

# Young / Sommer LLC

ATTORNEYS AT LAW

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February 25, 2022

Via Electronic Mail

Chris Brand, Chairman and  
Members of the Planning Board  
Town of Marlborough  
21 Milton Turnpike  
Milton, New York

RE: Application of Cellco Partnership d/b/a Verizon Wireless Proposed Public Utility/Personal Wireless Service Facility located at 50 Cross Street, Marlborough

Dear Chairman Brand and Members of the Planning Board:

Please accept this letter as Verizon Wireless' response to the comments contained in the HDR January 8, 2022 letter. For ease of reference, the HDR comments have been provided below in their entirety followed by our responses. Please note that some of the comments concerning the radio frequency issues have been modified during subsequent telephone conversations between Mr. Musso and the Verizon Wireless RF Engineers.

Comment 1. Visual Resources Evaluation (VRE) Report [§152-6 K(2)]

- A visual assessment was conducted by the applicant's consultant (Tectonic) in November 2021 and a report dated December 7, 2021 was submitted as part of the application package reviewed. Public notice per the Wireless Code was not provided at the time of this November 2021 balloon test, and a subsequent test with noticing is required.
- As discussed at the January 3, 2022 Planning Board Meeting, the applicant is working on scheduling and posting required notice for a balloon test with a target date of Saturday January 29, 2022, with weather dates on Monday January 31 and each consecutive day after that. HDR will work with the applicant on the balloon test methods and field reconnaissance, development of a communications plan to coordinate in the event of a weather delay and will keep the Planning Board updated. The applicant will provide proof of notice in the Southern Ulster Times and copy of notice to the Town.
  - HDR will coordinate with the applicant and the Planning Board leading up to field work and establish a mobile phone / email chain to confirm if the balloon test is "on" or "off" based on the weather forecast. This should include phone / email

contacts for the Town (Planning Board and other Boards if necessary), the Marlboro School District (if necessary), HDR, and the applicant representatives involved. Wind forecasts<sup>1</sup> are not generally available more than 24-36 hours in advance, so a phone / email chain is important to keep all parties apprised. HDR (and possibly Board members) may want to meet the applicant's visual assessment team in the field during the balloon test to discuss possible points of interest in terms of visibility, the means and methods of collecting photos and notes, etc.

- An updated VRE will be submitted after the balloon test. HDR will coordinate with the Planning Board as to whether additional photosimulations and viewpoints (in addition to what has been submitted prior) with different tower configurations/colors are needed. At this time, additional photosimulations at or near locations P-1, P-2, and P10 are recommended.
- In advance of the balloon test, an inventory (listing) of sites/properties of local or State cultural, historic, or other type of significance in the project area (including but not limited to scenic roadways, parks, and sites that are currently on or eligible for designation) should be submitted. The inventory should include the site/property name, address, and distance from the proposed Verizon facility. A map showing these site/property locations in relation to the proposed Verizon facility should accompany the inventory. Sites / properties of significance within the southern half of the Town of Marlborough and in neighboring municipalities (2-mile radius from the proposed site) should be included (HDR acknowledges that feedback was provided by Town representatives prior). The map should also clearly depict the municipal boundaries, zoning districts in the area, major roads, land uses, and prior photosimulation locations. This information will also be included in the future updated VRE Report.
- Copies of filings made to SHPO – and responses / determinations received back from SHPO on the proposed Verizon facility – should also be submitted to the Planning Board when available.
- Updated VRE Report:
  - The Applicant should provide a tabular list of photo locations, including addresses, at the completion of the balloon test (and prior to preparation of photosimulations and the VRE Report). Photosimulations – including alternate height analysis; alternative monopole configuration / colors; depiction of co-location potential; etc. – will be scoped further with the applicant after the balloon test is completed.
  - The contents of the updated VRE report will be scoped after the balloon test is completed. Contents will include: balloon test methods and notes from field work; camera and photography methodology; methods for photosimulation development, including alternate tower configurations; updating viewshed maps; utilization of the NYSDEC Visual Assessment Policy and other guidance.
- Photo examples from similar Verizon monopole projects in the area should be submitted, including the tower / structure and ground-based equipment compound.

### **RESPONSE.**

*In consultation with the Planning Board and its wireless consulting engineer, Michael Musso, Verizon Wireless has completed the required additional publicly noticed balloon test. The balloon test was completed on January 31, 2022. A Supplemental Visual Resource Evaluation*

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<sup>1</sup> In HDR's experience, winds above 8 MPH can negatively affect the balloon float.

(“VRE”) has been prepared to memorialize the results of the balloon test. A copy of the Supplemental VRE is provided in **Exhibit A** hereto.

Comment 2. Radio Frequency (RF) Report

- The report should include a plan view depiction of the lobes and associated radiation of the antennas.
- Co-location potential (2 future commercial co-locators) should be presented in the analysis.
- The proposed Verizon frequencies should be confirmed. The report should note that high-frequency 5G services (mm-Wave technology) are not being proposed with the application.

**RESPONSE.**

*The requested information is provided in the supplemental Radio Frequency report prepared by Verizon Wireless’ RF Design Engineer, a copy of which is annexed hereto in **Exhibit B**. Please note that even though State and local municipalities lack the jurisdiction to regulate the specific technologies relative to the provision of commercial wireless service (such jurisdiction is solely reserved by the Federal Communications Commission (“FCC”)), the current application does not propose to utilize millimeter Wave technology.*

Comment 3. Drawings

- Final Drawings should include a survey of the property (including lot lines) conducted by a licensed professional surveyor. [§152-6 F (6)]. The current Drawing set uses GIS data for orientation purposes.
- Per Code section 152-6 F (8), the location, size and height of all structures on the property should be included on one or more Drawings.
- Details of all proposed panel antenna models (there appears to be three different models) should be included on the Drawings.

**RESPONSE.**

*The revised construction drawings annexed hereto in **Exhibit C** provides the requested information.*

Comment 4. Justification of Site Selection / Engineering Necessity Case

- The desired RSRP signal strength (-95 dBm, -85dBm) for this project should be clarified. The software used to develop the signal propagation maps should be described.
- To supplement the information in this report, a Table is requested that lists the ‘on air’ (existing) Verizon macro sites in the area; the address of each (including municipality); Verizon antenna elevation (ACL, agl); type of site (tower, rooftop); and distance from the proposed facility at Marlboro H.S. The Mt. Zion and Wappingers Falls sites that are currently included in the report should be listed, along with the Town DPW site (along Rte 9W to the north), the ‘Balmville’ site in Newburgh, the closest Verizon site to the west, and the other sites to the east across the Hudson River that are shown on pg. 1 of the report.
- 700 MHz and 2100 MHz maps should be provided for each of these ‘on air’ Verizon macro sites, showing only the coverage and RSRP signal strength colors from each site (i.e., with all other sites ‘turned off’). Low- and high-band maps should also be provided for the proposed Verizon cell sites with all other sites ‘turned off’.
- Pg. 13 (700 MHz, -105 dBm). Provide existing conditions for Mt. Zion and Wappingers on separate maps with the other site “turned off”.
- Pg. 15 (2100 MHz, -105 dBm). Provide existing conditions for Mt. Zion and Wappingers on separate maps with the other site “turned off”.

- Several years ago, a 130-ft tall monopole was approved and constructed off Ann Kaley Lane (AT&T project). The monopole is located approximately 3,500-ft north of the proposed Verizon site. Verizon should discuss if co-location at this tower (below the AT&T array) is a viable alternative in the Engineering Necessity Case and provide low- and high-band (700 MHz and 2100 MHz) coverage maps for co-locating on this monopole to demonstrate whether this co-location would (or would not) provide the service needed. The maps should include only the co-location scenario (all other sites “turned off”), followed by the inclusion of coverage from Ann Kaley Lane plus the other existing ‘on air’ sites.
- To assess potential co-location and alternate height for the proposed monopole, 700 and 2100 MHz coverage maps are requested for an antenna centerline height of 76 ft agl. The maps should include only the alternate height scenario (all other sites “turned off”), followed by the inclusion of coverage from the alternate height evaluation plus the other existing ‘on air’ sites.
- It is acknowledged that the small cells along Route 9W provide focused Verizon service along that corridor. No additional information on these existing nodes is requested at this time.
- Capacity Charts (trends; 2020) were provided for two existing ‘on air’ Verizon macro sites. Data / charts with 2021 data are requested to supplement the information provided for these ‘on air’ sites.

**RESPONSE.**

*The requested information is provided in the supplemental report prepared by Verizon Wireless’ RF Engineer, which is annexed hereto as **Exhibit B**.*

**Comment 5. General**

- Eight Waivers of requirements of the Wireless Code (Chapter 152) are requested. The waivers should be discussed with the Planning Board, and HDR will evaluate them further in the future Tech Memo prepared for the application.

**RESPONSE.**

*No response required at this time.*

- The need for 12 panel antennas (vs. nine, as was included in the Conceptual Plan submittals) should be clarified.

**RESPONSE.**

*The need for twelve (12) antennas (vs. the nine shown on the Conceptual Plan) is provided in the supplemental Radio Frequency report which is annexed hereto as **Exhibit B**.*

- The proposed use of the 3500 MHz frequency (CBRS) should be described.

**RESPONSE.**

*Information concerning the use of the 3500 MHz frequency (CBRS) is provided in **Exhibit B**.*

- Please include a description of the color of proposed equipment. Per §152-6 F (14) a description of the proposed tower and antennas and all related fixtures should include height above pre-existing grade, materials, color, and lighting. Per §152-6 F building materials, colors, and textures should be designed to blend with the structure to which it may be affixed and/or to harmonize with the natural surroundings. As noted above, alternate colors / configurations of the monopole will be reviewed.

**RESPONSE.**

*The proposed monopole will have a galvanized steel finish, yielding a gray color. The antenna mounts will have a similar appearance to the monopole. The stock color of the antennas are white or light gray.*

- Interest in co-location from other wireless carriers – if the proposed monopole is approved and constructed – should be provided for the file (if known at this time).

**RESPONSE.**

*At this time, interest in collocation from other wireless carriers is not known. The tower and foundation, however, will be designed and built to structurally accommodate future collocators.*

- The need for a SWPPP will be confirmed by the Planning Board Engineer. The applicant should provide a narrative (with back-up calculations if needed) to confirm that no permanent stormwater control features are required.

**RESPONSE.**

*A SWPPP is not required for this project. Considering the length of the 12' wide gravel access driveway at approximately 500' and the 50'x50' fenced compound, the total area of disturbance for the project is approximately 0.5 acres, well short of the 1.0-acre threshold which triggers the need for a SWPPP.*

- Confirm if an emergency back-up generator is being proposed by Verizon.

**RESPONSE.**

*An emergency backup generator is not proposed for the facility.*

- Although a full structural and foundation analysis would be submitted and reviewed as part of a future Building Permit (should the application be approved), a narrative description of potential construction methods (type(s) of foundation construction; collection of borings; grading for equipment slabs and access road improvements; material handling) should be provided at this time. An example monopole specification / vendor cut sheet from a similar Verizon project - showing structural elements, typical welded sections, monopole diameter / taper, and other information - should also be provided at this time

**RESPONSE.**

*Upon full approval from the Town Planning Board Verizon will engage a geotechnical engineer to perform soil borings at the tower site. This information will be used by a tower manufacturer to design the foundation for the tower. Typically, a foundation for this type of tower will consist of a concrete mat foundation approximately 18'x18' square, 2' thick, and set 6' below grade. The tower itself will bear on a 5' diameter concrete pier which will in turn bear on the top of the mat foundation. A sample Verizon tower design cannot be provided at this time (proprietary information). Grading and construction for the fenced compound and access driveway will generally consist of removing all grass and top soil then overlaying that with filter fabric, gravel, and crushed stone.*

Please place this matter on the next available Planning Board agenda. In the meantime, if you should have any questions or require any further information concerning this project, I can be reached at (518) 438-9907 ext. 258.

This letter and the attached exhibits will be hand delivered to the Planning Board on Monday, February 28, 2022.

Thank you for your consideration.

Very truly yours,

YOUNG/SOMMER LLC

*Scott Olson*

By:

Scott P. Olson, Esq.

Enclosures

C: Michael Musso, M.S., MPH, P.E.(NY) (via email)

Jeffery S. Battistoni, Esq. (via email)

Patrick J. Hines, P.E. (via email)

# **EXHIBIT A**

# **VISUAL RESOURCE EVALUATION**

## **PROPOSED 90' TALL TELECOMMUNICATIONS STRUCTURE**

**Marlboro HS  
50 Cross Road  
Town of Marlborough  
Ulster County  
New York, 12542**

Submitted by:

**verizon**

1275 John Street, Suite 100  
West Henrietta, NY 14586

Prepared by:

**Tectonic**

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.  
36 British American Blvd., Suite 101  
Latham, New York 12110  
518-783-1630  
518-783-1544 FAX

**December 7, 2021  
Revised: February 25, 2022**

## **VISUAL RESOURCE EVALUATION**

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., was contracted by Verizon Wireless to conduct a “Visual Resource Evaluation” to determine which areas within the Town of Marlborough will contain views of the proposed 90 foot tall wireless telecommunications structure.

### **Setting:**

The proposed site is located on the Marlboro High School parcel at 50 Cross Road in the Town of Marlborough, Ulster County, New York. The surrounding land use is primarily residential with some small wooded areas. Within the study area the topography ranges in elevation from 3' +/- AMSL (Above Mean Sea Level) to 550' +/- AMSL. The predominant forest species are mixed deciduous and coniferous, with an estimated height of 40 to 60 feet. The field study for this visual resource evaluation was conducted in the mid-winter season during 100% leaf off conditions. The leaf off condition represents a worst case scenario in that it is a scenario in which the visibility of the structure is maximized due to the lack of leaves on existing deciduous vegetation.

### **Methodology:**

On Monday, January 31, 2022, Tectonic conducted a field investigation for the purpose of evaluating the viewshed associated with the proposed installation of the 90 foot tall monopole tower (structure). Conditions during the 4 hour field study were sunny with temperatures ranging from 5° to 20° and with wind speeds of approximately 3 mph. The study area primarily consisted of a one (1) mile radius from the project site with a few photo locations between 1 and 2 miles away. Analyzing a viewshed greater than a one (1) mile radius for a proposed structure of this height is generally unwarranted. Due to the fact that objects tend to appear smaller the farther they are from the viewer, in this case, the structure would appear very small, if visible at all, from a distance of more than one (1) mile.

The methodology utilized during the field investigations is referred to as a “balloon test.” The height of the proposed structure was simulated by floating a 4' diameter, helium-filled weather balloon at 90 feet above ground level (AGL). The balloon provided reference points for height as well as location and also provides a known dimension that later aids in the production of photo simulations.

Prior to the field study, Tectonic assessed the potential visibility in the study area by creating desktop viewshed maps using ESRI ArcGIS Desktop 10.8 in conjunction with a USGS 7.5 Minute Series Topographic Quadrangles Map and aerial base maps and street maps. Two viewshed maps were created – one delineating areas where visibility would be blocked by topography only, and another delineating areas where visibility would be blocked by topography, vegetation, and structures.

Tectonic drove the study area to confirm the potential visibility of the structure based on the viewshed maps. Areas delineated as “blocked by topography” were confirmed by viewing the site from public roadways within the one (1) mile radius and it was found that the topography only viewshed map first produced was correct and accurate, and that the balloon was in fact not visible from areas indicated to be blocked by topography. During the “in field” review, the participants conducted a second analysis to determine those areas from which views of the structure may be “visible” or “concealed by vegetation or structures.” The resulting data from this second analysis was reviewed and referenced on the “Viewshed Map” attached. The colors on the map delineate which areas have a line of sight to the structure and

those areas that have no line of sight to the structure due to blockage by topography, vegetation, or structures. The viewshed analysis resulted in the discovery that the proposed structure would be visible from a few locations within the Town. Specifically, the structure will be visible from the Marlboro HS property and adjacent roadways, and will have limited visibility from Chillura Lane, Felicello Drive, Prospect Street, South Street, Hillcrest Drive, Robyn Drive, Orchard View Drive, Ashlyn Drive, Lattintown Road, South Street, Plattekill Road, and Breezy Heights.

Photographs were taken from various vantage points within the study area to document the actual view towards the proposed structure, as well as the general character of the viewshed. Each photograph attached includes a brief description of the location and orientation from which it was taken, and the photo number corresponds to the key number on the viewshed map. Three locations were photographed at the Town's request (Gomez Mill House, Bowdoin Park, Samuel Morse House). The balloon was only visible from Bowdoin Park, but due to the distance from the Park to the structure (over 2 miles) the balloon is too small to be discernable in the captured photograph, correlating to a not visible designation for the proposed structure from this vantage point.

**Process:**

Photographs of the weather balloon from the viewpoints noted were taken with a Nikon D5300 Digital 24 megapixel camera using a 55mm focal length lens to mimic the view as observed from the human eye. A 4-foot diameter red helium filled balloon was floated to a height of 90'.

In order to analyze the potential visual impacts of the proposed structure, Tectonic took photographs of the balloon from locations within the search area for the purpose of preparing simulations of the proposed structure. Photographs for which there is a corresponding simulated view (1, 2, 3, 4, 6, 7, 9, 10, 12, 14, 15, 20) of the proposed structure were produced by first photographing an existing similar type structure, then photographing the view towards the proposed site where the marker balloon was set to a height of 90' AGL. The digital images of the balloons and similar structure were then merged and scaled through the use of the image editing software, "Adobe Photoshop CS5." With this process, the structure is scaled to the correct height and width by scaling the similar type structure using measurements from the marker balloon. The similar type structure used has an antenna array that spans eight feet (8'). By measuring the balloon width of 4', one can determine the proper width of the antenna array by multiplying the balloon width by a factor of 2. The composite is printed out directly on a color printer, producing the final image. In addition to simulating a standard galvanized steel (gray) monopole with the Verizon antennas, we have included a few alternate simulations showing a brown painted monopole, and a few simulations with two additional wireless carrier antenna arrays. Included at the end of the report are a few examples of existing monopole towers and fenced equipment compounds.

**Inventory of Properties with historic and aesthetic significance (Significant Site Inventory Log):**

LOC #	SITE/PROPERTY NAME	ADDRESS	DISTANCE	VISIBLE
1	DuBois-Sarles Octagon	17 South St, Marlborough, NY 12542	.70 miles ±	No
2	St Mary's Church	1211 US 9W, Marlborough, NY 12542	.71 miles ±	No
3	Brookside Motorworks	1217 US 9W, Marlborough, NY 12542	.71 miles ±	No
4	Christ Episcopal Church	426 Old Post Rd, Marlborough, NY 12542	.71 miles ±	No

5	Presbyterian Church and Cemetery	1282 US 9W, Marlborough, NY 12542	.79 miles ±	No
6	Merrit House	404 Old Post Rd, Marlborough, NY 12542	.71 miles ±	No
7	Elliot-Buckley House	404 Old Post Rd, Marlborough, NY 12542	.90 miles ±	No
8	Shady Brook Farms	351 Old Post Rd, Marlborough, NY 12542	1.00 miles ±	No
9	Farm with Farmerette	18 Birdsall Ave, Marlborough, NY 12542	.91 miles ±	No
10	Col. Lewis DuBois House	1406 US 9W, Marlborough, NY 12542	1.26 miles ±	No
11	Gomez Mill House	11 Millhouse Rd, Marlborough, NY 12542	1.23 miles ±	No
12	Amity Baptist Church	49 Bingham Rd, Marlborough, NY 12542	1.20 miles ±	No
13	Residence Barn	125 Old Post Rd, Marlborough, NY 12542	1.89 miles ±	No
14	Cosman family cemetery	181 Lattintown Rd, Newburgh, NY 12550	1.74 miles ±	No
15	Bowdoin Park	85 Sheafe Rd, Wappingers Falls, NY 12590	2.15 miles ±	No
16	Samuel Morse House	2683 South Rd, Poughkeepsie, NY 12601	5.38 miles ±	No

**Tabular list of photo locations (Photo Log):**

SLIDE #	DESCRIPTION	DISTANCE	VISIBLE
P-1	Looking northeast from the Cross Road entrance to Marlboro High School	1267'±	Yes
P-2	Looking east from the Plattekill Road exit from Marlboro High School	739'±	Yes
P-3	Looking northeast from the Plattekill Road & Chillura Road intersection	1320'±	Yes
P-4	Looking northeast from #5 Orchard View Drive	2270'±	Yes
P-5	Looking east from #12 and #14 Concord Drive	1742'±	Partial
P-6	Looking southeast from #10 Ashlyn Drive	3960'±	Yes
P-7	Looking east from #378 Lattintown Road	3749'±	Yes
P-8	Looking east from #11 Felicello Drive	2693'±	Partial
P-9	Looking east from #51 Felicello Drive	2165'±	Partial
P-10	Looking southwest from #68 Prospect Street	4066'±	Yes
P-11	Looking southwest from bus entrance of Marlboro Middle School	3590'±	Partial
P-12	Looking northeast from #23 Cross Road	2006'±	Yes
P-13	Looking northwest from #20 Robyn Drive	739'±	Yes
P-14	Looking west from #26 Breezy Heights	739'±	Partial
P-15	Looking west from #50 Breezy Heights	528'±	Yes
P-16	Looking southwest from #9 and #10 Jackson Avenue	1056'±	Partial
P-17	Looking northeast from intersection of Hillcrest Drive and South Street	3062'±	Yes
P-18	Looking west 200' east of intersection of Burma Road and Idlewild Road	9293'±	Yes
P-19	Looking west from #204 Plattekill Road	7075'±	Yes
P-20	Looking west from intersection of Plattekill Road and South Street	6230'±	Yes
P-21	Looking north from east of Gomez Mill House along Mill House Road	7075'±	No
P-22	Looking west from Bowdoin Park (Wappinger Falls)	11,400' ±	No
P-23	Looking southeast from Samuel Morse House (Poughkeepsie)	27,900' ±	No

