CITY OF CAMBRIDGE

BOARD OF ZONING APPEAL

831 Massachusetts Avenue, Cambridge MA 02139

617-349-6100

2024 OCT 28 PM 3:41

OFFICE OF THE CITY CLERK
CAMBRIDGE, MASSACHUSETTS

BZA Application Form

BZA Number: 1139918

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 C/O Cellco Partnership d/b/a Verizon Wireless

PETITIONER'S ADDRESS: c/o 1441 Main Street, Suite 1100, Springfield, MA 01103

LOCATION OF PROPERTY: **1350 Massachusetts Ave , Cambridge, MA**

TYPE OF OCCUPANCY: Retail - Store **ZONING DISTRICT:** Business B Zone

REASON FOR PETITION:

/Telecommunication Facility (antenna)/

DESCRIPTION OF PETITIONER'S PROPOSAL:

To accommodate new wireless technologies and wireless service needs of the surrounding community, Verizon Wireless proposes to REMOVE two (2) existing LTE antennas and hardware from the existing Alpha Sector, one (1) existing Alpha Sector 6 x 12 hybrid cable and one (1) existing Alpha Sector 6-OVP, and INSTALL one (1) new MS-6.3-DB90-T antenna to the proposed heavy duty wall bracket, seven (7) new RRHS inside of the existing penthouse, two (2) new Alpha Sector 12-OVP, two (2) new Alpha Sector 6 x 12 hybrid cables, as well as updated support equipment and cables as shown in greater detail on the Plans. No additional changes are proposed for the modification.

SECTIONS OF ZONING ORDINANCE CITED:

Article: 4.000 Section: 4.32.G.1 & Section 4.40 (Footnote 49)(Telecommunication Facility)
Article: 10.000 Section: 10.40 - 10.46 (Special Permits)
Article: 6409 Section: Federal Middle Class Tax Relief Act (Spectrum Act)

Original Signature(s): _____

(Petitioner (s) / Owner)

Brett Smith, Esq. as Authorized Agent
(Print Name) for Cellco Partnership

Address: 1441 Main Street, Suite 1100, Springfield, MA 01103
Tel. No. 413-737-1131

BZA APPLICATION FORM - OWNERSHIP INFORMATION

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

I/We President and Fellows of Harvard College
(OWNER)

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

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

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

*Pursuant to a deed of duly recorded in the date 12/22/2004, Middlesex South County Registry of Deeds at Book 44353, Page 481; or Middlesex Registry District of Land Court, Certificate No. _____ Book _____ Page _____.

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

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

Commonwealth of Massachusetts, County of Middlesex

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

Erika M. Roberts Notary

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

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

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

BZA Application Form

SUPPORTING STATEMENT FOR A SPECIAL PERMIT

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

Granting the Special Permit requested for 1350 Massachusetts Ave , Cambridge, MA (location) would not be a detriment to the public interest because:

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

As required by Verizon Wireless's license from the Federal Communications Commission ("FCC"), the upgraded facility will conform with the requirements of the FCC. The installation has been designed in a manner which will minimize any visual impacts to the surrounding properties and community and has been designed and camouflaged to provide minimal visibility on the structure on which it is located. The proposed modification to the existing facility is not inconsistent with the character that prevails in the surrounding neighborhood nor is it inconsistent with the requirements of the Zoning Ordinance pursuant to the previously issued Special Permit for the existing installation and use.

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:

The upgraded facility will have no effect on existing traffic or patterns of ingress or egress. The facility only generates about one or two vehicle trips per month by a standard passenger vehicle during normal business hours for routine maintenance.

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 upgraded facility will not adversely impact any operations of adjacent uses. There will be no emissions of light, odor, dust or glare and it will not generate any unusual noise or other adverse impacts. Instead, the facility will benefit the adjacent uses by enhancing wireless coverage in the area surrounding the installation.

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

The upgraded facility will create no nuisance, hazard, or any other negative impacts on the people or properties within the City of Cambridge. There will be no traffic, noise, light, odor or any other potentially negative impact generated from the upgraded facility. The upgraded facility will only provide the community with increased wireless service and enhance the health, safety, and welfare of the residents of the City of Cambridge.

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 upgraded facility is designed to minimize any potential visual impact to the surrounding properties and in no way impairs, but rather aligns with the purpose and intent of the Zoning

Ordinance.

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

E-Mail Address: bsmith@ssfpc.com

Date: _____

BZA Application Form

DIMENSIONAL INFORMATION

Applicant: President and Fellows of Harvard College
Location: 1350 Massachusetts Ave , Cambridge, MA
Phone: 413-737-1131

Present Use/Occupancy: Retail - Store
Zone: Business B Zone
Requested Use/Occupancy: Retail - Store

		Existing Conditions		Requested Conditions		Ordinance Requirements	
TOTAL GROSS FLOOR AREA:		N/A		N/A		N/A	(max.)
LOT AREA:		N/A		N/A		N/A	(min.)
RATIO OF GROSS FLOOR AREA TO LOT AREA: [2]		N/A		N/A		N/A	
LOT AREA OF EACH DWELLING UNIT		N/A		N/A		N/A	
SIZE OF LOT:	WIDTH	N/A		N/A		N/A	
	DEPTH	N/A		N/A		N/A	
SETBACKS IN FEET:	FRONT	N/A		N/A		N/A	
	REAR	N/A		N/A		N/A	
	LEFT SIDE	N/A		N/A		N/A	
	RIGHT SIDE	N/A		N/A		N/A	
SIZE OF BUILDING:	HEIGHT	195' - 6" (highest appurtenance)		No Change		N/A	
	WIDTH	N/A		N/A		N/A	
	LENGTH	N/A		N/A		N/A	
RATIO OF USABLE OPEN SPACE TO LOT AREA:		N/A		N/A		N/A	
NO. OF DWELLING UNITS:		N/A		N/A		N/A	
NO. OF PARKING SPACES:		N/A		N/A		N/A	
NO. OF LOADING AREAS:		N/A		N/A		N/A	
DISTANCE TO NEAREST BLDG. ON SAME LOT		N/A		N/A		N/A	

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.:

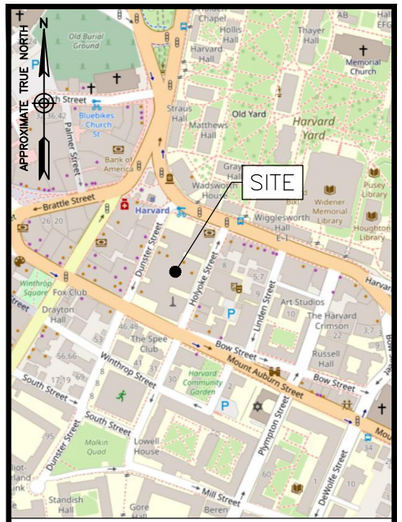
Not Applicable.

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'.

HARVARD SQ MA

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139

FUZE PROJECT ID: 16984516
PSLC: 137338



VICINITY MAP N.T.S.

ENGINEER

DEWBERRY ENGINEERS INC.
99 SUMMER ST.
SUITE 700
BOSTON, MA 02110

PHONE # (617) 531-0800

CONTACT: BENJAMIN REVETTE, PE

CONSTRUCTION

VERIZON WIRELESS
51 ALDER STREET
MEDWAY, MA 02053

BUILDING OWNER

PRESIDENT AND FELLOWS OF HARVARD COLLEGE
HOLYOKE CENTER, ROOM 1017
CAMBRIDGE, MA 02138

COORDINATES*:

LATITUDE: 42° 22' 22.35" N
LONGITUDE: 71° 07' 07.19" W
*PER RFDS

GROUND ELEVATION*:

19'±
*PER GOOGLE EARTH

PROJECT TEAM

PMI ACCESSED AT:	N/A
SMART TOOL VENDOR PROJECT NUMBER:	N/A
VZW LOCATION CODE (PSLC):	137338
FUZE NUMBER:	16984516
MOUNT MODIFICATION REQUIRED?	YES

CONTRACTOR PMI REQUIREMENTS

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

A.D.A. COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

- REMOVE (2) EXISTING LTE ANTENNAS AND HARDWARE FROM ALPHA SECTOR.
- INSTALL (1) NEW MS-6.3-DB90-T ANTENNA TO PROPOSED HEAVY DUTY WALL BRACKET.
- INSTALL (7) NEW RRHS INSIDE EXISTING PENTHOUSE TO NEW UNISTRUTS.
- REMOVE (1) EXISTING ALPHA SECTOR 6X12 HYBRID CABLE.
- REMOVE (1) EXISTING ALPHA SECTOR 6-OVP.
- INSTALL (2) NEW ALPHA SECTOR 12-OVP.
- INSTALL (2) NEW ALPHA SECTOR 6X12 HYBRID CABLES.
- INSTALL NEW JUMPER CABLES AS REQUIRED BY RFDS.

NOTE:

1. SCOPE OF WORK BASED ON ANTENNA REC FOR HARVARD SQ MA DATED 03/12/24. VERIFY SCOPE OF WORK WITH FINAL RFDS PRIOR TO CONSTRUCTION.

SCOPE OF WORK

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
C-1	ROOF PLAN
C-2	EXISTING & PROPOSED ANTENNA PLANS
C-3	WEST ELEVATION
C-4	CONSTRUCTION DETAILS
C-5	FINAL EQUIPMENT CONFIGURATION

SHEET INDEX

verizon WIRELESS

VERIZON WIRELESS
51 ALDER STREET
MEDWAY, MA 02053

HARVARD SQ MA

ANTMO DRAWINGS		
2	03/14/24	FOR SUBMITTAL
1	02/12/24	FOR SUBMITTAL
0	02/02/24	FOR SUBMITTAL

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

COMMONWEALTH OF MASSACHUSETTS
BENJAMIN B. REVETTE
CIVIL
No. 49220
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY:	03/14/2024 JG
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50170381

SITE NUMBER

137338

SITE ADDRESS

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL CONSTRUCTION NOTES :

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, AND COMPLY WITH VERIZON WIRELESS SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT "DIG SAFE" (888-344-7233) FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR WILL NOTIFY ENGINEER, VERIZON WIRELESS PROJECT CONSTRUCTION MANAGER, AND LANDLORD IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. ALL ROOF WORK SHALL BE DONE BY A QUALIFIED AND EXPERIENCED ROOFING CONTRACTOR IN COORDINATION WITH ANY CONTRACTOR WARRANTING THE ROOF TO ENSURE THAT THE WARRANTY IS MAINTAINED.
17. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
18. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
19. CONTRACTOR SHALL FURNISH VERIZON WIRELESS WITH THREE AS-BUILT SETS OF DRAWINGS UPON COMPLETION OF WORK.
20. ANTENNAS AND CABLES ARE TYPICALLY PROVIDED BY VERIZON WIRELESS. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH PROJECT MANAGER TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED BY VERIZON WIRELESS. ALL ITEMS NOT PROVIDED BY VERIZON WIRELESS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED BY VERIZON WIRELESS.
21. PRIOR TO SUBMISSION OF BID, CONTRACTOR WILL COORDINATE WITH VERIZON WIRELESS PROJECT MANAGER TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY VERIZON WIRELESS. ALL REQUIRED PERMITS NOT OBTAINED BY VERIZON WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
22. GENERAL CONTRACTOR SHALL HAVE A LICENSED HVAC CONTRACTOR START THE HVAC UNITS, SYNCHRONIZE THE THERMOSTATS, ADJUST ALL SETTINGS ON EACH UNIT ACCORDING TO VERIZON WIRELESS CONSTRUCTION MANAGER'S SPECIFICATIONS, AND THOROUGHLY TEST AND BALANCE EACH UNIT TO ENSURE PROPER OPERATION PRIOR TO TURNING THE SITE OVER TO OWNER.
23. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH VERIZON WIRELESS SPECIFICATIONS AND REQUIREMENTS.
24. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
25. UNLESS OTHERWISE NOTED VERIZON WIRELESS SHALL PROVIDE ALL REQUIRED RF MATERIAL FOR CONTRACTOR TO INSTALL, INCLUDING ANTENNAS, TMA'S, BIAS-T'S, COMBINERS, PDU, DC BLOCKS, SURGE ARRESTORS, GPS ANTENNA, GPS SURGE ARRESTOR, COAXIAL CABLE.
26. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL VERIFY ALL EQUIPMENT TO BE PROVIDED BY VERIZON WIRELESS FOR INSTALLATION BY CONTRACTOR.
27. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO VERIZON WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
28. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
29. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
30. CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS IN ADVANCE PRIOR TO CONSTRUCTION START, MORE SPECIFICALLY BEFORE; SEALING ANY FLOOR, WALL OR ROOF PENETRATION, FINAL UTILITY CONNECTIONS, POURING CONCRETE, BACKFILLING UTILITY TRENCHES AND STRUCTURAL POST OR MOUNTING CONNECTIONS, FOR ENGINEERING REVIEW AND INSPECTION.
31. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED D FIRE CODE APPROVED MATERIALS.
32. REPAIR ANY DAMAGE DURING CONSTRUCTION TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE CONSTRUCTION MANAGER AND LANDLORD.
33. ALL DISRUPTIVE WORK AND WORK WITHIN TENANT SPACES TO BE COORDINATED WITH BUILDING REPRESENTATIVE.

CODE SPECIFICATIONS:

1. ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

   MASSACHUSETTS STATE BUILDING CODE, 9TH EDITION, CONSISTENT WITH THE FOLLOWING CODES:
   2015 INTERNATIONAL RESIDENTIAL CODE (IRC)
   2015 INTERNATIONAL BUILDING CODE (IBC)
   2015 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
   2023 NATIONAL ELECTRICAL CODE (NEC)

   IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL.
2. ALL STRUCTURAL WORK TO BE DONE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL, 13TH EDITION (AISC 13TH ED.)
3. ALL CONCRETE WORK TO BE DONE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE (ACI 301) SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 318) AND BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
4. ALL REINFORCING STEEL WORK TO BE DONE IN ACCORDANCE WITH THE (ACI 315) MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.

GROUNDING NOTES:

1. GROUNDING SHALL COMPLY WITH NEC ART. 250.
2. GROUNDING CONDUCTORS SHALL BE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR INDOOR USE.
3. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
4. ROUTE GROUNDING CONNECTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NOT BE BENT AT RIGHT ANGLE. ALWAYS MAKE 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY.
5. CONNECTIONS TO GROUNDING BAR SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
6. TEST COMPLETED GROUNDING SYSTEM AND RECORD RESISTANCE VALUES FOR PROJECT CLOSE-OUT DOCUMENTATION. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS.
7. GROUNDING CONDUCTORS BETWEEN MGB AND WATERMAIN SHALL BE #2/0. BONDING JUMPERS FROM METALLIC SURFACES SHALL BE #2 MINIMUM. ALL GROUND CONDUCTORS AND BONDING JUMPERS SHALL BE SOFT DRAWN ANNEALED, TINNED, BARE STRANDED COPPER WIRE. COAXIAL CABLES SHALL BE GROUNDED AT A MINIMUM OF TWO LOCATIONS USING VERIZON PROVIDED GROUNDING KITS. EXACT LOCATIONS SHALL BE FINALIZED IN THE FIELD BY THE CONSTRUCTION MANAGER.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES, AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:

ASTM A-992, GRADE 50	ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE.
ASTM A-36	ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
ASTM A-500, GRADE B	HSS SECTION (SQUARE, RECTANGULAR, ROUND)
ASTM A-325, TYPE SC OR N	ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS.
F1554, GRADE 36	ALL ANCHORS BOLTS, UNLESS NOTED OTHERWISE.
ASTM A-53, GRADE B	STEEL PIPE

3. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION. WHERE WELD LENGTH IS NOT INDICATED, USE FULL LENGTH WELD. AT THE COMPLETION OF ALL WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
4. BOLTED CONNECTIONS SHALL USE BEARING TYPE GALVANIZED ASTM A325 BOLTS (3/4" DIA.) SUPPLIED WITH A NUT AND WASHER UNDER TURNED END AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. GALVANIZED ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
7. USE PRECAUTIONS & PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED METALS.
8. ALL EXISTING BEAM AND COLUMN DIMENSIONS SHALL BE FIELD VERIFY BY CONTRACTOR PRIOR TO FABRICATION. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THOSE SHOWN SHALL BE REPORTED TO DEWBERRY ENGINEER IMMEDIATELY.
9. CONNECTION DESIGN BY FABRICATOR WILL BE SUBJECT TO REVIEW AND APPROVAL BY ENGINEER.
10. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH SPECIFICATION ASTM A123/A123M-00 HOT-DIP GALVANIZED FINISH UNLESS OTHERWISE NOTED. GALVANIZING SHALL BE PERFORMED AFTER SHOP FABRICATION TO THE GREATEST EXTENT POSSIBLE. ALL DINGS, SCRAPES, MARS, AND WELDS IN THE GALVANIZED AREAS SHALL BE REPAIRED. REPAIR DAMAGED GALVANIZED COATINGS ON GALVANIZED ITEMS WITH GALVANIZED REPAIR PAINT ACCORDING TO ASTM A780 AND MANUFACTURER'S WRITTEN INSTRUCTIONS, PRIOR TO COMPLETION OF WORK. TOUCHUP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCHUP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.
11. ALL WELDED COMPONENTS TO BE SHOP WELDED PRIOR TO INSTALLATION. NO WELDING ACTIVITIES IS PERMITTED DURING INSTALLATION OF PROPOSED EQUIPMENT5 AND/OR HARDWARE ON SITE.

verizon WIRELESS

VERIZON WIRELESS
51 ALDER STREET
MEDWAY, MA 02053

HARVARD SQ MA

ANTMO DRAWINGS		
2	03/14/24	FOR SUBMITTAL
1	02/12/24	FOR SUBMITTAL
0	02/02/24	FOR SUBMITTAL

Dewberry®

Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

COMMONWEALTH OF MASSACHUSETTS
BENJAMIN B. REVETTE
CIVIL
No. 49220
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY:	03/14/2024 JG
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50170381
SITE NUMBER	

137338

SITE ADDRESS

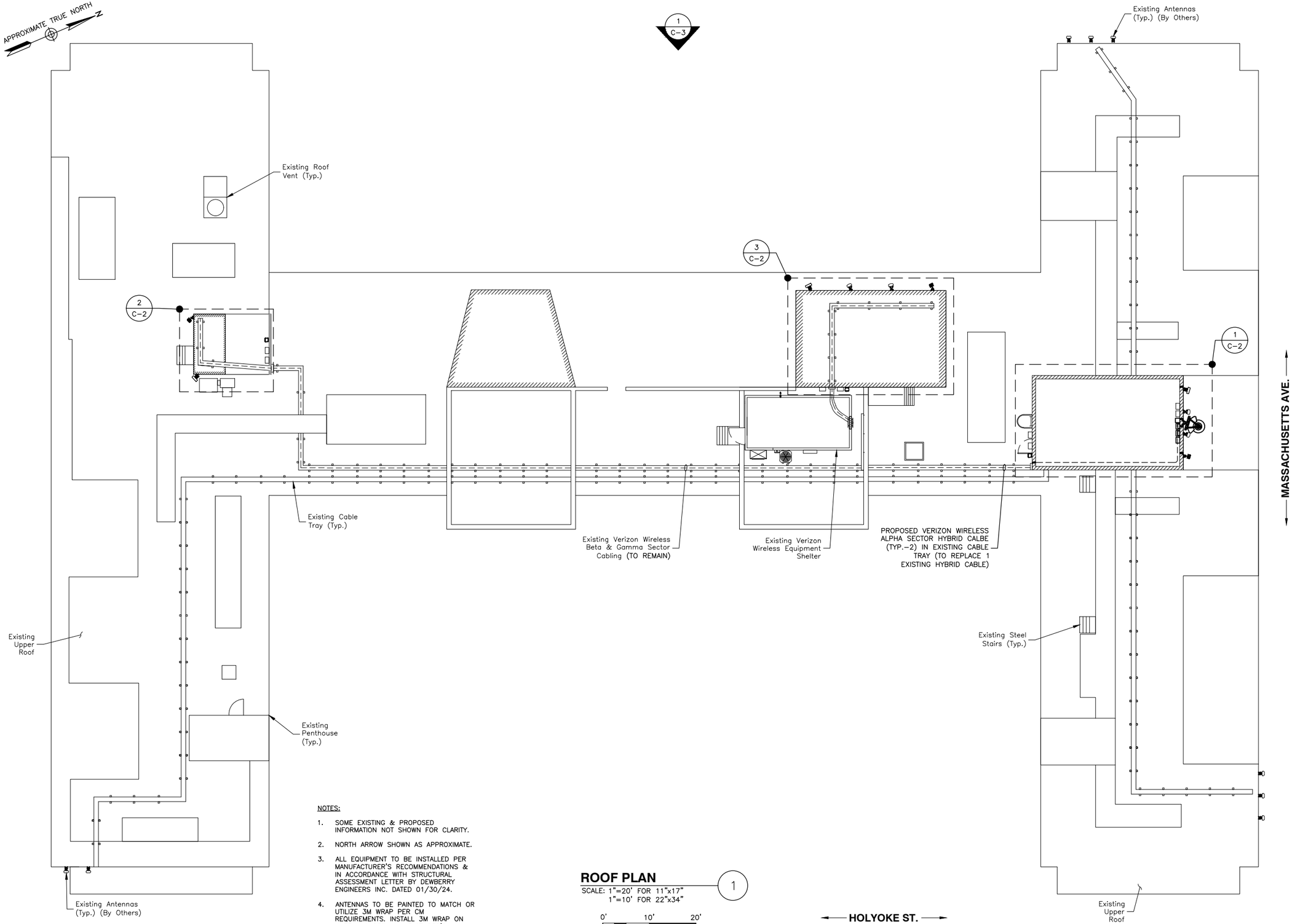
1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-1



NOTES:

1. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
2. NORTH ARROW SHOWN AS APPROXIMATE.
3. ALL EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS & IN ACCORDANCE WITH STRUCTURAL ASSESSMENT LETTER BY DEWBERRY ENGINEERS INC. DATED 01/30/24.
4. ANTENNAS TO BE PAINTED TO MATCH OR UTILIZE 3M WRAP PER CM REQUIREMENTS. INSTALL 3M WRAP ON ANTENNAS PER MANUFACTURER'S SPECIFICATION & RECOMMENDATIONS.

ROOF PLAN 1

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

verizon WIRELESS

VERIZON WIRELESS
51 ALDER STREET
MEDWAY, MA 02053

HARVARD SQ MA

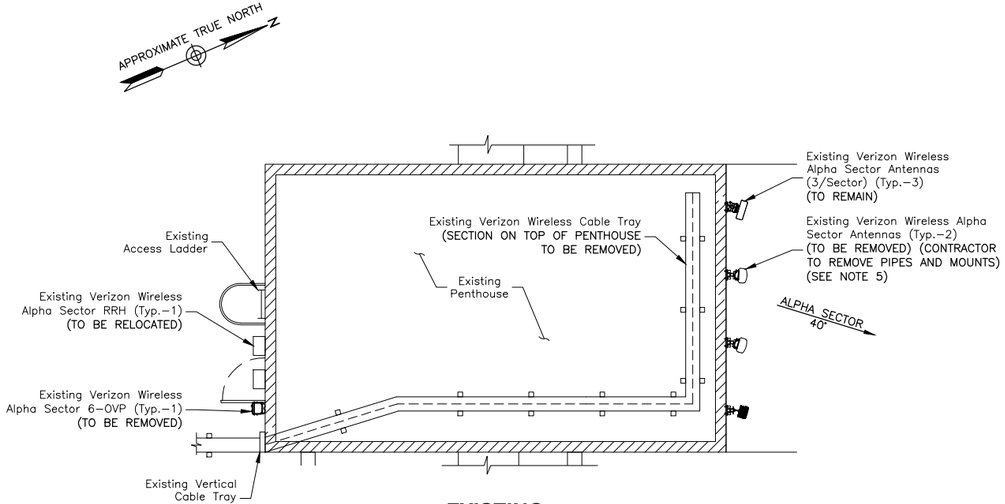
ANTMO	DRAWINGS	
2	03/14/24	FOR SUBMITTAL
1	02/12/24	FOR SUBMITTAL
0	02/02/24	FOR SUBMITTAL

Dewberry®

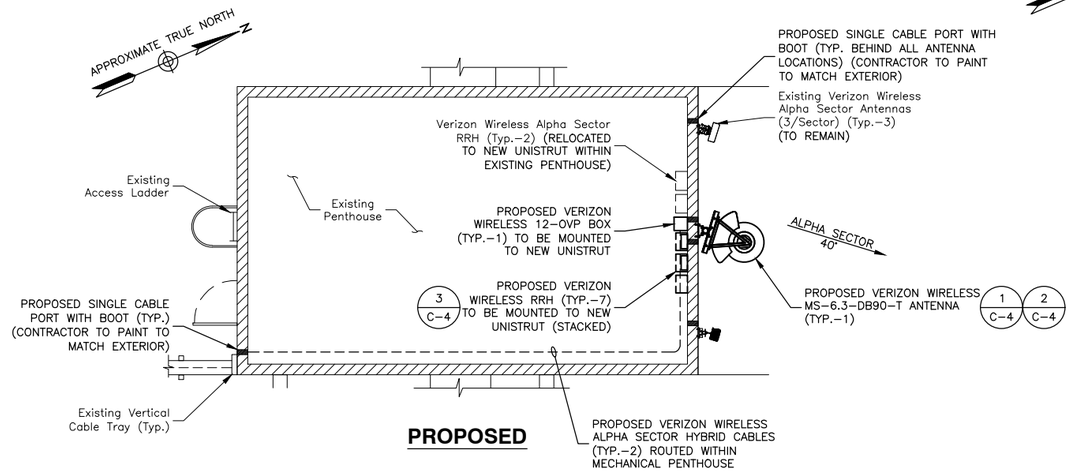
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

COMMONWEALTH OF MASSACHUSETTS
BENJAMIN B. REVETTE
CIVIL
No. 40220
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY: 03/14/2024 JG
REVIEWED BY: CDH
CHECKED BY: BBR
PROJECT NUMBER: 50121487
JOB NUMBER: 50170381
SITE NUMBER
137338
SITE ADDRESS
1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139
SHEET TITLE
ROOF PLAN
SHEET NUMBER
C-1



EXISTING



PROPOSED

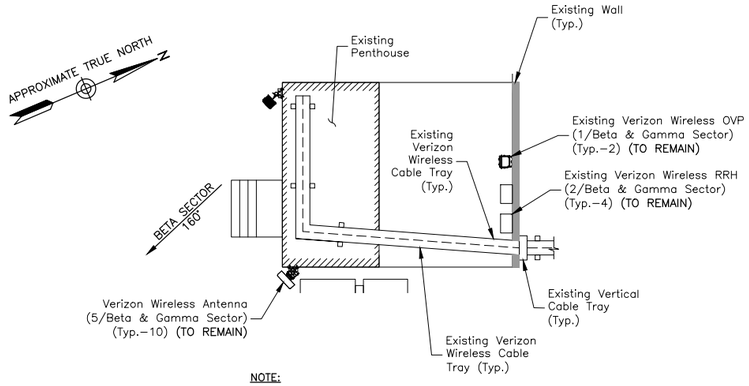
NOTES:

1. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
2. NORTH ARROW SHOWN AS APPROXIMATE.
3. ALL EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS & IN ACCORDANCE WITH STRUCTURAL ASSESSMENT LETTER BY DEWBERRY ENGINEERS INC. DATED 01/30/24.
4. ANTENNAS TO BE PAINTED TO MATCH OR UTILIZE 3M WRAP PER CM REQUIREMENTS. INSTALL 3M WRAP ON ANTENNAS PER MANUFACTURER'S SPECIFICATION & RECOMMENDATIONS.
5. CONTRACTOR TO REMOVE EXISTING ANTENNA PIPES AND MOUNTING HARDWARE. CUT EXISTING ANCHORS FLUSH WITH BUILDING FACADE AND WEATHERSEAL. PAINT OVER FINISHED WEATHERSEALING TO MATCH EXISTING FACED.

