. Roberts Notary

My commission expires 10/4/30 (Notary Seal).

ERIKA M ROBERTS
Notary Public
Commonwealth of Massachusetts
My Commission Expires October 4, 2030

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

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 1350 Massachusetts Ave , Cambridge, MA (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:

AT&T's Facility will comply with all applicable sections of the Ordinance as the modified Facility will not increase the height of the Building, and the new antennas will be the same sky grey color as the existing antennas (which best matches the color of the Building).

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 will not result in any substantial change in the character of the neighborhood as there will be no significant increase in the amount of traffic to and from the Site, or any changes to existing patterns of access or egress to the Site. Trips to and from the Facility will average one or two per month by maintenance personnel who will park their SUV in the existing parking area on Site and not on the street.

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

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:

AT&T's 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 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 comply with all applicable regulations and guidelines pertaining to radio frequency emissions.

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 Facility will be in harmony with the purposes of the Ordinance because by collocating a 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 Facility will not produce any smoke, odors, waste, glare or significant amounts of 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 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 Facility 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 Facility will be located on an existing Building. The collocation 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 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.

***If you have any questions as to whether you can establish all of the applicable legal requirements, you should consult with an attorney.**

BZA Application Form

DIMENSIONAL INFORMATION

Applicant: President and Fellows of Harvard College
Location: 1350 Massachusetts Ave , Cambridge, MA
Phone: 215-588-7035

Present Use/Occupancy: Telecommunications
Zone: Residence C Zone
Requested Use/Occupancy: Telecommunications

		Existing Conditions		Requested Conditions		Ordinance Requirements	
TOTAL GROSS FLOOR AREA:		74,913		0		0	(max.)
LOT AREA:		74,913		0		0	(min.)
RATIO OF GROSS FLOOR AREA TO LOT AREA: [2]		74,913		0		0	
LOT AREA OF EACH DWELLING UNIT		0		0		0	
SIZE OF LOT:	WIDTH	0		0		0	
	DEPTH	0		0		0	
SETBACKS IN FEET:	FRONT	0		0		0	
	REAR	0		0		0	
	LEFT SIDE	0		0		0	
	RIGHT SIDE	0		0		0	
SIZE OF BUILDING:	HEIGHT	121		0		0	
	WIDTH	0		0		0	
	LENGTH	0		0		0	
RATIO OF USABLE OPEN SPACE TO LOT AREA:		0		0		0	
NO. OF DWELLING UNITS:		0		0		0	
NO. OF PARKING SPACES:		0		0		0	
NO. OF LOADING AREAS:		0		0		0	
DISTANCE TO NEAREST BLDG. ON SAME LOT		0		0		0	

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

N/A this project is for an AT&T equipment upgrade on the roof.

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'.

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING ROOF TOP:
- NEW AT&T ANTENNAS: MS-MBA-3.2-H4-L4 (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2).
- NEW AT&T RRUS: 4490 B5/B12A (TYP. OF 2 PER ALPHA & GAMMA SECTOR, TOTAL OF 4).
- NEW AT&T RRUS: 4890 B25/B66 (TYP. OF 3 PER ALPHA & GAMMA SECTOR, TOTAL OF 6).
- NEW AT&T DIPLEXER: DBC0051F3V51-2 (TYP. OF 6 PER ALPHA & GAMMA SECTOR, TOTAL OF 12).

ITEMS TO BE REMOVED:
- DECOMMISSION EXISTING AT&T ANTENNA: OPA65R-BU4D (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2).
- DECOMMISSION EXISTING AT&T RRUS: 4415 B25 (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2).
- DECOMMISSION EXISTING AT&T RRUS: 4426 B66 (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2).
- DECOMMISSION EXISTING AT&T RRUS: 4449 B5/B12 (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2).

ITEMS TO REMAIN:
- (10) ANTENNAS, (12) RRU'S, (6) SURGE ARRESTORS, (12) 1-5/8" COAX, (12) DC POWER & (6) FIBER.

RFDS:	RFDS VERSION/DATE TBD
SITE ADDRESS:	1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138
LATITUDE:	42.3727989° N, 42° 22' 22.07" N
LONGITUDE:	-71.1185969° W, 71° 7' 6.94" W
TYPE OF SITE:	ROOF TOP / INDOOR EQUIPMENT
STRUCTURE HEIGHT:	121'-6"±
RAD CENTER:	126'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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C-1	PLOT PLAN	2
A-1	ROOFTOP & EQUIPMENT PLANS	2
A-2	EXISTING ANTENNA LAYOUT	2
A-3	PROPOSED ANTENNA LAYOUT	2
A-4	EXISTING ELEVATION	2
A-5	PROPOSED ELEVATION	2
A-6	DETAILS	2
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S-1	STRUCTURAL DETAILS	2
S-2	STRUCTURAL DETAILS	2
G-1	GROUNDING DETAILS	2
RF-1	RF PLUMBING DIAGRAM	2
RF-2	RF PLUMBING DIAGRAM	2

NOTE TO GENERAL CONTRACTOR: (PRIOR/DURING CONSTRUCTION)

CONTRACTOR TO CONTACT E.O.R. (TEP NORTHEAST, TEP OPCO,LLC) PRIOR TO ROOF/WALL OPENINGS TO COORDINATE/SCHEDULE THE FOLLOWING:
- INSPECTION OF EXISTING CONDITIONS AND LOCATIONS WHERE CONNECTIONS ARE BEING PROPOSED, INCLUDING INSPECTIONS OF STUB-UP ANCHORS AND/OR WALL ANCHORS PRIOR TO CONCEALING.

SITE NUMBER: MAL02215

SITE NAME: CAMBRIDGE MASS. AVE

FA CODE: 10071767

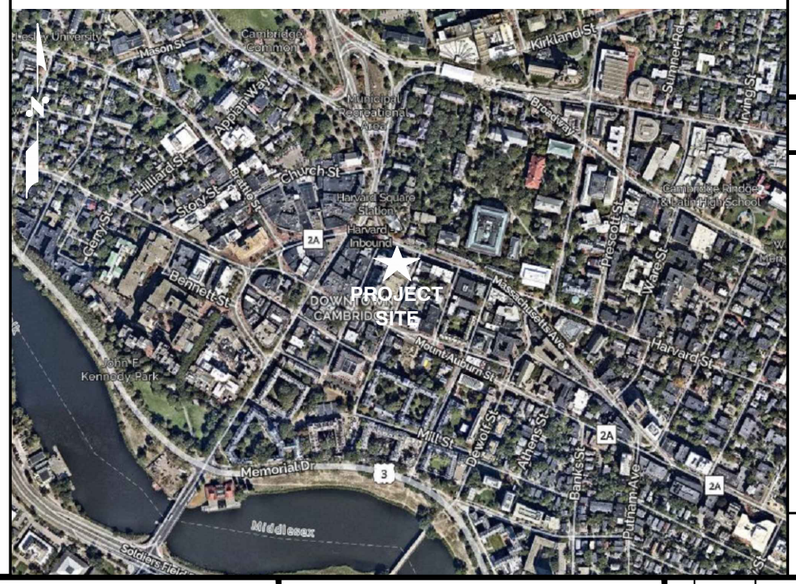
PACE ID: MRCTB071030, MRCTB071031

PROJECT: CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

VICINITY MAP

DIRECTIONS TO SITE:

HEAD SOUTHWEST, TURN RIGHT TOWARD LEGGATT MCCALL CONN, TURN LEFT ONTO LEGGATT MCCALL CONN, CONTINUE ONTO BURR ST, TURN LEFT ONTO COCHITUATE RD, USE THE RIGHT LANE TO TAKE THE I-90 E/MASS PIKE RAMP TO BOSTON TOLL ROAD, MERGE WITH I-90 E TOLL ROAD, TAKE EXIT 131 ON THE LEFT TOWARD CAMBRIDGE TOLL ROAD, MERGE WITH CAMBRIDGE ST, TURN LEFT ONTO MEMORIAL DR, TURN RIGHT ONTO PLYMPTON ST, TURN LEFT ONTO MASSACHUSETTS AVE, TURN LEFT ONTO DUNSTER ST, TURN LEFT DESTINATION WILL BE ON THE RIGHT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

UNDERGROUND SERVICE ALERT

811 DigSafe MA·ME·NH·RI·VT

WWW.DIGSAFE.COM
72 HOURS PRIOR

COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No. 40720
REGISTERED PROFESSIONAL ENGINEER

TEP
TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553

CENTERLINE
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY

AT&T
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	10/02/24	ISSUED FOR CONSTRUCTION	RB	AT	DPH
1	07/30/24	ISSUED FOR CONSTRUCTION	VD	AT	DPH
B	05/02/24	ISSUED FOR REVIEW	JS	AT	DPH
A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

AT&T

TITLE SHEET
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	T-1	2

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81 STANDARDS) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS AND #2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – CENTERLINE
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. 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 OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. **APPLICABLE BUILDING CODES:**
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

    BUILDING CODE: IBC 2015 & MA STATE BUILDING CODE 780 CMR 9TH EDITION
    ELECTRICAL CODE: 2020 NATIONAL ELECTRICAL CODE (NFPA 70, 2020)

    SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

    AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE OF ANTENNAS	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553

CENTERLINE
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY

AT&T
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	10/02/24	ISSUED FOR CONSTRUCTION	RB	AT	DPH
1	07/30/24	ISSUED FOR CONSTRUCTION	VD	AT	DPH
B	05/02/24	ISSUED FOR REVIEW	JS	AT	DPH
A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

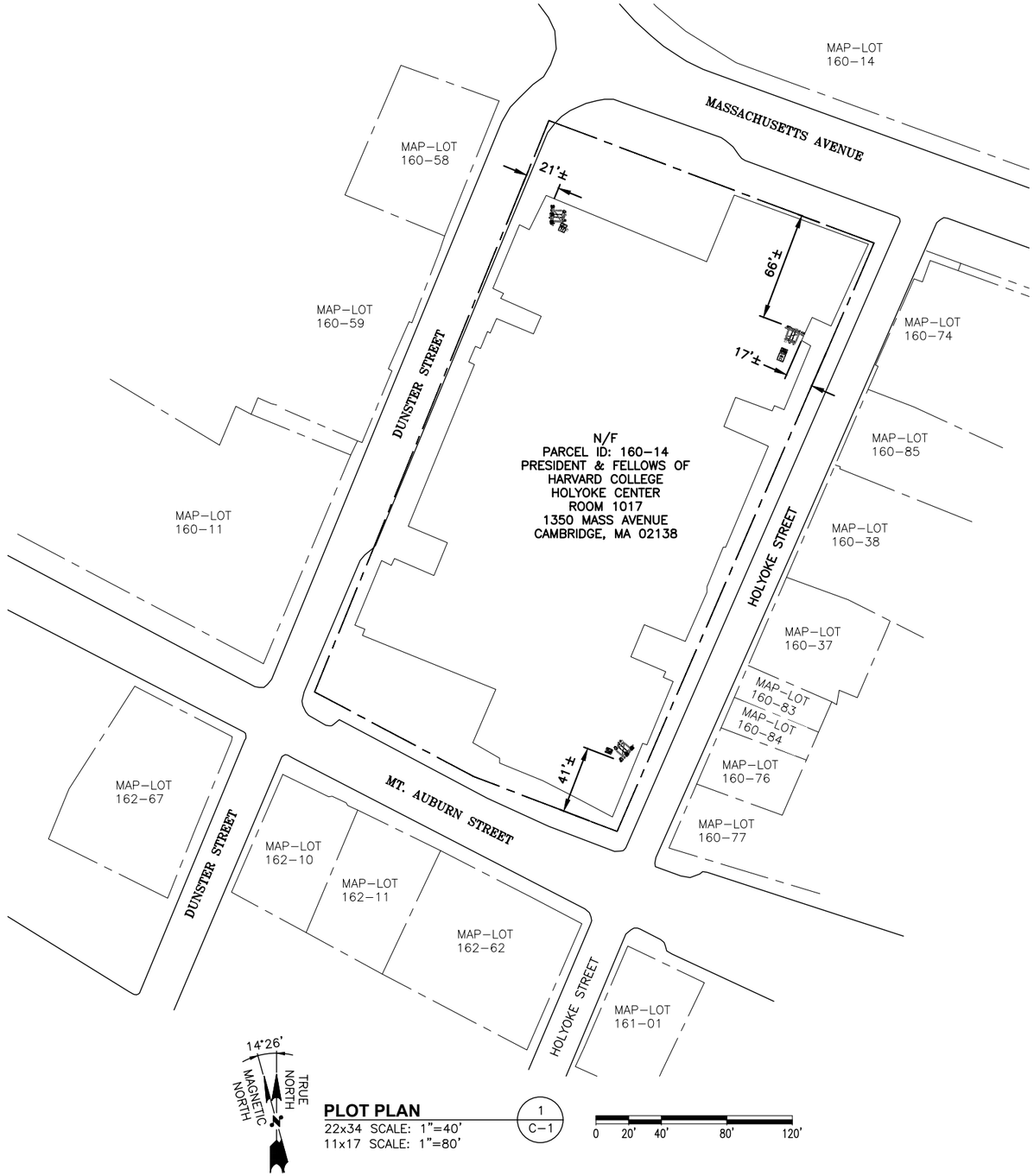
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No. 40720
REGISTERED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR – LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	GN-1	2



PLOT PLAN (1 / C–1)
22x34 SCALE: 1"=40'
11x17 SCALE: 1"=80'

ZONING INFORMATION

ZONING DISTRICT: BB–HSQ

DIMENSION REQUIREMENTS:	REQUIRED	PROPOSED±
ANTENNA SETBACKS:		
FRONT YARD SETBACK:	NONE	66'±
SIDE YARD SETBACK:	NONE	17'±
REAR YARD SETBACK:	NONE	41'±

GENERAL NOTES:

1.	FIELD SURVEY DATE:	N/A
2.	VERTICAL DATUM:	NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
3.	HORIZONTAL DATUM:	NORTH AMERICAN DATUM OF 1983 (NAD83)
4.	SITE CONTROL POINT:	CENTER OF EXISTING BUILDING LATITUDE: N 42° 22' 22.07" LONGITUDE: W 71° 7' 6.94"
5.	PROPERTY OWNER:	PRESIDENT & FELLOWS OF HARVARD COLLEGE HOLYOKE CENTER ROOM 1017 1350 MASS AVENUE CAMBRIDGE, MA 02138
6.	SITE NAME:	CAMBRIDGE MASS AVENUE
7.	SITE ADDRESS:	1350 MASS AVENUE CAMBRIDGE, MA 02138
8.	APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD FRAMINGHAM, MA 01701
9.	JURISDICTION:	CITY OF CAMBRIDGE
10.	TAX ID:	MAP 160, LOT 14
11.	PLAN REFERENCES:	CITY OF CAMBRIDGE GIS DATA
12.	ZONING JURISDICTION:	BB–HSQ

13. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE–CONSTRUCTION NOTIFICATION 72–HOURS PRIOR TO ANY EXCAVATION ACTIVITY:
DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1–888–344–7233
CALL BEFORE YOU DIG (CT): 1–800–922–4455

14. PROPERTY LINE INFORMATION IS COMPILED FROM ASSESSORS PLAN AND RECORD DOCUMENTS AND IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED AS THE RESULT OF A FIELD BOUNDARY SURVEY, AND IS SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. A FULL BOUNDARY SURVEY WAS NOT PERFORMED.

15. BEARING SYSTEM OF THIS PLAN IS BASED ON TRUE NORTH. TRUE NORTH WAS ESTABLISHED FROM EXISTING PLAN REFERENCE. IT IS NOT INTENDED TO BE AN EXACT REPRESENTATION OF TRUE NORTH.

NOTE:

ABUTTERS MAP PREPARED BY TOWER ENGINEERING PROFESSIONALS FROM THE CITY OF CAMBRIDGE, MA. ASSESSORS DATA AND OTHER SOURCES AND DOES NOT REPRESENT AN ACTUAL FIELD OR BOUNDARY SURVEY.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

REFER TO STRUCTURAL ANALYSIS BY: TEP OPCO LLC., DATED: OCTOBER 2, 2024 (REV.1) FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

LEGEND

- PROPERTY LINE–SUBJECT PARCEL
- PROPERTY LINE–ABUTTERS
- STREET BOUNDARY LINE
- MAP–LOT XXX–XX — PARCEL ID

COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No. 40720
REGISTERED PROFESSIONAL ENGINEER

TEP
TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553

CENTERLINE
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY

AT&T
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	10/02/24	ISSUED FOR CONSTRUCTION	RB	AT	DPH
1	07/30/24	ISSUED FOR CONSTRUCTION	VD	AT	DPH
B	05/02/24	ISSUED FOR REVIEW	JS	AT	DPH
A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

AT&T

PLOT PLAN

CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR – LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	C–1	2

NOTE:

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NOTE:

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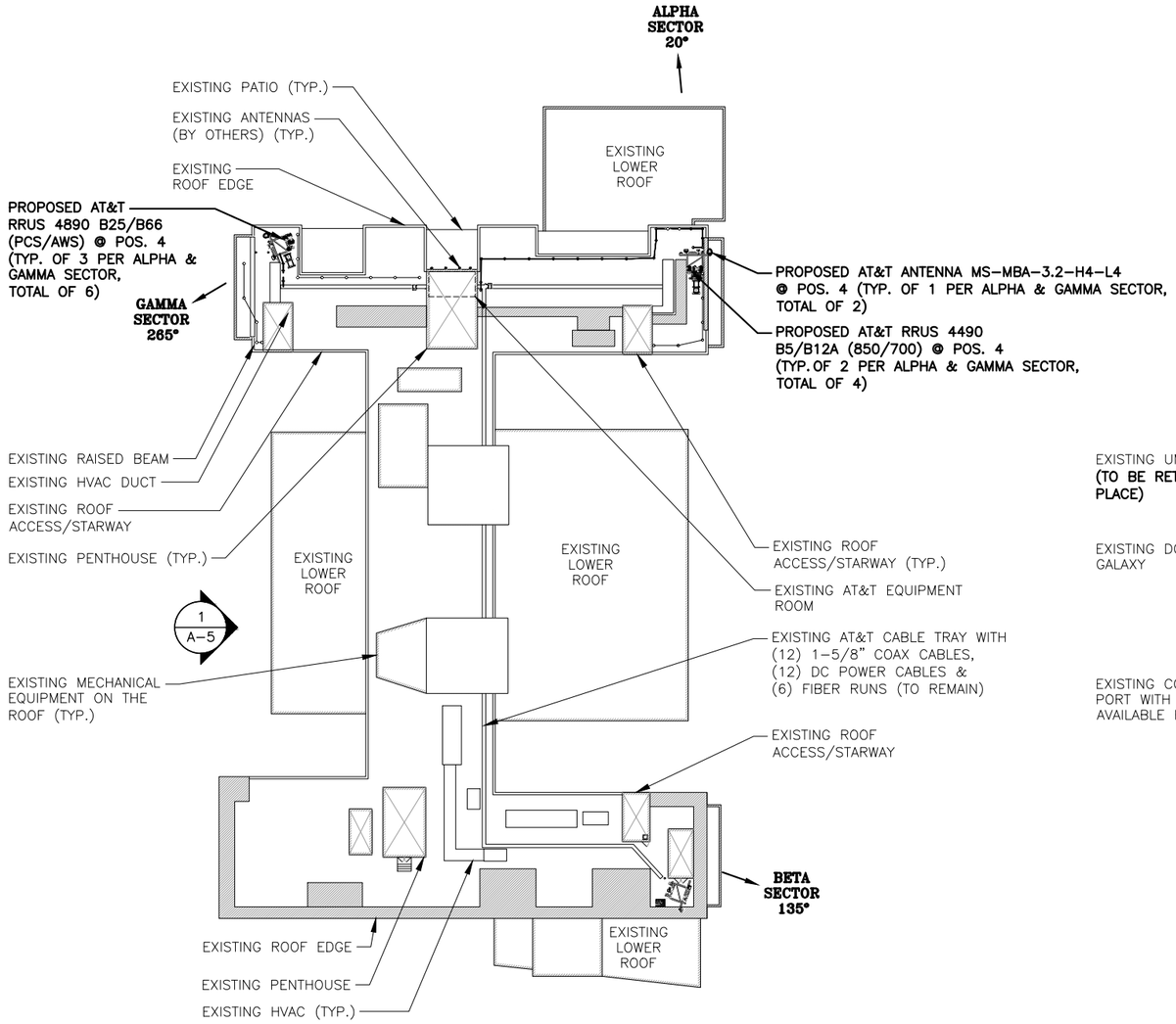

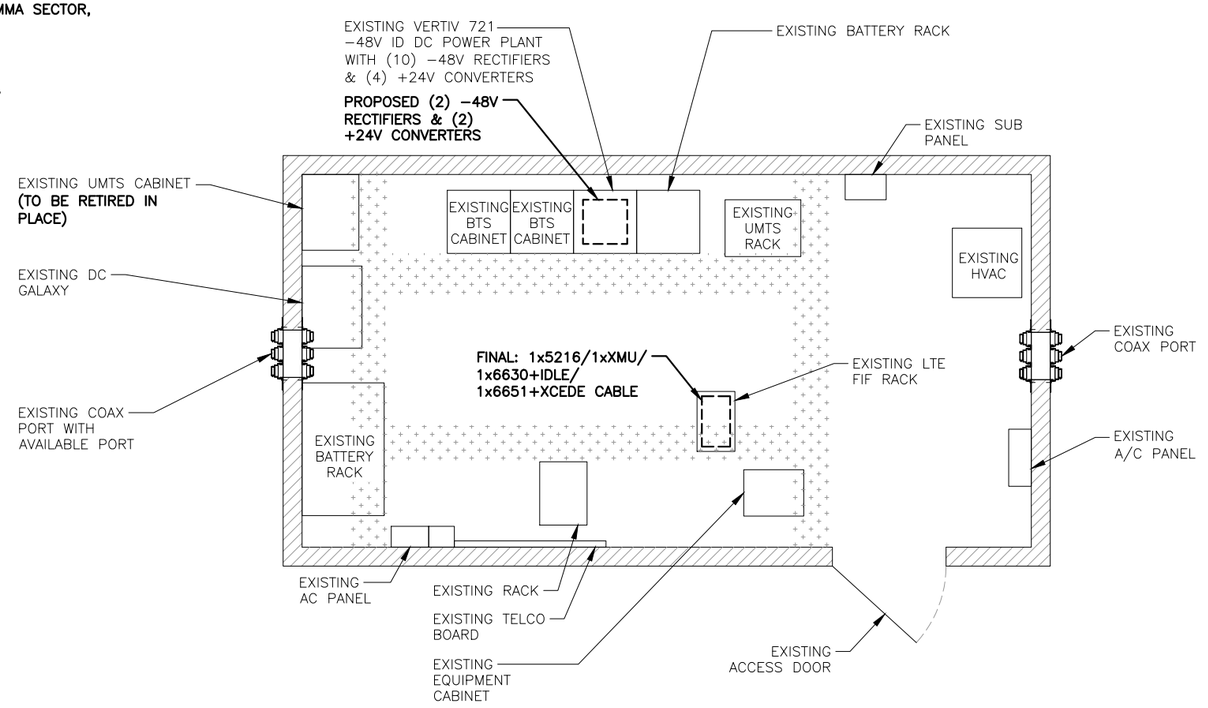

14°6' TRUE NORTH MAGNETIC NORTH

COMPOUND PLAN 1 A-1
22x34 SCALE: 1/32"=1'-0"
11x17 SCALE: 1/64"=1'-0"

0 16'-0" 32'-0" 64'-0" 96'-0"

14°6' TRUE NORTH MAGNETIC NORTH

EQUIPMENT PLAN 2 A-1
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

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A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

COMMONWEALTH OF MASSACHUSETTS
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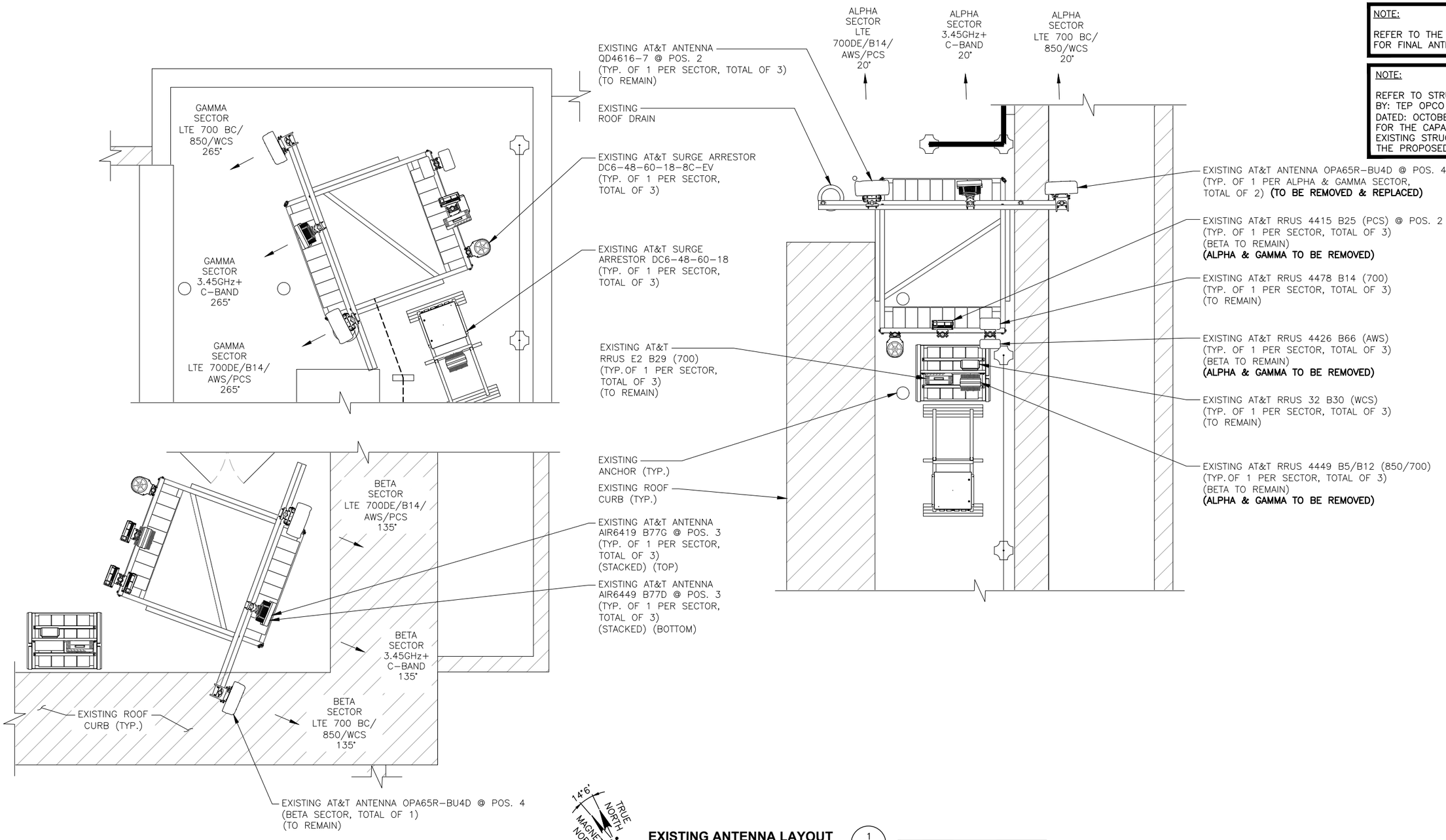
AT&T

ROOFTOP & EQUIPMENT PLANS
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	A-1	2



NOTE:

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NOTE:

REFER TO STRUCTURAL ANALYSIS BY: TEP OPCO LLC., DATED: OCTOBER 2, 2024 (REV.1), FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

EXISTING ANTENNA LAYOUT

22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

1 / A-3

0 1'-4" 2'-8" 5'-4" 8'-0"

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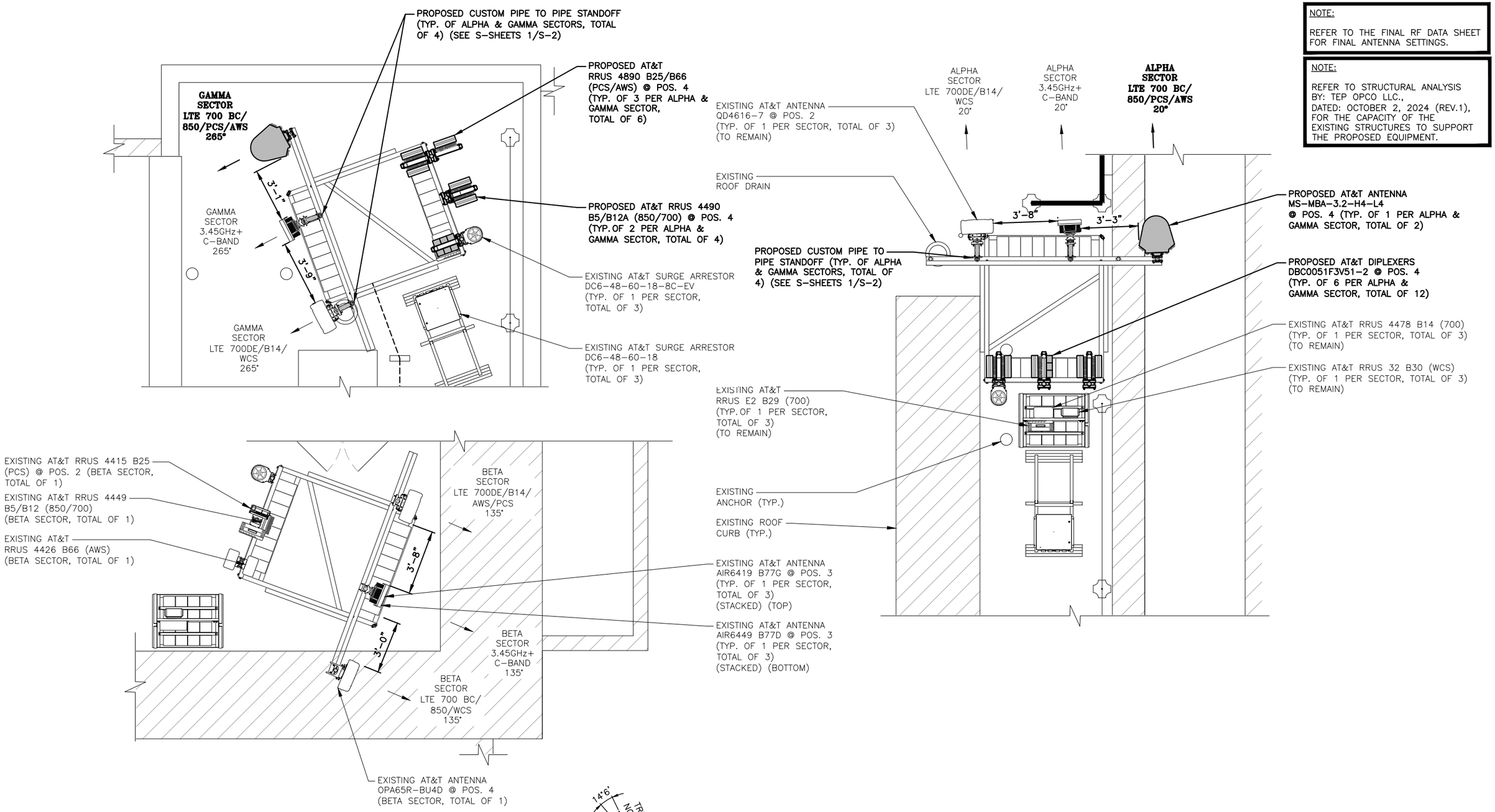
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
No. 40720
REGISTERED PROFESSIONAL ENGINEER

AT&T

EXISTING ANTENNA LAYOUT
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	A-2	2



NOTE:

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NOTE:

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PROPOSED ANTENNA LAYOUT

22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

1 / A-3

0 1'-4" 2'-8" 5'-4" 8'-0"

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

COMMONWEALTH OF MASSACHUSETTS
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CIVIL
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PROPOSED ANTENNA LAYOUT
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	A-3	2

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NOTE:

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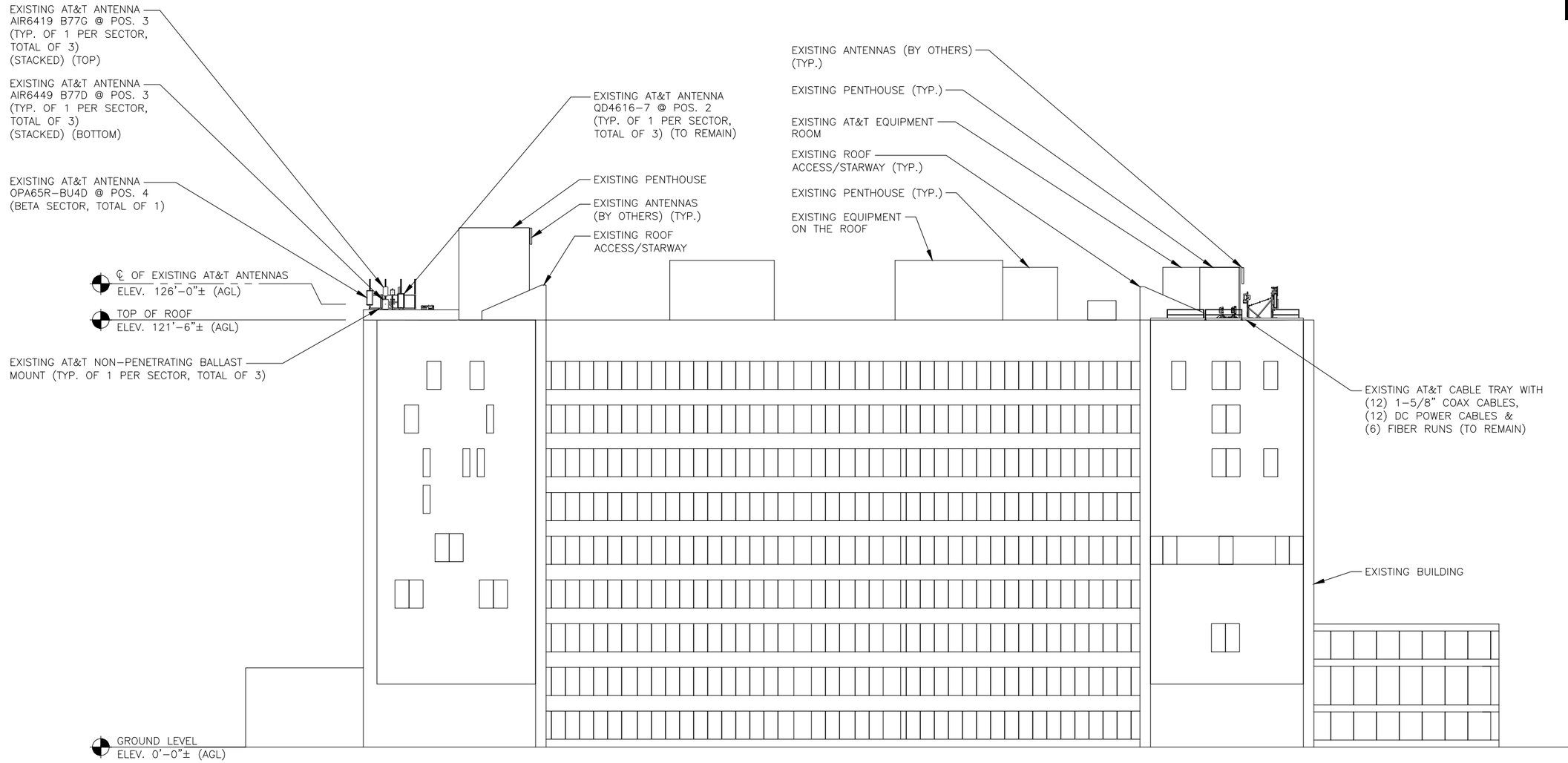