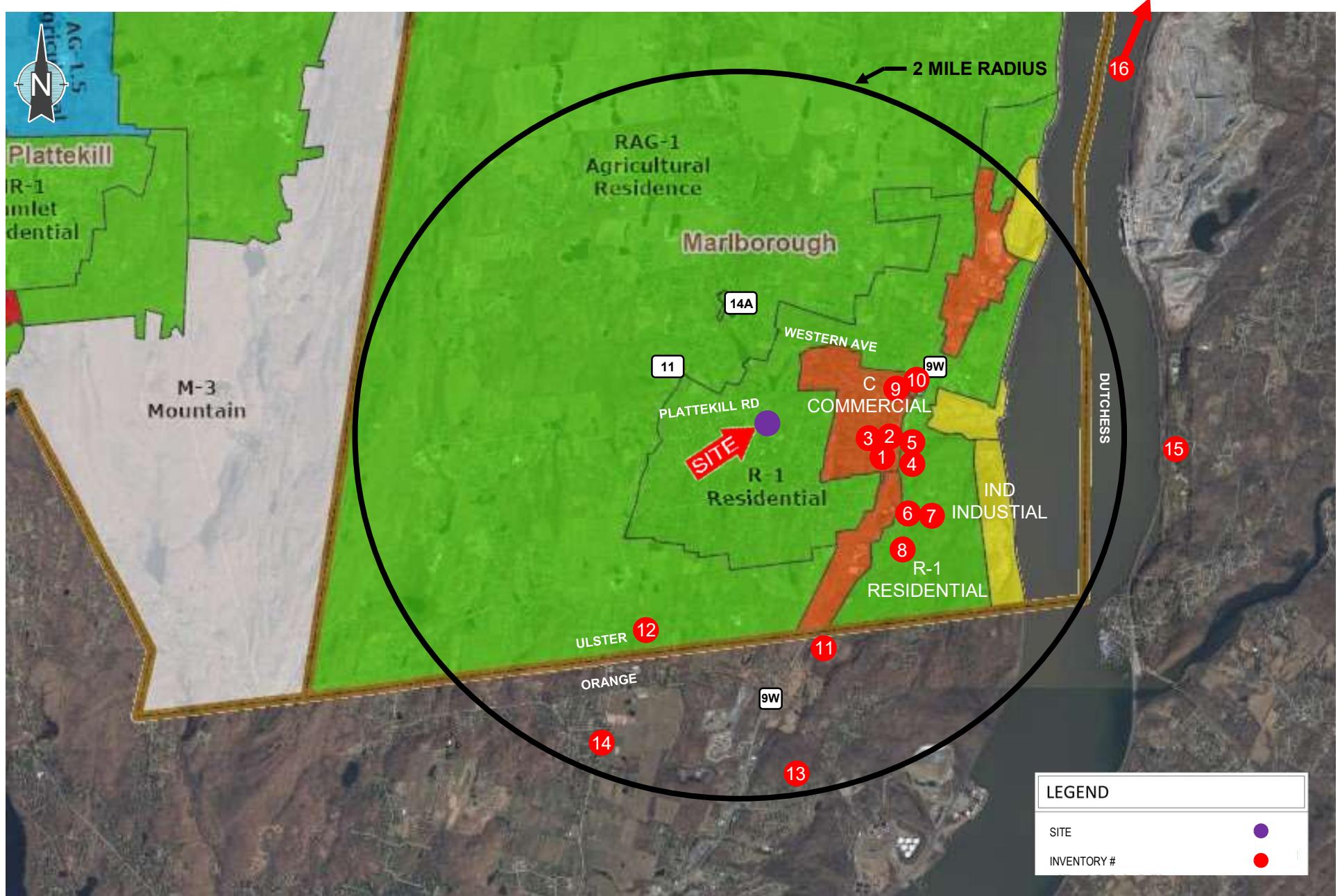
**Conclusion:**

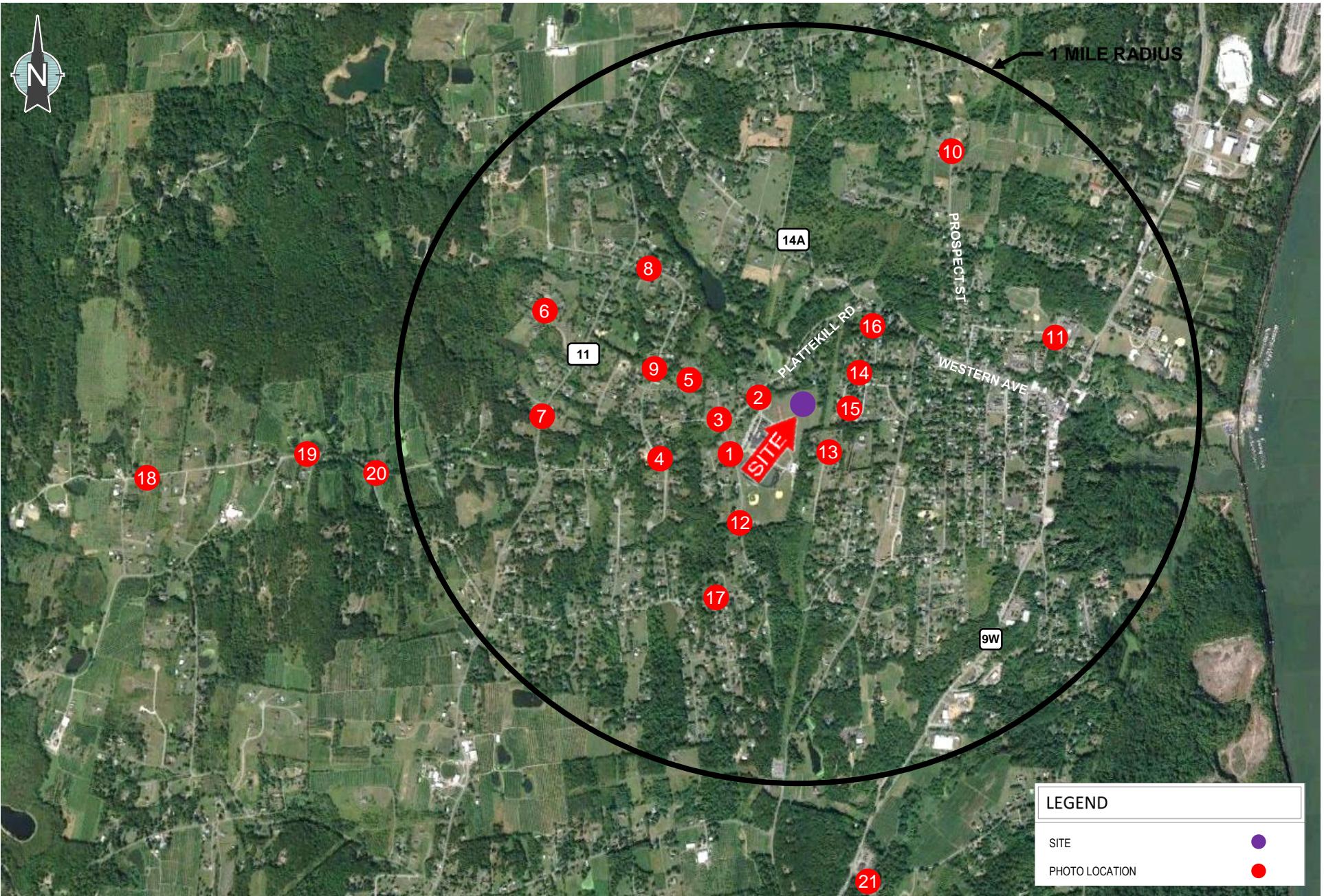
The Viewshed Analysis Map presents a conservative delineation of the viewshed within the study area and along public roadway, parks, and schools. The photo simulations have been prepared per the methodology described above and provide a general depiction of the appearance of the structure from the photographed viewpoints.

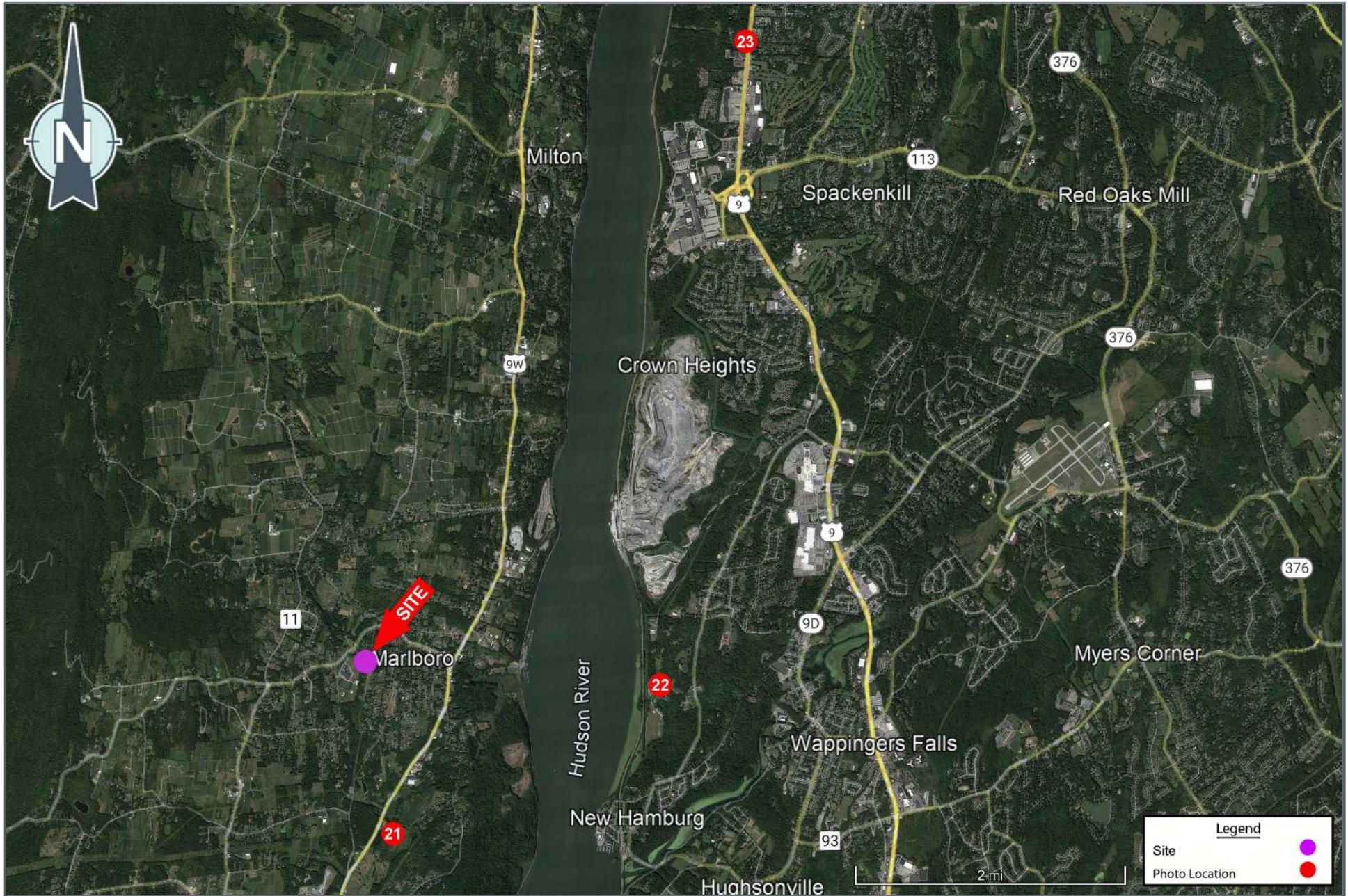
Sincerely,  
TECTONIC ENGINEERING CONSULTANTS, GEOLOGISTS & LAND SURVEYORS, D.P.C.

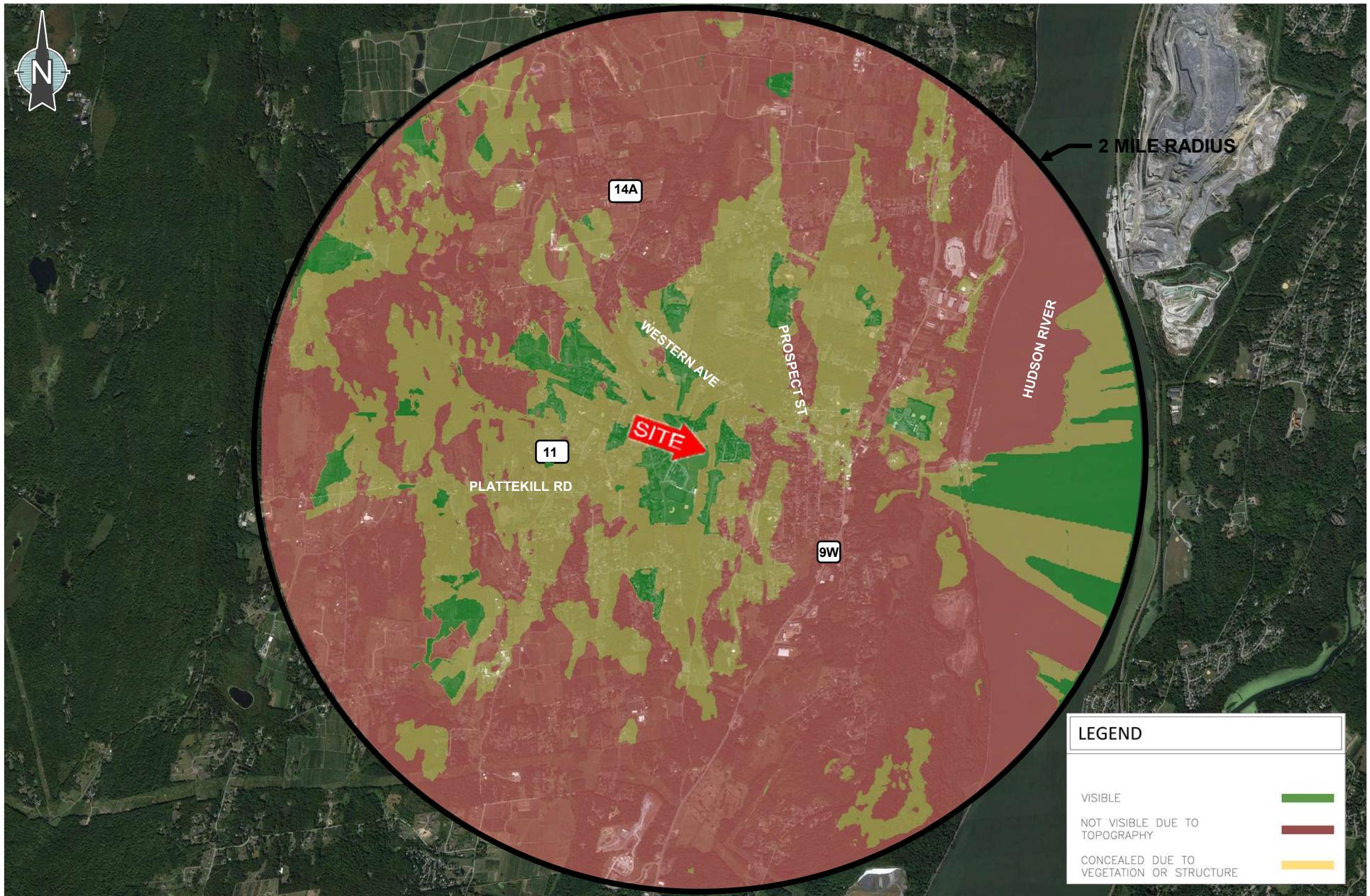
A handwritten signature in blue ink, appearing to read "Steven M. Matthews, PE".

Steven M. Matthews, PE  
Director of Engineering

































**Tectonic**   
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Looking northeast from the Plattekill Road & Chillura Road intersection.  
The proposed 90' gray monopole shown as visible from this location.

Distance from the photographic location to the proposed site is 1320'±

**S-3A**

10272.078

























































**Tectonic** 

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

**Looking west from #50 Breezy Heights.  
The proposed 90' monopole will be visible from this location.**

Distance from the photographic location to the proposed site is  $528' \pm$

**P-15**

10272.078



**Tectonic**  
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Looking west from #50 Breezy Heights.  
The proposed 90' gray monopole shown as visible from this location.

Distance from the photographic location to the proposed site is 528'±

**S-15A**

10272.078



**Tectonic**  
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Looking west from #50 Breezy Heights.  
The proposed 90' brown monopole shown as visible from this location.

Distance from the photographic location to the proposed site is 528'±

**S-15B**

10272.078



**Tectonic**   
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Looking west from #50 Breezy Heights.  
The proposed 90' gray monopole (3 carriers) shown as visible from this location.

Distance from the photographic location to the proposed site is 528'±

**S-15C**

10272.078



**Tectonic**   
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Looking west from #50 Breezy Heights.  
The proposed 90' brown monopole (3 carriers) shown as visible from this location.

**S-15D**

Distance from the photographic location to the proposed site is 528'±

10272.078













**Tectonic**  
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Looking west from of intersection of Plattekill Road and South Street.  
The proposed 90' gray monopole shown as visible from this location.

Distance from the photographic location to the proposed site is 6230'±

**S-20A**

10272.078















# **EXHIBIT B**



February 15, 2022

Chris Brand, Chairman  
And Members of the Planning Board  
Town of Marlborough  
21 Milton Turnpike  
Milton, NY 12547

Re: Application of Cellco Partnership d/b/a Verizon Wireless  
Personal Wireless Services Facility Proposed for  
50 Cross Street, Marlborough, NY

Dear Chairman Brand and Members of the Planning Board:

The plan view depiction of the associated antenna lobes and radiated patterns, as requested, are already contained in the submitted “Engineering Necessity Case - Marlboro HS” document on pages 14, 16, 18, 20, 21, dated August 16, 2021. For additional clarity, the azimuths shown are 60, 180, 300 degrees true north.

Verizon Wireless cannot provide other carrier co-location potential, or analysis for any future co-locators as Verizon is not aware of competitors’ existing or planned network objectives or equip configurations, which will be utilized for this proposed location. The proposed tower is however engineered and designed to accommodate up to two additional co-locations.

The proposed location is not planned for 5G mmWave technology, nor is the proposed hardware capable of 5G mmWave.

The clarification of RSRP signal strength, as it applies to the Upstate NY standard, is further described on page 11 in the submitted “Engineering Necessity Case - Marlboro HS” document. The propagation tool used to generate the coverage plots is known as ATOLL release version 3.4.1.19410.

The supplemental requested “on air” table has been inserted on page 3 and only includes sites pertinent to the report and included on the proposed and existing 700/2100 MHz best server plots on pages 13, 14, 17, 18.

As requested, in point #6 and further clarified in a recent phone conversation, we have added additional best server low band and mid band detail to slides 13, 14, 17, 18, to include neighboring sites Marlborough Hwy Dept and Balmville. To properly visually represent capacity offload capability, best server slides must be shown as a composite as opposed to stand alone coverage maps. Overlapping coverage while

necessary for mobility causes interference in LTE systems. LTE systems are designed and optimized to minimize overlapping cells.

Ann Kaley Ln Alt location - Added a supplemental “Coverage Comparison” section to the “Engineering Necessity Case - Marlboro HS” pages 22-27 document which further explains how this alternate location is not properly situated to allow for the necessary coverage and capacity improvements needed. This candidate is well outside the Search Ring and it is not properly situated to provide the necessary coverage and capacity relief necessary. This candidate is also located in an area of lower ground elevation compromising potential coverage and capacity capabilities due to area terrain and foliage especially near the schools and NW objectives along Lattintown Rd.

Co-location capability is further detailed in the “Engineering Necessity Case - Marlboro HS” page 28.

The capacity slides (charts) have been updated for the year 2021 in the “Engineering Necessity Case - Marlboro HS” pages 6-10.

Verizon typically leases and zones for a total of (12) antennas. This allows for future expansion of services. Initial installation is planned for nine antennas

Verizon Wireless will be utilizing the CBRS band of unlicensed spectrum, in the General Authorized Access (GAA) category for 4G LTE services including capacity relief.

Sincerely,

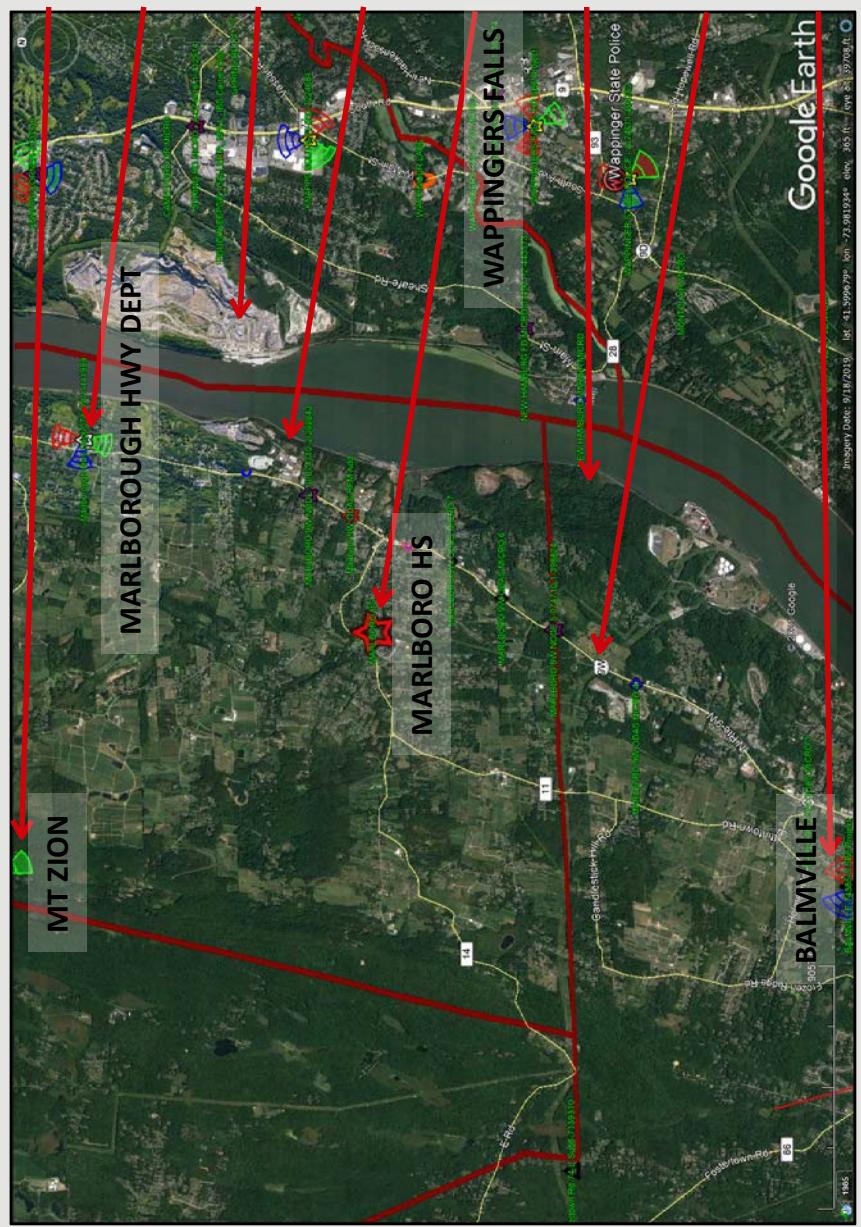
*Ron Evans*

Ron Evans  
Engineer – RF Design  
Verizon Wireless

cc: Town of Marlborough, Planning Board  
Michael P. Musso, M.S. MPH, P.E. HDR  
Verizon Wireless

# Verizon Wireless

## Communications Facility Engineering Necessity Case – “Marlboro HS”



Prepared by: Michael R. Crosby

**Project: The project is the installation and operation of a new monopole co-located wireless telecommunications site in the town of Marlborough (the “Project Facility”).**

**verizon**

# Introduction

The purpose of this subsequent analysis is to summarize and communicate the technical radio frequency (RF) information used in the justification of this new site.

**Coverage** and/or capacity deficiencies are the two main drivers that prompt the need for a new wireless communications facility/site. All sites provide a mixture of both capacity and coverage for the benefit of the end user.

**Coverage** can be defined as the existence of signal of usable strength and quality in an area, including but not limited to in-vehicles or in-buildings.

The need for improved coverage is identified by RF Engineers that are responsible for developing and maintaining the network. RF Engineers utilize both theoretical and empirical data sets (propagation maps and real world coverage measurements). Historically, coverage improvements have been the primary justification of new sites.

**Capacity** can be defined as the amount of traffic (voice and data) a given site can process before significant performance degradation occurs.

When traffic volume exceeds the capacity limits of a site serving a given area, network reliability and user experience degrades. Ultimately this prevents customers from making/receiving calls, applications cease functioning, internet connections time out and data speeds fail. This critical condition is more important than just a simple nuisance for some users. Degradation of network reliability and user experience can affect emergency responders and to persons in a real emergency situation can literally mean life or death.

# Project Need Overview

The project area, located in the southern portion of the town of **Marlborough** is currently served by two sites. These sites are overloaded requiring capacity relief. Additionally the project area is subject to significant terrain challenges for RF (signal) propagation. This terrain combined with area foliage and long distance prevent effective propagation of Verizon's RF signals into this area compounding the capacity issue with areas of variable coverage creating significant gaps in coverage.

The first serving site is **Mt. Zion**, located in the town of Marlborough, is approximately three miles northwest (of the project location) situated on an existing tower off Mt. Zion Rd. While this site provides weak/variable coverage in portions of the project area, it does so from a terrain and distance challenged position making the site not capable of efficiently or effectively providing adequate coverage or capacity.

The second serving site is **Wappingers Falls**, located in the town of Wappinger, is approximately four miles east (of the project location) situated on an existing water tank located off Wenliss Terrace. While this site provides weak/variable coverage in portions of the project area, it does so from a terrain and distance challenged position making the site not capable of efficiently or effectively providing adequate coverage or capacity.

Available (mid band AWS) carriers at these and other sites are not capable of effectively serving/offloading the project area due to inherent propagation losses from distance, challenging terrain and in building coverage losses negatively impacting high band coverage and capacity offload capabilities. There are other Verizon sites in this general area but due to distance and terrain they also do not provide any significant overlapping coverage in the area in question that could allow for increased capacity and improved coverage from other sources.

The primary objectives for this project are to increase capacity and improve coverage throughout portions of the town of Marlborough, more specifically portions of Plattekill Rd, Rt. 9W, Western Ave, Prospect St, Lattintown Rd, South St, Highland Ave, Marlboro HS and MS as well as neighboring residential and commercial areas along and near these roads. In order to offload capacity from Mt. Zion and Wappingers Falls a new dominant server must be created. This new dominant coverage will effectively offload the existing overloaded sites/cells as well as provide improved coverage where significant gaps exist today.

