



CITY OF CAMBRIDGE

BOARD OF ZONING APPEAL

831 Massachusetts Avenue, Cambridge MA 02139

617-349-6100

BZA Application Form

BZA Number: 251572

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

REASON FOR PETITION:

DESCRIPTION OF PETITIONER'S PROPOSAL:

AT&T modifications include replacing (12) antennas with (12) new antennas in nearly the same location, replacing (6) remote radio heads with (6) remote radio heads in nearly the same location, replacing certain cabling with new cables, add rectifiers, remove existing diplexers and TMA, 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) (Telecommunications Facility).

Article: 10.000 Section: 10.40 (Special Permit).

Article: 6409 Section: (Federal Middle Class Tax Relief Act -"Spectrum Act").

Original
Signature(s):

Allison Conwell

(Petitioner (s) / Owner)

Allison Conwell

(Print Name)

Address:

Tel. No.

E-Mail Address:

750 W. Center St. Ste 301 W. Bridgewater,
MA 02379

215-588-7035

aconwell@clinellc.com

Date:

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.

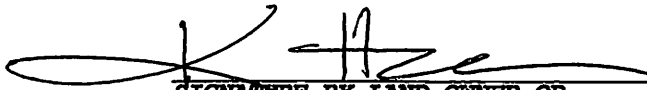
I/We PRESIDENT AND FELLOWS OF HARVARD COLLEGE
(OWNER)

Address: 1350 MASSACHUSETTS AVE, CAMBRIDGE MA 02138

State that I/We own the property located at 1350 MASS AVE, CAMBRIDGE which is the subject of this zoning application.

The record title of this property is in the name of PRESIDENT AND FELLOWS OF HARVARD COLLEGE

*Pursuant to a deed of duly recorded in the date 12/22/04, 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*

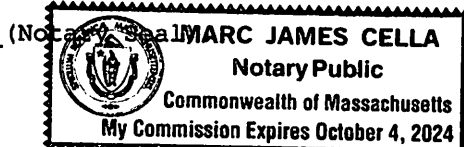
*Written evidence of Agent's standing to represent petitioner may be requested.

Commonwealth of Massachusetts, County of Middlesex

The above-name Kristen Hurston personally appeared before me, this 4 of December, 2023, and made oath that the above statement is true.

Marc J Cella Notary

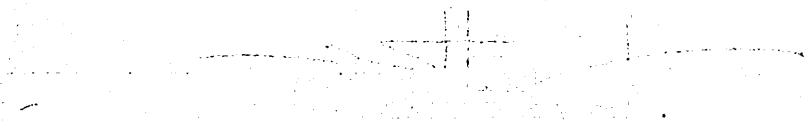
My commission expires Oct. 4, 2024



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

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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, 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 radio frequency 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 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. The 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
Requested Use/Occupancy: Telecommunications

		<u>Existing Conditions</u>		<u>Requested Conditions</u>		<u>Ordinance Requirements</u>	
<u>TOTAL GROSS FLOOR AREA:</u>		74,913		0		0	(max.)
<u>LOT AREA:</u>		74,913		0		0	(min.)
<u>RATIO OF GROSS FLOOR AREA TO LOT AREA: ²</u>		74,913		0		0	
<u>LOT AREA OF EACH DWELLING UNIT</u>		0		0		0	
<u>SIZE OF LOT:</u>	WIDTH	0		0		0	
	DEPTH	0		0		0	
<u>SETBACKS IN FEET:</u>	FRONT	0		0		0	
	REAR	0		0		0	
	LEFT SIDE	0		0		0	
	RIGHT SIDE	0		0		0	
<u>SIZE OF BUILDING:</u>	HEIGHT	121		0		0	
	WIDTH	0		0		0	
	LENGTH	0		0		0	
<u>RATIO OF USABLE OPEN SPACE TO LOT AREA:</u>		0		0		0	
<u>NO. OF DWELLING UNITS:</u>		0		0		0	
<u>NO. OF PARKING SPACES:</u>		0		0		0	
<u>NO. OF LOADING AREAS:</u>		0		0		0	
<u>DISTANCE TO NEAREST BLDG. ON SAME LOT</u>		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: <ul style="list-style-type: none">• NEW AT&T ANTENNAS: AIR6419 B77G (TYP. OF 1 PER SECTOR, TOTAL OF 3) (STACKED) (TOP).• NEW AT&T ANTENNAS: AIR6449 B77D (TYP. OF 1 PER SECTOR, TOTAL OF 3) (STACKED) (BOTTOM).• NEW AT&T ANTENNAS: QD4616-7 (TYP. OF 1 PER SECTOR, TOTAL OF 3).• NEW AT&T ANTENNAS: OPA65R-BU4D (TYP. OF 1 PER SECTOR, TOTAL OF 3).• NEW AT&T RRUS: 4415 B25 (1900) (TYP. OF 1 PER SECTOR, TOTAL OF 3).• NEW AT&T (3) Y-CABLES FOR DUAL BAND RADIOS (4449).	
	ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION: <ul style="list-style-type: none">• ADD 6651 + XCEDE CABLE.• FINAL: 1x5216/1xXMU/1x6630+IDLe/1x6651+XCEDE.• ADD (4) -48V RECTIFIERS FOR A TOTAL OF (10) RECTIFIERS INSIDE EXISTING POWER PLANT.• ADD (6) -48V UP-CONVERTERS FOR THE 4449 B5/B12, AIR6449, & AIR6419 IN BETA SECTOR.	
	ITEMS TO BE REMOVED: <ul style="list-style-type: none">• DECOMMISSION EXISTING AT&T ANTENNA: SBNHH-1D65A (TYP. OF 1 PER SECTOR, TOTAL OF 3).• DECOMMISSION EXISTING AT&T ANTENNA: 800-10964 (TYP. OF 1 PER SECTOR, TOTAL OF 3).• DECOMMISSION EXISTING AT&T ANTENNA: OPA-65R-LCUU-H4 (TYP. OF 1 PER SECTOR, TOTAL OF 3).• DECOMMISSION EXISTING AT&T ANTENNA: 742-264 (TYP. OF 1 PER SECTOR, TOTAL OF 3).• DECOMMISSION EXISTING AT&T DIPLEXERS: 78210250 (TYP. OF 2 PER SECTOR, TOTAL OF 6).• DECOMMISSION EXISTING AT&T TMA: LGP21401 (TYP. OF 2 PER SECTOR, TOTAL OF 6).• DECOMMISSION EXISTING AT&T RRUS: RRUS-12 B2 (TYP. OF 1 PER SECTOR, TOTAL OF 3).• DECOMMISSION EXISTING AT&T (12) 1-5/8" COAX CABLES.• DECOMMISSION EXISTING UMS CABINET (RETIRE IN PLACE)	
	ITEMS TO REMAIN: <ul style="list-style-type: none">• (15) RRU'S, (6) SURGE ARRESTOR, (12) 1-5/8" COAX, (12) DC POWER & (6) FIBER.	
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	

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:
<ul style="list-style-type: none">• 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

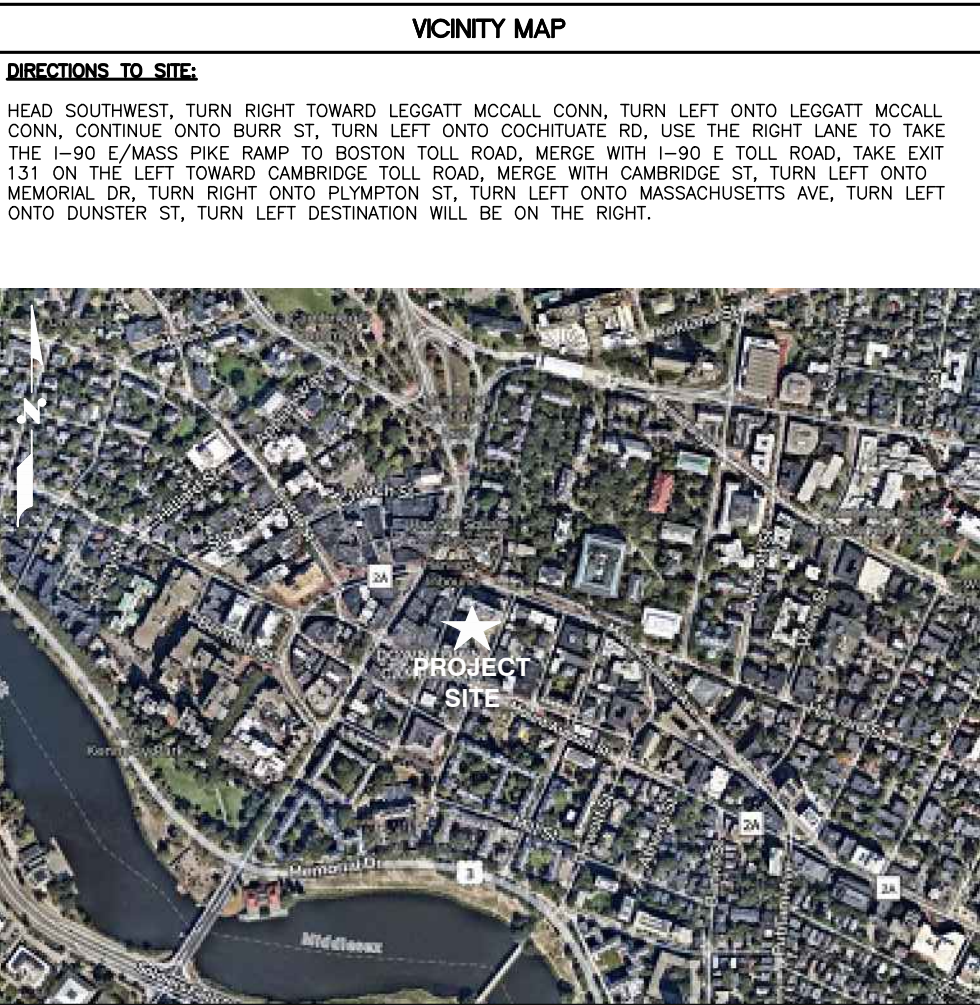
SITE NAME: CAMBRIDGE MASS. AVE

FA CODE: 10071767

PACE ID: MRCTB057991, MRCTB052221,MRCTB051167, MRCTB050815, MRCTB050786

PROJECT: 5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO, 5G NR 1SR CBAND, RF MODS, BBU RECONFIG, 2023 UPGRADE

DRAWING INDEX		
SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	2
GN-1	GENERAL NOTES	2
A-1	ROOFTOP & EQUIPMENT PLANS	2
A-2	EXISTING ANTENNA LAYOUT PLANS	2
A-3	PROPOSED ANTENNA LAYOUT PLANS	2
A-4	ELEVATION	2
A-5	DETAILS	2
A-6	DETAILS	2
G-1	GROUNDING DETAILS	2
RF-1	RF PLUMBING DIAGRAM	2



VICINITY MAP	GENERAL NOTES
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.	<ol style="list-style-type: none">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

WWW.DIGSAFE.COM
72 HOURS PRIOR

<div> TEP OPCO, LLC. 45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845 TEL: (978) 557-5553</div>	<div> 750 WEST CENTER STREET, SUITE #301 WEST BRIDGEWATER, MA 02379</div>	<div>SITE NUMBER: MAL02215 SITE NAME: CAMBRIDGE MASS. AVE 1350 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02138 MIDDLESEX COUNTY</div>	<div> 550 COCHITUATE ROAD FRAMINGHAM, MA 01701</div>	<table><tr><td>2</td><td>11/29/23</td><td>ISSUED FOR CONSTRUCTION</td><td>JS</td><td>AT</td><td>CHK</td></tr><tr><td>1</td><td>11/07/23</td><td>ISSUED FOR CONSTRUCTION</td><td>JS</td><td>AT</td><td>CHK</td></tr><tr><td>0</td><td>10/20/23</td><td>ISSUED FOR REVIEW</td><td>JS</td><td>AT</td><td>CHK</td></tr><tr><td>A</td><td>06/10/22</td><td>ISSUED FOR REVIEW</td><td>JS</td><td>AT</td><td>CHK</td></tr></table>	2	11/29/23	ISSUED FOR CONSTRUCTION	JS	AT	CHK	1	11/07/23	ISSUED FOR CONSTRUCTION	JS	AT	CHK	0	10/20/23	ISSUED FOR REVIEW	JS	AT	CHK	A	06/10/22	ISSUED FOR REVIEW	JS	AT	CHK	<div><div>DANIEL P. HAMM No. 40720 REGISTERED PROFESSIONAL ENGINEER</div></div>	<div>AT&T</div> <div>TITLE SHEET</div> <div>5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO, 5G NR 1SR CBAND, RF MODS, BBU RECONFIG, 2023 UPGRADE</div> <table><tr><td>SITE NUMBER</td><td>DRAWING NUMBER</td><td>REV</td></tr><tr><td>MAL02215</td><td>T-1</td><td>2</td></tr></table>	SITE NUMBER	DRAWING NUMBER	REV	MAL02215	T-1	2
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MAL02215	T-1	2																																		
SCALE: AS SHOWN			DESIGNED BY: AT	DRAWN BY: GD																																

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

FOR THE PURPOSE OF THE SUBCONTRACT DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

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

- 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.
- 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.
- DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- "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.
- THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 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.
- 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.
- 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.
- 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.
- SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
- ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

- 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 (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		




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



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

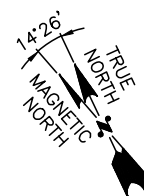
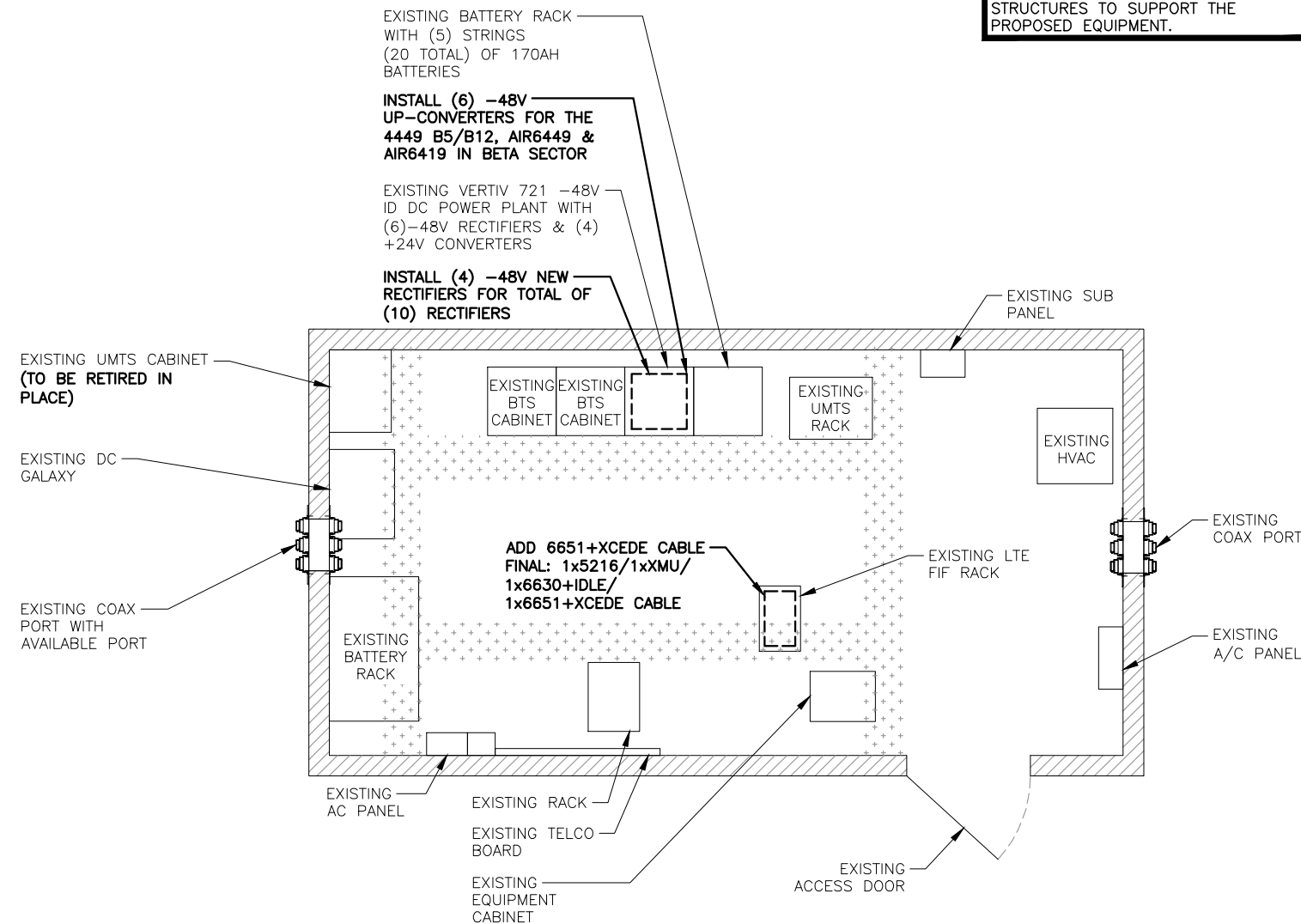
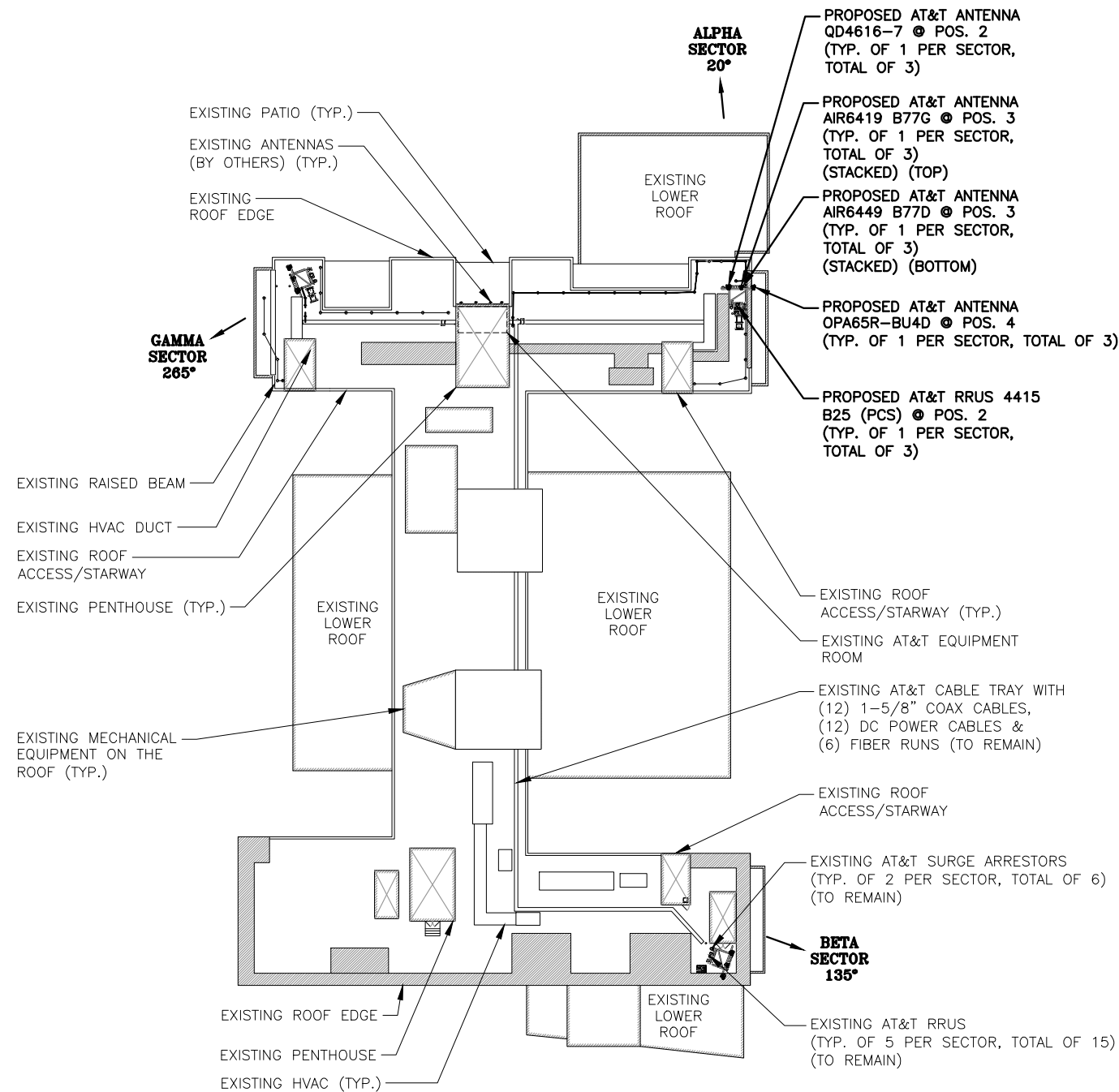
2	11/29/23	ISSUED FOR CONSTRUCTION	JS	AT	DPH		AT&T	
1	11/07/23	ISSUED FOR CONSTRUCTION	SC	AT	DPH		GENERAL NOTES 5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO, 5G NR 1SR BAND, RF MODS, BRU RECONFIG, 2023 UPGRADE	
0	10/20/23	ISSUED FOR REVIEW	JS	AT	DPH			
A	06/10/22	ISSUED FOR REVIEW	GD	AT	DPH			
NO.	DATE	REVISIONS	BY	CHK	APP			
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: GD		DATE: 06/10/22	PROJECT: MAL02215		
						DATE: 11/29/23	PROJECT: GN-1	
						DATE: 11/07/23	PROJECT: 2	

NOTE:

REFER TO THE FINAL RF DATA SHEET
V3 DATED 10/25/23 FOR FINAL
ANTENNA SETTINGS.

NOTE:

REFER TO STRUCTURAL ANALYSIS
BY: TEP NE. (TEP OPCO, LLC.)
DATED: NOVEMBER 1, 2023 (REV.1),
FOR THE CAPACITY OF THE EXISTING
STRUCTURES TO SUPPORT THE
PROPOSED EQUIPMENT.

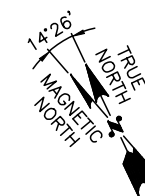


COMPOUND PLAN

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

1
A-1

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



EQUIPMENT PLAN

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

2
A-1

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



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

SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

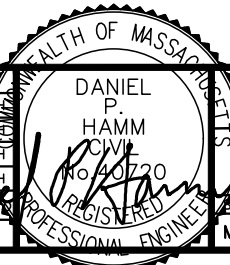
1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP
2	11/29/23	ISSUED FOR CONSTRUCTION	JS	AT	CPH
1	11/07/23	ISSUED FOR CONSTRUCTION	JS	AT	CPH
0	10/20/23	ISSUED FOR REVIEW	JS	AT	CPH
A	06/10/22	ISSUED FOR REVIEW	JS	AT	CPH

SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: GD



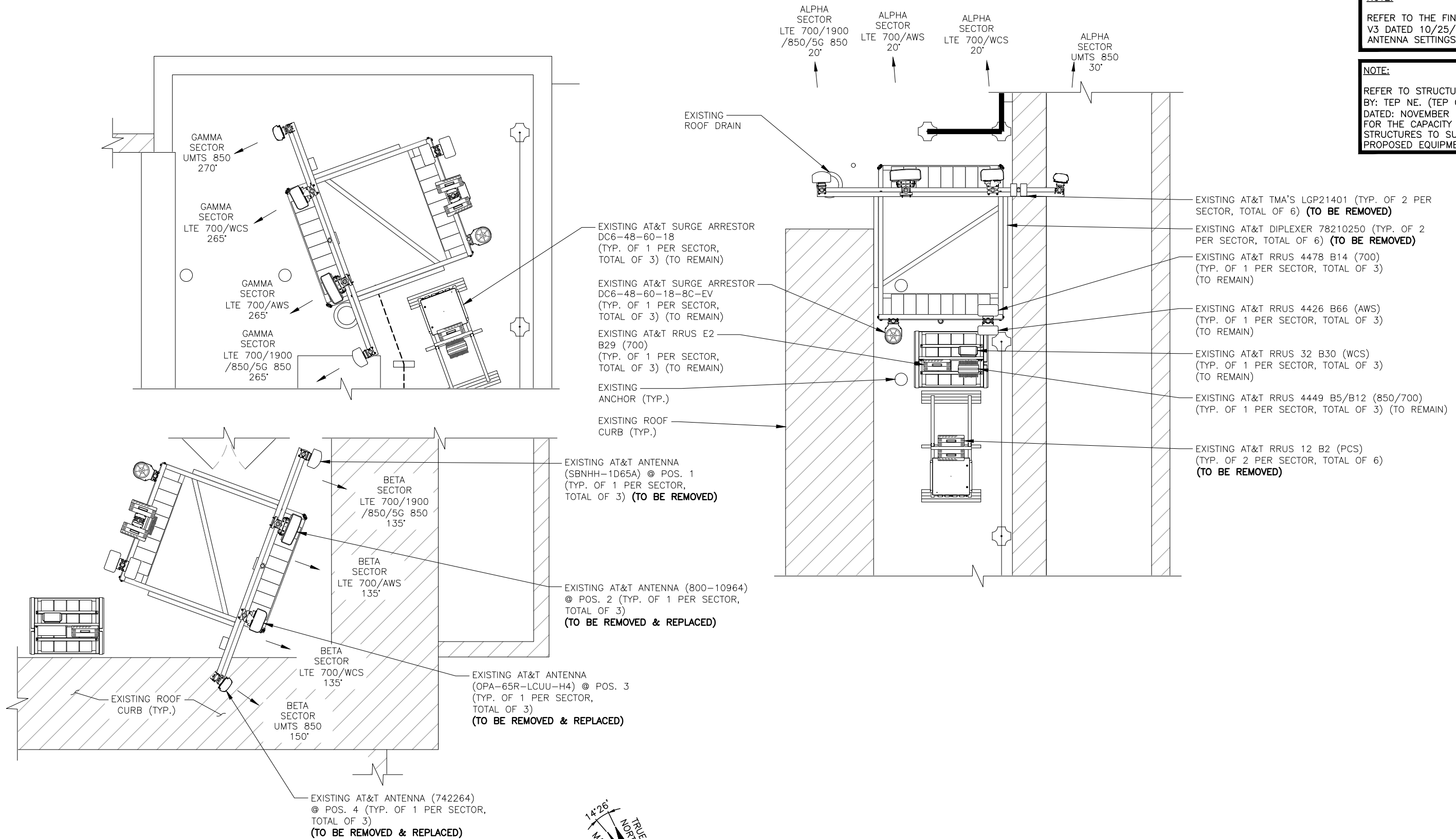
AT&T

ROOFTOP & EQUIPMENT PLANS
5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO,
5G NR 15R CRAND, RF MODS, BBU RECONFIG, 2023 UPGRADE

SITE NUMBER: MAL02215
DRAWING NUMBER: A-1
REV: 2

NOTE:
REFER TO THE FINAL RF DATA SHEET
V3 DATED 10/25/23 FOR FINAL
ANTENNA SETTINGS.

NOTE:
REFER TO STRUCTURAL ANALYSIS
BY: TEP NE. (TEP OPCO, LLC.)
DATED: NOVEMBER 1, 2023 (REV.1),
FOR THE CAPACITY OF THE EXISTING
STRUCTURES TO SUPPORT THE
PROPOSED EQUIPMENT.