ALPHA SECTOR 1

SCALE: 3/32"=1' FOR 11"x17"
3/16"=1' FOR 22"x34"

0' 4' 8' 12'



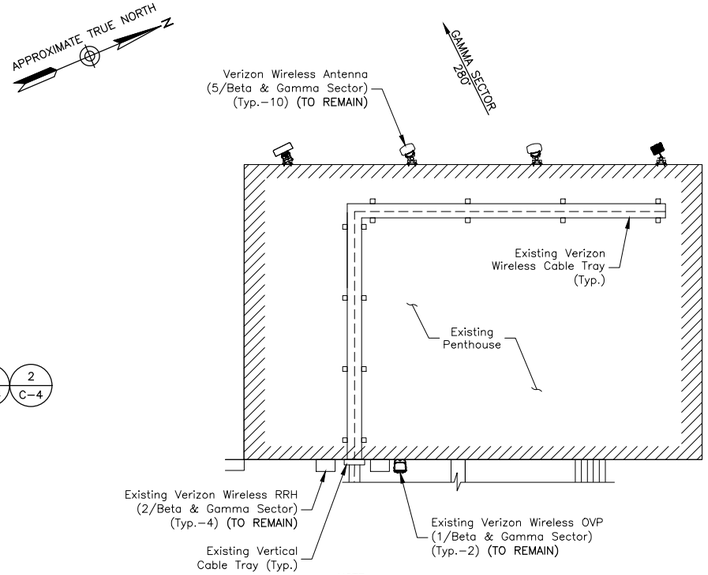
NOTE:

1. NO CHANGES ARE PROPOSED FOR BETA SECTOR.

EXISTING BETA SECTOR 2

SCALE: 3/32"=1' FOR 11"x17"
3/16"=1' FOR 22"x34"

0' 4' 8' 12'



NOTE:

1. NO CHANGES ARE PROPOSED FOR GAMMA SECTOR.

EXISTING GAMMA SECTOR 3

SCALE: 3/32"=1' FOR 11"x17"
3/16"=1' FOR 22"x34"

0' 4' 8' 12'

verizon WIRELESS

VERIZON WIRELESS
51 ALDER STREET
MEDWAY, MA 02053

HARVARD SQ MA

ANTMO	DRAWINGS	
2	03/14/24	FOR SUBMITTAL
1	02/12/24	FOR SUBMITTAL
0	02/02/24	FOR SUBMITTAL

Dewberry®

Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

DRAWN BY:	03/14/2024 JG
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50170381
SITE NUMBER	

137338

SITE ADDRESS

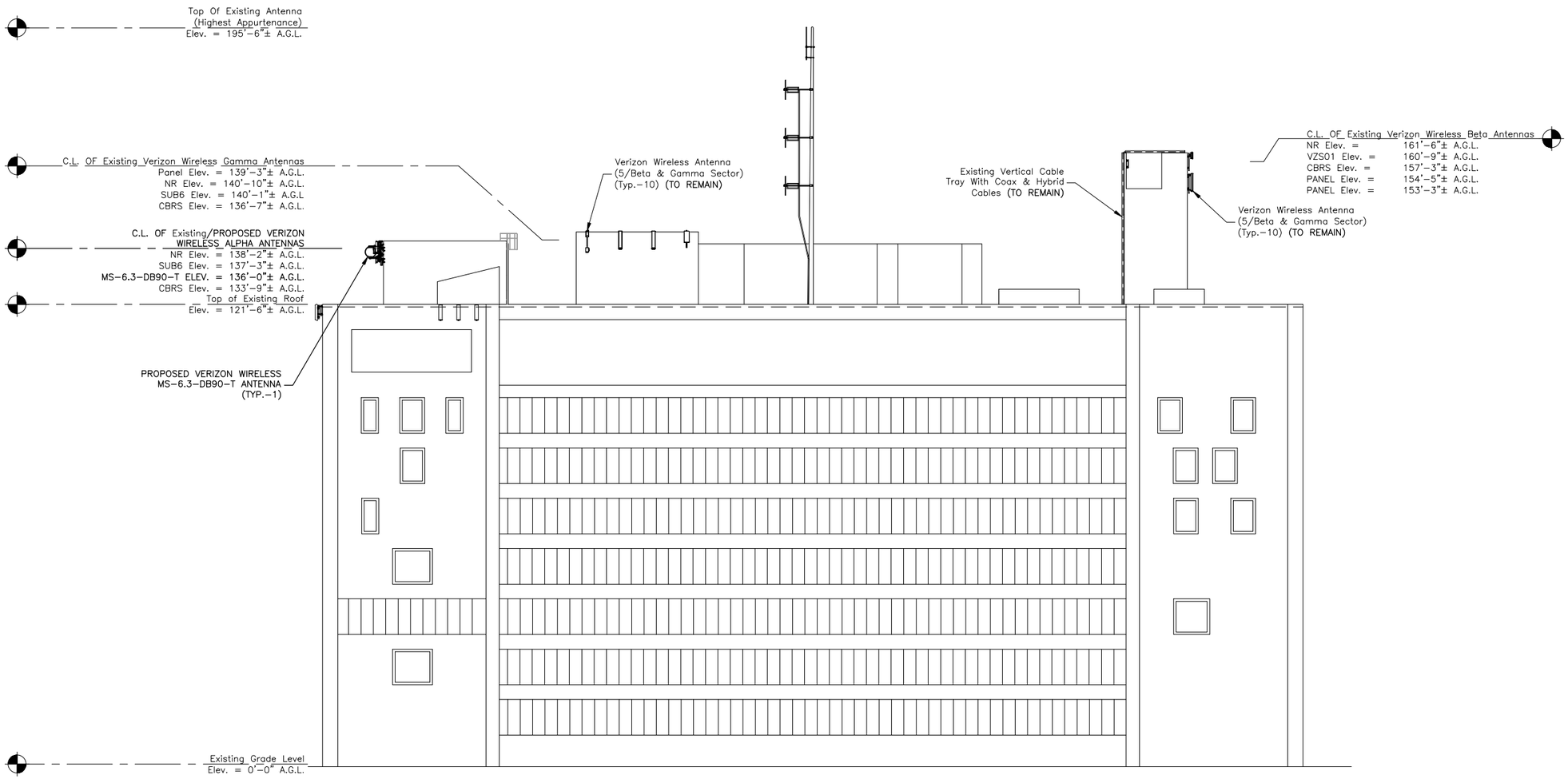
1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139

SHEET TITLE

EXISTING & PROPOSED ANTENNA PLANS

SHEET NUMBER

C–2



WEST ELEVATION

1

SCALE: 1/32"=1' FOR 11"x17"
1/16"=1' FOR 22"x34"

0' 8' 16' 32'

NOTES:

1. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
2. ELEVATION SHOWN AS APPROXIMATE.
3. ALL EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS & IN ACCORDANCE WITH STRUCTURAL ASSESSMENT LETTER BY DEWBERRY ENGINEERS INC. DATED 01/30/24.
4. ANTENNAS TO BE PAINTED TO MATCH OR UTILIZE 3M WRAP PER CM REQUIREMENTS. INSTALL 3M WRAP ON ANTENNAS PER MANUFACTURER'S SPECIFICATION & RECOMMENDATIONS.

verizon WIRELESS

VERIZON WIRELESS
51 ALDER STREET
MEDWAY, MA 02053

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ANTMO DRAWINGS		
2	03/14/24	FOR SUBMITTAL
1	02/12/24	FOR SUBMITTAL
0	02/02/24	FOR SUBMITTAL

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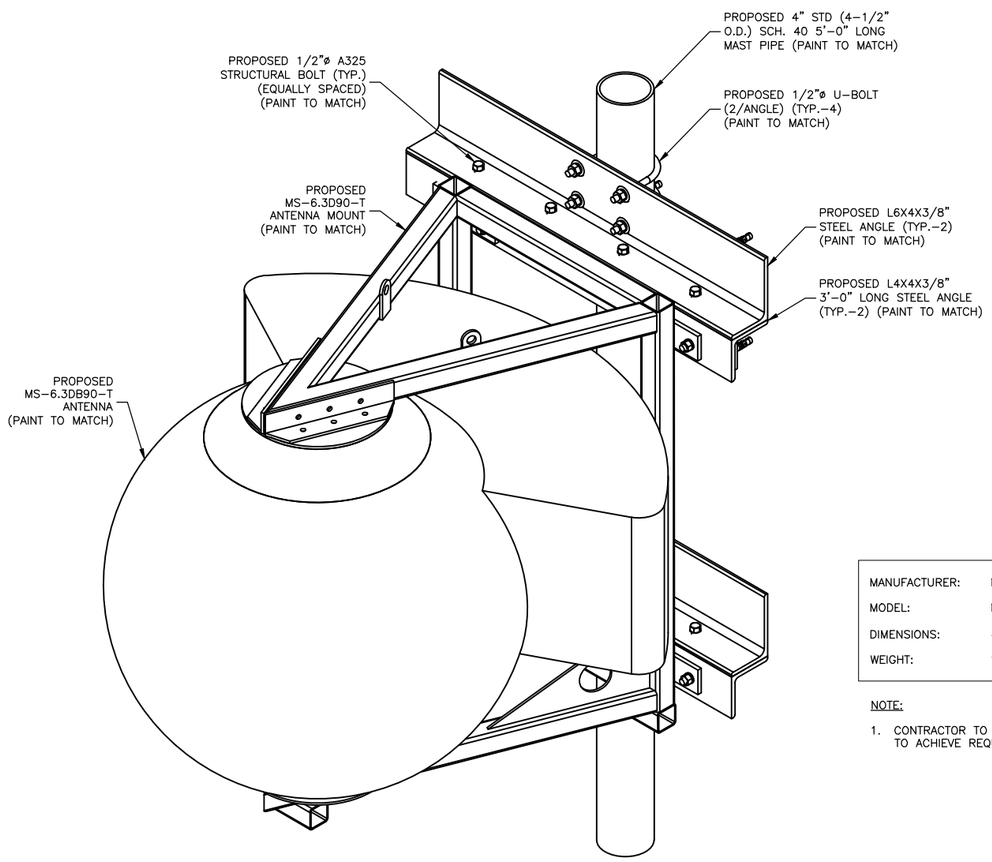
FAX: 617.695.3310

COMMONWEALTH OF MASSACHUSETTS
BENJAMIN B. REVETTE
CIVIL
No. 49220
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY: 03/14/2024 JG
REVIEWED BY: CDH
CHECKED BY: BBR
PROJECT NUMBER: 50121487
JOB NUMBER: 50170381
SITE NUMBER
137338
SITE ADDRESS
1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139
SHEET TITLE
WEST ELEVATION
SHEET NUMBER
C-3



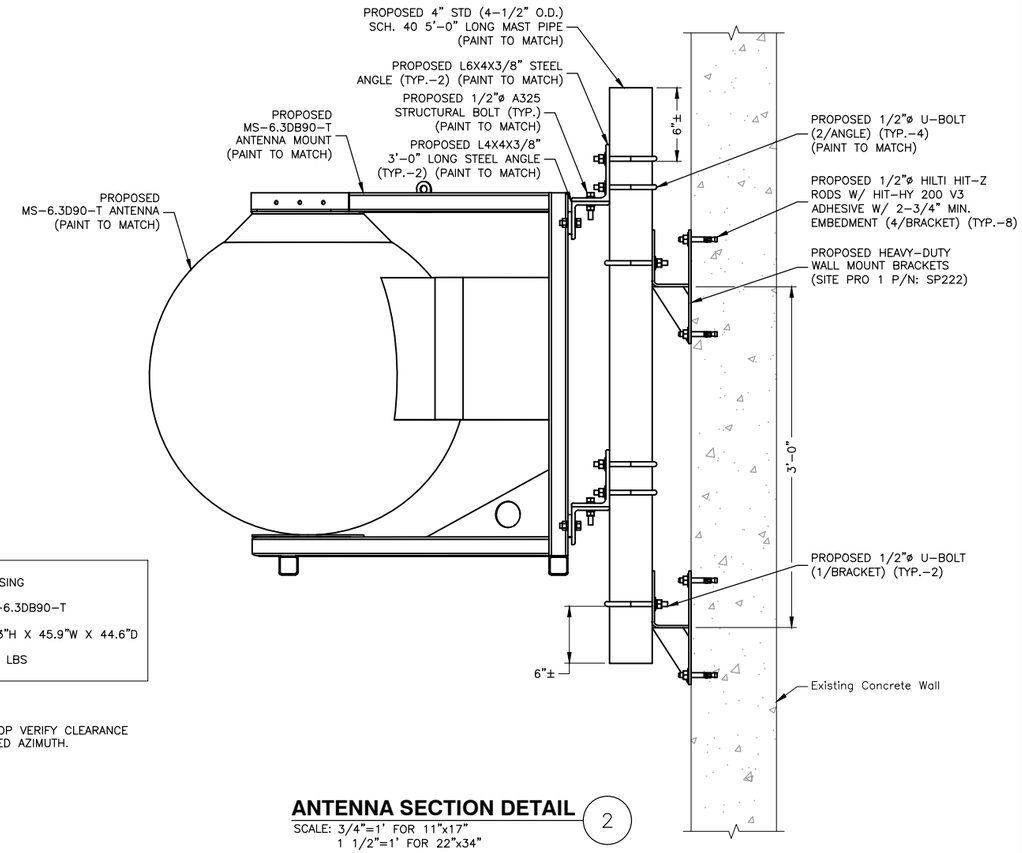
ANTENNA ISOMETRIC DETAIL 1

SCALE: N.T.S.

MANUFACTURER:	MATSING
MODEL:	MS-6.3DB90-T
DIMENSIONS:	40.3"H X 45.9"W X 44.6"D
WEIGHT:	117 LBS

NOTE:

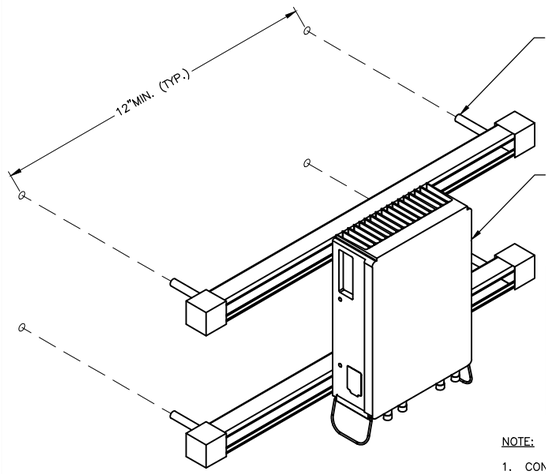
1. CONTRACTOR TO SHOP VERIFY CLEARANCE TO ACHIEVE REQUIRED AZIMUTH.

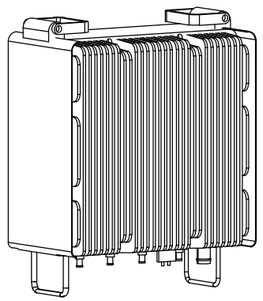


ANTENNA SECTION DETAIL 2

SCALE: 3/4"=1' FOR 11"x17"
1 1/2"=1' FOR 22"x34"

0' 1/2' 1' 1 1/2'





PROPOSED LTE 700/850	
MANUFACTURER:	SAMSUNG
MODEL:	700/850 MACRO RADIO RF4442d-13A
DIMENSIONS:	13.8"H X 11.9"W X 5.4"D
WEIGHT:	34.2 LBS

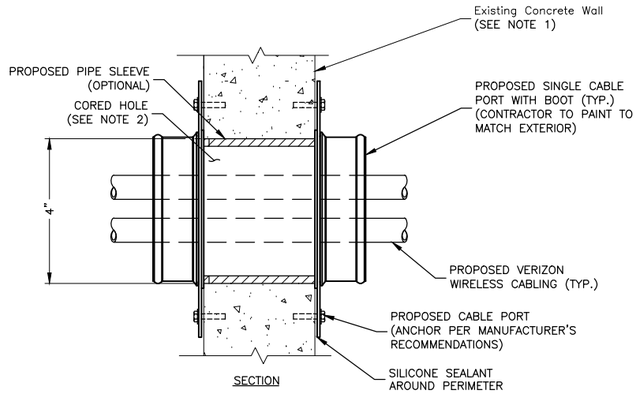
PROPOSED LTE AWS/PCS	
MANUFACTURER:	SAMSUNG
MODEL:	AWS/PCS MACRO RADIO RF44439d-25A
DIMENSIONS:	14.9"H X 14.9"W X 10.0"D
WEIGHT:	74.7 LBS

NOTE:

1. CONTRACTOR TO VERIFY WITH CONSTRUCTION MANAGER FOR FINAL MANUFACTURER SPECIFICATIONS PRIOR TO CONSTRUCTION.

RRH DETAILS 3

SCALE: N.T.S.



NOTES:

1. CONTRACTOR TO REPAIR ALL SPALLING CONCRETE IN THE AREAS OF THE CONCRETE CORES WITH EUCLID EURO REPAIR V100 MORTAR. CONTRACTOR TO PAINT TO MATCH.
2. CONTRACTOR TO DRILL NEW CORES BEHIND ANTENNAS TO MINIMIZE NEW CORE HOLE VISIBILITY FROM GRADE.

CONCRETE CORE DETAIL 4

SCALE: N.T.S.

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VERIZON WIRELESS
51 ALDER STREET
MEDWAY, MA 02053

HARVARD SQ MA

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1	02/12/24	FOR SUBMITTAL
0	02/02/24	FOR SUBMITTAL

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SUITE 700
BOSTON, MA 02110
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FAX: 617.695.3310

COMMONWEALTH OF MASSACHUSETTS
BENJAMIN B. REVETTE
CIVIL
No. 40220
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY:	03/14/2024 JG
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50170381
SITE NUMBER	

137338

SITE ADDRESS

1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139

SHEET TITLE

CONSTRUCTION DETAILS

SHEET NUMBER

C-4

FINAL EQUIPMENT CONFIGURATION

SECTOR	POSITION	TECHNOLOGY	ANTENNA MODEL	VENDOR	RRH (QTY./MODEL)	CENTERLINE	AZIMUTH	OVP	HYBRID CABLE TYPE	FEED LINE LENGTH*
ALPHA	A1	5G	(E) MT6407-77A	SAMSUNG	-	137'-3"±	40°	(1) (P) 12-OVP BOX TO REPLACE EXISTING	(2) (P) 6X12 HYBRID CABLE TO REPLACE EXISTING	210'±
	A2	5G LTE	(P) MS-6.3-DB90-T	MATSING	(1) (E) B2/B66A RFV01U-D1A (1) (E) B5/B13 RFV01U-D2A (2) (P) RF4442d-13A (5) (P) B2/B66 RF4439d-25A	136'-0"±	40°			
	A3	5G	(E) VZ-AT1K04	SAMSUNG	-	138'-2"±	40°			
	A4	CBRS LTE	(E) XXDWMM-12.5-65	SAMSUNG	-	133'-9"±	40°			
BETA	B1	5G	(E) MT6407-77A	SAMSUNG	-	160'-9"±	160°	(1) (E) OVP BOX TO REMAIN	(1) (E) 6X12 LI HYBRID CABLE TO REMAIN	330'±
	B2	LTE 700/850	(E) NHH-65A-R2B	COMMSCOPE	(1) (E) B5/B13 RFV01U-D2A	154'-5"±	160°			
	B3	LTE 1900/AWS	(E) NHH-65A-R2B	COMMSCOPE	(1) (E) B2/B66A RFV01U-D1A	153'-3"±	160°			
	B4	5G	(E) VZ-AT1K04	SAMSUNG	-	161'-6"±	160°			
	B5	CBRS LTE	(E) XXDWMM-12.5-65	SAMSUNG	-	157'-3"±	160°			
GAMMA	G1	5G	(E) MT6407-77A	SAMSUNG	-	140'-1"±	280°	(1) (E) OVP BOX TO REMAIN	(1) (E) 6X12 LI HYBRID CABLE TO REMAIN	60'±
	G2	LTE 700/850	(E) NHH-65A-R2B	COMMSCOPE	(1) (E) B5/B13 RFV01U-D2A	139'-3"±	280°			
	G3	LTE 1900/AWS	(E) NHH-65A-R2B	COMMSCOPE	(1) (E) B2/B66A RFV01U-D1A	139'-3"±	280°			
	G4	5G	(E) VZ-AT1K04	SAMSUNG	-	140'-10"±	280°			
	G5	CBRS LTE	(E) XXDWMM-12.5-65	SAMSUNG	-	136'-7"±	280°			

*CONTRACTOR TO FIELD VERIFY HYBRID CABLE LENGTHS PRIOR TO CONSTRUCTION. LENGTH IS ESTIMATED FROM THE BASE EQUIPMENT OVP TO SECTOR OVP WITH 15% BUFFER.

(E) = Existing
(P) = PROPOSED

FINAL EQUIPMENT CONFIGURATION (1)
SCALE: N.T.S.

VERIZON WIRELESS
51 ALDER STREET
MEDWAY, MA 02053

HARVARD SQ MA

ANTMO DRAWINGS		
2	03/14/24	FOR SUBMITTAL
1	02/12/24	FOR SUBMITTAL
0	02/02/24	FOR SUBMITTAL

Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

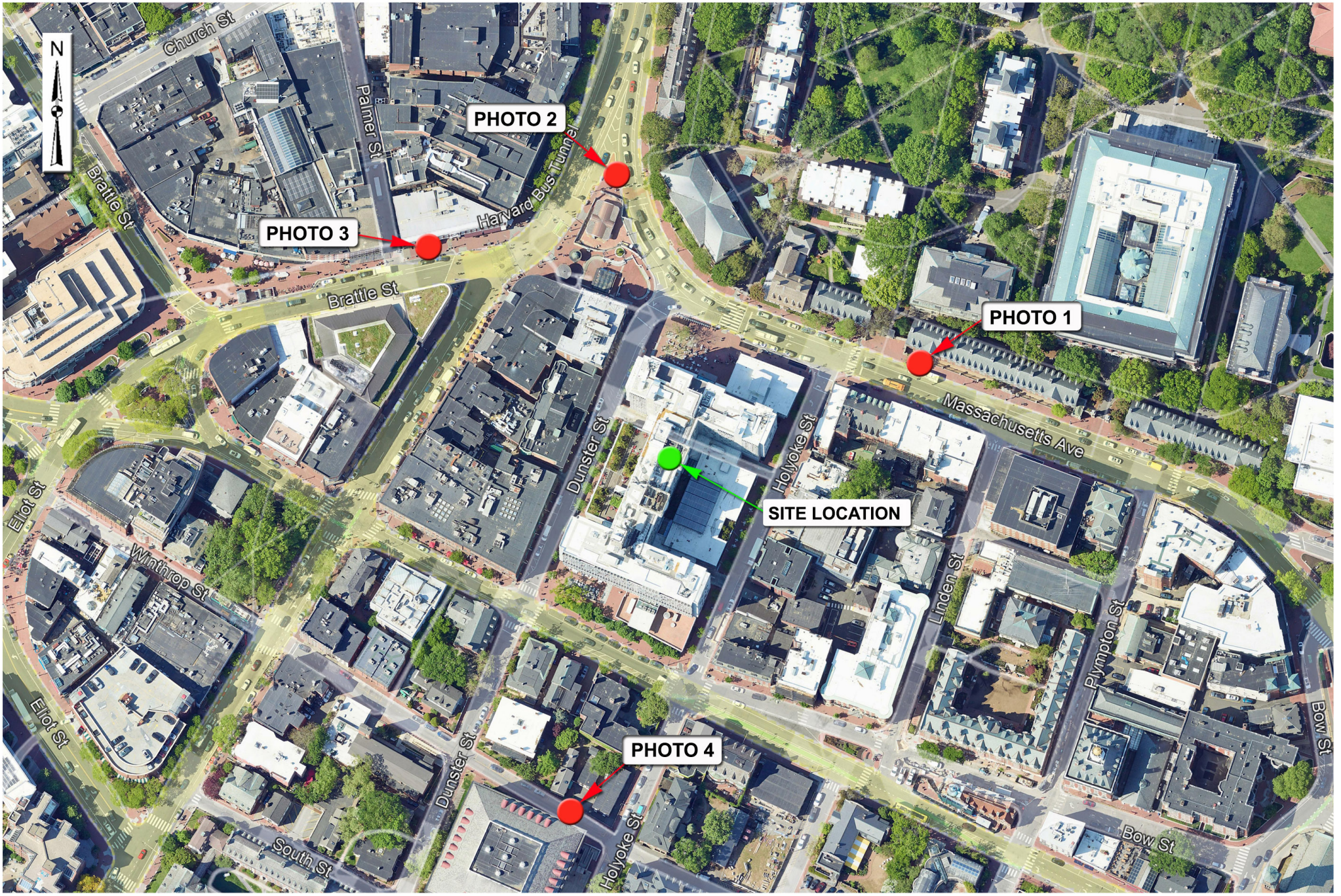
BENJAMIN B. REVETTE CIVIL No. 49220 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

DRAWN BY: 03/14/2024 JG
REVIEWED BY: CDH
CHECKED BY: BBR
PROJECT NUMBER: 50121487
JOB NUMBER: 50170381
SITE NUMBER
137338
SITE ADDRESS
1350 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139
SHEET TITLE
FINAL EQUIPMENT CONFIGURATION
SHEET NUMBER
C-5

verizon WIRELESS

Harvard SQ MA
1350 Massachusetts Avenue
Cambridge, MA 02139

Dewberry



verizon WIRELESS

Harvard SQ MA
1350 Massachusetts Avenue
Cambridge, MA 02139

Dewberry

verizon WIRELESS

Harvard SQ MA

Photo 1A

View Facing Southwest From Massachusetts Avenue

(Page 3 of 8)

Dewberry

verizon WIRELESS

Harvard SQ MA

Photo 1B

View Facing Southwest From Massachusetts Avenue

Dewberry

verizon WIRELESS

Harvard SQ MA

Photo 2A

View Facing SouthEast From Massachusetts Avenue

Dewberry

verizon WIRELESS

Harvard SQ MA

Photo 2B

View Facing SouthEast From Massachusetts Avenue

Dewberry

verizon WIRELESS

Harvard SQ MA

Photo 3

View Facing SouthEast From Bratte Street

Dewberry

verizon WIRELESS

Harvard SQ MA

Photo 4
View Facing North From Mt Auburn Street
(Page 8 of 8)

Dewberry

Verizon Wireless
c/o SAI Group LLC
Attn: Edward Onessimo
68 Avalon Road
Milton, MA 02186

VIA EMAIL

September 9, 2024
Harvard Planning and Real Estate
Attn: Kristen A. Hurston
1350 Massachusetts Avenue
Cambridge, MA 02138

RE: License Agreement (the "Lease"), dated September 2,1994, by and between Harvard Planning and Real Estate, agent for President and Fellows of Harvard College ("Licensor") and Cellco Partnership d/b/a Verizon Wireless ("Verizon Wireless"), covering the leased site located at 1350 Massachusetts Avenue Cambridge, Massachusetts (the "Premises") – **Verizon Wireless Site Name / Location Code: Harvard Sq MA / 137338**

Dear Ms. Hurston:
The purpose of this letter is to obtain Licensor's written consent to certain proposed modifications by Verizon Wireless to its equipment located on the building rooftop on the Premises as described herein below. Verizon Wireless hereby requests your consent to the following equipment modifications:

EQUIPMENT TO BE REMOVED:
NA

EQUIPMENT TO BE ADDED:
(1) Matsing MS-6.3-DB90A antenna
(5) Samsung RF4439d-25A RRHs
(2) Samsung RF4442d-13A RRHs
(1) 12-OVP
(2) Hybrid cables

A structural analysis of the tower has been performed based on the proposed equipment modifications, and no additional reinforcement of the tower structure or foundation are necessary to support the proposed modifications.

Please indicate Lessor's consent to the proposed modifications by signing in the space provided below. Please note that by giving your approval you are also granting permission to Verizon Wireless to act on your behalf in the filing of all applications for all permits related to the replacement and additional equipment at the referenced site.

Thank you for your cooperation in connection with this matter. If you have any questions or concerns regarding this request, please feel free to contact me at 617-691-7022.

Sincerely,

Edward Onessimo, SAI Communications
Site Development Contractor

Harvard Planning and Real Estate
agent for President and Fellows of Harvard College

By: _____
Name: Kristen A. Hurston
Title: Property Manager

Date: 09/19/2024

Bk: 44353 Pg: 481
2004 00319703
Bk: 44353 Pg: 481 Doc: DEED
Page: 1 of 5 12/22/2004 01:55 PM

Unit No. 1
Carr Foundation Arrow Street Condominium
Two Arrow Street
Cambridge, Massachusetts

MASSACHUSETTS EXCISE TAX
Southern Middlesex District ROD # 001
Date: 12/22/2004 01:55 PM
Ctrl# 044582 23567 Doc# 00319703
Fee: $25,992.00 Cons: $5,700,000.00

UNIT DEED

Gregory C. Carr Foundation, Inc., a Massachusetts non-profit corporation, with a principal place of business at 30 Brattle Street, Cambridge, Massachusetts (the " Grantor "), for consideration of $5,700,000.00 paid, grants to President and Fellows of Harvard College, a Massachusetts educational and charitable corporation with a principal place of business c/o Harvard Real Estate Services, Holyoke Center, 1350 Massachusetts Avenue, Cambridge, Massachusetts (" Grantee "), with Quitclaim Covenants, the unit known as Unit No. 1 (the "Unit") in Carr Foundation Arrow Street Condominium (" Condominium "), in Cambridge, Middlesex County, Massachusetts, a condominium established by the Grantor pursuant to Massachusetts General Laws, Chapter 183A by Master Deed dated as of December 21, 2004 and recorded herewith with the Middlesex South Registry of Deeds (the "Registry"). The Unit contains 7,997 square feet and is laid out as shown on the plans recorded herewith, which are copies of portions of the plans filed with the Master Deed, and to which is affixed the verified statement in the form required by Section 9 of said Chapter 183A.

The post office address of the Unit is Unit 1, Two Arrow Street, Cambridge, Massachusetts.

The Unit is conveyed together with:

1. A 32.39 percent interest in the " Common Elements " as described in said Master Deed;

2. A 34.97 percent interest in the " Arrow Street Common Elements " as described in the Master Deed;

3. A 100 percent interest in the " Theater Common Elements " as described in the Master Deed;

4. A 32.39 percent interest in the organization of unit owners.

Meaning and intending to convey with the Unit all rights and easements as are set forth in the Master Deed.

The Unit is conveyed with the benefit of and subject to:

1. The provisions of Massachusetts General Laws, Chapter 183A, as amended;

2. The provisions of the Master Deed and By-Laws as the same may be amended from time to time by instruments recorded in the Registry, which provisions, together with any

Property Address: Unit 1, Two Arrow Street, Cambridge
Grantee Address: 1350 Massachusetts Avenue, Cambridge

amendments thereto, shall constitute covenants running with the land and shall bind any entity having at any time any interest or estate in the Unit, its tenants, occupants and invitees as though such provisions were recited and stipulated at length herein;

3. Such taxes attributable to the Unit for the current year as are not yet due and payable;

4. Easements, rights, obligations, provisions, agreements, restrictions, building line limitation, zoning regulations, public utility and telephone easements, easements in favor of the Declarant of the Master Deed, and all other matters set forth or referred to in the Master Deed or appearing of record.

The Unit contains the approximate area listed above and is laid out as shown on the unit plan attached hereto and recorded herewith. The Unit shall be used solely for purposes permitted under the Master Deed and in accordance with all applicable laws, codes, permits and approvals.

For title, see two deeds to the Grantor recorded with said Deeds in Book 35587, Pages 198 and 203, respectively.

THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK

EXECUTED as a sealed instrument as of the 21st day of December, 2004.

GREGORY C. CARR FOUNDATION, INC.

By: _____
Gregory C. Carr
President and Treasurer

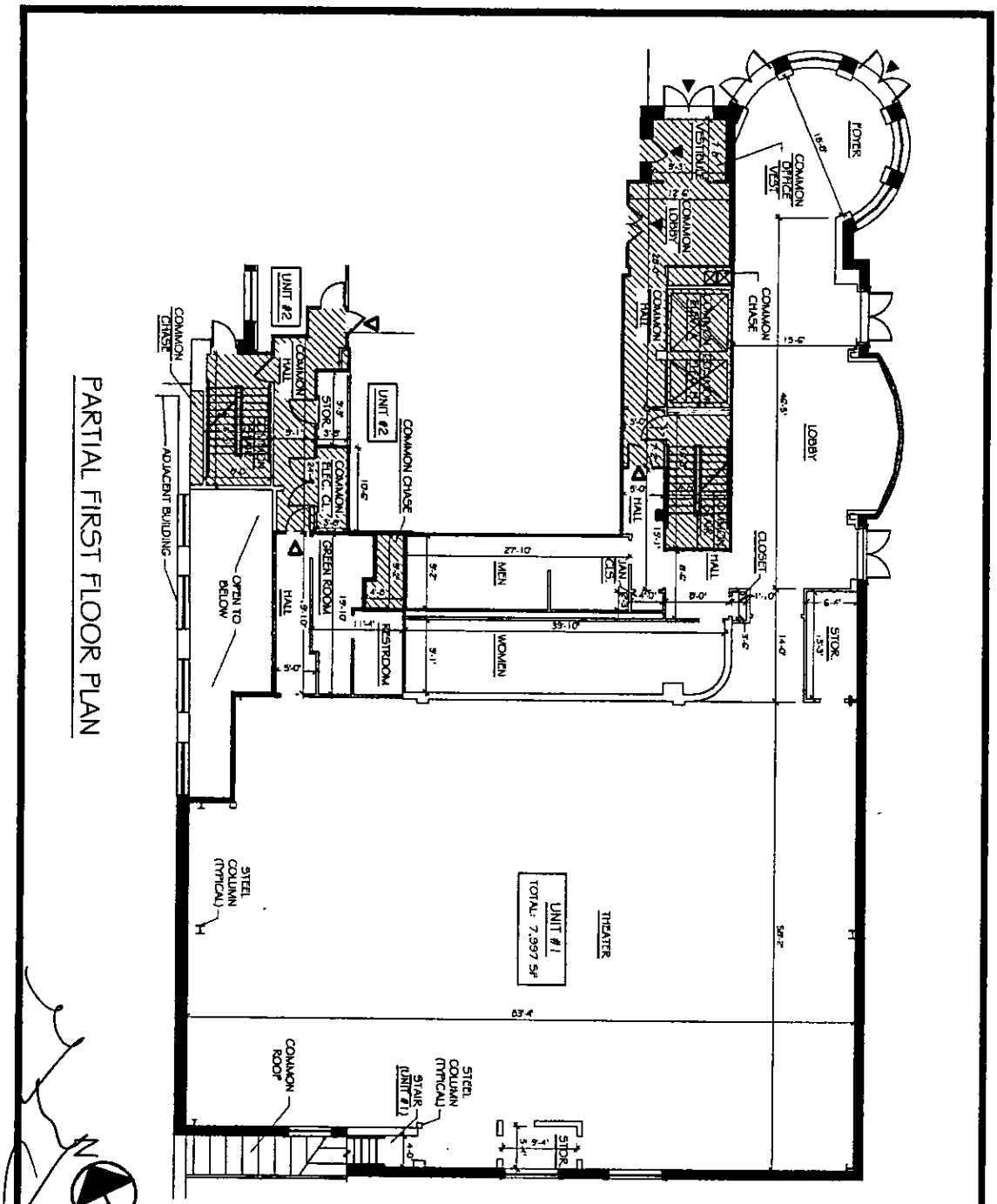
COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

On this 14th day of December, 2004, before me, the undersigned notary public, personally appeared the above-named Gregory C. Carr, proved to me through satisfactory evidence of identification, which was personal knowledge of identity, to be the person whose name is signed on the preceding document, and acknowledged to me that he signed it voluntarily for its stated purpose as President and Treasurer of Gregory C. Carr Foundation, Inc.