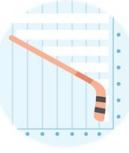
Following the search for co-locatable structures to resolve the aforementioned challenges and finding none available, Verizon proposes to attach the necessary antenna(s) to a new 90' tall monopole structure located at 50 Cross Rd, Marlborough, NY. Verizon's antennas will utilize 86' for the ACL (Antenna Center Line) with a top of antenna height of 90'. This solution will provide the necessary coverage and capacity improvements needed.

Additional neighboring (currently on-air) site details listed below and visual representations on p1 of this document:

<u>Neighboring Site Name</u>	<u>Address</u>	<u>Municipality</u>	<u>Direction</u>	<u>Distance</u>	<u>Type of Site</u>	<u>ACL</u>
Mt. Zion	366 Mount Zion Rd	Marlborough	Northwest	3.07mi	Guyed Structure	160'
Wappingers Falls	Wenliss Terrace	Wappingers Falls	Southeast	3.78mi	Water Tank	102'
Marlborough Hwy Dept	7 Woodcrest Lane	Marlborough	Northeast	2.45mi	Monopole	146'
Balmville	21 Bannerman View Dr	Newburgh	South	3.84mi	Lattice Tower	80'

# Wireless LTE (Voice and Data) Growth

The average North American smartphone user will consume 48 GB of data per month in 2023, up from just 5.2 GB per month in 2016 and 7.1 GB per month in 2017.<sup>1</sup>



55%

Of American homes are wireless only.<sup>2</sup>



In North America, the average household has 13 connected devices with smartphones outnumbering tablets 6 to 1.<sup>3</sup>

1. Ericsson Mobility Report November 2017  
2. CDC 2015 Wireless Substitution Early Release of Estimates From the National Health Interview Survey, January-July, 2016  
3. IHS Market Connected Device Market Monitor Q1 2016, February 2016

Wireless is a critical component in schools and for today's students.

20,000 learning apps are available for iPads. 72% of iTunes top selling educational apps are designed for preschoolers and elementary students.

600+ school districts replaced text books with tablets in classrooms.

77% of parents think tablets are beneficial to kids.

74% of school administrators feel digital content increases student engagement.

70% of teens use cellphones to help with homework.

Source: CTIA's Infographics Today's Wireless Family, October, 2017

National studies demonstrate that most home buyers value good cell service over many other factors including the proximity of schools when purchasing a home.

75%  
More than 75% of prospective home buyers said a good cellular connection was important to them.<sup>1</sup>

83%  
The same study showed that 83% of Millennials (those born between 1982 and 2004) said cell service was the most important factor in purchasing a home.

90%  
90% of U.S. households use wireless service. Citizens need access to 911 and reverse 911 and wireless may be their only connection.<sup>2</sup>

911 calls are made annually. In many areas, 80% or more are from wireless devices.<sup>1</sup>

**240 million**

1. National Emergency Number Association Enhancing 9-1-1 Operations With Automated Abandoned Callback  
2. CTIA, June 2015  
3. IHS Market Connected Device Market Monitor Q1 2016, February 2016

Wireless smart city solutions are being used to track available parking and minimize pollution and wasted time.

These same solutions are being used to track pedestrian and bike traffic to help planning and minimize accidents.

Smart, wireless connected lighting enables cities to control lighting remotely, saving energy and reducing energy costs by 20%.

4G technology is utilized to track and plan vehicle deliveries to minimize travel, maximize efficiency, and minimize carbon footprint.

4G technology is also used to monitor building power usage down to the circuit level remotely, preventing energy waste and supporting predictive maintenance on machines and equipment.

Wireless sensors placed in shipments are being used to track temperature-sensitive medications, equipment, and food. This is important for preventing the spread of food-borne diseases that kill 3,000 Americans each year.

Source: Verizon Innovation Center, February, 2018

Wireless facilities and property values.

Cell service in and around the home has emerged as a critical factor in home-buying decisions.



A wireless network is like a highway system...



US. mobile data traffic was 1.3 Exabytes per month in 2016, the equivalent of 334 million DVDs each month or 3,687 million text messages each second according to Cisco VNI Mobile Forecast Highlights, 2016-2021, Feb 2017

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# Explanation of Wireless Capacity

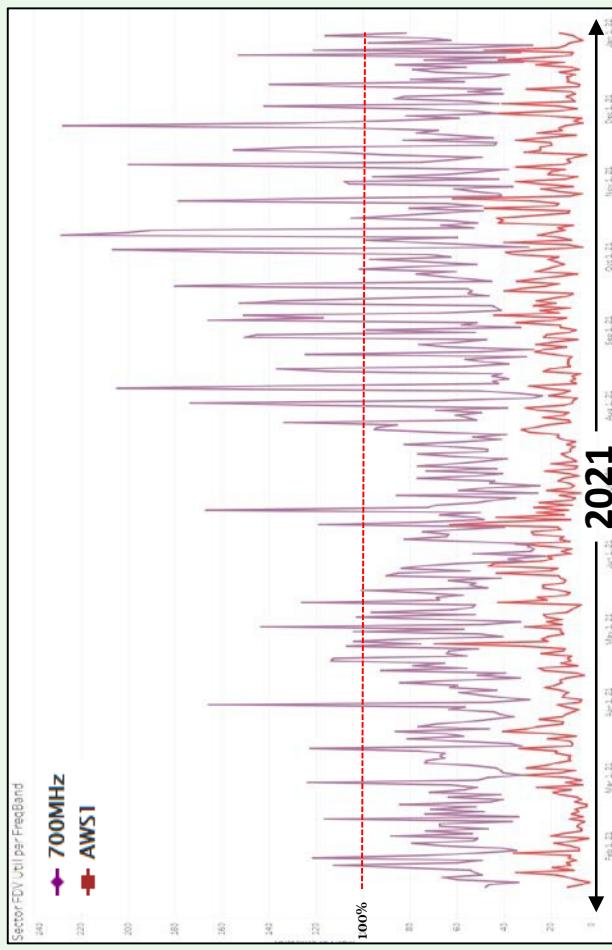
**Capacity** in this analysis is evaluated with up to three metrics further explained below. These metrics assist in determining actual usage for a given site as well as are used to project when a site is expected to run out of capacity (i.e. reach a point of exhaustion where it can no longer process the volume of voice and data requested by local wireless devices, thus no longer providing adequate service).

- Forward Data Volume (“**FDV**”), is a measurement of usage (data throughput) on a particular site over a given period of time.
- Average Schedule Eligible User (“**ASEU**”), is a measurement of the loading of the control channels and systems of a given site.
- Average Active Connections (“**AvgAC**”) is a measurement of the number of devices actively connected to a site in any given time slot.

Verizon Wireless uses proprietary algorithms developed by a task force of engineers and computer programmers to monitor each site in the network and accurately project and identify when sites will approach their capacity limits. Using a rolling two-year window for projected exhaustion dates allows enough time, in most cases, to develop and activate a new site. It is critical that these capacity approaching sectors are identified early and the process gets started and completed in time for new solutions (sites) to be on air before network issues impact the customers.



# Capacity Utilization FDV (Mt. Zion Beta)

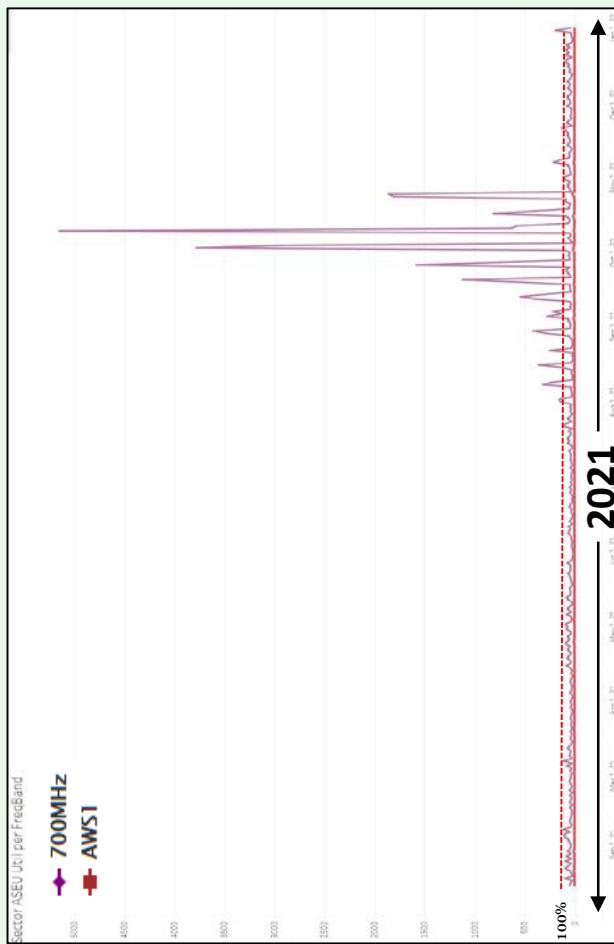


**Summary:** This graph shows FDV (Forward Data Volume) which is a measurement of the customer data usage that this sector currently serves. As this limit is approached, data rates slow to unacceptable levels, potentially causing unreliable service for Verizon Wireless customers.

The purple line represents the daily max busy hour 700MHz utilization and the dark red line is daily max busy hour AWS utilization on the **Beta** sector of the **Mt. Zion** site. The red dashed line is the limit where the sector reaches exhaustion and service starts to significantly degrade. The point in time where we see the purple or dark red lines reach or exceed the red dashed line is when service quickly degrades as usage continues to increase.

**Detail:** The existing **Mt. Zion** sector shown above has exceeded its capability of supporting FDV requirements as shown by the purple line exceeding the max utilization threshold (red dashed line). FDV is one of three metrics used in this presentation to evaluate capacity capability in this area.

# Capacity Utilization ASEU (Mt. Zion Beta)

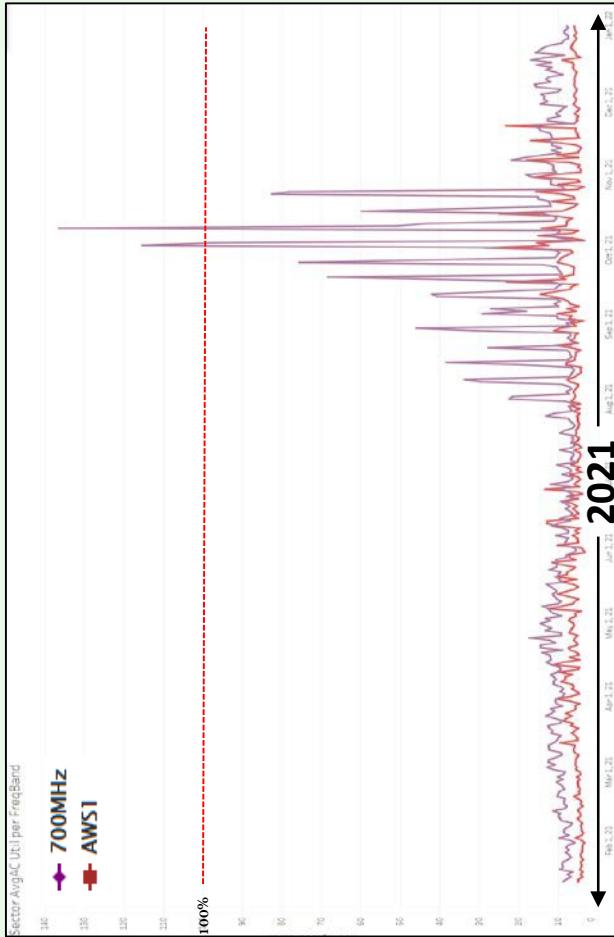


**Summary:** This graph shows ASEU (Average Schedule Eligible User). ASEU is a measurement of the loading of the control channels and systems of a given site. The ASEU load is heavily impacted by distant users or those in poor RF conditions.

The purple line represents the daily max busy hour 700MHz utilization and the dark red line is daily max busy hour AWS utilization on the **Beta** sector of the **Mt. Zion** site. The red dashed line is the limit where the sector reaches exhaustion and service starts to significantly degrade. The point in time where we see the purple or dark red lines reach or exceed the red dashed line is when service quickly degrades as usage continues to increase.

**Detail:** The existing **Mt. Zion** sector cannot support the traffic demand throughout the extent of the large geographic area it covers. **Mt. Zion** is overloaded, as shown by the purple actual use line exceeding the red dashed exhaustion threshold. This graph also reveals the inability of the AWS carrier (dark red line) to provide the necessary capacity offload for the low band carrier due to differences in RF propagation characteristics. The solution is network densification.

# Capacity Utilization AvgAC (Mt. Zion Beta)

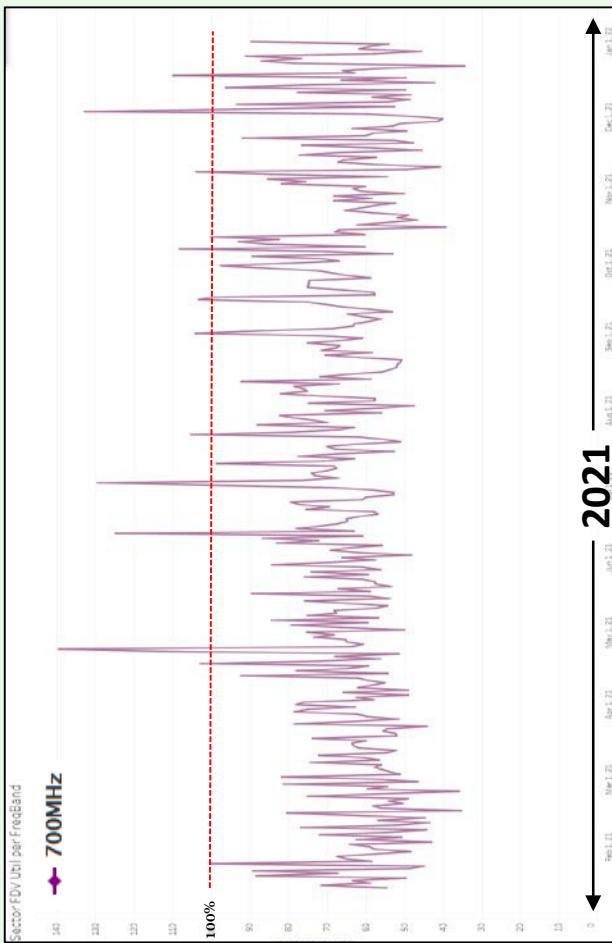


**Summary:** This graph shows AvgAC (**Average Active Connections**). AvgAC utilization by carrier is a measurement of max active connection capacity per sector in any given time slot. When this limit is reached, no additional devices will be able to connect to the site, resulting in connection failures and dropped calls.

The purple line represents the daily max busy hour 700MHz utilization and the dark red line is daily max busy hour AWS utilization on the **Beta** sector of the **Mt. Zion** site. The red dashed line is the limit where the sector reaches exhaustion and service starts to significantly degrade. The point in time where we see the purple or dark red lines reach or exceed the red dashed line is when service quickly degrades as usage continues to increase.

**Detail:** The existing **Mt. Zion** sector shown above is working normally for this metric. AvgAC is one of three metrics used in this presentation to evaluate capacity capability in this area.

# Capacity Utilization FDV (Wappingers Falls Delta)

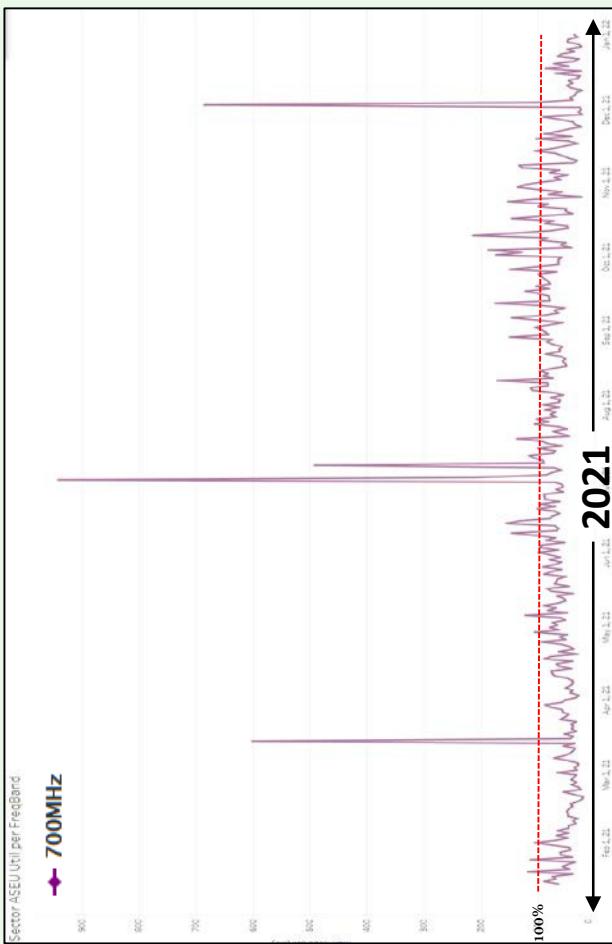


**Summary:** This graph shows FDV (Forward Data Volume) which is a measurement of the customer data usage that this sector currently serves. As this limit is approached, data rates slow to unacceptable levels, potentially causing unreliable service for Verizon Wireless customers.

The purple line represents the daily max busy hour 700MHz utilization on the **Delta** sector of the **Wappingers Falls** site. The red dashed line is the limit where the sector reaches exhaustion and service starts to significantly degrade. The point in time where we see the purple or dark red lines reach or exceed the red dashed line is when service quickly degrades as usage continues to increase.

**Detail:** The existing **Wappingers Falls** sector shown above has exceeded its capability of supporting FDV requirements as shown by the purple line exceeding the max utilization threshold (red dashed line). FDV is one of three metrics used in this presentation to evaluate capacity capability in this area.

# Capacity Utilization ASEU (Wappingers Falls Delta)

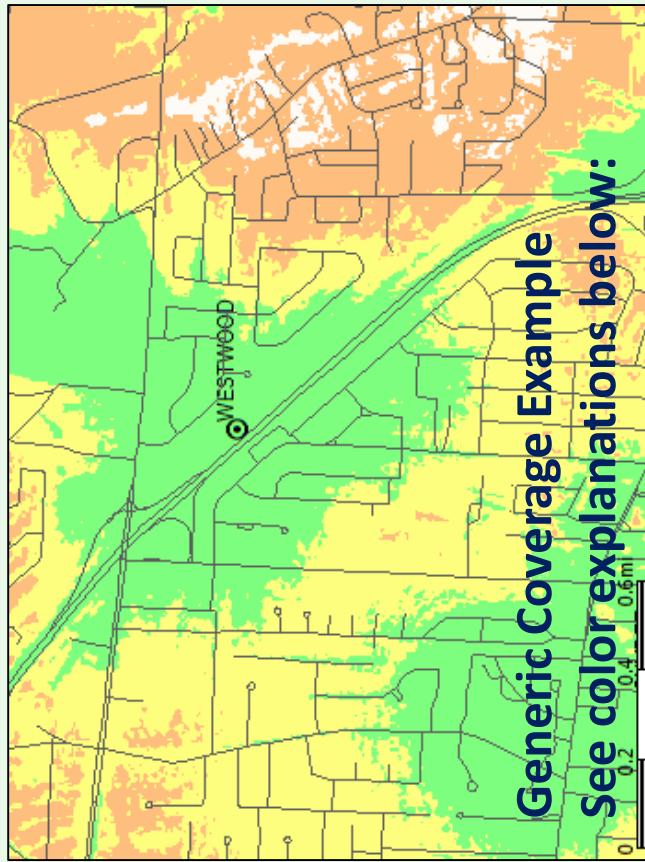


**Summary:** This graph shows ASEU (Average Schedule Eligible User). ASEU is a measurement of the loading of the control channels and systems of a given site. The ASEU load is heavily impacted by distant users or those in poor RF conditions.

The purple line represents the daily max busy hour 700MHz utilization on the **Delta** sector of the **Wappingers Falls** site. The red dashed line is the limit where the sector reaches exhaustion and service starts to significantly degrade. The point in time where we see the purple or dark red lines reach or exceed the red dashed line is when service quickly degrades as usage continues to increase.

**Detail:** The existing **Wappingers Falls** sector cannot support the traffic demand throughout the extent of the large geographic area it covers. **Wappingers Falls** is overloaded, as shown by the purple actual use line exceeding the red dashed exhaustion threshold. The solution is network densification.

# Explanation of Wireless Coverage



**Coverage** is best shown via coverage maps. RF engineers use computer simulation tools that take into account terrain, vegetation, building types, and site specifics to model the RF environment. This model is used to simulate the real world network and assist engineers to evaluate the impact of a proposed site (along with industry experience and other tools).

Many Verizon Wireless sites provide 3G CDMA at 850 MHz and 4G LTE at 700 MHz. As capacity requirements increase, higher frequency PCS (1900 MHz) and AWS (2100 MHz) carriers are added. In some mountaintop situations the mid band (higher frequency) AWS and PCS carriers are not fully effective due to excessive distance from the user population.

Coverage provided by a given site is affected by the frequencies used. Lower frequencies propagate further distances, and are less attenuated by clutter than higher frequencies. To provide similar coverage levels at higher frequencies, a denser network of sites is required (network densification).

Note the affect of clutter on the predicted coverage footprint above

\*\* Dark Green >= -75dBm RSRP, typically serves dense urban areas as well as areas of substantial construction (colleges, hospitals, dense multi family etc.)  
Green >= -85dBm RSRP, typically serves suburban single family residential and light commercial buildings  
Yellow >= -95dBm RSRP, typically serves most rural/suburban-residential and in car applications  
Orange >= -105dBm RSRP, rural/highway coverage, subject to variable conditions including fading and seasonality gaps  
White = <-105dBm RSRP, variable to no reliable coverage gap area

More detailed, site-specific coverage slides are later in the presentation

\*Signal strength requirements vary as dictated by specific market conditions

\*\* Not displayed in example map, layer not used in all site justifications

# Explanation of this Search Area

A **Search Area** is the geographical area within which a new site is targeted to solve a coverage or capacity deficiency. Three of the factors taken into consideration when defining a search area are topography, user density, and the existing network.

- **Topography** must be considered to minimize the obstacles between the proposed site and the target coverage area. For example, a site at the bottom of a ridge will not be able to cover the other side from a certain height.
- In general, the farther from a site the **User Population** is, the weaker the RF conditions are and the worse their experience is likely to be. These distant users also have an increased impact on the serving site's capacity. In the case of a multi-sector site, centralized proximity is essential to allow users to be evenly distributed and allow efficient utilization of the site's resources.
- The existing **Network Conditions** also guide the design of a new site. Sites placed too close together create interference due to overlap and are an inefficient use of resources. Sites that are too tall or not properly integrated with existing sites cause interference and degradeservice for existing users.
- Existing co-locatable structures inside the search area as well as within a reasonable distance of the search area are submitted by site acquisition and reviewed by RF Engineering. If possible, RF will make use of existing or nearby structures before proposing to build new towers.

