APPLICATION FOR SPECIAL PERMIT
FOR

27 PARK STREET
SOUTH HADLEY, MA

APRIL 7, 2015

Pittsfield Cellular Telephone Company
d/b/a Verizon Wireless
99 East River Drive
East Hartford, CT 06108

SPECIAL PERMIT APPLICATION

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As Adopted by Planning Board on December 13, 2010
Filed with Town Clerk on December 14, 2010

FORM SP

SOUTH HADLEY PLANNING BOARD

APPLICATION FOR SPECIAL PERMIT

Date April 7, 2015

Pursuant to the provisions of Chapter 40A of the General Laws of the Commonwealth of Massachusetts and the South Hadley Zoning By-Laws, the undersigned herewith submits the accompanying application for a Special Permit as described below and detailed in the supporting documentation which is incorporated into and made part of this application.

NATURE OF REQUEST (Check and Describe as Appropriate):

_____ **a. Alteration/expansion/change of a nonconforming use and/or structure**
_____ **b. Home occupation**
_____ **c. Professional business**
_____ **d. New/second hand car dealer**
_____ **e. Flag lot**
_____ **f. Two-family dwelling/Three-family dwelling**
_____ **g. Multifamily dwellings for more than three families**
_____ **h Flexible development**
X **i. Wireless communications facility**
_____ **j. Major earth removal, extraction, and/or fill activity**
_____ **k. Other (Describe _____)**

GENERAL DESCRIPTION OF REQUEST:

Verizon Wireless wishes to install antennas on an Alternate Tower Structure, a building on the Mount Holyoke campus, to improve wireless coverage to the center of town

APPLICABLE SECTIONS OF THE ZONING BYLAW:

Section 5(E); 7(s); 9

1. Applicant Bell Atlantic Mobile of Massachusetts Corporation, Ltd d/b/a Verizon Wireless

   Address 99 East River Drive
   East Hartford, CT 06108

   Telephone 413-737-1131 - Attorney Ellen Freyman, authorized agent

   Email Address: efreyman@ssfpc.com

2. Owner (if not applicant) Mount Holyoke College

   Address 50 College Street, South Hadley, MA

   Email Address: _____

3. Site Plan Preparer Hudson Design Group, LLC

   Title or License architect

   Address 1600 Osgood St, Building 20 North, Ste 3090, North Andover, MA 01845

   Telephone 1-978-557-5553

   Email Address: Doug Roberts - droberts@hudsondesigngroupllc.com

4. Deed of property recorded in the Hampshire County Registry of Deeds,
   Book 379 Page 185

5. Location and description of property (street and number if any) _____
   27 Park Street

   Assessors Map # 49 Parcel # 081

6. The subject property is presently in zoning district(s): RA-2

7. Is the subject property located within one or more of the Master Plan's Land Use Area Districts? No If so, in which of the districts or areas? _____

8. Is the subject property located in a National Historic District or listed as a Priority Heritage Landscape? No If so, which one? _____

9. Does the subject property abut a designated Scenic Roadway? No

10. Is the subject property within the designated South Hadley Falls Economic Opportunity Area? No

I, as applicant, certify that the application and all attachments are correct and complete.

Bell Atlantic Mobile of Massachusetts Corporation, Ltd
d/b/a Verizon Wireless

Signature of Applicant
Attorney Ellen W. Preyman, authorized agent

FOR PLANNING BOARD OFFICE USE:

11. Amount of Application Fee: _____ 12. Fee Paid? Yes ____ No ____

FOR TOWN CLERK (indicate date and time received:

Submission received on (Date)_____
at (time) _____

Signature _____

FORM SPR

SOUTH HADLEY PLANNING BOARD

APPLICATION FOR SITE PLAN REVIEW

Date April 7, 2015

File one completed application form together with ten (10) copies of the site plan with the Planning Board. One (1) copy of Form SPR shall be concurrently filed with the Town Clerk.

To the Planning Board:

The undersigned herewith submits the accompanying Site Plan for review as required by Section 12 of the Zoning By-Laws.

1. Applicant Bell Atlantic Mobile of Massachusetts Corporation Ltd d/b/a Verizon Wireless

   Address 99 East River Drive

   East Hartford, CT 06108

   Telephone 413-737-1131 - Attorney Ellen W. Freyman, authorized agent

2. Owner (if not applicant) Mount Holyoke College

   Address 27 Park Street, South Hadley, MA

3. Site Plan Preparer Hudson Design Group, LLC

   Title or License architect

   Address 1600 OSgood St, Building 20, Suite 3090m North Andover, MA 01845

4. Deed of property recorded in the Hampshire County Registry of Deeds,
   Book 379 Page 185

5. Location and description of property (street and number if any)

   27 Park Street

   Assessors Map # 48 Parcel # 081

6. Fee Paid: Yes X No

Signature of Applicant
Bell Atlantic Mobile of Massachusetts Corporation, Ltd
d/b/a Verizon Wireless by Ellen W. Freyman, authorized agent

Town Clerk:

Date of Submission April 7, 2015

Signature

CASH ONLY IF ALL *CheckLock*™ SECURITY FEATURES LISTED ON BACK INDICATE NO TAMPERING OR COPYING

SHATZ, SCHWARTZ AND FENTIN, P.C.
OPERATING ACCOUNT #2
1441 MAIN STREET
SPRINGFIELD, MA 01103-1406

TD BANK, NATIONAL ASSOCIATION
Springfield, Massachusetts 01103
53-7054/2113

09972

4/7/2015

PAY TO THE ORDER OF Town of South Hadley $ **125.00

One Hundred Twenty-Five and 00/100********** DOLLARS

▲ TAMPER RESISTANT TONER AREA ▲

MEMO Special Permit Appl.; VER005 140143 172 SBW

Donna Ridgway

⑈009972⑈ ⑆211370545⑆ 8240601802⑈

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Shatz, Schwartz and Fentin, P.C. 09972

Town of South Hadley	4/7/2015	
6200 · Client Disbursements	Special Permit Appl.; VER005 140143 172 SBW	125.00

TD Bank Client Expen Special Permit Appl.; VER005 140143 172 SBW 125.00

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SPRINGFIELD, MA 01103-1406

TD BANK, NATIONAL ASSOCIATION
Springfield, Massachusetts 01103
53-7054/2113

09973

4/7/2015

PAY TO THE ORDER OF Town of South Hadley $ **150.00

One Hundred Fifty and 00/100********** DOLLARS

▲ TAMPER RESISTANT TONER AREA ▲

PINK ICON DISAPPEARS WITH HEAT

MEMO Special Permit Appl.; VER005 140143 172 SBW

⑈009973⑈ ⑆211370545⑆ 8240601802⑈

Donna Ridgway Reid

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Town of South Hadley 6200 · Client Disbursements	4/7/2015 Special Permit Appl.; VER005 140143 172 SBW	150.00

TD Bank Client Expen Special Permit Appl.; VER005 140143 172 SBW 150.00

Book 379

785

Know all Men by these Presents, That I

Olive Chamberlin of South Hadley,

Olive Chamberlin

To

Mt. Holyoke Female Seminary.

in the County of Hampshire and Commonwealth of Massachusetts,

IN CONSIDERATION OF One thousand Dollars & other valuable consideration ~~Dollars,~~ paid by The Trustees of Mt. Holyoke Female Seminary, a Corporation established by law at said South Hadley,

the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Trustees, their successors and assigns, all that certain tract of land, with the buildings thereon, except the Store building, situate in said South Hadley and bounded and described as follows, viz: Beginning on the Easterly side of the highway leading from South Hadley to Holyoke at the Northwesterly corner of land of Mt. Holyoke Female Seminary and thence running Northerly along said Highway to a stone standing at the intersection of the Easterly side of said highway by the Southerly line of the highway leading to Granby; thence Easterly along said last mentioned highway and land now or late of Mrs. Tilly to land of Obed B. Bolton; thence Southerly along said Bolton's land to land of said Seminary, and thence Westerly along land of said Seminary to the place of beginning, containing about seven (7) acres and being the premises conveyed to me by deed of Samuel Pyne, recorded with Hampshire County Deeds, Book 268, Page 26, to which reference may be had. Reserving nevertheless to myself the Store building aforesaid, and the right to remove the same from said premises, at any time before the sixth day of June next, or within a reasonable time after the twenty fifth day of said June, also right to occupy the house, free of rent, for sixty days from date hereof.

TO HAVE AND TO HOLD granted premises, with all the privileges and appurtenances thereto

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belonging, to the said Trustee and their successors ~~heirs~~ and assigns, to ~~and~~ their own use and behoof forever. And I do hereby for myself and my heirs, executors and administrators, covenant with the said Grantee and their successors ~~heirs~~ and assigns, that I am lawfully seized in fee simple of the granted premises; that they are free from all incumbrances, save as aforesaid, that I have good right to sell and convey the same ~~to the~~ as aforesaid said and that I will and my heirs, executors and administrators shall

WARRANT AND DEFEND the same ~~premises~~ to the said Grantee, and their successors ~~heirs~~ and assigns forever, against the lawful claims and demands of all persons, save as aforesaid.

