GEHRING & ASSOCIATES, LLC
Wireless Planning & Zoning

Post Office Box 98
West Mystic, CT 06388

860-536-0675
wireless@gehringzone.com

June 14, 2022

Town Council
Town of Randolph
41Main Street
Randolph, MA 02368

RE: Application of Cellco Partnership d/b/a Verizon Wireless for a Special Permit and Administrative Site Plan Review to Install a New Wireless Communications Facility on the roof at 15 Memorial Parkway, Assessor's Parcel 54/B/5A&B

Dear Members of the Town Council:

Cellco Partnership d/b/a Verizon Wireless ("Applicant") is pleased to submit the enclosed Application for a Special Permit and Administrative Site Plan Review to construct a new Wireless Communications Facility at 15 Memorial Parkway, Assessor's Parcel 54/B/5A&B ("Subject Property"). The Subject Property is located in the Crawford Square Business Zoning District.

Verizon Wireless has identified certain coverage gaps and network capacity issues with its service in the vicinity of the Subject Property that could be alleviated by creating a new cell site in the area.

A search of the area did not discover any existing communications towers nearby to support Verizon's antennas. Accordingly, other sites, including tall buildings, were searched where a new antenna site could be located in an unobtrusive manner.

The Subject site was chosen because it is an existing building, owned by the Applicant's parent company, located in a commercial zoning district. The roof was chosen where antennas could be hidden inside faux chimney structures and remain generally unobtrusive to the neighborhood. No ground-mounted equipment is proposed.

Once constructed, the facility will host no employees so there will be no activity on-site as a result of this proposed installation. A Special Permit and Administrative Site Plan Review is respectfully requested. No variances are needed or requested for the proposed installation.

Enclosed for your review and consideration are the following which are incorporated into and made part of this Application:

Tab 1 - Town Application Forms
Tab 2 - Statement in Support of Application
Tab 3 - Landowner Authorization
Tab 4 - Assessor's Field Card, Tax Map and Deed
Tab 5 - FCC Licenses
Tab 6 - RF Engineer's Report and Coverage Plots
Tab 7 - RF Emissions Compliance Report
Tab 8 - Acoustical Compliance Report
Tab 9 - Photo-Simulations
Tab 10 - Site Plans & Elevation Drawings

The Applicant looks forward to its Public Hearing where the enclosed may be presented for your consideration and approval.

Sincerely,

Gehring & Associates, LLC

By _____
Carl W. Gehring, on behalf of Cellco Partnership d/b/a Verizon Wireless

Enclosures

cc: Verizon New England, Inc. - Landowner
Brian Ross - Verizon Wireless Real Estate Department

RANDOLPH TOWN COUNCIL

APPLICATION FOR A SPECIAL PERMIT

Project Type	O 24 Hour Operation O Drive Through Window X Wireless Communication Facility O Marijuana Facility O Other_____		O Adult Entertainment O Crematorium O Gravel Removal O Union Crossing Project
Type of Request	X Initial Application	O Renewal	O Modification/Amendment
Assessor Parcel ID *map-block-parcel*	54/B/5A&B	**Norfolk County Registry of Deeds**	*Book/Page or Cert #* 3107/0566
Parcel Address	15 Memorial Parkway		
Zoning District	Crawford Sq. Bus Dist.	**Size of Parcel**	20,110 SF
Parcel Attributes	O Wetland O Flood Plain O Wetland Resource		
Project Description	Install wireless communications facility on roof of building consisting of antennas hidden inside faux chimney stacks and radio equipment cabinets pursuant to the enclosed Plans and supporting materials incorporated into and made part of this application.		
Other permits or approvals required	O Conservation O Licensing Board O MassDOT O Stormwater O ZBA		

Applicant	Cellco Partnership d/b/a Verizon Wireless		
Contact person	Carl Gehring		
Applicant Status	O Owner X Tenant O Licensee O Buyer O Other_____		
Address	c/o Gehring & Associates, LLC, P. O. Box 98, West Mystic, CT 06388		
Phone	860-536-0675	**Email**	wireless@gehringzone.com

If property owner is not the Applicant, authorization from the owner is required

Surveyor	Dewberry Engineers, Inc.		
Contact person	Matt Tilden		
Address	99 Summer St, Suite 700, Boston, MA 02110		
Phone	617-695-3400	**Email**	mtilden@dewberry.com

Engineer	Dewberry Engineers, Inc.		
Contact person	Matt Tilden		
Address	99 Summer Street, Suite 700, Boston, MA 02110		
Phone	617-695-3400	Email	mtilden@dewberry.com

Property Owner	Verizon New England, Inc.		
Address	6 Bowdoin Square, 9th Floor, Boston, MA 02114		
Phone		Email	

For any application for a Special Permit, the applicant shall submit a narrative and additional documentation to support:

- That the proposed use is in harmony with the general purpose and intent of the Town's ordinances;
- That the proposed use is in an appropriate location and is not detrimental to the neighborhood and does not significantly alter the character of the zoning district;
- Adequate and appropriate facilities will be provided for the proper operation of the proposed use;
- That the proposed use would not be detrimental or offensive to the adjoining zoning districts and neighboring properties due to the effects of lighting, odors, smoke, noise, sewage, refuse materials or other visual nuisances;
- That the proposed use would not cause undue traffic congestion in the immediate area;
- Any specific requirements detailed in the Randolph Zoning Ordinances.

I hereby certify, under the pains and penalties of perjury, that the information contained in this application is true, accurate and complete to the best of my knowledge and belief. I agree to abide by the Randolph Zoning Ordinances and complete construction of the project in accordance with said ordinances, rules and any conditions of the Town Council.

Cellco Partnership d/b/a Verizon Wireless

By [signature] Its Agent
Applicant

JUNE 14, 2022
Date

APPLICATION FOR SPECIAL PERMIT by TOWN COUNCIL

The undersigned applicant hereby applies for a special permit from the Randolph Town Council in its capacity as the Special Permit Granting Authority under M.G.L., Ch. 40A sec. 9 and any other applicable law as follows:

1. **APPLICANT** (includes equitable owner or purchaser of a purchase and sales agreement):

Name: **Cellco Partnership d/b/a Verizon Wireless**

Address: **c/o Gehring & Associates, LLC, P. O. Box 98, West Mystic, CT 06388**

Tel. No.: Days **860-536-0675** Evenings _____

Email: **wireless@gehringzone.com**

____Check here if you are the purchaser on a purchase and sales agreement.

2. **OWNER,** if other than applicant:

Name: **Verizon New England, Inc.**

Address: **6 Bowdoin Square, 9th Floor, Boston, MA 02114**

Tel. No.: Days _____ Evenings _____

Email: _____

3. **PROPERTY:**

Street Address **15 Memorial Parkway**

Assessor's Map: **54** Block: **B** Parcel: **5 A&B**

Registry of deeds where deed, plan, or both recorded: _____

Deed recording: Book 3107 Page 0566

Plan recording: Plan # _____ Book: _____ Page _____

Property is located in the **Crawford Square Business District** zoning district.

4. NATURE OF RELIEF REQUESTED:

Special permit pursuant to Article/Section **Articles VIII, X, XI** of the Zoning By-law which designates the Town Council as the Special Permit Granting Authority (SPGA) for proscribed uses.

Detailed explanation of request:

Install a wireless communications facility on the roof of an existing building pursuant to the plans and supporting materials incorporated into and made part of this Application; pursuant to M.G.L. c.40A and the Telecommunications Act of 1996, 47 U.S.C. 332(c)(7)(B); All Rights Reserved.

4. EVIDENCE TO SUPPORT GRANT OF SPECIAL PERMIT:

Because of reasons set forth below, the special permit requested will be in harmony with the intent and purpose of the Zoning By-law:

Please see enclosed Supporting Statement.

Because of the reasons set forth below, the special permit requested will meet the additional requirements of the Zoning By-law as follows:

Please see enclosed Supporting Statement.

Please attach any relevant plans, maps or materials that you wish the Town Council to consider in reviewing this application.

If someone other than owner or equitable owner (attorney, purchaser on a purchase and sales agreement) is the Applicant or will represent the Applicant, owner or equitable owner must designate such representative below.

Name of Representative: **Cellco Partshership d/b/a Verizon Wireless, and its agents**

Address of Representative: **c/o Gehring & Associates, LLC, P. O. Box 98, West Mystic, CT 06388**

Tel No.: Days **860-536-0675** Evenings _____

Email: **wireless@gehringzone.com**

Relationship of representative to owner or equitable owner: **Tenant on roof**

I hereby authorize **Cellco Partnership d/b/a Verizon Wireless, and its agents** to represent my interests before the Special Permit Granting Authority (SPGA) with respect to this Special Permit Application.

See enclosed Letter of Authorization
(Signed by owner/equitable owner)

Date: **1-19-22**

Please attach any required Special Permit Fees.

I hereby certify under the pains and penalties of perjury that the information contained in this Application is accurate, true and complete to the best of my knowledge and information.

Cellco Partnership d/b/a Verizon Wireless
By Gehring, Its Agent — 6-14-22
Signature of Applicant — Date

See enclosed Letter of Authorization — **1-19-22**
Signature of Owner, if other than Applicant — Date

Attach all other documentation required for issuance of this Special Permit.

Note that Special Permits issued by the Town Council are governed, in part, by M.G.L. ch. 40A, Section 9, which states in pertinent part as follows:

> Each application for a special permit shall be filed by the petitioner with the city or town clerk and a copy of said application, including the date and time of filing certified by the city or town clerk, shall be filed forthwith by the petitioner with the special permit granting authority. The special permit granting authority shall hold a public hearing, for which notice has been given as provided in section eleven, on any application for a special permit within sixty-five days from the date of filing of such application; provided,

however, that a city council having more than five members designated to act upon such application may appoint a committee of such council to hold the public hearing. The decision of the special permit granting authority shall be made within ninety days following the date of such public hearing. The required time limits for a public hearing and said action, may be extended by written agreement between the petitioner and the special permit granting authority. A copy of such agreement shall be filed in the office of the city or town clerk. A special permit issued by a special permit granting authority shall require a two-thirds vote of boards with more than five members, a vote of at least four members of a five member board, and a unanimous vote of a three member board.

Failure by the special permit granting authority to take final action within said ninety days or extended time, if applicable, shall be deemed to be a grant of the special permit. The petitioner who seeks such approval by reason of the failure of the special permit granting authority to act within such time prescribed, shall notify the city or town clerk, in writing within fourteen days from the expiration of said ninety days or extended time, if applicable, of such approval and that notice has been sent by the petitioner to parties in interest. The petitioner shall send such notice to parties in interest by mail and each such notice shall specify that appeals, if any, shall be made pursuant to section seventeen and shall be filed within twenty days after the date the city or town clerk received such written notice from the petitioner that the special permit granting authority failed to act within the time prescribed. After the expiration of twenty days without notice of appeal pursuant to section seventeen, or, if appeal has been taken, after receipt of certified records of the court in which such appeal is adjudicated, indicating that such approval has become final, the city or town clerk shall issue a certificate stating the date of approval, the fact that the special permit granting authority failed to take final action and that the approval resulting from such failure has become final, and such certificate shall be forwarded to the petitioner. The special permit granting authority shall cause to be made a detailed record of its proceedings, indicating the vote of each member upon each question, or if absent or failing to vote, indicating such fact, and setting forth clearly the reason for its decision and of its official actions, copies of all of which shall be filed within fourteen days in the office of the city or town clerk and shall be deemed a public record, and notice of the decision shall be mailed forthwith to the petitioner, applicant or appellant, to the parties in interest designated in section eleven, and to every person present at the hearing who requested that notice be sent to him and stated the address to which such notice was to be sent. Each such notice shall specify that appeals, if any, shall be made pursuant to section seventeen and shall be filed within twenty days after the date of filing of such notice in the office of the city or town clerk.

Zoning ordinances or by-laws shall provide that a special permit granted under this section shall lapse within a specified period of time, not more than 3 years, which shall not include such time required to pursue or await the determination of an appeal referred to in section seventeen, from the grant thereof, if a substantial use thereof has not sooner commenced except for good cause or, in the case of permit for construction, if construction has not begun by such date except for good cause.

STATEMENT IN SUPPORT OF APPLICATION FOR A SPECIAL PERMIT AND ADMINISTRATIVE SITE PLAN REVIEW

Applicant:	Cellco Partnership d/b/a Verizon Wireless
Subject Parcel:	15 Memorial Parkway, Assessor's Parcel 54/B/5A&B ("Subject Property")
Zoning District:	Crawford Square Business District
Proposed Use:	Install a new Wireless Communications Facility on the roof of an existing building.
Requested:	Special Permit and Administrative Site Plan Review pursuant to Articles VIII, X, and XI and other applicable sections of the Town of Randolph Zoning Ordinance, M.G.L. Chapter 40A, and the Telecommunications Act of 1996, 47 U.S.C. 332(c)(7)(B);
Date:	June 14, 2022

A. DESCRIPTION OF PROPOSED INSTALLATION

Verizon Wireless has identified certain coverage gaps and capacity issues in its network in the vicinity of the Subject Property that could be alleviated with the installation of a new wireless facility in the area. A site acquisitions firm was hired by Verizon Wireless to look for a new site and no existing cell towers or other communications towers were found nearby. The only other existing towers in the area were located too far away to be effective in the present instance.

The Subject Property was chosen because it is a commercial property with clear roof space for the proposed installation. The Subject Property is perfectly located to satisfy the coverage objectives that motivated Verizon Wireless to build a new site in Randolph.

The Applicant now seeks approval of a Special Permit and Administrative Site Plan Review to install antennas inside faux chimney structures on the roof. The Applicant's installation will be unmanned and unoccupied, requiring only infrequent (approximately once per month) maintenance visits. Ingress and egress to service the installation will utilize existing access points into the Subject Property.

The proposed installation will produce no odor, dust, light or nuisance of any kind. The proposed use is really more of a "non-use" in the conventional sense in that, once constructed, nothing will occur on site. The only noticeable affects of the proposed installation will be the beneficial impact of enhanced and improved wireless communications to Verizon Wireless customers in the area.

B. PERSONAL WIRELESS SERVICE FACILITIES

Article X of the Town of Randolph Zoning Ordinance ("Ordinance") outlines the requirements and approval criteria pertaining to new wireless facilities. In order to demonstrate the Applicant's compliance, the Ordinance provisions are enumerated below (*in italics*) with the Applicant's responses thereto (in plain text) as follows:

> *ARTICLE X*
> ***Wireless Communications Facilities***
>
> ***§ 200-60. Exemptions.***
> *The following shall be exempt from the provisions of this article:*
> *A. Wireless communications facilities used only for Town or state public safety purposes.*
> *B. Wireless communications facilities used by a conforming, federally licensed amateur radio used in accordance with said FCC license as protected by MGL c. 40A, § 3, provided that:*
> *(1) Any such wireless communications facility is not used or licensed for any commercial purpose; and*
> *(2) Any mount used in connection with said federally licensed amateur radio use must be removed upon loss or termination of said FCC license.*
> *C. Television antennas, including so-called "dish antennas."*
> *D. Licensed commercial mobile radio services primarily used in support of the licensee's own business purpose, provided that (i) such services are not used as a dispatching or communications service for third parties and (ii) any wireless communications facilities used in connection therewith do not exceed the dimensional requirements under § 200-65. By way of example, but not limitation, exempt commercial mobile radio services would include such services used by a taxi or limousine company to communicate with its vehicles and repair, service, delivery, towing and fuel delivery companies to communicate with their respective vehicles.*

Not Applicable. Applicant is not proposing any of the above exempt installations.

> ***§ 200-61. Prohibitions.***
> *A. All towers used in wireless communications facilities shall be constructed only of galvanized steel and shall be of a freestanding, monopole-type construction. No lattice-style towers or guyed towers shall be allowed or permitted.*

Not Applicable. No tower is proposed.

B. No advertising signs shall be allowed. No other signs shall be allowed, except in accordance with § 200-68B.

No advertising is proposed.

C. Security barriers, as required by § 200-68C, around the wireless communications facilities shall not use razor wire, barbed wire, or similar types of material.

The proposed installation will be up on the roof of an existing building where access is already restricted.

D. The use of telephone and electric utility poles and structures as sites for wireless communications facilities is prohibited; except the use of electric utility transmission towers for which a special permit issued under this article is in effect shall be allowed, provided that any new wireless communications facility shall not exceed the terms and conditions of the special permit in effect for the existing wireless communications facility on which it is to be located.

Not Applicable.

E. Wireless communications facilities are prohibited in Residential, Business, Business/Professional, Business HA, Multifamily and Sanitary Facility Districts.

The Subject Property is located in the Crawford Square Business District which is not one of the aforementioned prohibited zoning districts.

F. Wireless communications facilities may not be located on a nonconforming building or structure, unless said building or structure first obtains the necessary zoning relief to extend, alter or change the building or structure in accordance with MGL c. 40A, § 6, and the requirements of this article are satisfied.

The Subject Building is not non-conforming.

G. Ground-mounted equipment for wireless communications facilities shall not generate acoustic noise in excess of fifty (50) decibels at the security barrier. Roofmounted or side-mounted equipment for wireless communications facilities

shall not generate noise in excess of fifty (50) decibels at ground level at the base of the building as measured from the point closest to the antenna.

The proposed facility will be compliant with the foregoing.

§ 200-62. Permitted locations.
Wireless communications facilities are permitted in Industrial Districts and on Town-owned property.

The Subject Property is not in either of the above-mentioned as-of-right districts so a Special Permit from the Town Council is respectfully requested pursuant to the Table of Allowable Activities in the Zoning Ordinance.

§ 200-63. General requirements.
A. The applicant must demonstrate that the wireless communications facility is necessary for the applicant to provide adequate wireless communications services by that applicant to the public.

Please see enclosed RF Report and RF Plots.

B. If primary coverage [greater than fifty percent (50%)] from the proposed wireless communications facility is outside of the Town of Randolph, then the special permit granting authority may decline the special permit, unless the applicant demonstrates that it is unable to locate within the town which is primarily receiving service from the proposed wireless communications facility.

See enclosed RF Report and RF Plots.

C. A wireless communications facility may locate as of right on any monopole for which a special permit issued under this article is in effect, provided that the new facility shall first obtain site plan approval from the special permit granting authority and provided, further, that any new wireless communications facility shall not exceed the terms and conditions of the special permit in effect for the existing facility on which it is to be located unless such terms and conditions are amended or modified.

Not Applicable.

D. The applicant must demonstrate to the special permit granting authority that the location of the proposed wireless communications facility complies with all of the requirements of this article and, furthermore, that the size and height of the

proposed facility is the minimum necessary for its intended purpose, using topographical advantage where possible.

The Applicant is proposing a facility on the roof of an existing building, not a new tower. The height of the building will work and the location will work to satisfy the coverage objectives needed to close the significant gaps in coverage and network capacity issues that motivated the Applicant to find a new site in the neighborhood.

§ 200-64. Location requirements.

If feasible, wireless communications facilities shall be located on or within existing structures, including but not limited to buildings, existing communications facilities, monopoles, and related structures, provided that such installation preserves the character and integrity of those structures. Notwithstanding the foregoing, the use of telephone and electric utility poles and structures as sites for wireless communications facilities is prohibited, except that the use of electric utility transmission towers for which a special permit issued under this article is in effect shall be allowed, provided that any new wireless communications facility shall not exceed the terms and conditions of the special permit in effect for the existing wireless communications facility on which it is to be located unless such terms and conditions are amended or modified.

The Applicant is proposing to utilize an existing building in compliance with this provision of the Ordinance.

B. If the applicant demonstrates to the satisfaction of the special permit granting authority that it is not feasible to locate on a preexisting structure, the wireless communications facility shall be designed so as to be camouflaged to the greatest extent possible, including, but not limited to, use of compatible building materials and colors, screening, landscaping with natural and/or artificial plantings (as indicated through site plan review), and placement within trees.

Not Applicable. The Applicant is indeed proposing to utilize an existing structure. However, notwithstanding the foregoing, the Applicant is also proposing to hide or camouflage its antennas inside faux chimney structures on the roof in harmony and compliance with this provision of the Ordinance.

C. A wireless communications facility shall be set back from the property lines of the lot upon which it is located by a distance equal to the overall vertical height of the tower and any attachments plus five (5) feet. This provision may be waived by the special permit granting authority along any property line which abuts land owned by, or in the control of, the applicant or the owner/operator of the proposed structure.

Not Applicable. The facility if proposed on the roof of an existing building. No tower is proposed.

D. Except for structures that are accessory to the wireless communications facility, on any lot containing such wireless communications facility no structure shall be constructed or erected within five hundred (500) feet of said wireless communications facility. This provision may be waived by the special permit granting authority along any property line which abuts land owned by, or in the control of, the applicant or the owner/operator of the proposed wireless communications facility.

Not Applicable. The facility is proposed on the roof of an existing building.

E. The frontage requirements of a lot containing a wireless communications facility shall be those of the underlying zoning district.

The Subject building conforms to existing zoning. The proposed installation will go up on the roof; there will be no new equipment on the ground.

F. No wireless communications facility shall be erected or constructed within three hundred (300) feet of a traveled way, or within five hundred (500) feet of any habitable dwelling or business.

Not Applicable. No new tower is proposed.

§ 200-65. Dimensional requirements.

A. Height.

(1) Height of ground-mounted wireless communications facilities. No wireless communications facility shall exceed one hundred fifty (150) feet in vertical height above existing grade; provided, however, that at the discretion of the special permit granting authority a greater height may be permitted upon a demonstration that such additional height is technologically necessary for the provision of essential public safety telecommunications services. For purposes of the foregoing sentence, "essential public safety telecommunications services" shall be limited to such services as are required for transmission purposes by law enforcement, fire protection and civil defense agencies.

Not Applicable. No new tower is proposed.

(2) Height of side-and roof-mounted wireless communications facilities. Side- and roof-mounted wireless communications facilities shall not project more than

twelve (12) feet above the height of an existing building or structure nor project more than twelve (12) feet above the height limit of the zoning district within which the wireless communications facility is located, whichever is less.

The Applicant's proposed roof-top antenna structures will only project ten (10) feet above the existing roof and only 6.2 feet above the zoning district height limit in compliance with this provision.

(3) Height of preexisting structures. New antennas located on any of the following existing structures shall be exempt from the height restrictions of this article, provided that there is no increase in height of the existing structure as a result of the installation of a wireless communications facility: monopoles.

Not Applicable.

B. Extensions from walls; extensions beyond the face of walls, side- and roof-mounted facilities. Side- and roof-mounted wireless communications facilities shall not extend beyond the face of any wall, or exterior surface in the case of a building or structure that does not have walls, by more than eighteen (18) inches.

The proposed roof-top installation will be set back from the roof's edge and will not project any distance beyond any wall face.

C. Setbacks; setbacks of preexisting structures. In the event that a preexisting structure is proposed as a mount for a wireless communications facility, the setback provisions of the underlying zoning district shall apply.

The existing structure conforms to the current zoning requirements of the underlying zoning district.

D. Surface area. Side- and roof-mounted wireless communications facilities shall not individually or in the aggregate have a front surface area facing surrounding streets and adjacent properties that exceeds fifty (50) square feet in area.

The Applicant is proposing to mount its antennas inside faux chimney structures hidden from view. However, these faux structures will exceed the aforementioned surface area limit therefore a WAIVER is respectfully requested so that this existing building may be used instead of having to build a new tower in the neighborhood.

E. Flexibility. In reviewing an application for a wireless communications facility, the special permit granting authority may reduce the required setback distance of the zoning district by as much as fifty percent (50%) of the required distance, if it finds that such reduction shall substantially better serve the purposes of this article. In making such a finding, the special permit granting authority shall consider both the visual and safety impacts of the proposed use.

Not Applicable.

§ 200-66. Design standards.
Wireless communications facilities shall be camouflaged as follows:
A. Camouflage by preexisting buildings or structures.
(1) Camouflaging, roof-mounted. When a wireless communications facility extends above the roof height of a building on which it is mounted, every effort shall be made to conceal the wireless communications facility within or behind existing architectural features to limit its visibility from public ways. Wireless communications facilities mounted on a roof shall be stepped back from the front facade in order to limit their impact on the building's silhouette.