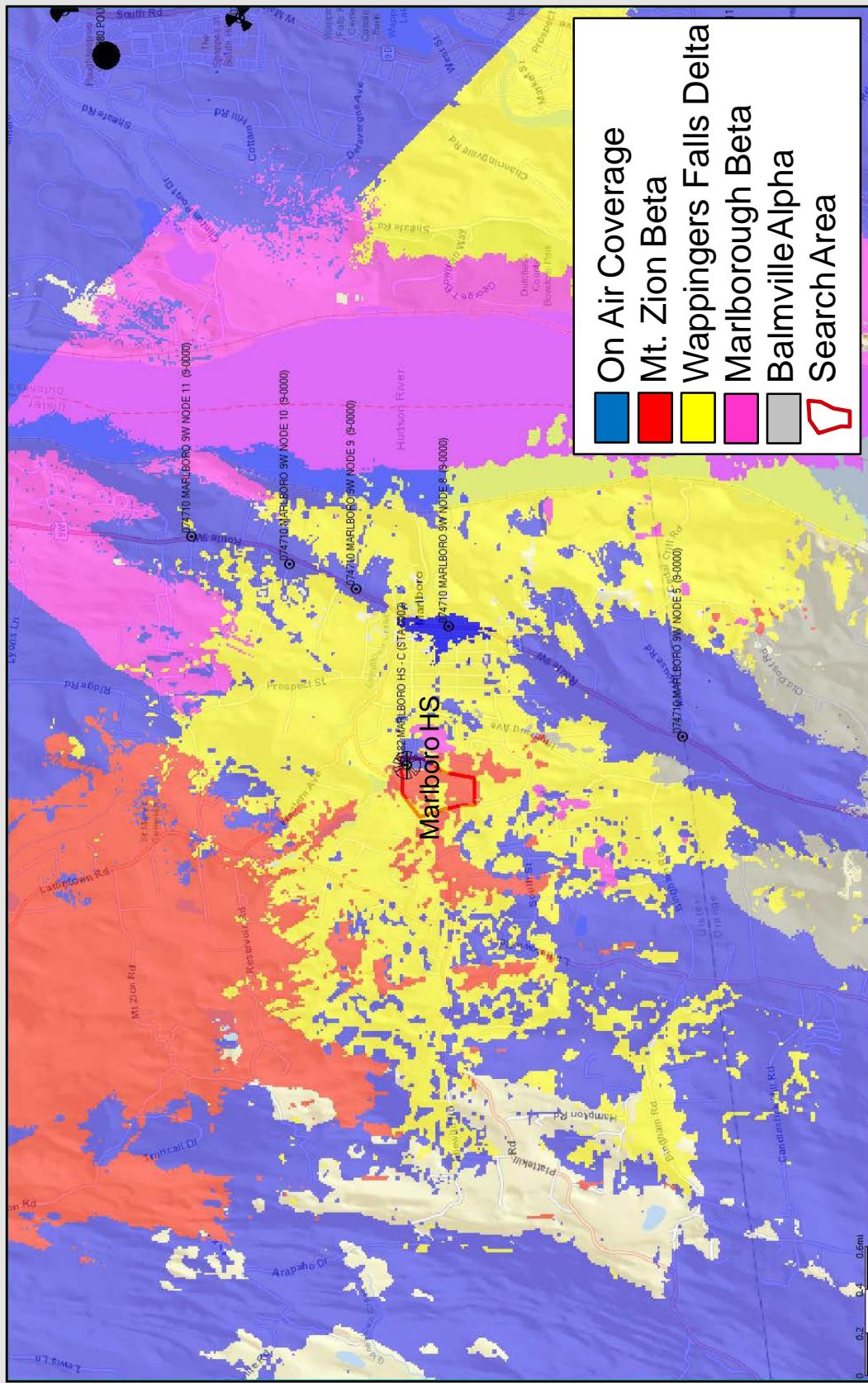


## Marlboro HS Search Area

To resolve the coverage and capacity deficiencies previously detailed, Verizon Wireless is seeking to add one new cell facility within this area to improve wireless service capacity and coverage. By offloading traffic from **Mt. Zion and Wappingers Falls** with the proposed site, adequate and reliable service will be restored. The new **Marlboro HS** site will provide dominant and dedicated signal to the identified portions of the town of **Marlborough**. This helps to improve not only the **Marlboro HS** project area but will also indirectly result with significant improvements in this portion of the town of **Marlborough** and southeastern **Ulster County**.

# Existing 700MHz Best Server -105dBm RSRP

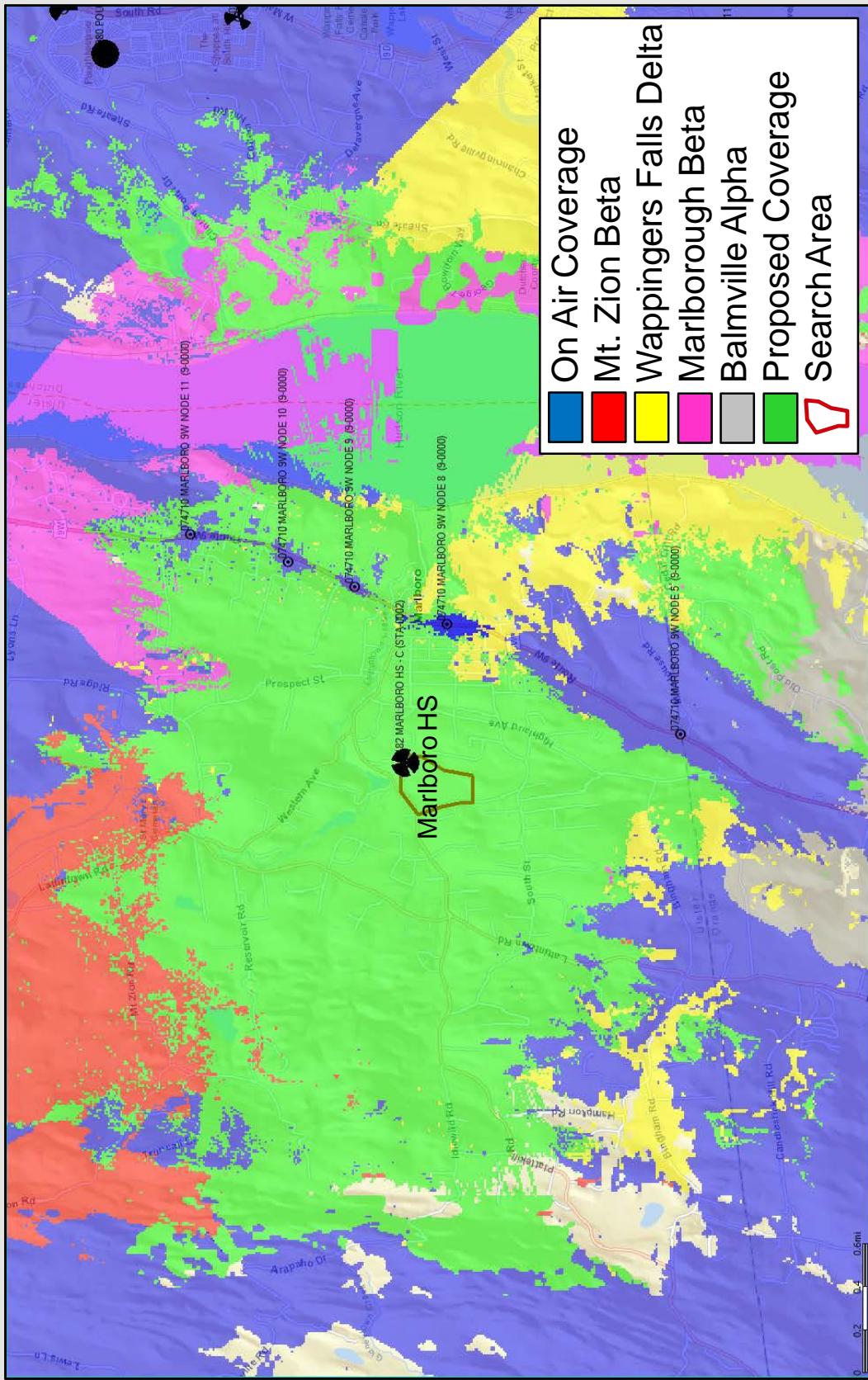
Best Server plots depict the actual footprint of each sector in question at one threshold so the viewer can accurately evaluate the area offloaded by the new sites dominant signal area.



The map above represents coverage from existing sites, with the sites in need of capacity offload detailed in the legend above. Blue coverage is from other on air sites. Marlborough Beta and Balmville Alpha were added at the request of Mr. Musso and are not part of the capacity offload discussion.

# Existing 700MHz Best Server -105dBm RSRP

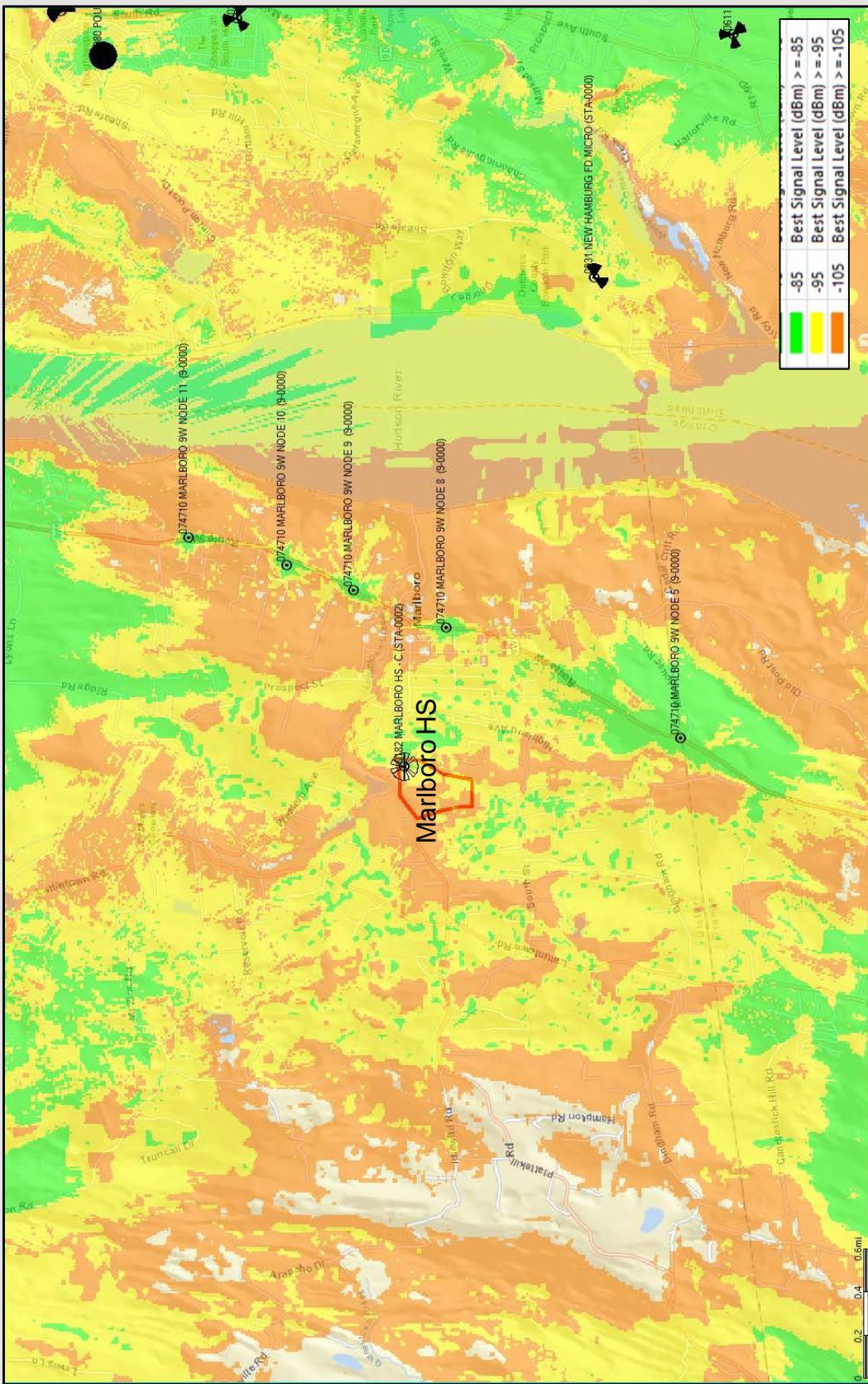
Best Server plots depict the actual footprint of each sector in question at one threshold so the viewer can accurately evaluate the area offloaded by the new sites dominant signal area (at 86' ACL).



The map above adds the footprint of the proposed Marlboro HS site in green. The green best server footprint provides improved coverage and capacity throughout the identified significant gap area. This will help to resolve the coverage and capacity issues impacting the Mt. Zion Beta and Wappingers Falls Delta sectors.

# Existing 700MHz Coverage

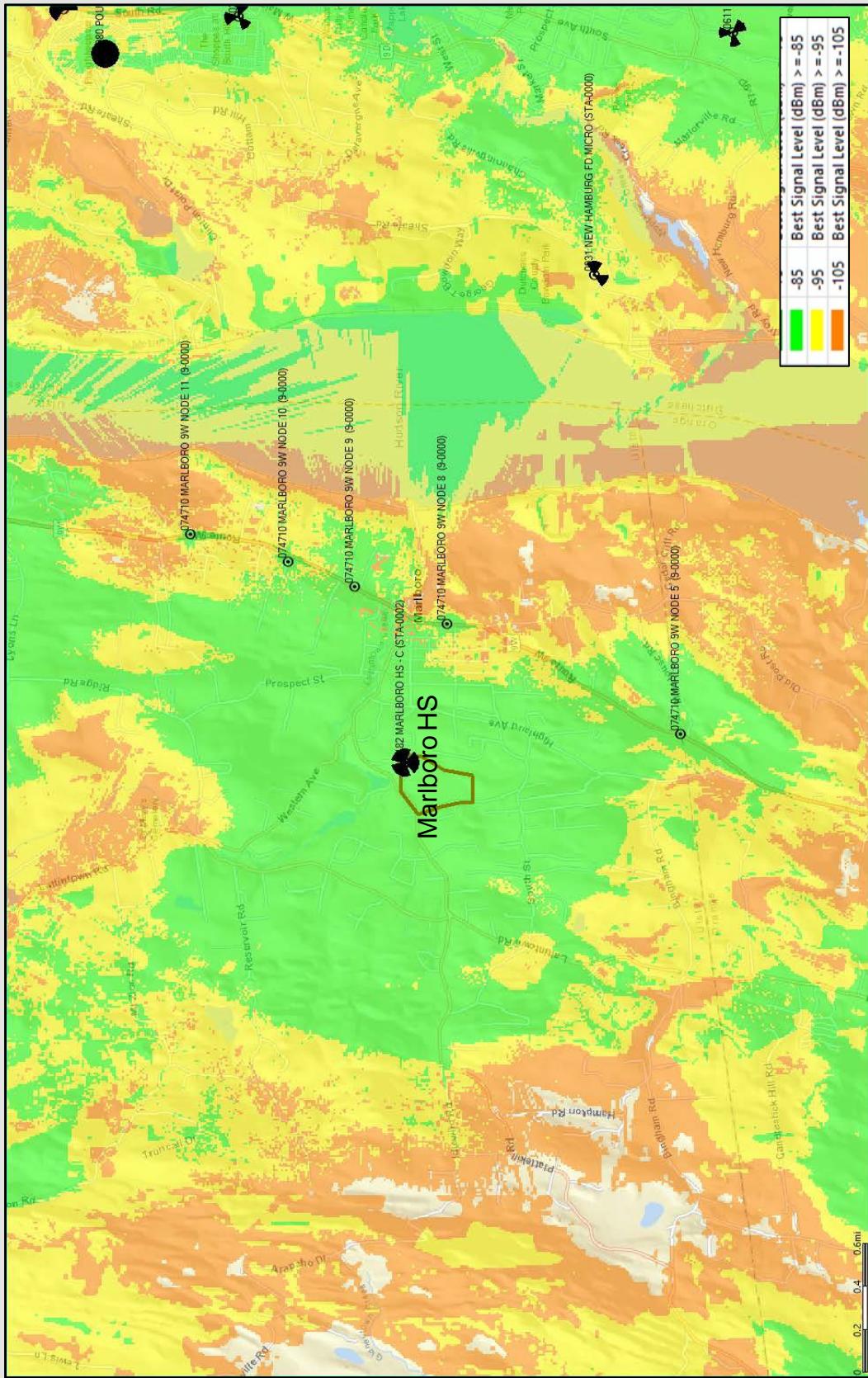
This coverage map shows how weak the RF conditions are in and around the Marlboro HS site area.  
Refer to slide 11 for further explanation of these color thresholds



The map above represents coverage from existing sites. This 700MHz signal is very weak throughout the project area which is a contributing factor to the overloaded conditions as explained in the capacity slides especially the ASEU slides on p7 and 10. Additional low band network densification is required to resolve these conditions.

# Proposed 700MHz Coverage

This coverage map shows how improved the RF conditions will be in and around the Marlboro HS site area (at 86' ACL). Refer to slide 11 for further explanation of these color thresholds.

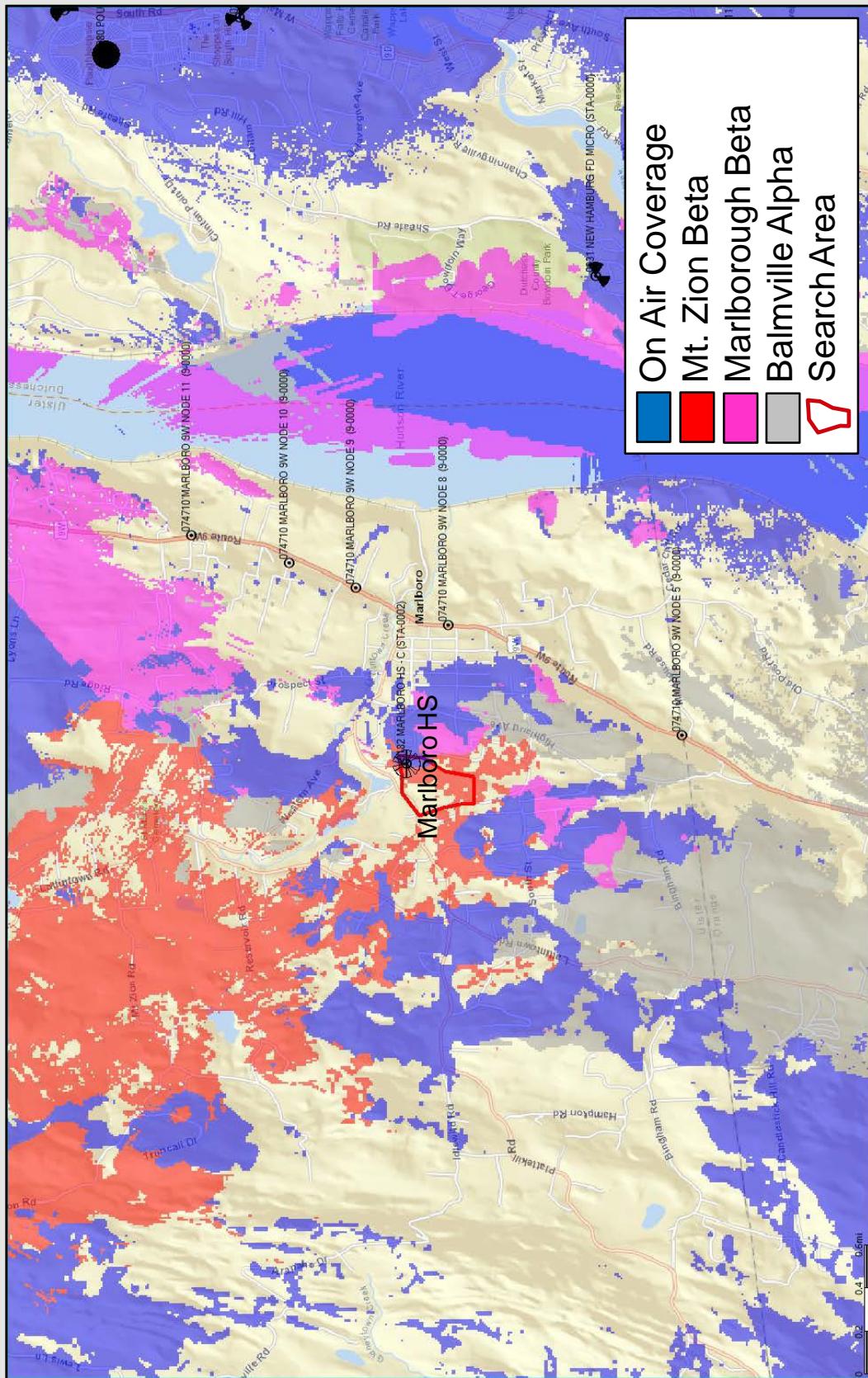


The map above adds the footprint of the proposed Marlboro HS site. The significantly improved signal strength corresponds to improved coverage and capacity throughout the identified significant gap area. This will help to resolve the coverage and capacity issues impacting the Mt. Zion Beta and Wappingers Falls Delta sectors.

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# Existing 2100MHz Best Server -105dBm RSRP

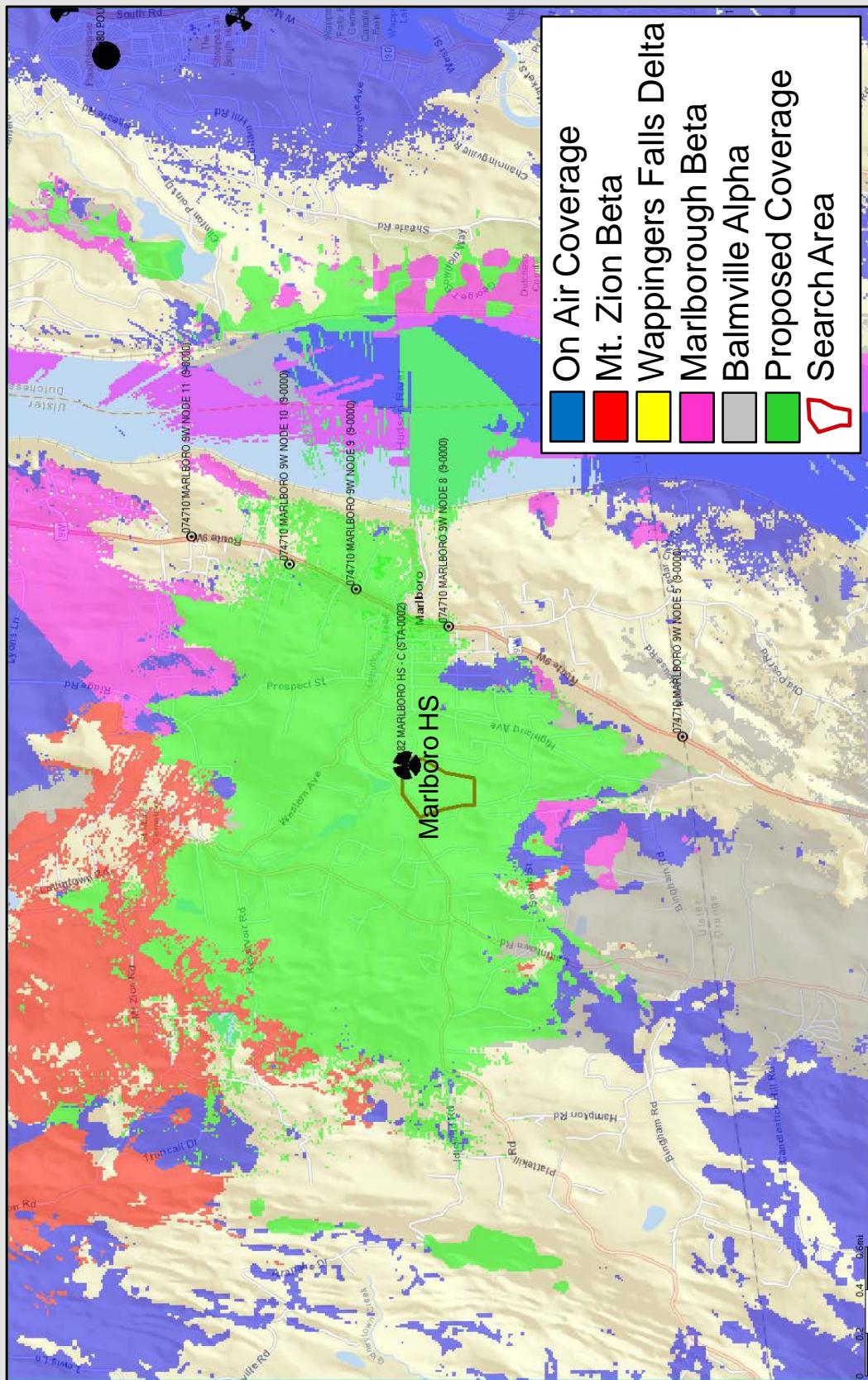
Best Server plots depict the actual footprint of each sector in question at one threshold so the viewer can accurately evaluate the area offloaded by the new sites dominant signal area.



The map above represents coverage from existing sites, with the sites in need of capacity offload detailed in the legend above. Blue coverage is from other on air sites. Marlborough Beta and Balmville Alpha were added at the request of Mr. Musso and are not part of the capacity offload discussion. Note that Wappingers Falls Delta is not shown as it is not currently equipped with AWS therefore there is no coverage from that sector. Other area coverage is from a variety of distant sites all experiencing similar inability to properly serve.

# Proposed 2100MHz Best Server -105dBm RSRP

Best Server plots depict the actual footprint of each sector in question at one threshold so the viewer can accurately evaluate the area offloaded by the new sites dominant signal area (at 86' ACL).

