PLAPC

PARISI LAW ASSOCIATES, P.C.

APPLICATION FOR
VARIANCES (Zoning Board of Appeals)
AND
SPECIAL PERMIT AND SITE PLAN REVIEW (Planning Board)
FOR
WIRELESS TELECOMMUNICATION FACILITY

Applicant:	**Vertex Towers, LLC**
Site Id:	**VT-MA-0473**
Property Address:	**Off Center Road, Shirley, MA**
Tax Assessors:	**Map 21A, Lot 19 (facility)** **Map 21A, Lot 19.2 (access)** **Map 21A, Lot 15.1 (access)** **Map 21A Lot 11 (access)** **Map 21A, Lot 9 (access)**
Property Owner:	**Maurice J. Wentworth, III and Marianne Wentworth, Trustees of the Wentworth Realty Trust – 2018 u/d/t dated September 28, 2018**
Date:	**May 31, 2023**

1. ~~Board of Appeals Application (Zoning Board of Appeals)~~
2. Application for Special Permit and Request for Public Hearing (Planning Board)
3. Application for Site Plan Review and Request for Public Hearing (Planning Board)
4. Filing Fees
5. Abutters List
6. Deed
7. Memorandum of Lease
8. Letter of Authorization
9. Project Narrative
10. TOWAIR (FAA Analysis re No Hazard to Air Navigation)
11. Report of Site Acquisition Specialist
12. Report of RF Engineer and RF Coverage Maps
13. Site Emissions Report
14. Removal Cost Estimate and draft Removal Bond
15. Structural Assessment
16. Site Plans

Respectfully submitted,

Francis D. Parisi, Esq.
Parisi Law Associates, P.C.
225 Dyer Street
Providence, RI 02903
(401) 447-8500 cell
fparisi@plapc.com

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APPLICATION FOR SPECIAL PERMIT & REQUEST FOR PUBLIC HEARING

Date: 5/31/23

In accordance with the requirements of the Protective Zoning By-Laws of the Town of Shirley, as amended, the undersigned hereby makes application for a Special Permit and requests a Public Hearing in connection therewith:

Special Permit Requested: Wireless Telecommunications Facility

Per Section 4.15.3.a of the Protective Zoning Bylaws.

1. Name of Applicant: Vertex Towers, LLC

   Address: c/o Parisi Law Associates, P.C. 225 Dyer Street Providence RI 02903

   Phone #: 401 447 8500 Email Address: fparisi@plapc.com

2. Name of Owner (if different than Applicant): Maurice Wentworth III and Marianne Wentworth, Trustees of Wentworth Realty Trust

   Address: PO Box 313, Shirley, MA 01464

3. Name of Engineer/Surveyor: Advanced Engineering Group PC

   Address: 500 North Broadway, East Providence, RI 02914

4. Deed of property recorded as Book 73075 and Page 562 in the Middlesex Southern District Registry of Deeds.

5. Property Address: Off Center Road
   Assessors Map/Block/Parcel: MAP 21A LOT 19
   Zoning: R-1
   Land area (in square feet): 2,130,995 sq ft +/-

Special Permit Applications filed with the Planning Board MUST be accompanied by a filing fee in accordance with current Fee Schedule; fifteen (15) copies of a plan prepared by a professional engineer or surveyor, if applicable; One 11 X 17 electronic copy emailed to planning@shirley-ma.gov; a Certified List of Abutters from the Town of Shirley Board of Assessors; Narrative statements including but not limited to pertinent zoning, parking, water supply, sewerage, use, and drainage issues, if applicable; and such other data or documentation as may be required by the Planning Board, including but not limited to an environmental impact statement

The applicant shall also file with the Town Clerk a written notice stating that an Application for a Special Permit has been submitted to the Planning Board, indicating the date of such submission, along with a copy of this application.

Vertex Towers, LLC
By Francis D. Parisi, Esq
Signature of Applicant Attorney-in-Fact

Maurice Wentworth III and Marianne Wentworth, Trustees of Wentworth Realty Trust
Signature of Owner By: Francis D. Parisi, Esq Authorized Agent

TOWN OF SHIRLEY
PLANNING BOARD

7 KEADY WAY • SHIRLEY, MA 01464

Telephone (978) 425-2600 Ext. 240
Facsimile (978) 425-2627

MEMORANDUM

TO:

FROM: **Shirley Planning Board**

DATE:

SUBJECT: Applicant Agreement to Pay Additional Costs

The purpose of this memorandum is to document the applicant's agreement to pay the additional costs of this Site Plan Review, Special Permit, or Definitive Plan, in addition to the amount specified in the latest Planning Board Fee Schedule, as required by the Town of Shirley's General Town By-Laws, Article III, Section 12. These additional costs will include the cost of the required legal ads and costs of postage to mail out two sets of abutter notices to all abutters, paid to the Planning Board, and the cost of the required abutter notices, paid to the Assessor's Office.

Planning Board Assistant
Town of Shirley

PROJECT NAME: Vertex Wireless Telecommunication Facility

SIGNATURE OF APPLICANT: Vertex Towers, LLC
By: Francis D. Parisi, Esq
Attorney-in-Fact

DATE: 5/31/23

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APPLICATION FOR SITE PLAN REVIEW & REQUEST FOR PUBLIC HEARING

Date: 5/31/23

In accordance with the requirements of the Protective Zoning By-Laws of the Town of Shirley, as amended, the undersigned hereby makes application for a Site Plan Review and requests a Public Hearing in connection therewith:

Permit Requested: **Site Plan Review**

Per Section 7 of the Protective Zoning Bylaws.

1. Name of Applicant: Vertex Towers, LLC

   Address: c/o Parisi Law Associates, P.C. 225 Dyer ST Providence, RI 02903

   Phone #: 401 447-8500 Email Address: fparisi@plapc.com

2. Name of Owner (if different than Applicant): Maurice Wentworth and Marianne Wentworth, Trustees of Wentworth Realty Trust

   Address: PO Box 313 Shirley, MA 01464

3. Name of Engineer/Surveyor: Advanced Engineering Group, P.C.

   Address: 500 North Broadway, East Providence, RI 02914

4. Deed of property recorded as Book 73075 and Page 562 in the Middlesex Southern District Registry of Deeds.

5. Property Address: Off Center Road
   Assessors Map/Block/Parcel: MAP 21A, LOT 19
   Zoning: R-1
   Land area (in square feet): 2,130,995 sq ft +/-

Site Plan Review Applications filed with the Planning Board MUST be accompanied by a filing fee in accordance with current Fee Schedule; fifteen (15) copies of a plan prepared by a professional engineer or surveyor, if applicable; One 11 X 17 electronic copy emailed to planning@shirley-ma.gov; a Certified List of Abutters from the Town of Shirley Board of Assessors; Narrative statements including but not limited to pertinent zoning, parking, water supply, sewerage, use, and drainage issues, if applicable; and such other data or documentation as may be required by the Planning Board, including but not limited to an environmental impact statement.

The applicant shall also file with the Town Clerk a written notice stating that an Application for a Site Plan Review has been submitted to the Planning Board, indicating the date of such submission, along with a copy of this application.

Vertex Towers, LLC
By: Frank D. Parisi, Esq
Signature of Applicant Attorney in Fact

Maurice Wentworth III and Marianne Wentworth, Trustees of Wentworth Realty Trust
By: Frank D. Parisi, Esq
Signature of Owner Authorized Agent

TOWN OF SHIRLEY
PLANNING BOARD
7 KEADY WAY • SHIRLEY, MA 01464
Telephone (978) 425-2600 Ext. 240
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Planning Board Assistant
Town of Shirley

PROJECT NAME: Vertex Wireless Telecommunications Facility

SIGNATURE OF APPLICANT: Vertex Towers, LLC

DATE: 5/31/23 BY: Francis D. Parisi, Esq
Attorney-in-Fact

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2019 00116785
Bk: 73075 Pg: 562 Doc: DEED
Page: 1 of 7 08/08/2019 10:57 AM

(Space above this line reserved for Registry of Deeds use)

QUITCLAIM DEED

We, Marianne Wentworth and Maurice Wentworth, aka Maurice J. Wentworth, III, of Worcester County, MA

for consideration paid and in full consideration of ONE AND NO/100 ($1.00) DOLLARS

grant to Maurice J. Wentworth, III and Marianne Wentworth, Trustees of the Wentworth Realty Trust – 2018 under Declaration of Trust dated September 28, 2018 to be recorded herewith, of 9 Munson Avenue, Shirley, MA

with QUITCLAIM covenants

Locus: 9 Munson Ave., and Center Rd., Shirley

A certain parcel of land with buildings thereon situated in the Southerly part of said Shirley, and described as follows;

BEGINNING at a point marked by a stone bound on the Westerly side line of Center Road, said point being distant 49.5 feet from the Northeasterly comer of the dwelling house at one time owned by Moses T. Gardner now owned by one Knowles;

THENCE turning North 37° 28' East 232.54 feet by Center Road to a corner at land late of Herbert E. Lawrence;

TIIENCE turning North 52° 37' West 1.09 feet by land late of said Lawrence to a marble bound; North 52° 37' West 142.25 feet by land late of said Lawrence to a marble bound;

THENCE turning North 37° 17' East 76.17 feet by land late of said Lawrence to a marble bound;

THENCE turning North 37° 49' East 16.50 feet by land late of said Lawrence to an iron rod at a comer of land of the President Suspender Co.;

THENCE turning North 36° 57' East 122.81 feet by land of the President Suspender Company to a stone bound at comer of land of Margaret Bradford;

THENCE turning North 53° 02' West 8.68 feet by land of said Bradford to stone bound;

THENCE turning North 64° 30' West 186.18 feet by land late of said Bradford to a stone bound;

THENCE turning North 35° 40' East 93.12 feet by land of said Bradford to a stone bound at land of Mary Park;

THENCE turning North 35° 40' East 194.10 feet by land of said Park to a stone bound at land of Morton E. Lawrence;

THENCE turning North 1° 01' West 509.55 feet by land late of said Lawrence to a stone bound at land of Harvey A. McCollester; turning North 28° 43' East 238.86 feet by land of said McCollester to a stone bound;

THENCE turning South 76° 10' East 159.65 feet by land of said McCollester to a stone bound at Center Road;

THENCE turning North 2° 0' East 238.98 feet by Center Road to a stone bound;

THENCE by Center Road by the arc of a circle (whose radius is 689.14 feet) North 2 ° 23' 10" East 9.29 feet to an oak hub at land of Charles W. Marshall;

THENCE turning North 62° 49' West 1410.52 feet by land of said Marshall to an iron pin set in the ground near the base of a yellow birch tree;

THENCE turning South 20° 51.5' West 54.91 feet by fence to an oak hub;

THENCE turning South 10° 31' West 243.68 feet by fence and wall to a 1/4" drill hole in the base stone of a wall comer at land late of one Parker;

THENCE turning South 61° 52' East 237.76 feet by land late of Parker or other to a nail in a stump;

THENCE turning South 23° 12' West 778.70 feet by land of Parker or other by the stone wall to an oak hub set in the comer of stone walls;

THENCE turning North 80° 19' 09" West by land of Parker or other, and others 1006.5 feet to an oak hub and stones set at high water mark at Paper Mill Pond (so called);

THENCE by high water mark along said pond to an oak hub (which is by a straight line South 4° 23.5' West 787.88 feet from the point previously mentioned) at land of the Boston and Maine Railroad Co. and 35.75 feet Northerly from the center line of location of the Boston and Maine Railroad Co.;

THENCE by land of the Boston and Maine Railroad Co. Easterly by several courses about 755 feet to an oak hub which is 45.25 feet Northerly from the center line of location of the Boston and Maine Railroad;

THENCE turning South 21" 30' West 92.17 feet across land of the Boston and Maine Railroad Co. to an oak hub;

THENCE turning South 21° 30' West 62.28 feet to an oak hub near an 18" Elm tree at Catacoonamaug Brook;

THENCE turning South 55° 52' East 33.20 feet by the said brook to a stake;

THENCE turning North 65° 41' East 41.56 feet by said brook to a stake;

THENCE turning South 54° 23' East 113.04 feet by said brook to a stake at the Mill Pond;

THENCE turning South 86° 17' East 65.22 feet by the pond to a stake;

THENCE turning North 72 ° 31' East 58.83 feet by the pond to a stake;

THENCE turning South 20° 04' East 44.49 feet by the pond to a stake;

THENCE turning South 70° 54' East 48.39 feet by the pond to a stake;

THENCE turning South 44° 14' East 58.89 feet by the pond to a stake;

THENCE turning South 46° 12' East 123.19 feet by the pond to a stake;

THENCE turning South 29° 55' East 79.81 feet by the pond to an oak hub at land of President Suspender Co.;

THENCE turning South 52° 41' East 73.92 feet by land of the President Suspender Co. to an iron pipe at the end of the dam;

THENCE turning South 2° 11' East 49.5 feet along the dam to an oak hub;

THENCE turning South 54° 55' East 99.25 feet to an iron pipe at land of President Suspender Co.;

THENCE turning South 55° 35' East 190.34 by land of President Suspender Co. to an oak hub;

THENCE turning North 41° 35' East 263.04 feet by land now or formerly of H. Edgarton or other to an oak hub at the Boston and Maine Railroad Co. being 38.5 feet from the center line of location of the Boston and Maine Railroad Co.;

THENCE turning North 41° 35' East 68.04 feet across the land of the Boston and Maine Railroad Co. to an oak hub which is 27.50 feet from the center line of location of the Boston and Maine Railroad Co.;

THENCE turning North 41° 35' East 22 feet across Munson Avenue to an oak hub at land of Quinty et al;

THENCE turning North 58° 571 West 27.63 feet by land of said Quinty et al to an old hub at land of one Gendron;

THENCE turning North 58° 57' West 55.50 feet by land of said Gendron to a stone bound;

THENCE turning North 41° 18' East 210.25 feet by land of said Gendron to an oak hub;

THENCE turning South 64° 08' East 304.31 feet by land of said Gendron, by land of said Quinty and by land of said Knowles to a stone bound at the point of beginning.

Excluding the following parcels from the above, which have been previously conveyed;

Parcel	Owner	Book/Page	Location
21 A 9	Stanley M. Jurga Carole E. Jurga	20420/182	20 Center Road
21 A 10	Stanley P.Jurga Jurga Family Trust	24463/501	18 Center Road

21 A 11	Stanley P. Jurga Jurga Family Trust	24463/501	16 Center Road
21 A 15.1	Stanley P. Jurga Carol E. Jurga	32221/494	Center Road
21 A 16	Helen Labowicz	9872/211	11 Munson Ave.
21 A 17	John C. Guthrie III Catherine U. Guthrie	12472/244	13 Munson Ave.
21 A 18	John C. Guthrie	42025/106	15 Munson Ave.
21 A 19.1	John C. Guthrie III Catherine U. Guthrie	13048/128	Munson Ave.
21 A. 19.2	Stanley M. Jurga Carol E. Jurga	13342/183	18 Center Road
21 A. 20	Shirley Water District	3267/150	Center Road
16 A 6	Ampac Enterprises	19490/103	1 Main Street

For Grantor's title see deed recorded with the ~~Worcester~~ Middlesex South JH Registry of Deeds in Book 58653, Page 134.

EXECUTED as an instrument under seal this 29 day of May, 2019.

Maurice Wentworth,
aka Maurice J. Wentworth, III

Marianne Wentworth

COMMONWEALTH OF MASSACHUSETTS

County of Middlesex

On this 29th day of May, 2019, before me, the undersigned notary public, personally appeared Marianne Wentworth and Maurice Wentworth, aka Maurice J. Wentworth, III, proved to me through satisfactory evidence of identification, which was [X] a driver's license and/or [ ] _____ to be the persons whose names are signed on the preceding or attached document, and acknowledged to me that they signed it voluntarily for its stated purpose.

Notary Public:
My Commission Expires: 1/17/2025

WILLIAM C. OELFKE
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires On
January 17, 2025

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Record and Return to:
Vertex Towers, LLC
155 South Street, Suite 102
Wrentham, MA 02093

MEMORANDUM OF LEASE

This Memorandum of Lease evidences a Lease Agreement ("Agreement") by and between Vertex Towers, LLC a Massachusetts limited liability company with a mailing address of 155 South Street, Suite 102, Wrentham, MA 02093 (the "TENANT") and Marianne Wentworth and Maurice J. Wentworth III, Trustees of the Wentworth Realty Trust – 2018, u/d/t September 28th, 2018, with a mailing address of P.O. Box 313, Shirley, MA 01464 (collectively, the "LANDLORD"), which Agreement contains, among other things, the following terms:

1. LANDLORD owns certain real property located at off Center Road in the Town of Shirley, Middlesex County, Commonwealth of Massachusetts, which is depicted as Lot 19, on Assessor's Map 21-A, and being further described as the same real property conveyed by that certain deed recorded in Deed Book 73075 at Page 562 of the Middlesex County Registry of Deeds, (the "Subject Property") Subject to the terms of the Agreement, LANDLORD has granted to TENANT an option to lease a portion of the Subject Property and to acquire certain easements for ingress, egress and utilities collectively known as the "Leased Premises".
2. The Agreement will constitute a lease of the Leased Premises. The Agreement is for an initial term of ten (10) years commencing on the date that TENANT exercises its option as defined in agreement, along with five (5) additional ten (10) year renewal terms, unless earlier terminated by TENANT.
3. The Leased Premises may be used exclusively by TENANT for all legal purposes outlined in the Agreement, including without limitation, erecting, installing, operating and maintaining radio and communications towers, buildings, and equipment; TENANT is entitled to sublease and/or sublicense the Leased Premises, including any communications towers located thereon.
4. Pursuant to the Agreement, excluding a sale of the Subject Property in its entirety, provided such sale also includes the Leased Premises, LANDLORD has granted a TENANT a right of first refusal in connection with all requests, proposals or offers from any third party other than the TENANT's to acquire, lease or obtain an easement (or other right of way) under all or any portion of the Leased Premises.
5. By this Memorandum, the parties hereto intend to record a reference to the Agreement and do hereby ratify and confirm all of the terms and conditions of the Agreement and declare that the Leased Premises are subject to all of the applicable provisions of the Agreement. In the event of a conflict between this Memorandum and the Agreement, the Agreement will control.

[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK, SIGNATURES BEGIN ON NEXT PAGE]

IN WITNESS WHEREOF, the parties hereto have fully executed this Agreement as of the date last signed by a Party hereto.

TENANT:
VERTEX TOWERS, LLC

By: _____
Name: Stephen Kelleher
Title: Manager
Date: 1-27-2022

LANDLORD:
WENTWORTH REALTY TRUST - 2018
u/d/t September 28th, 2018

By: Marianne Wentworth
Name: Marianne Wentworth
Title: Trustee
Date: 1/17/2022

By: _____
Name: Maurice J. Wentworth III
Title: Trustee
Date: 1/17/2022

TENANT ACKNOWLEDGEMENT
COMMONWEALTH OF MASSACHUSETTS
COUNTY OF NORFOLK:

On the date below, before me personally appeared Stephen Kelleher, Manager of Vertex Towers, LLC, to me known (or proved to me on the basis of satisfactory evidence) to be the individual who executed the foregoing instrument, and he acknowledged said instrument by him executed to be his free act and deed in said capacity as Manager.

Date: 01/27/2022

Notary Public Signature: _____

ERIN E VOZZELLA
Notary Public, Commonwealth of Massachusetts
My Commission Expires APRIL 15, 2022

Notary Stamp or Seal

LANDLORD ACKNOWLEDGEMENT
COMMONWEALTH OF MASSACHUSETTS
COUNTY OF MIDDLESEX:

On the date below, before me personally appeared Marianne Wentworth and Maurice J. Wentworth III, Trustees of the Wentworth Realty Trust – 2018 u/d/t September 28th, 2018, to me known (or proved to me on the basis of satisfactory evidence) to be the individuals who executed the foregoing instrument, and they acknowledged said instrument by them executed to be their free act and deed in said capacity as Trustees.

Date: 1/17/22

Notary Public Signature: _____

Shinyoung Morrison
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
01/13/2028

Notary Stamp or Seal

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LETTER OF AUTHORIZATION

We, Marianne Wentworth and Maurice J. Wentworth III, Trustees of the Wentworth Realty Trust – 2018, u/d/t September 28th, 2018, which the Wentworth Realty Trust – 2018 owns a certain parcel of land located at off Center Road in the Town of Shirley, Middlesex County, Commonwealth of Massachusetts, which is depicted as Lot 19, on Assessor's Map 21-A, and being further described as the same real property conveyed by that certain deed recorded in Deed Book 73075 at Page 562 of the Middlesex County Registry of Deeds (the "Property").

As Trustees of the above-referenced Property, we hereby authorize Vertex Towers, LLC and any of its designated agents or assigns, to apply for all necessary municipal, state, federal and other permits necessary to accommodate the installation of a wireless telecommunication facility on the Property.

Sign: Marianne Wentworth
Marianne Wentworth

Date: 1/17/2022

Sign: _____
Maurice Wentworth

Date: 1/17/2022

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PLAPC

PARISI LAW ASSOCIATES, P.C.

APPLICATION FOR
VARIANCES (Zoning Board of Appeals)
AND
SPECIAL PERMIT AND SITE PLAN REVIEW (Planning Board)
FOR
WIRELESS TELECOMMUNICATION FACILITY

Applicant:	**Vertex Towers, LLC**
Site Id:	**VT-MA-0473**
Property Address:	**Off Center Road, Shirley, MA (facility)**
Tax Assessors:	**Map 21A, Lot 19 (facility)**
	Map 21A, Lot 19.2 (access) (18 Center Road)
	Map 21A, Lot 11 (access) (16 Center Road)
	Map 21A Lot 15.1 (access) (18 Center Road)
	Map 21A, Lot 9 (access) (20 Center Road)
Property Owner:	**Maurice J. Wentworth, III and Marianne Wentworth, Trustees of the Wentworth Realty Trust – 2018 u/d/t dated September 28, 2018**
Date:	**May 31, 2023**

PROJECT NARRATIVE

INTRODUCTION

The Applicant Vertex Towers, LLC, a Massachusetts limited liability company ("Vertex") is a telecommunications infrastructure developer. Vertex develops, manages and owns telecommunications facilities in strategic locations across the country. The Vertex team has been working in the industry since the industry was founded and has the experience and expertise to navigate the challenges of the most complex markets.

Vertex is sometimes herein referred to as the "Applicant".

The Applicant's proposed Wireless Telecommunications Facility is shown on plans submitted with this Application (the "Plans"). The Applicant proposes to construct a 125' tall monopole- style tower at Off Center Road, Shirley, MA, Tax Assessors Map 21A, Lot 19 (the "Property") that will structurally accommodate at least 4 wireless broadband telecommunications carriers and associated antennas, electronic equipment and cabling; and fence in the base of the tower to accommodate ground based telecommunications equipment. As shown on the Plans that accompany this Application, AT&T Wireless will place panel style antennas and required electronic equipment at a height of approximately 120' on the tower, it is anticipated that various telecommunications companies, including Verizon Wireless, T-Mobile / SprintPCS, Dish Networks and other wireless communications companies will place panel style antennas and required electronic equipment at heights of approximately 110', 100' and 95' (centerline) on the tower, and each will place telecommunications equipment and backup batteries inside equipment shelter(s) and/or weatherproof cabinets to be located immediately adjacent to the base of the tower.

Power/telephone cabinets will be installed just outside the fenced in compound. Applicant's Wireless Communications Facility is similar to the other telecommunication facilities already located in the surrounding area and has been designed in accordance with the Town's Zoning Bylaw as much as possible.

The Property (Map 21A, Lot 19) is a large, 48 acre substantially undeveloped parcel in the Residential 1 (R1) Zoning District, abutting land owned by the Shirley Water District and on which there is a power line and water line easement. The Shirley Tax Assessor has confirmed that all taxes due on the Property are current. Access to the Property is over an existing right of way from Center Road over adjacent lots [Map 21A, Lot 19.2 (18 Center Road); Map 21A, Lot 11 (16 Center Road); Map 21A Lot 15.1 (18 Center Road); and Map 21A, Lot 9 (20 Center Road)] over which the Applicant has secured access and utility easements.

A wireless telecommunications facility is not a permitted use in the R-1 Zoning District. Accordingly, the Applicant respectfully requests a VARIANCE from Sections 3.2.1 and 4.15.3.d from the ZONING BOARD OF APPEALS.

Section 4.15.5.b of the Zoning Bylaw requires that "any tower shall be set back from any lot line by a minimum distance equal to the height of the tower above the lowest surrounding grade, but in no case less than the minimum required setbacks for the district in which it is situated. Appurtenant structures shall also conform to the minimum required setbacks for the district in which the facility is located." The Facility is immediately adjacent to a lot owned by the Shirley Water District and used for utility purposes. Accordingly, the Applicant respectfully requests a VARIANCE from Section 4.15.5.b (and Section 3.2.2 if necessary) from the ZONING BOARD OF APPEALS.

