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

BUSINESS LICENSE APPLICATION - Small Wireless Facility

File #: 21-001931

License #: BL21-000022

Address: 42 BOW ST

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 attachers 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.

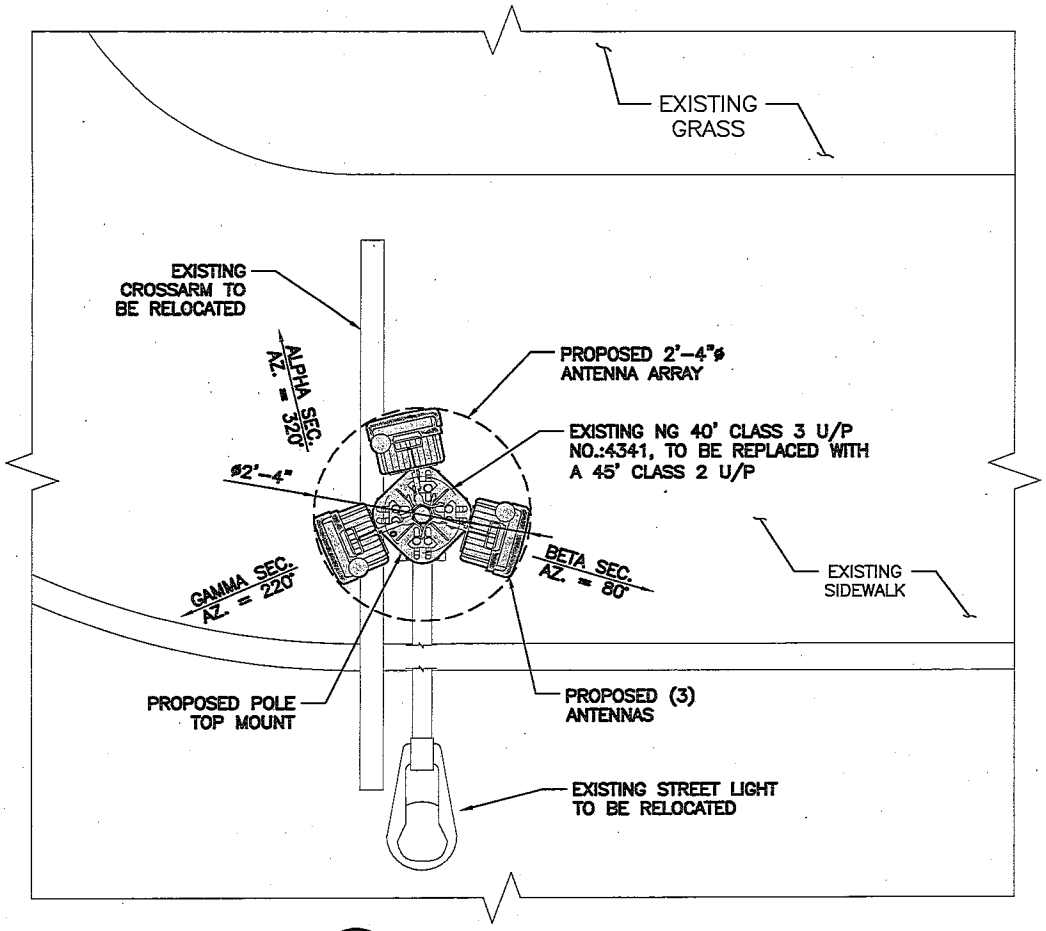
Respectfully Submitted,

Sean Conway

Sean Conway
Principal Engineer
(508) 320-2017

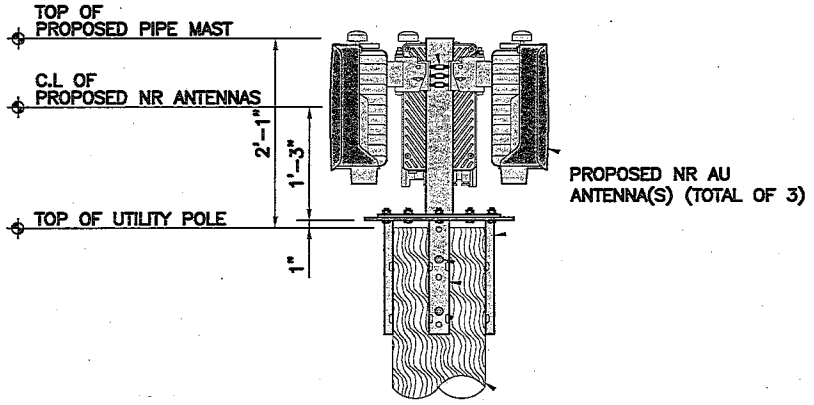
