CONSULTING • MANAGEMENT
FIELD SERVICES

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April 1st, 2020

City of Portsmouth
Zoning Board of Adjustment
1 Junkins Avenue, 3rd Floor,
Portsmouth, NH 03801

Re:	**Special Exception Application to Attach Antennas and Supporting Equipment as a, "Concealed Wireless Telecommunications Facility" to an Existing Hampton Inn.**
Applicant:	**Cellco Partnership d/b/a Verizon Wireless ("VzW")**
Address:	**Existing Hampton Inn, located at 99 Durgin Lane, Portsmouth, NH 03801 ("Portsmouth_4_NH")**

Dear Board of Adjustment,

VzW is submitting herewith the enclosed Special Exception Application Package so that it may install, operate and maintain wireless communication antennas and supporting equipment (together, the "Concealed Wireless Telecommunications Facility") on the above-referenced Hampton Inn as depicted on the plans submitted herewith. Consultant for the applicant spoke with Peter Stith, Principal Planner on March 16, 2020 and was advised that an application for a special exception needs to be filed with the Zoning Board of Adjustment due to City Zoning Ordinance. VzW is proposing wireless communications antennas in order to be able to provide coverage and capacity relief and improve wireless service throughout Portsmouth, particularly where, as here, VzW has identified areas of dense demand for its Long-Term Evolution ("LTE" or "4G") voice and data services.

VzW is one of the nation's leading Federal Communications Commission-licensed providers of wireless telecommunications services, extending coverage to almost all of the top 100 markets in the United States. It has developed one of the largest and most reliable national wireless networks to provide wireless voice and data services to an ever-growing customer base, last counted at over 135 million, and continuously works to enhance and improve its network.

"Available" Technology

One of VzW's key network design objectives is to provide seamless and reliable coverage without either significant gaps or dead spots, or any inability to handle and off-load voice and data traffic, particularly in areas of high data demand. To provide this level of coverage—as required by the federal Telecommunications Act of 1996—VzW utilizes a variety of available technologies. At present, these technologies fall into three categories: (1) macro-sites, (2) small cells and Cloud Radio Access Network ("CRAN") nodes, and (3) indoor and outdoor distributed antenna systems ("DAS"). The deployment of a particular technology in a specific location is largely dependent upon the specific network coverage/capacity needs of the area around the location, and the environment in which the technology will be used. In particular, it is critical that each technology deployed complements the other technologies already being deployed in its vicinity, in order to avoid interference and to establish a more robust overall network.

Macro-sites are the most common deployed wireless technology and represent a basic solution applicable to most environments, whether a busy urban center, rural area, or in between. These sites typically consist of an antenna support structure—such as a monopole or lattice tower, or a building rooftop—with three sectors of antennas intended to serve a broad geographic area around the site. Macro-sites were deployed as part of the first-generation analog networks in the 1980s. As wireless technologies have evolved through second, third and now fourth generation networks (with 5G on the horizon), the macro-site infrastructure has continued to be a vital component of FCC-licensed carriers' wireless networks because they provide the first critical layer of broad-area coverage needed to support wireless network connectivity.

Small cells and CRAN nodes are a relatively recent addition to the set of available technology solutions used to deploy wireless services. VzW's small cell and CRAN applications generally consist of a smaller, lower-power antenna (as compared to that on a macro-site) mounted on a utility pole, light pole or on- or two-story building rooftop, and are typically used to serve smaller isolated areas of heavy network usage, such as strip malls, schools, town commons and high traffic areas/intersections. These technologies operate at the same frequencies as macro-sites and their coverage areas are subject to the same impacts of surrounding obstructions, or "clutter," such as trees, buildings and topographical variations. However, because small cells and CRAN nodes are typically deployed on shorter structures below such "clutter," their coverage areas are limited to open line-of-sight stretches up and down the adjacent roadways, and across open areas surrounding the locations listed above.

Indoor and outdoor DAS are also used to provide coverage in discrete areas. They are typically owned and operated by third parties as a lower-powered, neutral host solution, where multiple wireless carriers

"plug in" at a central head-end location. Examples of indoor/outdoor DAS systems include large sporting venues such as Fenway Park, Gillette Stadium, casinos, and major underground traffic corridors such as the central Artery Tunnel in Boston.

Based on its objectives in Portsmouth, VzW has concluded that the proposed Macro-site is the most appropriate technology available to serve its network needs in this area at this time.

VzW's Proposal

With the aim of deploying Macro-site technology throughout New Hampshire, VzW has entered into agreements with property owners, including this Hampden Inn, among others, which allow for the installation of telecommunications antennas throughout the area.

The proposed Macro-site will primarily consist of collocating six panel antennas (two per sector, three sectors) and three remote radio heads (RRHs, one per sector, three sectors) at a centerline height of 49 feet, 4 inches above grade level on the roof of an existing building (Hampton Inn), which was constructed in 1997. Construction will be limited to the vicinity of the existing rooftop surface, interior and exterior parapet walls, and interior of the existing building. The antennas will be mounted on the existing interior parapet wall on the rooftop, as depicted in the submitted plans and photo simulations. Additionally, Verizon Wireless proposes to place support equipment on a proposed equipment frame on the rooftop. Utilities will be routed along existing ground conduits on sleepers on the roof and routed through existing conduits within the building's janitor closet from the roof to the first floor, and then routed along the first floor ceiling to the existing water main in the basement. There is no ground disturbance proposed for this installation. With respect to visual impacts, the equipment will be entirely concealed from view.

The strategic integration of wireless telecommunications technology is a surgical approach to the continued deployment of Verizon's existing LTE and AWS networks in Portsmouth and throughout New Hampshire, particularly in those areas of high data traffic. When Macro-site antennas are strategically placed throughout a targeted geographic area, the end result is an overall increase in performance and efficiency, both within the target area and the network as a whole.

The proposed location is intended to address a gap in service by providing adequate capacity and coverage improvement to the roadways, businesses, and residential areas immediately surrounding the Hampden Inn. The Macro-site will address the high wireless usage in those locations, while also freeing up network capacity elsewhere in the area, as macro-sites that currently need to provide service to those locations can use the relief to provide better wireless service to other high usage areas. Improved wireless access provides enormous economic benefits to communities. Because of wireless technology, it is easier to start a business today than it ever has been, as entrepreneurs can market, buy inventory, accept payments, and keep in touch with customers from their phones, wherever they go. Similarly, wireless access lets consumers research potential purchases in real time while shopping. Most importantly, a robust wireless network is vital to ensuring that residents, visitors, and businesses in Portsmouth have entirely reliable access to public safety and that public safety is always connected to the services they need to save lives while working in the field.

Following installation, VzW technicians will monitor and occasionally visit the macro-site for maintenance purposes. Except for standard electrical service, the installations will not impact utilities,

schools, traffic or other municipal resources. Because there is no generator or HVAC unit, the Macro-site will not create any noise or vibrations.

Special Exception Criteria

This application for special exception meets all necessary criteria per Section 10.232.20 of the City Zoning Ordinance. This installation falls under Section 10.923.30 "Facilities Allowed by Special Exception," as it involves a wireless telecommunications facility, the use of which is not permitted under Section 923.10 or 923.20 and which is not prohibited under Section 923.40. The project presents no hazard to the public or adjacent property through potential fire, explosion or release of toxic materials. The project presents no detriment to property values in the vicinity or change in the essential characteristics of any area including residential neighborhoods or business and industrial districts on account of the location or scale of buildings and other structures, parking areas, accessways, odor, smoke, gas, dust, or other pollutant, noise, glare, heat, vibration, or unsightly outdoor storage of equipment, vehicles or other materials. Further, the installation poses no traffic safety hazard or a substantial increase in the level of traffic congestion in the vicinity, no excessive demand on municipal services, and no significant increase of stormwater runoff onto adjacent property or streets.

Environmental Statement

EnviroBusiness, Inc. (EBI) Consulting conducted a review of the installation to determine if any necessary statements are required under the National Environmental Protection Act or the National Historic Preservation Act. Based on EBIs review of files held by the New Hampshire Division of Historical Resources (NH SHPO), no historic properties were identified in the Area of Potential Effect (APE) and the age of the building was confirmed (built in 1997). Therefore, an Environmental Assessment (EA), Draft Environmental Impact Statement (DEIS) or Environmental Impact Statement (EIS) is not required.

The following table summarizes each proposed installation.

Site Name	Approximate Location	Mount Type	Antenna Height	Existing Structure Height
Portsmouth_4_NH	99 Durgin Lane	Concealed (Parapet)	52'6"	56'5"

Materials Included

Due to COVID-19 concerns, all materials will be submitted electronically. Please find below the list of materials being submitted for your review.

1.) Special Exception Petition, dated 4/1/2020;
2.) Radio Frequency Affidavit, dated 4/1/2020;
3.) FCC licenses;
4.) Signed Agreement from Property Owner, dated 3/19/2020;
5.) Design Plans for Portsmouth_4_NH, prepared by Dewberry Engineers Inc., dated 3/6/2020;
6.) Structural Assessment, prepared by Dewberry Engineers Inc., dated 2/18/2020;
7.) Photo simulations, prepared by Dewberry Engineers Inc., dated 3/9/2020;

Portsmouth Board of Adjustment
March 24, 2020

FCC Shot Clock

The Telecommunications Act of 1996 provides that a local government "shall act on any request for authorization to place, construct, or modify personal wireless service facilities *within a reasonable period of time* after the request is duly filed" (emphasis added). In 2009, the FCC issued Ruling No. 09-99, which provides specific time periods defining what constitutes "a reasonable period of time." For collocations on existing structures, a municipality has 90 dates from the date an application is received by the municipality to process and reach a final decision on that application. However, since then the Federal Communications Commission has published 2018 FCC Order, which clarifies the proper standard of review for courts and municipalities to use when considering whether denial of a colocation application would prohibit or have the effect of prohibiting the provision of personal wireless service. The Nationwide Programmatic Agreement (NPA) defines a collocation as, "mounting or installation of an antenna on an existing tower, building, or structure for the purpose of transmitting and/or receiving radio frequency signals for communications purposes, whether or not there is an existing antenna on the structure."

The 2018 FCC Order maintains that municipalities have 90 days from the date an application is received to review a proposed collocation on a pre-existing structure that is not a small wireless facility ("Small Cell").

The Board of Adjustment is receiving this complete petition on April 1, 2020. Ninety (90) days from that date is June 30, 2020 and, therefore, the board has until Wednesday, July 1, 2020, to reach a final decision on this petition.

Conclusion

The proposed Macro-site is the least intrusive means available to address an identified coverage gap in the above-described area of dense demand for VzW's LTE voice and data services in Portsmouth. The Macro-site will provide enhanced service to this area while avoiding the aesthetic impacts of a traditional wireless facility such as a tower.

Please place this special exception application on the agenda for the next available Board of Adjustment meeting. Thank you for your timely attention to this matter. If you should have any questions regarding the enclosed materials, please do not hesitate to contact me directly.

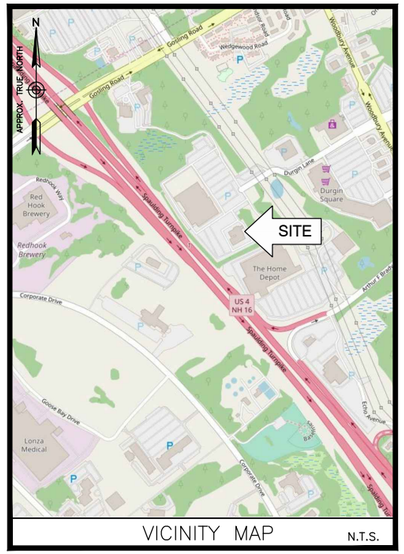
Very truly yours,

Benjamin Skillin

BCS

PORTSMOUTH 4 NH

99 DURGIN LANE
PORTSMOUTH, NH 03801



VICINITY MAP N.T.S.

DIRECTIONS FROM WESTBOROUGH:

TAKE I-495 N. TAKE EXIT 60 (SIGNS FOR MA-286/BEACHES/SALISBURRY) AND MERGE ONTO I-95 N, ENTERING NEW HAMPSHIRE. TAKE EXIT 4 TO MERGE ONTO NH-16 N/US-4 W TOWARD WHITE MTS. TAKE EXIT 1 FOR GOSLING RD TOWARD PEASE INTERNATIONAL TRADEPORT. DRIVE TO DURGIN LN. TURN RIGHT ONTO GOSLING RD. TURN RIGHT ONTO DURGIN LN. TURN LEFT TO STAY ON DURGIN LN. THE SITE WILL BE ON THE RIGHT.

ENGINEER

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

PHONE # (617) 531-0807
FAX # (617) 695-3310

CONTACT: BENJAMIN B. REVETTE, P.E

CONSTRUCTION

VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

CONTACT: TODD WHITE

PHONE # (603) 505-0700

CONSULTANT TEAM

SITE NAME:

PORTSMOUTH 4 NH

PROPERTY OWNER:

GIRI DOVER LLC
225 W SQUANTUM ST
SUITE 200
QUINCY, MA 02171

PETITIONER:

CELLCO PARTNERSHIP
d/b/a VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581-3956

ELECTRIC UTILITY:

EVERSOURCE
(800) 362-7764

TELEPHONE UTILITY:

FAIRPOINT
(844) 968-7224

MAP-LOT ID:

0239-0015-0000

EXISTING ROOF:*

LATITUDE: 43° 05' 46.73" N (NAD83)
LONGITUDE: 70° 47' 46.73" W (NAD83)
* BASED ON GOOGLE EARTH

PROJECT SUMMARY

SITE ADDRESS:
99 DURGIN LANE
PORTSMOUTH, NH 03801

ZONING DISTRICT:
G-1: GATEWAY CORRIDOR

PROJECT DIRECTORY

THE SITE WILL CONSIST OF MOUNTING (3) SECTOR OF ANTENNAS AND ASSOCIATED ANTENNA EQUIPMENT BEHIND A PARAPET WALL. A STEEL EQUIPMENT FRAME WILL BE INSTALLED ON THE ROOF OF AN EXISTING BUILDING.

PROJECT DESCRIPTION

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.

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
Z-1	ABUTTERS PLAN
C-1	PROPOSED ROOF PLAN
C-2	EAST ELEVATION & CONDUIT ROUTING
C-3	CONSTRUCTION DETAILS-I
C-4	CONSTRUCTION DETAILS-II
C-5	CONSTRUCTION DETAILS-III
S-1	EQUIPMENT FRAMING PLAN & DETAILS
S-2	STRUCTURAL CONNECTION DETAILS
S-3	PARAPET FRAMING & ANTENNA MOUNTING
E-1	ONE-LINE RISER DIAGRAMS
E-2	GROUNDING DIAGRAMS & DETAILS

SHEET INDEX

VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581-3956

PORTSMOUTH 4 NH

CONSTRUCTION DRAWINGS		
A	03/06/20	FOR COMMENT

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

DRAWN BY: JCM/JSD
REVIEWED BY: MFT
CHECKED BY: BBR
PROJECT NUMBER: 50121487
JOB NUMBER: 50121524

SITE NUMBER

540336

SITE ADDRESS

99 DURGIN LANE
PORTSMOUTH, NH 03801

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:

   NEW HAMPSHIRE STATE BUILDING CODE, CONSISTENT WITH THE FOLLOWING CODES:
   2009 INTERNATIONAL RESIDENTIAL CODE (IRC)
   2009 INTERNATIONAL BUILDING CODE (IBC)
   2009 INTERNATIONAL EXISTING BUILDING CODE (IBC)
   2017 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.

GENERAL ELECTRICAL NOTES:

1. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.
2. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TESTS, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ARCHITECT LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
3. HEIGHTS SHALL BE VERIFIED WITH OWNER PRIOR TO INSTALLATION.
4. THESE PLANS ARE DIAGRAMMATIC ONLY, FOLLOW AS CLOSELY AS POSSIBLE.
5. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, J-BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
6. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
7. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORY AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
8. ALL CONDUIT INSTALLED MAY BE SURFACE MOUNTED UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL CARRY OUT HIS WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES & O.S.H.A.
10. CONTRACTOR SHALL SECURE ALL NECESSARY BUILDING PERMITS AND PAY ALL REQUIRED FEES
11. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER. ANY WORK, MATERIAL OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.
12. ALL CONDUIT ONLY (C.O.) SHALL HAVE A PULL WIRE OR ROPE.
13. PROVIDE PROJECT MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
14. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.
15. USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURE.
16. ALL BUILDING WIRE #12 TO # 6 SHALL BE STRANDED COPPER TYPE THWN-THHN. CONDUCTORS #4 AND LARGER SHALL BE COPPER TYPE XHHW.
17. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED AND A MINIMUM OF 25,000 A.I.C. UNLESS OTHERWISE INDICATED.
18. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES
19. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
20. IN DRILLING HOLES INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, M PIPE RUNS, ETC., IT MUST BE CLEARLY UNDERSTOOD THAT TENDONS AND/OR REINFORCING STEEL WILL NOT BE DRILLED INTO CUT OR DAMAGED UNDER ANY CIRCUMSTANCES.
21. LOCATION OF TENDONS AND/OR REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND, THEREFORE, MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT VIA X-RAY OR OTHER DEVICES THAT CAN ACCURATELY LOCATE THE REINFORCING AND/OR STEEL TENDONS.
22. PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH FIRESTOP DETAILS.
23. WIRE AND CABLE CONDUCTORS SHALL BE STRANDED COPPER #12 AWG MINIMUM UNLESS SPECIFICALLY STATED OTHERWISE ON DRAWINGS.
24. VERIFY ALL CONDUIT ROUTING W/OWNER REP. & VERIZON WIRELESS C.M. NO OTHER SURFACE MOUNTED CONDUITS WILL BE ALLOWED OTHER THAN IN CHASES AND ABOVE CEILINGS.
25. ALL MATERIALS SHALL BE U.L. LISTED.
26. CONDUIT:

a. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR. RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2 LAPPED WRAPPED WITH HUNTS WRAP PROCESS NO. 3.

b. ELECTRICAL METALLIC TUBING SHALL HAVE U.L. LABEL, FITTINGS SHALL BE GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.

c. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.

d. CONDUIT RUNS MAY BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH ARCHITECT PRIOR TO INSTALLING.

27. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
28. COORDINATE THE ELECTRICAL SERVICE WITH BUILDING OWNER.
29. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 5 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE OWNER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE. SUBMIT TEST REPORTS AND FURNISH TO DISPATCH COMMUNICATIONS ONE COMPLETE SET OF PRINTS SHOWING "INSTALLED WORK".
30. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, AND FALL POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO PROJECT MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
31. ALL WALL AND FLOOR PENETRATIONS SHALL BE FIRE STOPPED WITH FS-ONE HIGH PERFORMANCE INTUMESCENT FIRE STOP BY HILTI OR APPROVED EQUAL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.

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118 FLANDERS ROAD
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PORTSMOUTH 4 NH

CONSTRUCTION DRAWINGS		
A	03/06/20	FOR COMMENT

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
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DRAWN BY:	JCM/JSD
REVIEWED BY:	MFT
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50121524

SITE NUMBER

540336

SITE ADDRESS

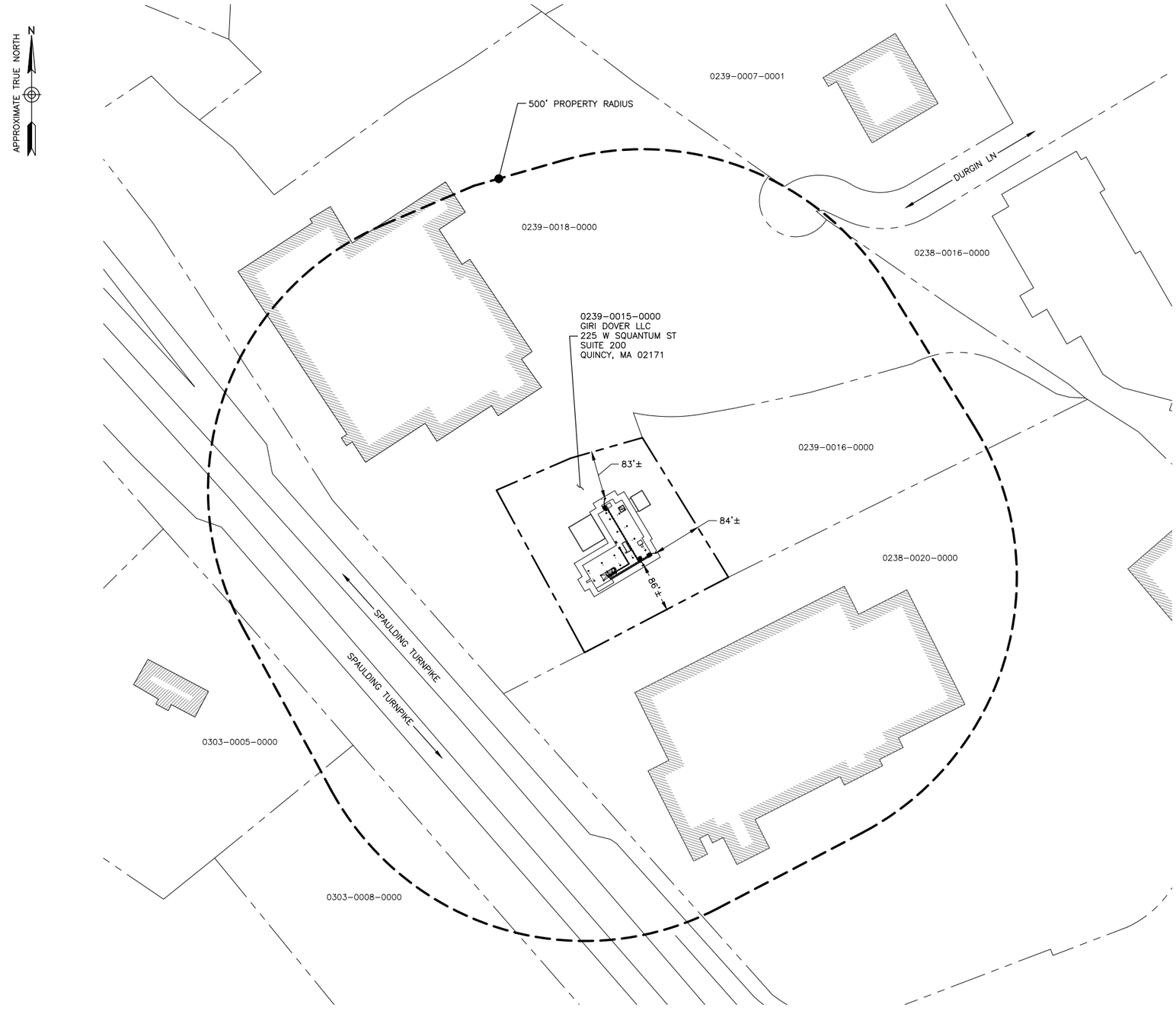
99 DURGIN LANE
PORTSMOUTH, NH 03801

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G-1



500' RADIUS ABUTTERS PLAN (1)

SCALE: 1"=200' FOR 11"x17"
1"=100' FOR 22"x34"

0' 100' 200'

ZONING DISTRICT
ZONING DISTRICT: G1 – GATEWAY NEIGHBORHOOD MIXED USE CORRIDOR

LEGEND

—·—·—	LOCUS PROPERTY LINE
— - - —	Existing Property Line
———	Edge Of Roadway
— — —	500' ABUTTERS
XX–XX	PARCEL ID
	Existing Building

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. PROPERTY LINES BASED ON CITY OF PORTSMOUTH, NH GIS MAP AND HAVE NOT BEEN VERIFIED WITH A FIELD SURVEY.

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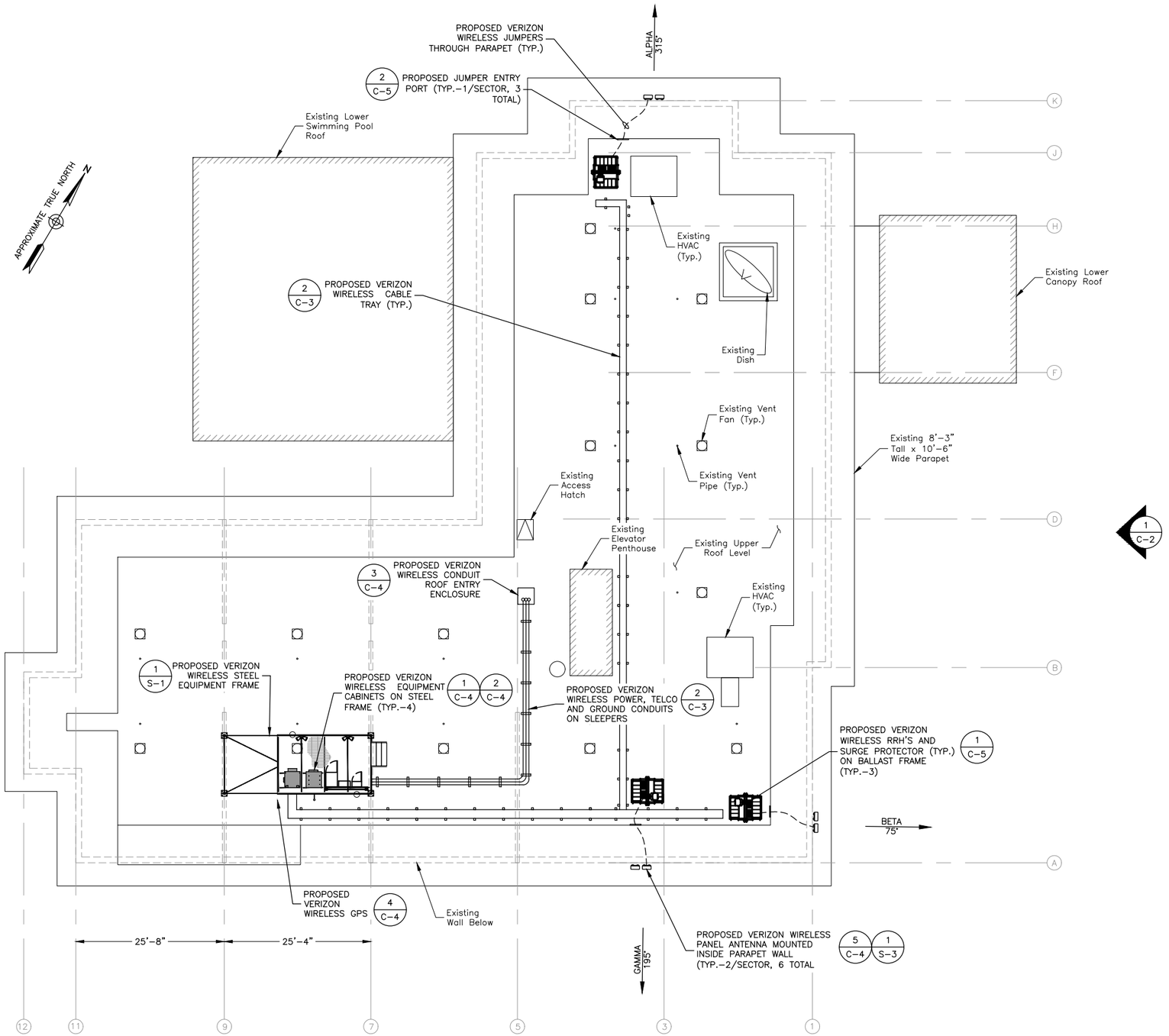
PORTSMOUTH, NH 03801

SHEET TITLE

ABUTTERS PLAN

SHEET NUMBER

Z–1



PROPOSED ROOF PLAN 1

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

0' 10' 20'

NOTES:

1. NOT ALL EXISTING AND PROPOSED INFORMATION SHOWN FOR CLARITY
2. NORTH SHOWN AS APPROXIMATE.
3. GROUND TO STREET SIDE OF EXISTING WATER MAIN.
4. ROOF PLAN BASED ON SITE VISIT BY DEWBERRY ENGINEERS INC. ON 07/01/19. STRUCTURAL FRAMING PLANS BASED ON 'ASI HOSPITALITY DESIGN FOR HAMPTON INN HOTEL, PORTSMOUTH NH' DATED 07/22/1996.