_____
Notary Public
[Seal]

MICHELE A. MULVANEY, Notary Public
My Commission Expires April 11, 2008



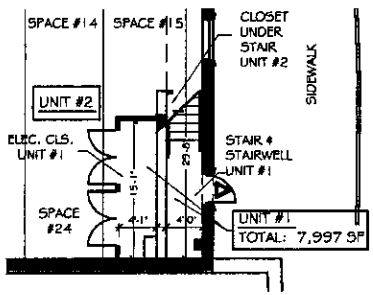
I hereby certify that these plans were prepared with the rules and regulations of the registry of deeds, the Commonwealth of Massachusetts.

I further certify that these plans, fully and accurately depict the units numbered 1 located at the Carr Foundation Arrow Street Condominium, Cambridge, MA, and fully and accurately depict the layout, locations, dimensions, approximate areas, and main entrance of each unit and the immediate common areas to which each such unit has access, all as built and in existence as of 11-24-04.

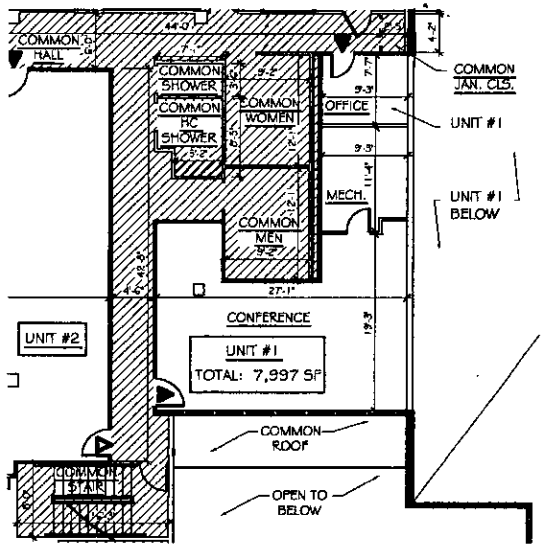
The area of each unit is computed exclusive of common area facilities and demising walls, and is dimensioned to the plane of the surface of the wall facing the interior of such unit.

COMMONWEALTH OF MASSACHUSETTS
GUY N. GRASSI
REGISTERED ARCHITECT
No. 5530
BOSTON
MASS.

SHEET 1 OF 2	DATE: 11-24-04
GRASSI DESIGN GROUP 46 WALTHAM STREET BOSTON, MASSACHUSETTS 02118 TELEPHONE: 617-956-9992	CARR FOUNDATION ARROW STREET CONDOMINIUM CAMBRIDGE, MA



PARTIAL GROUND FLOOR PLAN



PARTIAL SECOND FLOOR PLAN

UNIT DEMISING WALLS

UNIT INTERIOR WALLS

PRIMARY ENTRANCE

SECONDARY EGRESS

INTERIOR COMMON AREAS

SCALE:

0 4 8 16 FT.

I hereby certify that these plans were prepared with the rules and regulations of the registry of deeds, the Commonwealth of Massachusetts.

I further certify that these plans, fully and accurately depict the units numbered 1 located at the Carr Foundation Arrow Street Condominium, Cambridge, MA, and fully and accurately depict the layout, locations, dimensions, approximate areas, and main entrance of each unit and the immediate common areas to which each such unit has access, all as built and in existence as of 11-24-04.

The area of each unit is computed exclusive of common area facilities and demising walls, and is dimensioned to the plane of the surface of the wall facing the interior of such unit.

N

REGISTERED ARCHITECT
GUY N. GRASSI
No. 5930
BOSTON
MASS.
COMMONWEALTH OF MASSACHUSETTS

CARR FOUNDATION
ARROW STREET CONDOMINIUM
CAMBRIDGE, MA

DATE: 11-24-04

SHEET 2 OF 2

GRASSI DESIGN GROUP
46 WALTHAM STREET
BOSTON, MASSACHUSETTS 02118
TELEPHONE: 617-956-0992

BLOCK 160

Brattle St
Eliot St
Mt Auburn St
Palmer St
Massachusetts Ave
JFK St
Dunster St
Holyoke St
Linden St
Plympton St
Bow St
Winthrop St
South St
Eliot St
Holyoke Pl

City of Cambridge
Assessing Department

795 Massachusetts Ave.
Cambridge, MA 02139

Buildings
Lot Line
Block Line
City Boundary
Water
Sub-Parcel Line
Easement
Railway

10 Lot Number
160 Block Number
10 Cam Street Number
(125.0) Deed Dimension
100 Parcel size in Sq. Ft.
44.0LC Land Court Dimension
65.0 Survey Dimensions

DISCLAIMER:
All Real Property shown on this map was compiled from existing Assessor's Tax Maps dated 1920 to 2023 and maintained by the City Assessor's Office and the Department of Public Works. Subsequent maintenance has been completed using the City of Cambridge Geographic Information System (GIS). Parcels have not been created from survey, and map is suitable for assessing purposes only.

The City of Cambridge assumes no legal responsibility for information shown on this map.

N

0 15 30 60 Feet

1:460

Parcel Block Map

160

FY 2024

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WQJQ689	
Radio Service	
WU - 700 MHz Upper Band (Block C)	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
09-11-2019	07-15-2020	06-13-2029	

Market Number	Channel Block	Sub-Market Designator
REA001	C	0

Market Name
Northeast

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-13-2013	06-13-2019		

Waivers/Conditions:

If the facilities authorized herein are used to provide broadcast operations, whether exclusively or in combination with other services, the licensee must seek renewal of the license either within eight years from the commencement of the broadcast service or within the term of the license had the broadcast service not been provided, whichever period is shorter in length. See 47 CFR §27.13(b).

This authorization is conditioned upon compliance with section 27.16 of the Commission's rules

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

This license may not authorize operation throughout the entire geographic area or spectrum identified on the hardcopy version. To view the specific geographic area and spectrum authorized by this license, refer to the Spectrum and Market Area information under the Market Tab of the license record in the Universal Licensing System (ULS). To view the license record, go to the ULS homepage at http://wireless.fcc.gov/uls/index.htm?job=home and select "License Search". Follow the instructions on how to search for license information.

FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WQJQ689 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission
Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
KNKA201	
Radio Service CL - Cellular	
Market Numer CMA006	**Channel Block** B
Sub-Market Designator 0	

FCC Registration Number (FRN): 0003290673

Market Name
Boston-Lowell-Brockton-Lawrenc

Grant Date	Effective Date	Expiration Date	Five Yr Build-Out Date	Print Date
08-26-2014	11-01-2016	10-01-2024		

Site Information:

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
1	42-38-26.3 N	070-36-25.2 W	36.3	35.7	

Address: (Rockport) Thatcher Road
City: Rockport **County:** ESSEX **State:** MA **Construction Deadline:**

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	70.400	34.100	34.100	34.100	70.400	67.800	55.200	61.300
Transmitting ERP (watts)	246.920	325.500	33.310	0.940	0.820	0.820	1.210	20.070

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	70.400	34.100	34.100	34.100	70.400	67.800	55.200	61.300
Transmitting ERP (watts)	0.820	3.330	54.020	373.730	191.670	10.780	0.820	0.820

Antenna: 7
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	70.400	34.100	34.100	34.100	70.400	67.800	55.200	61.300
Transmitting ERP (watts)	3.330	0.820	0.820	0.820	7.810	126.630	409.780	89.650

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

FCC 601-C
March 2018

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
4	42-08-56.4 N	071-24-55.2 W	75.6	44.2	

Address: 113 Main Street

City: Medway **County:** NORFOLK **State:** MA **Construction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	59.500	66.700	61.200	46.900	23.900	39.300	13.900	12.300
Transmitting ERP (watts)	81.280	89.130	24.550	1.120	0.200	0.200	0.420	16.600

Antenna: 5

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	59.500	66.700	61.200	46.900	23.900	39.300	13.900	12.300
Transmitting ERP (watts)	0.200	2.000	33.800	95.500	67.610	10.700	0.200	0.200

Antenna: 6

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	59.500	66.700	61.200	46.900	23.900	39.300	13.900	12.300
Transmitting ERP (watts)	3.890	0.200	0.200	0.200	6.760	57.540	100.000	44.670

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
9	42-11-42.4 N	070-49-10.2 W	57.9	56.1	

Address: (Scituate) OFF CLAPP RD

City: SCITUATE **County:** PLYMOUTH **State:** MA **Construction Deadline:**

Antenna: 7

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	105.300	106.100	93.800	85.900	95.600	76.500	81.800	104.300
Transmitting ERP (watts)	172.400	167.230	26.990	1.190	0.960	0.960	1.720	28.870

Antenna: 8

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	105.300	106.100	93.800	85.900	95.600	76.500	81.800	104.300
Transmitting ERP (watts)	0.980	3.910	54.020	409.780	200.700	15.220	0.980	0.980

Antenna: 9

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	105.300	106.100	93.800	85.900	95.600	76.500	81.800	104.300
Transmitting ERP (watts)	4.490	0.980	0.980	1.300	10.060	123.750	449.320	96.060

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
10	42-52-57.3 N	071-16-28.2 W	163.0	58.2	

Address: (Derry) 46 FLOYD ROAD

City: DERRY **County:** ROCKINGHAM **State:** NH **Construction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	82.200	129.400	144.500	155.100	136.800	127.900	126.200	118.100
Transmitting ERP (watts)	31.810	146.820	102.310	15.410	1.000	1.000	1.000	1.130

Antenna: 5

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	82.200	129.400	144.500	155.100	136.800	127.900	126.200	118.100
Transmitting ERP (watts)	1.000	1.000	4.660	82.110	250.350	80.300	3.790	1.000

Antenna: 6

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	80.200	129.400	144.500	155.100	136.800	127.900	126.200	118.100
Transmitting ERP (watts)	32.480	1.680	1.000	1.000	1.000	13.740	107.220	143.470

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
12	41-52-08.3 N	070-52-56.1 W	29.6	58.2	

Address: (Middleboro) E. GROVE ST.

City: MIDDLESBORO **County:** PLYMOUTH **State:** MA **Construction Deadline:**

Antenna: 7

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	57.600	32.400	40.200	47.600	44.900	41.300	50.300	52.600
Transmitting ERP (watts)	277.330	364.730	40.890	2.250	0.960	0.960	2.410	20.640

Antenna: 8

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	57.600	32.400	40.200	47.600	44.900	41.300	50.300	52.600
Transmitting ERP (watts)	0.960	3.730	61.620	418.280	215.780	13.090	1.700	0.960

Antenna: 9

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	57.600	32.400	40.200	47.600	44.900	41.300	50.300	52.600
Transmitting ERP (watts)	5.070	1.130	0.610	1.600	5.050	89.040	278.490	66.210

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
14	42-28-06.3 N	071-27-16.2 W	102.1	54.0	

Address: Main Street

City: South Acton **County:** MIDDLESEX **State:** MA C**onstruction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	69.000	79.000	105.500	96.200	72.600	76.300	47.400	58.700
Transmitting ERP (watts)	65.200	77.960	20.970	2.400	0.200	0.200	2.000	13.720

Antenna: 5

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	69.000	79.900	105.500	96.200	72.600	76.300	47.400	58.700
Transmitting ERP (watts)	0.200	3.880	23.800	59.780	43.360	10.290	0.830	0.200

Antenna: 6

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	76.400	65.500	105.500	96.200	72.600	76.300	47.400	58.700
Transmitting ERP (watts)	5.010	0.420	0.200	0.740	6.570	43.660	91.210	34.920

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
15	42-30-08.4 N	070-55-02.2 W	39.6	46.3	

Address: 12 First Street

City: Salem **County:** ESSEX **State:** MA C**onstruction Deadline:**

Antenna: 7

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	63.400	62.100	62.800	77.900	77.500	70.500	40.900	50.900
Transmitting ERP (watts)	49.150	56.730	19.190	2.360	0.200	0.200	1.930	12.920

Antenna: 8

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	63.400	62.100	62.800	77.900	77.500	70.500	40.900	50.900
Transmitting ERP (watts)	0.100	1.550	9.520	23.920	17.350	4.120	0.330	0.100

Antenna: 9

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	63.400	62.100	62.800	77.900	77.500	70.500	40.900	50.900
Transmitting ERP (watts)	5.010	0.380	0.200	0.680	6.510	35.500	64.630	29.380

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
16	42-16-51.4 N	071-02-04.2 W	5.2	53.0	

Address: 100 HANCOCK STREET
City: QUINCY **County:** NORFOLK **State:** MA **Construction Deadline:**

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	43.000	44.100	42.200	29.000	8.300	14.800	12.100	31.500
Transmitting ERP (watts)	7.170	6.480	6.790	0.320	0.100	0.100	0.160	5.630

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	40.900	41.900	40.000	26.800	6.200	12.600	9.900	29.300
Transmitting ERP (watts)	0.100	0.340	3.140	2.480	2.970	1.500	0.100	0.100

Antenna: 7
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	43.000	44.100	42.200	29.000	8.300	14.800	12.100	31.500
Transmitting ERP (watts)	0.100	0.100	0.100	0.120	2.640	2.770	2.720	2.360

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
21	42-30-36.4 N	070-51-21.2 W	23.2	47.2	

Address: Tioga Way
City: Marblehead **County:** ESSEX **State:** MA **Construction Deadline:**

Antenna: 2
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	44.200	46.700	37.200	60.400	60.400	54.600	28.000	43.700
Transmitting ERP (watts)	0.100	0.130	3.130	7.860	6.600	1.220	0.100	0.100

Antenna: 3
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	44.200	46.700	37.200	60.400	60.400	54.600	28.000	43.700
Transmitting ERP (watts)	0.410	0.100	0.100	0.100	0.530	5.070	8.210	4.870

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	44.200	46.700	37.200	60.400	60.400	54.600	28.000	43.700
Transmitting ERP (watts)	6.780	7.760	2.800	0.100	0.100	0.100	0.100	1.540

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
22	42-51-55.4 N	070-56-13.2 W	94.5	50.9	

Address: (Amesbury) 10 DENNET WAY

City: AMESBURY **County:** ESSEX **State:** MA **Construction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	117.000	123.800	125.500	137.800	126.100	109.800	94.200	100.300
Transmitting ERP (watts)	178.880	225.190	34.880	0.860	0.860	0.860	0.860	10.780

Antenna: 5

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	117.000	123.800	125.500	137.800	126.100	109.800	94.200	100.300
Transmitting ERP (watts)	0.860	1.240	35.690	258.560	148.780	12.380	0.860	0.860

Antenna: 6

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	117.000	123.800	125.500	137.800	126.100	109.800	94.200	100.300
Transmitting ERP (watts)	3.110	0.830	0.860	0.860	3.110	89.650	270.740	81.760

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
24	42-03-31.4 N	071-17-29.2 W	105.5	59.1	

Address: (Wrentham) 415 Washington St. - Route 1

City: WRENTHAM **County:** NORFOLK **State:** MA **Construction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	99.900	78.700	94.600	120.300	114.800	77.800	71.700	95.700
Transmitting ERP (watts)	2.580	85.500	401.990	363.280	54.920	1.060	0.850	0.850

Antenna: 5

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	99.900	78.700	94.600	120.300	114.800	77.800	71.700	95.700
Transmitting ERP (watts)	0.850	0.850	0.850	8.930	146.240	311.250	197.740	18.980

Antenna: 6

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	99.900	78.700	94.600	120.300	114.800	77.800	71.700	95.700
Transmitting ERP (watts)	352.500	136.390	5.560	0.980	0.980	0.980	39.210	263.760

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
25	43-10-34.3 N	071-12-24.2 W	335.3	31.4	

Address: (Northwood) SADDLEBACK MOUNTAIN
City: NORTHWOOD **County:** ROCKINGHAM **State:** NH C**onstruction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	152.900	213.700	260.100	268.500	234.000	215.400	150.700	173.600
Transmitting ERP (watts)	45.240	219.790	199.540	31.860	1.550	1.000	1.000	2.360

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	152.900	213.700	260.100	268.500	234.000	215.400	150.700	173.600
Transmitting ERP (watts)	1.000	1.000	6.160	105.350	236.610	142.220	7.190	1.780

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	152.900	213.700	260.100	268.500	234.000	215.400	150.700	173.600
Transmitting ERP (watts)	55.630	1.980	1.000	1.000	2.260	8.170	110.540	141.320

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
27	41-41-13.4 N	070-48-25.1 W	22.9	59.4	

Address: (Mattapoisett) Industrial Drive
City: Mattapoisett **County:** PLYMOUTH **State:** MA C**onstruction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	61.700	76.400	79.200	79.900	80.600	75.400	56.100	60.600
Transmitting ERP (watts)	217.540	281.390	29.930	2.050	0.980	0.980	2.340	21.270

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	61.700	76.400	79.300	79.900	80.600	75.400	56.100	60.600
Transmitting ERP (watts)	0.980	10.610	118.800	349.190	74.510	4.550	0.980	0.980

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	61.700	76.400	79.200	79.900	80.600	75.400	56.100	60.600
Transmitting ERP (watts)	2.220	0.980	0.980	2.540	27.640	252.570	253.110	22.510

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
29	41-55-21.0 N	070-39-05.0 W	39.6	77.4	1021869

Address: (Plymouth) CALEB ST

City: Plymouth **County:** PLYMOUTH **State:** MA **Construction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	94.600	84.200	79.500	67.900	61.400	63.600	52.500	63.200
Transmitting ERP (watts)	252.450	246.240	37.800	1.470	0.940	0.940	2.080	39.370

Antenna: 5

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	94.600	84.200	79.500	67.900	61.400	63.600	52.500	63.200
Transmitting ERP (watts)	1.000	3.000	53.330	346.500	184.150	15.870	1.000	1.000

Antenna: 6

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	94.600	84.200	79.500	67.900	61.400	63.600	52.500	63.200
Transmitting ERP (watts)	4.660	1.000	1.000	1.000	5.610	128.480	425.450	99.740

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
31	42-14-40.0 N	071-30-38.0 W	142.6	102.0	1009024

Address: 1.25 MI NNE

City: HOPKINTON **County:** MIDDLESEX **State:** MA **Construction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	107.800	138.000	130.800	126.800	101.200	85.900	73.000	97.500
Transmitting ERP (watts)	23.200	21.890	16.370	2.550	0.130	0.100	1.640	13.250

Antenna: 5

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	107.800	138.000	130.800	126.800	101.200	85.900	73.000	97.500
Transmitting ERP (watts)	0.940	9.100	53.990	96.320	78.580	26.320	3.730	0.460

Antenna: 6

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	107.800	138.000	130.800	126.800	101.200	85.900	73.000	97.500
Transmitting ERP (watts)	13.400	1.700	0.620	2.340	18.300	72.460	95.170	63.740

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
34	42-23-29.5 N	071-07-22.9 W	7.9	26.8	

Address: 2067 MASSACHUSETTS AVENUE
City: CAMBRIDGE **County:** SUFFOLK **State:** MA **Construction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	-3.400	5.800	21.700	28.600	13.000	-2.600	-14.400	-21.300
Transmitting ERP (watts)	6.780	7.760	2.800	0.100	0.100	0.100	0.100	1.540

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	-3.400	5.800	21.700	28.600	13.000	-2.600	-14.400	-21.300
Transmitting ERP (watts)	0.100	0.130	3.130	7.860	6.600	1.220	0.100	0.100

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	-3.400	5.800	21.700	28.300	13.000	-2.600	-14.400	-21.300
Transmitting ERP (watts)	0.410	0.100	0.100	0.100	0.530	5.070	8.210	4.870

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
35	42-39-16.7 N	071-44-12.3 W	192.6	51.2	

Address: 84 Bayberry Hill Road
City: Townsend **County:** MIDDLESEX **State:** MA **Construction Deadline:**

Antenna: 2
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	57.900	139.500	149.200	136.100	102.200	42.700	-79.000	-25.700
Transmitting ERP (watts)	0.580	7.080	42.660	95.500	77.620	22.390	2.820	0.460

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	51.300	146.600	148.900	136.600	101.300	25.000	-79.700	-22.300
Transmitting ERP (watts)	35.060	35.620	17.670	2.660	0.200	0.150	1.860	13.500

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	51.300	146.600	148.900	136.600	101.300	25.000	-79.700	-22.300
Transmitting ERP (watts)	5.360	0.690	0.250	0.930	7.320	28.980	38.070	25.500

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
38	42-38-45.8 N	071-05-37.7 W	117.3	52.4	

Address: 5 Boston Hill Road

City: North Andover **County:** ESSEX **State:** MA **Construction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	96.900	98.200	110.000	111.300	110.000	101.700	90.300	106.200
Transmitting ERP (watts)	83.180	87.100	23.990	2.290	0.200	0.200	1.820	20.420

Antenna: 5

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	96.900	98.100	110.000	111.300	110.000	101.700	90.200	106.200
Transmitting ERP (watts)	0.240	4.170	38.020	97.720	66.070	11.750	1.050	0.200

Antenna: 6

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	96.900	98.200	110.000	111.300	110.000	101.700	90.200	106.200
Transmitting ERP (watts)	5.250	0.340	0.200	0.830	9.770	60.262	100.000	42.660

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
39	42-18-13.0 N	071-13-05.0 W	44.8	96.0	1018331

Address: 140 CABOT ST

City: NEEDHAM **County:** NORFOLK **State:** MA **Construction Deadline:**

Antenna: 1

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	44.200	68.400	58.900	48.800	36.300	40.300	44.100	41.600
Transmitting ERP (watts)	30.340	35.650	9.380	0.920	0.100	0.100	0.610	6.050

Antenna: 2

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	44.200	68.400	58.900	48.800	36.300	40.300	44.100	41.600
Transmitting ERP (watts)	0.100	1.230	10.440	23.990	19.000	4.420	0.370	0.100

Antenna: 3

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	0	45	90	135	180	225	270	315
Antenna Height AAT (meters)	44.200	68.400	58.900	48.800	36.300	40.300	44.100	41.600
Transmitting ERP (watts)	2.200	0.190	0.100	0.300	2.700	19.270	35.660	16.260

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** **Print Date:**

Location	Latitude	Longitude	Ground Elevation (meters)	Structure Hgt to Tip (meters)	Antenna Structure Registration No.
41	42-22-16.6 N	071-05-49.6 W	6.3	18.6	

Address: (Cambridge Donnelly Field site) 284 Norfolk Street

City: Cambridge **County:** MIDDLESEX **State:** MA C**onstruction Deadline:** 07-03-2014

Antenna: 1

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	-11.600	16.500	20.700	21.000	2.200	-20.400	2.300	-16.900
Transmitting ERP (watts)	48.150	197.980	63.920	1.080	0.680	0.680	0.680	0.850

Antenna: 2

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	-11.600	16.500	20.700	21.000	2.200	-20.400	2.300	-16.900
Transmitting ERP (watts)	0.670	0.670	18.990	128.120	74.750	3.300	0.670	0.670

Antenna: 3

Maximum Transmitting ERP in Watts: 140.820

Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	-10.600	17.600	21.700	22.000	3.200	-19.400	3.400	-15.900
Transmitting ERP (watts)	28.690	0.650	0.650	0.650	0.650	5.700	114.450	208.740

Control Points:

Control Pt. No. 3

Address: 500 W. Dove Rd.

City: Southlake **County:** TARRANT **State:** TX **Telephone Number:** (800)264-6620

Waivers/Conditions:

THE FOLLOWING CELLULAR GEOGRAPHIC SERVICE AREAS HAVE BEEN COMBINED (LISTED BY CALL SIGN, MARKET NUMBER AND BLOCK, AND MARKET NAME): KNKA201 6B BOSTON, MASSACHUSETTS KNKA251 76B

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WQGB277	0009783863
Radio Service AW - AWS (1710-1755 MHz and 2110-2155 MHz)	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
01-13-2022	01-13-2022	11-29-2036	01-14-2022

Market Number	Channel Block	Sub-Market Designator
CMA038	A	0

Market Name
Providence-Warwick-Pawtucket,

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date

Waivers/Conditions:

This authorization is conditioned upon the licensee, prior to initiating operations from any base or fixed station, making reasonable efforts to coordinate frequency usage with known co-channel and adjacent channel incumbent federal users operating in the 1710-1755 MHz band whose facilities could be affected by the proposed operations. See, e.g., FCC and NTIA Coordination Procedures in the 1710-1755 MHz Band, Public Notice, FCC 06-50, WTB Docket No. 02-353, rel. April 20, 2006.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

This license may not authorize operation throughout the entire geographic area or spectrum identified on the hardcopy version. To view the specific geographic area and spectrum authorized by this license, refer to the Spectrum and Market Area information under the Market Tab of the license record in the Universal Licensing System (ULS). To view the license record, go to the ULS homepage at http://wireless.fcc.gov/uls/index.htm?job=home and select "License Search". Follow the instructions on how to search for license information.

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The license is subject to compliance with the provisions of the January 12, 2001 Agreement between Deutsche Telekom AG, VoiceStream Wireless Corporation, VoiceStream Wireless Holding Corporation and the Department of Justice (DOJ) and the Federal Bureau of Investigation (FBI), which addresses national security, law enforcement, and public safety issues of the FBI and the DOJ regarding the authority granted by this license. Nothing in the Agreement is intended to limit any obligation imposed by Federal lawor regulation including, but not limited to, 47 U.S.C. Section 222(a) and (c)(1) and the FCC's implementing regulations. The Agreement is published at VoiceStream-DT Order, IB Docket No. 00-187, FCC 01-142, 16 FCC Rcd 9779, 9853 (2001).

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WQGB277 **File Number:** 0009783863 **Print Date:** 01-14-2022

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WQGA900	0009773233
Radio Service AW - AWS (1710-1755 MHz and 2110-2155 MHz)	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
01-11-2022	01-11-2022	11-29-2036	01-12-2022

Market Number	Channel Block	Sub-Market Designator
BEA003	B	1

Market Name
Boston-Worcester-Lawrence-Lowe

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date

Waivers/Conditions:

This authorization is conditioned upon the licensee, prior to initiating operations from any base or fixed station, making reasonable efforts to coordinate frequency usage with known co-channel and adjacent channel incumbent federal users operating in the 1710-1755 MHz band whose facilities could be affected by the proposed operations. See, e.g., FCC and NTIA Coordination Procedures in the 1710-1755 MHz Band, Public Notice, FCC 06-50, WTB Docket No. 02-353, rel. April 20, 2006.

AWS operations must not cause harmful interference across the Canadian or Mexican Border. The authority granted herein is subject to future international agreements with Canada or Mexico, as applicable.

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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Licensee Name: CELLCO PARTNERSHIP

Call Sign: WQGA900 **File Number:** 0009773233 **Print Date:** 01-12-2022

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE629	

Radio Service
PM - 3.7 GHz Service

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	A3	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

Operation for this combination license grants both interim and final rights for this PEA and is not impacted by the relocation process pursuant to 47 CFR ? 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE629 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE629	

Radio Service
PM - 3.7 GHz Service

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	A3	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

Operation for this combination license grants both interim and final rights for this PEA and is not impacted by the relocation process pursuant to 47 CFR ? 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE629 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE628	
Radio Service PM - 3.7 GHz Service	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	A2	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

Operation for this combination license grants both interim and final rights for this PEA and is not impacted by the relocation process pursuant to 47 CFR ? 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

This license may not authorize operation throughout the entire geographic area or spectrum identified on the hardcopy version. To view the specific geographic area and spectrum authorized by this license, refer to the Spectrum and Market Area information under the Market Tab of the license record in the Universal Licensing System (ULS). To view the license record, go to the ULS homepage at http://wireless.fcc.gov/uls/index.htm?job=home and select “License Search”. Follow the instructions on how to search for license information.

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August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE628 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE627	

Radio Service
PM - 3.7 GHz Service

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	A1	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

Operation for this combination license grants both interim and final rights for this PEA and is not impacted by the relocation process pursuant to 47 CFR ? 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

This license may not authorize operation throughout the entire geographic area or spectrum identified on the hardcopy version. To view the specific geographic area and spectrum authorized by this license, refer to the Spectrum and Market Area information under the Market Tab of the license record in the Universal Licensing System (ULS). To view the license record, go to the ULS homepage at http://wireless.fcc.gov/uls/index.htm?job=home and select “License Search”. Follow the instructions on how to search for license information.

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August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE627 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE630	
Radio Service PM - 3.7 GHz Service	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	A4	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

This final license provides authorization during the full 15-year license term. Operation under this final license may begin on the earlier of (1) 12/5/2025 or (2) the date that the certification for accelerated relocation for this PEA is validated by the FCC pursuant to 47 CFR § 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE630 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE631	
Radio Service PM - 3.7 GHz Service	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	A5	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

This final license provides authorization during the full 15-year license term. Operation under this final license may begin on the earlier of (1) 12/5/2025 or (2) the date that the certification for accelerated relocation for this PEA is validated by the FCC pursuant to 47 CFR § 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

Conditions:
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FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE631 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE632	

Radio Service
PM - 3.7 GHz Service

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	B1	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

This final license provides authorization during the full 15-year license term. Operation under this final license may begin on the earlier of (1) 12/5/2025 or (2) the date that the certification for accelerated relocation for this PEA is validated by the FCC pursuant to 47 CFR § 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

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FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE632 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE633	
Radio Service PM - 3.7 GHz Service	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	B2	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

This final license provides authorization during the full 15-year license term. Operation under this final license may begin on the earlier of (1) 12/5/2025 or (2) the date that the certification for accelerated relocation for this PEA is validated by the FCC pursuant to 47 CFR § 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

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FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE633 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRNE634	
Radio Service PM - 3.7 GHz Service	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
07-23-2021	07-23-2021	07-23-2036	

Market Number	Channel Block	Sub-Market Designator
PEA007	B3	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
07-23-2029	07-23-2033		

Waivers/Conditions:

This final license provides authorization during the full 15-year license term. Operation under this final license may begin on the earlier of (1) 12/5/2025 or (2) the date that the certification for accelerated relocation for this PEA is validated by the FCC pursuant to 47 CFR § 27.1412(g).