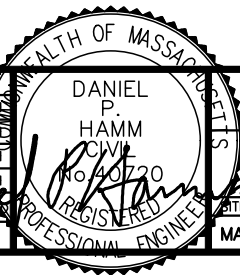
EXISTING ANTENNA LAYOUT

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

1
A-2

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

NO.	DATE	REVISIONS	BY	CHK	APP
2	11/29/23	ISSUED FOR CONSTRUCTION	JS	AT	CPH
1	11/07/23	ISSUED FOR CONSTRUCTION	JS	AT	CPH
0	10/20/23	ISSUED FOR REVIEW	JS	AT	CPH
A	06/10/22	ISSUED FOR REVIEW	JS	AT	CPH
NO.	DATE	REVISIONS	BY	CHK	APP
SCALE:	AS SHOWN	DESIGNED BY:	AT	DRAWN BY:	GD



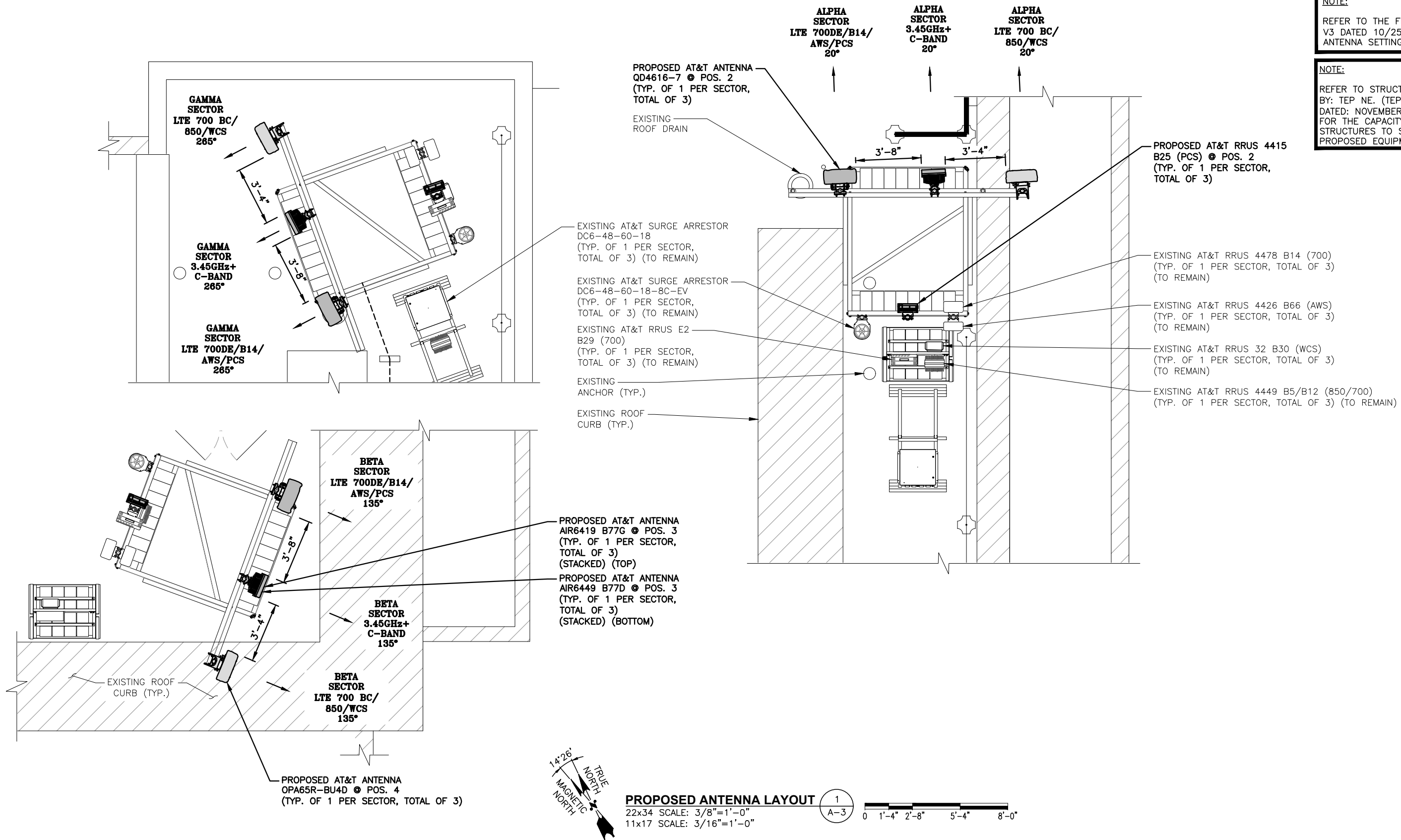
AT&T

ANTENNA LAYOUTS & ELEVATION
5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO,
5G NR 15R CRAND, RF MODS, BBU RECONFIG, 2023 UPGRADE

SITE NUMBER: MAL02215
DRAWING NUMBER: A-2
REV: 2

NOTE:
REFER TO THE FINAL RF DATA SHEET
V3 DATED 10/25/23 FOR FINAL
ANTENNA SETTINGS.

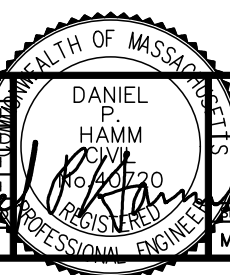
NOTE:
REFER TO STRUCTURAL ANALYSIS
BY: TEP NE. (TEP OPCO, LLC.)
DATED: NOVEMBER 1, 2023 (REV.1),
FOR THE CAPACITY OF THE EXISTING
STRUCTURES TO SUPPORT THE
PROPOSED EQUIPMENT.



SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE
1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY



NO.	DATE	REVISIONS	DESIGNED BY:	DRAWN BY:
2	11/29/23	ISSUED FOR CONSTRUCTION	JS	AT
1	11/07/23	ISSUED FOR CONSTRUCTION	JS	AT
0	10/20/23	ISSUED FOR REVIEW	JS	AT
A	06/10/22	ISSUED FOR REVIEW	JS	AT



AT&T	
PROPOSED ANTENNA PLAN 5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO, 5G NR 1500 MHz BAND, RF MODS, BBU RECONFIG, 2023 UPGRADE	
SITE NUMBER MAL02215	DRAWING NUMBER A-3
REV 2	

NOTE:

REFER TO STRUCTURAL ANALYSIS
BY: TEP NE. (TEP OPCO, LLC.)
DATED: NOVEMBER 1, 2023 (REV.1),
FOR THE CAPACITY OF THE EXISTING
STRUCTURES TO SUPPORT THE
PROPOSED EQUIPMENT.

NOTE:

REFER TO THE FINAL RF DATA SHEET
V3 DATED 10/25/23 FOR FINAL
ANTENNA SETTINGS.

EXISTING AT&T RRUS 4449
B5/B12 (850/700)
(TYP. OF 1 PER SECTOR,
TOTAL OF 3) (TO REMAIN)

PROPOSED AT&T ANTENNA
AIR6419 B77G @ POS. 3
(TYP. OF 1 PER SECTOR,
TOTAL OF 3)
(STACKED) (TOP)

PROPOSED AT&T ANTENNA
AIR6449 B77D @ POS. 3
(TYP. OF 1 PER SECTOR,
TOTAL OF 3)
(STACKED) (BOTTOM)

PROPOSED AT&T ANTENNA
OPA65R-BU4D @ POS. 4
(TYP. OF 1 PER SECTOR, TOTAL OF 3)

CL OF PROPOSED AT&T ANTENNAS
ELEV. 126'-0"± (AGL)

TOP OF ROOF
ELEV. 121'-6"± (AGL)

EXISTING AT&T NON-PENETRATING BALLAST
MOUNT (TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING AT&T RRUS E2
B29 (700)
(TYP. OF 1 PER SECTOR,
TOTAL OF 3) (TO REMAIN)

EXISTING AT&T SURGE ARRESTOR
DC6-48-60-18
(TYP. OF 1 PER SECTOR,
TOTAL OF 3) (TO REMAIN)

GROUND LEVEL
ELEV. 0'-0"± (AGL)

PROPOSED AT&T RRUS 4415
B25 (PCS) @ POS. 2
(TYP. OF 1 PER SECTOR,
TOTAL OF 3)

EXISTING AT&T SURGE ARRESTOR
DC6-48-60-18-8C-EV
(TYP. OF 1 PER SECTOR,
TOTAL OF 3) (TO REMAIN)

PROPOSED AT&T ANTENNA
QD4616-7 @ POS. 2
(TYP. OF 1 PER SECTOR,
TOTAL OF 3)

EXISTING PENTHOUSE

EXISTING ANTENNAS
(BY OTHERS) (TYP.)

EXISTING ROOF
ACCESS/STARWAY

EXISTING ANTENNAS (BY OTHERS)
(TYP.)

EXISTING PENTHOUSE (TYP.)

EXISTING AT&T EQUIPMENT
ROOM

EXISTING ROOF
ACCESS/STARWAY (TYP.)

EXISTING PENTHOUSE (TYP.)

EXISTING EQUIPMENT
ON THE ROOF

EXISTING AT&T RRUS 32 B30 (WCS)
(TYP. OF 1 PER SECTOR, TOTAL OF 3)
(TO REMAIN)

EXISTING AT&T RRUS 4478 B14 (700)
(TYP. OF 1 PER SECTOR, TOTAL OF 3)
(TO REMAIN)

EXISTING AT&T RRUS 4426 B66 (AWS)
(TYP. OF 1 PER SECTOR, TOTAL OF 3)
(TO REMAIN)

EXISTING AT&T CABLE TRAY WITH
(12) 1-5/8" COAX CABLES,
(12) DC POWER CABLES &
(6) FIBER RUNS (TO REMAIN)

EXISTING BUILDING

ELEVATION

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

1
A-4

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



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

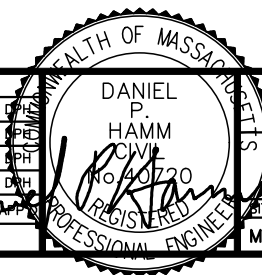
SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY

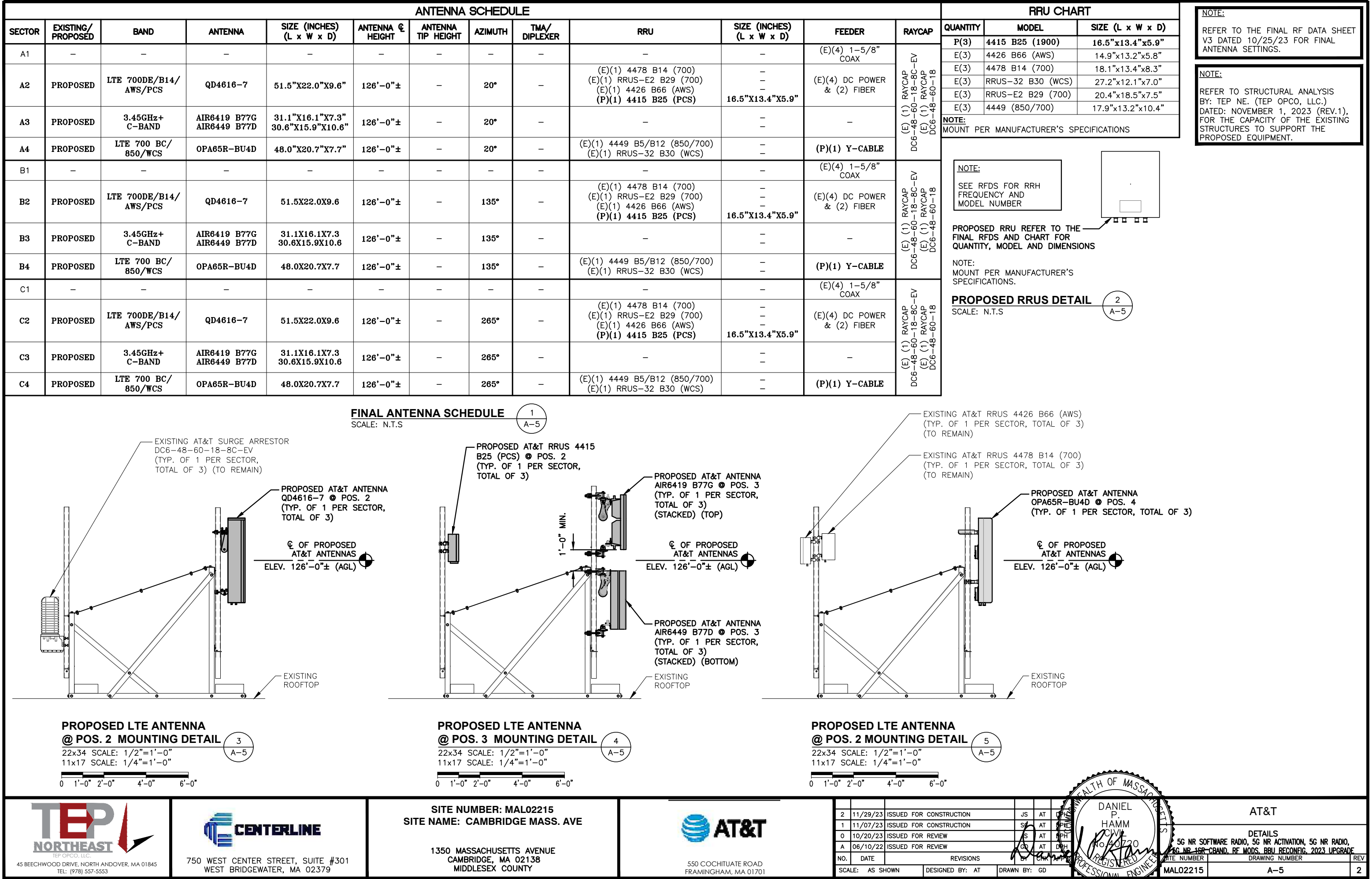


550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.		DATE	REVISIONS	BY	CHK	APP	DATE	SCALE	DESIGNED BY	DRAWN BY	DATE	SITE NUMBER	DRAWING NUMBER	REV
2	11/29/23	ISSUED FOR CONSTRUCTION		JS	AT									
1	11/07/23	ISSUED FOR CONSTRUCTION		JS	AT									
0	10/20/23	ISSUED FOR REVIEW		JS	AT									
A	06/10/22	ISSUED FOR REVIEW		JS	AT									
SCALE: AS SHOWN														
DESIGNED BY: AT														
DRAWN BY: GD														
ELEVATION														
5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO, 4G NR 15R CRAND, RF MODS, BBU RECONFIG, 2023 UPGRADE														
MAL02215														
A-4														
2														



AT&T



NOTE:
REFER TO THE FINAL RF DATA SHEET
V3 DATED 10/25/23 FOR FINAL
ANTENNA SETTINGS.

NOTE:
REFER TO STRUCTURAL ANALYSIS
BY: TEP NE. (TEP OPCO, LLC.)
DATED: NOVEMBER 1, 2023 (REV.1),
FOR THE CAPACITY OF THE EXISTING
STRUCTURES TO SUPPORT THE
PROPOSED EQUIPMENT.

MINIMUM BALLAST REQUIREMENTS ALPHA SECTOR ANTENNA MOUNT			
SIDE	EXISTING	PROPOSED	TOTAL
NUMBER OF BLOCKS (FRONT SLED)	38	0	38
NUMBER OF BLOCKS (BACK SLED)	46	0	46
SIZE OF BLOCKS	VARIES	N/A	VARIES
WEIGHT OF BLOCKS	VARIES	N/A	VARIES
TOTAL BALLAST WEIGHT	2782 LBS.	0 LBS.	2782 LBS.

MINIMUM BALLAST REQUIREMENTS BETA SECTOR ANTENNA MOUNT			
SIDE	EXISTING	PROPOSED	TOTAL
NUMBER OF BLOCKS (FRONT SLED)	37	0	37
NUMBER OF BLOCKS (BACK SLED)	51	0	51
SIZE OF BLOCKS	VARIES	N/A	VARIES
WEIGHT OF BLOCKS	VARIES	N/A	VARIES
TOTAL BALLAST WEIGHT	2849 LBS.	0 LBS.	2849 LBS.

MINIMUM BALLAST REQUIREMENTS GAMMA SECTOR ANTENNA MOUNT			
SIDE	EXISTING	PROPOSED	TOTAL
NUMBER OF BLOCKS (FRONT SLED)	42	0	42
NUMBER OF BLOCKS (BACK SLED)	44	0	44
SIZE OF BLOCKS	VARIES	N/A	VARIES
WEIGHT OF BLOCKS	VARIES	N/A	VARIES
TOTAL BALLAST WEIGHT	2858 LBS.	0 LBS.	2858 LBS.

MINIMUM BALLAST REQUIREMENTS RRU BALLAST SLED (BLOCK STYLE)			
SIDE	EXISTING	PROPOSED	TOTAL
NUMBER OF BLOCKS (FRONT SLED)	6	3	9
NUMBER OF BLOCKS (BACK SLED)	6	3	9
SIZE OF BLOCKS	4"x8"x16" HOLLOW	4"x8"x16" SOLID	VARIES
WEIGHT OF BLOCKS	24 LBS./EACH	33 LBS./EACH	VARIES
TOTAL BALLAST WEIGHT	288 LBS.	198 LBS.	486 LBS.

MINIMUM BALLAST REQUIREMENTS RRU BALLAST SLED (SLEEPER STYLE)			
SIDE	EXISTING	PROPOSED	TOTAL
NUMBER OF BLOCKS (FRONT SLED)	9	0	9
SIZE OF BLOCKS	4"x4"x32" SOLID	N/A	4"x4"x32" SOLID
WEIGHT OF BLOCKS	44 LBS./EACH	N/A	VARIES
TOTAL BALLAST WEIGHT	396 LBS.	0 LBS.	396 LBS.

MINIMUM BALLAST REQUIREMENTS
SCALE: N.T.S

1
A-6

TEP

NORTHEAST

TEP OPCO, LLC.

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



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

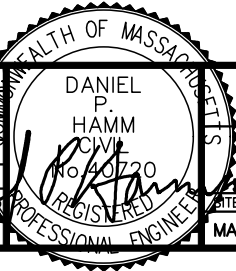
SITE NUMBER: MAL02215
SITE NAME: CAMBRIDGE MASS. AVE

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138
MIDDLESEX COUNTY

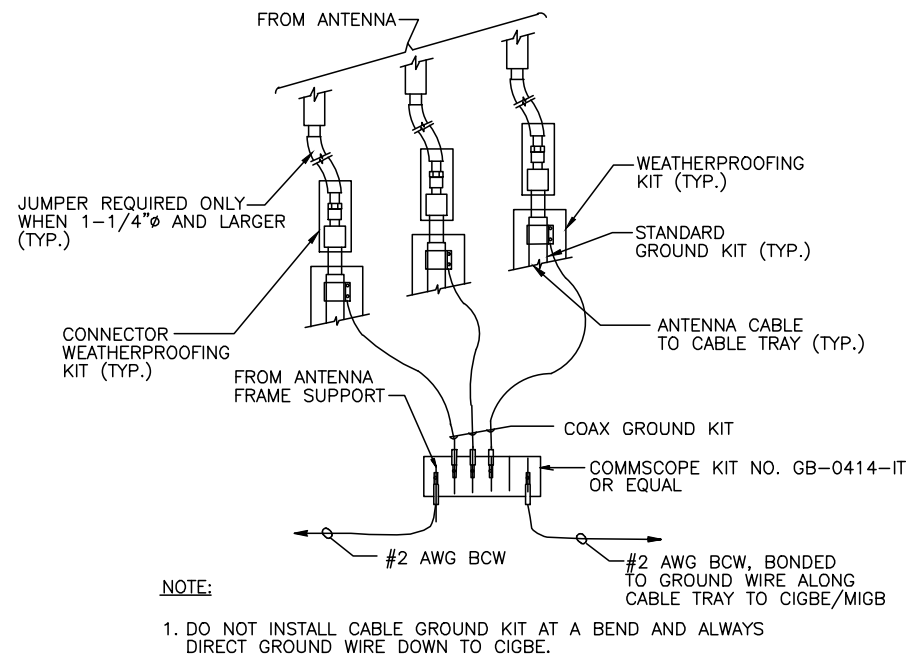


550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP
2	11/29/23	ISSUED FOR CONSTRUCTION	JS	AT	OP
1	11/07/23	ISSUED FOR CONSTRUCTION	JS	AT	OP
0	10/20/23	ISSUED FOR REVIEW	JS	AT	OP
A	06/10/22	ISSUED FOR REVIEW	JS	AT	OP
SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: GD					



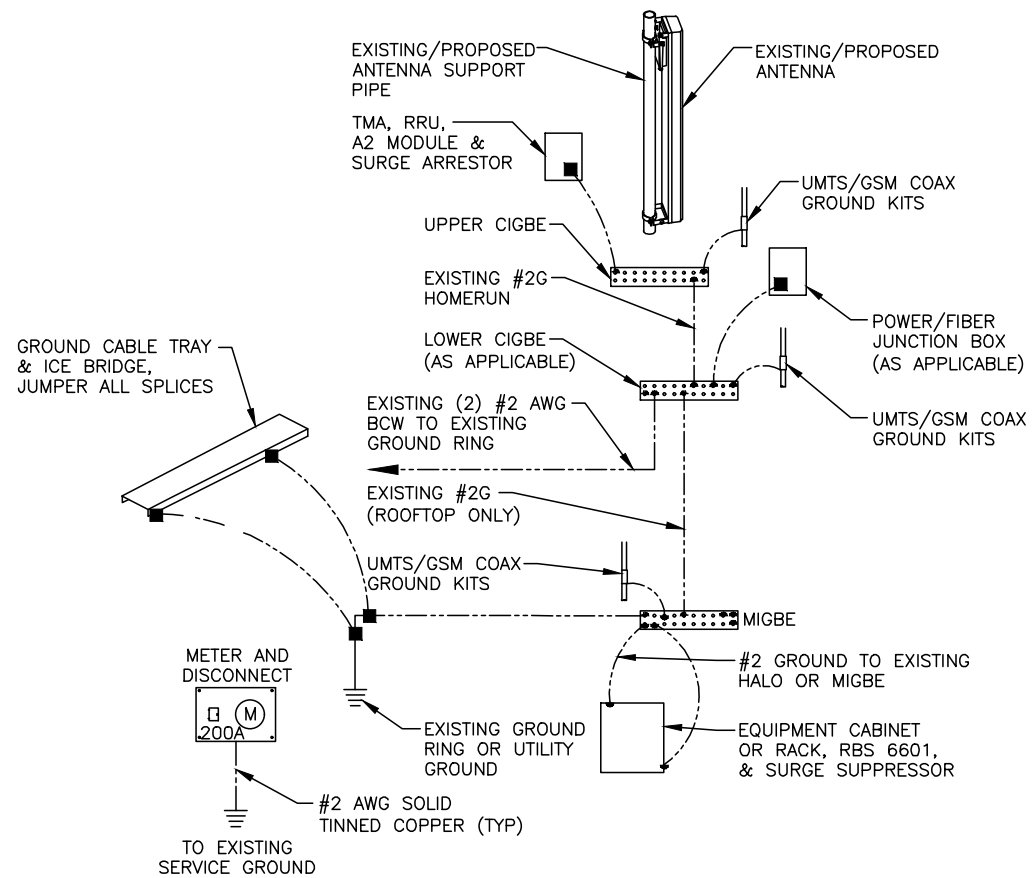
AT&T		
DETAILS 5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO, 5G NR 150 CRAND, RF MODS, BBU RECONFIG, 2023 UPGRADE		
SITE NUMBER MAL02215	DRAWING NUMBER A-6	REV 2



GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

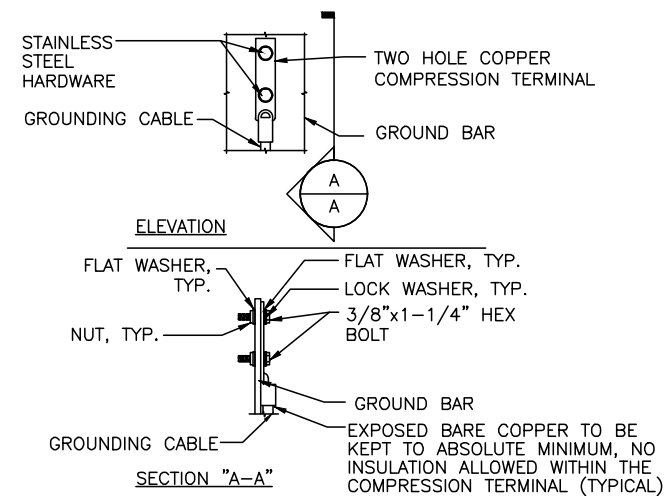
1
G-1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2
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

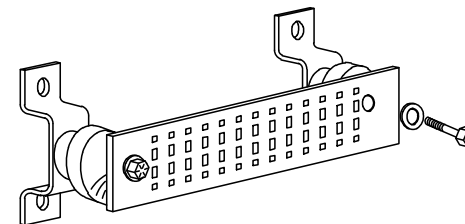
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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

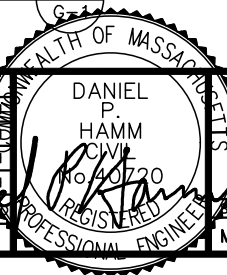
4
G-1

NO.	DATE	REVISIONS	BY	CHK	APP
2	11/29/23	ISSUED FOR CONSTRUCTION	JS	AT	CPH
1	11/07/23	ISSUED FOR CONSTRUCTION	SG	AT	CPH
0	10/20/23	ISSUED FOR REVIEW	SG	AT	CPH
A	06/10/22	ISSUED FOR REVIEW	SG	AT	CPH

SCALE: AS SHOWN

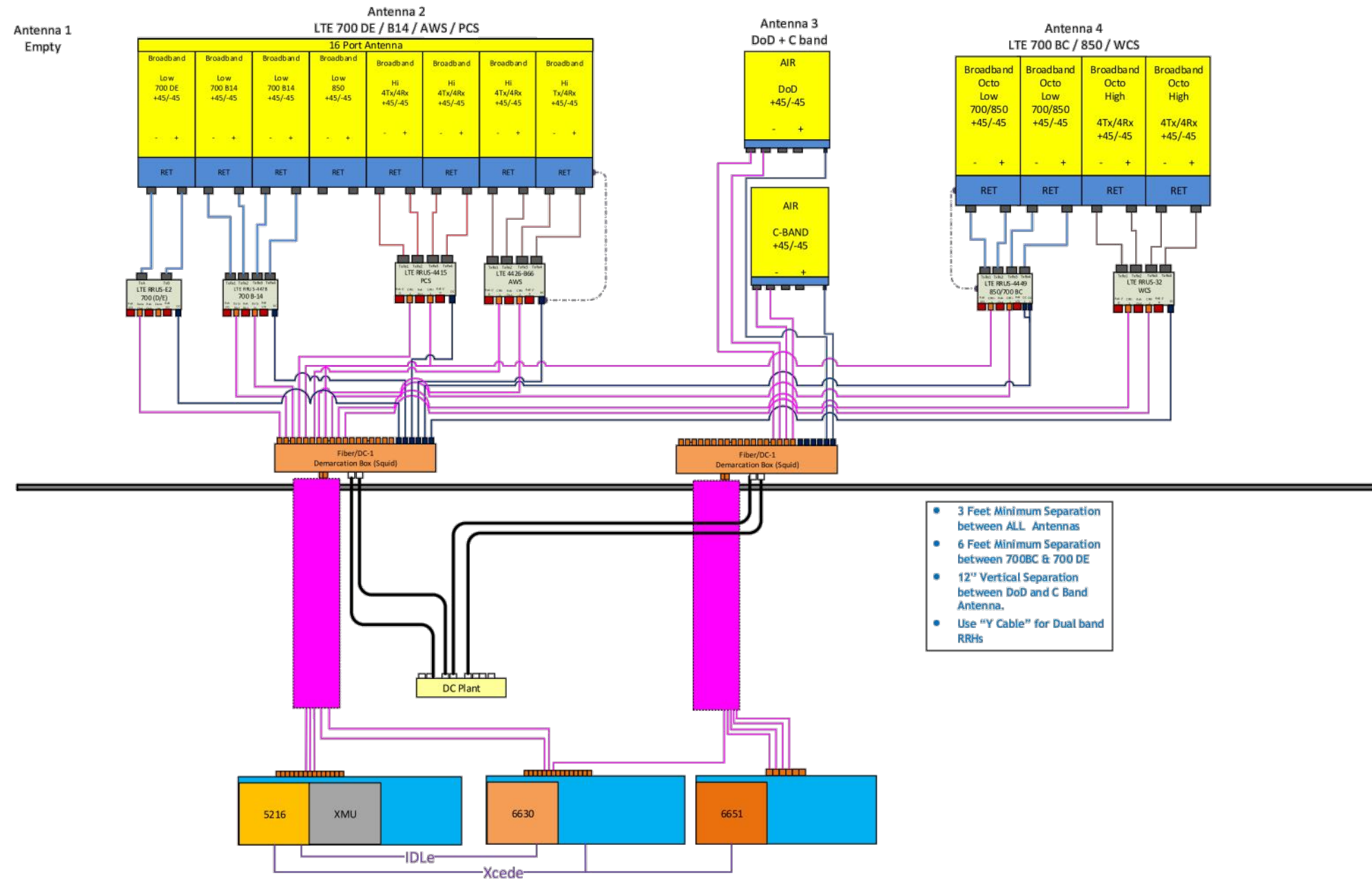
DESIGNED BY: AT

DRAWN BY: GD



AT&T

GROUNDING DETAILS		
5G NR SOFTWARE RADIO, 5G NR ACTIVATION, 5G NR RADIO, 4G NR 15R CRAND, RF MODS, BBU RECONFIG, 2023 UPGRADE		
SITE NUMBER	DRAWING NUMBER	REV
MAL02215	G-1	2



RF PLUMBING DIAGRAM
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 V3 DATED 10/25/23 FOR FINAL ANTENNA SETTINGS.