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JOB NUMBER:	50121524

SITE NUMBER

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SITE ADDRESS

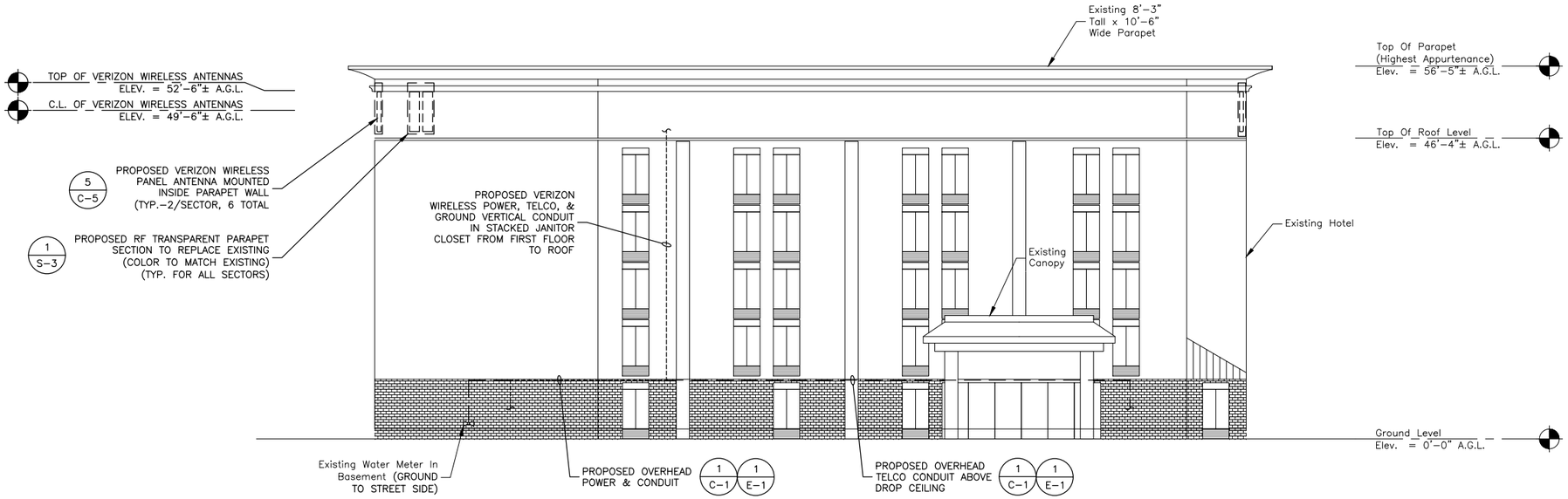
99 DURGIN LANE
PORTSMOUTH, NH 03801

SHEET TITLE

PROPOSED ROOF PLAN

SHEET NUMBER

C-1



EAST ELEVATION 1

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

0' 10' 20'

CONDUIT/ CABLE	CONDUIT SIZE	CONDUIT TYPE	START	TERMINATE	APPROX. DISTANCE	ROUTING NOTES
POWER	2"ø	EMT (INSIDE) RGS (OUTSIDE)	ELECTRICAL ROOM ON FIRST FLOOR	PPC ON VZW ROOFTOP STEEL FRAME	200'±	RUN CONDUIT OVERHEAD FROM ELECTRIC ROOM TO STACKED JANITOR CLOSET. RUN VERTICAL IN STACKED JANITOR CLOSET TO ROOF.
TELCO	2"ø WITH PULL STRING	EMT (INSIDE) RGS (OUTSIDE)	TELCO ROOM ON FIRST FLOOR	TELCO CABINET ON VZW ROOFTOP STEEL FRAME	250'±	RUN CONDUIT OVERHEAD FROM TELCO ROOM TO STACKED JANITOR CLOSET. RUN VERTICAL IN STACKED JANITOR CLOSET TO ROOF.
GROUND	1"ø	EMT (INSIDE) RGS (OUTSIDE)	TELCO ROOM ON FIRST FLOOR	MGB ON VZW ROOFTOP STEEL FRAME	200'±	RUN CONDUIT OVERHEAD FROM MECHANICAL ROOM TO STACKED JANITOR CLOSET. RUN VERTICAL IN STACKED JANITOR CLOSET TO ROOF.
COAX/ HYBRID CABLE	(1) 12x24 HYBRIDFLEX		VERIZON WIRELESS EQUIPMENT CABINET	ALPHA SECTOR	205'±	
	(1) 12x24 HYBRIDFLEX			BETA SECTOR	110'±	
	(1) 12x24 HYBRIDFLEX			GAMMA SECTOR	100'±	

CONDUIT CHART 2

SCALE: N.T.S.

CONDUIT NOTES:

1. SEE GENERAL ELECTRICAL NOTE #26 ON SHEET G-1 FOR CONDUIT SPECIFICATIONS.
2. CONDUIT LENGTHS SHOWN ARE APPROXIMATE. CONTRACTOR TO VERIFY CONDUIT LENGTH & ROUTE PRIOR TO CONSTRUCTION. OWNER & VERIZON WIRELESS C.M. TO APPROVE FINAL ROUTINGS.
3. CONTRACTOR TO IDENTIFY ALL CONDUIT PENETRATIONS, TURNS, PULL BOXES, EXPANSION JOINTS & VERIFY ROUTE WITH VERIZON WIRELESS CM & BUILDING OWNER PRIOR TO CONSTRUCTION.
4. PAINT CONDUIT TO MATCH EXISTING SURROUNDINGS AS REQUIRED BY BUILDING OWNER & PROVIDE LABELS PER VERIZON WIRELESS REQUIREMENTS.
5. FIRE STOP ALL INTERIOR WALL PENETRATIONS. WEATHER SEAL ALL EXTERIOR WALL PENETRATIONS.

NOTES:

1. NOT ALL EXISTING AND PROPOSED INFORMATION SHOWN FOR CLARITY
2. PROPOSED EQUIPMENT PLATFORM & RRH BALLAST LOCATIONS AND ORIENTATION PENDING STRUCTURAL ANALYSIS.
3. FINAL POWER, TELCO, AND GROUND ROUTING PENDING APPROVAL.
4. A.G.L. - ABOPVE GROUND LEVEL
   C.L. = CENTERLINE
5. GROUND TO STREET SIDE OF EXISTING WATER MAIN.

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CONSTRUCTION DRAWINGS		
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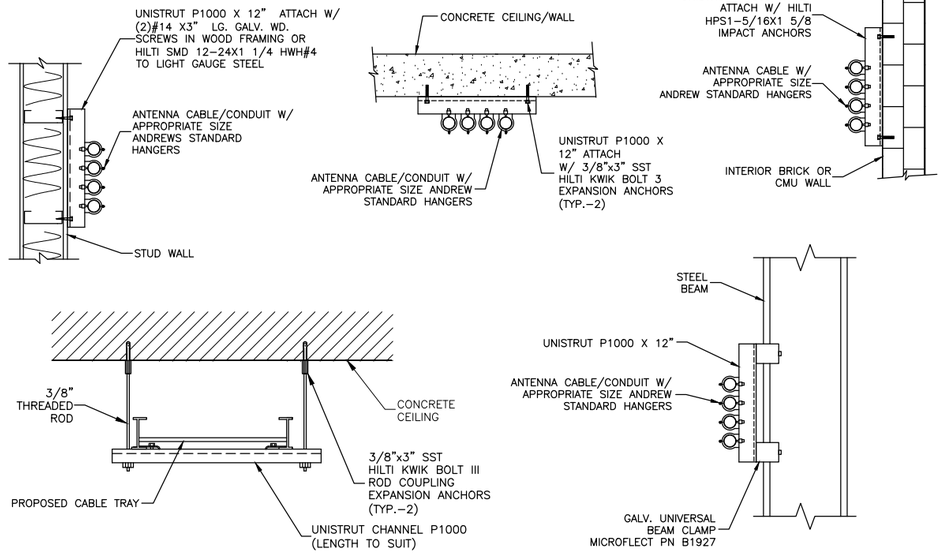
PROJECT NUMBER: 50121487
JOB NUMBER: 50121524
SITE NUMBER
540336
SITE ADDRESS
99 DURGIN LANE
PORTSMOUTH, NH 03801
SHEET TITLE
EAST ELEVATION & CONDUIT ROUTING
SHEET NUMBER
C-2

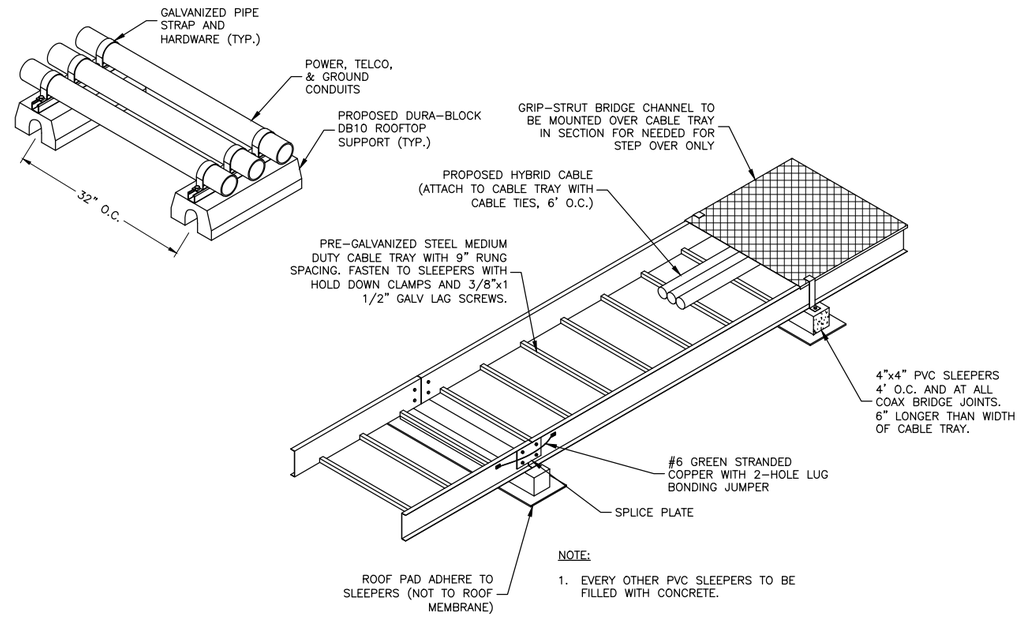


NOTES:

1. ALL COAX SUPPORT SPACING: 4'-0" MAX.
2. ALL CONDUIT SUPPORT SPACING: 10'-0" MAX.

CABLE/CONDUIT SUPPORT 1

SCALE: N.T.S.

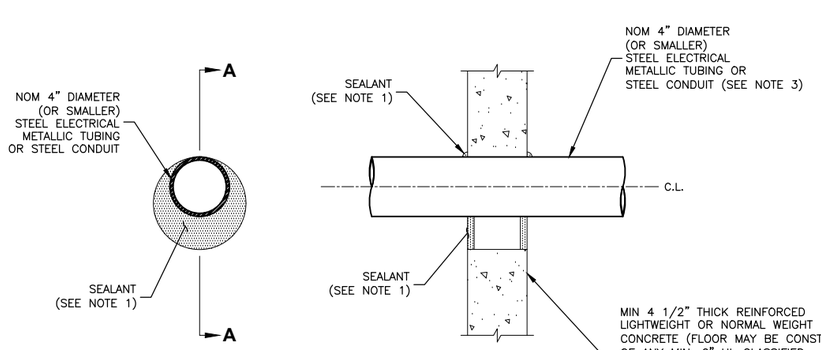


NOTE:

1. EVERY OTHER PVC SLEEPERS TO BE FILLED WITH CONCRETE.

CABLE TRAY DETAIL 2

SCALE: N.T.S.



UL SYSTEM NO. C-AJ-1259
F RATING - 3 HR.
T RATING - 0 HR.

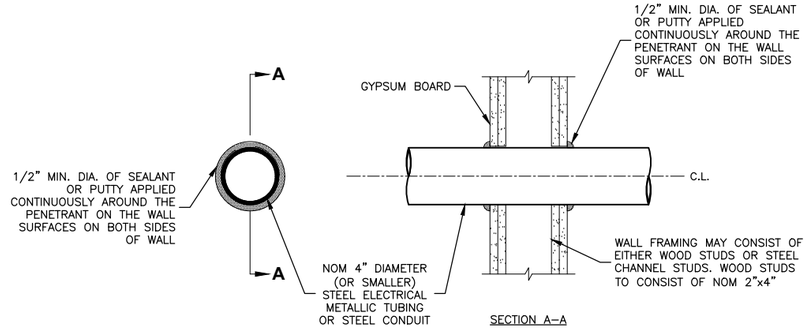
NOTES:

1. FILL, VOID OR CAVITY MATERIAL* - SEALANT - MIN. 1/2" THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF FLOOR OR WALL. AT THE POINT CONTACT LOCATION BETWEEN PENETRATING ITEM AND CONCRETE, A MIN. 1/4" THICK BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/ PENETRATING ITEM INTERFACE ON BOTH SIDES OF FLOOR OR WALL.
2. FORMING MATERIAL - (OPTIONAL, NOT SHOWN) - MINERAL WOOL BATT PACKING MATERIAL OR POLYURETHANE BACKER ROD FRICTION FITTED INTO OPENING AND RECESSED FROM FLOOR OR WALL SURFACES AS REQUIRED TO ACCOMMODATE THICKNESS OF FILL MATERIAL.
3. ONE CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN THE CONDUIT AND THE PERIPHERY OF THE OPENING SHALL BE A MIN. OF 0" (POINT OF CONTACT) TO A MAX. OF 3". CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

* BEARING THE UL CLASSIFICATION MARK.

CORING DETAIL 3

SCALE: N.T.S.



SYSTEM NO. W-L-1344
F RATINGS - 1 AND 2 HR
T RATING - 1/4 HR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - LESS THAN 1 CFM/SQ FT

NOTES:

1. THE 1 AND 2 HOUR FIRE RATED GYPSUM WALL BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS & MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL & PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY.
2. 5" DIAMETER OPENING MAX.

SECTION - THROUGH PENETRATION FIRESTOP SYSTEM 4

SCALE: N.T.S.

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CONSTRUCTION DRAWINGS		
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PROJECT NUMBER:	50121487
JOB NUMBER:	50121524

SITE NUMBER

540336

SITE ADDRESS

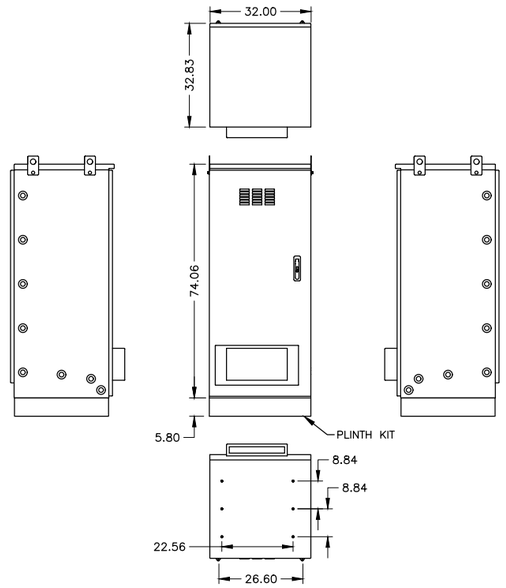
99 DURGIN LANE
PORTSMOUTH, NH 03801

SHEET TITLE

CONSTRUCTION DETAILS-I

SHEET NUMBER

C-3



CHARLES CABINET CUBE-BB48E1HN1

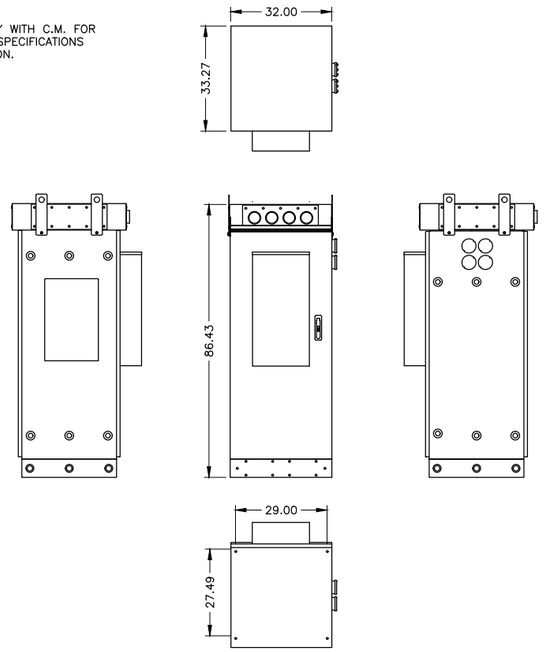
SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

1

0' 1' 2' 4'

NOTE:

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

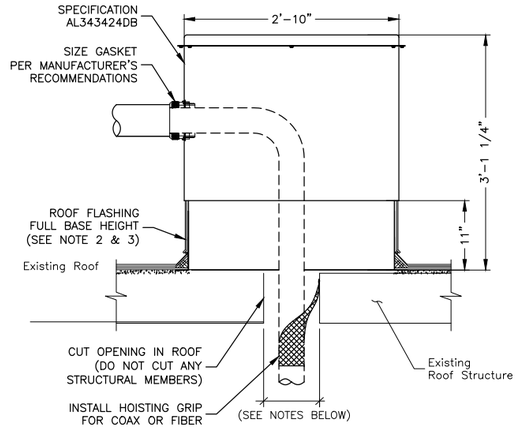


CHARLES CABINET CUBE-PM63912MC1

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

2

0' 1' 2' 4'



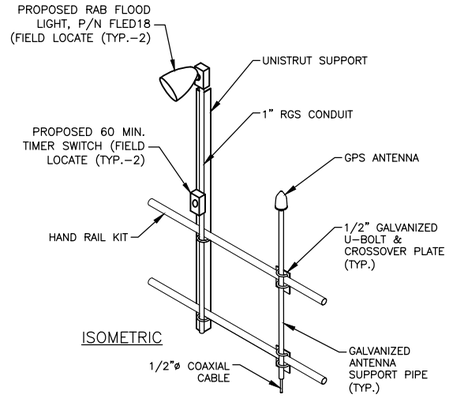
NOTES:

1. INSTALL RPH–ROOF PENETRATION HOUSINGS LLC ASSEMBLY PER MANUFACTURER'S SPECIFICATIONS BY FISKIO INC. (800) 288–6816 (IN NEW ENGLAND) (800) 994–0945(OUTSIDE NEW ENGLAND).
2. FLASHING & SEALANTS TO MATCH EXISTING ROOFING SYSTEM. WEATHERPROOF ALL EDGES WITH EXTERIOR GRADE SILICON.
3. CONTRACTOR TO USE BUILDING'S APPROVED ROOFER AND SHALL NOT VOID ANY EXISTING WARRANTY. CONTRACTOR TO SEAL ALL UNUSED PORTS WITH PROPER SEALANT CAPS.
4. NO STRUCTURAL JOISTS ARE TO BE CUT DURING INSTALLATION.
5. INSULATE ROOF PENETRATION AFTER CONDUIT/FEEDER INSTALLATION.

RPH- ROOF PENETRATION HOUSING

SCALE: N.T.S.

3



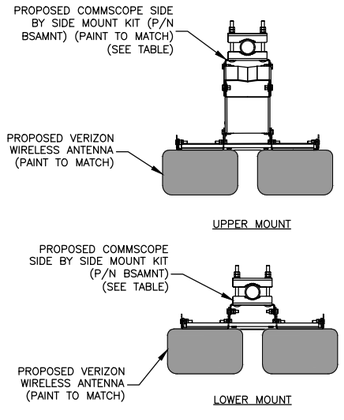
NOTES:

1. GROUND ANTENNAS AND MOUNTS PER MANUFACTURERS RECOMMENDATIONS AND VERIZON WIRELESS STANDARDS.
2. FIELD LOCATE GPS ANTENNAS & WORK LIGHT WITH VERIZON WIRELESS CM APPROVAL.
3. MOUNT GPS ANTENNAS PER MANUFACTURERS RECOMMENDATIONS.

GPS /WORK LIGHT MOUNTING DETAILS

SCALE: N.T.S.

4



COMMSCOPE P/N: BSAMNT MOUNT TABLE

COMMSCOPE P/N	SUPPORTED ANTENNAS	QUANTITY REQUIRED PER (2) ANTENNAS	NUMBER OF MOUNTING POINTS	GAP BETWEEN ANTENNAS
BSAMNT–SBS–1–2	SBNHH–1D65A/B/C NHH–65A/B/C–R2B	1	2	3–3/8"
BSAMNT–SBS–2–2	JAHH–65A/B/C–R3B JAHH–45A–R3B NHH–45A–R2B SBNHH–1D45A/B	1	2	2"
BSAMNT–SBS–2–3	JAHH–45B/C–R3B SBNHH–1D45C	1	3	2"

TABLE BASED ON POWER POINT PRESENTATION BY COMMSCOPE TITLED SIDE BY SIDE MOUNTS. CONTRACTOR TO VERIFY PART NUMBERS WITH MANUFACTURER PRIOR TO ORDERING. INSTALL PER MANUFACTURER RECOMMENDATIONS & SPECIFICATIONS.

NOTES:

1. SPACING OF PROPOSED EQUIPMENT SHALL BE CONFIRMED AND PROPOSED MOUNTS SHALL NOT IMPEDE EQUIPMENT CLEARANCES. ACCESS TO EQUIPMENT SHALL BE MAINTAINED.
2. PROPOSED ANTENNA MOUNT SHALL BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS.
3. DETAIL FOR BETA, GAMMA & DELTA SECTORS.

SIDE BY SIDE ANTENNA MOUNT

SCALE: N.T.S.

5

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JOB NUMBER:	50121524

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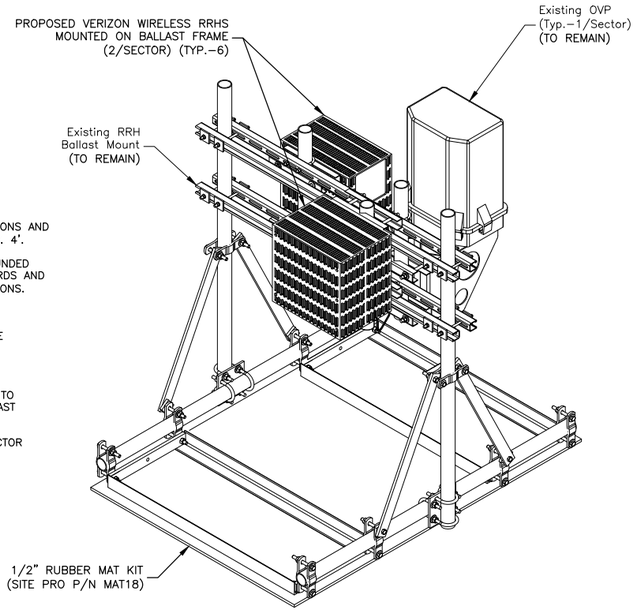
SHEET TITLE

CONSTRUCTION DETAILS–II

SHEET NUMBER

C–4



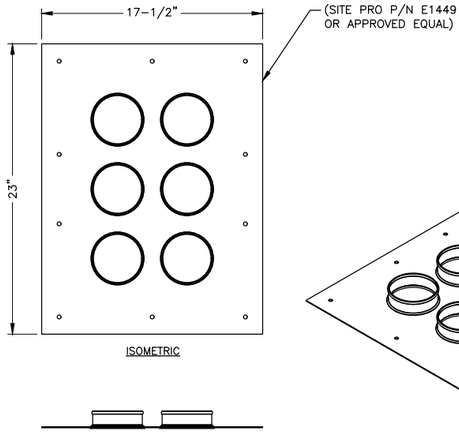
NOTES:

1. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS AND MINIMIZED OVERALL HEIGHT, MAX. 4'.
2. ALL EQUIPMENT SHALL BE GROUNDED PER VERIZON WIRELESS STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.
3. DETAIL IS SCHEMATIC.
4. ALL MOUNTING HARDWARE TO BE GALVANIZED.
5. NO BALLAST REQUIRED.
6. CLEAN & INSPECT ROOF PRIOR TO PLACEMENT OF PROPOSED BALLAST FRAME.
7. BOND FRAME & REMOTE TO SECTOR GROUND BAR.

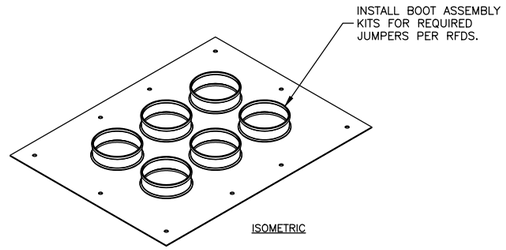
RRH BALLAST MOUNT DETAIL

SCALE: N.T.S.

1



PORT LAYOUT: 2x3
PORT SIZE: 4"
WALL OPENING: 9.5"x15"
OVERALL SIZE: 17.5"x23"
WEIGHT: 4.8 LBS



NOTES:

1. CONTRACTOR TO THOROUGHLY DRY AREA BEFORE CORING, INSTALLING AND SEALING CABLEPORT & BOOTS.
2. CONTRACTOR TO INSTALL BOOT ASSEMBLY KITS FOR REQUIRED JUMPERS PER RFDS.
3. CONTRACTOR TO FILL THE BOOT CAVITY W/ BOOT SEALER TO FORM A CONICAL SHAPE TO ALLOW WATER RUN OFF.
4. WATERPROOF ALL EDGES AND HOLES.

COAX/JUMPER ENTRY PANEL DETAIL

SCALE: N.T.S.

2

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VERIZON WIRELESS
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PORTSMOUTH 4 NH

CONSTRUCTION DRAWINGS		
A	03/06/20	FOR COMMENT

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REVIEWED BY:	MFT
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50121524

SITE NUMBER

540336

SITE ADDRESS

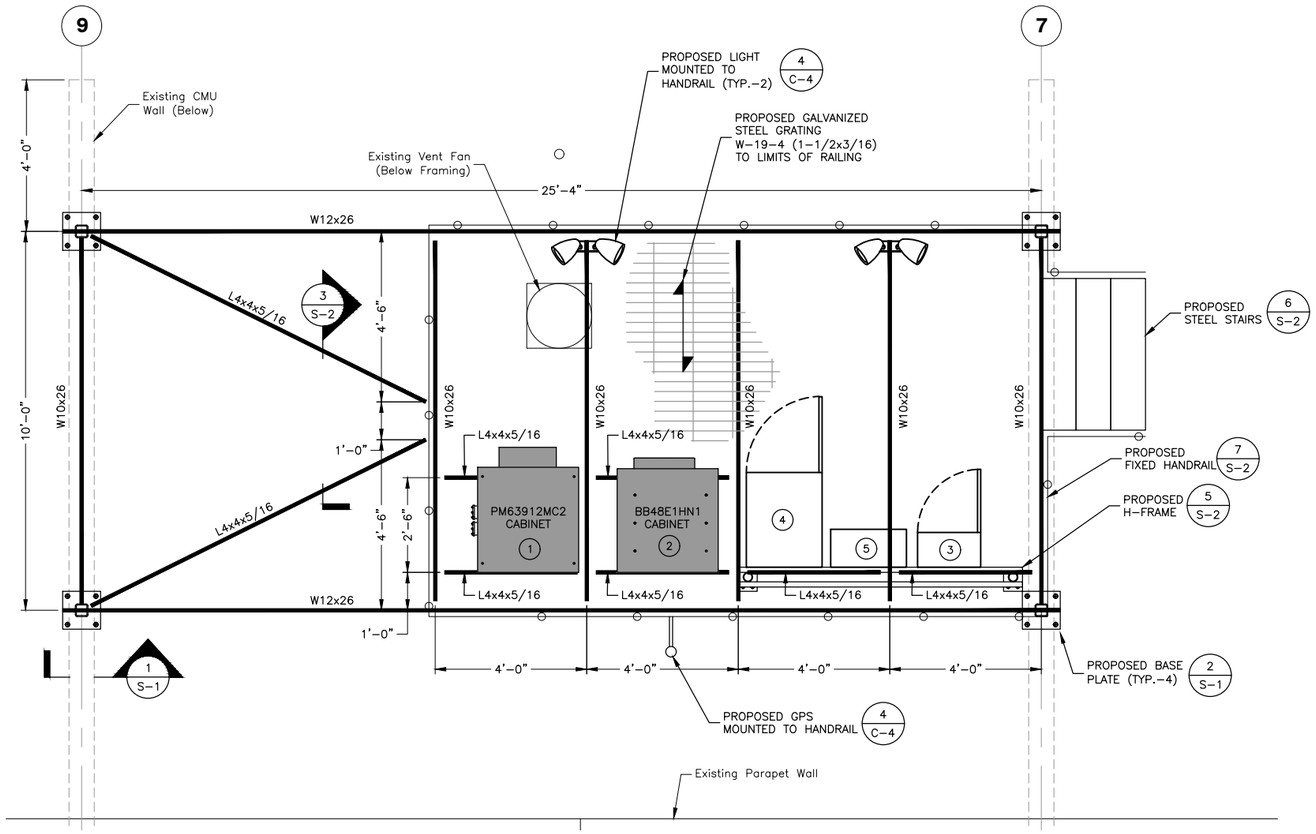
99 DURGIN LANE
PORTSMOUTH, NH 03801

SHEET TITLE

CONSTRUCTION DETAILS-III

SHEET NUMBER

C-5



FRAMING PLAN

1

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

0' 1' 2' 4'

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:

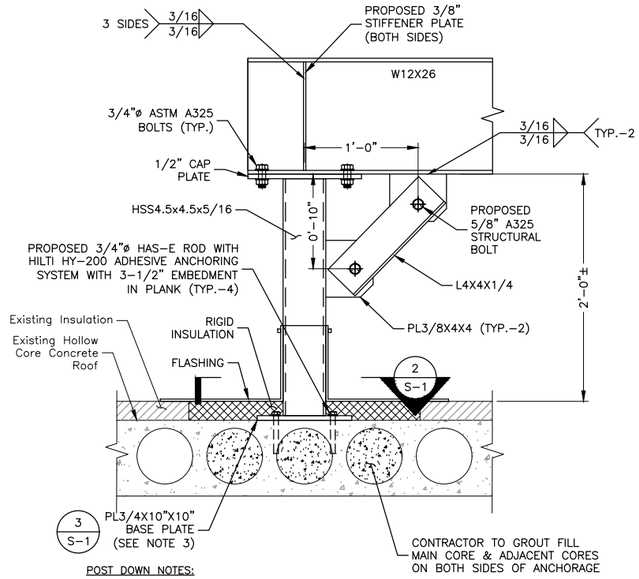
ASTM A–992, GRADE 50	ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE.
ASTM A–36	ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
ASTM A–500, GRADE B	HSS SECTION (SQUARE, RECTANGULAR, ROUND)
ASTM A–325, TYPE N	ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS.
F1554, GRADE 36	ALL ANCHORS BOLTS, 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 EQUIPMENTS AND/OR HARDWARE ON SITE.