EXISTING ELEVATION (1 / A-4)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

AT&T

EXISTING ELEVATION
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	A-4	2

NOTE:

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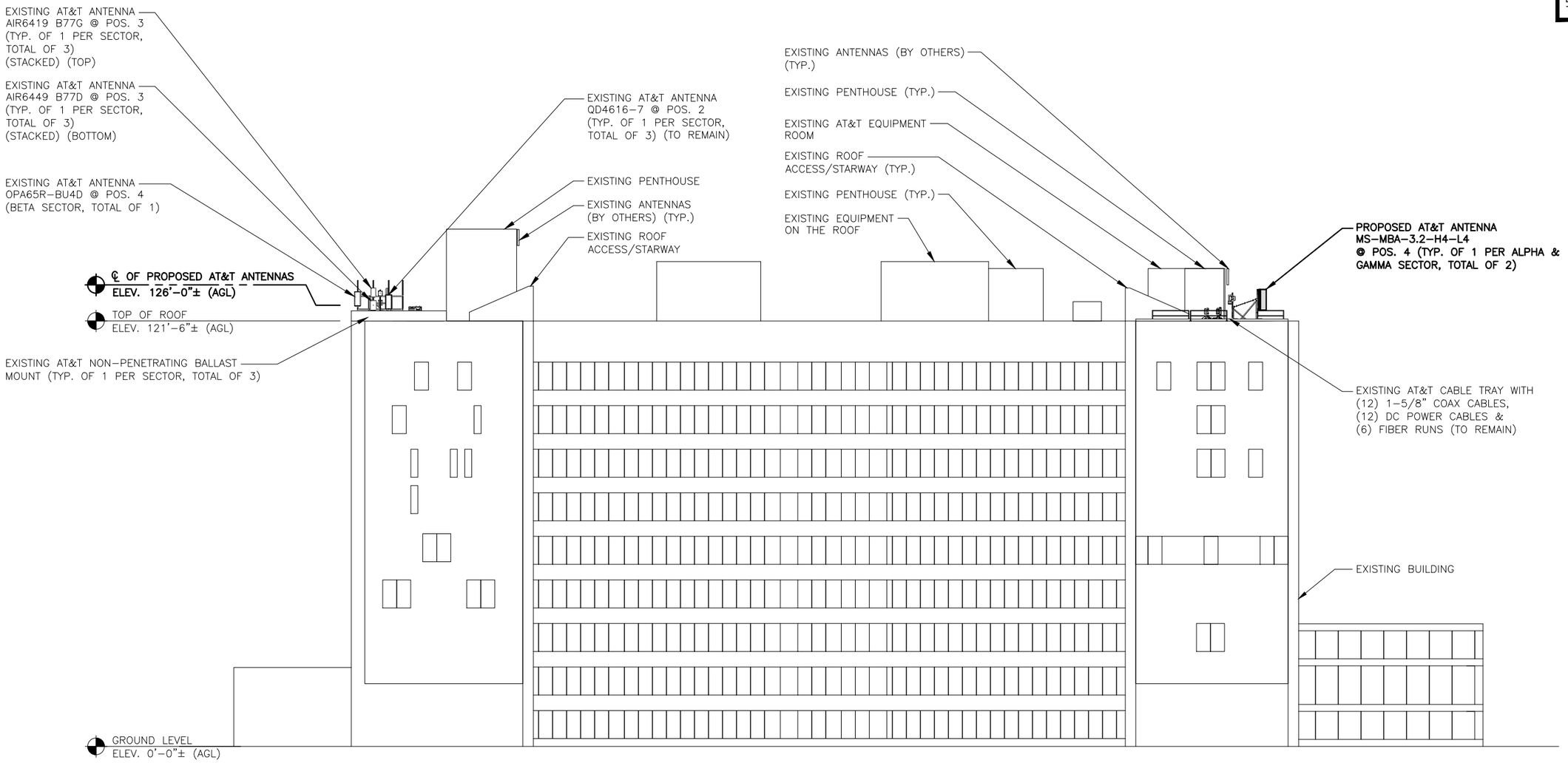

PROPOSED ELEVATION (1 / A-5)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"

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A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
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REGISTERED PROFESSIONAL ENGINEER

AT&T

PROPOSED ELEVATION
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	A-5	2

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	–	–	–	–	–	–	–	–	–	(E)(4) 1-5/8" COAX	(E)(1) DC6-48-60-18-8C-EV (E)(1) DC6-48-60-18
A2	EXISTING	LTE 700DE/B14/ WCS	QD4616-7	51.5"X22.0"X9.6"	126'-0"±	20°	–	(E)(1) 4478 B14 (700) (E)(1) RRUS-E2 B29 (700) (E)(1) RRUS-32 B30 (WCS)	– – –	(E)(4) DC POWER & (2) FIBER	
A3	EXISTING	3.45GHz+ C-BAND	AIR6419 B77G AIR6449 B77D	31.1"X16.1"X7.3" 30.6"X15.9"X10.6"	126'-0"±	20°	–	–	– –	–	
A4	**PROPOSED**	**LTE 700 BC/ 850/PCS/AWS**	**MS-MBA-3.2-H4-L4**	**71.9"X24.1"X28.3"**	**126'-0"±**	**20°**	**(P)(6) DBC0051F3 V51-2**	**(P)(3) 4890 B25/B66 (PCS/AWS) (P)(2) 4490 B5/B12A (850/700)**	**17.5"X15.2"X6.9" 17.5"X15.1"X6.8"**	–	
B1	–	–	–	–	–	–	–	–	–	(E)(4) 1-5/8" COAX	(E)(1) DC6-48-60-18-8C-EV (E)(1) DC6-48-60-18
B2	EXISTING	LTE 700DE/B14/ AWS/PCS	QD4616-7	51.5"X22.0"X9.6"	126'-0"±	135°	–	(E)(1) 4478 B14 (700) (E)(1) RRUS-E2 B29 (700) (E)(1) 4426 B66 (AWS) (E)(1) 4415 B25 (PCS)	– – – –	(E)(4) DC POWER & (2) FIBER	
B3	EXISTING	3.45GHz+ C-BAND	AIR6419 B77G AIR6449 B77D	31.1"X16.1"X7.3" 30.6"X15.9"X10.6"	126'-0"±	135°	–	–	– –	–	
B4	EXISTING	LTE 700 BC/ 850/WCS	OPA65R-BU4D	48.0X20.7X7.7	126'-0"±	135°	–	(E)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	– –	(E)(1) Y-CABLE	
C1	–	–	–	–	–	–	–	–	–	(E)(4) 1-5/8" COAX	(E)(1) DC6-48-60-18-8C-EV (E)(1) DC6-48-60-18
C2	EXISTING	LTE 700DE/B14/ WCS	QD4616-7	51.5"X22.0"X9.6"	126'-0"±	265°	–	(E)(1) 4478 B14 (700) (E)(1) RRUS-E2 B29 (700) (E)(1) RRUS-32 B30 (WCS)	– – –	(E)(4) DC POWER & (2) FIBER	
C3	EXISTING	3.45GHz+ C-BAND	AIR6419 B77G AIR6449 B77D	31.1"X16.1"X7.3" 30.6"X15.9"X10.6"	126'-0"±	265°	–	–	– –	–	
C4	**PROPOSED**	**LTE 700 BC/ 850/PCS/AWS**	**MS-MBA-3.2-H4-L4**	**71.9"X24.1"X28.3"**	**126'-0"±**	**265°**	**(P)(6) DBC0051F3 V51-2**	**(P)(3) 4890 B25/B66 (PCS/AWS) (P)(2) 4490 B5/B12A (850/700)**	**17.5"X15.2"X6.9" 17.5"X15.1"X6.8"**	–	

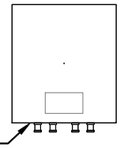
RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
P(4)	**4490 B5/B12A**	**17.5"X15.1"X6.8"**
P(6)	**4890 B25/B66**	**17.5"X15.2"X6.9"**
E(1)	4426 B66 (AWS)	14.9"x13.2"x5.8"
E(3)	4478 B14 (700)	18.1"x13.4"x8.3"
E(3)	RRUS-32 B30 (WCS)	27.2"x12.1"x7.0"
E(3)	RRUS-E2 B29 (700)	20.4"x18.5"x7.5"
E(1)	4449 (850/700)	17.9"x13.2"x10.4"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:

SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL

2
A-6

SCALE: N.T.S

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

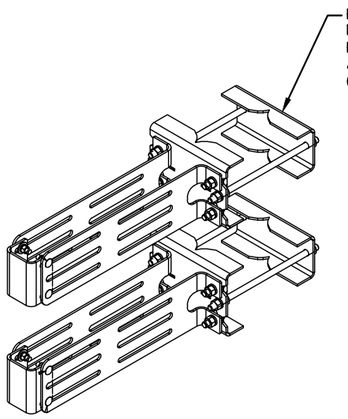
NOTE:

REFER TO STRUCTURAL ANALYSIS BY: TEP OPCO LLC.,
DATED: OCTOBER 2, 2024 (REV.1), FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

FINAL ANTENNA SCHEDULE

1
A-6

SCALE: N.T.S

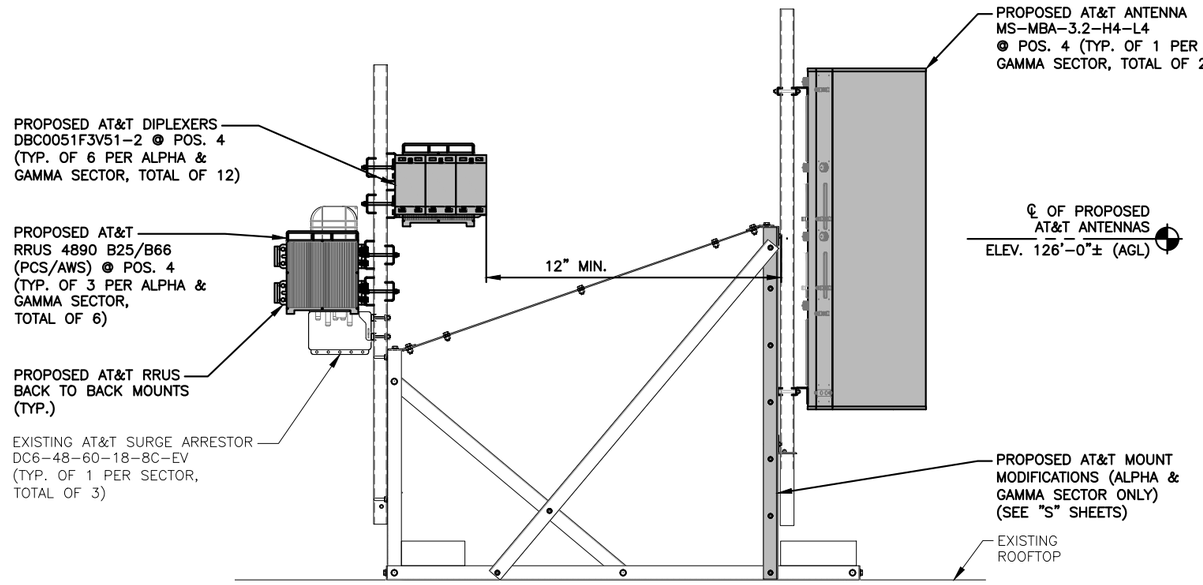


PROPOSED DUAL RRU MOUNT, COMMSCOPE PART #RR-FA2 OR APPROVED EQUAL (TYP.)

PROPOSED BACK TO BACK MOUNT COMMSCOPE (RR-FA2)

3
A-6

SCALE: N.T.S



PROPOSED LTE ANTENNA @ POS. 4 MOUNTING DETAIL

4
A-6

22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

0 8" 1'-4" 2'-8"

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AT&T

DETAILS
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	A-6	2

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

1. REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
2. PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
3. PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
4. HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
5. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
6. AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
3. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
4. VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
5. CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
6. EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

REQUIRED INSPECTIONS AND SITE REVIEW DOCUMENT AS A CONDITION OF THE BUILDING PERMIT THE FOLLOWING INSPECTIONS AND SITE REVIEWS IDENTIFIED BY THE BUILDING OFFICIAL ARE REQUIRED FOR WORK PER THE 9TH EDITION OF THE MASSACHUSETTS STATE BUILDING CODE, 780 CMR, SECTION 110 AND CHAPTER 17

REQUIRED SITE REVIEW AND DOCUMENTATION FOR PORTIONS OR PHASES CONSTRUCTION [1,6,7]

(TO BE PERFORMED BY THE APPROPRIATE REGISTERED DESIGN PROFESSIONAL OR HIS/HER DESIGNEE OR M.G.L.C 112 §81R CONTRACTOR)

SITE REVIEW AND DOCUMENTATION	X	SITE REVIEW AND DOCUMENTATION	X
SOIL CONDITION/ANALYSIS/REPORT		ENERGY EFFICIENCY REQUIREMENTS	
FOOTING AND FOUNDATION (INCLUDING REINFORCEMENT AND FOUNDATION ATTACHMENT)		FIRE ALARM INSTALLATION[2]	
CONCRETE FLOOR AND UNDER FLOOR		FIRE SUPPRESSION INSTALLATION[3]	
LOWEST FLOOR FLOOD ELEVATION		FIELD REPORTS[5]	
STRUCTURAL FRAME - WALL/FLOOR/ROOF		CARBON MONOXIDE DETECTION SYSTEM[4]	
LATH AND PLASTER/GYPSUM		SEISMIC REINFORCEMENT	
FIRE RESISTANT WALL/PARTITIONS FRAMING		SMOKE CONTROL SYSTEMS	
FIRE RESISTANT WALL/PARTITIONS FINISH ATTACHMENTS		SMOKE AND HEAT VENTS	
ABOVE CEILING INSPECTION		ACCESSIBILITY (521 CMR)	
FIRE BLOCKING/STOPPING SYSTEM		OTHER:	
EMERGENCY LIGHTING/EXIT SIGNAGE			
MEANS OF EGRESS COMPONENTS		SPECIAL INSPECTIONS (SECTION 1704):	X
ROOFING, COPING/SYSTEM			
VENTING SYSTEMS (KITCHEN, CHEMICAL, FUME)			
MECHANICAL SYSTEMS			

1. IT IS THE RESPONSIBILITY OF THE PERMIT APPLICANT TO NOTIFY THE BUILDING OFFICIAL OF REQUIRED INSPECTIONS (X). INSPECTION OF 780 CMR FIRE PROTECTION SYSTEMS MAY BE WITNESSED BY THE FIRE OFFICIAL AND INSTALLATION PERMITS ARE REQUIRED FROM THE FIRE DEPARTMENT PER 527 CMR.
2. INCLUDE NFPA 72 TEST AND ACCEPTANCE DOCUMENTATION
3. INCLUDE APPLICABLE NFPA 13, 13R, 13D, 14, 15, 17, 20, 241, ETC. - TEST AND ACCEPTANCE DOCUMENTATION
4. INCLUDE NFPA 720 RECORD OF COMPLETION AND INSPECTION AND TEST FORM
5. INCLUDE FIELD REPORTS AND RELATED DOCUMENTATION
6. WORK SHALL NOT PROCEED, OR BE CONCEALED, UNTIL THE REQUIRED INSPECTION HAS BEEN APPROVED BY THE BUILDING OFFICIAL, AND NOTHING WITHIN CONSTRUCTION CONTROL SHALL HAVE THE EFFECT OF WAIVING OR LIMITING THE BUILDING OFFICIAL'S AUTHORITY TO ENFORCE THIS CODE WITH RESPECT TO EXAMINATION OF THE CONTRACT DOCUMENTS, INCLUDING PLANS, COMPUTATIONS AND SPECIFICATIONS, AND FIELD INSPECTIONS.
7. ROUGH AND/OR FINISH INSPECTIONS OF ELECTRICAL, PLUMBING, OR SHEET METAL SHALL BE INSPECTED PRIOR TO ROUGH AND FINISH INSPECTIONS BY THE BUILDING OFFICIAL.

MASSACHUSETTS AMENDMENTS TO THE IBC (REFERENCE 780 CMR):

107.6 CONSTRUCTION CONTROL.
107.6.1 GENERAL. THIS SECTION SHALL APPLY TO THE CONSTRUCTION CONTROLS, PROFESSIONAL SERVICES AND CONTRACTOR SERVICES REQUIRED FOR BUILDINGS AND STRUCTURES NEEDING REGISTERED DESIGN PROFESSIONAL SERVICES.

107.6.1.1 SPECIALIZED STRUCTURES. TELECOMMUNICATION TOWERS, WIND TURBINE TOWERS, AND SIMILAR STRUCTURES ARE ENGINEERED STRUCTURES AND SHALL BE SUBJECT TO THE REQUIREMENTS OF SECTION 107.6.

107.6.2.2 CONSTRUCTION. THE REGISTERED DESIGN PROFESSIONALS WHO ARE RESPONSIBLE FOR THE DESIGN, PLANS, CALCULATIONS, AND SPECIFICATIONS, THEIR DESIGNEE OR THE REGISTERED DESIGN PROFESSIONALS WHO HAVE BEEN RETAINED FOR CONSTRUCTION PHASE SERVICES, SHALL PERFORM THE FOLLOWING TASKS:

1. REVIEW, FOR CONFORMANCE TO 780 CMR AND THE DESIGN CONCEPT, SHOP DRAWINGS, SAMPLES AND OTHER SUBMITTALS BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS.
2. PERFORM THE DUTIES FOR REGISTERED DESIGN PROFESSIONALS IN 780 CMR 17.00 SPECIAL INSPECTIONS AND TESTS.
3. BE PRESENT AT INTERVALS APPROPRIATE TO THE STAGE OF CONSTRUCTION TO BECOME GENERALLY FAMILIAR WITH THE PROGRESS AND QUALITY OF THE WORK AND TO DETERMINE IF THE WORK IS BEING PERFORMED IN A MANNER CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND 780 CMR.

THE PERMIT APPLICATION SHALL NOT BE DEEMED COMPLETED UNTIL ALL OF THE CONSTRUCTION DOCUMENTS REQUIRED BY 780 CMR HAVE BEEN SUBMITTED. DOCUMENTATION INDICATING THAT WORK COMPLIES WITH THE PLANS AND SPECIFICATIONS SHALL BE PROVIDED AT THE COMPLETION OF EACH PHASE WHEN REQUIRED BY THE BUILDING OFFICIAL. UPON COMPLETION OF THE WORK, THE REGISTERED DESIGN PROFESSIONAL SHALL FILE A FINAL DOCUMENT TO THE BUILDING OFFICIAL INDICATING THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THW APPROVED PLANS AND 780 CMR. FORMS FOR CONSTRUCTION CONTROL WHEN REQUIRED BY THE BUILDING OFFICIAL SHALL BE THOSE FOUND AT http://www.mass.gov/ocabr/government/oca-agencies/dpl-lp/opsi/.

107.6.2.3 SPECIAL INSPECTIONS AND TESTS. SPECIAL INSPECTIONS AND TESTS SHALL BE PROVIDED IN ACCORDANCE WITH 780 CMR 17.00 SPECIAL INSPECTIONS AND TESTS.

170.6.2.4 NON STRUCTURAL SYSTEM TEST AND INSPECTION. TESTS AND INSPECTIONS OF NON-STRUCTURAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE ENGINEERING PRACTICE STANDARDS, REFERENCED STANDARDS LISTED IN 780 CMR 35.00: REFERENCED STANDARDS, OR AS OTHERWISE SPECIFIED IN 780 CMR.

107.6.3 CONSTRUCTION CONTRACTOR SERVICES. THE ACTUAL CONSTRUCTION OF THE WORK SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AS IDENTIFIED ON THE APPROVED PERMIT AND SHALL INVOLVE THE FOLLOWING:

1. EXECUTION OF ALL WORK IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.
2. EXECUTION AND CONTROL OF ALL METHODS OF CONSTRUCTION IN A SAFE AND SATISFACTORY MANNER IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL STATUTES AND REGULATIONS.
3. UPON COMPLETION OF THE CONSTRUCTION, CERTIFICATION IN WRITING TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE THAT, TO THE BEST OF THE CONTRACTOR'S KNOWLEDGE AND BELIEF, CONSTRUCTION HAS BEEN DONE IN SUBSTANTIAL ACCORD WITH SECTION 107.6 AND WITH ALL PERTINENT DEVIATIONS SPECIFICALLY NOTED. THE BUILDING OFFICIAL MAY REQUIRE A COPY OF THIS CERTIFICATION.

107.6.4 PROJECT REPRESENTATION. A PROJECT REPRESENTATIVE MAY BE REQUIRED BY THE BUILDING OFFICIAL. THIS REPRESENTATIVE SHALL KEEP DAILY RECORDS AND SUBMIT REPORTS AS MAY BE REQUIRED BY THE BUILDING OFFICIAL. THIS PROJECT REPRESENTATION REQUIREMENT SHALL BE DETERMINED PRIOR TO THE ISSUANCE OF THE PERMIT AND MAY BE A PREREQUISITE FOR PERMIT ISSUANCE. REFUSAL BY THE APPLICANT TO PROVIDE SUCH SERVICE IF REQUIRED BY THE BUILDING OFFICIAL SHALL RESULT IN THE DENIAL OF THE PERMIT. ALL FEES AND COSTS RELATED TO THE PERFORMANCE OF PROJECT REPRESENTATION SHALL BE BORNE BY THE OWNER. WHEN APPLICATIONS FOR UNUSUAL DESIGNS OR MAGNITUDE OF CONSTRUCTION ARE FILED, OR WHERE REFERENCE STANDARDS REQUIRE SPECIAL ARCHITECTURAL OR ENGINEERING INSPECTIONS, THE BUILDING OFFICIAL MAY REQUIRE THAT THE PROJECT REPRESENTATIVE BE A REGISTERED DESIGN PROFESSIONAL IN ADDITION TO THOSE REGISTERED DESIGN PROFESSIONALS REQUIRED ELSEWHERE IN ACCORDANCE WITH SECTION 107.6.

107.6.5 BUILDING OFFICIAL RESPONSIBILITY. NOTHING CONTAINED IN SECTION 107.6 SHALL HAVE THE EFFECT OF WAIVING OR LIMITING THE BUILDING OFFICIAL'S AUTHORITY TO ENFORCE 780 CMR WITH RESPECT TO EXAMINATION OF THE CONTRACT DOCUMENTS, INCLUDING PLANS, COMPUTATIONS AND SPECIFICATIONS, AND FIELD INSPECTIONS.

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WEST BRIDGEWATER, MA 02379

SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY

AT&T
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	10/02/24	ISSUED FOR CONSTRUCTION	RB	AT	DPH
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B	05/02/24	ISSUED FOR REVIEW	JS	AT	DPH
A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

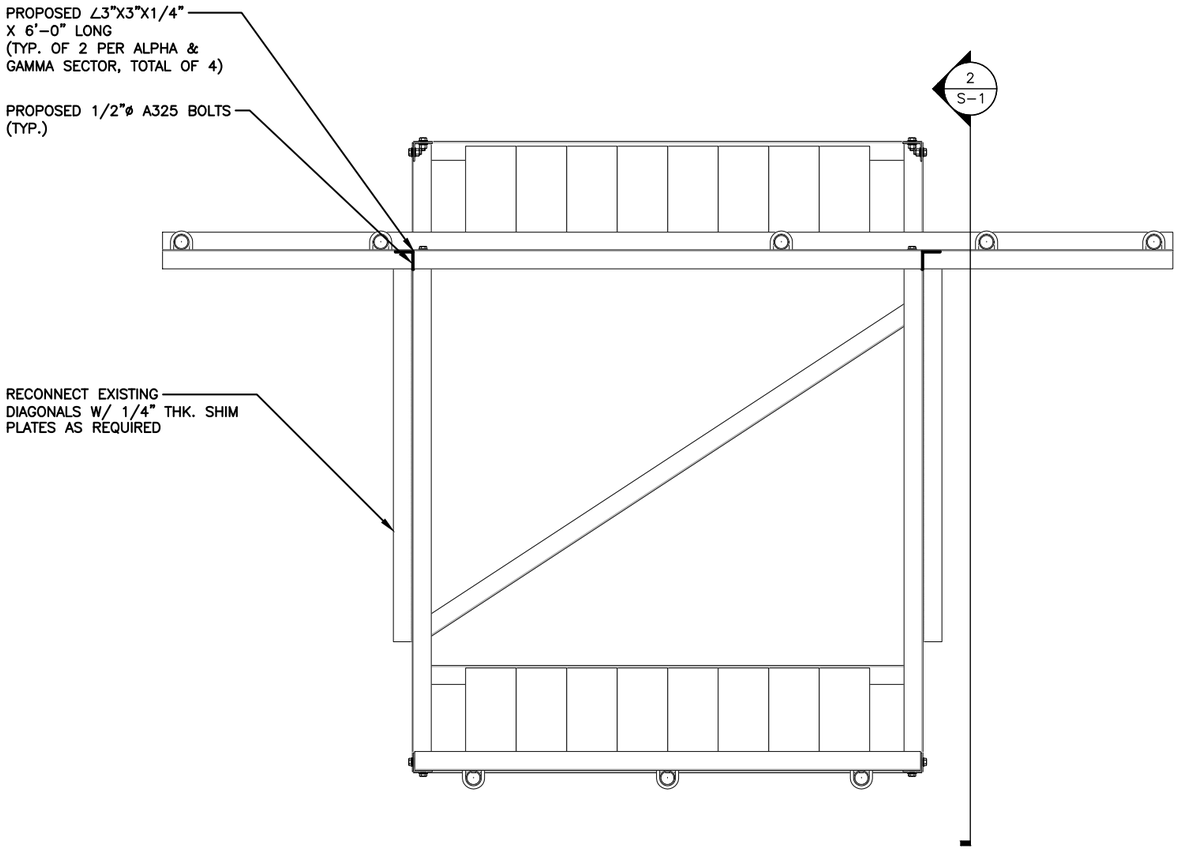
COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No. 40720
REGISTERED PROFESSIONAL ENGINEER

AT&T

STRUCTURAL NOTES

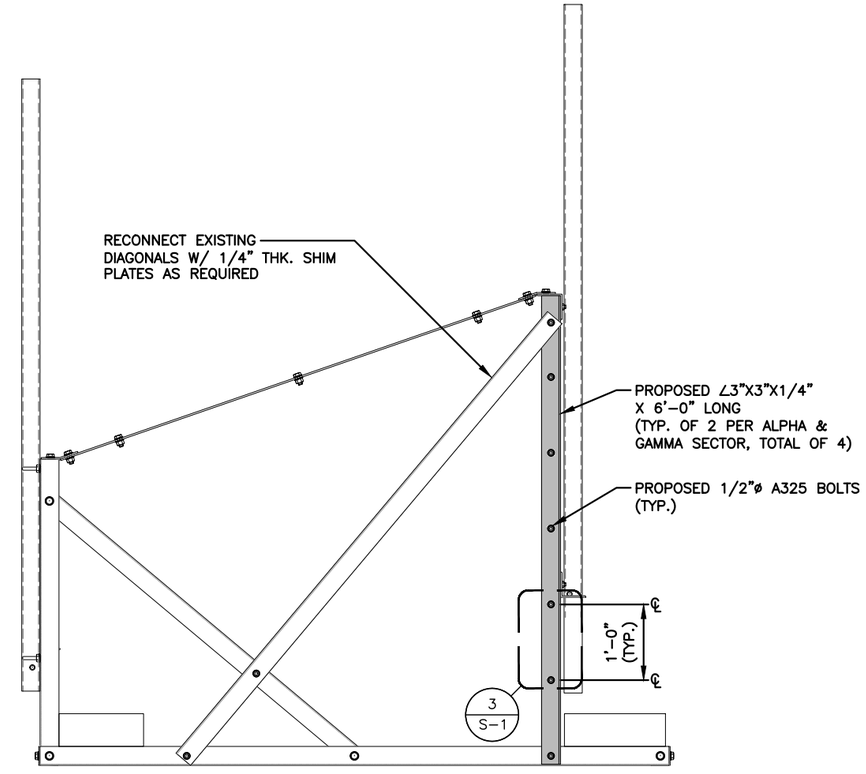
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	SN-1	2



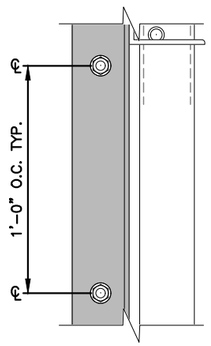
PROPOSED ALPHA & GAMMA SECTOR
MOUNT MODIFICATIONS PLAN DETAIL (1 / S-1)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"



PROPOSED ALPHA & GAMMA SECTOR
MOUNT MODIFICATIONS SIDE DETAIL (2 / S-1)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"



PROPOSED CONNECTION DETAIL (3 / S-1)
22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"

0 0'-2" 0'-4" 0'-8" 1'-0"

NOTE:

REFER TO STRUCTURAL ANALYSIS BY: TEP OPCO LLC., DATED: OCTOBER 2, 2024 (REV.1), FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

COMMONWEALTH OF MASSACHUSETTS
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STRUCTURAL DETAILS
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
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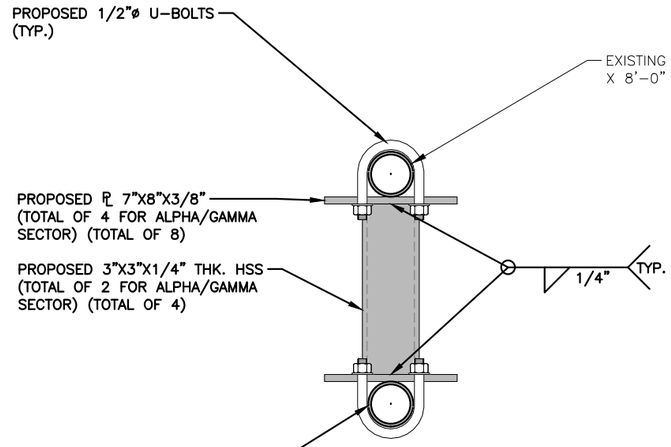
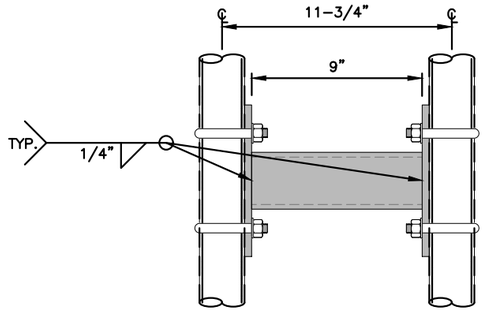
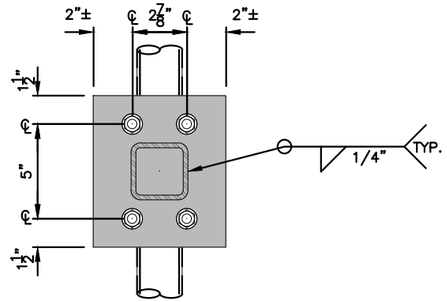


PLAN



SIDE



2" STD.
CONNECTION ELEVATION

NOTE:

REFER TO STRUCTURAL ANALYSIS BY: TEP OPCO LLC., DATED: OCTOBER 2, 2024 (REV.1), FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

PROPOSED HSS STANDOFF DETAIL (ALPHA/GAMMA) (1 / S-2)

22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"

0 0'-2" 0'-4" 0'-8" 1'-0"

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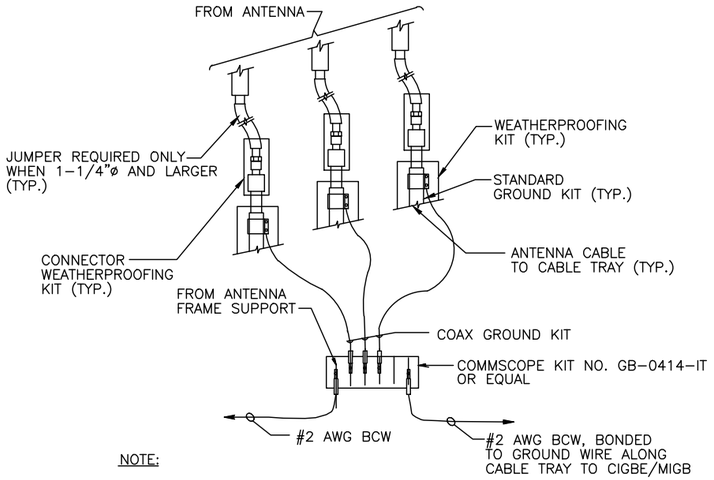
STRUCTURAL DETAILS
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR - LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	S-2	2



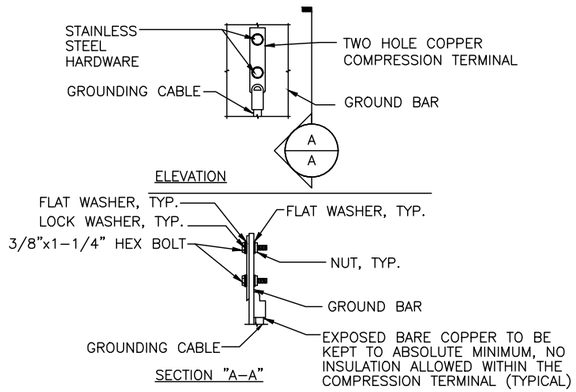
NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

1 / G-1



NOTES:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

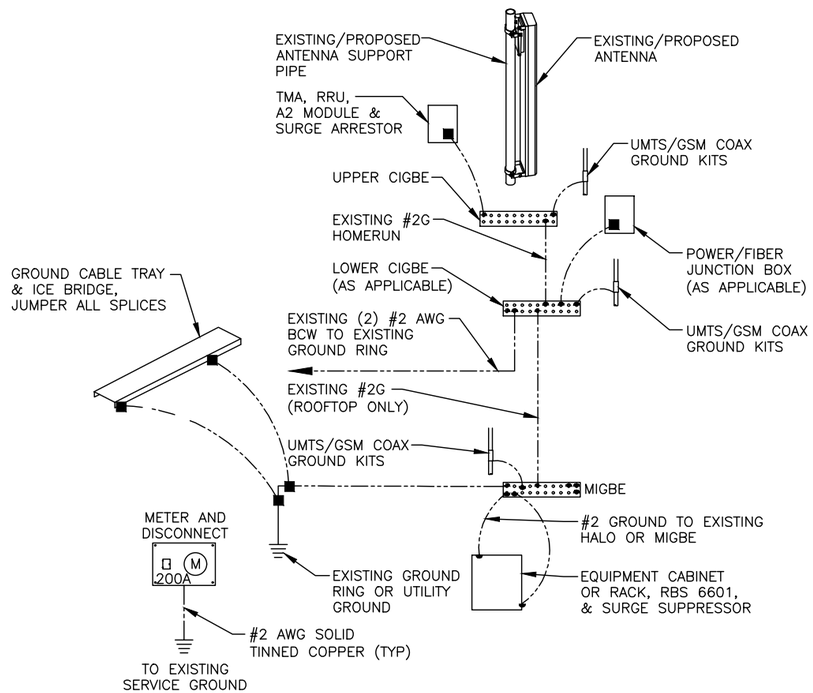
TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