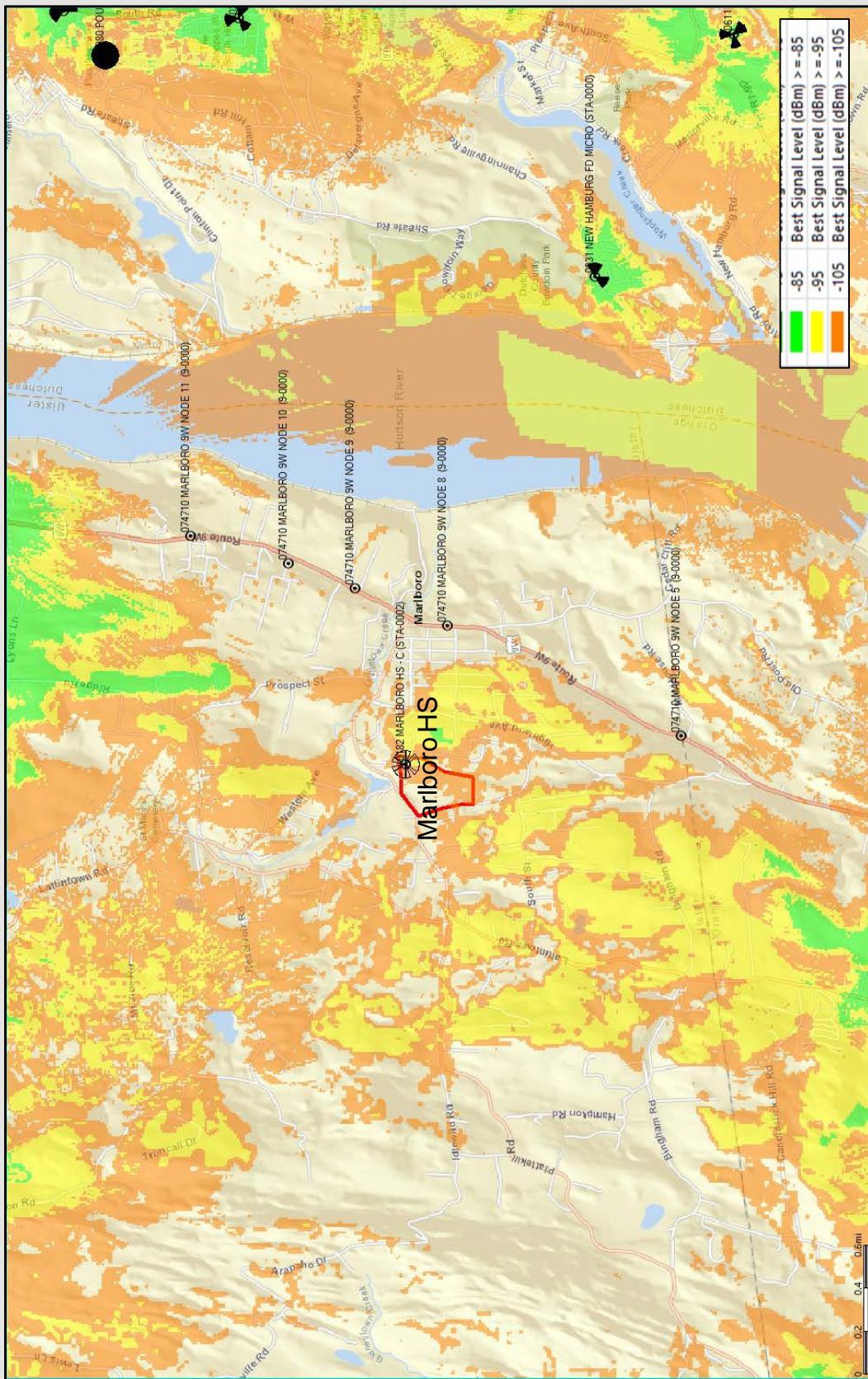


The map above adds the footprint of the proposed Marlboro HS site in green. The green best server footprint provides improved coverage and capacity throughout the identified significant gap area. This will help to resolve the coverage and capacity issues impacting the Mt. Zion Beta and Wappingers Falls Delta sectors.

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# Existing 2100MHz Coverage

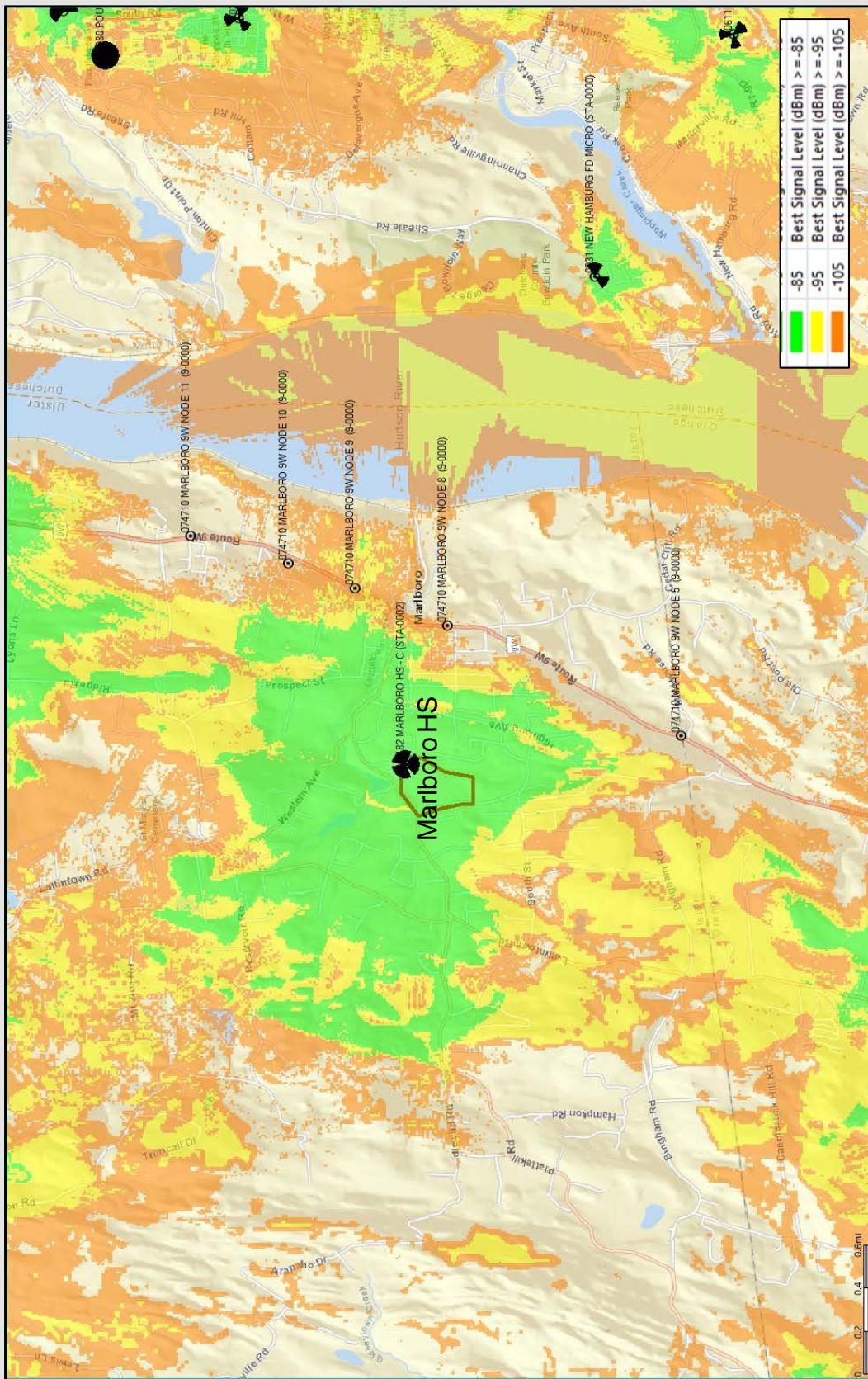
This coverage map shows the RF conditions in and around the Marlboro HS site area.  
Refer to slide 11 for further explanation of these color thresholds.



The map above represents coverage from existing sites. This 2100MHz signal is very weak throughout the project area which is a contributing factor to the overloaded conditions as explained in the capacity slides especially the ASEU slides on p7 and 10. Additional mid band network densification is required to resolve these conditions.

# Proposed 2100MHz Coverage

This coverage map shows how improved the RF conditions will be in and around the Marlboro HS site area (at 86' ACL). Refer to slide 11 for further explanation of these color thresholds



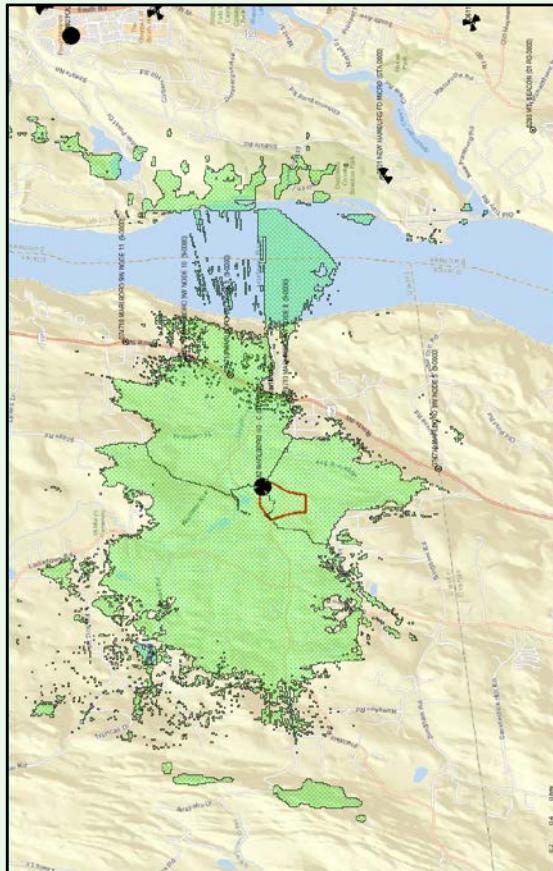
The map above adds the footprint of the proposed Marlboro HS site. The improved signal strength corresponds to improved coverage and capacity throughout the identified significant gap area. This will help to resolve the coverage and capacity issues impacting the Mt. Zion Beta and Wappingers Falls Delta sectors.

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# RF Justification Summary

The network was analyzed to determine whether there is sufficient **RF coverage and capacity** in the **town of Marlborough**. It was determined that there are significant gaps in adequate LTE service for Verizon Wireless in the 700 and 2100MHz frequency bands. In addition to the coverage deficiencies, Verizon Wireless' network does not have sufficient capacity (low band or mid band) to handle the existing and projected LTE voice and data traffic in the area near and neighboring the proposed **Marlboro HS** facility ("targeted service improvement area"). Based on the need for additional coverage and capacity while considering the topography and specific area requiring service, any further addition of capacity to distant existing sites does not remedy Verizon's significant gap in reliable service. Therefore, the proposed facility is also needed to provide "**capacity relief**" to the existing nearby Verizon Wireless sites, allowing the proposed facility and those neighboring sites to adequately serve the existing and projected capacity demand in this area.

With the existing network configuration there are significant gaps in service which restricts Verizon Wireless customers from originating, maintaining or receiving reliable calls and network access. It is our expert opinion that the proposed height will satisfy the coverage and capacity needs of Verizon Wireless and its subscribers in this portion of the **town of Marlborough** and the **Marlboro HS** project area. The proposed location depicted herein satisfies the identified service gaps and is proposed at the minimum height necessary for adequate service.



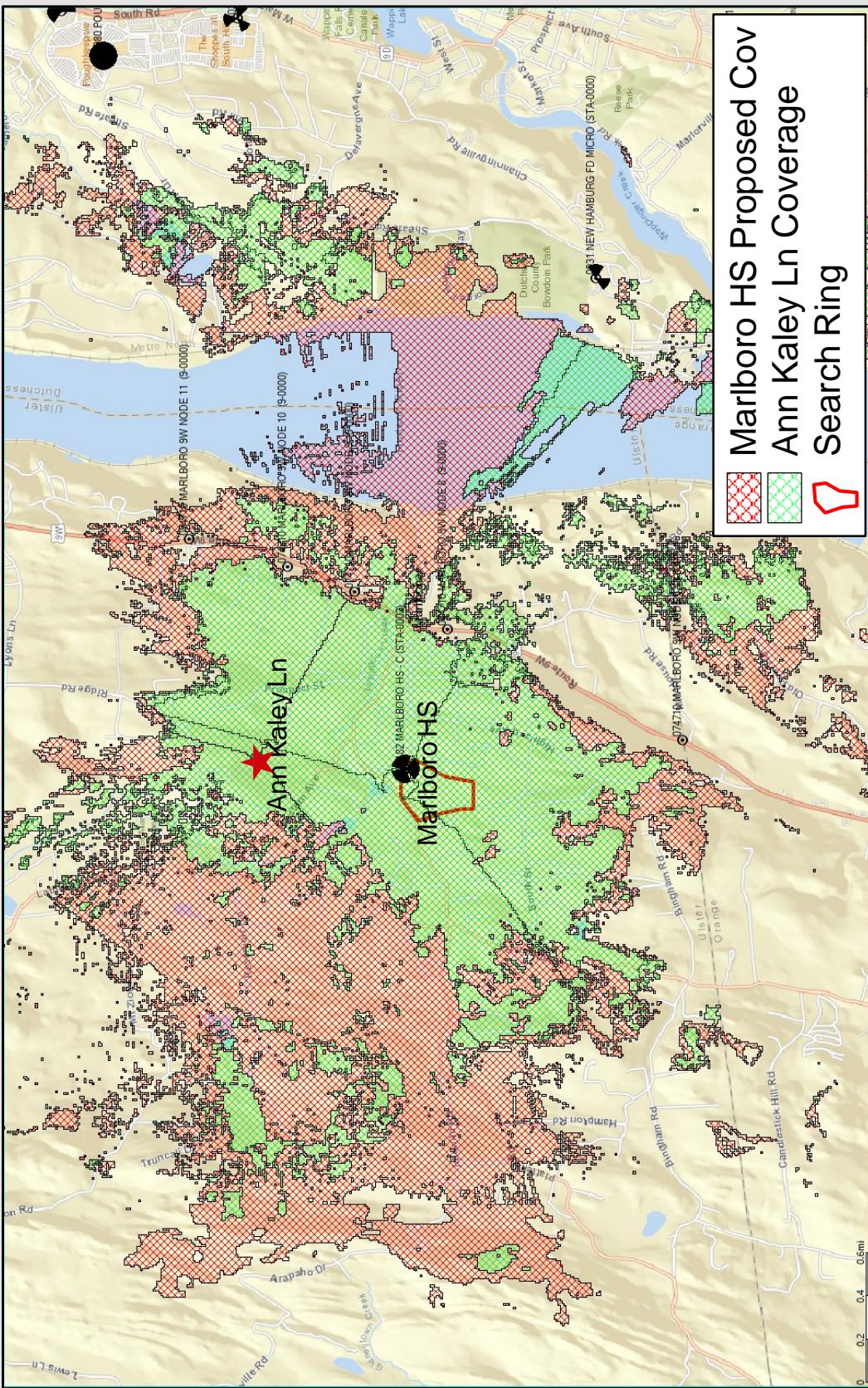
The proposed site at 86' ACL resolves the substantial and significant gaps in coverage and capacity impacting the Marlboro HS site area. This gap is shown above: The green shaded area represents the gap in coverage and capacity that Marlboro HS (site) will resolve.

*Michael R. Crosby*

Michael R. Crosby  
Engineer IV – RF Design  
Verizon Wireless

## Supplemental – Ann Kaley Ln 700MHz -105dBm Coverage Comparison

This coverage map shows the delta between the proposed coverage footprint (red/green) and the alternate Ann Kaley Ln coverage (green). The red hashed coverage represents the geographic area where the alternate location is not capable of providing coverage and capacity relief. For the sake of simplicity only the weakest coverage level is used below. In reality this delta is even greater for in-building coverage concerns and traffic distribution.



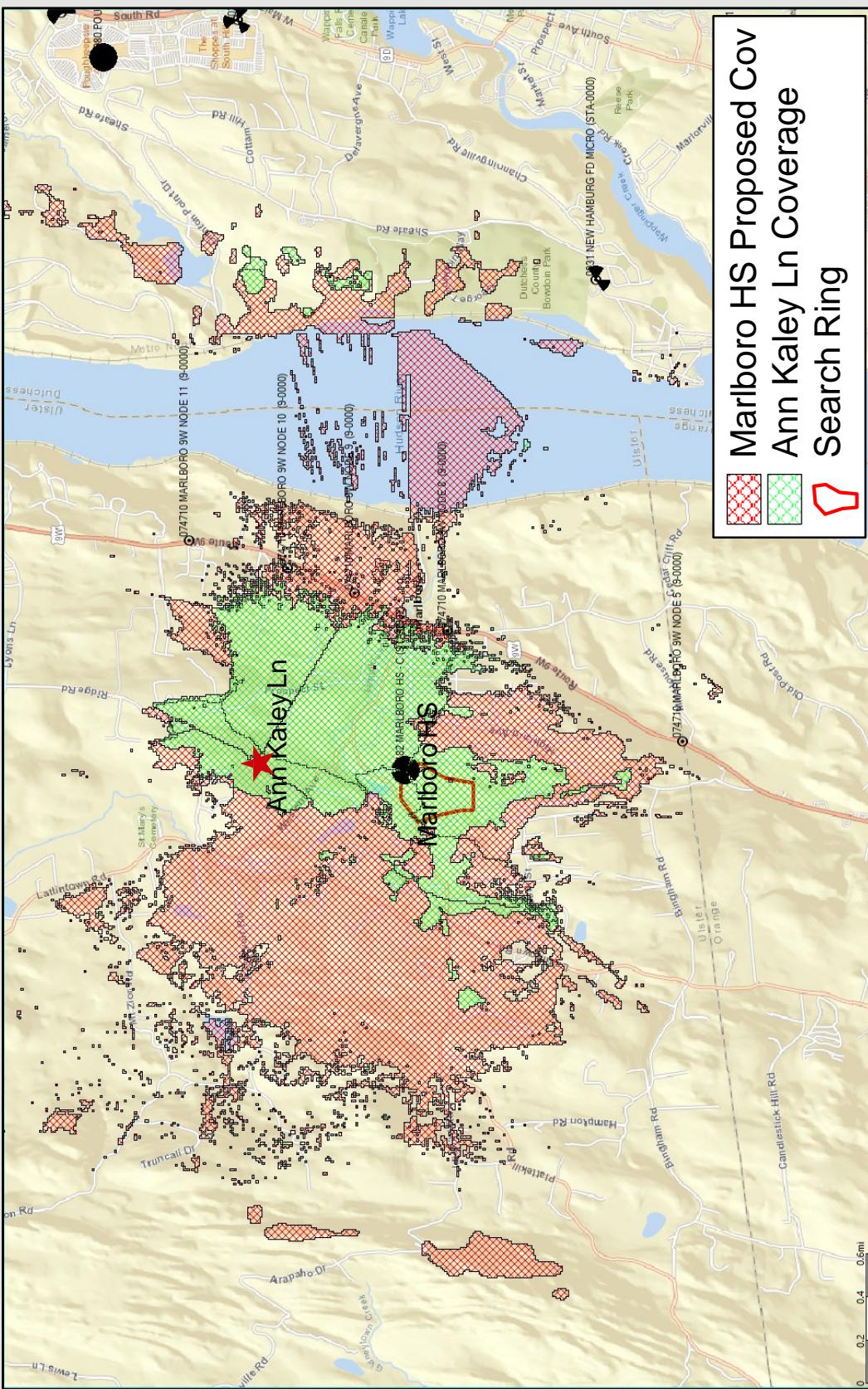
This candidate is well outside the Search Ring and it is not properly situated to provide the necessary coverage and capacity relief necessary. This candidate is also located in an area of lower ground elevation compromising potential coverage and capacity capabilities due to area terrain and foliage especially near the schools and NW objectives along Lattintown Rd.

Ann Kaley Ln – **RF Rejected**

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# Supplemental – Ann Kaley Ln 2100MHz -105dBm Coverage Comparison

This coverage map shows the delta between the proposed coverage footprint (red/green) and the alternate Ann Kaley Ln coverage (green). The red hashed coverage represents the geographic area where the alternate location is not capable of providing coverage and capacity relief. For the sake of simplicity only the weakest coverage level is used below. In reality, this delta is even greater for in building coverage concerns and traffic distribution.



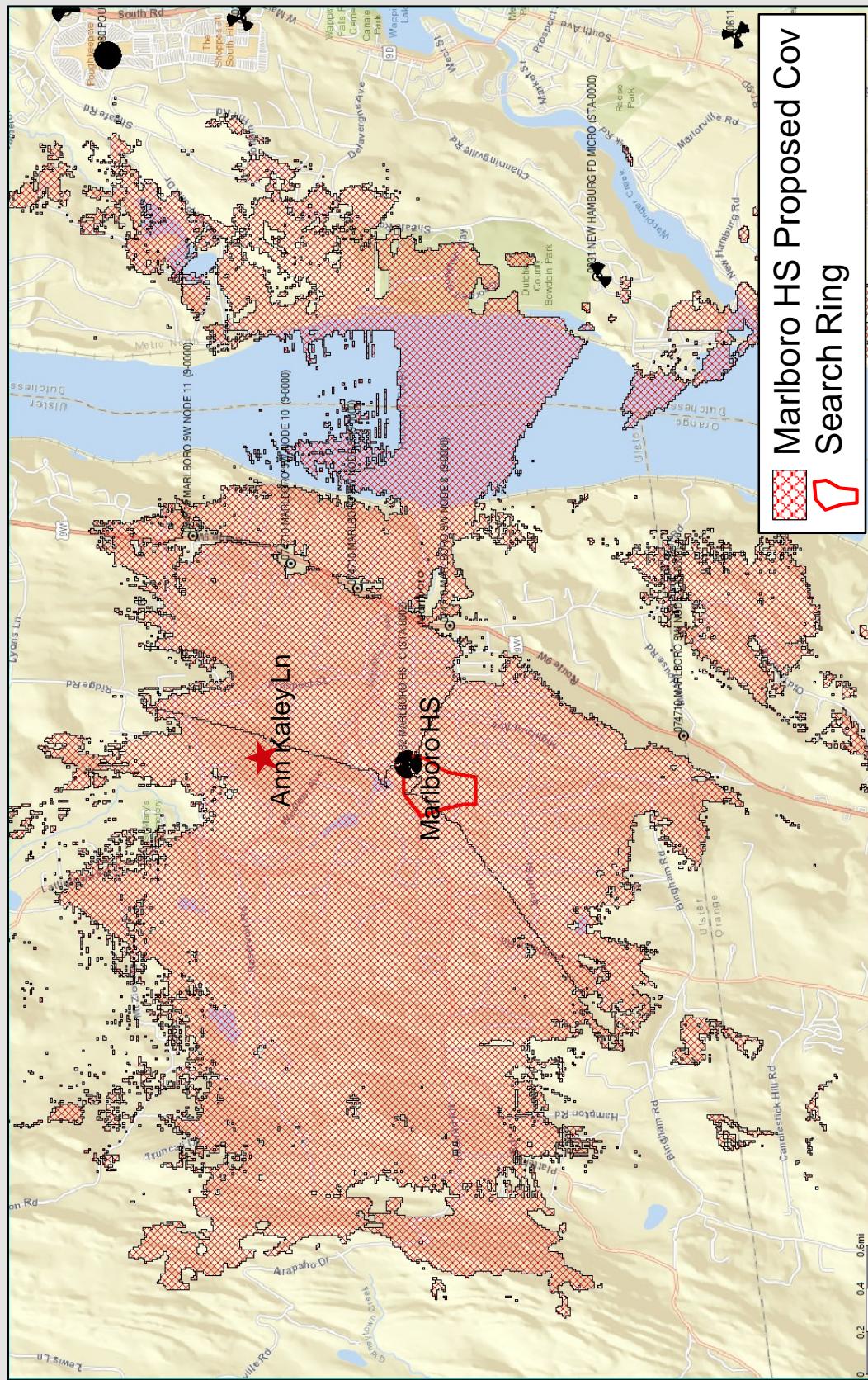
This candidate is well outside the Search Ring and it is not properly situated to provide the necessary coverage and capacity relief necessary. This candidate is also located in an area of lower ground elevation compromising potential coverage and capacity capabilities due to area terrain and foliage especially near the schools and NW objectives along Lattintown Rd.

