



CITY OF SOMERVILLE

Commonwealth of Massachusetts
93 Highland Avenue
Somerville, MA 02143
(617) 625-6600

BUSINESS LICENSE APPLICATION - Small Wireless Facility

File #: 21-001927

License #: BL21-000019

Address: 40 Marion Street

Licensee: Derek Maheux Centerline Communications

DBA Name: Verizon Wireless

Business Ownership Type: Partnership / LLP

Legal Name of Entity: Cellco Partnership d/b/a Verizon Wireless

Owners/Officers: , , ,

License Information:

Do you believe this to be a 6409(a) application?: Don't Know

Describe the reason for the work, and the intended beneficiaries: The proposed small cell installation will enhance network capacity and coverage and bring improved wireless service to Somerville and the immediately surrounding area.

Provide the detailed description of the work that should appear on the License: Proposed installation of a small cell wireless facility on an existing Eversource utility pole

of installations on existing poles: 1

of installations on new poles: 0

Provide the legal name of the entity that will own the License: Cellco Partnership d/b/a Verizon Wireless

Approval Conditions:

Approved By:

Hans Jensen, Approved

Karla Cuarezma, Approved

Malik Drayton, Approved with Conditions

APPROVAL CONDITION: MD20210225: Contractor shall take all necessary precautions to avoid damaging any tree or tree part with equipment.

APPROVAL CONDITION: MD20210225: All nearby street tree(s) shall be protected prior to and during all construction activities using TREE BOX or TREE WRAPS. . TREE BOX shall be constructed from 2 in. x 4 in. lumber creating a box around the border of the tree pit with 2 in. x 4 in. lumber standing straight up at the corners and wrapped with orange snow fence. Detail attached. . TREE WRAPS

(TREE TRUNK WRAPPING PROTECTION LUMBER) shall consist of 2 in. x 4 in. and 8 ft. height lumber wired together in close spacing with zip ties or 16 gauge galvanized steel wire to form a protective enclosure around tree trunks. Use burlap to separate the wood from the bark if necessary to prevent wood from scraping or bruising bark. Do not use staples or puncture the trunk in any way.

APPROVAL CONDITION: MD20210225: Any tree roots less than two (2) inches in diameter that cannot be avoided during construction shall be carefully and cleanly cut with a clean pair of pruning shears or loppers. Roots are to be cut back flush with the edge of the trench. If any tree roots greater than two (2) inches in diameter are encountered, stop work immediately and contact the City Urban Forester. Any and all pruning of roots greater than 2 inches in diameter must be completed under the supervision of the City Urban Forester.

John Power, Approved with Conditions

Electrical Review approved, conditional upon electrical permit application/approval for scope of work.

Mark Lawhorne, Approved

John J. Long, Approved

118 Flanders Road
Third Floor
Westborough, MA 01851

Sean Conway
Principal Engineer

February 10, 2021

City of Somerville City Council
c/o City Clerk's Office
93 Highland Avenue
Somerville, MA 02143

Re: Verizon Application for Small Wireless Facilities ("SWF")

Dear City Clerk and City Council Members:

Enclosed please find the application of Cellco Partnership d/b/a Verizon Wireless ("Verizon") for approval to install SWF on existing wooden utility poles within Somerville's public right of way at the following locations:

| Site Name | Address | Pole # |
|----------------|---------------------|-------------------|
| BOS_SOM_032_MA | 299 Medford Street | unmarked |
| BOS_SOM_034_MA | 434 McGrath Highway | unmarked |
| BOS_SOM_060_MA | 53 Concord Avenue | 112/3 |
| BOS_SOM_061_MA | 40 Marion Street | 221/5 |
| BOS_SOM_072_MA | 15 Ivaloo Street | BECO1179/ VZ179/1 |
| BOS_SOM_076_MA | 2 Belmont Street | unmarked |
| BOS_SOM_086_MA | 40 Bow Street | unmarked |

Consistent with the City Clerk's proposed fees for a SWF license approved by the City Council on July 11, 2019, Verizon shall submit a New License Fee of \$100.00 per installation upon approval of each location included in the application. Under the City's Ordinance Relative to Small Wireless Facilities in the Public Rights-of-Way ("Ordinance"), Section 12-144(a), no public hearing is required.

Included within the application are a set of plans for each proposed location along with a structural analysis for each existing utility pole as well as a license granted from the pole owner (Eversource) to Verizon to install the SWF at each proposed location. Additionally, we have included a compliance letter along with a diagram which shows that each proposed antenna array is more than fifteen (15) feet from a residence's window, door opening, porch or balcony as required by the City's Design Standards for Small Wireless Facilities Placement in the Public Right-of-Way ("Design Standards"). Further, as described in detail below, Verizon respectfully requests a waiver of two (2) dimensional requirements in the Ordinance that materially inhibit Verizon's ability to provide 5G services in Somerville.

Request For Waiver

Under the City's Design Standards, an applicant may request a waiver of any of the requirements in the Ordinance or Design Standards as long as the applicant "specif[ies] those provisions for which it seeks a waiver, and . . . include[s] specific explanations as to the need for waiver of each, including an explanation of why compliance with the requirement(s) would prohibit or effectively prohibit the provision of services as protected by applicable law." This provision acts as a "safety valve" that recognizes that advanced network equipment, including the equipment used for



5G, is evolving and subject to changes over time. Without this safety valve, restrictive dimensional requirements would act as an effective prohibition of wireless services in violation of Federal Communications Commission requirements.

- Waiver Request #1: Verizon requests that the City waive the requirement in Section 12-148(e) of the Ordinance that requires that “antennas shall be limited to snug-mount, canister-mount, and concealed . . . with a diameter of no more than six inches greater than the diameter of the [top of the] pole.” It is not technically feasible to comply with the canister requirement because use of such a canister would make the antenna ineffective. Simply put, while Verizon’s 5G antennas meet the “snug-mount” requirement, the antennas are not able to be located within canisters. Unlike 4G antennas, which are often referred to as “cantennas” due to their shape, Verizon’s panel 5G antennas are not contained within canisters. Each individual antenna in the array has a height of 19.3”, width of 11” and depth of 7.9”. It is important to note that even if Verizon were able to deploy such a canister around the antenna array, the size of the resulting structure would exceed the 3 cubic foot requirement called for in the Ordinance. Additionally, a canister surrounding the antenna array could potentially interfere with transmission of Ultra-Wide-Band (UWB) 5G signals which can be blocked by nearby surfaces.