Section 4.15.3.a provides that "No wireless telecommunications facility, which shall include towers of any type greater than five (5) feet in height, satellite dishes over three (3) feet in diameter, antenna(s), panels, and appurtenant structures, shall be erected or installed except in compliance with the provisions of this Section…. In all cases, a Special Permit is required from the Shirley Planning Board in accordance with the requirements set forth herein. Granting of a Special Permit is required prior to approval of a Site Plan by the Planning Board." In addition, 4.15.7.a. provides that "Site Plan Approval by the Planning Board is required for the siting and construction of all wireless telecommunication facilities as defined above in Section 4.15.2 of this Bylaw." Accordingly, the Applicant respectfully requests a SPECIAL PERMIT and SITE PLAN APPROVAL from the PLANNING BOARD.

THE PROJECT

Wireless telecommunications carriers are in the process of independently designing, constructing and upgrading wireless telecommunications networks to serve areas in and around the Town of Shirley. Such a network requires a grid of radio transmitting and receiving cell sites located at varying distances depending on the location of existing and proposed installations in relation to the surrounding topography. The radio transmitting and receiving facilities require a path from the facility to the user on the ground. This requires the antennas to be located in a location above the tree line where the signal is not obstructed or degraded by buildings or topographical features.

Once constructed, the Facility will be unmanned and will involve only periodic maintenance visits. The only utilities required to operate the facility are electrical power as well as telephone service which are currently available at the property. The traffic generated by the facility will be one or two vehicle trips per month by maintenance and technical personnel to ensure the telecommunications site remains in good working order. These visits will not result in any material increase in traffic or disruption to patterns of access or egress that will cause congestion hazards or cause a substantial change in the established neighborhood character. The Applicant's maintenance personnel will make use of the access roads and parking to be constructed at the Property. The proposed Facility will not obstruct existing rights-of-way or pedestrian access and will not change the daily conditions of access, egress, traffic, congestion hazard, or character of the neighborhood. The installation will not require the addition of any new parking or loading spaces.

The construction of the Applicant's Facility will enhance service coverage in the Town of Shirley and surrounding communities. The enhancement of service coverage in the Town of Shirley is desirable to the public convenience for personal use of wireless services and for community safety in times of public crisis and natural disaster. Wireless communications service also provides a convenience to residents and is an attractive feature and service to businesses. In addition, the requested use at this location will not result in a change in the appearance of the surrounding neighborhoods. The use is passive in nature and will not generate any traffic, smoke, dust, heat, glare, discharge of noxious substances, nor will it pollute waterways or groundwater. Once constructed, the facility will comply with all applicable local, state and federal safety regulations.

Moreover and most importantly:

1. The proposed Facility will promote and conserve the convenience and general welfare of the inhabitants of Shirley by enhancing telecommunications services within the Town.

2. The proposed Facility will lessen the danger from fire and natural disasters by providing emergency communications in the event of such fires and natural disasters.

3. The proposed Facility will preserve and increase the amenities of the Town by enhancing telecommunications services.

4. The proposed Facility will facilitate the adequate provision of transportation by improving mobile telecommunications for business, personal and emergency uses.

Wireless service is important to public safety and convenience. As of the end of 2019, there were an estimated 442 million mobile wireless subscribers in the United States. See FCC's *2020 Communications Marketplace Report*, p. 12 (December 31, 2020). There are now more wireless subscriptions than landline telephone subscriptions in the United States, and the number of landline telephone subscribers across the nation is declining each year while the number of wireless users increases. Moreover, it is forecasted that wireless connections will become more significant as network service providers facilitate increase connectivity directly between devices, sensors, monitors, etc., and their networks. *Id.*

For many Americans, wireless devices have become an indispensable replacement for traditional landline telephones. Even when Americans maintain both types of telephone service, Americans are opting increasingly to use wireless devices over their landline telephones. For Americans living in "wireless-only" homes and for those others while away from their homes, cell phones are often their only lifeline in emergencies. Over 97% of Americans now own a cellphone of some kind and more than 85% own smartphones; more importantly, more than 50 percent of American households are now wireless only for voice connectivity, and 15% of adults are "smartphone-only" internet users – meaning they own a smartphone, but do not have traditional home broadband service. *http://www.pewinternet.org/fact-sheet/mobile/* Approximately 80% of the millions of 911 calls made daily are placed from cell phones, and that percentage is growing. *https://www.ctia.org/the-wireless-industry/infographics-library*. The FCC's Phase II E911 rules require wireless service providers to transmit the location of a wireless 911 call, within certain parameters for accuracy. Under the FCC's rules, wireless providers are subject to increasingly stringent 911 location accuracy requirements almost every year through 2024. See *http://www.fcc.gov/guides/wireless-911-services*

COMPLIANCE WITH SITING CRITERIA FOR WIRELESS COMMUNICATIONS FACILITIES

4.15. Wireless Telecommunications Towers and Facilities (Added 9-11-00; Revised 6-8-09)

4.15.1. Purpose

The purpose of this Bylaw is to establish general guidelines for the siting of wireless telecommunication towers for private or commercial use, antenna(s), satellite dishes greater than three (3) feet in diameter, and appurtenant structures. The intent of this Bylaw is to:

a. Require the location of the towers on land in areas where the adverse impact on the community is minimal,

b. Minimize the number and overall height of towers in Shirley,

c. Require the co-location of different telecommunication companies antenna(s) on towers as much as possible

d. Encourage the siting of towers and appurtenances to minimize their visibility to the public, including if possible location of antenna(s) in or on existing buildings,

e. Enhance the ability of the providers of telecommunications services to provide such services to the community quickly, effectively and efficiently, and

f. To encourage the co-location of municipal use on wireless telecommunication towers and facilities by local municipal agencies use upon request.

The proposed Facility has been designed to fulfill the purpose and intent and specific requirements of the Town's Bylaw as much as possible. The location of the proposed Facility is on a large substantially undeveloped and heavily treed lot, abutting other utility type uses. There are no other structures of sufficient height anywhere near the Property which would provide the requisite telecommunications coverage. The Facility as proposed meets all required height limitations and setback requirements as much as possible, and has been sited in such a way as to minimize its visibility as much as possible. As a wireless infrastructure developer, Vertex encourages co-location and has relationships with all of the existing wireless telecommunications carriers licensed in this market and intends to provide space on the proposed Facility at commercially reasonable rates, which will minimize the total number of towers in the community. Once constructed, the proposed Facility will have no adverse impact on the Town's ecological, aesthetic, historical and recreational resources, and will facilitate the provision of telecommunications services throughout the Town and enhance the ability of wireless carriers to provide telecommunications services to the community quickly, effectively and efficiently.

4.15.2. Definitions

Intentionally omitted.

4.15.3. General Requirements

a. No wireless telecommunications facility, which shall include towers of any type greater than five (5) feet in height, satellite dishes over three (3) feet in diameter, antenna(s), panels, and appurtenant structures, shall be erected or installed except in compliance with the provisions of this Section. The foregoing provision shall also apply to antennas to be added to an existing tower, which specific antennas were not previously approved during a Special Permit process. In all cases, a Special Permit is required from the Shirley Planning Board in accordance with the requirements set forth herein. Granting of a Special Permit is required prior to approval of a Site Plan by the Planning Board.

The Applicant respectfully requests a SPECIAL PERMIT and SITE PLAN APPROVAL from the PLANNING BOARD.

b. Only free-standing towers not requiring guy wires for support are allowed.

The proposed Facility will be a free-standing tower without guy wires.

c. Tower height shall be limited to the minimum height necessary, as determined from objective technical evidence presented by the applicant. The tower shall not exceed seventy-five (75) feet above the average grade of the existing terrain at the tower base, or its base structure, unless the applicant demonstrates to the satisfaction of the Planning Board that a taller tower will permit multiple users without impact on the viewshed, and that the applicant will be unable to provide service with a shorter tower. In all cases, tower height shall be limited to the Federal Aviation Administration height limit beyond which lighting would be required for the particular siting area proposed, or 125 feet, whichever is less.

The proposed Facility will not exceed 125' in height), and will not require FAA lighting. As is evidenced by the Report of RF Engineer which accompanies this Application, the Facility will be the minimum height necessary to satisfy the coverage objective for multiple wireless carriers, without impact on the viewshed.

d. Wireless telecommunications facilities shall be suitably screened from abutters and residential neighborhoods and located only in commercially zoned property. Towers may be allowed on a lot as an accessory use to a main building, however no more than one (1) tower may be sited on any parcel of land.

The proposed Facility will be setback and suitable screened from all residential neighborhoods. However, the Property (Map 21A, Lot 19) is a large, 48 acre substantially undeveloped parcel in the Rural Residential 1 (RR1) Zoning District, abutting land owned by the Shirley Water District and on which there is a power line and water line easement. Accordingly, the Applicant respectfully requests a VARIANCE from Section 4.15.3.d from the ZONING BOARD OF APPEALS.

e. There shall be a presumption by the Special Permit Granting Authority (SPGA) that the applicant service can be provided by location of antenna(s) in or on existing buildings or structures. This presumption may be rebutted by hard evidence to the contrary that such location is not feasible.

As is evidenced by the Report of Site Acquisition Specialist and the Report of a Radio Frequency Engineer and accompanying maps and attachments, there are no existing buildings or structures that would feasibly provide the requisite coverage.

f. **When utilizing existing buildings or structures for antenna(s) location, antenna(s) shall, be enclosed within an existing structure such as a church steeple or clock tower. Antenna(s) may only be placed on the exterior of existing buildings or structures upon the determination by the SPGA that placement within existing buildings or structures is not feasible, and that the placement of such antenna(s) does not materially detract from the historic value or traditional view of buildings or structures in the vicinity. The height limit imposed by Section 4.15.3.c above shall also apply to antenna(s) placed on existing buildings and structures, and shall be measured from the lowest ground elevation adjacent to the existing building or structure.**

Not applicable.

g. **There shall be a presumption by the SPGA that co-location of multiple service providers now seeking, or anticipated to be seeking a tower location within the next three (3) years and within a two (2) mile radius of the proposed site, is possible, however each shall require a separate Special Permit This presumption may be rebutted by substantial evidence to the contrary that such co- location is not feasible.**

As a wireless infrastructure developer, Vertex designs its facilities to encourage co-location and has relationships with all of the existing wireless telecommunications carriers licensed in this market and intends to provide space on the proposed Facility at commercially reasonable rates.

h. **Facilities shall be removed upon cessation of use, at the sole expense of the owner(s) of the facility defined in Section 4.15.6.a below. Use of the facility shall be determined to have ceased when it has not been in use for a period of twelve (12) continuous months, of for a total of eighteen (18) out of the last thirty (30) months. Records shall**

be submitted to the SPGA annually indicating the usage of the facility over the previous twelve (12) months, and its current operational status. Such information shall be a condition of the Special Permit.

The Applicant agrees to comply with all reasonably and lawfully required procedural and other conditions generally and uniformly and lawfully imposed and applied by the Town with respect to the Facility and similar facilities

i. All wireless telecommunications facilities shall comply with all applicable standards and regulations of the Federal Communications Commission (FCC), Federal Aviation Administration (FAA), the American National Standards Institute, the Massachusetts Aeronautics Commission, and the Massachusetts Department of Public Health. The SPGA may require annual certification demonstrating continuing compliance with regulations and requirements of any or all of the above regulatory agencies as a condition of the Special Permit.

The proposed Facility has been designed to comply in all respects with all applicable health and safety standards. The Applicant agrees to comply with all reasonably and lawfully required procedural and other conditions generally and uniformly and lawfully imposed and applied by the Town with respect to the Facility and similar facilities.

j. **If the SPGA determines that independent review of the Special Permit is required, it may require the applicant to pay a review fee consisting of reasonable costs to be incurred by the SPGA for the employment of outside consultants pursuant to rules adopted by the SPGA as authorized by M.G.L. Chapter 44, Section 530.**

The Applicant agrees to comply with all reasonably and lawfully required procedural and other conditions generally and uniformly and lawfully imposed and applied by the Town with respect to the Facility and similar facilities.

4.15.4. Special Permit (Revised 6-8-09)

a. The Shirley Planning Board is hereby designated the Special Permit Granting Authority (SPGA) to grant Special Permits for wireless telecommunications facilities. Special Permits shall be administered according to Section 10.3 Issuance of Special Permits of the Shirley Protective Zoning Bylaw.

The Applicant respectfully requests a SPECIAL PERMIT and SITE PLAN APPROVAL from the PLANNING BOARD.

b. Expiration/Renewal

1. A Special Permit granted under this Bylaw shall expire within two (2) years of the date of issuance of the permit. Prior to the expiration of the Special Permit, the applicant

shall make application to the SPGA for renewal of the Special Permit for an additional two (2) year period. Said renewal shall not require the technical submissions of the original application, provided that conditions of the site and facility have not changed materially from the original application. A certification by a Structural Engineer licensed in the Commonwealth of Massachusetts as to the condition and structural integrity of the tower and its antennas shall accompany every application for renewal.

The Applicant believes that this requirement is unduly burdensome and unnecessary, and respectfully requests, as condition of approval of the Special Permit, that the Special Permit last indefinitely and that only modifications to the Facility require a new Special Permit. However, the Applicant agrees to provide a certification by a Structural Engineer licensed in the Commonwealth of Massachusetts as to the condition and structural integrity of the tower concurrent with the application for a building permit for the initial construction of the tower and each antenna addition to the tower.

2. Any transfer of licenses or equipment, shall require the new owner to re-apply for a Special Permit under the requirements of this Bylaw. Special Permits shall not be transferable under this Bylaw.

The Applicant believes that this requirement is unduly burdensome and unnecessary, and respectfully requests, as condition of approval of the Special Permit, only than notice be provided to the Town upon a change of ownership of the Facility.

c. Application

All applications for a Special Permit for a wireless telecommunications facility shall be submitted on forms provided by the SPGA and shall include at a minimum the following supporting information:

1. A locus plan at a scale of l inch=1000 feet which shall show all property lines, the exact location of the proposed structure(s), streets, topography in a general manner including significant landscape features, residential dwellings and neighborhoods within 1000 feet of the site, all buildings within 500 feet of the proposed facility, and all other wireless telecommunications towers within two (2) miles of the proposed site.

Accompanying this Application are detailed Site Plans, Reports, maps and other documentation providing all of the required information.

2. A color photograph of the proposed site from the five (5) clearest vantage points with a scale rendition of the appropriate view of the proposed tower superimposed over the photographs.

Following the visibility demonstration suggested by Section 4.15.4.d, the Applicant will provide color photographs of the Facility with a scale rendition of the appropriate view of the proposed Facility superimposed over the photographs.

3. Ten (10) copies of a plan conforming to requirements for a Site Plan set out in Section 7 of the Protective Zoning Bylaw and in the Site Plan Review Regulations adopted by the Shirley Planning Board.

Accompanying this Application are detailed Site Plans with all the required information.

4. Documentation consisting of a Technical Report prepared by a Professional Engineer registered in the Commonwealth of Massachusetts containing supporting calculations and technical details and criteria in support of the application and including at a minimum:

(a) Certification that the tower, antenna(s) and appurtenant structures comply with all standards of the Federal and State regulatory agencies cited in Section 4.15.3.i of this Bylaw.

Accompanying this Application are detailed Site Plans, Reports of RF Engineers and Site Acquisition Specialists, maps and other documentation providing all of the required information

(b) A listing of the pertinent specifications of the proposed facility relating to the square footage and plan view dimensions of the tower base and any appurtenant structures, heights of the tower and of appurtenant structures, depth of footings, height and construction of fencing, and detailed diagrams of the size, type and configuration of antenna(s) arrays proposed now, and anticipated in the future.

Accompanying this Application are detailed Site Plans providing all of the required information. Upon approval of the Facility by the Planning and Zoning Board, the Applicant will conduct further geotechnical analysis and provide a foundation design specific for this location to the Building Inspector concurrent with an application for building permit.

(c) An analysis of the of the proposed tower to accommodate multiple antenna(s) arrays from different wireless telecommunication companies, including type(s) of technology planned for and types and number of antenna(s) and/or transmitters/receivers. Also, a timetable for expected occupation of each of the available slots on the tower, to include expected type of technology and antenna(s).

Accompanying this Application are detailed Site Plans, other documentation providing all of the required information. Given the uncertainty of the timeline

of the local, state and federal regulatory process and well as budgetary process of the respective carriers, it is difficult to predict a timeline for expected occupation of each of the available slots on the tower.

(d) An analysis justifying the location, height and design of the facility with respect to technical, economic and competitive factors, as balanced against the expected neighborhood and environmental impacts.

Accompanying this Application are detailed Site Plans, Reports of RF Engineers and Site Acquisition Specialists, maps, this Project Narrative and other documentation providing all of the required information.

(e) **An analysis of the coverage area of the proposed tower showing neighboring streets and intensity of signal reception along each of the main streets within two (2) miles of the proposed facility. For comparison, a similar analysis of any alternative sites available or potentially available, or being considered for tower siting which could potentially serve substantially the same or a similar area.**

Accompanying this Application are detailed Site Plans, Reports of RF Engineers and Site Acquisition Specialists, maps, this Project Narrative and other documentation providing all of the required information.

5. A Marketing Report conducted by a recognized authority in the field of telecommunications services describing current demand for space on tower facilities and project demand for such space within the Town of Shirley for the next ten (10) years. Such report shall include data, calculations and projections in support of the project's conclusions.

Accompanying this Application are detailed Site Plans, Reports of RF Engineers and Site Acquisition Specialists, maps, this Project Narrative and other documentation providing all of the required information. Given the rapid evolution of telecommunications technology, it is difficult to predict with accuracy project demand for such space within the Town of Shirley for the next ten (10) years.

6. Written evidence of ownership or of long-term control (e.g., a long-term lease) of the property upon which the tower is to be erected. Long-term as used herein shall mean a period of time equivalent to at least three (3) terms of the Special Permit.

Accompanying this Application is a Memorandum of Lease evidencing long term control of the property on which the tower will be located.

d. The SPGA may require the applicant to perform an on-site demonstration of the visibility of the proposed tower by means of colored four (4) foot minimum diameter weather balloon held in place at the proposed site and maximum height of the tower.

This demonstration shall take place after the application for Special Permit has been made, but prior to the close of the public hearing on said Special Permit. The applicant shall take care to advertise the date of the demonstration in a newspaper widely circulated in the neighborhood of the proposed site and notice of said public hearing shall be mailed to direct abutters and all abutters within a three hundred (300) foot radius of the proposed tower location. Failure, in the opinion of the SPGA, to adequately advertise and notify abutters of this demonstration may be cause for the SPGA to require another, properly advertised demonstration.

The Applicant will conduct a Visibility Demonstration to illustrate the location and height of the proposed Facility by raising a balloon at and to the height of the proposed Facility. Said Visual Demonstration, will be held on a weekday prior to the public hearing from 9:00 am to 12:00 noon, weather and wind conditions permitting. In the event of inclement weather on April 16, 2022, the Visual Demonstration will be rescheduled until the next weekday, or each successive weekday, until wind and weather conditions permit a successful demonstration. The Applicant will provide notice to the Town and abutters within 300 feet and will place an advertisement in the same newspaper as the Town advertises public hearings.

e. Approval Criteria

The SPGA shall grant the Special permit only upon finding that the wireless telecommunications facility proposed:

1. Has been adequately described and justified to the SPGA by the applicant s compliance with the requirements of Sections 4.l5.4.a and 4.15.4.d, above.

2. Will not be detrimental or injurious, in the opinion of the SPGA to the neighborhood in which it is to be located.

3. Is sited and designed to have the minimum visual, economic and aesthetic impact possible on abutters. When considering an application for such a facility, the SPGA shall place great emphasis on the proximity of the facility to residential dwellings and its impact on these residences.

4. Is designed to be the minimum height necessary for the wireless telecommunications service required.

5. Is designed to accommodate the facilities of wireless telecommunications companies operating in the area to the maximum extent possible, and shall incorporate a tower capable of accommodating a minimum of three (3) separate antenna arrays (although appurtenant buildings may be constructed for only those users identified in the application for Special Permit); this requirement may be waived by the SPGA only upon a finding that for the particular site in question, said requirement is contrary to the public interest.

6. Due to technical requirements, topography or other unique constraints, the facility cannot be located at any other available site that would be less visible to the general public.

7. Has been demonstrated by technical data to be necessary due to the inability of existing facilities in the same or similar service area to accommodate the further antenna arrays required at the time of the application.

8. That it has been demonstrated by technical evidence that, if so requested by the Town, and not offered, co-location of lease space on the tower for the Town s emergency services personnel (Fire, Police and Ambulance) is not feasible.

9. In reviewing an application for a private antenna brought by a federally licensed amateur radio operator, the SPGA shall proceed within the constraints of MGL Chapter 40A, section 3, and the memorandum and order of the Federal Communications Commission in 101 FCC 2d 952 (1985) (PRB-1).

The Applicant believes that it has satisfied all of the approval criteria for a Wireless Communications Facility, and respectfully requests that the Planning Board make the requisite findings.

4.15.5. Design Requirements

a. All towers shall be designed to have sufficient structural capacity to support antenna arrays for a minimum of two (2) separate wireless telecommunications companies. It shall be a condition of the Special Permit that all towers and facilities applications allow consideration for an option to lease tower space by the Town s emergency services personnel (Fire, Police, and Ambulance) to be discussed within the public hearing process.

The Facility has designed to have sufficient structural capacity to support antenna arrays for more than (2) separate wireless telecommunications companies. The Applicant would agree to a condition that the Applicant provide an option to lease reasonable space on the tower for the reasonable requirements of the Town's emergency services personnel, subject to the Town's execution the Applicant's standard municipal co-location agreement.

b. Any tower shall be set back from any lot line by a minimum distance equal to the height of the tower above the lowest surrounding grade, but in no case less than the minimum required setbacks for the district in which it is situated. Appurtenant structures shall also conform to the minimum required setbacks for the district in which the facility is located.

The tower shall be set back from all lot lines by a minimum distance equal to the height of the tower, with the exception of the stand-alone, landlocked parcel owned by the Town of Shirley and used for utility purposes. To the extent deemed necessary by the Planning Board or the Zoning Board of Appeals, the Applicant respectfully requests a VARIANCE from this requirement from the ZONING BOARD OF APPEALS to permit construction of the Facility as proposed.

Appurtenant structures will also conform to the minimum required setbacks for the R-1 Zoning District; provided, however, that fencing and ground-based equipment will be located immediately adjacent to the stand-alone, landlocked parcel owned by the Town of Shirley used for utility purposes. To the extent these items are deemed "structures" and if deemed necessary by the Planning Board or the Zoning Board of Appeals, the Applicant respectfully requests a VARIANCE this requirement from the ZONING BOARD OF APPEALS to permit construction of the Facility as proposed.

c. Notwithstanding the provisions of Section 4.15.5.b, facilities shall be sited such that, at a minimum, a fifty (50) foot naturally vegetated buffer zone is provided between the nearest edge of the fencing surrounding the facility and any abutting property line.

There will be amply more than a fifty (50) foot naturally vegetated buffer zone between the nearest edge of the fencing surrounding the facility and any abutting property line, with the exception of the stand-alone, landlocked parcel owned by the Town of Shirley and used for utility purposes. To the extent deemed necessary by the Planning Board or the Zoning Board of Appeals, the Applicant respectfully requests a finding that the Facility as designed meets this requirement.

d. Lighting at all wireless telecommunications facilities shall be limited to low-intensity lighting intended for security purposes and installed at or near ground level. The source for such lighting shall not be directly visible from any residential property in the area of the site.

No lighting is proposed.

e. Fencing shall be provided to control unauthorized access to the tower. Such fencing shall not be of the barbed wire or razor wire type, but shall be a minimum of eight (8) feet in height with an added section of anti-climber returning to the exterior. Said

fencing shall be appropriately screened and colored to blend in with the surrounding landscape.

As proposed, the Facility will be a 6' chain link fence plus barbed wire to control unauthorized access to the tower. Although the Applicant believes that this is the most appropriate form of fencing for the Facility, the Applicant will agree to remove the barbed wire if required by the Planning Board.

f. Towers shall be colored so as to blend in with surrounding landscape, including the possibility of different colors to cause the structure(s) to blend with the landscape below the tree-line horizon, and the sky above the tree-line horizon. The SPGA may impose reasonable conditions to ensure the facility will have the minimal impact on the surrounding neighborhood, visually and from noise generated by it. Conditions may include grading, screening by plantings and otherwise, and painting, as well as increased setbacks if noise from the facility is a concern, and in the sole opinion of the SPGA, is not adequately addressed by the applicant.