EQUIPMENT LOADING:

			WEIGHT (LBS.)	
EQUIPMENT:	1	BB48E1HN1 CABINET	4,000 (EA.)	4,000
	2	PM63912MC2 CABINET	1,000 (EA.)	1,000
	3	POWER PANEL (ILC)	420 (EA.)	420
	4	TELCO CABINET	300 (EA.)	300
	5	HOFFMAN BOX	125 (EA.)	125
TOTAL EQUIPMENT LOAD =				5,845

STRUCTURAL ANALYSIS BASED ON LOADING SHOWN. NO ADDITIONAL EQUIPMENT SHALL BE ADDED WITHOUT ANALYSIS.



POST DOWN NOTES:

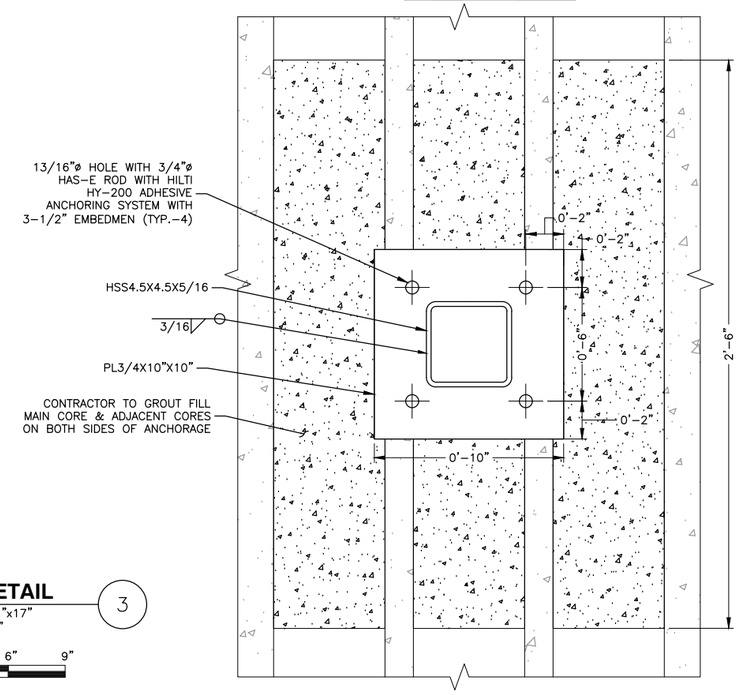
1. ALL ROOF PENETRATIONS SHALL BE SEALED AND WEATHERPROOFED. INSTALL TO SLOPE AWAY FROM THE PENETRATION, FREE DRAINING, SO AS NOT TO IMPEDE ON ANY EXISTING DRAINAGE PATTERNS AND BE COMPLETED BY THE BUILDING ROOFING CONTRACTOR TO MAINTAIN ALL ROOF WARRANTIES.
2. CONTRACTOR TO FIELD VERIFY POST DOWN CONNECTIONS PRIOR TO STEEL FABRICATION INSTALLATION.
3. CONTRACTOR TO PLACE BASE PLATE LEVEL ON CONCRETE SLAB. IF NOT LEVEL AND/OR SLAB IN POOR CONDITION, PROVIDE LEVELING GROUT AS REQUIRED.

POST DOWN DETAIL

2

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

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



BASE PLATE DETAIL

3

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

0' 3" 6" 9"

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CHECKED BY:	BBR
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JOB NUMBER:	50121524

SITE NUMBER

540336

SITE ADDRESS

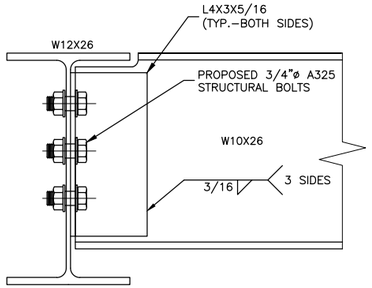
99 DURGIN LANE
PORTSMOUTH, NH 03801

SHEET TITLE

EQUIPMENT FRAMING PLAN & DETAILS

SHEET NUMBER

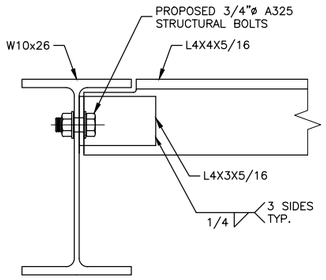
S–1



W12 TO W10 CONNECTION 1

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

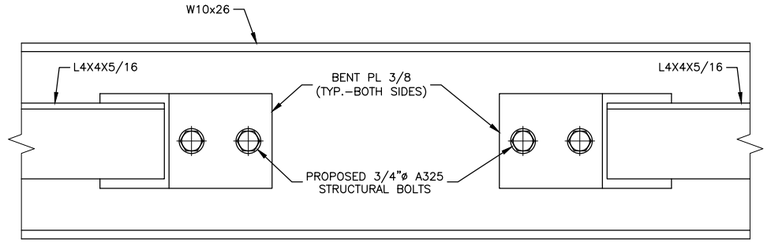
0' 3" 6" 9"



W10 TO L4X4X5/16 CONNECTION 2

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

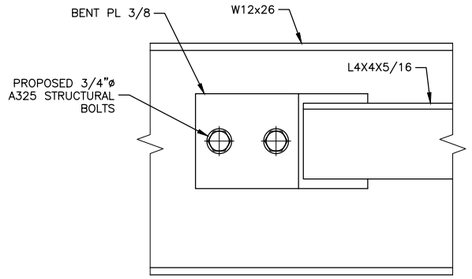
0' 3" 6" 9"



W10 TO 2- L4X4X5/16 CONNECTION 3

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

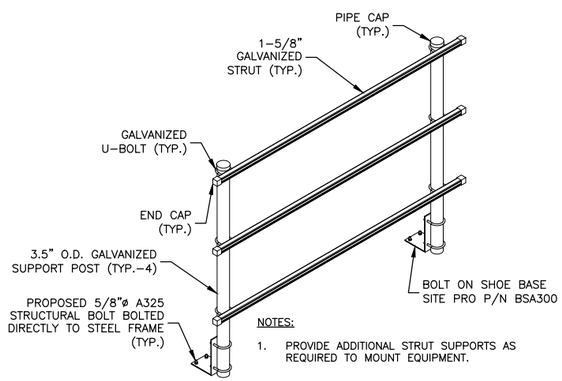
0' 3" 6" 9"



W12 to L4X4X5/16 CONNECTION 4

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

0' 3" 6" 9"

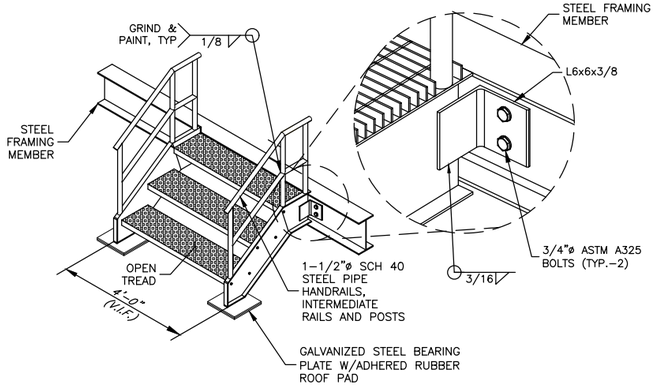


NOTES:

1. PROVIDE ADDITIONAL STRUT SUPPORTS AS REQUIRED TO MOUNT EQUIPMENT.

STRUT FRAME DETAIL 5

SCALE: N.T.S.

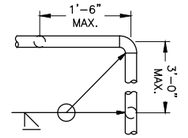


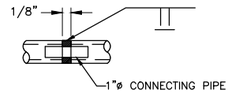
NOTES:

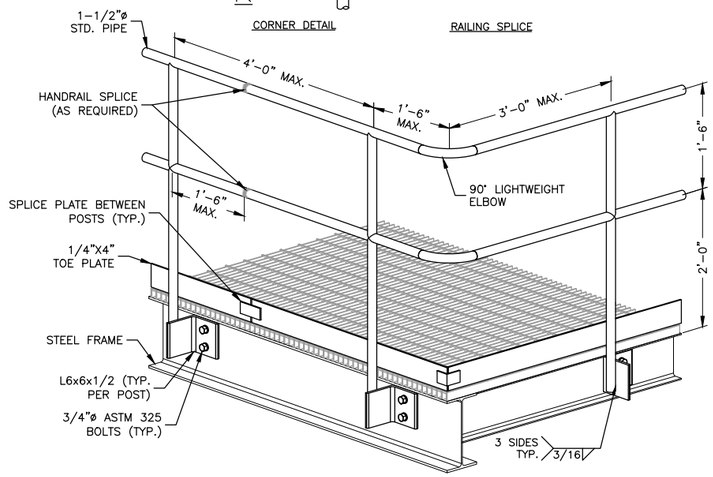
1. FABRICATE STAIR ASSEMBLY TO PROVIDE 7" RISERS AND 11" TREADS.
2. STAIR SHOWN IS A GENERAL DETAIL. REFER TO PLAN FOR SPECIFIC DIMENSIONS AND LAYOUT.
3. LANDING AND TREADS SHALL BE McNICHOLS GRIP STRUT 12 GAUGE STEEL STAIR TREADS (P/N: 26T4151230), OR APPROVED EQUAL.

STEEL STAIR DETAIL 6

SCALE: N.T.S.







NOTE:

1. ALL EXPOSED CORNERS MUST HAVE A 2" RADIUS ELBOW (UNO).

FIXED HANDRAIL 7

SCALE: N.T.S.

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PORTSMOUTH 4 NH

CONSTRUCTION DRAWINGS		
A	03/06/20	FOR COMMENT

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CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50121524

SITE NUMBER

540336

SITE ADDRESS

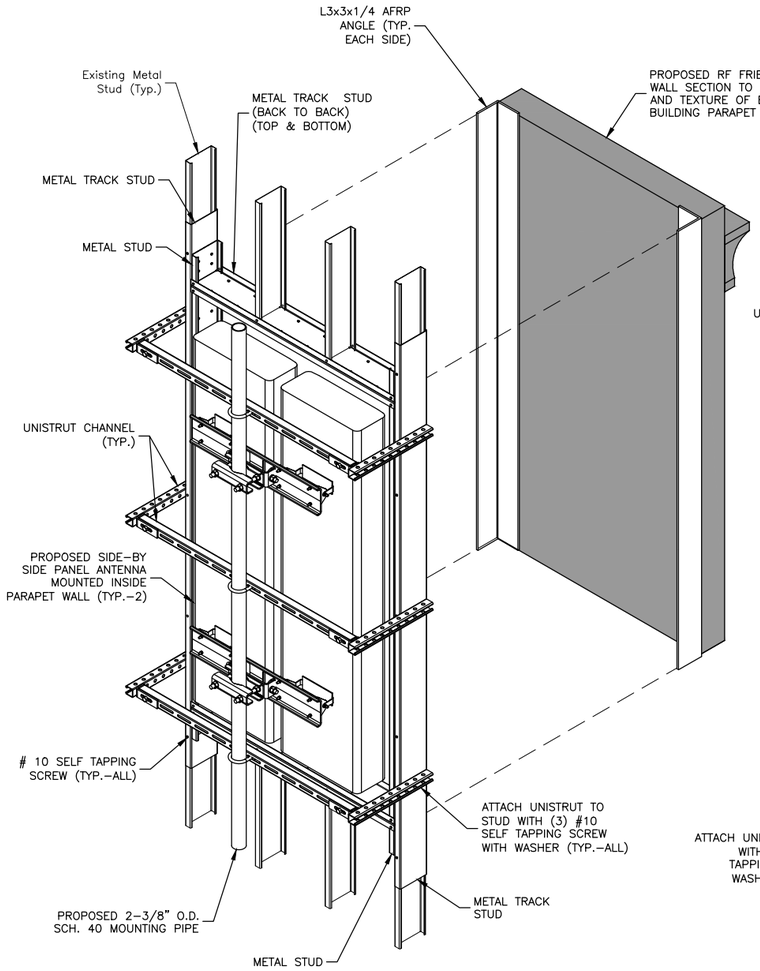
99 DURGIN LANE
PORTSMOUTH, NH 03801

SHEET TITLE

STRUCTURAL CONNECTION DETAILS

SHEET NUMBER

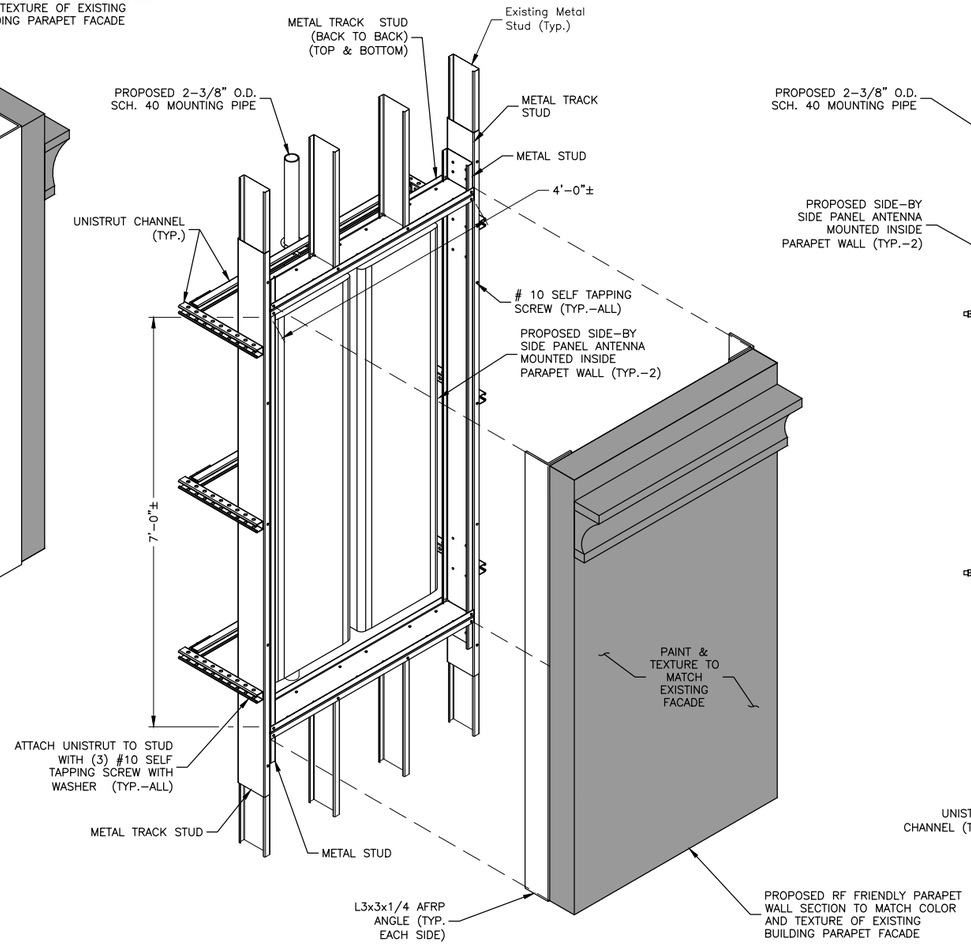
S–2



NOTES:

1. CONTRACTOR TO REMOVE (2) EXISTING METAL STUDS AND FRAME OUT SECTION TO INSTALL NEW SIDE BY SIDE ANTENNA.
2. COORDINATE FINAL PARAPET WALL FABRICATIONS AND CONNECTION WITH MANUFACTURER.

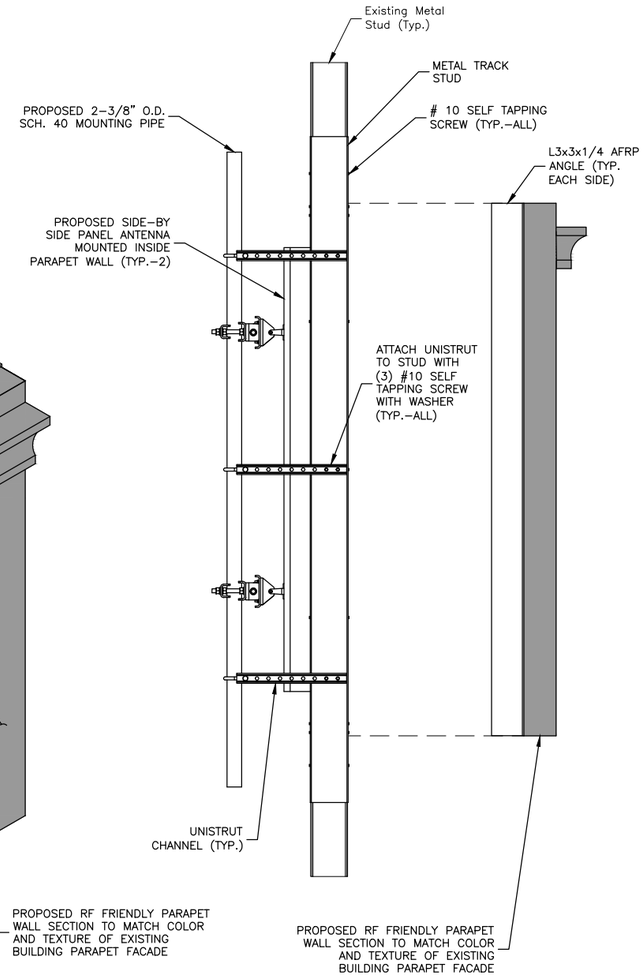
FRAMING ISOMETRIC - REAR (1)
SCALE: N.T.S.



NOTES:

1. CONTRACTOR TO REMOVE (2) EXISTING METAL STUDS AND FRAME OUT SECTION TO INSTALL NEW SIDE BY SIDE ANTENNA.
2. COORDINATE FINAL PARAPET WALL FABRICATIONS AND CONNECTION WITH MANUFACTURER.

FRAMING ISOMETRIC - FRONT (2)
SCALE: N.T.S.



NOTES:

1. CONTRACTOR TO REMOVE (2) EXISTING METAL STUDS AND FRAME OUT SECTION TO INSTALL NEW SIDE BY SIDE ANTENNA.
2. COORDINATE FINAL PARAPET WALL FABRICATIONS AND CONNECTION WITH MANUFACTURER.

FRAMING - SIDE (3)
SCALE: N.T.S.

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JOB NUMBER:	50121524

SITE NUMBER
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SITE ADDRESS
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SHEET TITLE
PARAPET FRAMING & ANTENNA MOUNTING

SHEET NUMBER
S-3

GENERAL ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
7. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE POWER PANEL CABINET (PPC) AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
8. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
9. ABOVE GROUND PORTION OF CONDUIT BETWEEN CABINET AND PROJECT OWNER'S CELL SITE PPC SHALL BE SCHEDULE 40 PVC CONDUIT.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. PROPOSED RAB DUAL FLOOD LIGHT, P/N HB2B & INTERMATIC FH SERIES 60 MIN. TIMER IN WP PLASTIC CASE, P/N E200. FIELD LOCATE LIGHT AND SWITCH AS NEEDED.
12. LIQUID–TIGHT FLEXIBLE CONDUIT SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATIONS OCCUR OR FLEXIBILITY IS NEEDED.

SITE ELECTRICAL NOTES:

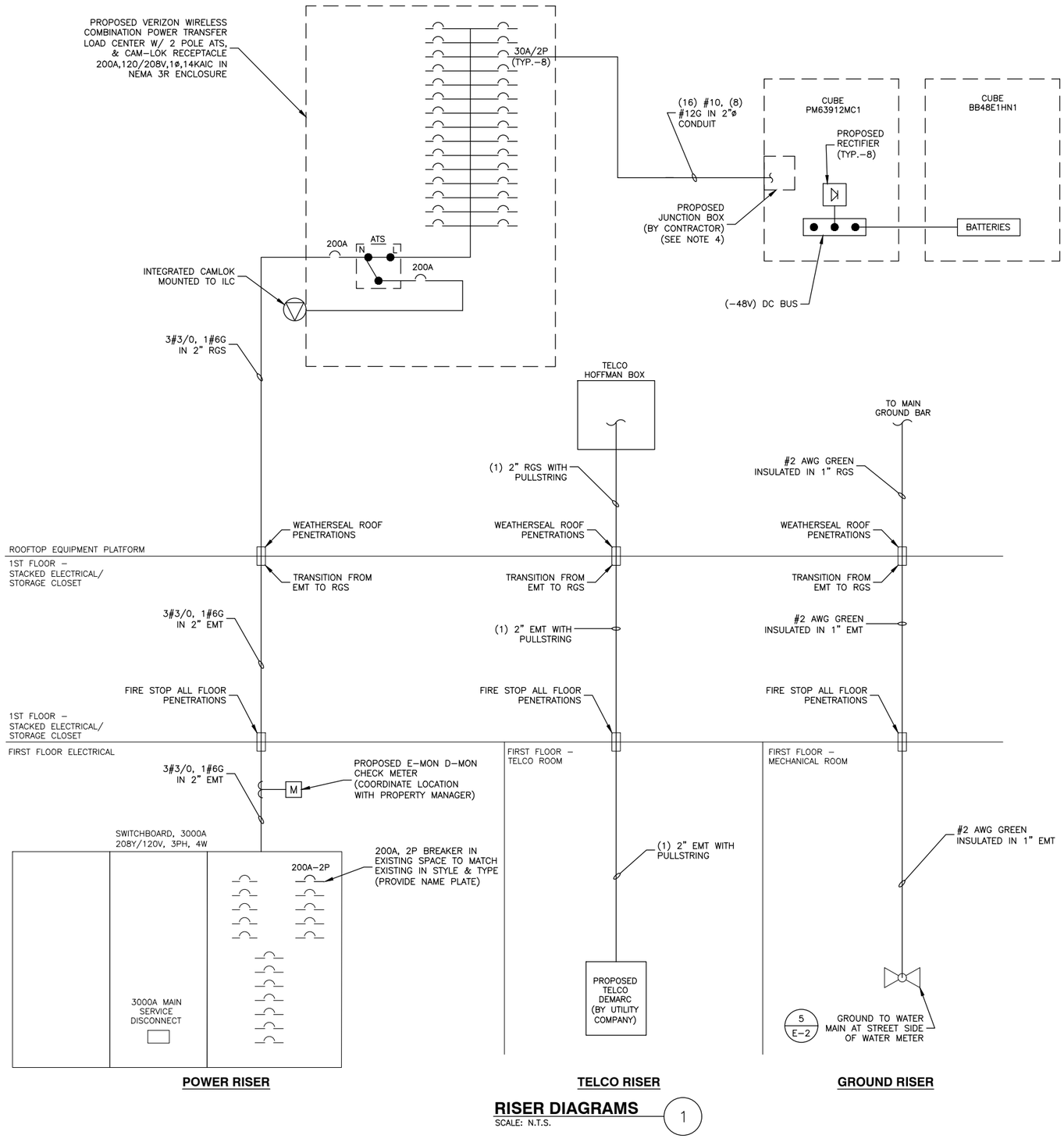
1. COORDINATE INSTALLATION AND NEW SERVICE LOCATION WITH UNIVERSITY REPRESENTATIVE.
2. PROPOSED RAB DUAL FLOOD LIGHT, P/N FFLED18 & INTERMATIC FH SERIES 60 MIN. TIMER IN WP PLASTIC CASE, P/N E200. FIELD LOCATE LIGHT AND SWITCH AS NEEDED. TYP.–2 UNITS.
3. INSTALL CIRCUIT BREAKERS, FEEDER, & CONDUIT TO EQUIPMENT CABINETS PER MANUFACTURER'S RECOMMENDATIONS.
4. CHECK METER SHALL BE FIELD LOCATED WITH BUILDING REPRESENTATIVE APPROVAL. PROVIDE MOUNTING STRUT FOR METER AS REQUIRED.
5. ALL COMPONENTS SHALL BE UL LISTED.

NEMA 3R

PANEL SCHEDULE - ILC

22,000 A.I.C.

W/200A MAIN C/B					
CKT #	DESCRIPTION	AMP	AMP	DESCRIPTION	CKT #
1	RECTIFIER #1	30	30	RECTIFIER #2	2
3					4
5	RECTIFIER #3	30	30	RECTIFIER #4	6
7					8
9	RECTIFIER #5	30	30	RECTIFIER #6	10
11					12
13	RECTIFIER #7	30	30	RECTIFIER #8	14
15					16
17	SPACE	–	–	SPACE	18
19					20
21	SPACE	–	20	CABINET RECEPTACLE	22
23	SPACE	–	20	PANEL RECEPTACLE	24
25	EXTERIOR LIGHT	15	20	PANEL RECEPTACLE	26
27	SPACE	–	–	SPACE	28
29	SPACE	–	–	SPACE	30



RISER DIAGRAMS

SCALE: N.T.S.

1

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VERIZON WIRELESS
118 FLANDERS ROAD
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CONSTRUCTION DRAWINGS		
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PROJECT NUMBER: 50121487

JOB NUMBER: 50121524

SITE NUMBER

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SITE ADDRESS

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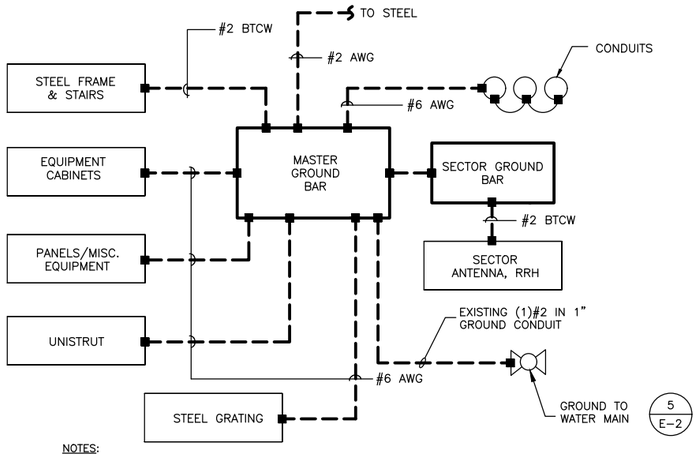
SHEET TITLE

ONE–LINE
RISER DIAGRAMS

SHEET NUMBER

E–1



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO GROUND BAR (GNP BAR).
2. ALL CELL EQUIPMENT (BCE, BATTERY FRAME, POWER CABINETS, MISC. EQUIPMENT FRAMES, ETC.) SHALL BE GROUNDED IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
3. ALL EXPOSED METAL OBJECTS SHALL BE BONDED AND JUMPED TO MGB.