Similarly, the 5G equipment being proposed by Verizon slightly exceeds the requirement that a pole-top antenna diameter be no more than 6” greater the diameter of the top of the pole. The Verizon 5G equipment exceeds the pole top diameter by approximately 8” rather 6”. This minor exception is warranted because the overall design proposed by Verizon (that does not include a canister) also eliminates the need to install fan that is required for cooling the equipment that is in a canister. The use of fans, and the resulting noise from the fans, is discouraged by the Ordinance in residential areas. In fact, the use of fans and their noise was a big part of the discussion when the City Council was developing the Ordinance. Finally, the small increase of diameter in array allows for the proper promulgation of the UWB 5G signal unique to the Verizon UWB 5G service. Attached to this letter is a diagram showing the proposed 5G SWF antenna array in detail. This design is used by Verizon in all Massachusetts 5G communities, including Boston, Arlington, Malden and Cambridge.

- Waiver Request #2: Verizon requests that the City waive the requirement in Section 12-148(d) of the Ordinance that requires that “[p]ole-mounted equipment minimum heights to the bottom of the equipment shall be 15 feet above sidewalk elevation.” As shown in the detailed plans included with this application, the lowest piece of equipment associated with the SWF facility (i.e., the “load center”) is located at a height of 10 feet above sidewalk elevation. It is not technically feasible to locate the load center at 15 feet height or higher because it is the utility pole owner (in this case, Eversource), that establishes SWF equipment height based on the electrical equipment and other attachments already on the pole. Moreover, the load center (also known as a “disconnect box”) contains the switch that can be accessed by emergency personnel to shut off power to the antenna in an emergency and must be able to be accessed by emergency personnel. In discussions with City personnel on September 22, 2020 and October 6, 2020, it is Verizon’s understanding that the City is in agreement with this waiver request.

Taken as a whole, Verizon’s waiver requests allow for the use of smaller equipment that will emit less noise because it eliminates the need for fans and uses existing utility poles for the placement of 5G equipment. All of these benefits are part of the language and intent of the Ordinance and Design Standards. Without granting of these waiver requests, Verizon’s ability to provide 5G in Somerville would be materially inhibited and would constitute an effective prohibition. For all these reasons, Verizon respectfully requests that the City grant its waver requests and approve the SWF applications contained herein.