3 / G-1

AT&T GROUNDING STANDARDS TO BE FOLLOWED:

ATT-TP-76416
ATT-TP-76300
ATT-CEM-18002
ATT-002-290-531
ATT-002-290-701
ATT-CEM-23001



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / G-1

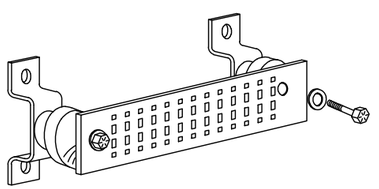
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2 AWG)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2 AWG)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2 AWG)
+24V POWER SUPPLY RETURN BAR (#2 AWG)
-48V POWER SUPPLY RETURN BAR (#2 AWG)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2 AWG)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2 AWG)
BUILDING STEEL (IF AVAILABLE) (#2 AWG)



GROUND BAR - DETAIL (AS REQUIRED)

SCALE: N.T.S

TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553

CENTERLINE
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY

AT&T
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	10/02/24	ISSUED FOR CONSTRUCTION	RB	AT	DPH
1	07/30/24	ISSUED FOR CONSTRUCTION	VD	AT	DPH
B	05/02/24	ISSUED FOR REVIEW	JS	AT	DPH
A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

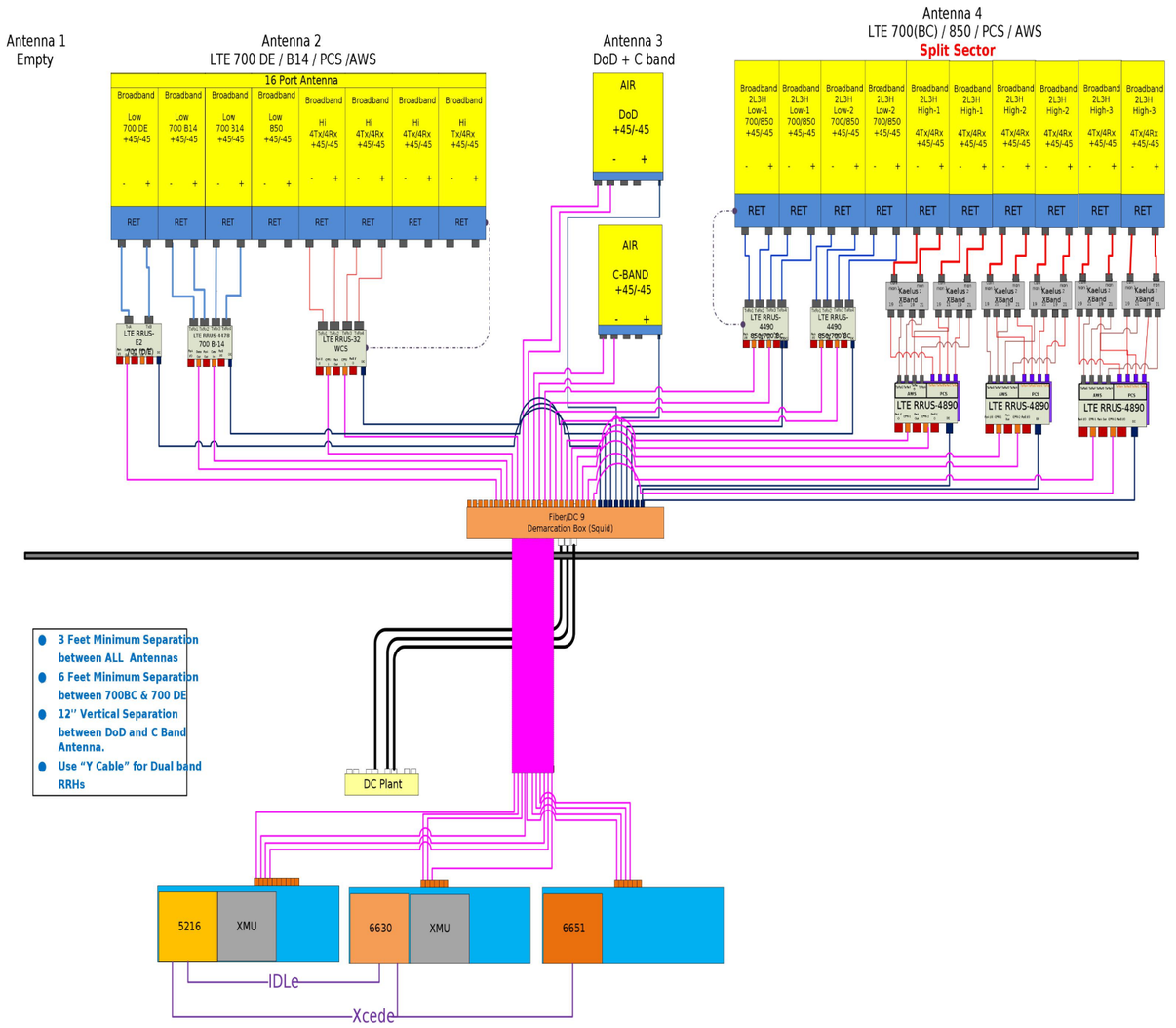
COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No. 40720
REGISTERED PROFESSIONAL ENGINEER

AT&T

GROUNDING DETAILS
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR – LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	G-1	2

ALPHA/GAMMA SECTORS



- 3 Feet Minimum Separation between ALL Antennas
- 6 Feet Minimum Separation between 700BC & 700 DE
- 12" Vertical Separation between DoD and C Band Antenna.
- Use "Y Cable" for Dual band RRHs

RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.
3. RFDS USED FOR REFERENCE.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

TEP
TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553

CENTERLINE
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
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AT&T
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
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1	07/30/24	ISSUED FOR CONSTRUCTION	VD	AT	DPH
B	05/02/24	ISSUED FOR REVIEW	JS	AT	DPH
A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

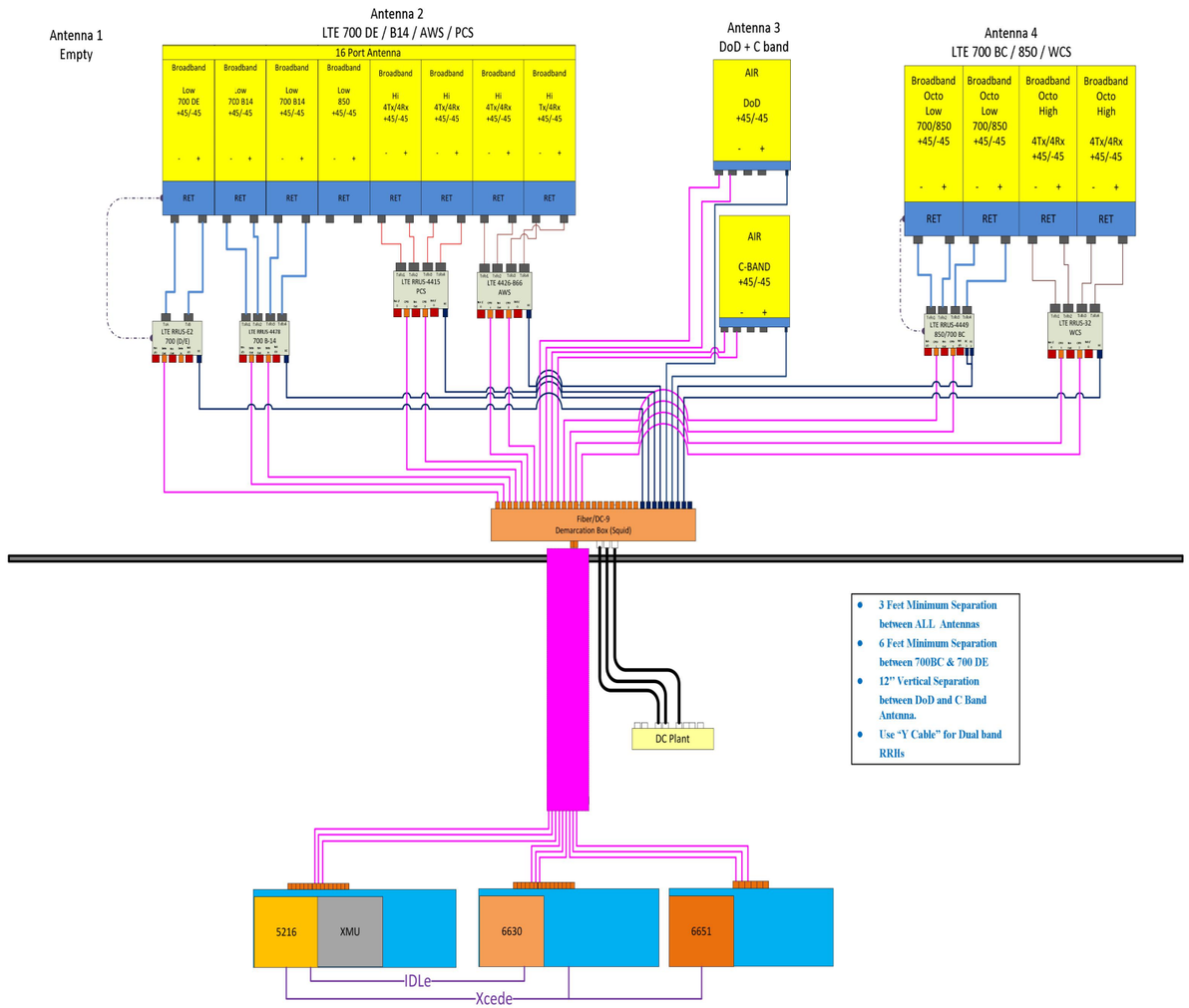
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

AT&T

RF PLUMBING DIAGRAM
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR – LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	RF–1	2

BETA SECTOR



- 3 Feet Minimum Separation between ALL Antennas
- 6 Feet Minimum Separation between 700BC & 700 DE
- 12" Vertical Separation between DoD and C Band Antenna.
- Use "Y Cable" for Dual band RRHs

RF PLUMBING DIAGRAM (1 / RF–2)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.
3. RFDS USED FOR REFERENCE.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553

CENTERLINE
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY

AT&T
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	10/02/24	ISSUED FOR CONSTRUCTION	RB	AT	DPH
1	07/30/24	ISSUED FOR CONSTRUCTION	VD	AT	DPH
B	05/02/24	ISSUED FOR REVIEW	JS	AT	DPH
A	04/25/24	ISSUED FOR REVIEW	GPJ	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GPJ

AT&T

RF PLUMBING DIAGRAM
CELL SITE CAPACITY MODIFICATIONS, SPLIT SECTOR – LTE

SITE NUMBER	DRAWING NUMBER	REV
MAL02215	RF–2	2

Prepared For:
CENTERLINE-AT&T
Site Number:
MA2215
Site Name:
CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138

SITE NO: MA2215
SITE NAME: CAMBRIDGE MASS. AVE
ADDRESS: 1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138

AT&T
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

CENTERLINE
750 WEST CENTER STREET, SUIT #301
WEST BRIDGEWATER, MA 02379

TEP
TEP OPCO, LLC
45 BEECHWOOD DRIVE,
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

SITE TYPE: ROOFTOP
DATE: 09/20/2024 | REV: 0
DRAWN BY: AFS
SCALE: N.T.S.

THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

LOCUS MAP

TAKEN FROM GOOGLE.COM ON 09/20/2024

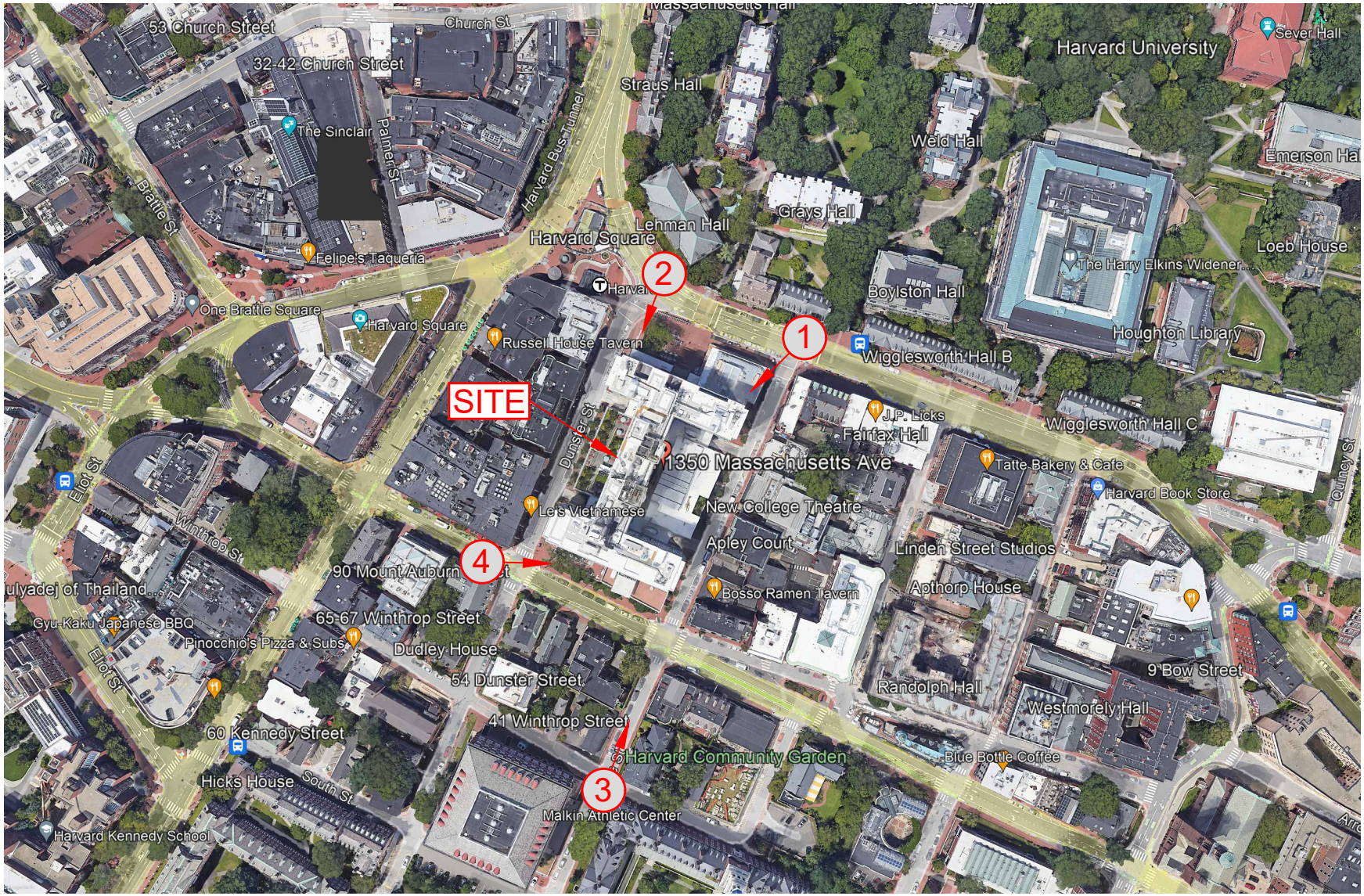


PHOTO LOCATION

SITE NO: MA2215 SITE NAME: CAMBRIDGE MASS. AVE ADDRESS: 1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138	AT&T 550 COCHITUATE ROAD FRAMINGHAM, MA 01701	CENTERLINE 750 WEST CENTER STREET, SUIT #301 WEST BRIDGEWATER, MA 02379	TEP TEP OPCO, LLC 45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845 TEL: (978) 557-5553	SITE TYPE: ROOFTOP DATE: 09/20/2024 | REV: 0 DRAWN BY: AFS SCALE: N.T.S.	THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

EXISTING CONDITIONS

LOCATION # 1

DATE OF PHOTO: 05/18/2023

VIEW SOUTHWEST FROM MASSACHUSETTS AVENUE

SITE NO: MA2215 SITE NAME: CAMBRIDGE MASS. AVE ADDRESS: 1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138	AT&T 550 COCHITUATE ROAD FRAMINGHAM, MA 01701	CENTERLINE 750 WEST CENTER STREET, SUIT #301 WEST BRIDGEWATER, MA 02379	TEP TEP OPCO, LLC 45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845 TEL: (978) 557-5553	SITE TYPE: ROOFTOP DATE: 09/20/2024 REV: 0 DRAWN BY: AFS SCALE: N.T.S.	THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

PROPOSED CONDITIONS

LOCATION # 1

DATE OF PHOTO: 05/18/2023

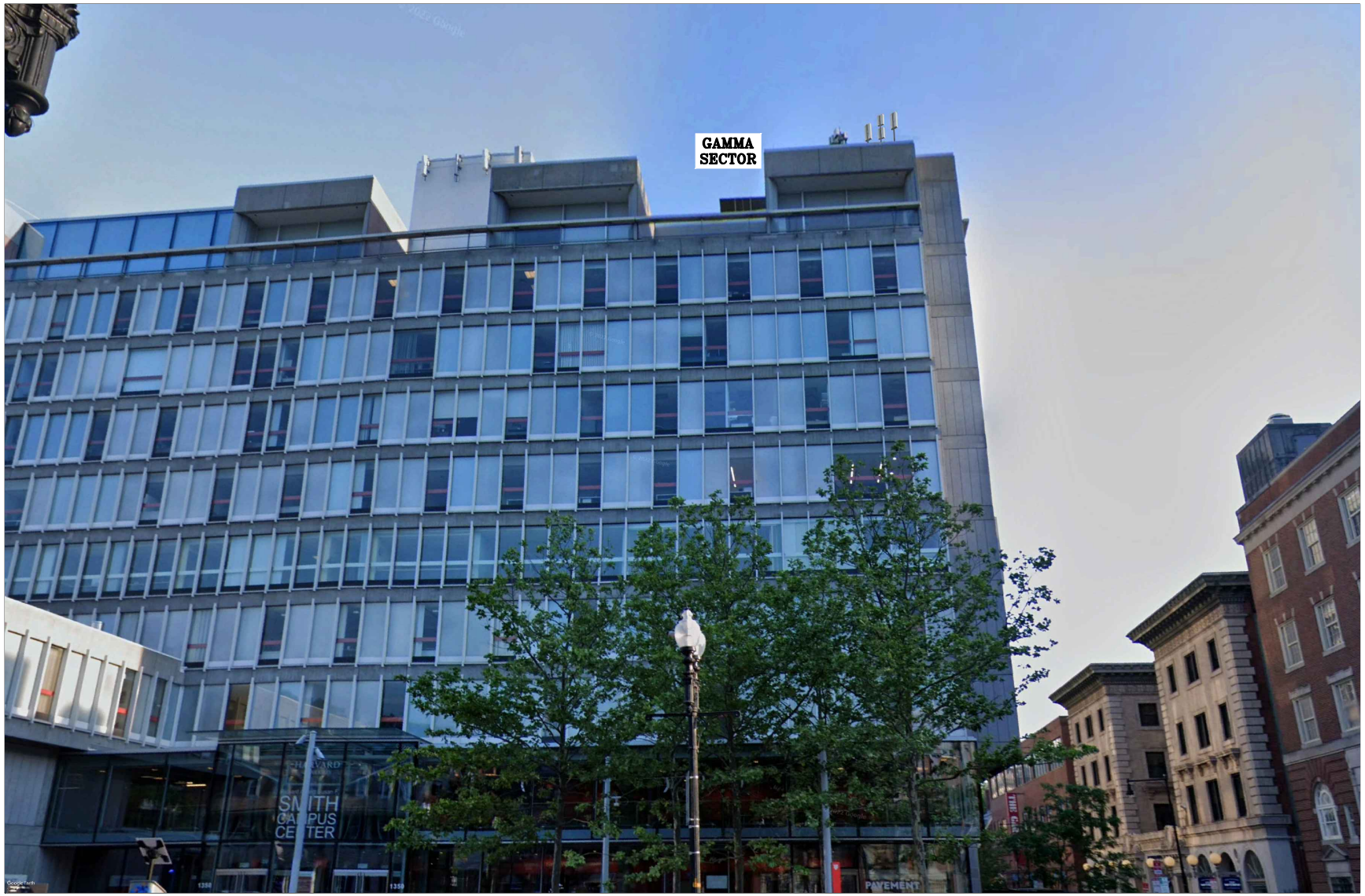
VIEW SOUTHWEST FROM MASSACHUSETTS AVENUE

SITE NO: MA2215 SITE NAME: CAMBRIDGE MASS. AVE ADDRESS: 1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138	AT&T 550 COCHITUATE ROAD FRAMINGHAM, MA 01701	CENTERLINE 750 WEST CENTER STREET, SUIT #301 WEST BRIDGEWATER, MA 02379	TEP TEP OPCO, LLC 45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845 TEL: (978) 557-5553	SITE TYPE: ROOFTOP DATE: 09/20/2024 REV: 0 DRAWN BY: AFS SCALE: N.T.S.	THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

EXISTING CONDITIONS

LOCATION # 2

DATE OF PHOTO: 05/18/2023



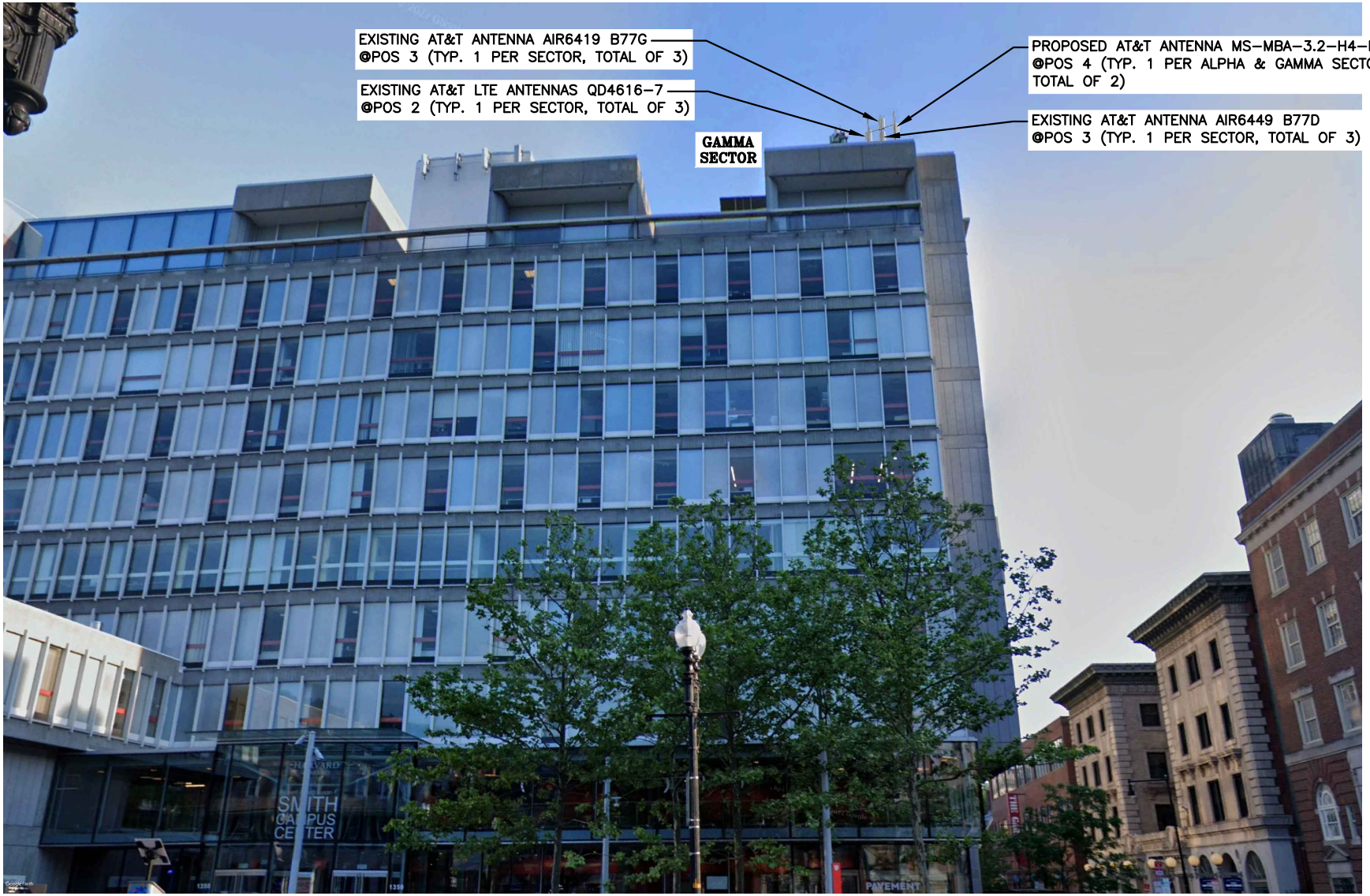
VIEW SOUTH FROM MASSACHUSETTS AVENUE

SITE NO: MA2215 SITE NAME: CAMBRIDGE MASS. AVE ADDRESS: 1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138	AT&T 550 COCHITUATE ROAD FRAMINGHAM, MA 01701	CENTERLINE 750 WEST CENTER STREET, SUIT #301 WEST BRIDGEWATER, MA 02379	TEP TEP OPCO, LLC 45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845 TEL: (978) 557-5553	SITE TYPE: ROOFTOP DATE: 09/20/2024 REV: 0 DRAWN BY: AFS SCALE: N.T.S.	THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

PROPOSED CONDITIONS

LOCATION # 2

DATE OF PHOTO: 05/18/2023



VIEW SOUTH FROM MASSACHUSETTS AVENUE

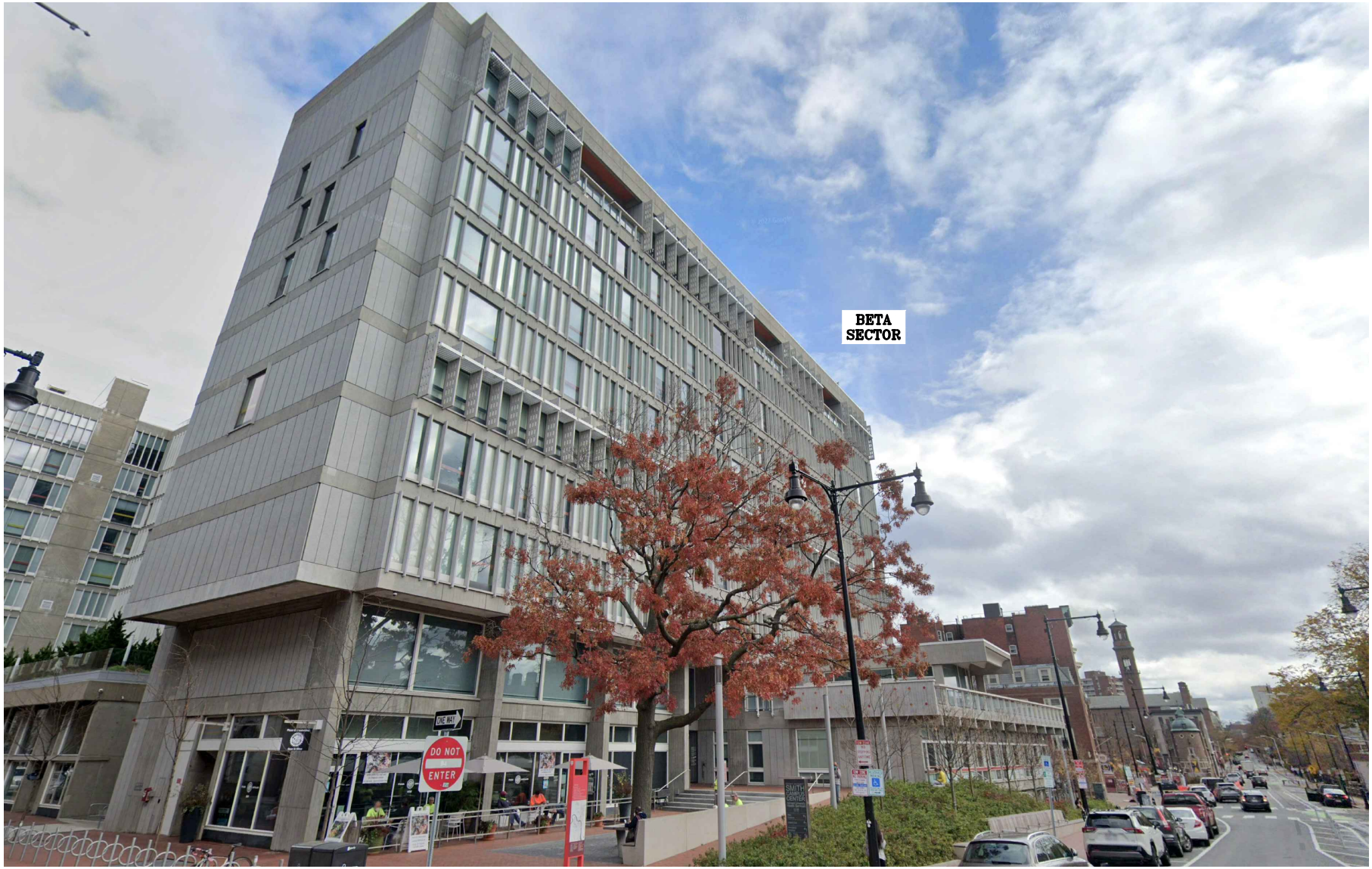
SITE NO: MA2215 SITE NAME: CAMBRIDGE MASS. AVE ADDRESS: 1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138	AT&T 550 COCHITUATE ROAD FRAMINGHAM, MA 01701	CENTERLINE 750 WEST CENTER STREET, SUIT #301 WEST BRIDGEWATER, MA 02379	TEP TEP OPCO, LLC 45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845 TEL: (978) 557-5553	SITE TYPE: ROOFTOP DATE: 09/20/2024 REV: 0 DRAWN BY: AFS SCALE: N.T.S.	THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

PROPOSED/EXISTING CONDITIONS LOCATION # 3 DATE OF PHOTO: 05/18/2023

VIEW NORTHEAST FROM HOLYOKE ST

SITE NO: MA2215 SITE NAME: CAMBRIDGE MASS. AVE ADDRESS: 1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138	AT&T 550 COCHITUATE ROAD FRAMINGHAM, MA 01701	CENTERLINE 750 WEST CENTER STREET, SUIT #301 WEST BRIDGEWATER, MA 02379	TEP TEP OPCO, LLC 45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845 TEL: (978) 557-5553	SITE TYPE: ROOFTOP DATE: 09/20/2024 REV: 0 DRAWN BY: AFS SCALE: N.T.S.	THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

PROPOSED/EXISTING CONDITIONS LOCATION # 4 DATE OF PHOTO: 05/18/2023



VIEW NORTHEAST FROM MT AUBURN ST

SITE NO: MA2215 SITE NAME: CAMBRIDGE MASS. AVE ADDRESS: 1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138	AT&T 550 COCHITUATE ROAD FRAMINGHAM, MA 01701	CENTERLINE 750 WEST CENTER STREET, SUIT #301 WEST BRIDGEWATER, MA 02379	TEP TEP OPCO, LLC 45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845 TEL: (978) 557-5553	SITE TYPE: ROOFTOP DATE: 09/20/2024 REV: 0 DRAWN BY: AFS SCALE: N.T.S.	THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

(REVISED)
STRUCTURAL ANALYSIS REPORT

For

AT&T Site Number: MAL02215 (Sector Split)

TEP Project Number: 316608.950092

AT&T Site Name: CAMBRIDGE MASS. AVE

1350 Massachusetts Avenue
Cambridge, MA 02138

Antennas and RRH's Mounted on Non-Penetrating Ballast Sleds on the Rooftop

Prepared for:

CENTERLINE AT&T

Dated: October 2, 2024 (Rev.1)
April 29, 2024

Prepared by:

(TEP OPCO, LLC)
45 Beechwood Drive
North Andover, MA 01845
(P) 978-557-5553
www.tepgroup.net

SCOPE OF WORK:

TEP has been authorized by AT&T to conduct a structural evaluation of the structure supporting the proposed equipment located in the areas depicted in the latest TEP construction drawings.

This report represents this office's findings, conclusions and recommendations pertaining to the support of AT&T's proposed antennas listed below.

This office conducted an on-site visual survey of the above site on June 2, 2022.

The following documents were used for our reference:

- Original Building Plans prepared by Sert, Jackson, and Gourley Architects dated March 23, 1964.
- Previous Structural Analysis prepared by Hudson Design Group LLC dated July 14, 2020.
- Existing Conditions Mount Mapping Report prepared by ProVertic LLC dated July 25, 2022.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing structure **IS CAPABLE** of supporting the proposed equipment loading.

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Roof Structure	Concrete Slab	Bending	68%	**PASS**

Based on our evaluation, we have determined that the existing mounts **ARE CAPABLE** of supporting the proposed equipment loading with the following modifications:

- **Reinforce existing vertical steel angles with proposed L3"x3"x1/4" steel angles (typ. of 2 per Alpha & Gamma sector, total of 4). Reference the latest TEP Construction Drawings for reinforcement details.**

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Ballast Mount	19	LC2	142%	**FAIL**
Modified Ballast Mount	1	LC3	82%	**PASS**

No additional ballast is required. The weight required to resist overturning and sliding forces does not exceed the weight of the proposed installation.

TEP did not perform a condition assessment of the entire roof but did perform an inspection of the existing roof members and structural bearing walls below the area where the equipment is proposed to be located.

*Reference documents attached.