**Ann Kaley Ln – RF Rejected**

**verizon** ✓

# Supplemental – Marlboro HS Proposed 700MHz -105dBm Coverage

This coverage map shows the proposed Marlboro HS coverage (Red).



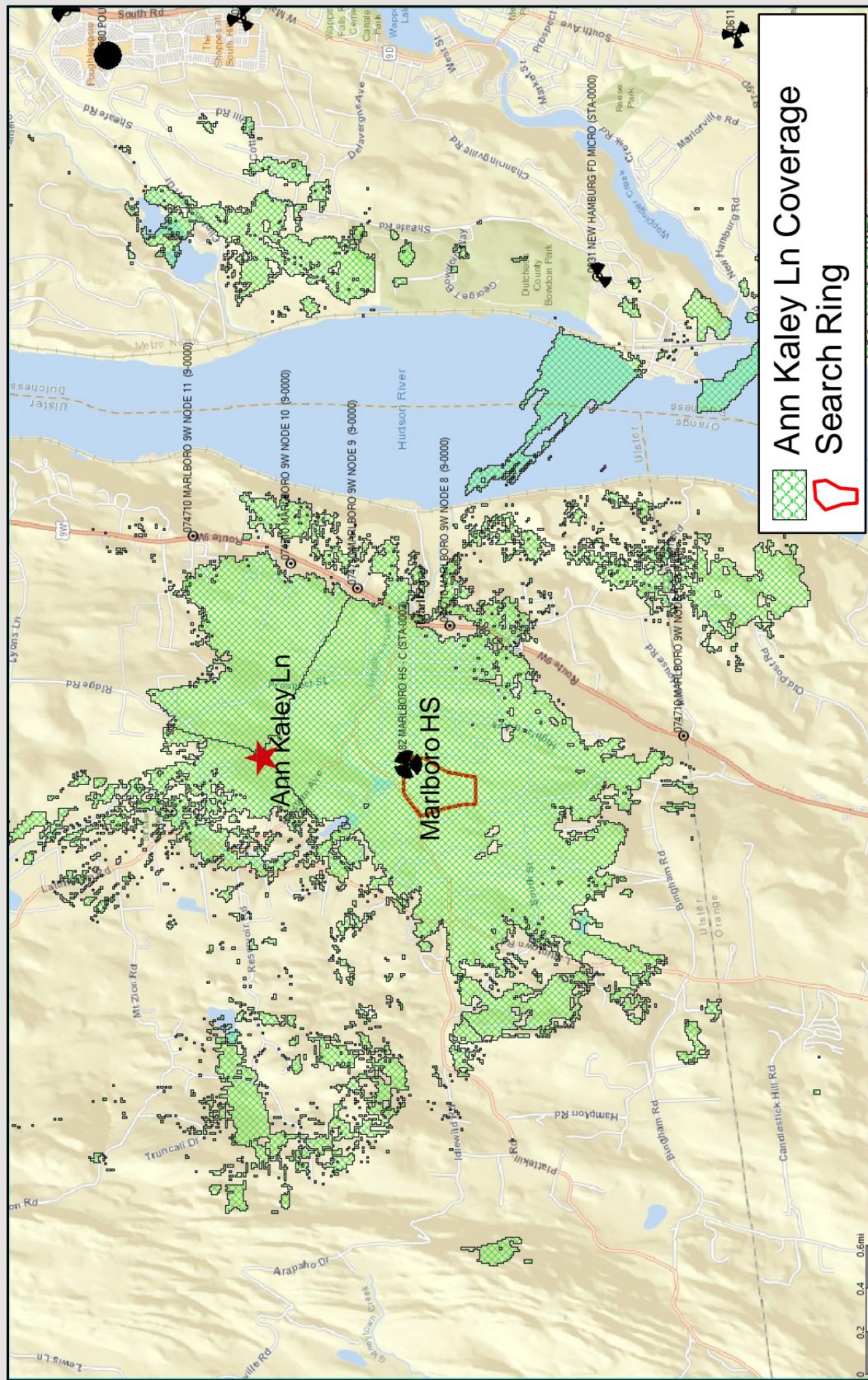
The proposed location is within the Search Ring and is properly situated to provide the necessary coverage and capacity relief necessary. This candidate is also located in an area of higher ground elevation capable of overcoming area terrain and foliage challenges. It is also centrally located to the objectives allowing for even sector capacity distribution.

**verizon**

Marlboro HS – RF Approved

# Supplemental – Ann Kaley Ln 700MHz -105dBm Coverage

This coverage map shows the alternate Ann Kaley Ln coverage (Green).



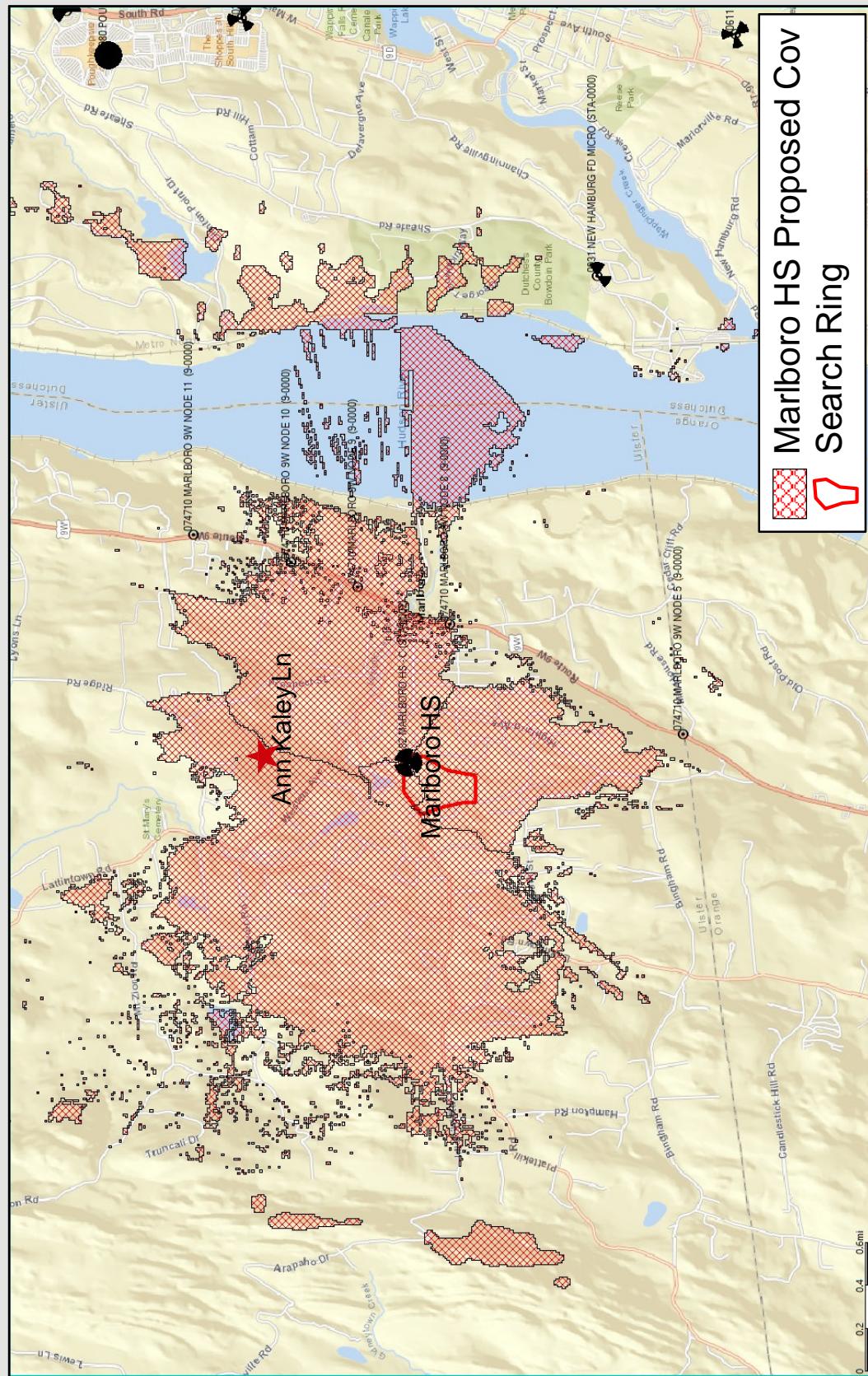
This candidate is well outside the Search Ring and it is not properly situated to provide the necessary coverage and capacity relief necessary. This candidate is also located in an area of lower ground elevation compromising potential coverage and capacity capabilities due to area terrain and foliage especially near the schools and NW objectives along Lattintown Rd.

Ann Kaley Ln – RF Rejected

**verizon** ✓

# Supplemental – Marlboro HS Proposed 2100MHz -105dBm Coverage

This coverage map shows the proposed Marlboro HS coverage (Red).



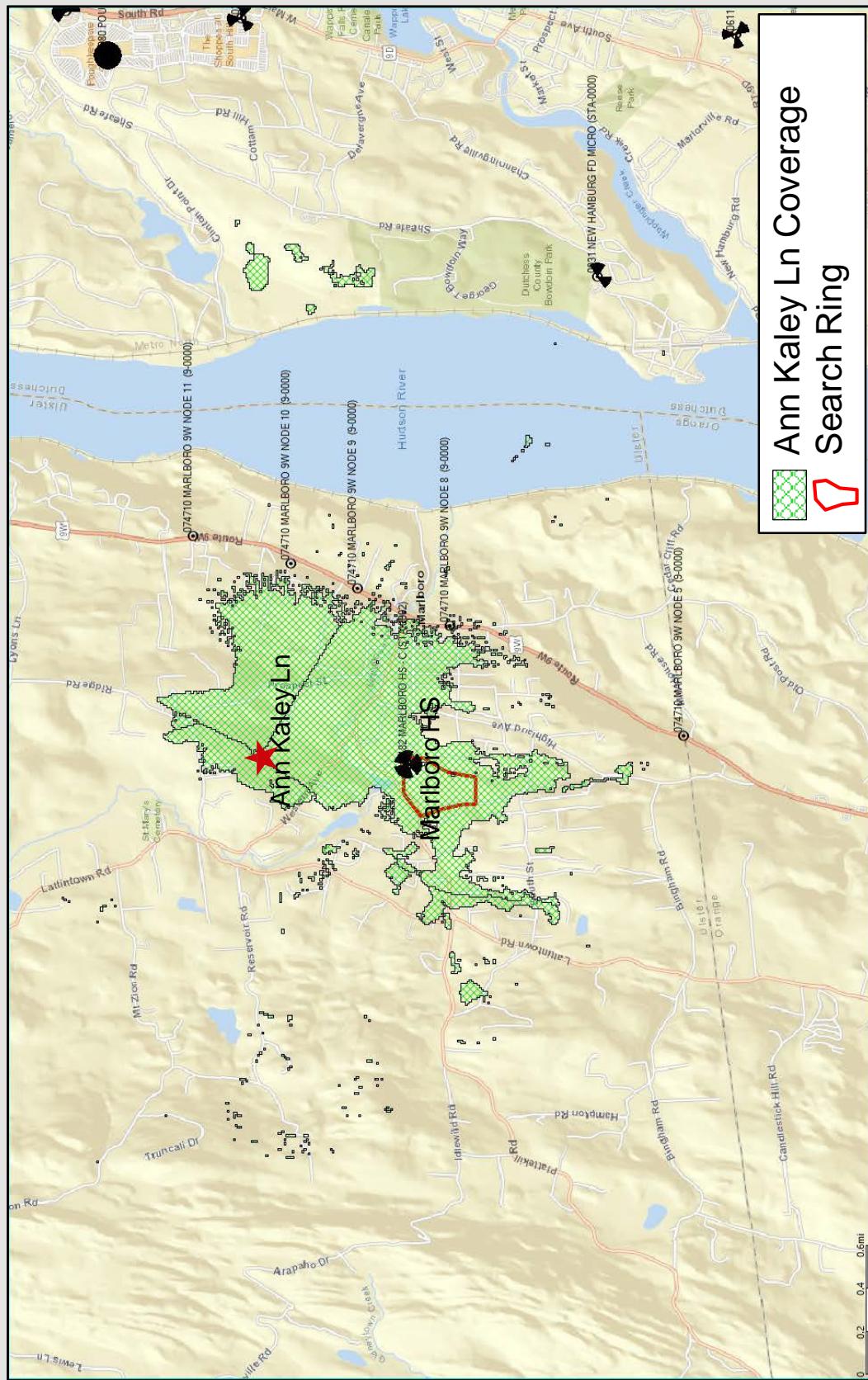
The proposed location is within the Search Ring and is properly situated to provide the necessary coverage and capacity relief necessary. This candidate is also located in an area of higher ground elevation capable of overcoming area terrain and foliage challenges. It is also centrally located to the objectives allowing for even sector capacity distribution.

**Marlboro HS – RF Approved**

**verizon**

# Supplemental – Ann Kaley Ln 2100MHz -105dBm Coverage

This coverage map shows the alternate Ann Kaley Ln coverage (Green).



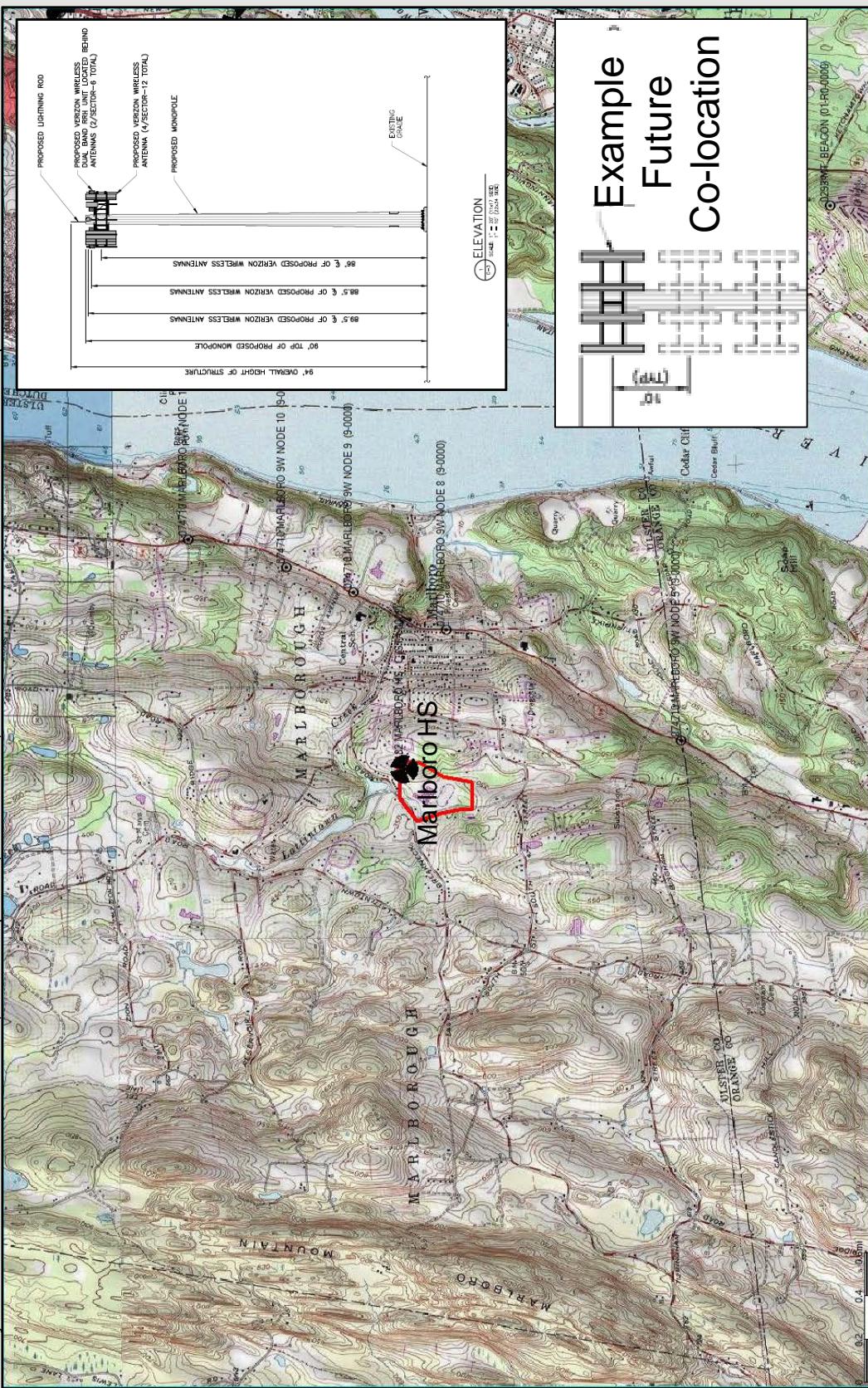
This candidate is well outside the Search Ring and it is not properly situated to provide the necessary coverage and capacity relief necessary. This candidate is also located in an area of lower ground elevation compromising potential coverage and capacity capabilities due to area terrain and foliage especially near the schools and NW objectives along Lattintown Rd.

**verizon** ✓

Ann Kaley Ln – RF Rejected

# Supplement – Marlboro HS Co-location Capability

This map shows the topographical underlay of the Marlboro HS project area. Several factors determine co-location capability and may vary considerably between different service providers. The proposed site, located on favorable ground elevation relative to the surrounding area is also centrally located to Verizon's coverage and capacity challenges in this project area allowing for not only adequate and reliable service but also helps resolve neighboring site challenges ultimately improving not only the Marlboro HS coverage footprint but also the surrounding area allowing for a larger community wide benefit. Verizon's network utilization, licensed frequencies, number of sites, site locations and hardware vendors differ from competitors.

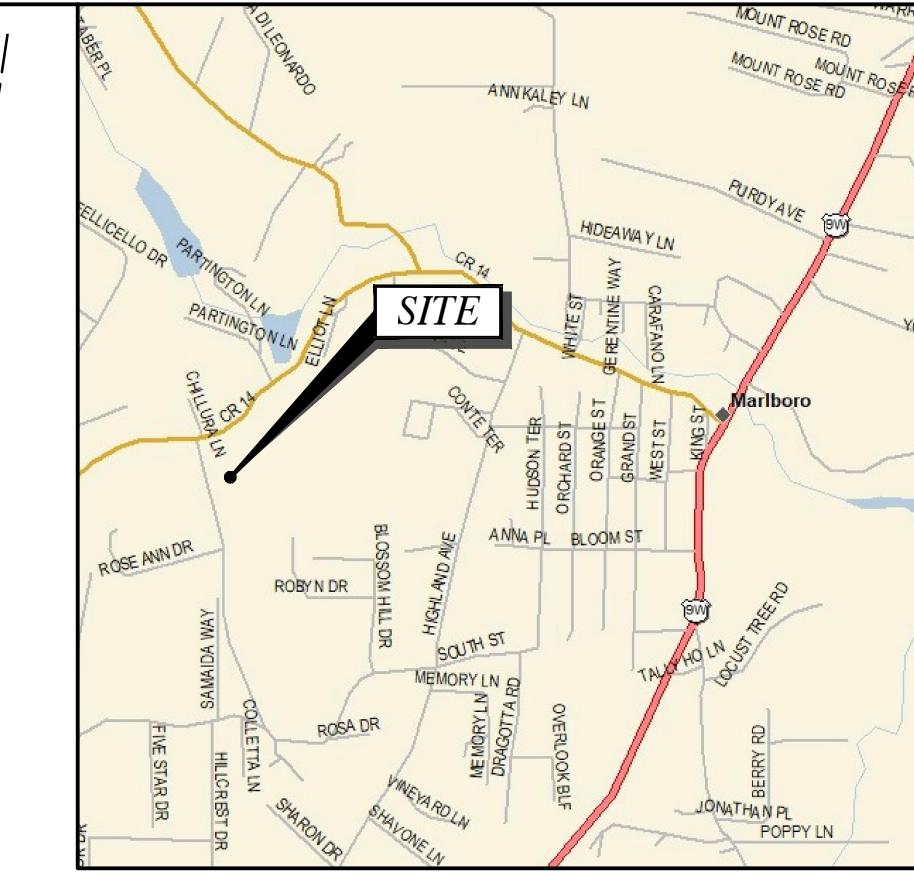
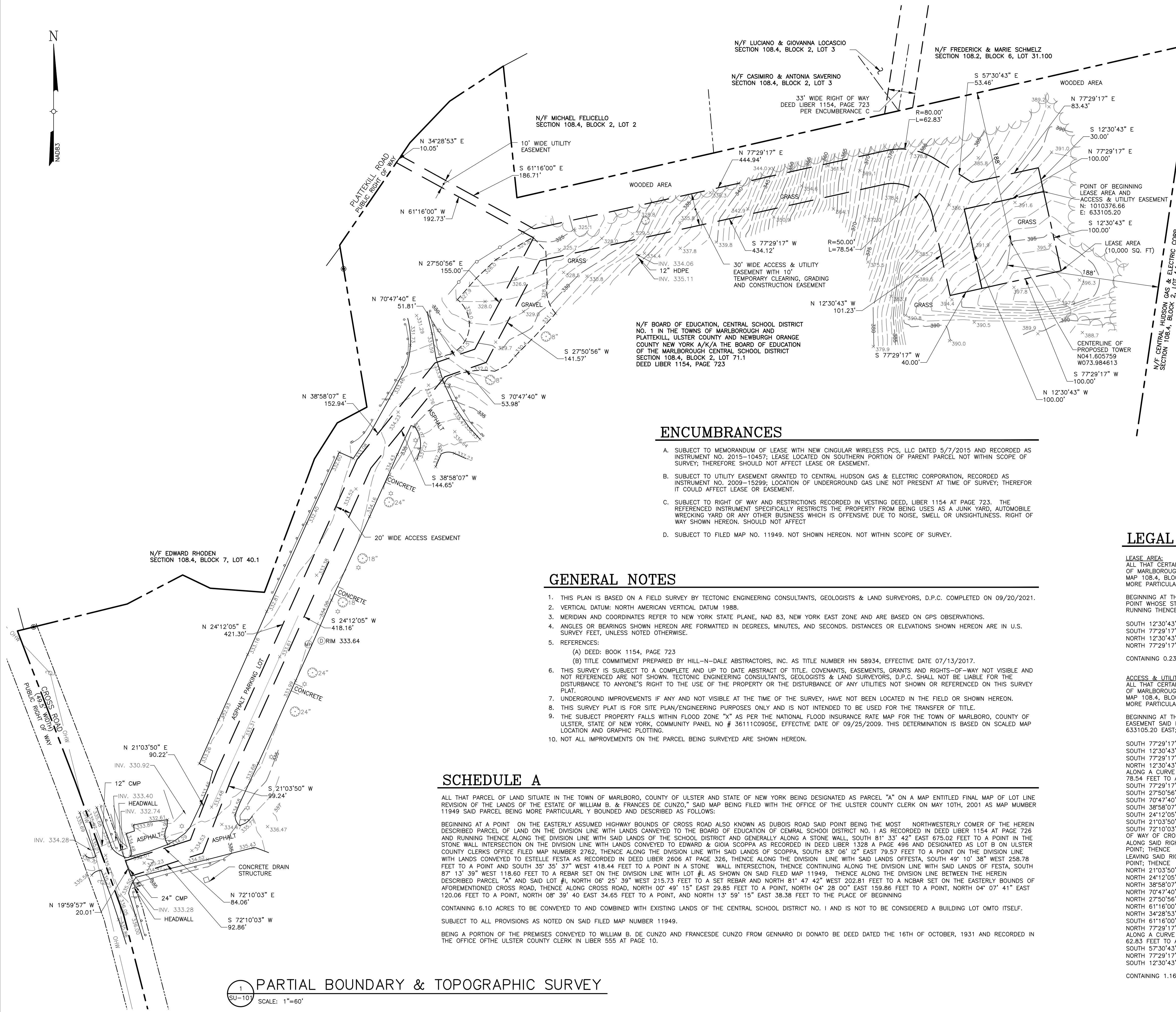


Although Verizon can't speak for other carriers or determine that the proposed Marlboro HS site is suitable for their networks we are able to determine that the site is designed and centrally located to a high utilization area, allows for even traffic distribution and is close enough in proximity to objectives allowing AWS and PCS frequencies to provide in building coverage at several high utilization locations. The proposed tower is very modest in height and is the absolute minimum height necessary for Verizon to solve their network coverage and capacity issues as detailed. The tower will be designed and constructed to allow for at least two additional co-locations.