The Facility has been designed and sited to blend in with the surrounding landscape as much as possible, given the coverage objective and other technical requirements and limitations of the Bylaw. The Facility will be a non-reflective galvanized steel monopole design with internal cabling and will be sited to minimize the visibility of the Facility from adjacent properties and shall be suitably screened from abutters and public rights of way. The Facility will be amply set back from abutting properties and buffered by a dense stand of existing trees on all sides and will be set back substantially from Center Road and Munson Ave and surrounded by other utility uses, to reduce the visual impact of the Facility as much as possible.

g. Access to the tower site shall be provided by a driveway designed to cause only minimal disturbance to the natural terrain, and provide emergency access at all times, the adequacy of which shall be determined by emergency services personnel and the SPGA. Wherever beneficial in the opinion of the SPGA, said access driveway shall be laid out so as to have sufficient turns to prevent passers-by from having direct line-of-site visibility to the facility.

Access to the Facility will be over an existing driveway of Center Road, which will be extended to the base of the Facility without direct line of site from the public right of way, and which will be more than adequate for access by emergency services personnel.

h. There shall be no signs, except for no trespassing signs discreetly placed, and a required sign giving a phone number where the owner or legal operator of the facility can be reached on a 24- hour basis. All signs shall conform with the sign requirements

of the Shirley Protective Zoning Bylaws, and shall be the minimum size necessary in the opinion of the SPGA to accomplish the purpose of the sign.

There shall be no signs, except for no trespassing signs discreetly placed, and a required sign giving a phone number where the owner or legal operator of the facility can be reached on a 24- hour basis. All signs shall conform with the sign requirements of the Shirley Protective Zoning Bylaws, and shall be the minimum size necessary to accomplish the purpose of the sign.

i. The height of satellite dishes (greater than three (3) feet in diameter as regulated under this Bylaw) located on property abutting property(s) upon which residential structures are sited, shall not exceed the height of the tree-line on the lot or an adjacent tree-line area, whichever is more conducive, and shall not be visible from any street.

The Facility will not contain any satellite dishes.

j. **There shall be one parking space only for each tower site to be used solely in connection with maintenance of the facility, and not to be used for the permanent storage of vehicles or other equipment.**

There will be only one parking space at the Facility to be used solely in connection with maintenance of the Facility and not for the permanent storage of vehicles or other equipment.

k. There shall be only one building allowed to be constructed at the base of the tower, and it shall be for the purpose of housing the necessary support equipment for the tower transmission and receiving antenna(s). Said building shall be no higher than twelve (12) feet above the surrounding grade to its highest point, shall have a peaked roof (minimum six (6) Vertical: twelve (12) Horizontal pitch) and architectural features consistent with the zoning district and with surrounding existing buildings, shall have a maximum footprint of 400 square feet, and shall be screened from abutting properties as much as is feasible in the opinion of the SPGA. Multiple story buildings are permitted only if additional stories are below grade.

The Applicant does not propose the construction of any “building” at the base of the Facility. It is anticipated that ground- based equipment will be contained within small, weatherproof cabinets which will be located within the fenced in compound, and which will not be more than 8’ in height.

l. **All network interconnections and other support equipment required to be sheltered shall be contained within the single support building allowed at the base of the tower. Other equipment shall be shown on the site plan, and may be subject to conditions or being placed within the support building. This determination shall be made by the**

SPGA based upon individual site conditions and the ability of the exterior equipment to be screened from abutting properties. The intent is to minimize visible clutter at the base of the tower to the maximum extent possible.

The Applicant does not propose the construction of any "building" at the base of the Facility. It is anticipated that ground- based equipment will be contained within small, weatherproof cabinets which will be located within the fenced in compound, and which will not be more than 8' in height. The fenced in base area will be amply set back and screened from all abutting residential properties.

m. **All electrical, telephone, and other utility wires servicing the facility, tower, dish or support structures for the said facility, shall be placed below ground, unless the SPGA determines that such placement is not feasible or is not in the best interest of the Town of Shirley. The construction standards for electrical service lines and appurtenances shall be designed according to specifications of Massachusetts Electric and Verizon Communications or applicable local telephone service carrier.**

As is shown on the Site Plans which accompany this Application, electrical and telephone service will be brought in via an existing overhead lines from Center Street which will be extended overhead to the base of the Facility. Given the existence of the overhead power lines and the length of the utility run, underground utilities are not feasible.

4.15.6. Performance Guarantees

a. It shall be the joint and several responsibility of the Special Permit applicant and any subsequent owners of the facility to completely remove the tower, antenna(s), satellite dish(es), panels, and all appurtenant structures upon cessation of use of the facility, and to restore the site to its pre- construction condition. An initial cash bond shall be posted in a passbook account in a reasonable amount set and approved by the SPGA to assure timely and complete removal of all above ground structures associated with the facility when the use of the facility is discontinued. The tower and appurtenances shall be removed within ninety (90) days of written request from the SPGA to the current facility owner, beyond which time the SPGA may utilize the posted bond to effect the removal of all above ground structures associated with the facility, and the restoration of the site to its original grades with a permanently stable landscaped surface.

A draft removal bond has been provided. A fully executed original bond will be provided to the building inspector prior to the issuance of a building permit.

b. The applicant shall submit a bid for the removal of the facility from three (3) qualified contractors at the time of initial Special Permit Application. The SPGA may use these bids at its discretion to set the removal bond amount.

An estimate of the cost to remove the facility prepared by a licensed professional engineer has been provided.

c. It shall be the responsibility of the current owner of the facility to maintain the entire facility and its access road and screening in a condition equivalent to that when construction was initially completed to the satisfaction of the SPGA. Therefore, a maintenance agreement between the applicant, or a designated operator, and the SPGA, shall be executed which defines the terms of and responsibility for the maintenance as required by the SPGA. Said agreement shall constitute a condition of the Special Permit. An additional bond shall be posted, in the form of a separate passbook account in an amount to be set and approved by the SPGA, to be utilized for maintenance of the facility and its access road and screening in the event the maintenance agreement to be executed between the SPGA and the applicant is not complied with to the on-going satisfaction of the SPGA.

The Applicant agrees to maintain the Facility and its access driveway and fencing in a condition equivalent to that when construction was initially completed. Given the use of the existing access driveway, the lack of additional screening necessary, the unmanned nature of the Facility and lack of traffic, and the deminimus amount of construction relative to the size of the parcel, the Applicant does not believe that a maintenance bond is necessary or required.

4.15.7. Site Plan Approval

a. Site Plan Approval by the Planning Board is required for the siting and construction of all wireless telecommunication facilities as defined above in Section 4.15.2 of this Bylaw. If modification of a previously issued Special Permit is sought, the Planning Board may require approval of a new site plan.

The Applicant has applied for and respectfully requests a SPECIAL PERMIT and SITE PLAN APPROVAL from the PLANNING BOARD.

b. Site Plan review by the Planning Board may be conducted concurrently with the proceedings and public hearings of the Special Permit application as defined in Section 4.15.4 of this Bylaw.

The Applicant respectfully requests that the Site Plan Review by the Planning Board be conducted concurrently with the proceedings and public hearings for the Special Permit.

c. Site Plan applications shall be made in conformance with the Site Plan Section (Section 7) of this Protective Zoning Bylaw, and in conformance with the Site Plan Review Regulations adopted by the Shirley Planning Board.

Accompanying this Application are Site Plans and other relevant information required for Site Plan Review.

COMPLIANCE WITH CRITERIA FOR SPECIAL PERMIT

8.5. Special Permits Issued by the Planning Board (Added 11-01-05)

8.5.4. Conditions and safeguards

a. The Planning Board shall not grant any special permit unless necessary conditions are satisfied, including but not limited to the following:

1. The proposed use is appropriate in the zone and specific site in question, more particularly to promote the most appropriate use of land throughout the Town in accordance with the Master Plan;

2. Adequate and appropriate facilities will be provided for proper operation of said use;

3. There will be no hazard to pedestrians or vehicles;

4. There will be no nuisance or adverse effect upon the neighborhood.

The proposed use is passive in nature and will not generate any traffic, noise, smoke, dust, heat, glare or discharge of noxious substances, nor will it pollute waterways or groundwater. There will be only a deminimus increase in impervious surfaces, and removal of surface waters will not adversely affect neighboring properties or the public storm drainage system.

Once constructed, the Facility will be unmanned and will involve only periodic maintenance visits. The traffic generated by the facility will be one or two vehicle trips per month by maintenance and technical personnel to ensure the telecommunications site remains in good working order. These visits will not result in any material increase in traffic or disruption to patterns of access or egress that will cause congestion hazards or cause a substantial change in the established neighborhood character. The Applicant's maintenance personnel will make use of the existing access driveway off Brigham Street which will be extended to the base of the Facility. The proposed Facility will not obstruct existing rights-of-way or pedestrian access and will not change the daily conditions of access, egress, traffic, congestion hazard, or character of the neighborhood. The installation will not require the addition of any new parking or loading spaces. As has been discussed throughout this Project Narrative, the proposed Facility has been designed to be compatible with the neighborhood character as much as possible.

The Facility will enhance service coverage in the Town and surrounding communities. The enhancement of service coverage in the Town is desirable to the public convenience for personal use of wireless services and for community safety in times of public crisis and natural disaster. Wireless communications service also provides a convenience to residents and is an attractive feature and service to businesses. In addition, the requested

use at this location will not result in a change in the appearance of the surrounding neighborhoods. Signage shall be limited to those needed at the base of the facility to identify the property and owners, and to comply with applicable safety standards. Once constructed, the Facility will comply with all applicable local, state and federal safety regulations.

COMPLIANCE WITH CRITERIA FOR VARIANCES

9.2.4. Variances

As provided by statute, the Board of Appeals may authorize with respect to a particular building, structure, or parcel of land, after a duly advertised public hearing, held within sixty-five (65) days after filing of an application with said Board and with the Town Clerk a Variance from any of terms of this Zoning Bylaw where owing to the circumstances relating to soil condition, shape, or topography of such land or structures, and especially affecting such land or structures, but not affecting generally the Zoning District in which it is located, a literal enforcement of the provisions of the ordinance or Bylaw would involve substantial hardship, financial or otherwise, to the owner of said building or parcel, and the desirable relief may be granted without substantial detriment to the public good and without nullifying or substantially derogating from the intent or purpose of such Zoning Bylaw.

Before any Variance is granted, the Board must find all of the following conditions to be present:

a. Conditions and circumstances are unique to the applicant's lot, structure or building and do not apply to the neighboring lands, structures or buildings in the same district;

b. Strict application of the provisions of this Bylaw would deprive the applicant of reasonable use of the lot, structure or building in a manner equivalent to the use permitted to be made by other owners of their neighborhood lands, structures or buildings in the same district;

c. The unique conditions and circumstances are not the result of actions of the applicant taken subsequent to the adoption of this Bylaw;

d. Relief, if approved, will not cause substantial detriment to the public good or impair the purposes and intent of this Bylaw;

e. Relief, if approved, will not constitute a grant of special privilege inconsistent with the limitations upon other properties in the district.

Given technical limitations with respect to:

- the location of the Facility relative to the surrounding neighborhoods and other existing telecommunication sites in and around the Town;
- the topography of the surrounding area;
- the lack of viable alternatives in the area;
- the height restrictions of the Facility imposed by the Bylaw;

- the Town's requirement to design facilities which accommodate multiple wireless communications companies;
- the demand for robust and reliable telecommunications coverage; and
- the requirement to accommodate rapidly evolving technologies;

the Applicant requires the requested Variances to permit construction of the Facility as proposed.As the Plans indicate, the proposed Facility has been designed to accommodate the antennas at least 4 wireless broadband co-locators. There are no existing or previously approved telecommunications facilities in the area of the proposed Facility, nor are there existing structures of sufficient height in the area of the proposed Facility, that will achieve the coverage objective of the proposed Facility. The Facility has been situated on the Property in such a wayto achieve the objectives of the Bylaw as much as possible.

As has been shown throughout this Project Narrative, the granting of the Variances will not be detrimental to the public safety, health or welfare or injurious to other property and will promote the public interest. The Variances will substantially secure the objectives, standards and requirements of these regulations, and a particular hardship exists and special circumstanceswarrant the granting of the Variances.

In 1996, the U.S. Congress enacted the Telecommunications Act of 1996, Pub. L. No.104-104, § 704; 110 Stat. 56 (1996) (the "TCA"). The intent of the TCA enacted by the U.S.Congress was to institute a framework to promote competition and innovation within this telecommunications industry. Under their respective licenses from the FCC, wireless telecommunications providers are obligated to provide a reliable "product" [i.e. wireless communications service] to the population in the metropolitan Boston region, which includes theTown. Likewise, consumer expectations for increasingly robust and reliable service requires competing service providers to identify and remedy existing gaps in reliable network coverage, or gaps that result from increasing subscriber voice and data traffic beyond the limits of existing network infrastructure. A carrier's failure to remedy network gaps in a timely fashioncan result in a significant loss of subscribers to competing telecommunications carriers. The proposed Facility and corresponding relief requested are necessary to remedy a gap in reliable service coverage within the various wireless carriers' existing network infrastructure.

The Applicant has investigated alternative sites in and around the defined geographic area within which engineers determined that a facility must be located to fill the gap in service coverage and to function effectively within the network of existing and planned facilities. No existing structure or property in or near the vicinity of the proposed Facility is feasible to accommodate the coverage network requirements.

Accordingly, a literal enforcement of the provisions of the Bylaw would prevent

the Applicant from eliminating an existing gap in reliable service coverage, resulting in a potential loss of subscribers and the inability to effectively compete for subscribers with FCC licensed competitors in the market, contrary to the intent of the Bylaw and the U.S. Congress in enactingthe TCA.

Moreover, this hardship is owing to the circumstances relating to topography of the surrounding area. The property is a large, substantially undeveloped lot in the R-1 Zoning District which is already surrounded by other utility uses. The surrounding area is provides no other feasible location in which to install and operate a wireless telecommunications facility. Existing structures and buildings in the area are insufficient in height to allow wireless carriers to operatethereon and provide adequate coverage to this significant gap in its network. The property provides a unique opportunity, given the existing tower as well as the location and area topography surrounding the Facility, to minimize any adverse visual impacts to the surrounding area. The proposed design conforms to the existing characteristics of the Property, and utilizes the existing structures on the property to screen the proposed Facility, thereby minimizing potential impacts.

The wireless communications systems being developed by the various telecommunications carriers operating in the area have has been designed employing the most sophisticated radio frequency engineering methods available. Radio frequency engineers determine the placement of network points-of-presence using computer engineering models that simultaneously evaluate are topography and population patterns to identify specific geographic areas to be serviced by each antenna facility in the network. As a result of this modeling, combined with actual coverage data provided by existing "on air" facilities, radio frequency engineers have identified a limited geographic area as a necessary location for a communications facility to remedy an existing gap in reliable service coverage in the general vicinity of the Property. Without the requested relief, there would remain a substantial "gap" in reliable service coverage in the carriers' respective networks. Radio frequency coverage maps confirm that a telecommunications facility located at the Property is required to remedy the existing gap in the wireless network coverage in the area. The requested height has been determined by engineers to be the minimum height necessary to connect coverage from the proposed Facility with coverage from adjacent cell sites in the carriers' respective networks (i.e. to remedy the existing "gap" in service and to effect reliable handoffs between adjacent cell sitesas a subscriber travels through the area).

Additionally, the requested height will allow future carriers to co-locate on the Facility thereby minimizing the number of new facilities needed to provide coverage to the Town.

In the context of a utility service where the critical criteria in the development of each facility is its ability to integrate with a network of surrounding sites and subsequently, for each cluster of sites to function within a regional/national network,

there is an underlying premise thateach site chosen by the Applicant for a facility possesses a unique location and topographical characteristics.

Finally, as noted in Nextel Communications of the Mid-Atlantic, Inc. v. Town of Wayland, 231 F.Supp. 2d 396, 406-407 [D. Mass. 2002], the "need for closing a significant gap in coverage, in order to avoid an effective prohibition of wireless services, constitutes another unique circumstance when a zoning variance is required." No existing structure or property in anallowed zoning district is technically suitable to resolve the existing gap in the wireless service coverage in the area. In addition, the existing structures located near the Property are not at a height sufficient to provide adequate coverage to this significant gap in its network. The Facilitywill be the minimum height necessary to provide coverage for multiple wireless carriers. Given the location and size of the Property, as well as the proposed design of the Facility, the proposed installation will have a minimal visual impact to the surrounding neighborhood while achievingthe carriers' requisite coverage.

- The proposed Facility will reduce the number of new structures ultimately needed toprovide wireless communication services in the surrounding area by providing co-location potential;

- The proposed Facility is designed to be at the minimum height necessary to provide adequate coverage to the area and keep potential visual impacts to a minimum;

- The proposed Facility will comply in all respects with radio frequency emission standards established by the FCC;

- The proposed Facility will not have any adverse effect on the value of land and buildings in the neighborhood or on the amenities thereof. The proposed use is passive, requires no employees on the premises, and has no characteristics that are incompatible with the underlying zoning. Specifically, it will generate only about two vehicle trips per month by a service technician for routine maintenance, will be served by standard electrical and telephone service, and requires no water, septic or other town services;

- The proposed Facility will promote and conserve the convenience and general welfare ofthe inhabitants of the Town by enhancing telecommunications services within the town;

- The proposed Facility will lessen the danger from fire and natural disasters by providing emergency communications in the event of such fires and natural disasters;

- The proposed Facility will involve no overcrowding of land or undue

concentration of population because it is an unmanned Facility;

- The proposed Facility will preserve and increase the amenities of the Town by enhancing the telecommunications services and will facilitate the adequate provisions of transportation by improving mobile telecommunications for business, personal and emergency uses;

- The proposed Facility will involve no adverse effects on public and private water supplies and indeed will utilize no water at all;

- The proposed Facility will involve no adverse effects on drainage, schools, parks, openspace, or other public requirements, and will involve no excessive noise or pollution to the environment;

- The proposed Facility will have no adverse effect on historic sites; and
- The proposed Facility will be an appropriate use of land within the Town.

Due to the unique size, shape, location and elevation of the subject Property and the topographyof the surrounding area as well as the existing zoning of the property and surrounding area, unique circumstances exist to justify the granting of the requested Variances. Moreover, Applicant's proposed Facility will have no impact on adjoining properties and the surrounding neighborhood in that the proposed Facility will produce no objectionable noise, glare, dust, smoke, fumes, odors, of effluent, and will not have any impact of traffic or circulation.

Accordingly, the Applicant requests findings that

1. a literal enforcement of the provisions of this chapter would involve a substantialhardship to the Applicant.

2. The hardship is owing to circumstances relating to the soil conditions, shape or topography of such land or structures and especially affecting such land or structures but notaffecting generally the zoning district in which it is located.

3. Desirable relief may be granted without nullifying or substantially derogating from theintent or purpose of the zoning bylaw.

In addition (or in the alternative), the Applicant requests a finding that strict compliance would cause a conflict with the TCA.

THE TELECOMMUNICATIONS ACT OF 1996

In 1996, the U.S. Congress enacted the Telecommunications Act of 1996, Pub. L. No. 104-104, § 704; 110 Stat. 56 (1996) (the "TCA" or the "Telecommunications Act'). The intent of the TCA as enacted by Congress was to institute a framework to promote competition and innovation within the telecommunications industry. Although this law specifically preserves local zoning authority with respect to the siting of wireless service facilities, it clarifies when the exercise of local zoning authority may be preempted by federal law. Section 704 of the TCA provides, in pertinent part, that

(7) PRESERVATION OF LOCAL ZONING AUTHORITY-

(A) GENERAL AUTHORITY- Except as provided in this paragraph, nothing in this Act shall limit or affect the authority of a State or local government or instrumentality thereof over decisions regarding the placement, construction, and modification of personal wireless service facilities.

(B) LIMITATIONS-

(i) The regulation of the placement, construction, and modification of personal wireless service facilities by any State or local government or instrumentality thereof--

> **(I) shall not unreasonably discriminate among providers of functionally equivalent services; and**
>
> **(II) shall not prohibit or have the effect of prohibiting the provision of personal wireless services.**

The intent of the TCA enacted by the U.S. Congress was to institute a framework to promote competition and innovation within this telecommunications industry. Under its respective licenses from the FCC, wireless telecommunications carriers are obligated to provide a reliable "product" [i.e. telecommunications service] to the population in western Massachusetts, which includes the Town of Shirley. Likewise, consumer expectations for increasingly robust and reliable service requires competing service providers to identify and remedy existing gaps in reliable network coverage, or gaps that result from increasing subscriber voice and data traffic beyond the limits of existing network infrastructure. A carrier's failure to remedy network gaps in a timely fashion can result in a significant loss of subscribers to competing telecommunications carriers. As demonstrated in the Application and supplemental materials provided by the Applicant, the proposed Facility and corresponding relief requested are necessary to remedy a gap in reliable service coverage within the existing network infrastructure. In Daniels v. Town of Londonderry, 157 N.H. 519 (2008), the New Hampshire Supreme Court upheld the grant of use and area variances for the construction of a cell tower in an agricultural-residential zone, noting that the Londonderry ZBA correctly treated the TCA as an "umbrella" that preempted local law under certain circumstances.

In a growing number of cases, federal courts have found that permit denials violate the TCA, even if such denials would be valid under state law. For example, in Omnipoint Communications v. Town of Lincoln, 107 F. Supp. 2d 108 (D. Mass. 2000), the court found that denial of a variance for a location outside of the town's wireless overlay district violated the TCA and ordered the variance to issue despite an Ordinance provision prohibiting use variances. The court in Nextel Communications v. Town of Wayland, 231 F. Supp. 2d 396 (D. Mass 2002) reached the same result. In that case, the court stated: "Although the Board's statement [regarding its lack of authority to issue a use variance] may be correct statement in Massachusetts regarding variances, it is not controlling in the special case of Telecommunications facilities…Under the Telecommunications Act, the Board cannot deny the variance if in so doing it would have the effect of prohibiting wireless services." Wayland at 406-407. Most notably, in Omnipoint Holdings. Inc. v. Town of Cranston, No. 08-2491 (1st Cir. Nov. 3, 2009), the United States Court of Appeals for the First Circuit affirmed a judgment of the United States District Court for the District of Rhode Island, which found that the Cranston Zoning Board of Review violated the TCA by effectively prohibiting the provision of wireless services in Cranston when it denied an application for a special use permit and variance to construct a wireless facility in a residential area. The Court noted that "[t]he effective prohibition clause does not stand alone; it is also part of the TCA's larger goal of encouraging competition to provide consumers with cheaper, higher-quality wireless technology…. As cell phone use increases, carriers need to build more facilities, especially in populated areas, to continue providing reliable coverage, and local regulations can present serious obstacles." *Cranston*, p. 25. More recently, in New Cingular Wireless, LLC v. Town of Manchester, Case No. 11-cv-334-SM (USDC D. NH Feb. 28, 2014), the United States District Court for the District of New Hampshire indicated that the Town of Manchester impermissibly denied a variance to construct a telecommunications tower in a (non-permitted) residential zone, in that the tower addressed significant coverage gaps and provided competitive and reliable wireless services and there was no feasible alternative. The Court noted that the Town must consider the public benefits of wireless services in determining whether to grant a zoning variance for a tower. Id.

The Applicant has investigated alternative sites in and around the defined geographic area within which its engineers determined that a facility must be located to fill the gap in service coverage and to function effectively within the wireless network of existing and planned facilities. No existing structure or property in or near the vicinity of the proposed Facility is feasible to accommodate the wireless network requirements. The proposed Facility is on large substantially undeveloped parcel and provides a substantial vegetative buffer. The wireless communications systems being developed by the various telecommunications carriers operating in the Shirley area have has been designed employing the most sophisticated radio frequency engineering methods available. Radio frequency engineers determine the placement of network points-of-presence using computer engineering models that simultaneously evaluate are topography and population patterns to identify specific geographic areas to be serviced by each antenna facility in the network. As a result of this modeling, combined with actual coverage data provided by existing "on air" facilities, the carriers' radio frequency engineers have identified a limited geographic area as a necessary location for a communications facility to remedy an existing gap in reliable service coverage in the general vicinity of the Property. Without the requested relief, there would remain a substantial

"gap" in reliable service coverage in the carriers' respective networks. Radio frequency coverage maps confirm that a telecommunications facility located at the Property is required to remedy the existing gap in the wireless network coverage in the area. The requested height has been determined by engineers to be the minimum height necessary to connect coverage from the proposed Facility with coverage from adjacent cell sites in the carriers' respective networks (i.e. to remedy the existing "gap" in service and to effect reliable handoffs between adjacent cell sites as a subscriber travels through the area).

Accordingly, denial of a permit to construct the Facility would prevent the Applicant from eliminating an existing gap in reliable service coverage, resulting in a potential loss of subscribers for the carriers and the inability to effectively compete for subscribers with other FCC licensed competitors in the market, contrary to the intent of the Ordinance and the U.S. Congress in enacting the TCA.