APPURTENANCE CONFIGURATION:

Appurtenances	Dimensions	Weight	**Elevation	Mount
(3) QD4616-7 Antennas	51.5"x22.0"x9.6"	109 lbs	126'-0"	Ballast Sled
(3) AIR6419 Antennas	31.2"x16.1"x9.1"	66 lbs	126'-0"	Ballast Sled
(3) AIR6449 Antennas	30.6"x15.9"x10.6"	84 lbs	126'-0"	Ballast Sled
(1) OPA65R-BU4D Antenna	48.0"x20.7"x7.7"	53 lbs	126'-0"	Ballast Sled
(3) 4478 B14 RRH's	18.1"x13.4"x8.3"	60 lbs	--	Ballast Sled
(3) RRUS-32 B30 RRH's	27.2"x12.1"x7.0"	60 lbs	--	Ballast Sled
(3) RRUS-E2 B29 RRH's	20.4"x18.5"x7.5"	53 lbs	--	Ballast Sled
(1) 4415 B25 RRH	16.5"x13.5"x6.3"	50 lbs	--	Ballast Sled
(1) 4426 B66 RRH	14.9"x13.2"x5.8"	49 lbs	--	Ballast Sled
(1) 4449 B5/B12 RRH	17.9"x13.2"x9.4"	73 lbs	--	Ballast Sled
(3) DC6-48-60-18 Surge Arrestors	20.1"x18.2"x6.4"	44 lbs	--	Ballast Sled
(3) DC6-48-60-18-8C-EV Surge Arrestors	31.4"x10.2" Ø	29 lbs	--	Ballast Sled
(2) MS-MBA-3.2-H4-L4 Antennas	71.9"x24.1"x28.3"	131 lbs	126'-0"	Ballast Sled
(4) 4490 B5/B12A RRH's	17.5"x15.1"x6.8"	68 lbs	--	Ballast Sled
(6) 4890 B25/B66 RRH's	17.5"x15.2"x6.9"	68 lbs	--	Ballast Sled
(12) DBC0051F3V51-2 Diplexers	8.6"x5.0"x2.2"	8 lbs	--	Ballast Sled

** Proposed equipment shown in bold.*
*** Elevation to antenna centerline.*

DESIGN CRITERIA:

International Building Code (IBC) 2015 with Massachusetts State Building Code 9th Edition, and ASCE 7-10 (Minimum Design Loads for Buildings and Other Structures).		
Wind		
Reference Wind Speed:	139 mph	(780 CMR Table 1604.11)
Exposure Category:	B	(ASCE 7-10 Chapter 26)
Risk Category:	III	(ASCE 7-10 Table 1.5-1)
Snow		
Ground Snow, P_g:	40 psf	(780 CMR Table 1604.11)
Importance Factor (I_s):	1.1	(ASCE 7-10 Table 1.5-2)
Exposure Factor (C_e):	0.9	(Fully Exposed, Table 7-2)
Thermal Factor (C_t):	1.0	(ASCE 7-10 Table 7-3)
Flat Roof Snow Load:	28 psf	(ASCE 7-10 Equation 7.3-1)
Min. Flat Roof Snow Load:	30 psf	(780 CMR Table 1604.11)
EIA/TIA-222-H Structural Standards for Steel Antenna Towers and Antenna Supporting Structures		
Wind		
City/Town:	Cambridge	
County:	Middlesex	
Wind Load:	128 mph	(TIA-222-H Figure B-2)
Ice		
Design Ice Thickness (t_i):	1.00 in	(TIA-222-H Figure B-9)
Structure Class:	II	(TIA-222-H Table 2-1)
Importance Factor (I_i):	1.0	(TIA-222-H Table 2-3)
Factored Thickness of Radial Ice (t_{iz}):	1.14 in	(TIA-222-H Sec. 2.6.10)

EXISTING ROOF CONSTRUCTION:

The existing roof construction consists of a roofing membrane over rigid insulation over a reinforced concrete slab supported by a system of reinforced concrete beams and columns.

ANTENNA/RRH/DIPLEXER SUPPORT RECOMMENDATIONS:

The proposed antennas, RRH's and diplexers are to be mounted on existing non-penetrating ballast mounts located on the rooftop.

Limitations and Assumptions:

1. Reference the latest TEP construction drawings for all the equipment locations and details.
2. All detail requirements will be designed and furnished in the construction drawings.
3. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
4. TEP is not responsible for any modifications completed prior to and hereafter which TEP was not directly involved.
5. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer requirements.
6. If field conditions differ from what is assumed in this report, then the engineer of record is to be notified as soon as possible.

FIELD PHOTOS:

Photo 1: Sample photo illustrating the existing Alpha sector.

Photo 2: Sample photo illustrating the existing Beta sector.

FIELD PHOTOS (CONT.):

Photo 3: Sample photo illustrating the existing Gamma sector.

Photo 4: Sample photo illustrating an existing ballast tray at an existing antenna mount.

FIELD PHOTOS (CONT.):

Photo 5: Sample photo illustrating an existing block-style RRH ballast sled.

Photo 6: Sample photo illustrating an existing sleeper-style RRH ballast sled.

Wind & Ice
Calculations

Date: 10/2/2024
Project Name: CAMBRIDGE MASS. AVE
Project No.: MA2215
Designed By: KM **Checked By:** MSC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

z=	126	(ft)
z_g=	1200	(ft)
α=	7.0	

K_z= 1.056

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c\ K_t/K_h)]^2$

$K_h = e^{(f*z/H)}$

K_{zt}= 1

(If Category 1 then K_{zt}=1.0)

Category= **1**

K_h=	1	
K_c=	1.0	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	126	
z_s=	8	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	1.00	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i =	1.00	in
Importance Factor = I=	1.00	(from Table 2-3)
K_{iz} =	1.14	(from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$

t_{iz} = 1.14 in

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2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	121.5	G_h=	0.85
2.6.9.2 Guyed Masts		G_h=	0.85
2.6.9.3 Pole Structures		G_h=	1.1
2.6.9 Appurtenances		G_h=	1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

F= q_z*G_h*$(EPA)_A$

q_z= 0.00256*K_z*K_{zt}*K_s*K_e*K_d*V_{max}^2

		K_z=	1.056	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.1	(from 2.6.7)
q_z=	**46.26**	K_e=	1.00	(from 2.6.8)
$q_{z\ (ice)}$=	**7.06**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.54**	V_{max}=	128	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

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Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	**C < 39** (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **1.14** in | **Angle =** **0 (deg)** | **Equivalent Angle =** **180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)
QD4616-7 Antenna	51.5	22.0	9.6	7.87	2.34	1.20	**437**	**77**
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.94	1.20	**194**	**36**
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	**188**	**35**
MS-MBA-3.2-H4-L4 Antenna	71.9	24.1	28.3	12.03	2.98	1.22	**680**	**117**
OPA65R-BU4D Antenna	48.0	20.7	7.7	6.90	2.32	1.20	**383**	**68**
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.10	1.20	**145**	**28**
4478 B14 RRH	18.1	13.4	8.3	1.68	1.35	1.20	**93**	**19**
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	**127**	**25**
4490 B5/B12A RRH	17.5	15.1	6.8	1.84	1.16	1.20	**102**	**20**
4890 B25/B66 RRH	17.5	15.2	6.9	1.85	1.15	1.20	**103**	**20**
4415 B25 RRH	16.5	13.5	6.3	1.55	1.22	1.20	**86**	**17**
4426 B66 RRH	14.9	13.2	5.8	1.37	1.13	1.20	**76**	**16**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.36	1.20	**91**	**18**
DBC0051F3V51-2 Diplexer	8.5	5.0	2.2	0.30	1.70	1.20	**16**	**5**
DBC0051F3V51-2 Diplexer (Shielded)	8.5	0.0	5.0	0.00	0.00	1.20	**0**	**1**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.36	1.20	**91**	**18**
DC6 Surge Arrestor	20.1	18.2	6.4	2.54	1.10	1.20	**141**	**27**
DC6 Surge Arrestor	31.4	10.2	10.2	2.22	3.08	0.70	**72**	**14**
L 3-1/2x3-1/2 Angle	3.5	12.0	-	0.29	0.29	2.00	**27**	
L 3x3 Angle	3.0	12.0	-	0.25	0.25	2.00	**23**	
2" Pipe	2.4	12.0	-	0.20	0.20	1.20	**11**	

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WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.14	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
QD4616-7 Antenna	51.5	22.0	9.6	7.87	3.43	2.34	5.36	1.20	1.33	437	211	211
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	194	113	113
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	188	127	127
MS-MBA-3.2-H4-L4 Antenna	71.9	24.1	28.3	12.03	14.13	2.98	2.54	1.22	1.20	680	786	786
OPA65R-BU4D Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	383	162	162
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	145	59	59
4478 B14 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	93	58	58
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	127	77	77
4490 B5/B12A RRH	17.5	15.1	6.8	1.84	0.83	1.16	2.57	1.20	1.20	102	46	46
4890 B25/B66 RRH	17.5	15.2	6.9	1.85	0.84	1.15	2.54	1.20	1.20	103	47	47
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	86	40	40
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	76	33	33
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	91	65	65
DBC0051F3V51-2 Diplexer	8.5	5.0	2.2	0.30	0.13	1.70	3.86	1.20	1.26	16	8	8
DBC0051F3V51-2 Diplexer (Shielded)	8.5	0.0	5.0	0.00	0.30	0.00	1.70	1.20	1.20	0	16	16
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	91	65	65
DC6 Surge Arrestor	20.1	18.2	6.4	2.54	0.89	1.10	3.14	1.20	1.23	141	51	51

WIND LOADS WITH ICE:

QD4616-7 Antenna	53.8	24.3	11.9	9.07	4.44	2.21	4.52	1.20	1.29	77	40	40
AIR6419 Antenna	33.5	18.4	11.4	4.28	2.65	1.82	2.94	1.20	1.22	36	23	23
AIR6449 Antenna	32.9	18.2	12.9	4.15	2.94	1.81	2.55	1.20	1.20	35	25	25
MS-MBA-3.2-H4-L4 Antenna	74.2	26.4	30.6	13.59	15.76	2.81	2.43	1.21	1.20	116	133	133
OPA65R-BU4D Antenna	50.3	23.0	10.0	8.03	3.49	2.19	5.04	1.20	1.31	68	32	32
RRUS-E2 B29 RRH	22.7	20.8	9.8	3.27	1.54	1.09	2.32	1.20	1.20	28	13	13
4478 B14 RRH	20.4	15.7	10.6	2.22	1.50	1.30	1.93	1.20	1.20	19	13	13
RRUS-32 B30 RRH	29.5	14.4	9.3	2.95	1.90	2.05	3.18	1.20	1.23	25	17	17
4490 B5/B12A RRH	19.8	17.4	9.1	2.39	1.25	1.14	2.18	1.20	1.20	20	11	11
4890 B25/B66 RRH	19.8	17.5	9.2	2.40	1.26	1.13	2.15	1.20	1.20	20	11	11
4415 B25 RRH	18.8	15.8	8.6	2.06	1.12	1.19	2.19	1.20	1.20	17	9	9
4426 B66 RRH	17.2	15.5	8.1	1.85	0.97	1.11	2.13	1.20	1.20	16	8	8
4449 B5/B12 RRH	20.2	15.5	11.7	2.17	1.64	1.30	1.73	1.20	1.20	18	14	14
DBC0051F3V51-2 Diplexer	10.8	7.3	4.5	0.55	0.34	1.48	2.40	1.20	1.20	5	3	3
DBC0051F3V51-2 Diplexer (Shielded)	10.8	2.3	7.3	0.17	0.55	4.72	1.48	1.30	1.20	2	5	5
DC6 Surge Arrestor	22.4	20.5	8.7	3.18	1.35	1.09	2.58	1.20	1.20	27	11	11

Date: 10/2/2024
Project Name: CAMBRIDGE MASS. AVE
Project No.: MA2215
Designed By: KM **Checked By:** MSC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.14 in.
Density of ice: 56 pcf

QD4616-7 Antenna

Weight of ice based on total radial SF area:

Height (in):	51.5	
Width (in):	22.0	
Depth (in):	9.6	
Total weight of ice on object:		150 lbs
Weight of object:	109.0 lbs	
Combined weight of ice and object:		259 lbs

AIR6419 Antenna

Weight of ice based on total radial SF area:

Height (in):	31.2	
Width (in):	16.1	
Depth (in):	9.1	
Total weight of ice on object:		71 lbs
Weight of object:	66.0 lbs	
Combined weight of ice and object:		137 lbs

AIR6449 Antenna

Weight of ice based on total radial SF area:

Height (in):	30.6	
Width (in):	15.9	
Depth (in):	10.6	
Total weight of ice on object:		72 lbs
Weight of object:	84.0 lbs	
Combined weight of ice and object:		156 lbs

MS-MBA-3.2-H4-L4 Antenna

Weight of ice based on total radial SF area:

Height (in):	71.9	
Width (in):	24.1	
Depth (in):	28.3	
Total weight of ice on object:		320 lbs
Weight of object:	131.0 lbs	
Combined weight of ice and object:		451 lbs

OPA65R-BU4D Antenna

Weight of ice based on total radial SF area:

Height (in):	48.0	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		129 lbs
Weight of object:	53.0 lbs	
Combined weight of ice and object:		182 lbs

RRUS-E2 B29 RRH

Weight of ice based on total radial SF area:

Height (in):	20.4	
Width (in):	18.5	
Depth (in):	7.5	
Total weight of ice on object:		50 lbs
Weight of object:	53.0 lbs	
Combined weight of ice and object:		103 lbs

4478 B14 RRH

Weight of ice based on total radial SF area:

Height (in):	18.1	
Width (in):	13.4	
Depth (in):	8.3	
Total weight of ice on object:		36 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		96 lbs

RRUS-32 B30 RRH

Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:		48 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		108 lbs

Date: 10/2/2024
Project Name: CAMBRIDGE MASS. AVE
Project No.: MA2215
Designed By: KM **Checked By:** MSC

ICE WEIGHT CALCULATIONS (Cont.)

4490 B5/B12A RRH

Weight of ice based on total radial SF area:

Height (in):	17.5	
Width (in):	15.1	
Depth (in):	6.8	
Total weight of ice on object:		36 lbs
Weight of object:	68.0 lbs	
Combined weight of ice and object:		104 lbs

4890 B25/B66 RRH

Weight of ice based on total radial SF area:

Height (in):	17.5	
Width (in):	15.2	
Depth (in):	6.9	
Total weight of ice on object:		36 lbs
Weight of object:	68.0 lbs	
Combined weight of ice and object:		104 lbs

4415 B25 RRH

Weight of ice based on total radial SF area:

Height (in):	16.5	
Width (in):	13.5	
Depth (in):	6.3	
Total weight of ice on object:		31 lbs
Weight of object:	50.0 lbs	
Combined weight of ice and object:		81 lbs

4426 B66 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	5.8	
Total weight of ice on object:		27 lbs
Weight of object:	49.0 lbs	
Combined weight of ice and object:		76 lbs

4449 B5/B12 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.4	
Total weight of ice on object:		36 lbs
Weight of object:	73.0 lbs	
Combined weight of ice and object:		109 lbs

DBC0051F3V51-2 Diplexer

Weight of ice based on total radial SF area:

Height (in):	8.6	
Width (in):	5.0	
Depth (in):	2.2	
Total weight of ice on object:		7 lbs
Weight of object:	7.5 lbs	
Combined weight of ice and object:		14 lbs

DC6 Surge Arrestor

Weight of ice based on total radial SF area:

Height (in):	20.1	
Width (in):	18.2	
Depth (in):	6.4	
Total weight of ice on object:		48 lbs
Weight of object:	44.0 lbs	
Combined weight of ice and object:		92 lbs

DC6 Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	31.4	
Diameter(in):	10.2	
Total weight of ice on object:		41 lbs
Weight of object:	29 lbs	
Combined weight of ice and object:		70 lbs

L 3-1/2x3-1/2 Angles

Weight of ice based on total radial SF area:

Height (in):	3.5	
Width (in):	3.5	
Per foot weight of ice on object:		8 plf

L 3x3 Angles

Weight of ice based on total radial SF area:

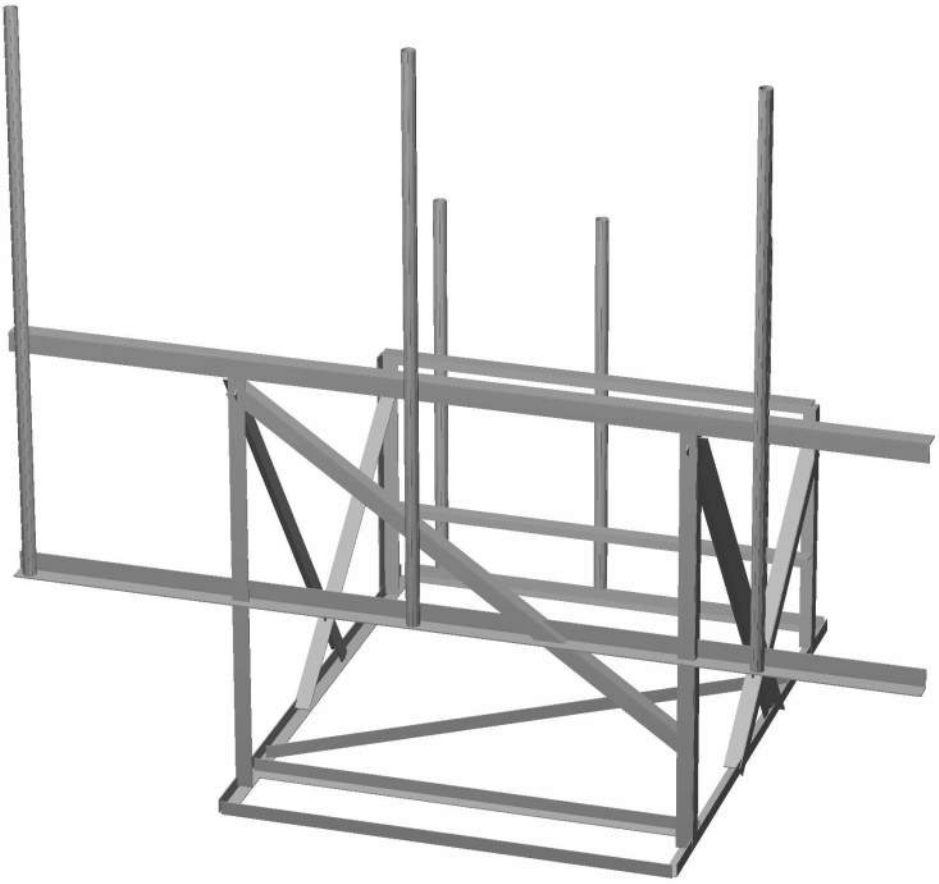
Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:		7 plf

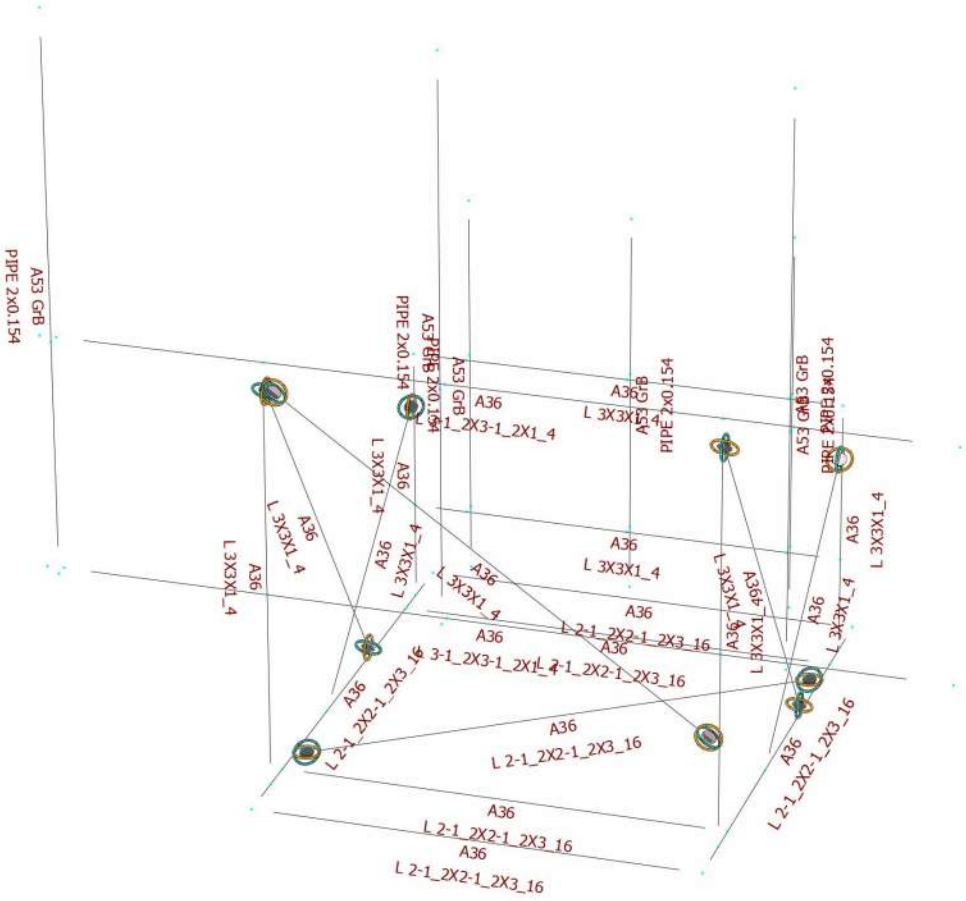
2" Pipe

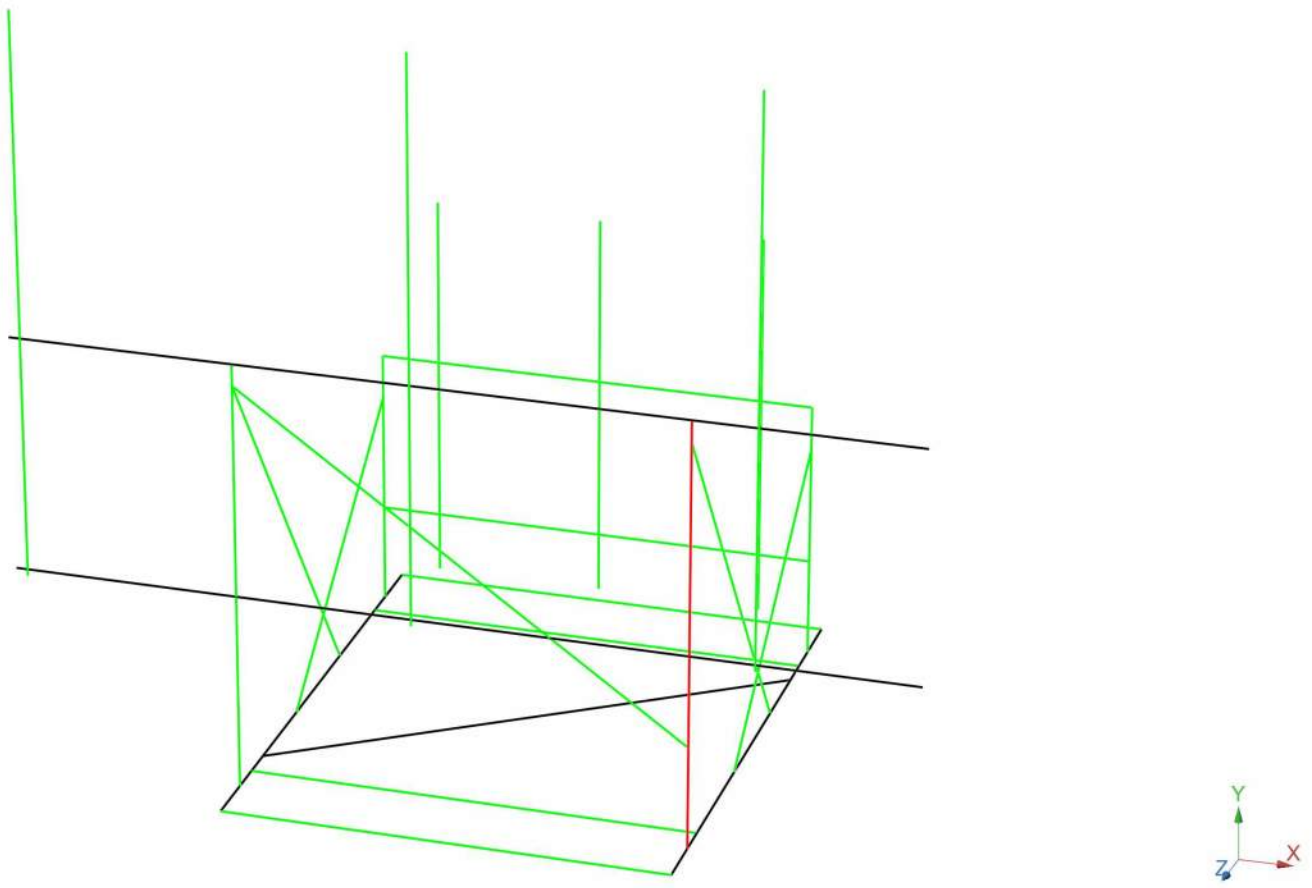
Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		5 plf

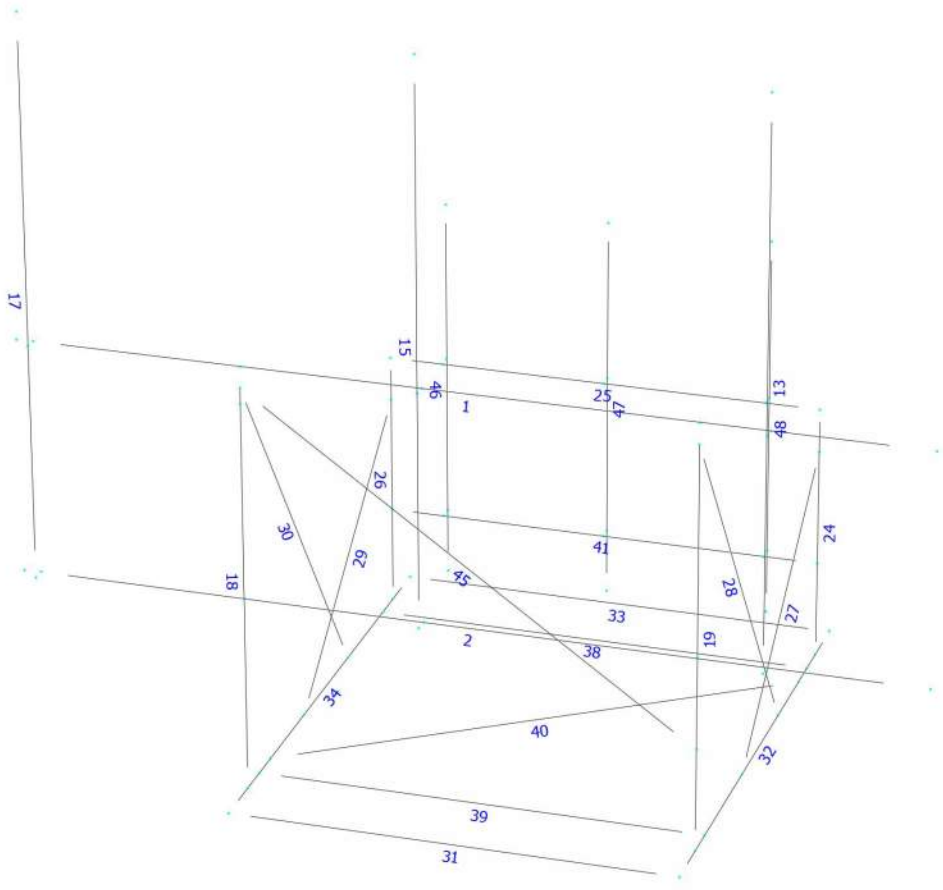
Existing Antenna Mount Calculations

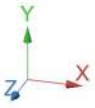

Y
X
Z


A53 GrB
PIPE 2x0.154
A36
L 3X3X1_4
L 2-1_2X2-1_2X3_16
L 3-1_2X3-1_2X1_4
Y
X
Z


Design status
Not designed
Error on design
Design O.K.
With warnings
Y
X
Z

Current Date: 4/29/2024 11:09 AM
Units system: English





RAM® Elements
CONNECT Edition

Current Date: 4/29/2024 11:09 AM
Units system: English

Load data

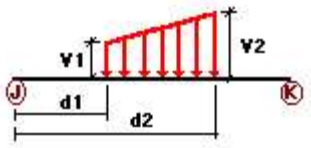
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wf	Wind Load (FRONT)	No	WIND
Ws	Wind Load (SIDE)	No	WIND
Wfice	Wind ICE (FRONT)	No	WIND
Wsice	Wind ICE (SIDE)	No	WIND
Di	Ice Load	No	LL

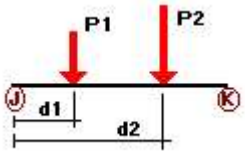
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wf	1	z	-0.027	-0.027	0.00	No	100.00	Yes
	2	z	-0.027	-0.027	0.00	No	100.00	Yes
	13	z	-0.011	-0.011	90.00	Yes	100.00	Yes
		z	-0.011	-0.011	0.00	No	40.00	Yes
	15	z	-0.011	-0.011	0.00	No	25.00	Yes
	17	z	-0.011	-0.011	0.00	No	25.00	Yes
	18	z	-0.023	-0.023	0.00	No	100.00	Yes
	19	z	-0.023	-0.023	0.00	No	100.00	Yes
	24	z	-0.023	-0.023	0.00	No	100.00	Yes
	25	z	-0.023	-0.023	0.00	No	100.00	Yes
	26	z	-0.023	-0.023	0.00	No	100.00	Yes
	27	z	-0.023	-0.023	0.00	No	100.00	Yes
	28	z	-0.023	-0.023	0.00	No	100.00	Yes
	29	z	-0.023	-0.023	0.00	No	100.00	Yes
	30	z	-0.023	-0.023	0.00	No	100.00	Yes
	41	z	-0.023	-0.023	0.00	No	100.00	Yes
	45	z	-0.023	-0.023	0.00	No	100.00	Yes
	46	z	-0.011	-0.011	0.00	No	100.00	Yes
	47	z	-0.011	-0.011	0.00	No	100.00	Yes
	48	z	-0.011	-0.011	0.00	No	100.00	Yes
Ws	13	x	-0.011	-0.011	0.00	No	100.00	Yes
	15	x	-0.011	-0.011	0.00	No	100.00	Yes
	17	x	-0.011	-0.011	0.00	No	100.00	Yes
	18	x	-0.023	-0.023	0.00	No	100.00	Yes

	19	x	-0.023	-0.023	0.00	No	100.00	Yes
	24	x	-0.023	-0.023	0.00	No	100.00	Yes
	26	x	-0.023	-0.023	0.00	No	100.00	Yes
	27	x	-0.023	-0.023	0.00	No	100.00	Yes
	28	x	-0.023	-0.023	0.00	No	100.00	Yes
	29	x	-0.023	-0.023	0.00	No	100.00	Yes
	30	x	-0.023	-0.023	0.00	No	100.00	Yes
	45	x	-0.023	-0.023	0.00	No	100.00	Yes
	46	x	-0.011	-0.011	0.00	No	100.00	Yes
	47	x	-0.011	-0.011	0.00	No	100.00	Yes
	48	x	-0.011	-0.011	0.00	No	100.00	Yes
Di	1	y	-0.008	-0.008	0.00	No	100.00	Yes
	2	y	-0.008	-0.008	0.00	No	100.00	Yes
	13	y	-0.005	-0.005	0.00	No	100.00	Yes
	15	y	-0.005	-0.005	0.00	No	100.00	Yes
	17	y	-0.005	-0.005	0.00	No	100.00	Yes
	18	y	-0.007	-0.007	0.00	No	100.00	Yes
	19	y	-0.007	-0.007	0.00	No	100.00	Yes
	24	y	-0.007	-0.007	0.00	No	100.00	Yes
	25	y	-0.007	-0.007	0.00	No	100.00	Yes
	26	y	-0.007	-0.007	0.00	No	100.00	Yes
	27	y	-0.007	-0.007	0.00	No	100.00	Yes
	28	y	-0.007	-0.007	0.00	No	100.00	Yes
	29	y	-0.007	-0.007	0.00	No	100.00	Yes
	30	y	-0.007	-0.007	0.00	No	100.00	Yes
	40	y	-0.009	-0.009	0.00	No	100.00	Yes
	41	y	-0.007	-0.007	0.00	No	100.00	Yes
	45	y	-0.007	-0.007	0.00	No	100.00	Yes
	46	y	-0.005	-0.005	0.00	No	100.00	Yes
	47	y	-0.005	-0.005	0.00	No	100.00	Yes
	48	y	-0.005	-0.005	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	13	y	-0.055	4.00	No
		y	-0.055	7.25	No
	15	y	-0.033	2.75	No
		y	-0.033	4.75	No
		y	-0.042	5.75	No
		y	-0.042	7.75	No
	17	y	-0.066	3.00	No
		y	-0.066	8.00	No
		y	-0.048	4.00	No
	46	y	-0.068	1.25	No
		y	-0.068	1.25	No
		y	-0.068	2.25	No
	47	y	-0.068	1.25	No
		y	-0.068	1.25	No

	48	y	-0.06	1.25	No
Wf	13	z	-0.219	4.00	No
		z	-0.219	7.25	No
	15	z	-0.097	2.75	No
		z	-0.097	4.75	No
		z	-0.094	5.75	No
		z	-0.094	7.75	No
	17	z	-0.34	3.00	No
		z	-0.34	8.00	No
	46	z	-0.047	1.25	No
		z	-0.047	1.25	No
		z	-0.047	2.25	No
	47	z	-0.046	1.25	No
		z	-0.046	1.25	No
	48	z	-0.127	1.25	No
Ws	13	x	-0.106	4.00	No
		x	-0.106	7.25	No
	15	x	-0.057	2.75	No
		x	-0.057	4.75	No
		x	-0.064	5.75	No
		x	-0.064	7.75	No
	17	x	-0.393	3.00	No
		x	-0.393	8.00	No
		x	-0.048	4.00	No
	46	x	-0.102	1.25	No
		x	-0.102	2.25	No
	47	x	-0.103	1.25	No
	48	x	-0.077	1.25	No
Wfice	13	z	-0.039	4.00	No
		z	-0.039	7.25	No
	15	z	-0.018	2.75	No
		z	-0.018	4.75	No
		z	-0.018	5.75	No
		z	-0.018	7.75	No
	17	z	-0.059	3.00	No
		z	-0.059	8.00	No
	46	z	-0.011	1.25	No
		z	-0.011	1.25	No
		z	-0.011	2.25	No
	47	z	-0.011	1.25	No
		z	-0.011	1.25	No
	48	z	-0.025	1.25	No
Wsice	13	x	-0.02	4.00	No
		x	-0.02	7.25	No
	15	x	-0.012	2.75	No
		x	-0.012	4.75	No
		x	-0.013	5.75	No
		x	-0.013	7.75	No
	17	x	-0.067	3.00	No
		x	-0.067	8.00	No
		x	-0.015	4.00	No
	46	x	-0.02	1.25	No
		x	-0.02	2.25	No
	47	x	-0.02	1.25	No
	48	x	-0.017	1.25	No
Di	13	y	-0.075	4.00	No
		y	-0.075	7.25	No
	15	y	-0.036	2.75	No
		y	-0.036	4.75	No
		y	-0.036	5.75	No

	y	-0.036	7.75	No
17	y	-0.16	3.00	No
	y	-0.16	8.00	No
	y	-0.042	4.00	No
46	y	-0.036	1.25	No
	y	-0.036	1.25	No
	y	-0.036	2.25	No
47	y	-0.036	1.25	No
	y	-0.036	1.25	No
48	y	-0.048	1.25	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wf	Wind Load (FRONT)	No	0.00	0.00	0.00
Ws	Wind Load (SIDE)	No	0.00	0.00	0.00
Wfice	Wind ICE (FRONT)	No	0.00	0.00	0.00
Wsice	Wind ICE (SIDE)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