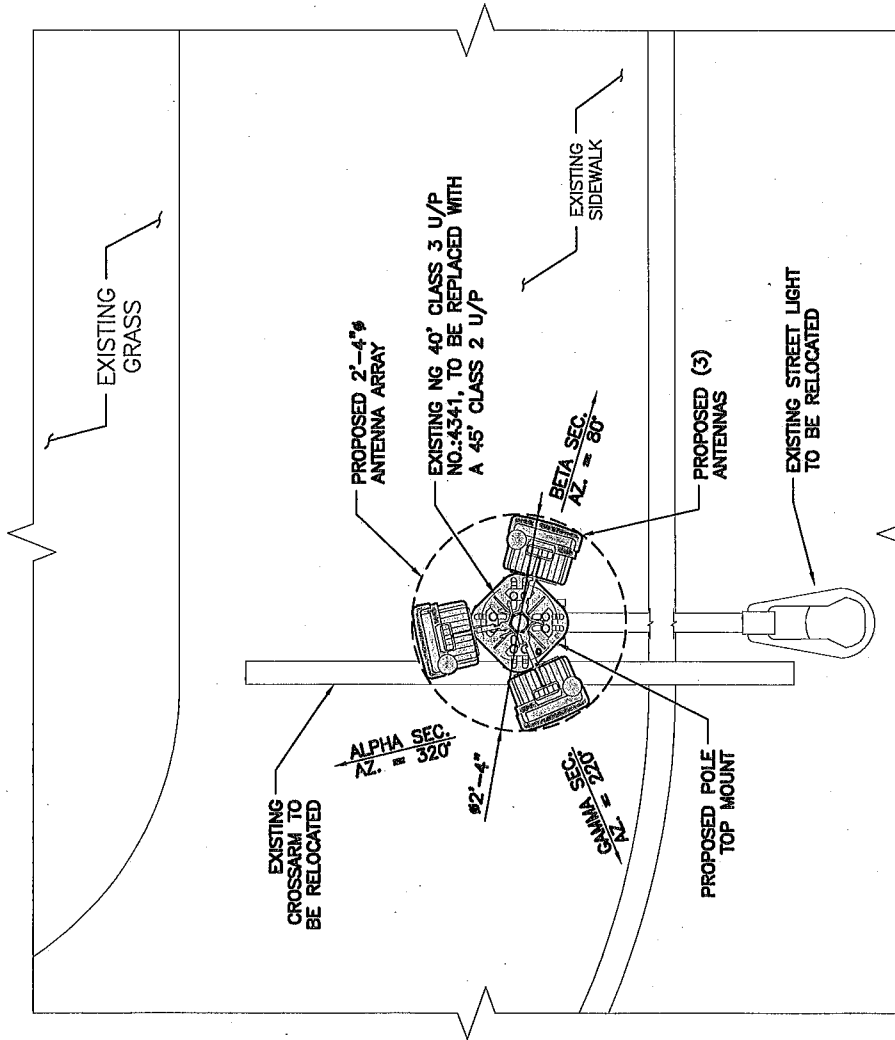
Respectfully Submitted,

Sean Conway

Sean Conway
Principal Engineer
(508) 320-2017

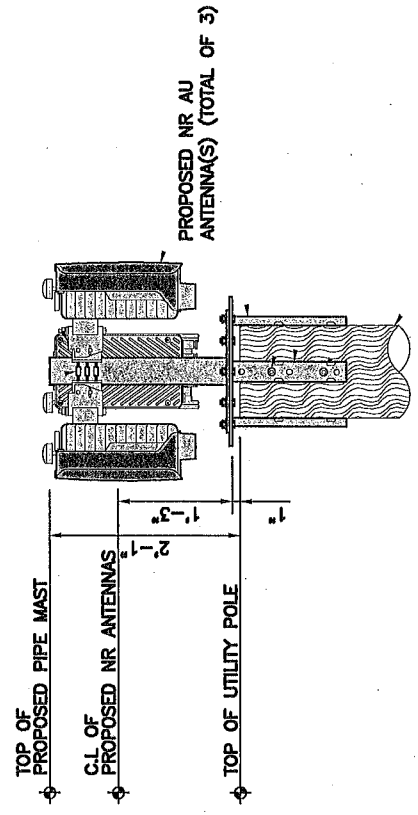
Attachment

ATTACHMENT



APPROX. NORTH

1 ANTENNA PLAN
SCALE: N.T.S.

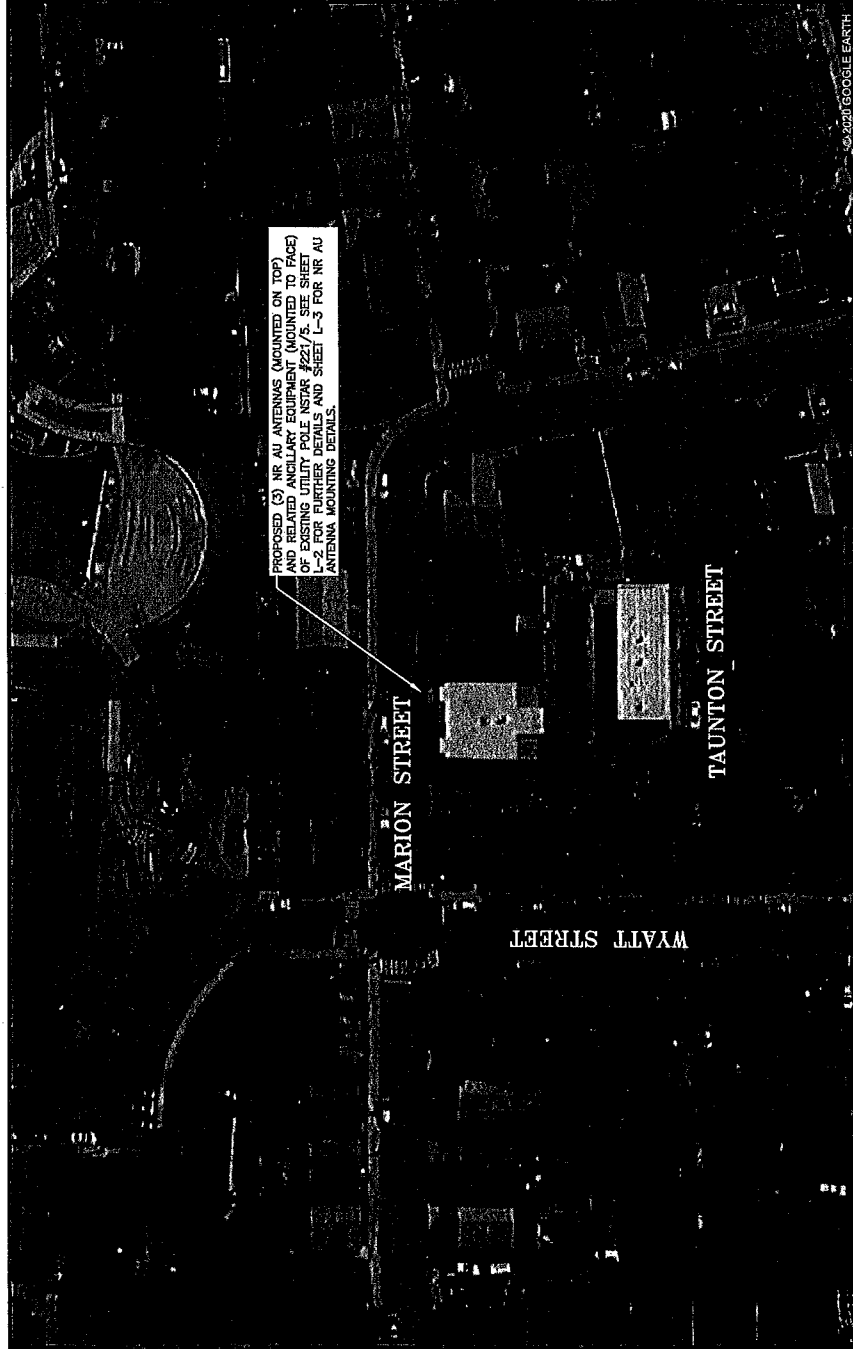


2 ANTENNA MOUNTING DETAIL
N.T.S.

RESIDING POWER COMPANY
EVERSOURCE

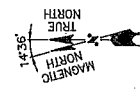
BOS SOM 061 MA

NSTAR #221/5
40 MARION STREET
SOMERVILLE, MA 02143



FIELD INSPECTION DATE: 05-18-2020

SITE COORDINATES:
LAT: N42° 22' 38.18"±
LONG: W71° 05' 02.31"±
LAT: N42.37723°±
LONG: W71.08643°±
APPROXIMATE GROUND ELEVATION: 11.0± AMSL



LOCATION PLAN/ AERIAL IMAGE
SCALE: N.T.S.

1
L-1

| SHEET INDEX | SHEET NO. | DESCRIPTION |
|-------------|-----------|--|
| | L-1 | LOCATION PLAN/AERIAL IMAGE |
| | L-2 | UTILITY POLE PHOTOGRAPH AND ELEVATION |
| | L-3 | ANTENNA & ANCILLARY EQUIPMENT DETAILS AND ONE LINE-DIAGRAM |

HDS
HUDSON
Design Group LLC
45 BEECHWOOD DRIVE
SOMERVILLE, MA 02143
TEL: 978.537.6553
FAX: 978.532.5586

CHECKED BY: UK
APPROVED BY: DPH

| SUBMITTALS | |
|------------|-------------|
| NO. | DESCRIPTION |
| 1 | 10/22/20 |
| 2 | 10/22/20 |
| 3 | 10/22/20 |
| 4 | 10/22/20 |
| 5 | 10/22/20 |
| 6 | 10/22/20 |
| 7 | 10/22/20 |
| 8 | 10/22/20 |
| 9 | 10/22/20 |
| 10 | 10/22/20 |

SITE NAME:
BOS SOM 061 MA
SITE ADDRESS:
40 MARION STREET
SOMERVILLE, MA 02143

SHEET TITLE
LOCATION
PLAN/AERIAL IMAGE

SHEET NUMBER
L-1

SUBMITTALS

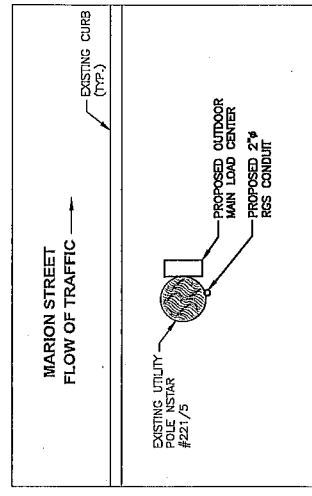
| REV. | DATE | DESCRIPTION | BY |
|------|----------|--------------------|----|
| 3 | 10/27/20 | BASED ON REVISIONS | SS |
| 2 | 10/27/20 | BASED ON REVISIONS | DM |
| 1 | 10/27/20 | BASED ON REVISIONS | DM |
| 0 | 10/27/19 | ISSUE EXIST | SS |