SUMMARY

Because the proposed facility meets all of the requirements for a Wireless Telecommunications Facility under the Shirley Zoning Bylaw other than those provisions for which variances and/or modifications have been requested, and pursuant to §704(a) of the Federal Telecommunications Act of 1996 which provides, among other things, that wireless facilities may not be prohibited in any particular area and that any denial of zoning relief must be based upon substantial evidence, the Applicant respectfully requests that the ZONING BOARD OF APPEALS GRANT the requested VARIANCES and the PLANNING BOARD GRANT a SPECIAL PERMIT and APPROVE THE SITE PLANS as proposed (with such if necessary), and the Town grant such other permits, relief or waivers deemed necessary by the Town under the current Bylaw and pending Bylaws amendments, if any, so that the Applicant may construct and operate the Facility as proposed.

Respectfully submitted,

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Parisi Law Associates, P.C.
225 Dyer Street
Providence, RI 02903
(401) 447-8500 cell
fparisi@plapc.com

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TOWAIR Determination Results

A routine check of the coordinates, heights, and structure type you provided indicates that this structure does not require registration.

*** NOTICE ***

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

DETERMINATION Results

PASS SLOPE(100:1): NO FAA REQ-RWY MORE THAN 10499 MTRS & 7752.89 MTRS (7.75290 KM) AWAY

Type	C/R	Latitude	Longitude	Name	Address	Lowest Elevation (m)	Runway Length (m)
AIRP	R	42-32-57.00N	071-45-7.00W	FITCHBURG MUNI	WORCESTER FITCHBURG, MA	100.1	1524.3

Your Specifications

NAD83 Coordinates	
Latitude	42-32-52.9 north
Longitude	071-39-27.2 west
Measurements (Meters)	
Overall Structure Height (AGL)	39.3
Support Structure Height (AGL)	38.1
Site Elevation (AMSL)	134.1
Structure Type	
MTOWER - Monopole	

Tower Construction Notifications
Notify Tribes and Historic Preservation Officers of your plans to build a tower.

CLOSE WINDOW

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STATEMENT OF BRENDAN M. GILL
Vertex Towers, LLC

I, Brendan Gill, hereby state the following in support of the application submitted by Vertex Towers, LLC for a multi-user Personal Wireless Service Facility ("PWSF") to be located off Center Street (Map 21A, Lot 19), Shirley, MA (the "Property"), consisting of a 125' monopole style tower and related ground equipment contained within a fenced compound (the "Site")

1. My name is Brendan M. Gill and I am the Director of Site Acquisition and Leasing for Vertex Towers, LLC.

2. I have worked in the telecommunications industry for over 10 years overseeing and assisting in the leasing, zoning, permitting and construction of wireless communications facilities and specifically in the investigation of all feasible alternatives and options locating a wireless communications facility within a search ring which would fill a significant gap in wireless coverage.

3. I have participated directly through my present and past employment in the development and analysis of hundreds of such facilities, including wireless communication facilities similar to the proposed Site.

4. I have personally visited the Property, and the areas surrounding the Property, on numerous occasions. I submit this affidavit based on my personal knowledge of the Property and the surrounding areas, while also working together with the experience and documentation provided by civil and radio frequency engineers, environmental consultants and based on my professional experience in the development of wireless communication facilities.

5. Part of my site acquisition and development duties include identifying potential candidates within an area identified as having a significant gap in coverage. The candidate identification process includes reviewing the applicable zoning ordinance with legal counsel, engineers, wetland scientists, and other professionals to identify areas where the proposed Site is allowed and feasible. First, I explore the area to determine whether there are any existing structures of sufficient height and structural capacity from which an antenna installation on such a structure would provide sufficient coverage. If there are no such existing structures, I identify properties, located within the narrowly defined search area, that appear to be suitable for the installation of a communications facility, while also eliminating certain properties that would not be suitable due various limitations or concerns related but not limited to, parcel size, access issues, landlocked parcels, conservation restrictions, wetlands, visibility, elevation, terrain and constructability. In order to be viable, a candidate must (i) provide adequate coverage to the identified significant gap in coverage and (ii) have a willing landowner with whom commercially reasonable lease terms may be negotiated. Preference is given to locations that closely comply with local zoning ordinances, or in the event no viable candidates are found within the search area, I attempt to identify other potentially suitable properties, with preference always given to existing structures.

6. In connection with this site, I have provided site acquisition services, including researching the area, and identifying potential alternative candidates to the leased ground space on the Property.

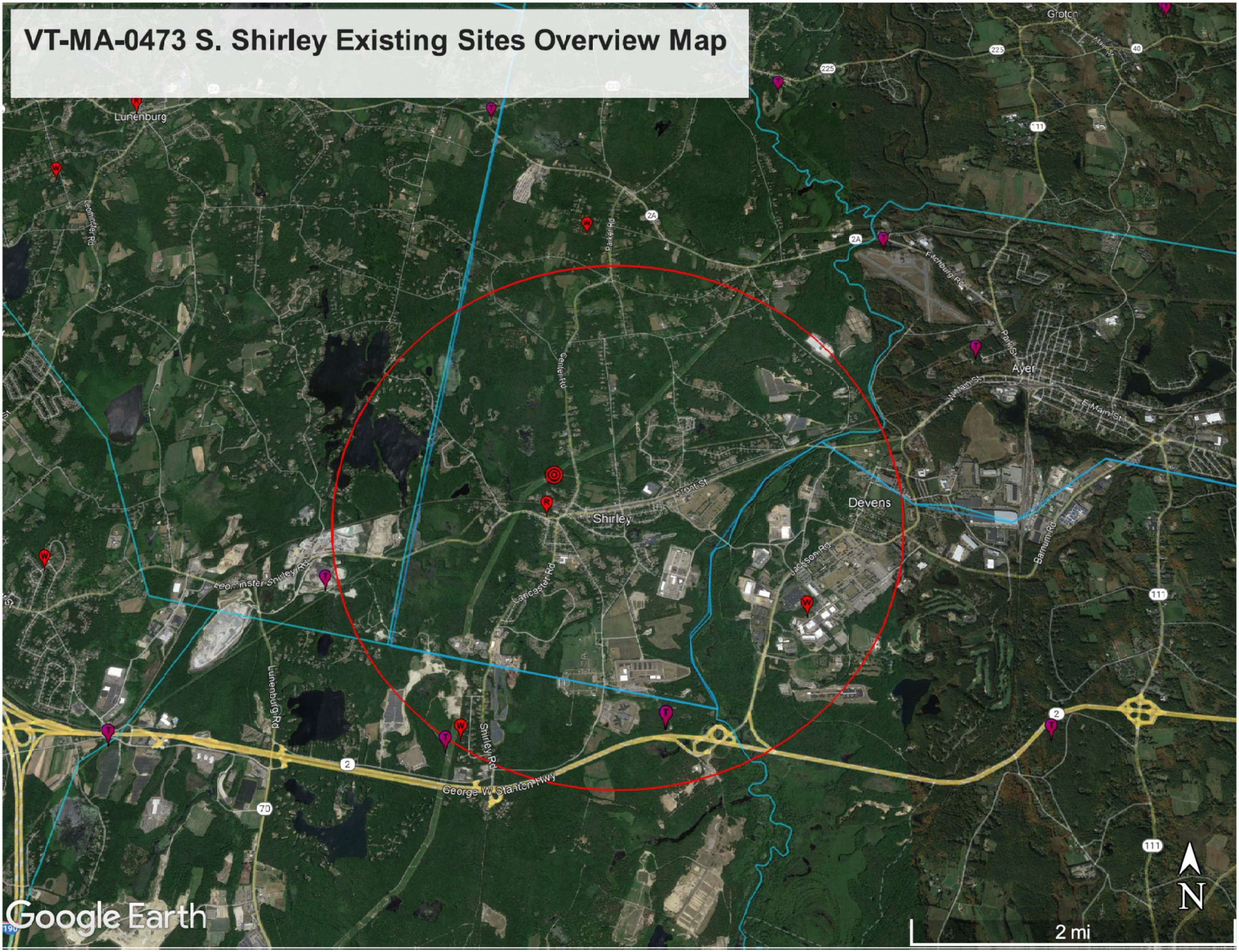
7. Based on my personal knowledge of the proposed Site and the and the surrounding area, there are no potential alternative candidates located within this geographically driven search ring that would be considered superior to the proposed Site. In addition, based on my experience, in my professional opinion, the proposed PWSF to be located off Center Street is the least intrusive and only available and viable alternative to adequate meet the coverage objective to fill this significant gap in coverage.

Executed this 11th of May , 2022.

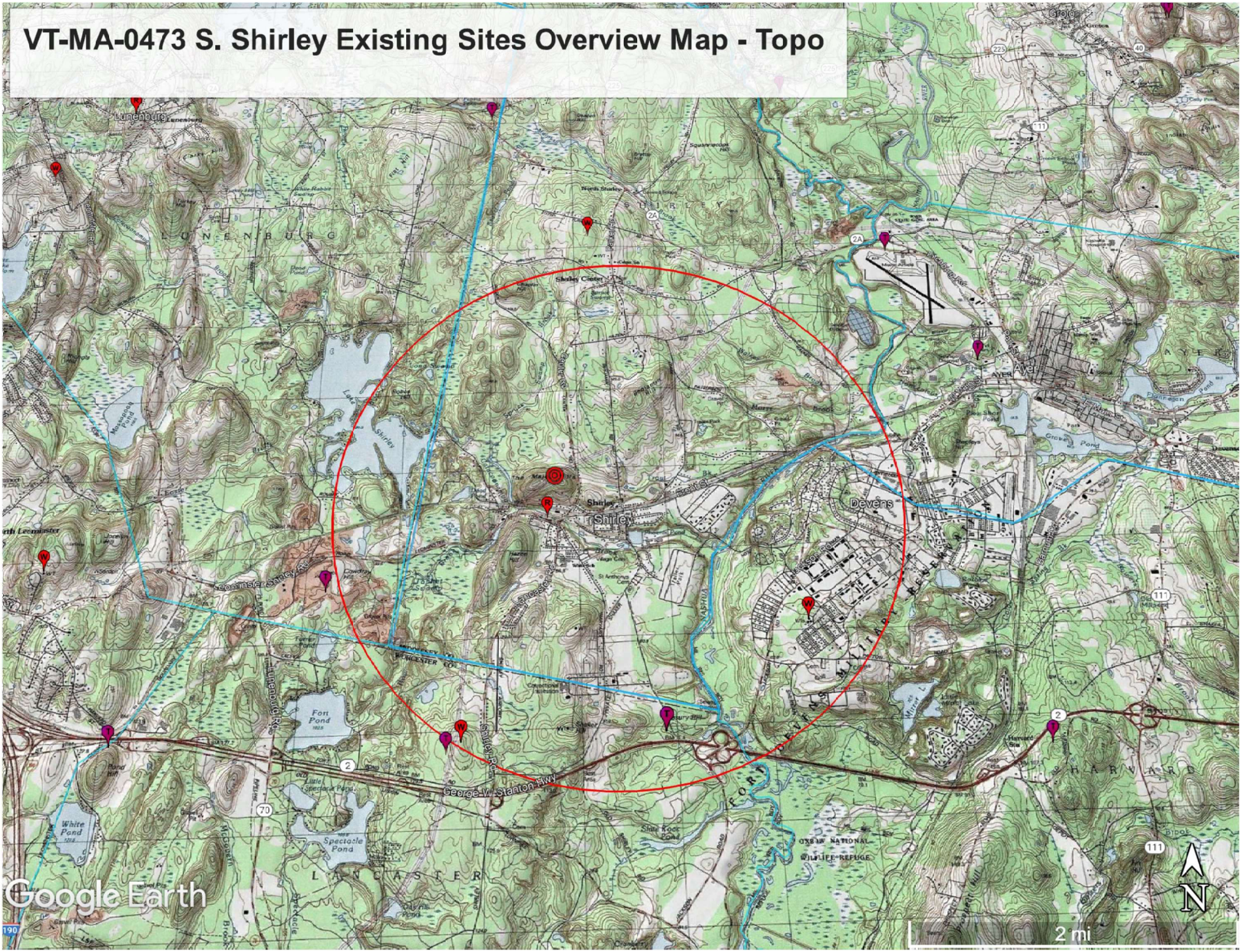
_____

Brendan M. Gill
Vertex Towers, LLC

VT-MA-0473 S. Shirley Existing Sites Overview Map



VT-MA-0473 S. Shirley Existing Sites Overview Map - Topo

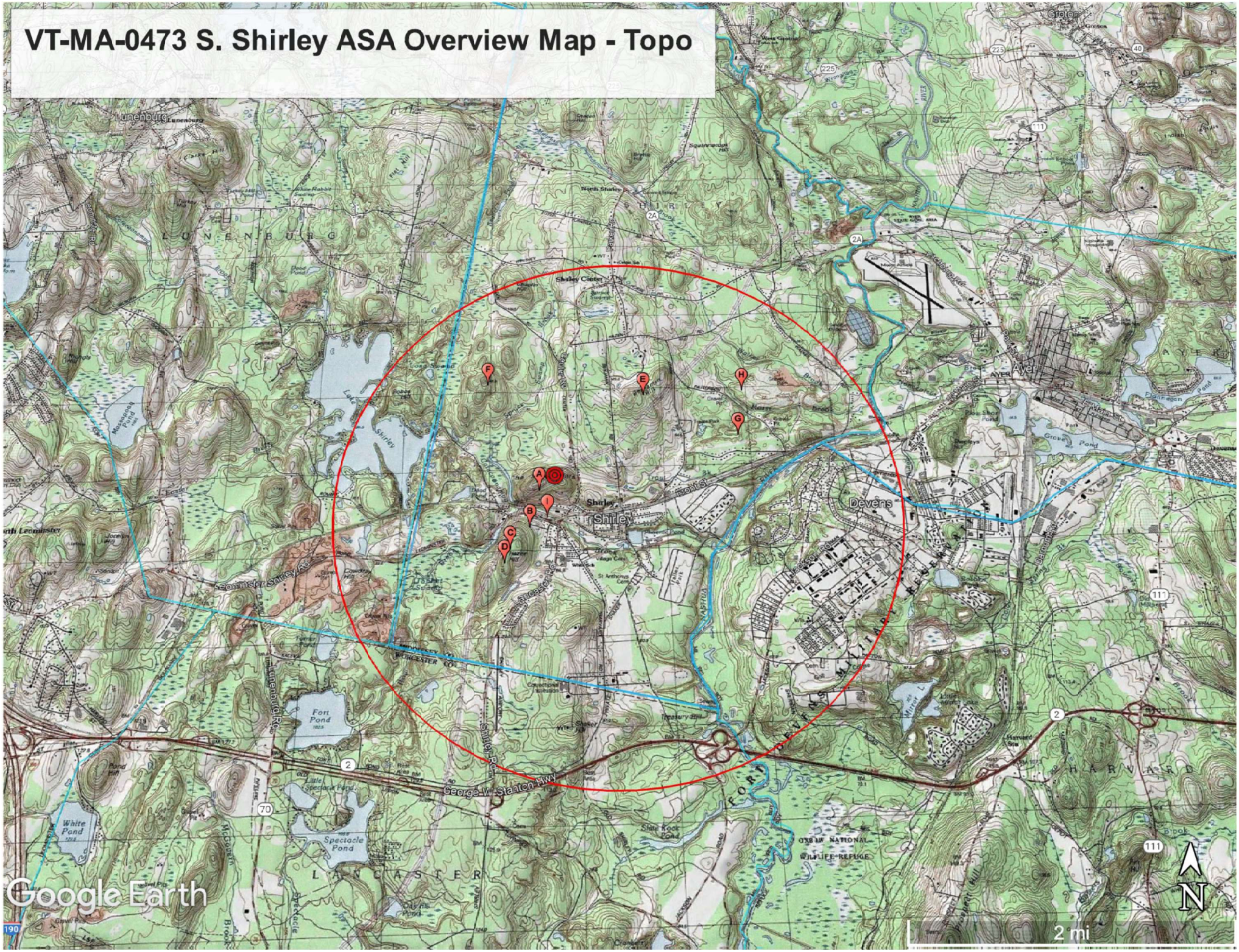


Alternative Site Analysis

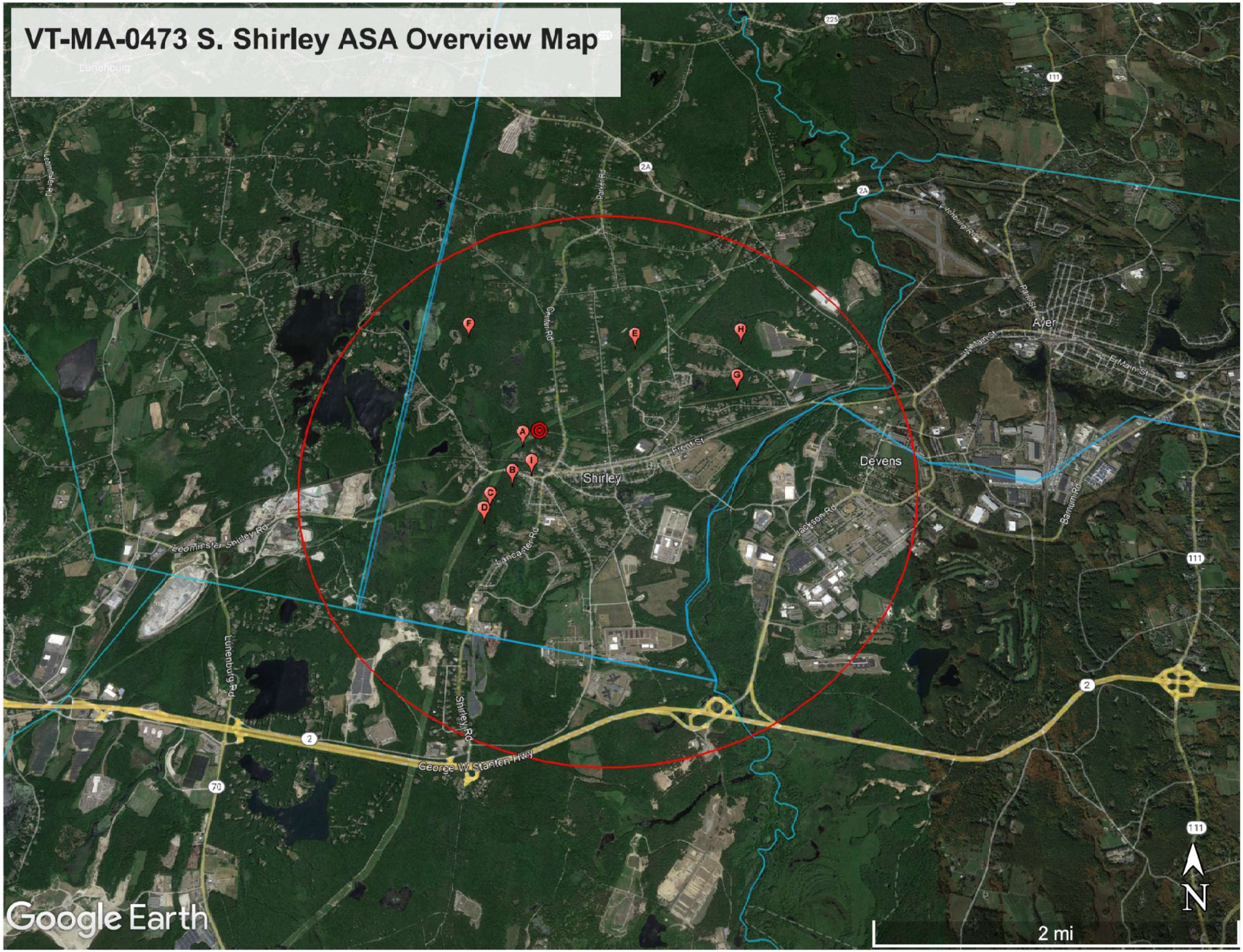
for Proposed Tower at off Center Street, Shirley, MA

ID	Address	Map	Lot	Block	ACRES	Latitude	Longitude	Distance from Proposed Location	Comments
A	15 MUNSON Ave	21A	18		7.4	42.5462573	-71.6598121	0.1	Land Owner is supportive of the project, property unable to support facility.
B	3 MAPLE St	16H	12		9.59	42.5423993	-71.6604028	0.4	Location is 50' lower in elevation and does not provide needed coverage to the North and West.
C	33 LANCASTER Rd	11A	13		43.19	42.5412071	-71.6629368	0.53	Landowner was not interested in siting tower on the parcel.
D	67 LANCASTER Rd	8A	2.03		44.75	42.5380825	-71.665193	0.85	Location is 50' lower in elevation and does not provide needed coverage to the North.
E	0 CLARK Rd	40A	7.2		11.96	42.5578863	-71.6445452	0.9	Landowner was not interested in siting tower on the parcel.
F	110 CENTER Rd	38A	1		111.48	42.5592346	-71.6675027	0.9	Location on property is not reachable due to wetlands
G	0 PATTERSON Rd	31A	5		29.76	42.5534947	-71.6310165	1.39	Landowner was not interested in siting tower on the parcel. Location is 120' lower in elevation and does not provide needed coverage to the North.
H	0 WALKER Rd	43A	10		36.34	42.5597129	-71.6298612	1.64	Location is 120' lower in elevation and does not provide needed coverage to the North.
I	17 LEOMINSTER Rd	16A	5		6.48	42.544376	-71.658834	0.28	Location is 120' lower in elevation and does not provide needed coverage to the North. Does have exisiting Carrier on rooftop, that creates space and structural constraints for additonal Carriers.

VT-MA-0473 S. Shirley ASA Overview Map - Topo



VT-MA-0473 S. Shirley ASA Overview Map



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

RF Report
Proposed Wireless Facility

MA2458
Center Road
Shirley, MA 01464

March 30, 2022

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1. Overview

This RF Report has been prepared on behalf of AT&T Mobility in support of its application to the Town of Shirley for the installation and operation of a wireless facility located at Center Road in Shirley, MA. The proposed facility consists of ground-based equipment cabinets and antennas mounted at a centerline of 120' AGL on a proposed monopole tower.

This report concludes that the proposed site will provide additional capacity and coverage improvement to areas of Shirley in order to improve deficient service areas along Center Road, Catacunemaug Road, Benjamin Road, Perimeter Road and the surrounding roads, neighborhoods and businesses in the proximity of the proposed site.

Included in this report is: a brief summary of the site's objectives, maps showing AT&T's neighboring sites, and predicted Radio Frequency coverage maps of the subject site and the surrounding sites in AT&T's network.

2. Introduction

AT&T's network requires the strategic deployment of antenna structures throughout the area to be covered, which are connected to receivers and transmitters that operate in 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. The signals are transferred through ground telephone lines (or other means of backhaul transport) and routed to their destinations by sophisticated electronic equipment. The size of the area served by each cell site is dependent 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. As customers move throughout the service area, the transmission from the portable device is automatically transferred to the AT&T facility with the best reception, without interruption in service, provided that there is overlapping coverage between the cells.

In order for AT&T's network to function effectively, there must be adequate overlapping coverage between the "serving cell" and "adjoining cells". This not only allows access to the network, but once connected allows for the transfer or "hand-off" of calls from one cell to another and prevents involuntary disconnections or "dropped calls." AT&T's 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 poor voice quality, dropped and blocked calls, slow data connections and transmissions, or no wireless service at all. These areas are commonly referred to as "coverage gaps."

We have concluded that by developing the proposed wireless communication facility at Center Road at an antenna centerline height of 120' AGL (above ground level), AT&T will be able to provide additional capacity and coverage improvement to residents, businesses, and traffic corridors within Shirley that are currently located within deficient service areas of AT&T's network.

3. AT&T Mobility Coverage and Capacity Objectives

In order to expand and enhance their wireless services throughout New England, AT&T must fill in existing coverage gaps and address capacity, interference, and high-speed broadband issues. As part of this effort, AT&T has determined that significant gaps in service exist in and around sections of the Town of Shirley, MA, as described further below.

AT&T currently operates wireless facilities similar to the proposed facility within Shirley and the surrounding cities/towns. Due in large part to the distances between the existing sites, the intervening topography, and volume of user traffic in the area, these existing facilities do not provide sufficient coverage to portions of Shirley. Specifically, AT&T determined that much of Shirley is without reliable service in the following areas and town roads[1], including but not limited to:

- Catacunemaug Road;
- Center Road;
    - Serves ~ 1,800 vehicles per day, as measured at South of Common Road (2020);
- Benjamin Road;
- Perimeter Road;
- Lancaster Road;
    - Serves ~ 4,030 vehicles per day, as measured at South of Main Street (2020);
- The surrounding roads, neighborhood and businesses in the proximity of the proposed site and the above-mentioned road.