The proposed antennas will be mounted inside faux chimney structures that will be set back from the roof's edge in full compliance with this provision of the Ordinance.

(2) Camouflaging, side-mounted. Wireless communications facilities which are side-mounted shall blend with the building's architecture and, if over five (5) square feet, shall be shielded with material which is consistent with the design features and materials of the building.

Not Applicable.

B. Camouflage by vegetation. If wireless communications facilities are not camouflaged from public viewing areas by existing buildings or structures, they shall be surrounded by buffers of dense tree growth and understory vegetation in all directions to create an effective year-round visual buffer. Ground-mounted wireless communications facilities shall provide a year-round vertical evergreen vegetated buffer of fifty (50) feet, or seventy-five percent (75%) of the overall height of the structure, in all directions, whichever is less. Trees and vegetation may be existent on the subject property or installed as part of the proposed wireless communications facility or as combination of both. Vegetation should be natural in appearance and consistent with surroundings, and be reviewed and receive approval from the Town of Randolph Planning Department. ***[Amended 4-23-2001 ATM by Art. 22, approved 12-21-2001]***

Not Applicable.

C. Color.
(1) Wireless communications facilities which are side-mounted on buildings shall be painted or constructed of materials to match the color of the building material directly behind them.
(2) To the extent that a wireless communications facility extends above the height of the vegetation immediately surrounding it, it shall be painted in a light gray or light blue hue which blends with sky and clouds.

Not Applicable.

§ 200-67. Equipment shelters.
Equipment shelters for wireless communications facilities shall be designed consistent with one (1) of the following design standards:
A. Equipment shelters must be located in underground vaults when reasonably practicable;
B. Equipment shelters must be designed consistent with the traditional materials, color and design of the area; and
C. Equipment shelters must be camouflaged behind an effective year-round landscape buffer, equal to the height of the proposed building, and/or wooden fence.

Not Applicable. No equipment shelter is proposed.

§ 200-68. Lighting, signage and security.
A. Wireless communications facilities shall be lighted only if required by the Federal Aviation Administration (FAA). Lighting of equipment shelters and any other structures on site shall be shielded from abutting property.

No lighting is proposed other than a work light in the equipment area that will only be used in the unlikely event an after-hours emergency necessitates a site visit requiring temporary illumination of the equipment area. There will otherwise be no lighting proposed.

B. Signs shall be limited to the minimum number, size and type needed to identify the property and the owner and to warn of any danger. All signs are subject to review and approval by the Building Inspector, consistent with the purposes of this article.

Understood.

C. All ground-mounted wireless communications facilities shall be surrounded by a security barrier, which barrier shall comply with § 200-61C.

Not Applicable.

§ 200-69. Historic buildings.
A. Any wireless communications facilities located on or within an historic structure shall not alter the character-defining features, distinctive construction methods, or original historic materials of the building.
B. Any alteration made to an historic structure to accommodate a wireless communications facility shall be fully reversible.

Not Applicable.

§ 200-70. Safety standards; radiofrequency radiation (RFR) standards.
All equipment proposed for a wireless communications facility shall comply with the FCC Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (FCC Guidelines) and any other applicable FCC guidelines and regulations.

The proposed facility will be fully compliant. Please see enclosed RF emissions compliance report.

§ 200-71. Application procedures.
A. Preapplication conference. Prior to submission of an application for a special permit under this regulation, the applicant shall meet with the special permit granting authority at a public meeting to discuss the proposed wireless communications
facility in general terms and to clarify the filing requirements.

The Applicant performed a pre-application meeting with the Town Council on June 13, 2022.

B. Preapplication filing requirements. The purpose of the preapplication conference is to inform the special permit granting authority as to the preliminary nature of the proposed wireless communications facility. As such, no formal filings are required for the preapplication conference. However, the applicant shall prepare and present sufficient preliminary architectural and/or engineering drawings to inform the special permit granting authority of the location of the proposed wireless communications facility, as well as its scale and overall design.

Understood.

C. Hazards to air navigation.
(1) Any application for a wireless communications facility which proposes building a new structure or adding to existing structures within airport approaches as defined in MGL c. 90, § 35B, and any amendments thereto or language substituted therefor, must include a certification by the applicant that:
(a) Either a permit from the Massachusetts Aeronautics Commission is not required because the structure is or will be in an area subject to airport approach regulations adopted pursuant to MGL c. 90, §§ 40A through 40I, in an approach to Logan International Airport, or less than thirty (30) feet above ground level; or
(b) A permit from the Massachusetts Aeronautics Commission is required pursuant to MGL c. 90, § 35B, and a copy of said permit is enclosed with the application.
(2) Applications for permits to build a new structure or add to an existing structure requiring the filing of a Notice of Proposed Construction or Alteration (FAA Form 7460-1) with the Federal Aviation Administration shall mail a copy of the completed FAA Form 7460-1 to the Massachusetts Aeronautic Commission within three (3) business days after submitting said form to the FAA.

Not Applicable. No new tower facility is proposed. FAA filing is not required.

§ 200-72. Application filing rules and regulations. [Amended 5-9-2011 by Ord. No. 2010-046]
The applicant shall comply with the application filing requirements as may be established by rule or regulation of the special permit granting authority, including that all applications made to a SPGA shall identify the owner of the property and the applicant, and their interests in the property. A purchase and sale agreement, lease agreement, or letter of intent may be submitted to satisfy this requirement. No application shall be considered complete until this requirement is met.

The Applicant is a tenant on the roof of a building owned by others. See enclosed Letter of Authorization from landowner.

§ 200-73. Water tower or reservoir sites.
The Town of Randolph's water towers and reservoirs represent a large public investment in water pressure stabilization and peak capacity reserves. Protection of the quality of the Town's water supply is of prime importance to the Town. As access to the Town's water storage systems increases, the potential for contamination of the public water supply also increases. For these reasons, an

applicant that seeks to place, construct, or modify a wireless communications facility on water tower or reservoir sites must demonstrate the following:
A. The applicant's access to the wireless communications facility will not increase the risks of contamination to the Town's water supply;
B. There is sufficient room on the structure and/or the ground to accommodate the applicant's wireless communications facility;
C. The presence of the wireless communications facility will not increase the water tower maintenance cost to the Town; and
D. The presence of the wireless communications facility will not be harmful to the health of workers maintaining the water tower or reservoir.

Not Applicable.

§ 200-74. Co-location.

A. Licensed carriers shall share wireless communications facilities and sites where feasible and appropriate, thereby reducing the number of wireless communications facilities that are standalone structures. All applicants for a special permit for a wireless communications facility shall demonstrate a good faith effort to co-locate with other carriers, by providing:
(1) A survey of all preexisting wireless communications facilities that may be feasible sites for co-locating wireless communications facilities;
(2) Evidence of contact with all other licensed carriers for commercial mobile radio services operating in the Commonwealth of Massachusetts; and
(3) Evidence of sharing information with all other licensed carriers necessary to determine if co-location is feasible under the design configuration most accommodating to co-location.

Not Applicable. The Applicant is proposing to co-locate on the roof of an existing building, not build a new tower.

B. An applicant shall demonstrate to the special permit granting authority that it has made a good faith effort to co-locate its wireless communications facility upon an existing wireless communications facility. The Town may retain a technical expert in the field of RF engineering and/or a structural engineer to verify if co-location at the site is not feasible or is feasible given the design configuration most accommodating to co-location. The cost for such a technical expert will be at the expense of the applicant.

The Applicant is proposing to co-locate on the roof of an existing building, not build a new tower. The Town Council, being intimately familiar with the Town can take judicial notice that there are no existing cell towers in that neighborhood that could be used instead of what is now being proposed. The enclosed RF report lists all the surrounding sites where the Applicant has installations that will connect with the proposed site.

C. If the special permit granting authority grants a special permit for collocated wireless communications facilities, the special permit shall state how many wireless communications facilities of what type shall be permitted on that site. Subject to § 200-63, wireless communications facilities to be located on an existing monopole for which a special permit issued under this article is in effect shall require no further zoning approval. The addition of any wireless communications facilities not specified in the approved special permit, however, shall require a new special permit.

Not Applicable.

D. In order to determine compliance with all applicable FCC regulations, estimates of RFR emissions will be required for all wireless communications facilities, including proposed and future wireless communications facilities both for the applicant and all co-locators.

Please see enclosed RF emissions compliance report which confirms the proposed facility will be compliant with all applicable RF emissions regulations.

§ 200-75. Monitoring and maintenance.

A. Upon issuance of a special permit under this article and after the wireless communications facility is in operation, the applicant shall submit to the Building Inspector, within ninety (90) days of beginning operations, and on each anniversary date of issuance of the Special permit, preexisting and current RFR measurements. Such measurements shall be signed and certified by an RF Engineer, registered as a professional engineer in the Commonwealth of Massachusetts, stating that the RFR measurements are accurate and whether they are in compliance with FCC Guidelines and, if they are not in compliance, how the measurements fail to comply with all applicable FCC Guidelines as specified in § 200-70. The measurements shall be submitted for both the applicant and all co-locators.

The Applicant respectfully reminds the Town Council that the regulation and governance of RF emissions is the exclusive jurisdiction of the federal government, specifically the FCC. The submitted compliance report demonstrates the facility will be compliance and thus a **WAIVER** from having to provide annual testing is respectfully requested.

B. Upon issuance of a special permit under this article and after the wireless communications facility is in operation, the applicant shall submit to the Building Inspector, within ninety (90) days of the issuance of the special permit, preexisting and current measurements of acoustic noise from the wireless

communications facility. Such measurements shall be certified and signed by an acoustical engineer, registered as a professional engineer in the Commonwealth of Massachusetts,
stating that noise measurements are accurate and whether they meet the noise standards of § 200-61G and, if they are not in compliance, how they fail to comply.

The Applicant is proposing an installation up on the roof of an existing building where there are already HVAC units that create some sound. But no new generator is proposed and no equipment that would create any disturbance beyond the lot lines is proposed. Accordingly, a **WAIVER** from having to provide a follow-up acoustical report, unless prompted by a specific complaint, is respectfully requested.

C. The applicant and co-applicant shall maintain the wireless communications facility. Such maintenance shall include, but shall not be limited to, painting, structural integrity, landscaping and general cleaning of the site.

The Applicant is proposing to install its equipment on the roof of an existing building, not build a new tower. However, the Applicant will, of course, maintain its equipment which will become an integral part of its wireless network in the area.

D. Failure by the applicant to provide the information required in this section shall result in a fine imposed on the applicant of $300 for each offense. Each day that such violation continues shall constitute a separate offense.

The Applicant respectfully requests the Town's exemption from those provisions where **WAIVERs** have been requested.

§ 200-76. Abandonment or discontinuance of use.
A. At such time that a licensed carrier plans to abandon or discontinue operation of a wireless communications facility, such carrier will notify the Building Inspector by certified U.S. mail of the proposed date of abandonment or discontinuation of operations. Such notice shall be given no less than thirty (30) days prior to abandonment or discontinuation of operations.
B. Upon abandonment or discontinuation of use, the carrier shall physically remove the wireless communications facility within ninety (90) days from the date of abandonment or discontinuation of use, including but not limited to removal of tower, antennas, mount, equipment shelter(s) and security barriers from the subject property, proper disposal of the waste materials from the site in accordance with local and state solid waste disposal regulations, and restoration of the location of the wireless communications facility to its natural condition, except that any landscaping and grading shall remain in the "after" condition

approved by the special permit granting authority in connection with the grant of the special permit.
C. As a condition of any special permit for the placement, construction, installation or modification of a wireless communications facility, a carrier shall place into escrow a sum of money, to be determined by the special permit granting authority, to cover
the costs of removing the wireless communications facility from the subject property, necessary funds to be held by an independent escrow agent to be jointly appointed by the carrier and the special permit granting authority. The carrier shall authorize and, as necessary, shall obtain the authorization of the owner of the property, to allow the escrow agent to enter upon the subject property to remove the wireless communications facility when the wireless communications facility has been abandoned or discontinued.
D. A wireless communications facility shall be deemed to be abandoned or discontinued if it has not been used for the purpose for which it was originally constructed for a period of six (6) months or more. In the event that the carrier fails to remove the wireless communications facility, in accordance with Subsection B,
above, the Town shall give notice to the carrier and the independent escrow agent that the wireless communications facility shall be removed by the escrow agent forthwith and the escrow agent, after affording written notice seven (7) days in advance to the carrier, shall remove the wireless communications facility.
E. Failure to follow the provisions of this section shall result in a fine of $300 for each offense. Each day that such violation continues shall constitute a separate offense.

The Applicant respectfully requests a **WAIVER** from providing escrow because use of an existing building rooftop is proposed, not a new tower. Furthermore, the Applicant already has a contractual obligation with its landlord to remove its trade fixtures upon termination of tenancy.

§ 200-77. Reconstruction or replacement of preexisting nonconforming facilities. *Wireless communications facilities that were in existence at the time of the adoption of this article may be reconstructed, altered, extended or replaced pursuant to special permit, provided that the special permit granting authority finds that such reconstruction, alteration, extension or replacement will not be substantially more detrimental to the neighborhood and/or the Town than the preexisting nonconforming structure. In making such a determination, the special permit granting authority shall consider whether the proposed reconstruction, alteration, extension or replacement will create public benefits*
such as opportunities for co-location, improvements in public safety, and/or reduction in visual and environmental impacts.

Not Applicable.

§ 200-78. Performance guarantees.

A. Upon issuance of a special permit, the applicant shall procure insurance in a reasonable amount determined and approved by the special permit granting authority after consultation, at the expense of the applicant, with one (1) or more insurance companies to cover damage from the structure, damage from transmissions and other site liabilities. On each anniversary date of the issuance of the special permit, the applicant shall file proof of insurance with the Building Inspector.

The Applicant is proposing to install on the roof of an existing privately-owned building. No new tower is proposed. No public land is being used. Accordingly, the Applicant respectfully requests a **WAIVER** from this inapplicable provision.

B. Annual certification demonstrating continuing compliance with the standards of the Federal Communications Commission, Federal Aviation Administration and the American National Standards Institute shall be filed with the Building Inspector by the applicant.

A **WAIVER** from this provision is respectfully requested. The Applicant is an FCC licensee thus it could not continue in business if it were not compliant with the FCC. The FAA is not implicated here because no new tower is proposed. And finally, a Building Permit will be applied for at which time the Applicant will provide the Building Department with whatever information it requires under 780 C.M.R. to process the Building Permit. Once complete, nothing will change unless modifications are required at which time a new building permit will be applied for and any information the Building Department requires under 780 C.M.R. will be provided again. Therefore, the need to provide annual certifications if no changes have been made is unnecessary.

§ 200-79. Term of special permit.

A. A special permit issued under this article shall be in effect for two (2) years and may be renewed pursuant to the same criteria as applied to the original special permit, provided that the application for renewal of the special permit is made thirty (30) days prior to the expiration date of the original or any renewed special permit.

A **WAIVER** is respectfully requested so that the Applicant may continue to peacefully operate on site, uninterrupted, as long as it holds valid FCC licenses to operate in the area. Furthermore, recent changes to federal telecommunications law render the above provision no longer enforceable.

§ 200-80. Fully enclosed facilities.
Notwithstanding anything to the contrary contained in this article, wireless communications facilities installed wholly within, and not protruding from, the interior space of an existing structure, excluding buildings used for residential use, shall be allowed as of right in all zoning districts, subject to all other applicable Ordinances and regulations of the Town and the following sections of this article: §§ 200-67, 200-68, 200-69, 200-70, 200-71, 200-72, 200-74, 200-75, 200-76, 200-78, 200-79 and 200-82.

Not Applicable.

C. SPECIAL PERMIT ANALYSIS

In addition to the wireless provisions of Article X discussed above, the provisions of Article VIII pertaining to Special Permits are also specifically applicable. In order to demonstrate the Applicant's compliance, the Ordinance provisions are outlined below (*in italics*) with the Applicant's responses thereto (in plain text) as follows:

A. General requirements for use.
(1) A special permit shall be granted by the Planning Board or the Town Council, only upon the written determination of either body, as applicable, that the adverse effects of the proposed use will not outweigh its beneficial impacts to the Town and to the neighborhood, in view of the particular characteristics of the site, and of the proposal in relation to the site.

The Applicant is proposing a wireless facility that will support the public safety and convenience at no cost to the Town. The installation will consist of antennas hidden inside faux chimney structures on the roof hidden from view. It is doubtful anyone will even notice the installation. Accordingly, there will be no foreseeable adverse effects resulting from this beneficial installation.

(2) In addition to any specific factors that may be listed in this chapter, the general criteria to be considered in reviewing an application for a special permit include:
(a) The proposed use is in harmony with the general purpose and intent of this chapter.

The stated purposes of the Town's Zoning Ordinance include, among other things, promoting the health, safety, convenience and general welfare of the public which the proposed installation will support.

(b) The proposed use is consistent with the Town Master Plan.

The Master Plan lists several goals for the Town, including:

- ✓ *Attract strategic development to generate jobs and expand the tax base.*
- ✓ *Support businesses of all sizes to thrive within Randolph.*
- ✓ *Ensure the expansion of community centers and school facilities account for current and future growth.*
- ✓ *Continue to provide excellent public programs to meet the broad ranging needs of the Town.*

Enhanced wireless connectivity and cutting-edge telecommunications support all of the aforementioned goals. Especially in this day, when so many people have become increasingly enamored with and dependent upon their wireless devices, enhanced wireless connectivity benefits the public safety, welfare and convenience.

(c) Traffic flow and safety concerns, including parking and loading.

The proposed unmanned, unoccupied wireless telephone utility installation will host no employees or customers thus traffic flow and parking and loading are non-issues and not applicable to what is being proposed.

(d) Adequacy of utilities and other public services.

The proposed unmanned and unoccupied installation will use no water or sewer services. Electric and landline telephone utilities already exist on site.

(e) Impacts on neighborhood character.

The proposed installation will be up on the roof of an existing building with the antennas hidden inside faux chimney structures.

(f) Impacts on the natural environment.

The proposed installation will make use of the roof of an existing building without expansion of its footprint and with no new equipment being placed on the ground. Accordingly, the installation will have no impact whatsoever on the natural environment.

(g) Fiscal impacts, including impacts on Town services, the tax base and employment.

The proposed unmanned and unoccupied wireless telephone utility installation will require no Town services. No burden will be added to the school system. No impacts on employment will occur; however, the installation of enhanced wireless services will help local businesses who rely on wireless connectivity for communications and that will be good for business and also good for the residents and visitors to that neighborhood of the Town.

D. SITE PLAN REVIEW

Article XI sets forth the standards, applicability and criteria used when analyzing Site Plans. In order to demonstrate the Applicant's compliance, the development standards enumerated in the Ordinance are provided below (*in italics*) with the Applicant's responses thereto (in plain text) as follows:

Section 200-95(A) Site development standards:
(1) Preserves significant natural features.

Not Applicable. The Applicant is proposing an installation on the roof of an existing building where no new ground disturbance is proposed. No natural features will be affected by the proposed installation.

(2) Ensures adequate methods for sewerage, refuse and other wastes resulting from the uses on the site.

Not Applicable. The proposed unmanned and unoccupied installation will use no water or sewer services and no waste or refuse will be produced by this wireless telephone facility.

(3) Provides stormwater management consistent with the requirements of the Stormwater Authority.

Not Applicable. There are no new installations being proposed on-grade. Existing stormwater patterns will not be altered by the proposed installation on the roof of an existing building.

(4) Ensures that utility connections are adequate and are connected from underground.

The installation is proposed up on the roof of an existing building where utilities, which are adequate on-site, will brought up from within the building.

(5) Parking meets the requirements of this chapter.

Not Applicable. The proposed unmanned and unoccupied wireless telephone utility installation will not require any parking.

E. CONCLUSION

Verizon Wireless's proposal, to install a new stealth pole on the roof of a commercial building off Memorial Parkway conforms in all respects to the requirements set forth in Town of Randolph Zoning Ordinance. Furthermore, the Applicant has met the general standards of Special Permits set forth in Chapter 40A of the Massachusetts General Laws.

In addition to state and local law, certain provisions of federal law are also applicable to the Applicant's proposal in that Verizon Wireless is a federally licensed communications provider. Pursuant to the Telecommunications Act of 1996 ("TCA"), Verizon Wireless is afforded certain protections in the analysis of local land use issues which, in effect, act as a federal overlay on a local board's zoning review process. Among other provisions, the TCA provides specifically in 47 U.S.C. Section 332(c)(7)(B)(i) that the action of local governments may not prohibit or have the effect of prohibiting wireless services in their communities. This provision is relevant because Verizon Wireless has a very specific coverage and capacity issue resulting in significant gaps in reliable network coverage in the vicinity of the Subject Property that will continue to exist should this site not be approved.

Furthermore, local governments must treat competing wireless service providers equally and *"shall not unreasonably discriminate among providers of functionally equivalent services."* This provision is relevant to the petition at hand as Verizon Wireless is just one of the wireless carriers that competes with other service providers who have received Town approval to erect cell towers and installed antennas and equipment in other areas in the Town. Verizon Wireless now respectfully requests that it be treated with the same consideration afforded its competitors who have made application, and were approved, for their wireless installations.

For all the foregoing reasons, the Town Council can, in clear conscience, approve the requested Special Permit and Site Plan Review knowing that the submitted Petition complies in all respects with the requirements of the Town of Randolph Zoning Ordinance, the purpose and intent of the specific wireless communications regulations enumerated therein, and state and federal law governing the petition at hand.

Accordingly, the Applicant respectfully requests approval of the requested Special Permit and Site Plan Review pursuant to the submitted Application and Plans.

Verizon New England, Inc.
6 Bowdoin Square, 9th Floor
Boston, MA 02114

January 19, 2022

RE: Evidence of Lease and Landowner's Consent to File for Land Use Permits Granted to Cellco Partnership d/b/a Verizon Wireless

To Whom It May Concern:

The undersigned is owner ("Landowner") of certain real property in the Town of Randolph, MA at 15 Memorial Parkway. Assessor's ID: 54/B/5.A&B ("Subject Property").

Please be advised that Landowner has entered into a lease with Cellco Partnership d/b/a Verizon Wireless ("Applicant") to install a wireless communications facility on a portion of the Subject Property and permission is hereby granted to Applicant to make application for Building, Zoning, Planning, Town Council, or any other Land Use or Regulatory Permit(s) required to effectuate the installation of said wireless facility.

The Applicant, or its agent, is hereby authorized to execute the required application(s) regarding this matter. Permission is also hereby granted for public officials and Board, Commission, or Council members, as required, to enter upon the Subject Property for the limited purpose of inspecting the specific site and access that are the subject of Verizon Wireless's proposed installation.

Sincerely,

Verizon New England, Inc.