SITE NAME:
BOS SOM 061 MA

SITE ADDRESS:
 NSTAR #221/S
 40 MILLBURN AVENUE
 SOMERVILLE, MA 02143

SHEET TITLE
**ANTENNA & ANCILLARY
 EQUIPMENT DETAILS AND
 ONE-LINE DIAGRAM**

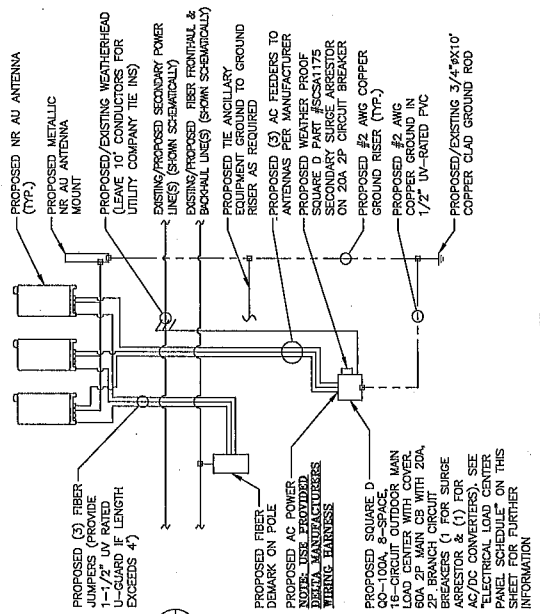
SHEET NUMBER
L-3



ANTENNA ORIENTATION PLAN 1
 22x34 SCALE: 3/4"=1'-0"
 11x17 SCALE: 3/8"=1'-0"



ANCILLARY EQUIPMENT ORIENTATION PLAN 2
 22x34 SCALE: 3/4"=1'-0"
 11x17 SCALE: 3/8"=1'-0"



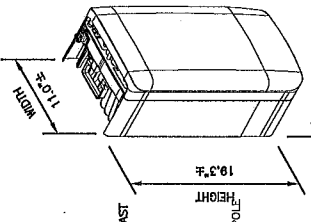
- ONE-LINE DIAGRAM NOTES:**
- PROVIDE WEATHER TIGHT SEAL CONNECTORS TO EACH SIDE OF ENCLOSURE HOUSING.
 - COORDINATE ANY FURTHER MISCELLANEOUS WIRING AND CONDUIT REQUIREMENTS WITH VERIZON WIRELESS AND ELECTRIC COMPANY

FIBER/ELECTRICAL ONE-LINE DIAGRAM 4
 SCALE: N.T.S.

SQUARE D QO-100A, 8-SPACE, 16-CIRCUIT OUTDOOR MAIN LOAD CENTER, SINGLE PHASE IN 3R ENCLOSURE

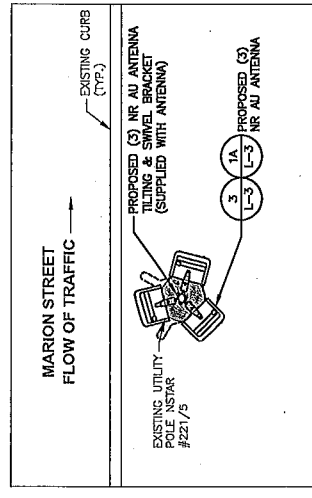
| CIRCUIT | DESCRIPTION | AMP |
|---------|----------------|-----|
| 1 | NR AU ANTENNAS | 20 |
| 2 | BLANK | - |
| 3 | BLANK | - |
| 4 | BLANK | - |
| 5 | BLANK | - |
| 6 | BLANK | - |
| 7 | BLANK | - |
| 8 | SURGE ARRESTOR | 20 |

ELECTRICAL LOAD CENTER PANEL SCHEDULE 4A
 SCALE: N.T.S.

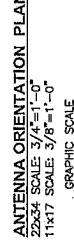


TYPICAL ANTENNA
 DIMENSIONS: 7.9"x11.0"x19.3"
 WEIGHT: 36.04 LBS

TYPICAL ANTENNA 3
 SCALE: N.T.S.



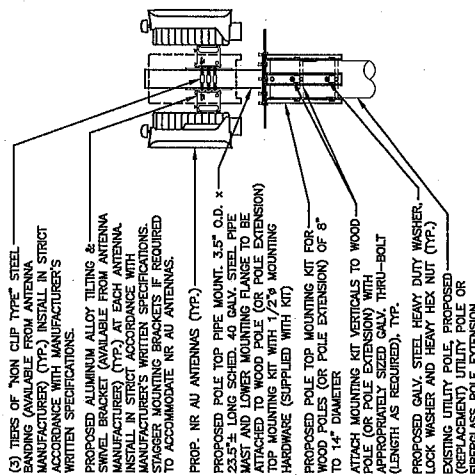
ANTENNA ORIENTATION PLAN 1
 22x34 SCALE: 3/4"=1'-0"
 11x17 SCALE: 3/8"=1'-0"



ANCILLARY EQUIPMENT ORIENTATION PLAN 2
 22x34 SCALE: 3/4"=1'-0"
 11x17 SCALE: 3/8"=1'-0"



- NOTES:**
- CONFIRM DOWNTILT REQUIREMENTS (IF ANY) AND AZIMUTH SPECIFICATIONS WITH VERIZON WIRELESS "RF" ENGINEER AT TIME OF CONSTRUCTION.
 - MOUNT SHALL BE INSTALLED IN SUCH A WAY TO ENSURE PLUMB INSTALLATION OF PIPE INST.
 - UTILITY POLE APPURTENANCES NOT SHOWN FOR CLARITY.



NR AU ANTENNA MOUNT DETAIL 1A
 22x34 SCALE: 1/2"=1'-0"

ANTENNA ORIENTATION PLAN 1
 L-3

ELECTRICAL LOAD CENTER PANEL SCHEDULE 4A
 L-3

FIBER/ELECTRICAL ONE-LINE DIAGRAM 4
 L-3

STRUCTURAL ANALYSIS REPORT

For

BOS_SOM_061_MA

40 Marion Street
Somerville, MA 02143

Equipment Mounted on Utility Pole



Prepared for:

verizon^v

118 Flanders Road
Westborough, MA 01581

Dated: June 4, 2020



HGD **HUDSON**
Design Group LLC

45 Beechwood Drive
North Andover, MA 01845
Phone: (978) 557-5553

www.hudsondesigngroupllc.com



SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by Verizon to conduct a structural evaluation of the existing utility pole supporting the proposed Verizon equipment.

This report represents this office's findings, conclusions and recommendations pertaining to the support of the proposed Verizon equipment listed below.

This office conducted an on-site visual survey of the above areas on May 18, 2020. Attendees included Patrick Barrett (HDG – Field Technician).

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing pole **is in conformance** with the National Electric Safety Code 2017 (NESC). The utility pole structure is rated at 49.4%.