IN WITNESS WHEREOF, I the said Olive Chamberlin (Widow)

~~have~~ hereunto set my hand and seal this Seventh day of May in the year ~~of our Lord~~ one thousand eight hundred and eighty-three.

Signed, sealed and delivered in presence of

L. Morgan Smith.
Samuel Sears.

Olive Chamberlin. Seal

Commonwealth of Massachusetts.

HAMPSHIRE, ss. May 14th 1883.

Then personally appeared the above named Olive Chamberlin and acknowledged the foregoing instrument to be her free act and deed. Before me.

L. Morgan Smith Justice of the Peace.

HAMPSHIRE, ss. May 14 1883

9 o'clock 51 minutes A.M.

The foregoing is a true copy of the original.

Henry P. Billings Register.

NARRATIVE AND REQUEST FOR WAIVER

APPLICANT:	Bell Atlantic Mobile of Massachusetts Corporation, Ltd. d/b/a Verizon Wireless
PROPERTY:	27 Park Street South Hadley, Massachusetts
RELIEF SOUGHT:	Special Permit for Wireless Communications Facility pursuant to Section 5(E) and Section 7(S) of the South Hadley Zoning Bylaw

Pursuant to M.G.L.c. 40A, §9, and the above-referenced sections of the South Hadley Zoning Bylaw, Bell Atlantic Mobile of Massachusetts Corporation, Ltd. d/b/a Verizon Wireless ("Verizon Wireless") requests a special permit to permit the erection of antennas and related equipment on the roof of the Clapp Building on the campus of Mt. Holyoke College (the "Property"). The proposed installation will improve wireless coverage and capacity in the center of South Hadley.

Verizon Wireless is proposing to erect twelve (12) 8ft antennas and nine (9) remote radioheads attached to the façade of the Property and a 10'x20' equipment room within the roof eaves as shown on the plans. The antennas will be camouflaged and integrated into the existing building to mitigate any visual impact. The equipment room will house radio and related equipment of Verizon Wireless, including receiving, transmitting, switching, processing and performance monitoring equipment and automatic heating and cooling equipment and an emergency generator for use during power outages.

Verizon Wireless' equipment is monitored 24 hours a day through Verizon Wireless' switching facility. There are no personnel working at the site. Approximately once a month, a technician will visit the site during normal working hours for maintenance purposes. Parking is available for the technician's vehicle on the campus. Accordingly, Verizon Wireless requests a waiver from the requirement that it have a designated parking space in accordance with Section 6(D)(1) of the Bylaw. A sign of one square foot will be posted at the site listing Federal Communications Commission information and twenty-four hour emergency information. Both electrical and telephone service is required for the facility and will be installed according to the site plan.

The integration of each site within the Verizon Wireless "network" is critical to the efficient operation of the network. The site will "connect" to other Verizon Wireless sites located in South Hadley and Granby. Inadequate service within the center of the Town of South Hadley will be remedied by the installation of the facility at this site. The proposed installation of equipment on the Property is necessary to enhance 4G LTE service to Verizon Wireless' customers in South Hadley.

As noted, Verizon Wireless is also submitting with this application site plans, antenna specifications, and all other information regarding the applicant and the installation as required by the South Hadley Zoning Bylaw. Representatives of Verizon Wireless will be present at the public hearing to further describe the proposed installation and answer questions of the Board.

Thank you for your consideration of this application.

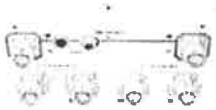
Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D65C

Andrew® Tri-band Antenna, 698–896 and 2 x 1710–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.



- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1710–1880	1850–1990	1920–2180	2300–2360
Gain, dBi	16.2	16.0	17.7	17.9	18.5	18.5
Beamwidth, Horizontal, degrees	66	64	70	65	63	58
Beamwidth, Vertical, degrees	8.9	7.8	5.7	5.2	5.0	4.4
Beam Tilt, degrees	0–11	0–11	0–7	0–7	0–7	0–7
USLS, dB	11	12	15	15	15	14
Front-to-Back Ratio at 180°, dB	29	31	27	27	28	27
CPR at Boresight, dB	27	21	18	19	16	19
CPR at Sector, dB	14	9	10	10	8	4
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	400	400	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1710–1880	1850–1990	1920–2180	2300–2360
Gain by all Beam Tilts, average, dBi	15.8	15.6	17.3	17.8	18.2	18.1
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.5	±0.3	±0.2	±0.5	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 16.0	0 ° | 15.8	0 ° | 17.3	0 ° | 17.7	0 ° | 18.0	0 ° | 17.9
	5 ° | 16.0	5 ° | 15.8	4 ° | 17.4	4 ° | 17.8	4 ° | 18.2	4 ° | 18.2
	11 ° | 15.5	11 ° | 15.2	7 ° | 17.3	7 ° | 17.7	7 ° | 18.1	7 ° | 18.2
Beamwidth, Horizontal Tolerance, degrees	±1.2	±1.9	±3.4	±3.8	±4.7	±3.7
Beamwidth, Vertical Tolerance, degrees	±0.6	±0.5	±0.3	±0.2	±0.3	±0.2
USLS, dB	13	14	17	16	17	15
Front-to-Back Total Power at 180° ± 30°, dB	26	24	27	25	25	26
CPR at Boresight, dB	29	22	20	21	19	21
CPR at Sector, dB	14	11	13	11	9	5

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® multiband with internal RET
Band	Multiband
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2360 MHz | 698 – 896 MHz

Mechanical Specifications

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All specifications are subject to change without notice. See www.commscope.com for the most current information. Revised: October 22, 2014

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D65C

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	879.0 N @ 150 km/h 197.6 lbf @ 150 km/h
Wind Speed, maximum	241.4 km/h | 150.0 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	2438.0 mm | 96.0 in
Width	301.0 mm | 11.9 in
Net Weight	22.5 kg | 49.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	11.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

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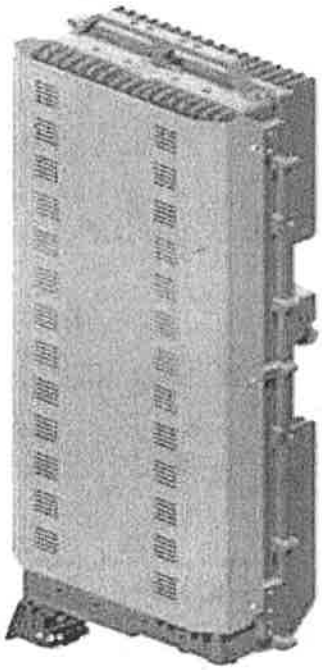
All specifications are subject to change without notice. See www.commscope.com for the most current information. Revised: October 22, 2014

ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
RRH2X60-AWS FOR BAND 4 APPLICATIONS

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.



A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

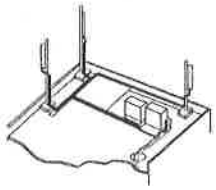
EASY INSTALLATION

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

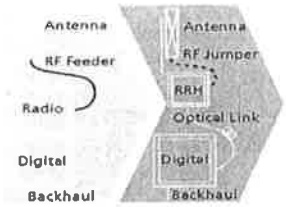
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

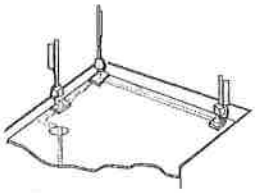
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

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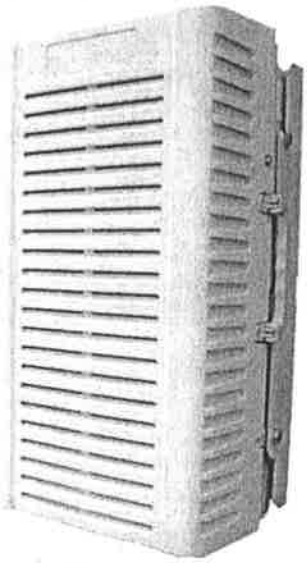
Alcatel·Lucent

AT THE SPEED OF IDEAS™

ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
RRH2X60-1900A-4R FOR BAND 2/25 APPLICATIONS

The Alcatel-Lucent RRH2x60-1900A-4R is a high power, small form factor Remote Radio Head operating in the PCS 1900MHz frequency band for WCDMA and LTE technologies. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.



A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-1900A-4R is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent RRH2x60-1900A-4R integrates all the latest technologies. This allows operators to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent RRH2x60-1900A-4R is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

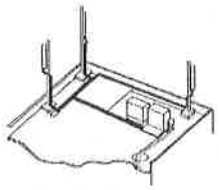
The Alcatel-Lucent RRH2x60-1900A-4R is a very cost-effective solution to deploy LTE MIMO.