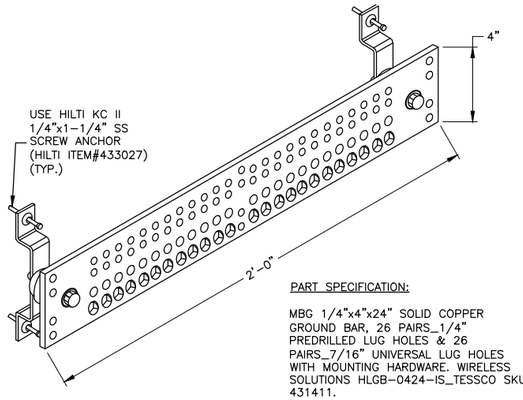
GROUNDING DIAGRAM 1

SCALE: N.T.S.

GROUNDING LEGEND

SYMBOL	DESCRIPTION
▶	EXOTHERMIC WELD
■	MECHANICAL CONNECTION
– – – – –	GROUND CONDUCTOR
G.I.	GREEN INSULATED

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.

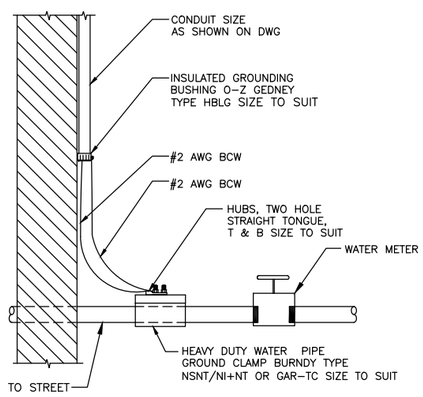


PART SPECIFICATION:

MBG 1/4"x4"x24" SOLID COPPER GROUND BAR, 26 PAIRS_1/4" PREDRILLED LUG HOLES & 26 PAIRS_7/16" UNIVERSAL LUG HOLES WITH MOUNTING HARDWARE. WIRELESS SOLUTIONS HLGB-0424-IS_TESSCO SKU 431411.

GROUND BAR DETAIL 2

SCALE: N.T.S.

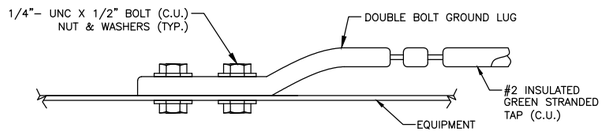


NOTE:

1. BURNDY TYPE GROUND CLAMP SHOULD BE ATTACHED ON STREET SIDE OF WATER CUT-OFF. VALVE IS INSULATED BETWEEN WATER METER & STREET GROUNDING CLAMP SHOULD BE ATTACHED TO STREET SIDE.

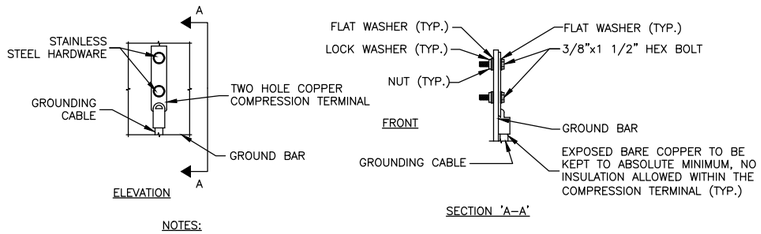
WATER METER GROUNDING 5

SCALE: N.T.S.



CONNECTION TO EQUIPMENT DETAIL 3

SCALE: N.T.S.

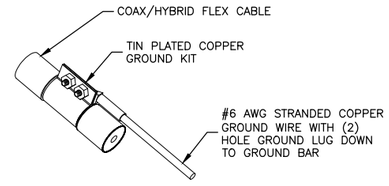


NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 6

SCALE: N.T.S.



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND. ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TIN PLATED COPPER WITH TWO-HOLE LUG, SIZE PER COAX DIAMETER.
3. WEATHER SEAL GROUND KIT PER CARRIER REQUIREMENTS.
4. COAX CABLE GROUND KIT LOCATION & QUANTITY SHALL BE PER CARRIER SPECIFICATIONS & STANDARDS.

COAX/HYBRID FLEX GROUNDING DETAIL 7

SCALE: N.T.S.

verizon WIRELESS
VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581-3956

PORTSMOUTH 4 NH

CONSTRUCTION DRAWINGS		
A	03/06/20	FOR COMMENT

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

DRAWN BY:	JCM/JSD
REVIEWED BY:	MFT
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50121524

SITE NUMBER

540336

SITE ADDRESS

99 DURGIN LANE
PORTSMOUTH, NH 03801

SHEET TITLE

GROUNDING SCHEMATIC & DETAILS

SHEET NUMBER

E-2

For visual reference only. Actual visibility is dependent upon weather conditions, season, sunlight, and viewer location.

verizon WIRELESS
118 Flanders Road
Westborough, MA 01581

PORTSMOUTH 4 NH

DEWBERRY NO. 50114605
(Page 1 of 8)

Dewberry
Dewberry Engineers Inc.
99 Summer St.
Suite 700
Boston, MA 02110


N
PHOTO 3
PHOTO 2
SITE LOCATION
PHOTO 1
Durgin Ln
4
verizon
WIRELESS
PORTSMOUTH 4 NH
99 Durgin Lande
Portsmouth, NH 03801
(Page 2 of 8)
Dewberry


Actual View
Hampton Inn
Hampton Inn
verizon WIRELESS
PORTSMOUTH 4 NH
Photo 1A
View Facing North
From Durgin Lane
(Page 3 of 8)
Dewberry

Proposed View

verizon WIRELESS

PORTSMOUTH 4 NH

Photo 1B

View Facing North
From Durgin Lane
(Page 4 of 8)

Dewberry®

Actual View

verizon WIRELESS

PORTSMOUTH 4 NH

Photo 2A

View Facing west
From Durgin Lane
(Page 5 of 8)

Dewberry®

Proposed View

verizon WIRELESS

PORTSMOUTH 4 NH

Photo 2B

View Facing west
From Durgin Lane
(Page 6 of 8)

Dewberry®

Actual View

verizon WIRELESS

PORTSMOUTH 4 NH

Photo 3A

View Facing South
From Durgin Lane
(Page 7 of 8)

Dewberry

Proposed View

verizon WIRELESS

PORTSMOUTH 4 NH

Photo 3B

View Facing South
From Durgin Lane
(Page 8 of 8)

Dewberry

Dewberry Engineers Inc.
99 Summer Street, Suite 700
Boston, MA 02110-1200
617.695.3400
617.695.3310 fax
www.dewberry.com

February 18, 2020

Andrew Leone
Verizon Wireless
118 Flanders Road
Westborough, MA 01581

Re: Portsmouth 4 NH
540336
2560256
99 Durgin Lane
Portsmouth, NH 03801

Andrew Leone:

Verizon Wireless has proposed to install six (6) new dual-mounted antennas, six (6) new Remote Radio Heads (RRHs), and one (1) new OVP on the rooftop at the above referenced site. The proposed antennas will be inside the existing parapet wall and the proposed RRHs and OVP will be mounted on proposed ballast mounts on the roof. Verizon Wireless also has proposed to install new equipment cabinets on a new steel platform on the rooftop.

Dewberry Engineers Inc. (Dewberry) has reviewed the antenna design sheets (dated 07/23/19) provided by Verizon Wireless and has determined that the proposed platform, proposed antenna mounts and existing building have adequate capacity to support the proposed equipment configuration. Dewberry assumes that the proposed platform, proposed antenna mounts and associated equipment are installed per the latest Construction Drawings by Dewberry.

Our assessment is based on the assumption that the existing structure is in good condition and were 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.

Brandon Kelsey, P.E.
Structural Project Engineer

Dewberry Engineers, Inc.
Structural Analysis Summary Sheet

Job No.:	50121487 / 50121524	**By:**	JSD	**Date:**	02/13/20
Job Name:	Portsmouth 4 NH	**Checked:**	SA	**Date:**	02/14/20

Location: 99 Durgin Lane, Portsmouth, NH 03801
Client: Verizon Wireless

Scope of Work:

- Proposed installation of six (6) dual mounted antennas.
- Proposed installation of six (6) RRHs, one (1) OVP, and three (3) ballast mounts
- Proposed installation of one (1) BB48E1HN1 cabinet (4,000 lb.), one (1) PM63912MC2 cabinet (1,000 lb.), one (1) power panel (420 lb.), one (1) telco cabinet (300 lb.), and one (1) Hoffman box (125 lb.) on a new steel platform.

Codes / Standards / References:

- IBC 2015
- New Hampshire State Building Code (BCR 300)
- TIA-222-G
- AISC 14th Ed.
- RFDS dated 07/23/19
- Existing construction drawings by ASI Hospitality Design Consultants dated 09/03/96
- Site visit by Dewberry Engineers on 07/01/19

Design & Analysis Assumptions:

- The proposed equipment and steel platform are installed per the latest Construction Drawings by Dewberry.
- Design and analysis are based on dead and wind loads. The analysis checks for normal bending and shear stresses.
- The analysis checks for overturning based on a minimum factor of safety of 1.5 and sliding based on a minimum factor of safety of 1.2.

Conclusion / Recommendations:

- The existing structure has sufficient capacity to support the proposed installation.
- Proposed ballast mounts do not require any additional ballast.
- The proposed platform post downs are to utilize Hilti Hit-Z rods with Hilti Hit-HY 200. Grout fill (minimum f'_c of 5,000 psi) the main core and adjacent cores on each side of the anchorage a minimum of 30".

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Job Number	50121524
Made by:	JSD
Date:	02/13/20
Checked by:	SA
Date:	02/14/20

(Portsmouth 4 NH) - Design Wind Load

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Wind Load Design Criteria

Site Name: Portsmouth 4 NH

General Information & Design Input

Item	Value	Description	Reference
V_{ult} =	121.00	Ultimate Design Wind Speed	*ASCE 7-10, ATC Windspeed*
V_{asd} =	93.80	$(\sqrt{0.6}) * V_{ult}$	*Adjustment for ASD Load Combo. 1.0D+0.6W*
K_d =	0.95	Wind Direction Probability Factor	*Table 26.6-1*
Class	II	Structure Classification	*Table 1.5-1*
I =	1.00	Importance Factor (Without Ice)	*Table 1.5-2*
z = h =	50.66	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 =	0.81	Velocity Pressure Coefficient	*Table 29.3-1*
Topo. Cat.	1.00	Topographic Category (1-5)	*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_h =	0.85	Gust Effect Factor	*Sect. 26.9.1*
$q_{z\ design}$ =	17.5 psf	$= 0.00256(K_z)(K_{zt})(K_d)(V_{asd}^2)(I)$	*Sect.29.3.2*

Design Wind Forces:

Section 2.6.9.2

$F_a = q_{z\ design} G_h (EPA)_a$ *(where $(EPA)_a$ = effective projected area of the appurtenance = $C_a A_a$)*

(see calculation tables on following pages)

Dewberry

Job Number	50121524
Made by:	JSD
Date:	02/13/20
Checked by:	SA
Date:	02/14/20

(Portsmouth 4 NH) - Design Wind Load

\\capecod\Projects\50121487\50121524 - Portsmouth 4 NH (50114605)\Engineering\Structural\COLO\Structural Analysis\Rev.0\Calcs\50121524 - Ballast Calcs.xlsx

Element Definition

Description	Dimensions (in.)			Weight	Length /
	W	D	H	(lb)	# Supports
B2/B66A RRH	15.00	10.00	15.00	97.50	1.00
B5/B13 RRH	15.00	8.10	15.00	82.00	1.00
OVP	16.50	12.60	21.60	32.00	1.00

Design Wind Load

Members	Dimensions (ft.)			Area $(A_a)_n$	Area $(A_a)_t$	Aspect	Aspect	C_{an}	C_{at}
	Width	Depth	Height	*(normal)*	*(tangent)*	Ratio	Ratio	*(normal)*	*(tangent)*
	(Normal)	*(Tangent)*	*(or span)*	*(sf)*	*(sf)*	*(normal)*	*(tangent)*	*Table 2-8*	*Table 2-8*
B2/B66A RRH	1.25	0.83	1.25	1.56	1.04	1.00	1.51	1.20	1.20
B5/B13 RRH	1.25	0.68	1.25	1.56	0.85	1.00	1.84	1.20	1.20
OVP	1.38	1.05	1.80	2.48	1.89	1.30	1.71	1.20	1.20

Design Effective Projected Area & Wind Loads

Members	EPA_a @ 0.0°	EPA_a @ 30.0°	EPA_a @ 60.0°	EPA_a @ 90.0°	F_a @ 0.0°	F_a @ 30.0°	F_a @ 60.0°	F_a @ 90.0°	Gravity Load @ Support
	(sf)	*(sf)*	*(sf)*	*(sf)*	*(lb)*	*(lb)*	*(lb)*	*(lb)*	*(lb)*
B2/B66A RRH	1.87	1.72	1.40	1.25	27.8	25.5	20.9	18.6	97.5
B5/B13 RRH	1.87	1.66	1.23	1.02	27.8	24.7	18.3	15.2	82.0
OVP	2.98	2.80	2.45	2.27	44.3	41.6	36.4	33.7	32.0

Dewberry

Job Number	50121524
Made by:	JSD
Date:	02/13/20
Checked by:	SA
Date:	02/14/20

(Portsmouth 4 NH) - RT-RRU5HD Ballast Calc.

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Dead Load of Support Equip. Rack

Item	Quantity	Weight		Total Weight (lb)
B2/B66A RRH	1	97.50	lb. ea.	97.50
B5/B13 RRH	1	82.00	lb. ea.	82.00
OVP	1	32.00	lb. ea.	32.00
RT-RRU5HD	1	282.00	lb. ea.	282.00

Σ Total Weight (A_W) = 493.50 lb

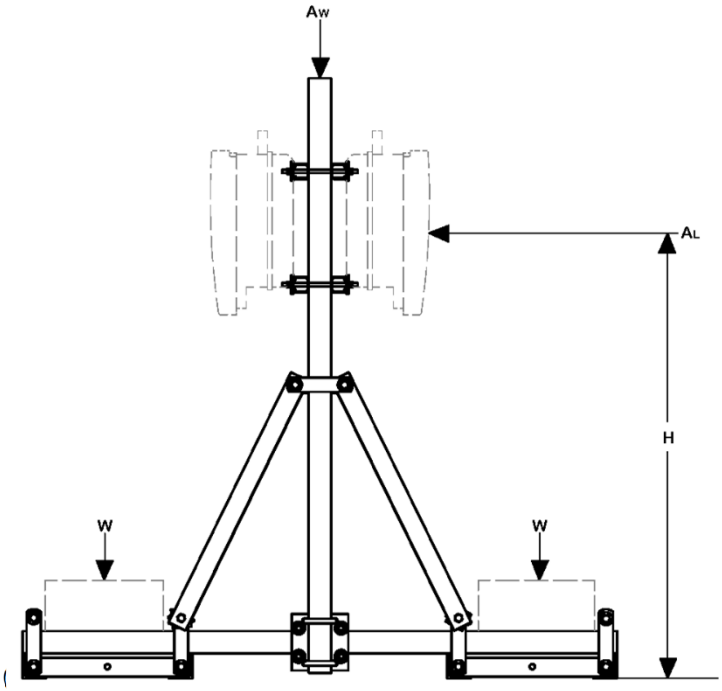
Wind Load on Support Equip. Rack

- Use wind load from two RRHs (worst case scenario):

$P_W = A_L =$ 72.1 lb

Calculate Required Ballast for Support Equip. Rack

- Ballast Equation provided by RT-RRU5HD spec. sheet based on 1.5 safety factor.



Ballast Equation Input:

W = ?
H = 4.33 ft.
A_L = 72.1 lb
A_W = 493.5 lb

Check sled for overturning:

$$W = \frac{(A_L * H * 1.5) - (A_W * 2.625)}{4.5}$$

W = 0.0 lb *(if W < 0, W = 0)*

(per tray, total of 2 trays)

2W = 0.0 lb

(Total Ballast Weight)

Total Dead Load = 493.5 lb

(If W < 0, Total DL = A_W otherwise Total DL = A_W +2W)

Total Dist. Load = 21.7 psf

(Total Load / 22.75 sf)

Job Information

	Engineer	Checked	Approved
Name:	JSD	SA	
Date:	13-Feb-20		

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	39	Highest Node	39
Number of Elements	59	Highest Beam	59

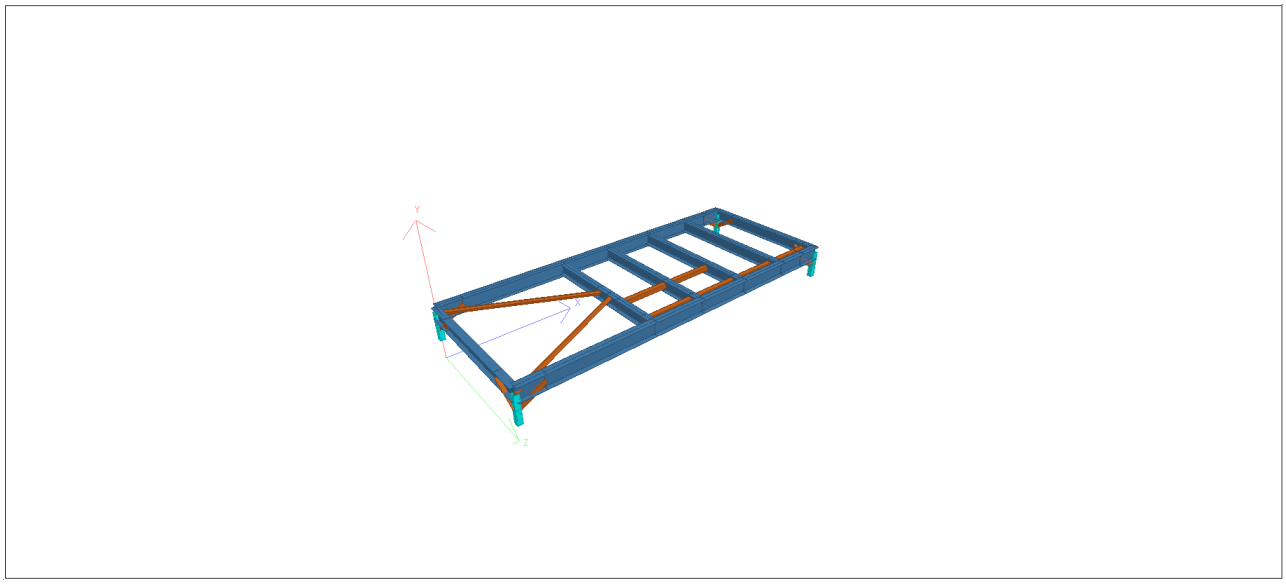
Number of Basic Load Cases	5
Number of Combination Load Cases	26

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DEAD
Primary	2	LIVE
Primary	3	SNOW
Primary	4	WIND (Z)
Primary	5	WIND (X)
Combination	6	1.4D
Combination	7	1.2D + 1.6L + 0.5S
Combination	8	1.2D + 1.0L + 1.6S
Combination	9	1.2D + 1.6S + 0.5W(+Z)
Combination	10	1.2D + 1.6S + 0.5W(-Z)
Combination	11	1.2D + 1.6S + 0.5W(+X)
Combination	12	1.2D + 1.6S + 0.5W(-X)
Combination	13	1.2D + 1.0L + 0.5S + 1.0W(+Z)
Combination	14	1.2D + 1.0L + 0.5S + 1.0W(-Z)
Combination	15	1.2D + 1.0L + 0.5S + 1.0W(+X)
Combination	16	1.2D + 1.0L + 0.5S + 1.0W(-X)
Combination	17	1.0D
Combination	18	1.0D + 1.0L
Combination	19	1.0D + 1.0S
Combination	20	1.0D + 0.6W(+Z)
Combination	21	1.0D + 0.6W(-Z)
Combination	22	1.0D + 0.6W(+X)
Combination	23	1.0D + 0.6W(-X)
Combination	24	1.0D + 0.75L + 0.75S + 0.75(0.6W(+Z))
Combination	25	1.0D + 0.75L + 0.75S + 0.75(0.6W(-Z))



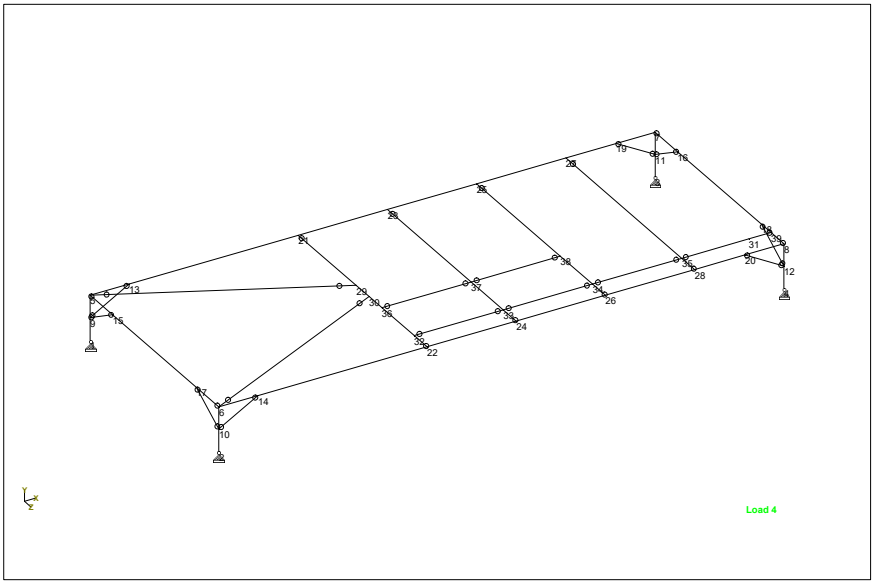
3D Rendered View

Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	1.500	0.000
2	0.000	1.500	10.000
3	25.330	1.500	0.000
4	25.330	1.500	10.000
5	0.000	3.500	0.000
6	0.000	3.500	10.000
7	25.330	3.500	0.000
8	25.330	3.500	10.000
9	0.000	2.500	0.000
10	0.000	2.500	10.000
11	25.330	2.500	0.000
12	25.330	2.500	10.000
13	1.750	3.500	0.000
14	1.750	3.500	10.000
15	0.000	3.500	1.750
16	25.330	3.500	1.750
17	0.000	3.500	8.250
18	25.330	3.500	8.250
19	23.580	3.500	0.000
20	23.580	3.500	10.000
21	9.330	3.500	0.000
22	9.330	3.500	10.000
23	13.330	3.500	0.000
24	13.330	3.500	10.000
25	17.330	3.500	0.000

Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
26	17.330	3.500	10.000
27	21.330	3.500	0.000
28	21.330	3.500	10.000
29	9.330	3.500	4.500
30	9.330	3.500	5.500
31	24.330	3.500	9.000
32	9.330	3.500	9.000
33	13.330	3.500	9.000
34	17.330	3.500	9.000
35	21.330	3.500	9.000
36	9.330	3.500	6.500
37	13.330	3.500	6.500
38	17.330	3.500	6.500
39	25.330	3.500	9.000



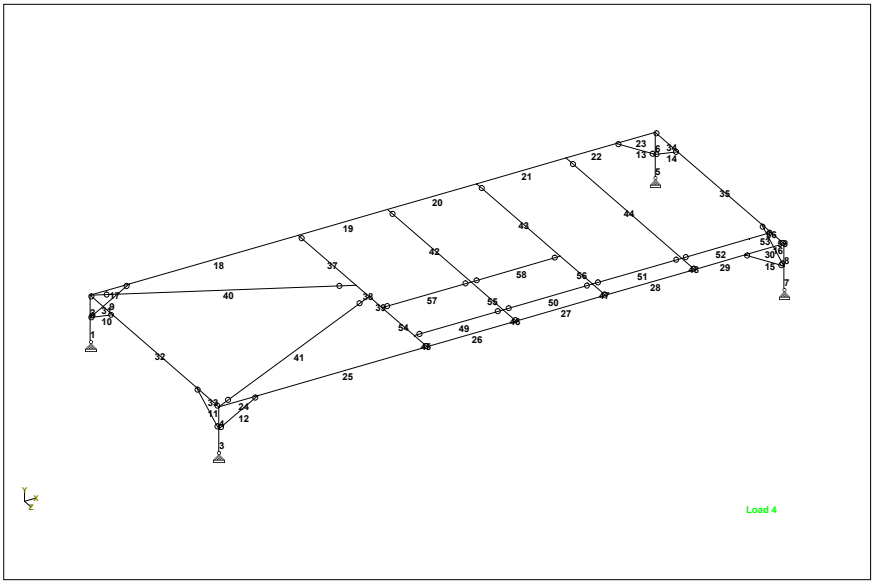
Node Labels

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	9	1.000	3	0
2	9	5	1.000	3	0
3	2	10	1.000	3	0
4	10	6	1.000	3	0
5	3	11	1.000	3	0
6	11	7	1.000	3	0
7	4	12	1.000	3	0
8	12	8	1.000	3	0
9	9	13	2.016	4	45
10	9	15	2.016	4	45
11	10	17	2.016	4	45
12	10	14	2.016	4	45
13	11	19	2.016	4	45
14	11	16	2.016	4	45
15	12	20	2.016	4	45
16	12	18	2.016	4	45
17	5	13	1.750	1	0
18	13	21	7.580	1	0
19	21	23	4.000	1	0
20	23	25	4.000	1	0
21	25	27	4.000	1	0
22	27	19	2.250	1	0
23	19	7	1.750	1	0
24	6	14	1.750	1	0
25	14	22	7.580	1	0
26	22	24	4.000	1	0
27	24	26	4.000	1	0
28	26	28	4.000	1	0
29	28	20	2.250	1	0
30	20	8	1.750	1	0
31	5	15	1.750	2	0
32	15	17	6.500	2	0
33	17	6	1.750	2	0
34	7	16	1.750	2	0
35	16	18	6.500	2	0
36	18	39	0.750	2	0
37	21	29	4.500	2	0
38	29	30	1.000	2	0
39	30	36	1.000	2	0
40	29	5	10.359	5	45
41	30	6	10.359	5	45
42	23	37	6.500	2	0
43	25	38	6.500	2	0
44	27	35	9.000	2	0
45	32	22	1.000	2	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
46	33	24	1.000	2	0
47	34	26	1.000	2	0
48	35	28	1.000	2	0
49	32	33	4.000	5	45
50	33	34	4.000	5	45
51	34	35	4.000	5	45
52	35	31	3.000	5	45
53	31	39	1.000	5	45
54	36	32	2.500	2	0
55	37	33	2.500	2	0
56	38	34	2.500	2	0
57	36	37	4.000	5	45
58	37	38	4.000	5	45
59	39	8	1.000	2	0



Beam Labels

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
1	W12X26	7.650	17.300	204.000	0.285	STEEL
2	W10X26	7.610	14.100	144.000	0.385	STEEL
3	HSST4.5X4.5X0.313	4.680	13.500	13.500	21.699	STEEL
4	L40404	1.930	4.863	1.216	0.041	STEEL
5	L40405	2.400	5.941	1.498	0.080	STEEL

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	STEEL	29E+3	0.300	0.000	6E -6
2	STAINLESSSTEEL	28E+3	0.300	0.000	10E -6
3	ALUMINUM	10E+3	0.330	0.000	13E -6
4	CONCRETE	3.15E+3	0.170	0.000	5E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip-ft/deg)	rY (kip-ft/deg)	rZ (kip-ft/deg)
1	Fixed	Fixed	Fixed	-	-	-
2	Fixed	Fixed	Fixed	-	-	-
3	Fixed	Fixed	Fixed	-	-	-
4	Fixed	Fixed	Fixed	-	-	-

Releases

Beam ends not shown in this table are fixed in all directions.