APPURTENANCES CONFIGURATION:

| Appurtenances | Elev. | Mount |
|----------------------|--------|-------------------|
| (3) Typical Antennas | 35'-7" | Top of Wood Pole |
| (1) Demarc Box | 15'-6" | Side of Wood Pole |
| (1) Load Center | 9'-0" | Side of Wood Pole |

ANALYSIS RESULTS SUMMARY:

| Component | Max. Stress Ratio | Elev. of Component (ft) | Pass/Fail |
|------------------|-------------------|-------------------------|-----------|
| SYP 3 (Existing) | 49.4% | 0 – 32.3 | PASS |



DESIGN CRITERIA:

| National Electric Safety Code 2017 (NESC) and the Massachusetts State Building Code 9 th Edition. | | |
|--|------------|-------------------|
| Wind | | |
| City/Town: | Somerville | |
| County: | Middlesex | |
| NESC Rule | Rule 250B | NESC Section 25 |
| Construction Grade | C | NESC Section 25 |
| Wind Load: | 39.53 mph | NESC Table 230-2 |
| Ice | | |
| Loading District | Heavy | NESC Figure 250-1 |
| Radial Ice Thickness: | 0.50 in | NESC Table 230-1 |

1. Approximate height above grade to center of the proposed Antenna: 35'-7" +/-

***Calculations and referenced documents are attached.**



HUDSON
Design Group LLC

EXISTING STRUCTURE:

The existing 32'-4" +/- wood pole is assumed to be Southern Yellow Pine Class 3 (Fb=8000 psi) with a 12.0" diameter base. If field conditions differ from what is assumed in this report, then the engineer of record is to be notified as soon as possible.

ANTENNA SUPPORT RECOMMENDATIONS:

The new antennas are proposed to be installed on a top mounting kit secured to the wood pole using thru bolts.

EQUIPMENT SUPPORT RECOMMENDATIONS:

The new equipment is proposed to be installed on the wood pole using the approved manufacturer's mounts.

Limitations and assumptions:

1. Reference the latest HDG construction drawings for all the equipment locations details.
2. Mount all equipment per manufacturer's specifications.
3. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities. Contractor to perform pre-inspection prior to construction.
4. All antennas and waveguide cables are assumed to be properly installed and supported as per the manufacturer requirements.
5. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
6. If field conditions differ from what is assumed in this report, then the engineer of record is to be notified as soon as possible.
7. HDG did not perform any geotechnical analysis / or / investigation. Soil Information is unknown.



HUDSON
Design Group LLC

FIELD PHOTOS:



Photo 1: Sample photo illustrating the existing wood pole.



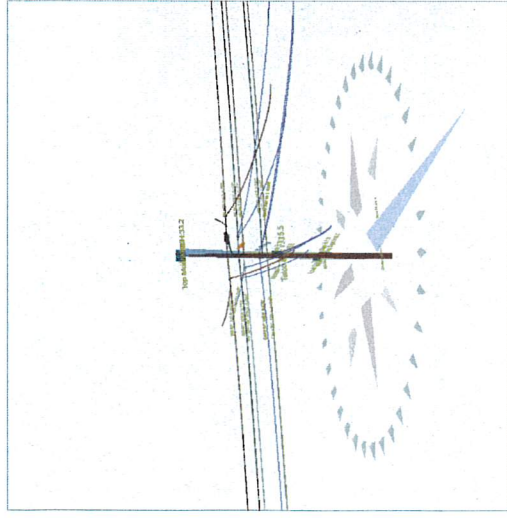
HUDSON
Design Group LLC

Calculations

Pole Num: NSTAR #221/5 Pole Length / Class: 37.53 / 3 Code: NESR Structure Type: Unguyed Tangent
Pole Number: NSTAR #221/5 Species: SOUTHERN PINE NESR Rule: Rule 250B Status Unguyed
Site Name: BOS_SOM_061_MA Setting Depth (ft): 5.25 Construction Grade: C Pole Strength Factor: 0.85
Site Address: 40 Marion Street G/L Circumference (in): 37.70 Loading District: Heavy Transverse Wind LF: 1.75
City, State: Somerville, MA G/L Fiber Stress (psi): 8,000 Ice Thickness (in): 0.50 Wire Tension LF: 1.00
Zip Code: 02143 Allowable Stress (psi): 6,800 Wind Speed (mph): 39.53 Vertical LF: 1.90
Designed By: LBW Fiber Stress Ht. Reduc: No Wind Pressure (psf): 4.00
Latitude: 42.377269° N **Longitude:** 71.100642° W **Elevation:** -20'

| Pole Capacity Utilization (%) | Height (ft) | Wind Angle (deg) |
|-------------------------------|-------------|------------------|
| Maximum | 49.4 | 0.0 |
| Groundline | 49.4 | 0.0 |
| Vertical | 9.4 | 19.83 |

| Pole Moments (ft-lb) | Load Angle (deg) | Wind Angle (deg) |
|----------------------|------------------|------------------|
| Max Cap Util | 46,820 | 25.4 |
| Groundline | 46,820 | 25.4 |
| GL Allowable | 96,140 | |



Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 25.4°

| | Shear Load* (lbs) | Applied Load (%) | Bending Moment (ft-lb) | Applied Moment (%) | Pole Capacity (%) | Bending Stress (+/- psi) | Vertical Load (lbs) | Vertical Stress (psi) | Total Stress (psi) | Pole Capacity (%) |
|-----------------------|-------------------|------------------|------------------------|--------------------|-------------------|--------------------------|---------------------|-----------------------|--------------------|-------------------|
| Powers | 175 | 7.0 | 4,107 | 8.8 | 4.3 | 295 | 458 | 4 | 299 | 4.4 |
| Comms | 2,044 | 81.5 | 36,294 | 77.5 | 37.8 | 2,606 | 2,356 | 21 | 2,627 | 38.6 |
| GenericEquipments | 70 | 2.8 | 1,813 | 3.9 | 1.9 | 130 | 384 | 3 | 134 | 2.0 |
| Pole | 175 | 7.0 | 2,825 | 6.0 | 2.9 | 203 | 1,857 | 16 | 219 | 3.2 |
| Streetlights | 45 | 1.8 | 1,781 | 3.8 | 1.9 | 128 | 142 | 1 | 129 | 1.9 |
| Insulators | 0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 66 | 1 | 1 | 0.0 |
| Pole Load | 2,509 | 100.0 | 46,820 | 100.0 | 48.7 | 3,362 | 5,263 | 47 | 3,408 | 50.1 |
| Pole Reserve Capacity | | | 49,320 | | 51.3 | 3,438 | | | 3,392 | 49.9 |