Attachment

ATTACHMENT



APPROX. NORTH

1 ANTENNA PLAN
SCALE: N.T.S.

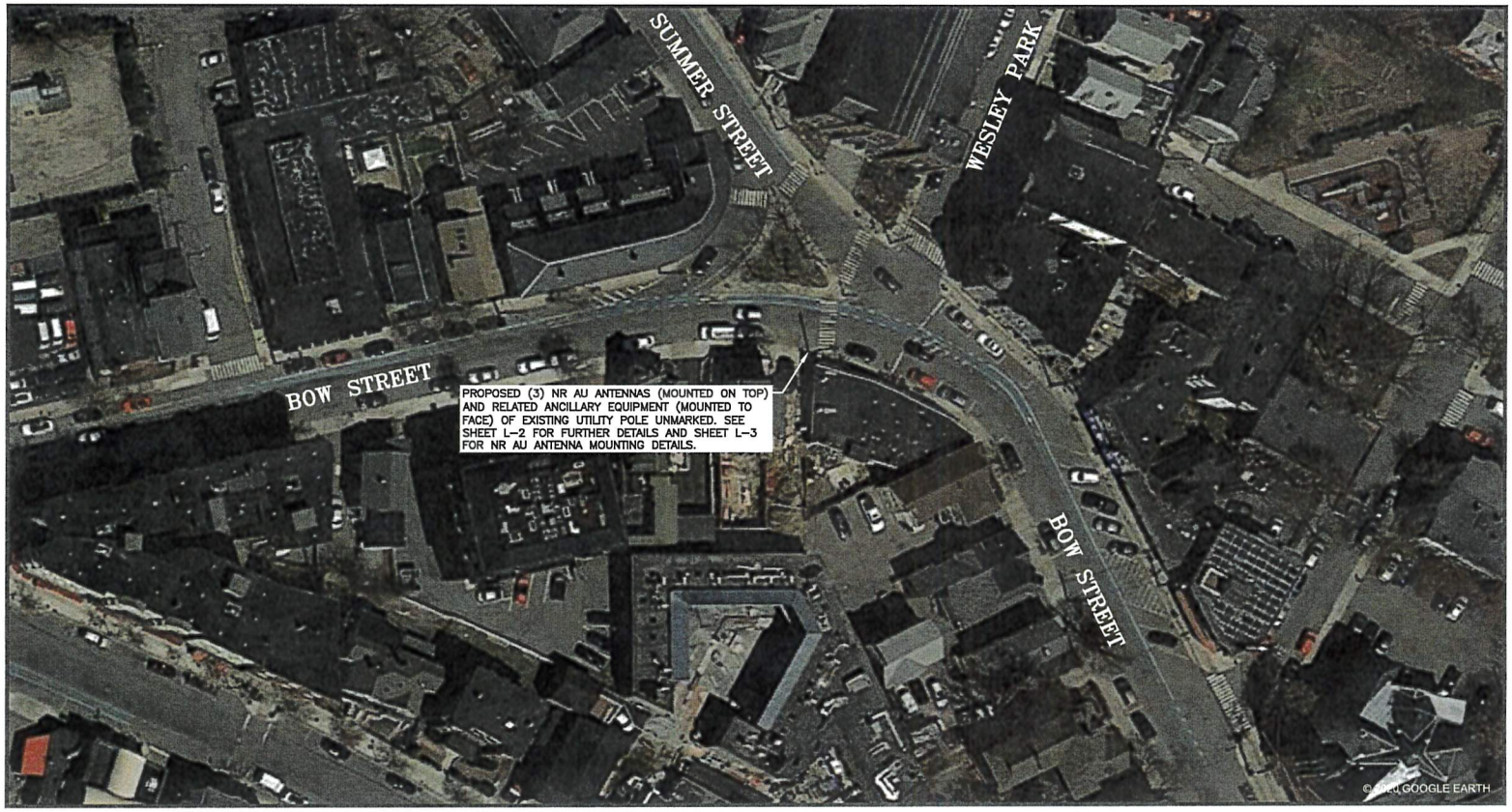


2 ANTENNA MOUNTING DETAIL
N.T.S.

BOS SOM 086 MA

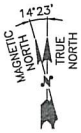
POLE UNMARKED
42 BOW STREET
SOMERVILLE, MA 02143

PRESIDING POWER COMPANY
EVERSOURCE



FIELD INSPECTION DATE: 05-18-2020

SITE COORDINATES: LAT: N42° 22' 53.78"±
LONG: W71° 05' 52.65"±
LAT: N42.381606°±
LONG: W71.097958°±
APPROXIMATE GROUND ELEVATION: 23.0'± AMSL