EASY INSTALLATION

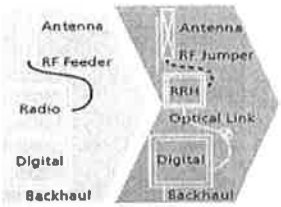
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-1900A-4R installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-1900A-4R is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

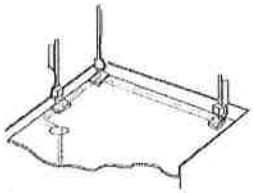
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-190A-4R is compact and weighs about 21 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-1900A-4R integrates two power amplifiers of 60W rating (at each antenna connector)
- RRH2x60-1900A-4R can operate WCDMA only, LTE only or a mix of WCDMA and LTE
- RRH2x60-1900A-4R offers the possibility for WCDMA (non MIMO) to operate the two radio chains independently (2 blocks of 20 MHz anywhere in the band)
- RRH2x60-1900A-4R is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO deployment and/or WCDMA and LTE simultaneous operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 500x285x208 mm (30l with solar shield)
- Weight : 21 kg (46 lbs) (with solar shield)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption: 460W typ. @2x60W (100%RF)

RF Characteristics

- Supported spectrum: DL 1930-1990 / UL 1850-1910
- Frequency band: 3GPP band 2/25
- Output power: 2x60W at antenna connectors
- Technology supported: W-CDMA and LTE
- Instantaneous bandwidth: 20 MHz (MIMO) or 2x20 MHz (non MIMO)
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -124.8dBm for WCDMA and -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 15km using SM fiber
- TMA/RETA: AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions: ETS300-019-1-4 class4.1E
- Ingress Protection: IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089
- Safety : IEC60950-1, EN 60825-1
- Regulatory: CE Mark-European Directive 2002/95/EC (RoHS), 2002/96/EC (WEEE), 1999/5/EC (R&TTE)
- Health : EN 50385

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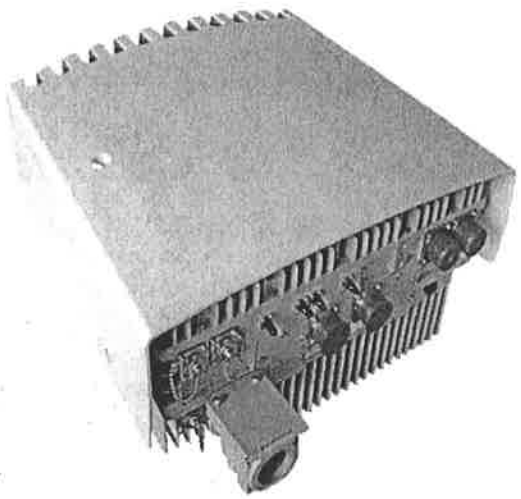
Alcatel·Lucent

ALCATEL-LUCENT REMOTE RADIO HEAD

RRH2X40 700 MHZ (B13)

The Alcatel-Lucent RRH2x40-07U is a high-power, small form-factor Remote Radio Head (RRH) operating in the North American Digital Dividend / 700MHz frequency band (3GPP Band 13). The Alcatel-Lucent RRH2x40-07U is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



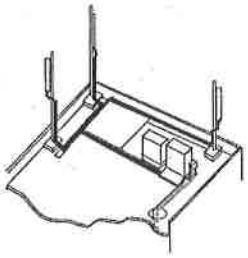
A distributed eNodeB expands deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-07U is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-07U has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to two-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 10 MHz of bandwidth.

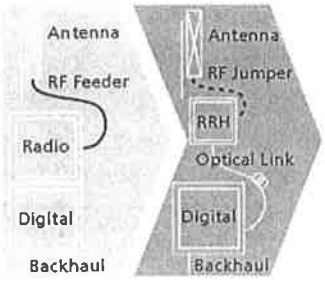
The Alcatel-Lucent RRH2x40-07U is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-07U installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

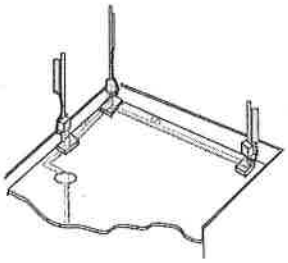
The Alcatel-Lucent RRH2x40-07U is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-07U is compact and weights less than 23 kg (50 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.



Macro



RRH for space-constrained cell sites



Distributed

Excellent RF performance

Because of its small size and weight, the Alcatel-Lucent RRH2x40-07U can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-07U where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-07U provides more RF power while at the same time consuming less electricity.

FEATURES

- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless), noise-free, and heaterless unit
- Best-in-class power efficiency, with significantly reduced energy consumption

BENEFITS

- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning

TECHNICAL SPECIFICATIONS

Dimensions
- Height: 400 mm (15.7 in.)
- Width: 380 mm (15 in.)
- Depth: 200 mm (7.9 in.)

Weight
- Approx. 23 kg (50 lb) (without mounting kit)

Power
- DC variant : - 48V
- Typical power consumption ≈ 310W @ 2x40W

Optical Interface
Type/number of fibers:
- Up to 2.4 Gbps
  - Single-Mode: one SM fibre per RRH2x40 carrying UL + DL using CWDM (@1550/1310nm)
  - Multi-Mode: Two MM fibers per RRH2x40, one for UL, 2nd for DL (@850 nm)
- Optical fiber length
  - Up to 300m, using MM fiber
  - Up to 15/40km, using SM fiber

Operating environment
- Outdoor temperature range:
  - ¬ With solar load: -40°C to+50°C (-40°F to +122°F)
  - ¬Without solar load: -40°C to+55°C (-40°F to +131°F)
- Passive convection cooling (no fans)
- Enclosure protection
  - ¬ IP65 (International Protection rating)

Electromagnetic Compatibility (EMC)
- FCC, GR1089

Safety
- CSA / UL

Radio Characteristics
- Frequency band: 700 MHz; 3GPP Band 13
- Bandwidth: up to 10 MHz
- RF output power at antenna port:
  - ¬ 40 W nominal RF power for each Tx port
- Rx diversity: 2-way
- Noise figure: below 2.5 dB typical
- ALD features
  - ¬ TMA
  - ¬ Remote electrical tilt (RET) support (AISG v2.0)

Alarms and ports
- Six external alarms
- Two optical ports to support daisy-chaining

About Alcatel-Lucent
Alcatel-Lucent (Euronext Paris and NYSE: ALU) provides solutions that enable service providers, enterprises and governments worldwide, to deliver voice, data and video communication services to end-users. As a leader in fixed, mobile and converged broadband networking, IP technologies, applications, and services, Alcatel-Lucent offers the end-to-end solutions that enable compelling communications services for people at home, at work and on the move. For more information, visit Alcatel-Lucent on the Internet: http://www.alcatel-lucent.com. **Copyright © 2012 by Alcatel-Lucent. All Rights Reserved.**
January, 2012

Alcatel·Lucent

Hudson Design Group LLC

April 7, 2015

Town of South Hadley
South Hadley Town Hall
116 Main Street
South Hadley, MA 01075

Re: Verizon Wireless Telecommunication Site
Site Name: South Hadley Center
MT Holyoke Collage
27 Park Street
South Hadley, MA 01075

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 Verizon Wireless telecommunication site at the above-referenced location. These costs are based on data compiled in the 2014 Building Construction Cost Data, 72st Annual Edition published by RS Means and from industry-specific data.