By: Jennifer Miller

Property Location 15 MEMORIAL PKWY | Map ID 54/ B/ 5.A&B/ / | Bldg Name | State Use 4300
Vision ID 9805 | Account # 7191 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 12-22-2021 10:45:17

CURRENT OWNER

NEW ENGLAND TEL & TEL CO
C/O DUFF AND PHELPS
PO BOX 2749

ADDISON TX 75001

TOPO	UTILITIES	STRT / ROAD	LOCATION
1 Level	1 All Public	1 Paved	
		7 Heavy Traffic	

SUPPLEMENTAL DATA

Alt Prcl ID	54-B-005.A&B	CYCLICAL	2023
Census	4203.02	OWNER	O
IN			
Zone	CSBD	SFLA	22412
Nbhd	CG	Lot Size	.46166
Color			
GIS ID	F_779979_2884911	Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraised	Assessed
INDUSTR.	4300	820,400	820,400
IND LAND	4300	354,700	354,700
INDUSTR.	4300	4,800	4,800
	Total	1,179,900	1,179,900

421

RANDOLPH, MA

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
NEW ENGLAND TEL & TEL CO	3107	0566	08-20-1952	Q	I	0	00

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2021	4300	820,400	2020	4300	820,400	2019	4300	785,200
	4300	295,200		4300	295,200		4300	281,500
	4300	4,800		4300	4,800		4300	4,800
	Total	1,120,400		Total	1,120,400		Total	1,071,500

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	820,400
Appraised Xf (B) Value (Bldg)	0
Appraised Ob (B) Value (Bldg)	4,800
Appraised Land Value (Bldg)	354,700
Special Land Value	0
Total Appraised Parcel Value	1,179,900
Valuation Method	C
Total Appraised Parcel Value	1,179,900

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	B	Tracing	Batch
0001				1

NOTES

VERIZON PHONE BLDG

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments
B-17-110	03-08-2017	BP	Permit			100		BUILD PARTITION WALL WIT
07-0392	10-22-2007	RE	Remodel	328,244	10-08-2008	100	12-31-2007	REMOVAL OF INTERIOR GE
07-0241	06-20-2007	RE	Remodel	164,000	10-08-2008	100	12-31-2007	FACADE & ROOF TOP ALT. F
07-0015	01-17-2007	RE	Remodel	80,000	12-31-2007	100	12-31-2007	INTERIOR RENOVATIONS
04-0362	08-31-2004	BP	Permit	78,000	08-02-2005	100	08-02-2005	REROOF
96-267	09-01-1996	BP	Permit	0		100		HVAC UPGRADE

VISIT / CHANGE HISTORY

Date	Id	Type	Is	Cd	Purpost/Result
04-03-2014	SW	8		15	Field Review
10-08-2008	RJH			00	Measure And List
09-20-2007	PDB			00	Measure And List
10-24-2006	PSM			15	Field Review

LAND LINE VALUATION SECTION

B	Use Code	Description	Zone	Land Type	Land Units		Unit Price	I. Factor	Site Index	Cond.	Nbhd.	Nbhd Adj	Notes	Location Adjustment		Adj Unit Pric	Land Value
1	4300	Tel X Sta	CSB	Site	20,110	SF	8.82	1.00000	5	1.00	CG	2.000			0	17.64	354,700
				Total Card Land Units	0	AC	Parcel Total Land Area:	0								Total Land Value	354,700

Property Location 15 MEMORIAL PKWY | Map ID 54/ B/ 5.A&B/ / | Bldg Name | State Use 4300
Vision ID 9805 | Account # 7191 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 12-22-2021 10:45:19

CONSTRUCTION DETAIL

Element	Cd	Description
Style	78	Phone Building
Model	96	Industrial
Grade	06	C
Stories	2.00	
Occupancy	1.00	
Exterior Wall 1	20	Brick
Exterior Wall 2		
Roof Structure	01	Flat
Roof Cover	04	Tar & Gravel
Interior Wall 1	05	Drywall
Interior Wall 2		
Interior Floor 1	06	Asphalt Tile
Interior Floor 2		
Heating Fuel	03	Gas
Heat Type	04	Forced Hot Air
AC Percent	100	
Heat Percent	100	
Bldg Use	4300	Tel X Sta
Total Rooms	0	
Bedrooms	0	
Full Baths	0	
Half Baths	4	
Xtra Fixtures	0	
Frame	05	Steel
Plumbing	02	Average
Foundation	08	Poured Conc
Partitions	02	Average
Wall Height	12.00	
% Sprinkler	0.00	
1st Floor Use		

CONSTRUCTION DETAIL (CONTINUED)

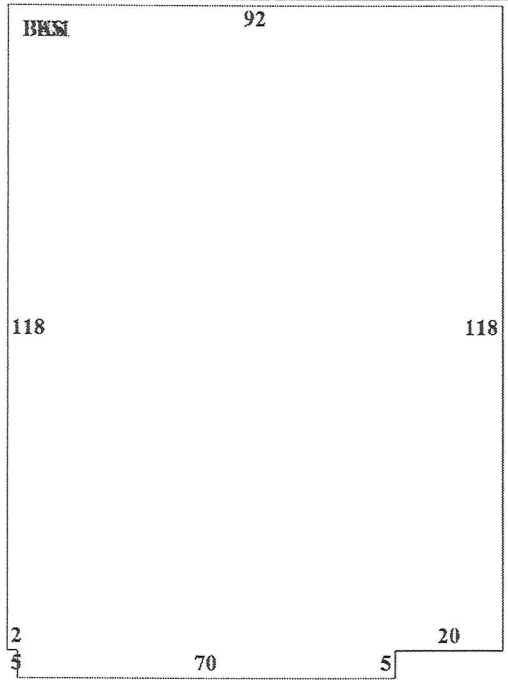
Element	Cd	Description

MIXED USE

Code	Description	Percentage
4300	Tel X Sta	100
		0
		0

COST / MARKET VALUATION

RCN	1,439,242
Year Built	1953
Effective Year Built	1988
Depreciation Code	A
Remodel Rating	
Year Remodeled	
Depreciation %	33
Functional Obsol	0
External Obsol	10
Trend Factor	1
Condition	
Condition %	
Percent Good	57
Cns Sect Rcnld	820,400
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	



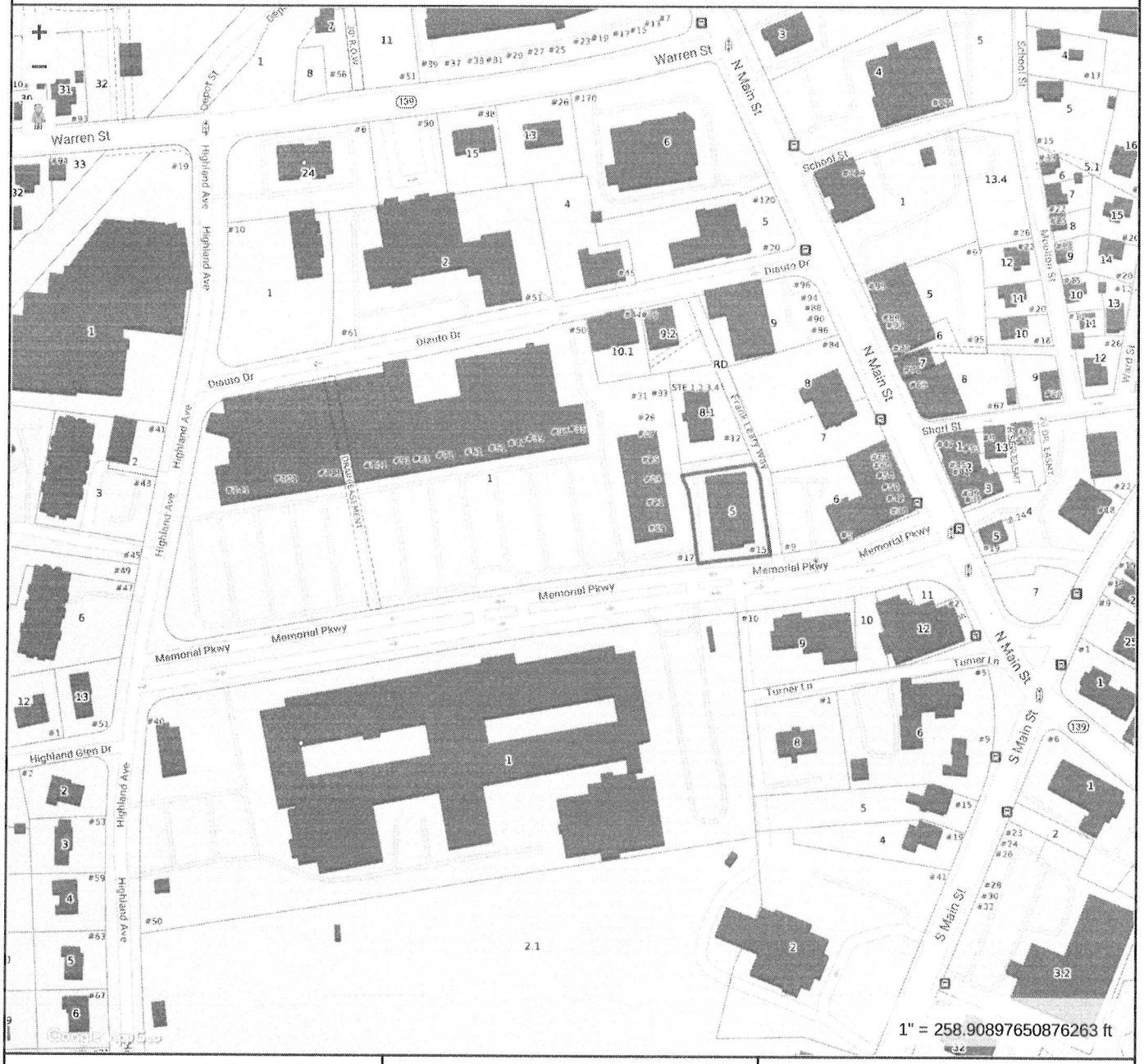
OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	L/B	Units	Unit Price	Yr Blt	Cond. Cd	% Good	Grade	Grade Adj	Appr. Value
LT1	Lights - Single	L	1	375.00	1953	A	50	C	1.00	200
PAV1	Paving - Asphal	L	6,700	1.20	1953	A	50	C	1.00	4,000
FES	Fire Escape	B	2	750.00	1985	A	0	C	1.00	0
SHD3	Shed - Metal	L	176	5.00	2007	G	60	B	1.13	600

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Floor Area	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	11,206	11,206	11,206	58.38	654,206
BSM	Basement	0	11,206	2,241	11.67	130,830
FUS	Finished Upper Story	11,206	11,206	11,206	58.38	654,206
	Ttl Gross Liv / Lease Area	22,412	33,618	24,653		1,439,242

net randolph 19 memorial



Property Information

Property ID	54-B-5.A&B
Location	15 MEMORIAL PKWY
Owner	NEW ENGLAND TEL & TEL CO

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Randolph, MA makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 6/14/2021
Data updated on a daily basis

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

3107

566

feet, thence westerly by land of M. J. Diauto a distance of 238.61 feet, thence southerly by land of Town of Randolph a distance of 21.06 feet, thence easterly along line of Memorial Drive to a point of beginning a distance of 248.56 feet, as per plan by Lawrence W. DeCelle, Surveyor, on file with the Board of Selectmen, at a sale price of $1034.00.

A True Copy:

Attest: Wilho E. Maun
Town Clerk

NOT AN OFFICIAL COPY

Rec'd & entered for record Aug.20,1952 at 3h.59m.P.M.

---

otherwise known as Michael J. Diauto.

I, MICHAEL JOSEPH DIAUTO, of Randolph, in the County of Norfolk

County, Massachusetts,

of

being unmarried, for consideration paid, grant to NEW ENGLAND TELEPHONE AND TELEGRAPH COMPANY, a New York corporation,

of with quitclaim covenants

the land in a parcel of land situated on the Northwesterly side of Memorial Parkway in said Randolph, shown on Plan of Land in

(Description and encumbrances, if any)

Randolph, Mass. Norfolk County, dated April 22, 1952 by L. W. DeCelle & Sons. Civil Engineers, to be recorded herewith, bounded and described as follows:

SOUTHEASTERLY on said Memorial Parkway, One Hundred Twenty-five (125) feet;

SOUTHWESTERLY on land now or formerly of M. A. Kane and M. I. Pearlstein, One Hundred Thirty and 06/100 (130.06) feet;

NORTHWESTERLY on the same, One Hundred Twenty-five and 58/100 (125.58) feet; and

NORTHEASTERLY on other land of the Grantor herein, One Hundred Thirty-six and 58/100 (136.58) feet.

The granted premises comprise Parcel "A" and Parcel "B" as shown on said plan and according to said plan contains 15,915 square feet.

The granted premises comprise portions of the same premises conveyed to the Grantor herein by Socony Vacuum Oil Company, Incorporated, by deed dated May 24, 1949, recorded with Norfolk Deeds, Book 2834, Page 357, and by the Town of Randolph by deed of even delivery and record herewith, and the same are hereby conveyed subject to the taxes to be assessed as of January 1, 1952.

Subject to taxes assessed as of Jan 1-1952.

Massachusetts Deed Excise Stamps in sum of $ 18.45 affixed and cancelled on back of this instrument.

U. S. Federal Revenue Stamps in sum of $ 17.60 affixed and cancelled on back of this instrument.

I, CHARLOTTE L. DIAUTO, husband wife of said grantor

release to said grantee all rights of dower and homestead and other interests therein. tenancy by the entirety

Witness our hands and seals this 18th day of June 1952.

Michael J. Diauto

Charlotte Lillian Diauto

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

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

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

FCC Registration Number (FRN): 0003290673

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

Market Number	Channel Block	Sub-Market Designator
REA001	C	0

Market Name
Northeast

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

Waivers/Conditions:

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

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

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

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

FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

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

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission
Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

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

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

FCC Registration Number (FRN): 0003290673

Market Name
Boston-Lowell-Brockton-Lawrenc

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

Site Information:

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

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 7
Maximum Transmitting ERP in Watts: 140.820

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

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

FCC 601-C
March 2018

Licensee Name: CELLCO PARTNERSHIP

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

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

Address: 113 Main Street
City: Medway **County:** NORFOLK **State:** MA **Construction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

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

Address: (Scituate) OFF CLAPP RD
City: SCITUATE **County:** PLYMOUTH **State:** MA **Construction Deadline:**

Antenna: 7
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 8
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 9
Maximum Transmitting ERP in Watts: 140.820

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

Licensee Name: CELLCO PARTNERSHIP

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

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

Address: (Derry) 46 FLOYD ROAD
City: DERRY **County:** ROCKINGHAM **State:** NH **Construction Deadline:**

Antenna: 4

Maximum Transmitting ERP in Watts:	140.820							
Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	82.200	129.400	144.500	155.100	136.800	127.900	126.200	118.100
Transmitting ERP (watts)	31.810	146.820	102.310	15.410	1.000	1.000	1.000	1.130

Antenna: 5

Maximum Transmitting ERP in Watts:	140.820							
Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	82.200	129.400	144.500	155.100	136.800	127.900	126.200	118.100
Transmitting ERP (watts)	1.000	1.000	4.660	82.110	250.350	80.300	3.790	1.000

Antenna: 6

Maximum Transmitting ERP in Watts:	140.820							
Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	80.200	129.400	144.500	155.100	136.800	127.900	126.200	118.100
Transmitting ERP (watts)	32.480	1.680	1.000	1.000	1.000	13.740	107.220	143.470

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

Address: (Middleboro) E. GROVE ST.
City: MIDDLESBORO **County:** PLYMOUTH **State:** MA **Construction Deadline:**

Antenna: 7

Maximum Transmitting ERP in Watts:	140.820							
Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	57.600	32.400	40.200	47.600	44.900	41.300	50.300	52.600
Transmitting ERP (watts)	277.330	364.730	40.890	2.250	0.960	0.960	2.410	20.640

Antenna: 8

Maximum Transmitting ERP in Watts:	140.820							
Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	57.600	32.400	40.200	47.600	44.900	41.300	50.300	52.600
Transmitting ERP (watts)	0.960	3.730	61.620	418.280	215.780	13.090	1.700	0.960

Antenna: 9

Maximum Transmitting ERP in Watts:	140.820							
Azimuth(from true north)	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Antenna Height AAT (meters)	57.600	32.400	40.200	47.600	44.900	41.300	50.300	52.600
Transmitting ERP (watts)	5.070	1.130	0.610	1.600	5.050	89.040	278.490	66.210

Licensee Name: CELLCO PARTNERSHIP

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

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

Address: Main Street
City: South Acton **County:** MIDDLESEX **State:** MA **Construction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

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

Address: 12 First Street
City: Salem **County:** ESSEX **State:** MA **Construction Deadline:**

Antenna: 7
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 8
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 9
Maximum Transmitting ERP in Watts: 140.820

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

Licensee Name: CELLCO PARTNERSHIP

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

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

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 7
Maximum Transmitting ERP in Watts: 140.820

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

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

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

Antenna: 2
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 3
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Licensee Name: CELLCO PARTNERSHIP

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

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

Address: (Amesbury) 10 DENNET WAY
City: AMESBURY **County:** ESSEX **State:** MA **Construction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

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

Address: (Wrentham) 415 Washington St. - Route 1
City: WRENTHAM **County:** NORFOLK **State:** MA **Construction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

Licensee Name: CELLCO PARTNERSHIP

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

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

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

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

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

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

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

Licensee Name: CELLCO PARTNERSHIP

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

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

Address: (Plymouth) CALEB ST
City: Plymouth **County:** PLYMOUTH **State:** MA **Construction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

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

Address: 1.25 MI NNE
City: HOPKINTON **County:** MIDDLESEX **State:** MA **Construction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

Licensee Name: CELLCO PARTNERSHIP

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

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

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

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

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

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

Antenna: 2
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Licensee Name: CELLCO PARTNERSHIP

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

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

Address: 5 Boston Hill Road
City: North Andover **County:** ESSEX **State:** MA **Construction Deadline:**

Antenna: 4
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 5
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 6
Maximum Transmitting ERP in Watts: 140.820

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

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

Address: 140 CABOT ST
City: NEEDHAM **County:** NORFOLK **State:** MA **Construction Deadline:**

Antenna: 1
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 2
Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 3
Maximum Transmitting ERP in Watts: 140.820

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

Licensee Name: CELLCO PARTNERSHIP

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

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

Address: (Cambridge Donnelly Field site) 284 Norfolk Street

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

Antenna: 1

Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 2

Maximum Transmitting ERP in Watts: 140.820

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

Antenna: 3

Maximum Transmitting ERP in Watts: 140.820

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

Control Points:

Control Pt. No. 3

Address: 500 W. Dove Rd.

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

Waivers/Conditions:

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

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: 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:

NONE

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: KNLH310 **File Number:** **Print Date:**

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: AIRTOUCH CELLULAR

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

Call Sign	File Number
KNLF646	
Radio Service CW - PCS Broadband	

FCC Registration Number (FRN): 0006146468

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

Market Number	Channel Block	Sub-Market Designator
BTA051	C	3

Market Name
Boston, MA

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

Waivers/Conditions:

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

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

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

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

FCC 601-MB
August 2021

Licensee Name: AIRTOUCH CELLULAR

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

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

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

Call Sign	File Number
WQGB266	0009783855
Radio Service AW - AWS (1710-1755 MHz and 2110-2155 MHz)	

FCC Registration Number (FRN): 0003290673

Grant Date	Effective Date	Expiration Date	Print Date
02-10-2022	02-10-2022	11-29-2036	02-11-2022

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.

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

Licensee Name: CELLCO PARTNERSHIP

Call Sign: WQGB266 **File Number:** 0009783855 **Print Date:** 02-11-2022

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

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

Call Sign	File Number
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.

FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

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

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: CELLCO PARTNERSHIP

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

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

FCC Registration Number (FRN): 0003290673

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

Market Number	Channel Block	Sub-Market Designator
BEA003	B	1

Market Name
Boston-Worcester-Lawrence-Lowe

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

Waivers/Conditions:

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

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

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

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

FCC 601-MB
August 2021

Licensee Name: CELLCO PARTNERSHIP

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

700 MHz Relicensed Area Information:

Market	Market Name	Buildout Deadline	Buildout Notification	Status

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
Phone: (603) 644 2800
support@csquaredsystems.com

RF Report

Proposed Wireless Facility
15 Memorial Parkway
Randolph, MA 02368

April 28, 2022

TABLE OF CONTENTS

LIST OF TABLES

ATTACHMENTS

1. Overview

This RF Report has been prepared on behalf of Verizon Wireless' proposal to the Town of Randolph for the installation and operation of a wireless facility located at 15 Memorial Parkway. The proposed facility consists of an equipment platform and telecommunications cabinets along with antennas and associated equipment mounted on the rooftop.

This report concludes that the proposed site will fill in coverage gaps and provide additional capacity in order to improve deficient service areas to downtown Randolph and along N/S Main Street (Route 28), Route 139 (Warren Street), and the surrounding roads, neighborhoods, and business/shopping/community areas in the proximity of the proposed site.

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 4th Generation (4G) voice and data services over LTE technology in the 700 MHz, Cellular (800 MHz), PCS (1900 MHz), and AWS (2100 MHz) frequency bands as allocated by the FCC, along with the CBRS band (3.5-3.7 GHz). It is also in the midst of deploying advanced 5th generation (5G) NR services in its cellular, C-band (3.7-3.98 GHz) and 28 GHz licensed frequency bands. These 4G and 5G networks are used to provide high-speed wireless connections used by mobile devices for fast web browsing, media streaming, video conferencing, and other applications that require broadband connections. The mobile devices that benefit from these advanced networks include typical smartphones, tablets, laptops, and Wi-Fi hotspots. With the continual advancement of its networks, Verizon Wireless customers will enjoy even faster connections to people, information, and entertainment in a day and age when reliable wireless connectivity is an indispensable part of daily personal and business life.

As explained within this report, Verizon Wireless has identified the need to add a new facility to its existing network of sites in the Randolph area to improve coverage and capacity to a significant gap in service that now exists in Randolph, 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 (207% from 2015-2020 for mobile wireless data traffic 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 collocating the proposed wireless communication facility on the rooftop at 15 Memorial Parkway at an antenna centerline height of 43' AGL (above ground level), Verizon Wireless will be able to provide substantially improved coverage and additional capacity to residents, businesses, and traffic corridors within Randolph that are currently located within gaps in service of Verizon Wireless' network.

[1] "2021 Annual Survey Highlights", July 27, 2021, CTIA. https://www.ctia.org/news/2021-annual-survey-highlights

3. The Proposed Facility

Verizon Wireless' proposed facility consists principally of the following elements:

1) A 12'-0" x 16'-6" steel equipment platform with telecommunications equipment cabinets and utility connections on the rooftop;
2) Twelve (12) panel antennas (three per sector) mounted at a centerline elevation of 6'-9" above the roof (43' AGL) and inside 48" outer diameter fiberglass canisters, on four ballast mounts (two canisters per mount);
3) Remote Radio Heads (RRH) with accessory junction boxes and surge suppressors ballast-mounted alongside the antennas;

4. Coverage and Capacity Objectives

As mentioned above, Verizon Wireless is in the process of advancing its 4G LTE high-speed wireless broadband system in the 700 MHz, Cellular, PCS, AWS and CBRS frequency bands, in accordance with its applicable licenses from the FCC. Verizon is also in the midst of deploying a 5G NR system in its licensed cellular, C-Band, and 28 GHz frequency bands. 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 significant gaps in service exist in and around sections of Randolph, as described further below.

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

- Downtown Randolph;
- N/S Main Street (Route 28)
- Route 139 (Warren Street);
    - Serves ~ 18,600 vehicles per day as measured between Route 24 and Route 28 (2020);
- Town Hall, Turner Library, Randolph High School, Randolph P.D. and Central Station;
- The surrounding roads, neighborhoods, and business/shopping/community areas in the proximity of the proposed site.

The proposed site located at 15 Memorial Parkway ("Randolph 3 MA") 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 residents, businesses, and visitors in this area.

[2] Traffic counts are sourced from the Massachusetts Department of Transportation, Transportation Data Management System. https://mhd.public.ms2soft.com/tcds/tsearch.asp?loc=Mhd&mod=

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 sufficient height is considered) 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 15 Memorial Parkway is the most appropriate solution to address its targeted coverage and capacity objectives.

6. Pertinent Site Data

Table 1 below details the site-specific information for the on-air and proposed Verizon Wireless macro-sites used to perform the coverage analysis and generate the coverage plots provided herein.

Site Name	Address	City/Town	Location		Structure Type	Antenna Height (ft AGL)	Status
			Latitude	Longitude			
Abington 3	485 N Quincy St.	Brockton	42.1246	-71.0011	Self-Support	125	On-Air
Avon	15 Grant Dr.	Avon	42.1286	-71.0694	Self-Support	140	On-Air
Braintree 8	531-533 Pond St.	Braintree	42.1948	-71.0300	Self-Support	92	On-Air
Brockton N	1001 North Montello St.	Brockton	42.1124	-71.0255	Monopole	140	On-Air
Canton	1000 Turnpike St.	Canton	42.1510	-71.1017	Self-Support	150	On-Air
Canton E	490 Turnpike St.	Canton	42.1687	-71.1092	Rooftop	48.8	On-Air
Holbrook	153 South Franklin St.	Holbrook	42.1506	-71.0049	Monopole	160	On-Air
Holbrook 2	329 Pine St.	Holbrook	42.1659	-71.0011	Power Lines	137	On-Air
Randolph	10 York Ave.	Randolph	42.1815	-71.0687	Self-Support	137	On-Air
Randolph E	37 Teed Dr.	Randolph	42.1744	-71.0247	Monopole	118	On-Air
Randolph North	490 High St.	Randolph	42.2029	-71.0669	Monopole	100	On-Air
Randolph SO	106 Mazzeo Dr.	Randolph	42.1599	-71.0623	Monopole	150	On-Air
Randolph 3	**15 Memorial Parkway**	Randolph	**42.1635**	**-71.0433**	**Rooftop**	**43**	**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 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 model coverage and other related RF parameters used in site design and network expansion.