LOCATION PLAN/ AERIAL IMAGE (1 / L-1)
SCALE: N.T.S

SHEET INDEX

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	09/21/20	REVISED LOAD CENTER LOCATION	DS
2	06/02/20	REVISED PER NEW STANDARD	SF
1	03/05/20	REVISED PER COMMENTS	MR
0	02/02/19	LEASE EXHIBIT	SF

SITE NAME:
BOS SOM 086 MA

SITE ADDRESS:
POLE UNMARKED
42 BOW STREET
SOMERVILLE, MA 02143

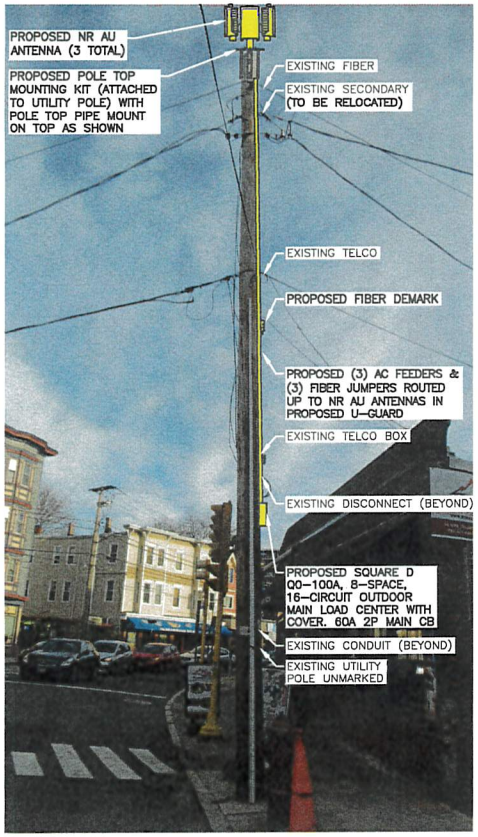
SHEET TITLE
LOCATION PLAN/AERIAL IMAGE

SHEET NUMBER
L-1

LEASE EXHIBIT
(NOT FOR CONSTRUCTION)

GENERAL NOTE:

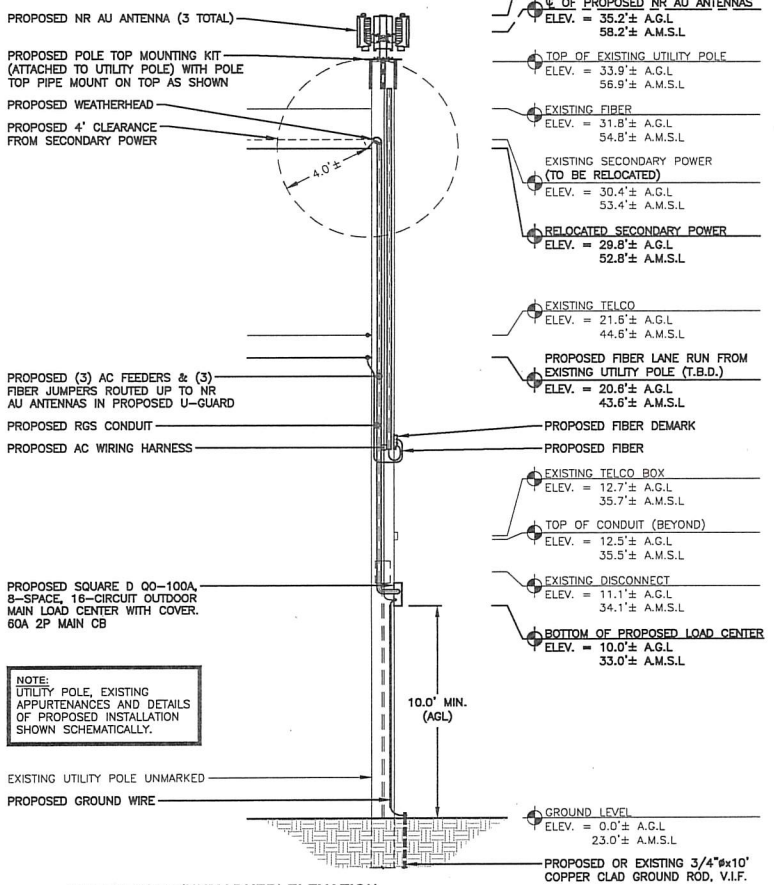
1. THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION, SIZE AND ORIENTATION OF THE PROPOSED WIRELESS TELECOMMUNICATIONS EQUIPMENT INSTALLATION ON THE UTILITY POLE AND ARE NOT SPECIFICALLY INTENDED FOR CONSTRUCTION.
2. VERIZON WIRELESS SHALL PLACE WEATHER RESISTANT PHENOLIC PLACARDS ON UTILITY POLE AND ANCILLARY EQUIPMENT TO IDENTIFY EQUIPMENT OWNERSHIP & CONTACT INFORMATION TO BE UTILIZED IN THE CASE OF EMERGENCY.
3. AN ANALYSIS OF THE CAPACITY OF THE EXISTING UTILITY POLE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC. REFER TO LATEST STRUCTURAL ANALYSIS.
4. VERIZON WIRELESS' GENERAL CONTRACTOR SHALL EXTEND EFFORTS TO ENSURE THAT ALL PROPOSED EQUIPMENT MEETS THE REQUIREMENTS OF THE EXISTING UTILITY COMPANY OR COMPANIES CURRENTLY OCCUPYING THE UTILITY POLE AND THE 2017 NATIONAL ELECTRICAL SAFETY CODE.