License is conditioned on compliance with all applicable FCC rules and regulations, including licensee making payments required by 47 C.F.R. §§ 27.1401- 27.1424 as described in FCC 20-22. See FCC 20-22, paras. 178-331.

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FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRNE634 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRBA944	
Radio Service UU - Upper Microwave Flexible Use Service	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
09-11-2018	02-27-2019	10-06-2028	

Market Number	Channel Block	Sub-Market Designator
BTA051	L1	1

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-01-2024			

Waivers/Conditions:

Grant of the request to update licensee name is conditioned on it not reflecting an assignment or transfer of control (see Rule 1.948); if an assignment or transfer occurred without proper notification or FCC approval, the grant is void and the station islicensed under the prior name.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

This license may not authorize operation throughout the entire geographic area or spectrum identified on the hardcopy version. To view the specific geographic area and spectrum authorized by this license, refer to the Spectrum and Market Area information under the Market Tab of the license record in the Universal Licensing System (ULS). To view the license record, go to the ULS homepage at http://wireless.fcc.gov/uls/index.htm?job=home and select "License Search". Follow the instructions on how to search for license information.

FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRBA944 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
WRBA945	
Radio Service UU - Upper Microwave Flexible Use Service	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
09-11-2018	02-27-2019	10-06-2028	

Market Number	Channel Block	Sub-Market Designator
BTA051	L2	1

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-01-2024			

Waivers/Conditions:

Grant of the request to update licensee name is conditioned on it not reflecting an assignment or transfer of control (see Rule 1.948); if an assignment or transfer occurred without proper notification or FCC approval, the grant is void and the station islicensed under the prior name.

Conditions:

Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WRBA945 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: AIRTOUCH CELLULAR

ATTN: REGULATORY
AIRTOUCH CELLULAR
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
KNLF646	
Radio Service CW - PCS Broadband	

FCC Registration Number (FRN): 0006146468

Grant Date	Effective Date	Expiration Date	Print Date
12-02-2016	11-30-2017	01-03-2027	

Market Number	Channel Block	Sub-Market Designator
BTA051	C	3

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
12-07-2003	01-03-2007		

Waivers/Conditions:

This authorization is subject to the condition that, in the event that systems using the same frequencies as granted herein are authorized in an adjacent foreign territory (Canada/United States), future coordination of any base station transmitters within 72 km (45 miles) of the United States/Canada border shall be required to eliminate any harmful interference to operations in the adjacent foreign territory and to ensure continuance of equal access to the frequencies by both countries.

Special Condition for AU/name change (6/4/2016): Grant of the request to update licensee name is conditioned on it not reflecting an assignment or transfer of control (see Rule 1.948); if an assignment or transfer occurred without proper notification or FCC approval, the grant is void and the station is licensed under the prior name.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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FCC 601-MB
August 2021

Licensee Name: AIRTOUCH CELLULAR

Call Sign: KNLF646 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
5055 NORTH POINT PKWY, NP2NE NETWORK ENGINEERING
ALPHARETTA, GA 30022

Call Sign	File Number
KNLH242	0007716969
Radio Service CW - PCS Broadband	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
06-02-2017	06-02-2017	06-27-2027	06-06-2017

Market Number	Channel Block	Sub-Market Designator
BTA051	F	0

Market Name
Boston, MA

1st Build-out Date	2nd Build-out Date	3rd Build-out Date	4th Build-out Date
06-27-2002			

Waivers/Conditions:

This authorization is subject to the condition that, in the event that systems using the same frequencies as granted herein are authorized in an adjacent foreign territory (Canada/United States), future coordination of any base station transmitters within 72 km (45 miles) of the United States/Canada border shall be required to eliminate any harmful interference to operations in the adjacent foreign territory and to ensure continuance of equal access to the frequencies by both countries.

This authorization is conditioned upon the full and timely payment of all monies due pursuant to Sections 1.2110 and 24.716 of the Commission's Rules and the terms of the Commission's installment plan as set forth in the Note and Security Agreement executed by the licensee. Failure to comply with this condition will result in the automatic cancellation of this authorization.

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

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FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNLH242 **File Number:** 0007716969 **Print Date:** 06-06-2017

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

MS-6.3DB90-A

Multi-Beam Dual Band Spherical Lens Antenna: 3 independent low frequency (698-896MHz-A, 790-960MHz-B) cross-polarized beams and 6 independent high-frequency (1710-2690MHz) cross-polarized beams, with 0-15° tilt for each 40° sector and 2X2 MIMO support per beam. Sector consists of 1 low-band beam and 2 high-band beams.

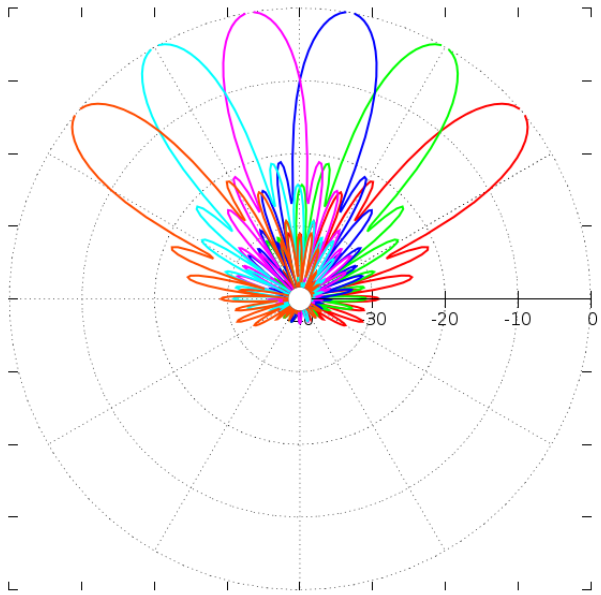
*Optional Packages:

a) **MS-6.3DB90-RET**
AISG 2.0 Remote Electrical Tilt

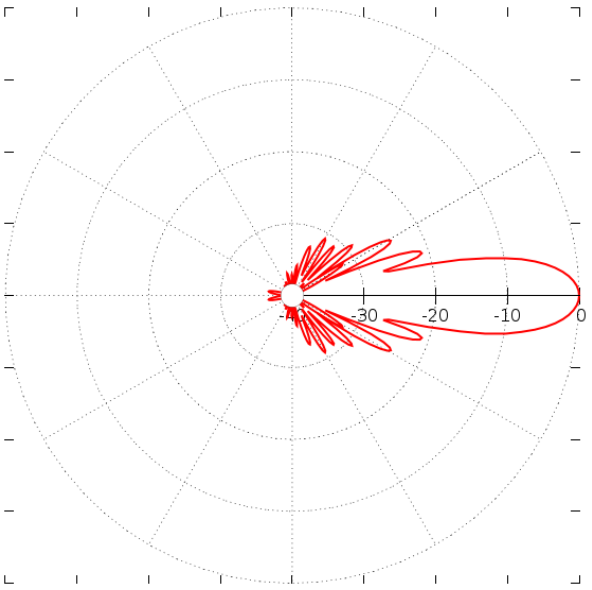
b) **MS-6.3DB90-B**
Low Band Frequency Range (800-960MHz)

PATTERN RESULTS:

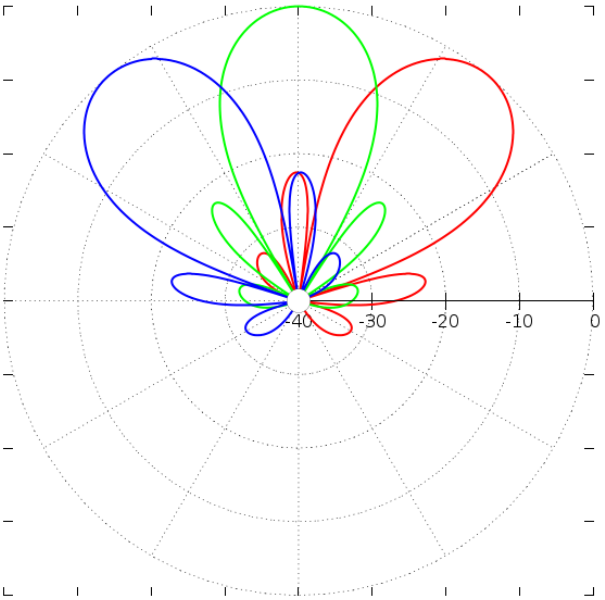
High-Band Horizontal Pattern (1.80GHz)



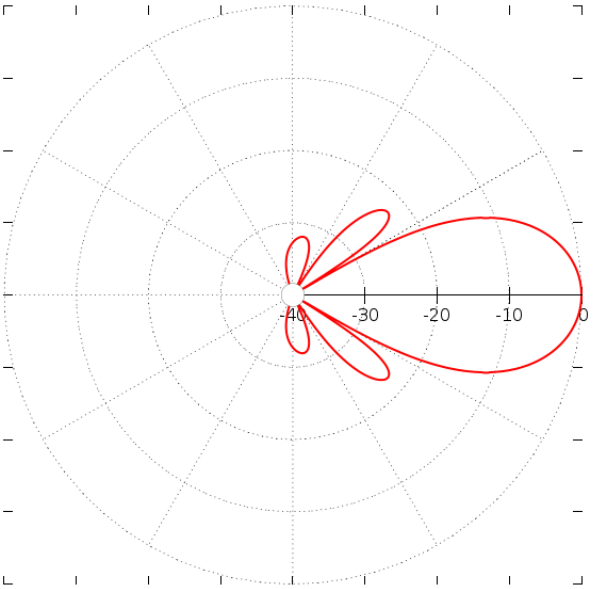
High-Band Vertical pattern (1.80GHz)



Low-Band Horizontal Pattern (0.85GHz)



Low-Band Vertical Pattern (0.85GHz)



EMAIL: Info@matsing.com **WEBSITE**: www.matsing.com **PHONE**: (949)356-2223

MATSING
RF Lens Technologies

ESTIMATED TECHINCAL SPECIFICATIONS PER BEAM

Frequency	698-896 MHz	1710-2690 MHz
Gain	16.5dBi	24dBi
Return Loss	>15dB	>15dB
Polarization	Dual Slant ±45	Dual Slant ±45
Horizontal Coverage	120°	120°
Horizontal Beamwidth (10dB level)	40° ± 4°	20° ± 2°
Vertical Beamwidth (10dB level)	42°	21°
Beam Cross-over	10dB typical	10dB typical
Total Number of Beams	3	6
Manual Adjustable Tilt per 20° sector (each sector having 2 high-band beams and 1 low-band beam)	10° to 25°	0° to 15°
First Sidelobe Level	<-18dB	<-18dB
Front to Back Ratio	>28dB	>28dB
Isolation Port to Port -Polarization	>28dB	>28dB
Isolation Port to Port – Beam	>28dB	>28dB
Power Rating	400W per port	300W per port
Intermodulation	<-150dBc	<-150dBc
Impedance	50 ohm	50 ohm
Connector Quantity and Type	6 7/16 DIN female	12 7/16 DIN female

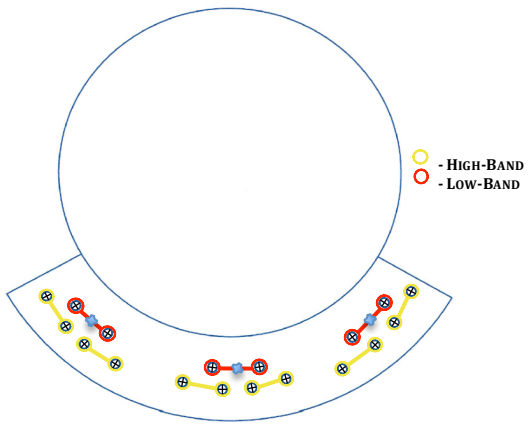
ESTIMATED MECHINCAL DATA

Dimensions (H x W x D)	Spherical Lens diameter: 90cm/35inch Antenna dimensions: 100 x 110 x 120 cm 39 x 43 x 47 inch
Antenna Weight	60kg 132lbs
Radome Material	Fibre Glass
Mounting	2 position pipe mount Compatible pipe diameter: 6.1 – 11.4 cm 2.4 – 4.5 inch

ESTIMATED ENVIRONMENTAL RATINGS

Humidity	95% RH @ +30°C
Temperature	-40°C to +70°C
Wind load	55N @ 160km/hr 13lbf @ 160km/hr

Connector Layout



EMAIL: Info@matsing.com **WEBSITE**: www.matsing.com **PHONE**: (949)356-2223

verizon
NPP RFDS

NORTHEAST > North East > New England > West Roxbury-1 > HARVARD_SQ_MA

Flanagan, Jason - jason.flanagan@verizonwireless.com - 20240312_101224

Project Details		Location Information	
Carrier Aggregation	N	Site Id	674518
Ecip	N	Search Ring#	
Project Name	SECTOR ADD	E-NodeB ID#	056257|0560074|0569001
Project Alt Name	HARVARD_SQ_ALPHA_EXPANSION	PSLC#	137338
Project Id	16984516	Switch Name	West Roxbury-1
Designed Sector Carrier 4G	29	Tower Type	
Designed Sector Carrier 5G	11	Site Type	MACRO
Additional Sector Carrier 4G	0	Street Address	1350 Massachusetts Ave
Additional Sector Carrier 5G	0	City	Cambridge
Suffix		State	MA
FP Solution Type & Tech Type	MODIFICATION;4G_Sector-Add-CBRS;4G_Sector-Add-L-Sub6;4G_Sector-Add-Sub1;4G_Sector-Add-Sub3	Zip Code	02139
		County	Middlesex
		Latitude	42.372875/ 42° 22' 22.350"
		Longitude	-71.118664/ 71° 7' 7.190"

Project Scope

Antenna Summary

Added Antenna

700	850	1900	AWS	CBRS	L-Sub6	28GHz	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit
LTE	LTE,5G	LTE	LTE				MATSING	MS-6.3-DB90A	136	137.7	40(A)	PHYSICAL	1

Removed Antenna

700	850	1900	AWS	CBRS	L-Sub6	28GHz	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit

Retained Antenna

700	850	1900	AWS	CBRS	L-Sub6	28GHz	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit
					5G		Samsung	MT6407-77A	156	157.5	160(B)	PHYSICAL	1
					5G		Samsung	MT6407-77A	136	137.5	40(A)	PHYSICAL	1
					5G		Samsung	MT6407-77A	140	141.5	280(C)	PHYSICAL	1
LTE	LTE,5G	LTE	LTE				COMMSCOPE	NHH-65A-R2B	159	161.3	160(2),160(32)	PHYSICAL	2
LTE	LTE,5G	LTE	LTE				COMMSCOPE	NHH-65A-R2B	140	142.3	280(3),280(33)	PHYSICAL	2
						5G	SAMSUNG	VZ-AT1K04	156	156.7	160(B)	PHYSICAL	1
						5G	SAMSUNG	VZ-AT1K04	137	137.7	40(A)	PHYSICAL	1
						5G	SAMSUNG	VZ-AT1K04	141	141.7	280(C)	PHYSICAL	1
				LTE			SAMSUNG	XXDWMM-12.5-65	134.5	135	40(A)	PHYSICAL	1
				LTE			SAMSUNG	XXDWMM-12.5-65	138.5	139	280(C)	PHYSICAL	1
				LTE			SAMSUNG	XXDWMM-12.5-65	153	153.5	160(B)	PHYSICAL	1

Added: 1	Removed: 0	Retained: 13

Non Antenna Summary

Added Non Antenna

Equipment Type	Locatio	700	850	1900	AWS	CBRS	28GHz	Make	Model	Install Type	Quantity
OVP	Tower								12 OVP	PHYSICAL	1
Hybrid Cable	Tower							N/A	6x12 Hybriflex LI	PHYSICAL	2
RRU	Tower			LTE	LTE			Samsung	B2/B66A RRH ORAN (RF4439d-25A)	PHYSICAL	5
RRU	Tower	LTE	LTE,5G					Samsung	RF4442d-13A	PHYSICAL	2

Removed Non Antenna

Equipment Type	Locatio	700	850	1900	AWS	CBRS	28GHz	Make	Model	Install Type	Quantity
OVP	Tower							ovp	6 OVP	PHYSICAL	1
Hybrid Cable	Tower							Hybrid	6X12 Hybrid Cables	PHYSICAL	1

Retained Non Antenna

Equipment Type	Locatio	700	850	1900	AWS	CBRS	28GHz	Make	Model	Install Type	Quantity
OVP	Tower							ovp	6 OVP	PHYSICAL	2
Hybrid Cable	Tower							Hybrid	6X12 Hybrid Cables	PHYSICAL	2
RRU	Tower						5G	Samsung	AT1K04 DC	PHYSICAL	3
RRU	Tower			LTE	LTE			Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)	PHYSICAL	3
RRU	Tower	LTE	LTE,5G					Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)	PHYSICAL	3
RRU	Tower					LTE		Samsung	CBRS RRH - RT4401-48A	PHYSICAL	3

Added: 10	Removed: 2	Retained: 16

Services							
700 LTE	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	01	02	03	01	02	03	04
Azimuth	40	160	280	40	160	280	40
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257	056257
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	5230	5230	5230	5230	5230	5230	5230
Mech Down-tilt	4	12	10	4	12	10	4
Elect Down-tilt	1	2	1	10	8	8	10
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	70.07	59.23	80.27	88.22	59.23	80.27	94.53
Transmitter Max Power	47.8 dBm	47.8 dBm	47.8 dBm	47.8 dBm	47.8 dBm	47.8 dBm	47.8 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	RF4442d-13A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	1,4	1,4	1
Transmitter Id	9373662	9373666	9373670	14249286	14249289	14249292	14249394
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10	10	10	10	10
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services		
700 LTE	**60MHZ (8029284)**	**YARD (8400068)**
Sector		05
Azimuth		40
Cell/Enodeb-Id		056257
Antenna Model		MS-6.3-DB90A
Antenna Make		MATSING
Centerline		136
DLEARFCN		5230
Mech Down-tilt		12
Elect Down-tilt		10
Tip Height		137.7
Regulatory Power		85.62
Transmitter Max Power		47.8 dBm
TMA Make		
TMA Model		
RRU Make		Samsung
RRU Model		RF4442d-13A
Number of Tx,Rx		2 , 2
Operational Port Count		0
Position		1
Transmitter Id		16397398
Source		VZNPP
Bandwidth		10
Ant. Dimensions H x W x D(inch)		40.0 x 51.0 x 40.0
Weight(lb)		90.0

Services							
850 LTE	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	01	02	03	01	02	03	04
Azimuth	40	160	280	40	160	280	40
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257	056257
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	2560	2560	2560	2560	2560	2560	2560
Mech Down-tilt	4	12	10	4	12	10	4
Elect Down-tilt	1	2	1	10	16	14	10
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	47.95	76	60.37	59.1	50.21	39.88	53.9
Transmitter Max Power	47.8 dBm	47.8 dBm	47.8 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	RF4442d-13A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	1,4	1,4	1
Transmitter Id	12390909	12390910	12390911	14249280	14249281	14249282	14249391
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10	10	10	10	10
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services		
850 LTE	**60MHZ (8029284)**	**YARD (8400068)**
Sector		05
Azimuth		40
Cell/Enodeb-Id		056257
Antenna Model		MS-6.3-DB90A
Antenna Make		MATSING
Centerline		136
DLEARFCN		2560
Mech Down-tilt		12
Elect Down-tilt		10
Tip Height		137.7
Regulatory Power		81.58
Transmitter Max Power		46.0 dBm
TMA Make		
TMA Model		
RRU Make		Samsung
RRU Model		RF4442d-13A
Number of Tx,Rx		2 , 2
Operational Port Count		0
Position		1
Transmitter Id		14249392
Source		VZNPP
Bandwidth		10
Ant. Dimensions H x W x D(inch)		40.0 x 51.0 x 40.0
Weight(lb)		90.0

Services							
850 NR	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	0031	0032	0033	0031	0032	0033	0034
Azimuth	40	160	280	40	160	280	40
Cell/Enodeb-Id	0569001	0569001	0569001	0569001	0569001	0569001	0569001
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	2560	2560	2560	2560	2560	2560	2560
Mech Down-tilt	4	12	10	4	12	10	4
Elect Down-tilt	1	2	1	10	16	14	10
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	47.95	76	60.37	59.1	50.21	39.88	53.9
Transmitter Max Power	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	RF4442d-13A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	1,4	1,4	1
Transmitter Id	12390909	12390910	12390911	14249280	14249281	14249282	14249391
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10	10	10	10	10
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services		
850 NR	**60MHZ (8029284)**	**YARD (8400068)**
Sector		0035
Azimuth		40
Cell/Enodeb-Id		0569001
Antenna Model		MS-6.3-DB90A
Antenna Make		MATSING
Centerline		136
DLEARFCN		2560
Mech Down-tilt		12
Elect Down-tilt		10
Tip Height		137.7
Regulatory Power		81.58
Transmitter Max Power		46.0 dBm
TMA Make		
TMA Model		
RRU Make		Samsung
RRU Model		RF4442d-13A
Number of Tx,Rx		2 , 2
Operational Port Count		0
Position		1
Transmitter Id		14249392
Source		VZNPP
Bandwidth		10
Ant. Dimensions H x W x D(inch)		40.0 x 51.0 x 40.0
Weight(lb)		90.0

Services							
1900 LTE	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	01	02	03	01	02	03	04
Azimuth	40	160	280	40	160	280	40
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257	056257
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	1025	1025	1025	1025	1025	1025	1025
Mech Down-tilt	2	3	3	2	3	3	2
Elect Down-tilt	1	1	1	6	6	6	6
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	91.13	60.77	111.34	306.53	60.77	111.34	292.73
Transmitter Max Power	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	4	4	1
Transmitter Id	9373663	9373667	9373671	14249287	14249290	14249293	14249395
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	15	15	15	15	15	15	15
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services					
1900 LTE	**60MHZ (8029284)**	**YARD (8400068)**			
Sector		05	06	07	08
Azimuth		40	40	40	40
Cell/Enodeb-Id		056257	056257	056257	056257
Antenna Model		MS-6.3-DB90A	MS-6.3-DB90A	MS-6.3-DB90A	MS-6.3-DB90A
Antenna Make		MATSING	MATSING	MATSING	MATSING
Centerline		136	136	136	136
DLEARFCN		1025	1025	1025	1025
Mech Down-tilt		3	3	2	3
Elect Down-tilt		6	6	6	6
Tip Height		137.7	137.7	137.7	137.7
Regulatory Power		251.46	401.3	377.11	288.71
Transmitter Max Power		46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make					
TMA Model					
RRU Make		Samsung	Samsung	Samsung	Samsung
RRU Model		B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx		2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count		0	0	0	0
Position		1	1	1	1
Transmitter Id		14249398	14249401	14249383	14249386
Source		VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth		15	15	15	15
Ant. Dimensions H x W x D(inch)		40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0
Weight(lb)		90.0	90.0	90.0	90.0

Services							
AWS LTE	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	01	02	03	01	02	03	04
Azimuth	40	160	280	40	160	280	40
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257	056257
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	2050	2050	2050	2050	2050	2050	2050
Mech Down-tilt	2	3	3	2	3	3	2
Elect Down-tilt	1	1	1	6	6	6	6
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	73.24	73.24	73.24	291.43	73.24	73.24	253.82
Transmitter Max Power	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	1	1	1
Transmitter Id	9373664	9373668	9373672	14249288	14249291	14249294	14249396
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	20	20	20	20	20	20	20
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services					
AWS LTE	**60MHZ (8029284)**	**YARD (8400068)**			
Sector		05	06	07	08
Azimuth		40	40	40	40
Cell/Enodeb-Id		056257	056257	056257	056257
Antenna Model		MS-6.3-DB90A	MS-6.3-DB90A	MS-6.3-DB90A	MS-6.3-DB90A
Antenna Make		MATSING	MATSING	MATSING	MATSING
Centerline		136	136	136	136
DLEARFCN		2050	2050	2050	2050
Mech Down-tilt		3	3	2	3
Elect Down-tilt		6	6	6	6
Tip Height		137.7	137.7	137.7	137.7
Regulatory Power		242.4	271.97	278.31	461.88
Transmitter Max Power		46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make					
TMA Model					
RRU Make		Samsung	Samsung	Samsung	Samsung
RRU Model		B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx		2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count		0	0	0	0
Position		1	1	1	1
Transmitter Id		14249399	14249402	14249384	14249387
Source		VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth		20	20	20	20
Ant. Dimensions H x W x D(inch)		40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0
Weight(lb)		90.0	90.0	90.0	90.0

Services						
CBRS LTE	**60MHZ (8029284)**			**YARD (8400068)**		
Sector	19	20	21	19	20	21
Azimuth	40	160	280	40	160	280
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257
Antenna Model	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65
Antenna Make	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG
Centerline	134.5	153	138.5	134.5	153	138.5
DLEARFCN	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537
Mech Down-tilt	0	0	0	0	0	0
Elect Down-tilt	8	8	8	8	8	8
Tip Height	135	153.5	139	135	153.5	139
Regulatory Power	5.09, 5.09, 5.09, 5.09	5.09, 5.09, 5.09, 5.09	5.09, 5.09, 5.09, 5.09	5.09, 5.09, 5.09, 5.09	5.09, 5.09, 5.09, 5.09	5.09, 5.09, 5.09, 5.09
Transmitter Max Power	36.44 dBm	36.44 dBm	36.44 dBm	36.44 dBm	36.44 dBm	36.44 dBm
TMA Make						
TMA Model						
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A
Number of Tx,Rx	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Operational Port Count	0	0	0	0	0	0
Position				2	2	2
Transmitter Id	9373674	9373675	9373676	14249295	14249296	14249297
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	10, 20, 20, 20	10, 20, 20, 20	10, 20, 20, 20	10, 20, 20, 20	10, 20, 20, 20	10, 20, 20, 20
Ant. Dimensions H x W x D(inch)	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35
Weight(lb)	2.86	2.86	2.86	2.86	2.86	2.86

Services						
CBAND NR	**60MHZ (8029284)**			**YARD (8400068)**		
Sector	0031	0032	0033	0031	0032	0033
Azimuth	40	160	280	40	160	280
Cell/Enodeb-Id	0569001	0569001	0569001	0569001	0569001	0569001
Antenna Model	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A
Antenna Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
Centerline	136	156	140	136	156	140
DLEARFCN	648672	648672	648672	648672	648672	648672
Mech Down-tilt	0	0	0	0	0	0
Elect Down-tilt	1	1	1	0	0	0
Tip Height	137.5	157.5	141.5	137.5	157.5	141.5
Regulatory Power	1273.96	1273.96	1273.96	1273.96	1273.96	1273.96
Transmitter Max Power	50.0 dBm	50.0 dBm	50.0 dBm	50.0 dBm	50.0 dBm	50.0 dBm
TMA Make						
TMA Model						
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	64	64	64	64	64	64
Position				3	3	3
Transmitter Id	9031100	9031102	9031103	14249298	14249299	14249300
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	60	60	60	60	60	60
Ant. Dimensions H x W x D(inch)	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51
Weight(lb)	87.1	87.1	87.1	87.1	87.1	87.1

Services						
28 GHz NR	**60MHZ (8029284)**			**YARD (8400068)**		
Sector	0238	0239	0240	0238	0239	0240
Azimuth	40	160	280	40	160	280
Cell/Enodeb-Id	0560074	0560074	0560074	0560074	0560074	0560074
Antenna Model	VZ-AT1K04	VZ-AT1K04	VZ-AT1K04	VZ-AT1K04	VZ-AT1K04	VZ-AT1K04
Antenna Make	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG
Centerline	137	156	141	137	156	141
DLEARFCN	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165
Mech Down-tilt	0	0	0	0	0	0
Elect Down-tilt	0	0	0	0	0	0
Tip Height	137.7	156.7	141.7	137.7	156.7	141.7
Regulatory Power	1.76, 1.76, 1.76, 1.76, 1.76, 1.76	1.76, 1.76, 1.76, 1.76, 1.76, 1.76	1.76, 1.76, 1.76, 1.76, 1.76, 1.76	1.86, 1.86, 1.86, 1.86, 1.86, 1.86	1.86, 1.86, 1.86, 1.86, 1.86, 1.86	1.86, 1.86, 1.86, 1.86, 1.86, 1.86
Transmitter Max Power	26.0 dBm	26.0 dBm	26.0 dBm	26.0 dBm	26.0 dBm	26.0 dBm
TMA Make						
TMA Model						
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	AT1K04 DC	AT1K04 DC	AT1K04 DC	AT1K04 DC	AT1K04 DC	AT1K04 DC
Number of Tx,Rx	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Operational Port Count	0	0	0	0	0	0
Position				2	2	2
Transmitter Id	9373677	9373678	9373679	14249283	14249284	14249285
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100
Ant. Dimensions H x W x D(inch)	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4
Weight(lb)	29.26	29.26	29.26	29.26	29.26	29.26

Callsigns Per Antenna

Sector	Make	Model	Ant CL Height AG	Ant Tip Height	Azimuth	Elect Down-tilt	Mech Down-tilt	Gain	Bandwidth	Regulatory Power	700	850	1900	2100	28 GHz	31 GHz	39 GHz	LSub-6	CBRS
01	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	12.35	26	88.22	WQJQ689								
02	COMMSCOPE	NHH-65A-R2	159	161.3	160	8	12	11.29	66.75	59.23	WQJQ689								
03	COMMSCOPE	NHH-65A-R2	140	142.3	280	8	10	11.29	66.75	80.27	WQJQ689								
04	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	12.65	25.1	94.53	WQJQ689								
05	MATSING	MS-6.3-DB90A	136	137.7	40	10	12	12.85	25	85.62	WQJQ689								
0031	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	14.25	23	59.1		KNKA201							
0032	COMMSCOPE	NHH-65A-R2	159	161.3	160	16	12	10.15	62	50.21		KNKA201							
0033	COMMSCOPE	NHH-65A-R2	140	142.3	280	14	10	10.36	61.5	39.88		KNKA201							
0034	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	13.85	21.9	53.9		KNKA201							
0035	MATSING	MS-6.3-DB90A	136	137.7	40	10	12	13.55	21	81.58		KNKA201							
01	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	14.25	23	59.1		KNKA201							
02	COMMSCOPE	NHH-65A-R2	159	161.3	160	16	12	10.15	62	50.21		KNKA201							
03	COMMSCOPE	NHH-65A-R2	140	142.3	280	14	10	10.36	61.5	39.88		KNKA201							
04	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	13.85	21.9	53.9		KNKA201							
05	MATSING	MS-6.3-DB90A	136	137.7	40	10	12	13.55	21	81.58		KNKA201							
01	MATSING	MS-6.3-DB90A	136	137.7	40	6	2	19.75	11	306.53			KNLF646,KNLH242,KNLH310						
02	COMMSCOPE	NHH-65A-R2	159	161.3	160	6	3	14.42	66.75	60.77			KNLF646,KNLH242,KNLH310						
03	COMMSCOPE	NHH-65A-R2	140	142.3	280	6	3	14.42	66.75	111.34			KNLF646,KNLH242,KNLH310						
04	MATSING	MS-6.3-DB90A	136	137.7	40	6	2	19.65	11.2	292.73			KNLF646,KNLH242,KNLH310						
05	MATSING	MS-6.3-DB90A	136	137.7	40	6	3	20.75	9.9	251.46			KNLF646,KNLH242,KNLH310						
06	MATSING	MS-6.3-DB90A	136	137.7	40	6	3	20.05	10.6	401.3			KNLF646,KNLH242,KNLH310						
07	MATSING	MS-6.3-DB90A	136	137.7	40	6	2	19.25	11.7	377.11			KNLF646,KNLH242,KNLH310						
08	MATSING	MS-6.3-DB90A	136	137.7	40	6	3	21.35	9.2	288.71			KNLF646,KNLH242,KNLH310						
01	MATSING	MS-6.3-DB90A	136	137.7	40	6	2	20.85	9.7	291.43				WQGA900,WQGB266					