Load Summary by Owner - Reporting Angle Mode: Load - Reporting Angle: 25.4°

| | Shear Load* (lbs) | Applied Load (%) | Bending Moment (ft-lb) | Applied Moment (%) | Pole Capacity (%) | Bending Stress (+/- psi) | Vertical Load (lbs) | Vertical Stress (psi) | Total Stress (psi) | Pole Capacity (%) |
|-------------|-------------------|------------------|------------------------|--------------------|-------------------|--------------------------|---------------------|-----------------------|--------------------|-------------------|
| <Undefined> | 2,264 | 90.2 | 42,182 | 90.1 | 43.9 | 3,029 | 3,022 | 27 | 3,056 | 44.9 |
| Existing | 16 | 0.6 | 216 | 0.5 | 0.2 | 16 | 95 | 1 | 16 | 0.2 |
| Proposed | 54 | 2.1 | 1,596 | 3.4 | 1.7 | 115 | 289 | 3 | 117 | 1.7 |
| Pole | 175 | 7.0 | 2,825 | 6.0 | 2.9 | 203 | 1,857 | 16 | 219 | 3.2 |
| Totals: | 2,509 | 100.0 | 46,820 | 100.0 | 48.7 | 3,362 | 5,263 | 47 | 3,408 | 50.1 |

Detailed Load Components:

| Power | Owner | Height (ft) | Horiz. Offset (in) | Cable Diameter (in) | Sag at Max Temp (ft) | Cable Weight (lbs/ft) | Lead/Span Length (ft) | Span Angle (deg) | Wire Length (ft) | Tension (lbs) | Tension Moment* (ft-lb) | Offset Moment* (ft-lb) | Wind Moment* (ft-lb) | Moment at GL* (ft-lb) |
|-------------------|--------------|-------------|--------------------|---------------------|----------------------|-----------------------|-----------------------|------------------|------------------|---------------|-------------------------|------------------------|----------------------|-----------------------|
| Secondary | DUPLEX 6 AWG | 25.07 | 6.56 | 0.5370 | | 0.071 | 116.2 | 267.0 | 116.2 | | | -24 | 315 | 290 |
| Secondary | DUPLEX 6 AWG | 25.13 | 6.56 | 0.5370 | | 0.071 | 116.2 | 267.0 | 116.2 | | | -24 | 316 | 291 |
| Secondary | DUPLEX 1/0 | 24.91 | 96.57 | 0.9540 | 1.59 | 0.260 | 44.7 | 356.2 | 44.9 | 168 | 3,385 | -8 | 85 | 3,461 |
| Secondary | DUPLEX 1/0 | 24.95 | 72.64 | 0.9540 | 0.29 | 0.260 | 12.7 | 208.2 | 12.7 | 95 | -2,252 | -2 | 2 | -2,253 |
| Secondary | DUPLEX 6 AWG | 25.07 | 6.56 | 0.5370 | | 0.071 | 125.9 | 92.3 | 125.9 | | | -26 | 365 | 338 |
| Secondary | DUPLEX 6 AWG | 25.13 | 6.56 | 0.5370 | | 0.071 | 125.9 | 92.3 | 125.9 | | | -26 | 366 | 339 |
| Secondary | DUPLEX 1/0 | 24.90 | 48.71 | 0.9540 | 0.52 | 0.260 | 12.3 | 154.8 | 12.4 | 39 | -586 | 1 | 81 | -504 |
| Secondary | DUPLEX 1/0 | 24.90 | 48.71 | 0.9540 | 1.62 | 0.260 | 52.6 | 15.7 | 52.8 | 238 | 5,645 | 5 | -5 | 5,645 |
| Overlashed Bundle | 8M | 25.10 | 6.56 | 0.2720 | 1.11 | 0.131 | 116.2 | 267.0 | 116.2 | 1,528 | -18,246 | -28 | 1,033 | -17,240 |