4. Pertinent Site Data

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

Site Name	Address	City	Location		Antenna Height (ft AGL)	Structure Type	Status
			Latitude	Longitude			
MA3046	369 NASHUA STREET	LEOMINSTER	42.5237	-71.7344	187	GUYED TOWER	On Air
MA3109	696 FORT POND ROAD	LANCASTER	42.5198	-71.6706	133	MONOPOLE	On Air
MA3179	60 OLD SHIRLEY ROAD	HARVARD	42.5207	-71.5939	88	MONOPINE	On Air
MA3183	47 POOR FARM ROAD	HARVARD	42.5221	-71.5687	90	MONOPOLE	On Air
MA3229	25 BROOK STREET	AYER	42.5625	-71.5964	165	MONOPOLE	On Air
MA3394	2005 MASSACHUSETTS AVEN	LUNENBURG	42.5947	-71.6692	184	MONOPOLE	On Air
MA3406	29 GIVRY STREET	DEVENS	42.5333	-71.6238	107	WATER TANK	On Air
MA3564	94 WEST MAIN STREET	GROTON	42.5990	-71.6230	86	MONOPOLE	On Air
MA5148	270 ELECTRIC AVENUE	LUNENBURG	42.5829	-71.7522	90	MONOPOLE	On Air
MA2458	**CENTER ROAD**	**SHIRLEY**	**42.5480**	**-71.6576**	**120**	**MONOPOLE**	**Proposed**

Table 1: AT&T Mobility Site Information Used in Coverage Analysis [2]

[1] Traffic counts are sourced from the Massachusetts Department of Transportation.

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

5. Coverage Analysis and Propagation Plots

The radio frequency coverage plots provided in this report were produced using deciBel Planner™, a Windows-based RF propagation computer modeling program and network planning tool. The software takes into account the geographical features of an area, land cover, antenna models, antenna heights, RF transmitting power and receiver thresholds to predict coverage and other related RF parameters used in site design and wireless network expansion.

While AT&T holds licenses in the 700 MHz, 850 MHz (Cellular), 1900 MHz (PCS), 2100 MHz (AWS), 2300 MHz (WCS) and 3500 MHz bands, this report focuses on the 700 MHz and 1900 MHz layers, which are representative of the 4G LTE service most readily available to AT&T subscribers in Shirley and are the spectrum layers that are essential to AT&T's ability to address the coverage needs for their 4G LTE service offerings. It is relevant to note that the 700 MHz coverage layer, which serves as the "base" layer for the LTE service, has a substantially larger coverage footprint due to the propagation characteristics of the frequency band. The 1900 MHz, 2100 MHz, and 2300 MHz overlay layers will have incrementally smaller footprints and are used by AT&T to manage capacity.

The following paragraphs discuss each of the AT&T maps attached hereto.

Attachment 1 titled *"MA2458 - Neighbor Sites & Radial Distances"* provides a view of the subject area showing the locations of AT&T's existing sites within Shirley relative to the proposed facility that may be contributing to the aggregate coverage in Shirley.

Attachment 2 titled *"MA2458 – Area Terrain Map"* details the topographical features around the proposed "MA2458" 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, cyan, green and yellow shades correspond to lower elevations, whereas the orange, red, grey and white shades indicate higher elevations.

Attachment 3 titled "*MA2458 - Existing 700 MHz & 1900 MHz LTE Coverage (-83 dBm, -86 dBm)"* shows the coverage provided to areas of Shirley from the "On-Air" sites listed in Table 1. The green and yellow shaded areas represent the minimum required signal strengths for reliable, high-quality service and performance of the 700 MHz and 1900 MHz network layers, respectively. Because of the superior propagation characteristics of 700 MHz relative to 1900 MHz frequencies, the 1900 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 or "white" areas, whereas the deficient areas of 1900 MHz coverage consist of both the green and white areas. As shown in this plot, the surrounding AT&T macro-sites are unable to provide enhanced, high data rate coverage to the targeted area of Shirley.

Attachment 4 titled "*MA2458 - 700 MHz & 1900 MHz LTE Coverage with Proposed Site (-83 dBm, -86 dBm)*" shows how this proposed site would fill in the existing coverage gaps and improve AT&T's 700 MHz and 1900 MHz LTE networks within the targeted areas. As shown by the additional areas of coverage in comparison with the Attachment 3, the proposed facility will provide coverage to:

- ~ 0.6 mi long Benjamin Road/Harvard Road at the 700 MHz frequency (-83 dBm);
- ~ 0.5 mi Lancaster Road/Leominster Road at the 700 MHz frequency (-83 dBm)

- ~ 0.3 mi Catacunemaug Road at the 700 MHz frequency (-83 dBm);
- ~ 1057 additional residents[3] and ~ 402 additional employees[4] within the surrounding area at the 700 MHz frequency (-83 dBm);
- ~ 244 additional residents and ~ 88 additional employees within the surrounding area at the 1900 MHz frequency (-86 dBm);
- The surrounding roads, neighborhoods, and business areas within the proximity of the proposed site;

Attachment 5 titled "*MA2458 - Existing 700 MHz & 1900 MHz LTE Coverage (-93 dBm, -96 dBm)*" shows the coverage provided to areas of Shirley from the "On-Air" sites listed in Table 1. The green and yellow shaded areas represent the minimum required for adequate level of service on the 700 MHz and 1900 MHz network layers, respectively. As mentioned previously, the 1900 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 or "white" areas, whereas the deficient areas of 1900 MHz coverage consist of both the green and white areas. As shown in this plot, the surrounding AT&T macro-sites are unable to provide adequate coverage to area of Shirley, particularly at the 1900 MHz frequencies.

Attachment 6 titled "*MA2458 - 700 MHz & 1900 MHz LTE Coverage with Proposed Site (-93 dBm, -96 dBm)*" shows the composite of coverage with the proposed "MA2458" facility. As shown by the additional areas of coverage in comparison with the Attachment 3, the proposed facility will provide coverage to:

- ~ 1.1 mi long Center Road at the 700 MHz frequency (-93 dBm);
- ~ 0.8 mi long Catacunemaug Road at the 700 MHz frequency (-93 dBm);
- ~ 0.7 mi long Benjamin Road/Perimeter Road at the 700 MHz frequency (-93 dBm)
- ~ 1658 additional residents and ~ 507 additional employees within the surrounding area at the 700 MHz frequency (-93 dBm);
- ~ 1159 additional residents and ~ 328 additional employees within the surrounding area at the 1900 MHz frequency (-96 dBm);
- The surrounding roads, neighborhoods, and business areas within the proximity of the proposed site;

Attachment 7 titled *"MA2458 – Existing 700 MHz LTE Sector Footprints"* depicts the areas primarily served by the sectors (a.k.a. signal "footprints") of the "On-Air" AT&T macro-sites in the area, which are shown by a 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, AT&T 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 AT&T's 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.

[3] Population counts are based upon 2010 U.S. Census residential data. Please note that this does not include any visitors in the area.

[4] Employee population counts are based upon the 2015 U.S. Census Bureau LEHD database.

Attachment 8 titled *"MA2458 - 700 MHz LTE Sector Footprints with Proposed Site"* shows the composite coverage with the overall footprint of the proposed facility in dark green. As shown in this map, the proposed "MA2458" facility is an effective solution to provide capacity relief to the area, particularly to the "MA3406" gamma sector (red), the "MA3109" gamma sector (yellow), the "MA3394" beta sector (blue) and the "MA3406" alpha sector (cyan). The proposed facility is centrally located in the area of deficient coverage making it particularly suited to distribute the traffic load across multiple sectors and provide a dominant server to this pocket of usage. Table 2 below details the capacity relief based on the sector footprints shown in Attachments 7 and 8.

Sector	Current			With "MA2458"			Offload Summary		
	Residential Pops	Employees	Area (mi2)	Residential Pops	Employees	Area (mi2)	Total Residential Pops Offloaded	Total Employees Offloaded	Area Offloaded (mi2/%)
MA3406 Gamma	4324	2497	4.6	2931	1691	3.1	1393 (32.2%)	806 (32.3%)	1.5 (32.6%)
MA3109 Gamma	2376	1185	8.08	1712	1065	5.88	664 (27.9%)	120 (10.1%)	2.2 (27.2%)
MA3394 Beta	846	139	3.05	687	131	2.5	159 (18.8%)	8 (5.8%)	0.55 (18%)
MA3406 Alpha	1603	1422	3.73	1356	1292	3.18	247 (15.4%)	130 (9.1%)	0.55 (14.7%)

Table 2: AT&T Mobility Capacity Offload of Proposed Site

6. Summary

In undertaking its build-out of 4G LTE service in Middlesex County, AT&T has determined that an additional facility is needed to provide reliable service and additional capacity in Shirley, MA. AT&T determined that installing the proposed wireless communications facility at Center Road in Shirley at an antenna centerline height of 120 feet (AGL) will provide additional capacity and coverage needed in the targeted coverage areas including key roadways such as Catacunemaug Road, Center Road, Benjamin Road, Perimeter Road and the surrounding roads, neighborhoods and businesses in the proximity of the proposed site. In addition to providing service to the targeted areas of Shirley, AT&T is providing enhanced services for first responders through the implementation of FirstNet's National Public Safety Broadband Network ("NPSBN"). Without the installation of the proposed site, AT&T will be unable to improve and expand their existing 4G LTE wireless communication services in this area of Shirley; therefore, AT&T respectfully requests that the Town of Shirley act favorably upon the proposed facility.

7. Statement of Certification

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

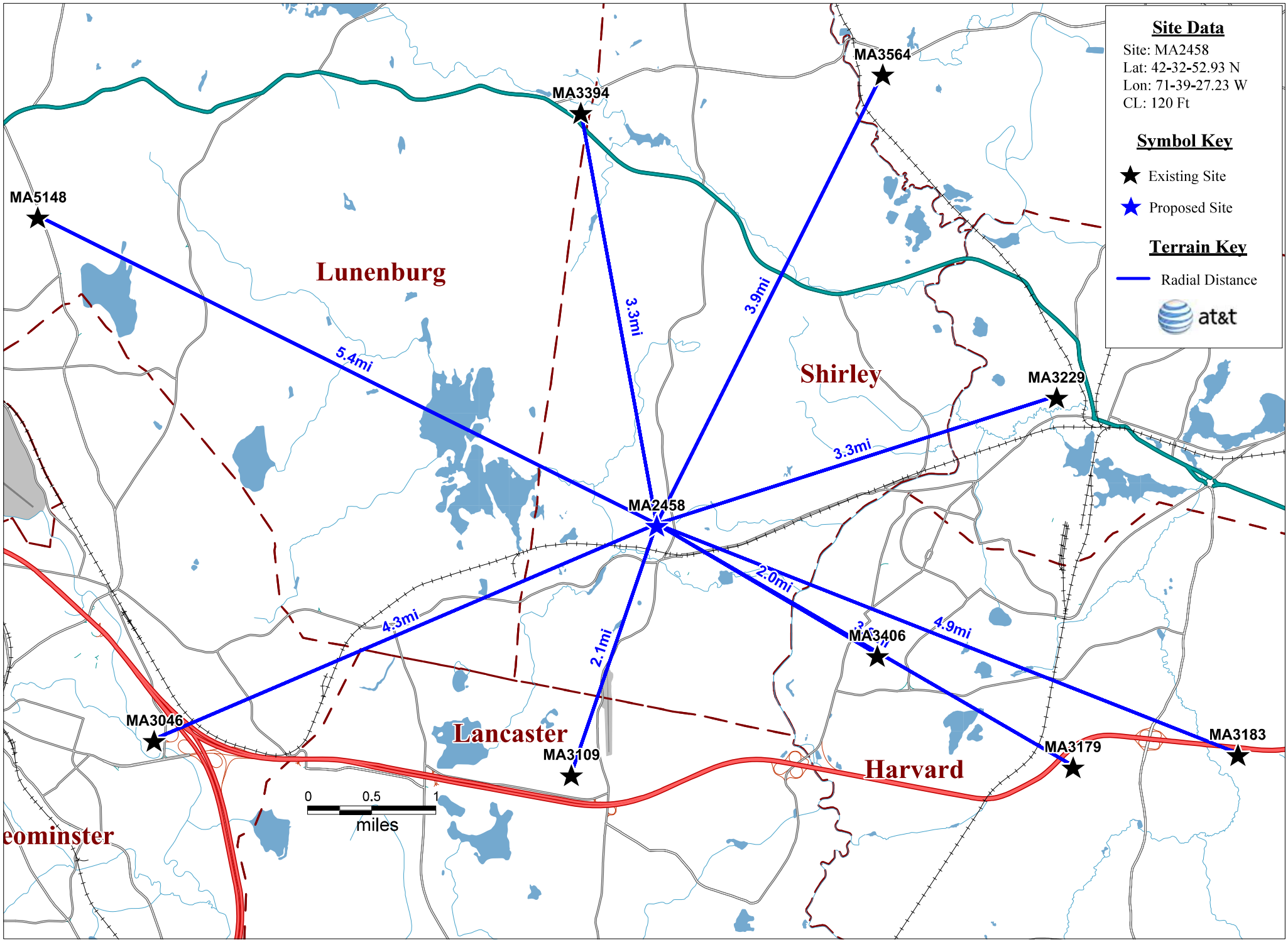
Sohail Usmani

Sohail Usmani
C Squared Systems, LLC

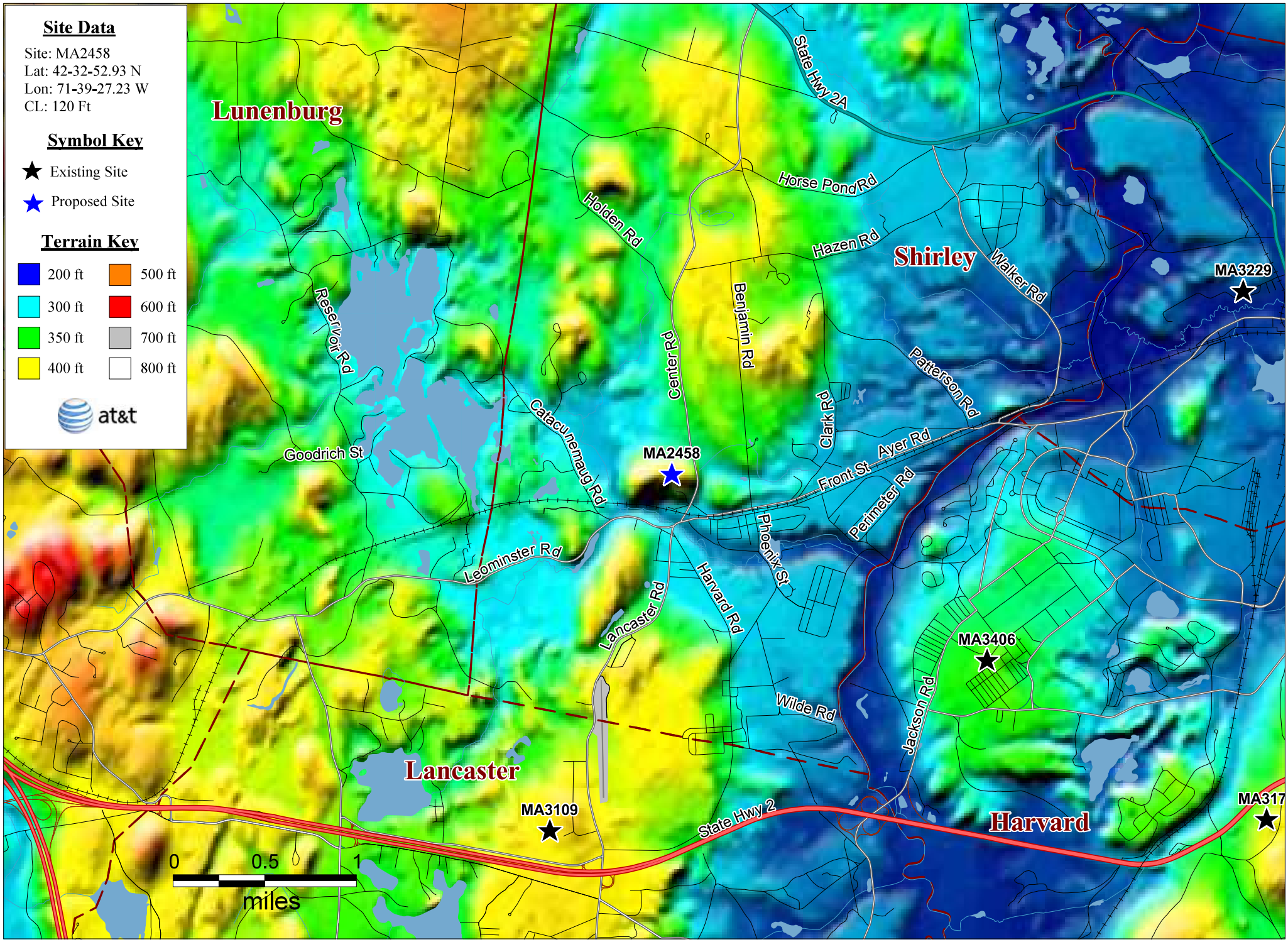
March 30, 2022
Date

8. Attachments

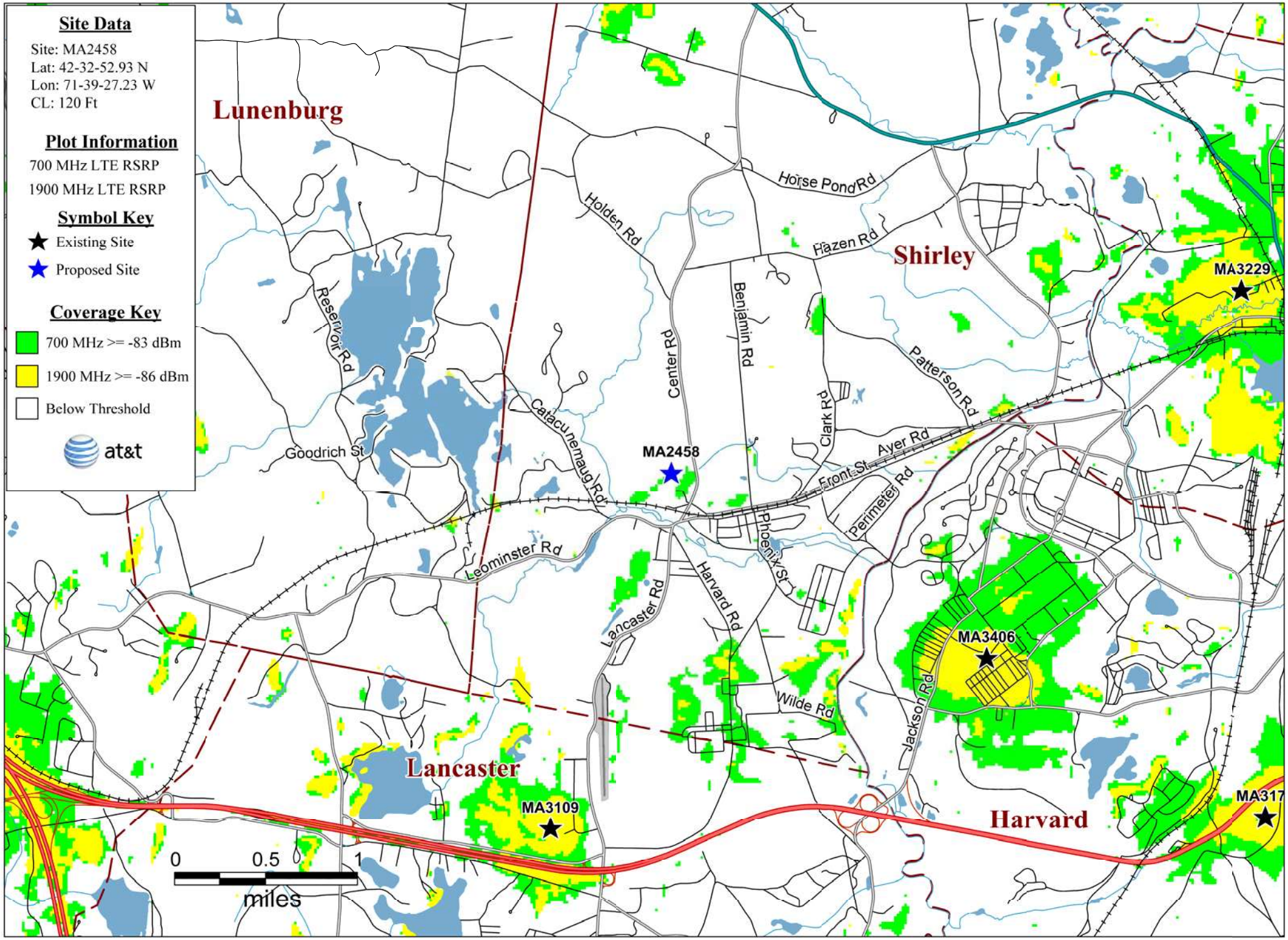
MA2458 - Neighbor Sites & Radial Distances



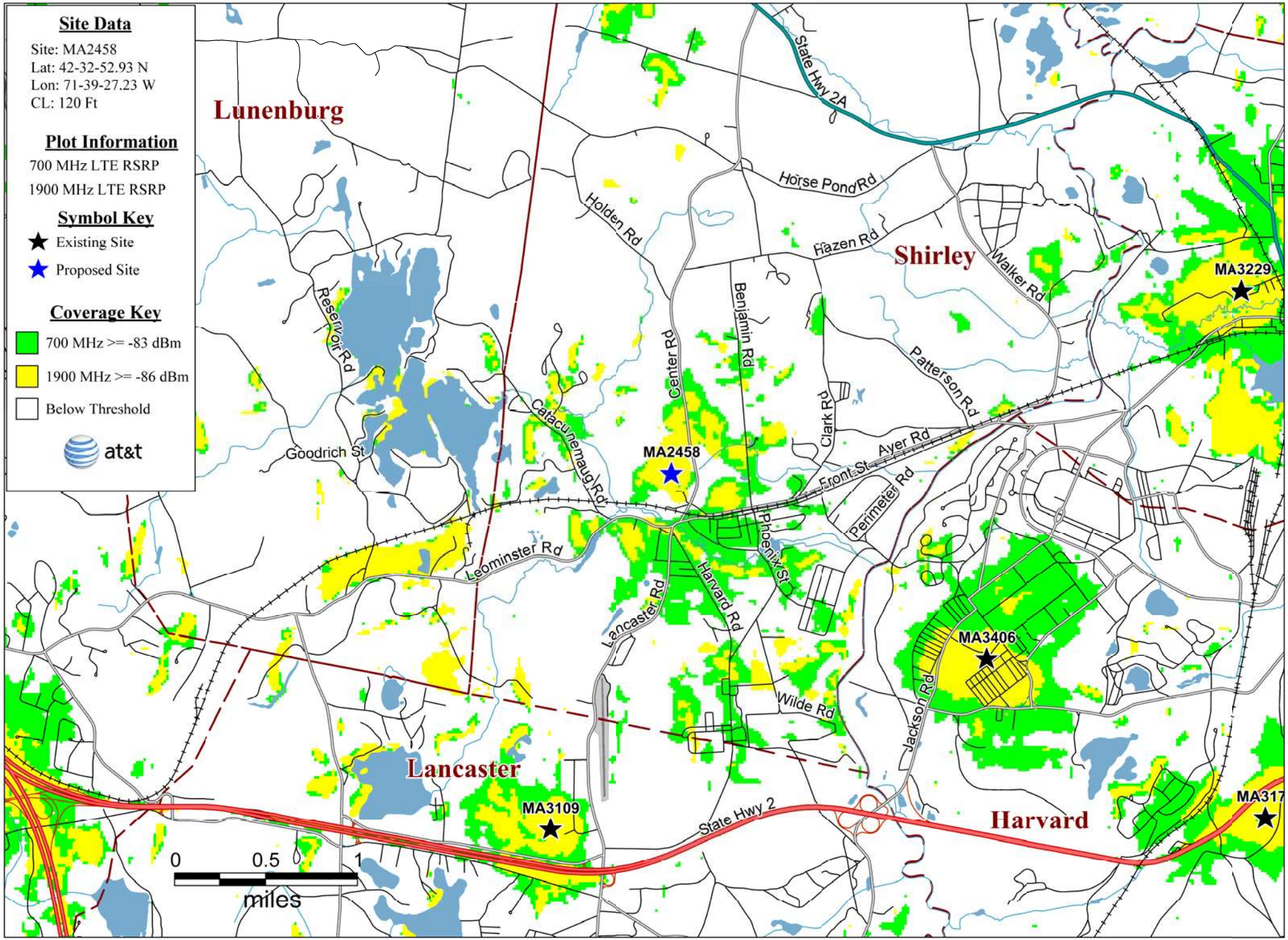
MA2458 - Area Terrain Map



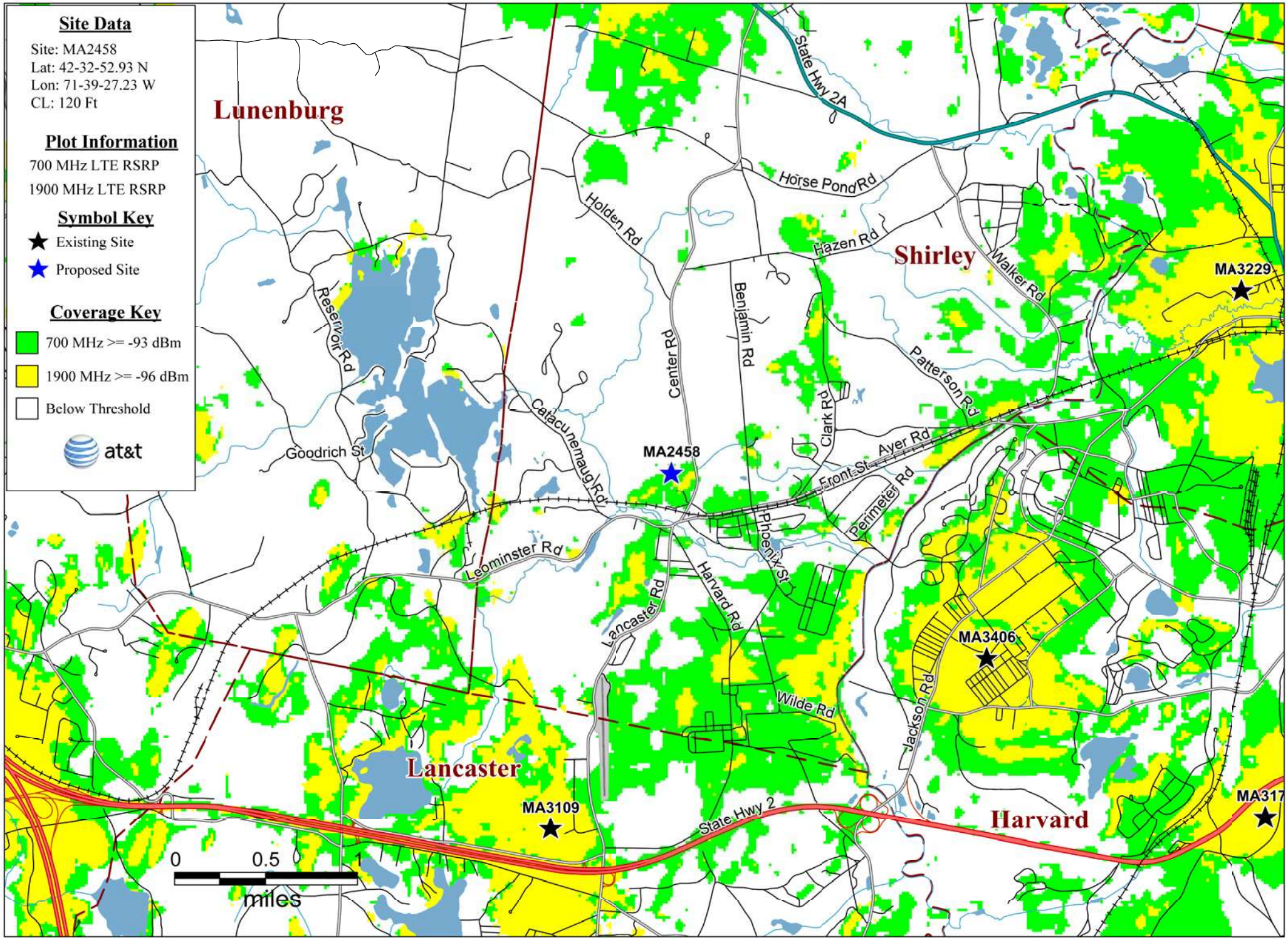
MA2458 - Existing 700 MHz & 1900 MHz LTE Coverage (-83 dBm, -86 dBm)