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



500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067



750 WEST CENTER STREET., #301
WEST BRIDGEWATER, MA 02379



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

SITE TYPE: ROOFTOP

DATE: 05/18/2023 **REV:** 0

DRAWN BY: AM

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 08/29/2022

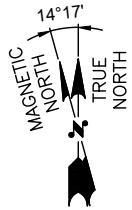
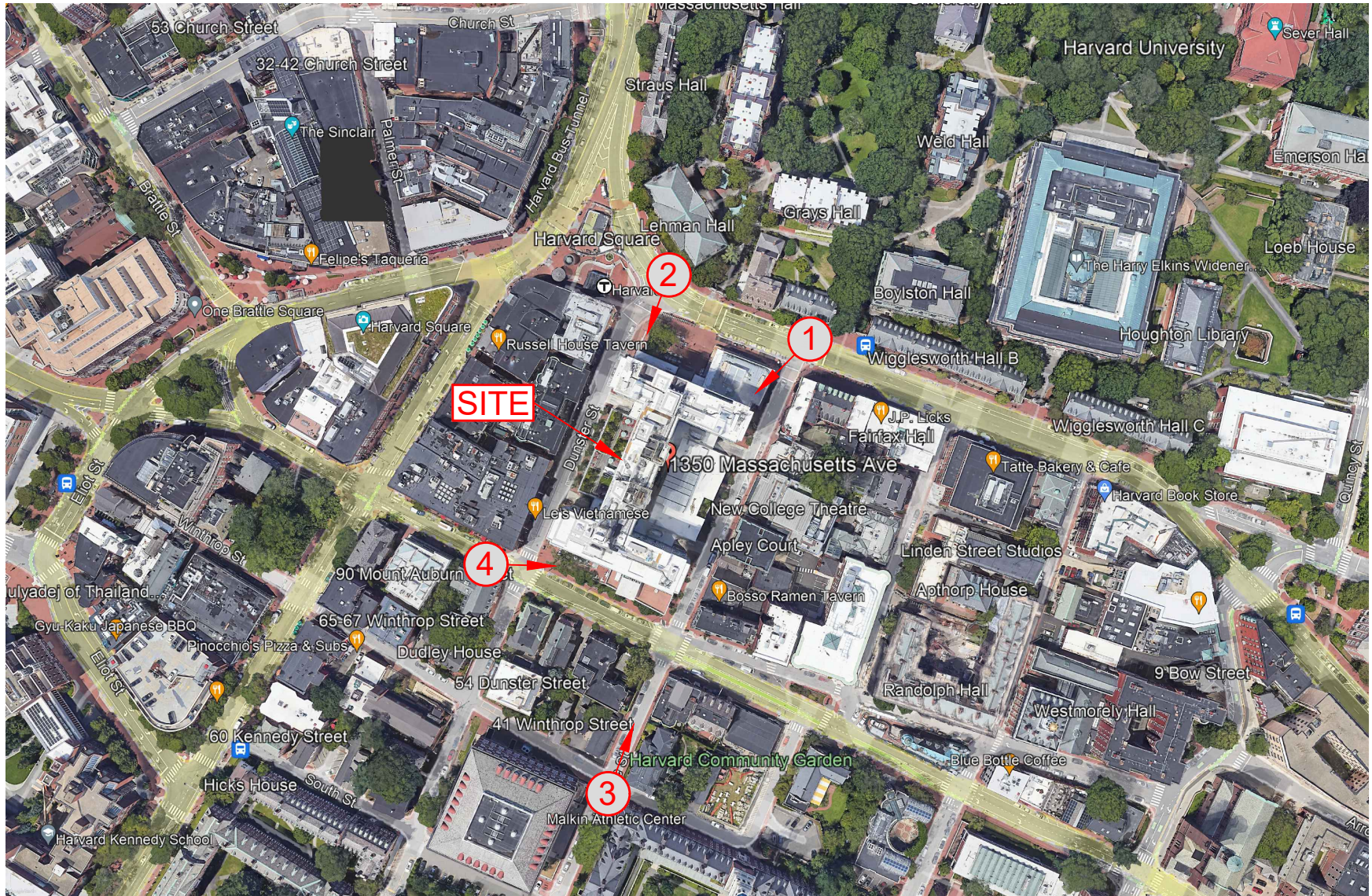


PHOTO LOCATION

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



500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06067



750 WEST CENTER STREET., #301
 WEST BRIDGEWATER, MA 02379



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

SITE TYPE: ROOFTOP

DATE: 05/18/2023 **REV:** 0

DRAWN BY: AM

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VIEW SOUTHWEST FROM MASSACHUSETTS AVENUE

SITE NO: MA2215
SITE NAME: CAMBRIDGE MASS. AVE

ADDRESS: 1350 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02138



500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06067



750 WEST CENTER STREET., #301
 WEST BRIDGEWATER, MA 02379



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

SITE TYPE: ROOFTOP

DATE: 05/18/2023 **REV:** 0

DRAWN BY: AM

SCALE: N.T.S.

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PROPOSED CONDITIONS

LOCATION # 1

DATE OF PHOTO: 09/02/2022



VIEW SOUTHWEST FROM MASSACHUSETTS AVENUE

SITE NO: MA2215
SITE NAME: CAMBRIDGE MASS. AVE

ADDRESS: 1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138



500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067



750 WEST CENTER STREET., #301
WEST BRIDGEWATER, MA 02379



SITE TYPE: ROOFTOP

DATE: 05/18/2023 REV: 0

DRAWN BY: AM

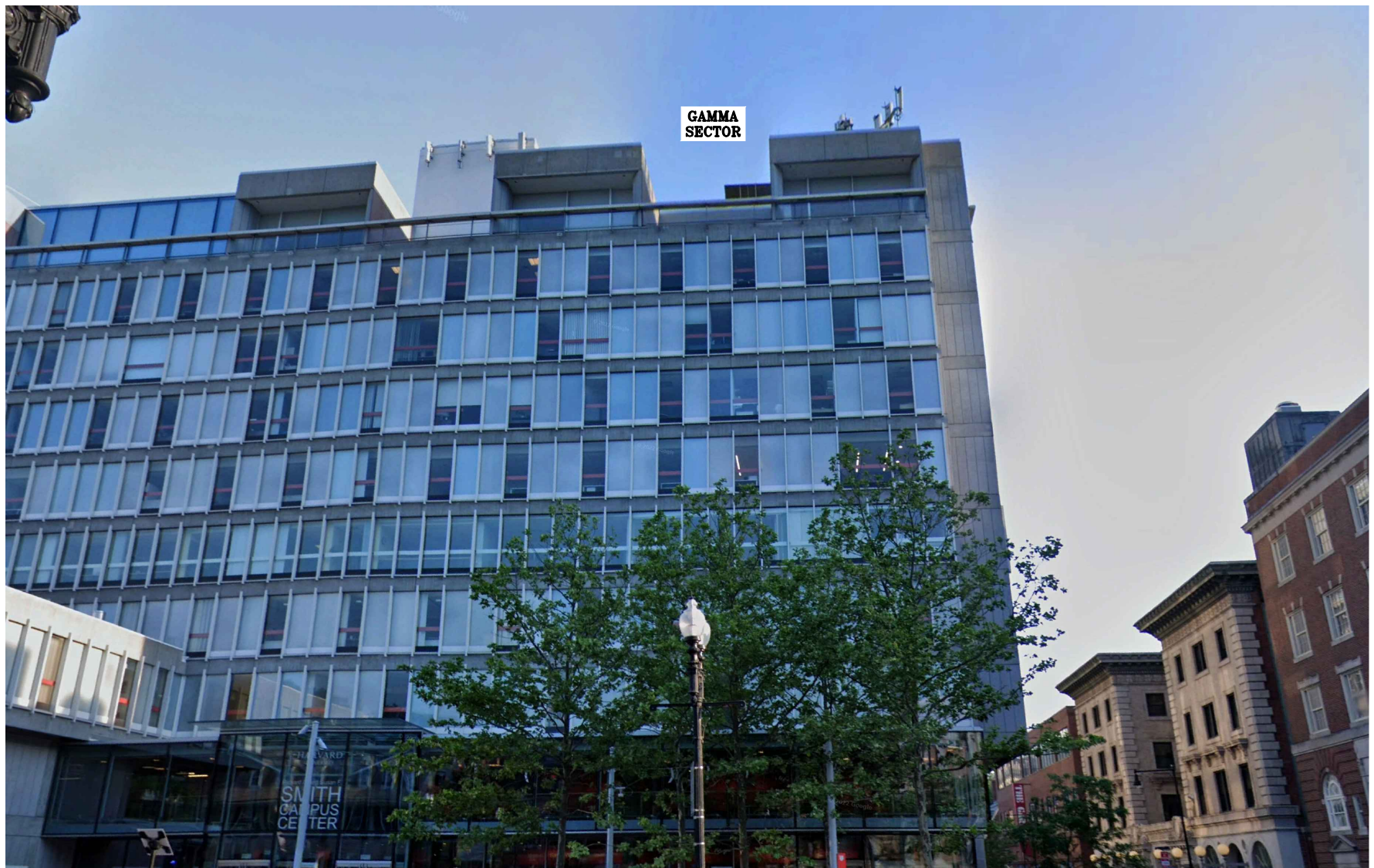
SCALE: N.T.S.

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: 09/02/2022



VIEW SOUTH FROM MASSACHUSETTS AVENUE

SITE NO: MA2215
SITE NAME: CAMBRIDGE MASS. AVE

ADDRESS: 1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138



500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067



750 WEST CENTER STREET., #301
WEST BRIDGEWATER, MA 02379



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

SITE TYPE: ROOFTOP

DATE: 05/18/2023 **REV:** 0

DRAWN BY: AM

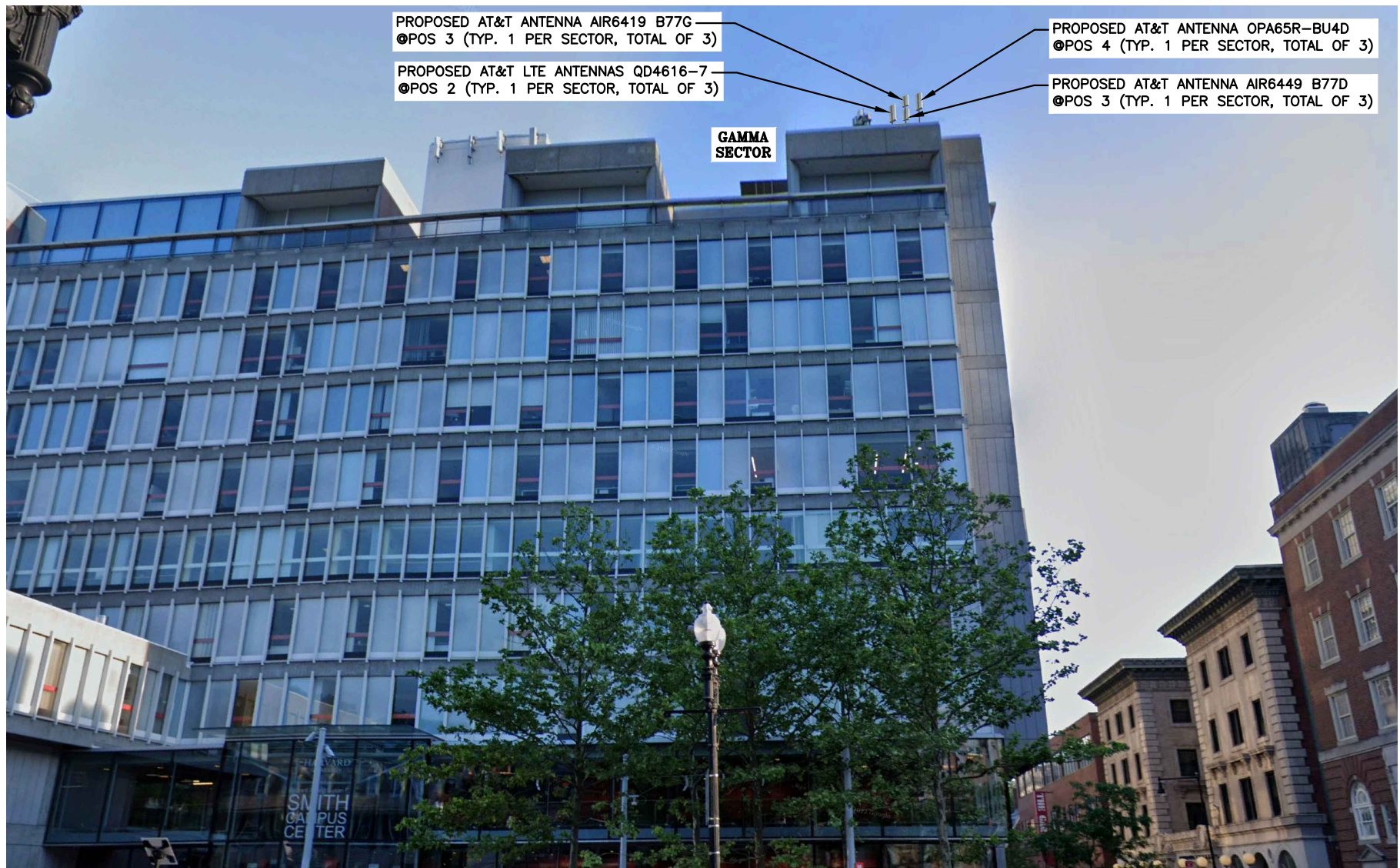
SCALE: N.T.S.

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: 09/02/2022



VIEW SOUTH FROM MASSACHUSETTS AVENUE

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



SITE TYPE: ROOFTOP
DATE: 05/18/2023 REV: 0
DRAWN BY: AM
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 # 3

DATE OF PHOTO: 09/02/2022



VIEW NORTHEAST FROM HOLYOKE ST

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



500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067



750 WEST CENTER STREET., #301
WEST BRIDGEWATER, MA 02379



SITE TYPE: ROOFTOP

DATE: 05/18/2023 **REV:** 0

DRAWN BY: AM

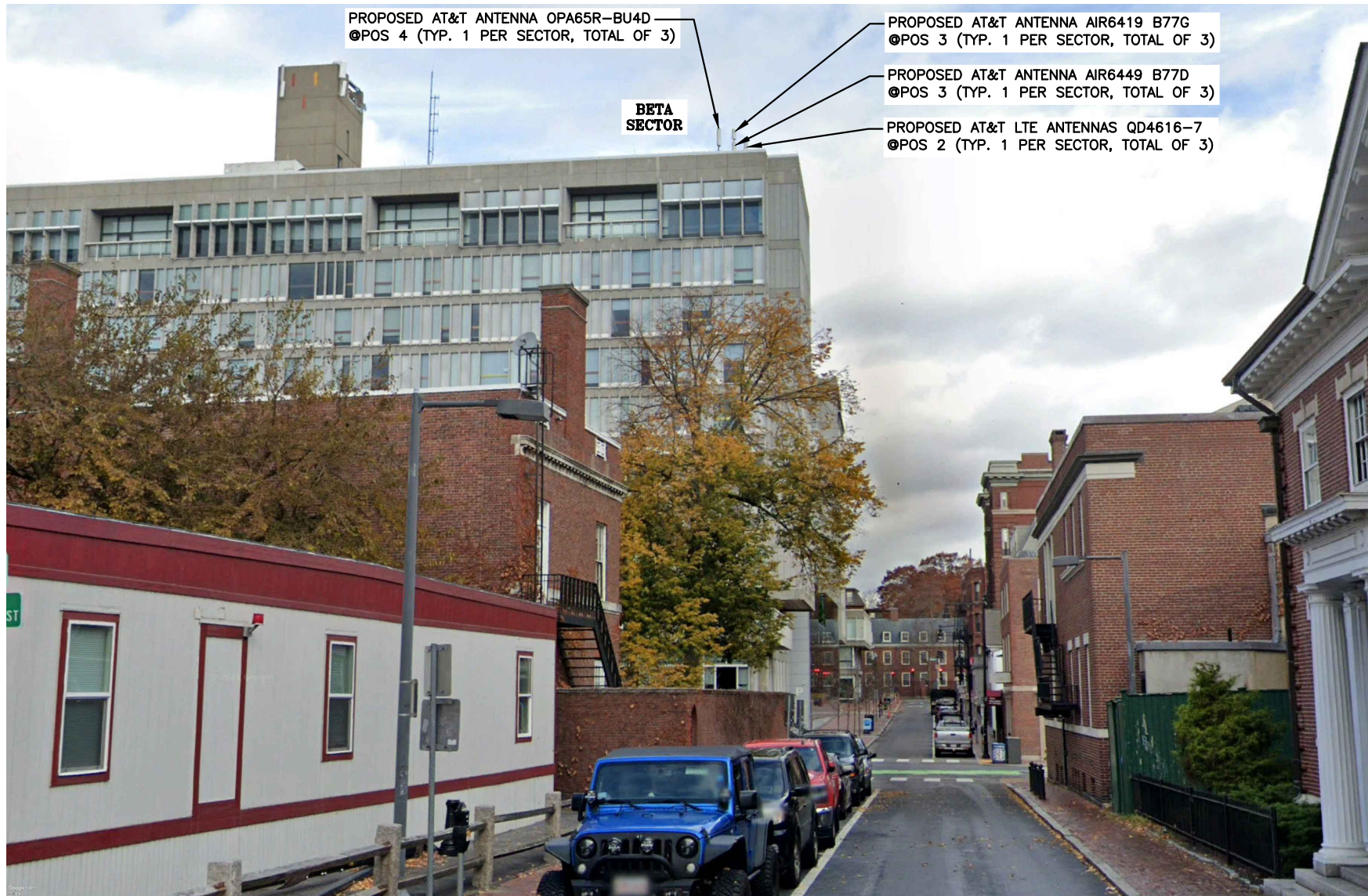
SCALE: N.T.S.

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 # 3

DATE OF PHOTO: 09/02/2022



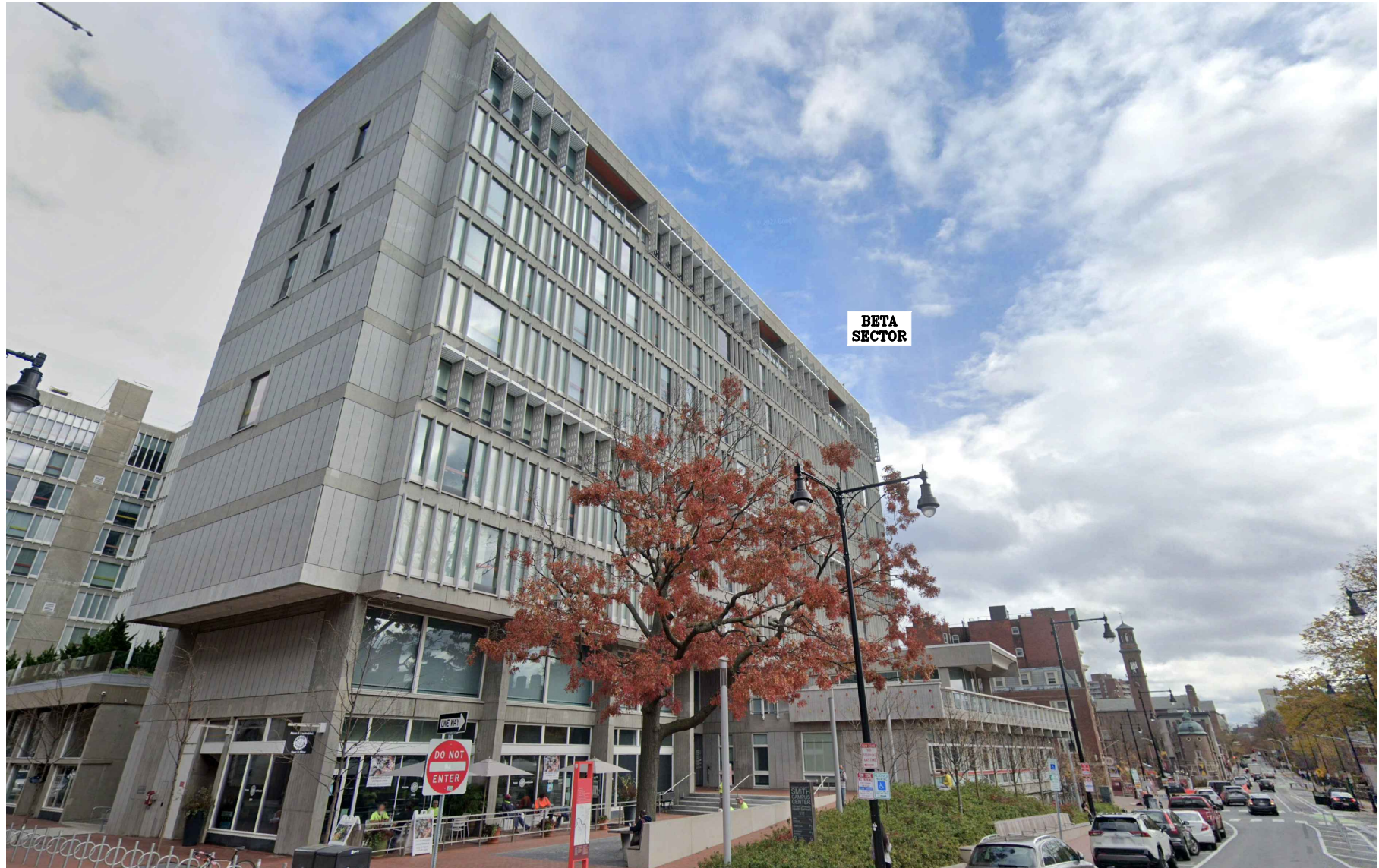
VIEW NORTHEAST FROM HOLYOKE ST

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



SITE TYPE: ROOFTOP
DATE: 05/18/2023 **REV:** 0
DRAWN BY: AM
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.



VIEW NORTHEAST FROM MT AUBURN ST

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

 **at&t**
 500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06067

 **CENTERLINE**
 COMMUNICATIONS
 750 WEST CENTER STREET., #301
 WEST BRIDGEWATER, MA 02379

 **TEPI**
 NORTH
 EAST
 TEL: (978) 557-5553

SITE TYPE: ROOFTOP
DATE: 05/18/2023 **REV:** 0
DRAWN BY: AM
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.

STRUCTURAL ANALYSIS REPORT

For

AT&T Site Number: MA2215 (C-BAND)

TEP Project Number: 316608.747682

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:



Dated: September 22, 2023

Prepared by:



(TEP OPCO, LLC)
45 Beechwood Drive
North Andover, MA 01845
(P) 978.557.5553
www.tepgroup.net





SCOPE OF WORK:

TEP Northeast (TEP NE) 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 NE 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.
- Supplemental Building Plans prepared by Bruner/Cott & Associates dated May 15, 2015.
- Previous Structural Analysis prepared by Hudson Design Group LLC dated November 5, 2019.
- 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.

- **The proposed installation results in a net reduction in projected wind area and weight compared to the existing installation.**

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

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Antenna Ballast Mount	19	LC4	94%	PASS

	Controlling Load Case	Stress Ratio	Pass/Fail
Alpha Sector Ballast Mount	Overturning	89%	PASS
Beta Sector Ballast Mount	Overturning	90%	PASS
Gamma Sector Ballast Mount	Overturning	83%	PASS

	Controlling Load Case	Stress Ratio	Pass/Fail
RRH Mount* (Block Ballast)	Overturning	92%	PASS
RRH Mount (Sleeper Ballast)	Overturning	41%	PASS

* Additional ballast required. Reference the tables on page 3 for the minimum ballast requirements.

*Reference documents attached.

CONCLUSION SUMMARY: (CONT.)

Reference the tables below for the minimum ballast requirements:

MINIMUM BALLAST REQUIREMENTS – ALPHA SECTOR ANTENNA MOUNT			
	Existing	Proposed	Total
Number of Blocks on Front Sled	38	0	38
Number Blocks on Back Sled	46	0	46
Size of Blocks	Varies	N/A	Varies
Weight of Blocks	Varies	N/A	Varies
Total Ballast Weight	2,782 lbs.	0 lbs.	2,782 lbs.

MINIMUM BALLAST REQUIREMENTS – BETA SECTOR ANTENNA MOUNT			
	Existing	Proposed	Total
Number of Blocks on Front Sled	37	0	37
Number Blocks on Back Sled	51	0	51
Size of Blocks	Varies	N/A	Varies
Weight of Blocks	Varies	N/A	Varies
Total Ballast Weight	2,849 lbs.	0 lbs.	2,849 lbs.

MINIMUM BALLAST REQUIREMENTS – GAMMA SECTOR ANTENNA MOUNT			
	Existing	Proposed	Total
Number of Blocks on Front Sled	42	0	42
Number Blocks on Back Sled	44	0	44
Size of Blocks	Varies	N/A	Varies
Weight of Blocks	Varies	N/A	Varies
Total Ballast Weight	2,858 lbs.	0 lbs.	2,858 lbs.

MINIMUM BALLAST REQUIREMENTS – RRH BALLAST SLED (BLOCK-STYLE)			
	Existing	Proposed	Total
Number of Blocks on Front Sled	6	3	9
Number Blocks on Back Sled	6	3	9
Size of Blocks	4"x8"x16" Hollow	4"x8"x16" Solid	Varies
Weight of Blocks	24 lbs. /each	33 lbs. /each	Varies
Total Ballast Weight	288 lbs.	198 lbs.	486 lbs.

MINIMUM BALLAST REQUIREMENTS – RRH BALLAST SLED (SLEEPER-STYLE)			
	Existing	Proposed	Total
Number of Sleepers	9	0	9
Size of Blocks	4"x4"x32" Solid	N/A	4"x4"x32" Solid
Weight of Blocks	44 lbs. /each	N/A	44 lbs. /each
Total Ballast Weight	396 lbs.	0 lbs.	396 lbs.

No additional ballast is required at the antenna mount ballast sleds, nor at the sleeper-style RRH ballast sled. The number of blocks required for the proposed equipment does not exceed the current number of blocks.

TEP NE 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) 4478 B14 RRH's	18.1"x13.4"x8.3"	60 lbs	--	Ballast Sled
(3) RRUS-E2 B29 RRH's	20.4"x18.5"x7.5"	53 lbs	--	Ballast Sled
(3) 4449 B5/B12 RRH's	17.9"x13.2"x9.4"	73 lbs	--	Ballast Sled
(3) RRUS-32 B30 RRH's	27.2"x12.1"x7.0"	60 lbs	--	Ballast Sled
(3) DC6-48-60-18-8C-EV Surge Arrestors	31.4"x10.2" Ø	29 lbs	--	Ballast Sled
(3) DC6-48-60-18-8F Surge Arrestors	20.1"x18.2"x6.4"	44 lbs	--	Ballast Sled
(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
(3) OPA65R-BU4D Antennas	48.0"x20.7"x7.7"	53 lbs	126'-0"	Ballast Sled
(3) 4415 B25 RRH's	16.5"x13.5"x6.3"	50 lbs	--	Ballast Sled
(3) RRUS-32 B66A RRH's	27.2"x12.1"x7.0"	60 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):	1.10	(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	
EIA/TIA-222-H Structural Standards for Steel Antenna Towers and Antenna Supporting Structures		
Wind		
City/Town:	Cambridge	
County:	Middlesex	
Wind Load:	139 mph	(TIA-222-H Figure B-2)
Ice		
Design Ice Thickness (t_i):	1.0 in	(TIA-222-H Figure B-9)
Structure Class:	III	(TIA-222-H Table 2-1)
Importance Factor (I_i):	1.15	(TIA-222-H Table 2-3)
Factored Thickness of Radial Ice (t_{iz}):	1.31 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 reinforced concrete beams and columns.

ANTENNA/RRH SUPPORT RECOMMENDATIONS:

The proposed antennas and RRH's are to be mounted on existing non-penetrating ballast mounts located on the rooftop. Reference the tables on page 3 for the minimum ballast requirements.