DESCRIPTION	UNIT	QTY	UNIT COST	TOTAL COST
MOBILIZATION AND DEMOBILIZATION	EA	5	$500.00	$2,500
CRANE RENTAL	DAY	3	$3,500	$10,500
REMOVE OF EQUIPMENT	EA	3	2000	$6,000
REMOVE BTS AND BATTERY CABINETS, AND GENERATOR	LH	48	$81.29	$4,877
REMOVE METER, TELCO DEMARK & CONDUITS	LF	265	$14.00	$3,180
REMOVE COAX CABLE & TRAYS	EA	1	$3,000.00	$3,000
HAUL AND DISPOSE MATERIALS	CY	50	$15.00	$750
FINAL CLEAN-UP	EA	1	$5,000.00	$5,000
SUBTOTAL				$35,807
CONTINGENCY			10%	$3,581
REGIONAL ADJUSTMENT			6.50%	$2,560
TOTAL COST				**$41,948**

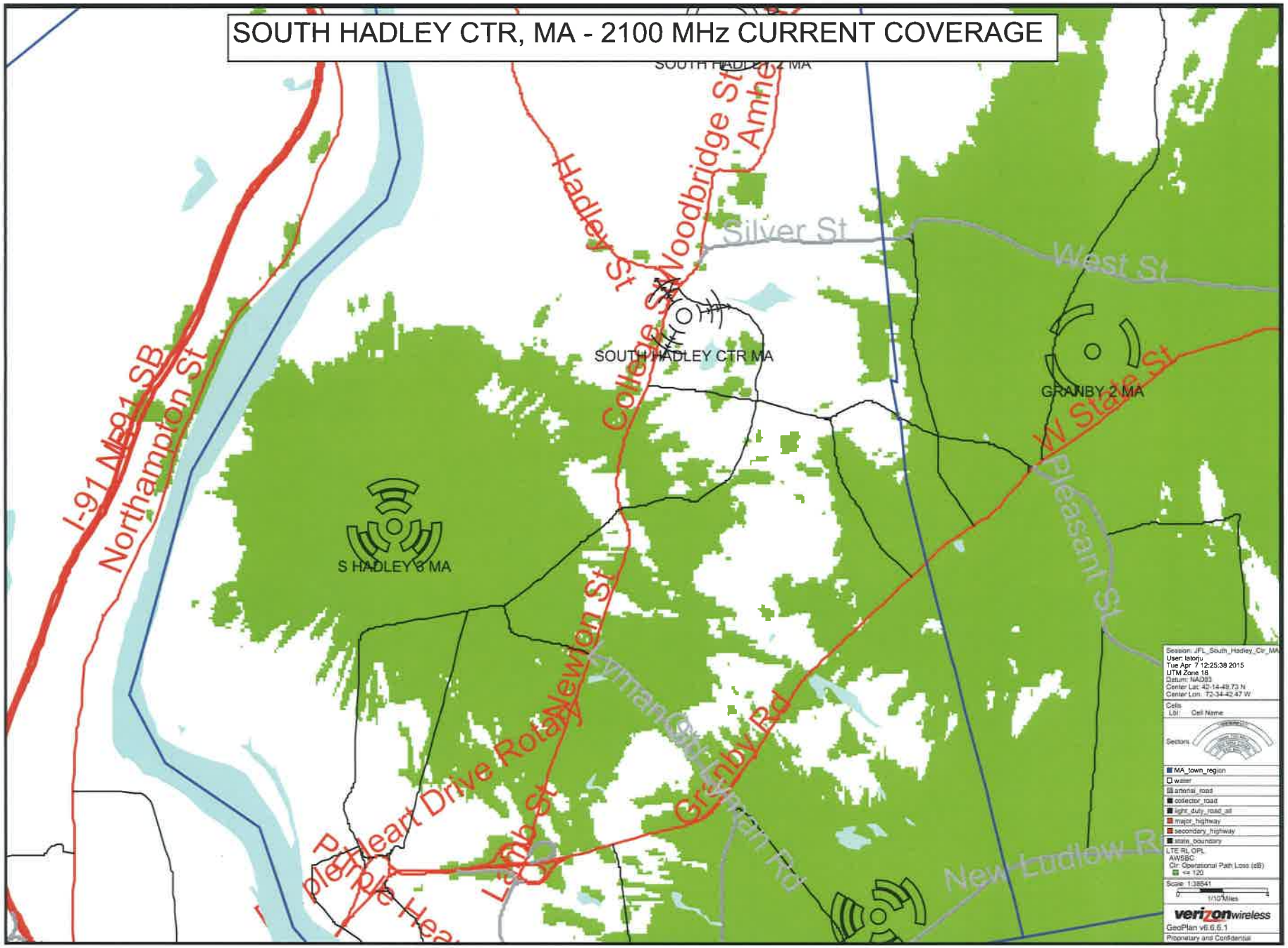
Based on the cost estimate provided in this report, it is my professional opinion that an appropriate surety amount to secure the removal of the facility would not exceed $41,948.

Very truly yours,

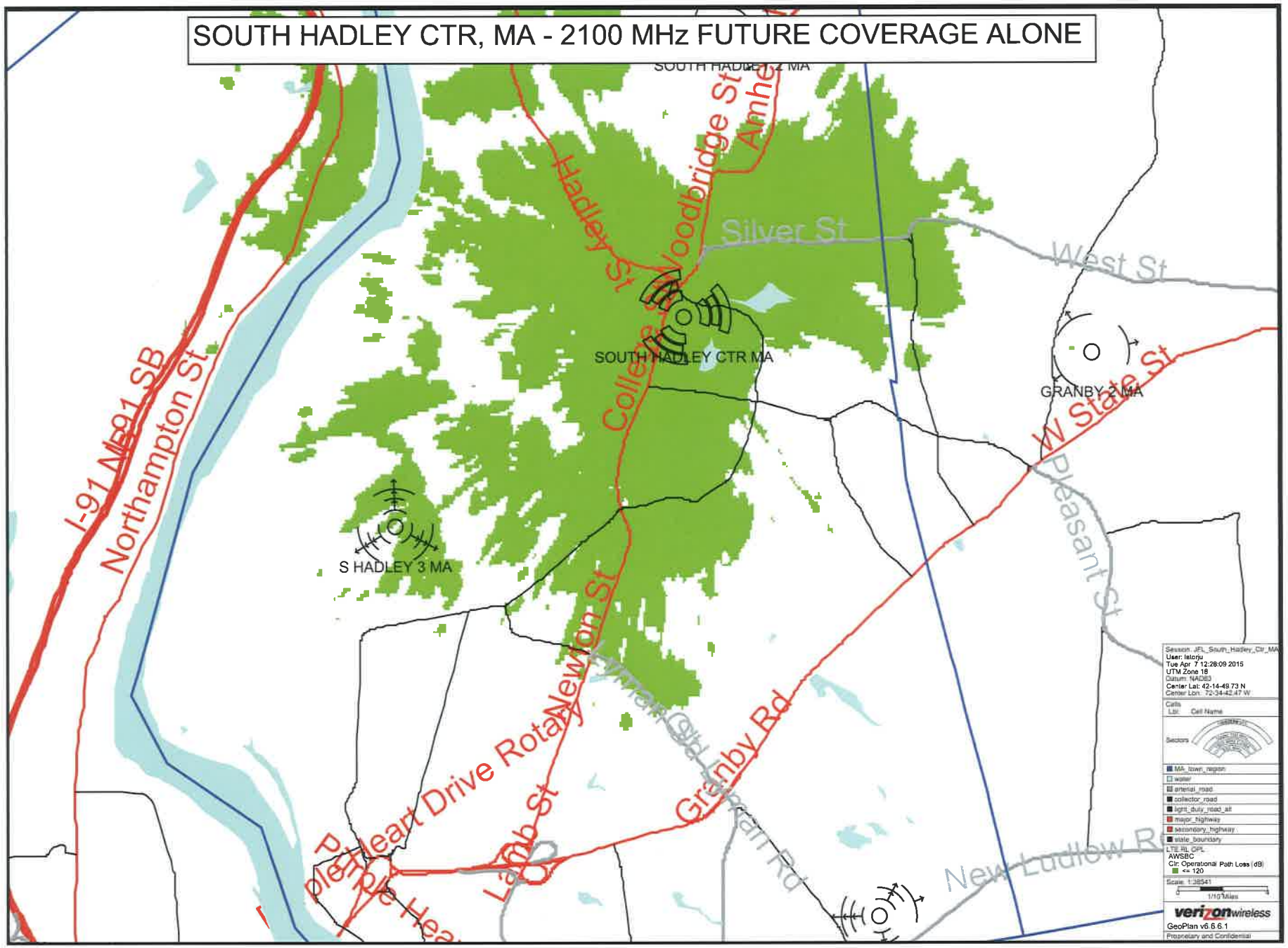
Douglas J. Roberts - Architect
Hudson Design Group LLC

p: 978.557.5553 f: 978.336.5586 a: 1600 Osgood Street, Building 20 North, Suite 3090, N. Andover, MA 01845
p: 413.588.8139 f: 413.517.0590 a: 116 Pleasant Street, Ste 302, Easthampton, MA 01027