RAM® Elements
CONNECT Edition

Current Date: 4/29/2024 11:09 AM
Units system: English

Steel Code Check

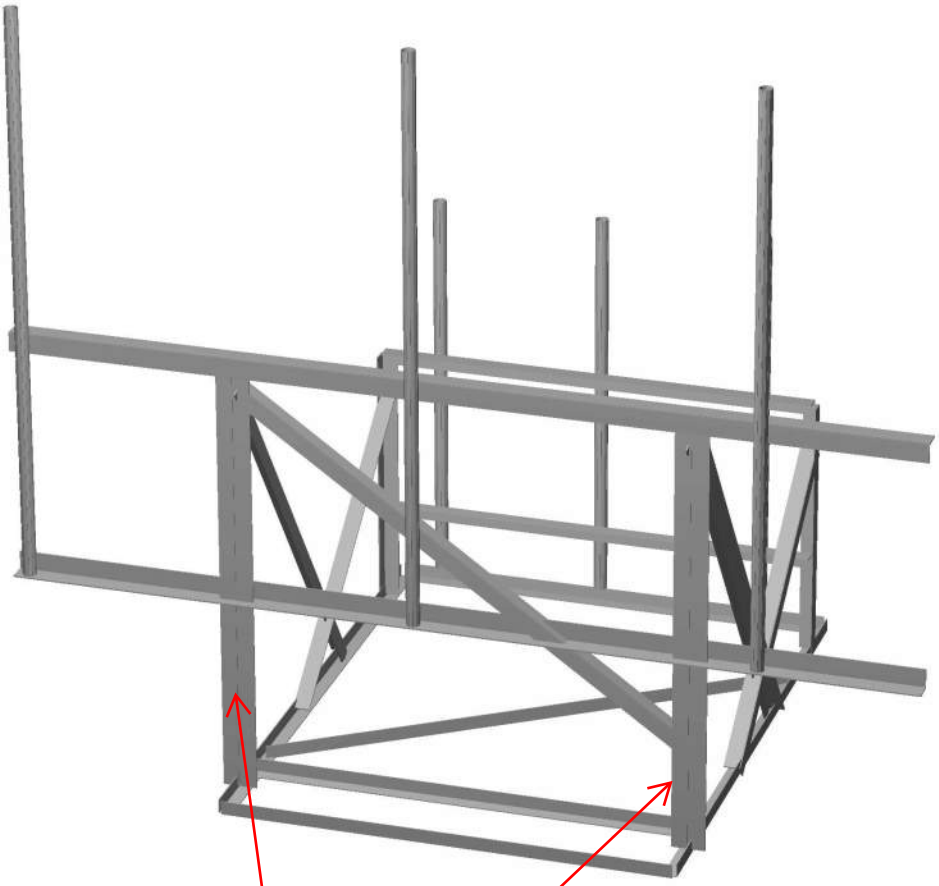
Report: Summary - Group by member

Load conditions to be included in design :

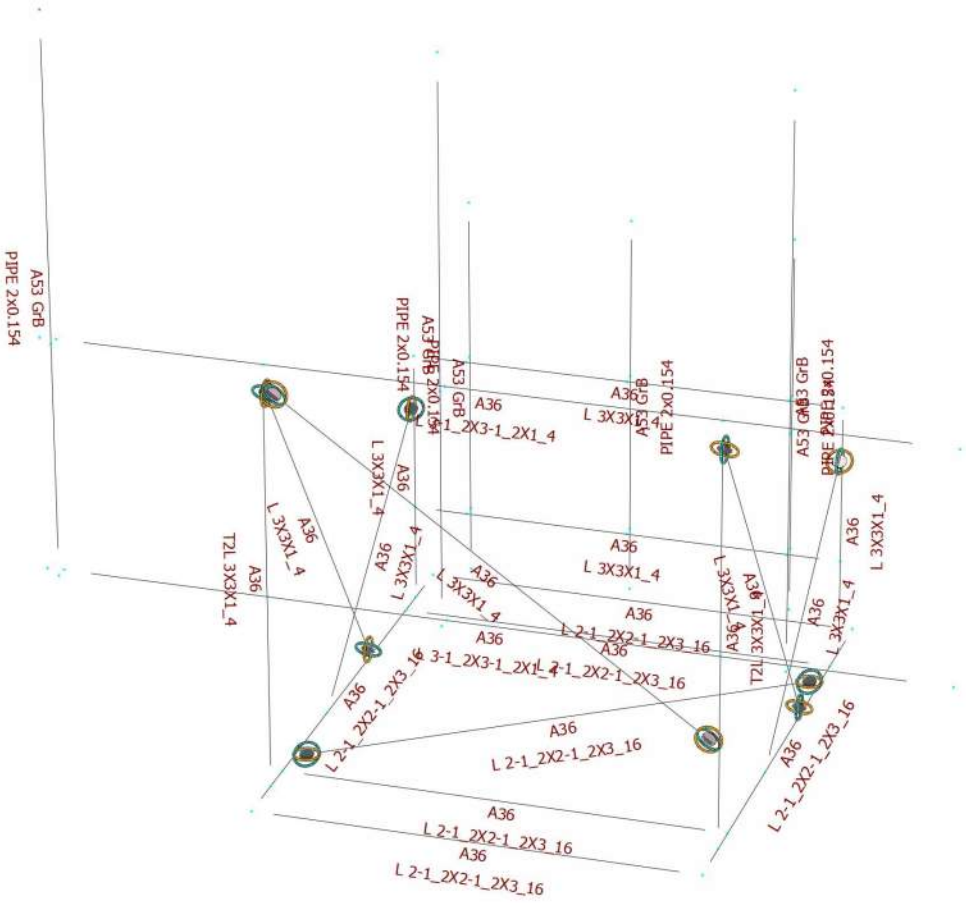
LC1=1.2DL+Wf
LC2=1.2DL+Ws
LC3=0.9DL+Wf
LC4=0.9DL+Ws
LC5=1.2DL+Wfice+Di
LC6=1.2DL+Wsice+Di
LC7=1.4DL
LC8=0.9DL

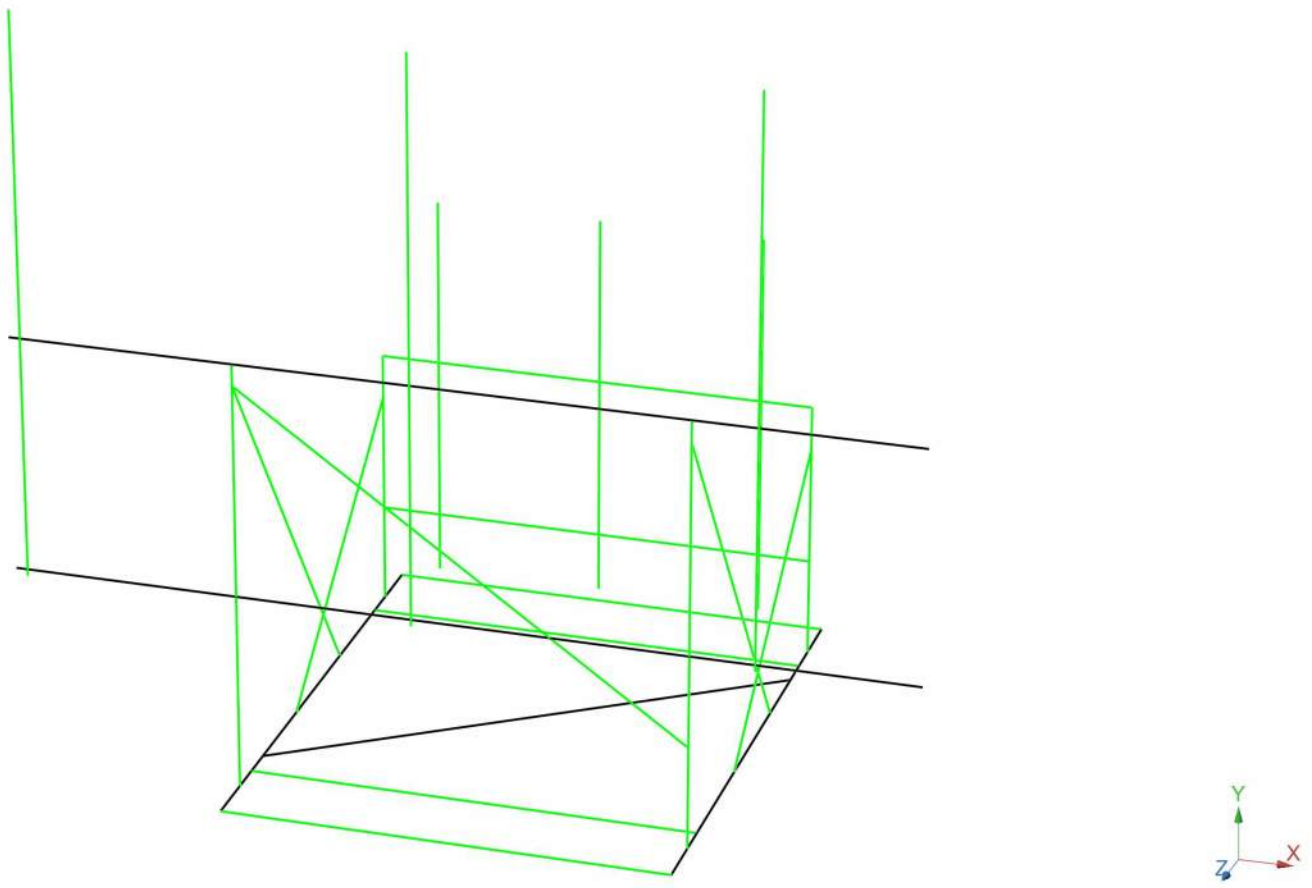
Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 2-1_2X2-1_2X3_16	**31**	LC4 at 100.00%	0.14	OK	
		32	LC4 at 9.38%	**0.89**	**OK**	
		33	LC2 at 100.00%	0.06	OK	
		34	LC2 at 90.63%	0.79	With warnings	
		38	LC2 at 100.00%	0.05	OK	
		39	LC4 at 100.00%	0.10	OK	
		40	LC5 at 50.00%	0.13	With warnings	
	L 3-1_2X3-1_2X1_4	**1**	LC3 at 75.00%	**0.82**	**With warnings**	
		2	LC2 at 39.29%	0.53	With warnings	
	L 3X3X1_4	**18**	LC4 at 45.31%	0.66	OK	
		19	LC2 at 75.00%	**1.42**	**N.G.**	
		24	LC4 at 35.42%	0.32	OK	
		25	LC1 at 50.00%	0.31	OK	
		26	LC2 at 62.50%	0.38	OK	
		27	LC3 at 0.00%	0.13	OK	
		28	LC3 at 28.13%	0.13	OK	
		29	LC3 at 0.00%	0.10	OK	
		30	LC3 at 59.38%	0.25	OK	
		41	LC2 at 100.00%	0.43	OK	
		45	LC4 at 28.13%	0.20	OK	
	PIPE 2x0.154	**13**	LC1 at 56.25%	0.23	OK	
		15	LC3 at 59.38%	0.23	OK	
		17	LC2 at 56.25%	**0.68**	**OK**	
		46	LC2 at 81.25%	0.19	OK	
		47	LC4 at 81.25%	0.27	OK	
		48	LC1 at 41.67%	0.15	OK	

Modified Antenna Mount
Calculations

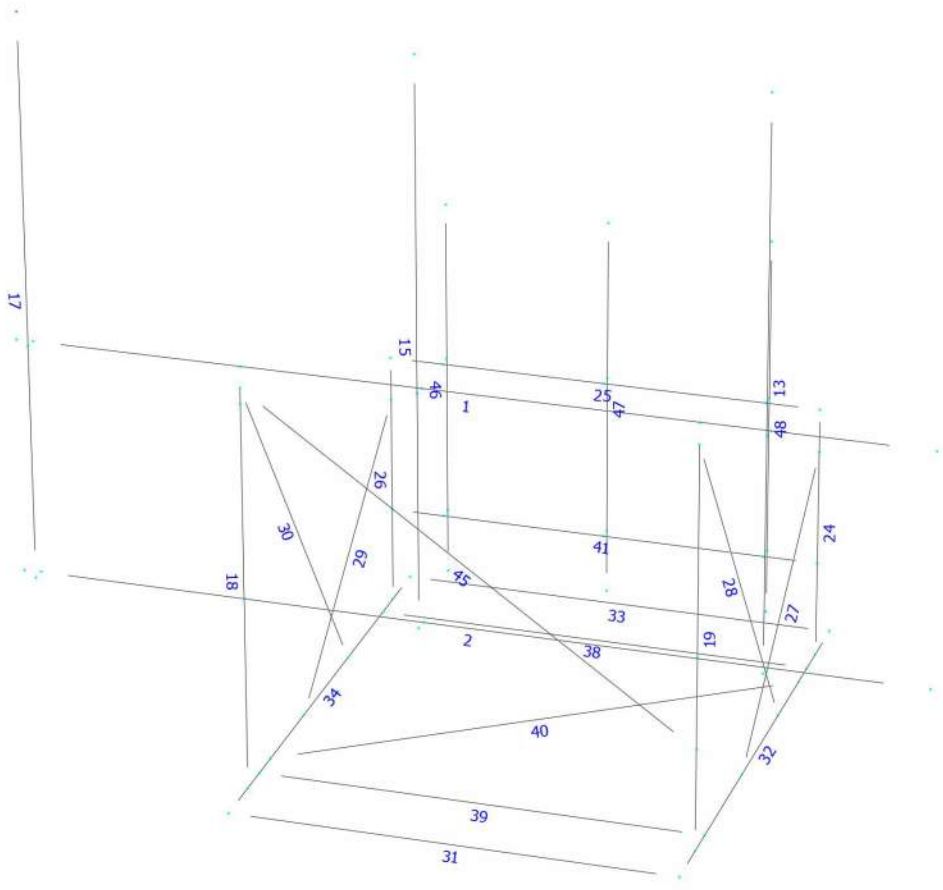


Reinforce existing vertical steel angles with proposed L3”x3”x1/4” steel angles (typ. of 2 per Alpha & Gamma sector, total of 4). Reference the latest TEP Construction Drawings for reinforcement details.


A53 GrB
PIPE 2x0.154
A36
L 3X3X1_4
L 2-1_2X2-1_2X3_16
L 3-1_2X3-1_2X1_4
T2L 3X3X1_4
Y
X
Z


Design status
Not designed
Error on design
Design O.K.
With warnings
Y
X
Z

Current Date: 4/29/2024 11:07 AM
Units system: English



RAM® Elements
CONNECT Edition

Current Date: 4/29/2024 11:07 AM
Units system: English

Load data

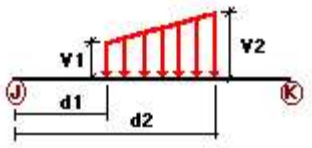
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wf	Wind Load (FRONT)	No	WIND
Ws	Wind Load (SIDE)	No	WIND
Wfice	Wind ICE (FRONT)	No	WIND
Wsice	Wind ICE (SIDE)	No	WIND
Di	Ice Load	No	LL

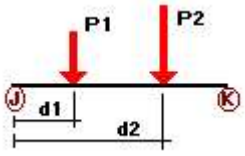
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wf	1	z	-0.027	-0.027	0.00	No	100.00	Yes
	2	z	-0.027	-0.027	0.00	No	100.00	Yes
	13	z	-0.011	-0.011	90.00	Yes	100.00	Yes
		z	-0.011	-0.011	0.00	No	40.00	Yes
	15	z	-0.011	-0.011	0.00	No	25.00	Yes
	17	z	-0.011	-0.011	0.00	No	25.00	Yes
	18	z	-0.023	-0.023	0.00	No	100.00	Yes
	19	z	-0.023	-0.023	0.00	No	100.00	Yes
	24	z	-0.023	-0.023	0.00	No	100.00	Yes
	25	z	-0.023	-0.023	0.00	No	100.00	Yes
	26	z	-0.023	-0.023	0.00	No	100.00	Yes
	27	z	-0.023	-0.023	0.00	No	100.00	Yes
	28	z	-0.023	-0.023	0.00	No	100.00	Yes
	29	z	-0.023	-0.023	0.00	No	100.00	Yes
	30	z	-0.023	-0.023	0.00	No	100.00	Yes
	41	z	-0.023	-0.023	0.00	No	100.00	Yes
	45	z	-0.023	-0.023	0.00	No	100.00	Yes
	46	z	-0.011	-0.011	0.00	No	100.00	Yes
	47	z	-0.011	-0.011	0.00	No	100.00	Yes
	48	z	-0.011	-0.011	0.00	No	100.00	Yes
Ws	13	x	-0.011	-0.011	0.00	No	100.00	Yes
	15	x	-0.011	-0.011	0.00	No	100.00	Yes
	17	x	-0.011	-0.011	0.00	No	100.00	Yes
	18	x	-0.023	-0.023	0.00	No	100.00	Yes

	19	x	-0.023	-0.023	0.00	No	100.00	Yes
	24	x	-0.023	-0.023	0.00	No	100.00	Yes
	26	x	-0.023	-0.023	0.00	No	100.00	Yes
	27	x	-0.023	-0.023	0.00	No	100.00	Yes
	28	x	-0.023	-0.023	0.00	No	100.00	Yes
	29	x	-0.023	-0.023	0.00	No	100.00	Yes
	30	x	-0.023	-0.023	0.00	No	100.00	Yes
	45	x	-0.023	-0.023	0.00	No	100.00	Yes
	46	x	-0.011	-0.011	0.00	No	100.00	Yes
	47	x	-0.011	-0.011	0.00	No	100.00	Yes
	48	x	-0.011	-0.011	0.00	No	100.00	Yes
Di	1	y	-0.008	-0.008	0.00	No	100.00	Yes
	2	y	-0.008	-0.008	0.00	No	100.00	Yes
	13	y	-0.005	-0.005	0.00	No	100.00	Yes
	15	y	-0.005	-0.005	0.00	No	100.00	Yes
	17	y	-0.005	-0.005	0.00	No	100.00	Yes
	18	y	-0.007	-0.007	0.00	No	100.00	Yes
	19	y	-0.007	-0.007	0.00	No	100.00	Yes
	24	y	-0.007	-0.007	0.00	No	100.00	Yes
	25	y	-0.007	-0.007	0.00	No	100.00	Yes
	26	y	-0.007	-0.007	0.00	No	100.00	Yes
	27	y	-0.007	-0.007	0.00	No	100.00	Yes
	28	y	-0.007	-0.007	0.00	No	100.00	Yes
	29	y	-0.007	-0.007	0.00	No	100.00	Yes
	30	y	-0.007	-0.007	0.00	No	100.00	Yes
	40	y	-0.009	-0.009	0.00	No	100.00	Yes
	41	y	-0.007	-0.007	0.00	No	100.00	Yes
	45	y	-0.007	-0.007	0.00	No	100.00	Yes
	46	y	-0.005	-0.005	0.00	No	100.00	Yes
	47	y	-0.005	-0.005	0.00	No	100.00	Yes
	48	y	-0.005	-0.005	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	13	y	-0.055	4.00	No
		y	-0.055	7.25	No
	15	y	-0.033	2.75	No
		y	-0.033	4.75	No
		y	-0.042	5.75	No
		y	-0.042	7.75	No
	17	y	-0.066	3.00	No
		y	-0.066	8.00	No
		y	-0.048	4.00	No
	46	y	-0.068	1.25	No
		y	-0.068	1.25	No
		y	-0.068	2.25	No
	47	y	-0.068	1.25	No
		y	-0.068	1.25	No

	48	y	-0.06	1.25	No
Wf	13	z	-0.219	4.00	No
		z	-0.219	7.25	No
	15	z	-0.097	2.75	No
		z	-0.097	4.75	No
		z	-0.094	5.75	No
		z	-0.094	7.75	No
	17	z	-0.34	3.00	No
		z	-0.34	8.00	No
	46	z	-0.047	1.25	No
		z	-0.047	1.25	No
		z	-0.047	2.25	No
	47	z	-0.046	1.25	No
		z	-0.046	1.25	No
	48	z	-0.127	1.25	No
Ws	13	x	-0.106	4.00	No
		x	-0.106	7.25	No
	15	x	-0.057	2.75	No
		x	-0.057	4.75	No
		x	-0.064	5.75	No
		x	-0.064	7.75	No
	17	x	-0.393	3.00	No
		x	-0.393	8.00	No
		x	-0.048	4.00	No
	46	x	-0.102	1.25	No
		x	-0.102	2.25	No
	47	x	-0.103	1.25	No
	48	x	-0.077	1.25	No
Wfice	13	z	-0.039	4.00	No
		z	-0.039	7.25	No
	15	z	-0.018	2.75	No
		z	-0.018	4.75	No
		z	-0.018	5.75	No
		z	-0.018	7.75	No
	17	z	-0.059	3.00	No
		z	-0.059	8.00	No
	46	z	-0.011	1.25	No
		z	-0.011	1.25	No
		z	-0.011	2.25	No
	47	z	-0.011	1.25	No
		z	-0.011	1.25	No
	48	z	-0.025	1.25	No
Wsice	13	x	-0.02	4.00	No
		x	-0.02	7.25	No
	15	x	-0.012	2.75	No
		x	-0.012	4.75	No
		x	-0.013	5.75	No
		x	-0.013	7.75	No
	17	x	-0.067	3.00	No
		x	-0.067	8.00	No
		x	-0.015	4.00	No
	46	x	-0.02	1.25	No
		x	-0.02	2.25	No
	47	x	-0.02	1.25	No
	48	x	-0.017	1.25	No
Di	13	y	-0.075	4.00	No
		y	-0.075	7.25	No
	15	y	-0.036	2.75	No
		y	-0.036	4.75	No
		y	-0.036	5.75	No

	y	-0.036	7.75	No
17	y	-0.16	3.00	No
	y	-0.16	8.00	No
	y	-0.042	4.00	No
46	y	-0.036	1.25	No
	y	-0.036	1.25	No
	y	-0.036	2.25	No
47	y	-0.036	1.25	No
	y	-0.036	1.25	No
48	y	-0.048	1.25	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wf	Wind Load (FRONT)	No	0.00	0.00	0.00
Ws	Wind Load (SIDE)	No	0.00	0.00	0.00
Wfice	Wind ICE (FRONT)	No	0.00	0.00	0.00
Wsice	Wind ICE (SIDE)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

RAM® Elements
CONNECT Edition

Current Date: 4/29/2024 11:07 AM
Units system: English

Steel Code Check

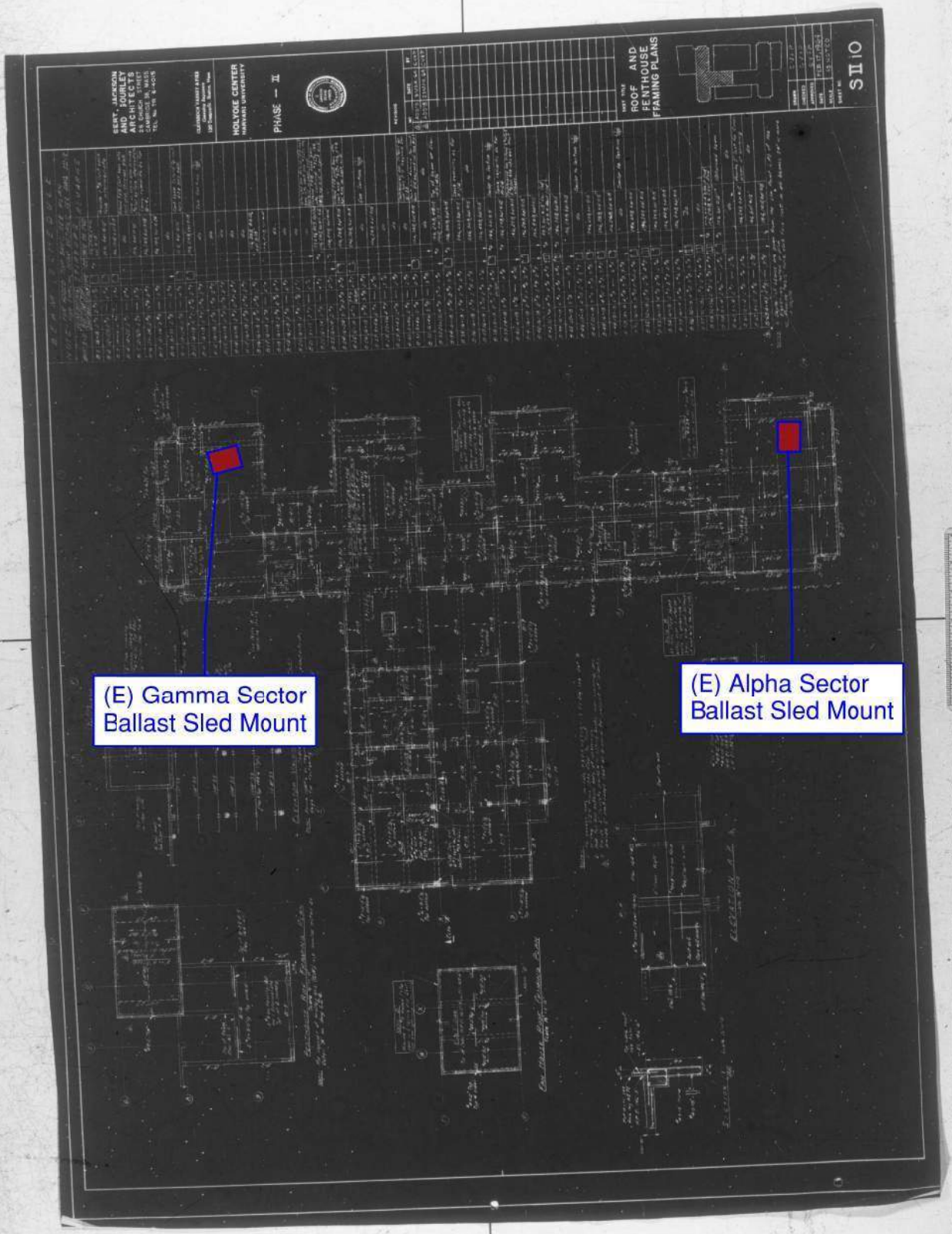
Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+Wf
LC2=1.2DL+Ws
LC3=0.9DL+Wf
LC4=0.9DL+Ws
LC5=1.2DL+Wfice+Di
LC6=1.2DL+Wsice+Di
LC7=1.4DL
LC8=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 2-1_2X2-1_2X3_16	**31**	LC4 at 100.00%	0.11	OK	
		32	LC4 at 10.16%	0.57	OK	
		33	LC2 at 100.00%	0.06	OK	
		34	LC2 at 89.84%	**0.75**	**With warnings**	
		38	LC2 at 100.00%	0.05	OK	
		39	LC4 at 100.00%	0.11	OK	
		40	LC5 at 50.00%	0.13	With warnings	
	L 3-1_2X3-1_2X1_4	**1**	LC3 at 75.00%	**0.82**	**With warnings**	
		2	LC1 at 75.00%	0.36	With warnings	
	L 3X3X1_4	**24**	LC4 at 35.42%	0.29	OK	
		25	LC1 at 50.00%	0.31	OK	
		26	LC2 at 62.50%	0.35	OK	
		27	LC3 at 0.00%	0.13	OK	
		28	LC3 at 28.13%	0.13	OK	
		29	LC3 at 0.00%	0.10	OK	
		30	LC3 at 59.38%	0.25	OK	
		41	LC2 at 100.00%	**0.41**	**OK**	
		45	LC4 at 28.13%	0.13	OK	
	PIPE 2x0.154	**13**	LC1 at 56.25%	0.23	OK	
		15	LC3 at 59.38%	0.24	OK	
		17	LC2 at 56.25%	**0.68**	**OK**	
		46	LC2 at 81.25%	0.18	OK	
		47	LC4 at 81.25%	0.25	OK	
		48	LC1 at 41.67%	0.15	OK	
	T2L 3X3X1_4	**18**	LC2 at 45.31%	0.27	OK	
		19	LC2 at 76.56%	**0.41**	**OK**	

Roof Framing
Calculations


(E) Gamma Sector
Ballast Sled Mount
(E) Alpha Sector
Ballast Sled Mount

Project Title: CAMBRIDGE MASS. AVE
Engineer: KM
Project ID: MA2215
Project Descr: (Sector Split)

Concrete Beam

File: MA2215 (Sector Split).ec6

Lic. # : KW-06015425
Tower Engineering Professionals, Inc.

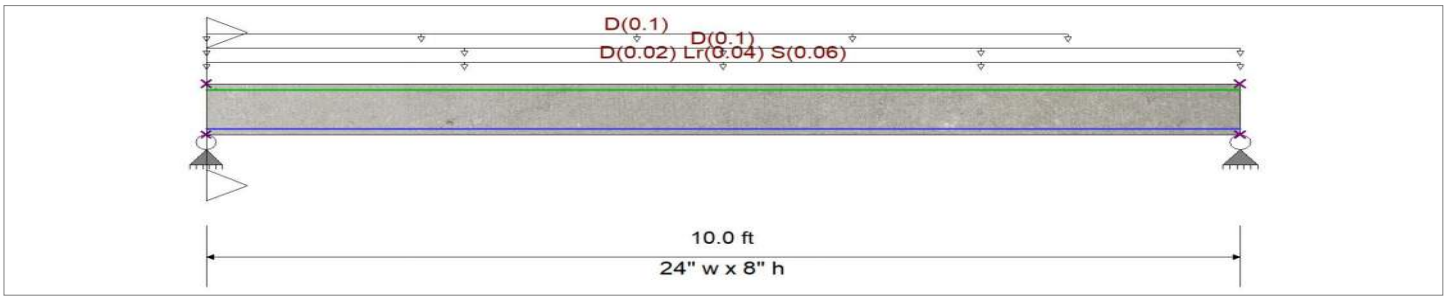
DESCRIPTION: Roof Slab 1 (Beneath Alpha Sector Sled)

CODE REFERENCES

Calculations per ACI 318-14, IBC 2015, CBC 2016, ASCE 7-10
Load Combination Set : ASCE 7-10

Material Properties

f'c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
fr = f'c$^{1/2}$ * 7.50	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups		40.0 ksi
fy - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #		3
			Number of Resisting Legs Per Stirrup =		2



Cross Section & Reinforcing Details

Rectangular Section, Width = 24.0 in, Height = 8.0 in
Span #1 Reinforcing....
2-#4 at 1.0 in from Bottom, from 0.0 to 10.0 ft in this span
2-#4 at 1.0 in from Top, from 0.0 to 10.0 ft in this span

Beam self weight calculated and added to loads
Load for Span Number 1
Uniform Load : D = 0.010, Lr = 0.020, S = 0.030 ksf, Tributary Width = 2.0 ft, (Roof Load)
Uniform Load : D = 0.050 ksf, Extent = 0.0 -->> 10.0 ft, Tributary Width = 2.0 ft, (HVAC Unit)
Uniform Load : D = 0.050 ksf, Extent = 0.0 -->> 8.330 ft, Tributary Width = 2.0 ft, (Antenna Ballast Mount - Alpha Sector)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	**0.574** : 1	Maximum Deflection			
Section used for this span		**Typical Section**	Max Downward Transient Deflection	0.004 in	Ratio =	28426 >=360.
Mu : Applied		7.317 k-ft	Max Upward Transient Deflection	0.000 in	Ratio =	0 <360.0
Mn * Phi : Allowable		12.751 k-ft	Max Downward Total Deflection	0.033 in	Ratio =	3654 >=180.
Location of maximum on span		4.973 ft	Max Upward Total Deflection	0.000 in	Ratio =	0 <180.0
Span # where maximum occurs		Span # 1				

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Overall MAXimum	2.353	2.214
Overall MINimum	0.200	0.200
+D+H	2.053	1.914
+D+L+H	2.053	1.914
+D+Lr+H	2.253	2.114
+D+S+H	2.353	2.214
+D+0.750Lr+0.750L+H	2.203	2.064
+D+0.750L+0.750S+H	2.278	2.139
+D+0.60W+H	2.053	1.914

Project Title: CAMBRIDGE MASS. AVE
Engineer: KM
Project ID: MA2215
Project Descr: (Sector Split)

Concrete Beam

File: MA2215 (Sector Split).ec6

Lic. # : KW-06015425
Tower Engineering Professionals, Inc.

DESCRIPTION: Roof Slab 1 (Beneath Alpha Sector Sled)

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
+D+0.70E+H	2.053	1.914
+D+0.750Lr+0.750L+0.450W+H	2.203	2.064
+D+0.750L+0.750S+0.450W+H	2.278	2.139
+D+0.750L+0.750S+0.5250E+H	2.278	2.139
+0.60D+0.60W+0.60H	1.232	1.148
+0.60D+0.70E+0.60H	1.232	1.148
D Only	2.053	1.914
Lr Only	0.200	0.200
S Only	0.300	0.300
H Only		

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft) Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	10.000	7.32	12.75	0.57
+1.40D+1.60H					
Span # 1	1	10.000	7.14	12.75	0.56
+1.20D+0.50Lr+1.60L+1.60H					
Span # 1	1	10.000	6.37	12.75	0.50
+1.20D+1.60L+0.50S+1.60H					
Span # 1	1	10.000	6.49	12.75	0.51
+1.20D+1.60Lr+0.50L+1.60H					
Span # 1	1	10.000	6.92	12.75	0.54
+1.20D+1.60Lr+0.50W+1.60H					
Span # 1	1	10.000	6.92	12.75	0.54
+1.20D+0.50L+1.60S+1.60H					
Span # 1	1	10.000	7.32	12.75	0.57
+1.20D+1.60S+0.50W+1.60H					
Span # 1	1	10.000	7.32	12.75	0.57
+1.20D+0.50Lr+0.50L+W+1.60H					
Span # 1	1	10.000	6.37	12.75	0.50
+1.20D+0.50L+0.50S+W+1.60H					
Span # 1	1	10.000	6.49	12.75	0.51
+1.20D+0.50L+0.20S+E+1.60H					
Span # 1	1	10.000	6.27	12.75	0.49
+0.90D+W+0.90H					
Span # 1	1	10.000	4.59	12.75	0.36
+0.90D+E+0.90H					
Span # 1	1	10.000	4.59	12.75	0.36

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
+D+S+H	1	0.0328	5.000		0.0000	0.000

Project Title: CAMBRIDGE MASS. AVE
Engineer: KM
Project ID: MA2215
Project Descr: (Sector Split)

Concrete Beam

File: MA2215 (Sector Split).ec6

Lic. # : KW-06015425
Tower Engineering Professionals, Inc.