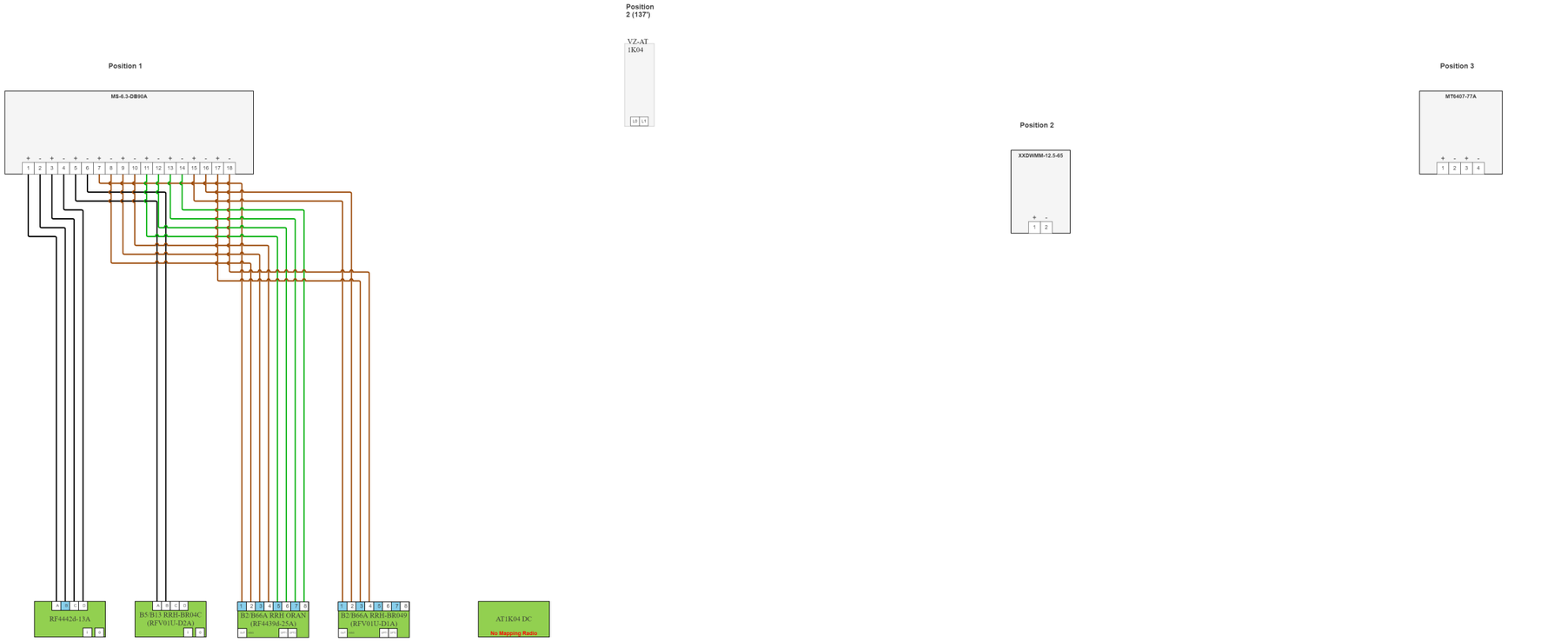
02	COMMSCOPE	NHH-65A-R2	159	161.3	160	6	3	15.05	57.25	73.24				WQGA900,WQGB266					
03	COMMSCOPE	NHH-65A-R2	140	142.3	280	6	3	15.05	57.25	73.24				WQGA900,WQGB266					
04	MATSING	MS-6.3-DB90A	136	137.7	40	6	2	20.45	10.2	253.82				WQGA900,WQGB266					
05	MATSING	MS-6.3-DB90A	136	137.7	40	6	3	20.05	10.6	242.4				WQGA900,WQGB266					
06	MATSING	MS-6.3-DB90A	136	137.7	40	6	3	20.65	10	271.97				WQGA900,WQGB266					
07	MATSING	MS-6.3-DB90A	136	137.7	40	6	2	20.65	9.9	278.31				WQGA900,WQGB266					
08	MATSING	MS-6.3-DB90A	136	137.7	40	6	3	22.95	7.6	461.88				WQGA900,WQGB266					
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0031	Samsung	MT6407-77A	136	137.5	40	0	0	23.05	100	1273.96								WRNE627,WRNE628,WRNE629	
0032	Samsung	MT6407-77A	156	157.5	160	0	0	23.05	100	1273.96								WRNE627,WRNE628,WRNE629	

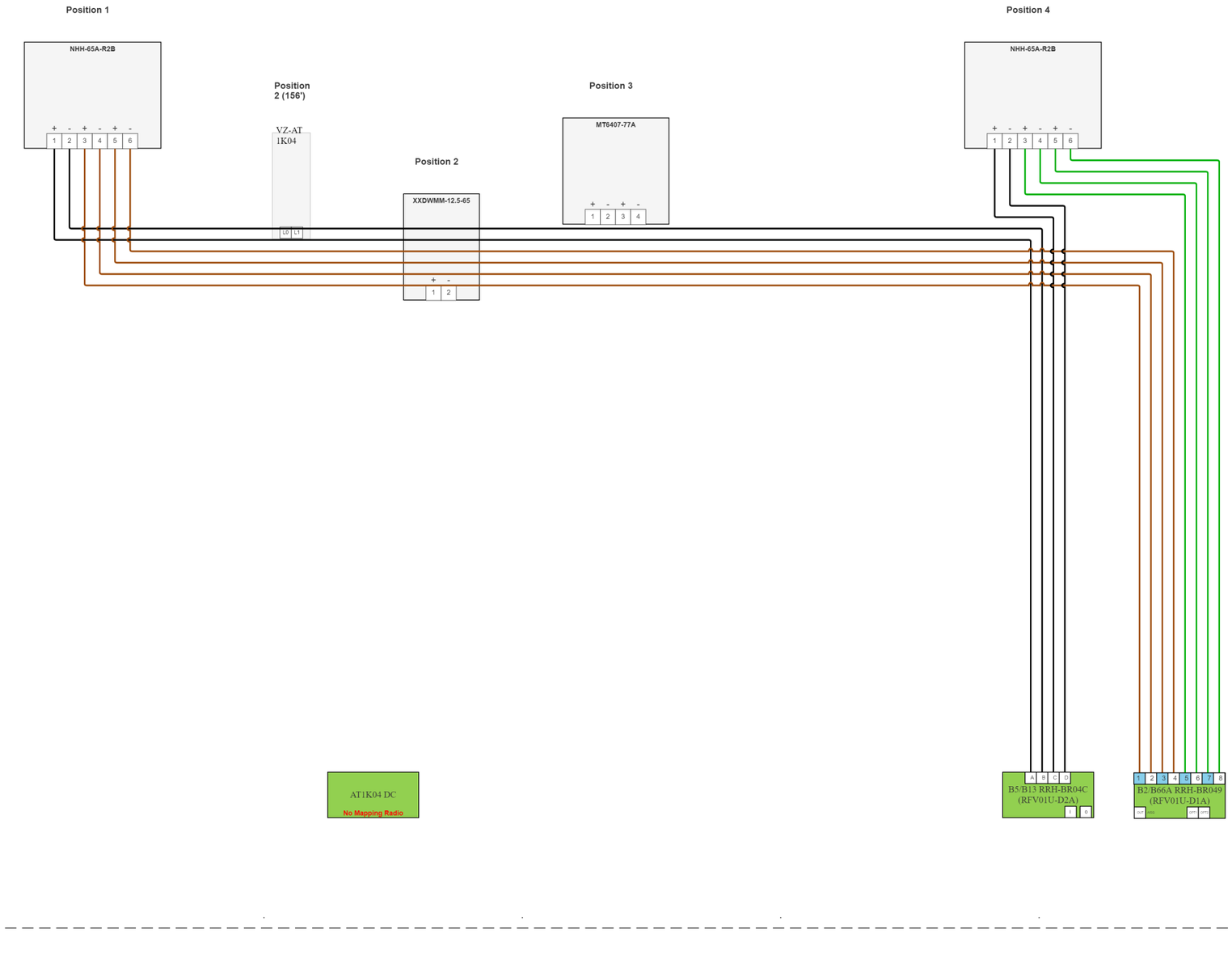
0033	Samsung	MT6407-77A	140	141.5	280	0	0	23.05	100	1273.96								WRNE627,WRNE628,WRNE629	
19	SAMSUNG	XXDWMM-12.5-65	134.5	135	40	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
19	SAMSUNG	XXDWMM-12.5-65	134.5	135	40	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
19	SAMSUNG	XXDWMM-12.5-65	134.5	135	40	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
19	SAMSUNG	XXDWMM-12.5-65	134.5	135	40	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
20	SAMSUNG	XXDWMM-12.5-65	153	153.5	160	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
20	SAMSUNG	XXDWMM-12.5-65	153	153.5	160	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
20	SAMSUNG	XXDWMM-12.5-65	153	153.5	160	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
20	SAMSUNG	XXDWMM-12.5-65	153	153.5	160	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
21	SAMSUNG	XXDWMM-12.5-65	138.5	139	280	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
21	SAMSUNG	XXDWMM-12.5-65	138.5	139	280	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
21	SAMSUNG	XXDWMM-12.5-65	138.5	139	280	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
21	SAMSUNG	XXDWMM-12.5-65	138.5	139	280	8	0	10.45	64.7	5.09									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617

Callsigns

Callsign	Market	Radio Code	Market #	Block	State	County	License Name	Wholly Owner	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/Sq. mil	Status	Action	Approve for Insvc
WQJQ689	Northeast	WU	REA001	C	MA	25017	Cellco Partnership	Yes	22.000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	94.53	1000	1995.55	proposed	added	1
KNKA201	Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	CL	CMA006	B	MA	25017	Cellco Partnership	Yes	25.000	835.000 - 845.000/846.500 - 849.000	880.000 - 890.000/891.500 - 894.000	835.000 - 845.000/846.500 - 849.000	880.000 - 890.000/891.500 - 894.000	81.58	400	1995.55	proposed	added	1
KNLF646	Boston, MA	CW	BTA051	C	MA	25017	AirTouch Cellular	Yes	10.000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	401.3	1640	1995.55	proposed	added	1
KNLH310	Boston, MA	CW	BTA051	E	MA	25017	AirTouch Cellular	Yes	10.000	1885.000 1890.000/.000 - .000	1965.000 1970.000/.000 - .000	1885.000 1890.000/.000 - .000	1965.000 1970.000/.000 - .000	401.3	1640	1995.55	proposed	added	1
KNLH242	Boston, MA	CW	BTA051	F	MA	25017	Cellco Partnership	Yes	10.000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	401.3	1640	1995.55	proposed	added	1
CBRS_CALL SIGN	UNLICENSE	3.5 GHz	UNLICENSE	UNLICENSE	MA	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	- / -	- / -	5.09		1995.55	proposed	retained	
WRBA936	Boston, MA	UU	BTA051	L1	MA	25017	Cellco Partnership	Yes	325.000	27600.000 27925.000/.000 - .000	.000 - .000/.000 - .000	27600.000 27925.000/.000 - .000	.000 - .000/.000 - .000	1.86		1995.55	proposed	added	1
WRBA937	Boston, MA	UU	BTA051	L2	MA	25017	Cellco Partnership	Yes	325.000	27925.000 27950.000/.000 - .000	28050.000 28350.000/.000 - .000	27925.000 27950.000/.000 - .000	28050.000 28350.000/.000 - .000	1.86		1995.55	proposed	added	1
WRLD615	D25017 - Middlesex, MA	PL	D25017	0	MA	25017	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	5.09	501	1995.55	proposed	retained	1
WRLD617	D25017 - Middlesex, MA	PL	D25017	0	MA	25017	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	5.09	501	1995.55	proposed	retained	1
WRLD616	D25017 - Middlesex, MA	PL	D25017	0	MA	25017	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	5.09	501	1995.55	proposed	retained	1

WQGB266	Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	AW	CMA006	A	MA	25017	Cellco Partnership	Yes	20.000	1710.000 1720.000/.000 - .000	2110.000 2120.000/.000 - .000	1710.000 1720.000/.000 - .000	2110.000 2120.000/.000 - .000	461.88	1640	1995.55	proposed	added	1
WRNE627	Boston, MA	PM	PEA007	A1	MA	25017	Cellco Partnership	Yes	20.000	3700.000 3720.000/.000 - .000	.000 - .000/.000 - .000	3700.000 3720.000/.000 - .000	.000 - .000/.000 - .000	1273.96	1640	1995.55	proposed	retained	1
WRNE628	Boston, MA	PM	PEA007	A2	MA	25017	Cellco Partnership	Yes	20.000	3720.000 3740.000/.000 - .000	.000 - .000/.000 - .000	3720.000 3740.000/.000 - .000	.000 - .000/.000 - .000	1273.96	1640	1995.55	proposed	retained	1
WRNE629	Boston, MA	PM	PEA007	A3	MA	25017	Cellco Partnership	Yes	20.000	3740.000 3760.000/.000 - .000	.000 - .000/.000 - .000	3740.000 3760.000/.000 - .000	.000 - .000/.000 - .000	1273.96	1640	1995.55	proposed	retained	1
WQGA900	Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH-R	AW	BEA003	B	MA	25017	Cellco Partnership	Yes	20.000	1720.000 1730.000/.000 - .000	2120.000 2130.000/.000 - .000	1720.000 1730.000/.000 - .000	2120.000 2130.000/.000 - .000	461.88	1640	1995.55	proposed	added	1


Position 1
MS-6.3-DB90A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
RF4442d-13A
B5/B13 RRH-BR04C (RFV01U-D2A)
B2/B66A RRH ORAN (RF4439d-25A)
B2/B66A RRH-BR049 (RFV01U-D1A)
AT&T
Position 2 (137°)
VZ-AT
1K04
Position 2
XXDWMM-12.5-65
Position 3
MT6407-77A
Alpha
(Proposed)
Legends
RET dc signal capable port
700/850(LB)
700(LT)
850(CB)
AWS(AW)
PCS(PC)
AWS/PCS(HB)
28GHz(U28)
39GHz(U39)
L-Sub6(S6)
CBRS(RS)
LAA(LA)
Fiber
AISG
DC
Coax
Coax Jumper
Sectors Shared Equipments
Notes:
-Antenna view is from the back of the antennas
-Colors of connections are just for clarification
-Size of objects in drawing doesn't reflect equipment true dimensions
Sector design
Shelter



Beta
(Proposed)

Legends

RET dc signal capable port

- 700/850(LB)
- 700(LT)
- 850(CB)
- AWS(AW)
- PCS(PC)
- AWS/PCS(HB)
- 28GHz(U28)
- 39GHz(U39)
- L-Sub6(S6)
- CBRS(RS)
- LAA(LA)
- Fiber
- AISG
- DC

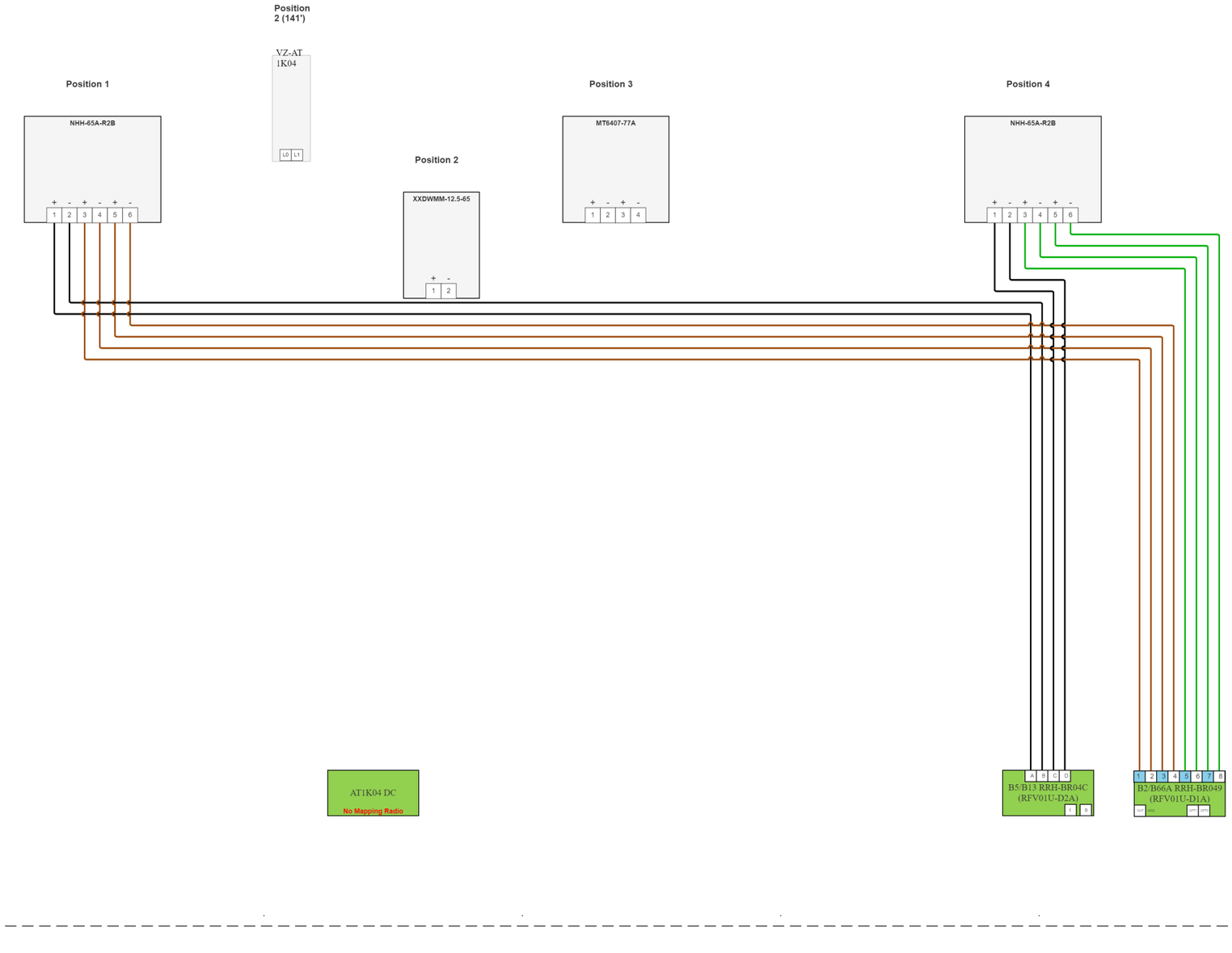
Coax

Coax Jumper

Sectors Shared Equipments

Notes:

-Antenna view is from the back of the antennas
-Colors of connections are just for clarification
-Size of objects in drawing doesn't reflect equipment true dimensions



Gamma
(Proposed)

Legends

RET dc signal capable port

- 700/850(LB)
- 700(LT)
- 850(CB)
- AWS(AW)
- PCS(PC)
- AWS/PCS(HB)
- 28GHz(U28)
- 39GHz(U39)
- L-Sub6(S6)
- CBRS(RS)
- LAA(LA)
- Fiber
- AISG
- DC

Coax

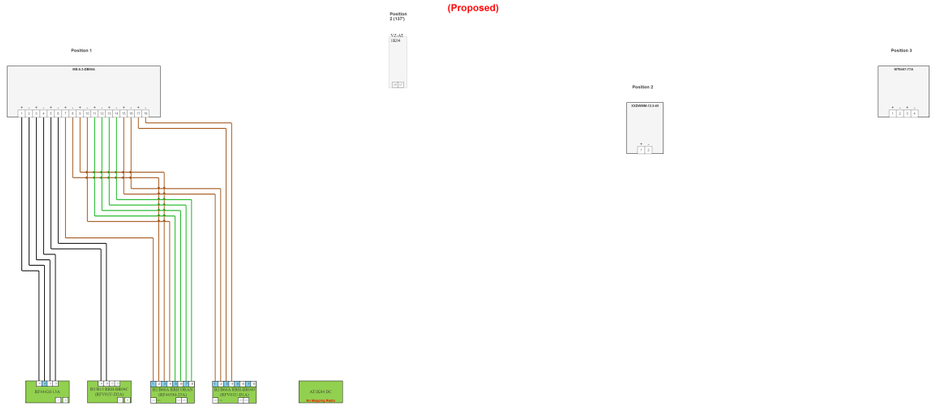
Coax Jumper

Sectors Shared Equipments

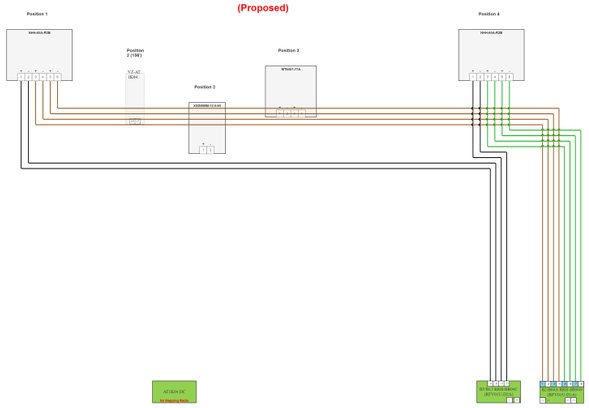
Notes:

-Antenna view is from the back of the antennas
-Colors of connections are just for clarification
-Size of objects in drawing doesn't reflect equipment true dimensions

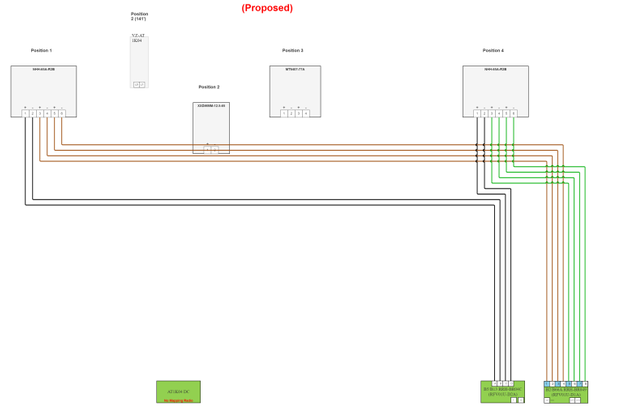
Alpha
(Proposed)



Beta
(Proposed)



Gamma
(Proposed)



Dewberry Engineers Inc.
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Dewberry

January 30, 2024

Andrew Leone
Verizon Wireless
51 Alder Street
Medway, MA 02053

Re: Harvard SQ MA
Site ID: 137338
Fuze #: 16984516
1350 Massachusetts Ave
Cambridge, MA 02139

Dear Mr. Leone:

Verizon Wireless has proposed (1) new MS-6.3DB90-T with antenna mount, (2) new RF4442d-13A RRHs and (5) new RF4439d-25A on the rooftop at the above referenced site. Verizon also has (3) existing MT6407-77A 5G antennas w/ integrated RRHs, (4) existing NHH-65A-R2B antennas, (3) existing VZ-AT1K04 5G antennas w/ integrated AT1K04 DC RRHs, (3) existing CBRS RRHs RT4401-48A w/ integrated XXDWMM-12.5-65 antennas, (3) RFV01U-D1A RRHs, (3) RFV01U-D2A RRHs, and (3) 6-OVPs that are to remain. The proposed equipment will be façade mounted to the existing penthouse.

Dewberry Engineers Inc. (Dewberry) has reviewed the antenna design sheets (dated 12/28/23) provided by Verizon Wireless and has determined that the proposed façade mount and existing building have adequate capacity to support the proposed equipment configuration. Dewberry assumes that the new antennas, RRHs, OVPs and associated equipment are installed per the latest Construction Drawings by Dewberry.

This assessment is based on our visual inspection that the existing building structure is in good condition and was constructed in conformance with all applicable state and local building codes. If, during construction, any damage, deterioration, and/or discrepancies are noticed, Dewberry is to be notified to assess any deviation from the assumed condition. Any alteration in equipment loading described above and on the associated plans will void any conclusions expressed herein and will require further analysis and design. No structural qualification is made or implied by this structural letter for existing structural members not supporting the proposed installation.

If you have any questions, please do not hesitate to call me at 617-531-0744.

Sincerely,
Dewberry Engineers Inc.

COMMONWEALTH OF MASSACHUSETTS
BRANDON G KELSEY
CIVIL
NO. 54565
REGISTERED PROFESSIONAL ENGINEER

Brandon Kelsey, P.E.
Structural Project Engineer

01/31/2024

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Dewberry Engineers, Inc.
Structural Analysis Summary Sheet

Job No.:	50121487/50170381	**By:**	AMD	**Date:**	01/26/24
Job Name:	Harvard SQ MA	**Checked:**	BGK	**Date:**	01/29/24

Location: 1350 Massachusetts Avenue, Cambridge, MA 02139
Client: Verizon Wireless

Scope of Work:

- Proposed installation of (1) Matsing MS-6.3DB90-T antenna

Codes / Standards / References:

- Massachusetts State Building Code – 780 CMR 9th edition
- IBC 2015
- TIA-222-G
- ASCE 7-10
- AISC 14th Ed.
- RFDS dated 12/28/23
- Site visit by Dewberry Engineers on 01/10/24
- Latest Construction Drawings by Dewberry Engineers

Design & Analysis Assumptions:

- Assume antenna is centered on the proposed 4-1/2" OD Sch. 40 mounting pipe.
- Design and analysis are based on dead and wind loads. The analysis checks for normal bending and shear stresses.

Conclusion / Recommendations:

- The existing structure has sufficient capacity to support the proposed installation.
- The proposed wall mount has sufficient capacity to support the proposed installation.