The coverage plots included as attachments show coverage based on RSRP signal strengths of -95 dBm and above. All other areas (depicted in white) fall within coverage areas characterized by poor service quality, low data throughput, and the substantial likelihood of unreliable service.

Attachments A - E are discussed below:

Attachment A titled "Randolph 3 MA – Existing 700 MHz & 2100 MHz LTE Coverage (Macro-Sites)" shows the coverage provided to areas of Randolph, MA from the existing "On-Air" sites listed in Table 1. The green and yellow shaded areas represent the minimum desired level of coverage for much of this area for the 700 MHz and 2100 MHz network layers, respectively. Because of the superior propagation characteristics of 700 MHz relative to 2100 MHz, the 2100 MHz coverage areas (yellow) are generally contained within the 700 MHz coverage areas (green). As such, the deficient areas of 700 MHz coverage are defined by the unshaded areas, whereas the deficient areas of 2100 MHz coverage consist of both the green and white areas. As shown in this plot and described in the Coverage and Capacity Objectives section of this report, much of Randolph is in an area of deficient coverage. These coverage gaps, particularly at 2100 MHz, include downtown Randolph, N/S Main Street (Route 28), Route 139 (Warren Street), and the surrounding roads, neighborhoods, and business/shopping/community areas in the proximity of the proposed site.

Attachment B titled "Randolph 3 MA – 700 MHz & 2100 MHz LTE Coverage with Proposed Site (Macro-Sites)" shows the composite coverage with the proposed "Randolph 3" facility. As shown by the additional areas of 2100 MHz coverage, the proposed facility will provide coverage to:

- ~ 0.2 mi along N/S Main Street (Route 28);
- ~ 0.2 mi along Route 139 (Warren Street);
- ~ 900 additional residents[4], ~ 550 additional employees[5] and ~ 300 (2100 MHz) additional structures[6];
- The surrounding roads, neighborhoods, and business/shopping/community areas in the proximity of the proposed site.

[4] Residential population counts referenced here and elsewhere within this report are based upon the 2010 U.S. Census data.

[5] Employee population counts referenced here and elsewhere within this report are based upon the 2017 U.S. Census Bureau LEHD database.

[6] Structure counts referenced here in this report are based upon "roofprint" data sourced from MassGIS (Bureau of Geographic Information). The dataset contains two-dimensional roof outlines for all buildings larger than 150 ft² and may not necessarily include only dwellings. For additional information, refer to https://docs.digital.mass.gov/dataset/massgis-data-building-structures-2-d

Attachment C titled "Randolph 3 MA – Existing 700 MHz LTE Sector Footprints (Macro-Sites)" depicts the areas primarily served by the sectors (a.k.a. signal "footprints") of the surrounding 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. 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 presently 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 can impose a significant capacity burden on the sites primarily serving the area.

Attachment D titled "Randolph 3 MA – 700 MHz LTE Sector Footprints with Proposed Site (Macro-Sites)" shows the composite coverage with the overall footprint of the proposed facility in dark green. As shown in this map, the proposed "Randolph 3" facility is an effective solution to provide capacity relief to the area, particularly to the "Randolph South" alpha sector (red). The proposed facility is located near the targeted downtown area making it particularly suited to distribute the traffic load across multiple sectors and provide a dominant server to this gap in service. Table 2 below details the capacity relief based on the sector footprints shown in Attachments C and D.

Sector	Current			With "Randolph 3"			Offload Summary		
	Employee Pops	Residental Pops	Structures	Employee Pops	Residental Pops	Structures	Total Employee Pops Offloaded	Total Residential Pops Offloaded	Structures Offloaded
Randolph South Alpha	2379	6204	1804	839	4518	1295	1540 (64.7%)	1686 (27.2%)	509 (28.2%)

Table 2: Capacity Offload Summary

Attachment E titled "Randolph 3 MA – Area Topography Map" details the topographical features around the proposed "Randolph 3" 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 blue and green shades correspond to lower elevations, whereas the orange and red 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 specific frequency blocks of the 700 MHz band, the Cellular band, the PCS band, the AWS band, the CBRS band, the C-band, and 28 GHz 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.

9. Summary

In undertaking its build-out of 4G LTE and 5G NR service in Norfolk County, Verizon Wireless has determined that an additional facility is needed to provide reliable service and additional capacity throughout areas of Randolph, MA. By collocating its proposed wireless communications facility on the rooftop at 15 Memorial Parkway in Randolph at an antenna centerline height of 43 feet (AGL), Verizon Wireless will provide additional coverage and capacity needed in the targeted coverage areas including key roadways such as N/S Main Street (Route 28), Route 139 (Warren Street), and the surrounding roads, neighborhoods, and business/shopping/community areas in the proximity of the proposed site. Without the installation of the proposed site, Verizon Wireless will be unable to improve and expand their wireless communication services in this area of Randolph, MA; therefore, Verizon Wireless respectfully requests that the Town of Randolph 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.

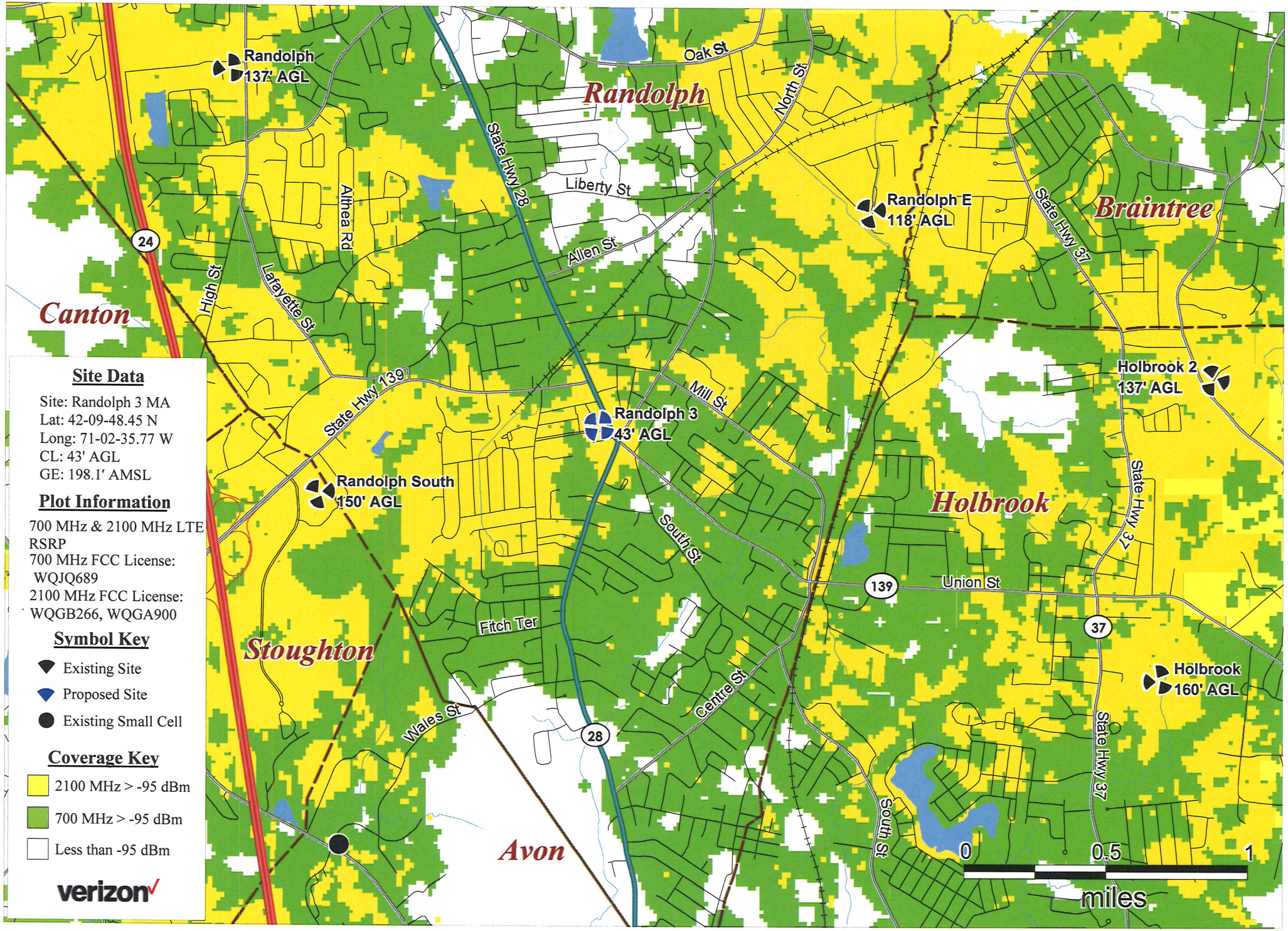
Keith Vellante

Keith Vellante
RF Engineer
C Squared Systems, LLC

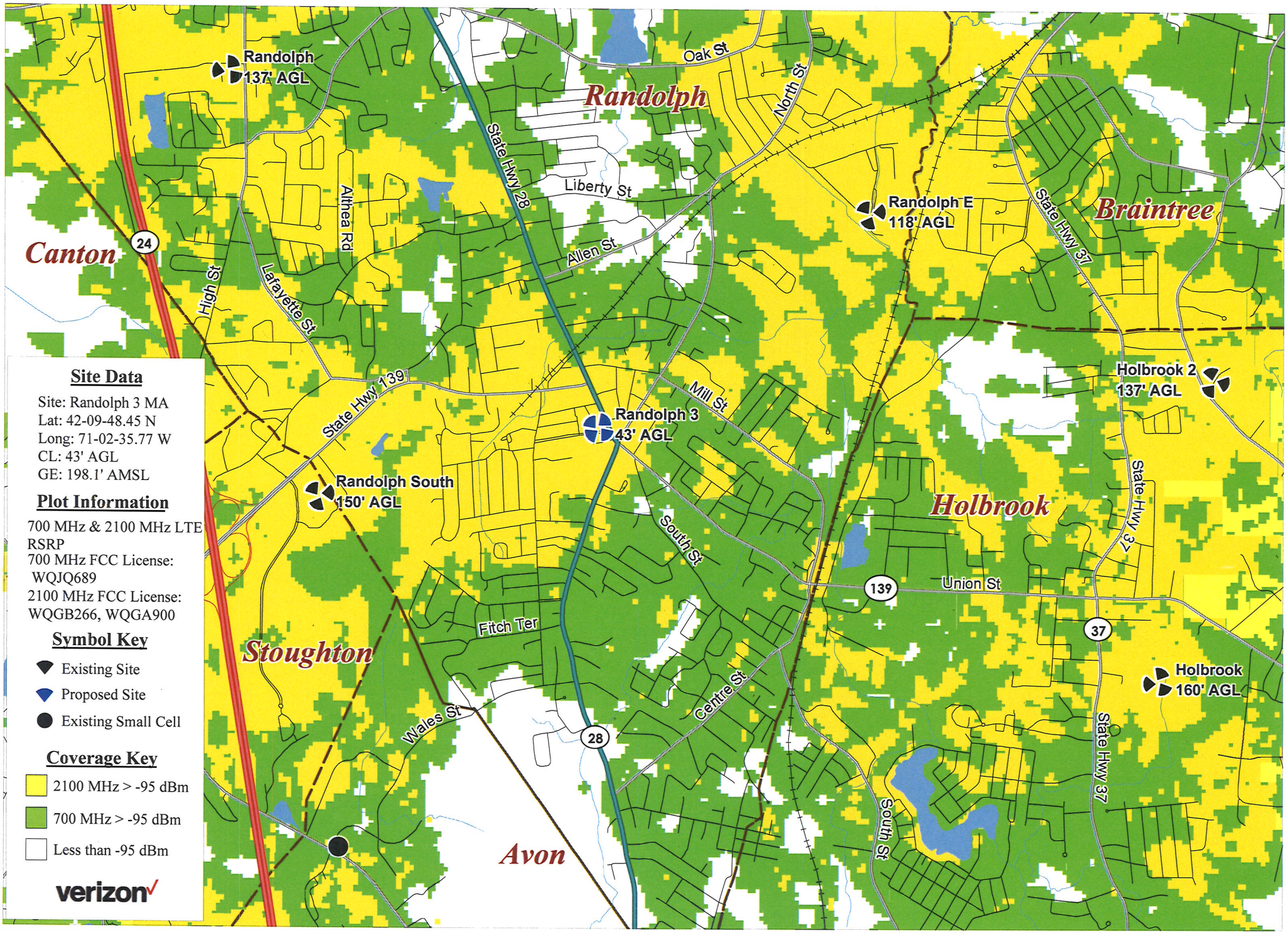
April 28, 2022
Date

11. Attachments

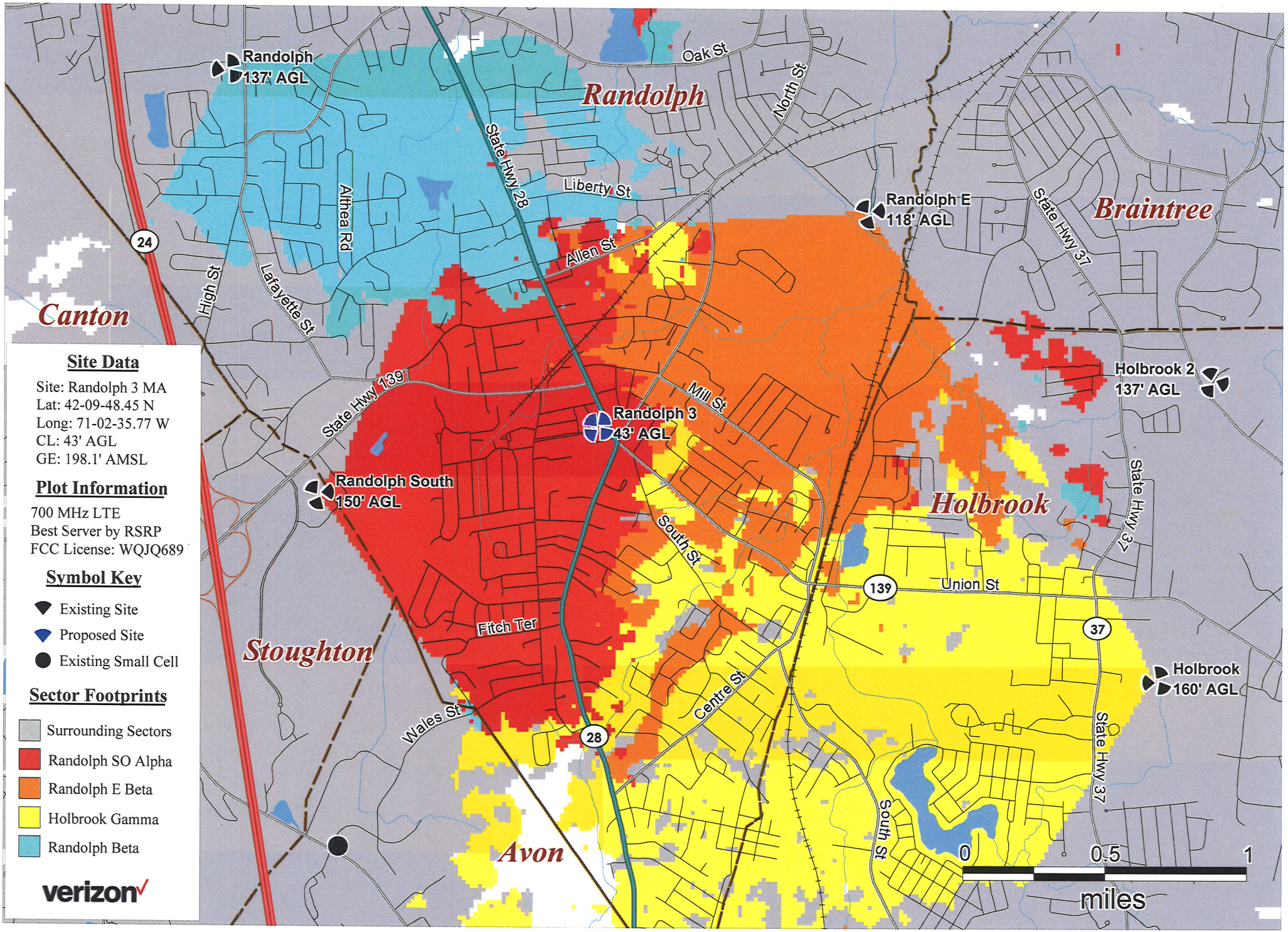
Attachment A:
Randolph 3 MA - Existing 700 MHz & 2100 MHz LTE Coverage (Macro-Sites)



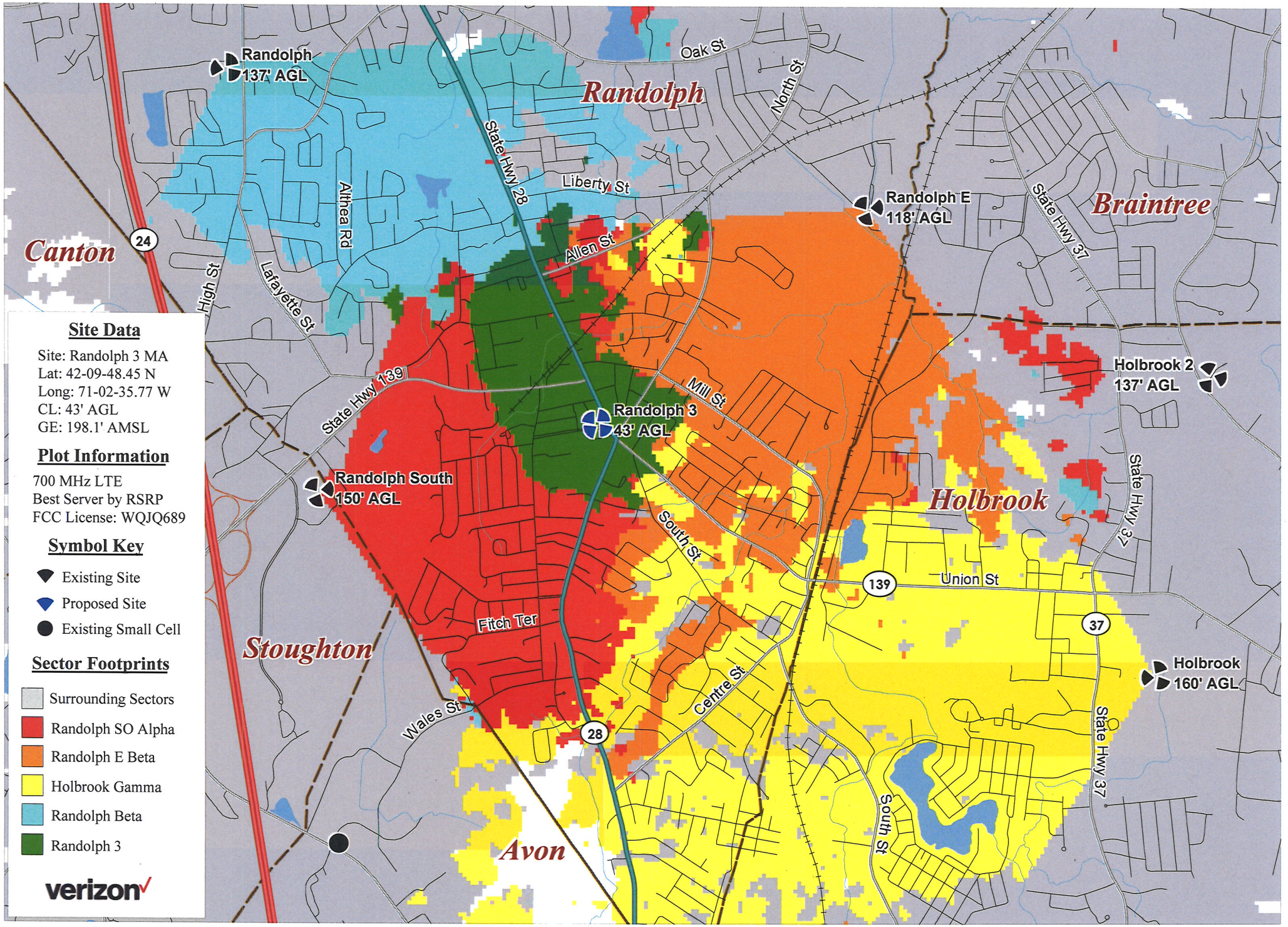
Attachment B:
Randolph 3 MA - 700 & 2100 MHz LTE Coverage with Proposed Site (Macro-Sites)



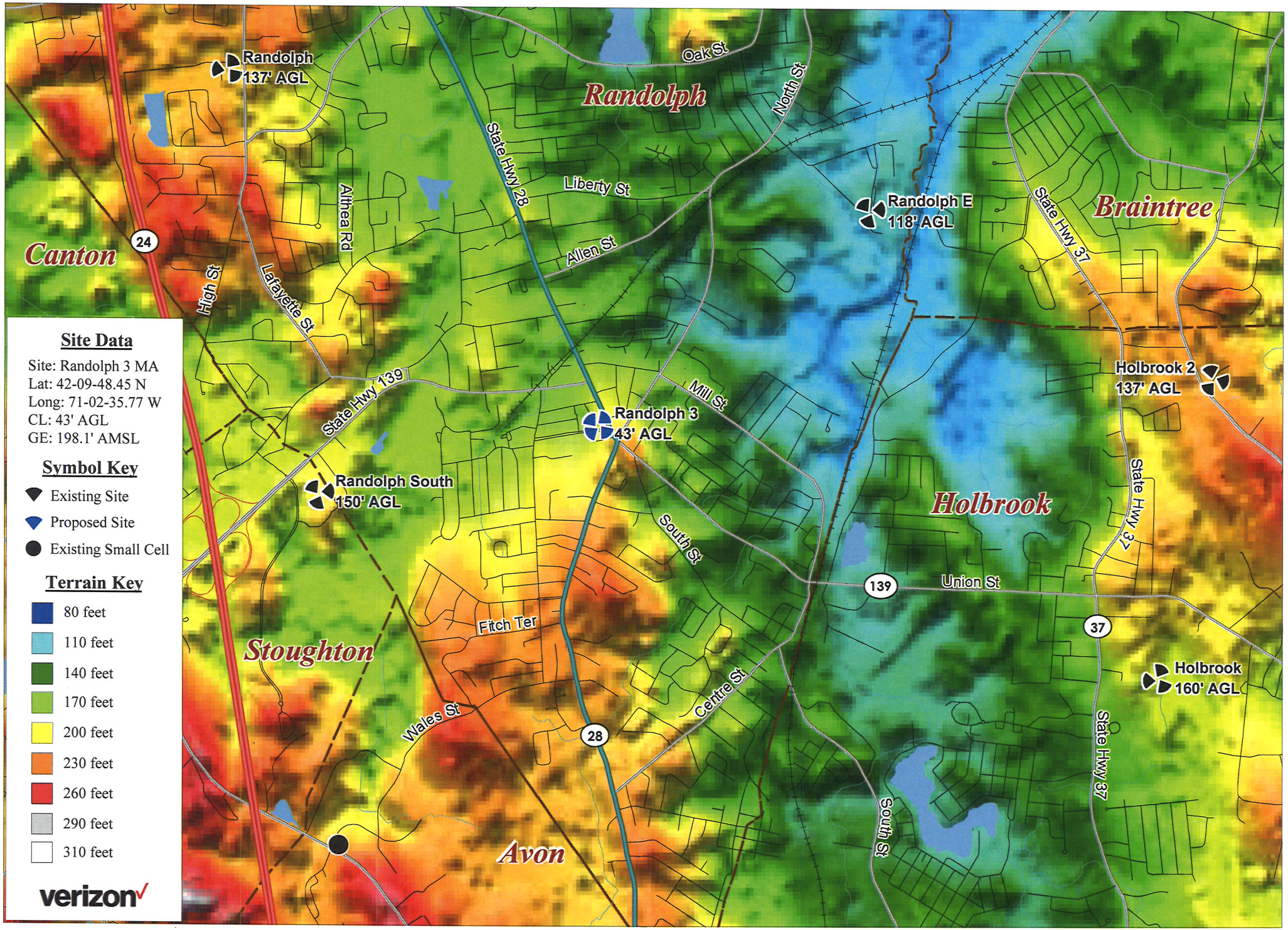
Attachment C:
Randolph 3 MA - Existing 700 MHz LTE Sector Footprints (Macro-Sites)



Attachment D:
Randolph 3 MA - 700 MHz LTE Sector Footprints with Proposed Site (Macro-Sites)



Attachment E:
Randolph 3 MA - Area Topography Map



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

January 31, 2022

RE: Installation of radio base station antennas and associated equipment for the Personal Wireless Services facility to be located on the rooftop of the building located at 33 Memorial Parkway, Randolph, MA.