Beam	Node	x	y	z	rx	ry	rz
9	9	Fixed	Fixed	Fixed	Fixed	Pin	Pin
9	13	Fixed	Fixed	Fixed	Fixed	Pin	Pin
10	9	Fixed	Fixed	Fixed	Fixed	Pin	Pin
10	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
11	10	Fixed	Fixed	Fixed	Fixed	Pin	Pin
11	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
12	10	Fixed	Fixed	Fixed	Fixed	Pin	Pin
12	14	Fixed	Fixed	Fixed	Fixed	Pin	Pin
13	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
13	19	Fixed	Fixed	Fixed	Fixed	Pin	Pin
14	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
14	16	Fixed	Fixed	Fixed	Fixed	Pin	Pin
15	12	Fixed	Fixed	Fixed	Fixed	Pin	Pin
15	20	Fixed	Fixed	Fixed	Fixed	Pin	Pin
16	12	Fixed	Fixed	Fixed	Fixed	Pin	Pin
16	18	Fixed	Fixed	Fixed	Fixed	Pin	Pin
31	5	Fixed	Fixed	Fixed	Fixed	Pin	Pin
33	6	Fixed	Fixed	Fixed	Fixed	Pin	Pin
34	7	Fixed	Fixed	Fixed	Fixed	Pin	Pin
37	21	Fixed	Fixed	Fixed	Fixed	Pin	Pin
40	29	Fixed	Fixed	Fixed	Fixed	Pin	Pin
40	5	Fixed	Fixed	Fixed	Fixed	Pin	Pin
41	30	Fixed	Fixed	Fixed	Fixed	Pin	Pin
41	6	Fixed	Fixed	Fixed	Fixed	Pin	Pin
42	23	Fixed	Fixed	Fixed	Fixed	Pin	Pin

Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
43	25	Fixed	Fixed	Fixed	Fixed	Pin	Pin
44	27	Fixed	Fixed	Fixed	Fixed	Pin	Pin
45	22	Fixed	Fixed	Fixed	Fixed	Pin	Pin
46	24	Fixed	Fixed	Fixed	Fixed	Pin	Pin
47	26	Fixed	Fixed	Fixed	Fixed	Pin	Pin
48	28	Fixed	Fixed	Fixed	Fixed	Pin	Pin
49	32	Fixed	Fixed	Fixed	Fixed	Pin	Pin
49	33	Fixed	Fixed	Fixed	Fixed	Pin	Pin
50	33	Fixed	Fixed	Fixed	Fixed	Pin	Pin
50	34	Fixed	Fixed	Fixed	Fixed	Pin	Pin
51	34	Fixed	Fixed	Fixed	Fixed	Pin	Pin
51	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
52	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
53	39	Fixed	Fixed	Fixed	Fixed	Pin	Pin
57	36	Fixed	Fixed	Fixed	Fixed	Pin	Pin
57	37	Fixed	Fixed	Fixed	Fixed	Pin	Pin
58	37	Fixed	Fixed	Fixed	Fixed	Pin	Pin
58	38	Fixed	Fixed	Fixed	Fixed	Pin	Pin
59	8	Fixed	Fixed	Fixed	Fixed	Pin	Pin

Primary Load Cases

Number	Name	Type
1	DEAD	Dead
2	LIVE	Live
3	SNOW	Snow
4	WIND (Z)	Wind
5	WIND (X)	Wind

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
6	1.4D	1	DEAD	1.40
7	1.2D + 1.6L + 0.5S	1	DEAD	1.20
		2	LIVE	1.60
		3	SNOW	0.50
8	1.2D + 1.0L + 1.6S	1	DEAD	1.20
		2	LIVE	1.00
		3	SNOW	1.60
9	1.2D + 1.6S + 0.5W(+Z)	1	DEAD	1.20
		3	SNOW	1.60
		4	WIND (Z)	0.50
10	1.2D + 1.6S + 0.5W(-Z)	1	DEAD	1.20
		3	SNOW	1.60
		4	WIND (Z)	-0.50
11	1.2D + 1.6S + 0.5W(+X)	1	DEAD	1.20
		3	SNOW	1.60
		5	WIND (X)	0.50
12	1.2D + 1.6S + 0.5W(-X)	1	DEAD	1.20
		3	SNOW	1.60
		5	WIND (X)	-0.50
13	1.2D + 1.0L + 0.5S + 1.0W(+Z)	1	DEAD	1.20
		2	LIVE	1.00
		3	SNOW	0.50
		4	WIND (Z)	1.00
14	1.2D + 1.0L + 0.5S + 1.0W(-Z)	1	DEAD	1.20
		2	LIVE	1.00
		3	SNOW	0.50
		4	WIND (Z)	-1.00
15	1.2D + 1.0L + 0.5S + 1.0W(+X)	1	DEAD	1.20
		2	LIVE	1.00
		3	SNOW	0.50
		5	WIND (X)	1.00
16	1.2D + 1.0L + 0.5S + 1.0W(-X)	1	DEAD	1.20
		2	LIVE	1.00
		3	SNOW	0.50
		5	WIND (X)	-1.00
17	1.0D	1	DEAD	1.00
18	1.0D + 1.0L	1	DEAD	1.00
		2	LIVE	1.00
19	1.0D + 1.0S	1	DEAD	1.00
		3	SNOW	1.00
20	1.0D + 0.6W(+Z)	1	DEAD	1.00
		4	WIND (Z)	0.60
21	1.0D + 0.6W(-Z)	1	DEAD	1.00
		4	WIND (Z)	-0.60
22	1.0D + 0.6W(+X)	1	DEAD	1.00

Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
		5	WIND (X)	0.60
23	1.0D + 0.6W(-X)	1	DEAD	1.00
		5	WIND (X)	-0.60
24	1.0D + 0.75L + 0.75S + 0.75(0.6W(+Z))	1	DEAD	1.00
		2	LIVE	0.75
		3	SNOW	0.75
		4	WIND (Z)	0.45
25	1.0D + 0.75L + 0.75S + 0.75(0.6W(-Z))	1	DEAD	1.00
		2	LIVE	0.75
		3	SNOW	0.75
		4	WIND (Z)	-0.45
26	1.0D + 0.75L + 0.75S + 0.75(0.6W(+X))	1	DEAD	1.00
		2	LIVE	0.75
		3	SNOW	0.75
		5	WIND (X)	0.45
27	1.0D + 0.75L + 0.75S + 0.75(0.6W(-X))	1	DEAD	1.00
		2	LIVE	0.75
		3	SNOW	0.75
		5	WIND (X)	-0.45
28	1.0D + 1.0L + 1.0S + 1.0W(+Z)	1	DEAD	1.00
		2	LIVE	1.00
		3	SNOW	1.00
		4	WIND (Z)	1.00
29	1.0D + 1.0L + 1.0S + 1.0W(-Z)	1	DEAD	1.00
		2	LIVE	1.00
		3	SNOW	1.00
		4	WIND (Z)	-1.00
30	1.0D + 1.0L + 1.0S + 1.0W(+X)	1	DEAD	1.00
		2	LIVE	1.00
		3	SNOW	1.00
		5	WIND (X)	1.00
31	1.0D + 1.0L + 1.0S + 1.0W(-X)	1	DEAD	1.00
		2	LIVE	1.00
		3	SNOW	1.00
		5	WIND (X)	-1.00

1 DEAD : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
31	-	-0.423	-	-	-	-
34	-	-0.423	-	-	-	-

1 DEAD : Beam Loads

Beam	Type	Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
49	UNI lbf/ft	GY	-750.000	0.670	-	3.330	-
50	UNI lbf/ft	GY	-187.500	0.670	-	3.330	-
57	UNI lbf/ft	GY	-750.000	0.670	-	3.330	-
58	UNI lbf/ft	GY	-187.500	0.670	-	3.330	-

1 DEAD : Selfweight

Direction	Factor	Assigned Geometry
Y	-1.000	ALL

4 WIND (Z) : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
31	-	0.134	-	-	-	-
	-0.113	-	-	-	-	-
34	-	0.134	-	-	-	-
	-0.113	-	-	-	-	-

4 WIND (Z) : Beam Loads

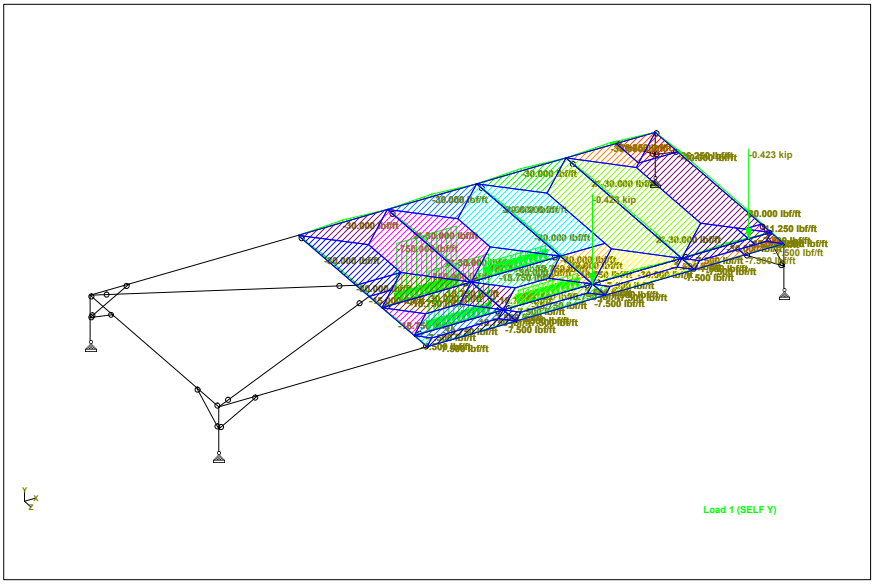
Beam	Type	Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
49	UNI lbf/ft	GY	123.000	0.670	-	3.330	-
	UNI lbf/ft	GZ	-203.000	0.670	-	3.330	-
50	UNI lbf/ft	GY	123.000	0.670	-	3.330	-
	UNI lbf/ft	GZ	-176.000	0.670	-	3.330	-
57	UNI lbf/ft	GY	-123.000	0.670	-	3.330	-
	UNI lbf/ft	GZ	-203.000	0.670	-	3.330	-
58	UNI lbf/ft	GY	-123.000	0.670	-	3.330	-
	UNI lbf/ft	GZ	-176.000	0.670	-	3.330	-

5 WIND (X) : Node Loads

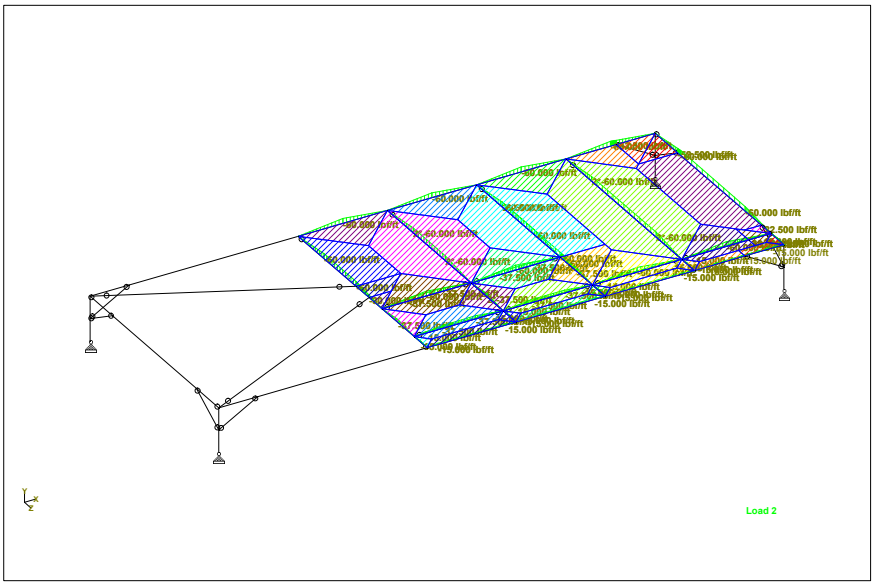
Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
31	-	-0.326	-	-	-	-
	0.265	-	-	-	-	-
34	-	0.326	-	-	-	-
	0.265	-	-	-	-	-

5 WIND (X) : Beam Loads

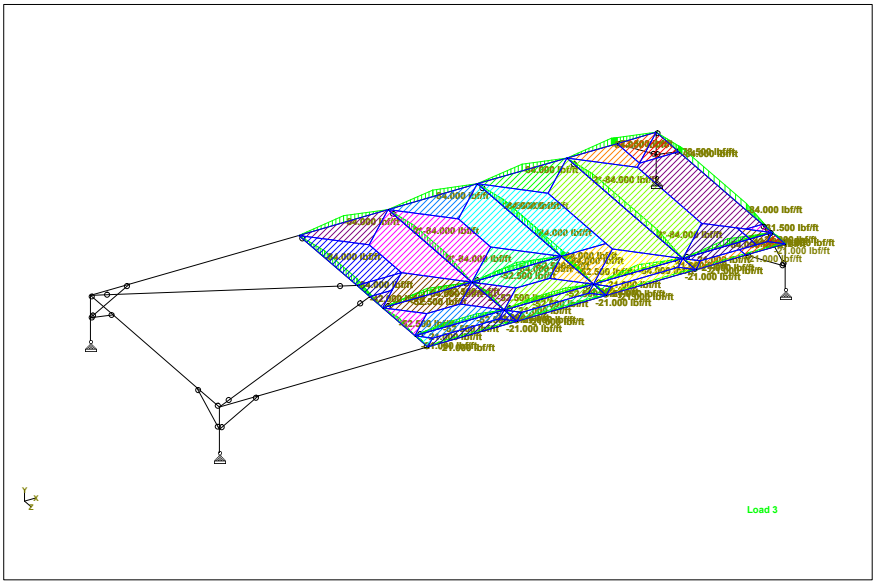
Beam	Type	Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
49	UNI lbf/ft	GY	123.000	0.670	-	2.000	-
	UNI lbf/ft	GY	-123.000	2.000	-	3.330	-
	UNI lbf/ft	GX	203.000	0.670	-	3.330	-
50	UNI lbf/ft	GY	123.000	0.670	-	2.000	-
	UNI lbf/ft	GY	-123.000	2.000	-	3.330	-
	UNI lbf/ft	GX	176.000	0.670	-	3.330	-
57	UNI lbf/ft	GY	123.000	0.670	-	2.000	-
	UNI lbf/ft	GY	-123.000	2.000	-	3.330	-
	UNI lbf/ft	GX	203.000	0.670	-	3.330	-
58	UNI lbf/ft	GY	123.000	0.670	-	2.000	-
	UNI lbf/ft	GY	-123.000	2.000	-	3.330	-
	UNI lbf/ft	GX	176.000	0.670	-	3.330	-



Applied Dead Loads



Applied Live Loads



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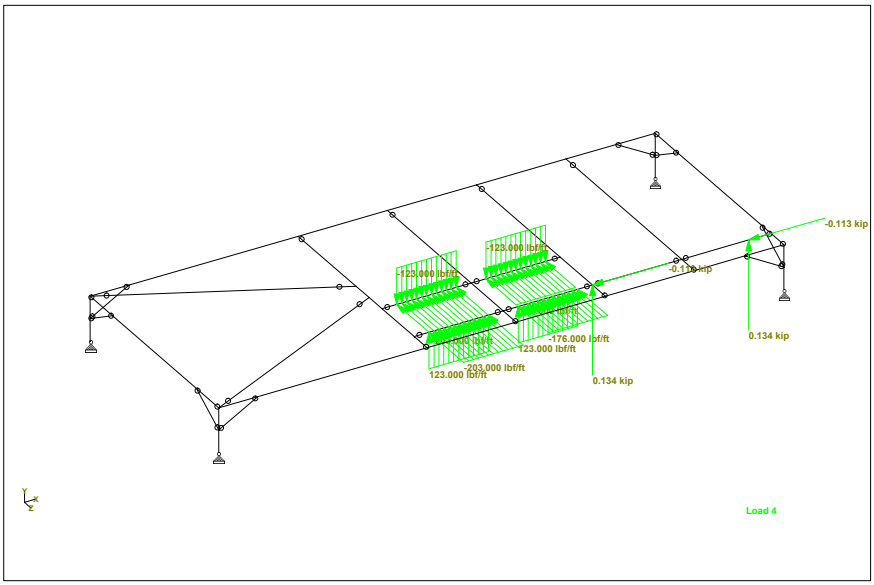

Typical Applied Wind Loads

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST4.5X4.	HSST4.5X4.	0.547	1.000	0.547	Eq. H1-1b	8	4.680	13.500	13.500	22.300
2	HSST4.5X4.	HSST4.5X4.	0.551	1.000	0.551	Eq. H1-1b	8	4.680	13.500	13.500	22.300
3	HSST4.5X4.	HSST4.5X4.	0.767	1.000	0.767	Eq. H1-1b	8	4.680	13.500	13.500	22.300
4	HSST4.5X4.	HSST4.5X4.	0.771	1.000	0.771	Eq. H1-1b	8	4.680	13.500	13.500	22.300
5	HSST4.5X4.	HSST4.5X4.	0.567	1.000	0.567	Eq. H1-1b	8	4.680	13.500	13.500	22.300
6	HSST4.5X4.	HSST4.5X4.	0.576	1.000	0.576	Eq. H1-1b	8	4.680	13.500	13.500	22.300
7	HSST4.5X4.	HSST4.5X4.	0.780	1.000	0.780	Eq. H1-1b	8	4.680	13.500	13.500	22.300
8	HSST4.5X4.	HSST4.5X4.	0.793	1.000	0.793	Eq. H1-1b	8	4.680	13.500	13.500	22.300
9	L40404	L40404	0.450	1.000	0.450	Eq. H1-1a	8	1.930	1.183	4.895	0.040
10	L40404	L40404	0.047	1.000	0.047	Sec. E1	13	1.930	1.183	4.895	0.040
11	L40404	L40404	0.047	1.000	0.047	Sec. E1	14	1.930	1.183	4.895	0.040
12	L40404	L40404	0.631	1.000	0.631	Eq. H1-1a	8	1.930	1.183	4.895	0.040
13	L40404	L40404	0.457	1.000	0.457	Eq. H1-1a	8	1.930	1.183	4.895	0.040
14	L40404	L40404	0.037	1.000	0.037	Sec. E1	28	1.930	1.183	4.895	0.040
15	L40404	L40404	0.637	1.000	0.637	Eq. H1-1a	8	1.930	1.183	4.895	0.040
16	L40404	L40404	0.038	1.000	0.038	Sec. E1	29	1.930	1.183	4.895	0.040
17	W12X26	W12X26	0.147	1.000	0.147	Eq. H1-1b	8	7.650	204.000	17.300	0.300
18	W12X26	W12X26	0.209	1.000	0.209	Eq. H1-1b	8	7.650	204.000	17.300	0.300
19	W12X26	W12X26	0.284	1.000	0.284	Eq. H1-1b	8	7.650	204.000	17.300	0.300
20	W12X26	W12X26	0.284	1.000	0.284	Eq. H1-1b	8	7.650	204.000	17.300	0.300
21	W12X26	W12X26	0.254	1.000	0.254	Eq. H1-1b	28	7.650	204.000	17.300	0.300
22	W12X26	W12X26	0.111	1.000	0.111	Eq. H1-1b	8	7.650	204.000	17.300	0.300
23	W12X26	W12X26	0.108	1.000	0.108	Eq. H1-1b	29	7.650	204.000	17.300	0.300
24	W12X26	W12X26	0.202	1.000	0.202	Eq. H1-1b	8	7.650	204.000	17.300	0.300
25	W12X26	W12X26	0.316	1.000	0.316	Eq. H1-1b	8	7.650	204.000	17.300	0.300

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
26	W12X26	W12X26	0.408	1.000	0.408	Eq. H1-1b	8	7.650	204.000	17.300	0.300
27	W12X26	W12X26	0.408	1.000	0.408	Eq. H1-1b	8	7.650	204.000	17.300	0.300
28	W12X26	W12X26	0.324	1.000	0.324	Eq. H1-1b	29	7.650	204.000	17.300	0.300
29	W12X26	W12X26	0.169	1.000	0.169	Eq. H1-1b	8	7.650	204.000	17.300	0.300
30	W12X26	W12X26	0.159	1.000	0.159	Eq. H1-1b	8	7.650	204.000	17.300	0.300
31	W10X26	W10X26	0.017	1.000	0.017	Eq. H1-1b	14	7.610	144.000	14.100	0.402
32	W10X26	W10X26	0.015	1.000	0.015	Eq. H1-1b	14	7.610	144.000	14.100	0.402
33	W10X26	W10X26	0.018	1.000	0.018	Eq. H1-1b	13	7.610	144.000	14.100	0.402
34	W10X26	W10X26	0.011	1.000	0.011	Eq. H1-1b	29	7.610	144.000	14.100	0.402
35	W10X26	W10X26	0.038	1.000	0.038	Eq. H1-1b	30	7.610	144.000	14.100	0.402
36	W10X26	W10X26	0.039	1.000	0.039	Eq. H1-1b	30	7.610	144.000	14.100	0.402
37	W10X26	W10X26	0.112	1.000	0.112	Eq. H1-1b	13	7.610	144.000	14.100	0.402
38	W10X26	W10X26	0.113	1.000	0.113	Eq. H1-1b	14	7.610	144.000	14.100	0.402
39	W10X26	W10X26	0.115	1.000	0.115	Eq. H1-1b	16	7.610	144.000	14.100	0.402
40	L40405	L40405	0.088	1.000	0.088	Sec. E1	28	2.400	1.464	5.975	0.078
41	L40405	L40405	0.094	1.000	0.094	Sec. E1	29	2.400	1.464	5.975	0.078
42	W10X26	W10X26	0.129	1.000	0.129	Eq. H1-1b	8	7.610	144.000	14.100	0.402
43	W10X26	W10X26	0.090	1.000	0.090	Eq. H1-1b	8	7.610	144.000	14.100	0.402
44	W10X26	W10X26	0.088	1.000	0.088	Eq. H1-1b	8	7.610	144.000	14.100	0.402
45	W10X26	W10X26	0.068	1.000	0.068	Eq. H1-1b	16	7.610	144.000	14.100	0.402
46	W10X26	W10X26	0.080	1.000	0.080	Sec. G2.1(a)	8	7.610	144.000	14.100	0.402
47	W10X26	W10X26	0.056	1.000	0.056	Sec. G2.1(a)	8	7.610	144.000	14.100	0.402
48	W10X26	W10X26	0.050	1.000	0.050	Eq. H1-1b	30	7.610	144.000	14.100	0.402
49	L40405	L40405	0.614	1.000	0.614	Eq. H1-1b	14	2.400	1.464	5.975	0.078
50	L40405	L40405	0.301	1.000	0.301	Eq. H1-1b	14	2.400	1.464	5.975	0.078
51	L40405	L40405	0.128	1.000	0.128	Eq. H1-1b	8	2.400	1.464	5.975	0.078
52	L40405	L40405	0.222	1.000	0.222	Eq. H1-1b	15	2.400	1.464	5.975	0.078
53	L40405	L40405	0.224	1.000	0.224	Eq. H1-1b	15	2.400	1.464	5.975	0.078
54	W10X26	W10X26	0.115	1.000	0.115	Eq. H1-1b	16	7.610	144.000	14.100	0.402
55	W10X26	W10X26	0.127	1.000	0.127	Eq. H1-1b	8	7.610	144.000	14.100	0.402
56	W10X26	W10X26	0.087	1.000	0.087	Eq. H1-1b	8	7.610	144.000	14.100	0.402
57	L40405	L40405	0.642	1.000	0.642	Eq. H1-1b	13	2.400	1.464	5.975	0.078
58	L40405	L40405	0.330	1.000	0.330	Eq. H1-1b	28	2.400	1.464	5.975	0.078
59	W10X26	W10X26	0.039	1.000	0.039	Eq. H1-1b	30	7.610	144.000	14.100	0.402

Failed Members

There is no data of this type.

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	12	15:1.2D + 1.0L	**0.023**	-0.001	0.001	0.023	-0.000	-0.000	0.000
Min X	10	16:1.2D + 1.0L	**-0.031**	-0.000	0.000	0.031	0.000	0.000	0.001
Max Y	26	5:WIND (X)	0.011	**0.014**	-0.003	0.018	-0.000	-0.000	-0.000
Min Y	24	8:1.2D + 1.0L +	-0.013	**-0.550**	-0.004	0.550	-0.000	-0.000	0.000
Max Z	34	14:1.2D + 1.0L	-0.013	-0.366	**0.130**	0.389	0.001	-0.000	0.003
Min Z	34	13:1.2D + 1.0L	-0.004	-0.344	**-0.135**	0.370	0.000	0.000	0.003
Max rX	29	6:1.4D	0.001	-0.250	-0.003	0.250	**0.002**	-0.000	-0.001
Min rX	1	13:1.2D + 1.0L	0.000	0.000	0.000	0.000	**-0.000**	-0.000	0.002
Max rY	8	14:1.2D + 1.0L	-0.022	-0.000	0.001	0.022	-0.000	**0.002**	0.004
Min rY	31	13:1.2D + 1.0L	-0.004	-0.061	-0.032	0.069	-0.000	**-0.002**	0.005
Max rZ	31	8:1.2D + 1.0L +	-0.014	-0.086	-0.014	0.088	-0.000	-0.001	**0.006**
Min rZ	14	8:1.2D + 1.0L +	-0.004	-0.071	-0.001	0.071	-0.000	0.000	**-0.004**
Max Rst	24	8:1.2D + 1.0L +	-0.013	-0.550	-0.004	**0.550**	-0.000	-0.000	0.000

Maximum Allowable Deflection = L / 240
25.33' / 240 x 12" / 1' = 1.267"
0.550" < 1.267" OK!