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Job Number	50170381
Made by:	AMD
Date:	01/29/24
Checked by:	BGK
Date:	01/29/24

(Harvard SQ MA) - Design Wind Load

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Wind Load Design Criteria

Site Name: Harvard SQ MA

Wind Loading General Information & Design Input from ASCE 7-16

Item	Value	Description	Reference
V_{Ult} =	139.00	Design Wind Speed (mph)	*ASCE 7-16, Hazard Tool*
K_d =	0.85	Wind Directionality Factor	*Table 26.6-1*
Risk Cat.	III	Risk Category	*Table 1.5-1*
I =	1.15	Importance Factor (Without Ice)	*Table 1.5-2*
z = h =	136.00	ft. (A.G.L.)	*Max. Center of Appurtenance*
Exp. Cat.	B	Exposure Category	*Sect. 26.7.3*
z_g =	1200.00	Terrain Exposure Constant	*Table 26.9-1*
α =	7.00	Terrain Exposure Constant	*Table 26.9-2*
K_z =	1.08	Velocity Pressure Coefficient	*Table 29.3-1*
Topo. Cat.	1	Topographic Feature	*Sect. 26.8.1*
e =	2.72	Natural Logarithmic base	
γ =	N/A	Height attenuation Factor	
L_h =	N/A	Distace upwind of crest	
H =	N/A	ft. Height of crest above surrounding terrain	
K_1 =	N/A	Topographic Multiplier	*Figure 26.8-1*
K_2 =	N/A	Topographic Multiplier	*Figure 26.8-1*
K_3 =	N/A	Topographic Multiplier	*Figure 26.8-1*
K_{zt} =	1.00	$= (1+K_1K_2K_3)^2$	*Sect. 26.8.2*
G =	0.85	Gust Effect Factor	*Sect. 26.9.1*
$q_{z\ design}$ =	52.2 psf	$= 0.00256(K_z)(K_{zt})(K_d)(V^2)$	*Sect.29.3.2*

Design Wind Forces:

Section 29.5

$F_A = q_{z\ design} G C_f A_f$

$F_{ai} = q_{z\ ice} G_h (EPA)_{ai}$

(where A_f = $(EPA)_A$ = effective projected area of the appurtenance)

(see calculation tables on following pages)

Dewberry

Job Number	50170381
Made by:	AMD
Date:	01/29/24
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Date:	01/29/24

(Harvard SQ MA) - Design Wind Load

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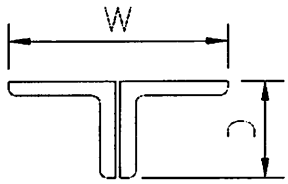
Element Definition

Description	Dimensions (in.)			Weight (lb)	Length / # Supports
	W	D	H		
MS-6.3D90-T	45.90	44.60	40.30	130.70	1.00
STRUCTURAL MEMBERS					
4-1/2" OD pipe	4.50	4.50	12.00	10.79	*Pipe*

Note:

1) For Double Angles assume the following:



Dewberry

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Made by:	AMD
Date:	01/29/24
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(Harvard SQ MA) - Design Wind Load

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Design Wind Load

Members	Dimensions (ft.)			Area $(A_a)_n$	Area $(A_a)_t$	Aspect Ratio	Aspect Ratio	C_{an}	C_{at}
	Width (Normal)	Depth (Tangent)	Height (or span)	(normal) (sf)	(tangent) (sf)	(normal)	(tangent)	(normal) Table 2-8	(tangent) Table 2-8
MS-6.3D90-T	3.83	3.72	3.36	12.87	12.50	0.88	0.90	1.20	1.20
STRUCTURAL MEMBERS									
4-1/2" OD pipe	0.38	0.38	1.00	0.38	0.38	2.63	2.63	0.70	0.70

Design Effective Projected Area & Wind Loads

Members	EPA_a @ 0.0° (sf)	EPA_a @ 30.0° (sf)	EPA_a @ 60.0° (sf)	EPA_a @ 90.0° (sf)	F_a @ 0.0° (lb)	F_a @ 30.0° (lb)	F_a @ 60.0° (lb)	F_a @ 90.0° (lb)	Gravity Load @ Support (lb)
MS-6.3D90-T	15.44	15.33	15.11	15.00	685.3	680.3	670.5	665.6	130.7
STRUCTURAL MEMBERS									
4-1/2" OD pipe	0.27	-	-	-	11.8	-	-	-	10.8

Dewberry

Job Number	50170381
Made by:	AMD
Date:	01/29/24
Checked by:	BGK
Date:	01/29/24

(Harvard SQ MA) - HY200 Anchorage Calc

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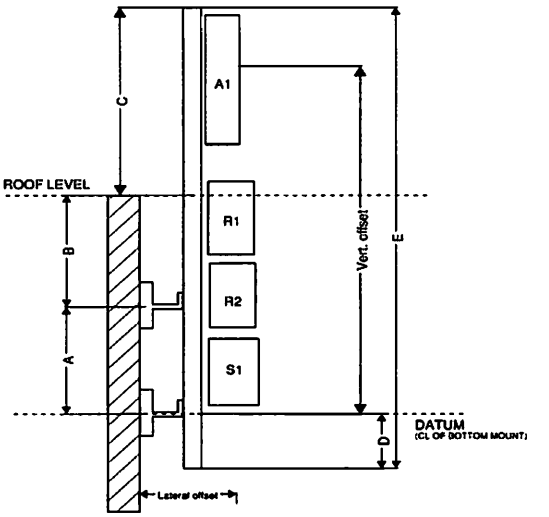
Top & Bottom Mounting Bracket Anchroage Check (LRFD)

- 1.2DL + 1.0WL
- Existing parapet wall is considered to be 8" concrete wall with 2500 psi compressive strength
- Anchor bolts proposed are 1/2" diameter Hilit Hit HY 200 epoxy anchors with threaded rods and 2-3/4" embedment into concrete

Vertical dim. between top and bottom mount =	3.0 ft	(dim A)
Vertical dim. between top mount and roof =	1.3 ft	(dim B)
Vertical dim between Roof and top of pipe =	0.0 ft	(dim C)
Length of pipe below bottom mount =	1.75 ft	(dim D)
Total length of pipe =	6.0 ft	(dim E)
# of Mounts =	2	



Equipment	Quantity	1.2 DL (lb)	Lateral Offset (ft)	1.2 DL Moment (lb-ft)
MS-6.3D90-T	1	156.84	2.00	313.68
4-1/2" OD pipe	1	64.74	0.5	32.37
	Total =	232.37		346.05

		Back Wind				Side Wind		Pipe Check	
Equipment	Vert. Offset (ft)	Above Top Mount	Shielding Factor	1.0WL (lb)	1.0 WL Moment (lb-ft)	1.0 WL (lb)	1.0 WL Moment (lb-ft)	Cantilever (ft)	1.0 WL Moment (lb-ft)
MS-6.3D90-T	2.5	No	1			666 lb	1664		
4-1/2" OD pipe	3.0					46 lb	138.24	0.6	10
			Total =	0	0	711.68	1802.24		10

Dead Load Design:

DL Tension = 115 lb-ft (Top Mount)
DL Shear = 116 lb (Per Mount)

Back Wind Load Design:

WL Tension from Cantilever = 0 lb-ft (Top Mount)
WL Global Tension = 0 lb (Per Mount)

Side Wind Load Design:

WL Moment from Cantilever = 901 lb-ft (Per Mount)
WL Global Shear = 356 lb (Per Mount)

Pipe Check:

Moment = 10 lb-ft
Φ = 0.9
Z = 4.05 in^3
Yield strength = 35 ksi
M_{all} = Φ * Z * yield strength = 10630.8 lb-ft

10 lb-ft < 10631 lb-ft OK

Side wind Loading Case:

Top Mount Tension = 115 lb (Hilti Fz direction)
Top Mount Moment = 901 lb-ft (Hilti My direction)
Top Mount DL Shear = 116 lb (Hilit Fy direction)
Top Mount WL Shear = 356 lb (Hilti Fx direction)

Company:	Dewberry Engineers, Inc.	Page:	1
Address:		Specifier:	Ashley Deuschle, EI
Phone I Fax:	321-354-9795 |	E-Mail:	adeuschle@dewberry.com
Design:	Drafts_Concrete - Jan 26, 2024	Date:	1/29/2024
Fastening point:			

Specifier's comments:

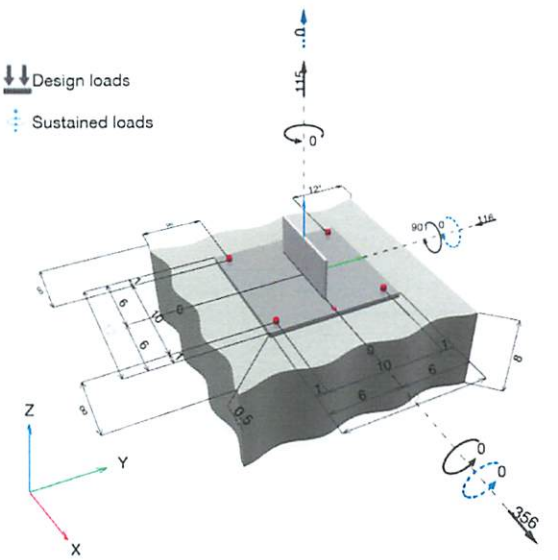
1 Anchor Design

1.1 Input data

Anchor type and diameter:	**HIT-HY 200 V3 + HIT-Z 1/2**
Item number:	2018443 HIT-Z 1/2" x 4 1/2" (element) / 2334276 HIT-HY 200-R V3 (adhesive)
Effective embedment depth:	$h_{ef,opti}$ = 2.750 in. ($h_{ef,limit}$ = 5.750 in.)
Material:	DIN EN ISO 4042
Evaluation Service Report:	ESR-4868
Issued I Valid:	11/1/2022 | 11/1/2024
Proof:	Design Method ACI 318-14 / Chem
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate[CBFEM]:	l_x x l_y x t = 12.000 in. x 12.000 in. x 0.500 in.;
Profile:	Rectangular plates and bars (AISC), 8 - 1/4; (L x W x T) = 8.000 in. x 0.250 in.
Base material:	cracked concrete, 2500, f_c' = 2,500 psi; h = 8.000 in., Temp. short/long: 32/32 °F
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present edge reinforcement: none or < No. 4 bar

[CBFEM] - The anchor calculation is based on a component-based Finite Element Method (CBFEM)

Geometry [in.] & Loading [lb, ft.lb]



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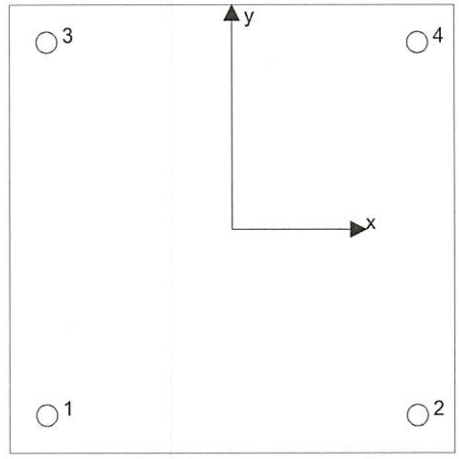
Fastening point:			

1.1.1 Design results

Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 115; V_x = 356; V_y = -116; M_x = 0.000; M_y = 901.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	50

1.2 Load case/Resulting anchor forces



Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	1,123	92	89	-21
2	10	94	89	-30
3	1,124	97	90	-37
4	7	93	88	-28

resulting tension force in (x/y)=(0.000/0.000): 0 [lb]
resulting compression force in (x/y)=(0.000/0.000): 0 [lb]

Anchor forces are calculated based on a component-based Finite Element Method (CBFEM)

1.3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi$ N_n	Status
Steel Strength*	1,124	8,695	13	OK
Pullout Strength*	1,124	7,108	16	OK
Sustained Tension Load Bond Strength*	N/A	N/A	N/A	N/A
Concrete Breakout Failure**	2,265	4,591	50	OK

* highest loaded anchor **anchor group (anchors in tension)

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Design:	Drafts_Concrete - Jan 26, 2024	Date:	1/29/2024
Fastening point:			

1.3.1 Steel Strength

N_{sa} = ESR value — refer to ICC-ES ESR-4868
$\phi\ N_{sa} \geq N_{ua}$ — ACI 318-14 Table 17.3.1.1

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.14	94,200

Calculations

N_{sa} [lb]
13,377

Results

N_{sa} [lb]	ϕ_{steel}	$\phi\ N_{sa}$ [lb]	N_{ua} [lb]
13,377	0.650	8,695	1,124

1.3.2 Pullout Strength

$N_{pn} = N_p\ \lambda_a$ — refer to ICC-ES ESR-4868
$\phi\ N_{pn} \geq N_{ua}$ — ACI 318-14 Table 17.3.1.1

Variables

λ_a	N_p [lb]
1.000	10,936

Calculations

N_{pn} [lb]
10,936

Results

N_{pn} [lb]	$\phi_{concrete}$	$\phi\ N_{pn}$ [lb]	N_{ua} [lb]
10,936	0.650	7,108	1,124

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Address:		Specifier:	Ashley Deuschle, EI
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Fastening point:			

1.3.3 Concrete Breakout Failure

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ — ACI 318-14 Eq. (17.4.2.1b)

$\phi N_{cbg} \geq N_{ua}$ — ACI 318-14 Table 17.3.1.1

A_{Nc} see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)

$A_{Nc0} = 9 h_{ef}^2$ — ACI 318-14 Eq. (17.4.2.1c)

$\Psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e'_N}{3 h_{ef}}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.4)

$\Psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.5b)

$\Psi_{cp,N} = MAX\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.7b)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ — ACI 318-14 Eq. (17.4.2.2a)

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\Psi_{c,N}$
2.750	4.923	0.004	12.000	1.000

c_{ac} [in.]	k_c	λ_a	f'_c [psi]
4.125	17	1.000	2,500

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\Psi_{ec1,N}$	$\Psi_{ec2,N}$	$\Psi_{ed,N}$	$\Psi_{cp,N}$	N_b [lb]
272.25	68.06	0.456	0.999	1.000	1.000	3,876

Results

N_{cbg} [lb]	$\phi_{concrete}$	ϕN_{cbg} [lb]	N_{ua} [lb]
7,063	0.650	4,591	2,265

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Design:	Drafts_Concrete - Jan 26, 2024	Date:	1/29/2024
Fastening point:			

1.4 Shear load

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi$ V_n	Status
Steel Strength*	97	3,532	3	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength (Concrete Breakout Strength controls)**	375	21,707	2	OK
Concrete edge failure in direction y+**	356	17,254	3	OK

* highest loaded anchor **anchor group (relevant anchors)

1.4.1 Steel Strength

V_{sa} = ESR value refer to ICC-ES ESR-4868
ϕ $V_{steel} \geq V_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]
0.14	94,200

Calculations

V_{sa} [lb]
5,886

Results

V_{sa} [lb]	ϕ_{steel}	ϕ V_{sa} [lb]	V_{ua} [lb]
5,886	0.600	3,532	97

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Address:		Specifier:	Ashley Deuschle, EI
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Design:	Drafts_Concrete - Jan 26, 2024	Date:	1/29/2024
Fastening point:			

1.4.2 Pryout Strength (Concrete Breakout Strength controls)

$V_{cpg} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \right]$ — ACI 318-14 Eq. (17.5.3.1b)

$\phi V_{cpg} \geq V_{ua}$ — ACI 318-14 Table 17.3.1.1

A_{Nc} see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)

$A_{Nc0} = 9 h_{ef}^2$ — ACI 318-14 Eq. (17.4.2.1c)

$\Psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e'_N}{3 h_{ef}}} \right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.4)

$\Psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.5b)

$\Psi_{cp,N} = MAX\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.7b)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ — ACI 318-14 Eq. (17.4.2.2a)

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	2.750	0.000	0.000	12.000

$\Psi_{c,N}$	c_{ac} [in.]	k_c	λ_a	f'_c [psi]
1.000	4.125	17	1.000	2,500

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\Psi_{ec1,N}$	$\Psi_{ec2,N}$	$\Psi_{ed,N}$	$\Psi_{cp,N}$	N_b [lb]
272.25	68.06	1.000	1.000	1.000	1.000	3,876

Results

V_{cpg} [lb]	$\phi_{concrete}$	ϕV_{cpg} [lb]	V_{ua} [lb]
31,010	0.700	21,707	375

1.4.3 Concrete edge failure in direction y+

$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} \Psi_{parallel,V} V_b$ — ACI 318-14 Eq. (17.5.2.1b)

$\phi V_{cbg} \geq V_{ua}$ — ACI 318-14 Table 17.3.1.1

A_{Vc} see ACI 318-14, Section 17.5.2.1, Fig. R 17.5.2.1(b)

$A_{Vc0} = 4.5 c_{a1}^2$ — ACI 318-14 Eq. (17.5.2.1c)

$\Psi_{ec,V} = \left(\frac{1}{1 + \frac{2e'_v}{3c_{a1}}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.5.2.5)

$\Psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.5.2.6b)

$\Psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ — ACI 318-14 Eq. (17.5.2.8)

$V_b = \left(7\left(\frac{l_e}{d_a}\right)^{0.2} \sqrt{d_a}\right) \lambda_a \sqrt{f'_c} c_{a1}^{1.5}$ — ACI 318-14 Eq. (17.5.2.2a)

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\Psi_{c,V}$	h_a [in.]
12.000	-	0.000	1.000	8.000

l_e [in.]	λ_a	d_a [in.]	f'_c [psi]	$\Psi_{parallel,V}$
2.750	1.000	0.500	2,500	2.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{h,V}$	V_b [lb]
368.00	648.00	1.000	1.000	1.500	14,468

Results

V_{cbg} [lb]	$\phi_{concrete}$	ϕV_{cbg} [lb]	V_{ua} [lb]
24,649	0.700	17,254	356

1.5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.493	0.028	5/3	32	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

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Fastening point:			

1.6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates as per current regulations (ETAG 001/Annex C, EOTA TR029, etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid base plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- Design Strengths of adhesive anchor systems are influenced by the cleaning method. Refer to the INSTRUCTIONS FOR USE given in the Evaluation Service Report for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- Installation of Hilti adhesive anchor systems shall be performed by personnel trained to install Hilti adhesive anchors. Reference ACI 318-14, Section 17.8.1.
- The anchor design methods in PROFIS Engineering require rigid anchor plates, as per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 etc.). This means that the anchor plate should be sufficiently rigid to prevent load re-distribution to the anchors due to elastic/plastic displacements. The user accepts that the anchor plate is considered close to rigid by engineering judgment."

1.7 Installation data

Profile: Rectangular plates and bars (AISC), 8 - 1/4; (L x W x T) = 8.000 in. x 0.250 in.

Hole diameter in the fixture (pre-setting) : d_f = 0.562 in.

Hole diameter in the fixture (through fastening) : d_f = 0.625 in.

Plate thickness (input): 0.500 in.

Drilling method: Hammer drilled
Cleaning: Compressed air cleaning of the drilled hole according to instructions for use is required

Anchor type and diameter: HIT-HY 200 V3 + HIT-Z 1/2
Item number: 2018443 HIT-Z 1/2" x 4 1/2" (element) / 2334276 HIT-HY 200-R V3 (adhesive)

Maximum installation torque: 29.502 ft.lb

Hole diameter in the base material: 0.562 in.

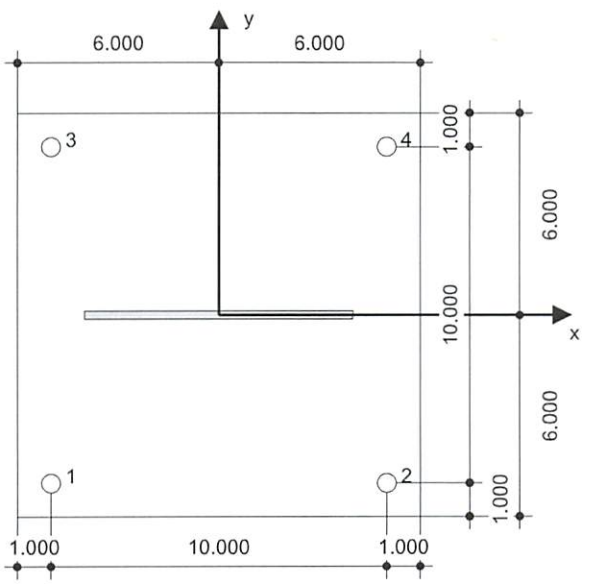
Hole depth in the base material: 3.750 in.

Minimum thickness of the base material: 5.000 in.

1/2 Hilti HIT-Z Carbon steel non-cleaning bonded expansion anchor with Hilti HIT-HY 200 V3 Safe Set System

1.7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• -	• Dispenser including cassette and mixer • Torque wrench



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-5.000	-5.000	-	-	-	22.000
2	5.000	-5.000	-	-	-	22.000
3	-5.000	5.000	-	-	-	12.000
4	5.000	5.000	-	-	-	12.000

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Fastening point:			

2 Anchor plate design

2.1 Input data

Anchor plate:	Shape: Rectangular l_x x l_y x t = 12.000 in x 12.000 in x 0.500 in Calculation: CBFEM Material: ASTM A36; F_y = 36,000 psi; ε_{lim} = 5.00%
Anchor type and size:	HIT-HY 200 V3 + HIT-Z 1/2, h_{ef} = 2.750 in
Anchor stiffness:	The anchor is modeled considering stiffness values determined from load displacement curves tested in an independent laboratory. Please note that no simple replacement of the anchor is possible as the anchor stiffness has a major impact on the load distribution results.
Design method:	AISC and LRFD-based design using component-based FEM
Stand-off installation:	e_b = 0.000 in (No stand-off); t = 0.500 in
Profile:	8 - 1/4; (L x W x T x FT) = 8.000 in x 0.250 in x - x - Material: ASTM A36; F_y = 36,000 psi; ε_{lim} = 5.00% Eccentricity x: 0.000 in Eccentricity y: 0.000 in
Base material:	Cracked concrete; 2500; $f_{c,cyl}$ = 2,500 psi; h = 8.000 in
Welds (profile to anchor plate):	Type of redistribution: Plastic Material: E70xx
Mesh size:	Number of elements on edge: 8 Min. size of element: 0.394 in Max. size of element: 1.969 in

2.2 Summary

	Description	Profile		Anchor plate			Concrete [%]
		σ_{Ed} [psi]	ε_{Pl} [%]	σ_{Ed} [psi]	ε_{Pl} [%]	Hole bearing [%]	
1	Combination 1	16,874	0.00	9,081	0.00	1	3

2.3 Anchor plate classification

Results below are displayed for the decisive load combinations: Combination 1

Anchor tension forces	Equivalent rigid anchor plate (CBFEM)	Component-based Finite Element Method (CBFEM) anchor plate design
Anchor 1	712 lb	1,123 lb
Anchor 2	0 lb	10 lb
Anchor 3	712 lb	1,124 lb
Anchor 4	0 lb	7 lb

User accepted to consider the selected anchor plate as rigid by his/her engineering judgement. This means the anchor design guidelines can be applied.

2.4 Profile/Stiffeners/Plate

Profile and stiffeners are verified at the level of the steel to concrete connection. The connection design does not replace the steel design for critical cross sections, which should be performed outside of PROFIS Engineering.

2.4.1 Equivalent stress and plastic strain

Part	Load combination	Material	f_y [psi]	ε_{lim} [%]	σ_{Ed} [psi]	ε_{Pl} [%]	Status
Plate	Combination 1	ASTM A36	36,000	5.00	9,081	0.00	OK
Profile	Combination 1	ASTM A36	36,000	5.00	16,874	0.00	OK

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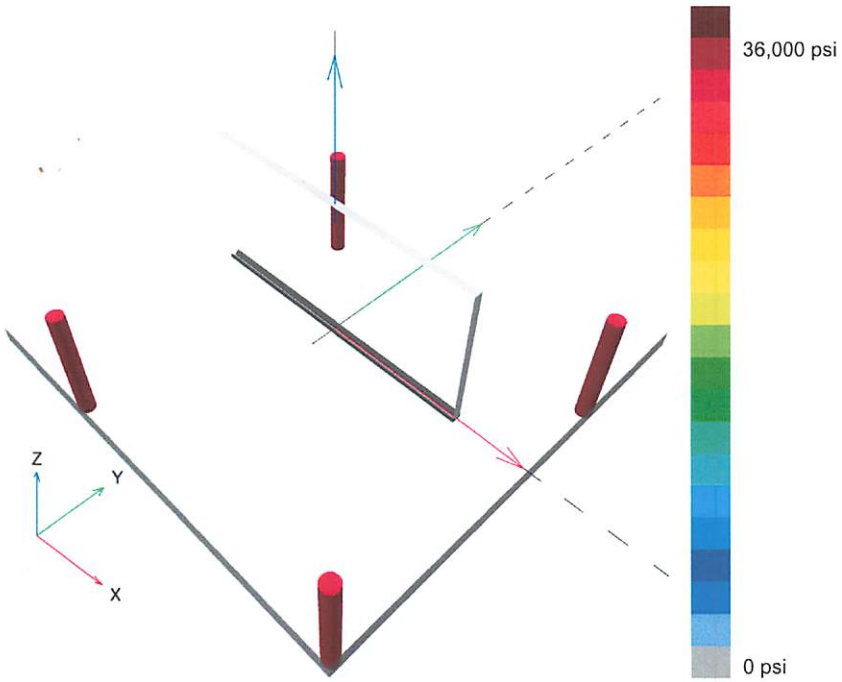
Fastening point:			

2.4.1.1 Equivalent stress

Results below are displayed for the decisive load combination: 1 - Combination 1



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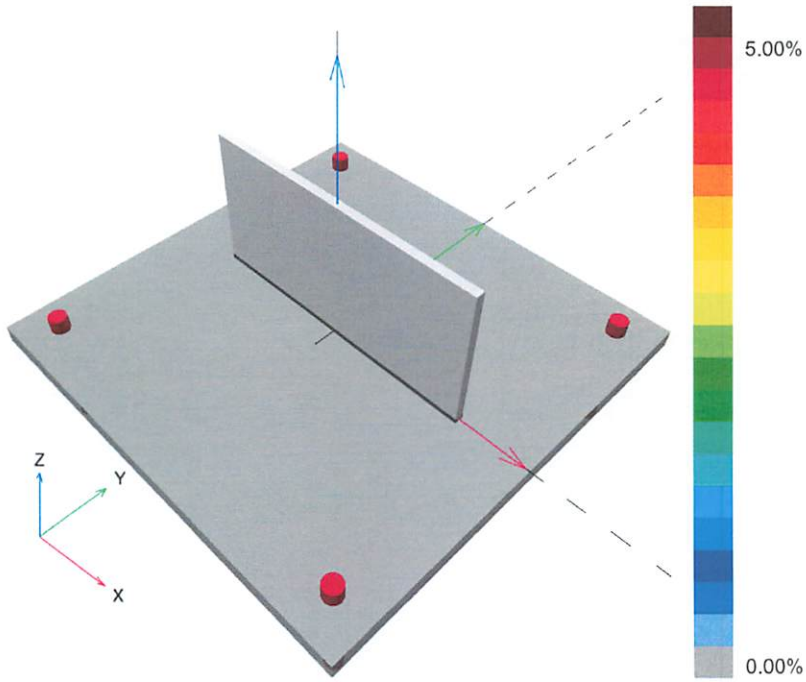
2.4.1.2 Plastic strain

Results below are displayed for the decisive load combination: 1 - Combination 1



2.4.2 Plate hole bearing resistance, AISC 360-16 Section J3

Decisive load combination: 1 - Combination 1

Equations

$R_n = \min(1.2\, l_c\, t\, F_u\, ,\ 2.4\, d\, t\, F_u)$ (AISC 360-16 J3-6a, c)

$\Phi R_n = 0.75\, R_n$

$V \leq \Phi R_n$

Variables

	l_c [in]	t [in]	F_u [psi]	d [in]	R_n [lb]
Anchor 1	0.745	0.500	58,000	0.500	25,923
Anchor 2	11.323	0.500	58,000	0.500	34,800
Anchor 3	0.802	0.500	58,000	0.500	27,913
Anchor 4	3.004	0.500	58,000	0.500	34,800

Results

	V [lb]	ΦR_n [lb]	Utilization [%]	Status
Anchor 1	92	19,442	1	OK
Anchor 2	94	26,100	1	OK
Anchor 3	97	20,935	1	OK

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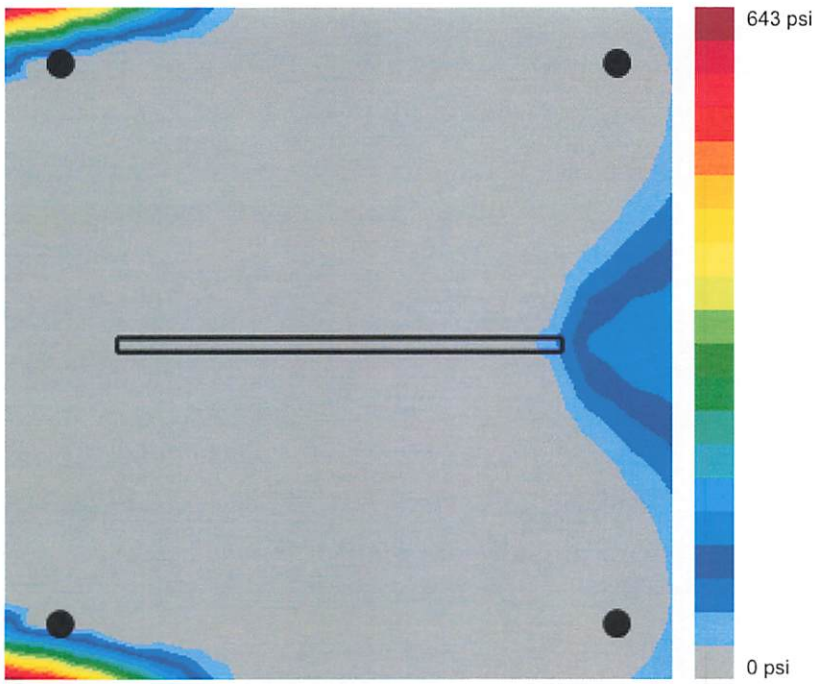
	V [lb]	ΦR_n [lb]	Utilization [%]	Status
Anchor 4	92	26,100	1	OK

2.5 Concrete

Decisive load combination: 1 - Combination 1

2.5.1 Compression in concrete under the anchor plate



2.5.2 Concrete block compressive strength resistance check, AISC 360-16 Section J8

Equations

$$F_p = \Phi f_{p,max}$$

$$f_{p,max} = 0.85 f_c' \sqrt{\left(\frac{A_2}{A_1}\right)} \le 1.7 f_c; \quad \sqrt{\left(\frac{A_2}{A_1}\right)} \le 2$$

$$\sigma = \frac{N}{A_1}$$

$$\text{Utilization} = \frac{\sigma}{F_p}$$

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Variables

N [lb]	f_c' [psi]	Φ	A_1 [in²]	A_2 [in²]
2,337	2,500	0.65	30.31	1,072.96

Results

Load combination	F_p [psi]	σ [psi]	Utilization [%]	Status
Combination 1	2,762	77	3	OK

2.6 Symbol explanation

A_1	Loaded area of concrete
A_2	Supporting area
d	Nominal diameter of the bolt
ε_{lim}	Limit plastic strain
ε_{Pl}	Plastic strain from CBFEM results
f_c	Concrete compressive strength
f_c'	Concrete compressive strength
F_u	Specified minimum tensile strength of the connected material
F_p	Concrete block design bearing strength
$f_{p,max}$	Concrete block design bearing strength maximum
f_y	Yield strength
l_c	Clear distance, in the direction of the force, between the edge of the hole and the edge of the adjacent hole or edge of the material
N	Resulting compression force
σ	Average stress in concrete
σ_{Ed}	Equivalent stress
Φ	Resistance factor
ΦR_n	Factored resistance
t	Thickness of the anchor plate
V	Resultant of shear forces Vy, Vz in bolt.

2.7 Warnings

- By using the CBFEM calculation functionality of PROFIS Engineering you may act outside the applicable design codes and your specified anchor plate may not behave rigid. Please, validate the results with a professional designer and/or structural engineer to ensure suitability and adequacy for your specific jurisdiction and project requirements.
- The anchor is modeled considering stiffness values determined from load displacement curves tested in an independent laboratory. Please note that no simple replacement of the anchor is possible as the anchor stiffness has a major impact on the load distribution results.

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Fastening point:			

3 Summary of results

Design of the anchor plate, anchors, welds and other elements are based on CBFEM (component based finite element method) and AISC.

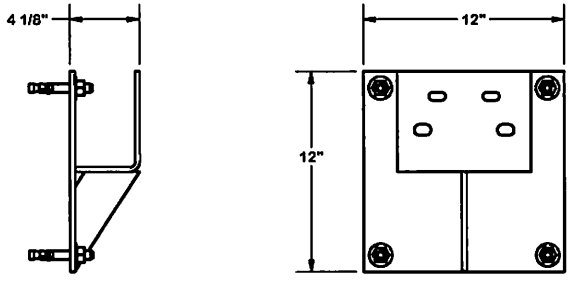
	Load combination	Max. utilization	Status
Anchors	Combination 1	50%	OK
Anchor plate	Combination 1	26%	OK
Concrete	Combination 1	3%	OK
Profile	Combination 1	47%	OK

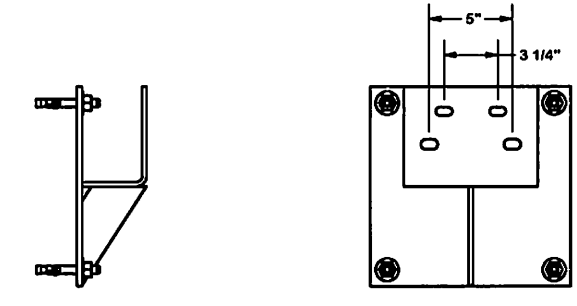
Fastening meets the design criteria!