SOUTH HADLEY CTR, MA - 2100 MHz CURRENT COVERAGE



SOUTH HADLEY CTR, MA - 2100 MHz FUTURE COVERAGE ALONE



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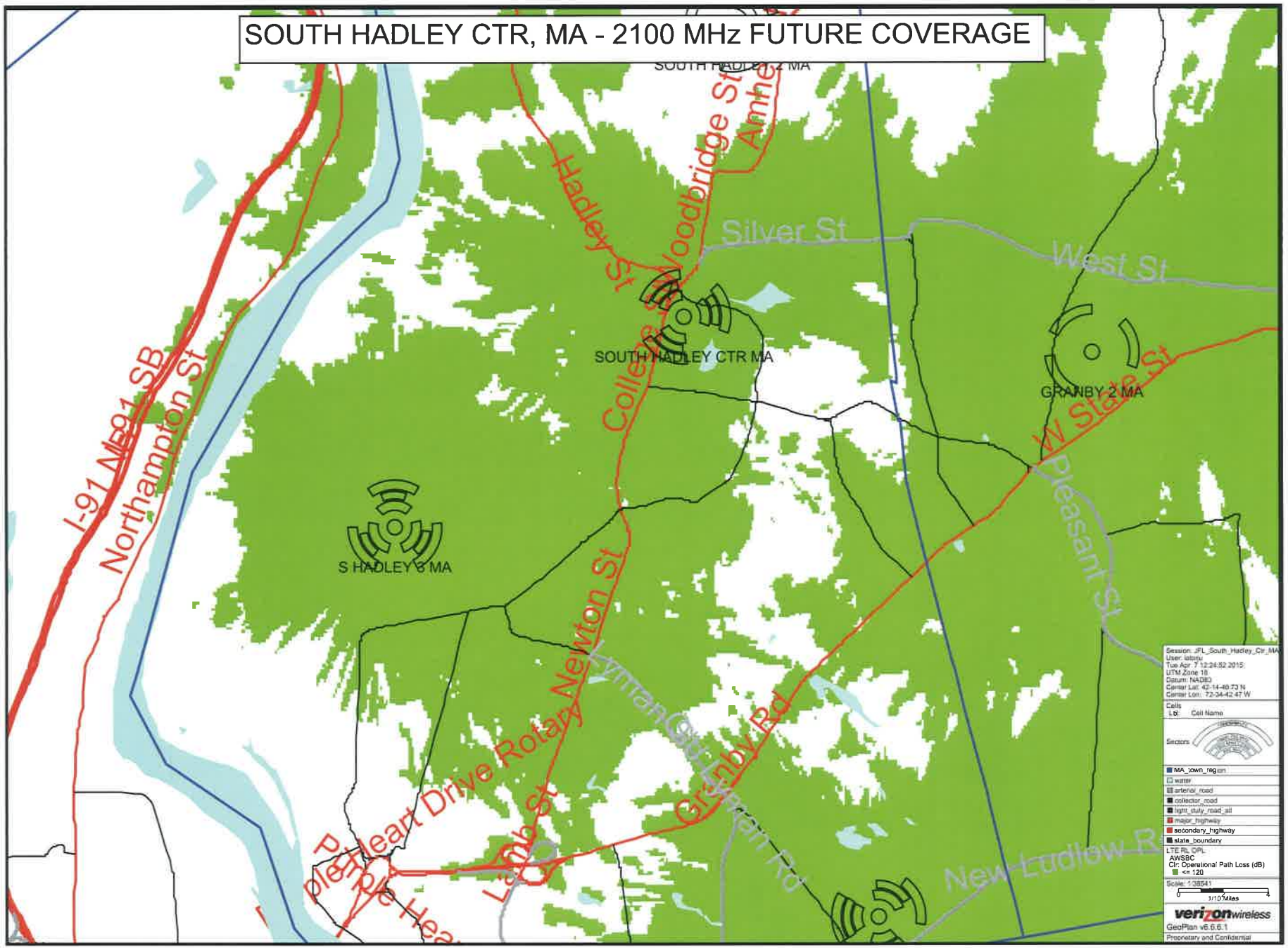
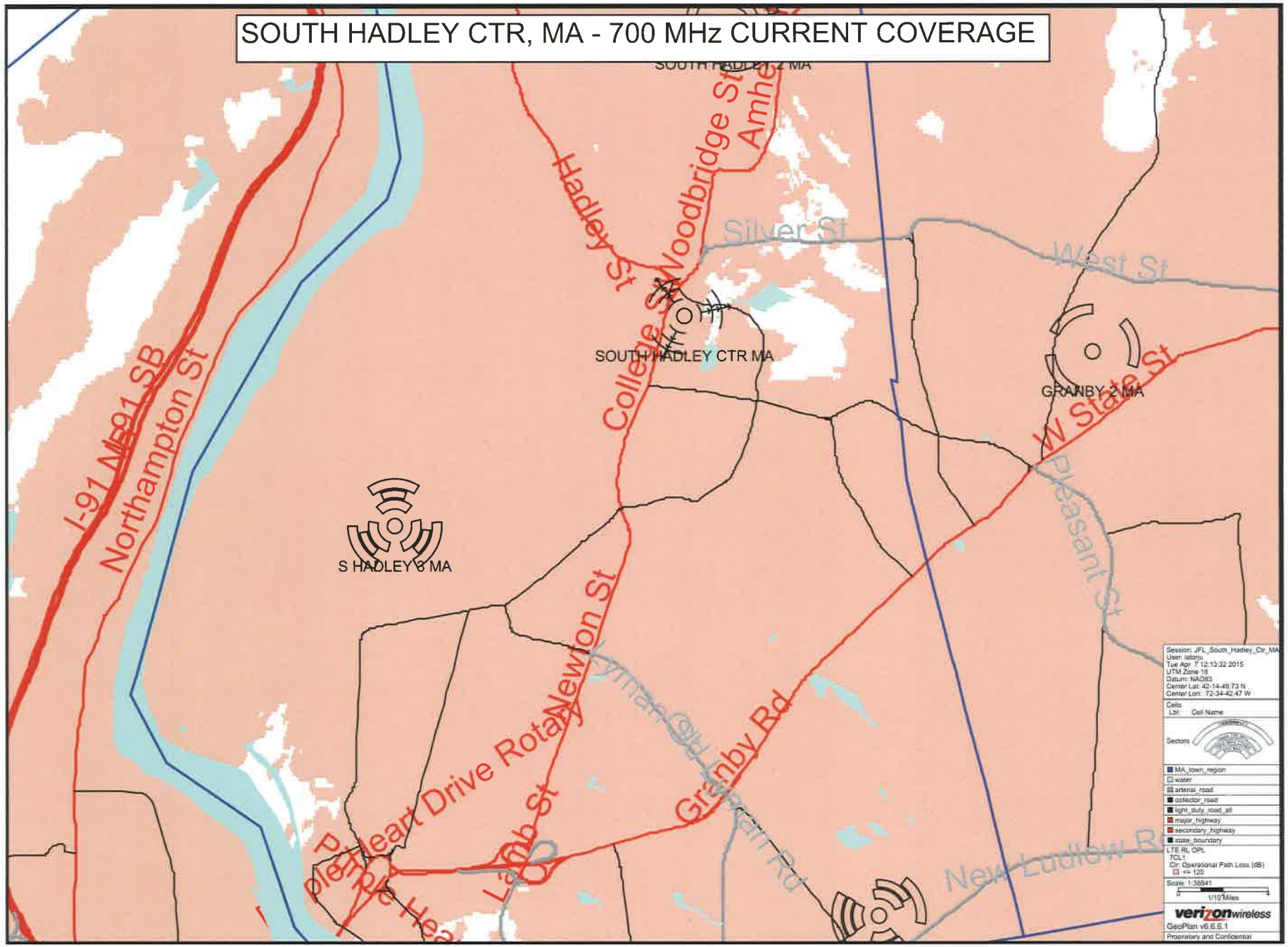
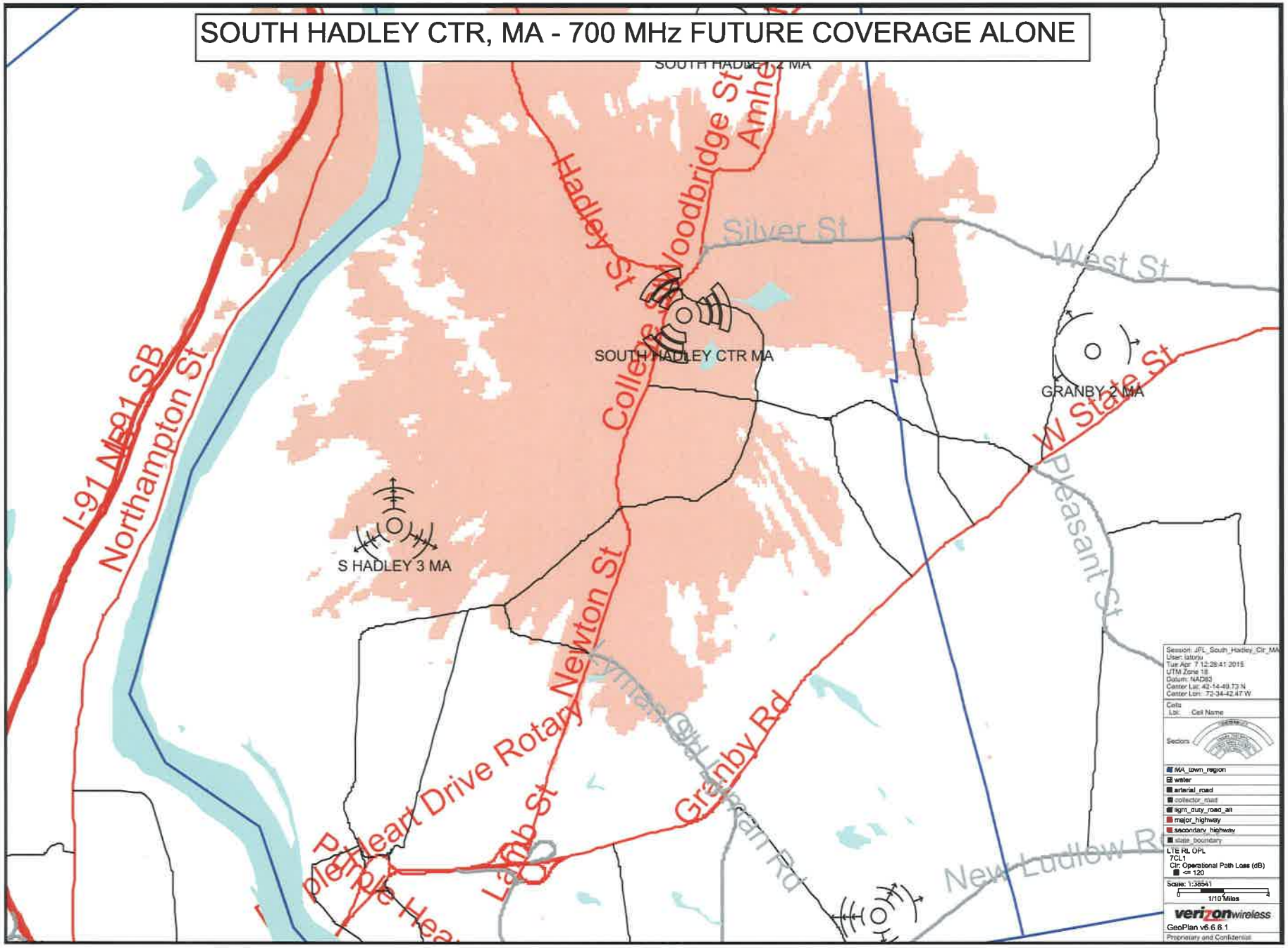