PURPOSE

I have reviewed the information pertinent to the proposed installation at the above location. To determine regulatory compliance, theoretical calculations of maximal radio-frequency (RF) fields have been prepared. The physical conditions are that Verizon Wireless proposes to mount their personal wireless services (PWS) directional panel antennas (installed in four different "arrays" aimed in different directions) on the roof-top of the building located at 33 Memorial Parkway, Randolph, MA (See Figures 2a and 2b). The proposed installation will allow Verizon Wireless to continue deployment of their Long-Term Evolution (LTE) and Advanced Wireless Services (AWS) systems.

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

SUMMARY

Theoretical RF field calculations data indicate the summation of the proposed Verizon Wireless PWS RF contributions would be within the established RF exposure guidelines; see Figure 3 and Table 3. This includes all publicly accessible areas, and within the building itself. The results support compliance with the pertinent sections of the FCC's Rules and MDPH regulations regarding PWS facilities. Access to the areas between the antennas and the roof edge is restricted to those workers who have been trained in RF Safety and the Occupational Safety and Health Administration (OSHA) rules for fall protection.[iv]

Based on the results of the theoretical RF fields I have calculated; it is my expert opinion that this facility would comply with all regulatory guidelines for RF exposure with the installation of the proposed Verizon Wireless antennas and transmitters.

Note: The analyses, conclusions and professional opinions are based upon the precise parameters and conditions of this particular site; **Existing Rooftop at 33 Memorial Parkway, Randolph, MA**. Utilization of these analyses, conclusions and professional opinions for any personal wireless services installation, existing or proposed, other than the aforementioned has not been sanctioned by the author, and therefore should not be accepted as evidence of regulatory compliance.

INTRODUCTORY INFORMATION: MAKING SENSE OF THE "G"S

There are many references to the so-called "generation" of wireless technologies in use. Each new "generation" of wireless technologies has colloquially been designated a numbered "G".[1] The latest "G" to come out, the fifth generation of wireless technologies or so called "5G", has attracted extensive research interest, both inside and outside the scientific community. According to the 3rd generation partnership project,[2] 5G networks should support three major families of applications: (1) Enhanced mobile broadband; (2) Machine type communications, and (3) Ultra-reliable and low-latency communications. These situations require much more "connectivity" than the latest fourth generation (aka "4G" or "Long Term Evolution (LTE)") networks can handle. Thus, new networks must be able to handle this high system throughput, in addition to supporting existing older technologies still in use. This is being accomplished through additional spectrum assignments both higher and lower than currently assigned frequencies used by PWS facilities. In fact, currently deployed 5G networks are operating at frequencies once used by television stations.

Nonetheless, frequencies assigned by the FCC for 5G use are all within the bands currently under regulatory oversight, including setting safe limits of exposure to RF energy for both workers, and members of the public. Just recently (4/2020) the FCC has reaffirmed the efficacy of their regulatory exposure limits to RF energy; including those for 5G. On another note, the premiere journal on matters associated with radiation safety (The Health Physics Journal) has released an article on 5G: IEEE Committee on Man and Radiation—Comar Technical Information Statement: Health and Safety Issues Concerning Exposure of the General Public to Electromagnetic Energy from 5G Wireless Communications Networks; Bushberg, J.T.; Chou, C.K.; Foster, K.R.; Kavet, R.; Maxson, D.P.; Tell, R.A.; Ziskin, M.C.

From an RF safety standpoint, there is nothing peculiar about the fifth generation of wireless technologies that would set it apart from any of the other advancements of technologies; including the first two generations (first analog then digital communications), the third generation (the first to be referred to a numbered-series as "3G"), and the currently deployed fourth generations (LTE). Recently published studies in peer-reviewed journals[v] have shown typical exposures to RF energy from operating 5G systems to be well-within the exposure limits.

The FCC currently has categories of devices operating in the Citizens Broadband Radio Service (CBRS) 3.5 GHz band. Category A refers to a lower power base station, while B and C refer to CBSDs that must be deployed outdoors and have increasingly higher maximum power limits.

---

[1] PWS "Generations": **1G**: Analog voice; **2G**: Digital voice; **3G**: Mobile data; **4G**: LTE and mobile Internet; **5G**: Mobile networks interconnect people, control machines, objects, and devices with multi-Gbps peak rates and ultra-low latency.

[2] SOURCE: (https://www.3gpp.org/about-3gpp) The 3rd Generation Partnership Project (3GPP) unites [Seven] telecommunications standard development organizations (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC), known as "Organizational Partners" and provides their members with a stable environment to produce the Reports and Specifications that define 3GPP technologies.

EXPOSURE LIMITS AND GUIDELINES

RF exposure guidelines enforced by the FCC were established by the Institute of Electrical and Electronics Engineers (IEEE)[vi] and the National Council on Radiation Protection and Measurement (NCRP).[vii] The RF exposure guidelines are listed for RF workers and members of the public. The applicable FCC RF exposure guidelines for the public are listed in Table 1 and depicted in Figure 1. All listed values are intended to be averaged over any contiguous 30-minute period. The applicable exposure limits for workers (the "controlled area") are five times higher but averaged over any 6-minute period.

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

Frequency Bands	Maximum Permissible Exposure (MPE) in Equivalent Power Density
300 - 1500 MHz	$f/1500$ mW/cm^2
1500 - 100,000 MHz	1.0 mW/cm^2

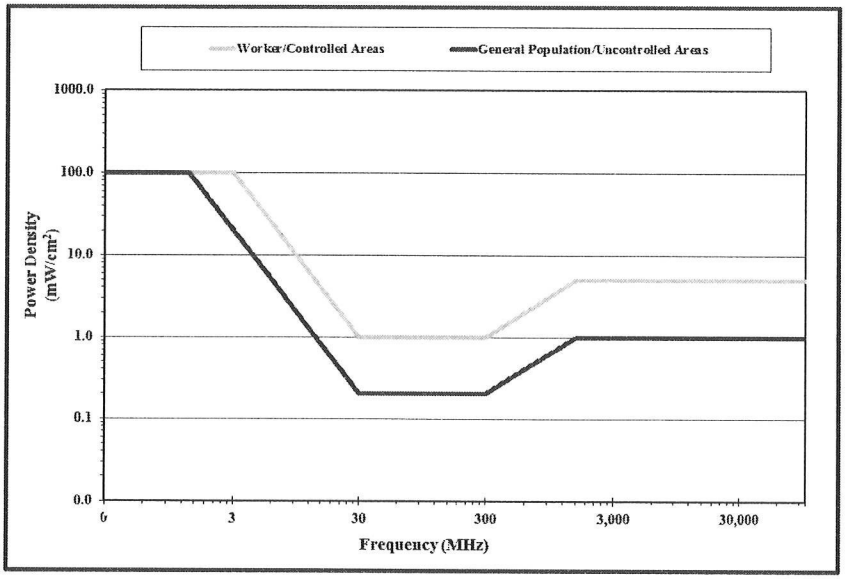


Figure 1: FCC Limits for Maximum Permissible Exposure (MPE)

NOTE: FCC 5% Rule – When the exposure limits are exceeded in an accessible area due to the emissions from multiple fixed RF sources, actions necessary to bring the area into compliance are the shared responsibility of all licensees whose RF sources produce, at the area in question, levels that exceed 5% of the applicable exposure limit proportional to power. (Federal Register / Vol. 85, No. 63 / Wednesday, April 1, 2020 / Rules and Regulations 18145)

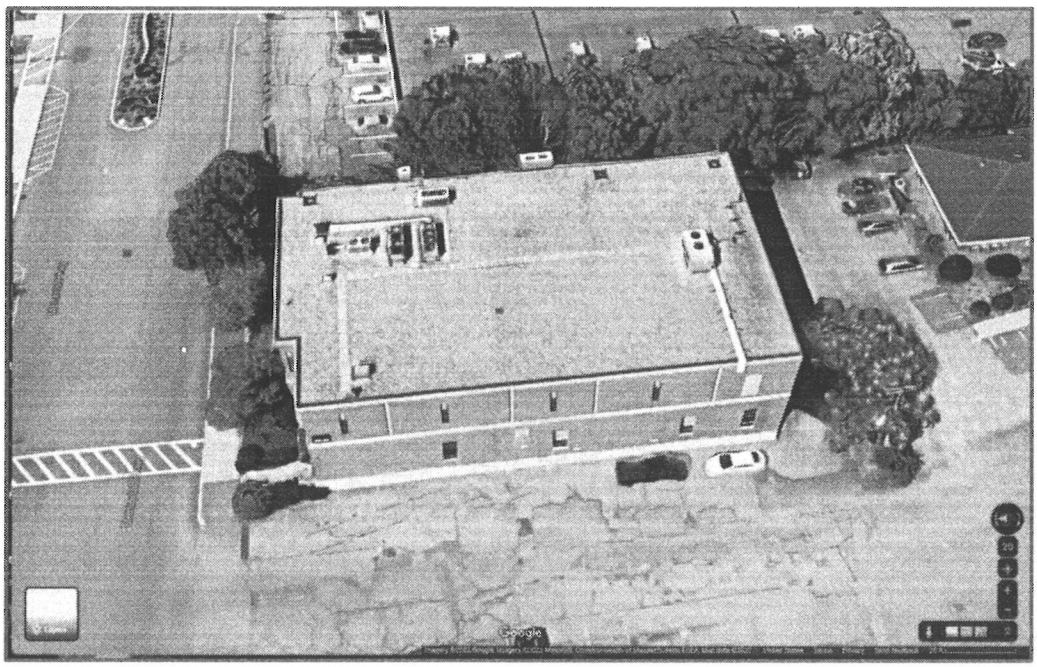


Figure 2a: Building Rooftop
33 Memorial Parkway, Randolph, MA
(Picture courtesy Google Maps©2022 and may not represent current conditions)

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

Will it be physically possible to stand next to or touch any omnidirectional antenna and/or stand in front of a directional antenna? **NO;** Access to the rooftop will be restricted, and the site will adhere to established RF safety guidelines regarding the PWS antennas, including appropriate signage and access control.

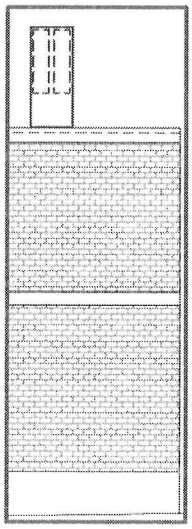


Figure 2b: Proposed Antenna Placement
(Picture courtesy Dewberry Engineers Inc., LLC®)

PROPOSED ANTENNA INVENTORY

Table 2: Transmitter and Antenna Data and Supporting Parameters for Proposed Verizon Wireless PWS Site at 33 Memorial Parkway, Randolph, MA

Remote Radio Head Unit (RRH or RRU) See Appendix A for Specifications			**Antenna Information See Appendix B for Energy Patterns**			
Model	Frequency (MHz)† / Technology	Tx Power (watts)‡	Manufacturer/ Model	Gain (dBd)	**ERP** (watts)⁂	Centerline Height (AGL)
Sector A @ 50°; Sector B @ 140°; Sector C @ 225°, Sector D @ 320°						
RFV01U-D1A (B2)	1890-1900 / PCS LTE	4X40	CommScope / NHH-45B-R2B	17.49	8977	40'
RFV01U-D1A (B66)	2120-2130 / AWS LTE	4X60		17.94	14935	40'
RFV01U-D2A (B13)	746-757 / LTE	4X40	CommScope / NHH-45B-R2B	14.28	4287	40'
RFV01U-D2A (B5)	835-845 / LTE	4X40		15.23	5335	40'
RFV01U-D2A (B5)	835-845 / 5Gnr	4X40		15.23	5335	40'

Table Notes

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

‡ Maximum rated output power (total).

⁂ **ERP**: Effective Radiated Power is the directional (RF) power (in watts) that would have to be radiated by a half-wave dipole antenna to give the same radiation intensity as the actual source at a distant receiver located in the direction of the antenna's strongest beam (main lobe). (Source Wiki).

Personal Wireless Services (PWS) Technologies

5G: See footnote #1, page 2

AWS: Advanced Wireless Services

LTE: Long Term Evolution (a.k.a. "4G")

PCS: Personal Communication System

THEORETICAL RF FIELD CALCULATIONS - GROUND LEVELS
METHODOLOGY: OUTDOOR GROUND LEVELS

These calculations are based on what are called "worst-case" estimates. That is, the estimates assume 100% use of all transmitters simultaneously. Additionally, the calculations make the assumption that the surrounding area is a flat plane. The resultant values are thus conservative in that they over predict actual resultant power densities.

The calculations are based on the information contained in Table 2 inventory:

- Effective Radiated Power (ERP) (see Appendix A).
- Antenna height (centerline).
- Antenna vertical radiation patterns; the source of the negative gain (G) values. "Directional" antennas are designed to focus the RF signal, resulting in "patterns" of signal loss and gain. These patterns (see Appendix B) display the loss of signal strength relative to the direction of propagation due to elevation angle changes. The gain is expressed as "G^E". Note: G is a unitless factor usually expressed in decibels (dB); where $G = 10^{(dB/10)}$.
  For example: for an antenna *gain* of 3 dB, the net factor (G) = $10^{(3/10)} = 2$.
  For an antenna *loss* of -3 dB, the net factor (G) = $10^{(-3/10)} = 0.5$.

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

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

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

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

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

Ground reflections may add in-phase with the direct wave, and essentially double the electric field intensity. Because power density is proportional to the *square* of the electric field, the power density may quadruple, that is, increase by a factor of four (4). Since ERP is routinely used, it is necessary to convert ERP into EIRP by multiplying the ERP by the factor of 1.64, which is the gain of a half-wave dipole relative to an isotropic radiator. Therefore, downrange power density estimates can be calculated by using the formula:

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

To calculate the % MPE, use the formula:

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

RESULTS
OUTDOOR GROUND LEVELS

The results of the calculations for the potential RF emissions resulting from the proposed Verizon Wireless PWS antennas are depicted in Figure 3 as plotted against linear distance from the base of the **building** in any direction. Note that the values have been calculated for a height of 6' AGL in accordance with regulatory rationale. Also depicted on the graph are values for a height of 16' AGL (height of a typical 2nd story). The curves are variable due to the application of the vertical energy patterns.

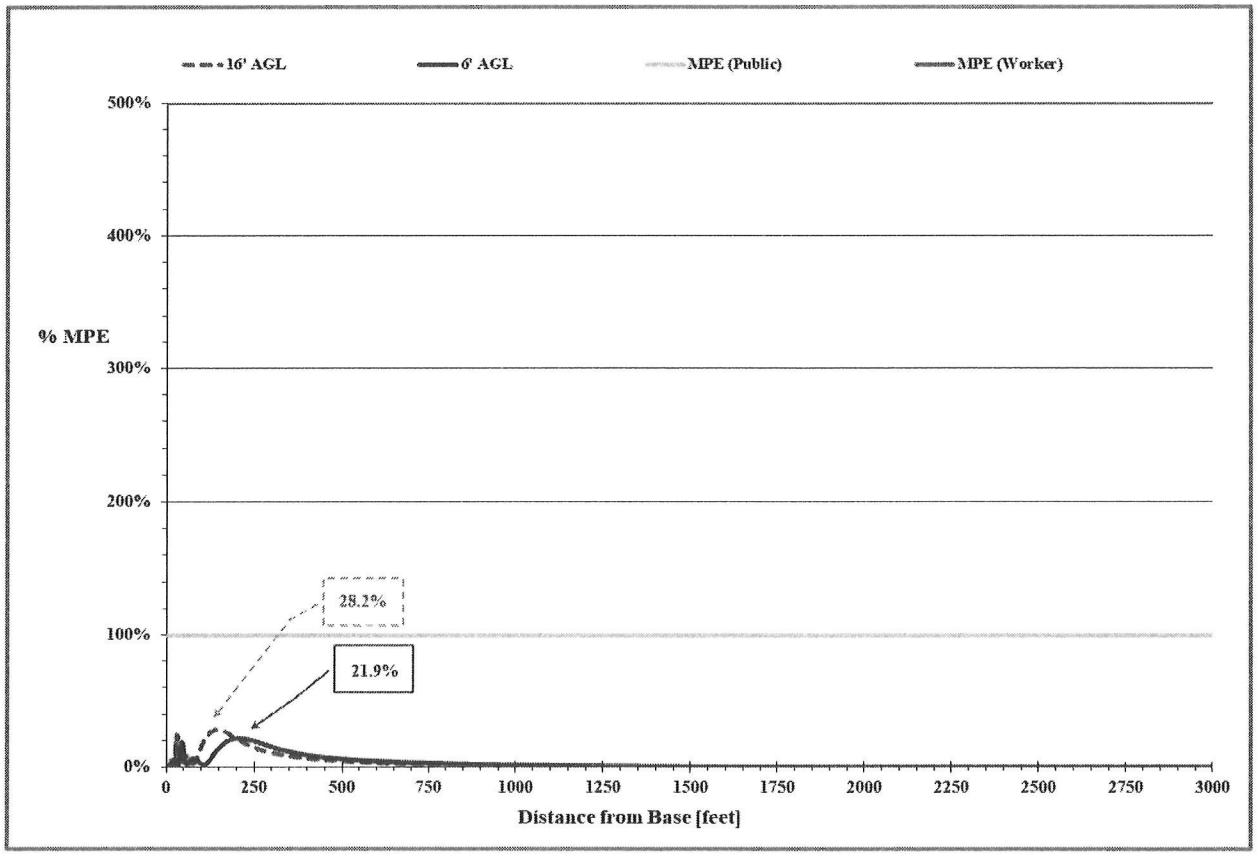


Figure 3: Theoretical Cumulative Maximum Percent MPE - vs. – Distance
***Proposed* Verizon Wireless RF Contributions: PWS Site at 33 Memorial Parkway, Randolph, MA**

THEORETICAL RF FIELD CALCULATIONS – HOST BUILDING METHODOLOGY: HOST BUILDING ROOF-TOP

Theoretical RF field calculations for the near proximity of RF source terms (in this case Verizon Wireless transmit antennas) are not straight forward. The power density associated with antennas vary greatly with distance, see Figure 3. For these additional theoretical calculations, a cylindrical model was used, where "spatially averaged plane-wave equivalent power densities parallel to the antenna may be estimated by dividing the net antenna input power by the surface area of an imaginary cylinder surrounding the length of the radiating antenna." The calculations performed for this analysis once again represent the "worst case".

The power density estimates can be calculated by using the formula:

$$S = \frac{P_{net}}{2 \cdot \Pi \cdot R \cdot h}$$

Where: P_{net} = net power to antenna (watts)
R = Distance (range) from antenna
h = aperture height of the antenna

The following assumptions have been made for these near proximity calculations:

- 100% use of all transmitters simultaneously.
- The surrounding area is a flat plane at the referenced height AGL.
- Resultant values are near/far field spatially averaged; that is, predicting the average field over the cross section of the body.

METHODOLOGY: WITHIN THE BUILDING (UNDER THE ANTENNAS)

In addition to intensity losses at angles away from the main beam (90° down), there are losses due to attenuation by building materials. A good approximation of these losses is -10 dB, or ($10^{(-10/10)} = 0.1$). The modified formula is shown below, using the value of the gain (negative value) for an angle of 90° straight down:

$$S = \frac{0.522 \cdot ERP \cdot G^{E}}{R^2}$$

RESULTS
HOST BUILDING ROOF-TOP

The results of further calculations for the summation of the proposed **Verizon Wireless** PWS RF emissions are depicted in Figure 4 for locations on the roof-top of the building; the ground-level areas outside the building are included in Figure 3. The scaling is set as follows: Rooftop areas are colored **GREEN** for 0 to 100% **MPE(Public)**; **BLUE** for above 100% **MPE(Public)**; **YELLOW** for above 100% **MPE(Worker)**; and **RED** for above 5X **MPE(Worker)**. **Note that 20% MPE(Worker) = 100% MPE(Public).**

Figure 4: Theoretical Cumulative Maximum Percent MPE
Potential Maximum RF Fields on the Roof Top from the Verizon Wireless Antennas
Proposed Verizon Wireless PWS Site at 33 Memorial Parkway, Randolph, MA

RESULTS
WITHIN THE HOST BUILDING (UNDER THE ANTENNAS)

The results of the percent Maximum Permissible Exposure (% MPE) calculations for locations within the building (15') under the antennas from the **summation** of the proposed Verizon Wireless PWS RF emissions are listed in Table 3.

Table 3: Transmitter and Antenna Data and Supporting Parameters for Exposure Guidelines Calculations WITHIN the Building Below Antennas Proposed Verizon Wireless PWS Site at 33 Memorial Parkway, Randolph, MA

Remote Radio Head Unit (RRH or RRU) See Appendix A for Specifications			**Antenna Information See Appendix B for Energy Patterns**			
Model	Frequency (MHz)† / Technology	Tx Power (watts)‡	Manufacturer/ Model	**ERP** (watts)	Gain (dBd) At -90°	Total % $MPE_{(Public)}$ At 15' Below Antenna
Sector A @ 50°; Sector B @ 170°; Sector C @ 290°						
RFV01U-D1A (B2)	1890-1900 / PCS LTE	4X40	CommScope / NHH-45B-R2B	8977	-42.02	0.014%
RFV01U-D1A (B66)	2120-2130 / AWS LTE	4X60		14935	-42.74	0.020%
RFV01U-D2A (B13)	746-757 / LTE	4X40	CommScope / NHH-45B-R2B	4287	-39.51	0.024%
RFV01U-D2A (B5)	835-845 / LTE	4X40		5335	-34.38	0.087%
RFV01U-D2A (B5)	835-845 / 5Gnr	4X40		5335	-34.38	0.087%
					TOTAL	**0.233%**

Table Notes

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

‡ Maximum rated output power (total).

⁂ **ERP**: Effective Radiated Power is the directional (RF) power (in watts) that would have to be radiated by a half-wave dipole antenna to give the same radiation intensity as the actual source at a distant receiver located in the direction of the antenna's strongest beam (main lobe). (Source Wiki).

Personal Wireless Services (PWS) Technologies

5G: See footnote #1, page 2
AWS: Advanced Wireless Services
LTE: Long Term Evolution (a.k.a. "4G")
PCS: Personal Communication System

CONCLUSION

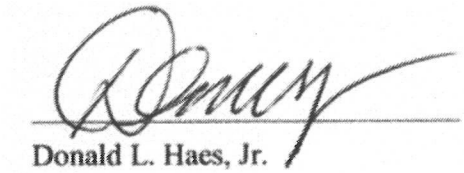
Theoretical RF field calculations data indicate the summation of the proposed Verizon Wireless PWS RF contributions would be within the established RF exposure guidelines; see Figure 3 and Table 3. This includes all publicly accessible areas, and within the building itself. The results support compliance with the pertinent sections of the FCC's Rules and MDPH regulations regarding PWS facilities. Access to the areas between the antennas and the roof edge is restricted to those workers who have been trained in RF Safety and the Occupational Safety and Health Administration (OSHA) rules for fall protection.

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

Based on the results of the theoretical RF fields I have calculated; it is my expert opinion that this facility would comply with all regulatory guidelines for RF exposure with the installation of the proposed Verizon Wireless antennas and transmitters.

Feel free to contact me if you have any questions.