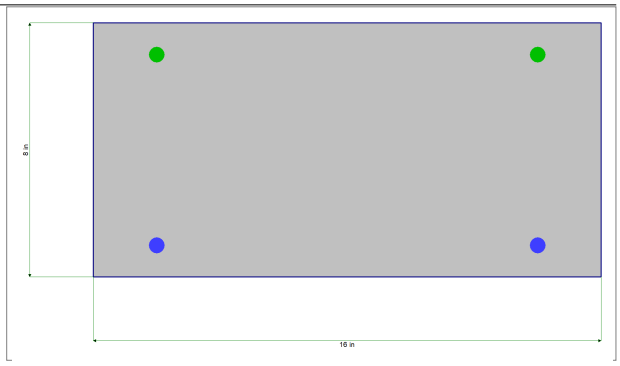
DESCRIPTION: Roof Slab 2 (Beneath Gamma Sector Sled)

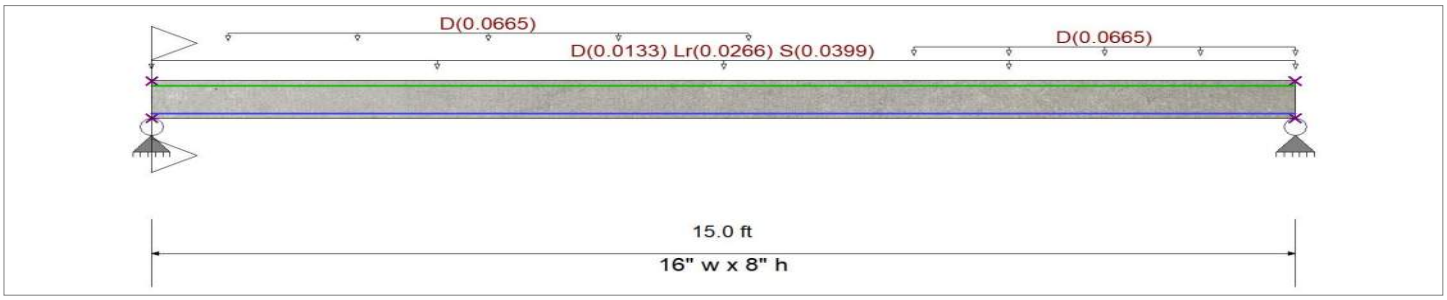
CODE REFERENCES

Calculations per ACI 318-14, IBC 2015, CBC 2016, ASCE 7-10
Load Combination Set : ASCE 7-10

Material Properties

f'c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
fr = f'c$^{1/2}$ * 7.50	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups		40.0 ksi
fy - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #		3
			Number of Resisting Legs Per Stirrup =		2





Cross Section & Reinforcing Details

Rectangular Section, Width = 16.0 in, Height = 8.0 in
Span #1 Reinforcing....
2-#4 at 1.0 in from Bottom, from 0.0 to 15.0 ft in this span
2-#4 at 1.0 in from Top, from 0.0 to 15.0 ft in this span

Beam self weight calculated and added to loads
Load for Span Number 1
Uniform Load : D = 0.010, Lr = 0.020, S = 0.030 ksf, Tributary Width = 1.330 ft, (Roof Load)
Uniform Load : D = 0.050 ksf, Extent = 10.0 -->> 15.0 ft, Tributary Width = 1.330 ft, (HVAC Unit)
Uniform Load : D = 0.050 ksf, Extent = 1.0 -->> 7.830 ft, Tributary Width = 1.330 ft, (Antenna Ballast Mount - Gamma Sector)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	**0.679** : 1	Maximum Deflection				
Section used for this span	**Typical Section**	Max Downward Transient Deflection	0.021 in	Ratio =	8443	>=360.
Mu : Applied	8.299 k-ft	Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0
Mn * Phi : Allowable	12.218 k-ft	Max Downward Total Deflection	0.148 in	Ratio =	1219	>=180.
Location of maximum on span	7.295 ft	Max Upward Total Deflection	0.000 in	Ratio =	0	<180.0
Span # where maximum occurs	Span # 1					

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Overall MAXimum	1.742	1.776
Overall MINimum	0.199	0.199
+D+H	1.442	1.477
+D+L+H	1.442	1.477
+D+Lr+H	1.642	1.677
+D+S+H	1.742	1.776
+D+0.750Lr+0.750L+H	1.592	1.627
+D+0.750L+0.750S+H	1.667	1.702
+D+0.60W+H	1.442	1.477

Project Title: CAMBRIDGE MASS. AVE
Engineer: KM
Project ID: MA2215
Project Descr: (Sector Split)

Concrete Beam

File: MA2215 (Sector Split).ec6

Lic. # : KW-06015425
Tower Engineering Professionals, Inc.

DESCRIPTION: Roof Slab 2 (Beneath Gamma Sector Sled)

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
+D+0.70E+H	1.442	1.477
+D+0.750Lr+0.750L+0.450W+H	1.592	1.627
+D+0.750L+0.750S+0.450W+H	1.667	1.702
+D+0.750L+0.750S+0.5250E+H	1.667	1.702
+0.60D+0.60W+0.60H	0.865	0.886
+0.60D+0.70E+0.60H	0.865	0.886
D Only	1.442	1.477
Lr Only	0.199	0.199
S Only	0.299	0.299
H Only		

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft) Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	15.000	8.30	12.22	0.68
+1.40D+1.60H					
Span # 1	1	15.000	7.59	12.22	0.62
+1.20D+0.50Lr+1.60L+1.60H					
Span # 1	1	15.000	6.88	12.22	0.56
+1.20D+1.60L+0.50S+1.60H					
Span # 1	1	15.000	7.07	12.22	0.58
+1.20D+1.60Lr+0.50L+1.60H					
Span # 1	1	15.000	7.70	12.22	0.63
+1.20D+1.60Lr+0.50W+1.60H					
Span # 1	1	15.000	7.70	12.22	0.63
+1.20D+0.50L+1.60S+1.60H					
Span # 1	1	15.000	8.30	12.22	0.68
+1.20D+1.60S+0.50W+1.60H					
Span # 1	1	15.000	8.30	12.22	0.68
+1.20D+0.50Lr+0.50L+W+1.60H					
Span # 1	1	15.000	6.88	12.22	0.56
+1.20D+0.50L+0.50S+W+1.60H					
Span # 1	1	15.000	7.07	12.22	0.58
+1.20D+0.50L+0.20S+E+1.60H					
Span # 1	1	15.000	6.73	12.22	0.55
+0.90D+W+0.90H					
Span # 1	1	15.000	4.88	12.22	0.40
+0.90D+E+0.90H					
Span # 1	1	15.000	4.88	12.22	0.40

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
+D+S+H	1	0.1476	7.500		0.0000	0.000

Reference Documents

BEAM SCHEDULE

NOTE: FOR ADDED TOP BARS, SEE PLAN
FOR TYPICAL BEAM DETAILS SEE DWG S-16

MARK	G-D	REINFORCING BOTTOM	REINFORCING TOP	STIRRUPS SIZE	STIRRUPS SPACE EA END	REMARKS
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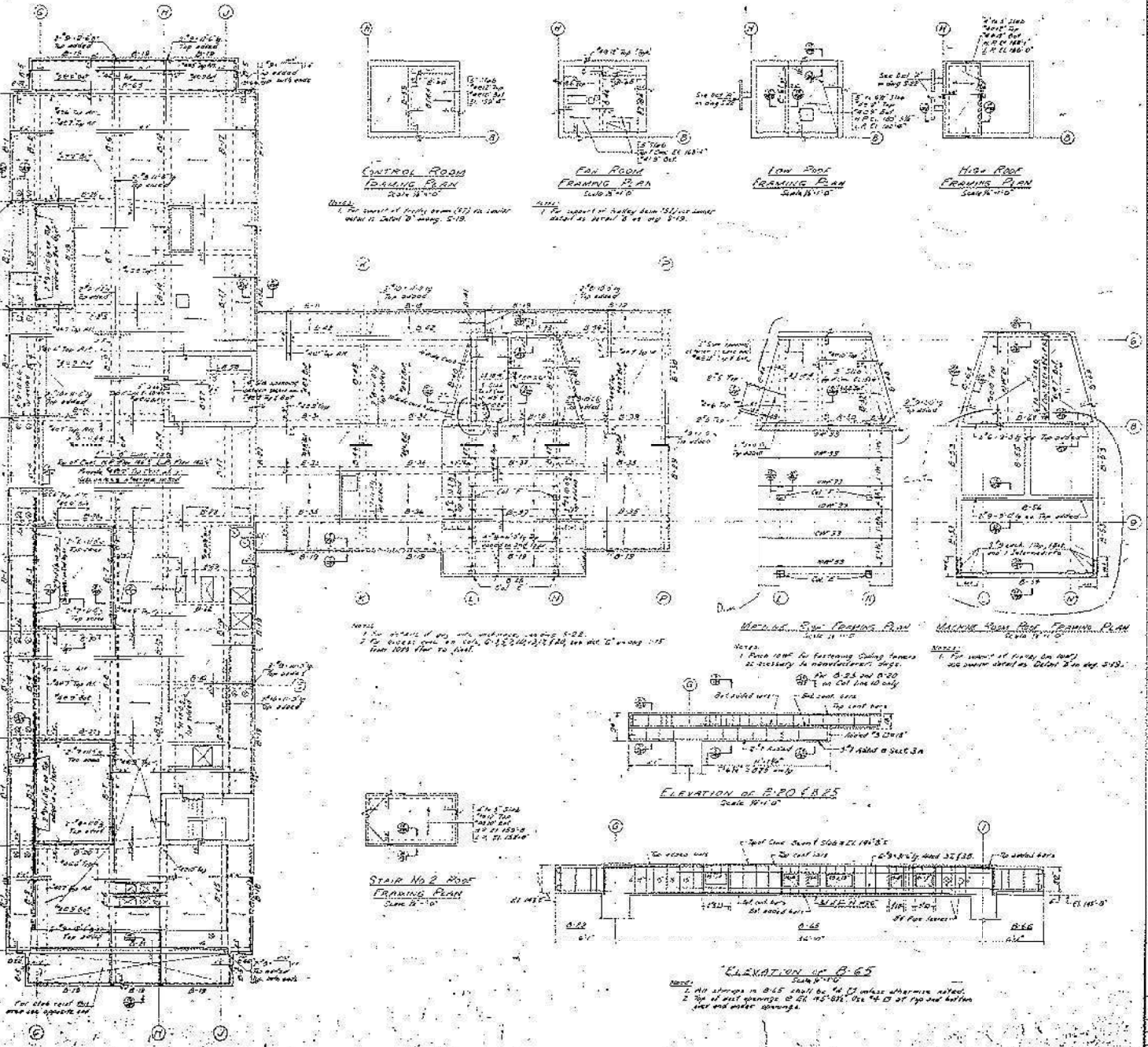
Note: mark "SEAT" horizontal beam tops intermediate for beam seat detail.



SERT, JACKSON AND GOURLEY ARCHITECTS
4 BRATTLE STREET
CAMBRIDGE 38, MASS
TEL. No. UN 4-7594

PROJECT NO. 5808

HARVARD UNIVERSITY OFFICE AND HEALTH CENTER BUILDING

REVISIONS

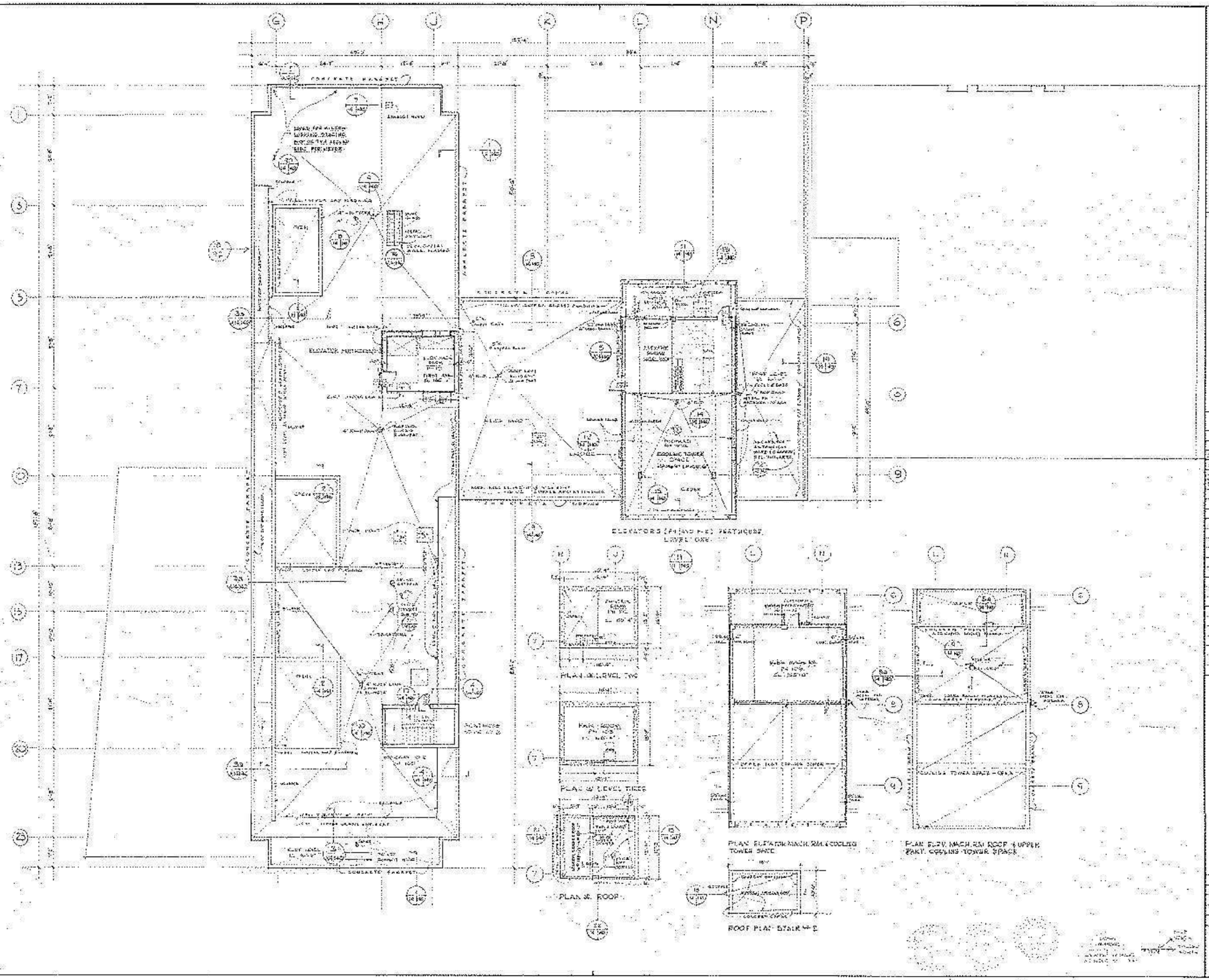
NO.	DATE	BY

SHEET TITLE

ROOF AND PENTHOUSE FRAMING PLAN

DRAWN	A.M.K.
CHECKED	C.T.V.D.
APPROVED	J.H.W. Jr.
DATE	3 MARCH 1961
SCALE	AS NOTED
SHEET NO.	S-14

S10
ROOF AND PENTHOUSE FRAMING PLANS
PHASE I - II
HOUSTON CENTER



SERT, JACKSON AND GOURLEY ARCHITECTS
4 SCOTTIE STREET
CAMBRIDGE 38, MASS.
TEL. No. UN 4-7594

PROJECT NO. 5405

HARVARD UNIVERSITY
OFFICE AND HEALTH CENTER BUILDING

REVISIONS

NO.	DATE	BY
1	12 MAR 62	HC
2	26 MAR 62	HC
3	28 MAR 62	HC
4	13 MAY 62	HC

SHEET TITLE

KEY PLAN
PENT HOUSE
AND ROOF

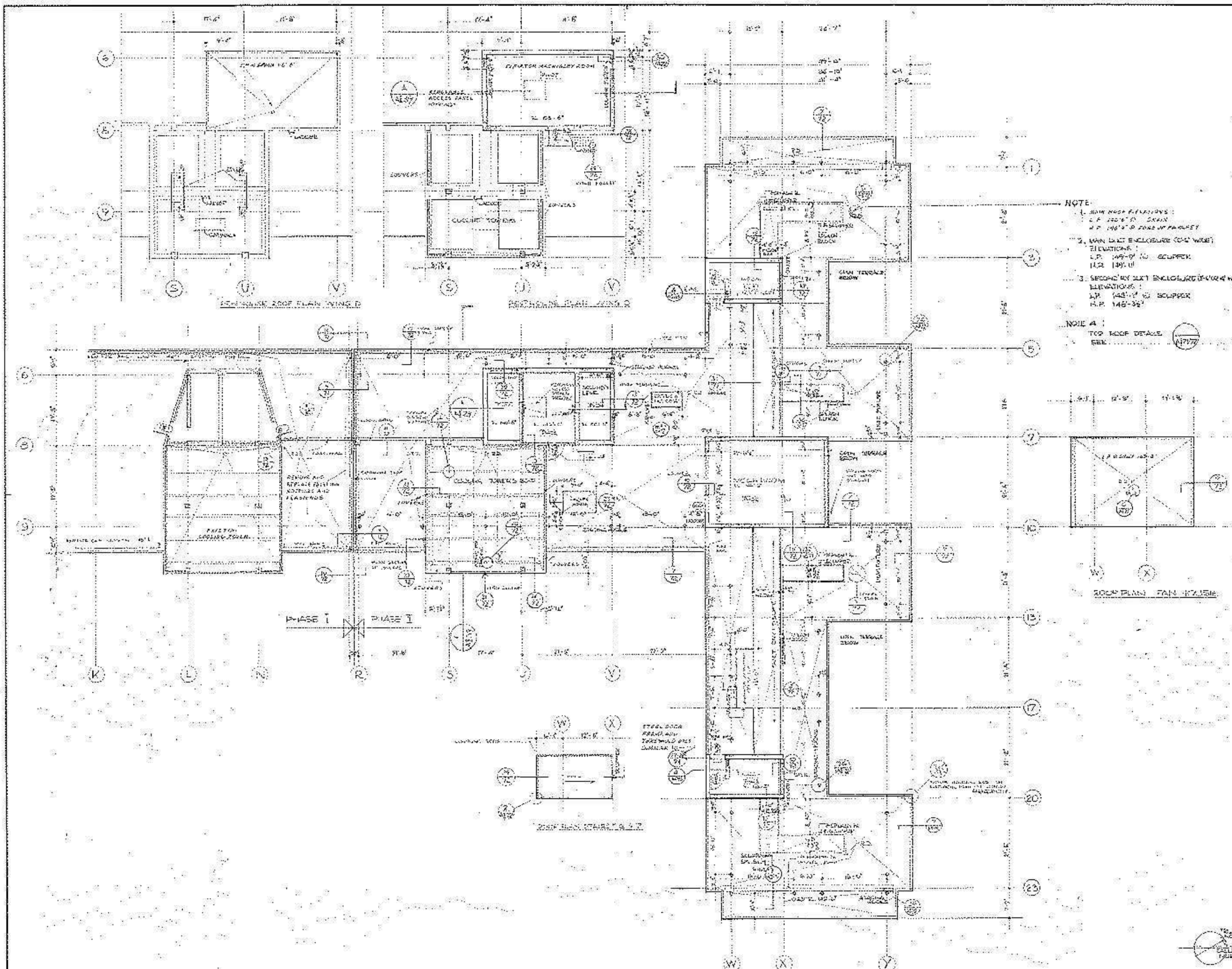
NOTES ALL ELEVATIONS

DRAWN	
CHECKED	
APPROVED	
DATE	
SCALE	

SHEET NO.

A-14

100-12



SERT, JACKSON AND GOURLEY ARCHITECTS
25 CHURCH STREET
CAMBRIDGE 38, MASS
TEL. No. TR 6-4015

HOLYOKE CENTER
HARVARD UNIVERSITY

REVISIONS

SHEET TITLE

ROOF & PENTHOUSE PLANS

DRAWN
CHECKED
APPROVED
DATE
SCALE
SHEET NO.

AII 26

108-25

brownrudnick

MICHAEL R. DOLAN
direct dial: +1 617.856.8548
mdolan@brownrudnick.com

October 18, 2024

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 Install Transmission Equipment on the existing 121'6" above ground level ("AGL") building (the "Building") located at 1350 Massachusetts Avenue, Cambridge MA 02138 (Assessor's Parcel Identification Map 160, Lot 14), 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 Appeal:

On behalf of AT&T, while reserving all rights, we are pleased to submit this Eligible Facilities Request and Special Permit Application (the "Application") to the City of Cambridge Board of Zoning Appeals (the "Board") in support of AT&T's request to add and modify Transmission Equipment on the existing Building located at 1350 Massachusetts Avenue, Cambridge, MA 02139 (Assessor's Parcel Identification Map 160, Lot 14) (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 Harvard University. AT&T currently has an existing wireless antenna facility on the roof of the Building. As shown in the plans, AT&T is proposing to add and replace certain equipment, antennas and cabling on the roof of the Building so as to improve the RF signal transmission for AT&T customers in this area of Cambridge (the antenna facility as improved pursuant to this application, collectively hereinafter referred to as the "Facility").

In particular, AT&T is proposing to add and relocate the following:

Replace 2 existing antennas with 2 new antennas in nearly the same locations, replace 6 remote radio heads with 10 new remote radio heads in nearly the same locations, replace certain cabling with new cables, add diplexers, and remove and replace certain equipment in AT&T's existing rooftop equipment shelter.

AT&T's Facility will comply with all applicable terms and conditions of the Cambridge Zoning Ordinance (the "Ordinance"). As the proposed antennas of the Facility will be the same sky grey color as the existing antennas (which best matches the color of the Building), 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 Cambridge are preserved. The Facility will be passive in nature and will not generate unreasonable noise, odors, smoke, waste, or significant amounts of traffic. This is an unmanned facility and will not have negative effects upon adjoining lots. The Facility will 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 consistent with the Plans submitted herewith.

ELIGIBLE FACILITIES REQUEST

On behalf of AT&T, while reserving all rights, we seek approval of the modified facility 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 (as referenced previously) on an existing Building used by an FCC licensed wireless carrier. The existing Building is a Structure that is 121'6" AGL supporting wireless Transmission Equipment. AT&T seeks administrative approval for the proposed equipment 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.

The equipment identified on the Plans submitted as part of this Eligible Facilities Request application that will be collocated 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 Building 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 Base Station.

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 equipment will not increase the height of the Building nor protrude from the edge of the Building by more than six feet (6'). AT&T does not propose excavating outside of the Site and is not adding more than the standard number of equipment cabinets. Lastly, AT&T's proposed equipment will not defeat any concealment elements because the antennas will be mounted in a similar fashion as the existing antennas and are mostly invisible from the ground. AT&T's proposed Transmission Equipment at the Building contained in this Eligible Facilities Request fully conforms 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 equipment does 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 Facility will comply with all applicable sections of the Ordinance as the modified Facility will not increase the height of the Building, and the new antennas will be the same sky grey color as the existing antennas (which best matches the color of the Building).

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

AT&T's Facility will not result in any substantial change in the character of the neighborhood as there will be no significant increase in the amount of traffic to and from the Site, or any changes to existing patterns of access or egress to the Site. Trips to and from the Facility will average one or two per month by maintenance personnel who will park their SUV in the existing parking area on Site and not on the street.

(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 equipment because AT&T's Facility will 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 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 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 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 Facility will be in harmony with the purposes of the Ordinance because by collocating a 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 Facility will not produce any smoke, odors, waste, glare or significant amounts of 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 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 Facility 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 Facility will be located on an existing Building. The collocation 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 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 Facility will not result in an increase in the height of the Building or any alteration of existing setbacks on the Site. AT&T's equipment will not result in any significant 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 antennas will be the same sky grey color as the existing antennas (which best matches the color of the Building). AT&T's Facility will not produce any waste and noise levels on Site will not increase as a result of AT&T's Facility, nor will there be any additional exterior lighting as a result of AT&T's Facility.

AT&T's Facility will operate using standard electric and telephone services. As the Facility will be unmanned, it will require no water or sewer services, and City infrastructure will not be overburdened.

4.40 (49)(3)

Where it is proposed to erect such a facility in any residential zoning district, the extent to which there is a demonstrated public need for the facility at the proposed locations, the existence of alternative, functionally suitable sites in nonresidential locations, the existence of alternative, functionally suitable sites in nonresidential locations, the character of the prevailing uses in the area, and the prevalence of other, existing mechanical systems and equipment carried on or above the roof of nearby structures. The Board of Zoning Appeal shall grant a special permit to erect such a facility in a residential zoning district only upon a finding that nonresidential uses predominate in the vicinity of the proposed facility's location and that the telecommunication facility is not inconsistent with the character that does prevail in the surrounding neighborhood.

AT&T proposes improvements and modifications to its existing antenna facility at the Site and the property is in the Business B zoning district. AT&T proposes the Facility so that it will continue to fill a significant gap in coverage and provide adequate wireless communications services coverage to this part of the City of Cambridge. The use will be passive in nature, producing no unreasonable noise, smoke odor, waste, or glare. There will be no significant increase in the amount of traffic to and from the Site as maintenance visits will average one or two per month.

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 install personal wireless service facilities. We respectfully request that the Board review AT&T's proposed Facility and determine that the installation does 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

Michael R. Dolan, Esq.

ATTACHMENTS

1. Application Form
2. Letter of Authorization – Notarized Owner Information Form
3. FCC Licenses
4. Photographs/Photosimulations
5. Plans
6. Structural Report
7. MPE Study
8. FCC Public Notice

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.

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 proposed facility is NOT a substantial change.

For Base Stations, the modification increases the height of the structure by more than 10% or more than ten (10) feet, whichever is greater;

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

For Base Stations, 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 more six (6) feet.

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 four cabinets as a part of this project.

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

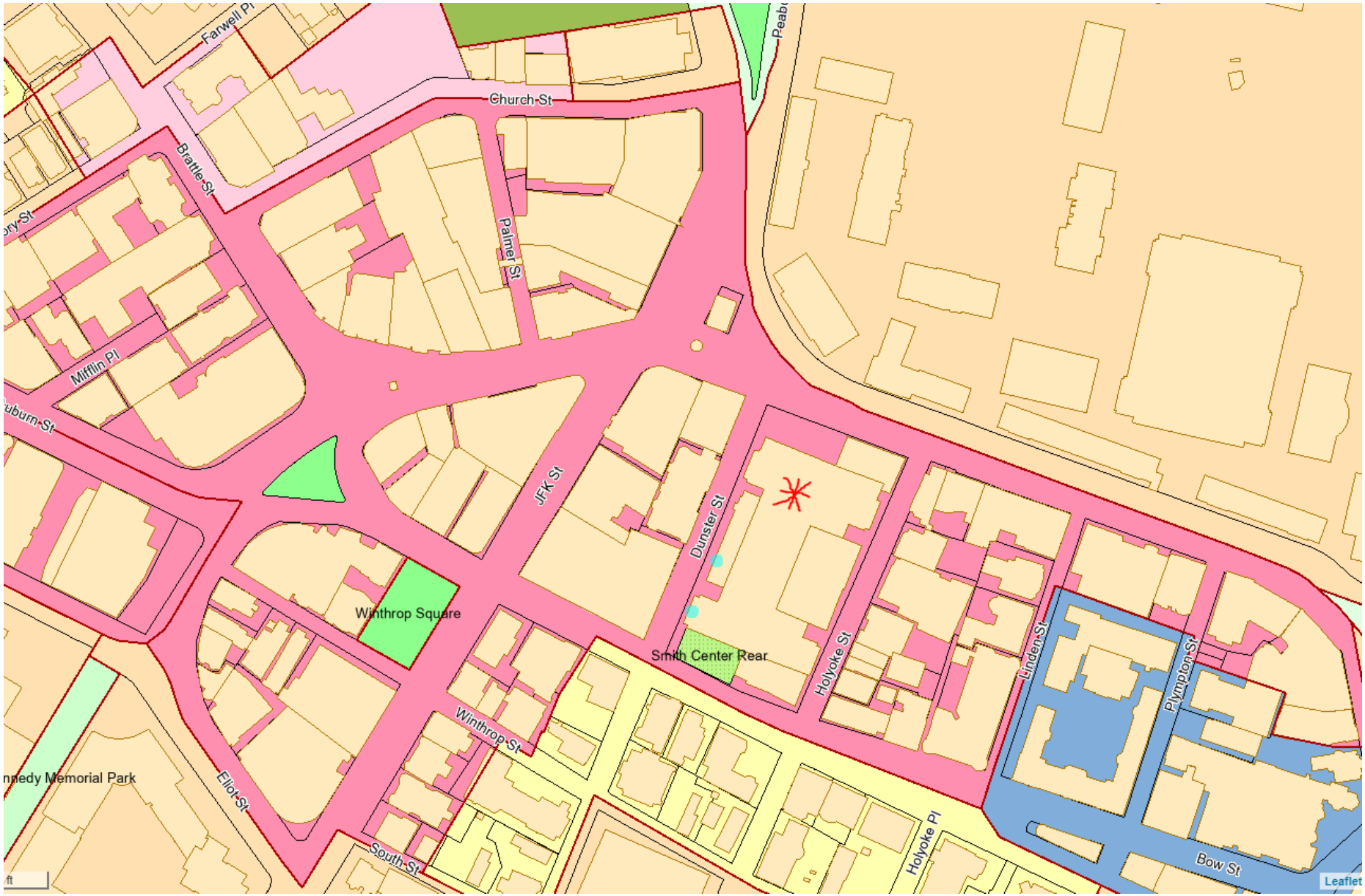
AT&T does not propose any excavation or deployment outside the current site.

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

As depicted on the Plans, AT&T's modification will be substantially similar to the existing transmission equipment on the Building and the new antennas will be the same sky grey color as the existing antennas (which best matches the color of 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.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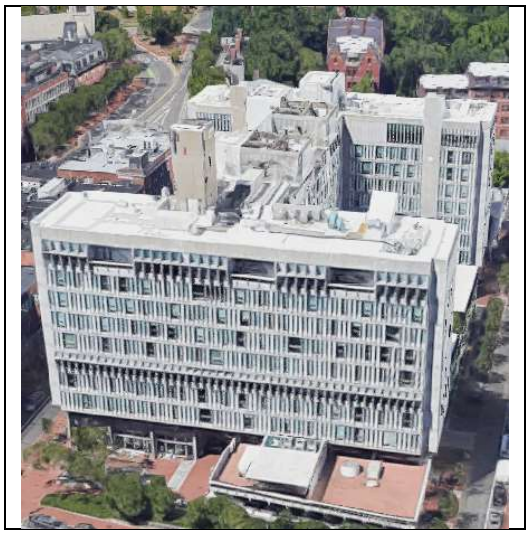
Brattle St
Palmer St
Mifflin Pl
JFK St
Dunster St
Holyoke St
Linden St
Plympton St
Holyoke Pl
Bow St
Winthrop Square
Smith Center Rear
Winthrop St
Eliot St
South St
Leaflet

Radio Frequency Safety Survey Report Prediction (RFSSRP)

AT&T Rooftop Facility

Site Name	CAMBRIDGE MASS. AVE
Site ID	MA2215
Site Address	1350 MASSACHUSETTS AVENUE, CAMBRIDGE, MA 02138

Latitude: 42.372799 **Longitude:** -71.118597 **USID:** 3126 **FA**: 10071767 **Centerline PN:** Internal **Pace ID:** MRCTB071030, RCTB071031	**Prepared for:** Centerline on behalf of AT&T **Report Date:** May 13, 2024 **Report Writer:** Katrina Styx **Report Reviewer:** Yasir Alqadhili



Statement of Compliance

AT&T will be compliant with FCC regulations upon installation of recommended mitigation measures.

TABLE OF CONTENTS

1.0 GENERAL SUMMARY

Centerline has been contracted to provide a Radio Frequency (RF) Analysis for the following AT&T rooftop facility to determine whether the facility is in compliance with federal standards and regulations regarding RF emissions. This analysis includes theoretical emissions calculations for all equipment for AT&T.

1.1 SITE SUMMARY

Analysis Site Data	
Site USID:	3126
Site FA#:	10071767
Site Name:	CAMBRIDGE MASS. AVE
Site Address:	1350 MASSACHUSETTS AVENUE, CAMBRIDGE, MA 02138
Site Latitude:	42.372799
Site Longitude:	-71.118597
Facility Type:	Rooftop
Compliance Summary	
Compliance Status:	Compliant Upon Mitigation
Site Data Information	
CD:	MAL02215__SECTOR SPLIT_CD_RevB_05.02.2024.pdf
RFDS:	Snapshot-RF Issue Preliminary RFDS-1704918876389.pdf

1.2 SITE MITIGATION

Signage and barriers are the primary means of mitigating accessible areas of exposure. Below is a summary of existing and recommended signage at this AT&T facility.

Existing Signage and Barriers (AT&T Sectors)										
Location	Information	Notice	Notice 2	Caution	Caution 2	Caution 2B	Caution 2C	Warning	Warning 2	Barriers
Alpha	0	0	0	0	3	0	0	0	0	X
Beta	0	0	0	0	2	0	0	0	0	0
Gamma	0	0	0	0	4	0	0	0	0	X

Recommended Signage and Barriers (AT&T Sectors) – Actions that MUST be Taken						
Location	Notice 2	Caution 2	Caution 2B	Caution 2C	Warning 2	Barriers
Alpha	0	3	0	0	0	0
Beta	0	3	0	0	0	X
Gamma	0	6	0	0	0	X

Final Compliant Configuration (AT&T Sectors) – All Mitigation Items that MUST be in Place										
Location	Information	Notice	Notice 2	Caution	Caution 2	Caution 2B	Caution 2C	Warning	Warning 2	Barriers
Alpha	0	0	0	0	5	0	0	0	0	X
Beta	0	0	0	0	5	0	0	0	0	X
Gamma	0	0	0	0	8	0	0	0	0	X

Alpha:

- Install an 11’ barrier as depicted in the signage diagrams. Install (3) Caution 2 signs on the proposed barrier.