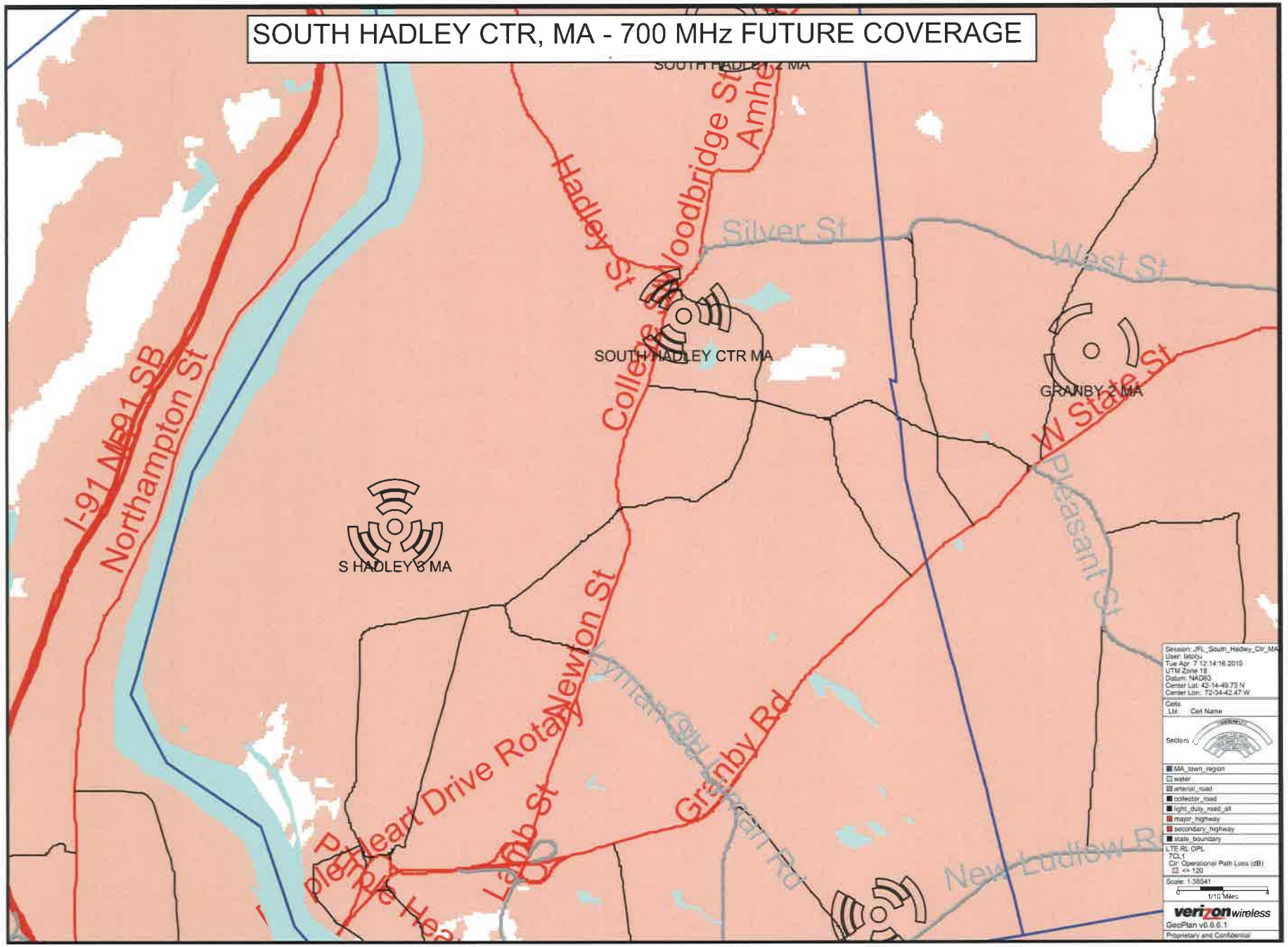
SOUTH HADLEY CTR, MA - 700 MHz CURRENT COVERAGE



SOUTH HADLEY CTR, MA - 700 MHz FUTURE COVERAGE ALONE



SOUTH HADLEY CTR, MA - 700 MHz FUTURE COVERAGE



Site Name: South Hadley Ctr, MA
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW PCS	1970	1	1500	1500	81	0.0822	1.0	8.22%
VZW Cellular	869	9	347	3123	81	0.1712	0.579333333	29.55%
VZW AWS	2145	1	1532	1532	81	0.0840	1.0	8.40%
VZW 700	698	1	1119	1119	81	0.0613	0.465333333	13.18%
Total Percentage of Maximum Permissible Exposure								59.35%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used.

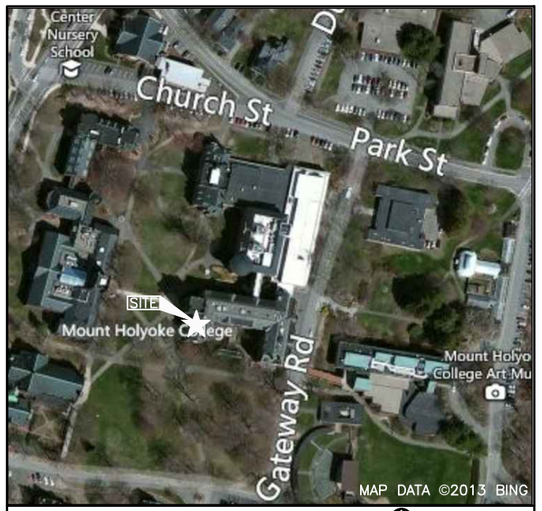
BELL ATLANTIC MOBILE OF MASSACHUSETTS CORPORATION, LTD.,

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

SOUTH HADLEY CENTER MA

27 PARK STREET
SOUTH HADLEY, MA 01075



VICINITY MAP **SCALE: N.T.S.**

DIRECTIONS TO SITE:

DEPART E RIVER DR TOWARD DARLIN ST
TURN LEFT TO STAY ON E RIVER DR
TURN LEFT ONTO US-44 / CONNECTICUT BLVD
TAKE RAMP LEFT FOR I-84 WEST TOWARD HARTFORD
AT EXIT 51, TAKE RAMP RIGHT FOR I-91 NORTH TOWARD SPRINGFIELD
AT EXIT 12, TAKE RAMP RIGHT FOR I-391 NORTH TOWARD HOLYOKE CTR
KEEP STRAIGHT ONTO RESNIC BLVD
BEAR LEFT ONTO W FRANKLIN ST, AND THEN IMMEDIATELY TURN RIGHT ONTO US-202 / BEECH ST
AT ROUNDABOUT, TAKE 2ND EXIT
TAKE RAMP RIGHT FOR RT-116 NORTH TOWARD S. HADLEY / AMHERST
TURN RIGHT ONTO RT-116 / LAMB ST
BEAR RIGHT ONTO CHURCH ST
KEEP STRAIGHT ONTO PARK ST
ARRIVE AT 27 PARK ST, SOUTH HADLEY, MA 01075.