Sincerely,



Donald L. Haes, Jr.
Certified Health Physicist

APPENDIX A

REMOTE RADIO HEAD UNIT: RFV01U-D1A RRU

CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-0970
Fax: +82-31-624-0501

1. General Information

1.1 Client Information

Company	Samsung Electronics Co., Ltd.
Contact Point	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Contact Person	Name : Kim, Jong-in E-mail : jered.kim@samsung.com Tel : +82-31-279-3096

1.2 Product Information

FCC ID	A3LRFV01U-D1A
Product Description	RRU (RFV01U)
Model name	RFV01U-D1A
Power Supply	-48 Vdc
Operating Frequency	- Band 66 DL : 2110 MHz- 2180 MHz, UL 1710 MHz - 1780 MHz - Band 2 DL : 1930 MHz- 1990 MHz, UL 1850 MHz - 1910 MHz
RF Output Power	- Band 66 2T(Single) BW 5 MHz : 40 W / path(Total 80 W) 2T(Single) BW 15 MHz : 90 W / path(Total 180 W) 4T(Single) BW 5 MHz : 20 W / path(Total 80 W) 4T(Single) BW 15 MHz : 60 W / path(Total 240 W) 2T(Multi Contiguous) BW 5 MHz+5 MHz : 60 W / path(Total 120 W) 2T(Multi Contiguous) BW 5 MHz+15 MHz: 88 W / path(Total 176 W) 4T(Multi Contiguous) BW 5 MHz+5 MHz: 40 W / path(Total 160 W) 4T(Multi Contiguous) BW 5MHz+15 MHz : 60 W / path(Total 240 W) 2T(Multi Non-Contiguous) BW 5 MHz+5 MHz : 60 W / path(Total 120 W) 2T(Multi Non-Contiguous) BW 15 MHz+5 MHz: 88 W / path(Total 176 W) 4T(Multi Non-Contiguous) BW 5 MHz+5 MHz: 40 W / path(Total 160 W) 4T(Multi Non-Contiguous) BW 15MHz+5 MHz : 60 W / path(Total 240 W) - Band 2 2T(Single) BW 5 MHz : 40 W / path(Total 80 W) 2T(Single) BW 15 MHz : 60 W / path(Total 120 W) 4T(Single) BW 5 MHz : 20 W / path(Total 80 W) 4T(Single) BW 15 MHz : 40 W / path(Total 160 W) 2T(Multi Contiguous) BW 5 MHz+5 MHz : 60 W / path(Total 120 W) 2T(Multi Contiguous) BW 5 MHz+15 MHz: 60 W / path(Total 120 W) 4T(Multi Contiguous) BW 5 MHz+5 MHz: 40 W / path(Total 160 W) 4T(Multi Contiguous) BW 5MHz+15 MHz : 40 W / path(Total 160 W) 2T(Multi Non-Contiguous) BW 5 MHz+5 MHz : 60 W / path(Total 120 W) 2T(Multi Non-Contiguous) BW 15 MHz+5 MHz: 60 W / path(Total 120 W) 4T(Multi Non-Contiguous) BW 5 MHz+5 MHz: 40 W / path(Total 160 W) 4T(Multi Non-Contiguous) BW 15MHz+5 MHz : 40 W / path(Total 160 W)
Channel Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz
Modulation Type	QPSK, 16QAM, 64QAM, 256QAM
Antenna Specification	Antenna type : Sector Maximum Peak Gain : below 19.7 dBi
FCC Rule	Part 2 : FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS Part 24 : PERSONAL COMMUNICATIONS SERVICES Part 27 : MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES KDB Publication 662911 D01 Multiple Transmitter Output v02r01

HCT CO.,LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEC: +82-31-645-6300 FAX: +82-31-645-6401

FCC REPORT

FCC Certification

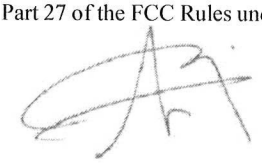
Applicant Name: SAMSUNG Electronics Co.,Ltd. Address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea	Date of Issue: August 7, 2017 Test Site/Location: HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA Report No.: HCT-R-1707-F009-2 HCT FRN: 0005866421

FCC ID:	A3LRFV01 U-D2A
APPLICANT:	SAMSUNG Electronics Co.,Ltd.

FCC Model:	RFV01U-D2A
EUT Type:	RRU(RFVOI U)
Frequency Range:	TX : 746 756 MHz (Band 13) / 369 - 894 MHz (Band 5) RX : 777 787 MHz (Band 13) / 824 - 849 MHz (Band 5)
Conducted Output Power:	Band 13 : 40W/path x 4 paths or 60W/path x 2 paths (Max output power :160W)
FCC Rule Part(s):	Band 5 : 40Wfpath x 4 paths or 60W/path x 2 paths (Max output power : 160W)
Data of Test:	CFR 47 Part 2, Part 22, Part 27 June 28, 2017 July 21, 2017

Engineering Statement;

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of FCC Part 27 of the FCC Rules under normal use and maintenance.



Report prepared by : Kyung Soo Kang
Engineer of Telecommunication testing center

Approved by : Jong Seok Lee
Manager of Telecommunication testing center

APPENDIX B

ANTENNA ENERGY PATTERNS: CommScope / NHH-45B-R2B

Model: NHH-45C-R2B

« « Back to selections

Select Radial Scale

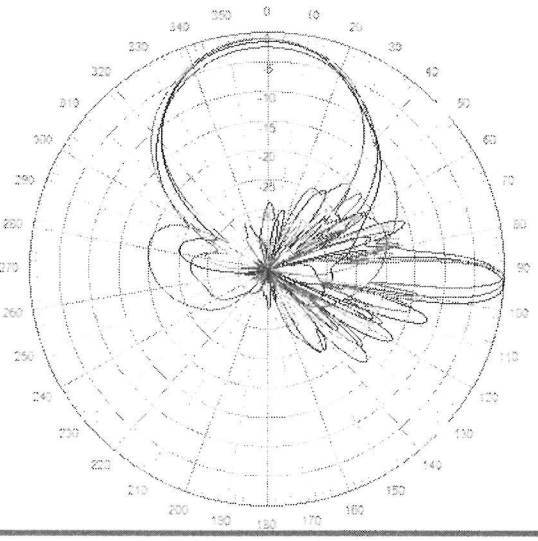
25 dB

40 dB

Apply

Legend

Description	Port	Frequency	Tilt	Cut	Color
Dual Polarization	Port 1	761	4	V	
Dual Polarization	Port 1	761	4	H	
Dual Polarization	Port 2 -45	880	2	V	
Dual Polarization	Port 2 -45	880	2	H	
Dual Polarization	Port 3 +45	1930	2	V	
Dual Polarization	Port 3 +45	1930	2	H	
Dual Polarization	Port 4 -45	2130	2	V	
Dual Polarization	Port 4 -45	2130	2	H	



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

STATEMENT OF CERTIFICATION

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

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

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

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

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

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

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

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

Date: January 31, 2022

Donald L. Haes, Jr.
Certified Health Physicist

DONALD L. HAES, JR., CHP

Radiation Safety Specialist

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

SUMMARY OF QUALIFICATIONS

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

- **Certification -**
  - Board Certified by the American Board of Health Physics 1994; renewed 1998, 2002, 2006, 2010, 2014, and 2018. Expiration 12/31/2022.
  - Board Certified by the Board of Laser Safety 2008; renewed 2011, 2014, 2017, 2020. Expiration 12/31/2023.

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

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

REFERENCES

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

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

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

[iv] Occupational Safety and Health Administration, U.S. Department of Labor. 29 CFR Part 1926.501 - Duty to have fall protection.

[v]. Jamshed, Muhammad Ali (Institute of Communication Systems (ICS), Home of 5G Innovation entre (5GIC), University of Surrey, Guildford GU2 7XH, U.K). *Electro-magnetic field exposure reduction/avoidance for the next generations of wireless communication systems.* IEEE Journal of Electromagnetics, RF, And Microwaves in Medicine and Biology, Vol. 4, No. 1, March 2020.

[vi]. IEEE C95.1-1999: American National Standard, *Safety levels with respect to human exposure to radio frequency electromagnetic fields, from 3 kHz to 300 GHz* (Updated in 2020 as C95.1-2019/Cor 2-2020™ *Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz, Corrigenda 2*).

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

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

Environmental Sound Assessment

Wireless Communications Facility

33 Memorial Parkway
Randolph, Massachusetts 02368

February 16, 2022

Prepared For:

Verizon Wireless
118 Flanders Road
Westborough, MA 01581

Prepared By:

Modeling Specialties
30 Maple Road
Westford, MA 01886

ENVIRONMENTAL SOUND ASSESSMENT

Verizon Wireless proposes to build and operate a rooftop Wireless Telecommunications Facility in Randolph, Massachusetts to support wireless communications in the area. The proposed installation will include antennas on an existing commercial building at 33 Memorial Parkway. Supporting electronic equipment will be located on a rooftop platform. Verizon's electronic equipment cabinets are designed to minimize environmental effects.

Overview of Project and Site Vicinity

The project is located in the downtown area of Randolph. The existing building is commercial with a parking area. The proposed layout is on the roof of the existing building. The Verizon proposal does not include a generator, so is expected to have little effect on the community sound levels. Nevertheless, the electronics cabinets do produce some sound, which was quantified and compared to Randolph standards. The facility is surrounded by commercial and institutional uses that include the Randolph High School and Randolph Fire Department. The downtown commercial area is not only relatively insensitive to modest levels of sound but is itself a source of sound because of traffic, activities and rooftop mechanical sources. The school and fire station are sometimes associated with significant sources of sound with emergency equipment and busses. There are no existing residences near the site. The nearest property that appears (from a drive-by survey) to be a parish residence about 500 feet to the southeast just off Route 28 and shielded from the site by the main body of the church building.

The purpose of this study is to present the existing conditions around the site and the sound levels that are expected to result from the project. Sound levels from the proposed equipment is expected be very low, meeting the standards with a large margin. For that reason, no field survey or formal sound level measurements were made for this study. The Randolph sound standard that is used for this study is 50 dBA at the ground level near the foot of the building. A brief series of daytime measurements was made to see if the current sound levels were actually less than 50 dBA. The project sound levels expected at the receptor locations were estimated using standard noise modeling techniques prescribed in acoustical literature.

This study is based on the Construction Drawings issued by the Dewberry Engineers updated September 23, 2021. This conservative study is based on the highest sound levels that the proposed equipment is expected to make even though it makes that sound only a small fraction of the time. Figure 1 has a backdrop of a Google aerial image and is annotated to show the proposed site, surrounding area and nearby receptor locations along with their orientations from the Site building.

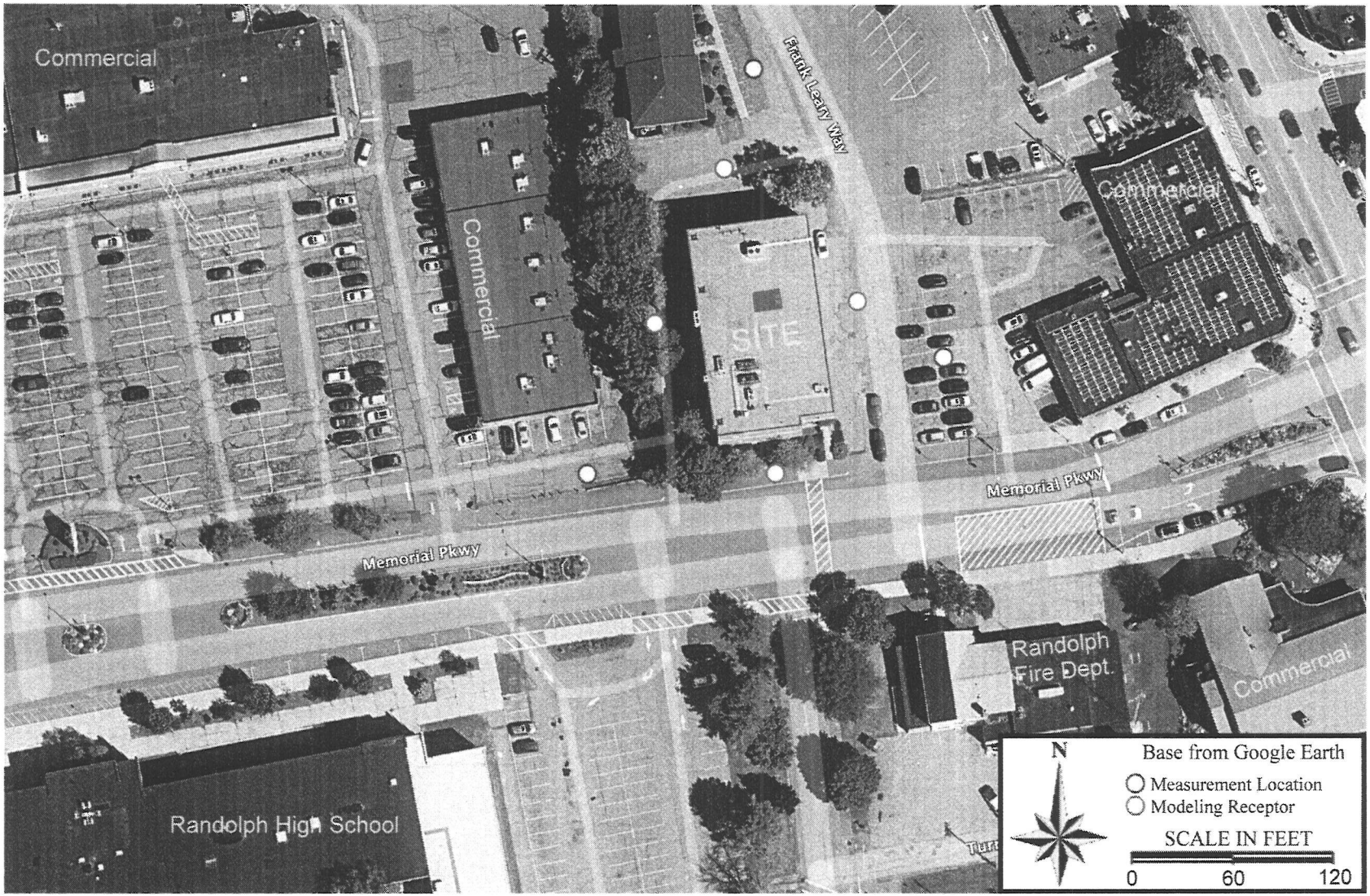


Figure 1: Project Area Showing the Proposed Equipment Compound, Property Lines and Nearest Receptors

Discussion of General Noise Analysis Methods

There are a number of ways in which sound (noise) levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. Following is a brief introduction to the noise measurement terminology used in this assessment.

Noise Metrics

The Sound Level Meter used to measure noise is a standardized instrument.[1] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various circumstances. One of these is the *A-weighting* network. A-weighted sound levels emphasize the middle frequency sounds and de-emphasize lower and higher frequency sounds; they are reported in decibels designated as "dBA." All broadband levels represented in this study are weighted using the A-weighting scale. Figure 2 illustrates typical sound levels produced by sources that are familiar to most people.

The sounds in our environment usually vary with time, so they cannot always be described with a single number. Two methods are used for describing variable sounds. These are *exceedance levels* and *equivalent level.* Both are derived from a large number of moment-to-moment A-weighted sound level measurements. Exceedance levels are designated L_n, where "n" can have any value from 0 to 100 percent. For example:

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the *residual* sound level, which is the sound level observed when there are no loud, transient noises.

- L_{50} is the median sound level: the sound level in dBA exceeded 50 percent of the time during the measurement period.

- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the *intrusive* sound level because it is caused by occasional louder noises like those from passing motor vehicles.

By using exceedance levels, it is possible to separate prevailing, steady sounds (L_{90}) from occasional, louder sounds (L_{10}) in the environment.

---

1 *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983, published by the Standards Secretariat of the Acoustical Society of America, NY.

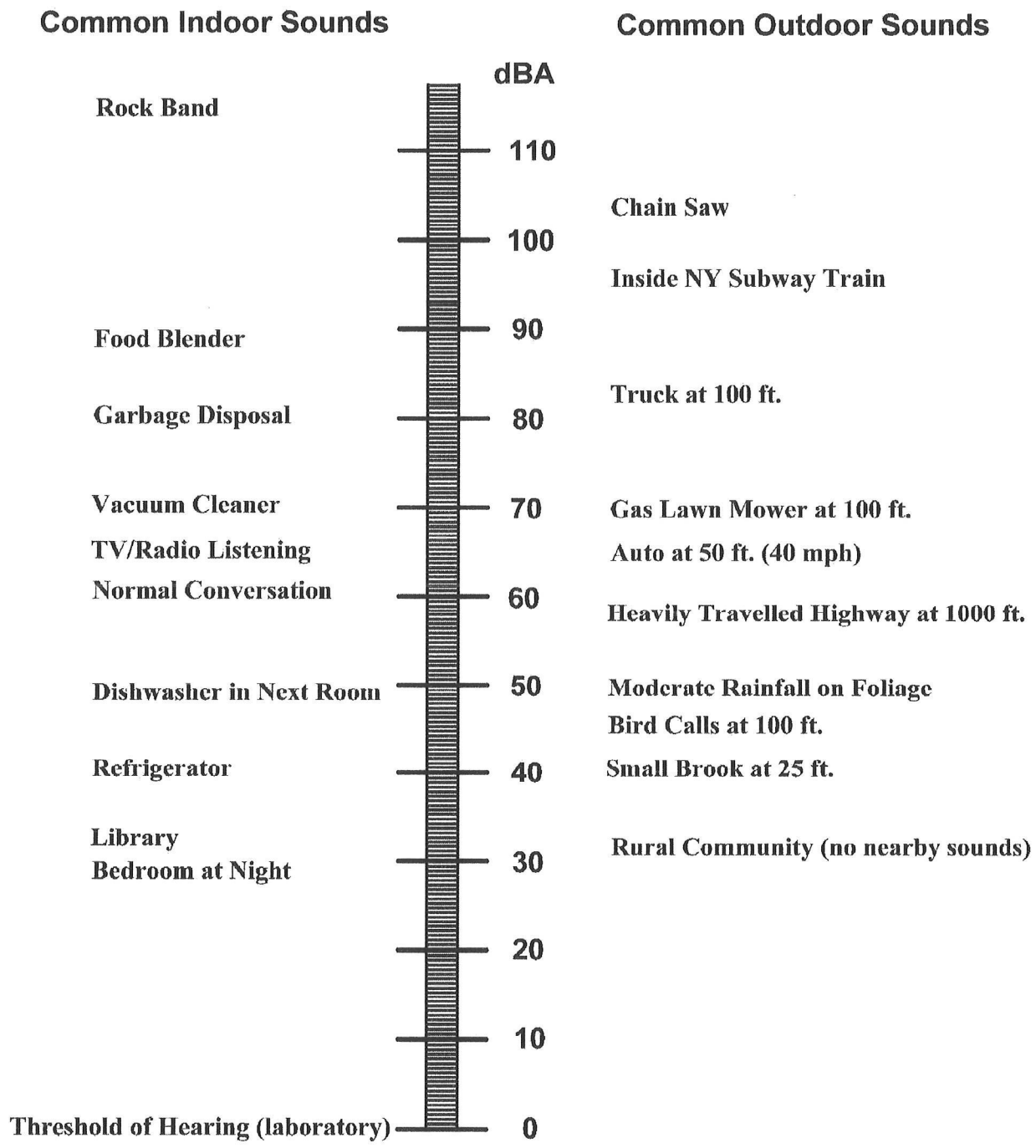


Figure 2: Typical Sound Levels from Everyday Experience

The *equivalent level* is the level of a hypothetical steady sound that has the same energy as the actual fluctuating sound observed. The equivalent level is designated L_{eq}, and is also A-weighted. The equivalent level is strongly influenced by occasional loud, intrusive noises. When a steady sound is observed, all of the Ln and Leq are equal.

In the design of noise control treatments, it is essential to know something about the frequency spectrum of the sound of interest. Noise control treatments do not function like the human ear, so simple A-weighted levels are not useful for noise-control design or the identification of tones. The spectra of sounds are usually stated in terms of *octave band sound pressure levels* in dB, with the octave frequency bands being those established by standard.[2] The sounds at the proposed site were evaluated with respect to the octave band sound pressure levels, as well as the A-weighted equivalent sound level. Only the A-weighted values are presented here since they represent the more easily recognized sound scale that is relevant to the Town and regional standards.

Noise Regulations and Criteria

Sound compliance is judged on two bases: the extent to which governmental regulations or guidelines are met, and the extent to which it is estimated that the community is protected from the excessive sound levels. The governmental regulations that may be applicable to sound produced by activities at the project site are summarized below.

Federal

- Occupational noise exposure standards: 29 CFR 1910.95. This regulation restricts the noise exposure of employees at the workplace as referred to in OSHA requirements. Workers will not routinely attend this facility. Furthermore, the facility will emit only occasional sounds of modest levels, as demonstrated by this study.

State

- In Massachusetts, noise is regulated as an air pollutant. 310 CMR §7.10 U qualitatively prohibits "unnecessary emissions from [a] source of sound that may cause noise". This is interpreted quantitatively by MDEP's Form BWP AQ SFP3 and their DAQC Policy 90-001. The MDEP's Noise Policy states that a new noise intrusion may not increase the broadband sound level by more than 10 dBA over the pre-existing L_{90} ambient level. Tonal sounds, defined as any octave band level that exceeds the levels in adjacent octave bands by 3 dB or more, are also prohibited. The MDEP usually defers to applicable quantitative local ordinances when available.

---

2 *American National Standard Specification for Octave, Half-octave and Third-octave Band Filter Sets*, ANSI S1.11-1966(R1975).

Local

- The Town of Randolph General Code Chapter 141 defines and prohibits unreasonable noise from many types of sources. There is a requirement at 141.5 that protects properties that are habitable, but a review of the area identified no residential properties that will be exposed to the proposed equipment. A section that can be applied to this facility is at section 141.1. excerpted below:

  UNREASONABLE OR EXCESSIVE NOISE —

  (1) Noise measured in excess of fifty (50) dBa between the hours of 11:00 p.m. and 7:00 a.m., or in excess of seventy (70) dBa at all other hours; or

  (2) In the absence of an applicable noise level standard, any noise plainly audible at a distance of three hundred (300) feet or, in the case of loud amplification devices or similar equipment, noise plainly audible at a distance of one hundred (100) feet from its source by a person of normal hearing.

  The Randolph Code Article X specifically addresses Wireless Communication Facilities. It includes a noise requirement at Section 200-61.G that is excerpted below:

  G. Ground-mounted equipment for wireless communications facilities shall not generate acoustic noise in excess of fifty (50) decibels at the security barrier. Roof-mounted or side-mounted equipment for wireless communications facilities shall not generate noise in excess of fifty (50) decibels at ground level at the base of the building as measured from the point closest to the antenna.

Existing Community Sound Levels

The Verizon proposal is to install antennas on the roof that have no potential of emitting sound. The installation will include cabinet mounted support electronics with the potential to emit modest sound. Because the proposal does not involve a backup generator, this study does not include a formal field survey. However, daytime sound levels were measured around the host building to determine how the existing daytime sound levels compare to the 50 dBA Randolph project sound standard. The measurements indicate that the levels in the area are generally below 50 dBA and are dominated by sound from roadway traffic, commercial activities and the din of building mechanical sounds. One location southwest of the building was dominated by the sound from a fleet of buses queued at the High School. It is presumed that this source would be limited to align with the morning and afternoon bus schedule.

Table 1: Summary of Measured Daytime Sound Levels Around the Site

Location Measured	Distance from Building (Ft)	Measured Level (dBA)
North	60	45
East	50	48
Southwest	50	52

The facility layout is shown in Figure 3. The corresponding elevation sketch is shown in Figure 4.