# **EXHIBIT C**



N  
NAD83



**verizon**  
1275 JOHN STREET, SUITE 100  
WEST HENRIETTA, NY 14586

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P.O. Box 37 Mountaintville, NY 10953 (800) 828-6531  
Project Contact Info: 3101 American Blvd.  
Suite 101 Latham, NY 12110 Phone: (518) 783-1630

WORK ORDER NUMBER 10272.78 DRAWN BY SW

NO. DATE 0 02/02/22 ISSUE FOR COMMENT

RELEASED BY	DATE
DOMINICK T. SANTINI, IV P.L.S. 51084	



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0 1 2 3

ORIGINAL SIZE IN INCHES

SITE INFORMATION

MARLBORO HS  
RE PN: 20161555323  
LC: 442361

SITE ADDRESS

50 CROSS ROAD  
TOWN OF MARLBOROUGH  
ULSTER COUNTY  
NY 12542

SHEET TITLE

PARTIAL BOUNDARY &  
TOPOGRAPHIC SURVEY

SHEET NUMBER

**SU-101**

N  
GRID



NOTE:

THE PROPERTY LINES HEREON ARE APPROXIMATE BASED ON GIS DATA AND ARE FOR ORIENTATION PURPOSES ONLY. THEY DO NOT REPRESENT A PROPERTY/BOUNDARY DECISION BY A LAND SURVEYOR.

AD-1 ADJOINERS PLAN

SCALE: 1" = 400' (11x17 SIZE)  
1" = 200' (22x34 SIZE)

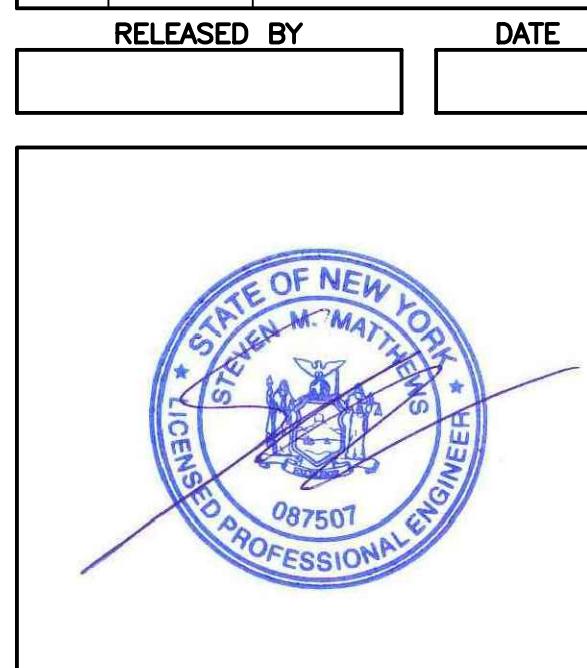
SBL	OWNER	ADDRESS	CITY/STATE	ZIP
108.4-2-71.100	Marlboro Central School Dist 1	21 Milton Tpke	Milton NY	12547
108.4-1-27.300	Albert J Pagano Jr	17 Cross Rd	Marlboro NY	12542
108.4-1-33.100	Anthony Pagano Jr	126 Hurley Rd	Salt Point NY	12578
108.2-7-40.100	Vincent J Certo	58 Plattekill Rd	Marlboro NY	12542
108.4-2-7	Thomas R Branning	50 Breezy Heights Dr	Marlboro NY	12542
108.2-7-40.200	Michelle M Mylie	4 Chillura Ln	Marlboro NY	12542
108.4-2-34.440	Jiezhuoma Shi	16 Center St	Marlboro NY	12542
108.4-2-63	Pano Harpolis	7 Robyn Dr	Marlboro NY	12542
108.4-1-12	Ann Rose Scaturro	55 Cross Rd	Marlboro NY	12542
108.4-2-3	Casimiro Saverino	33 Plattekill Rd	Marlboro NY	12542
108.4-2-2	Michael Felicello	39 Plattekill Rd	Marlboro NY	12542
108.4-2-62	Melissa A Drake	48 South St	Marlboro NY	12542
108.4-1-25	Frank Bolognese	27 Cross Rd	Marlboro NY	12542
108.4-2-1	Edward Rhoden	55 Plattekill Rd	Marlborough NY	12542
108.4-2-6	Lois D Diorio	54 Breezy Hts	Marlboro NY	12542
108.4-2-72.300	Stephen Leechow	17 Robyn Dr	Marlboro NY	12542
108.2-6-31.200	Paul Schmelz	15 Elliott Ln	Marlboro NY	12542
108.2-6-33	Luciano Locascio	27 Plattekill Rd	Marlboro NY	12542
108.4-1-26	Alma Pleasant	23 Cross Rd	Marlboro NY	12542
108.4-1-22	Dean F Roberts	35 Cross Rd	Marlboro NY	12542
108.4-1-21	James E Marquis	39 Cross Rd	Marlboro NY	12542
108.4-1-23	John E Johnston	31 Cross Rd	Marlboro NY	12542
108.4-1-24	John E Johnston	31 Cross Rd	Marlboro NY	12542
108.2-6-3	Marlboro Property Inc Management Inc	97 Cedar Valley Road	Poughkeepsie NY	12603
108.4-2-5	Andrea E Burke	60 Breezy Hts	Marlboro NY	12542
108.4-2-13	Suzanne Ellis	49 Breezy Height	Marlboro NY	12542
108.2-6-32	Frederick L Schmelz	P.O. Box 892	Marlboro NY	12542
108.2-6-31.100	Frederick Schmelz	21 Elliott Ln	Marlboro NY	12542
108.4-2-34.310	Robert A DiLello	20 Robyn Dr	Marlboro NY	12542
108.4-2-72.200	Octavid Santiago	19 Robyn Dr	Marlboro NY	12542
108.2-6-34	Tyler Daniels	23 Plattekill Road	Marlboro NY	12542
108.2-7-32.210	Michael Presutti Jr	26 Plattekill Rd	Marlboro NY	12542
108.4-2-11	Jonathan W Robertson	30 Breezy Heights	Marlboro NY	12542
108.4-2-10	Tibor Ban	34 Breezy Hts	Marlboro NY	12542
108.4-2-9	Tibor Ban	34 Breezy Hts	Marlboro NY	12542
108.4-2-12	William J Pezzo	45 Breezy Hts Dr	Marlboro NY	12542
108.4-2-8	Michael Carofano	46 Breezy Heights	Marlboro NY	12542
108.2-7-40.500	John A Darmiento	5 Chillura Ln	Marlboro NY	12542
108.4-2-32	John Casullo	P.O. Box 73	Marlboro NY	12542
108.4-1-17	Theresa R Morehead	41 Cross Rd	Marlboro NY	12542
108.4-2-34.210	Gregory Herd	24 Robyn Dr	Marlboro NY	12542
108.4-2-72.100	John E Lynn	21 Robyn Dr	Marlboro NY	12542
108.4-1-14	Kevin Doherty	12 Rose Ann Dr	Marlboro NY	12542
108.4-1-15	Jonathan R Callaizakis	14 Rose Ann Dr	Marlboro NY	12542
108.4-1-16	Sheldon Chevers	2 Fairview Avenue Apt 3	Poughkeepsie NY	12601
108.4-2-69	Ermelinda Pagan Living Trust (Trust)	11 Robyn Dr	Marlboro NY	12542
108.4-1-28	Albert Pagano	13 Cross Rd	Marlboro NY	12542
108.4-1-29	Jean Pagano	9 Cross Rd	Marlboro NY	12542
108.4-1-27.200	Anthony Pagano	126 Hurley Rd	Salt Point NY	12578
108.4-1-27.100	Robert Bogle	88 South St	Marlboro NY	12542
108.4-7-16.100	Estelle Festa	6 Cross Rd	Marlboro NY	12542
108.4-2-70.100	Christopher Ryan	16 Cross Rd	Marlboro NY	12542
108.4-2-4.100	Central Hudson Gas & Electric	284 South Rd	Poughkeepsie NY	12602
108.2-7-40.300	Scott Oliver	8 Chillura Ln	Marlboro NY	12542
108.2-7-39	Joseph M Noto	44 Plattekill Rd	Marlboro NY	12542
108.2-7-40.400	Michael Morehead	9 Chillura Ln	Marlboro NY	12542
108.2-7-38.100	Steven Markle	30 Partington Ln	Marlboro NY	12542
108.2-7-32.110	William Gephard	115 Western Ave	Marlboro NY	12542
108.2-7-38.200	Brett Allan Partington Jr	5000 Landmakr Dr Unit 5310	Aliquippa PA	15001

2 ADJOINERS LIST  
AD-1 SCALE: NTS

verizon  
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(800) 829-8531  
www.tectonicengineering.com  
Project Manager  
36 British American Blvd.  
Suite 101  
Latham, NY 12110  
Phone: (518) 783-1630

WORK ORDER NUMBER	DRAWN BY
10272.78	TRR
NO. DATE ISSUE	
0 8/13/21 FOR COMMENT	
1 8/30/21 PER COMMENTS	
2 10/22/21 FOR ZONING	
3 2/23/22 PER COMMENTS	



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SITE INFORMATION  
MARLBORO HS  
RE PN: 20161555323  
LC: 442361

SITE ADDRESS  
50 CROSS RD  
TOWN OF MARLBOROUGH  
ULSTER COUNTY  
NY 12542

SHEET TITLE  
ADJOINERS PLAN

SHEET NUMBER

AD-1

N  
GRID



1 SETBACK PLAN  
SB-1

SCALE: 1" = 200' (11x17 SIZE)  
1" = 100' (22x34 SIZE)

## BULK REQUIREMENTS

TOWN OF MARLBOROUGH  
ZONING DISTRICT: R-1 RESIDENTIAL

	REQUIRED	EXISTING	PROPOSED
MINIMUM YARDS (TOWER)			
FRONT:	188 FT	-	1302 FT
SIDE:	188 FT	-	188 FT
REAR:	188 FT	-	188 FT
MINIMUM YARDS (COMPOUND)			
FRONT:	35 FT	-	1273 FT
SIDE:	35 FT	-	163 FT
REAR:	50 FT	-	156 FT
MAXIMUM TOWER HEIGHT:	BASED ON RF NEED	-	94 FT

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Mountaintown, NY 10953  
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(800) 829-8531  
www.tectonicengineering.com  
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Latham, NY 12110  
Phone: (518) 783-1630

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3	2/23/22	PER COMMENTS

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0 1 2 3

ORIGINAL SIZE IN INCHES

SITE INFORMATION

MARLBORO HS  
RE PN: 20161555323  
LC: 442361

SITE ADDRESS

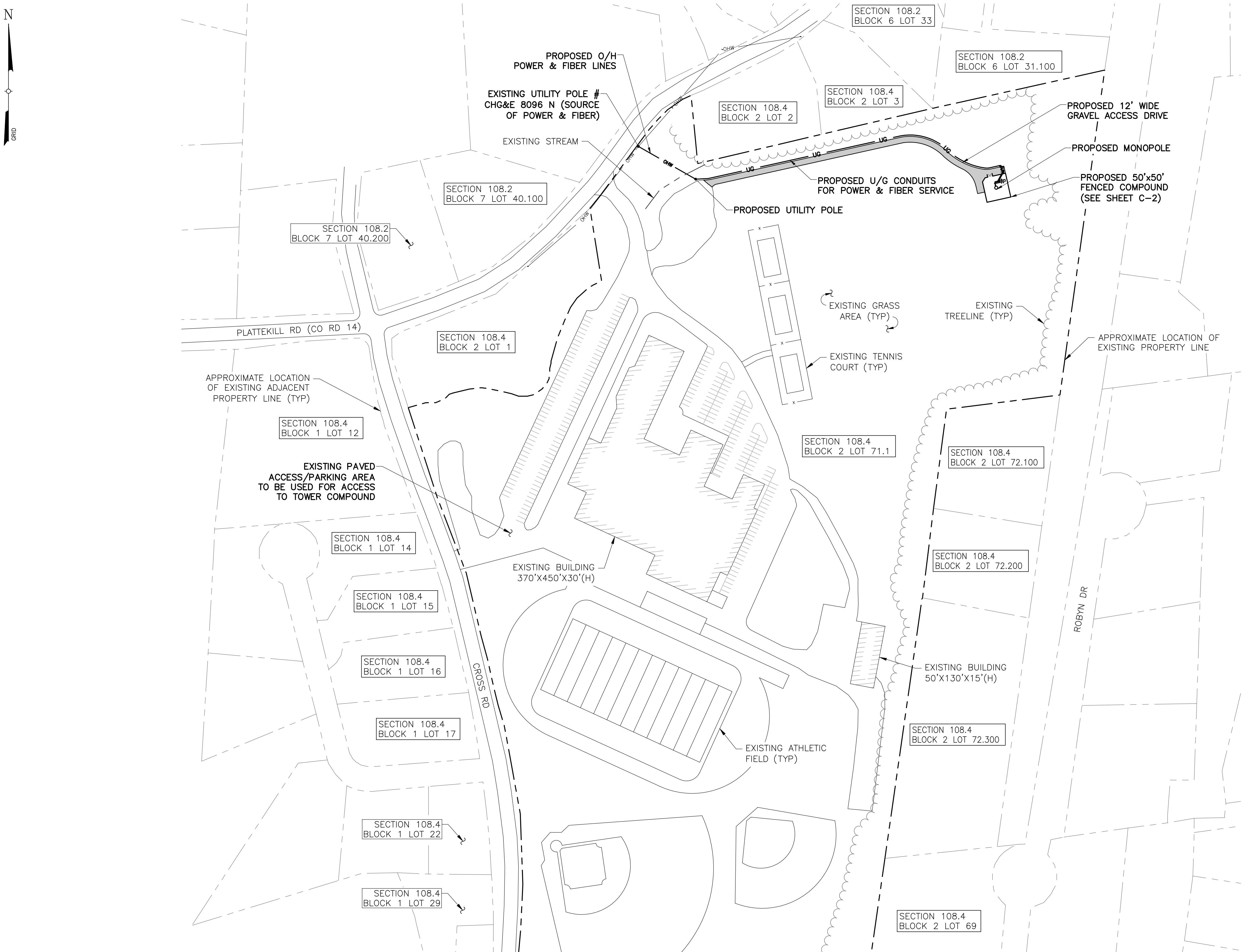
50 CROSS RD  
TOWN OF MARLBOROUGH  
ULSTER COUNTY  
NY 12542

SHEET TITLE

SETBACK PLAN & BULK REQUIREMENTS

SHEET NUMBER

**SB-1**



**verizon**✓

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WEST HENRIETTA, NY 14586

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3	2/23/22
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**MARLBORO HS**  
**RE PN: 20161555323**  
**LC: 442361**

EC. 442501 SITE ADDRESS

SITE ADDRESS  
50 CROSS RD  
TOWN OF MARLBOROUGH  
ULSTER COUNTY  
NY 12542

---

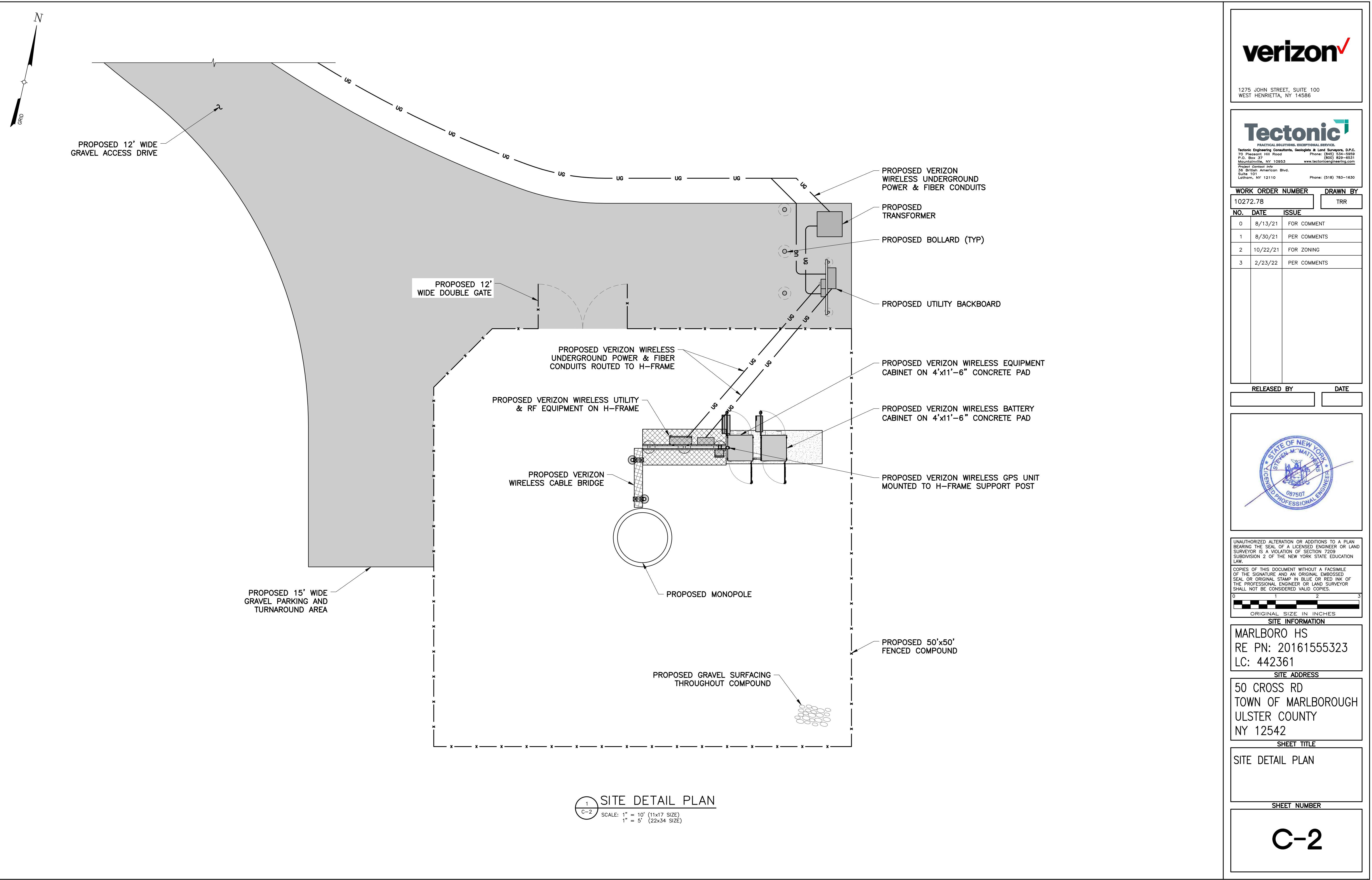
**SHEET TITLE**

## OVERALL SITE PLAN

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SHEET NUMBER

01



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WEST HENRIETTA, NY 14586

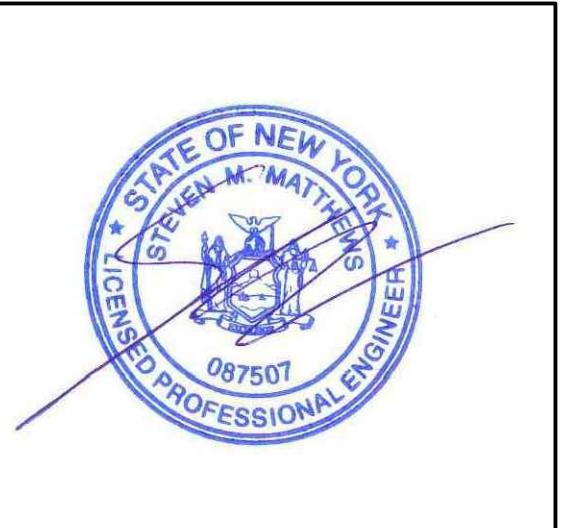
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79 Pinetree Hill Road Phone: (585) 824-8550  
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Mountaintop, NY 10953 www.tectonicengineering.com  
Project: 36 British American Blvd.  
Suite 101, Latham, NY 12110 Phone: (518) 783-1630

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0 1 2 3  
ORIGINAL SIZE IN INCHES