Limitations and Assumptions:

1. Reference the latest TEP NE 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 NE is not responsible for any modifications completed prior to and hereafter which TEP NE 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: 9/21/2023
 Project Name: CAMBRIDGE MASS. AVE
 Project No.: MA2215
 Designed By: CL Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

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

$K_z =$ **1.056**

$z =$ **126** (ft)
 $z_g =$ **1200** (ft)
 $\alpha =$ **7.0**

$$K_{zmin} \leq K_z \leq 2.01$$

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 =
 Importance Factor =

$t_i =$ **1.00** in
 $I =$ **1.15** (from Table 2-3)
 $K_{iz} =$ **1.14** (from Sec. 2.6.10)

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

$t_{iz} =$ **1.31** 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

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

$G_h =$ 1.35

$G_h =$ 1.00

2.6.11.2 Design Wind Force on Appurtenances

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

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

$q_z =$ 49.59

$q_z (ice) =$ 6.42

$q_z (30) =$ 2.31

$K_z =$ 1.056 (from 2.6.5.2)

$K_{zt} =$ 1.0 (from 2.6.6.2.1)

$K_s =$ 1.0 (from 2.6.7)

$K_e =$ 1.00 (from 2.6.8)

$K_d =$ 0.95 (from Table 2-2)

$V_{max} =$ 139 mph (Ultimate Wind Speed)

$V_{max (ice)} =$ 50 mph

$V_{30} =$ 30 mph

Table 2-2

Structure Type	Wind Direction Probability Factor, K_d
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		$1.2 - 2.8(r_s) \geq 0.85$	$1.4 - 4.0(r_s) \geq 0.90$	$2.0 - 6.0(r_s) \geq 1.25$
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	$39 \leq C \leq 78$ (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 = 1.31 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	468	71
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.94	1.20	208	34
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	201	33
OPA65R-BU4D Antenna	48.0	20.7	7.7	6.90	2.32	1.20	411	63
4478 B14 RRH	18.1	13.4	8.3	1.68	1.35	1.20	100	18
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.10	1.20	156	26
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.36	1.20	98	17
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	136	23
4415 B25 RRH	16.5	13.5	6.3	1.55	1.22	1.20	92	16
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	2.25	1.20	136	23
DC6-48-60-18-8F Surge Arrestor	20.1	18.2	6.4	2.54	1.10	1.20	151	25
DC6-48-60-18-8C-EV Surge Arrestor	31.4	10.2	10.2	2.22	3.08	0.70	77	14
2" Pipe	2.4	12.0		0.20	0.20	1.20	12	
L 3x3 Angles	3.0	12.0		0.25	0.25	2.00	25	

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WIND LOADS

Angle = 90 (deg)

Ice Thickness = 1.31 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	468	226	226
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	208	121	121
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	201	136	136
OPA65R-BU4D Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	411	174	174
4478 B14 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	100	62	62
RRUS-E2 B29 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	156	64	64
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	98	70	70
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	136	83	83
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	92	43	43
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	136	83	83
DC6-48-60-18-8F Surge Arrestor	20.1	18.2	6.4	2.54	0.89	1.10	3.14	1.20	1.23	151	54	54

WIND LOADS WITH ICE:

QD4616-7 Antenna	54.1	24.6	12.2	9.26	4.60	2.20	4.43	1.20	1.29	71	38	38
AIR6419 Antenna	33.8	18.7	11.7	4.40	2.76	1.81	2.88	1.20	1.22	34	22	22
AIR6449 Antenna	33.2	18.5	13.2	4.28	3.05	1.79	2.51	1.20	1.20	33	24	24
OPA65R-BU4D Antenna	50.6	23.3	10.3	8.20	3.63	2.17	4.90	1.20	1.31	63	30	30
4478 B14 RRH	20.7	16.0	10.9	2.31	1.57	1.29	1.90	1.20	1.20	18	12	12
RRUS-E2 B29 RRH	23.0	21.1	10.1	3.38	1.62	1.09	2.27	1.20	1.20	26	12	12
4449 B5/B12 RRH	20.5	15.8	12.0	2.26	1.72	1.30	1.71	1.20	1.20	17	13	13
RRUS-32 B30 RRH	29.8	14.7	9.6	3.05	1.99	2.03	3.10	1.20	1.23	23	16	16
4415 B25 RRH	19.1	16.1	8.9	2.14	1.19	1.19	2.14	1.20	1.20	16	9	9
RRUS-32 B66A RRH	29.8	14.7	9.6	3.05	1.99	2.03	3.10	1.20	1.23	23	16	16
DC6-48-60-18-8F Surge Arrestor	22.7	20.8	9.0	3.29	1.43	1.09	2.52	1.20	1.20	25	11	11

Date: 9/21/2023

Project Name: CAMBRIDGE MASS. AVE

Project No.: MA2215

Designed By: CL Checked By: MSC



ICE WEIGHT CALCULATIONS

Thickness of ice: 1.31 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: 174 lbs

Weight of object: 109.0 lbs

Combined weight of ice and object: 283 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: 82 lbs

Weight of object: 66.0 lbs

Combined weight of ice and object: 148 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: 83 lbs

Weight of object: 84.0 lbs

Combined weight of ice and object: 167 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: 150 lbs

Weight of object: 53.0 lbs

Combined weight of ice and object: 203 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: 41 lbs

Weight of object: 60.0 lbs

Combined weight of ice and object: 101 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: 58 lbs

Weight of object: 53.0 lbs

Combined weight of ice and object: 111 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: 42 lbs

Weight of object: 73.0 lbs

Combined weight of ice and object: 115 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: 55 lbs

Weight of object: 60.0 lbs

Combined weight of ice and object: 115 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: 36 lbs

Weight of object: 46.0 lbs

Combined weight of ice and object: 82 lbs

RRUS-32 B66A 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: 55 lbs

Weight of object: 60.0 lbs

Combined weight of ice and object: 115 lbs

DC6-48-60-18-8F 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: 55 lbs

Weight of object: 44.0 lbs

Combined weight of ice and object: 99 lbs

DC6-48-60-18-8C-EV 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: 48 lbs

Weight of object: 29 lbs

Combined weight of ice and object: 77 lbs

2" Pipe

Per foot weight of ice:

diameter (in): 2.38

Per foot weight of ice on object: 6 plf

L 3x3 Angles

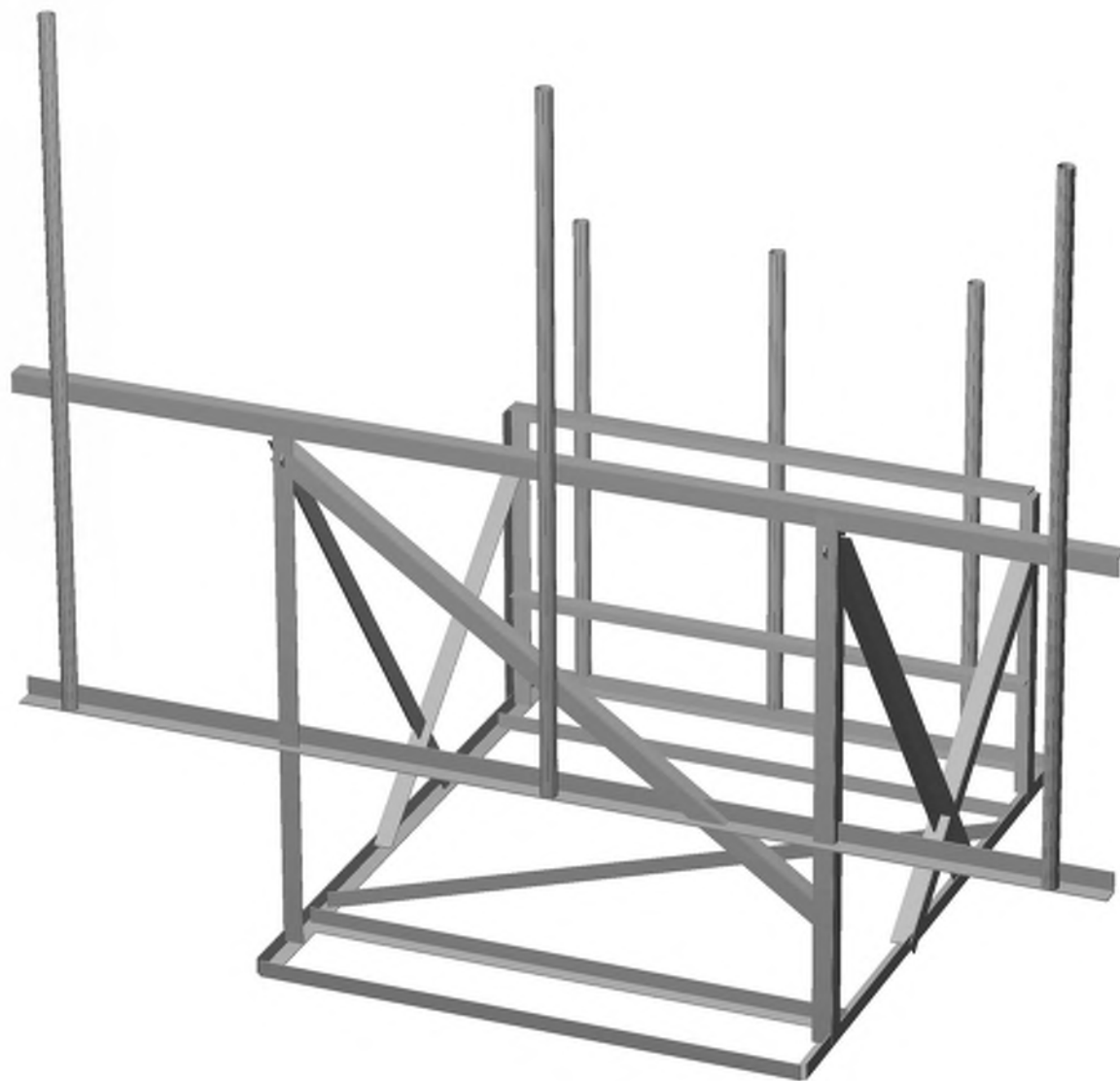
Weight of ice based on total radial SF area:

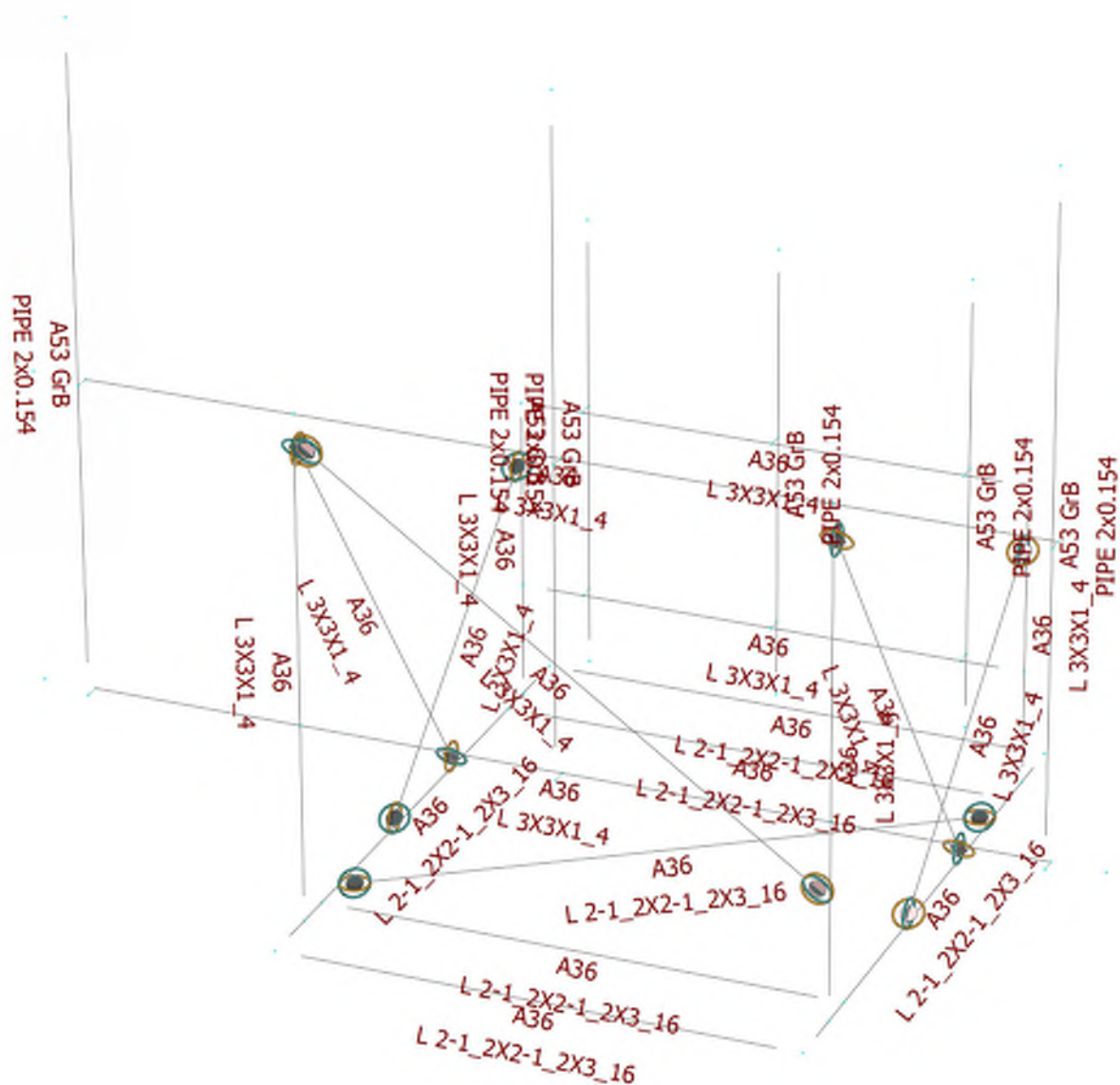
Height (in): 3

Width (in): 3

Per foot weight of ice on object: 9 plf

Antenna Mount Calculations

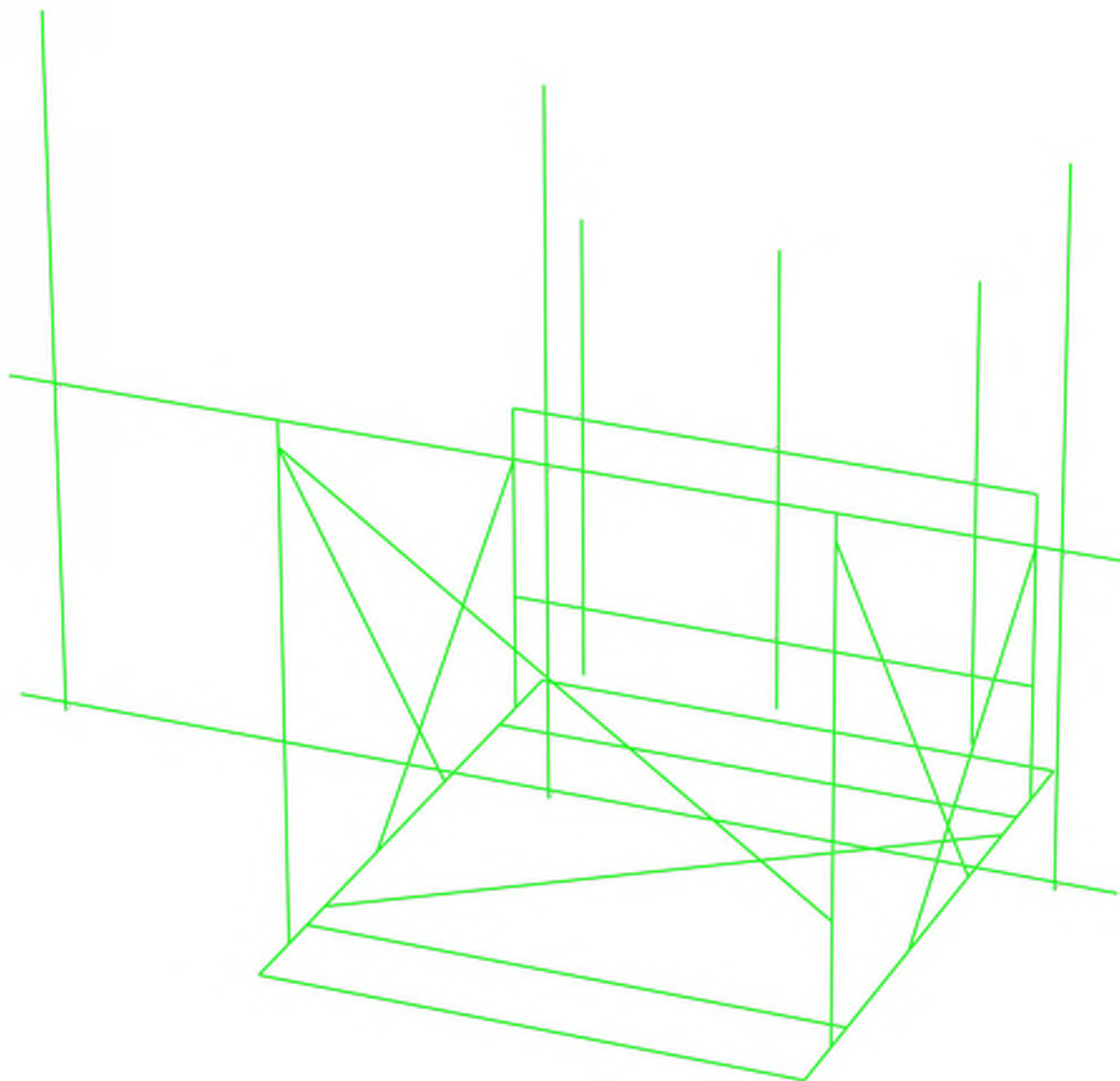


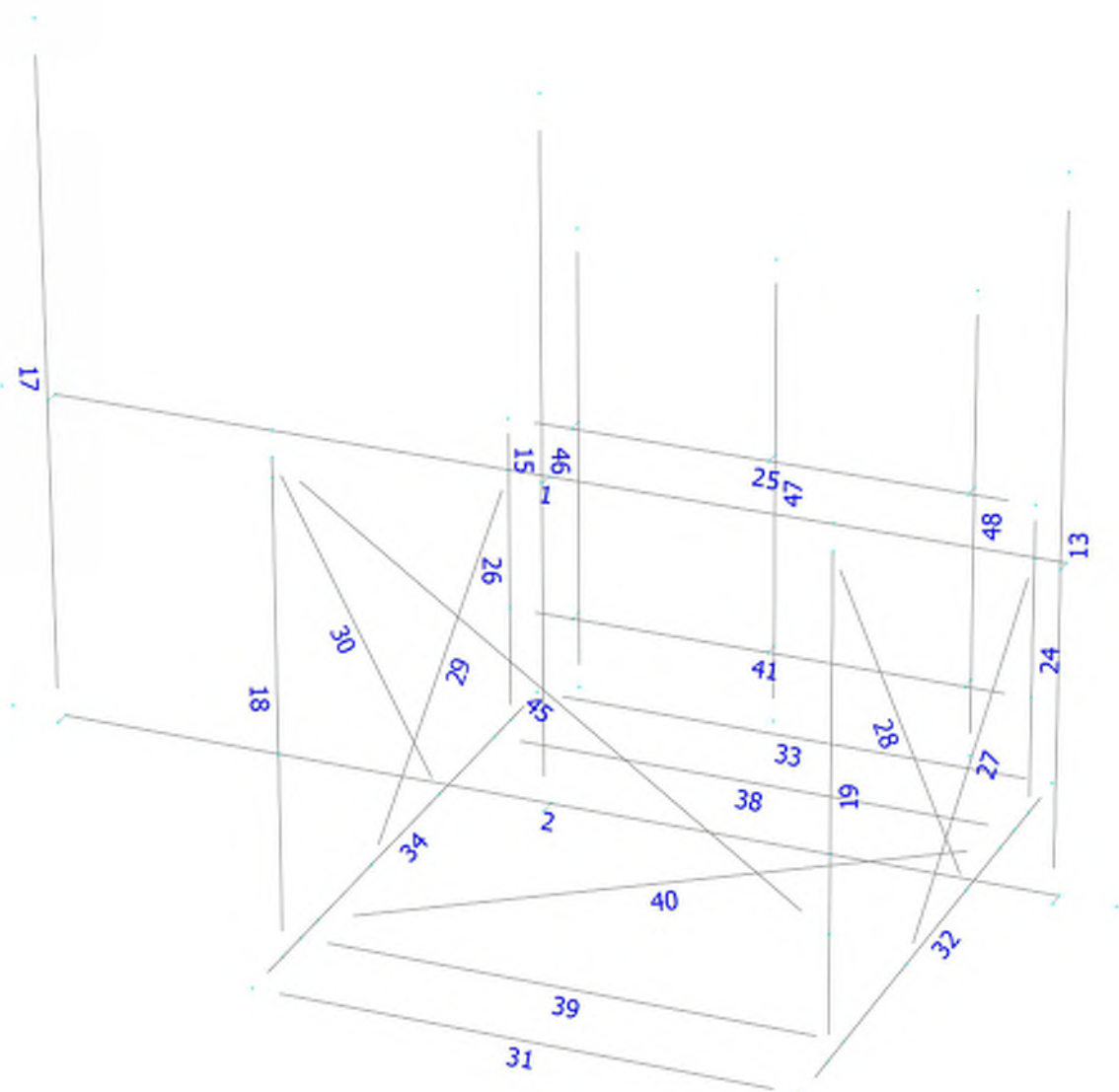




Design status

- Not designed
- Error on design
- Design O.K.
- With warnings





Current Date: 9/21/2023 2:46 PM
 Units system: English

Load data

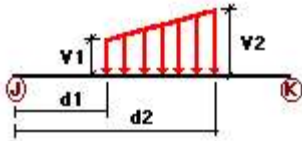
GLOSSARY

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

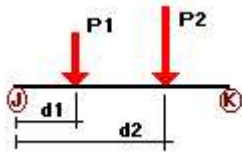
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wf	1	z	-0.025	-0.025	0.00	No	100.00	Yes
	2	z	-0.025	-0.025	0.00	No	100.00	Yes
	18	z	-0.025	-0.025	0.00	No	100.00	Yes
	19	z	-0.025	-0.025	0.00	No	100.00	Yes
	24	z	-0.025	-0.025	0.00	No	100.00	Yes
	25	z	-0.025	-0.025	0.00	No	100.00	Yes
	26	z	-0.025	-0.025	0.00	No	100.00	Yes
	27	z	-0.025	-0.025	0.00	No	100.00	Yes
	28	z	-0.025	-0.025	0.00	No	100.00	Yes
	29	z	-0.025	-0.025	0.00	No	100.00	Yes
	30	z	-0.025	-0.025	0.00	No	100.00	Yes
	41	z	-0.025	-0.025	0.00	No	100.00	Yes
	45	z	-0.025	-0.025	0.00	No	100.00	Yes
	46	z	-0.012	-0.012	50.00	Yes	100.00	Yes
	47	z	-0.012	-0.012	50.00	Yes	100.00	Yes
	48	z	-0.012	-0.012	50.00	Yes	100.00	Yes
Ws	13	x	-0.012	-0.012	0.00	No	100.00	Yes
	15	x	-0.012	-0.012	0.00	No	100.00	Yes
	17	x	-0.012	-0.012	0.00	No	100.00	Yes
	18	x	-0.025	-0.025	0.00	No	100.00	Yes
	19	x	-0.025	-0.025	0.00	No	100.00	Yes
	24	x	-0.025	-0.025	0.00	No	100.00	Yes
	26	x	-0.025	-0.025	0.00	No	100.00	Yes
	27	x	-0.025	-0.025	0.00	No	100.00	Yes

Di	28	x	-0.025	-0.025	0.00	No	100.00	Yes
	29	x	-0.025	-0.025	0.00	No	100.00	Yes
	30	x	-0.025	-0.025	0.00	No	100.00	Yes
	45	x	-0.025	-0.025	0.00	No	100.00	Yes
	46	x	-0.012	-0.012	0.00	No	100.00	Yes
	47	x	-0.012	-0.012	0.00	No	100.00	Yes
	48	x	-0.012	-0.012	0.00	No	100.00	Yes
	1	y	-0.009	-0.009	0.00	No	100.00	Yes
	2	y	-0.009	-0.009	0.00	No	100.00	Yes
	13	y	-0.006	-0.006	0.00	No	100.00	Yes
	15	y	-0.006	-0.006	0.00	No	100.00	Yes
	17	y	-0.006	-0.006	0.00	No	100.00	Yes
	18	y	-0.009	-0.009	0.00	No	100.00	Yes
	19	y	-0.009	-0.009	0.00	No	100.00	Yes
	24	y	-0.009	-0.009	0.00	No	100.00	Yes
	25	y	-0.009	-0.009	0.00	No	100.00	Yes
	26	y	-0.009	-0.009	0.00	No	100.00	Yes
	27	y	-0.009	-0.009	0.00	No	100.00	Yes
	28	y	-0.009	-0.009	0.00	No	100.00	Yes
	29	y	-0.009	-0.009	0.00	No	100.00	Yes
	30	y	-0.009	-0.009	0.00	No	100.00	Yes
	40	y	-0.009	-0.009	0.00	No	100.00	Yes
	41	y	-0.009	-0.009	0.00	No	100.00	Yes
	45	y	-0.009	-0.009	0.00	No	100.00	Yes
	46	y	-0.006	-0.006	0.00	No	100.00	Yes
	47	y	-0.006	-0.006	0.00	No	100.00	Yes
	48	y	-0.006	-0.006	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	13	y	-0.055	3.67	No
		y	-0.055	7.67	No
	15	y	-0.033	2.42	No
		y	-0.033	4.92	No
		y	-0.042	5.92	No
		y	-0.042	8.42	No
		y	-0.037	3.67	No
	17	y	-0.037	7.67	No
		y	-0.037	7.67	No
	46	y	-0.046	1.00	No
		y	-0.06	2.00	No
	47	y	-0.073	1.50	No
	48	y	-0.029	1.50	No
Wf	13	z	-0.234	3.67	No
		z	-0.234	7.67	No
	15	z	-0.104	2.42	No
		z	-0.104	4.92	No
		z	-0.101	5.92	No
		z	-0.101	8.42	No

Ws	17	z	-0.206	3.67	No
		z	-0.206	7.67	No
	46	z	-0.092	1.00	No
		z	-0.10	2.00	No
	47	z	-0.098	1.50	No
	48	z	-0.077	1.50	No
	13	x	-0.113	3.67	No
		x	-0.113	7.67	No
	15	x	-0.061	2.42	No
		x	-0.061	4.92	No
Wfice		x	-0.068	5.92	No
		x	-0.068	8.42	No
	17	x	-0.087	3.67	No
		x	-0.087	7.67	No
	46	x	-0.043	1.00	No
		x	-0.062	2.00	No
	47	x	-0.07	1.50	No
	48	x	-0.077	1.50	No
	13	z	-0.036	3.67	No
		z	-0.036	7.67	No
Wsice	15	z	-0.017	2.42	No
		z	-0.017	4.92	No
		z	-0.017	5.92	No
		z	-0.017	8.42	No
	17	z	-0.032	3.67	No
		z	-0.032	7.67	No
	46	z	-0.016	1.00	No
		z	-0.018	2.00	No
	47	z	-0.017	1.50	No
	48	z	-0.014	1.50	No
Di	13	x	-0.019	3.67	No
		x	-0.019	7.67	No
	15	x	-0.011	2.42	No
		x	-0.011	4.92	No
		x	-0.012	5.92	No
		x	-0.012	8.42	No
	17	x	-0.015	3.67	No
		x	-0.015	7.67	No
	46	x	-0.009	1.00	No
		x	-0.012	2.00	No
	47	x	-0.013	1.50	No
	48	x	-0.014	1.50	No
	13	y	-0.087	3.67	No
		y	-0.087	7.67	No
	15	y	-0.041	2.42	No
		y	-0.041	4.92	No
		y	-0.042	5.92	No
		y	-0.042	8.42	No
	17	y	-0.075	3.67	No
		y	-0.075	7.67	No
	46	y	-0.036	1.00	No
		y	-0.041	2.00	No
	47	y	-0.042	1.50	No
	48	y	-0.048	1.50	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

Current Date: 9/21/2023 2:46 PM
 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+Wfice+Di
 LC7=1.4DL
 LC8=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
<i>L 2-1_2X2-1_2X3_16</i>		31	LC2 at 0.00%	0.09	OK	
		32	LC1 at 64.06%	0.82	OK	
		33	LC2 at 100.00%	0.04	OK	
		34	LC1 at 35.94%	0.79	OK	
		38	LC7 at 50.00%	0.03	OK	
		39	LC2 at 0.00%	0.05	OK	
		40	LC5 at 50.00%	0.13	OK	
<i>L 3X3X1_4</i>		1	LC3 at 25.00%	0.60	OK	
		2	LC4 at 34.82%	0.58	OK	
		18	LC2 at 39.06%	0.58	OK	
		19	LC4 at 23.44%	0.94	OK	
		24	LC4 at 35.42%	0.28	OK	
		25	LC1 at 48.44%	0.26	OK	
		26	LC2 at 62.50%	0.33	OK	
		27	LC3 at 31.25%	0.32	OK	
		28	LC3 at 18.75%	0.25	OK	
		29	LC3 at 31.25%	0.31	OK	
		30	LC1 at 15.63%	0.17	OK	
		41	LC2 at 100.00%	0.36	OK	
		45	LC4 at 18.75%	0.16	OK	
<i>PIPE 2x0.154</i>		13	LC2 at 53.13%	0.17	OK	
		15	LC2 at 53.13%	0.20	OK	
		17	LC2 at 56.25%	0.19	OK	
		46	LC1 at 41.67%	0.16	OK	
		47	LC4 at 81.25%	0.23	OK	
		48	LC4 at 81.25%	0.11	OK	

Date: 9/21/2023
 Project Name: CAMBRIDGE MASS. AVE
 Project No.: MA2215
 Designed By: CL Checked By: MSC



Calculate Total Ballast Required for Alpha Sector Ballast Mount

Wind Forces

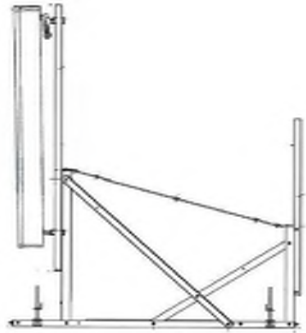
Antennas, $F_1 =$ 1288 lbs

Other Equipment, $F_2 =$ 367 lbs

Appurtenance Heights

Antenna Height, $D_1 =$ 5.5 ft

Other Equipment, $D_2 =$ 5 ft



Sled Length, $L_{\text{sled}} =$ 8.33 ft

Sled Width, $W_{\text{sled}} =$ 6.67 ft

Factor of Safety = 1.5

Overturning Moment, $M =$ $(F_1 D_1 + F_2 D_2) * FS$
 13379 lbs-ft

Hold Down Force, $H =$ M / L_{sled}
 1606.07 lbs (per side)

Calculate Required Ballast at Front Sled

Frame	248 lbs
Appurtenances	312 lbs
Existing Ballast	1254 lbs
Total =	1814 lbs

(38) 4"x8"x16" Solid Block @ 33 lbs. /each

Total Add. Ballast Req'd, $W_F =$ 0.00 lbs

Req'd Add. Blocks at Front = 0 (4"x8"x16" Solid Block @ 34 lbs. /each)

Calculate Required Ballast at Rear Sled

Frame	496 lbs
Appurtenances	208 lbs
Existing Ballast	1188 lbs
Existing Ballast	340 lbs
Total =	2232 lbs

(36) 4"x8"x16" Solid Block @ 33 lbs. /each

(10) 8"x8"x16" Hollow Block @ 34 lbs. /each

Total Add. Ballast Req'd, $W_R =$ 0.00 lbs

Req'd Add. Blocks at Rear = 0 (4"x8"x16" Solid Block @ 34 lbs. /each)