CONSULTANT TEAM

PROJECT ENGINEER

HUDSON DESIGN GROUP, LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
NORTH ANDOVER, MA 01845
TEL: 1-(978)-557-5553
FAX: 1-(978)-336-5586

MEP ENGINEER

HUDSON DESIGN GROUP, LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
NORTH ANDOVER, MA 01845
TEL: 1-(978)-557-5553
FAX: 1-(978)-336-5586

PROJECT SUMMARY

SITE NAME:	SOUTH HADLEY CENTER MA
SITE ADDRESS:	27 PARK STREET SOUTH HADLEY, MA 01075
APPLICANT:	BELL ATLANTIC MOBILE OF MASSACHUSETTS CORP. LTD., d/b/a VERIZON WIRELESS
ZONING DISTRICT:	TOWN OF SOUTH HADLEY, MA
ZONING JURISDICTION:	RA-2 (RESIDENCE A-2)
LATITUDE:	N42° 15' 25.85"
LONGITUDE:	W72° 34' 28.26"
PARCEL ID:	MAP 49 LOT 81 & MAP 48 LOT 02
PROPERTY OWNER:	MT HOLYOKE COLLEGE 50 COLLEGE ST SOUTH HADLEY, MA

SHEET INDEX

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
C-1	PLOT PLAN
A-1	ROOF PLAN
A-2	ELEVATION

DIG SAFE
3 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE 888-DIG-SAFE
UNDERGROUND SERVICE ALERT

FOR ZONING

PREPARED FOR: BELL ATLANTIC MOBILE OF MASSACHUSETTS CORPORATION, LTD. D.B.A.
verizon wireless

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No.40720
REGISTERED PROFESSIONAL ENGINEER

Daniel P. Hamm

CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

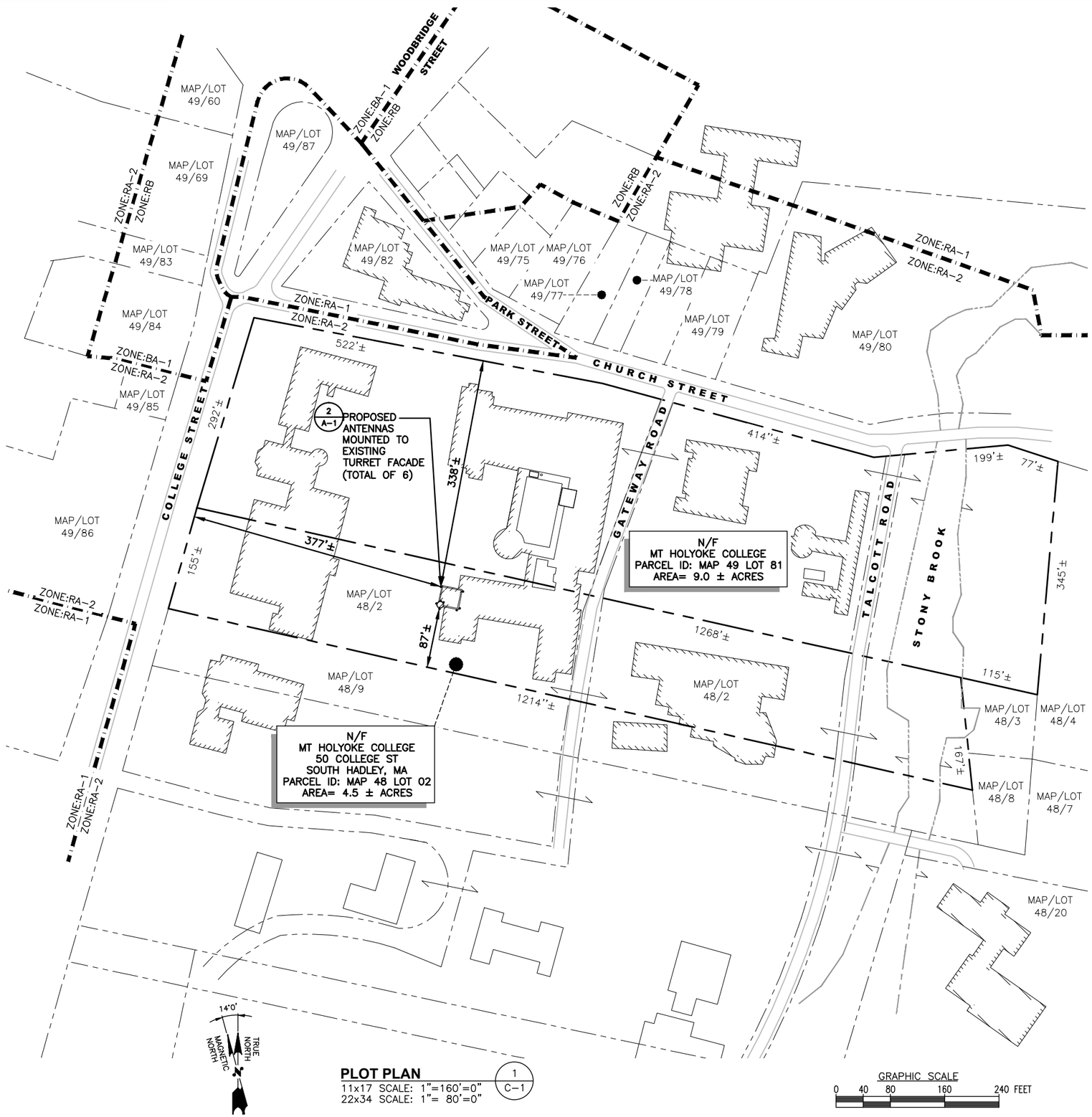
REV.	DATE	DESCRIPTION	BY
0	4/1/15	ISSUED FOR REVIEW	SZB

SITE NAME:
SOUTH HADLEY CENTER MA

SITE ADDRESS:
27 PARK STREET
SOUTH HADLEY, MA 01075

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



PLOT PLAN (1 / C-1)
11x17 SCALE: 1"=160'=0"
22x34 SCALE: 1"= 80'=0"

SOURCE:

TOWN OF SOUTH HADLEY ASSESSORS MAP AND MASS. GIS ONLINE MAPS

SITE SPECIFIC NOTES:

1. SITE SURVEY HAS NOT BEEN CONDUCTED BY HUDSON DESIGN GROUP, LLC FOR THIS PROJECT. ALL SETBACKS SHOWN ON THIS PLAN ARE TAKEN FROM THE FACE OF PROPOSED ANTENNAS TO PROPERTY LINES AND ARE APPROXIMATE.
2. VERIFY AZIMUTHS W/ RF ENGINEER.
3. PROPERTY LINE INFORMATION IS COMPILED FROM ASSESSORS PLAN AND RECORD DOCUMENTS 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.**

ZONING DISTRICT ABBREVIATIONS:

RA-1	RESIDENCE A-1
RA-2	RESIDENCE A-2
RB	RESIDENCE B

LEGEND:

- PROPERTY LINE-SUBJECT PARCEL
- PROPERTY LINE – ABUTTERS
- ZONING BOUNDARY LINE
- EXISTING BUILDING

ZONING INFORMATION

JURISDICTION:	TOWN OF SOUTH HADLEY, MA	
ZONING DISTRICT TYPE:	RA-2 (RESIDENCE A-2)	
DIMENSION REQUIREMENTS:	REQUIRED (FT)	PROP.± (FT)
FRONT YARD SETBACK:	25'	338'±
SIDE YARD SETBACK:	10'	337'±
REAR YARD SETBACK:	20'	87'±
MAXIMUM BUILDING HEIGHT:	35'	N/A
MAXIMUM LOT COVERAGE:	40%	N/A

(ALL MEASUREMENTS ARE IN FEET ± UNLESS OTHERWISE NOTED)

FOR ZONING

PREPARED FOR: BELL ATLANTIC MOBILE OF MASSACHUSETTS CORPORATION, LTD. D.B.A.

verizon wireless

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
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COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No. 40720
REGISTERED PROFESSIONAL ENGINEER