Reaction Summary

	Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
Max FX	2	31:1.0D + 1.0L	**12.870**	5.463	-0.033	0.000	0.000	0.000
Min FX	4	30:1.0D + 1.0L	**-12.363**	8.453	-0.557	0.000	0.000	0.000
Max FY	4	30:1.0D + 1.0L	-12.363	**8.453**	-0.557	0.000	0.000	0.000
Min FY	1	29:1.0D + 1.0L	7.029	**3.055**	-0.797	0.000	0.000	0.000
Max FZ	1	28:1.0D + 1.0L	9.188	4.149	**0.867**	0.000	0.000	0.000
Min FZ	2	29:1.0D + 1.0L	12.728	5.771	**-0.869**	0.000	0.000	0.000
Max MX	1	28:1.0D + 1.0L	9.188	4.149	0.867	**0.000**	0.000	0.000
Min MX	1	28:1.0D + 1.0L	9.188	4.149	0.867	**0.000**	0.000	0.000
Max MY	1	28:1.0D + 1.0L	9.188	4.149	0.867	0.000	**0.000**	0.000
Min MY	1	28:1.0D + 1.0L	9.188	4.149	0.867	0.000	**0.000**	0.000
Max MZ	1	28:1.0D + 1.0L	9.188	4.149	0.867	0.000	0.000	**0.000**
Min MZ	1	28:1.0D + 1.0L	9.188	4.149	0.867	0.000	0.000	**0.000**

Dewberry

Job Number	50121524
Made by:	JSD
Date:	2/13/2020
Checked by:	SA
Date:	2/14/2020

(Portsmouth 4 NH) - Solid Brick Wall Anchorage Design

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Design Mount Anchorage to Exist. Concrete Slab

- Loading is taken from STAAD model
- Mounted to existing precast hollow core deck planks utilzing a minimum 10"x10" Plate

Max. Loading

Shear Loads on Bolts

Direct Shear

F_x = 12.870 k

F_z = 0.869 k

F_r = 12899 lb $(F_x^2+F_z^2)^{0.5}$

Shear due to Torsion

M_y = 0.0 k-in = 0 lb-in

Moment arm (d_y) = 8.5 in $\sqrt{(S_v^2+S_h^2)}$

Tension Loads on Bolts

Direct Tension

F_y = 0.000 k = 0 lb

Tension due to Prying

M_x = 0.0 k-in = 0 lb-in

Moment arm (d_x) = 8.0 in $S_v + S_e$

M_z = 0.0 k-in = 0 lb-in

Moment arm (d_z) = 8.0 in $S_h + S_e$

Connection Information

Bolt Diameter =	5/8	
Effective Embedment =	3.75 in	
n =	4 bolts	*(# of bolts)*
n' =	2 bolts	*(# of bolts resisting moments)*
S_v =	6.00 in	*(Vertical Bolt Spacing)*
S_h =	6.00 in	*(Horizontal Bolt Spacing)*
S_e =	2.00 in	*(Edge Distance)*
D_E =	> 12 in	*(End Distance)*

Max. Loading per Bolt

Max. Shear per Bolt

- Divide shear equally among bolts

$V_{max.} = F_r / n + M_y / d_y n$

= 12899lb / 4 bolts + (0lb-in / 2in) / 4 bolts

= 3225 lb/bolt

Max. Tension per Bolt

- Assume tension (F_z) divided by all bolts and tension due to prying resisted by n' bolts

$T_{max} = F_z / n + M_z / d_z n' + M_x / d_x n'$

= 0lb / 4 bolts + (0lb-in / 8in) / 2 bolts + (0lb-in / 8in) / 2 bolts

= 0 lb/bolt

Connection Capacity

- Use HILTI HIT-HY 200 for Concrete Construction *(See attached HILTI charts)*
- 5/8 " diameter Hilti Hit-Z rods with an effective embedment of 3.75"
- Minimum f'_c = 5000 psi (per existing construction drawings)

Allowable Shear

$V_{allow\ steel}$ =	5625 lb	(Table 5)
$V_{design\ base}$ =	10930 lb	(Table 4)
Spacing Factor =	0.60	(Table 14)
End Distance Factor =	1.00	(Table 14)
Thickness Factor =	0.73	(Table 14)
$V_{allow\ base}$ =	4787 lb	

Allowable Tension

$T_{allow\ steel}$ =	13850 lb	(Table 5)
$T_{design\ base}$ =	5075 lb	(Table 4)
Spacing Factor =	0.77	(Table 14)
End Distance Factor =	1.00	(Table 14)
$T_{allow\ base}$ =	3908 lb	

Check anchors for Tension/Shear

Allowable Shear =	4787 lb			Max. Shear =	3225 lb
Allowable Tension =	3908 lb			Max. Tension =	0 lb

$$\frac{T_{max.}}{T_{allow.}} + \frac{V_{max.}}{V_{allow.}} \leq 1$$

$$\frac{0\ lb}{3908\ lb} + \frac{3225\ lb}{4787\ lb} = \mathbf{0.67} \quad \mathbf{< 1.00, OK}$$

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Made by:	JSD
Date:	02/13/20
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Date:	02/14/20

(Portsmouth 4 NH) - Structure Loading

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Site Name: Portsmouth 4 NH

Existing Building Information

- Built 1996/1997
- Roof contructed with 8" x 4'-0" Precast Concrete Hollow Core Planks
- Equipment Platform posts down on the deck over 8" Grouted CMU Walls
- ASCE 7-10 Hazard Tool used for wind and snow loads

Existing Dead Load

- Estimated roof dead load:

8x48 Flexicore Weight =	62.00 psf	*(see attached table)*
Roofing Membrane =	1.50 psf	*(Bituminous, smooth surface)*
3" Rigid Insulation =	4.50 psf	*(0.75 psf per 1/2")*
Miscellaneous =	4.00 psf	
Total Exist. Dead Load =	63.5 psf	

Note: estimated values using Table C3-1 ASCE 7-10

Proposed Dead Load

- Proposed load on deck panels:

RRH Ballast Mount =	21.7 psf	*(see ballast calcs)*

- Proposed load on equipment platform:

BB48E1HN1 Cabinet =	500 plf	*(4000 / 2.67')*
PM63912MC2 Cabinet =	375 plf	*(1000 / 2.67')*
Power Panel =	420 lb	
Telco Cabinet =	300 lb	
Hoffman Box =	125 lb	

Live Load

Live Load =	30.0 psf	*(assumed maintenance live load)*
Roof Live Load =	40.0 psf	*(per existing construction drawings)*

Snow Load (ASCE 7-10)

General Design Criteria

Exposure Factor, C_e =	1.0	*(ASCE 7-10, Table 7-2)*
Thermal Factor, C_t =	1.0	*(ASCE 7-10, Table 7-3)*
Importance Factor, I_s =	1.0	*(ASCE 7-10, Table 1.5-2)*
Ground Snow Load, p_g =	50 psf	*(ASCE 7-10 Hazard Tool)*

Minimum Snow Load, p_m = $MIN(I_s p_g, I_s p_g)$ *(ASCE 7-10, Sect. 7.3.4)*
= 20.0 psf

Design Snow Load, p_f = $0.7 C_e C_t I_s p_g$ *(ASCE 7-10, Eqn. 7.3-1)*
= 35.0 psf ***(Use 35 psf)***

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(Portsmouth 4 NH) - Precast Concrete Panel Check

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Precast Concrete Panels, 25'-4" Clear Span, 48" Wide, 8" Deep

- Panel Capacity from Safe Load Table (see attached)
- Tabulated loads are based on U = 1.2D + 1.6L
- Conservatively use M_u from lowest reinforcement panel
- Conservatively assume ballast mount at mid-span of conc. plank

Panels Load

Resisting Moment: 47600 lb-ft *(Load Tables)* length = 25.33 ft spacing = 48 in

Resisting Shear: 7516 lb *(M * 4 / length)*

Loading

R_2 =	382 lb	w_1 =	528.80 plf *(full length)*	Area Load =	132.2 psf *1.2DL & 1.6S*
M_2 =	4313 lb-ft	w_2 =	138.88 plf	Area Load =	34.7 psf *1.6(Ballast Sled)*
Max Moment:	46734 lb-ft	a =	9.92 ft *(at midspan)*	c =	9.92 ft
Max Shear:	7080 lb	b =	5.50 ft		

Resisting Moment > Max Moment? **OK!**

Resisting Shear > Max Shear? **OK!**

Table 5 - Steel design strength for Hilti HIT-Z and HIT-Z-R rods [1,2]

Nominal anchor diameter in.	ACI 318-14 Chapter 17 Based Design					
	HIT-Z carbon steel rod			HIT-Z-R stainless steel rod		
	Tensile[3] ϕN_{sa} lb (kN)	Shear[4] ϕV_{sa} lb (kN)	Seismic Shear[5] $\phi V_{sa,eq}$ lb (kN)	Tensile[3] ϕN_{sa} lb (kN)	Shear[4] ϕV_{sa} lb (kN)	Seismic Shear[5] $\phi V_{sa,eq}$ lb (kN)
3/8	4,750 (21.1)	1,930 (8.6)	1,930 (8.6)	4,750 (21.1)	2,630 (11.7)	2,630 (11.7)
1/2	8,695 (38.7)	3,530 (15.7)	2,295 (10.2)	8,695 (38.7)	4,815 (21.4)	3,610 (16.1)
5/8	13,850 (61.6)	5,625 (25.0)	3,655 (16.3)	13,850 (61.6)	7,670 (34.1)	4,985 (22.2)
3/4	20,455 (91.0)	8,310 (37.0)	5,400 (24.0)	20,455 (91.0)	11,330 (50.4)	7,365 (32.8)

1 See section 3.1.8 to convert design strength value to ASD value.
2 HIT-Z and HIT-Z-R rods are to be considered brittle steel elements.
3 Tensile = $\phi A_{se,N} f_{uta}$ as noted in ACI 318-14 Chapter 17.
4 Shear values determined by static shear tests with $\phi V_{sa} \leq \phi\ 0.60\ A_{se,V} f_{uta}$ as noted in ACI 318-14 Chapter 17.
5 Seismic Shear = $\alpha_{V,seis}\ \phi_{Vsa}$: Reduction for seismic shear only. See section 3.1.8 for additional information on seismic applications.

Hilti HIT-Z(-R) rod permissible combinations of edge distance, anchor spacing, and concrete thickness

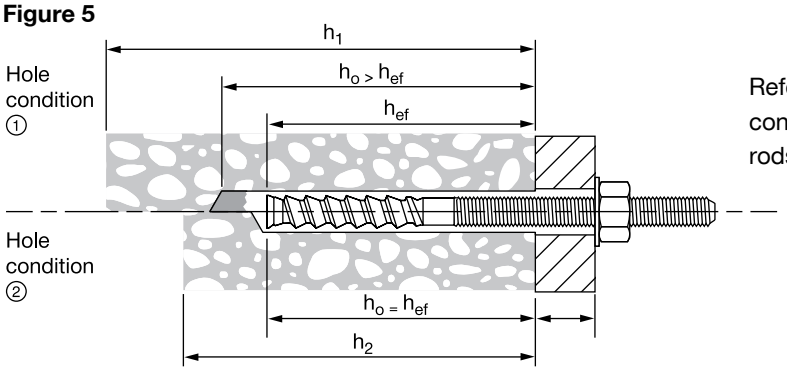
The Hilti HIT-Z and HIT-Z-R anchor rods produce higher expansion forces in the concrete slab when the installation torque is applied. This means that the anchor must be installed with larger edge distances and spacing when compared to standard threaded rod, to minimize the likelihood that the concrete slab will split during installation.

The permissible edge distance is based on the concrete condition (cracked or uncracked), the concrete thickness, and anchor spacing if designing for anchor groups. The permissible concrete thickness is dependent on whether or not the drill dust is removed during the anchor installation process.

Step 1: Check concrete thickness

When using Hilti HIT-Z and HIT-Z-R anchor rods, drilling dust does not need to be removed for optimum capacity when base material temperatures are greater than 41° F (5° C) and a hammer drill with a carbide tipped drill bit is used. However, concrete thickness can be reduced if the drilling dust is removed. The figure below shows both drilled hole conditions. Drilled hole condition 1 illustrates the hole depth and concrete thickness when drilling dust is left in the hole. Drilled hole condition 2 illustrates the corresponding reduction when drill dust is removed by using compressed air, Hilti TE-CD or TE-YD Hollow Drill Bits with a Hilti vacuum.

Figure 5



Refer to tables 6 to 9 in this section for the minimum concrete thicknesses associated with the Hilti HIT-Z(-R) rods based on diameter and drilled hole condition.

Step 2: Check edge distance and anchor spacing

Tables 6 to 9 in this section show the minimum edge distance and anchor spacing based on a specific concrete thickness and whether or not the design is for cracked or uncracked concrete. There are two cases of edge distance and anchor spacing combinations for each embedment and concrete condition (cracked or uncracked). **Case 1** is the minimum edge distance needed for one anchor or for two anchors with large anchor spacing. **Case 2** is the minimum anchor spacing that can be used, but the edge distance is increased to help prevent splitting. Linear interpolation can be used between **Case 1** and **Case 2** for any specific concrete thickness and concrete condition. See the following figure and calculation which can be used to determine specific edge distance and anchor spacing combinations.

Table 3 - Hilti HIT-HY 200 design strength with concrete/pullout failure for Hilti HIT-Z(-R) rods in uncracked concrete[1,2,3,4,5,6,7,8,9,10]

Nominal anchor diameter in.	Effective embed. in. (mm)	Tension — ΦN_n				Shear — ΦV_n			
		f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)	f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)
3/8	2-3/8 (60)	2,855 (12.7)	3,125 (13.9)	3,610 (16.1)	4,425 (19.7)	3,075 (13.7)	3,370 (15.0)	3,890 (17.3)	4,765 (21.2)
	3-3/8 (86)	4,835 (21.5)	5,170 (23.0)	5,170 (23.0)	5,170 (23.0)	10,415 (46.3)	11,410 (50.8)	13,175 (58.6)	16,135 (71.8)
	4-1/2 (114)	5,170 (23.0)	5,170 (23.0)	5,170 (23.0)	5,170 (23.0)	16,035 (71.3)	17,570 (78.2)	20,285 (90.2)	24,845 (110.5)
1/2	2-3/4 (70)	3,555 (15.8)	3,895 (17.3)	4,500 (20.0)	5,510 (24.5)	7,660 (34.1)	8,395 (37.3)	9,690 (43.1)	11,870 (52.8)
	4-1/2 (114)	7,445 (33.1)	7,615 (33.9)	7,615 (33.9)	7,615 (33.9)	16,035 (71.3)	17,570 (78.2)	20,285 (90.2)	24,845 (110.5)
	6 (152)	7,615 (33.9)	7,615 (33.9)	7,615 (33.9)	7,615 (33.9)	24,690 (109.8)	27,045 (120.3)	31,230 (138.9)	38,250 (170.1)
5/8	3-3/4 (95)	5,665 (25.2)	6,205 (27.6)	7,165 (31.9)	8,775 (39.0)	12,200 (54.3)	13,365 (59.5)	15,430 (68.6)	18,900 (84.1)
	5-5/8 (143)	10,405 (46.3)	11,400 (50.7)	13,165 (58.6)	13,905 (61.9)	22,415 (99.7)	24,550 (109.2)	28,350 (126.1)	34,720 (154.4)
	7-1/2 (191)	13,905 (61.9)	13,905 (61.9)	13,905 (61.9)	13,905 (61.9)	34,505 (153.5)	37,800 (168.1)	43,650 (194.2)	53,455 (237.8)
3/4	4 (102)	6,240 (27.8)	6,835 (30.4)	7,895 (35.1)	9,665 (43.0)	13,440 (59.8)	14,725 (65.5)	17,000 (75.6)	20,820 (92.6)
	6-3/4 (171)	13,680 (60.9)	14,985 (66.7)	17,305 (77.0)	18,500 (82.3)	29,460 (131.0)	32,275 (143.6)	37,265 (165.8)	45,645 (203.0)
	8-1/2 (216)	18,500 (82.3)	18,500 (82.3)	18,500 (82.3)	18,500 (82.3)	41,635 (185.2)	45,605 (202.9)	52,660 (234.2)	64,500 (286.9)

Table 4 - Hilti HIT-HY 200 design strength with concrete/pullout failure for Hilti HIT-Z(-R) rods in cracked concrete[1,2,3,4,5,6,7,8,9,10]

Nominal anchor diameter in.	Effective embed. in. (mm)	Tension — ΦN_n				Shear — ΦV_n			
		f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)	f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)
3/8	2-3/8 (60)	2,020 (9.0)	2,215 (9.9)	2,560 (11.4)	3,135 (13.9)	2,180 (9.7)	2,385 (10.6)	2,755 (12.3)	3,375 (15.0)
	3-3/8 (86)	3,425 (15.2)	3,755 (16.7)	4,335 (19.3)	5,170 (23.0)	7,380 (32.8)	8,085 (36.0)	9,335 (41.5)	11,430 (50.8)
	4-1/2 (114)	5,170 (23.0)	5,170 (23.0)	5,170 (23.0)	5,170 (23.0)	11,360 (50.5)	12,445 (55.4)	14,370 (63.9)	17,600 (78.3)
1/2	2-3/4 (70)	2,520 (11.2)	2,760 (12.3)	3,185 (14.2)	3,905 (17.4)	5,425 (24.1)	5,945 (26.4)	6,865 (30.5)	8,405 (37.4)
	4-1/2 (114)	5,275 (23.5)	5,780 (25.7)	6,670 (29.7)	7,110 (31.6)	11,360 (50.5)	12,445 (55.4)	14,370 (63.9)	17,600 (78.3)
	6 (152)	7,110 (31.6)	7,110 (31.6)	7,110 (31.6)	7,110 (31.6)	17,490 (77.8)	19,160 (85.2)	22,120 (98.4)	27,095 (120.5)
5/8	3-3/4 (95)	4,010 (17.8)	4,395 (19.5)	5,075 (22.6)	6,215 (27.6)	8,640 (38.4)	9,465 (42.1)	10,930 (48.6)	13,390 (59.6)
	5-5/8 (143)	7,370 (32.8)	8,075 (35.9)	9,325 (41.5)	11,420 (50.8)	15,875 (70.6)	17,390 (77.4)	20,080 (89.3)	24,595 (109.4)
	7-1/2 (191)	11,350 (50.5)	12,430 (55.3)	13,905 (61.9)	13,905 (61.9)	24,440 (108.7)	26,775 (119.1)	30,915 (137.5)	37,865 (168.4)
3/4	4 (102)	4,420 (19.7)	4,840 (21.5)	5,590 (24.9)	6,845 (30.4)	9,520 (42.3)	10,430 (46.4)	12,040 (53.6)	14,750 (65.6)
	6-3/4 (171)	9,690 (43.1)	10,615 (47.2)	12,255 (54.5)	15,010 (66.8)	20,870 (92.8)	22,860 (101.7)	26,395 (117.4)	32,330 (143.8)
	8-1/2 (216)	13,690 (60.9)	15,000 (66.7)	17,320 (77.0)	18,155 (80.8)	29,490 (131.2)	32,305 (143.7)	37,300 (165.9)	45,685 (203.2)

1 Section 3.1.8 for explanation on development of load values.
2 See Section 3.1.8 to convert design strength value to ASD value.
3 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.
4 Apply spacing, edge distance, and concrete thickness factors in tables 10 - 17 as necessary to the above values. Compare to the steel values in table 5. The lesser of the values is to be used for the design.
5 Data is for temperature range A: Max. short term temperature = 130°F (55°C), max. long term temperature = 110°F (43°C).
For temperature range B: Max. short term temperature = 176°F (80°C), max. long term temperature = 110°F (43°C) multiply above values by 1.0.
For temperature range C: Max. short term temperature = 248°F (120°C), max. long term temperature = 162°F (72°C) multiply above values by 0.90.
Short term elevated concrete temperatures are those that occur over brief intervals, e.g., as a result of diurnal cycling. Long-term concrete temperatures are roughly constant over significant periods of time.
6 Tabular values are for dry and water saturated concrete conditions.
7 Tabular values are for short-term loads only. For sustained loads, see section 3.1.8.
8 Tabular values are for normal-weight concrete only. For lightweight concrete multiply design strength (factored resistance) by λ_a as follows:
For sand-lightweight, λ_a = 0.51. For all-lightweight, λ_a = 0.45.
9 Tabular values are for static loads only. Seismic design is not permitted for uncracked concrete. For seismic loads, multiply cracked concrete tabular values in tension only by the following reduction factors:
3/8-in diameter - $\alpha_{N,seis}$ = 0.705
1/2-in to 3/4-in diameter - $\alpha_{N,seis}$ = 0.75
See Section 3.1.8 for additional information on seismic applications.
10 Diamond core drilling with Hilti HIT-Z(-R) rods is permitted with no reduction in published data above.

Table 14 - Load adjustment factors for 5/8-in. diameter Hilti HIT-Z and HIT-Z-R rods in uncracked concrete [1,2]

5/8-in. HIT-Z(-R) uncracked concrete			Spacing factor in tension f_{AN}			Edge distance factor in tension f_{RN}			Spacing factor in shear[3] f_{AV}			Edge distance in shear: ⊥ Toward edge f_{RV}			Edge distance in shear: ∥ To and away from edge f_{RV}			Concrete thickness factor in shear[4] f_{HV}		
Embedment h_{ef}	in.	(mm)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)
Spacing (s) / Edge distance (c_a) / Concrete thickness (h), - in. (mm)	3-1/8	(79)	0.64	0.59	0.57	n/a	n/a	0.20	0.55	0.54	0.53	n/a	n/a	0.07	n/a	n/a	0.13	n/a	n/a	n/a
	3-1/4	(83)	0.64	0.60	0.57	n/a	0.24	0.20	0.55	0.54	0.53	n/a	0.11	0.07	n/a	0.21	0.14	n/a	n/a	n/a
	3-3/4	(95)	0.67	0.61	0.58	0.34	0.25	0.21	0.56	0.54	0.53	0.23	0.13	0.09	0.34	0.27	0.17	n/a	n/a	n/a
	4	(102)	0.68	0.62	0.59	0.36	0.26	0.22	0.57	0.55	0.53	0.25	0.15	0.10	0.36	0.29	0.19	n/a	n/a	n/a
	5	(127)	0.72	0.65	0.61	0.42	0.29	0.24	0.58	0.56	0.54	0.36	0.21	0.13	0.42	0.38	0.24	n/a	n/a	n/a
	5-1/2	(140)	0.74	0.66	0.62	0.45	0.31	0.25	0.59	0.56	0.55	0.41	0.24	0.15	0.45	0.40	0.25	0.61	n/a	n/a
	6	(152)	0.77	0.68	0.63	0.49	0.33	0.26	0.60	0.57	0.55	0.47	0.27	0.18	0.49	0.42	0.26	0.63	n/a	n/a
	7	(178)	0.81	0.71	0.66	0.57	0.36	0.29	0.62	0.58	0.56	0.59	0.34	0.22	0.59	0.47	0.29	0.68	n/a	n/a
	7-3/8	(187)	0.83	0.72	0.66	0.60	0.38	0.30	0.62	0.59	0.56	0.64	0.37	0.24	0.64	0.49	0.30	0.70	0.58	n/a
	8	(203)	0.86	0.74	0.68	0.65	0.40	0.31	0.63	0.59	0.57	0.72	0.41	0.27	0.72	0.52	0.31	0.73	0.61	n/a
	9	(229)	0.90	0.77	0.70	0.73	0.45	0.34	0.65	0.60	0.58	0.86	0.50	0.32	0.86	0.58	0.34	0.78	0.65	n/a
	9-1/4	(235)	0.91	0.77	0.71	0.76	0.46	0.35	0.65	0.61	0.58	0.89	0.52	0.34	0.89	0.59	0.35	0.79	0.65	0.57
	10	(254)	0.94	0.80	0.72	0.82	0.50	0.37	0.67	0.62	0.59	1.00	0.58	0.38	1.00	0.64	0.38	0.82	0.68	0.59
	11	(279)	0.99	0.83	0.74	0.90	0.55	0.39	0.68	0.63	0.60	1.00	0.67	0.43	1.00	0.70	0.43	0.86	0.71	0.62
	12	(305)	1.00	0.86	0.77	0.98	0.60	0.43	0.70	0.64	0.60	1.00	0.76	0.50	1.00	0.77	0.50	0.90	0.75	0.65
	14	(356)	1.00	0.91	0.81	1.00	0.70	0.50	0.73	0.66	0.62		0.96	0.62		0.96	0.62	0.97	0.81	0.70
	16	(406)	1.00	0.97	0.86		0.80	0.57	0.77	0.69	0.64		1.00	0.76		1.00	0.76	1.00	0.86	0.75
	18	(457)	1.00	1.00	0.90		0.89	0.64	0.80	0.71	0.66			0.91			0.91		0.91	0.79
	24	(610)	1.00		1.00		1.00	0.86	0.90	0.78	0.71			1.00			1.00		1.00	0.91
	30	(762)						1.00	1.00	0.85	0.76									1.00
	36	(914)								0.92	0.81									
	> 48	(1219)								1.00	0.92									

Table 15 - Load adjustment factors for 5/8-in. diameter Hilti HIT-Z and HIT-Z-R rods in cracked concrete [1,2]

5/8-in. HIT-Z(-R) cracked concrete			Spacing factor in tension f_{AN}			Edge distance factor in tension f_{RN}			Spacing factor in shear[3] f_{AV}			Edge distance in shear: ⊥ Toward edge f_{RV}			Edge distance in shear: ∥ To and away from edge f_{RV}			Concrete thickness factor in shear[4] f_{HV}		
Embedment h_{ef}	in.	(mm)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)
Spacing (s) / Edge Distance (c_a) / Concrete thickness (h), - in. (mm)	3-1/8	(79)	0.64	0.59	0.57	0.67	0.56	0.50	0.55	0.54	0.53	0.18	0.10	0.07	0.35	0.20	0.13	n/a	n/a	n/a
	3-1/4	(83)	0.64	0.60	0.57	0.69	0.56	0.51	0.55	0.54	0.53	0.19	0.11	0.07	0.38	0.22	0.14	n/a	n/a	n/a
	3-3/4	(95)	0.67	0.61	0.58	0.75	0.60	0.53	0.56	0.54	0.53	0.23	0.13	0.09	0.47	0.27	0.17	n/a	n/a	n/a
	4	(102)	0.68	0.62	0.59	0.78	0.62	0.55	0.57	0.55	0.53	0.26	0.15	0.10	0.51	0.30	0.19	n/a	n/a	n/a
	5	(127)	0.72	0.65	0.61	0.91	0.70	0.60	0.58	0.56	0.54	0.36	0.21	0.13	0.72	0.41	0.27	n/a	n/a	n/a
	5-1/2	(140)	0.74	0.66	0.62	0.98	0.74	0.63	0.59	0.56	0.55	0.41	0.24	0.15	0.83	0.48	0.31	0.61	n/a	n/a
	6	(152)	0.77	0.68	0.63	1.00	0.78	0.66	0.60	0.57	0.55	0.47	0.27	0.18	0.94	0.54	0.35	0.64	n/a	n/a
	7	(178)	0.81	0.71	0.66	1.00	0.87	0.72	0.62	0.58	0.56	0.59	0.34	0.22	1.00	0.68	0.44	0.69	n/a	n/a
	7-3/8	(187)	0.83	0.72	0.66	1.00	0.90	0.74	0.62	0.59	0.56	0.64	0.37	0.24	1.00	0.74	0.48	0.70	0.59	n/a
	8	(203)	0.86	0.74	0.68	1.00	0.96	0.78	0.63	0.59	0.57	0.73	0.42	0.27	1.00	0.84	0.54	0.73	0.61	n/a
	9	(229)	0.90	0.77	0.70	1.00	1.00	0.85	0.65	0.60	0.58	0.87	0.50	0.32	1.00	1.00	0.65	0.78	0.65	n/a
	9-1/4	(235)	0.91	0.77	0.71			0.86	0.66	0.61	0.58	0.90	0.52	0.34			0.68	0.79	0.66	0.57
	10	(254)	0.94	0.80	0.72			0.91	0.67	0.62	0.59	1.00	0.58	0.38			0.76	0.82	0.68	0.59
	11	(279)	0.99	0.83	0.74			0.98	0.69	0.63	0.60		0.67	0.44			0.88	0.86	0.72	0.62
	12	(305)	1.00	0.86	0.77			1.00	0.70	0.64	0.60		0.77	0.50			1.00	0.90	0.75	0.65
	14	(356)	1.00	0.91	0.81				0.74	0.66	0.62		0.97	0.63			1.00	0.97	0.81	0.70
	16	(406)		0.97	0.86				0.77	0.69	0.64		1.00	0.77				1.00	0.86	0.75
	18	(457)		1.00	0.90				0.80	0.71	0.66			0.92					0.92	0.79
	24	(610)			1.00				0.90	0.78	0.71			1.00					1.00	0.92
	30	(762)							1.00	0.85	0.76									1.00
	36	(914)								0.92	0.81									
	> 48	(1219)								1.00	0.92									

1 Linear interpolation not permitted.

2 When combining multiple load adjustment factors (e.g. for a four-anchor pattern in a corner with thin concrete member) the design can become very conservative. To optimize the design, use Hilti PROFIS Anchor Design software or perform anchor calculation using design equations from ACI 318 Chapter 17 or CSA A23.3 Annex D.

3 Spacing factor reduction in shear applicable when $c < 3*h_{ef}$. f_{AV}, is applicable when edge distance, $c < 3*h_{ef}$. If $c \geq 3*h_{ef}$, then $f_{AV} = f_{AN}$.

4 Concrete thickness reduction factor in shear, f_{HV}, is applicable when edge distance, $c < 3*h_{ef}$. If $c \geq 3*h_{ef}$, then $f_{HV} = 1.0$.

If a reduction factor value is in a shaded area, this indicates that this specific edge distance may not be permitted with a certain spacing (or vice versa). Check with figure 6 and table 8 of this section to calculate permissible edge distance, spacing and concrete thickness combinations.