Calculate Imposed Loading from Ballast Mount

Bearing Area of Ballast Mount, $A_{\text{SLED}} =$ 55.56 ft^2

Net Weight of Loaded Frame, $W_{\text{NET}} =$ 2480 lbs

Resultant Area Load = 44.64 psf

Date: 9/21/2023
 Project Name: CAMBRIDGE MASS. AVE
 Project No.: MA2215
 Designed By: CL Checked By: MSC



Calculate Total Ballast Required for Beta Sector Ballast Mount

Wind Forces

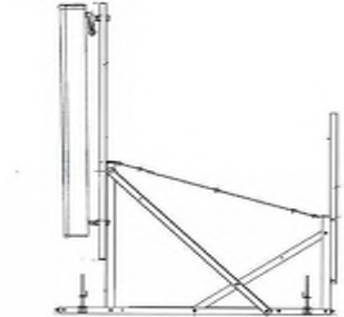
Antennas, $F_1 = 1288$ lbs

Other Equipment, $F_2 = 367$ lbs

Appurtenance Heights

Antenna Height, $D_1 = 5.5$ ft

Other Equipment, $D_2 = 5$ ft



Sled Length, $L_{\text{sled}} = 8.33$ ft

Sled Width, $W_{\text{sled}} = 6.67$ ft

Factor of Safety = 1.5

Overturning Moment, $M = (F_1 D_1 + F_2 D_2) * FS$
 13379 lbs-ft

Hold Down Force, $H = M / L_{\text{sled}}$
 1606.07 lbs (per side)

Calculate Required Ballast at Front Sled

Frame	248 lbs
Appurtenances	312 lbs
Existing Ballast	340 lbs
Existing Ballast	891 lbs
Total =	1791 lbs

(10) 8"x8"x16" Hollow Block @ 34 lbs. /each
 (27) 4"x8"x16" Solid Block @ 33 lbs. /each

Total Add. Ballast Req'd, $W_F = 0.00$ lbs
 0

Req'd Add. Blocks at Front = 0 (4"x8"x16" Solid Block @ 34 lbs. /each)

Calculate Required Ballast at Rear Sled

Frame	496 lbs
Appurtenances	208 lbs
Existing Ballast	1155 lbs
Existing Ballast	238 lbs
Existing Ballast	225 lbs
Total =	2322 lbs

(35) 4"x8"x16" Solid Block @ 33 lbs. /each
 (7) 8"x8"x16" Hollow Block @ 34 lbs. /each
 (9) 6"x8"x16" Hollow Block @ 25 lbs. /each

Total Add. Ballast Req'd, $W_R = 0.00$ lbs

Req'd Add. Blocks at Rear = 0 (4"x8"x16" Solid Block @ 34 lbs. /each)

Calculate Imposed Loading from Ballast Mount

Bearing Area of Ballast Mount, $A_{\text{SLED}} =$	55.56 ft ²
Net Weight of Loaded Frame, $W_{\text{NET}} =$	2570 lbs
Resultant Area Load =	46.26 psf

Date: 9/21/2023
 Project Name: CAMBRIDGE MASS. AVE
 Project No.: MA2215
 Designed By: CL Checked By: MSC



Calculate Total Ballast Required for Gamma Sector Ballast Mount

Wind Forces

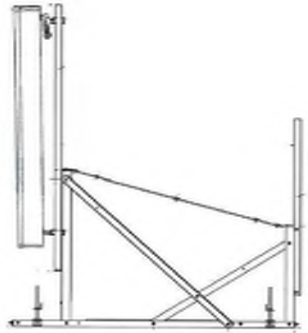
Antennas, $F_1 =$ 1288 lbs

Other Equipment, $F_2 =$ 367 lbs

Appurtenance Heights

Antenna Height, $D_1 =$ 5.5 ft

Other Equipment, $D_2 =$ 5 ft



Sled Length, $L_{\text{sled}} =$ 8.33 ft

Sled Width, $W_{\text{sled}} =$ 6.67 ft

Factor of Safety = 1.5

Overturning Moment, $M =$ $(F_1 D_1 + F_2 D_2) * FS$
 13379 lbs-ft

Hold Down Force, $H =$ M / L_{sled}
 1606.07 lbs (per side)

Calculate Required Ballast at Front Sled

Frame	248 lbs	
Appurtenances	312 lbs	
Existing Ballast	1386 lbs	(42) 4"x8"x16" Solid Block @ 33 lbs. /each
Total =	1946 lbs	

Total Add. Ballast Req'd, $W_F =$ 0.00 lbs

Req'd Add. Blocks at Front = 0 (4"x8"x16" Solid Block @ 34 lbs. /each)

Calculate Required Ballast at Rear Sled

Frame	496 lbs	
Appurtenances	208 lbs	
Existing Ballast	680 lbs	(20) 8"x8"x16" Hollow Block @ 34 lbs. /each
Existing Ballast	792 lbs	(24) 4"x8"x16" Solid Block @ 33 lbs. /each
Total =	2176 lbs	

Total Add. Ballast Req'd, $W_R =$ 0.00 lbs

Req'd Add. Blocks at Rear = 0 (4"x8"x16" Solid Block @ 34 lbs. /each)

Calculate Imposed Loading from Ballast Mount

Bearing Area of Ballast Mount, $A_{\text{SLED}} =$ 55.56 ft^2
 Net Weight of Loaded Frame, $W_{\text{NET}} =$ 2424 lbs
 Resultant Area Load = 43.63 psf

RRH Mount Calculations

Date: 9/21/2023
 Project Name: CAMBRIDGE MASS. AVE
 Project No.: MA2215
 Designed By: CL Checked By: MSC



Calculate Total Ballast Required for Ballast Mount

Assume (2) RRH's as projected area

Wind Force, $F =$ 272 lbs

Height, $H =$ 3 ft

Weight of Frame = 163 lbs

Weight of Appurtenances = 120 lbs

Weight of Frame + Equipment, $W =$ 283 lbs

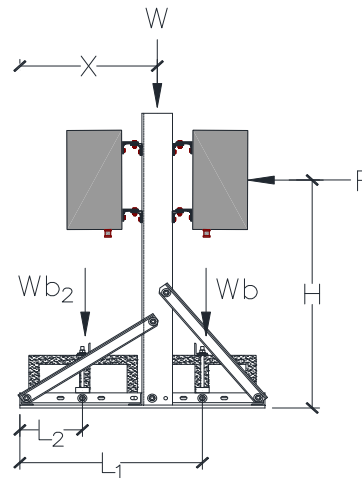
50% of Frame Width, $X =$ 1.75 ft

Length, $L_1 =$ 2.83 ft

Length, $L_2 =$ 0.67 ft

Weight of Existing Ballast, $W_{b2} =$ 144 lbs

(6) 4"x8"x16" Hollow Blocks @ 24 lbs. /each



Sled Length, $L_{sled} =$ 3.50 ft

Sled Width, $W_{sled} =$ 3.50 ft

Factor of Safety (FS) = 1.5

Overturning at Ballast

$$\Sigma M = 0 \rightarrow W_b = [(F \cdot H \cdot FS) - (W \cdot X) - (W_{b2} \cdot L_2)] / L_1 = 223 \text{ lbs.}$$

Calculate Required Ballast

(Assume Proposed Blocks to be 4"x8"x16" Solid Concrete Block @ 33 lbs. /each)

Weight Req'd to Resist Overturning = 223 lbs

Weight of Existing Ballast = 144 lbs

(6) 4"x8"x16" Hollow Blocks @ 24 lbs. /each

Req'd Add. Weight per Tray = 79 lbs

Number of Proposed Blocks = 3 BLOCKS PER SIDE

Calculate Imposed Loading from Ballast Mount

Bearing Area of Ballast Mount, $A_{sLED} =$ 12.25 ft²

Net Weight of Loaded Frame, $W_{NET} =$ 769 lbs

Resultant Area Load = 62.77 psf

Date: 9/21/2023
 Project Name: CAMBRIDGE MASS. AVE
 Project No.: MA2215
 Designed By: CL Checked By: MSC



Calculate Total Ballast Required for Ballast Mount (Typ.)

Assumed (1) RRH and (1) Surge Arrestor as Projected Wind Area

Wind Force, F_w = 307 lbs.

Height, H = 3.25 ft

Weight of Frame = 83 lbs

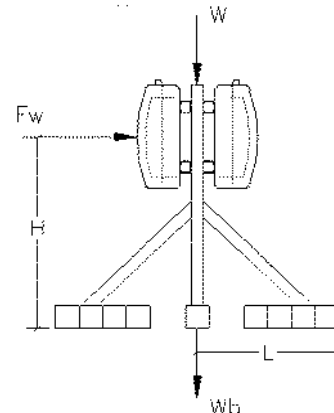
Weight of Appurtenances = 97 lbs

Weight of Frame + Equipment, W = 180 lbs

50% of Frame Width, L = 3.04 ft

Weight of Existing Ballast, W_b = 396 lbs

(9) 4"x4"x32" Sleepers @ 44 lbs./each



Length, L_{frame} = 6.08 ft

Width, W_{frame} = 2.67 ft

Factor of Safety (FS) = 1.5

Overturning at Ballast

$$\Sigma M = 0 \rightarrow W_{b, req} = [(F \cdot H \cdot FS) - ((W + W_b) \cdot L)] / L_{frame} = -42 \text{ lbs.}$$

Verify Adequacy of Existing Ballast

$$W_{b, req} < W_b \rightarrow \text{Therefore, OK!}$$

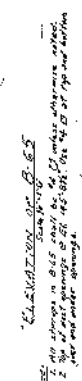
Calculate Imposed Loading from Ballast Mount

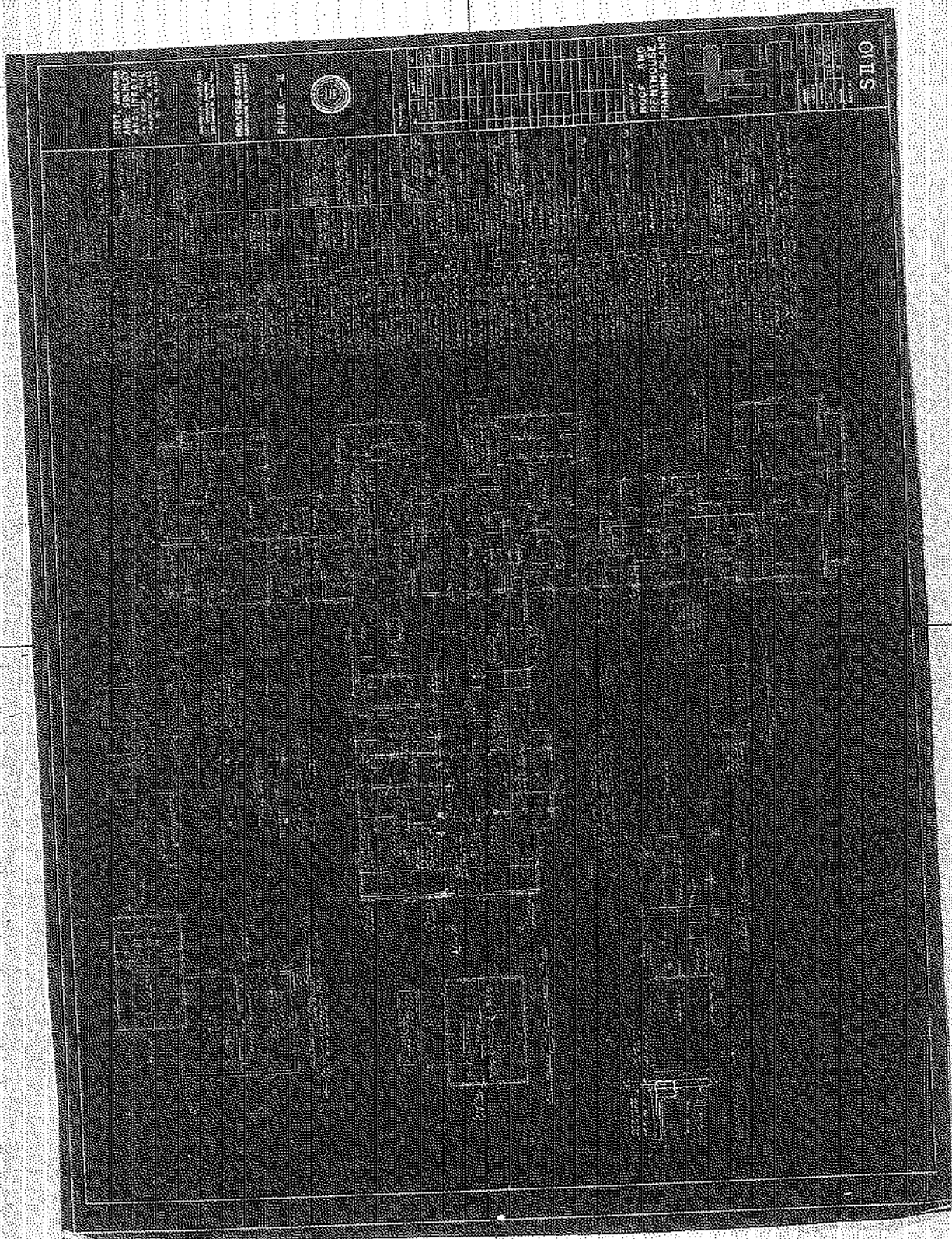
Bearing Area of Ballast Mount, A_{SLED} = 16.21 ft^2

Net Weight of Loaded Frame, W_{NET} = 576 lbs

Resultant Area Load = 35.54 psf

Reference Documents

[illegible]



SEY, JAMES
AND SONS
ARCHITECTS
10, QUEEN'S ROAD, LONDON, W.

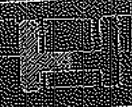
HOUSE DESIGN
FOR MR. J. H. B. B. B.

PHASE - 1



NO.	DESCRIPTION	QTY.	UNIT PRICE	TOTAL
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HOUSE AND
GARDEN
DESIGN
FOR MR. J. H. B. B. B.



HOUSE AND
GARDEN
DESIGN
FOR MR. J. H. B. B. B.

ST. 10

SERT, JACKSON
ARCHITECTS
4 NORTOL STREET
CAMBRIDGE 38, MASS
TEL. NO. UN. 4-7594

PROJECT NO. 3404

HARVARD UNIVERSITY
OFFICE AND HEALTH
CENTER BUILDING

NO.	DATE	BY
1	10/1/68	J.S.
2	10/1/68	J.S.
3	10/1/68	J.S.
4	10/1/68	J.S.
5	10/1/68	J.S.
6	10/1/68	J.S.
7	10/1/68	J.S.
8	10/1/68	J.S.
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10	10/1/68	J.S.
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29	10/1/68	J.S.
30	10/1/68	J.S.

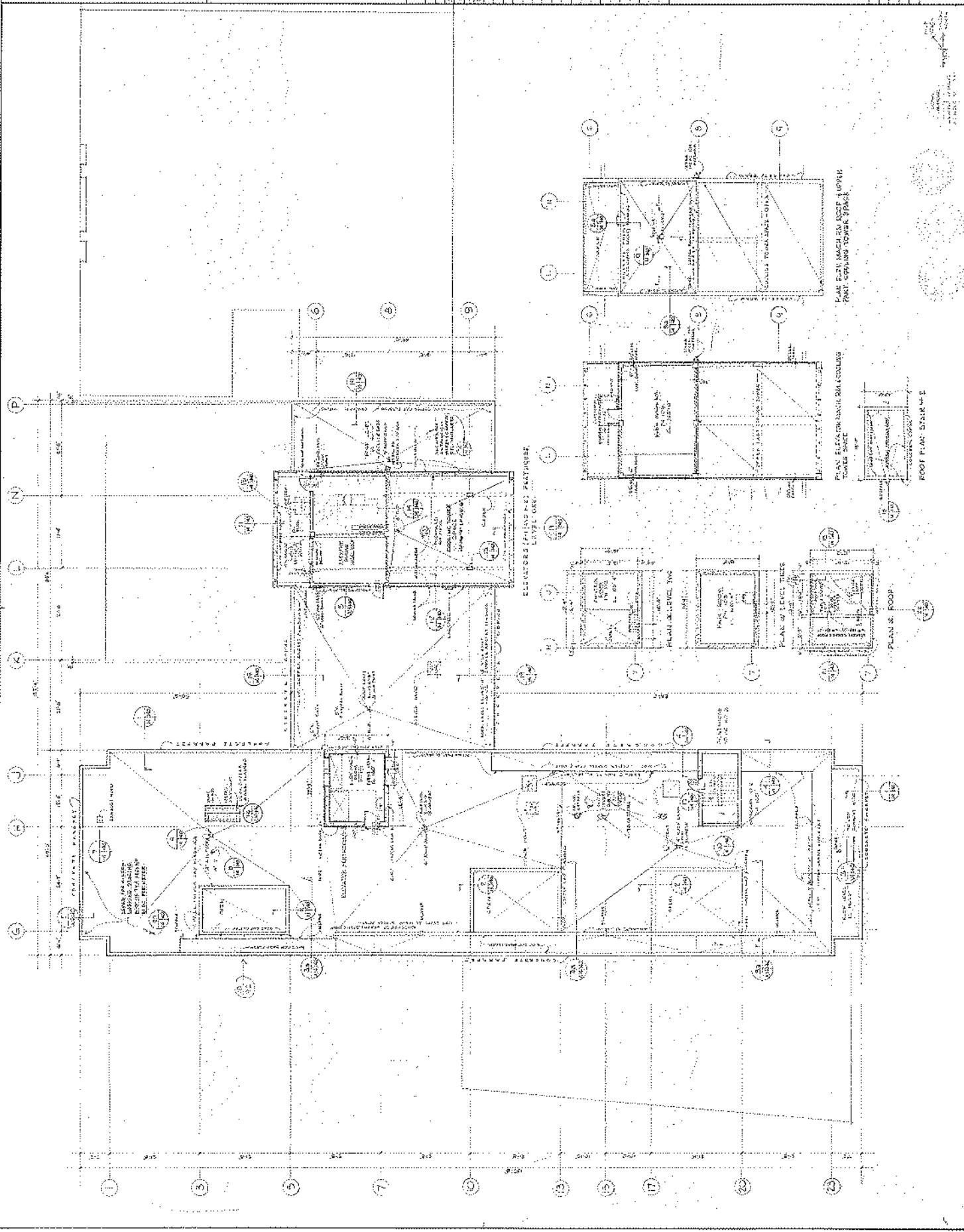
SHEET TITLE

KEY PLAN
PENT HOUSE
AND ROOF

DATE: 10/1/68
BY: J.S.

OWNER	HARVARD UNIVERSITY
DESIGNED BY	SERT, JACKSON ARCHITECTS
DATE	10/1/68
SCALE	1/4" = 1'-0"
SHEET NO.	A-14

A-14





PUBLIC NOTICE

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

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

DA 12-2047
January 25, 2013

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

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

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

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

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

² *Id.*, § 6409(a).

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

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

size is ordinarily excluded from the Commission's required historic preservation review under Section 106 of the National Historic Preservation Act (NHPA).⁵ The Commission later adopted the same definition in the *2009 Declaratory Ruling* to determine whether an application will be treated as a collocation when applying Section 332(c)(7) of the Communications Act of 1934.⁶ The Commission has also applied a similar definition to determine whether a modification of an existing registered tower requires public notice for purposes of environmental review.⁷

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

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

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

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.

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

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

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

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

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

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

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

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

-FCC-

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

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

APPENDIX

SEC. 6409. WIRELESS FACILITIES DEPLOYMENT.

(a) FACILITY MODIFICATIONS.

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

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

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

December 5, 2023

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 12 existing antennas with 12 new antennas in nearly the same locations, replace 6 remote radio heads with 6 new remote radio heads in nearly the same locations, replace certain cabling with new cables, add rectifiers, remove existing diplexers and TMA, 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

A handwritten signature in cursive script that reads "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.

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.

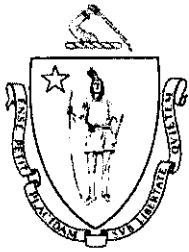
(iii) Following a supplemental submission, the State or local government will have 10 days to notify the applicant that the supplemental submission did not provide the information identified in the original notice delineating missing information. The timeframe is tolled in the case of second or subsequent 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]

62266034 v1-WorkSiteUS-024519/0782



THE COMMONWEALTH OF MASSACHUSETTS
OFFICE OF THE ATTORNEY GENERAL

CENTRAL MASSACHUSETTS DIVISION
10 MECHANIC STREET, SUITE 301
WORCESTER, MA 01608

MAURA HEALEY
ATTORNEY GENERAL

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

February 17, 2015

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

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

Dear Ms. Powers:

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

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

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

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

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

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

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

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

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

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

Second, for religious, educational, and child care uses, G.L. c. 40A, § 3 allows the Town to impose only reasonable regulations in eight areas: the bulk and height of structures, yard size, lot area, setbacks, open space, parking and building coverage requirements. Nothing in G.L. c. 40A, § 3 allows the Town to impose requirements regarding impervious surface, screening, landscaping, lighting, and stormwater management on religious, educational, and child care uses. Because the text in underline and bold above conflicts with the G.L. c. 40A, § 3 protections for religious, educational, and child care uses, the Town cannot apply this text to such uses. We urge the Town to consult closely with Town Counsel when applying the new text in the EIDR by-law to religious, educational, and child care uses to ensure that the Town complies with G.L. c. 40A, § 3.¹

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

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

MAURA HEALEY
ATTORNEY GENERAL

Margaret J. Hurley

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

cc: Town Counsel Thomas P. McCusker

ULS License

Wireless Communications Service License - KNLB200 - New Cingular Wireless PCS, LLC

Call Sign	KNLB200	Radio Service	WS - Wireless Communications Service
Status	Active	Auth Type	Regular

Rural Service Provider Bidding Credit

Is the Applicant seeking a Rural Service Provider (RSP) bidding credit?

Reserved Spectrum

Reserved Spectrum

Market

Market	MEA001 - Boston	Channel Block	B
Submarket	0	Associated Frequencies (MHz)	002310.00000000-002315.00000000-002355.00000000-002360.00000000

3.7 GHz License Type

3.7 GHz Linked License

Dates

Grant	02/07/2020	Expiration	07/21/2027
Effective	01/14/2023	Cancellation	

Buildout Deadlines

1st	03/13/2017	2nd	09/13/2019
-----	------------	-----	------------

Discontinuance Dates

1st	2nd
-----	-----

Notification Dates

1st	03/03/2017	2nd	09/04/2019
-----	------------	-----	------------

Licensee

FRN	0003291192	Type	Limited Liability Company
-----	------------	------	---------------------------

Licensee

New Cingular Wireless PCS, LLC 208 S. Akard St. 20F Dallas, TX 75202 ATTN FCC Group	P:(855)699-7073 F:(214)746-6410 E:FCCMW@att.com
--	---

Contact

AT&T Services, Inc. Cecil J Mathew 208 S. Akard St. 20F Dallas, TX 75202 ATTN Michael P. Goggin	P:(855)699-7073 F:(202)457-3073 E:FCCMW@att.com
---	---

Ownership and Qualifications

Radio Service Type	Fixed, Mobile		
Regulatory Status	Common Carrier, Non-Common Carrier	Interconnected	Yes

Alien Ownership

The Applicant answered "No" to each of the Alien Ownership questions.

Basic Qualifications

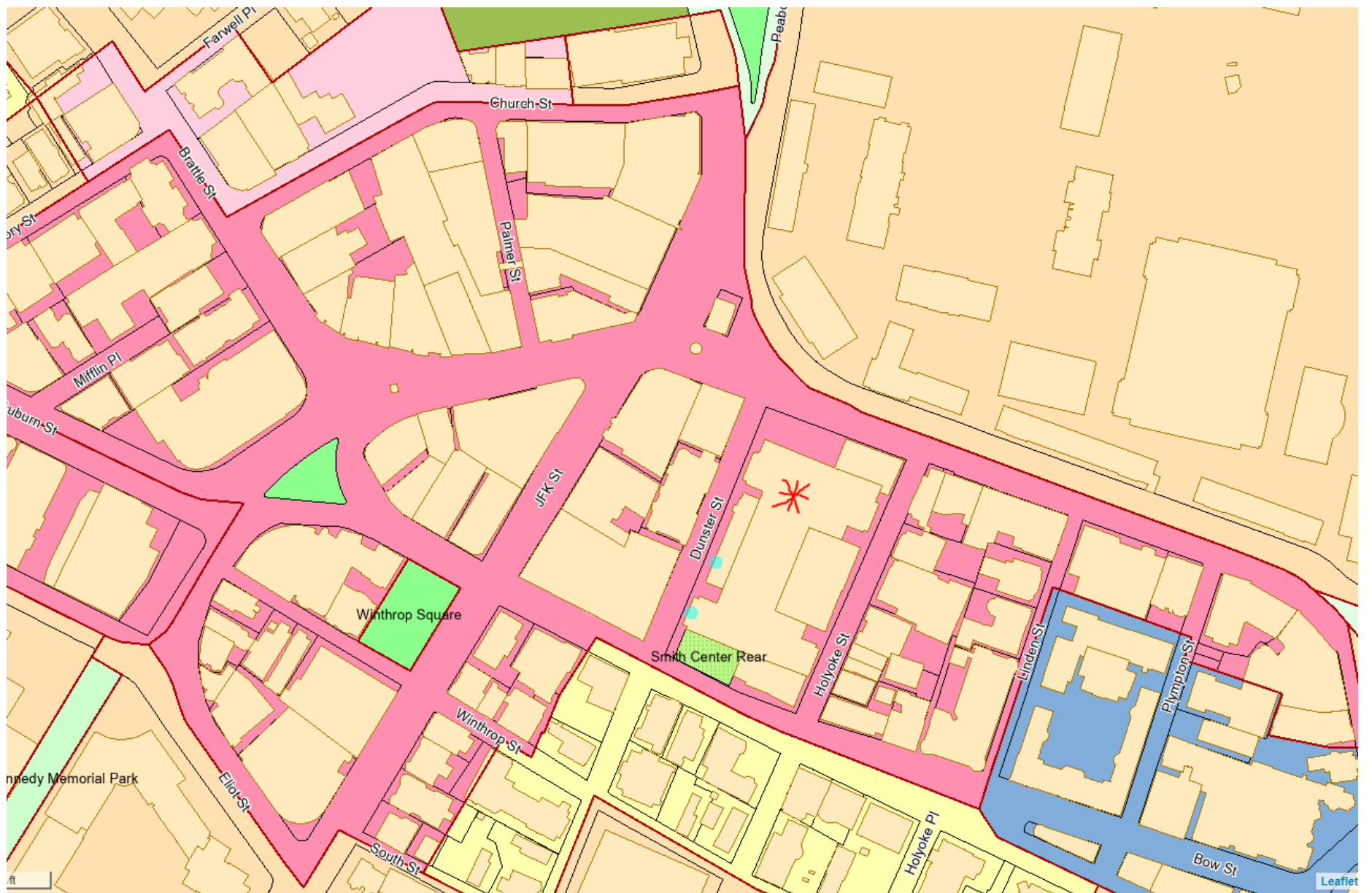
The Applicant answered "No" to each of the Basic Qualification questions.

Tribal Land Bidding Credits

This license did not have tribal land bidding credits.

Demographics

Race	
Ethnicity	Gender

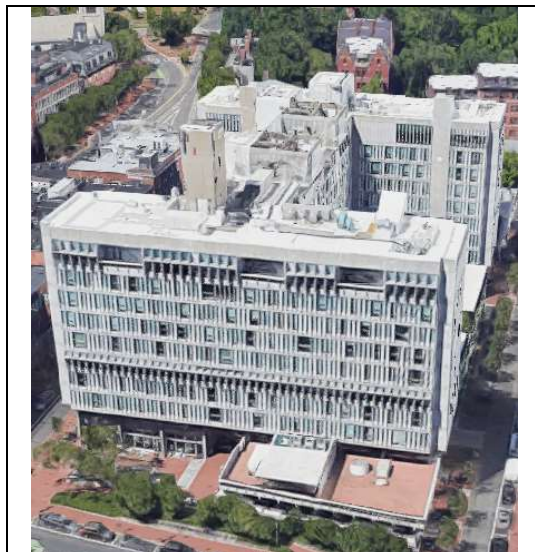




CENTERLINE

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: MRCTB057991, MRCTB052221, MRCTB051167, MRCTB050815, MRCTB050786	Prepared for: Centerline on behalf of AT&T Report Date: November 27, 2023 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.