Daniel P. Hamm

CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

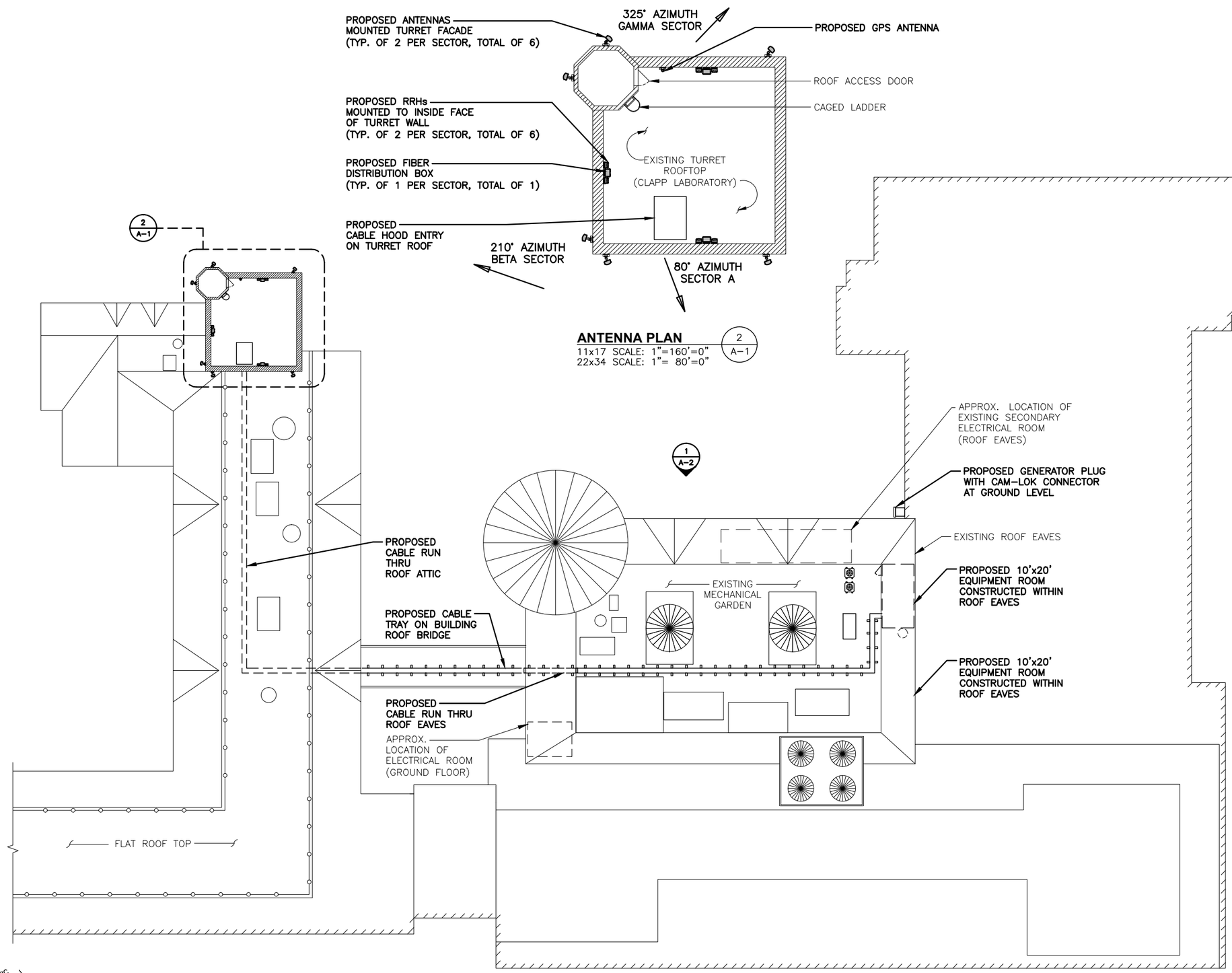
REV.	DATE	DESCRIPTION	BY
0	4/1/15	ISSUED FOR REVIEW	SZB

SITE NAME:
SOUTH HADLEY CENTER MA

SITE ADDRESS:
27 PARK STREET
SOUTH HADLEY, MA 01075

SHEET TITLE
PLOT PLAN

SHEET NUMBER
C-1



FOR ZONING

PREPARED FOR: BELL ATLANTIC MOBILE OF MASSACHUSETTS CORPORATION, LTD. D.B.A.

verizon wireless

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Daniel P. Hamm

CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	4/1/15	ISSUED FOR REVIEW	SZB

SITE NAME:
SOUTH HADLEY CENTER MA

SITE ADDRESS:
27 PARK STREET
SOUTH HADLEY, MA 01075

SHEET TITLE
ROOF PLAN

SHEET NUMBER
A-1

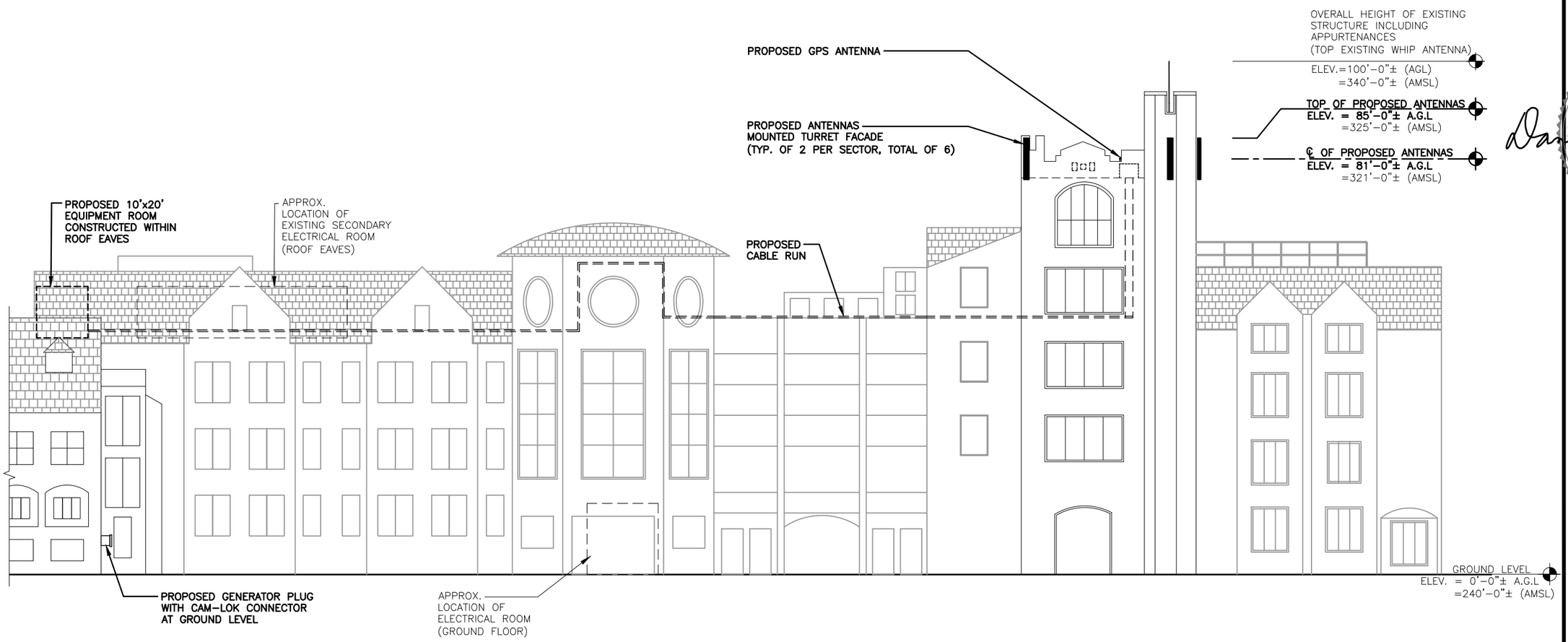
PROPOSED ANTENNA INFORMATION			
SECTOR	STATUS	AZIMUTH	CABLE LENGTH
ALPHA	PROPOSED	80°	388'
BETA	PROPOSED	210°	420'
GAMMA	PROPOSED	325°	450'

NOTE: CABLE LENGTH = EXACT LENGTH PLUS 25'

APPROXIMATE COORDINATES: LAT: N42° 15' 25.85" LONG: W72° 34' 28.26"

NOTE:

AN ANALYSIS OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS NOT BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC. DRAWINGS ARE SUBJECT TO CHANGE PENDING OUTCOME OF A STRUCTURAL ANALYSIS.



ELEVATION (1 / A-2)
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

GRAPHIC SCALE
0 5'-4" 10'-8" 21'-4" 32'-0"

FOR ZONING

PREPARED FOR: BELL ATLANTIC MOBILE OF MASSACHUSETTS CORPORATION, LTD. D.B.A.
verizon wireless

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COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No. 40720
REGISTERED PROFESSIONAL ENGINEER

Daniel P. Hamm

CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	4/1/15	ISSUED FOR REVIEW	SZB

SITE NAME:
SOUTH HADLEY CENTER MA

SITE ADDRESS:
27 PARK STREET
SOUTH HADLEY, MA 01075

SHEET TITLE
ELEVATION

SHEET NUMBER
A-2