Extruded

Hollow Core

PRESTRESSED CONCRETE SLAB

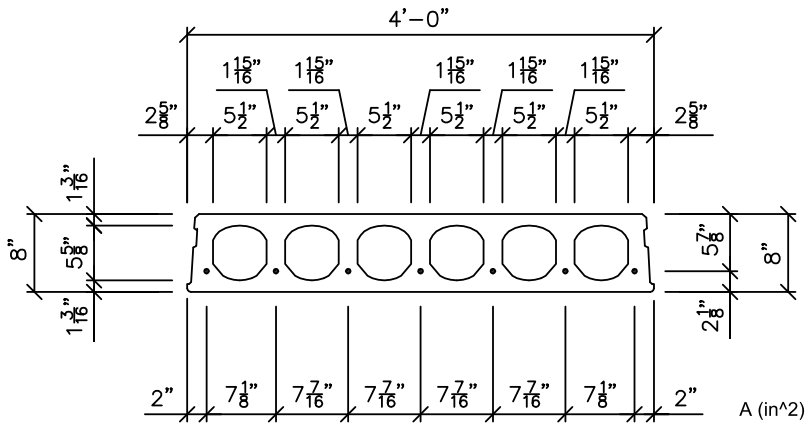
8" X 48" Section

Safe Load Table

UNIFORMLY DISTRIBUTED SUPERIMPOSED SERVICE LOAD IN PSF

Standard Designation	Strands No. & Size	Strand Area Sq. In.	M Ft.-Kips per Unit	ϕM_n Ft.-Kips Per Unit	Span Length (l) in Ft.																				
					15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
848-152	7 - 6/10	1.519	99.6	153.3	582	543	508	477	450	425	389	350	316	285	258	234	212	193	176	160	146	134	122	111	**102**
848-139	5 - 6/10 & 2 - 1/2	1.391	93.3	142.3	582	543	508	477	447	399	358	322	291	263	238	215	195	177	161	146	133	121	110	100	**91**
848-126	3 - 6/10 & 4 - 1/2	1.263	87.0	131.0	582	543	508	460	408	364	326	293	264	239	216	197	178	161	146	132	120	109	99	90	**81**
848-107	7 - 1/2	1.071	77.6	113.4	582	508	445	392	347	309	276	247	222	200	181	164	149	135	123	111	101	91	82	**73**	**66**
848-77	5 - 1/2	0.765	62.6	83.8	420	363	317	277	244	216	192	171	152	136	122	109	98	88	79	71	**63**	**57**	**50**		
848-61	4 - 1/2	0.612	55.1	68.1	333	287	249	217	190	167	147	130	115	102	91	80	71	63	56						
848-46	3 - 1/2	0.459	47.6	52.0	243	208	179	155	134	117	102	88	77	67	58	50									

controlled by: ultimate shear service



A (in^2) =	222.6 in^2	f'_c =	9000 psi
b_w (in) =	13.266 in	f'_{ci} =	3500 psi
I_g (in^4) =	1701.04 in^4	f_{pu} =	270 ksi
y_b (in) =	4.034 in		

NOTES:

1) Grouted weight of structural unit is 62 psf or 248 plf based on concrete unit weight of 154 pcf.
2) Design is based on ACI Standard, "Building Code Requirements for Reinforced Concrete (ACI318)."
3) No shear reinforcement is required for the tabulated loads to the right of the heavy stepped line.
4) Tabulated loads are based on U=1.2D+1.6L and with all load superimposed on the structural section considered as live load.
5) Tabulated loads in the blue area may be achieved by adding partial concrete corefill.
6) Tabulated loads in yellow are controlled by permissible flexural tension at service loads.
7) Tabulated loads in bold font have deflections in excess of L/360.
8) All strand stressed to 70% of ultimate.
9) For longer spans and conditions not covered in the load table, consult Molin.

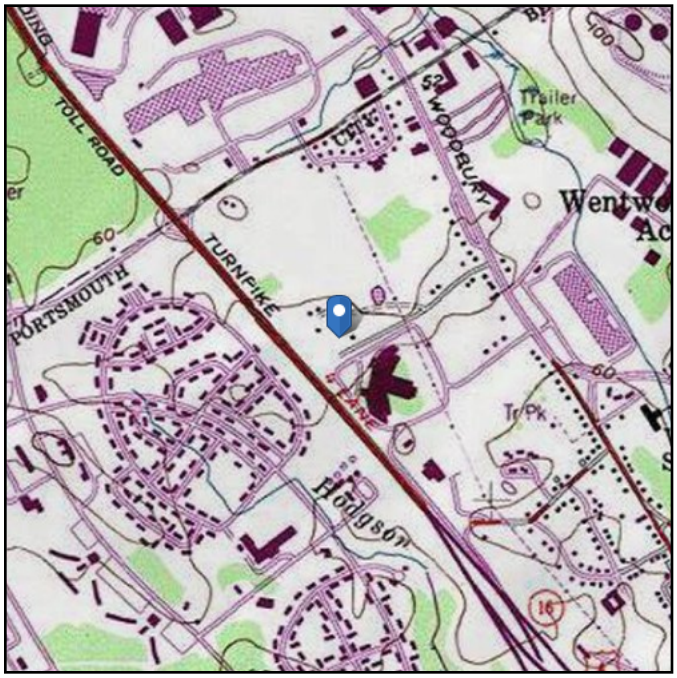
Molin Concrete Products Company • 415 Lilac Street • Lino Lakes, MN 55014
Office: 651.786.7722 • 800.336.6546 • Fax: 651.786.0229
www.molin.com • e-mail: info@molin.com

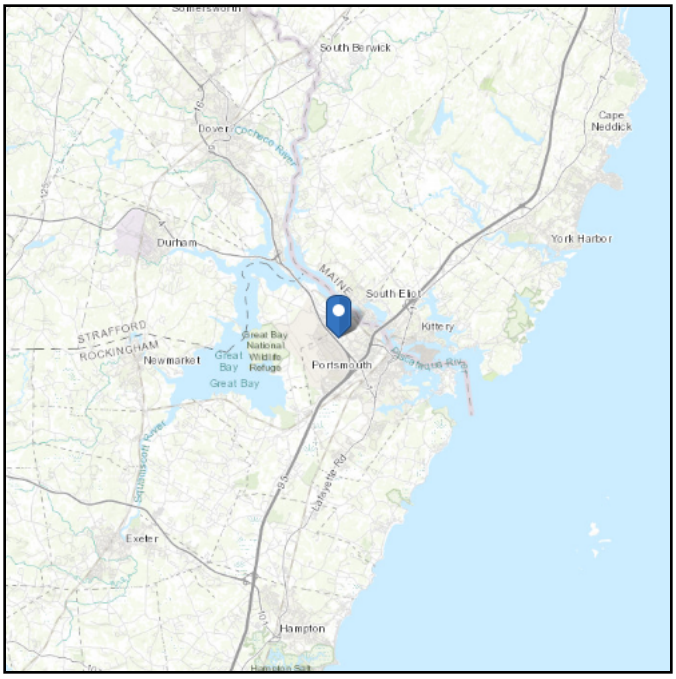
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class:

Elevation: 69.8 ft (NAVD 88)
Latitude: 43.087503
Longitude: -70.796457





Wind

Results:

Wind Speed:	121 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	99 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Thu Feb 13 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Snow

Results:

Ground Snow Load, p_g:	50 lb/ft^2
Elevation:	69.8 ft
Data Source:	ASCE/SEI 7-10, Fig. 7-1.
Date Accessed:	Thu Feb 13 2020

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

EAST > North East > New England > New England East > PORTSMOUTH_4_NH - A

- Feliciano-Rivera, Rafael - rafael.feliciano-rivera@verizonwireless.com - 07/23/2019 08:05:28

Project Detail		Location Information	
Site Type		**Siterra Site ID#**	
Carrier Aggregation	false	**Site Name**	PORTSMOUTH_4_NH - A
MPT Id	581113	**Siterra SR#**	
eCIP-0	false	**E-NodeB ID#**	061533
Project Name	MANUAL Initial Build ENTRY - 2560256	**PSLC#**	540336
RFDS Project ID	1525855	**Switch Name**	
Project ID	2560256	**Tower Owner**	
Site Traker Project ID		**Tower Type**	Rooftop
RFDS Project Scope	07/17/2019 - REV0: Initial Install (6) Hexport (NHH-65B-R2B) antennas on side-by-side mounting brackets. Install (1) 12 OVP Junction Box Install (1) 12x24 Hybridflex cable Install (3) Samsund 700/850 Dualband RRH Install (3) Samsund AWS/PCS Dualband RRH	**Street Address**	Hampton Inn
		City	Portsmouth
		State	NH
		Zip Code	03801
		County	Rockingham
		Latitude	43.087503 / 43° ° 5' ' 15.0108" " N
		Longitude	-70.796457 / 70° ° 47' ' 47.2452" " W

PORTSMOUTH_4_NH - A - Feliciano-Rivera, Rafael - rafael.feliciano-rivera@verizonwireless.com - 07/23/2019 08:05:28

Antenna Summary

Added Antennas

700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	QTY
YES		YES		YES	YES	CommScope	NHH-45B-R2B	46	49	315,75,195	false	false	PHYSICAL	6

Removed Antennas

700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	QTY

Retained Antennas

700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	QTY

Added: 6	Removed: 0	Retained: 0

PORTSMOUTH_4_NH - A - Feliciano-Rivera, Rafael - rafael.feliciano-rivera@verizonwireless.com - 07/23/2019 08:05:28

Equipment Summary

Added Non Antennas													
Equipment Type	**700 LTE**	**850 CDMA**	**850 LTE**	**1900 CDMA**	**1900 LTE**	**2100 LTE**	**Location**	**Make**	**Model**	**Cable Length**	**Cable Size**	**Inst. Type**	**Quantity**
RRU					YES	YES	Tower	Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)			PHYSICAL	3
RRU	YES		YES				Tower	Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)			PHYSICAL	3
OVP Box	YES		YES		YES	YES	Tower	Raycap	12 OVP Junction Box			PHYSICAL	1
Hybrid Cable	YES		YES		YES	YES	Tower		Hybrid Cable		12x24	PHYSICAL	1
Mount	YES		YES		YES	YES	Tower	Commscope	BSAMNT-SBS-1-2			PHYSICAL	3
Coaxial Cables	YES		YES		YES	YES	Tower		Foam		1/2"	PHYSICAL	36
Hybrid Cable	YES		YES		YES	YES	Tower		Tower		1x1	PHYSICAL	6
Removed Non Antennas													
Equipment Type	**700 LTE**	**850 CDMA**	**850 LTE**	**1900 CDMA**	**1900 LTE**	**2100 LTE**	**Location**	**Make**	**Model**	**Cable Length**	**Cable Size**	**Inst. Type**	**Quantity**
Retained Non Antennas													
Equipment Type	**700 LTE**	**850 CDMA**	**850 LTE**	**1900 CDMA**	**1900 LTE**	**2100 LTE**	**Location**	**Make**	**Model**	**Cable Length**	**Cable Size**	**Inst. Type**	**Quantity**

Services

700 MHZ LTE				
	Current Version:	Proposed Version:		
		0002		
Sector		01	02	03
Azimuth		315	75	195
Cell/ENode B ID		061533	061533	061533
Antenna Model		NHH-45B-R2B_Port 1 45_0750_02	NHH-45B-R2B_Port 1 45_0750_02	NHH-45B-R2B_Port 1 45_0750_09
Antenna Make		CommScope	CommScope	CommScope
Centerline(Ft)		46	46	46
Mechanical DT(Deg.)		0	0	0
Electrical DT		2	2	9
Tip Height		49	49	49
TMA make				
TMA model				
RRU make		Samsung	Samsung	Samsung
RRU model		B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
# of Tx, Rx Lines		4,4	4,4	4,4
Position				

2100 MHZ LTE

	Current Version:	Proposed Version:		
		0002		
Sector		01	02	03
Azimuth		315	75	195
Cell/ENode B ID		061533	061533	061533
Antenna Model		NHH-45B-R2B_Port 3 45_2120_02	NHH-45B-R2B_Port 3 45_2120_02	NHH-45B-R2B_Port 3 45_2120_05
Antenna Make		CommScope	CommScope	CommScope
Centerline(Ft)		46	46	46
Mechanical DT(Deg.)		0	0	0
Electrical DT		2	2	5
Tip Height		49	49	49
TMA make				
TMA model				
RRU make		Samsung	Samsung	Samsung
RRU model		B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
# of Tx, Rx Lines		4,4	4,4	4,4
Position				

1900 MHZ LTE				
	Current Version:	Proposed Version:		
		0002		
Sector		01	02	03
Azimuth		315	75	195
Cell/ENode B ID		061533	061533	061533
Antenna Model		NHH-45B-R2B_Port 3 45_1970_02	NHH-45B-R2B_Port 3 45_1970_02	NHH-45B-R2B_Port 3 45_1970_05
Antenna Make		CommScope	CommScope	CommScope
Centerline(Ft)		46	46	46
Mechanical DT(Deg.)		0	0	0
Electrical DT		2	2	5
Tip Height		49	49	49
TMA make				
TMA model				
RRU make		Samsung	Samsung	Samsung
RRU model		B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
# of Tx, Rx Lines		4,4	4,4	4,4
Position				

850 MHZ LTE				
	Current Version:	Proposed Version:		
		0002		
Sector		01	02	03
Azimuth		315	75	195
Cell/ENode B ID		061533	061533	061533
Antenna Model		NHH-45B-R2B_Port 1 45_0880_02	NHH-45B-R2B_Port 1 45_0880_02	NHH-45B-R2B_Port 1 45_0880_09
Antenna Make		CommScope	CommScope	CommScope
Centerline(Ft)		46	46	46
Mechanical DT(Deg.)		0	0	0
Electrical DT		2	2	9
Tip Height		49	49	49
TMA make				
TMA model				
RRU make		Samsung	Samsung	Samsung
RRU model		B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
# of Tx, Rx Lines		4,4	4,4	4,4
Position				

Service Comments

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Callsigns Per Antenna - Proposed

Sector	Make	Model	Centerline	Tip Height	Azimuth(TN)	Elec. Tilt	Mech. Tilt	Gain	Horiz BW	Regulatory Power	700 Callsigns	850 Callsigns	1900 Callsigns	2100 Callsigns	28 GHz Callsigns	31 GHz Callsigns	39 GHz Callsigns
01	CommScope	NHH-45B-R2B_Port 1 45_0880_02	46ft/14.02m	49ft/14.94m	315	2	0	15.408	43	490.68		KNKA201					
02	CommScope	NHH-45B-R2B_Port 1 45_0880_02	46ft/14.02m	49ft/14.94m	75	2	0	15.408	43	490.68		KNKA201					
02	CommScope	NHH-45B-R2B_Port 1 45_0750_02	46ft/14.02m	49ft/14.94m	75	2	0	14.418	48	122.34	WQJQ689						
01	CommScope	NHH-45B-R2B_Port 1 45_0750_02	46ft/14.02m	49ft/14.94m	315	2	0	14.418	48	122.34	WQJQ689						
03	CommScope	NHH-45B-R2B_Port 1 45_0880_09	46ft/14.02m	49ft/14.94m	195	9	0	15.298	43	489.55		KNKA201					
01	CommScope	NHH-45B-R2B_Port 3 45_1970_02	46ft/14.02m	49ft/14.94m	315	2	0	17.898	43	298.17			KNLF646,KNLH242,KNLH310				
02	CommScope	NHH-45B-R2B_Port 3 45_1970_02	46ft/14.02m	49ft/14.94m	75	2	0	17.898	43	298.17			KNLF646,KNLH242,KNLH310				
03	CommScope	NHH-45B-R2B_Port 3 45_1970_05	46ft/14.02m	49ft/14.94m	195	5	0	17.888	43	297.49			KNLF646,KNLH242,KNLH310				
03	CommScope	NHH-45B-R2B_Port 3 45_2120_05	46ft/14.02m	49ft/14.94m	195	5	0	18.118	41	235.25				WQGA900,WQGB266			
01	CommScope	NHH-45B-R2B_Port 3 45_2120_02	46ft/14.02m	49ft/14.94m	315	2	0	18.038	41	230.96				WQGA900,WQGB266			

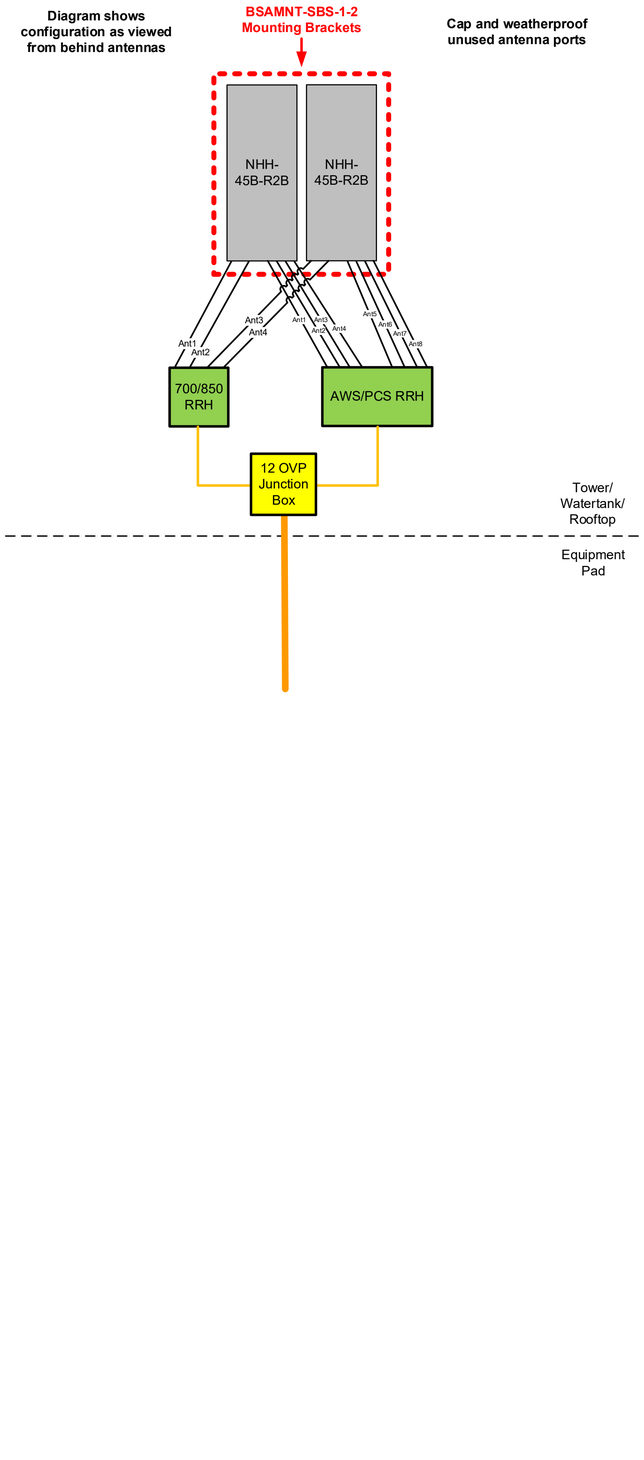
02	CommScope	NHH-45B-R2B_Port 345_2120_02	46ft/14.02m	49ft/14.94m	75	2	0	18.038	41	230.96				WQGA900,WQGB266			
03	CommScope	NHH-45B-R2B_Port 145_0750_09	46ft/14.02m	49ft/14.94m	195	9	0	14.548	48	126.05	WQJQ689						

Callsigns

Callsigns	Market	Radio Code	Market Number	Block	State	County	Licensee Name	Wholly Owned	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/ Sq Mi	Status	Project Action
KNKA201	*Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH*	*CL*	*CMA006*	*B*	*NH*	*Rockingham*	*Cellco Partnership*	*Yes*	*25.000*	*835.000-845.000*	*880.000-890.000*	*846.500-849.000*	*891.500-894.000*	*489.55*	*500*	*425.0*	*Active*	*Added*
KNLF646	*Boston, MA*	*CW*	*BTA051*	*C*	*NH*	*Rockingham*	*AirTouch Cellular*	*Yes*	*10.000*	*1895.000-1900.000*	*1975.000-1980.000*	*.000-.000*	*.000-.000*	*298.17*	*1640*	*425.0*	*Active*	*Added*
KNLH242	*Boston, MA*	*CW*	*BTA051*	*F*	*NH*	*Rockingham*	*Cellco Partnership*	*Yes*	*10.000*	*1890.000-1895.000*	*1970.000-1975.000*	*.000-.000*	*.000-.000*	*298.17*	*1640*	*425.0*	*Active*	*Added*
KNLH310	*Boston, MA*	*CW*	*BTA051*	*E*	*NH*	*Rockingham*	*AirTouch Cellular*	*Yes*	*10.000*	*1885.000-1890.000*	*1965.000-1970.000*	*.000-.000*	*.000-.000*	*298.17*	*1640*	*425.0*	*Active*	*Added*
WPLM413	Boston, MA	LD	BTA051	B	NH	Rockingham	Cellco Partnership	Yes	150.000	31000.000-31075.000	31225.000-31300.000	.000-.000	.000-.000			425.0	Active	
WPOH955	Boston, MA	LD	BTA051	A	NH	Rockingham	Cellco Partnership	Yes	300.000	29100.000-29250.000	31075.000-31225.000	.000-.000	.000-.000			425.0	Active	
WQGA900	*Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH-R*	*AW*	*BEA003*	*B*	*NH*	*Rockingham*	*Cellco Partnership*	*Yes*	*20.000*	*1720.000-1730.000*	*2120.000-2130.000*	*.000-.000*	*.000-.000*	*235.25*	*1640*	*425.0*	*Active*	*Added*
WQGB266	*Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH*	*AW*	*CMA006*	*A*	*NH*	*Rockingham*	*Cellco Partnership*	*Yes*	*20.000*	*1710.000-1720.000*	*2110.000-2120.000*	*.000-.000*	*.000-.000*	*235.25*	*1640*	*425.0*	*Active*	*Added*

WQJQ689	*Northeast*	*WU*	*REA001*	*C*	*NH*	*Rockingham*	*Cellco Partnership*	*Yes*	*22.000*	*746.000-757.000*	*776.000-787.000*	*.000-.000*	*.000-.000*	*126.05*	*1000*	*425.0*	*Active*	*Added*
WRBA934	Boston, MA	UU	BTA051	L1	NH	Rockingham	Cellco Partnership	Yes	325.000	27600.000-27925.000	.000-.000	.000-.000	.000-.000			425.0	Active	
WRBA935	Boston, MA	UU	BTA051	L2	NH	Rockingham	Cellco Partnership	Yes	325.000	27925.000-27950.000	28050.000-28350.000	.000-.000	.000-.000			425.0	Active	
WRBE692	Manchester, NH	UU	PEA060	6-A	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	38850.000-38900.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBE693	Manchester, NH	UU	PEA060	6-B	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	39550.000-39600.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBE844	Manchester, NH	UU	PEA060	7-A	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	38900.000-38950.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBE845	Manchester, NH	UU	PEA060	7-B	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	39600.000-39650.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBF484	Manchester, NH	UU	PEA060	9-A	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	39000.000-39050.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBF485	Manchester, NH	UU	PEA060	9-B	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	39700.000-39750.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBF774	Manchester, NH	UU	PEA060	10-A	NH	Rockingham	Straight Path Spectrum, LLC	Yes	.000	.000-.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBF775	Manchester, NH	UU	PEA060	10-B	NH	Rockingham	Straight Path Spectrum, LLC	Yes	.000	.000-.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBF950	Manchester, NH	UU	PEA060	11-A	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	39100.000-39150.000	.000-.000	.000-.000	.000-.000			.0	Active	

WRBF951	Manchester, NH	UU	PEA060	11-B	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	39800.000-39850.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBG410	Manchester, NH	UU	PEA060	12-A	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	39150.000-39200.000	.000-.000	.000-.000	.000-.000			.0	Active	
WRBG411	Manchester, NH	UU	PEA060	12-B	NH	Rockingham	Straight Path Spectrum, LLC	Yes	50.000	39850.000-39900.000	.000-.000	.000-.000	.000-.000			.0	Active	

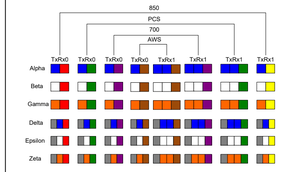


Legend

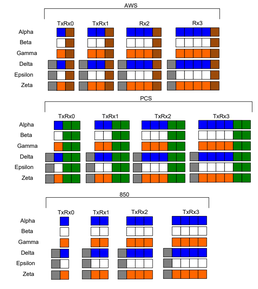
- RF coax (jumpers, mainlines, etc.)
- RET and TMA control cables
- Hybriflex cables
- Antennas
- RRHs and BTSs
- Junction Boxes
- Diplexers, Triplexers, Quadriplexers, and TMA's

VIEW IS FROM BEHIND THE ANTENNAS

Coax Colors



Specific Color Codes for LTE Tx/Rx



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RF Report

Proposed Wireless Facility
99 Durgin Lane
Portsmouth, NH 03801

April 1, 2020

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ATTACHMENTS

1. Overview

This RF Report has been prepared on behalf of Verizon Wireless in support of its application to the City of Portsmouth for the installation and operation of a wireless facility located at 99 Durgin Lane. The proposed facility consists of equipment cabinets, antennas, and other telecommunications equipment mounted on the rooftop of the building.

This report concludes that the proposed site will provide adequate service capacity and coverage improvement to areas of northern Portsmouth in order to improve deficient service areas to Route 16, Woodbury Avenue, and the surrounding roads, neighborhoods, and business/retail/community areas.

Included in this report is: a brief summary of the site's objectives, maps showing Verizon Wireless' current network plan, and modeled Radio Frequency coverage of the subject site and the surrounding sites in Verizon Wireless' network.

2. Introduction

Verizon Wireless provides digital voice and data communications services using 3rd Generation (3G) CDMA/EVDO technology in the Cellular (800 MHz) and PCS (1900 MHz) frequency bands, and is in the midst of deploying advanced 4th Generation (4G) voice and data services over LTE technology in the 700 MHz, PCS, and AWS (2100 MHz) frequency bands as allocated by the FCC. These networks are used by mobile devices for fast web browsing, media streaming, and other applications that require broadband connections. The mobile devices that benefit from these advanced networks are not limited to basic handheld phones, but also include devices such as smartphones, PDA's, tablets, and laptop air-cards. With the evolving rollout of 4G LTE services and devices, Verizon Wireless customers will have even faster connections to people, information, and entertainment.

As explained within this report, Verizon Wireless has identified the need to add a new facility to its existing network of sites in the seacoast area to improve coverage and capacity to a gap in service that now exists in northern Portsmouth, in order to support reliable communications and meet the growing demand in the area.

To maintain a reliable and robust communications system for the individuals, businesses, public safety workers and others who use its network, Verizon Wireless deploys a network of cell sites (also called wireless communications facilities) throughout the areas in which it is licensed to provide service. These cell sites consist of antennas mounted on structures, such as buildings and towers, supported by radio and power equipment. The receivers and transmitters at each of these sites process signals within a limited geographic area known as a "cell."

Mobile subscriber handsets and wireless devices operate by transmitting and receiving low power radio frequency signals to and from these cell sites. Handset signals that reach the cell site are transferred through land lines (or other means of backhaul transport) and routed to their destinations by sophisticated electronic equipment. In order for Verizon Wireless' network to function effectively, there must be adequate overlapping coverage between the "serving cell" and adjoining cells. This not only allows a user to access the network initially, but also allows for the transfer or "hand-off" of calls and data transmissions from one cell to another, and prevents unintended disconnections or "dropped calls."

Verizon Wireless' antennas also must be located high enough above ground level to allow transmission (a.k.a. propagation) of the radio frequency signals above trees, buildings and other natural or man-made structures that may obstruct or diminish the signals. Areas without adequate radio frequency coverage have substandard service, characterized by dropped and blocked calls, slow data connections, or no wireless service at all, and are commonly referred to as coverage gaps.

The size of the area potentially served by each cell site depends on several factors including the number of antennas used, the height at which the antennas are deployed, the topography of the surrounding land, vegetative cover, and natural or man-made obstructions in the area. The actual service area at any given time also depends on the number of customers who are on the network in range of that cell site. As customers move throughout the service area, the transmission from the phone or other device is automatically transferred to the Verizon Wireless facility with the best reception, without interruption in service, provided that there is overlapping coverage between the cells.

Each cell site must be primarily designed to strike a balance between the overall geographic coverage area it will serve, and the site's capacity to support the usage within the coverage footprint. In rural areas, cell sites are generally designed to have broader coverage footprints because the potential traffic is sparser and distributed over a larger area. In more densely populated suburban and urban environments, the capacity to handle calls and data transmissions is of increasing concern, and cell sites must limit their coverage footprint to an area where the offered network traffic can be supported by the radio equipment and resources. Due to the aggressive historical and projected growth of mobile usage, particularly for mobile data (82% in 2017-2018 in the U.S.[1]), instances arise where the usage demand can no longer be supported by the site(s) serving an area, and new facilities must be integrated to provide capacity relief to the overloaded sites.