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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:	10071767.AE201.220820
RFDS:	NEW-ENGLAND_BOSTON_MAU2215_2021-5G-NR-Radio_5G-NR-1SR-CBAND_sp656b_PTN_10071767_3126_03-02-2021_Final-Approved_v2.00

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
Access 1	0	0	0	0	0	0	0	0	0	0

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	0	0	0	0	X
Beta	0	3	0	0	0	X
Gamma	0	3	0	0	0	X
Access 1	0	0	0	0	0	0

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	3	0	0	0	0	X
Beta	0	0	0	0	5	0	0	0	0	X
Gamma	0	0	0	0	7	0	0	0	0	X
Access 1	0	0	0	0	0	0	0	0	0	0

Alpha:

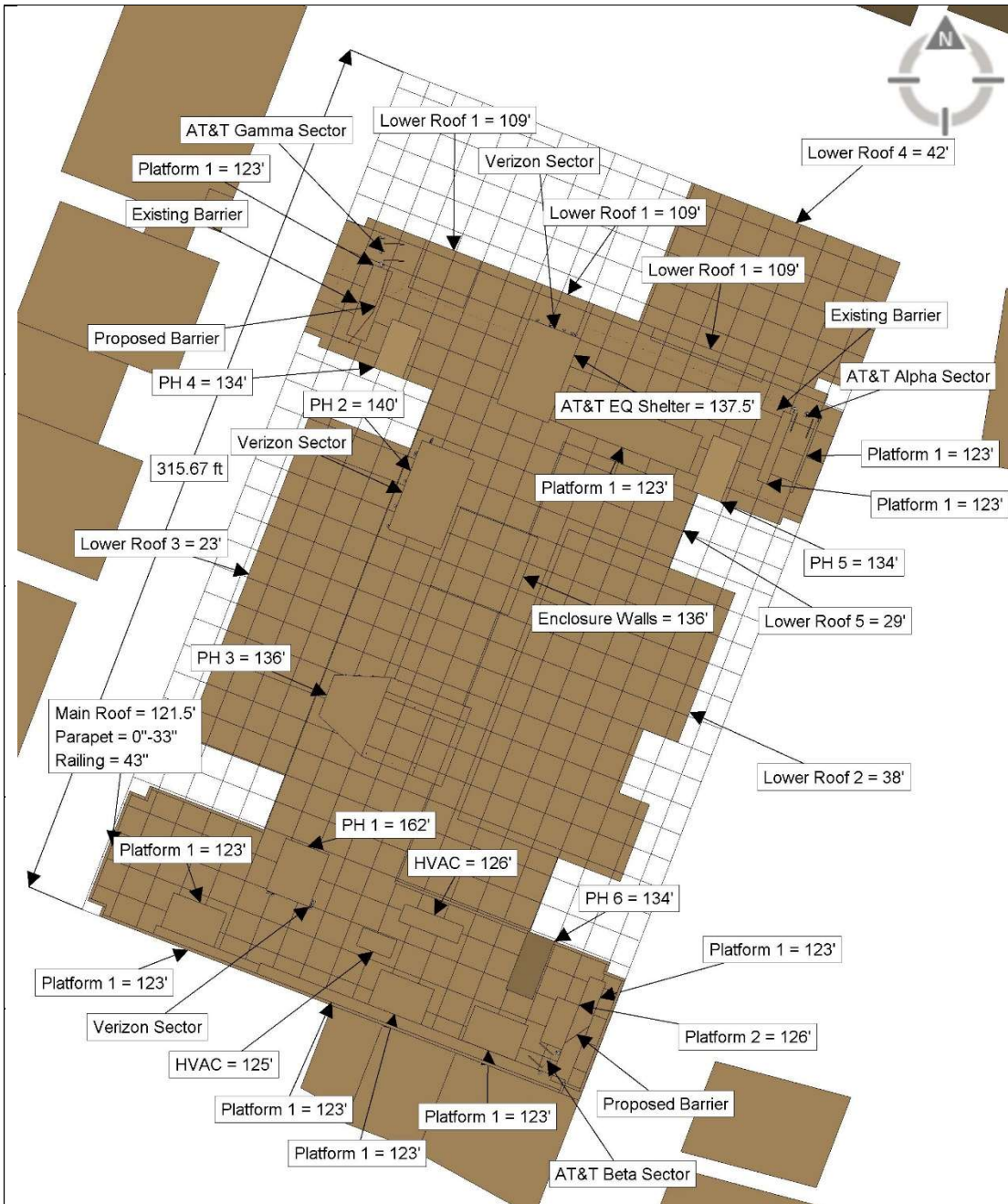
- No action required.

Beta:

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

Gamma:

- Install a 29' barrier on Platform 1 as depicted in the diagrams below. Relocate (2) Caution 2 signs from the existing barrier onto the proposed barrier. Install (3) additional Caution 2 signs on the proposed barrier.

2.0 SITE SCALE MAP

All Sectors
Grid size: 10'



INFO 1
Sign



Caution 1
Sign



INFO 2
Sign



Caution 2B
Sign



Notice 1
Sign



Caution 2
Sign



Notice 2
Sign



Warning 2
Sign



Existing
Barrier



Proposed
Barrier



Items to be
removed

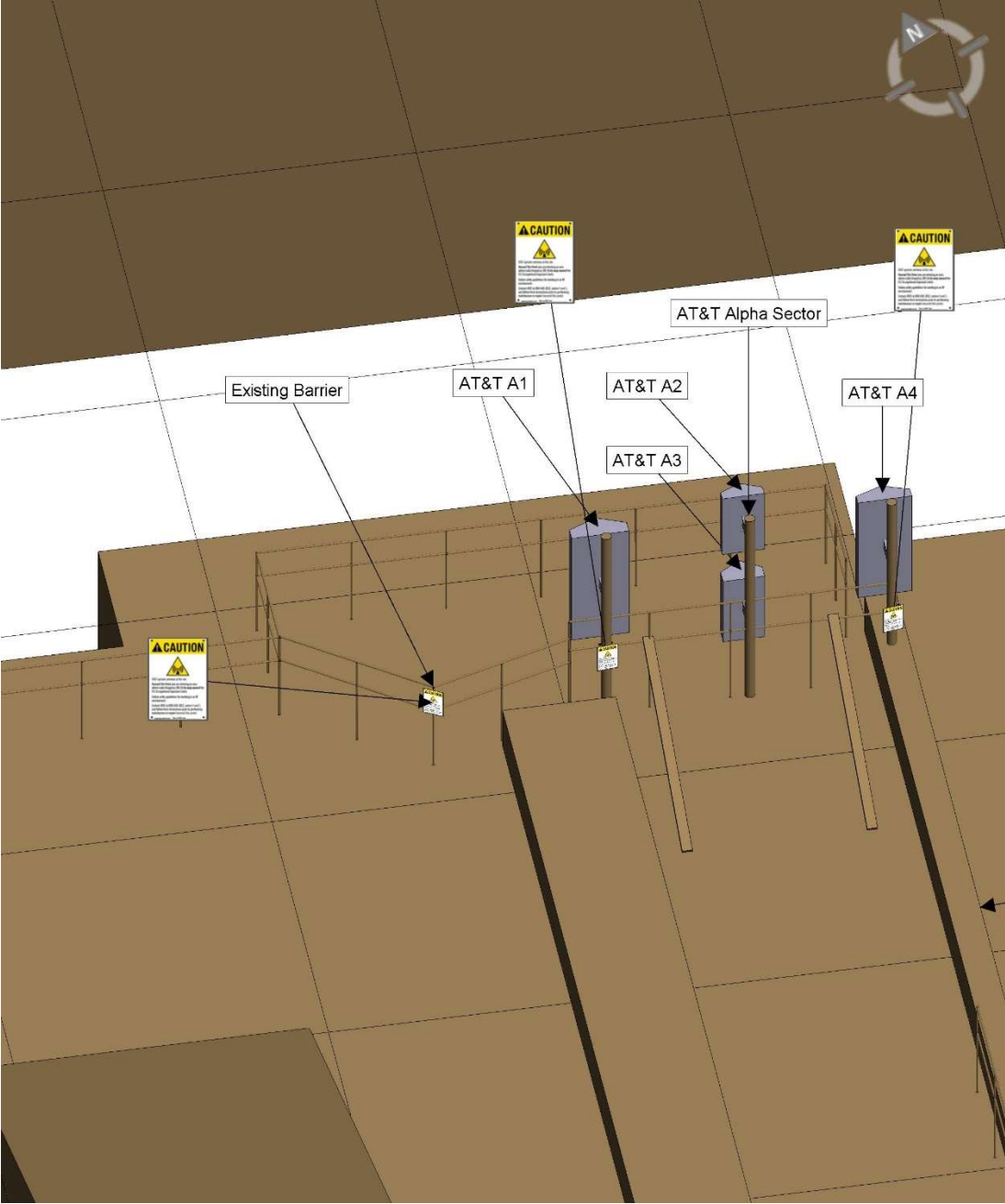









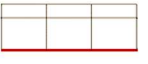





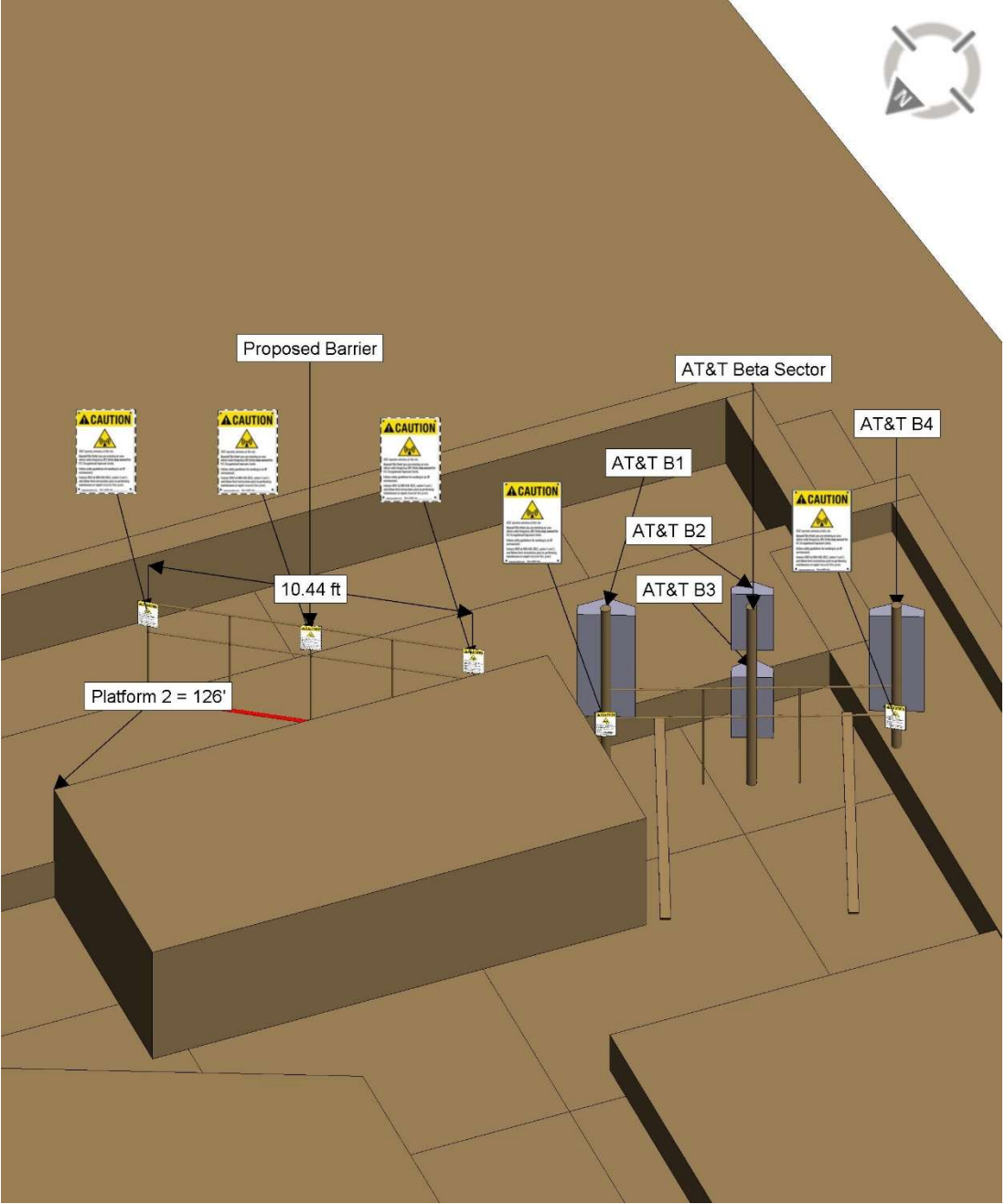









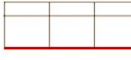



Existing
Sign

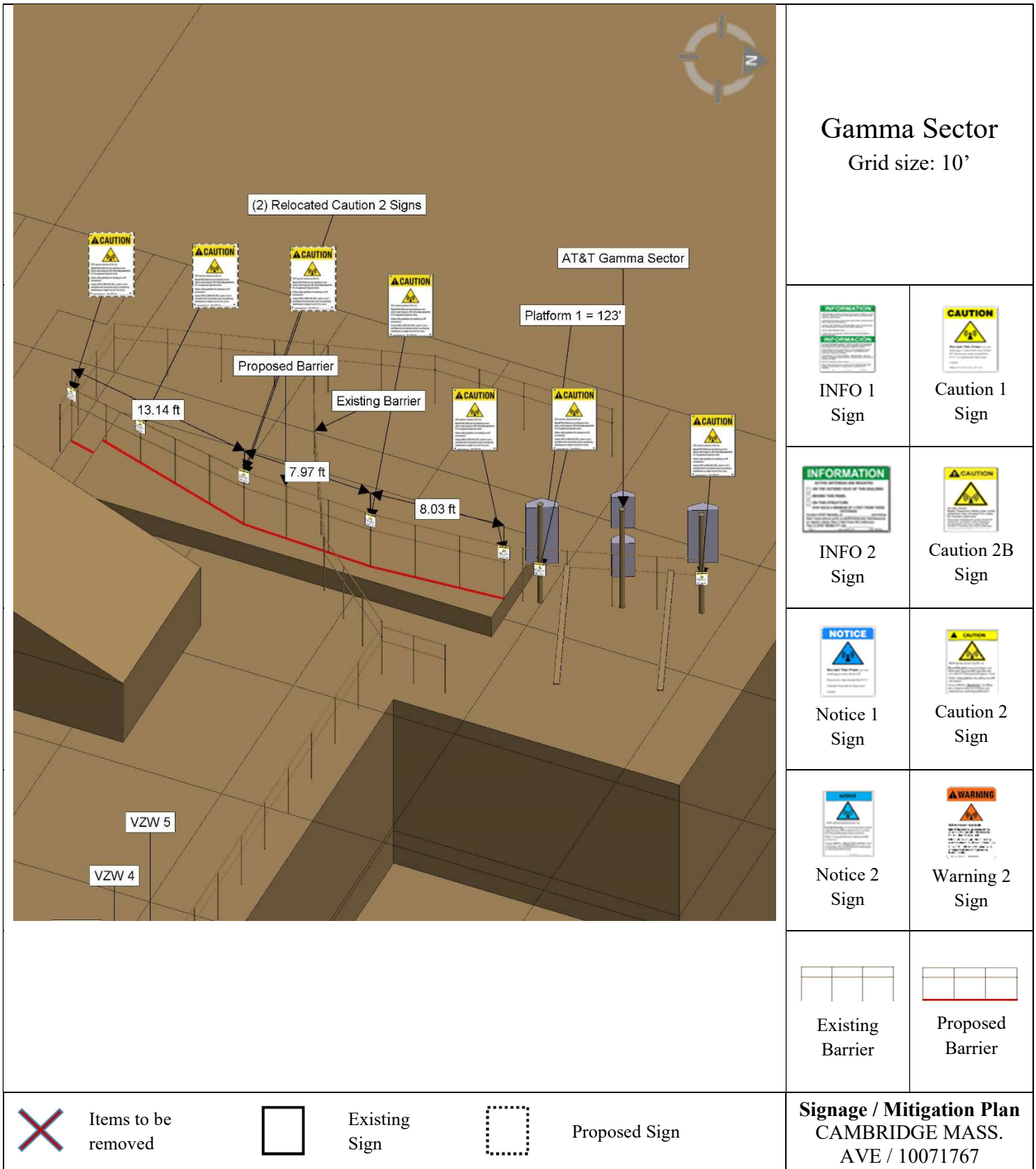


Proposed Sign

Signage / Mitigation Plan
CAMBRIDGE MASS.
AVE / 10071767

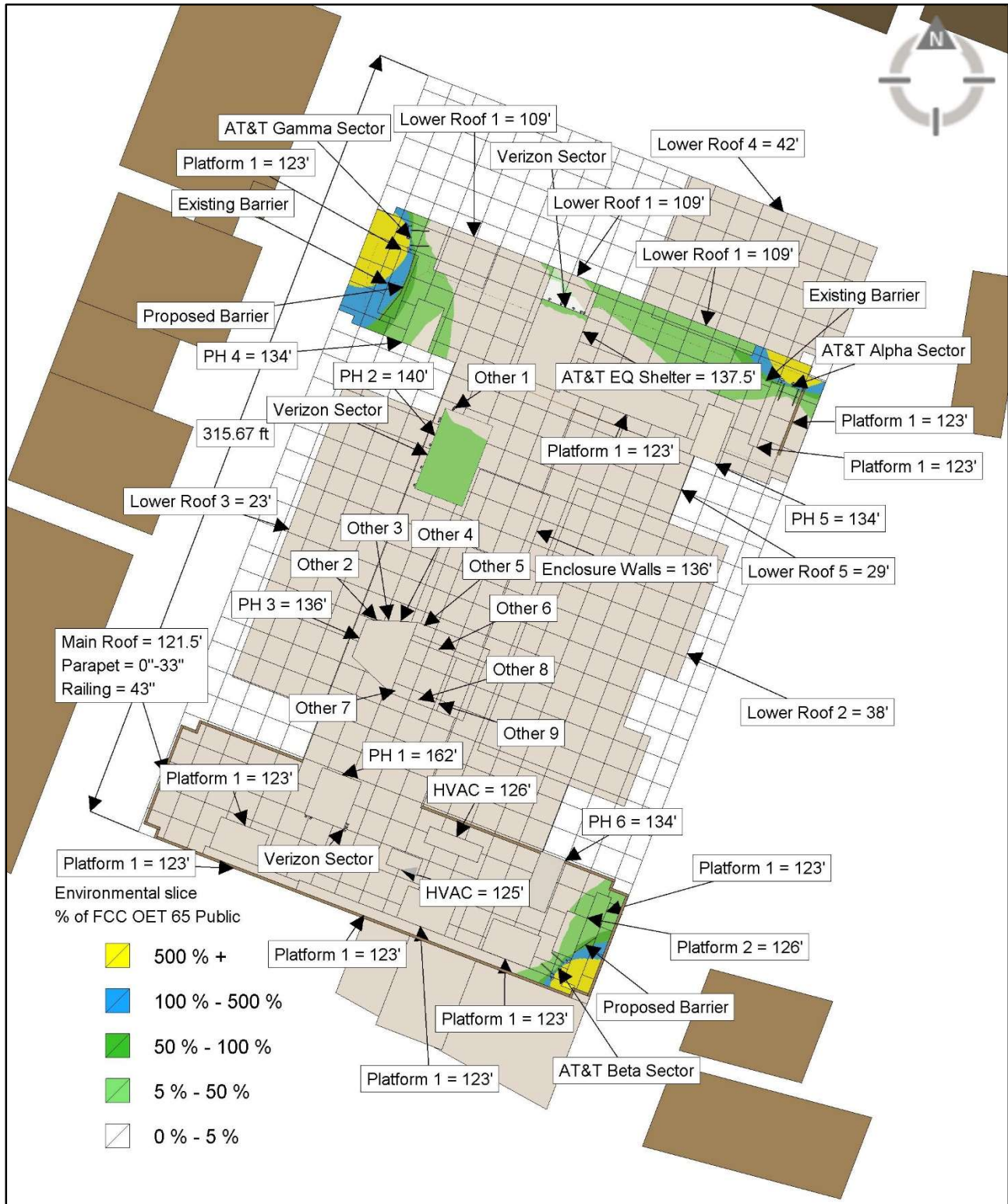
		<h2>Alpha Sector</h2> <p>Grid size: 10'</p>	
		 <p>INFO 1 Sign</p>	 <p>Caution 1 Sign</p>
		 <p>INFO 2 Sign</p>	 <p>Caution 2B Sign</p>
		 <p>Notice 1 Sign</p>	 <p>Caution 2 Sign</p>
		 <p>Notice 2 Sign</p>	 <p>Warning 2 Sign</p>
		 <p>Existing Barrier</p>	 <p>Proposed Barrier</p>
 <p>Items to be removed</p>	 <p>Existing Sign</p>	 <p>Proposed Sign</p>	Signage / Mitigation Plan CAMBRIDGE MASS. AVE / 10071767

	<p>Beta Sector Grid size: 10'</p>	
	 INFO 1 Sign	 Caution 1 Sign
	 INFO 2 Sign	 Caution 2B Sign
	 Notice 1 Sign	 Caution 2 Sign
	 Notice 2 Sign	 Warning 2 Sign
	 Existing Barrier	 Proposed Barrier
 Items to be removed  Existing Sign  Proposed Sign	<p>Signage / Mitigation Plan CAMBRIDGE MASS. AVE / 10071767</p>	



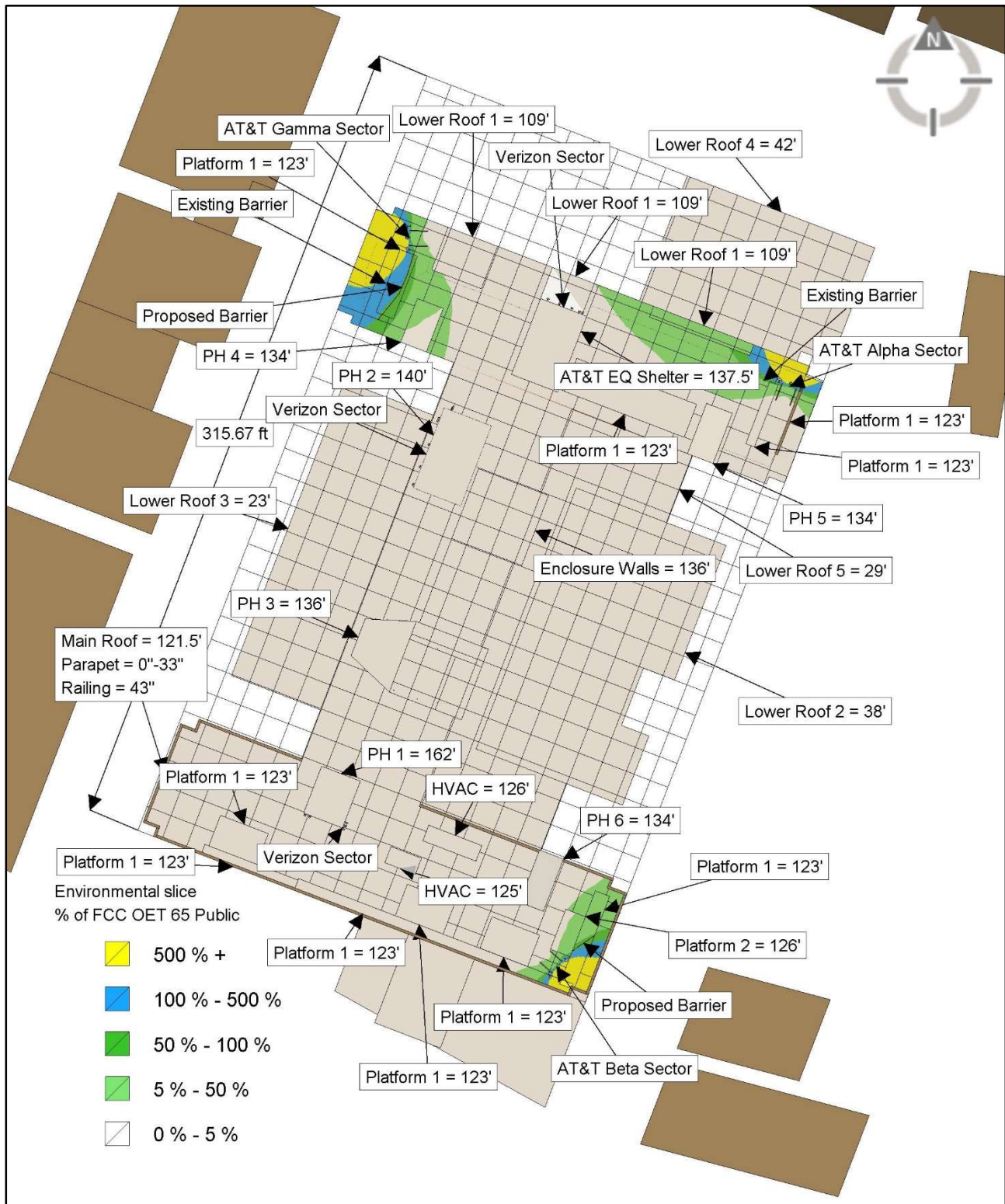
3.0 RF EXPOSURE DIAGRAMS

Composite



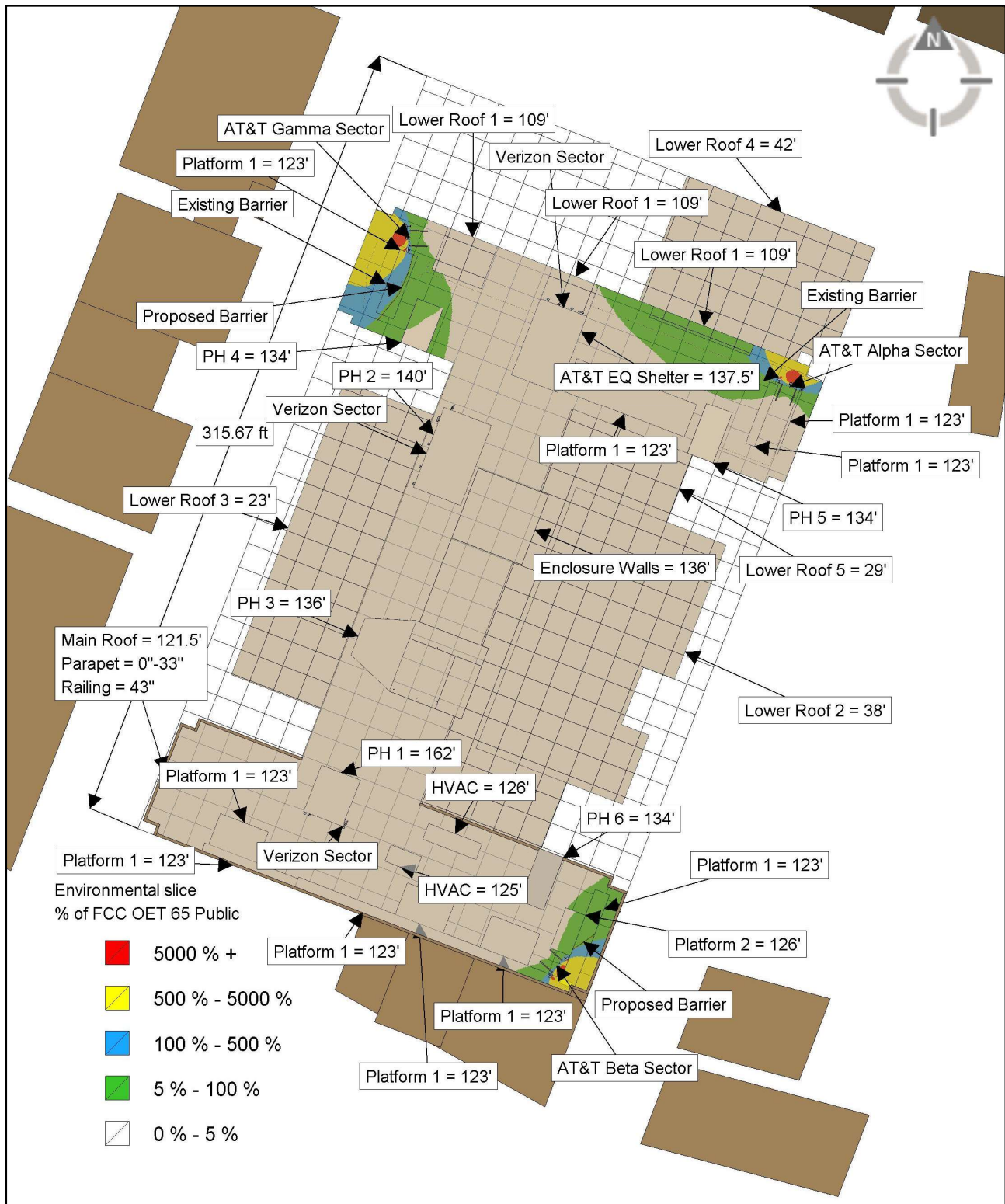
Grid Size: 10'