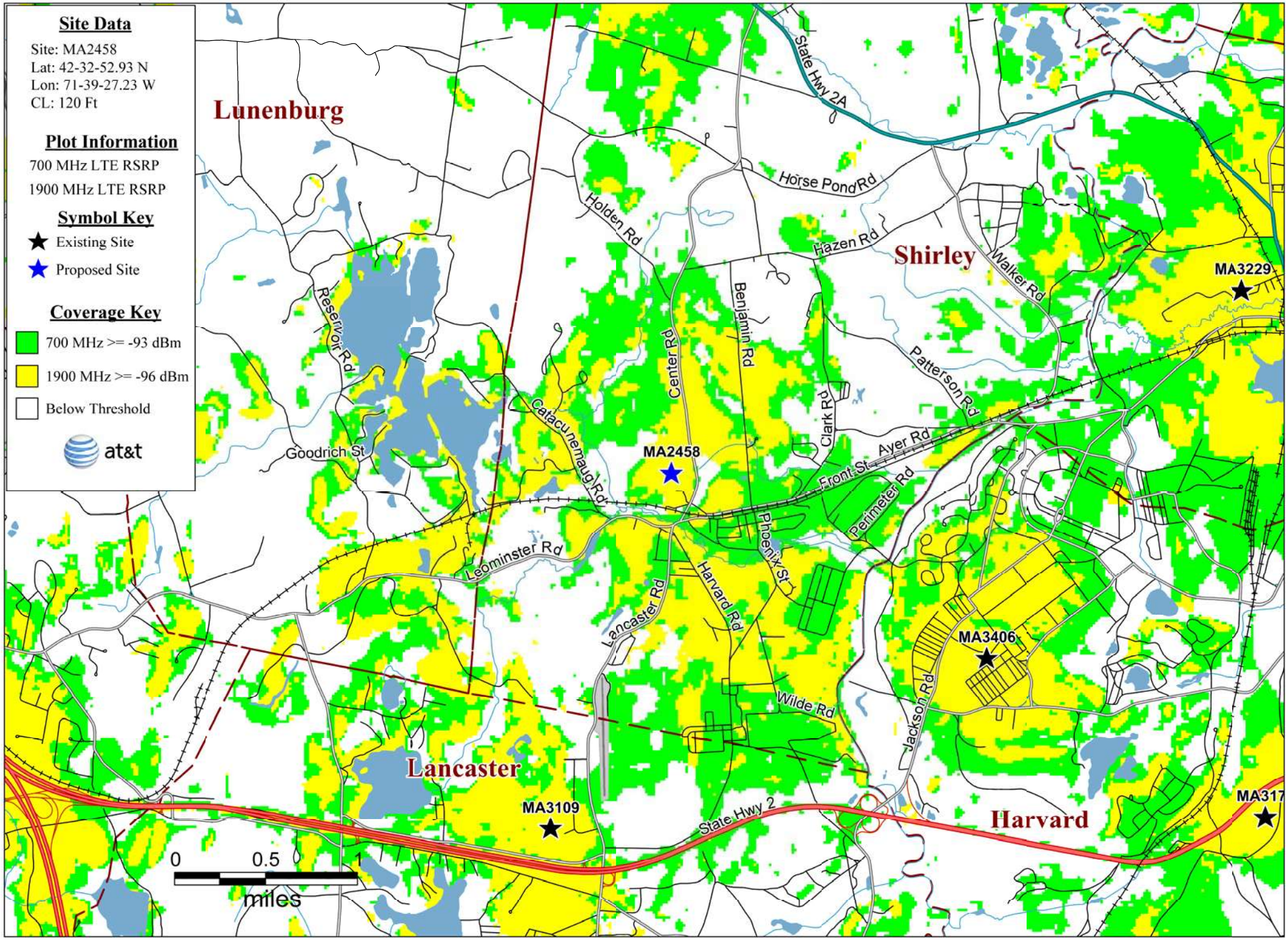
MA2458 - 700 MHz & 1900 MHz LTE Coverage with Proposed Site (-83 dBm, -86 dBm)



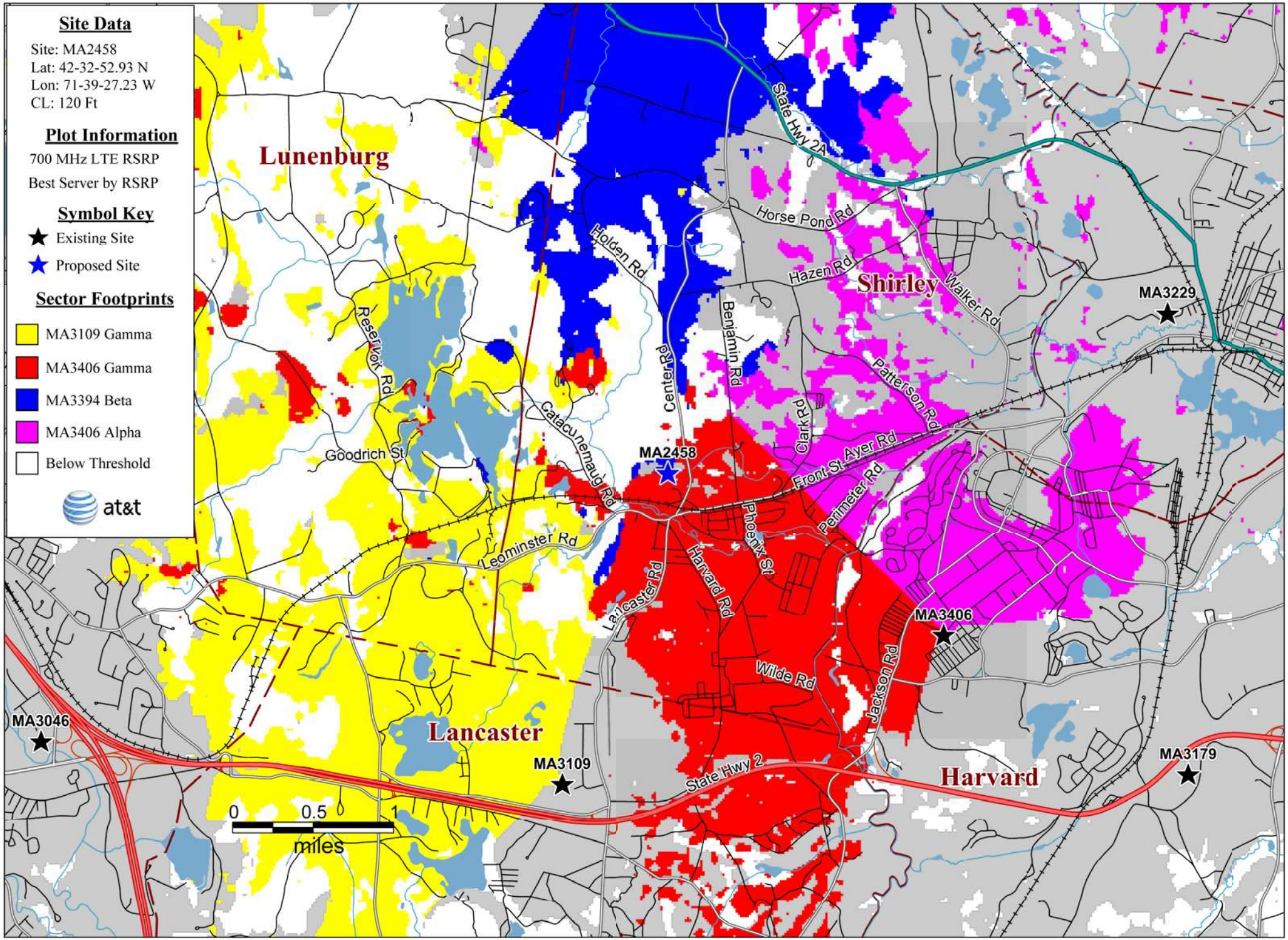
MA2458 - Existing 700 MHz & 1900 MHz LTE Coverage (-93 dBm, -96 dBm)



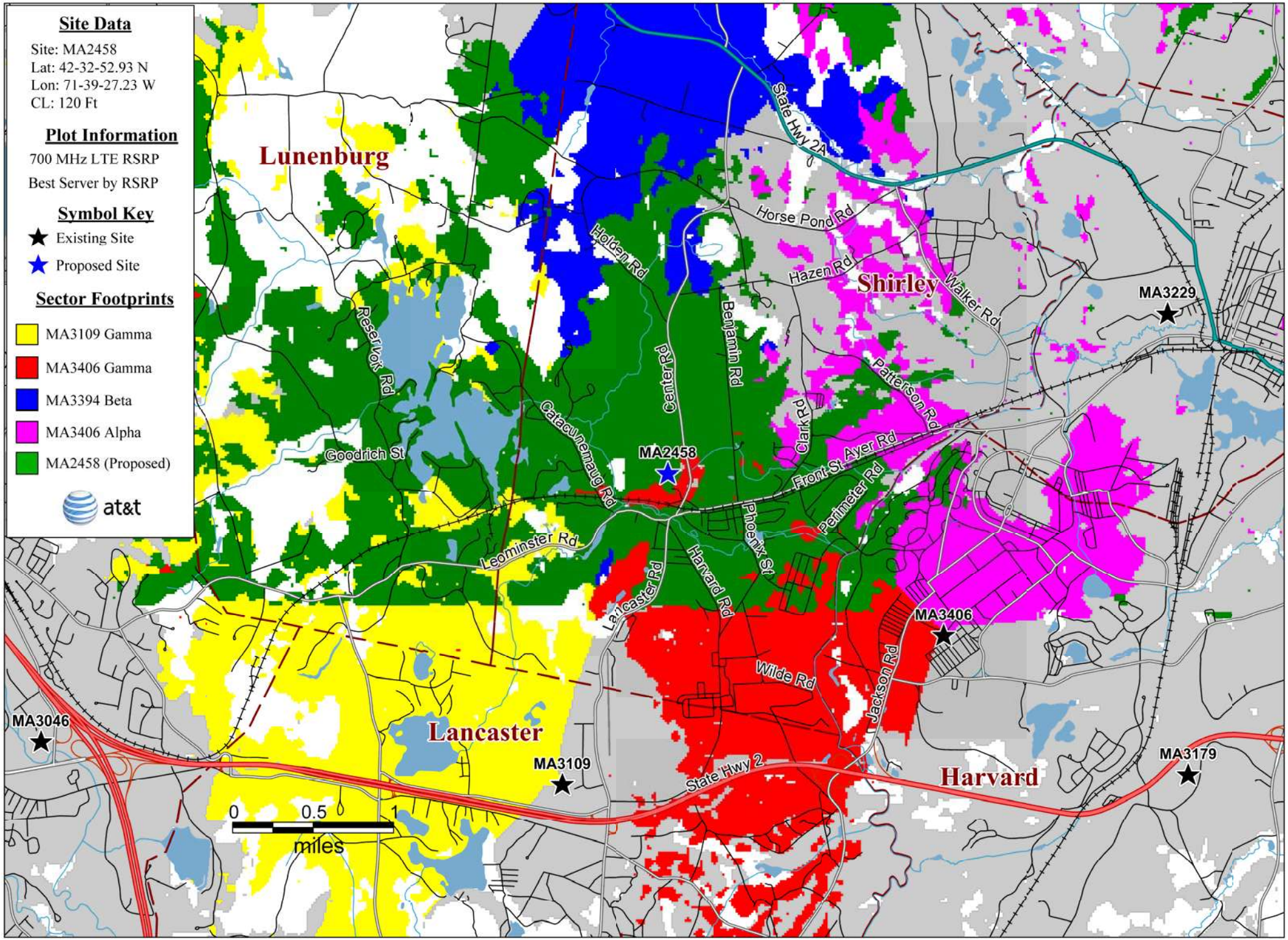
MA2458 - 700 MHz & 1900 MHz LTE Coverage with Proposed Site (-93 dBm, -96 dBm)



MA2458 - Existing 700 MHz LTE Sector Footprints (-108 dBm)



MA2458 - 700 MHz LTE Sector Footprints with Proposed Site (-108 dBm)



13

Site Emissions Report For Shirley, MA
Date Performed: 02/13/202

This site emissions analysis was created for Vertex Towers, LLC. The Monopole analysis was performed to include all 4 major carriers. According to the analysis, this Monopole located at Center Road in Shirley, MA, MA 01464. (44.32-52.93 N, -71.39-27.23 W) does pass the FCC requirements for Radio Frequency emissions. The FCC requirements used in this report were determined from the FCC OET65 documentation and calculations.

The Monopole assumes the worst case scenario which would not occur in the real world. It assumes that all 4 carriers are using all frequency bands and are all on the lowest height of the tower.

The approach taken for calculations takes into account the typical antenna used, since a Cell Site antenna is directional and has different gains at different angles.
At the lowest height of 80ft, the highest emissions does not go above 4.57 µW/cm² which is **0.457%** of the Maximum Permissible Emissions requirements, which is less than 1% of the MPE requirements.
Site Name: MA-2458

Coordinates: (44.32-52.93 N, -71.39-27.23 W)

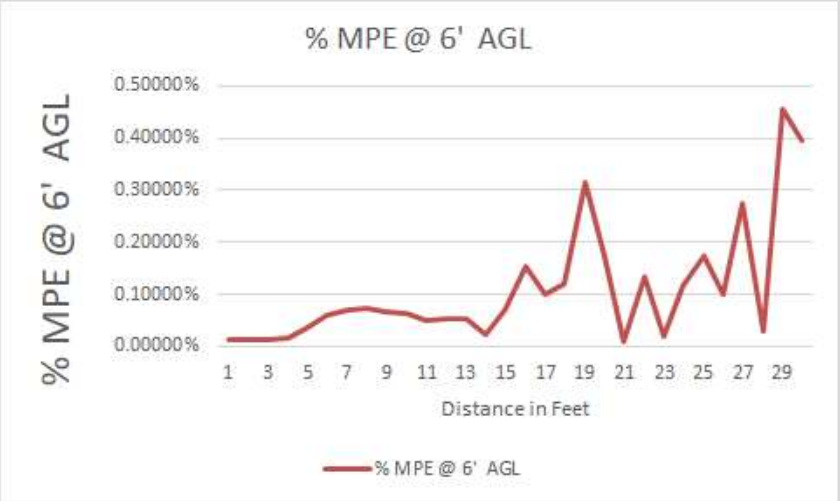
Location: Shirley, MA 01464. Carrier Available Heights (ft): 120,110,90,80

Equation for Predicting RF Fields:

$$S = \frac{EIRP}{4\pi R^2} \quad (4)$$

where: EIRP = equivalent (or effective) isotropically radiated power
S = power density (in appropriate units, e.g. mW/cm²)

Reference: OET Bulletin 65



Wireless Service Provider	Frequency Band	ERP (Watts)
Carrier 1	1900MHz	1250
Carrier 1	700MHz	1000
Carrier 1	850MHz	1000
Carrier 1	2100MHz	2500
Carrier 2	1900MHz	2000
Carrier 2	700MHz	1000
Carrier 2	850MHz	1000
Carrier 2	2100MHz	1000
Carrier 3	1900MHz	1360
Carrier 3	2100MHz	1360
Carrier 3	700MHz	1000
Carrier 4	850MHz	400
Carrier 4	1900MHz	1360

Analysis Performed by: Jose Hernandez
Jose Hernandez – President / Principal. RF Engineer - JNaerowaves.Corp

Jose Hernandez is an independent Radio Frequency Engineer with 20 years of experience as an engineer in the Wireless Telecommunications field. Jose has performed numerous emissions reports for the Wireless Telecommunications Industry.

02/13/2023

14

ADVANCED ENGINEERING GROUP, P.C.

500 North Broadway
East Providence, RI 02914
Phone: (401) 354-2403

May 23, 2023

Sarah Widing
Planning Board - Chairperson
Town of Shirley
7 Keady Way
Shirley, MA 01464

Site ID: Removal Bond Estimate (RBE)
Proposed Antenna Installation
Off Center Road Shirley, MA 01464
Vertex Towers Reference: VT-MA-0473A

To Whom It May Concern:

The following estimate has been prepared to summarize the take down and removal costs that would be associated with the proposed installation at the above-referenced location and shown on plans by this office dated 03/29/23. These costs are based on data compiled in the Heavy Construction Cost Data, published by RS Means and from industry-specific data.

RS Means Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
n/a	Mobilization and demobilization of crews and equipment	EA	1	$5,000.00	$5,000.00
24119190840	Dumpster Rental	WK	1	$850.00	$850.00
24113601700	Fencing demolition, remove chain link posts & fabric, 8' to 10' high	LF	244	$4.35	$1061.40
24113620200	Remove Fence Gate	EA	1	$122.19	$122.19
15433602760	Crane Rental (150 ton)	Day	1	$3,210.49	$3,210.49
24113780900	Tower Removal	EA	1	$5,901.83	$5,901.83
Labor Crew K-2	Remove general site equip.	LH	72	$91.69	$6,601.68
26-05-05.10-0120	Remove power & telco conduit from cabinet to backboard	LF	50	$4.35	$217.50
03-05-05.10-0060	Concrete Pad Removal	CY	10	$132.00	$1,320.00
02-41-16.17-4250	Concrete Disposal	CY	10	$14.85	$148.50
260505101570	Remove Transformer	EA	1	$1,485.61	$1,485.61
24119193040	Haul and Dump Demo Material	CY	20	$56.23	$1,124.60
G1030-110-1000	Excavate Stone in Compound	CY	66.67	$12.15	$810.04
G1030-110-1200	Haul and Dump Stone	CY	66.67	$16.15	$1076.72
329119130800	Loam for Restoration	SY	500	$6.08	$3,040.00
329219144900	Grass Seed	MSF	5	$29.56	$147.80
n/a	Final Cleanup	EA	1	$1,000.00	$1,000.00
	Subtotal				$33,118.36
	Contingencies	EA	1	10.00%	$3,311.84
	TOTAL COST				$36,430.20

ADVANCED
ENGINEERING GROUP, P.C.

500 North Broadway
East Providence, RI 02914
Phone: (401) 354-2403

Based on the cost estimate provided in this report, it is my professional opinion that an appropriate surety amount to secure the removal of the facility would not exceed $40,000.

Should you have any questions please contact me at 401-354-2403.

Very truly yours,

Scott N. Adams, P.E.
Advanced Engineering Group, P.C.

DRAFT

ISSUED THROUGH

A.A. DORITY COMPANY

BOSTON

TOWER / STRUCTURE / EQUIPMENT REMOVAL BOND

Location tower/structure/equipment:

Site ID:
Bond No.

KNOW ALL MEN BY THESE PRESENTS:

That Vertex Tower Assets, LLC, 155 South Street, Suite 205, Wrentham, MA 02093 as Principal and, NGM Insurance Company, a corporation duly organized under the laws of the State of Florida as Surety, are held and firmly bound unto the Town of as Obligee, the penal sum of for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents, the liability of the surety being limited to the penal sum of this bond regardless of the number of years the bond is in effect.

WHEREAS, the Principal has entered into a written agreement with the property owner for the placement of a tower, structure or equipment furnishing telephone, television or other electronic media service, which agreement sets forth the terms and conditions which govern the use of such towers, structures or equipment and which agreement is hereby specifically referred to and made part hereof, and

WHEREAS, the Town of and/or the property owner, requires the submission of a bond guaranteeing the maintenance, replacement, removal or relocation of said tower,

NOW THEREFORE, the condition of this obligation is such, that if the above bounded Principal shall perform in accordance with the aforesaid ordinance and/or agreement, and Indemnify the Obligee against all loss caused by the Principal's breach of any ordinance or agreement relating to the maintenance, replacement, removal or relocation of a tower, structure or equipment, then this obligation shall be void; otherwise to remain in full force and effect unless cancelled as set forth below.

THIS BOND may be cancelled by Surety by giving thirty (30) days written notice to the Obligee by certified mail. Such cancellation shall not affect any liability the surety has incurred under this bond prior to the effective date of the termination.

PROVIDED that no action, suit or proceeding shall be maintained against the Surety on this bond unless the action is brought within twelve (12) months of the cancellation date of this bond.

SIGNED this day of

Principal: Vertex Tower Assets, LLC

Surety: NGM Insurance Company

NGM INSURANCE COMPANY
A member of The Main Street America Group

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That NGM Insurance Company, a Florida corporation having its principal office in the City of Jacksonville, State of Florida, pursuant to Article IV, Section 2 of the By-Laws of said Company, to wit:

> "Article IV, Section 2. The board of directors, the president, any vice president, secretary, or the treasurer shall have the power and authority to appoint attorneys-in-fact and to authorize them to execute on behalf of the company and affix the seal of the company thereto, bonds, recognizances, contracts of indemnity or writings obligatory in the nature of a bond, recognizance or conditional undertaking and to remove any such attorneys-in-fact at any time and revoke the power and a

does hereby make, constitute and appoint

---

its true and lawful Attorneys-in-fact, to make, execute, seal and deliver for and on its behalf, and as its act and deed, bonds, undertakings, recognizances, contracts of indemnity, or other writings obligatory in nature of a bond subject to the following limitation:

1. No one bond to exceed

and to bind NGM Insurance Company thereby as fully and to the same extent as if such instruments were signed by the duly authorized officers of NGM Insurance Company; the acts of said Attorney are hereby ratified and confirmed.

This power of attorney is signed and sealed by facsimile under and by the authority of the following resolution adopted by the Directors of NGM Insurance Company at a meeting duly called and held on the 2nd day of December 1977.