| Overlashed Bundle | 8M | 25.10 | 6.56 | 0.2720 | 1.87 | 0.131 | 125.9 | 92.3 | 125.9 | 1,283 | 12,633 | -30 | 1,198 | 13,800 | | |
|-------------------|----------|-------------|--------------------|---------------------|----------------------|-----------------------|-----------------------|------------------|------------------|---------------|-------------------------|------------------------|----------------------|-----------------------|--------|--------|
| Totals: | | | | | | | | | | | | | 578 | -164 | 3,756 | 4,170 |
| Comm | Owner | Height (ft) | Horiz. Offset (in) | Cable Diameter (in) | Sag at Max Temp (ft) | Cable Weight (lbs/ft) | Lead/Span Length (ft) | Span Angle (deg) | Wire Length (ft) | Tension (lbs) | Tension Moment* (ft-lb) | Offset Moment* (ft-lb) | Wind Moment* (ft-lb) | Moment at GL* (ft-lb) | | |
| Overlashed Bundle | 8M | 23.10 | 6.72 | 0.2720 | 1.37 | 0.131 | 125.9 | 92.3 | 125.9 | 2,482 | 22,471 | -40 | 1,282 | 23,714 | | |
| Telco | TELE 1.0 | 23.06 | 7.21 | 1.0000 | | 0.400 | 125.9 | 92.3 | 125.9 | | | -60 | 515 | 455 | | |
| Telco | TELE 1.0 | 23.06 | 6.21 | 1.0000 | | 0.400 | 125.9 | 92.3 | 125.9 | | | -52 | 515 | 464 | | |
| CATV | CATV .50 | 22.90 | 48.74 | 0.5700 | 1.64 | 0.600 | 52.6 | 15.7 | 52.8 | 280 | 6,131 | 6 | -4 | 6,133 | | |
| Overlashed Bundle | 8M | 23.10 | 6.72 | 0.2720 | 0.66 | 0.131 | 116.2 | 267.0 | 116.2 | 3,616 | -39,707 | -37 | 1,106 | -38,637 | | |
| Telco | TELE 1.0 | 23.06 | 6.23 | 1.0000 | | 0.400 | 116.2 | 267.0 | 116.2 | | | -48 | 445 | 397 | | |
| Telco | TELE 1.0 | 23.06 | 7.23 | 1.0000 | | 0.400 | 116.2 | 267.0 | 116.2 | | | -55 | 445 | 389 | | |
| CATV | CATV .50 | 22.99 | 48.81 | 0.5700 | 1.60 | 0.600 | 44.7 | 356.2 | 44.9 | 197 | 3,823 | -11 | 66 | 3,878 | | |
| CATV | CATV .50 | 22.99 | 48.81 | 0.5700 | 1.40 | 0.600 | 49.1 | 325.6 | 49.2 | 312 | 3,481 | -12 | 319 | 3,788 | | |
| Overlashed Bundle | 1/4" EHS | 22.20 | 6.79 | 0.2500 | 1.72 | 0.121 | 125.9 | 92.3 | 125.9 | 727 | 6,329 | -37 | 943 | 7,234 | | |
| CATV | CATV .50 | 22.10 | 25.20 | 0.5700 | 1.64 | 0.600 | 52.6 | 15.7 | 52.8 | 280 | 6,012 | 3 | -4 | 6,011 | | |
| CATV | CATV .50 | 22.20 | 6.79 | 0.5700 | 0.52 | 0.600 | 12.3 | 154.8 | 12.4 | 45 | -634 | -8 | 60 | -581 | | |
| Overlashed Bundle | 8M | 22.20 | 6.79 | 0.2720 | 0.66 | 0.131 | 116.2 | 267.0 | 116.2 | 3,616 | -38,160 | -37 | 1,063 | -37,133 | | |
| Fiber | TELE 1.0 | 22.16 | 6.30 | 1.0000 | | 0.400 | 116.2 | 267.0 | 116.2 | | | -48 | 427 | 379 | | |
| Fiber | TELE 1.0 | 22.16 | 7.30 | 1.0000 | | 0.400 | 116.2 | 267.0 | 116.2 | | | -56 | 427 | 372 | | |
| CATV | CATV .50 | 19.40 | 7.00 | 0.5700 | 1.68 | 0.600 | 125.9 | 92.3 | 125.9 | 2,629 | 19,994 | 38 | 1,010 | 21,042 | | |
| CATV | CATV .50 | 19.40 | 7.00 | 0.5700 | 1.68 | 0.600 | 125.9 | 92.3 | 125.9 | 2,629 | 19,994 | 38 | 1,010 | 21,042 | | |
| CATV | CATV .50 | 19.40 | 7.00 | 0.5700 | 1.68 | 0.600 | 125.9 | 92.3 | 125.9 | 2,629 | 19,994 | 38 | 1,010 | 21,042 | | |
| CATV | CATV .50 | 19.40 | 7.00 | 0.5700 | 1.64 | 0.600 | 52.6 | 15.7 | 52.8 | 280 | 5,363 | 16 | -3 | 5,376 | | |
| CATV | CATV .50 | 19.40 | 7.00 | 0.5700 | 1.87 | 0.600 | 52.6 | 15.7 | 52.8 | 234 | 4,474 | 16 | -3 | 4,487 | | |
| Overlashed Bundle | 6M | 18.90 | 7.04 | 0.2420 | 0.72 | 0.104 | 116.2 | 267.0 | 116.2 | 2,098 | -18,857 | -18 | 869 | -18,006 | | |
| Telco | TELE 1.0 | 18.85 | 7.04 | 1.0000 | | 0.400 | 116.2 | 267.0 | 116.2 | | | -26 | 328 | 302 | | |
| CATV | CATV .50 | 19.40 | 7.00 | 0.5700 | 1.18 | 0.600 | 49.1 | 325.6 | 49.2 | 420 | 4,096 | -15 | 279 | 4,360 | | |
| CATV | CATV .50 | 19.40 | 7.00 | 0.5700 | 1.40 | 0.600 | 49.1 | 325.6 | 49.2 | 312 | 3,041 | -15 | 279 | 3,305 | | |
| Fiber | TELE 1.0 | 17.90 | 7.12 | 1.0000 | 1.71 | 0.400 | 125.9 | 92.3 | 125.9 | 4,996 | 35,039 | -85 | 1,187 | 36,140 | | |
| Fiber | TELE 1.0 | 17.90 | 7.12 | 1.0000 | 1.64 | 0.400 | 116.2 | 267.0 | 116.2 | 4,707 | -40,052 | -79 | 1,024 | -39,107 | | |
| Totals: | | | | | | | | | | | | | 22,831 | -583 | 14,596 | 36,845 |

| Generic Equipment | Owner | Height (ft) | Horiz. Offset (in) | Offset Angle (deg) | Rotate Angle (deg) | Unit Weight (lbs) | Unit Height (in) | Unit Depth (in) | Unit Diameter (in) | Unit Length (in) | Offset Moment* (ft-lb) | Wind Moment* (ft-lb) | Moment at GL* (ft-lb) |
|-------------------|----------|-------------|--------------------|--------------------|--------------------|-------------------|------------------|-----------------|--------------------|------------------|------------------------|----------------------|-----------------------|
| Box | Existing | 16.30 | 6.99 | 270.0 | 0.0 | 20.00 | 20.00 | 4.50 | -- | 7.00 | -9 | 118 | 108 |
| Box | Existing | 15.50 | 6.30 | 0.0 | 0.0 | 20.00 | 20.00 | 3.00 | -- | 6.00 | 18 | 60 | 78 |
| Box | Existing | 7.90 | 5.89 | 270.0 | 0.0 | 5.00 | 18.00 | 1.00 | -- | 13.00 | -2 | 24 | 22 |
| Box | Existing | 6.70 | 5.98 | 270.0 | 0.0 | 5.00 | 12.00 | 1.00 | -- | 12.00 | -2 | 13 | 11 |
| Box | Proposed | 9.00 | 7.16 | 90.0 | 0.0 | 19.80 | 15.50 | 3.70 | -- | 11.30 | 10 | 47 | 57 |

| Box | Verizon Fiber Demarc | Proposed | 15.50 | 6.50 | 90.0 | 0.0 | 3.00 | 12.30 | 3.40 | -- | 3.00 | 1 | 49 | 50 | |
|----------------|----------------------|----------|-------|------|-------|-----|-------|-------|------|------|-------|-----|-----------|--------------|--------------|
| Cylinder | Top Mount Kit | Proposed | 33.20 | 0.19 | 0.0 | 0.0 | 15.16 | 24.00 | -- | 3.50 | -- | 0 | 133 | 133 | |
| Box | Antenna | Proposed | 33.60 | 7.89 | 0.0 | 0.0 | 38.00 | 19.30 | 7.90 | -- | 11.00 | 43 | 521 | 564 | |
| Box | Antenna | Proposed | 33.60 | 7.61 | 118.8 | 0.0 | 38.00 | 19.30 | 7.90 | -- | 11.00 | -3 | 388 | 385 | |
| Box | Antenna | Proposed | 33.60 | 7.61 | 241.2 | 0.0 | 38.00 | 19.30 | 7.90 | -- | 11.00 | -37 | 469 | 432 | |
| Totals: | | | | | | | | | | | | | 19 | 1,821 | 1,840 |