AT&T Only

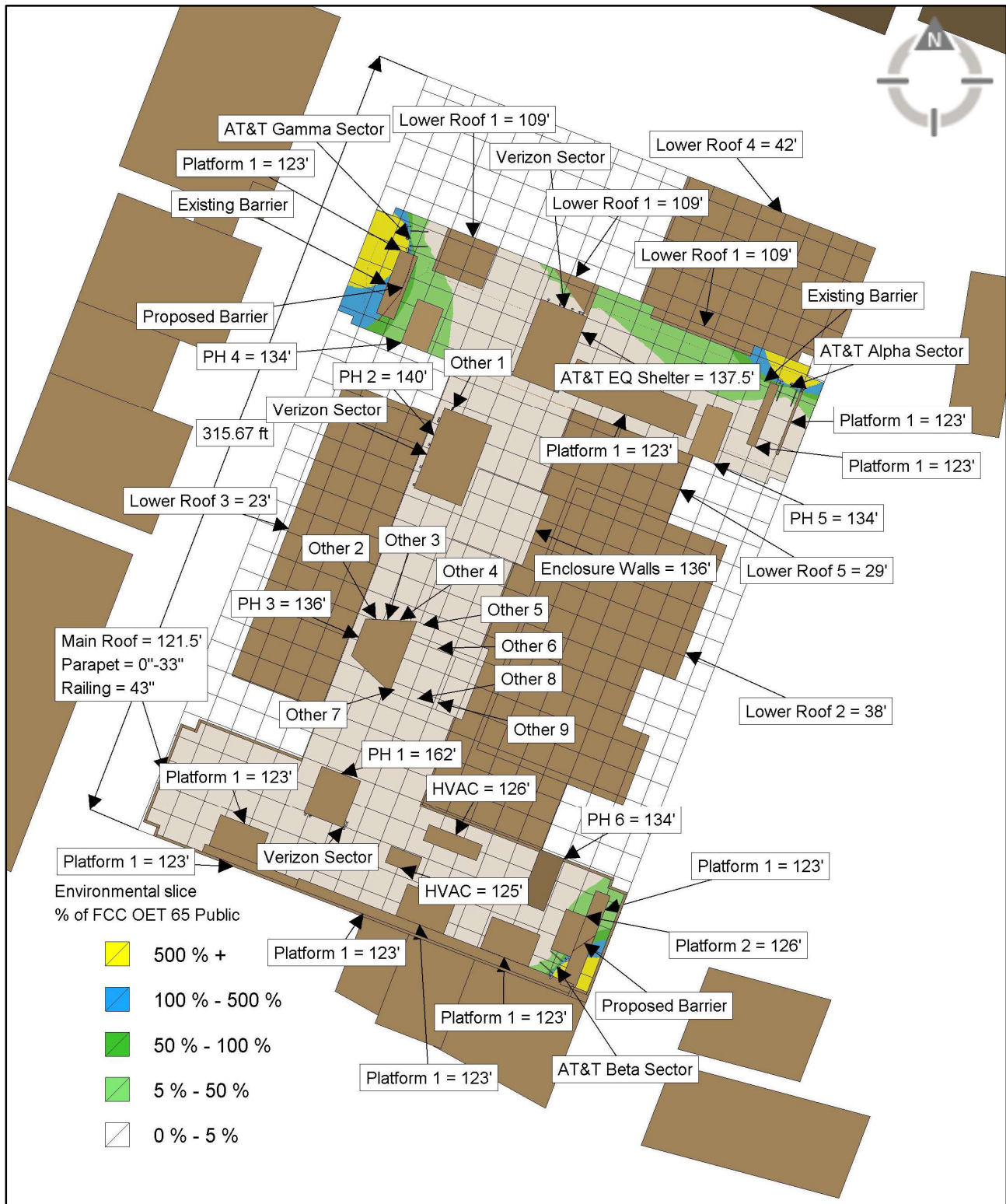


Grid Size: 10'

AT&T Only with 5000% Threshold

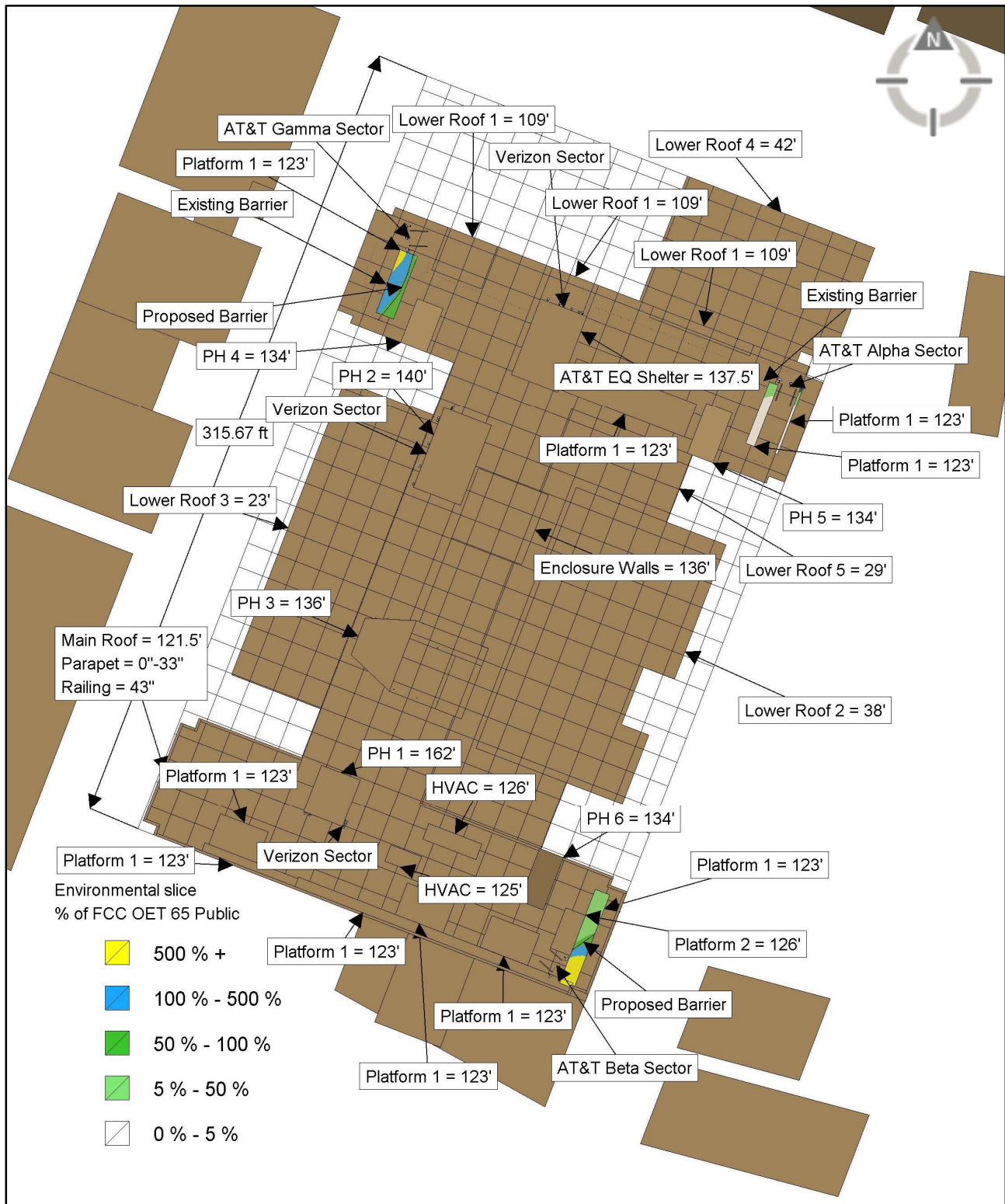


Main Level 121.5'



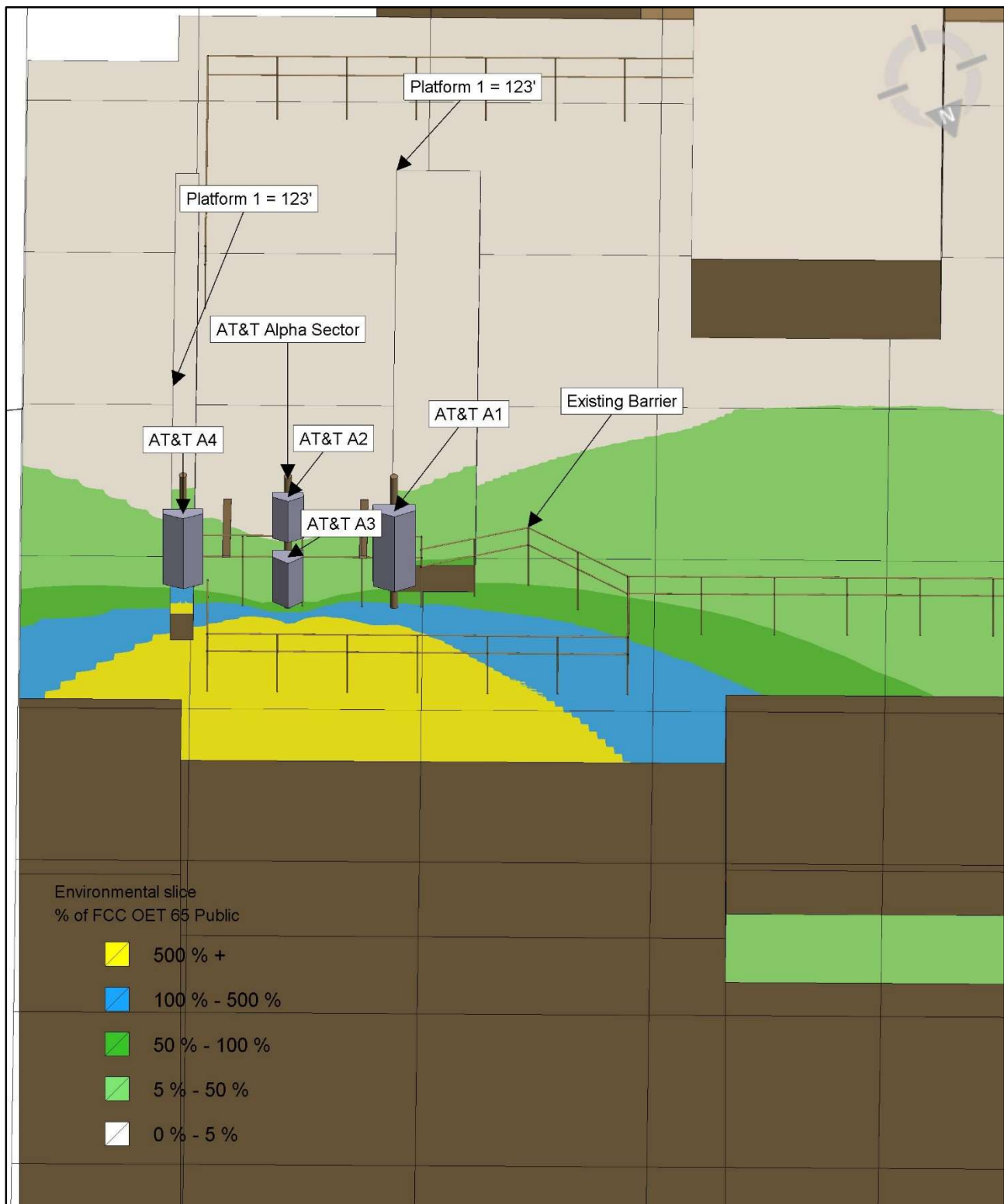
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Platform 1 Level 123'



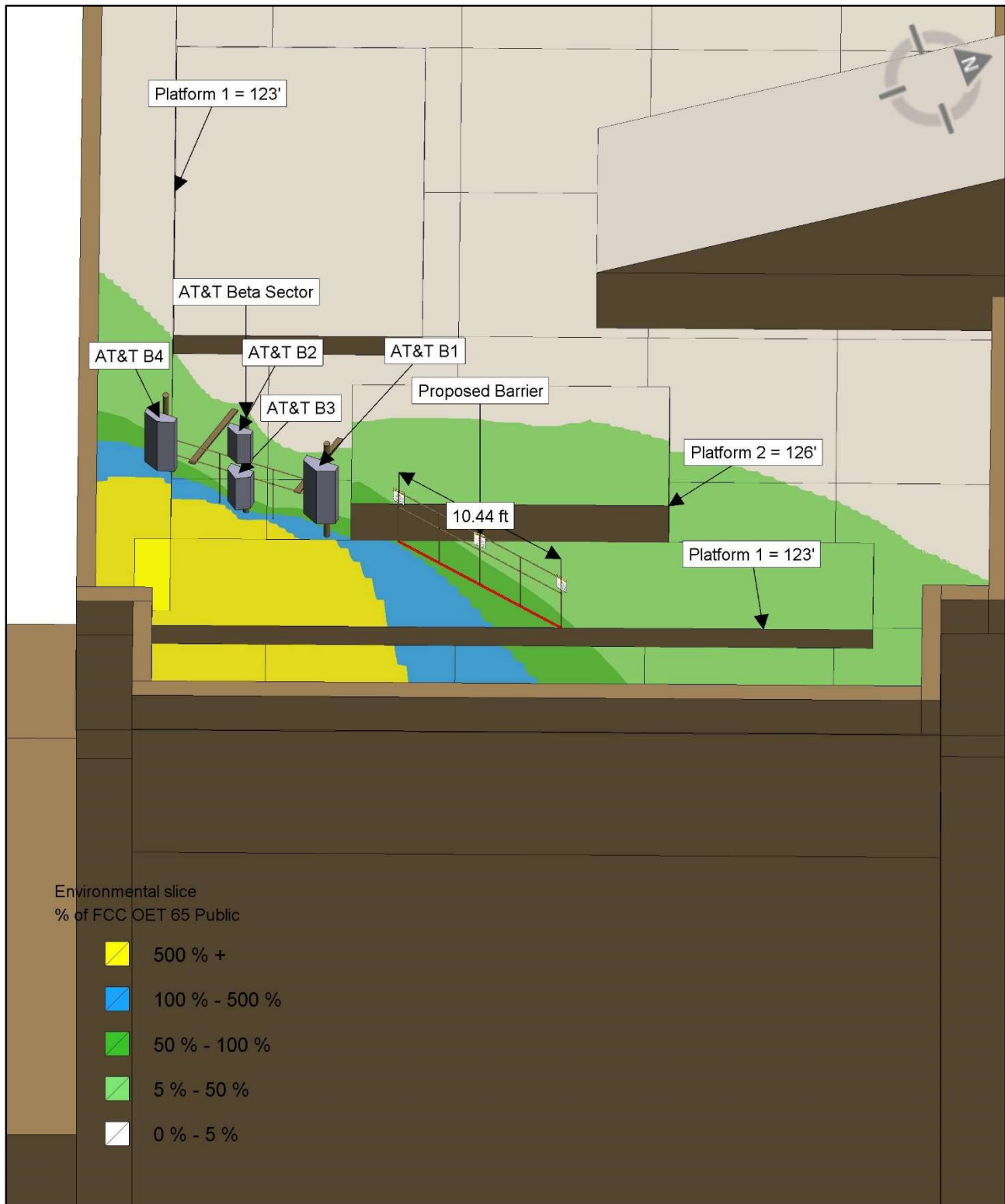
Grid Size: 10'

Alpha Emissions

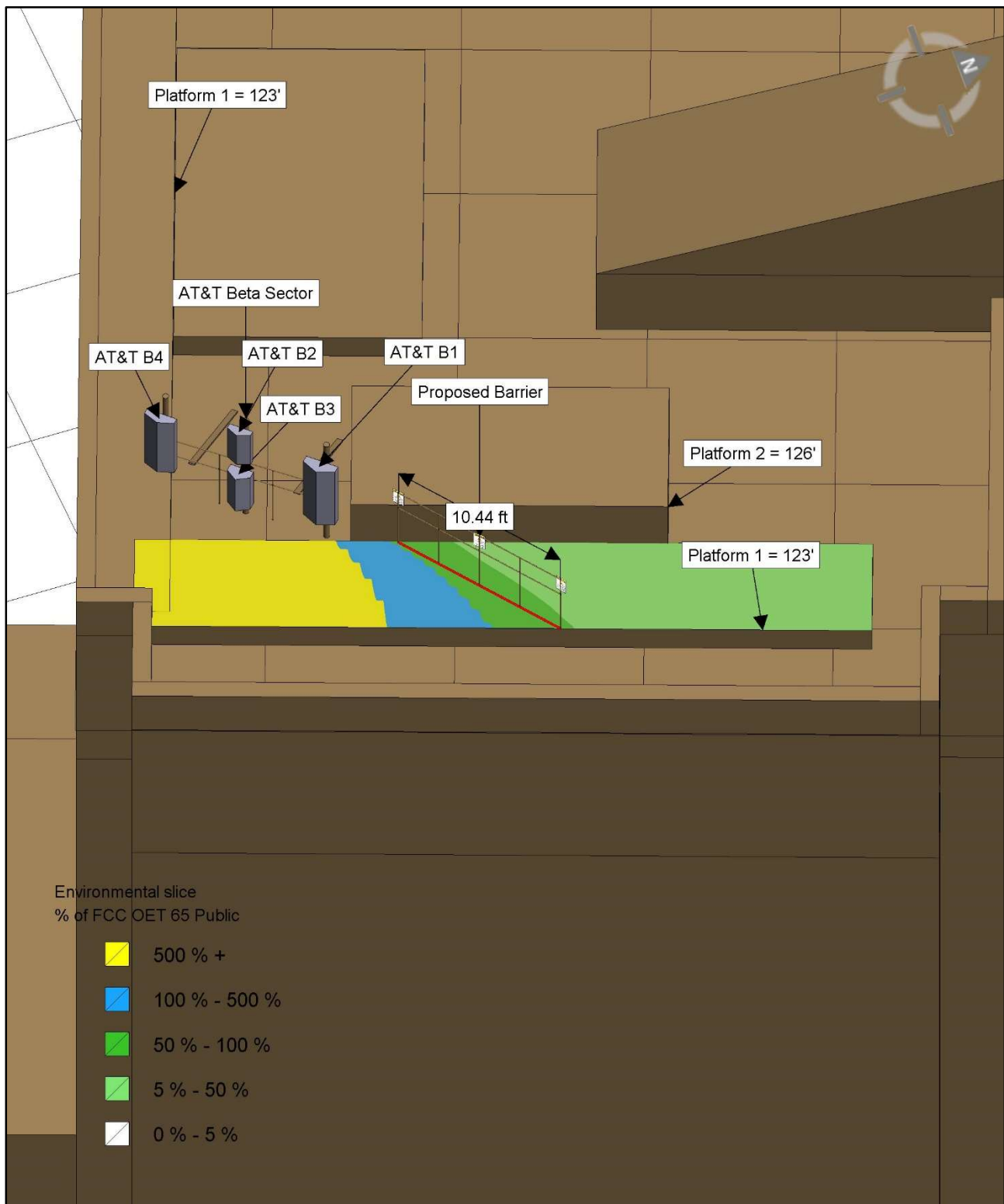


Grid Size: 10'

Beta Emissions

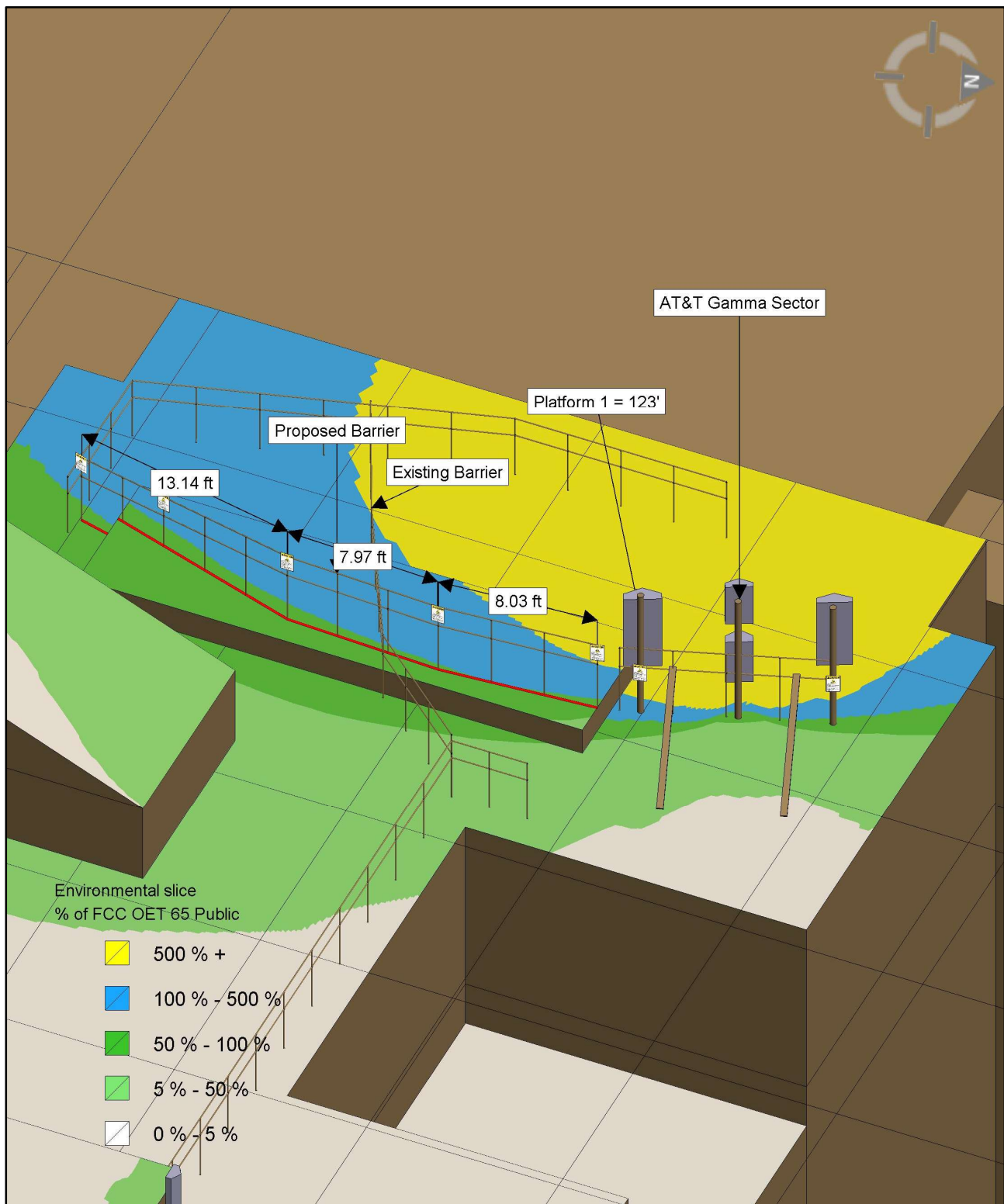


Beta Platform 1 Level 123'



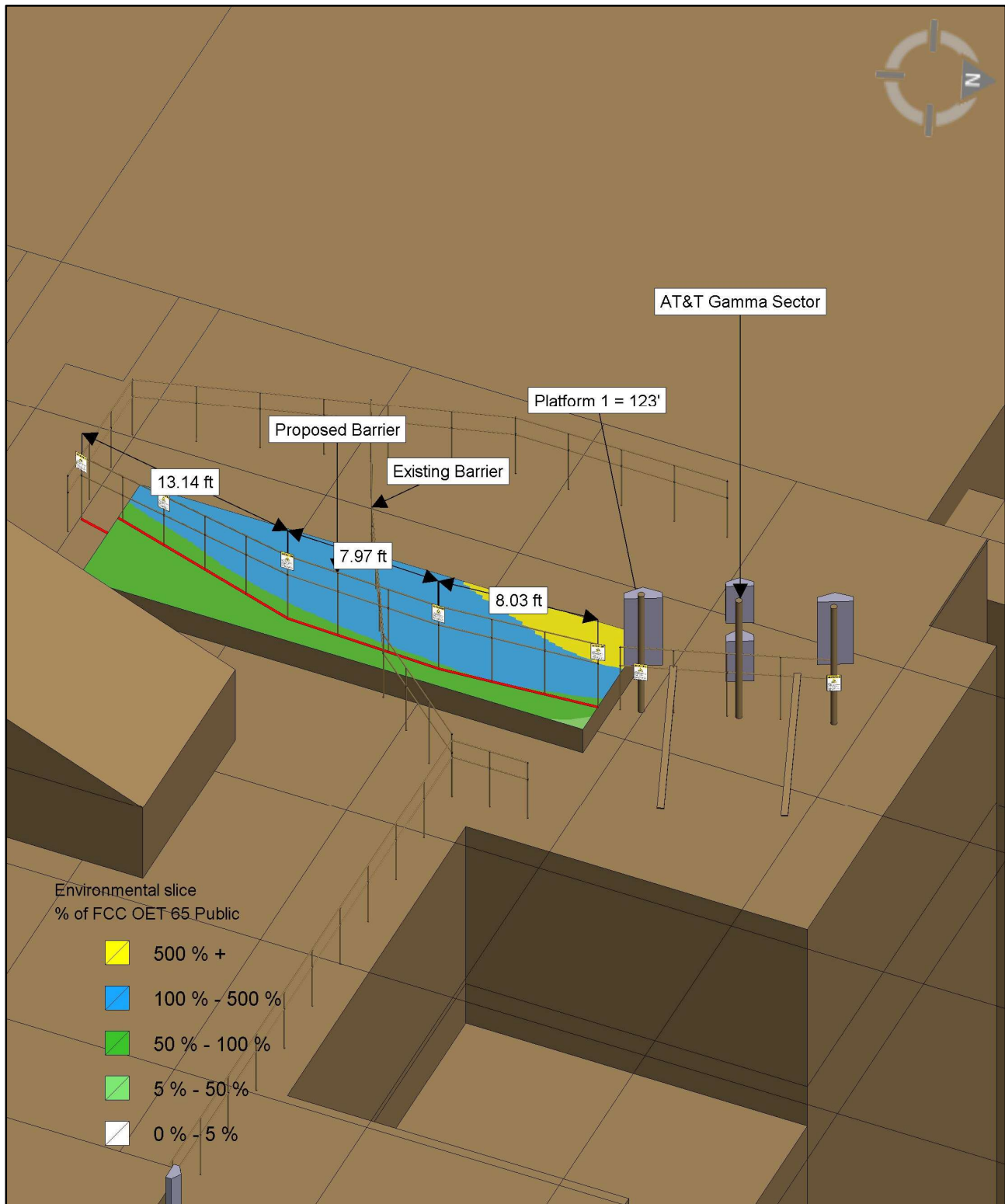
Grid Size: 10'

Gamma Emissions



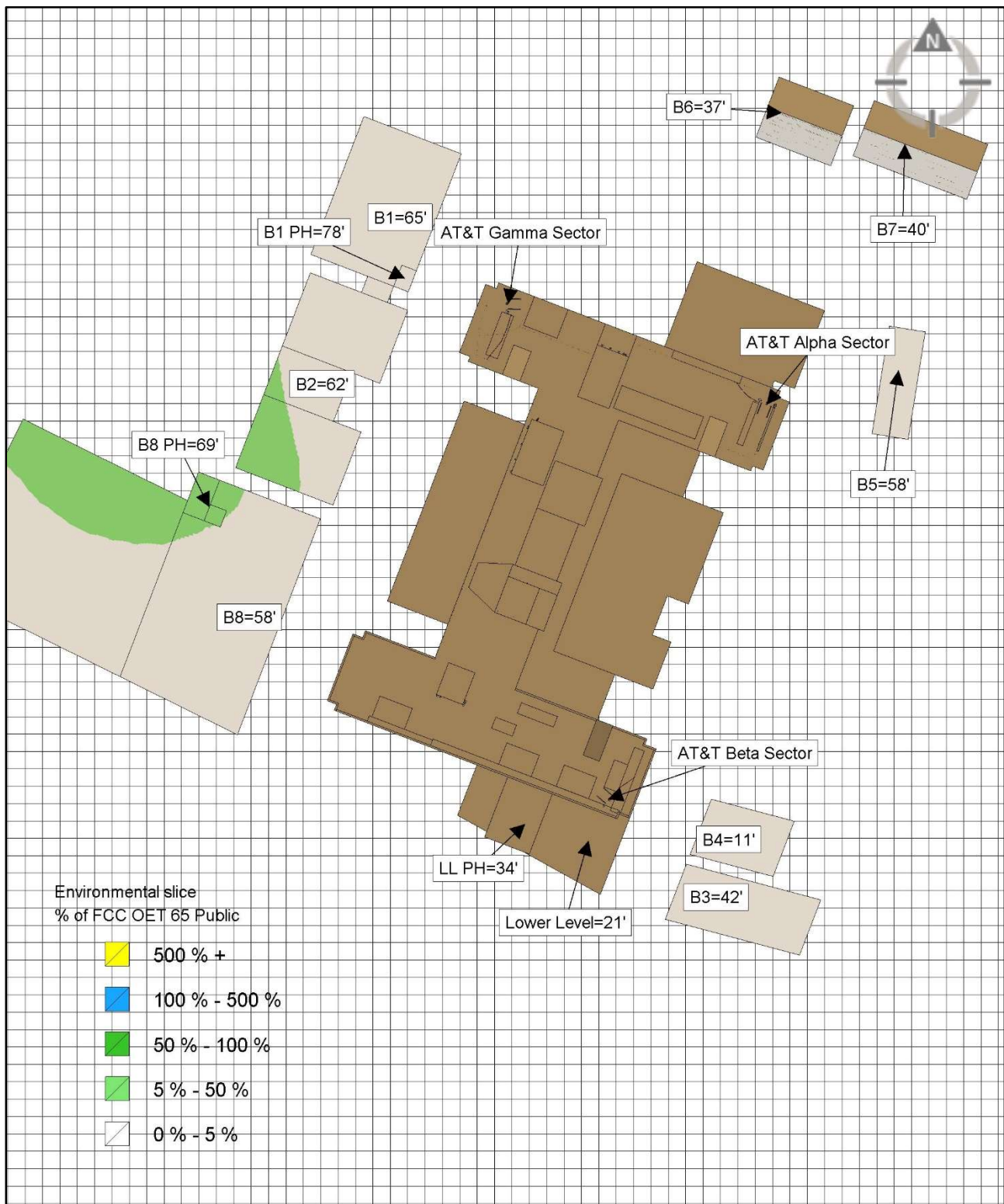
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Gamma Platform 1 Level 123'