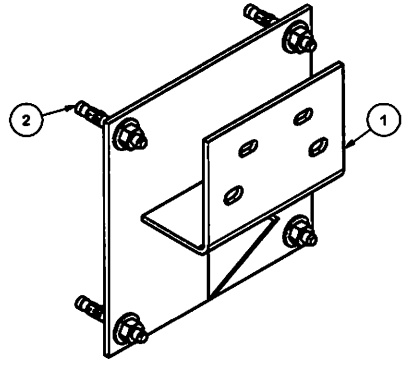
4 Remarks; Your Cooperation Duties

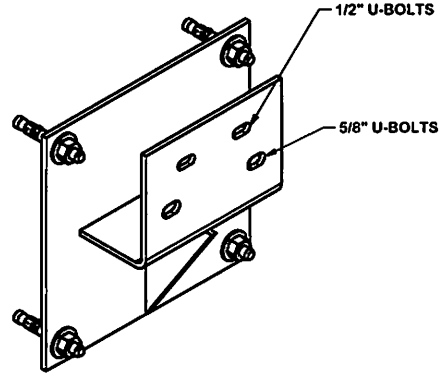
- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-SP22	HEAVY WALL MOUNT BRACKET		16.16	32.32
2	8	SWA123	1/2" X 3-3/4" STAINLESS WEDGE ANCHOR		0.30	2.41
					TOTAL WT. #	34.73









TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: SOLID WALL KIT

CPD NO.		DRAWN BY	ENG. APPROVAL	PART NO.
		CEK 5/25/2011		SP222
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 6/2/2011	SP222

SITE PRO 1 — A valmont company

Engineering Support Team: 1-888-753-7446

Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

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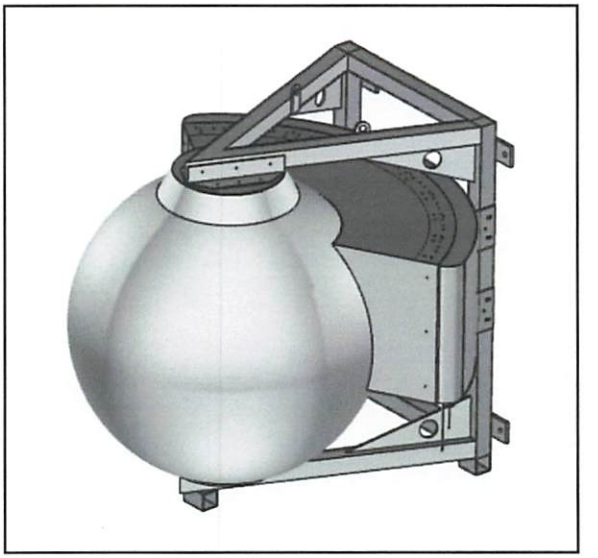


MS-6.3DB90-T

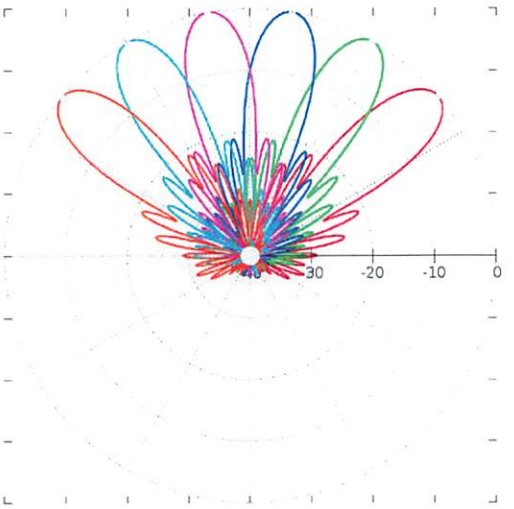
Multi-Beam Dual Band Spherical Lens Antenna: 3 independent low frequency (617-896 MHz) cross-polarized beams and 6 independent high-frequency (1695-2690MHz) cross-polarized beams, with 0-15° tilt for each 40° sector and 2X2 MIMO support per beam. Sector consists of 1 low-band beam and 2 high-band beams.

Standard RET Configuration.

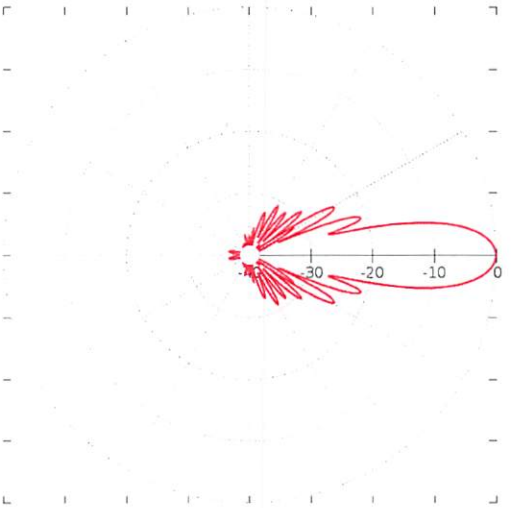
LTE® LENS TECHNOLOGY ENABLED

PATTERN RESULTS:

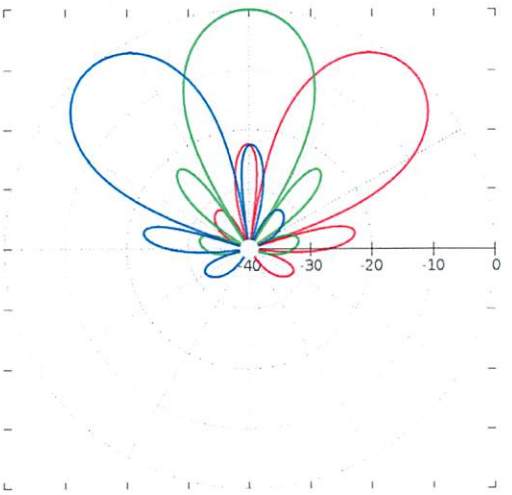
High-Band Horizontal Pattern (1.80GHz)



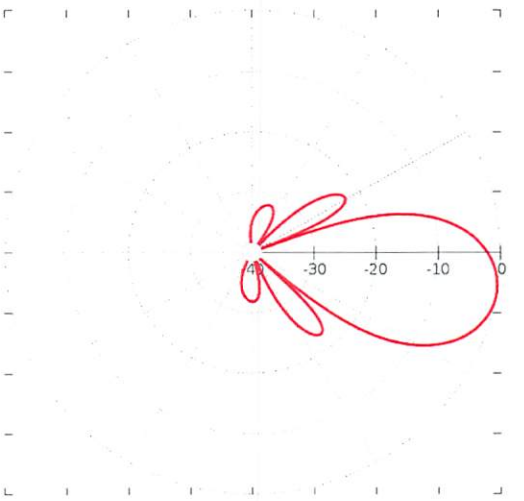
High-Band Vertical pattern (1.80GHz)



Low-Band Horizontal Pattern (0.85GHz)



Low-Band Vertical Pattern (0.85GHz)



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LENS TECHNOLOGY ENABLED

MS-6.3DB90-T

TECHNICAL SPECIFICATIONS PER BEAM

Frequency	617-896 MHz	1695-2690 MHz
Gain	16.5dBi	22.8dBi
VSWR	<1.5:1	<1.5:1
Polarization	Dual Slant ±45°	Dual Slant ±45°
Horizontal Coverage	120°	120°
Horizontal Beamwidth (10dB level) Horizontal Beamwidth (3dB level)	40° 23°	20° 12°
Vertical Beamwidth (10dB level) Vertical Beamwidth (3dB level)	42° 23°	21° 12°
Beam Cross-over	10dB typical	10dB typical
Total Number of Beams	3	6
Manual Adjustable Tilt per 40° sector (each sector having 2 high-band beams and 1 low- band beam)	10° to 25°	0° to 15°
First Sidelobe level	<-15dB	<-16dB
Front to Back Ratio	>28dB	>28dB
Isolation Port to Port - Polarization	>28dB	>28dB
Isolation Port to Port - Beam	>26dB	>28dB
Power Rating	250W per port	250W per port
Intermodulation	<-153dBc	<-153dBc
Impedance	50 ohm	50 ohm
Connector Quantity and Type	6 X 4.3-10 female	12 X 4.3-10 female

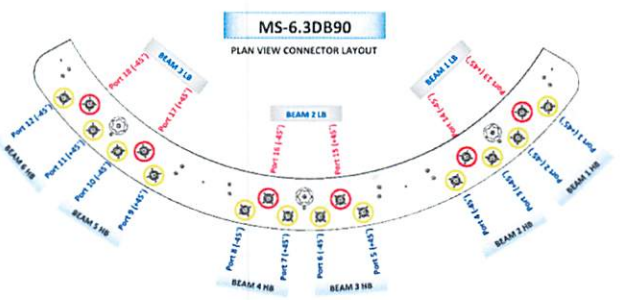
MECHANICAL DATA

Dimensions (H x W x D)	Spherical Lens diameter: 90cm/35inch Antenna dimensions: 102.3 x 116.5 x 113.2 cm 40.3 x 45.9 x 44.6 inch
Antenna Weight	53kg/117lbs [Without RET] 59.3kg/130.7lbs [With RET]
Radome Material	Fiber Glass
Mounting	Adjustable Clamps Compatible pipe diameter: 6.1 – 11.4 cm 2.4 – 4.5 inch

ENVIRONMENTAL RATINGS

Humidity	95% RH @ +30°C
Temperature	-40°C to +70°C
Wind load (Front)	754 N @ 151 km/hr 170 lbf @ 151 km/hr

CONNECTOR LAYOUT:



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verizon
NPP RFDS

NORTHEAST > North East > New England > West Roxbury-1 > HARVARD_SQ_MA

Flanagan, Jason - jason.flanagan@verizonwireless.com - 20231228_140932

Project Details		Location Information	
Carrier Aggregation	N	Site Id	674518
Ecip	N	Search Ring#	
Project Name	SECTOR ADD	E-NodeB ID#	056257|0560074|0569001
Project Alt Name	HARVARD_SQ_ALPHA_EXPANSION	PSLC#	137338
Project Id	16984516	Switch Name	West Roxbury-1
Designed Sector Carrier 4G	29	Tower Type	
Designed Sector Carrier 5G	11	Site Type	MACRO
Additional Sector Carrier 4G	0	Street Address	1350 Massachusetts Ave
Additional Sector Carrier 5G	0	City	Cambridge
Suffix		State	MA
FP Solution Type & Tech Type	MODIFICATION;4G_Sector-Add-CBRS;4G_Sector-Add-L-Sub6;4G_Sector-Add-Sub1;4G_Sector-Add-Sub3	Zip Code	02139
		County	Middlesex
		Latitude	42.372875/ 42° 22' 22.350"
		Longitude	-71.118664/ 71° 7' 7.190"

Project Scope

Antenna Summary

Added Antenna

700	850	1900	AWS	CBRS	L-Sub6	28GHz	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit
LTE	5G,LTE	LTE	LTE				MATSING	MS-6.3-DB90A	136	137.7	90(A),80(A),40(A),50(A),10(A),0(A),160(A),70(A),30(A),350(A)	PHYSICAL	1

Removed Antenna

700	850	1900	AWS	CBRS	L-Sub6	28GHz	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit

Retained Antenna

700	850	1900	AWS	CBRS	L-Sub6	28GHz	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit
					5G		Samsung	MT6407-77A	156	157.5	160(B)	PHYSICAL	1
					5G		Samsung	MT6407-77A	136	137.5	40(A)	PHYSICAL	1
					5G		Samsung	MT6407-77A	140	141.5	280(C)	PHYSICAL	1
LTE	5G,LTE	LTE	LTE				COMMSCOPE	NHH-65A-R2B	159	161.3	160(2),160(32)	PHYSICAL	2
LTE	5G,LTE	LTE	LTE				COMMSCOPE	NHH-65A-R2B	140	142.3	280(3),280(33)	PHYSICAL	2
						5G	SAMSUNG	VZ-AT1K04	156	156.7	160(B)	PHYSICAL	1
						5G	SAMSUNG	VZ-AT1K04	137	137.7	40(A)	PHYSICAL	1
						5G	SAMSUNG	VZ-AT1K04	141	141.7	280(C)	PHYSICAL	1
				LTE			SAMSUNG	XXDWMM-12.5-65	134.5	135	40(A)	PHYSICAL	1
				LTE			SAMSUNG	XXDWMM-12.5-65	138.5	139	280(C)	PHYSICAL	1
				LTE			SAMSUNG	XXDWMM-12.5-65	153	153.5	160(B)	PHYSICAL	1

Added: 1	Removed: 0	Retained: 13

Non Antenna Summary

Added Non Antenna

Equipment Type	Locatio	700	850	1900	AWS	CBRS	28GHz	Make	Model	Install Type	Quantity
RRU	Tower			LTE	LTE			Samsung	B2/B66A RRH ORAN (RF4439d-25A)	PHYSICAL	5
RRU	Tower	LTE	5G,LTE					Samsung	RF4442d-13A	PHYSICAL	2

Removed Non Antenna

Equipment Type	Locatio	700	850	1900	AWS	CBRS	28GHz	Make	Model	Install Type	Quantity

Retained Non Antenna

Equipment Type	Locatio	700	850	1900	AWS	CBRS	28GHz	Make	Model	Install Type	Quantity
RRU	Tower						5G	Samsung	AT1K04 DC	PHYSICAL	3
RRU	Tower			LTE	LTE			Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)	PHYSICAL	3
RRU	Tower	LTE	5G,LTE					Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)	PHYSICAL	3
RRU	Tower					LTE		Samsung	CBRS RRH - RT4401-48A	PHYSICAL	3

Added: 7	Removed: 0	Retained: 12

Services							
700 LTE	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	01	02	03	01	02	03	04
Azimuth	40	160	280	80	160	280	40
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257	056257
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	5230	5230	5230	5230	5230	5230	5230
Mech Down-tilt	4	12	10	4	12	10	4
Elect Down-tilt	1	2	1	10	8	8	10
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	70.07 (W/MHz) ERP	59.23 (W/MHz) ERP	80.27 (W/MHz) ERP	88.22 (W/MHz) ERP	59.23 (W/MHz) ERP	80.27 (W/MHz) ERP	94.53 (W/MHz) ERP
Transmitter Max Power	47.8 dBm	47.8 dBm	47.8 dBm	47.8 dBm	47.8 dBm	47.8 dBm	47.8 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	RF4442d-13A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	1,4	1,4	1
Transmitter Id	9373662	9373666	9373670	14249286	14249289	14249292	14249394
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10	10	10	10	10
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services		
700 LTE	**60MHZ (8029284)**	**YARD (8400068)**
Sector		05
Azimuth		0
Cell/Enodeb-Id		056257
Antenna Model		MS-6.3-DB90A
Antenna Make		MATSING
Centerline		136
DLEARFCN		5230
Mech Down-tilt		12
Elect Down-tilt		10
Tip Height		137.7
Regulatory Power		85.62 (W/MHz) ERP
Transmitter Max Power		47.8 dBm
TMA Make		
TMA Model		
RRU Make		Samsung
RRU Model		RF4442d-13A
Number of Tx,Rx		2 , 2
Operational Port Count		0
Position		1
Transmitter Id		16397398
Source		VZNPP
Bandwidth		10
Ant. Dimensions H x W x D(inch)		40.0 x 51.0 x 40.0
Weight(lb)		90.0

Services							
850 LTE	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	01	02	03	01	02	03	04
Azimuth	40	160	280	40	160	280	40
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257	056257
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	2560	2560	2560	2560	2560	2560	2560
Mech Down-tilt	4	12	10	4	12	10	4
Elect Down-tilt	1	2	1	10	16	14	10
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	47.95 (W/MHz) ERPSD	76.00 (W/MHz) ERPSD	60.37 (W/MHz) ERPSD	59.10 (W/MHz) ERPSD	50.21 (W/MHz) ERPSD	39.88 (W/MHz) ERPSD	53.90 (W/MHz) ERPSD
Transmitter Max Power	47.8 dBm	47.8 dBm	47.8 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	RF4442d-13A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	1,4	1,4	1
Transmitter Id	12390909	12390910	12390911	14249280	14249281	14249282	14249391
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10	10	10	10	10
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services		
850 LTE	**60MHZ (8029284)**	**YARD (8400068)**
Sector		05
Azimuth		160
Cell/Enodeb-Id		056257
Antenna Model		MS-6.3-DB90A
Antenna Make		MATSING
Centerline		136
DLEARFCN		2560
Mech Down-tilt		12
Elect Down-tilt		10
Tip Height		137.7
Regulatory Power		81.58 (W/MHz) ERPSD
Transmitter Max Power		46.0 dBm
TMA Make		
TMA Model		
RRU Make		Samsung
RRU Model		RF4442d-13A
Number of Tx,Rx		2 , 2
Operational Port Count		0
Position		1
Transmitter Id		14249392
Source		VZNPP
Bandwidth		10
Ant. Dimensions H x W x D(inch)		40.0 x 51.0 x 40.0
Weight(lb)		90.0

Services							
850 NR	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	0031	0032	0033	0031	0032	0033	0034
Azimuth	40	160	280	40	160	280	40
Cell/Enodeb-Id	0569001	0569001	0569001	0569001	0569001	0569001	0569001
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	2560	2560	2560	2560	2560	2560	2560
Mech Down-tilt	4	12	10	4	12	10	4
Elect Down-tilt	1	2	1	10	16	14	10
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	47.95 (W/MHz) ERPSD	76.00 (W/MHz) ERPSD	60.37 (W/MHz) ERPSD	59.10 (W/MHz) ERPSD	50.21 (W/MHz) ERPSD	39.88 (W/MHz) ERPSD	53.90 (W/MHz) ERPSD
Transmitter Max Power	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	RF4442d-13A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	1,4	1,4	1
Transmitter Id	12390909	12390910	12390911	14249280	14249281	14249282	14249391
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10	10	10	10	10
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services		
850 NR	**60MHZ (8029284)**	**YARD (8400068)**
Sector		0035
Azimuth		160
Cell/Enodeb-Id		0569001
Antenna Model		MS-6.3-DB90A
Antenna Make		MATSING
Centerline		136
DLEARFCN		2560
Mech Down-tilt		12
Elect Down-tilt		10
Tip Height		137.7
Regulatory Power		81.58 (W/MHz) ERPSD
Transmitter Max Power		46.0 dBm
TMA Make		
TMA Model		
RRU Make		Samsung
RRU Model		RF4442d-13A
Number of Tx,Rx		2 , 2
Operational Port Count		0
Position		1
Transmitter Id		14249392
Source		VZNPP
Bandwidth		10
Ant. Dimensions H x W x D(inch)		40.0 x 51.0 x 40.0
Weight(lb)		90.0

Services							
1900 LTE	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	01	02	03	01	02	03	04
Azimuth	40	160	280	90	160	280	50
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257	056257
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	1025	1025	1025	1025	1025	1025	1025
Mech Down-tilt	2	3	3	2	3	3	2
Elect Down-tilt	1	1	1	6	6	6	6
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	91.13 (W/MHz) EIRP	60.77 (W/MHz) EIRP	111.34 (W/MHz) EIRP	306.53 (W/MHz) EIRP	60.77 (W/MHz) EIRP	111.34 (W/MHz) EIRP	292.73 (W/MHz) EIRP
Transmitter Max Power	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	4	4	1
Transmitter Id	9373663	9373667	9373671	14249287	14249290	14249293	14249395
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	15	15	15	15	15	15	15
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services		
1900 LTE	60MHZ (8029284)	YARD (8400068)

Sector	05	06	07	08
Azimuth	10	70	30	350
Cell/Enodeb-Id	056257	056257	056257	056257
Antenna Model	MS-6.3-DB90A	MS-6.3-DB90A	MS-6.3-DB90A	MS-6.3-DB90A
Antenna Make	MATSING	MATSING	MATSING	MATSING
Centerline	136	136	136	136
DLEARFCN	1025	1025	1025	1025
Mech Down-tilt	3	3	2	3
Elect Down-tilt	6	6	6	6
Tip Height	137.7	137.7	137.7	137.7
Regulatory Power	251.46 (W/MHz) EIRP	401.30 (W/MHz) EIRP	377.11 (W/MHz) EIRP	288.71 (W/MHz) EIRP
Transmitter Max Power	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make	Samsung	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0
Position	1	1	1	1
Transmitter Id	14249398	14249401	14249383	14249386
Source	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	15	15	15	15
Ant. Dimensions H x W x D(inch)	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0
Weight(lb)	90.0	90.0	90.0	90.0

Services							
AWS LTE	**60MHZ (8029284)**			**YARD (8400068)**			
Sector	01	02	03	01	02	03	04
Azimuth	40	160	280	90	160	280	50
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257	056257
Antenna Model	NHH-65A-R2B	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A	NHH-65A-R2B	NHH-65A-R2B	MS-6.3-DB90A
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE	MATSING	COMMSCOPE	COMMSCOPE	MATSING
Centerline	136	159	140	136	159	140	136
DLEARFCN	2050	2050	2050	2050	2050	2050	2050
Mech Down-tilt	2	3	3	2	3	3	2
Elect Down-tilt	1	1	1	6	6	6	6
Tip Height	138.3	161.3	142.3	137.7	161.3	142.3	137.7
Regulatory Power	73.24 (W/MHz) EIRP	73.24 (W/MHz) EIRP	73.24 (W/MHz) EIRP	291.43 (W/MHz) EIRP	73.24 (W/MHz) EIRP	73.24 (W/MHz) EIRP	253.82 (W/MHz) EIRP
Transmitter Max Power	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make							
TMA Model							
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0	0	0	0
Position				1	1	1	1
Transmitter Id	9373664	9373668	9373672	14249288	14249291	14249294	14249396
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	20	20	20	20	20	20	20
Ant. Dimensions H x W x D(inch)	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0	55.59 x 11.89 x 7.09	55.59 x 11.89 x 7.09	40.0 x 51.0 x 40.0
Weight(lb)	35.0	35.0	35.0	90.0	35.0	35.0	90.0

Services		
AWS LTE	**60MHZ (8029284)**	**YARD (8400068)**

Sector	05	06	07	08
Azimuth	10	70	30	350
Cell/Enodeb-Id	056257	056257	056257	056257
Antenna Model	MS-6.3-DB90A	MS-6.3-DB90A	MS-6.3-DB90A	MS-6.3-DB90A
Antenna Make	MATSING	MATSING	MATSING	MATSING
Centerline	136	136	136	136
DLEARFCN	2050	2050	2050	2050
Mech Down-tilt	3	3	2	3
Elect Down-tilt	6	6	6	6
Tip Height	137.7	137.7	137.7	137.7
Regulatory Power	242.40 (W/MHz) EIRP	271.97 (W/MHz) EIRP	278.31 (W/MHz) EIRP	461.88 (W/MHz) EIRP
Transmitter Max Power	46.0 dBm	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make	Samsung	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	0	0	0	0
Position	1	1	1	1
Transmitter Id	14249399	14249402	14249384	14249387
Source	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	20	20	20	20
Ant. Dimensions H x W x D(inch)	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0	40.0 x 51.0 x 40.0
Weight(lb)	90.0	90.0	90.0	90.0

Services						
CBRS LTE	**60MHZ (8029284)**			**YARD (8400068)**		
Sector	19	20	21	19	20	21
Azimuth	40	160	280	40	160	280
Cell/Enodeb-Id	056257	056257	056257	056257	056257	056257
Antenna Model	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65
Antenna Make	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG
Centerline	134.5	153	138.5	134.5	153	138.5
DLEARFCN	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537	55990, 56141, 56339, 56537
Mech Down-tilt	0	0	0	0	0	0
Elect Down-tilt	8	8	8	8	8	8
Tip Height	135	153.5	139	135	153.5	139
Regulatory Power	5.82 (W/MHz) EIRPSD, 5.82 (W/MHz) EIRPSD, 5.82 (W/MHz)	5.82 (W/MHz) EIRPSD, 5.82 (W/MHz) EIRPSD, 5.82 (W/MHz)	5.82 (W/MHz) EIRPSD, 5.82 (W/MHz) EIRPSD, 5.82 (W/MHz)	5.82 (W/MHz) EIRPSD, 5.82 (W/MHz) EIRPSD, 5.82 (W/MHz)	5.82 (W/MHz) EIRPSD, 5.82 (W/MHz) EIRPSD, 5.82 (W/MHz)	5.82 (W/MHz) EIRPSD, 5.82 (W/MHz) EIRPSD, 5.82 (W/MHz)
Transmitter Max Power	37.02 dBm	37.02 dBm	37.02 dBm	37.02 dBm	37.02 dBm	37.02 dBm
TMA Make						
TMA Model						
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A
Number of Tx,Rx	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Operational Port Count	0	0	0	0	0	0
Position				2	2	2
Transmitter Id	9373674	9373675	9373676	14249295	14249296	14249297
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	10, 20, 20, 20	10, 20, 20, 20	10, 20, 20, 20	10, 20, 20, 20	10, 20, 20, 20	10, 20, 20, 20
Ant. Dimensions H x W x D(inch)	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35	12.32 x 8.66 x 1.35
Weight(lb)	2.86	2.86	2.86	2.86	2.86	2.86

Services						
CBAND NR	**60MHZ (8029284)**			**YARD (8400068)**		
Sector	0031	0032	0033	0031	0032	0033
Azimuth	40	160	280	40	160	280
Cell/Enodeb-Id	0569001	0569001	0569001	0569001	0569001	0569001
Antenna Model	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A
Antenna Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
Centerline	136	156	140	136	156	140
DLEARFCN	648672	648672	648672	648672	648672	648672
Mech Down-tilt	0	0	0	0	0	0
Elect Down-tilt	1	1	1	0	0	0
Tip Height	137.5	157.5	141.5	137.5	157.5	141.5
Regulatory Power	1273.96 (W/MHz) EIRP	1273.96 (W/MHz) EIRP	1273.96 (W/MHz) EIRP	1273.96 (W/MHz) EIRP	1273.96 (W/MHz) EIRP	1273.96 (W/MHz) EIRP
Transmitter Max Power	50.0 dBm	50.0 dBm	50.0 dBm	50.0 dBm	50.0 dBm	50.0 dBm
TMA Make						
TMA Model						
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A	MT6407-77A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Operational Port Count	64	64	64	64	64	64
Position				3	3	3
Transmitter Id	9031100	9031102	9031103	14249298	14249299	14249300
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	60	60	60	60	60	60
Ant. Dimensions H x W x D(inch)	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51	35.12 x 16.06 x 5.51
Weight(lb)	87.1	87.1	87.1	87.1	87.1	87.1

Services						
28 GHz NR	**60MHZ (8029284)**			**YARD (8400068)**		
Sector	0238	0239	0240	0238	0239	0240
Azimuth	40	160	280	40	160	280
Cell/Enodeb-Id	0560074	0560074	0560074	0560074	0560074	0560074
Antenna Model	VZ-AT1K04	VZ-AT1K04	VZ-AT1K04	VZ-AT1K04	VZ-AT1K04	VZ-AT1K04
Antenna Make	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG
Centerline	137	156	141	137	156	141
DLEARFCN	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165	2073333, 2074999, 2076665, 2080833, 2082499, 2084165
Mech Down-tilt	0	0	0	0	0	0
Elect Down-tilt	0	0	0	0	0	0
Tip Height	137.7	156.7	141.7	137.7	156.7	141.7
Regulatory Power	1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD	1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD	1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD, 1.76 (W/MHz) EIRPSD	1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD	1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD	1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD, 1.86 (W/MHz) EIRPSD
Transmitter Max Power	26.0 dBm	26.0 dBm	26.0 dBm	26.0 dBm	26.0 dBm	26.0 dBm
TMA Make						
TMA Model						
RRU Make	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model	AT1K04 DC	AT1K04 DC	AT1K04 DC	AT1K04 DC	AT1K04 DC	AT1K04 DC
Number of Tx,Rx	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Operational Port Count	0	0	0	0	0	0
Position				2	2	2
Transmitter Id	9373677	9373678	9373679	14249283	14249284	14249285
Source	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP	VZNPP
Bandwidth	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100	100, 100, 100, 100, 100, 100
Ant. Dimensions H x W x D(inch)	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4	16.81 x 11.02 x 6.4
Weight(lb)	29.26	29.26	29.26	29.26	29.26	29.26

Callsigns Per Antenna

Sector	Make	Model	Ant CL Height AG	Ant Tip Height	Azimuth	Elect Down-tilt	Mech Down-tilt	Gain	Bandwidth	Regulatory Power	700	850	1900	2100	28 GHz	31 GHz	39 GHz	LSub-6	CBRS
01	MATSING	MS-6.3-DB90A	136	137.7	80	10	4	12.35	26	88.22	WQJQ689								
02	COMMSCOPE	NHH-65A-R2	159	161.3	160	8	12	11.29	66.75	59.23	WQJQ689								
03	COMMSCOPE	NHH-65A-R2	140	142.3	280	8	10	11.29	66.75	80.27	WQJQ689								
04	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	12.65	25.1	94.53	WQJQ689								
05	MATSING	MS-6.3-DB90A	136	137.7	0	10	12	12.85	25	85.62	WQJQ689								
0031	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	14.25	23	59.1		KNKA201							
0032	COMMSCOPE	NHH-65A-R2	159	161.3	160	16	12	10.15	62	50.21		KNKA201							
0033	COMMSCOPE	NHH-65A-R2	140	142.3	280	14	10	10.36	61.5	39.88		KNKA201							
0034	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	13.85	21.9	53.9		KNKA201							
0035	MATSING	MS-6.3-DB90A	136	137.7	160	10	12	13.55	21	81.58		KNKA201							
01	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	14.25	23	59.1		KNKA201							
02	COMMSCOPE	NHH-65A-R2	159	161.3	160	16	12	10.15	62	50.21		KNKA201							
03	COMMSCOPE	NHH-65A-R2	140	142.3	280	14	10	10.36	61.5	39.88		KNKA201							
04	MATSING	MS-6.3-DB90A	136	137.7	40	10	4	13.85	21.9	53.9		KNKA201							
05	MATSING	MS-6.3-DB90A	136	137.7	160	10	12	13.55	21	81.58		KNKA201							
01	MATSING	MS-6.3-DB90A	136	137.7	90	6	2	19.75	11	306.53			KNLF646,KNLH242,KNLH310						
02	COMMSCOPE	NHH-65A-R2	159	161.3	160	6	3	14.42	66.75	60.77			KNLF646,KNLH242,KNLH310						
03	COMMSCOPE	NHH-65A-R2	140	142.3	280	6	3	14.42	66.75	111.34			KNLF646,KNLH242,KNLH310						
04	MATSING	MS-6.3-DB90A	136	137.7	50	6	2	19.65	11.2	292.73			KNLF646,KNLH242,KNLH310						
05	MATSING	MS-6.3-DB90A	136	137.7	10	6	3	20.75	9.9	251.46			KNLF646,KNLH242,KNLH310						
06	MATSING	MS-6.3-DB90A	136	137.7	70	6	3	20.05	10.6	401.3			KNLF646,KNLH242,KNLH310						
07	MATSING	MS-6.3-DB90A	136	137.7	30	6	2	19.25	11.7	377.11			KNLF646,KNLH242,KNLH310						
08	MATSING	MS-6.3-DB90A	136	137.7	350	6	3	21.35	9.2	288.71			KNLF646,KNLH242,KNLH310						
01	MATSING	MS-6.3-DB90A	136	137.7	90	6	2	20.85	9.7	291.43				WQGA900,WQGB266					