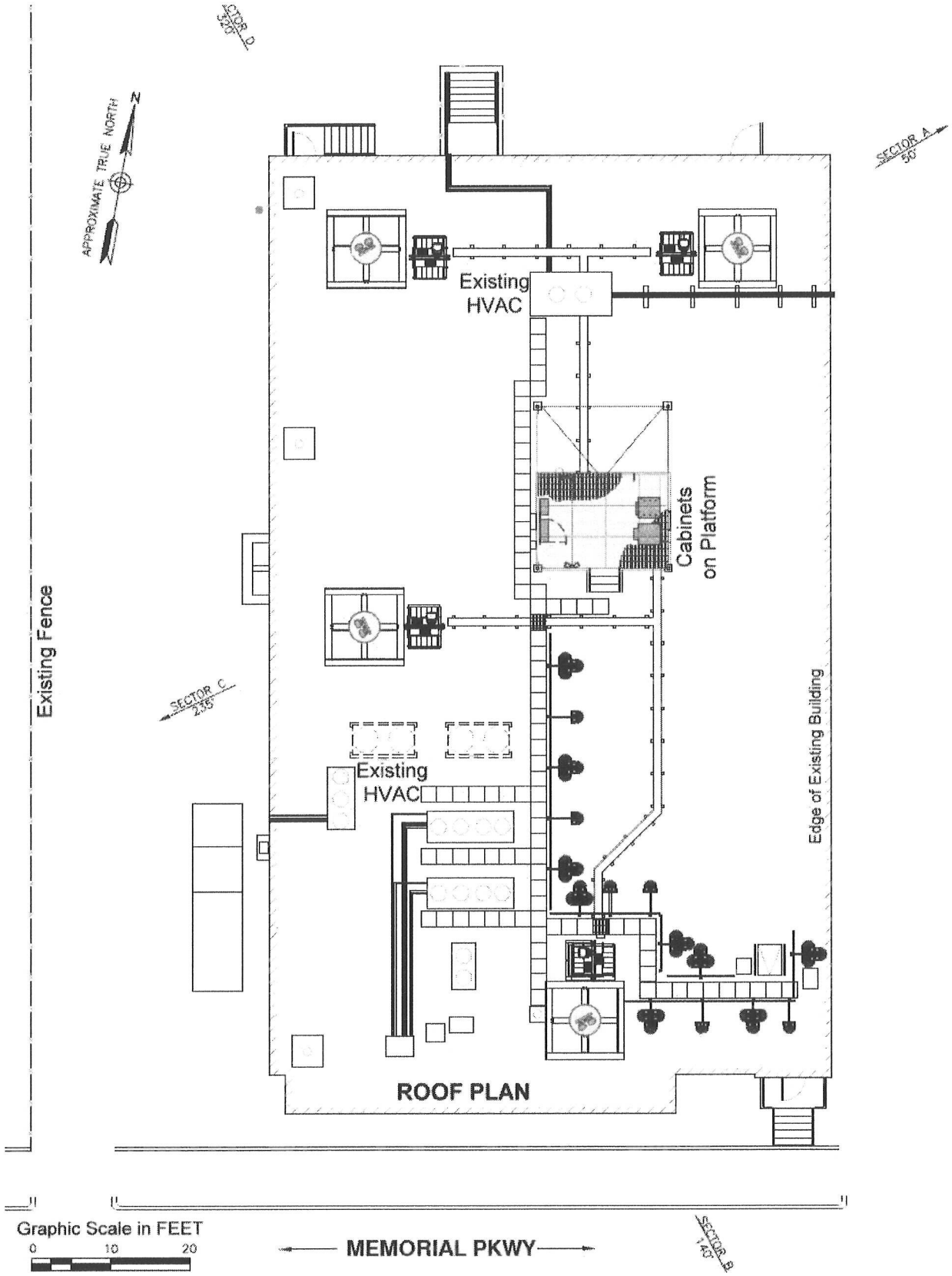


Figure 3: Roof Plan Showing the Existing and (Highlighted) Proposed Equipment

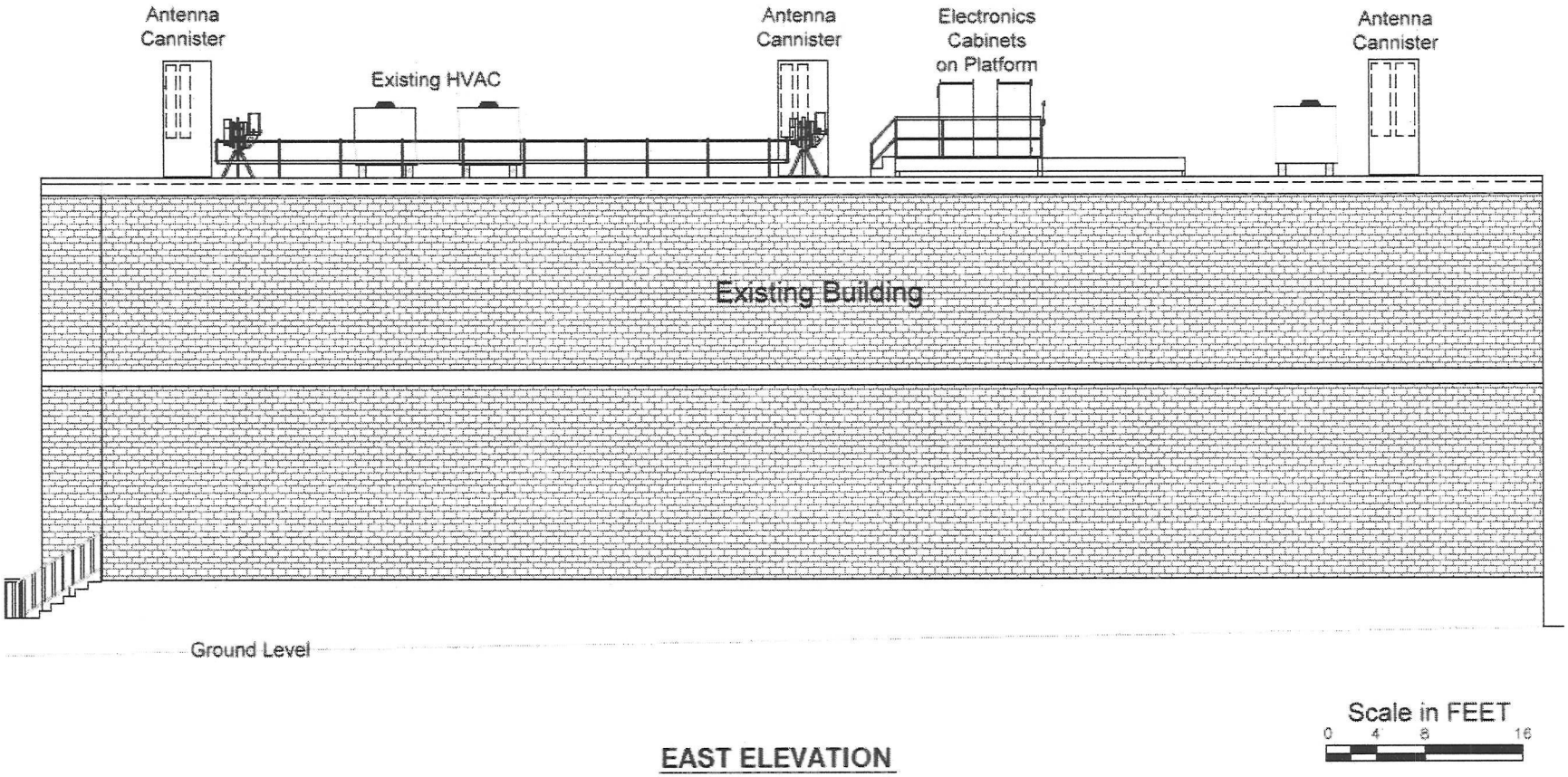


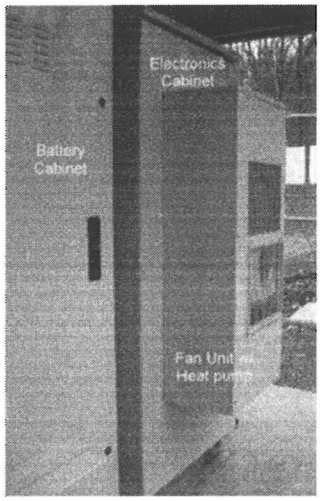
Figure 4: Elevation Plan Showing the Vertical Character of the Building and Proposed Antenna Canisters

Sounds from the Proposed Installation

Most of the wireless infrastructure produces no sound. Cabling and piping for utilities is within or attached to the existing building. The antenna canisters are acoustically inert and are designed for minimal risk of wind noise. Only one type of source is planned for this facility as quantified in this study. The antennas will be supported by cabinet mounted radio electronics on a platform in the center of the roof.

Project Sound Emissions

There are two Verizon cabinets in their typical equipment configuration. One cabinet has only batteries and is not cooled. Their electronics cabinet is usually cooled by small fans that draw ambient air in through vents and distribute it to cool the cabinet. It has a smooth broadband character that produces about 50 dBA at 3 feet from the unit. This is not expected to be audible except from the platform area.



When the cabinet exceeds a safe temperature, usually about 90°F, the door mounted cooler supplements the cooling fans to protect the electronics. The cooler emits sound only from the front of the cabinet that is about 50 dBA at a distance of 23 feet. The cooler operation is only expected during the few hottest daytime periods of the summer and is based on the unit's sound being emitted toward the West.

Modeling Details

Noise prediction modeling was performed using CADNA software under downwind weather conditions as assumed in the standard ISO 9613-2. Table 2 summarizes the modeling input parameters.

Table 2: Modeling Input Parameters

Item	Modeling Input and Description
Terrain	Flat Terrain assumed
Temperature	10°C
Relative Humidity	70%
Weather Condition	6.5 mph, directly from facility to receptor*
Ground Attenuation	0.2, hard surface (0.5 = soft ground, 0.0 = pure reflection)
Atmospheric Inversion	CONCAWE – Category F**
# of Sound Reflections	2
Receptor Height	1.5 meter above ground level

** Propagation calculations incorporate the adverse effects of certain atmospheric and meteorological conditions on sound propagation, such as gentle breeze of 1 to 5 m/s (ISO 1996-2: 1987) from source to receiver.*

*** Category F represents a stable atmosphere that promotes noise propagation.*

Sound Level Modeling Results

Since all the equipment with the potential to emit sound will be on the roof, the sound will be shielded in some locations by the roof itself. The propagation is based on a straight-string distance from the equipment source and the property line receiver location. The combined sound from the routine equipment operation will be 50 dBA

or less at the property lines as shown in Table 3. A graphical summary of the modeling result is also provided in Figure 5.

Table 3: Summary of Property Line Sound Levels for Worst Case Operation

Receptor Location	Distance from Building (Ft)	Equipment Sound (dBA)	Randolph Compliance?
P/L North	20	27	Yes
P/L East	20	27	Yes
P/L South	10	24	Yes
P/L West	20	27	Yes

Conclusions

The potential sound of the proposed Wireless Telecommunications Facility was evaluated using ambient field data and numerical modeling methods. Equipment operating sound levels were quantified using vendor estimates confirmed by representative field measurement at other installations. Much of the infrastructure and equipment produces no significant sound. The cabinet fans will operate as needed to protect the cabinet electronics from heat. The cabinet fans typically operate continuously at a very low level of sound that can only be noticed from on the rooftop platform. Under high ambient temperatures, usually above 90° F, the cabinet will trigger the supplementary cooler on its door. This represents a rare worst-case sound event that would only occur on a few hottest days a year. Under this worst-case condition, the facility is still expected to meet the 50 dBA standard at all ground level locations.

The proposed site is commercial property by zoning and existing use. This study is based on the facility's worst-case daytime sounds, which represent very infrequent conditions. The modeling shows that the facility will produce very low sound levels at ground level locations near the foot of the building. It is typical to also report on the potential to affect the nearest residences. The nearest habitable building identified by a drive-around survey seems to be a parish residence more than 500 feet to the southeast. The residence is completely shielded from Site activities by the main body of the church structure. The results of the study indicate that the proposed equipment sound levels are expected to be below the Randolph standards by a wide margin.

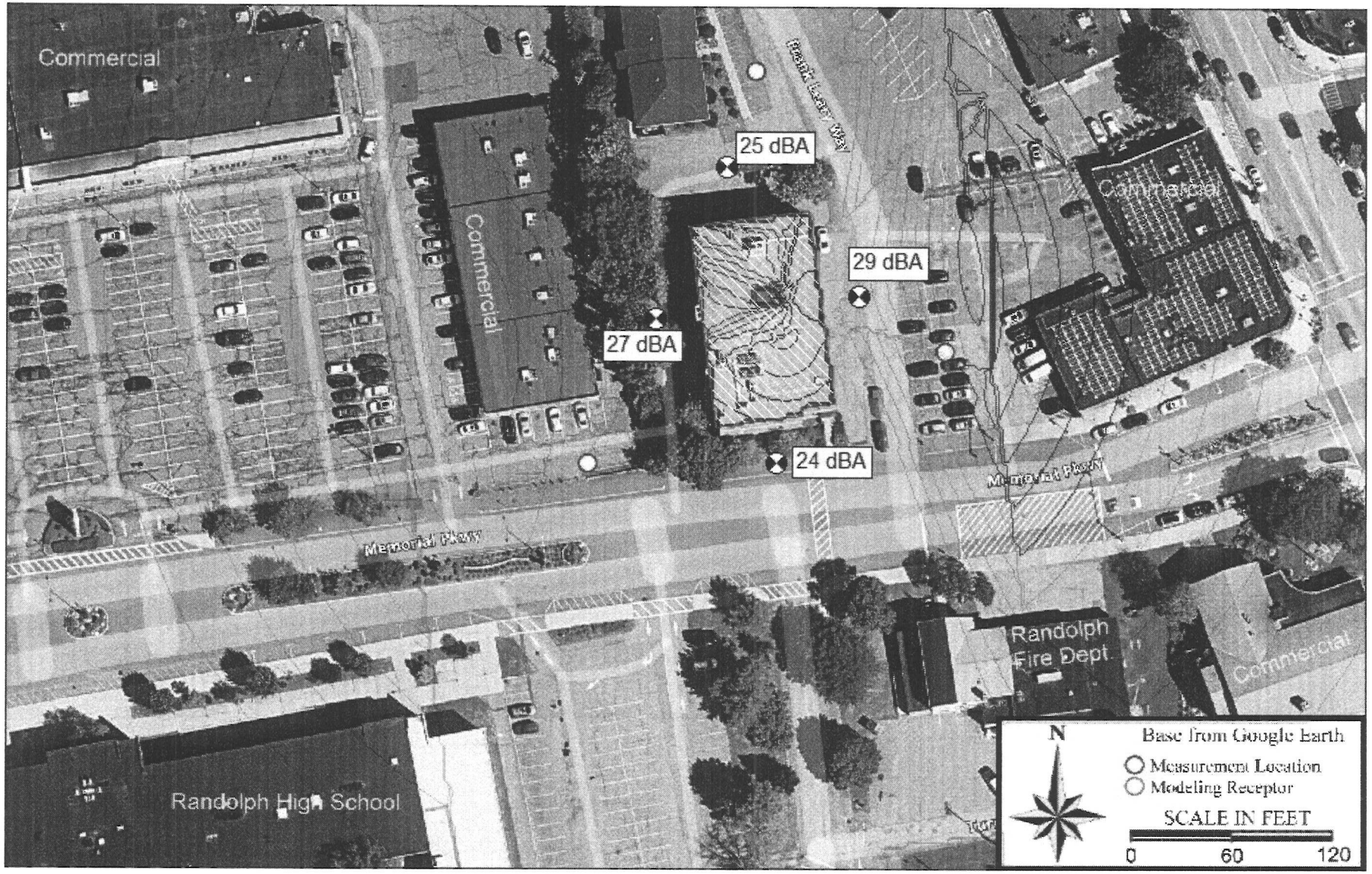
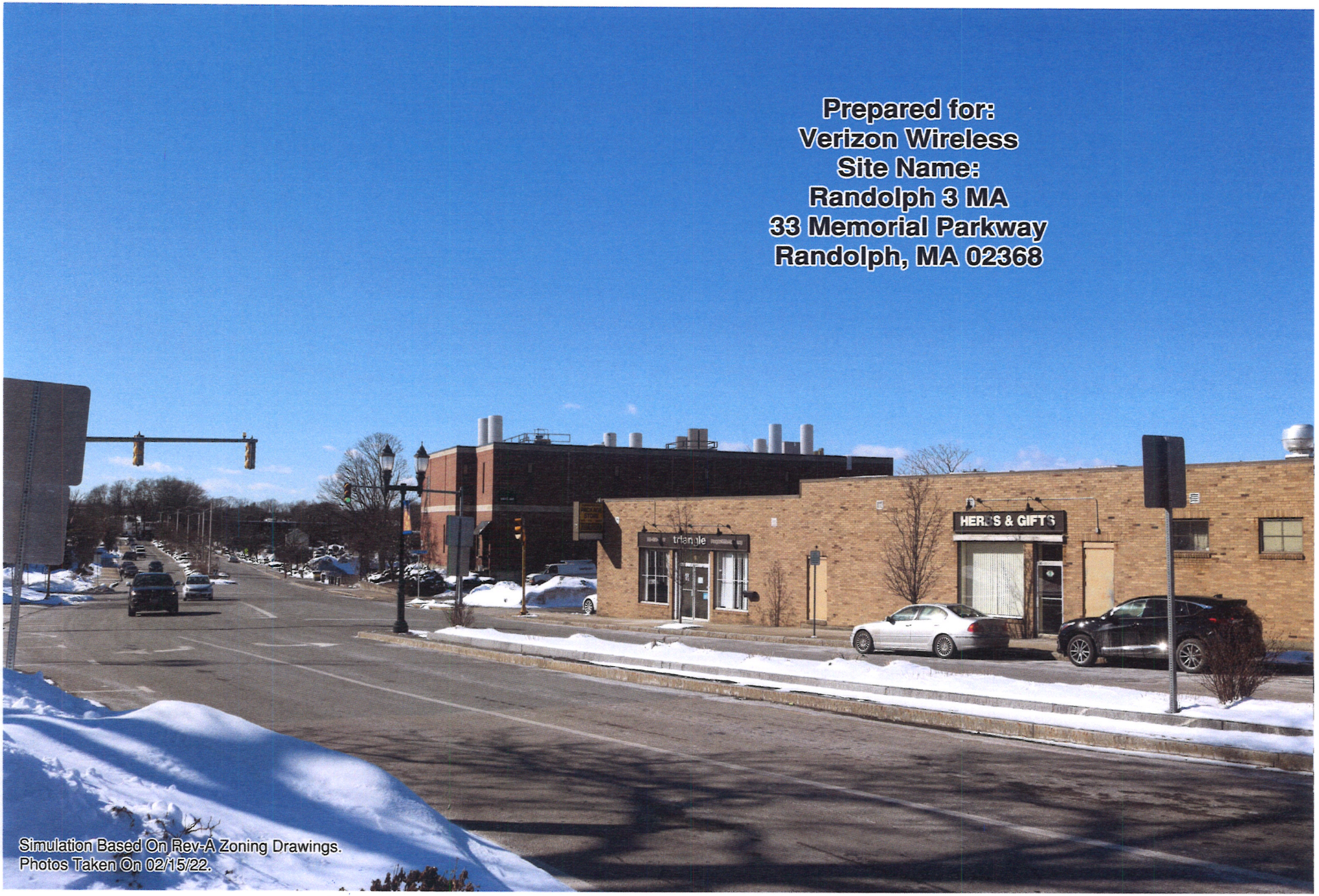


Figure 5: Graphical Summary of the Facility Sound (with the Supplemental Cooler)



verizon WIRELESS

Randolph 3 MA
33 Memorial Parkway
Randolph, MA 02368

Dewberry

verizon WIRELESS

RANDOLPH 3 MA
33 Memorial Parkway
Randolph, MA 02368
(Page 2 of 8)

Dewberry

verizon WIRELESS

Northeastern University MA

Photo 1A

View Facing South From Diauto Drive

(Page 3 of 8)

Dewberry

verizon WIRELESS

Northeastern University MA
Photo 1B
View Facing South From Diauto Drive
(Page 4 of 8)

Dewberry

verizon WIRELESS

RANDOLPH 3 MA

Photo 2A

View Facing East From N Main Street

(Page 5 of 8)

Dewberry

verizon WIRELESS

RANDOLPH 3 MA

Photo 2B

View Facing East From N Main Street

(Page 6 of 8)

Dewberry

verizon WIRELESS

RANDOLPH 3 MA
Photo 3A
View Facing East From N Main Street
(Page 7 of 8)

Dewberry

verizon WIRELESS

RANDOLPH 3 MA

Photo 3B

View Facing East From N Main Street

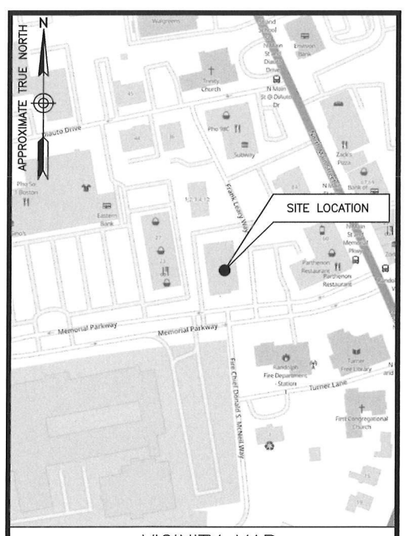
(Page 8 of 8)

Dewberry

verizon WIRELESS

RANDOLPH 3 MA

15 MEMORIAL PARKWAY
RANDOLPH, MA 02368



VICINITY MAP N.T.S.

DIRECTIONS FROM LOWELL, MA:

TAKE I–95 S/MA–128S. CONTINUE ONTO I–93 N/US–1 N. TAKE EXIT 5A TO MERGE ONTO MA–28 S/N MAIN ST TOWARD RANDOLPH. MERGE ONTO MA–28 S/N MAIN ST. TURN RIGHT ONTO MEMORIAL PARKWAY. THE SITE WILL BE ON THE RIGHT.

ENGINEER

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

PHONE # (617) 531–0813
FAX # (617) 695–3310

CONTACT: BENJAMIN B. REVETTE

CONSTRUCTION

VERIZON WIRELESS
900 CHELMSFORD STREET
TOWER 2 FLOOR 5
LOWELL, MA 01851

PHONE # (781) 645–8076

CONTACT: JESSE LORETTE

CONSULTANT TEAM

SITE NAME:
RANDOLPH 3 MA

PROPERTY OWNER:
NEW ENGLAND TEL & TEL CO
C/O DUFF & PHELPS
PO BOX 2749
ADDISON, TX 75001

APPLICANT:
VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581–3956

MBLU:
54/B/5 A&B

ELECTRIC UTILITY:
NATIONAL GRID
(800) 322–3223

TELEPHONE UTILITY:
VERIZON
(800) 827–4966

COORDINATES*:
LATITUDE: 42° 09' 48.45" N
LONGITUDE: 71° 02' 35.77" W
*PER FAA–2C

PROJECT SUMMARY

SITE ADDRESS:
15 MEMORIAL PARKWAY
RANDOLPH MA 02368

ZONING DISTRICT:
CSBD (CRAWFORD SQUARE BUSINESS DISTRICT)

PROJECT DIRECTORY

THE SITE WILL CONSIST OF INSTALLING (12) ANTENNAS INSIDE (8) FIBERGLASS CANISTERS ON BALLAST FRAMES ON THE ROOFTOP. EQUIPMENT CABINETS WILL BE INSTALLED ON A NEW STEEL PLATFORM ON THE ROOFTOP. ADDITIONAL RF SUPPORT EQUIPMENT WILL BE INSTALLED NEAR THE ANTENNAS. POWER & TELCO WILL COME FROM EXISTING SOURCES ON SITE.