We have concluded that by installing the proposed wireless communication facility at 99 Durgin Lane at an antenna centerline height of 49.3' AGL (above ground level), Verizon Wireless will be able to provide additional capacity and coverage improvement to a gap in service effecting the residents, businesses, and traffic corridors within northern Portsmouth.

[1] "2019 Annual Survey Highlights", June 20, 2019, CTIA.
https://www.ctia.org/news/2019-annual-survey-highlights

3. The Proposed Facility

Verizon Wireless' proposal consists principally of the following elements:

1) A steel equipment frame on the roof of the subject building to support telecommunication equipment cabinets;
2) Six (6) panel antennas (two per sector) mounted inside the parapet wall and behind RF transparent screening, at a centerline elevation of 49.3';
3) Three (3) ballast mounts (one per sector) with Remote Radio Heads (RRH) with accessory junction boxes and surge suppressors mounted on the roof nearby the antennas;
4) Hybrid DC power/fiber cables, routed from the equipment cabinets to the ballast mounts along cable tray on the southern side of the building, and along horizontal cable.
5) Telco/power/fiber utility connections routed from the first floor to the rooftop in a stacked janitor closet;

4. Coverage and Capacity Objectives

As mentioned above, Verizon Wireless is in the process of rolling out its 4G LTE high-speed wireless broadband system in the 700 MHz, PCS, and AWS frequency bands, in accordance with its licenses from the FCC. In order to expand and enhance their wireless services throughout New England, Verizon Wireless must fill in existing coverage gaps and address capacity, interference, and high-speed broadband issues. As part of this effort, Verizon Wireless has determined that additional network capacity is needed in and around sections of the City of Portsmouth, NH, as described further below.

Verizon Wireless currently operates wireless facilities similar to the proposed facility within Portsmouth and the surrounding cities/towns. Due in large part to the distances between the existing sites, the intervening topography, and volume of user traffic in the area, these existing facilities do not provide sufficient capacity to portions of the seacoast. Specifically, Verizon Wireless determined that much of northern Portsmouth is without reliable service in the following areas and town roads[2], including but not limited to:

- Route 16;
    - Serves ~ 69,000 vehicles per day, as measured between Arthur Brady Drive and Exist 1 (2019);
- Woodbury Avenue;
    - Serves ~ 16,500 vehicles per day, as measured south of Durgin Lane (2019);
- The surrounding roads, neighborhoods, and business/retail/community areas such as the Home Depot, the Crossings shopping plaza, and Durgin Square.

The proposed site located at 99 Durgin Lane ("Portsmouth 4") is needed to fill in these targeted gaps in service, in order to improve network quality and reliability for Verizon Wireless subscribers traveling along these roads, as well as to the numerous business patrons and visitors in this area.

[2] Traffic counts are sourced from the New Hampshire Department of Transportation, Transportation Data Management System.

5. Site Search and Selection Process

To find a site that provides acceptable service, adequate capacity, and fills the gaps in coverage, computer modeling software is used to define a search area. The search ring identifies the area within which a site could be located (assuming that sufficient height is used) that would have a high probability of addressing the significant coverage gap and/or meeting the capacity objectives established by the Verizon Wireless RF (Radio Frequency) engineers.

Once a search ring is determined, Verizon Wireless' real estate specialists search within the proximity of the defined area for existing buildings, towers, and other structures of sufficient height that would meet the defined objectives. If none are found, then the focus shifts to "raw land" sites. A suitable site must satisfy the technical requirements identified by the RF engineers, must be available for lease, and must have access to a road and be otherwise suitable for constructing a cell site of the required size and height. Every effort is made to use existing structures before pursuing a "raw land" build to minimize the number of new towers throughout the towns being served.

After the search of the area had been completed, Verizon Wireless determined that collocating on the building rooftop at 99 Durgin Lane is the most appropriate solution to address the targeted coverage and capacity objectives.

6. Pertinent Site Data

Table 1 below details the site-specific information for the existing, planned, and proposed Verizon Wireless sites used to perform the coverage analysis and generate the coverage plots provided herein. This list includes all existing Verizon Wireless macro-sites within two miles of the City of Portsmouth.

Site Name	Address	City/State	Location		Antenna Height (ft AGL)	Structure Type	Status
			Latitude	Longitude			
Dover Point	Finch Lane	Dover, NH	43.1668	-70.8585	140	Monopole	On-Air
Durham UNH	8 Foss Farm Road	Durham, NH	43.1264	-70.9382	114	Water Tank	On-Air
Durham UNH 2	15 Strafford Avenue	Durham, NH	43.1390	-70.9304	123	Rooftop	On-Air
Eliot	66 Dow Highway	Eliot, ME	43.1367	-70.7769	138	Monopole	On-Air
Greenland	Breakfast Hill Road	Greenland, NH	43.0272	-70.8233	135	Guyed	On-Air
Kittery	147 Rogers Road	Kittery, ME	43.0990	-70.7399	98	Water Tank	On-Air
Kittery 2	33Government Street	Kittery, ME	43.0855	-70.7452	75	Steeple	On-Air
Madbury E	3 Jenkins Road	Madbury, NH	43.1433	-70.8778	125	Monopole	On-Air
Newfields	24 Baker Street	Newfields, NH	43.0389	-70.9387	127	Stealth Monopole	On-Air
Newington	165 Gosling Road	Newington, NH	43.0995	-70.7913	193	Rooftop	On-Air
Newmarket	426 Wadleigh Falls Road	Newmarket, NH	43.0669	-70.9396	67	Lattice	On-Air
Pease AP	International Drive	Portsmouth, NH	43.0786	-70.7992	137	Monopole	On-Air
Portsmouth Dt	56 Islington Street	Portsmouth, NH	43.0748	-70.7620	114.5	Lattice	On-Air
Portsmouth Relo	680 Peverly Hill Road	Portsmouth, NH	43.0456	-70.7772	157	Lattice	Planned
Rye	94 Grove Road	Rye, NH	42.9946	-70.7829	157	Monopole	On-Air
Rye 2	Port Way	Rye, NH	43.034811	-70.7268	157	Monopole	Planned
Stratham	313 Portsmouth Ave	Stratham, NH	43.040186	-70.8812	170	Monopole	On-Air
Newington 2	372 Shattuck Way	Newington, NH	43.115872	-70.8122	185	Silo	Planned
Portsmouth 4	99 Durgin Lane	Portsmouth, NH	43.087528	-70.7964	49.3	Rooftop	Proposed

Table 1: Verizon Wireless Site Information Used in Coverage Analysis[3]

[3] Some sites listed in this table are outside the plot view but are included for completeness of information.

7. Coverage Analysis and Propagation Plots

The signal propagation plots provided in this report show coverage for the 700 MHz frequency range and were produced using deciBel Planner™, a Windows-based RF propagation computer modeling program and network planning tool. The software considers the topographical features of an area, land cover, antenna models, antenna heights, RF transmitting power and receiver thresholds to predict coverage and other related RF parameters used in site design and network expansion.

The plots included as attachments depict best server coverage based on RSRP (Reference Signal Received Power) for Verizon Wireless' 4G LTE network.

Attachments A - C are discussed below:

Attachment A titled "Portsmouth 4 – Existing/Planned 700 MHz LTE Sector Footprints" depicts the areas primarily served by the sectors (a.k.a. signal "footprints") of the "On-Air" and "Planned" Verizon Wireless sites in the area, which are shown by the unique color for each particular sector of interest. For clarity, all other sectors of less interest with respect to the proposed site are shown in grey. "On-Air" sites are existing Verizon Wireless facilities and "Planned" sites are those that have begun the permitting process. As demand for wireless voice and data services continues to grow, Verizon Wireless manages the footprint of each sector so that it can support the demand within the area it is primarily serving. In addition to improving coverage to the area, the proposed site will also serve existing and anticipated demand in the vicinity and thereby offload some of the burden experienced by the surrounding sites. In that way, those sites will be able to more adequately serve the demand for service in the areas nearer to those surrounding sites. Please note that the outer parts of each sector footprint may include areas that have signal strength below the targeted value required for reliable service to Verizon Wireless' customers. The fact that low-level signal may reach these areas does not mean that these areas experience adequate coverage. These unreliable areas of low signal level may impose a significant capacity burden on the sites primarily serving the area.

Attachment B titled "Portsmouth 4 - 700 MHz LTE Sector Footprints with Proposed Site" shows the composite coverage with the overall footprint of the proposed facility in dark green. As shown in this map, the proposed "Portsmouth 4" facility is an effective solution to provide capacity relief to the area, particularly to the "Newington" beta (red) and the "Pease AP" gamma sector (yellow). The proposed facility is centrally located in the area of deficient coverage making it particularly suited to provide a dominant server to this busy area, thereby offloading the sectors of the surrounding sites currently serving the area. Table 2 below details the capacity relief based on the sector footprints shown in Attachments A and B.

Sector	Current			With "Portsmouth 4"			Offload Summary		
	Employee Pops	Residental Pops	Area (mi^2)	Employee Pops	Residental Pops	Area (mi^2)	Total Employee Pops Offloaded	Total Residential Pops Offloaded	Area Offloaded (mi^2/%)
Newington Beta	4157	1743	1.36	2176	883	0.81	**1981 (47.7%)**	**860 (49.3%)**	**0.55 (40.4%)**
Pease AP Gamma	4546	66	2.31	4391	50	2.15	**155 (3.4%)**	**16 (24.2%)**	**0.16 (6.9%)**

Table 2: Capacity Offload Summary[4]

Attachment C titled "Portsmouth 4 – Area Terrain Map" details the topographical features around the proposed "Portsmouth 4" site. These terrain features play a key role in dictating both the unique coverage areas served from a given location, and the coverage gaps within the network. This map is included to provide a visual representation of the terrain variations that must be considered when determining the appropriate location and design of a proposed wireless facility. The darker blue shades correspond to lower elevations, whereas the red and grey shades indicate higher elevations.

8. Certification of Non-Interference

Verizon Wireless certifies that the proposed facility will not cause interference to any lawfully operating emergency communication system, television, telephone or radio, in the surrounding area. The FCC has licensed Verizon Wireless to transmit and receive in the Upper C-Block of the 700 MHz band,BA Block of the Cellular (850 MHz) band, the C3, E, and F Blocks of the PCS (1900 MHz) band, and the A and B Blocks of the AWS (2100 MHz) band of the RF spectrum. As a condition of the FCC licenses, Verizon Wireless is prohibited from interfering with other licensed devices that are being operated in a lawful manner. Furthermore, no emergency communication system, television, telephone, or radio is licensed to operate on these frequencies, and therefore interference is highly unlikely.

[4] Residential population counts are based upon the 2010 U.S. Census data. Employee population counts are based upon the 2015 U.S. Census Bureau LEHD database. Please note that neither includes visitor or vehicular counts in the area.

9. Summary

In undertaking its build-out of 4G LTE service in Rockingham County, Verizon Wireless has determined that an additional facility is needed to provide reliable service and additional capacity throughout areas of northern Portsmouth, NH. Verizon Wireless determined that installing the proposed wireless communications facility at 99 Durgin Lane in Portsmouth at an antenna centerline of 49.3 feet (AGL) will provide additional coverage and capacity needed in the targeted coverage areas and along Route 16, Woodbury Avenue, and the surrounding roads, neighborhoods, and business/retail/community areas. Without the installation of the proposed site, Verizon Wireless will be unable to improve and expand their existing 4G LTE wireless communication services in this area of Portsmouth; therefore, Verizon Wireless respectfully requests that the City of Portsmouth act favorably upon the proposed facility.

10. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate.

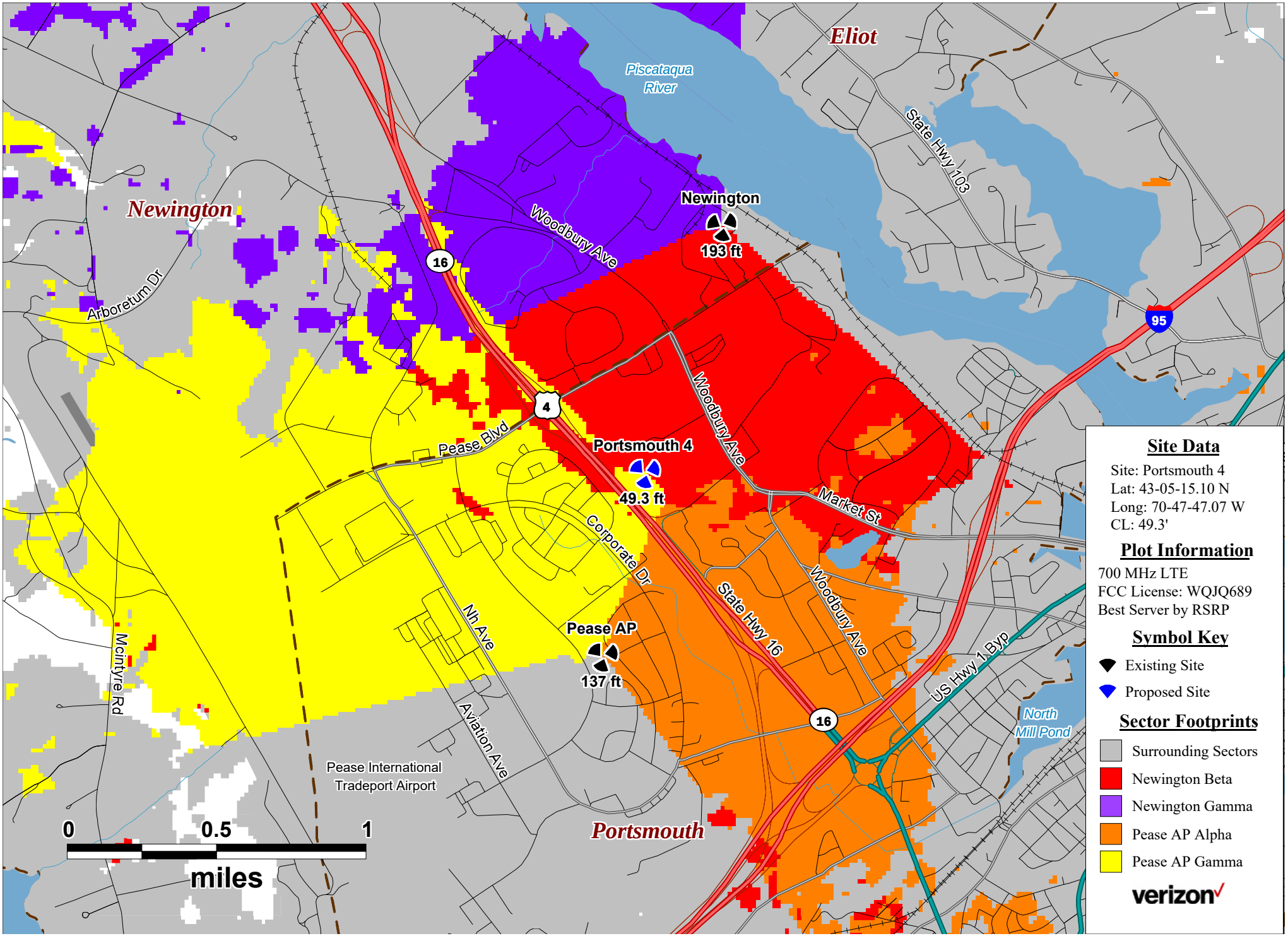
Keith Vellante

Keith Vellante
RF Engineer
C Squared Systems, LLC

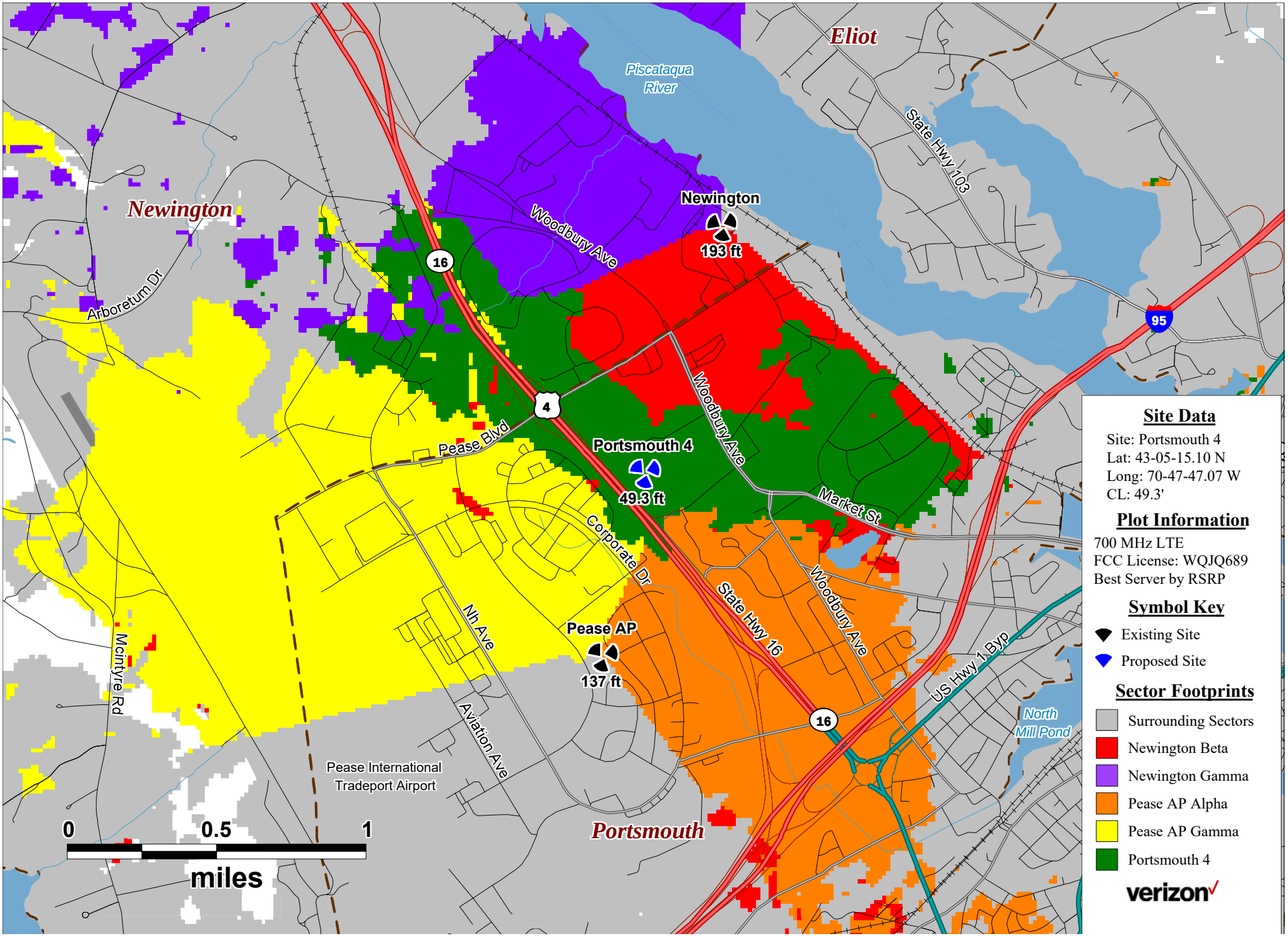
April 1, 2020
Date

11. Attachments

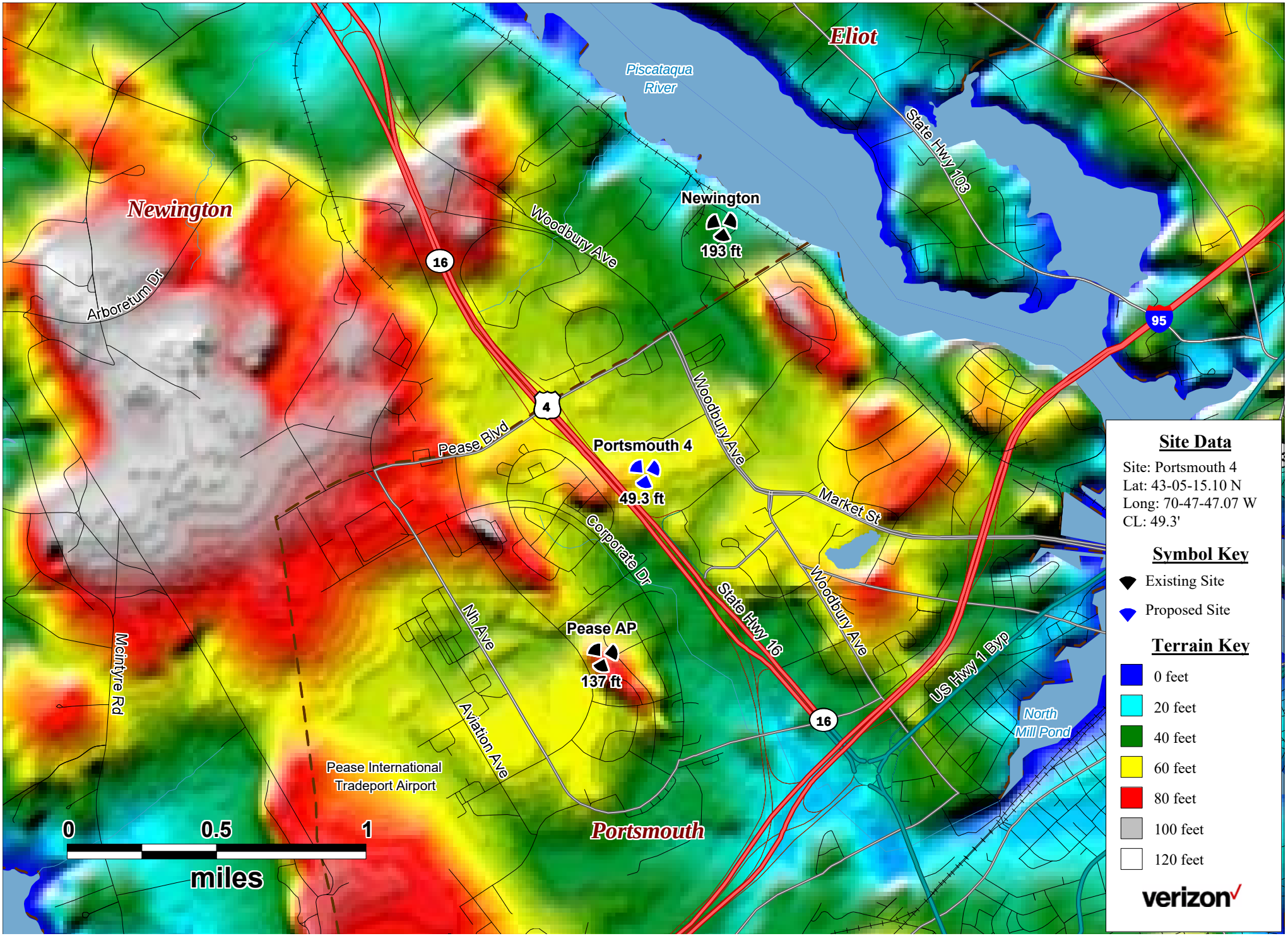
Attachment A:
Portsmouth 4 - Existing/Planned 700 MHz LTE Sector Footprints



Attachment B:
Portsmouth 4 - 700 MHz LTE Sector Footprints with Proposed Site



Attachment C:
Portsmouth 4 - Area Terrain Map



SITE NAME: Portsmouth 4, NH
ATTY/DATE: Lozier, 11-5-19
Location Code: 540336

BUILDING AND ROOFTOP LEASE AGREEMENT

This Building and Rooftop Lease Agreement (the "Agreement") made as of the latter date of signature below, between **Giri Dover, LLC**, a New Hampshire limited liability company with its principal place of business located at Giri Hotels, 225 West Squantum Street, Suite 200, Quincy, Massachusetts 02171, hereinafter designated LESSOR and **Cellco Partnership,** d/b/a Verizon Wireless with its principal offices at One Verizon Way, Mail Stop 4AW100, Basking Ridge, New Jersey 07920 (telephone number 866-862-4404), hereinafter designated LESSEE. LESSOR and LESSEE are at times collectively referred to hereinafter as the "Parties" or individually as the "Party."

IN WITNESS WHEREOF, the Parties hereto have set their hands and affixed their respective seals the day and year first above written.

WITNESS

LESSOR:

Giri Dover, LLC

By: _____

Name: Ashish Sangani
Its: President and CEO

Date: 3/19/2020

verizon

118 Flanders Road
3rd Floor
Westborough, MA 01581

January 4, 2017

Dear Sir/Madam:

Re: Structure Consulting Group

Please accept this letter as notification that Structure Consulting Group has been engaged to perform research on certain properties and real estate including submitting for zoning approval, building permits and negotiating real estate agreements as well as engage in certain engineering analysis and construction for Verizon Wireless' ongoing network enhancement.

Structure Consulting Group is authorized to act on Verizon Wireless' behalf for the purpose of filing and consummating any zoning and/or building permit applications necessary to obtain approval of the applicable jurisdiction for the installation and/or modification of Verizon Wireless' communications facilities.

Should you have any questions regarding any of Structure Consulting Group's activities on behalf of Verizon Wireless, feel free to contact me at 508-439-3278 or via email at andrew.candiello@verizonwireless.com.

Respectfully,

Andrew Candiello
Verizon Wireless
Project Manager – Real Estate

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
1120 SANCTUARY PKWY, #150 GASA5REG
ALPHARETTA, GA 30009-7630

Call Sign	File Number
WQGB266	0006150458
Radio Service	
AW - AWS (1710-1755 MHz and 2110-2155 MHz)	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
11-29-2006	01-04-2014	11-29-2021	02-14-2014

Market Number	Channel Block	Sub-Market Designator
CMA006	A	0

Market Name
Boston-Lowell-Brockton-Lawrenc

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.

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WQGB266 **File Number:** 0006150458 **Print Date:** 02-14-2014

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).

Federal Communications Commission
Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

ATTN: REGULATORY
CELLCO PARTNERSHIP
1120 SANCTUARY PKWY, #150 GASA5REG
ALPHARETTA, GA 30009-7630

Call Sign	File Number
KNKA201	0006356224
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	08-26-2014	10-01-2024		08-26-2014

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 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 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 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.

Licensee Name: CELLCO PARTNERSHIP

Call Sign: KNKA201 **File Number:** 0006356224 **Print Date:** 08-26-2014

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 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 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 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 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 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 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 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 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 **Construction Deadline:**

Antenna: 4 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 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 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 **Construction Deadline:**

Antenna: 7 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 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 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 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 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 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 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 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 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 **Construction Deadline:**

Antenna: 4 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 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 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 **Construction Deadline:**

Antenna: 4 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 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 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 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 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 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 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 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 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 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 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 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 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 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 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:** 0006356224 **Print Date:** 08-26-2014

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 **Construction Deadline:** 07-03-2014

Antenna: 1 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 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 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:

License renewal granted on a conditional basis, subject to the outcome of FCC proceeding WT Docket No. 10-112 (see FCC 10-86, paras. 113 and 126).

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: 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.

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.

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.

Licensee Name: AIRTOUCH CELLULAR

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

License renewal granted on a conditional basis, subject to the outcome of FCC proceeding WT Docket No. 10-112 (see FCC 10-86, paras. 113 and 126).

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.

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.

License renewal granted on a conditional basis, subject to the outcome of FCC proceeding WT Docket No. 10-112 (see FCC 10-86, paras. 113 and 126).

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
KNLH310	
Radio Service CW - PCS Broadband	

FCC Registration Number (FRN): 0006146468

Grant Date	Effective Date	Expiration Date	Print Date
06-08-2017	11-30-2017	06-27-2027	

Market Number	Channel Block	Sub-Market Designator
BTA051	E	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:

License renewal granted on a conditional basis, subject to the outcome of FCC proceeding WT Docket No. 10-112 (see FCC 10-86, paras. 113 and 126).

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.

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
WQGA900	
Radio Service AW - AWS (1710-1755 MHz and 2110-2155 MHz)	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
11-29-2006	11-01-2016	11-29-2021	

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.

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.

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	0008587211
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	09-11-2019	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).

License renewal granted on a conditional basis, subject to the outcome of FCC proceeding WT Docket No. 10-112 (see FCC 10-86, paras. 113 and 126).

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.

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WQJQ689 **File Number:** 0008587211 **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status