SITE INFORMATION

MARLBORO HS  
RE PN: 20161555323  
LC: 442361

SITE ADDRESS

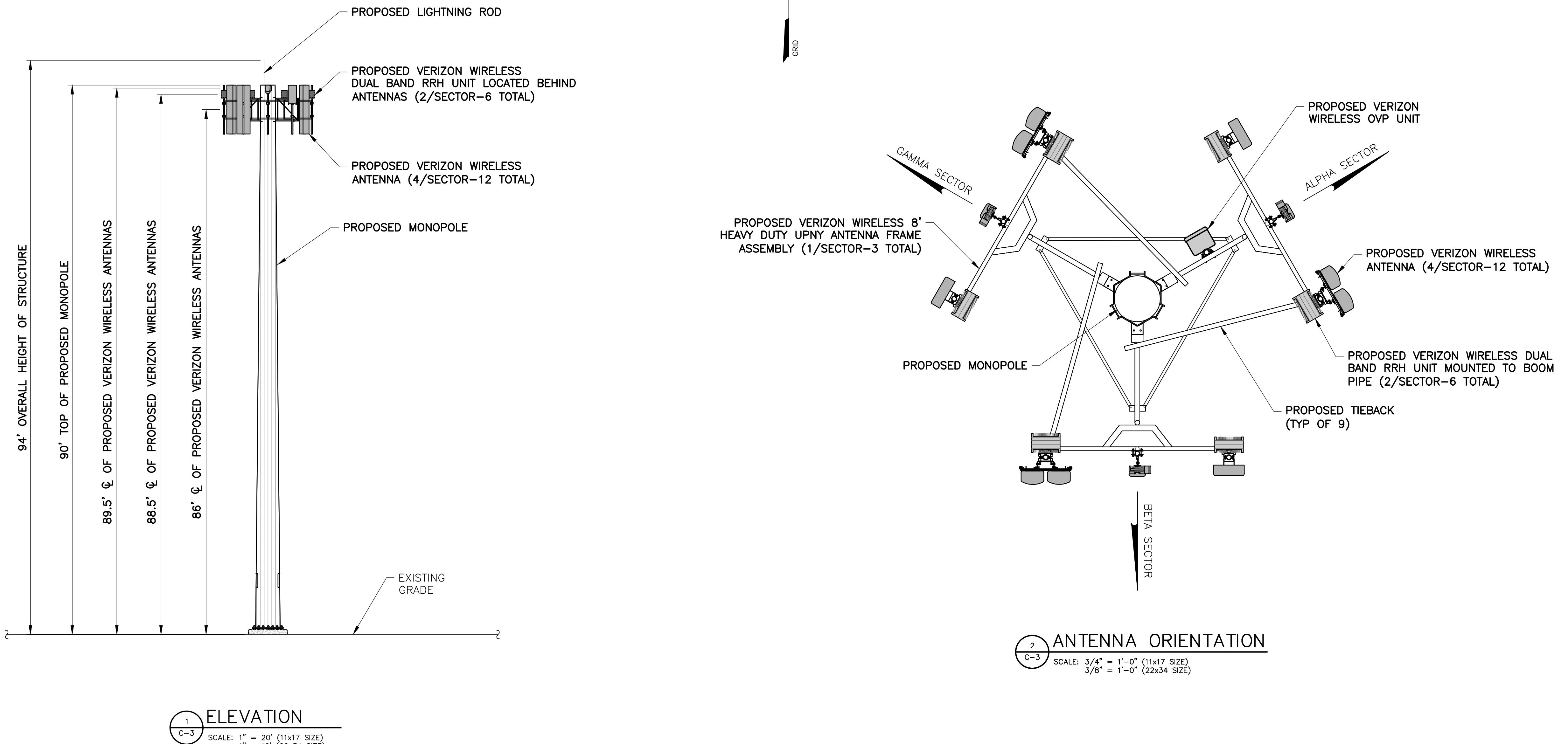
50 CROSS RD  
TOWN OF MARLBOROUGH  
ULSTER COUNTY  
NY 12542

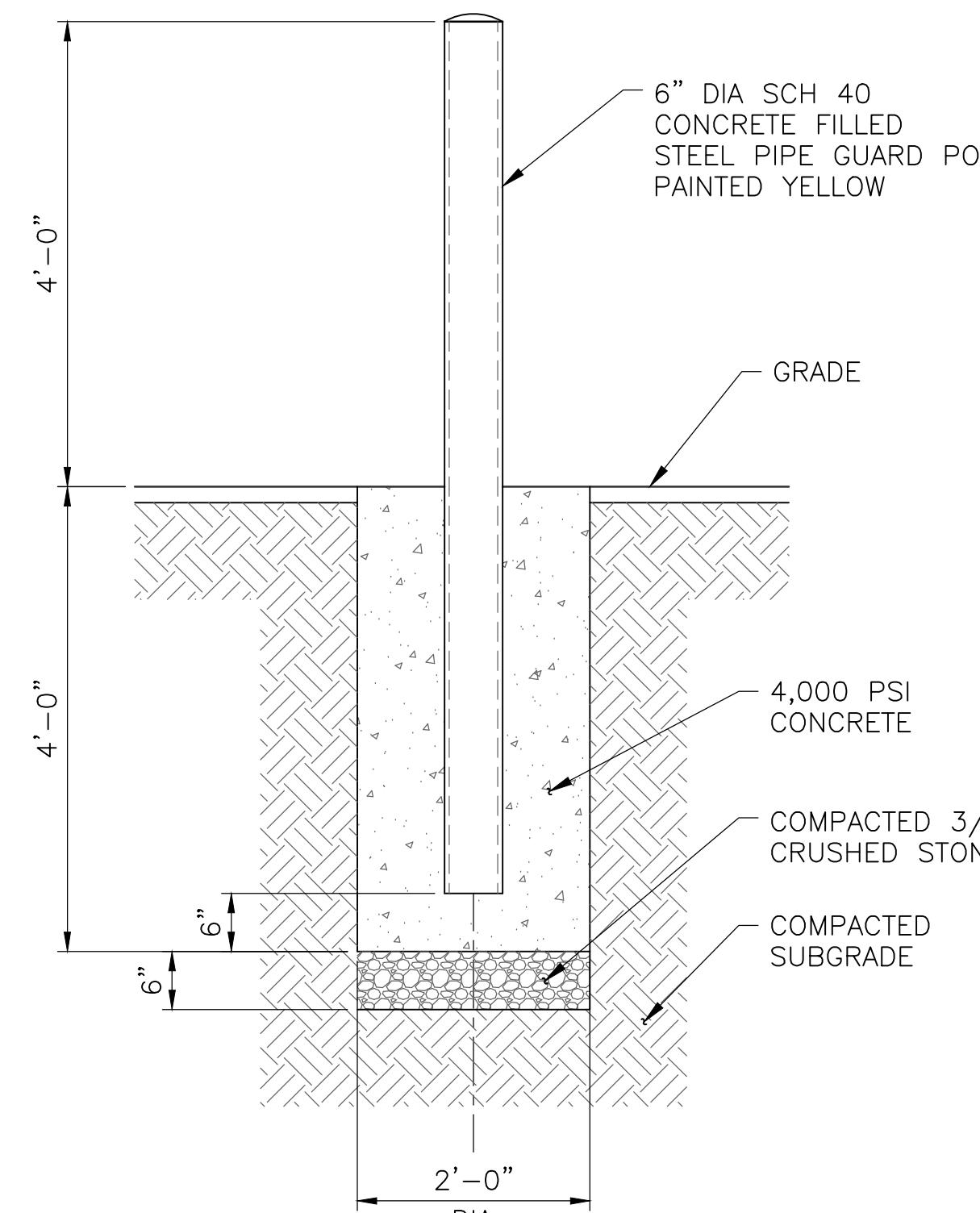
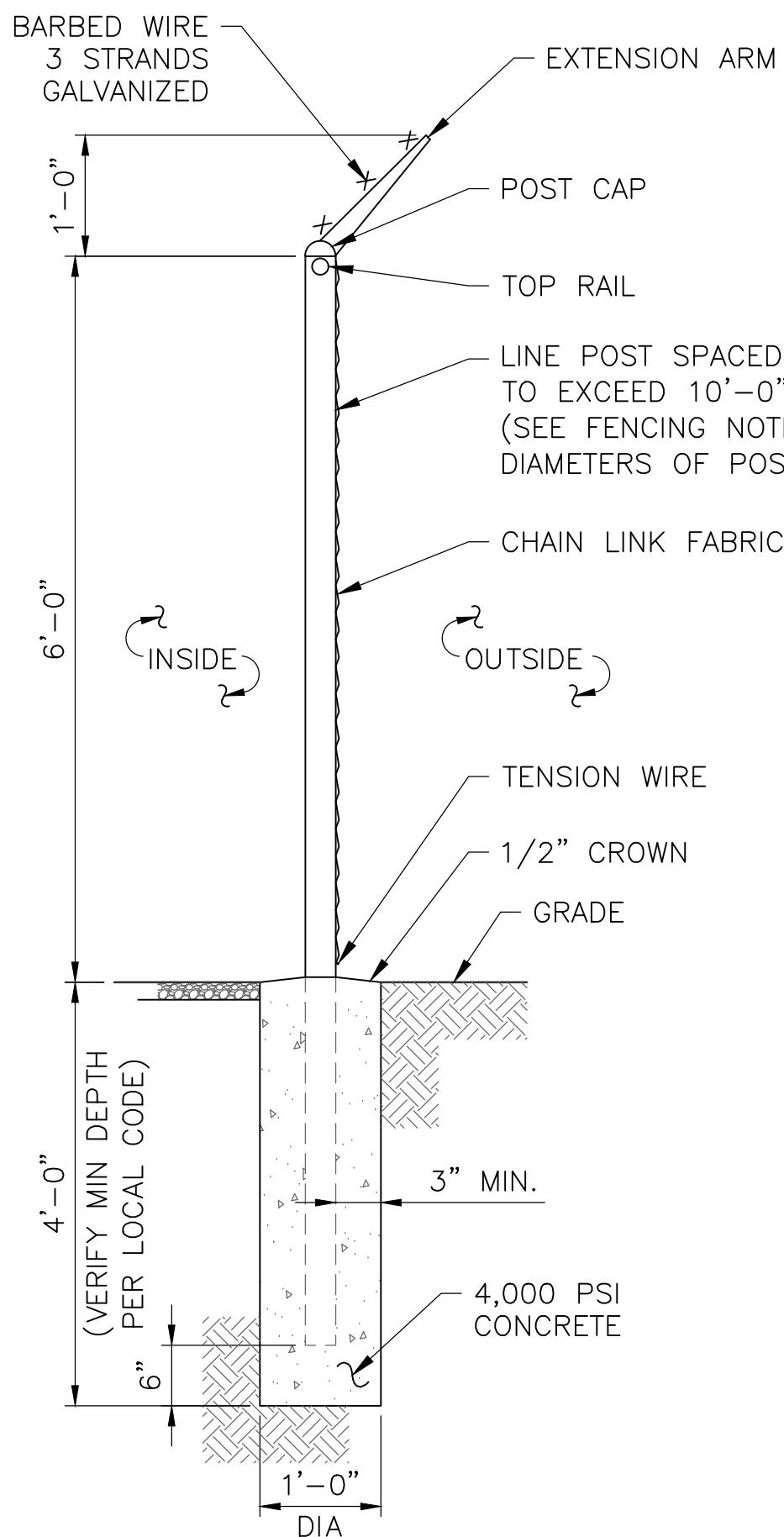
SHEET TITLE

ELEVATION &  
ORIENTATION PLAN

SHEET NUMBER

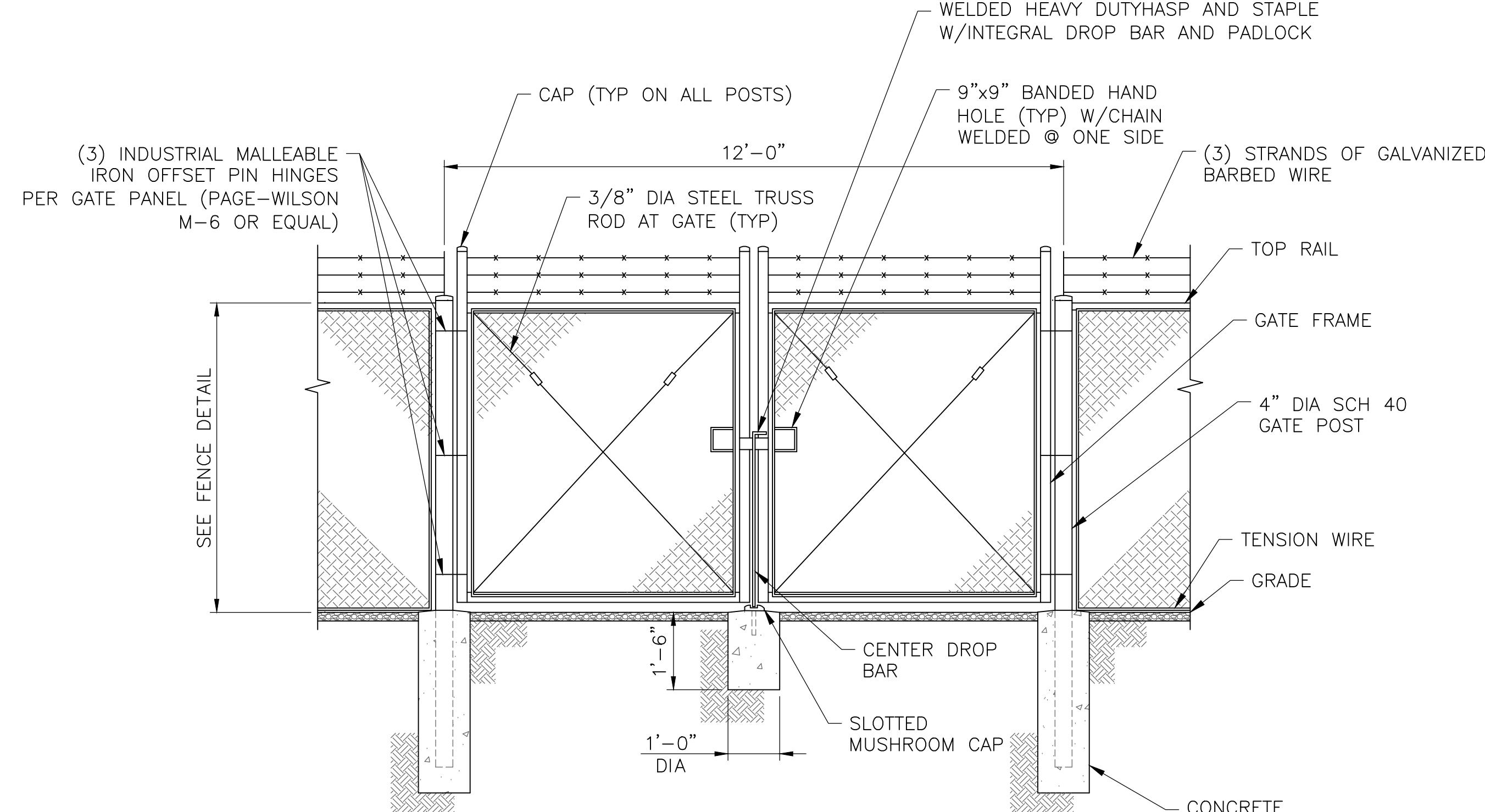
**C-3**



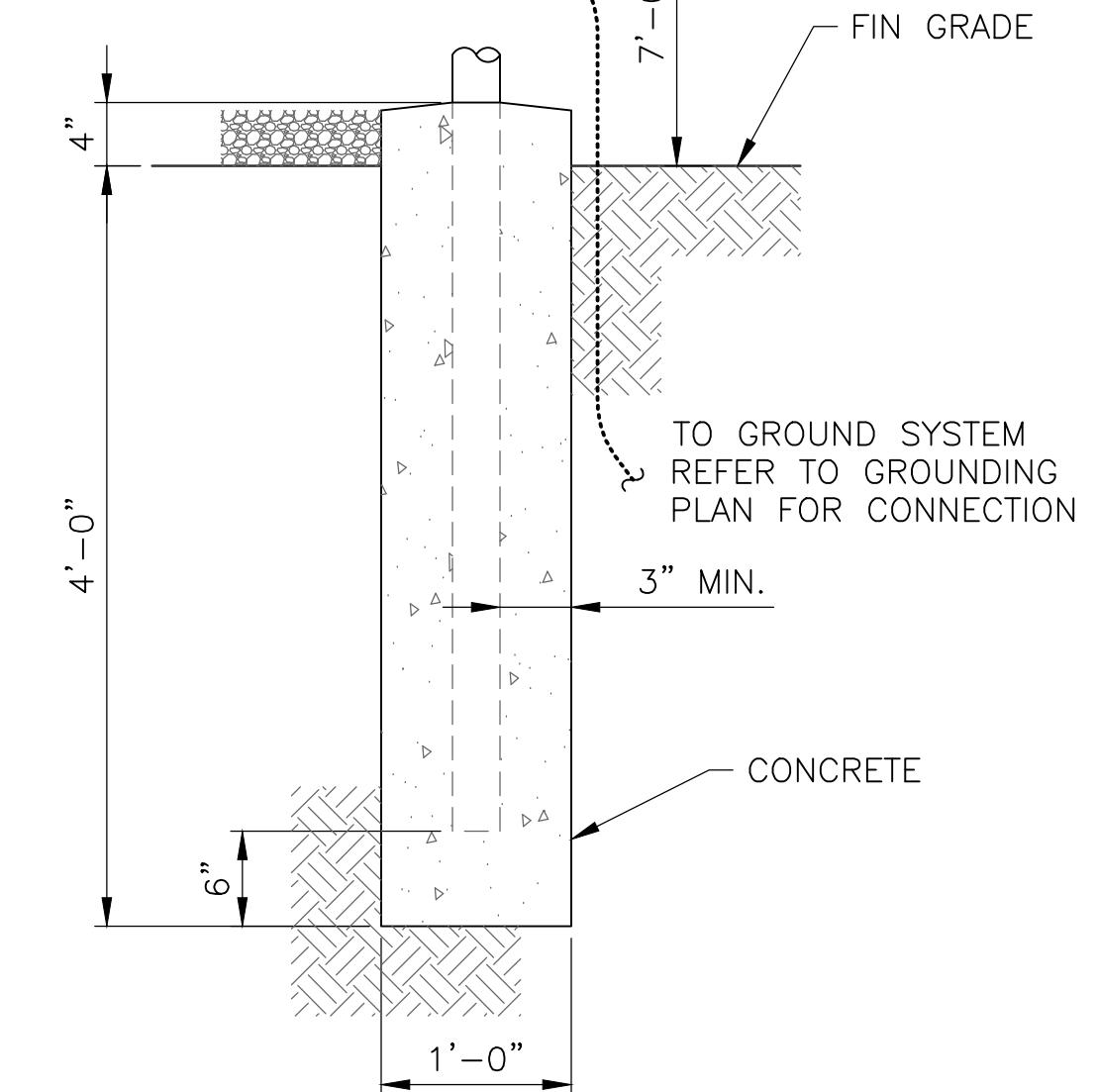
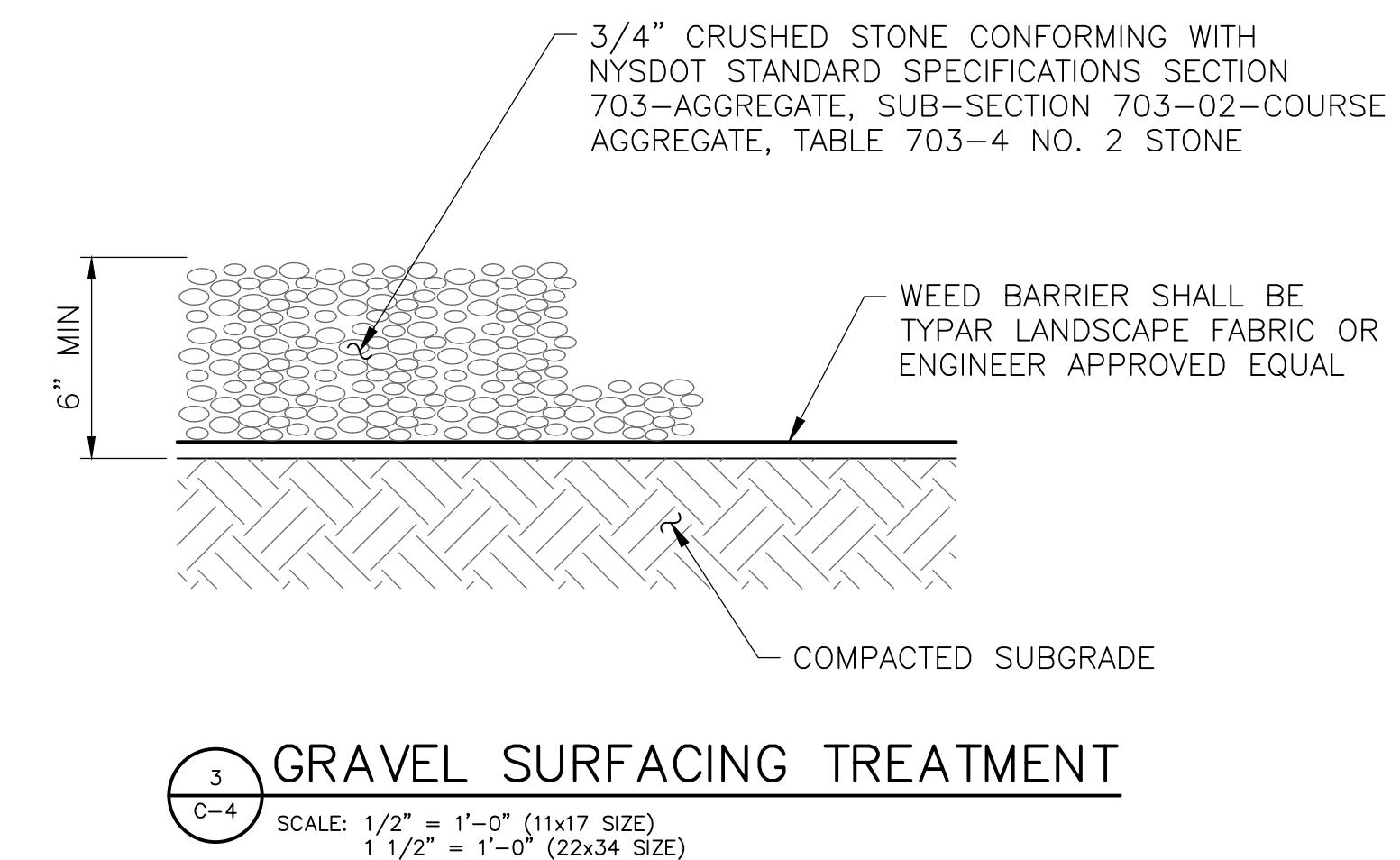


**1 FENCE DETAIL**  
C-4  
SCALE: 3/8" = 1'-0" (11x17 SIZE)  
3/4" = 1'-0" (22x34 SIZE)

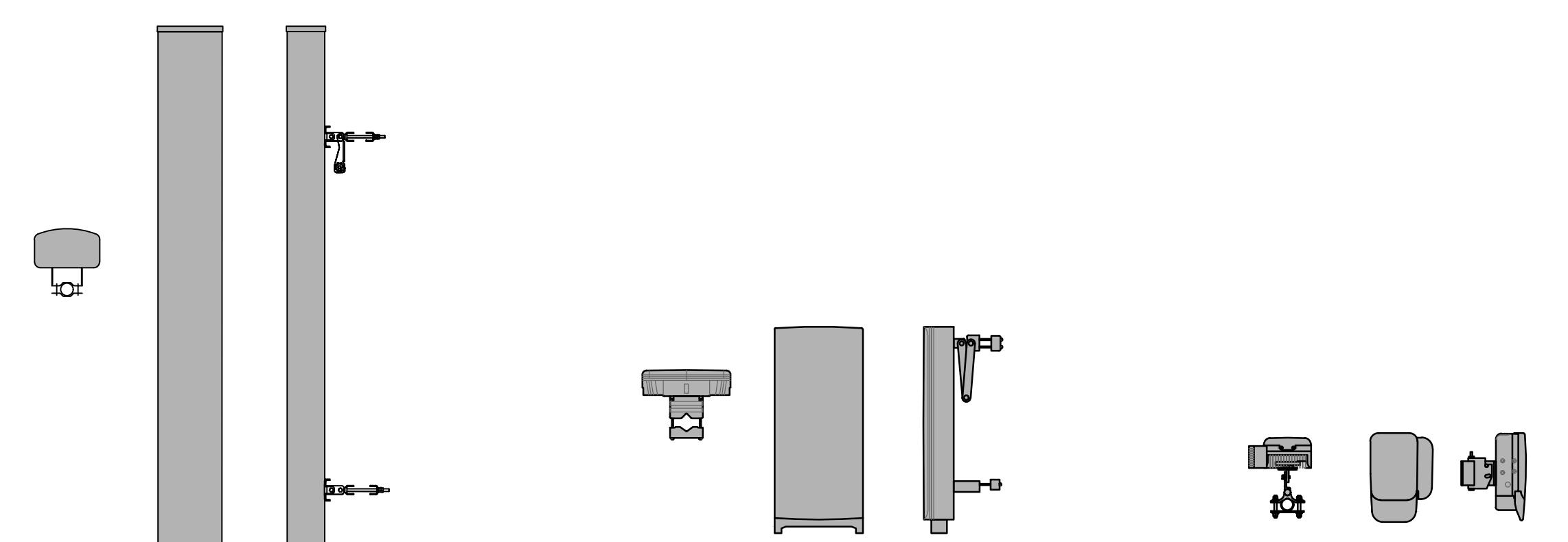
**2 BOLLARD DETAIL**  
C-4  
SCALE: 3/8" = 1'-0" (11x17 SIZE)  
3/4" = 1'-0" (22x34 SIZE)



**5 DOUBLE GATE DETAIL**  
C-4  
SCALE: 1/4" = 1'-0" (11x17 SIZE)  
1/2" = 1'-0" (22x34 SIZE)



**4 CABLE BRIDGE**  
C-4  
SCALE: 1/2" = 1'-0" (11x17 SIZE)  
1" = 1'-0" (22x34 SIZE)



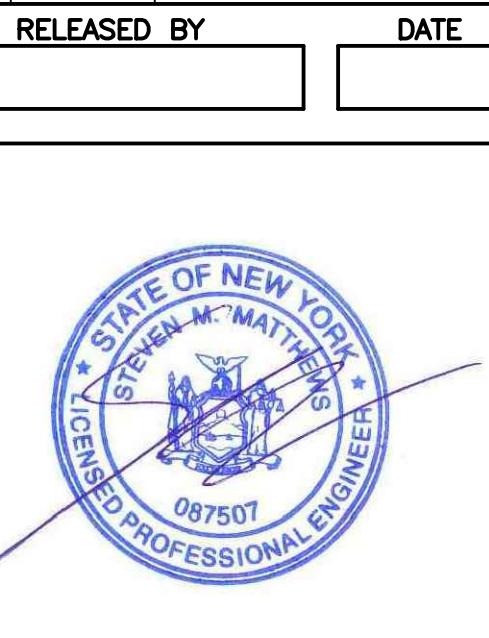
**6 ANTENNA DETAILS**  
C-4  
SCALE: 1" = 4' (11x17 SIZE)  
1" = 2' (22x34 SIZE)



Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C.  
70 Pine Hill Road  
P.O. Box 37  
Mountaintop, NY 10953  
Project No. 36  
36 British American Blvd.  
Suite 101  
Lothian, NY 12110  
Phone: (518) 783-1630

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0 1 2 3  
ORIGINAL SIZE IN INCHES

**SITE INFORMATION**  
MARLBORO HS  
RE PN: 20161555323  
LC: 442361

**SITE ADDRESS**  
50 CROSS RD  
TOWN OF MARLBOROUGH  
ULSTER COUNTY  
NY 12542

**SHEET TITLE**

**SITE DETAILS**

**SHEET NUMBER**

**C-4**

**verizon**

1275 JOHN STREET, SUITE 100  
WEST HENRIETTA, NY 14586

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799 Pittsford-Swilling Hill Road  
P.O. Box 37  
Mountaintop, NY 10953  
Project No. 36  
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0 1 2 3

ORIGINAL SIZE IN INCHES

SITE INFORMATION

MARLBORO HS  
RE PN: 20161555323  
LC: 442361

SITE ADDRESS

50 CROSS RD  
TOWN OF MARLBOROUGH  
ULSTER COUNTY  
NY 12542

SHEET TITLE

EQUIPMENT ELEVATIONS

SHEET NUMBER

**C-5**