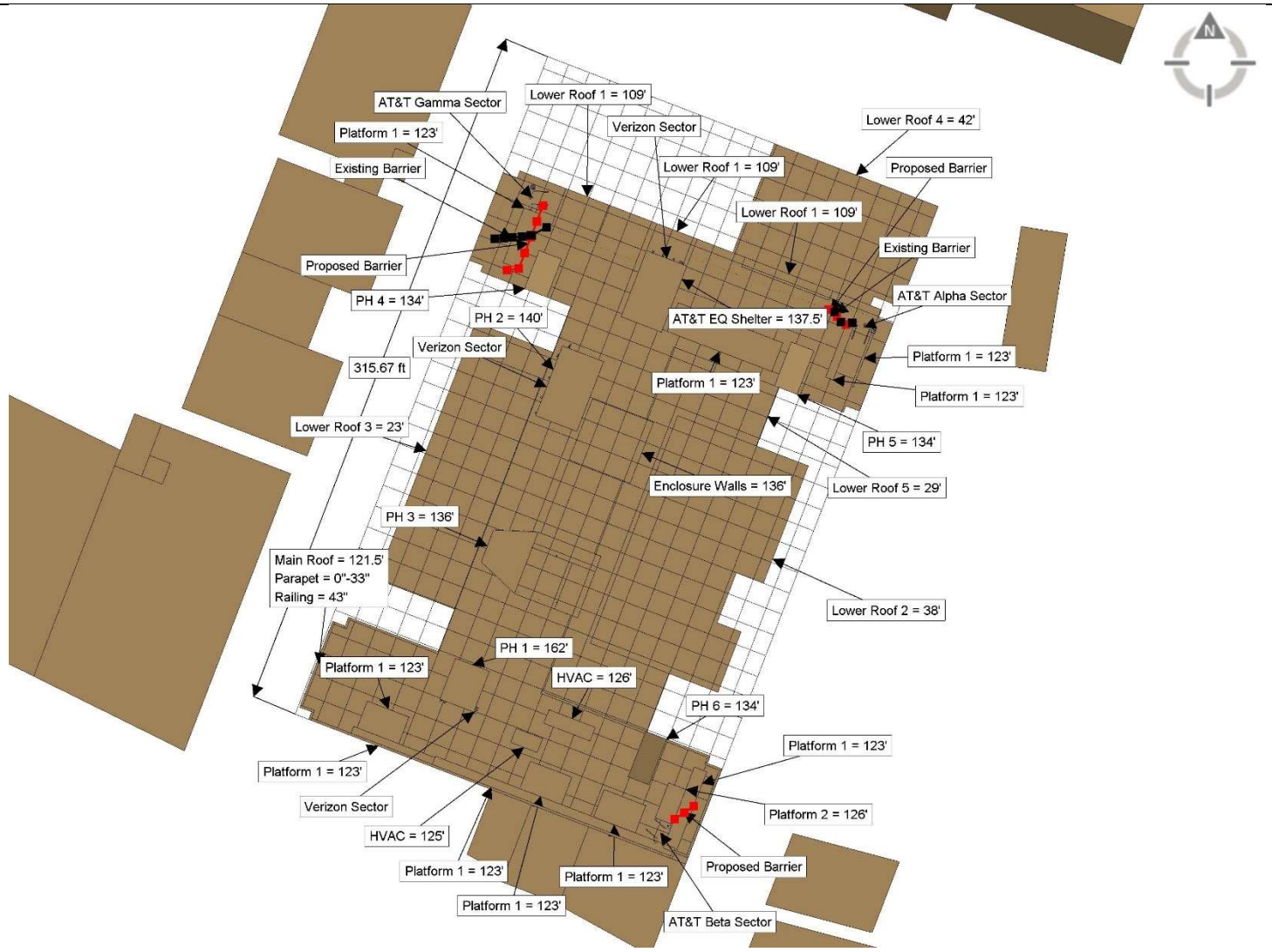
Beta:

- Install a 10’ barrier on Platform 1 as depicted in the signage diagrams. Install (3) Caution 2 signs on the proposed barrier.

Gamma:

- Install a 36’ barrier (6’ and 30’ segments) as depicted in the signage diagrams. Install (6) Caution 2 signs on the proposed barrier.

2.0 SITE SCALE MAP



All Sectors

Grid size: 10'

 INFO 1	 Caution 2
 Notice 1	 Caution 2B
 Notice 2	 Caution 2C
 Caution 1	 Warning 2
Existing Barrier	Proposed Barrier

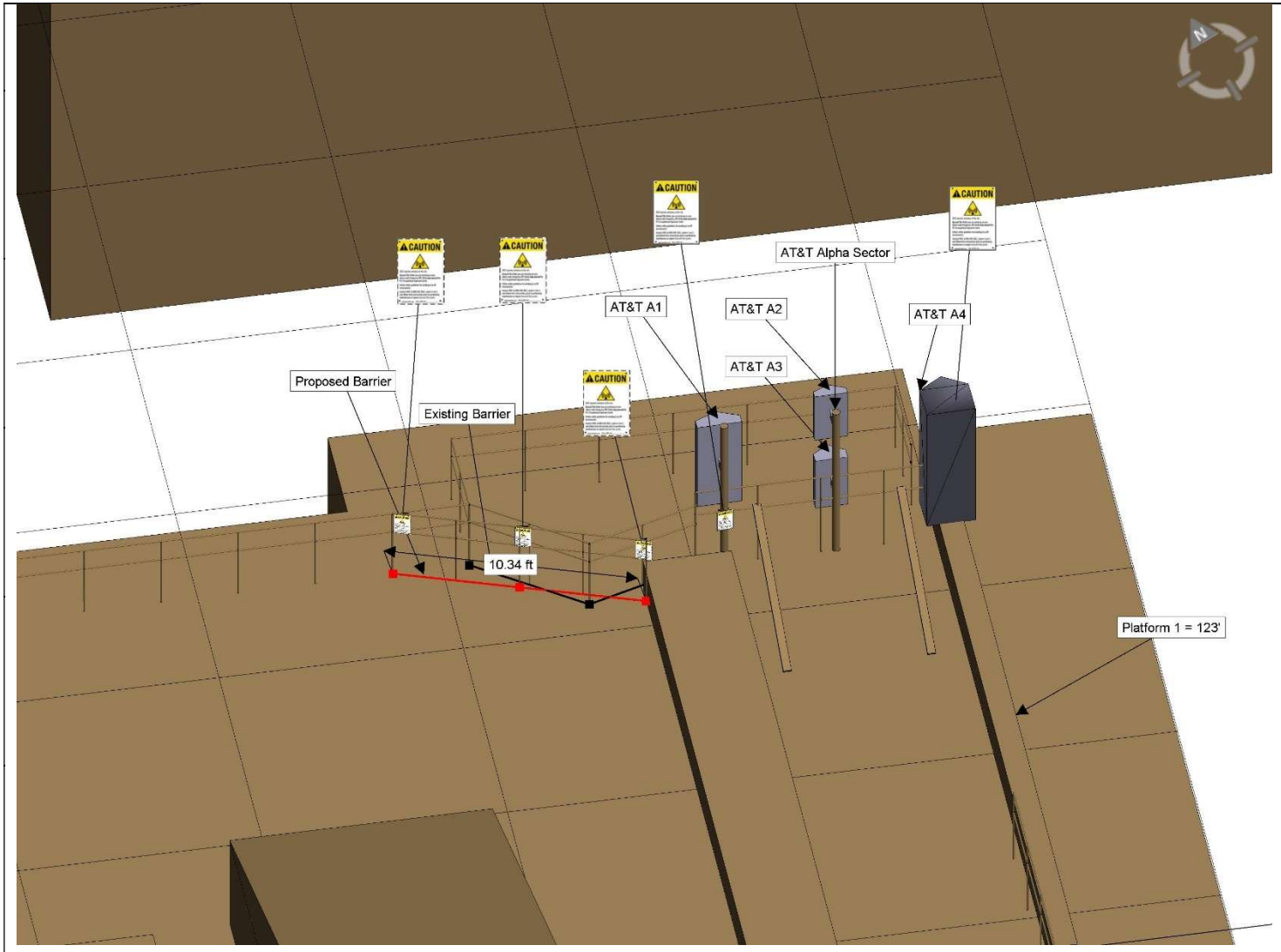
Items to be removed

Existing Sign

Proposed Sign

Signage / Mitigation Plan
CAMBRIDGE MASS. AVE / 10071767

CENTERLINE



Alpha Sector

Grid size: 10’

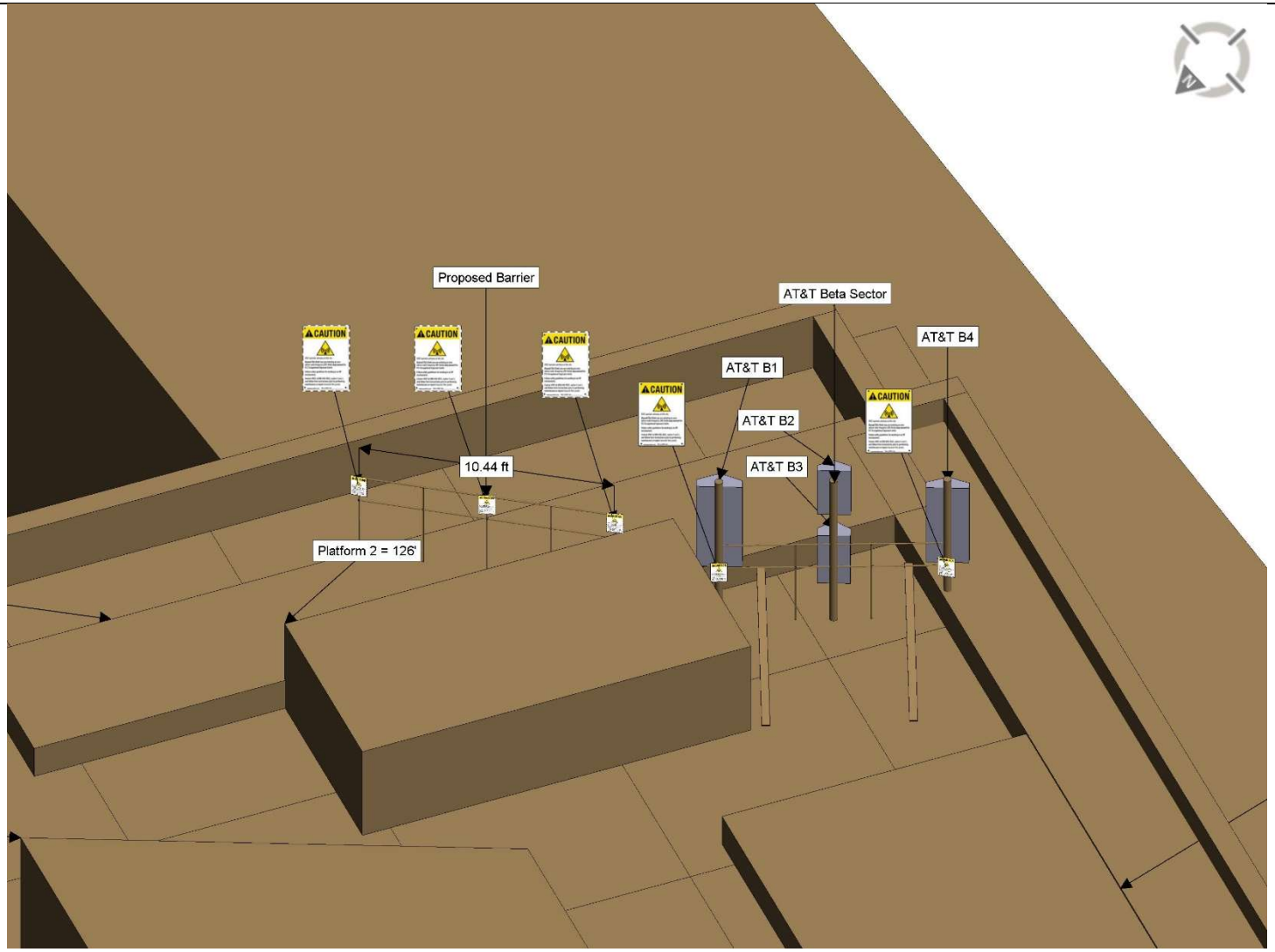
 INFO 1	 Caution 2
 Notice 1	 Caution 2B
 Notice 2	 Caution 2C
 Caution 1	 Warning 2
 Existing Barrier	 Proposed Barrier

 Items to be removed

 Existing Sign

 Proposed Sign

Signage / Mitigation Plan
CAMBRIDGE MASS. AVE / 10071767



Beta Sector

Grid size: 10'

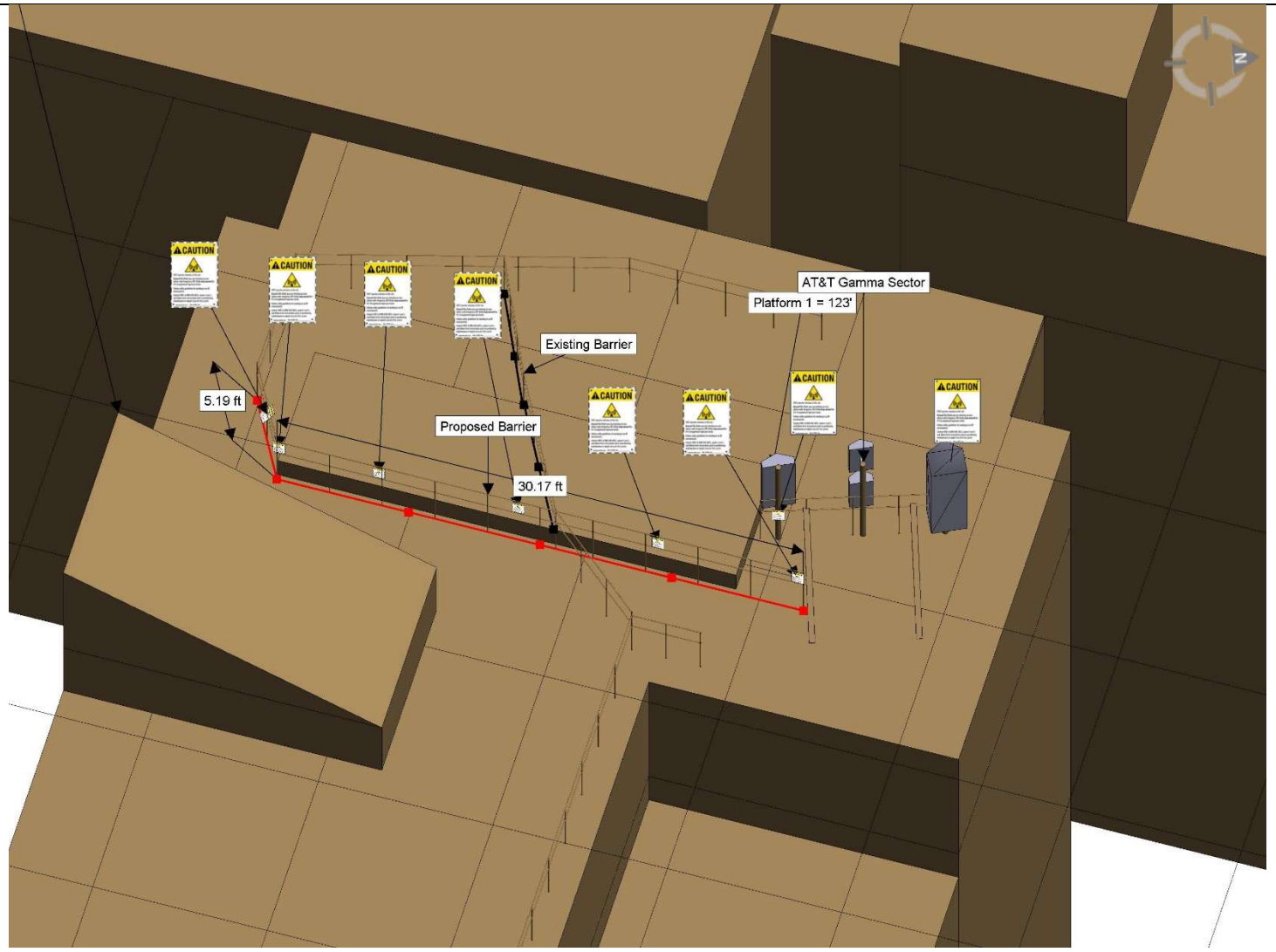
 INFO 1	 Caution 2
 Notice 1	 Caution 2B
 Notice 2	 Caution 2C
 Caution 1	 Warning 2
 Existing Barrier	 Proposed Barrier

Items to be removed

Existing Sign

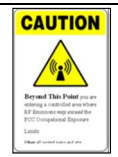
Proposed Sign

Signage / Mitigation Plan
CAMBRIDGE MASS. AVE / 10071767



Gamma Sector

Grid size: 10'

 INFO 1	 Caution 2
 Notice 1	 Caution 2B
 Notice 2	 Caution 2C
 Caution 1	 Warning 2
 Existing Barrier	 Proposed Barrier

 Items to be removed

 Existing Sign

 Proposed Sign

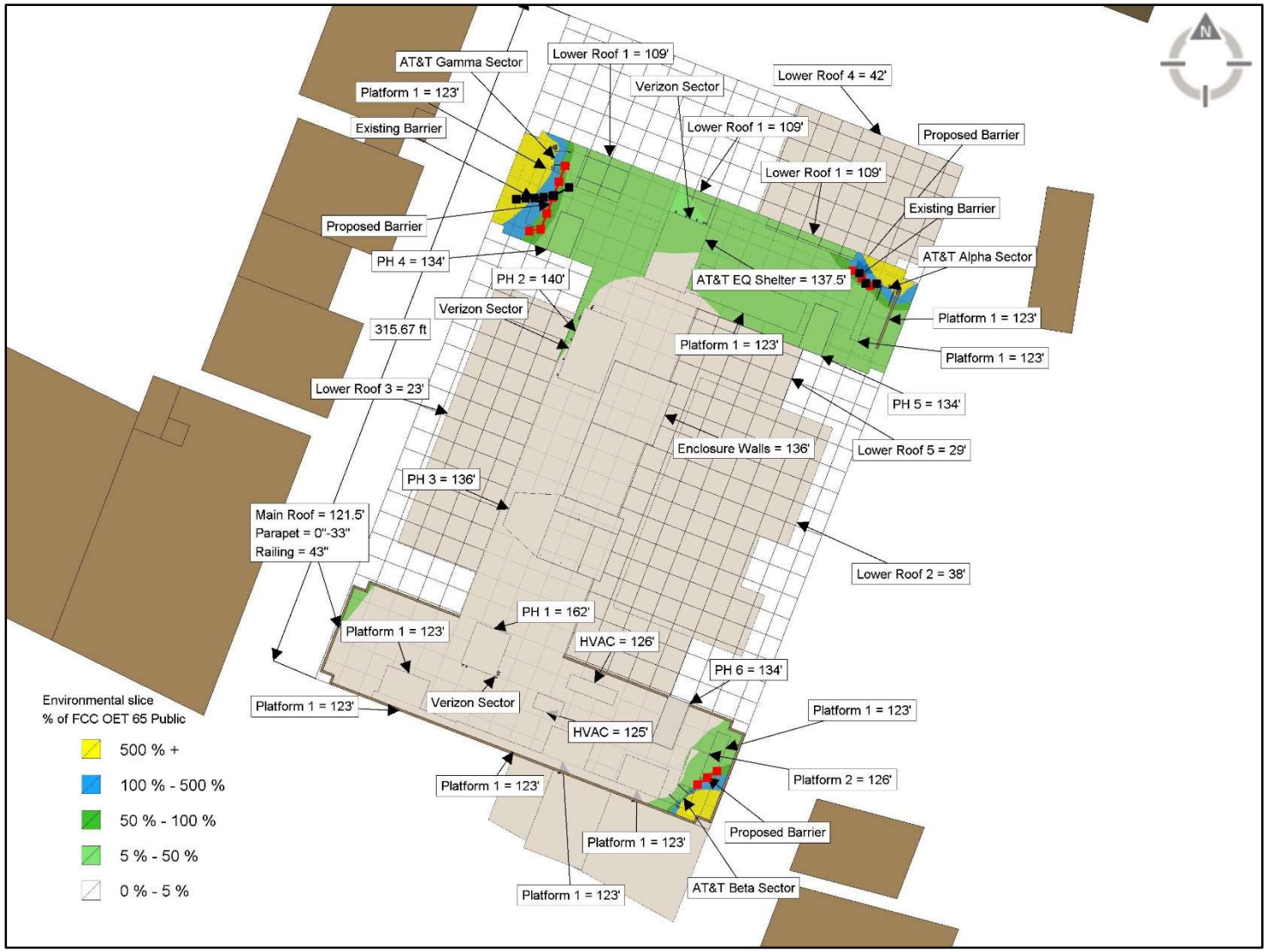
Signage / Mitigation Plan
CAMBRIDGE MASS. AVE / 10071767

3.0 RF EXPOSURE DIAGRAMS

Composite

Grid Size: 10'

AT&T Only



Grid Size: 10'

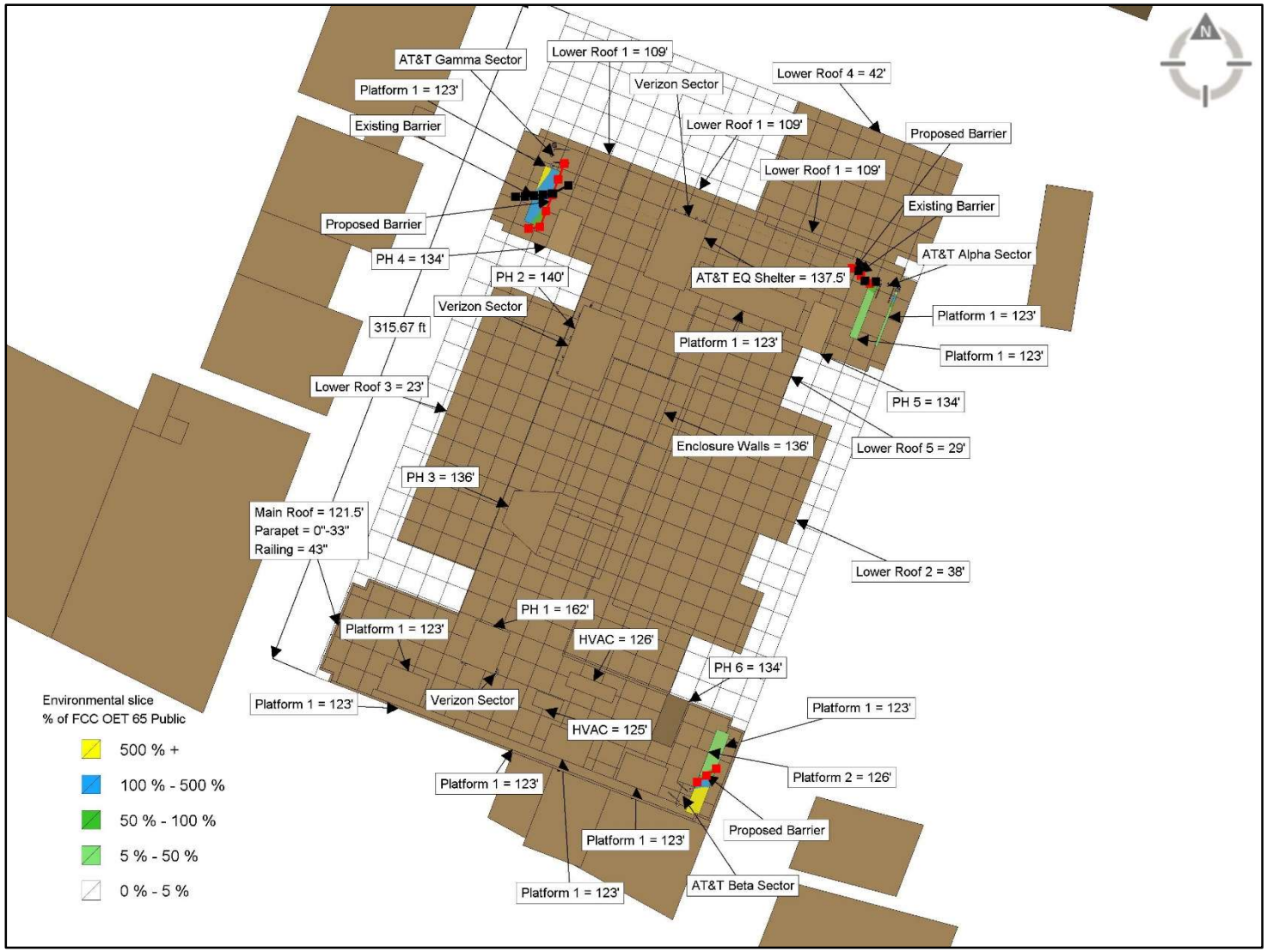
AT&T Only with 5000% Threshold

Grid Size: 10'

Main Level 121.5'

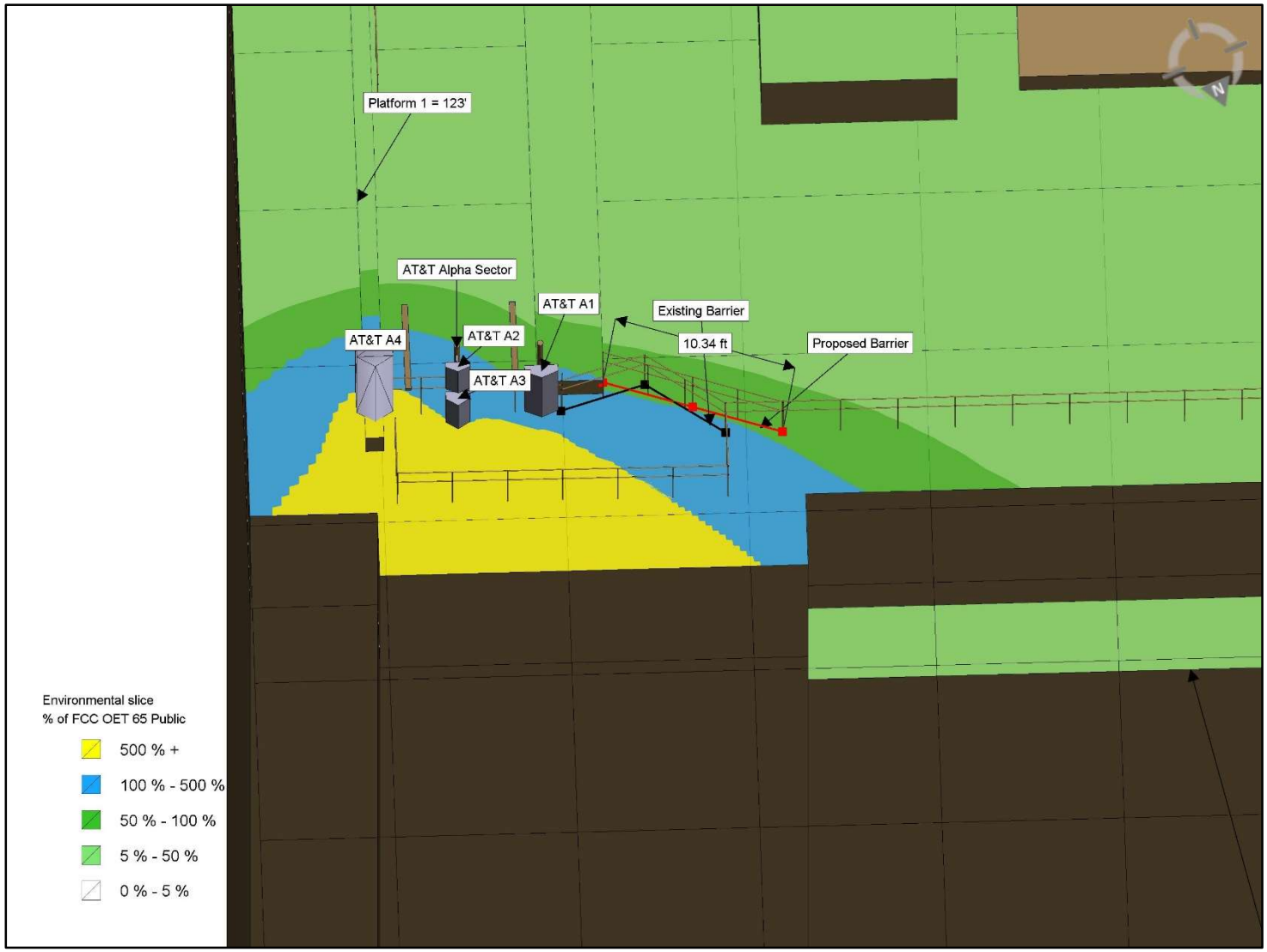
Grid Size: 10'

Platform 1 Level 123'



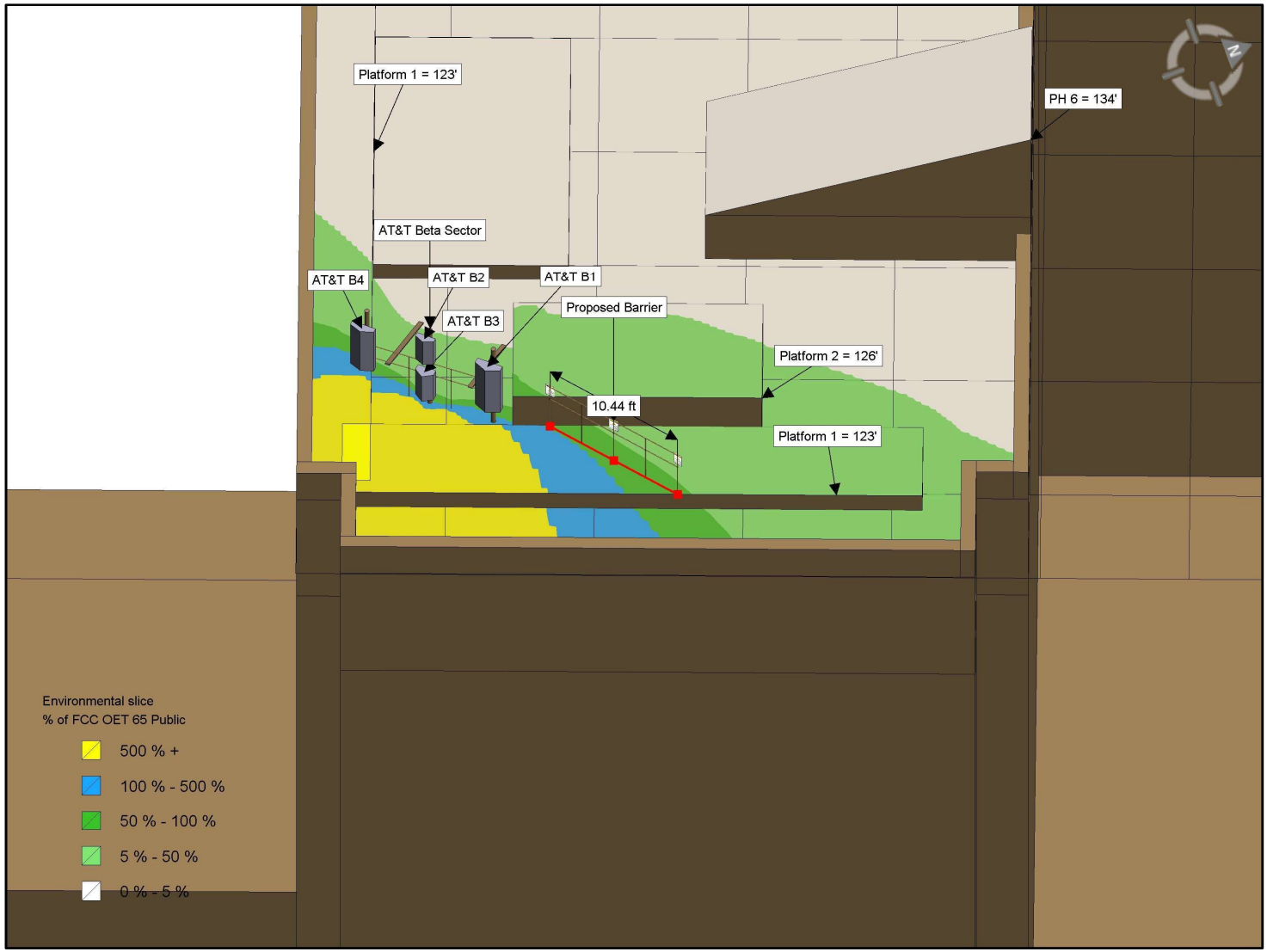
Grid Size: 10'

Alpha Emissions



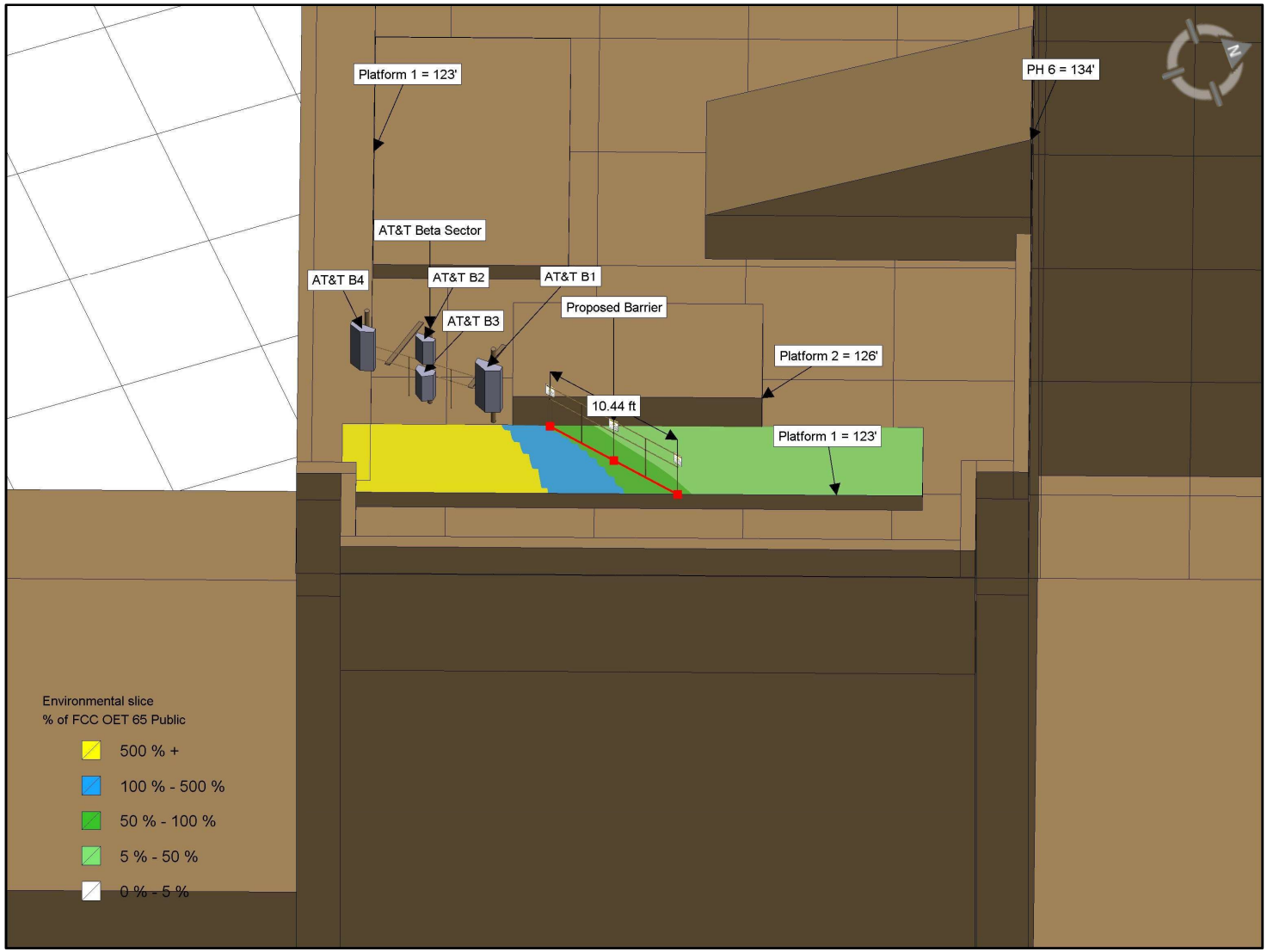
Grid Size: 10'