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
Z–1	300' ABUTTERS PLAN
Z–2	ROOF PLAN
Z–3	EAST ELEVATION
Z–4	EQUIPMENT PLATFORM PLAN & BALLAST FRAMES

SHEET INDEX

verizon WIRELESS

VERIZON WIRELESS
900 CHELMSFORD STREET
TOWER 2 FLOOR 5
LOWELL, MA 01851

RANDOLPH 3 MA

ZONING DRAWINGS		
1	06/14/22	FOR SUBMITTAL
0	04/04/22	FOR SUBMITTAL
A	02/18/22	FOR COMMENT

Dewberry®

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

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

DRAWN BY:	SCA
REVIEWED BY:	MFT
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50121567

SITE NUMBER

295169

SITE ADDRESS

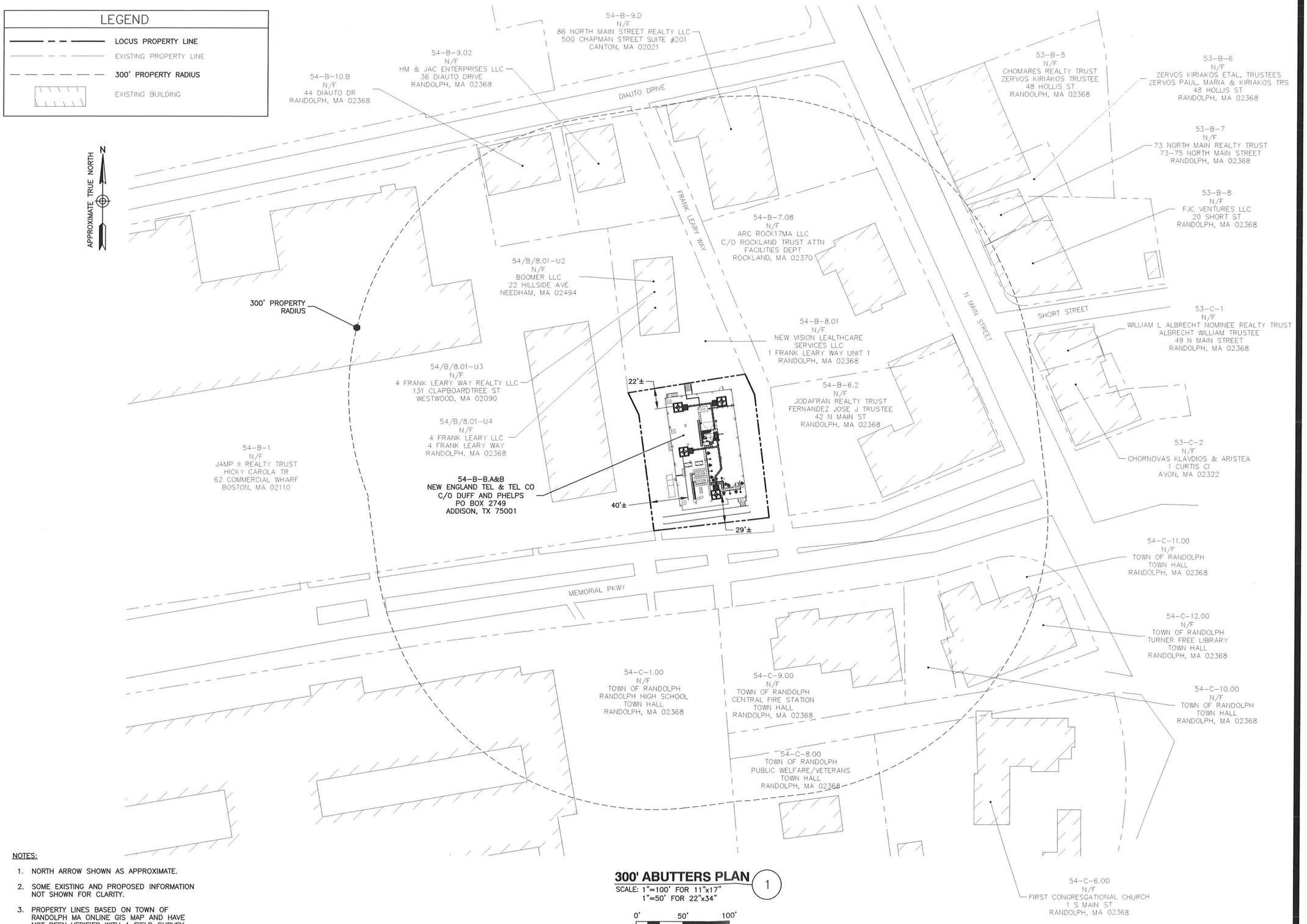
15 MEMORIAL PARKWAY
RANDOLPH, MA 02368

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T–1



NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. PROPERTY LINES BASED ON TOWN OF RANDOLPH MA ONLINE GIS MAP AND HAVE NOT BEEN VERIFIED WITH A FIELD SURVEY.

300' ABUTTERS PLAN 1

SCALE: 1"=100' FOR 11"x17"
1"=50' FOR 22"x34"

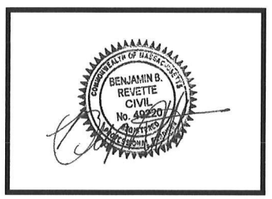
0' 50' 100'

verizon WIRELESS
VERIZON WIRELESS
900 CHELMSFORD STREET
TOWER 2 FLOOR 5
LOWELL, MA 01851

RANDOLPH 3 MA

ZONING DRAWINGS		
1	06/14/22	FOR SUBMITTAL
0	04/04/22	FOR SUBMITTAL
A	02/18/22	FOR COMMENT

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



DRAWN BY:	SCA
REVIEWED BY:	MFT
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50121567

SITE NUMBER

295169

SITE ADDRESS

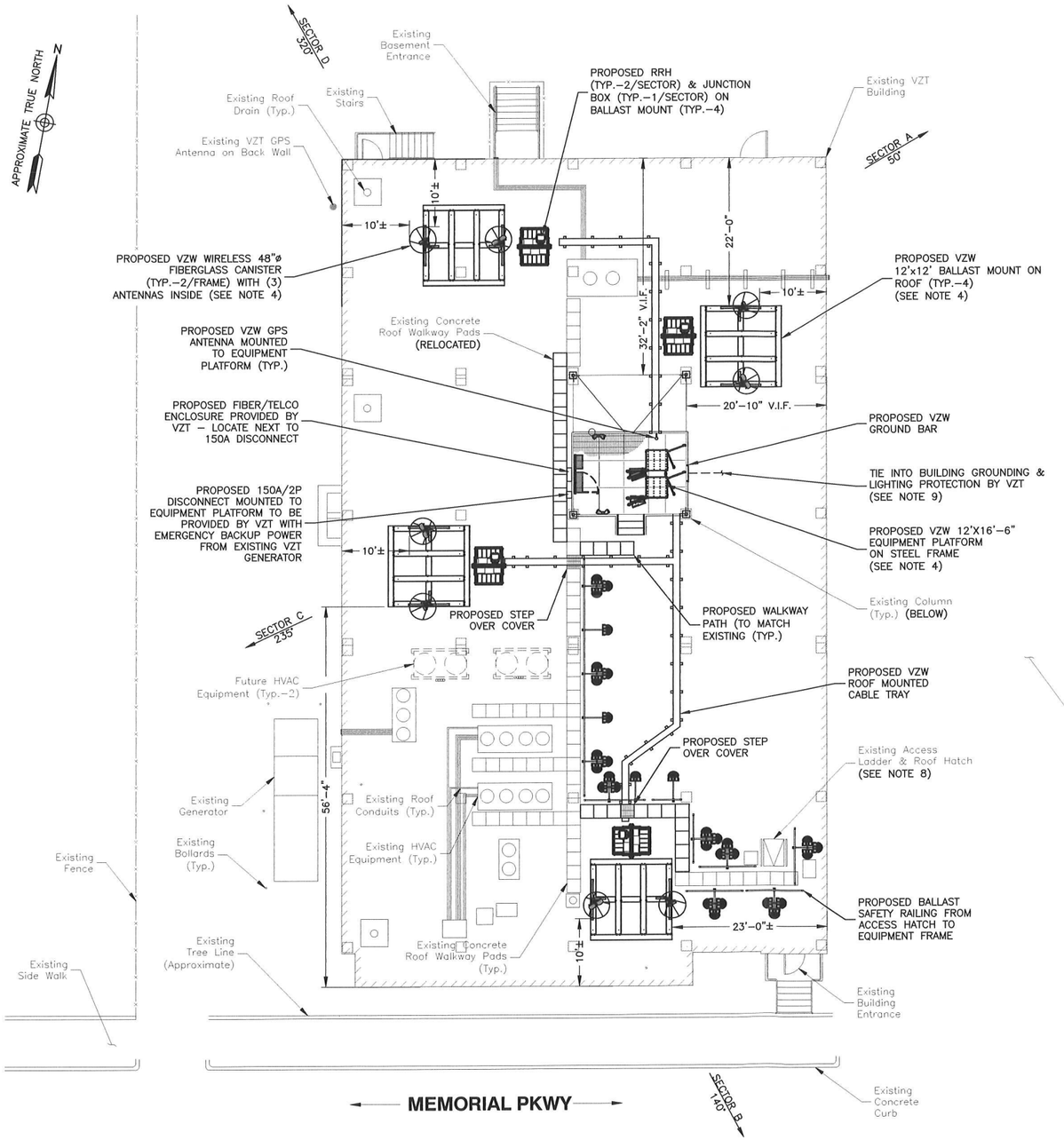
15 MEMORIAL PARKWAY
RANDOLPH, MA 02368

SHEET TITLE

300' ABUTTERS PLAN

SHEET NUMBER

Z-1



COORDINATES*:

42° 09' 48.45"N
71° 02' 35.77"W

GROUND ELEVATION*:

198.1' NAVD 88

* GROUND COORDINATES & ELEVATION BASED ON FAA–2C CERTIFICATION

NOTES:

1. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
2. NORTH ARROW SHOWN AS APPROXIMATE.
3. PLANS BASED ON FIELD OBSERVATION DURING SITE VISIT BY DEWBERRY ENGINEERS INC. ON 12/14/17 AND EXISTING DRAWINGS BY VERIZON TITLED "5476006–02" DATED 12/23/10.
4. ANTENNAS, ASSOCIATED EQUIPMENT, AND PLATFORM SHALL BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS REPORT BY DEWBERRY ENGINEERS INC. DATED 10/15/20.
5. AZIMUTH AND NUMBERS OF ANTENNAS AND ASSOCIATED EQUIPMENT PENDING FINAL RF DESIGN.
6. POWER/TELCO/GROUNDING UTILITY ROUTING PENDING VZT APPROVAL AND DESIGN.
7. RELOCATION OF EXISTING ROOFTOP WALKWAY AND EQUIPMENT PENDING VZT APPROVAL.
8. CAGE TO BE INSTALLED ON LADDER BY VZT. LADDER SAFETY POST AND PULLEY SYSTEM TO BE INSTALLED BY VZW.
9. REMOVE ALL ROOF ROCK BALLAST UNDER THE RRH AND ANTENNA BALLAST SLEDS AND RELOCATED ROOF PADS. ALL ROOF WORK SHALL BE DONE IN COMPLIANCE WITH ALL WARRANTY REQUIREMENTS.
10. GROUNDING MUST COMPLY WITH VZT STANDARDS. ALL GROUND BARS MUT BE COPPER OR NICKEL–PLATED COPPER TO COMPLY WITH CURRENT VZT STANDARDS.

ROOF PLAN 1

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

0' 10' 20'

LEASE SPACE

GRAND TOTAL LEASED SPACE	858± S.F.
VERTICAL SQUARE FEET	0± S.F.
HORIZONTAL SQUARE FEET	858± S.F.

CABLE LENGTH TABLE

SECTOR	CABLE LENGTH*
ALPHA	75'±
BETA	85'±
GAMMA	60'±
DELTA	85'±

*LENGTH IS FROM VERIZON WIRELESS EQUIPMENT AREA TO RRH BALLAST FRAME.

verizon WIRELESS

VERIZON WIRELESS
900 CHELMSFORD STREET
TOWER 2 FLOOR 5
LOWELL, MA 01851

RANDOLPH 3 MA

ZONING DRAWINGS

1	06/14/22	FOR SUBMITTAL
0	04/04/22	FOR SUBMITTAL
A	02/18/22	FOR COMMENT

Dewberry®

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

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

DRAWN BY:	SCA
REVIEWED BY:	MFT
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50121567
SITE NUMBER	

295169

SITE ADDRESS

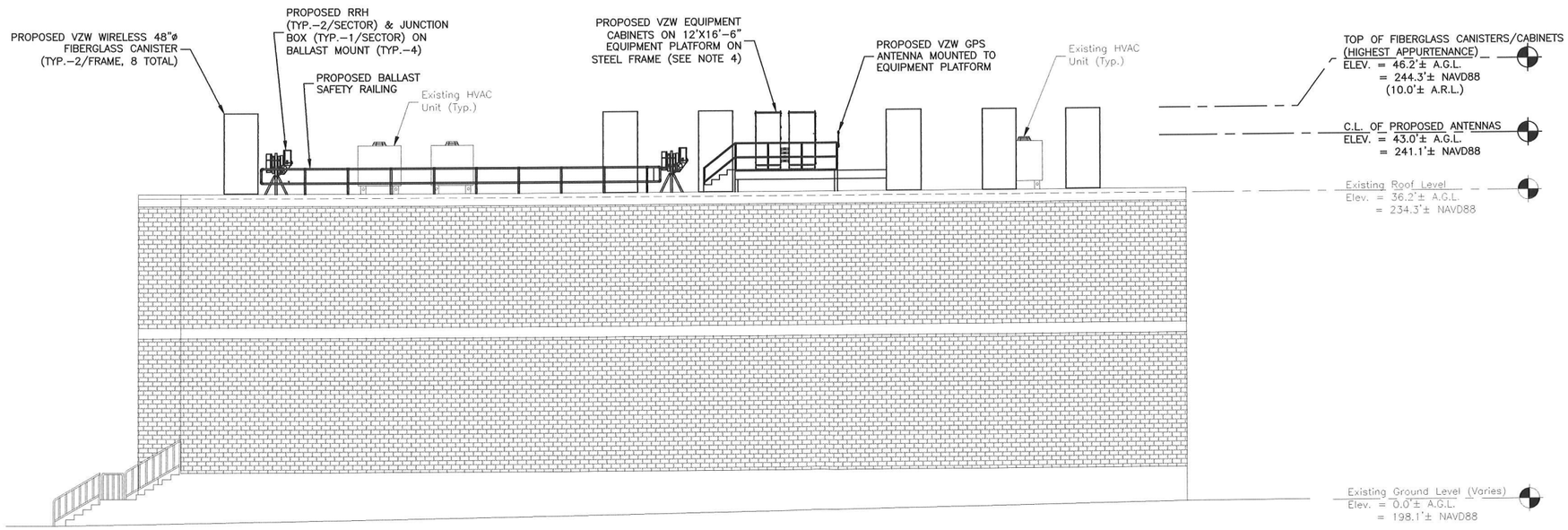
15 MEMORIAL PARKWAY
RANDOLPH, MA 02368

SHEET TITLE

ROOF PLAN

SHEET NUMBER

Z–2



EAST ELEVATION (1)
SCALE: 1/16"=1' FOR 11"x17"
1/8"=1' FOR 22"x34"

0' 4' 8' 16'

NOTES:

1. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
2. A.G.L. = ABOVE GRADE LEVEL
   A.R.L. = ABOVE ROOF LEVEL
   NAVD88 = NORTH AMERICAN VERTICAL DATUM OF 1988.
3. PLANS BASED ON FIELD OBSERVATION DURING SITE VISIT BY DEWBERRY ENGINEERS INC. ON 12/14/17 AND EXISTING DRAWINGS BY VERIZON TITLED "5476006–02" DATED 12/23/10.
4. ANTENNAS, ASSOCIATED EQUIPMENT, AND PLATFORM SHALL BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS REPORT BY DEWBERRY ENGINEERS INC. DATED 10/15/20.
5. AZIMUTH AND NUMBERS OF ANTENNAS AND ASSOCIATED EQUIPMENT PENDING FINAL RF DESIGN.
6. POWER/TELCO/GROUNDING UTILITY ROUTING PENDING VZT APPROVAL AND DESIGN.
7. RELOCATION OF EXISTING ROOFTOP WALKWAY AND EQUIPMENT PENDING VZT APPROVAL.
8. CAGE TO BE INSTALLED ON LADDER BY VZT. LADDER SAFETY POST AND PULLEY SYSTEM TO BE INSTALLED BY VZW.
9. GROUNDING MUST COMPLY WITH VZT STANDARDS. ALL GROUND BARS MUT BE COPPER OR NICKEL–PLATED COPPER TO COMPLY WITH CURRENT VZT STANDARDS.

verizon WIRELESS

VERIZON WIRELESS
900 CHELMSFORD STREET
TOWER 2 FLOOR 5
LOWELL, MA 01851

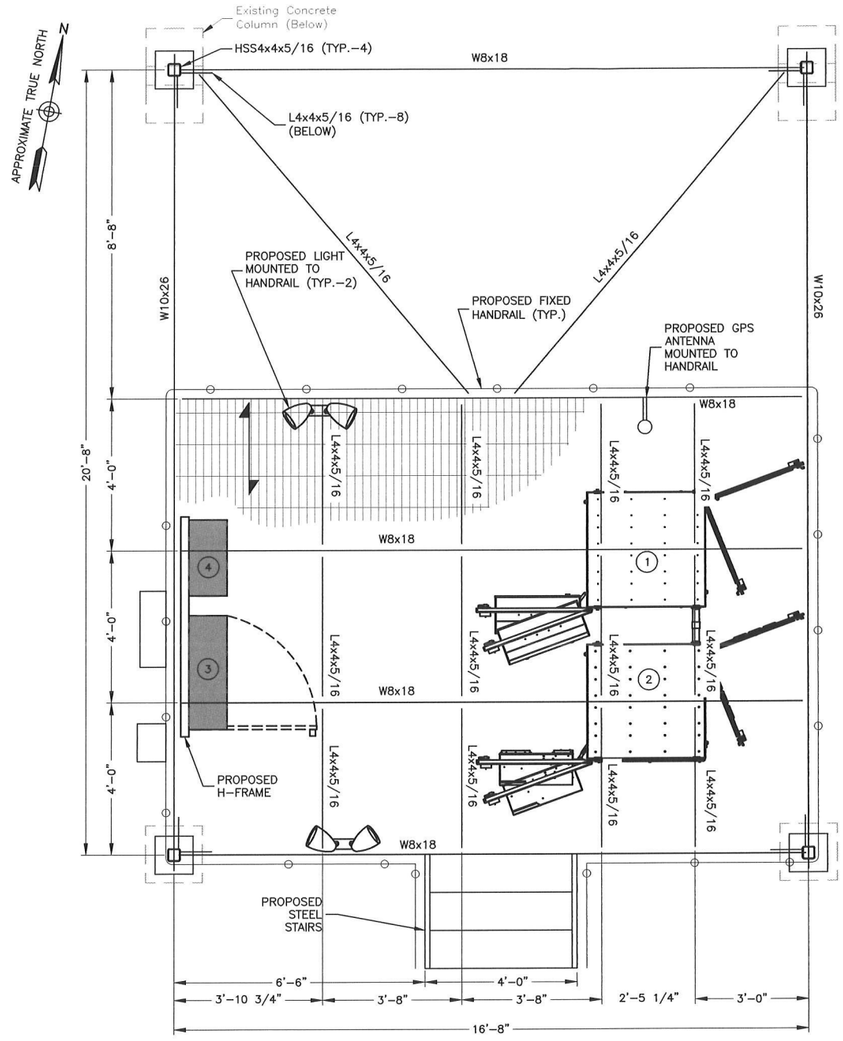
RANDOLPH 3 MA

ZONING DRAWINGS		
1	06/14/22	FOR SUBMITTAL
0	04/04/22	FOR SUBMITTAL
A	02/18/22	FOR COMMENT

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

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

DRAWN BY: SCA
REVIEWED BY: MFT
CHECKED BY: BBR
PROJECT NUMBER: 50121487
JOB NUMBER: 50121567
SITE NUMBER
295169
SITE ADDRESS
15 MEMORIAL PARKWAY
RANDOLPH, MA 02368
SHEET TITLE
EAST ELEVATION
SHEET NUMBER
Z–3



NOTE:

1. CONTRACTOR TO BOLT CABINETS TO L4X4X5/16 ANGLE.

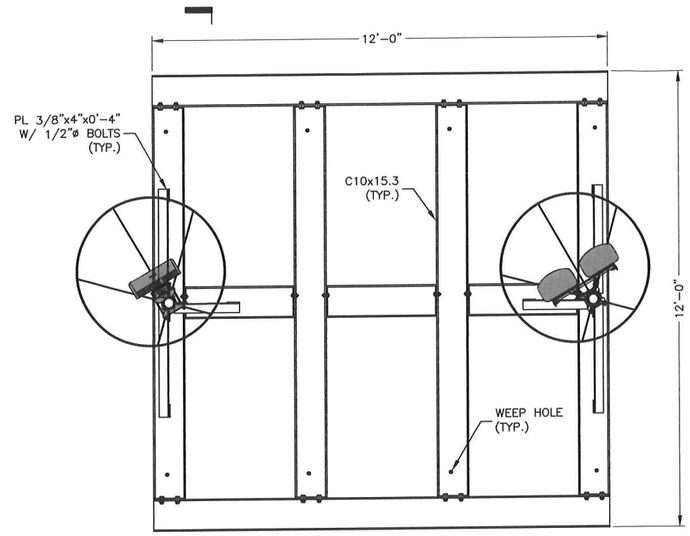
FRAMING PLAN (1)

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

0' 1' 2' 4'

EQUIPMENT LOADING:			WEIGHT (LBS.)	
EQUIPMENT:	1	CMC74–36E (EQUIPMENT CABINET)	1,000 (EA.)	1,000
	2	CMC74–36B (BATTERY CABINET)	4,000 (EA.)	4,000
	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.



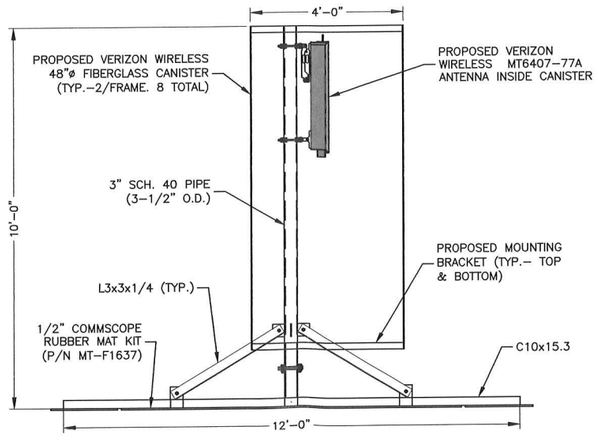
3 / Z–4

PLAN

12'-0" x 12'-0" BASE FRAME (2)

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

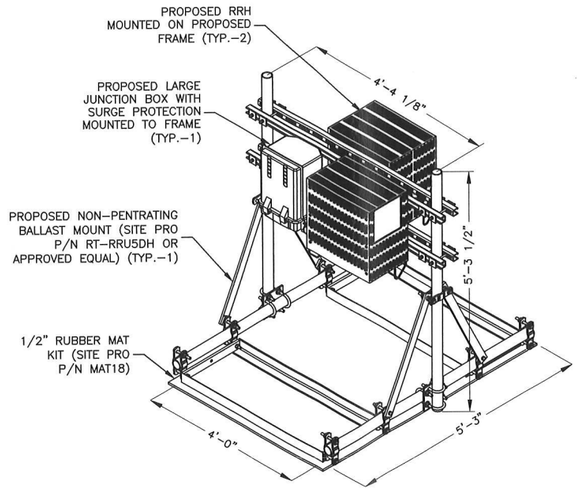
0' 1' 2' 4'



12'-0"x12'-0" BALLAST FRAME SECTION (3)

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

0' 1' 2' 4'



RRH/JUNCTION BOX MOUNT (4)

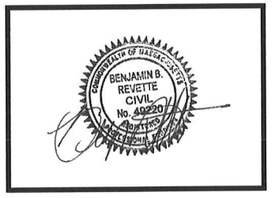
SCALE: N.T.S.

verizon WIRELESS
VERIZON WIRELESS
900 CHELMSFORD STREET
TOWER 2 FLOOR 5
LOWELL, MA 01851

RANDOLPH 3 MA

ZONING DRAWINGS		
1	06/14/22	FOR SUBMITTAL
0	04/04/22	FOR SUBMITTAL
A	02/18/22	FOR COMMENT

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



DRAWN BY:	SGK
REVIEWED BY:	MFT
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50121567

SITE NUMBER

295169

SITE ADDRESS

15 MEMORIAL PARKWAY
RANDOLPH, MA 02368

SHEET TITLE

EQUIPMENT PLATFORM & BALLAST FRAMES

SHEET NUMBER

Z–4