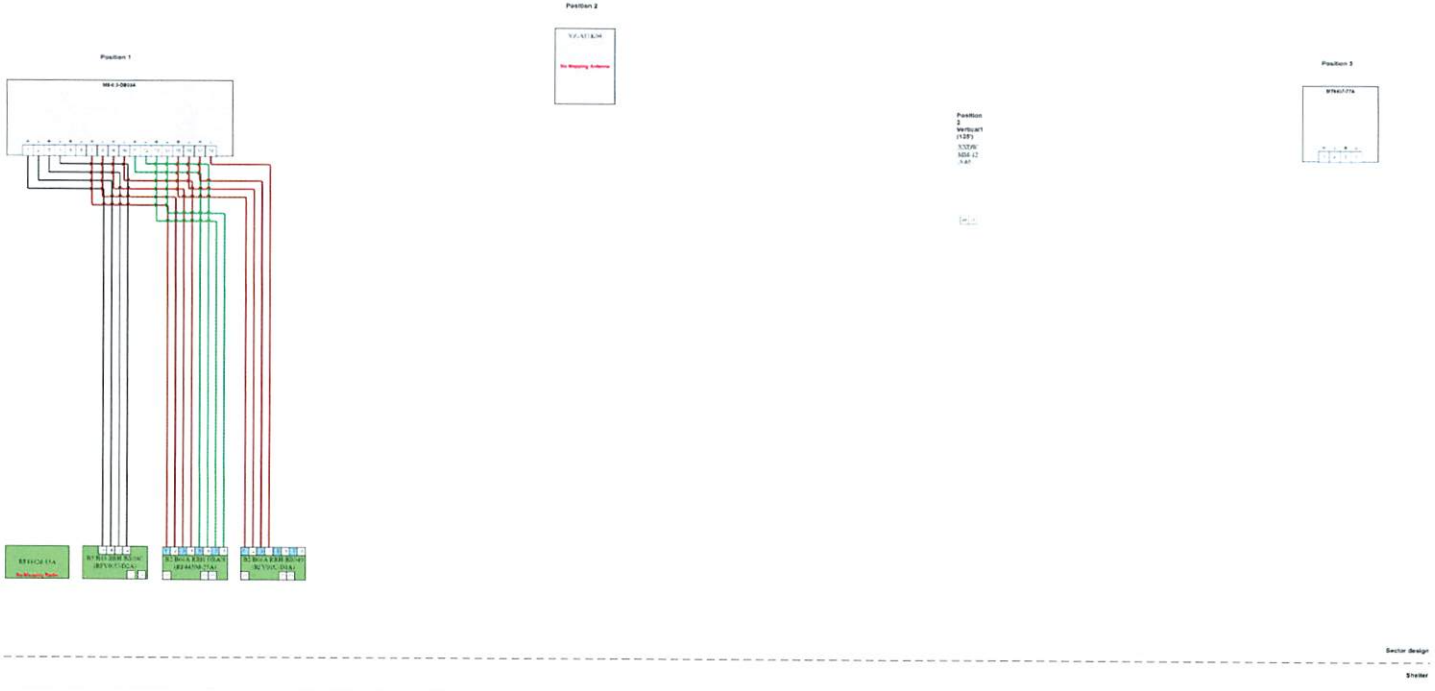
02	COMMSCOPE	NHH-65A-R2	159	161.3	160	6	3	15.05	57.25	73.24				WQGA900,WQGB266					
03	COMMSCOPE	NHH-65A-R2	140	142.3	280	6	3	15.05	57.25	73.24				WQGA900,WQGB266					
04	MATSING	MS-6.3-DB90A	136	137.7	50	6	2	20.45	10.2	253.82				WQGA900,WQGB266					
05	MATSING	MS-6.3-DB90A	136	137.7	10	6	3	20.05	10.6	242.4				WQGA900,WQGB266					
06	MATSING	MS-6.3-DB90A	136	137.7	70	6	3	20.65	10	271.97				WQGA900,WQGB266					
07	MATSING	MS-6.3-DB90A	136	137.7	30	6	2	20.65	9.9	278.31				WQGA900,WQGB266					
08	MATSING	MS-6.3-DB90A	136	137.7	350	6	3	22.95	7.6	461.88				WQGA900,WQGB266					
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0238	SAMSUNG	VZ-AT1K04	137	137.7	40	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0239	SAMSUNG	VZ-AT1K04	156	156.7	160	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0240	SAMSUNG	VZ-AT1K04	141	141.7	280	0	0	25.85	52	1.86					WRBA936,WRBA937				
0031	Samsung	MT6407-77A	136	137.5	40	0	0	23.05	100	1273.96								WRNE627,WRNE628,WRNE629	
0032	Samsung	MT6407-77A	156	157.5	160	0	0	23.05	100	1273.96								WRNE627,WRNE628,WRNE629	

0033	Samsung	MT6407-77A	140	141.5	280	0	0	23.05	100	1273.96								WRNE627,WRNE628,WRNE629	
19	SAMSUNG	XXDWMM-12.5-65	134.5	135	40	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
19	SAMSUNG	XXDWMM-12.5-65	134.5	135	40	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
19	SAMSUNG	XXDWMM-12.5-65	134.5	135	40	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
19	SAMSUNG	XXDWMM-12.5-65	134.5	135	40	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
20	SAMSUNG	XXDWMM-12.5-65	153	153.5	160	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
20	SAMSUNG	XXDWMM-12.5-65	153	153.5	160	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
20	SAMSUNG	XXDWMM-12.5-65	153	153.5	160	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
20	SAMSUNG	XXDWMM-12.5-65	153	153.5	160	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
21	SAMSUNG	XXDWMM-12.5-65	138.5	139	280	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
21	SAMSUNG	XXDWMM-12.5-65	138.5	139	280	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
21	SAMSUNG	XXDWMM-12.5-65	138.5	139	280	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617
21	SAMSUNG	XXDWMM-12.5-65	138.5	139	280	8	0	10.45	64.7	5.82									CBRS_CALLSIGN,WRLD615,WRLD616,WRLD617

Callsigns

Callsign	Market	Radio Code	Market #	Block	State	County	License Name	Wholly Owner	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/Sq. mil	Status	Action	Approve for Insvc
WQJQ689	Northeast	WU	REA001	C	MA	25017	Cellco Partnership	Yes	22.000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	94.53	1000	1995.55	proposed	added	1
KNKA201	Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	CL	CMA006	B	MA	25017	Cellco Partnership	Yes	25.000	835.000 - 845.000/846.500 - 849.000	880.000 - 890.000/891.500 - 894.000	835.000 - 845.000/846.500 - 849.000	880.000 - 890.000/891.500 - 894.000	81.58	400	1995.55	proposed	added	1
KNLF646	Boston, MA	CW	BTA051	C	MA	25017	AirTouch Cellular	Yes	10.000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	401.3	1640	1995.55	proposed	added	1
KNLH310	Boston, MA	CW	BTA051	E	MA	25017	AirTouch Cellular	Yes	10.000	1885.000 1890.000/.000 - .000	1965.000 1970.000/.000 - .000	1885.000 1890.000/.000 - .000	1965.000 1970.000/.000 - .000	401.3	1640	1995.55	proposed	added	1
KNLH242	Boston, MA	CW	BTA051	F	MA	25017	Cellco Partnership	Yes	10.000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	401.3	1640	1995.55	proposed	added	1
CBRS_CALL SIGN	UNLICENSE	3.5 GHz	UNLICENSE	UNLICENSE	MA	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	- / -	- / -	5.82		1995.55	proposed	retained	
WRBA936	Boston, MA	UU	BTA051	L1	MA	25017	Cellco Partnership	Yes	325.000	27600.000 27925.000/.000 - .000	.000 - .000/.000 - .000	27600.000 27925.000/.000 - .000	.000 - .000/.000 - .000	1.86		1995.55	proposed	added	1
WRBA937	Boston, MA	UU	BTA051	L2	MA	25017	Cellco Partnership	Yes	325.000	27925.000 27950.000/.000 - .000	28050.000 28350.000/.000 - .000	27925.000 27950.000/.000 - .000	28050.000 28350.000/.000 - .000	1.86		1995.55	proposed	added	1
WRLD615	D25017 - Middlesex, MA	PL	D25017	0	MA	25017	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	5.82	501	1995.55	proposed	retained	1
WRLD616	D25017 - Middlesex, MA	PL	D25017	0	MA	25017	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	5.82	501	1995.55	proposed	retained	1
WRLD617	D25017 - Middlesex, MA	PL	D25017	0	MA	25017	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	3550.000 3650.000/.000 - .000	.000 - .000/.000 - .000	5.82	501	1995.55	proposed	retained	1

WQGB266	Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	AW	CMA006	A	MA	25017	Cellco Partnership	Yes	20.000	1710.000 1720.000/ .000 - .000	2110.000 2120.000/ .000 - .000	1710.000 1720.000/ .000 - .000	2110.000 2120.000/ .000 - .000	461.88	1640	1995.55	proposed	added	1
WRNE627	Boston, MA	PM	PEA007	A1	MA	25017	Cellco Partnership	Yes	20.000	3700.000 3720.000/ .000 - .000	.000 - .000/.000 - .000	3700.000 3720.000/ .000 - .000	.000 - .000/.000 - .000	1273.96	1640	1995.55	proposed	retained	1
WRNE628	Boston, MA	PM	PEA007	A2	MA	25017	Cellco Partnership	Yes	20.000	3720.000 3740.000/ .000 - .000	.000 - .000/.000 - .000	3720.000 3740.000/ .000 - .000	.000 - .000/.000 - .000	1273.96	1640	1995.55	proposed	retained	1
WRNE629	Boston, MA	PM	PEA007	A3	MA	25017	Cellco Partnership	Yes	20.000	3740.000 3760.000/ .000 - .000	.000 - .000/.000 - .000	3740.000 3760.000/ .000 - .000	.000 - .000/.000 - .000	1273.96	1640	1995.55	proposed	retained	1
WQGA900	Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH-R	AW	BEA003	B	MA	25017	Cellco Partnership	Yes	20.000	1720.000 1730.000/ .000 - .000	2120.000 2130.000/ .000 - .000	1720.000 1730.000/ .000 - .000	2120.000 2130.000/ .000 - .000	461.88	1640	1995.55	proposed	added	1



Alpha
(Proposed)

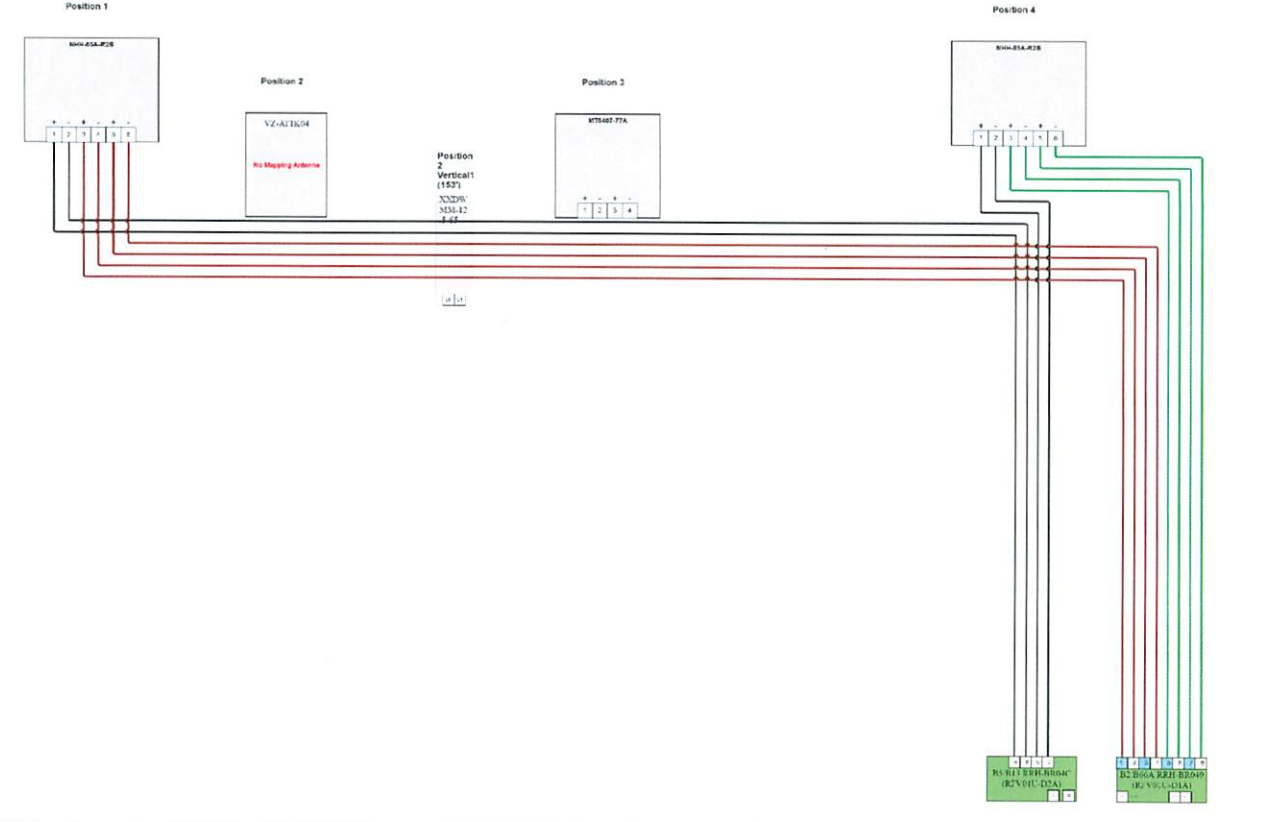
Legends

RET dc signal capable port

- 700/850(LB)
- 700(LT)
- 850(CB)
- AWS(AW)
- PCS(PC)
- AWS/PCS(HB)
- 28GHz(U28)
- 39GHz(U39)
- L-Sub6(S6)
- CBRS(RS)
- LAA(LA)
- Fiber
- AISG
- DC
- Coax
- Coax Jumper
- Sectors Shared Equipments

Notes:

-Antenna view is from the back of the antennas
-Colors of connections are just for clarification
-Size of objects in drawing doesn't reflect equipment true dimensions



Beta
(Proposed)

Legends

RET dc signal capable port

- 700/850(LB)
- 700(LT)
- 850(CB)
- AWS(AW)
- PCS(PC)
- AWS/PCS(HB)
- 28GHz(U28)
- 39GHz(U39)
- L-Sub6(S6)
- CBRS(RS)
- LAA(LA)
- Fiber
- AISG
- DC

Coax
Coax Jumper
Sectors Shared Equipments

Notes:

-Antenna view is from the back of the antennas
-Colors of connections are just for clarification
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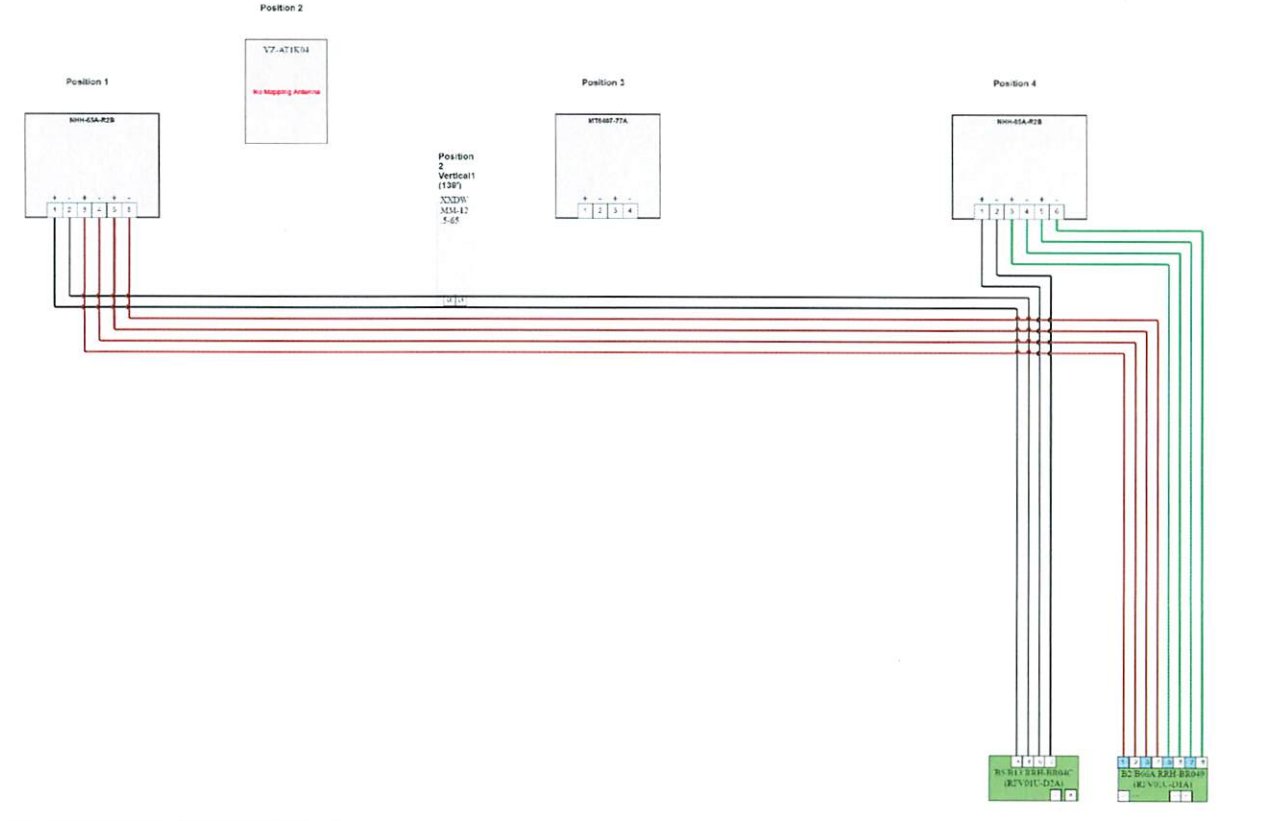

Gamma
(Proposed)

Legends

RET dc signal capable port

700/850(LB)
700(LT)
850(CB)
AWS(AW)
PCS(PC)
AWS/PCS(HB)
28GHz(U28)
39GHz(U39)
L-Sub6(S6)
CBRS(RS)
LAA(LA)
Fiber
AISG
DC

Coax
Coax Jumper
Sectors Shared Equipments

Notes:

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-Colors of connections are just for clarification
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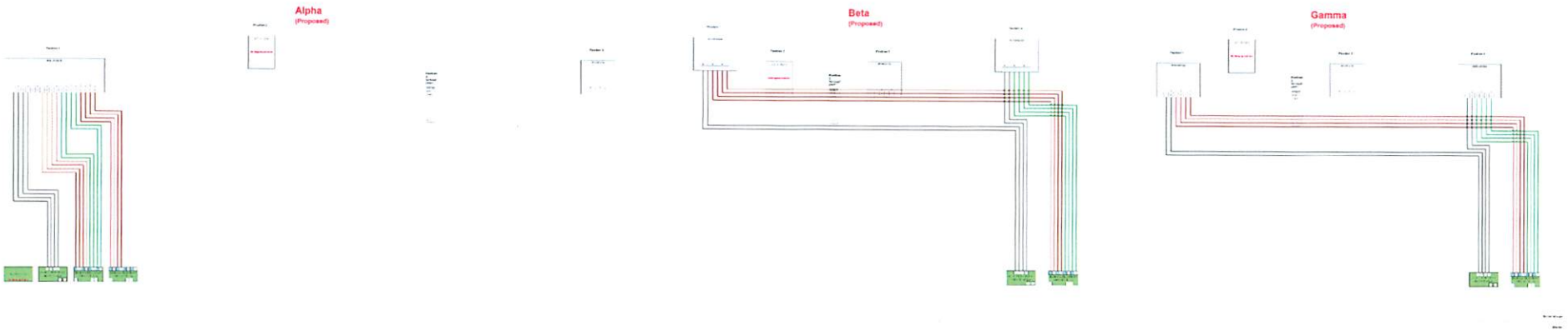
Alpha
(Proposed)
Beta
(Proposed)
Gamma
(Proposed)

Verizon Wireless 60-Day Eligible Facility
Request Modification of Existing Wireless Installation

Request Date: *October 16, 2024*

Jurisdiction: *City of Cambridge, Massachusetts*

Department: *Board of Zoning Appeals*

Site Address: *1350 Massachusetts Avenue, Cambridge, MA 02139*

Verizon Wireless Contact: *Edward Onessimo, SAI Communications, (617) 691-7022*

This document serves as Verizon Wireless's eligible facilities request to modify an existing wireless rooftop facility at the above-referenced site address pursuant to Section 6409 of the Federal Spectrum Act and Federal Communications Commission ("FCC") rules (the "Spectrum Act"). Review by the City of Cambridge is limited to determining administratively whether the proposed modification qualifies as an eligible facilities request that does not substantially change the physical dimensions of the wireless facility. All permits necessary to commence construction must be approved within 60 days of the request date set forth above, subject to tolling for incompleteness.

For this request, Verizon Wireless attaches the following documents for the permit required by the City of Cambridge to commence construction of the modification:

1. *Special Permit Application;*
2. *Plans prepared by Dewberry Engineers Inc. dated March 14, 2024 (the "Plans");*
3. *Property Owner Letter of Authorization;*
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5. *Deed for 1350 Massachusetts Avenue*
6. *FCC Licenses*
7. *Antenna Specifications*
8. *RFDS Report*
9. *Structural Analysis*
10. *Photo Simulations of proposed modifications*

Project Description

To accommodate new wireless technologies and wireless service needs of the surrounding community, Verizon Wireless proposes to REMOVE two (2) existing LTE antennas and hardware from the existing Alpha Sector, one (1) existing Alpha Sector 6x12 hybrid cable and one (1) existing Alpha Sector 6-OVP, and INSTALL one (1) new MS-6.3-DB90-T antenna to the proposed heavy duty wall bracket, seven (7) new RRHS inside of the existing penthouse, two (2) new Alpha Sector 12-OVP, two (2) new Alpha Sector 6x12 hybrid cables, as well as updated support equipment and cables as shown in greater detail on the Plans. No additional changes are proposed for the modification.

FCC Rules for Eligible Facilities Requests

The Spectrum Act states 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." An "eligible facilities request"[1] is defined to include any collocation, removal, or replacement of existing equipment.[2]

The FCC adopted rules providing legally binding guidance on key terms of the Spectrum Act, notably defining "substantial change" with the six thresholds described below.[3] The FCC requires that qualifying eligible facilities requests be approved within 60 days, subject to tolling for incompleteness.[4] The 60-day period begins when an applicant takes the first procedural step required by a local government, and submits written documentation.[5] The only submittal documents a local government can require are those relevant to determining if a proposed modification qualifies as an eligible facilities request.[6] If a local government does not render a decision within the 60-day period, an eligible facilities request can be deemed granted by operation of law.[7]

The Proposed Modification Does Not Constitute a "Substantial Change"

Below are the FCC's six "substantial change" thresholds for a wireless base station,[8] each followed by an explanation why the proposed modification does not exceed that threshold.

1) It increases the height of the structure by more than 10% or more than ten feet, whichever is greater.

---

[1] 47 U.S.C. § 1455(a)(1).
[2] 47 U.S.C. § 1455(a)(2).
[3] *See* Report and Order FCC 14-153, 29 FCC Rcd. 12865 (FCC October 17, 2014); *see also* Report and Order FCC 20-153, 2020 WL 6501650 (FCC October 27, 2020).
[4] *See* 47 C.F.R. § 1.6100(c)(2),(3).
[5] Declaratory Ruling 20-75, 35 FCC Rcd 5977, ¶ 16 (FCC June 9, 2020).
[6] *See* 47 C.F.R. § 1.6100(c)(1).
[7] *See* 47 C.F.R. § 1.6100(c)(4).
[8] *See* 47 C.F.R. § 1.6100(b)(7).

As shown on the Plans, there is no proposed height increase beyond the existing structure's highest appurtenance.

2) 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.

As shown on the Plans, none of the proposed equipment protrudes from the edge of the building by more than six feet.

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

As shown on the Plans, no new cabinets are proposed.

4) Entails any excavation or deployment outside the current site (as defined at 47 C.F.R. § 1.6100(b)(6)).

As shown on the Plans, none of the modifications entail excavation or deployment outside the current site.

5) Would defeat any concealment elements of the existing facility.

As shown on the Plans, the existing concealment elements of the base structure will not change and the installation will remain designed to camouflage with the structure on which it is located. Therefore, the modification does not defeat any concealment elements of the existing facility.

6) Does not comply with conditions associated with the prior approval of the existing facility, unless the non-compliance is due only to a change in height, width, etc., that does not exceed the first four thresholds.

The proposed changes will comply with the conditions associated with the prior approval..

In sum, the modification clearly qualifies as an "eligible facilities request" under the Spectrum Act and FCC rules, because it does not exceed any of the thresholds such that it would "substantially change" the physical dimensions of the existing base station.

Failure to process this eligible facilities request and approve all necessary permits within 60 days may result in the request being deemed granted by operation of law.

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[7] *See* 47 C.F.R. § 1.6100(c)(4).
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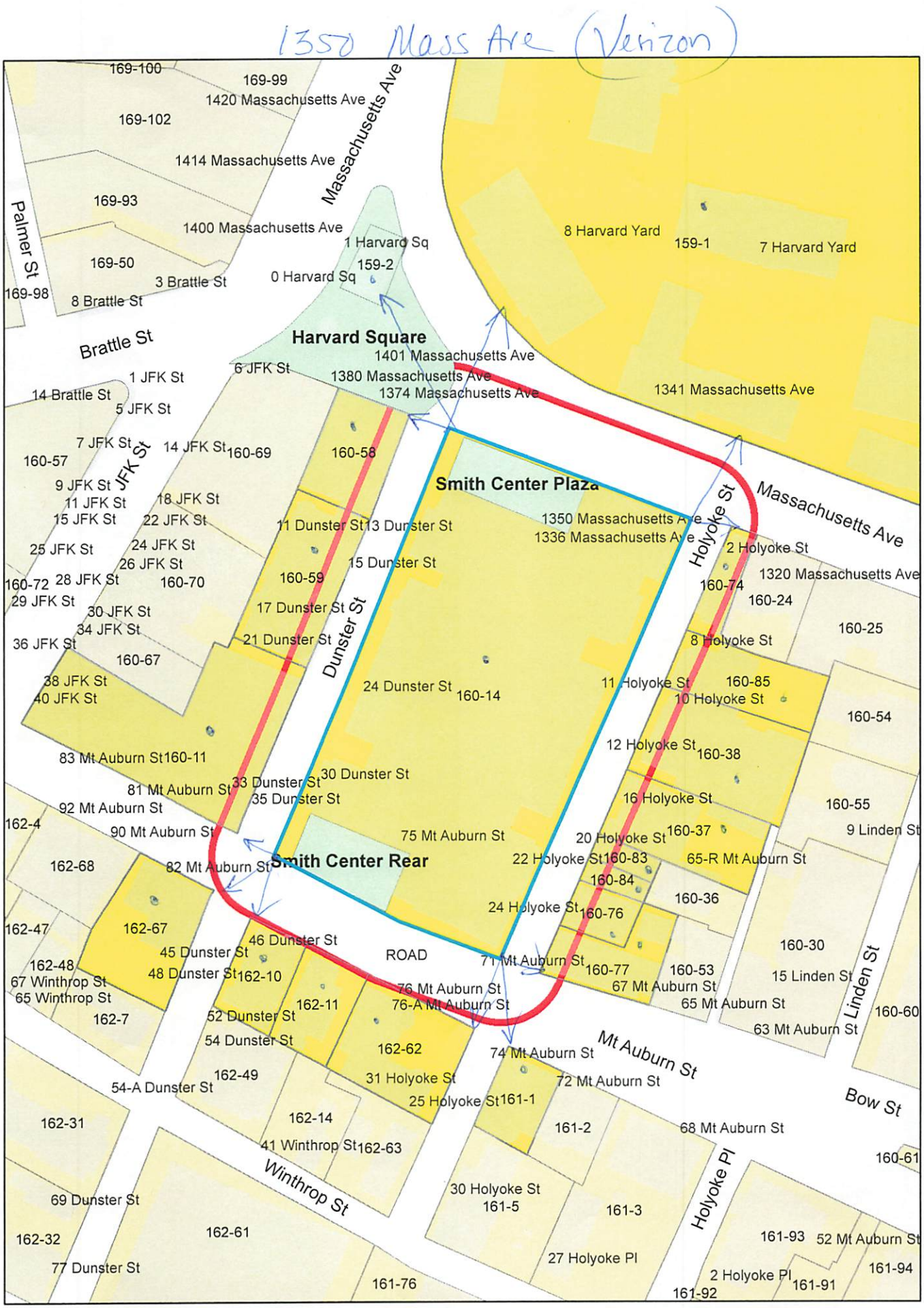
1350 Mass Ave (Verizon)
Massachusetts Ave
Palmer St
Brattle St
Harvard Square
JFK St
Dunster St
Smith Center Plaza
Smith Center Rear
Holyoke St
Linden St
Mt Auburn St
Bow St
Winthrop St
Holyoke Pl
ROAD
169-100
169-99
1420 Massachusetts Ave
169-102
1414 Massachusetts Ave
169-93
1400 Massachusetts Ave
169-50
169-98
3 Brattle St
8 Brattle St
1 Harvard Sq
0 Harvard Sq
159-2
8 Harvard Yard
159-1
7 Harvard Yard
1401 Massachusetts Ave
1380 Massachusetts Ave
1374 Massachusetts Ave
1341 Massachusetts Ave
6 JFK St
1 JFK St
14 Brattle St
5 JFK St
7 JFK St
14 JFK St
160-69
160-58
160-57
9 JFK St
11 JFK St
18 JFK St
15 JFK St
22 JFK St
25 JFK St
24 JFK St
26 JFK St
160-72
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160-70
29 JFK St
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34 JFK St
36 JFK St
160-67
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40 JFK St
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92 Mt Auburn St
162-4
90 Mt Auburn St
162-68
82 Mt Auburn St
162-47
162-67
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45 Dunster St
162-48
48 Dunster St
162-10
67 Winthrop St
65 Winthrop St
162-7
52 Dunster St
54 Dunster St
162-11
54-A Dunster St
162-49
162-31
162-14
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162-63
69 Dunster St
162-32
162-61
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161-76
11 Dunster St
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17 Dunster St
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24 Dunster St
160-14
33 Dunster St
30 Dunster St
35 Dunster St
75 Mt Auburn St
76 Mt Auburn St
76-A Mt Auburn St
162-62
31 Holyoke St
25 Holyoke St
161-1
74 Mt Auburn St
72 Mt Auburn St
71 Mt Auburn St
30 Holyoke St
161-5
161-3
27 Holyoke Pl
2 Holyoke Pl
161-92
161-91
161-93
52 Mt Auburn St
161-94
68 Mt Auburn St
161-2
160-61
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1336 Massachusetts Ave
2 Holyoke St
1320 Massachusetts Ave
160-74
160-24
160-25
8 Holyoke St
11 Holyoke St
160-85
10 Holyoke St
160-54
12 Holyoke St
160-38
16 Holyoke St
160-55
9 Linden St
20 Holyoke St
160-37
22 Holyoke St
160-83
65-R Mt Auburn St
160-84
160-36
24 Holyoke St
160-76
160-30
15 Linden St
160-77
160-53
67 Mt Auburn St
65 Mt Auburn St
63 Mt Auburn St
160-60

1350 Mass Ave (Verizon)

Petitioner

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

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

CELLCO PARTNERSHIP
C/O BRETT SMITH
1441 MAIN STREET – SUITE 1100
SPRINGFIELD, MA 01103

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

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

159-1 / 160-37-38-74 / 161-1 / 162-11
PRESIDENT & FELLOWS OF HARVARD
COLLEGE C/O HARVARD REAL ESTATE, INC.
HOLYOKE CENTER,ROOM 1000
1350 MASSACHUSETTS AVE
CAMBRIDGE, MA 02138-3895

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

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

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

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

160-11
TRINITY REALTY LIMITED PARTNERSHIP I
P.O. BOX 380212
CAMBRIDGE, MA 02238

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

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

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