> Voted: That the signature of any officer authorized by the By-Laws and the company seal may be affixed by facsimile to any power of attorney or special power of attorney or certification of either given for the execution of any bond, undertaking, recognizance or other written obligation in the nature thereof; such signature and seal, when so used being hereby adopted by the company as the original signature of such office and the original seal of the company, to be valid and binding upon the company with the same force and effect as though manually affixed.

IN WITNESS WHEREOF, NGM Insurance Company has caused these presents to be signed by its Vice President, General Counsel and Secretary and its corporate seal to be hereto affixed this day of

NGM INSURANCE COMPANY By:

State of Florida,
County of Duval.

On this before the subscriber a Notary Public of State of Florida in and for the County of Duval duly commissioned and qualified, came NGM Insurance Company, to me personally known to be the officer described herein, and who executed the preceding instrument, and he acknowledged the execution of same, and being by me fully sworn, deposed and said that he is an officer of said Company, aforesaid: that the seal affixed to the preceding instrument is the corporate seal of said Company, and the said corporate seal and her signature as officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Company; that Article IV, Section 2 of the By-Laws of said Company is now in force.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at Jacksonville, Florida this day of .

I, of NGM Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney executed by said Company which is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Company at Jacksonville, Florida this day of

WARNING: Any unauthorized reproduction or alteration of this document is prohibited.
TO CONFIRM VALIDITY of the attached bond please call 1-800-225-5646.
TO SUBMIT A CLAIM: Send all correspondence to 55 West Street, Keene, NH 03431 Attn: Bond Claims.
DocuGard #04546 contains a security pantograph, blue background, heat-sensitive ink, coin-reactive watermark, and microtext printing on border.
FADES WITH HEAT OR TOUCH

15

ADVANCED
ENGINEERING GROUP, P.C.

500 North Broadway
East Providence, RI 02914
Phone: (401) 354-2403
Fax: (401)-633-6354

May 24, 2023

Sarah Wilding
Planning Board - Chairperson
Town of Shirley
7 Keady Way
Shirley, MA 01464

RE: Structural Assessment
Proposed Antenna Installation
Off Center Road Shirley, MA 01464
Vertex Towers Reference: VT-MA-0473A

To Whom It May Concern:

The following information has been provided on behalf of Vertex Towers for the proposed wireless communications facility at the above location.

1. My name is Scott N. Adams. I am a licensed professional civil engineer in the Commonwealth of Massachusetts with registration number 46006.

2. I am a principal in the firm Advanced Engineering Group, P.C. working as consultant for the Wireless industry located at 500 North Broadway, East Providence, RI 02914. My professional services include providing professional engineering services for the design and construction of wireless facilities.

3. I am familiar with the design and construction of antenna support structures including monopoles, self-supported towers, and guyed towers. I have been involved with the design and construction of wireless facilities throughout New England for over twenty (20) years. My experience, as it relates to wireless facilities, includes foundation analysis and design, geotechnical analysis and reporting, drainage analysis and design, surveying, and site design.

4. The proposed antenna support structure proposed by Vertex Towers will consist of a 125-foot tall tapered, slip-joint galvanized steel monopole. The base diameter will be approximately 36 inches and will taper to an approximate diameter of 18 inches at the top. The monopole is custom fabricated, and the exact dimensions and details vary with each manufacturer. The pole cross-section is formed from a single steel plate, is bent on an industrial break-press with 16 flat faces to approximate a circle and is joined vertically with a welded seam. The pole is manufactured in sections that are 30 to 50 feet long and are assembled in the field with a slip-joint or friction joint between adjacent sections. The proposed foundation will consist of a reinforced concrete footing with approximate overall dimensions of 20 feet by 20 feet, approximately three (3) feet thick and set at a depth of approximately six (6) feet. The proposed monopole and foundation will be designed by a Massachusetts registered professional engineer in accordance with the Massachusetts State Building Code and the national tower code ANSI/TIA/EIA-222-G to withstand the most severe wind and icing conditions that can be reasonably expected to occur at the site.

5. By code design requirements, a steel monopole structure has a safety factor of 1.5 above and beyond the allowable stress created by a high-speed wind load.

6. The occurrence of failure of a properly designed, constructed, and maintained monopole is extremely rare. Load tests have determined that the probable structural failure mechanism is a bending or buckling of the monopole near its mid-point. A bent monopole reduces surface areas exposed to wind loading at the top thereby causing a redistribution of stress to lower monopole sections. Even with a complete structural failure of the monopole at the buckle point, the

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lower sections lean and remain standing while the upper sections topple in a hinge-like fashion. Under a catastrophic failure scenario where the upper half completely separates at the hinge point, it is my opinion that a conservative estimate of the monopole "fall zone" would be approximately ½ the overall structure height. Furthermore, engineering studies of tower failures and debris scatter show a statistical mean "fall zone" of ½ the overall structure height as referenced in a publication entitled: "Atmospheric Icing and Tower Collapse in the United States", 1996, U.S. Army Cold Regions Research and Engineering Laboratory.

7. The complete toppling of a monopole, like a tree, in an ultimate wind speed condition is prevented by the base foundation. The foundation design for the Vertex Towers monopole will be determined from geotechnical soil data obtained from field investigations. By code requirements, the foundation is designed to resist overturning or toppling of the monopole with a safety factor of two (2). This means that the monopole foundation can resist two (2) times the maximum stresses generated by the full high wind speed loading before overturning would occur. Since design codes require the monopole foundation to resist 2.0 times the maximum allowable load and the steel structure can resist 1.5 times the maximum allowable load, then the steel monopole structure will fail before the foundation. This design approach ensures that the monopole "fall zone" is limited to a distance less than the monopole height.

8. Under code requirements in ANSI/TIA/EIA-222-G and the Massachusetts State Building Code, forces other than a high-speed wind load must be considered in the structural design of a communications monopole. A reduced wind load (equivalent to 87 percent of the high-speed wind load) superimposed with ice accumulation must be considered. Also, forces from earthquakes must be evaluated in the structural design. However, due to the shape factor of a monopole structure, the most severe structural loading condition always results from the high-speed wind load thereby controlling the engineering design of the structure.

9. Industry statistics indicate that monopole failures are extremely rare with structures that are designed and constructed in accordance with ANSI/TIA/EIA-222-G standards. Based on building code requirements and industry design standards, it is my opinion that a properly constructed 125-foot monopole in Massachusetts can survive wind speeds of approximately equivalent to a Category Five Hurricane (winds exceeding 155 mph) or a F4 Tornado (Fujita Scale wind speeds from 207 to 260 mph with damage described as entire wood-frame structures blown off their foundations).

10. Based on the findings outlined above, it is my professional opinion that the proposed Vertex Towers telecommunications monopole and foundation will be designed under the most stringent requirements specified in the Massachusetts State Building Code and national tower code ANSI/TIA/EIA/222-G and will be certified by a Massachusetts registered professional engineer. The estimated maximum theoretical survival wind speed of the structure will be designed per the guidelines above with the most likely failure scenario being impact of wind-borne flying debris, including parts of buildings, during a Category Five Hurricane or F4 Tornado. Engineering studies of tower failures and debris scatter show a statistical mean "fall zone" of ½ the overall structure height.

Based on the findings and information provided above, it is my professional opinion that if the proposed monopole is designed as described above, the most common mode of failure is in the upper middle region of the tower causing a fall zone less than or equal to ½ the tower height (62.5 feet max. in this case).

Should you have any questions please contact me at 401-354-2403.

Very truly yours,

Scott N. Adams, P.E.
Advanced Engineering Group, P.C.

COMMONWEALTH OF MASSACHUSETTS
SCOTT N. ADAMS
CIVIL
No. 46006
REGISTERED PROFESSIONAL ENGINEER

16

VT-MA-0473
SOUTH SHIRLEY

OFF CENTER ROAD
SHIRLEY, MA 01464
MIDDLESEX COUNTY

SITE NO: VT-MA-0473

GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE LESEE/LICENSEE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.

4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS / CONTRACT DOCUMENTS.

7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.

9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETCETERA DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.

13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.

14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.

15. THE CONTRACTOR SHALL NOTIFY THE LESEE/LICENSEE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESEE/LICENSEE REPRESENTATIVE.

16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.

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

18. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS SHOWN HEREIN.

19. ALL DIMENSIONS SHOWN THUS ± ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS WHICH EFFECT THE CONTRACTORS WORK. CONTRACTOR TO VERIFY ALL DIMENSIONS WITH PROJECT OWNER PRIOR TO CONSTRUCTION.

20. NORTH ARROW SHOWN ON PLANS REFERS TO APPROXIMATE TRUE NORTH. PRIOR TO THE START OF CONSTRUCTION, ORDERING OR FABRICATING OF ANTENNA MOUNTS, CONTRACTOR SHALL CONSULT WITH PROJECT OWNER'S RF ENGINEER AND FIELD VERIFY ALL ANTENNA SECTOR LOCATIONS AND ANTENNA AZIMUTHS.

21. THE CONTRACTOR AND OR HIS SUB CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

22. ANTENNA INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS, TRANSMISSION LINES AND SUPPORT STRUCTURES.

23. COAXIAL CABLE CONNECTORS AND TRANSMITTER EQUIPMENT SHALL BE PROVIDED BY THE PROJECT OWNER AND IS NOT INCLUDED IN THESE CONSTRUCTION DOCUMENTS. A SCHEDULE OF PROJECT OWNER SUPPLIED MATERIALS IS ATTACHED TO THE BID DOCUMENTS (SEE EXHIBIT 3). ALL OTHER HARDWARE TO BE PROVIDED BY THE CONTRACTOR. CONNECTION HARDWARE SHALL BE STAINLESS STEEL.

24. WHEN "PAINT TO MATCH" IS SPECIFIED FOR ANTENNA CONCEALMENT, PAINT PRODUCT FOR ANTENNA RADOME SHALL BE SHERWIN WILLIAMS COROTHANE II. SURFACE PREPARATION AND APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND PROJECT OWNER'S GUIDELINE'S.

25. COORDINATION, LAYOUT, AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

26. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.

27. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW.

28. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF UTILITY COMPANY ENGINEERING. THE AREAS OF THE PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE EQUIPMENT, DRIVEWAY OR LEASE AREA SHALL BE RESTORED TO ORIGINAL CONDITION.

29. GRAVEL, SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED AND COVERED WITH MULCH UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN SOIL EROSION AND SEDIMENTATION CONTROLS AT ALL TIMES.

30. DURING CONSTRUCTION. PER FCC MANDATE, ENHANCED EMERGENCY (E911) SERVICE IS REQUIRED TO MEET NATIONWIDE STANDARDS.

31. FOR WIRELESS COMMUNICATIONS SYSTEMS. PROJECT OWNER'S IMPLEMENTATION REQUIRES DEPLOYMENT OF EQUIPMENT AND ANTENNAS GENERALLY DEPICTED ON THIS PLAN, ATTACHED TO OR MOUNTED IN CLOSE PROXIMITY TO THE BTS RADIO CABINETS. PROJECT OWNER RESERVES THE RIGHT TO MAKE REASONABLE MODIFICATIONS TO E911 EQUIPMENT AND LOCATION AS TECHNOLOGY EVOLVES TO MEET REQUIRED SPECIFICATIONS.

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

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

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

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

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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

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

BUILDING CODE:

MASSACHUSETTS STATE BUILDING CODE 780 CMR, 9TH EDITION
ELECTRICAL CODE: MASSACHUSETTS 527 CMR 12.00 (NEC 2020)
NFPA 780, 2017

VICINITY MAP

NORTH

VICINITY MAP
SCALE: NTS

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
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C-1	OVERALL SITE PLAN	1
C-2	EXISTING CONDITIONS	1
Z-1	SITE PLAN AND ELEVATION	1
Z-2	COMPOUND PLAN	1
Z-3	DETAILS	1

PROJECT SUMMARY

SITE NUMBER:	VT-MA-0473
SITE NAME:	MIDDLESEX
SITE ADDRESS:	OFF CENTER ROAD SHIRLEY, MA 01464
ASSESSOR'S PARCEL NO.:	MAP: 21A LOT: 19
CONSTRUCTION TYPE:	NSB
PROPERTY OWNER:	WENTWORTH, MARIANNE AND MAURICE PO BOX 313 SHIRLEY, MA 01464
APPLICANT, LESSEE/LICENSEE, PROJECT OWNER:	VERTEX TOWERS LLC 155 SOUTH STREET SUITE 102 WRENTHAM, MA 02093
TOWER TYPE:	MONOPOLE
TOWER HEIGHT:	125'±

TOWER DESIGN REQUIREMENT:
AS A CONDITION OF APPROVAL, THE TOWER MANUFACTURER WILL ENSURE THE TOWER IS DESIGNED TO BUCKEL AND/OR HINGE AT OR ABOVE THE TOWER'S MID POINT. THIS REQUIREMENT WILL BE ABOVE AND BEYOND REQUIREMENTS SPECIFIED IN THE STATE BUILDING CODE AND THE NATIONAL TOWER CODES ANSI/TIA/EIA/222-G AND BE CERTIFIED BY A MA REGISTERED PROFESSIONAL ENGINEER.

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

Vertex Towers LLC
VERTEX TOWER LLC
155 SOUTH STREET, SUITE 102
WRENTHAM, MA 02093

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500 North Broadway
East Providence, RI 02914
Tel: (401) 354-2403
Fax: (401) 633-6354

COMMONWEALTH OF MASSACHUSETTS
SCOTT N. ADAMS
CIVIL
No. 46008
REGISTERED PROFESSIONAL ENGINEER

AEG PROJECT #: 2021-0444

DRAWN BY: JWH

CHECKED BY: SNA

SUBMITTALS

REV#	DATE	DESCRIPTION
0	01/13/22	ISSUED FOR REVIEW
1	11/09/22	REVISED

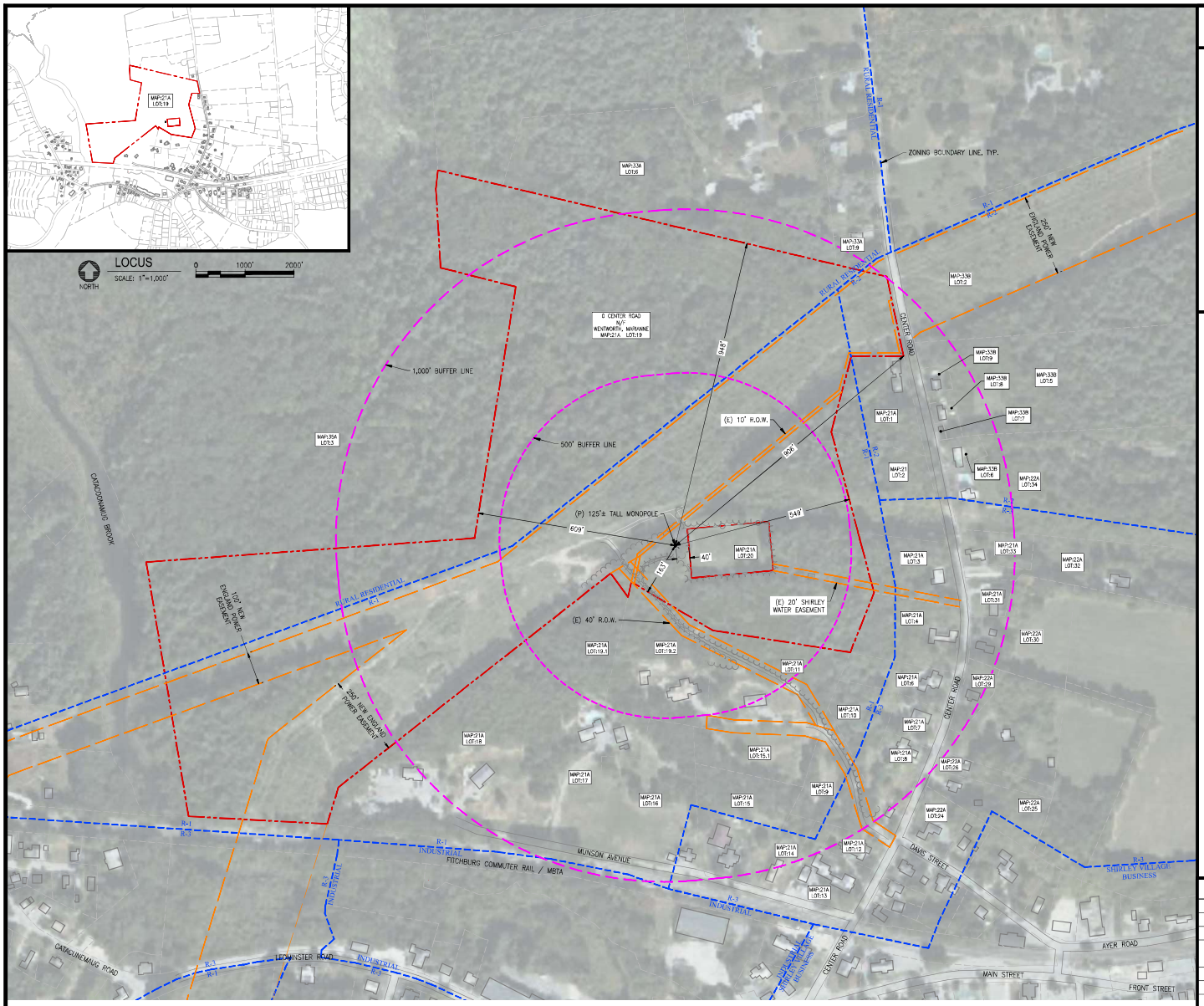
THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF VERTEX TOWERS, ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

SOUTH SHIRLEY

OFF CENTER ROAD
SHIRLEY, MA 01464
MIDDLESEX COUNTY

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



NORTH

1 / C-1 OVERALL SITE PLAN

SCALE: 1"=150'

0 150' 300'

PLAN NOTES:

1. INFORMATION ON THIS PLAN WAS OBTAINED FROM MASSGIS DATA LAYERS AND A SITE SURVEY.
2. A METES AND BOUND SURVEY WAS NOT COMPLETED BY ADVANCED ENGINEERING GROUP.
3. ZONING AND OVERLAY DISTRICTS WERE INTERPOLATED FROM TOWN OF SHIRLEY ZONING MAPS.

LEGEND

- PROPERTY LINE
- ABUTTING PROPERTY LINE
- EXIST. R.O.W. LAYOUT
- PROP. EASEMENT/LEASE AREA
- ZONING BOUNDARY
- EASEMENT
- EXIST. FENCE
- PROP. FENCE
- EXIST. BUILDING
- EXIST. OVERHEAD WIRE
- 500' ABUTTER RADIUS
- 1000' ABUTTER RADIUS
- LIMITS OF WORK
- PROP. SILT FILTRATION FENCE
- EXIST. EDGE OF TREE CANOPY
- PROP. EDGE OF TREE CANOPY

GENERAL NOTES:

1. FIELD SURVEY DATE: NOVEMBER 22, 2021
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
3. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83)
4. CENTER OF PROPOSED TOWER: LATITUDE: 42° 32' 52.90" N; LONGITUDE: 71° 39' 27.20" W; ELEVATION: 440'± AMSL
5. PROPERTY OWNER: WENTWORTH, MARIANNE AND MAURICE, PO BOX 313, SHIRLEY, MA 01464
6. SITE NUMBER: VT-MA-0473A
7. SITE ADDRESS: OFF CENTER STREET, SHIRLEY, MA 01464
8. & APPLICANT, LESSEE/LICENSEE & PROJECT OWNER: VERTEX TOWERS, LLC, 155 SOUTH STREET, SUITE 102, WRENTHAM, MA 02093
9. JURISDICTION: TOWN OF SHIRLEY
10. TAX ID: MAP: 21A LOT: 19 (48.92± ACRES)
11. DEED REFERENCE: BOOK: 58653 PAGE: 134
12. ZONING JURISDICTION: R-1 DISTRICT
13. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY: DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233 CALL BEFORE YOU DIG (CT): 1-800-922-4455
14. PROPERTY LINE INFORMATION IS COMPILED FROM ASSESSORS PLANS, DEEDS, AND PLANS OF RECORD AND IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED AS THE RESULT OF A FIELD BOUNDARY SURVEY, AND IS SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. A FULL BOUNDARY SURVEY WAS NOT PERFORMED.
15. THE PURPOSE OF THIS SURVEY IS TO SUPPORT THE DESIGN AND CONSTRUCTION OF A TELECOMMUNICATION FACILITY. USE OF THIS SURVEY BY ANYONE OTHER THAN VERTEX TOWERS AND USE OF THIS SURVEY FOR ANY PURPOSE NOT RELATED TO THE DESIGN OF THE INTENDED FACILITY IS STRICTLY PROHIBITED.
16. BEARING SYSTEM OF THIS PLAN IS BASED ON TRUE NORTH. TRUE NORTH WAS ESTABLISHED FROM GPS READINGS ON NOVEMBER 22, 2021.
17. SITE IS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FLOOD INSURANCE RATE MAP MIDDLESEX COUNTY, TOWN OF SHIRLEY COMMUNITY PANEL NUMBER 25017C0191E, EFFECTIVE DATE JUNE 04, 2010
18. WETLANDS WERE NOT OBSERVED WITHIN 100' OF THE LIMIT OF WORK.
19. IN THE EVENT THAT BENCHMARKS (TBM'S), ESTABLISHED FOR THIS PROJECT AND PUBLISHED ON THIS SURVEY, ARE DESTROYED, NOT RECOVERABLE OR A DISCREPANCY IS FOUND, THE USER SHOULD NOTIFY THIS FIRM IN WRITING PRIOR TO COMMENCING OR CONTINUING ANY WORK.
20. THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.

ZONING SUMMARY TABLE

ZONING DISTRICT:	R-1 RESIDENTIAL DISTRICT
ASSESSORS ID:	MAP: 21A LOT: 19 (48.92± ACRES)
PROPOSED USE:	WIRELESS COMMUNICATION FACILITY

DIMENSIONS	REQUIRED MINIMUM	PROVIDED
LOT SIZE (SF):	40,000 SF	2,130,955.2± SF
FRONTAGE:	175'	239'±
LOT WIDTH:	175'	1,077'±
LOT DEPTH:	150'	2,699'±
FRONT SETBACKS * :	40'	906'±
SIDE SETBACK * :	17'	40'±
REAR SETBACK * :	50'	163'±
WIRELESS TELECOMMUNICATIONS FACILITY		
MAXIMUM TOWER HEIGHT:	125'	125'

* DIMENSION MEASURED FROM PROPOSED TOWER TO THE NEAREST PROPERTY LINE

Vertex Towers LLC
VERTEX TOWER LLC
155 SOUTH STREET, SUITE 102
WRENTHAM, MA 02093

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COMMONWEALTH OF MASSACHUSETTS
SCOTT M. ADAMS
CIVIL
No. 48006
REGISTERED PROFESSIONAL ENGINEER

AEG PROJECT #: 2021-0444

DRAWN BY: JWH

CHECKED BY: SNA

SUBMITTALS

REV#	DATE	DESCRIPTION
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1	11/09/22	REVISED

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SOUTH SHIRLEY

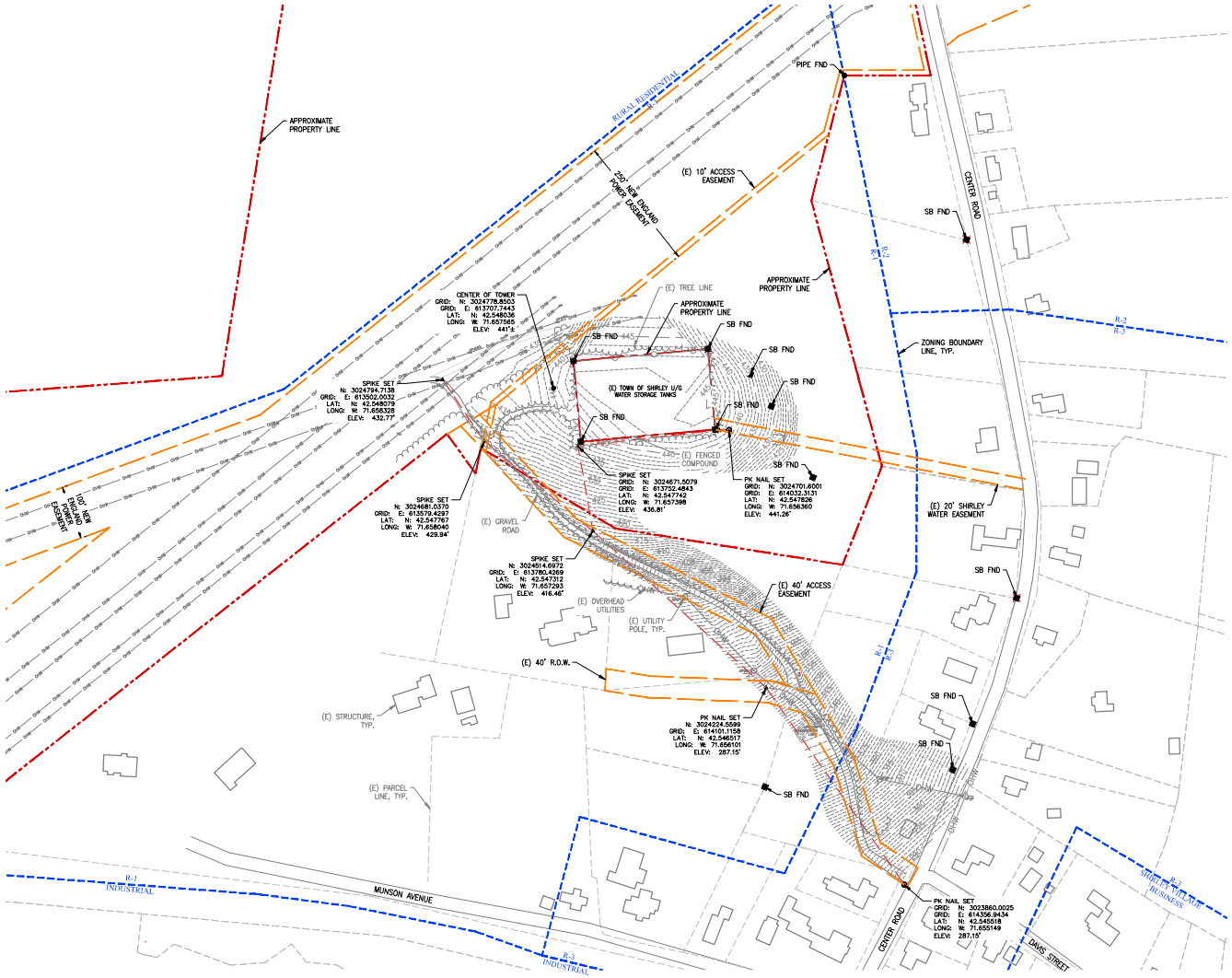
OFF CENTER ROAD
SHIRLEY, MA 01464
MIDDLESEX COUNTY

SHEET TITLE

OVERALL SITE PLAN

SHEET NUMBER

C-1



NORTH

1 / C-2 EXISTING CONDITIONS

SCALE: 1"=100'

0 100' 200'

PLAN NOTES:

1. INFORMATION ON THIS PLAN WAS OBTAINED FROM MASSGIS DATA LAYERS AND A SITE SURVEY.
2. A METES AND BOUND SURVEY WAS NOT COMPLETED BY ADVANCED ENGINEERING GROUP.
3. ZONING AND OVERLAY DISTRICTS WERE INTERPOLATED FROM TOWN OF SHIRLEY ZONING MAPS.