Beta Emissions



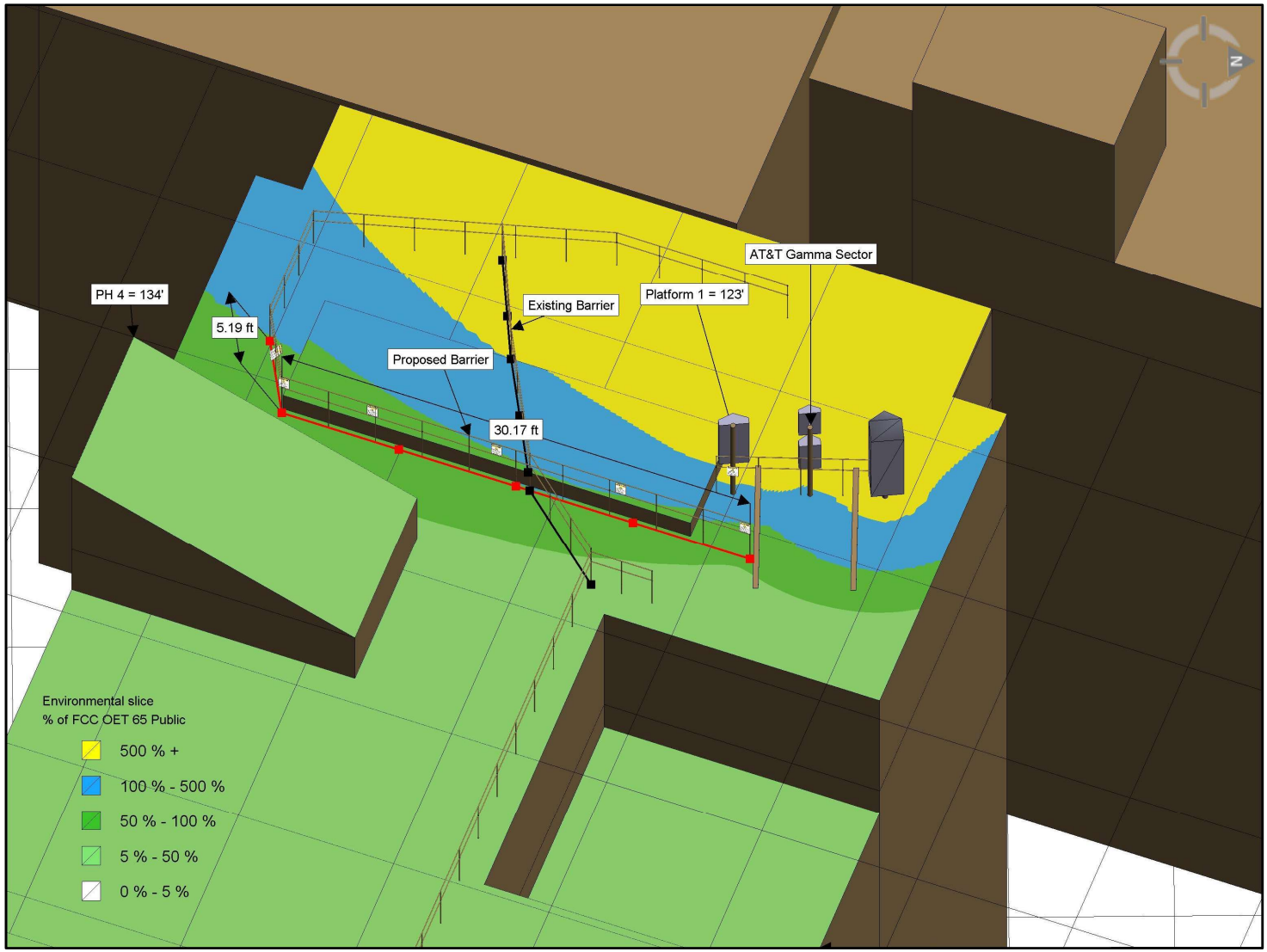
Grid Size: 10'

Beta Platform 1 Level 123'



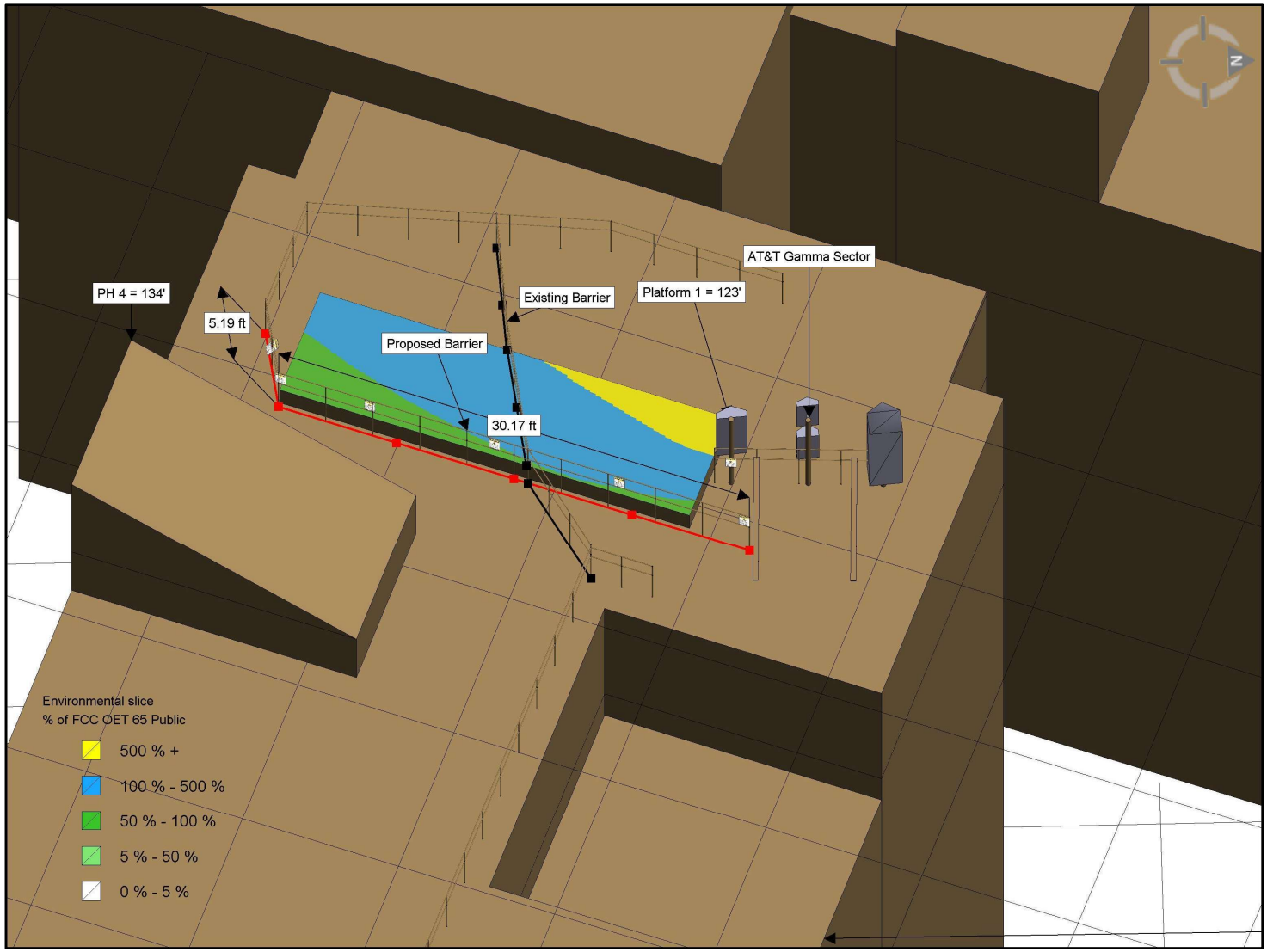
Grid Size: 10'

Gamma Emissions



Grid Size: 10'

Gamma Platform 1 Level 123'



Grid Size: 10'

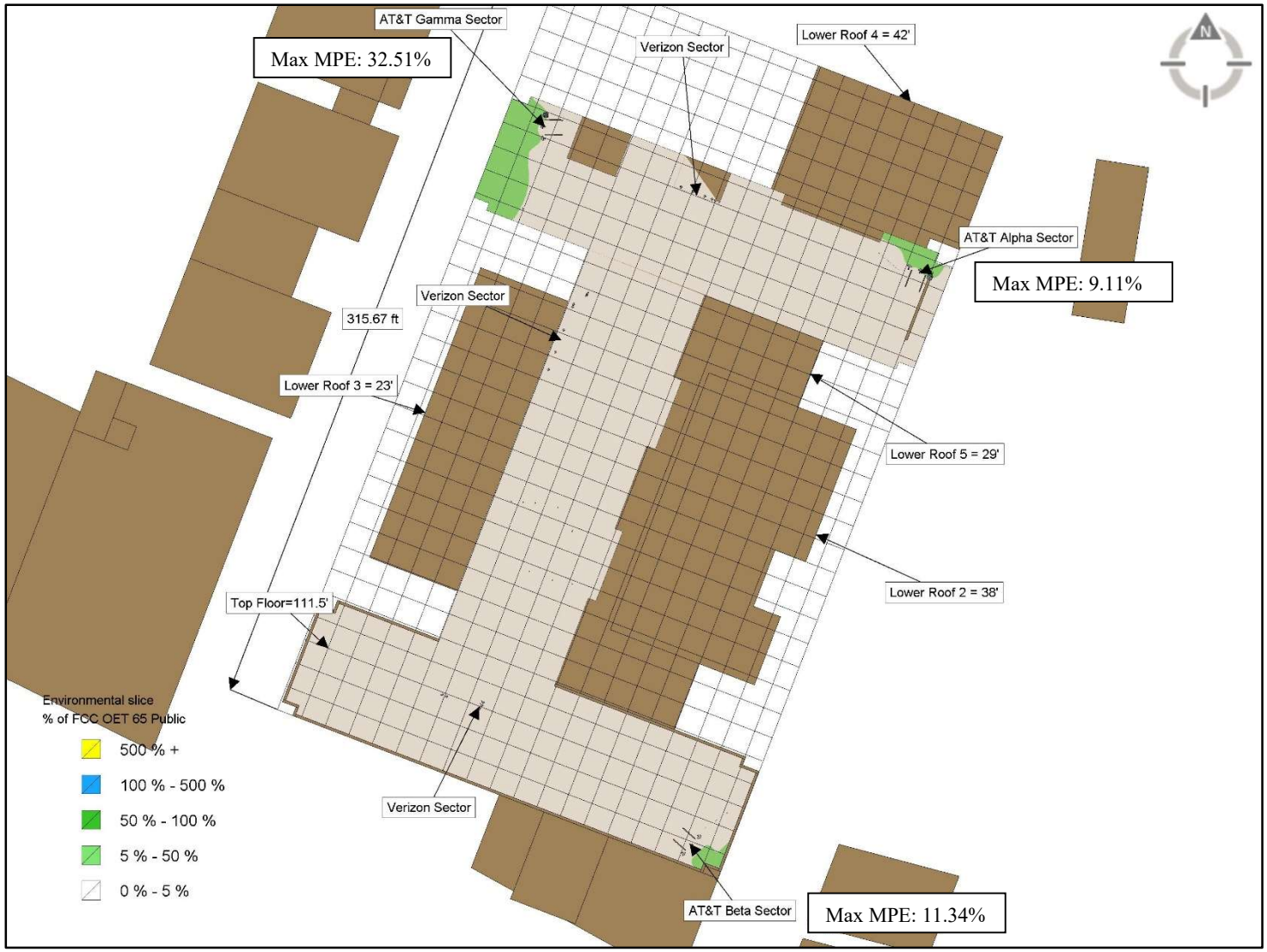
Adjacent Buildings Overview

Grid Size: 10'

Ground Level (Publicly Accessible Area)

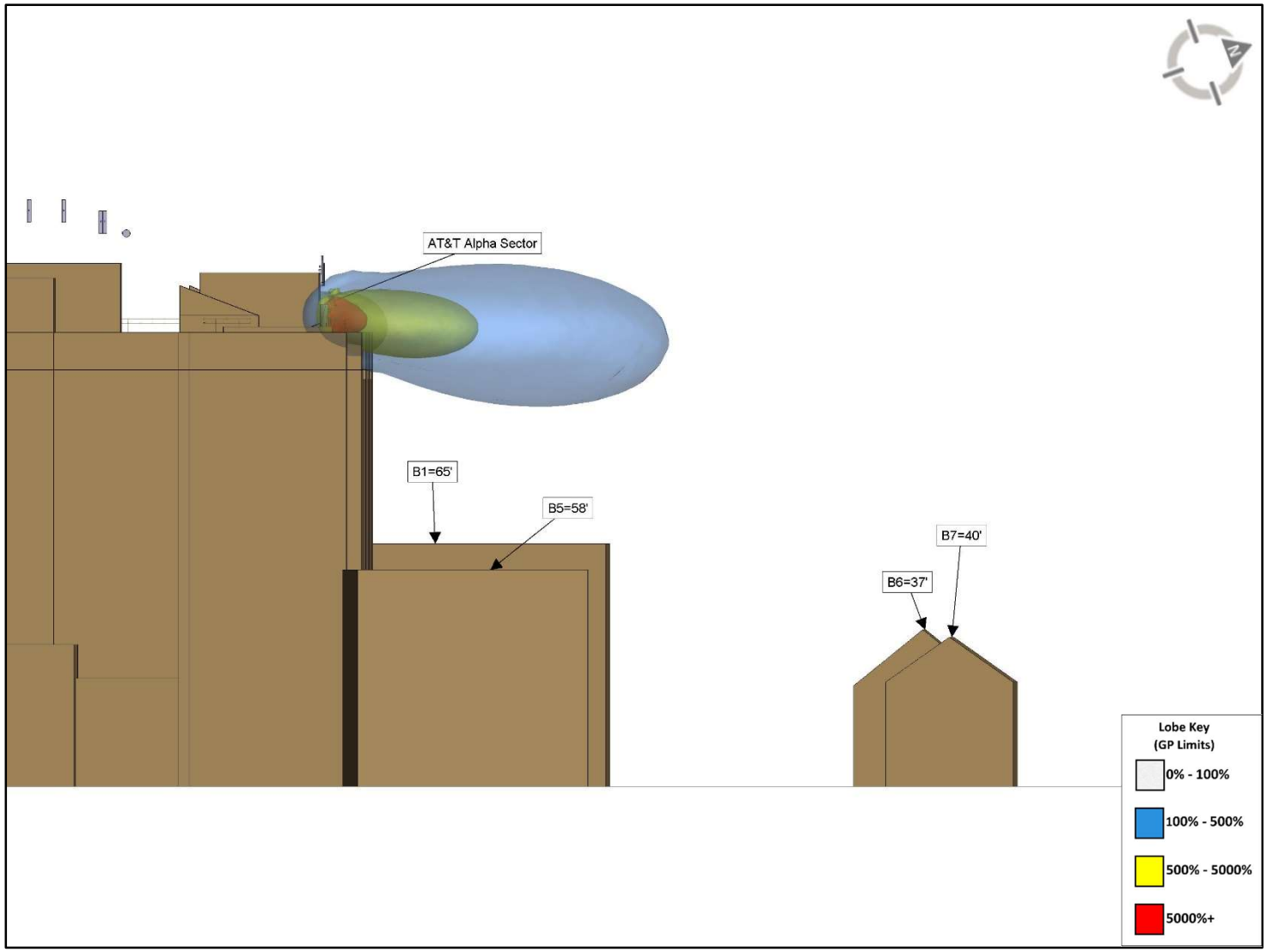
Grid Size: 10'

Top Floor Level (10dB Material Attenuation Applied to Simulate Top Floor Reductions)

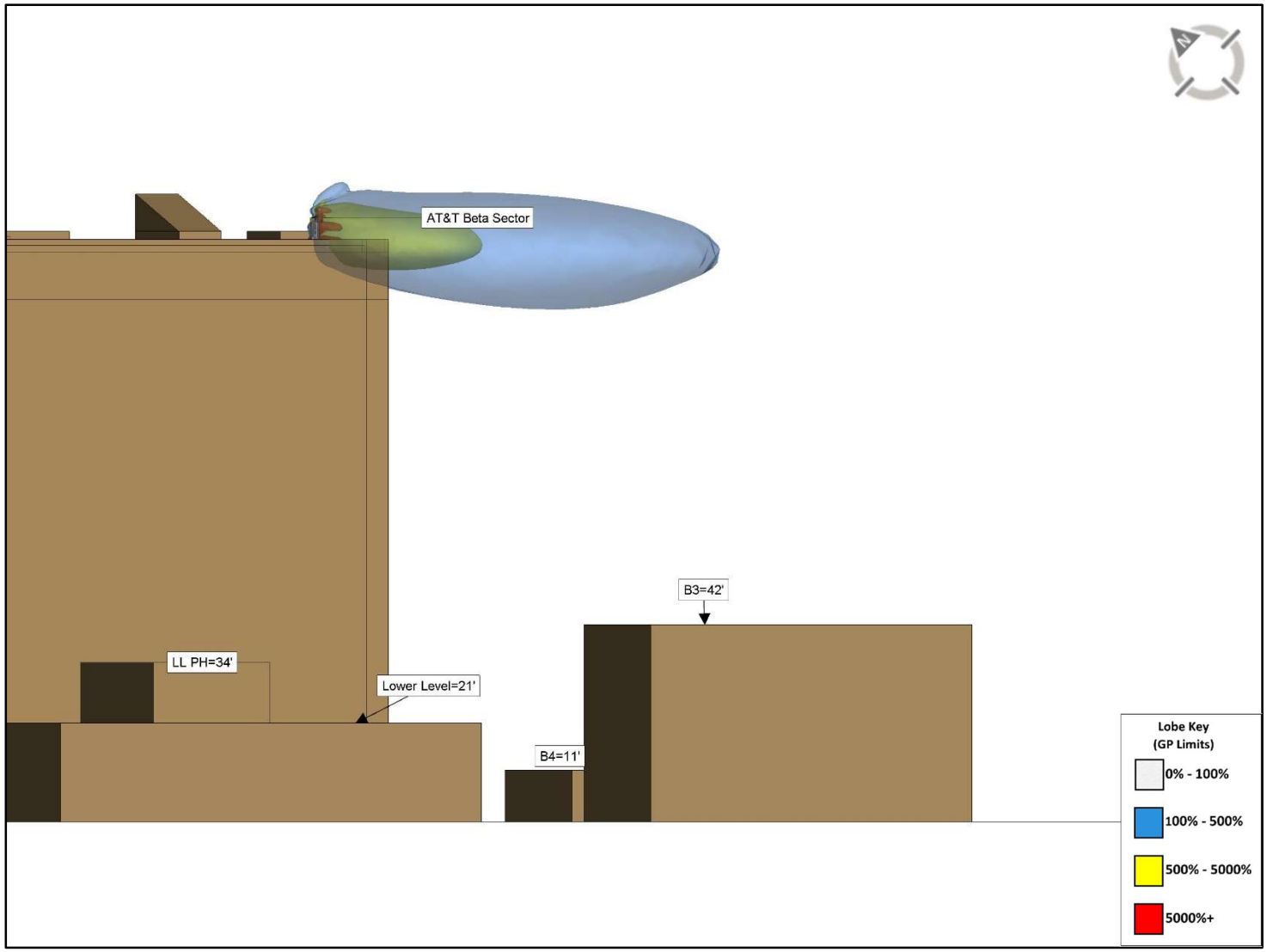


Grid Size: 10'

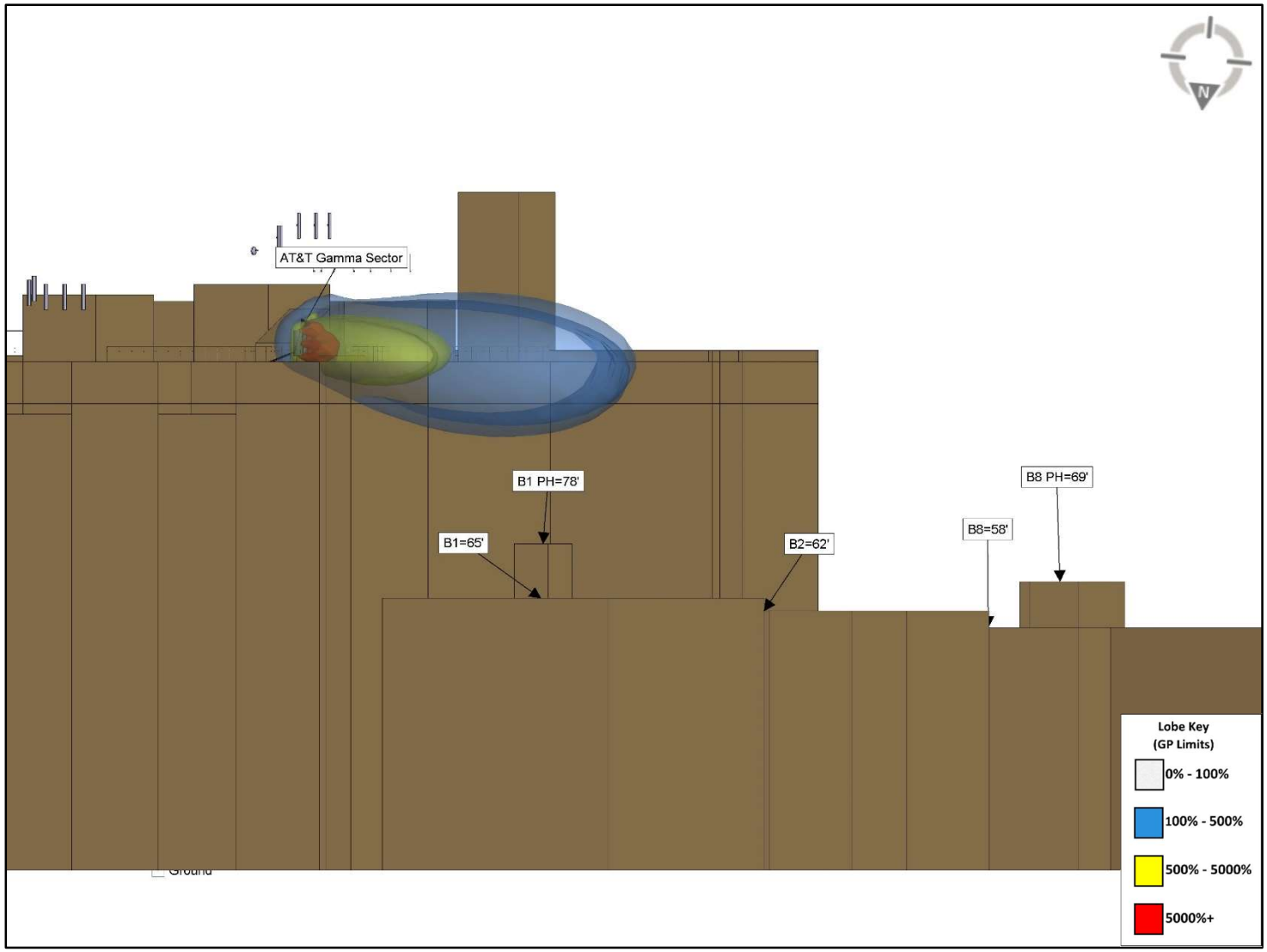
Alpha Sector Elevation View (3D Lobe)



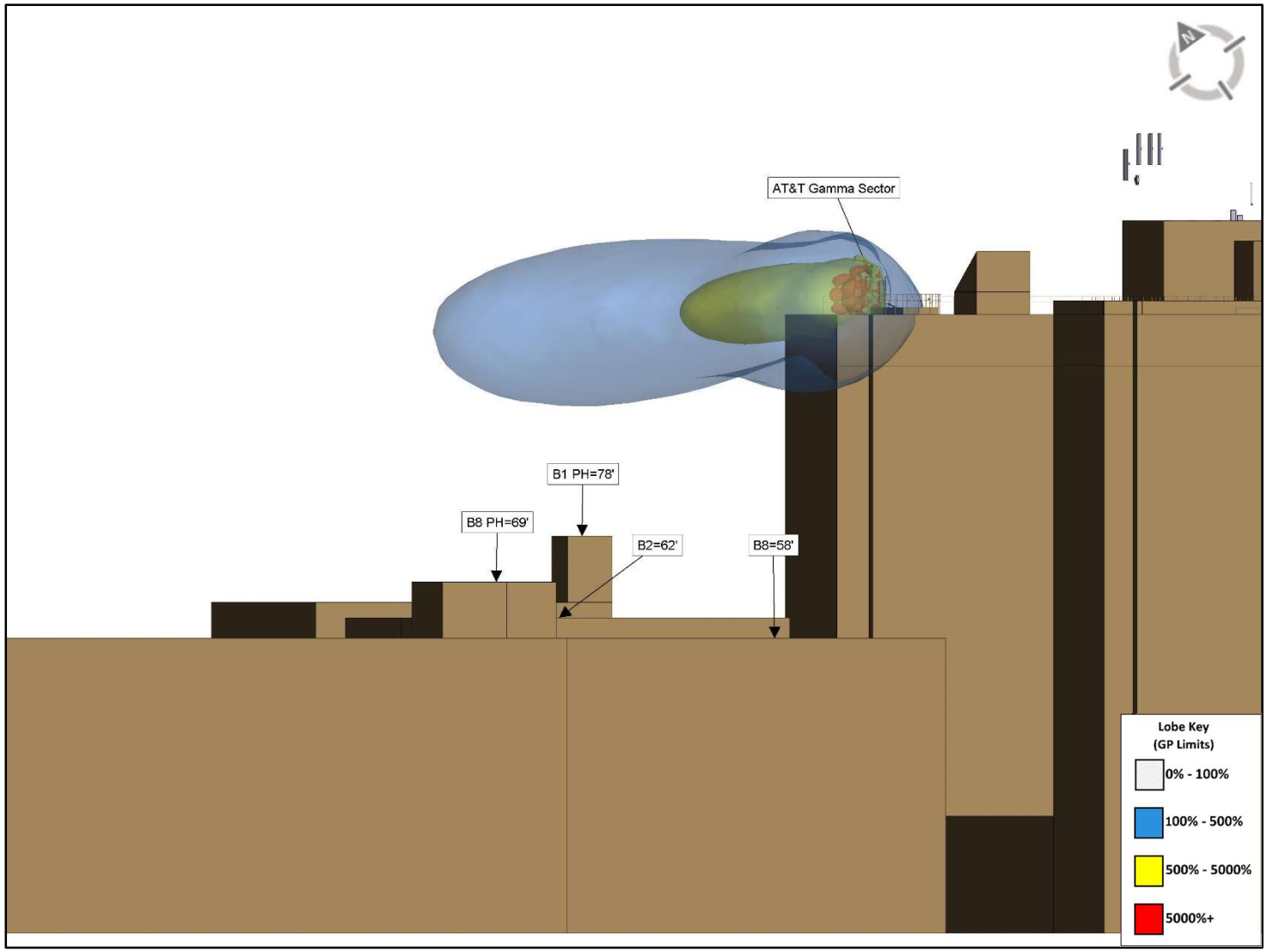
Beta Sector Elevation View (3D Lobe)



Gamma Sector Elevation View 1 (3D Lobe)



Gamma Sector Elevation View 2 (3D Lobe)



4.0 STATEMENT OF COMPLIANCE

Centerline conducted worst case modeling to determine whether the subject facility is in compliance with FCC regulations.

Based on the information analyzed, AT&T will be compliant with FCC regulations once the mitigation measures recommended in this report are implemented.

4.1 RECOMMENDATIONS

Existing Signage and Barriers (AT&T Sectors)										
Location	Information	Notice	Notice 2	Caution	Caution 2	Caution 2B	Caution 2C	Warning	Warning 2	Barriers
Alpha	0	0	0	0	3	0	0	0	0	X
Beta	0	0	0	0	2	0	0	0	0	0
Gamma	0	0	0	0	4	0	0	0	0	X

Recommended Signage and Barriers (AT&T Sectors) – Actions that MUST be Taken						
Location	Notice 2	Caution 2	Caution 2B	Caution 2C	Warning 2	Barriers
Alpha	0	3	0	0	0	0
Beta	0	3	0	0	0	X
Gamma	0	6	0	0	0	X

Final Compliant Configuration (AT&T Sectors) – All Mitigation Items that MUST be in Place										
Location	Information	Notice	Notice 2	Caution	Caution 2	Caution 2B	Caution 2C	Warning	Warning 2	Barriers
Alpha	0	0	0	0	5	0	0	0	0	X
Beta	0	0	0	0	5	0	0	0	0	X
Gamma	0	0	0	0	8	0	0	0	0	X

Alpha:

- Install an 11’ barrier as depicted in the signage diagrams. Install (3) Caution 2 signs on the proposed barrier.

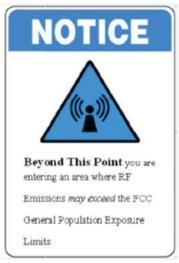
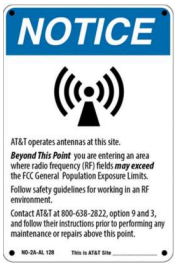
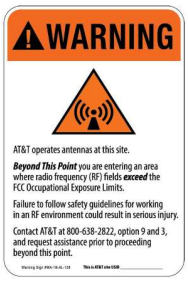
Beta:

- Install a 10’ barrier on Platform 1 as depicted in the signage diagrams. Install (3) Caution 2 signs on the proposed barrier.

Gamma:

- Install a 36’ barrier (6’ and 30’ segments) as depicted in the signage diagrams. Install (6) Caution 2 signs on the proposed barrier.

APPENDIX A: AT&T RF SIGNAGE

Sign	Description	Sign	Description
	**Information 1 Sign** Gives guidelines on how to proceed and who to contact regarding areas that may exceed either the FCC's General Population or Occupational emissions limits.		**Caution 2C Sign** Gives specific information on how to proceed and who to contact regarding antennas that are façade mounted, concealed or on stand-alone structures.
	**Blue Notice 1 Sign** Used to alert individuals that they are entering an area that may exceed the FCC's General Population emissions limit. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.		**Blue Notice 2 Sign** Used to alert individuals that they are entering an area that may exceed the FCC's General Population emissions limits. To be used on barriers or antenna sectors as a hybrid of the Information 1 and Blue Notice 1 signs.
	**Yellow Caution 1 Sign-Rooftop** Used to inform individuals that they are entering an area that may exceed the FCC's Occupational emissions limit. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.		**Yellow Caution 2 Sign-Rooftop** Used to alert individuals that they are entering an area that may exceed the FCC's Occupational emissions limit. To be used on barriers or antenna sectors as a hybrid of the Information 1 and Yellow Caution 1 signs.
	**Yellow Caution 2B Sign-Tower** Used to inform individuals that they are entering an area that may exceed the FCC's Occupational emissions limits. Must be placed at the base of the tower to warn tower climbers of potential for exposure.		**Warning 2 Sign** Used to inform individuals that they are entering an area that may exceed the FCC's Occupational emissions limit by a factor of 10 or greater. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.

APPENDIX B: FCC GUIDELINES AND EMISSIONS THRESHOLD LIMITS

All information used in this report was analyzed as a percentage of the Maximum Permissible Exposure (% MPE) limits as detailed in 47 CFR § 1.1310 as well as Federal Communications Commission (FCC) OET Bulletin 65 Edition 97-01. The FCC MPE limits are typically expressed in units of milliwatts per square centimeter (mW/cm^2) or microwatts per square centimeter ($\mu W/cm^2$). The exposure limits vary depending upon the frequencies being utilized. The General Population/Uncontrolled MPE limit (in mW/cm^2) for frequencies between 300 and 1500 is defined as frequency (in MHz) divided by 1500 ($f_{MHz}/1500$). Frequencies between 1500 and 100,000 MHz have a General Population/Uncontrolled MPE limit of 1 mW/cm^2 (1000 $\mu W/cm^2$). The calculated power density at each sample point divided by the limit at each calculated frequency provides a result in % MPE. Summing the calculated % MPE from all contributors provides a cumulative % MPE at a particular sample point. Because exposure limits may vary for each frequency band, it is necessary to report % MPE rather than power density.

All results were compared to the FCC radio frequency exposure rules as detailed in 47 CFR § 1.1307(b) to determine compliance with the MPE limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/ controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits, as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Additional details can be found in FCC OET 65.

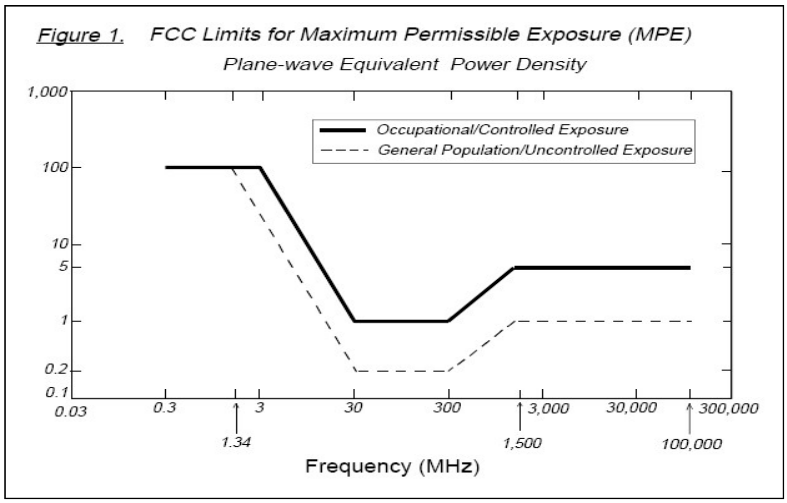
The FCC mandates that if a site is found to be out of compliance with regard to exposure, any system operator contributing 5% or more to areas exceeding the FCC's allowable limits will be responsible for bringing the site into compliance.

Additional details can be found in FCC OET 65.

Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)

* Plane-wave equivalent power density



APPENDIX C: CALCULATION METHODOLOGY

IXUS electromagnetic energy (EME) calculation software was used to assess all RF field levels presented in this study. IXUS software uses a fast and accurate EME calculation tool that allows for the determination of RF field strength in the vicinity of radio communication base stations and transmitters. At its core, the IXUS EME calculation module implements evaluation techniques detailed in the ITU-T K.61, CENELEC EN 50383, and IEC 62232 specifications and referenced in *C95.3 IEEE Recommended Practice for Measurements and Computations of Electric, Magnetic, and Electromagnetic Fields with Respect to Human Exposure to Such Fields, 0 Hz to 300 GHz*. The EME calculation result at any point in 3D space is achieved via a synthetic ray tracing technique, a conservative cylindrical envelope method, or through full-wave electromagnetic simulation. The ray tracing method is an advanced computation method described in IEC 622322 where the power is summed from elemental sources representing the individual components of the antenna which are selected by an analysis of published manufacturer datasheets and antenna pattern information. The selection of the solution method is determined by the particular antenna being considered.

APPENDIX D: CERTIFICATIONS

I, Katrina Styx, preparer of this report certify that I am fully trained and aware of the rules and regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document.

Katrina Styx

5/13/2024

I, Yasir Alqadhili, reviewer and approver of this report certify that I am fully trained and aware of the rules and regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document.

Yasir Alqadhili

5/13/2024

APPENDIX E: PROPRIETARY STATEMENT

This report was prepared for the use of AT&T to meet all applicable FCC requirements. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by Centerline are based solely on the information provided by AT&T and all observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to Centerline so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

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
TTY: 1-888-835-5322

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

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[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

---

[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.

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[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.

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]