| Streetlight | Owner | Height (ft) | Horiz. Offset (in) | Offset Angle (deg) | Rotate Angle (deg) | Unit Weight (lbs) | Unit Height (in) | Unit Depth (in) | Unit Diameter (in) | Unit Length (in) | Offset Moment* (ft-lb) | Wind Moment* (ft-lb) | Moment at GL* (ft-lb) | |
|----------------|-------------------------|-------------|--------------------|--------------------|--------------------|-------------------|------------------|-----------------|--------------------|------------------|------------------------|----------------------|-----------------------|--------------|
| Flood Light | Streetlight - 8 ft. Arm | 24.40 | 4.12 | 0.0 | 0.0 | 75.00 | 24.00 | 20.00 | 3.00 | 96.00 | 716 | 1,091 | 1,808 | |
| Totals: | | | | | | | | | | | | 716 | 1,091 | 1,808 |

| Insulator | Owner | Height (ft) | Horiz. Offset (in) | Offset Angle (deg) | Rotate Angle (deg) | Unit Weight (lbs) | Unit Diameter (in) | Unit Length (in) | Offset Moment* (ft-lb) | Wind Moment* (ft-lb) | Moment at GL* (ft-lb) | | |
|----------------|-------------|-------------|--------------------|--------------------|--------------------|-------------------|--------------------|------------------|------------------------|----------------------|-----------------------|----------|----------|
| Bolt | Single Bolt | 25.10 | 0.00 | 180.0 | 180.0 | 5.00 | 3.00 | 0.00 | 0 | 0 | 0 | | |
| Bolt | Three Bolt | 23.10 | 0.00 | 180.0 | 90.0 | 5.00 | 3.00 | 0.00 | 0 | 0 | 0 | | |
| Bolt | Three Bolt | 22.20 | 0.00 | 180.0 | 90.0 | 5.00 | 3.00 | 0.00 | 0 | 0 | 0 | | |
| Bolt | Single Bolt | 19.40 | 0.00 | 90.0 | 90.0 | 5.00 | 3.00 | 0.00 | 0 | 0 | 0 | | |
| Bolt | Single Bolt | 18.90 | 0.00 | 270.0 | 270.0 | 5.00 | 3.00 | 0.00 | 0 | 0 | 0 | | |
| Bolt | Single Bolt | 19.40 | 0.00 | 270.0 | 270.0 | 5.00 | 3.00 | 0.00 | 0 | 0 | 0 | | |
| Bolt | Single Bolt | 17.90 | 0.00 | 180.0 | 180.0 | 5.00 | 3.00 | 0.00 | 0 | 0 | 0 | | |
| Totals: | | | | | | | | | | | 0 | 0 | 0 |

| Pole Buckling | Buckling Constant | Buckling Column Height* (ft) | Buckling Section Height (% Buckling Col. Hgt.) | Buckling Section Diameter (in) | Minimum Buckling Diameter at GL (in) | Diameter at Tip (in) | Diameter at GL (in) | Modulus of Elasticity (psi) | Pole Density (pcf) | Ice Density (pcf) | Pole Tip Height (ft) | Buckling Load Capacity at Height (lbs) | Buckling Load Applied at Height (lbs) | Buckling Load Factor of Safety |
|---------------|-------------------|------------------------------|--|--------------------------------|--------------------------------------|----------------------|---------------------|-----------------------------|--------------------|-------------------|----------------------|--|---------------------------------------|--------------------------------|
| 2.00 | 19.79 | 33.82 | 10.97 | 6.64 | 7.02 | 12.01 | 2.13e+6 | 60.00 | 57.00 | 32.30 | 56,288 | 559.94 | 10.64 | |



HUDSON
Design Group LLC

June 1, 2020

Nicole O'Brien
Verizon Wireless
118 Flanders Rd, 3Rd Fl.
Westborough, MA 01581

RE: BOS SOM 061 MA
NSTAR #221/5
40 Marion Street
Somerville, MA 02143
Lat: N42.377272°
Long: W71.100642°

The following letter has been prepared to illustrate that the pole top at this site is more than 15 feet from the nearest window. HDG has visited the site on May 20, 2020 to confirm the measurement.

Sincerely,
Jose Xavier
Project Executive
Hudson Design Group LLC

HG
HUDSON
 Design Group LLC

4 BEECHWOOD DRIVE
 N. ANDOVER, MA 01861
 TEL: (978) 551-5553
 FAX: (978) 551-5554

CHECKED BY: UK

APPROVED BY: DPH

SUBMITTALS

| REV. | DATE | DESCRIPTION | BY |
|------|----------|----------------------|----|
| 0 | 10/01/20 | TOP OF POLE ABUTTERS | SP |

SITE NAME:
 BOS SOM 061 MA

SITE ADDRESS:
 N STAR #2217/S
 40 WINDMILL STREET
 SOMERVILLE, MA 02143

SHEET TITLE
 TOP OF POLE
 ABUTTERS

SHEET NUMBER
SK-1



TOP OF POLE ABUTTERS
 SCALE: N.T.S.

1
 SK-1

2349179

APPLICATION AND POLE ATTACHMENT LICENSE

ANTENNA / NODE LICENSE

Licensee VERIZON WIRELESS
Street Address ONE VERIZON WAY, MAIL STOP 4AW100
City, State and Zip BASKING, RIDGE NEW JERSEY 07920
Date 6/25/19

In accordance with the terms and conditions of the **CONSTRUCTION REQUIREMENTS FOR DISTRIBUTED ANTENNA SYSTEMS (DAS) ON DISTRIBUTION POLES AGREEMENT**, application is hereby made for a license to make 1 Antenna (Node) Attachment to pole and 1 Power Supply and 2 other attachments located in the municipality of Somerville in the State of Massachusetts.

This request will be designated **Pole Attachment License Application Number** BosSom061MA-525003
Attached are my power supply specifications if applicable. The cable's strand size is 0.5 and weight per foot of cable is 0.2.

Licensee's Name (Print) Barbara Kassabian

Signature Barbara Kassabian

NSTAR d/b/a EVERSOURCE
Power Company

Title _____
Tel. No. _____
Fax No. _____
E-mail _____

*******For licensor use, do not write below this line*******
Pole Attachment License Application Number _____ is hereby granted to make 1 Antenna / Node attachment described in this application to _____ attachments to JO¹ pole _____ attachment to FO² pole, _____ attachment to JU³ pole, _____ Power Supplies and _____ other attachments located in the municipality of _____, in the State of Massachusetts as indicated on the attached Form 3.

Licensor's Name (Print) Richard Comeau
Signature Richard Comeau

(AGREEMENT ID #) _____

Title Supervisor
Date 3/18/2020
Tel. No. _____

The Licensee shall submit an original copy of this application to NSTAR Electric Company d/b/a EVERSOURCE ENERGY.