LEGEND

- PROPERTY LINE
- ABUTTING PROPERTY LINE
- EXIST. R.O.W. LAYOUT
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- 1000' ABUTTER RADIUS
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11. DEED REFERENCE: BOOK: 58653 PAGE: 134
12. ZONING JURISDICTION: R-1 DISTRICT
13. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY: DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233 CALL BEFORE YOU DIG (CT): 1-800-922-4455
14. PROPERTY LINE INFORMATION IS COMPILED FROM ASSESSORS PLANS, DEEDS, AND PLANS OF RECORD AND IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED AS THE RESULT OF A FIELD BOUNDARY SURVEY, AND IS SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. A FULL BOUNDARY SURVEY WAS NOT PERFORMED.
15. THE PURPOSE OF THIS SURVEY IS TO SUPPORT THE DESIGN AND CONSTRUCTION OF A TELECOMMUNICATION FACILITY. USE OF THIS SURVEY BY ANYONE OTHER THAN VERTEX TOWERS AND USE OF THIS SURVEY FOR ANY PURPOSE NOT RELATED TO THE DESIGN OF THE INTENDED FACILITY IS STRICTLY PROHIBITED.
16. BEARING SYSTEM OF THIS PLAN IS BASED ON TRUE NORTH. TRUE NORTH WAS ESTABLISHED FROM GPS READINGS ON NOVEMBER 22, 2021.
17. SITE IS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FLOOD INSURANCE RATE MAP MIDDLESEX COUNTY, TOWN OF SHIRLEY COMMUNITY PANEL NUMBER 25017C0191E, EFFECTIVE DATE JUNE 04, 2010
18. WETLANDS WERE NOT OBSERVED WITHIN 100' OF THE LIMIT OF WORK.
19. IN THE EVENT THAT BENCHMARKS (TBM'S), ESTABLISHED FOR THIS PROJECT AND PUBLISHED ON THIS SURVEY, ARE DESTROYED, NOT RECOVERABLE OR A DISCREPANCY IS FOUND, THE USER SHOULD NOTIFY THIS FIRM IN WRITING PRIOR TO COMMENCING OR CONTINUING ANY WORK.
20. THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.

ZONING SUMMARY TABLE

ZONING DISTRICT:	R-1 RESIDENTIAL DISTRICT	
ASSESSORS ID:	MAP: 21A LOT: 19 (48.92± ACRES)	
PROPOSED USE:	WIRELESS COMMUNICATION FACILITY	
DIMENSIONS	REQUIRED MINIMUM	PROVIDED
LOT SIZE (SF):	40,000 SF	2,130,955.2± SF
FRONTAGE:	175'	239'±
LOT WIDTH:	175'	1,977'±
LOT DEPTH:	150'	2,699'±
FRONT SETBACKS * :	40'	906'±
SIDE SETBACK * :	17'	40'±
REAR SETBACK * :	50'	153'±
WIRELESS TELECOMMUNICATIONS FACILITY		
MAXIMUM TOWER HEIGHT:	125'	125'

* DIMENSION MEASURED FROM PROPOSED TOWER TO THE NEAREST PROPERTY LINE

Vertex Towers LLC
VERTEX TOWER LLC
155 SOUTH STREET, SUITE 102
WRENTHAM, MA 02093

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COMMONWEALTH OF MASSACHUSETTS
SCOTT N. ADAMS
CIVIL
No. 46006
REGISTERED PROFESSIONAL ENGINEER

AEG PROJECT #: 2021-0444

DRAWN BY: JWH

CHECKED BY: SNA

SUBMITTALS

REV#	DATE	DESCRIPTION
0	01/13/22	ISSUED FOR REVIEW
1	11/09/22	REVISED

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SOUTH SHIRLEY

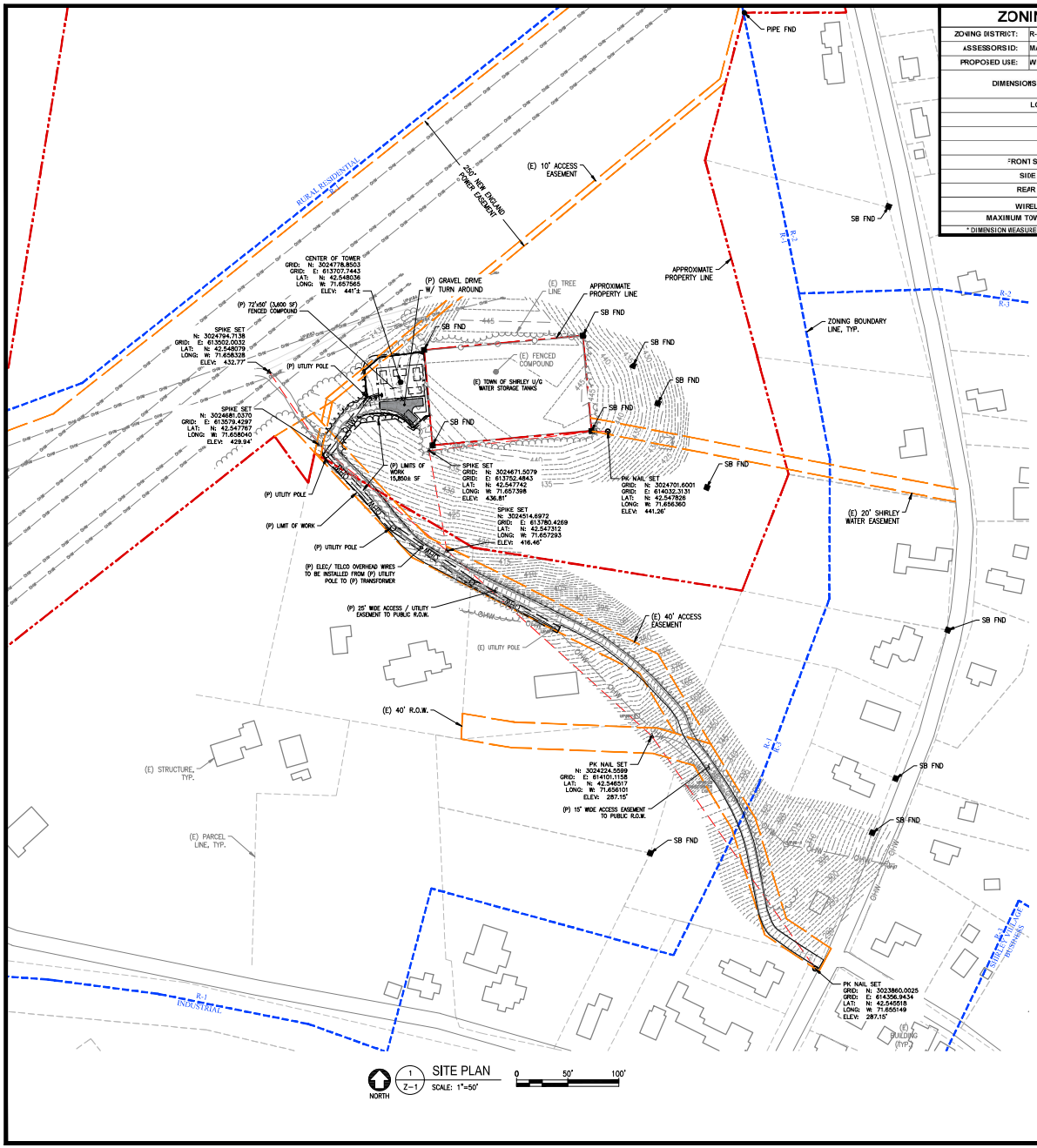
OFF CENTER ROAD
SHIRLEY, MA 01464
MIDDLESEX COUNTY

SHEET TITLE

EXISTING CONDITIONS

SHEET NUMBER

C-2



1 SITE PLAN
Z-1
SCALE: 1"=50'
0 50' 100'

ZONING SUMMARY TABLE

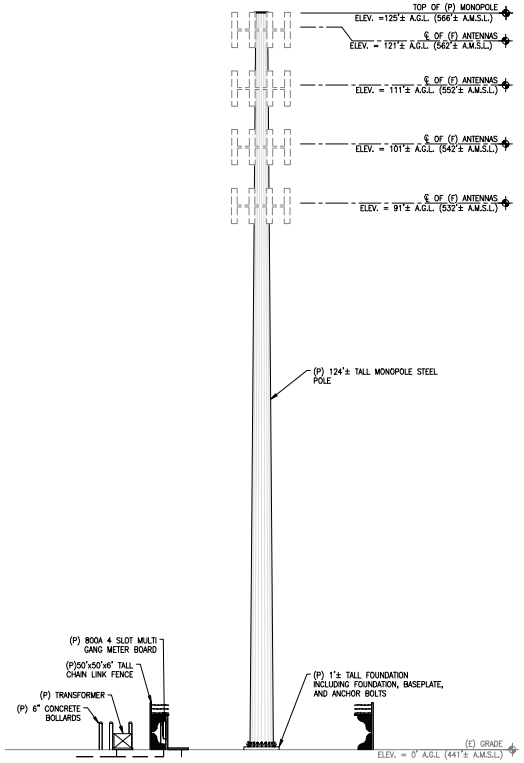
ZONING DISTRICT:	R-1 RESIDENTIAL DISTRICT
ASSESSORS ID:	MAP: 21A LOT: 19 (48.92± ACRES)
PROPOSED USE:	WIRELESS COMMUNICATION FACILITY

DIMENSIONS	REQUIRED MINIMUM	PROVIDED
LOT SIZE (SF):	40,000 SF	2,130,955.2± SF
FRONTAGE:	175'	239'±
LOT WIDTH:	175'	1,077'±
LOT DEPTH:	150'	2,699'±
FRONT SETBACK :	40'	906'±
SIDE SETBACK* :	17'	40'±
REAR SETBACK* :	50'	163'±
WIRELESS TELECOMMUNICATIONS FACILITY		
MAXIMUM TOWER HEIGHT:	125'	125'

* DIMENSION MEASURED FROM PROPOSED TOWER TO THE NEAREST PROPERTY LINE

LEGEND

- PROPERTY LINE
- ABUTTING PROPERTY LINE
- EXIST. R.O.W. LAYOUT
- PROP. EASEMENT/LEASE AREA
- ZONING BOUNDARY
- EASEMENT
- EXIST. FENCE
- PROP. FENCE
- EXIST. BUILDING
- EXIST. OVERHEAD WIRE
- 500' ABUTTER RADIUS
- 1000' ABUTTER RADIUS
- LIMITS OF WORK
- PROP. SILT FILTRATION FENCE
- EXIST. EDGE OF TREE CANOPY
- PROP. EDGE OF TREE CANOPY



2 ELEVATION
Z-1
SCALE: 1"=10'-0"
0 10' 20'

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COMMONWEALTH OF MASSACHUSETTS
SCOTT N. ADAMS
CIVIL
No. 49006
REGISTERED PROFESSIONAL ENGINEER

AEG PROJECT #: 2021-0444

DRAWN BY: JWH

CHECKED BY: SNA

SUBMITTALS

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SOUTH SHIRLEY

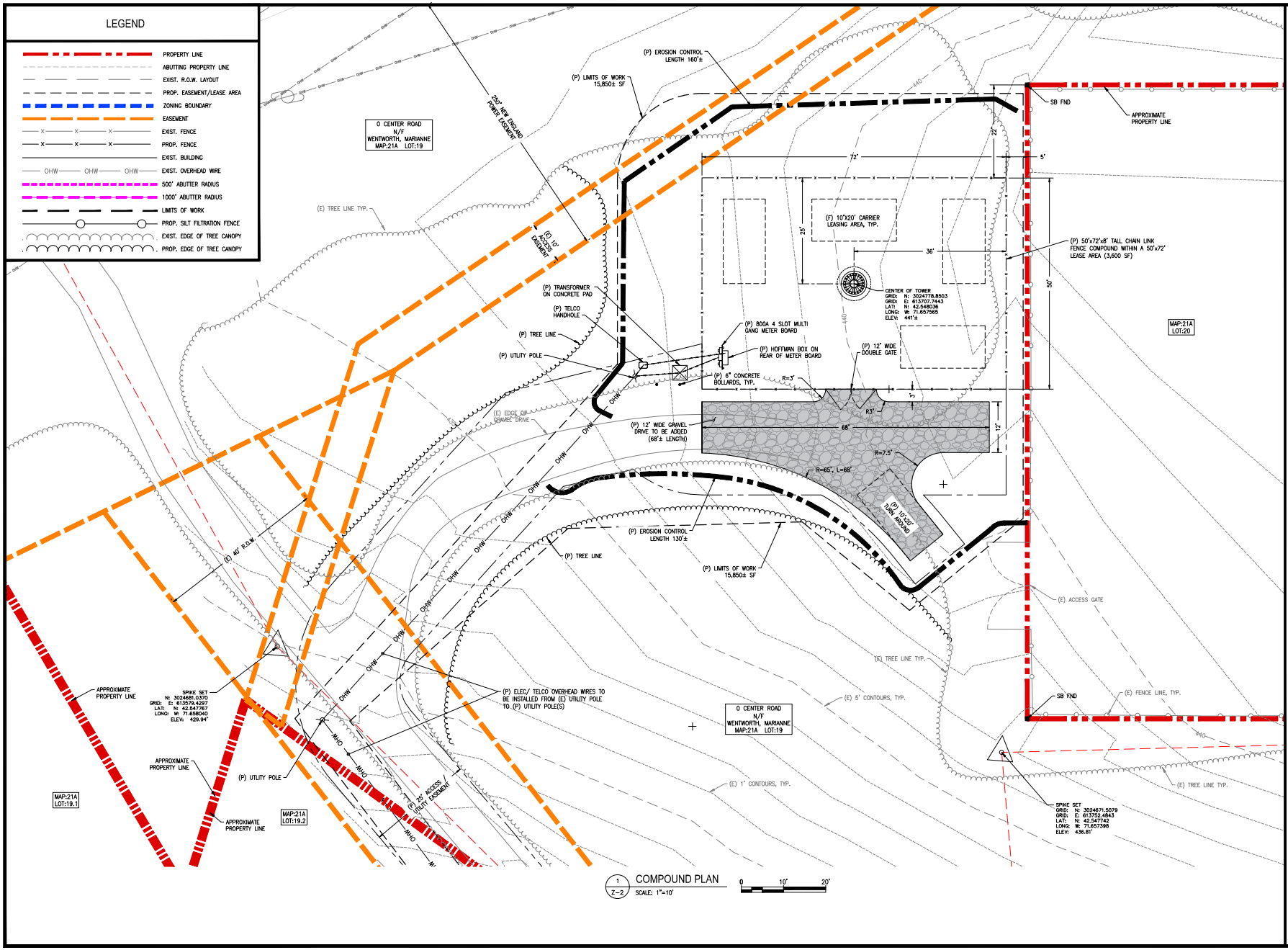
OFF CENTER ROAD
SHIRLEY, MA 01464
MIDDLESEX COUNTY

SHEET TITLE

SITE PLAN AND ELEVATION

SHEET NUMBER

Z-1



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SOUTH SHIRLEY

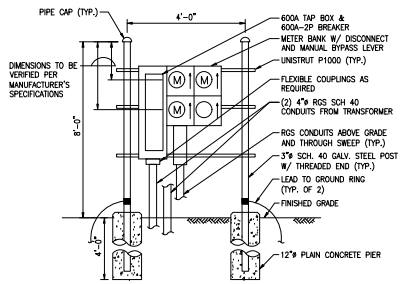
OFF CENTER ROAD
SHIRLEY, MA 01464
MIDDLESEX COUNTY

SHEET TITLE

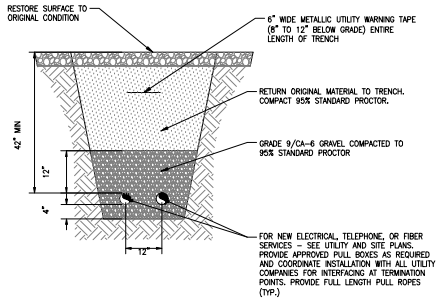
COMPOUND PLAN

SHEET NUMBER

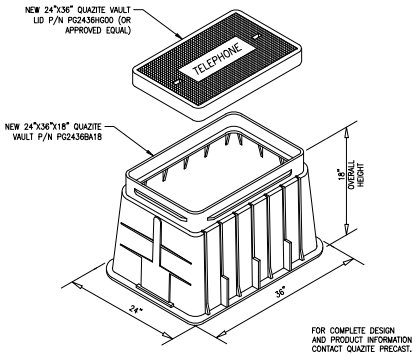
Z-2



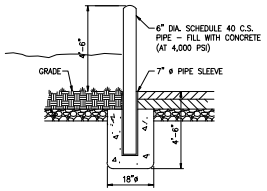
1 Z-3 METER BOARD DETAIL
SCALE: N.T.S.



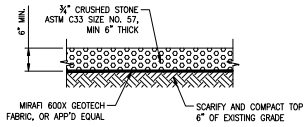
2 Z-3 TRENCH DETAIL AT ACCESS CROSSING
SCALE: N.T.S.



3 Z-3 TELCO HANDHOLE ISOMETRIC
SCALE: N.T.S.



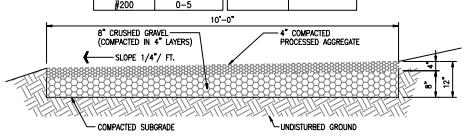
4 Z-3 BOLLARD DETAIL
SCALE: N.T.S.



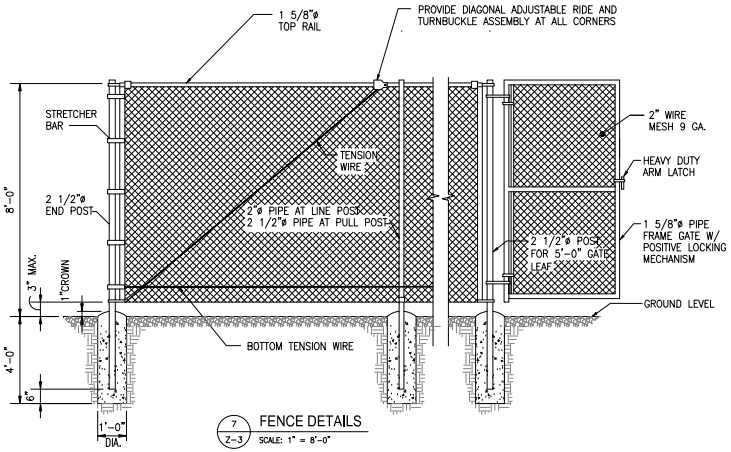
5 Z-3 GRAVEL COMPOUND DETAIL
SCALE: N.T.S.

CRUSHED GRAVEL	
SIEVE	% PASSING BY WEIGHT
5"	100
3 1/2"	90-100
1 1/2"	55-95
1/4"	25-60
#10	15-45
#40	5-25
#100	0-10
#200	0-5

PROCESSED AGGREGATE	
SIEVE	% PASSING BY WEIGHT
2 1/4"	100
2"	95-100
3/4"	50-75
1/4"	25-45
#40	5-20
#100	2-12



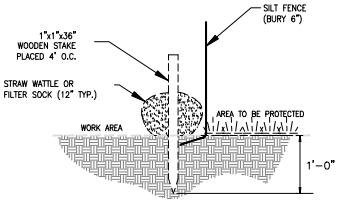
6 Z-3 GRAVEL ACCESS CROSS SECTION
SCALE: NTS

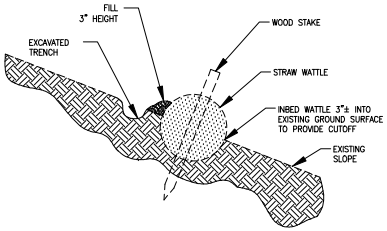


7 Z-3 FENCE DETAILS
SCALE: 1" = 8'-0"

FENCE NOTES:

1. INSTALL FENCING PER ASTM F-567, SWING GATE PER ASTM F-900.
2. ALL END POSTS, LINE POSTS, PULL POSTS, POSTS FOR GATE LEAF, PIPES FOR GATE FRAME AND TOP RAILS SHALL BE SCHEDULE 40 PIPE PER ASTM F-1083.
3. FABRIC SHALL BE 12 GA. CORE WIRE SIZE 2" MESH CONFORMING TO ASTM A-392.
4. TENSION WIRE SHALL BE 7 GA. GALV. STEEL.
5. TIE WIRE SHALL BE 11 GA. GALV. STEEL (MIN.) AT POSTS AND RAILS. A SINGLE WRAP FABRIC TIE AT TENSION WIRE BY HOG RINGS SPACED MAX. OF 24" INTERVALS
6. BARBED WIRE SHALL BE DOUBLE STRAND 12 1/2" O.D. TWISTED WIRE TO MATCH W/FABRIC 14 GA., 4 PT. BARBS SPACES AT APPROXIMATELY 5" O.C.
7. STEEL FENCE SYSTEM SHALL INCLUDE THE FENCE POSTS, FABRIC, GATE SYSTEM AND ALL NECESSARY ERECTION ACCESSORIES, FITTINGS AND FASTENINGS. ALL FENCE SYSTEM COMPONENTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153. GATES SHALL BE SWING GATES WITH 5'-0" LEAFS. REFER TO TYPICAL FENCE DETAIL FOR ADDITIONAL INFORMATION. INSTALL FENCE AFTER CONCRETE HAS ATTAINED 75% OF 28 DAY DESIGN STRENGTH.
8. SCREENING SLATS SHALL BE INSTALLED ON PROPOSED FENCING (COLOR: GREEN OR AS DET'S BY PROJECT OWNER)
9. COMPLY WITH LOCAL ORDINANCES OF BARBED WIRE PERMIT REQUIREMENTS, IF REQUIRED.





8 Z-3 EROSION CONTROL BARRIER DETAIL
SCALE: NTS

EROSION AND SEDIMENT CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONRTOL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE SYSTEM.

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COMMONWEALTH OF MASSACHUSETTS
SCOTT N. ADAMS
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No. 48026
REGISTERED PROFESSIONAL ENGINEER

AEG PROJECT #: 2021-0444

DRAWN BY: JWH

CHECKED BY: SNA

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SOUTH SHIRLEY

OFF CENTER ROAD
SHIRLEY, MA 01464
MIDDLESEX COUNTY

SHEET TITLE

DETAILS

SHEET NUMBER

Z-3