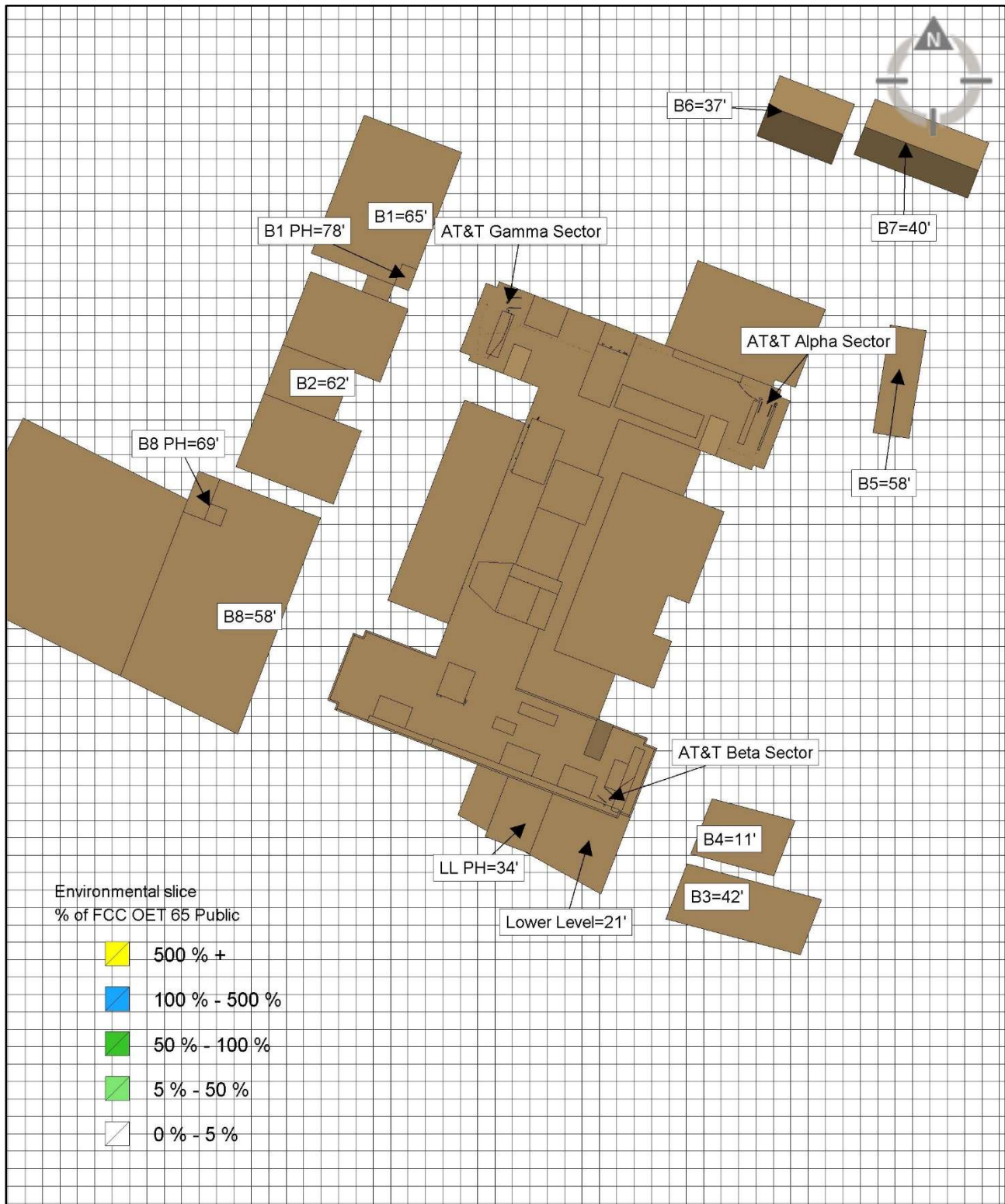
Grid Size: 10'

Adjacent Buildings Overview



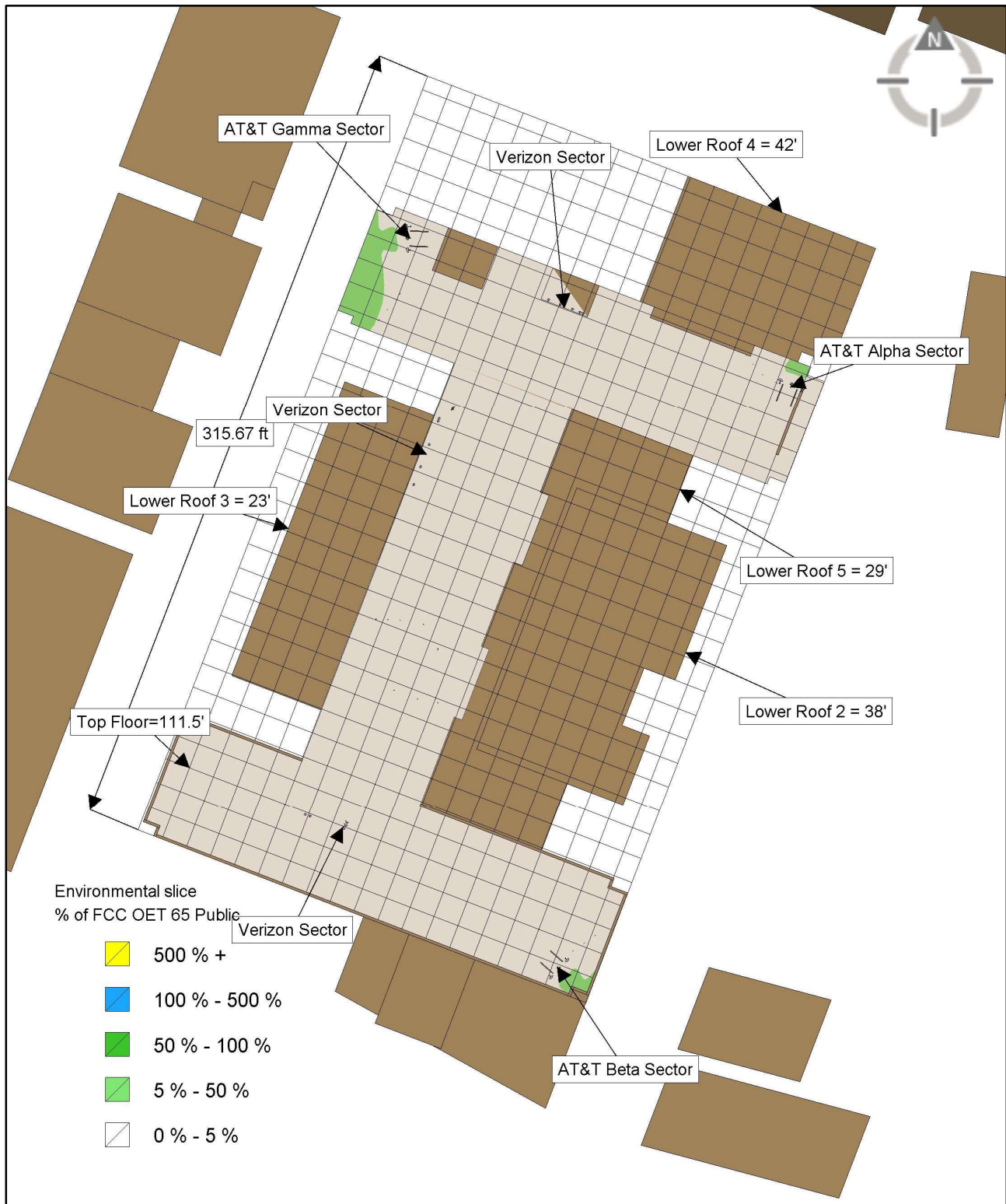
Grid Size: 10'

Ground Level (Publicly Accessible Area)



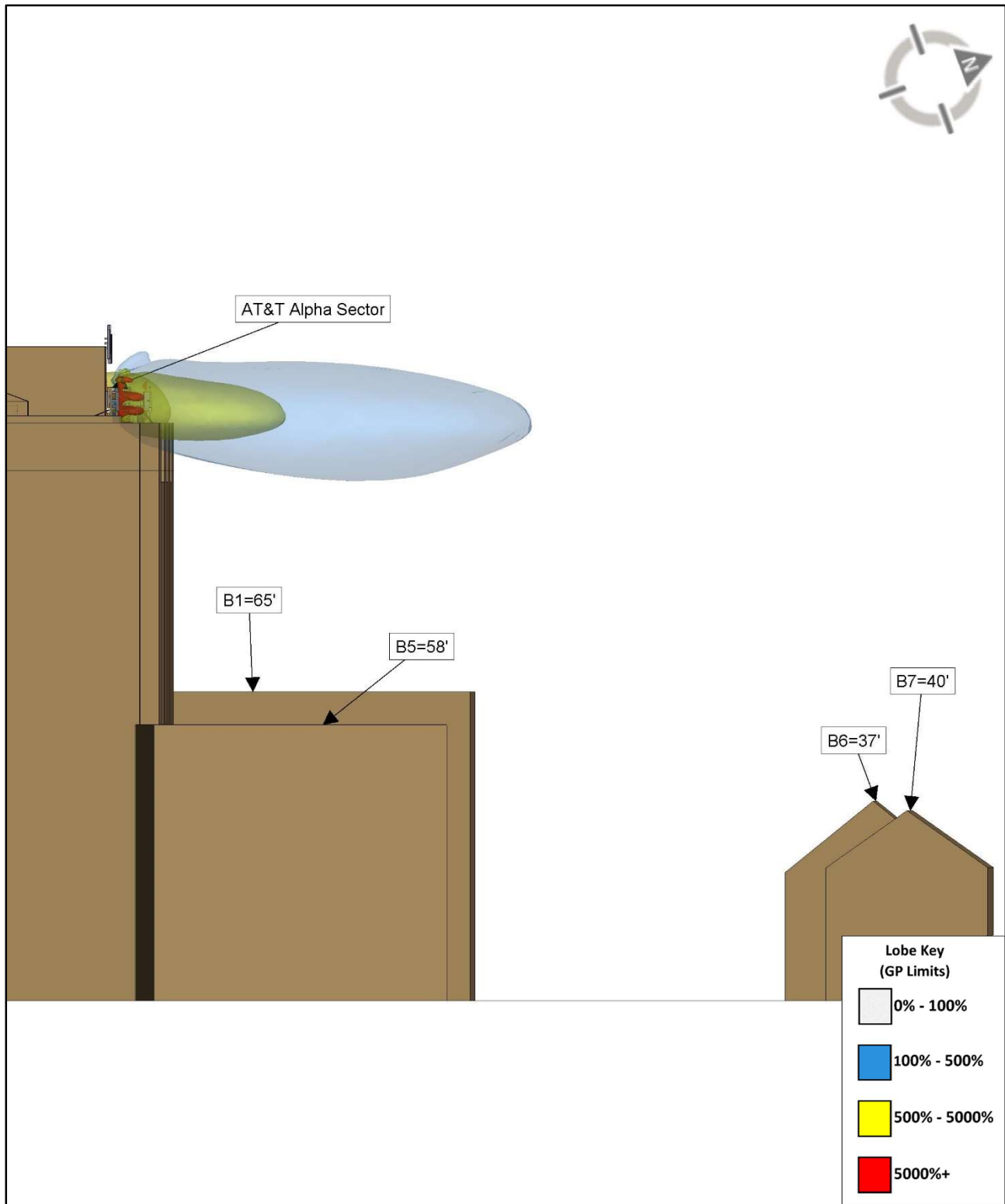
Grid Size: 10'

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

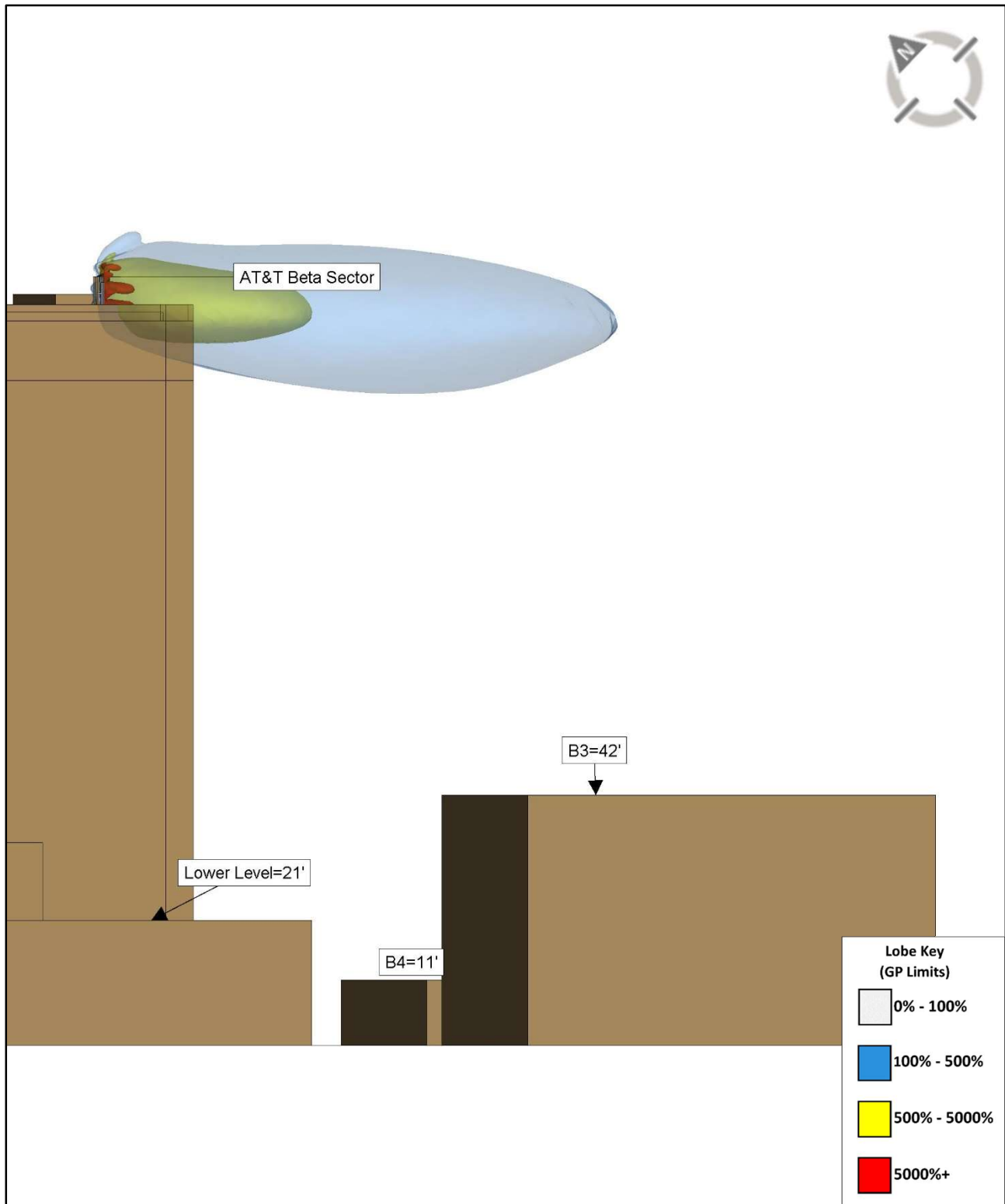


Grid Size: 10'

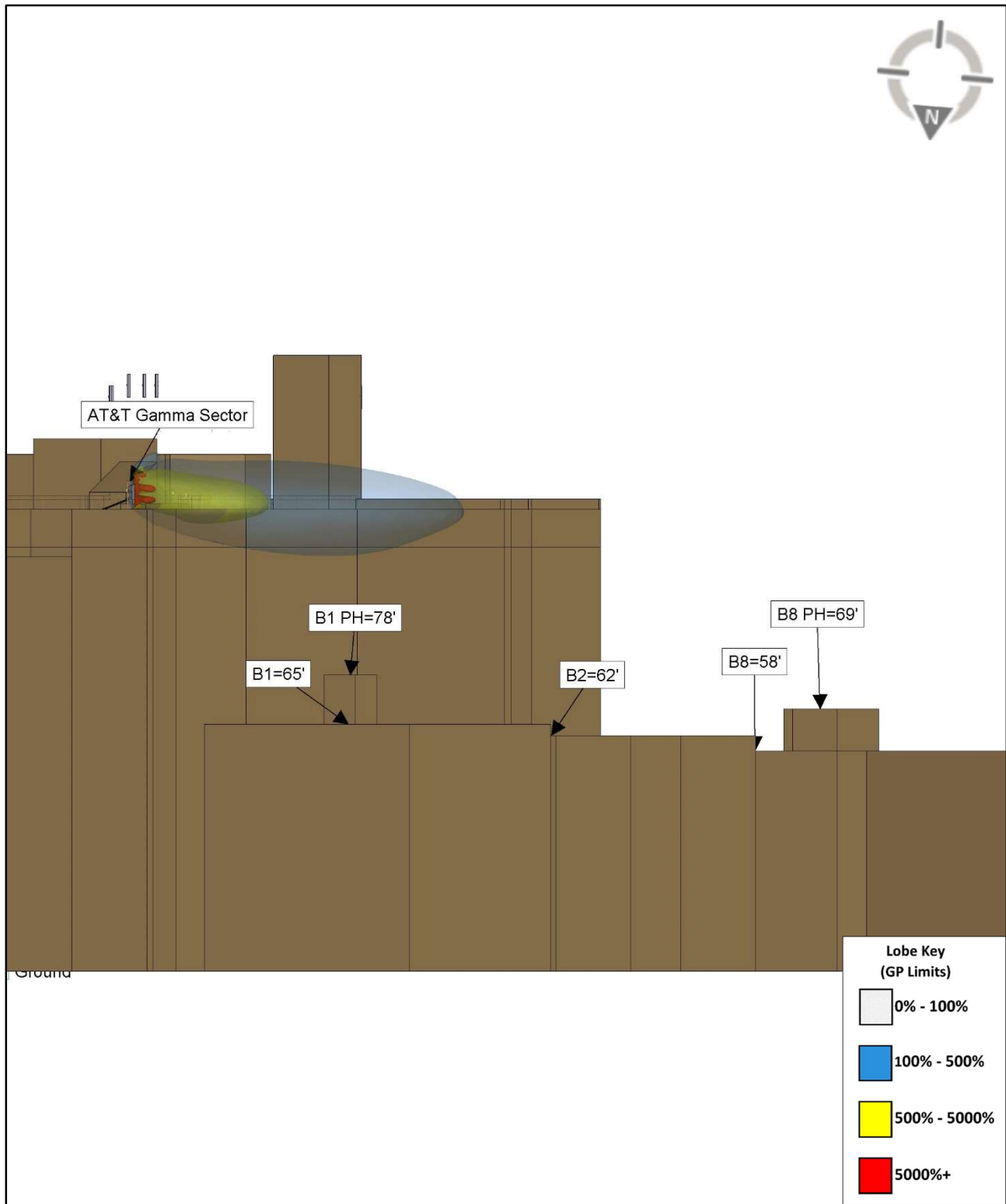
Alpha Sector Elevation View (3D Lobe)



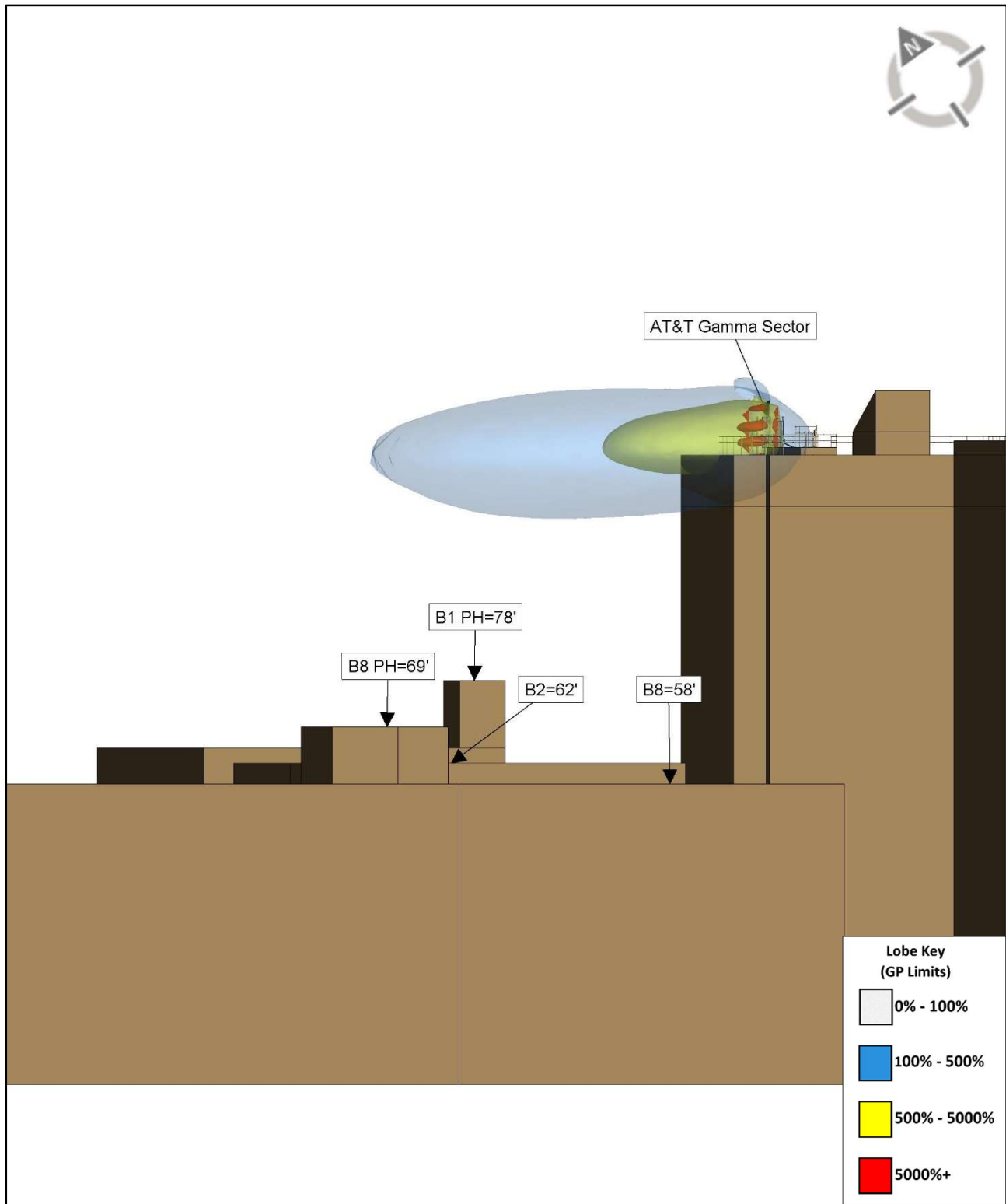
Beta Sector Elevation View (3D Lobe)



Gamma Sector Elevation View 1 (3D Lobe)



Gamma Sector Elevation View 2 (3D Lobe)



4.0 STATEMENT OF COMPLIANCE

Centerline conducted a theoretical modeling utilizing maximum radio powers at 100% duty cycle 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
Access 1	0	0	0	0	0	0	0	0	0	0

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	0	0	0	0	X
Beta	0	3	0	0	0	X
Gamma	0	3	0	0	0	X
Access 1	0	0	0	0	0	0

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	3	0	0	0	0	X
Beta	0	0	0	0	5	0	0	0	0	X
Gamma	0	0	0	0	7	0	0	0	0	X
Access 1	0	0	0	0	0	0	0	0	0	0

Alpha:

- No action required.




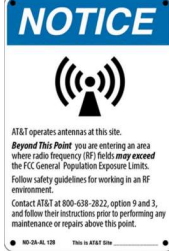




Beta:

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

Gamma:

- Install a 29' barrier on Platform 1 as depicted in the diagrams below. Relocate (2) Caution 2 signs from the existing barrier onto the proposed barrier. Install (3) additional 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 ($\mu\text{W}/\text{cm}^2$). 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 ($f_{\text{MHz}}/1500$). Frequencies between 1500 and 100,000 MHz have a General Population/Uncontrolled MPE limit of $1 \text{ mW}/\text{cm}^2$ ($1000 \mu\text{W}/\text{cm}^2$). 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.

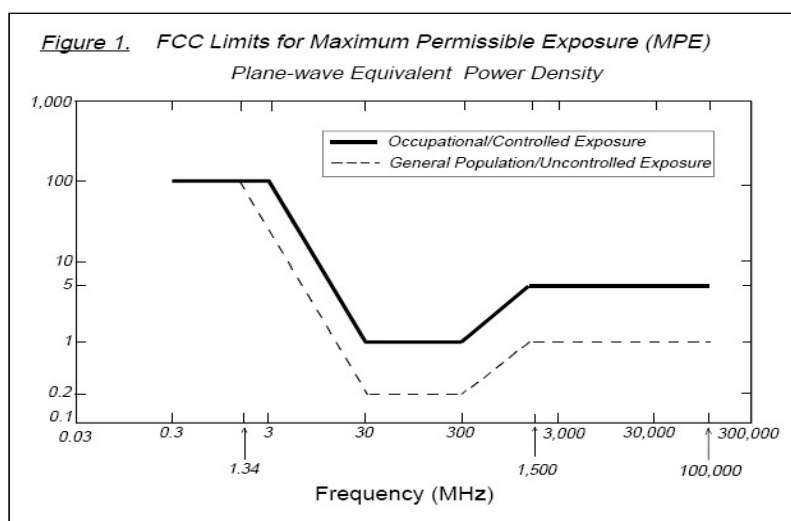
The FCC mandates that if a site is found to be out of compliance with regard to exposure, any system operator contributing 5% or more to areas exceeding the FCC's allowable limits will be responsible for bringing the site into compliance.

Additional details can be found in FCC OET 65.

Table 1: 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

11/27/2023

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

11/27/2023

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.

The map shows the Smith Center area in Boston, with streets including Church St, Brattle St, Dunster St, Holyoke St, and Mt Auburn St. The Smith Center Plaza, Smith Center Rear, and Harvard Square are labeled. A red line with blue arrows indicates a route starting from the Smith Center Rear, going north on Dunster St, then east on Harvard Sq, and finally south on Holyoke St.

1350 Mass Ave

Petitioner

160-14-74-37
PRESIDENT AND FELLOWS OF HARVARD COLLEGE
HOLYOKE CENTER, ROOM 1017
1350 MASS AVENUE
CAMBRIDGE, MA 02138-3895

159-1 / 162-11 / 161-1
PRESIDENT & FELLOWS OF HARVARD COLLEGE
C/O HARVARD REAL ESTATE, INC.
HOLYOKE CENTER, ROOM 1000
1350 MASSACHUSETTS AVE
CAMBRIDGE, MA 02138-3895

CENTERLINE COMMUNICATIONS
C/O ALLISON CONWELL, AGENT
750 W CENTER STREET #301
WEST BRIDGEWATER, MA 02379

160-77
HARVARD STUDENT AGENCIES, INC
67 MT. AUBURN ST
CAMBRIDGE, MA 02138

160-83
PLATIN LLC
15 WALNUT ST., SUITE 150
WELLESLEY, MA 02481

160-84
22 HOLYOKE STREET LLC
ONE APPLE RD
BEVERLY, MA 01915

162-62
76 MOUNT AUBURN STREET, INC.
C/O NED BANNON
76 MOUNT AUBURN ST
CAMBRIDGE, MA 02138

160-38
HARVARD UNIVERSITY REAL ESTATE INC.
HOLYOKE CENTER - ROOM 1000
1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02138

162-67
45 DUNSTER STREET LLC
2 HOLYOKE PLACE
CAMBRIDGE, MA 02138

160-58
CAMBRIDGE SAVINGS BANK
81 WYMAN ST
WALTHAM, MA 02451

160-59
DANA CHAMBERS ALLIANCE
FACILITIES DEPARTMENT
81 WYMAN ST
WALTHAM, MA 02451

1160-11
TRINITY REALTY LIMITED PARTNERSHIP I
P.O. BOX 380212
CAMBRIDGE, MA 02238

160-85
P.C. HOLYOKE STREET, LLC,
160 FEDERAL ST. 9TH FL
BOSTON, MA 02110

162-10
SIGNET ASSOCIATES
46 DUNSTER ST
CAMBRIDGE, MA 02138

160-14
PRESIDENT & FELLOW OF HARVARD HARVARD
UNIVERSITY R.E. DEPT
HOLYOKE CENTER., ROOM 451
1350 MASS AVE
CAMBRIDGE, MA 02138-3895

160-76
WHOLEY, FREDERICK R.,
TRS OF THE FREDERICK R. WHOLEY TRS
15 ANIS ROAD
BELMONT, MA 02478

159-2
CITY OF CAMBRIDGE
C/O YI-AN HUANG
CITY MANAGER

159-2
CITY OF CAMBRIDGE
C/O MEGAN BAYER
CITY SOLICITOR