UTILITY POLE (UNMARKED) PHOTOGRAPH
(EXISTING CONDITIONS/SCHEMATIC RENDERING) (1 / L-2)
SCALE: N.T.S

ANTENNA AND MOUNT NOTE:
CONTRACTOR SHALL POSITION/ROTATE PROPOSED ANTENNA MOUNT/BRACKET IN SUCH A WAY SO AS TO NOT INTERFERE WITH EXISTING STREET LIGHT, PRIMARY POWER CROSSARM(S) (IF PRESENT), BRACKETS, BRACES, SECONDARY POWER SUPPORTS OR ANY OTHER MISCELLANEOUS APPURTENANCES AND RELATED SUPPORT BRACKETS ENCOUNTERED LOCATED ON THE EXISTING UTILITY POLE.

EQUIPMENT AND MOUNT NOTE:
CONTRACTOR SHALL POSITION/ROTATE PROPOSED EQUIPMENT AND ASSOCIATED MOUNTS/BRACKETS IN SUCH A WAY SO AS TO NOT INTERFERE WITH EXISTING WIRES/PANELS ETC. OR ANY OTHER MISCELLANEOUS APPURTENANCES AND RELATED SUPPORT BRACKETS ENCOUNTERED LOCATED ON THE FACE OF THE EXISTING UTILITY POLE.



NOTE:
UTILITY POLE, EXISTING APPURTENANCES AND DETAILS OF PROPOSED INSTALLATION SHOWN SCHEMATICALLY.

UTILITY POLE (UNMARKED) ELEVATION
(PROPOSED CONDITIONS) (2 / L-2)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

GRAPHIC SCALE
0 1'-4" 2'-8" 5'-4" 8'-0"

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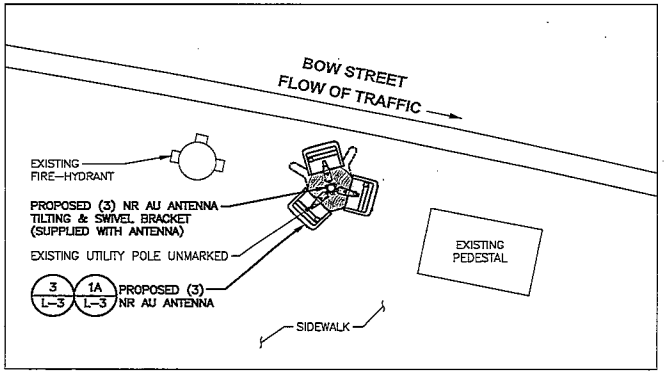
SITE NAME:
BOS SOM 086 MA

SITE ADDRESS:
POLE UNMARKED
42 BOW STREET
SOMERVILLE, MA 02143

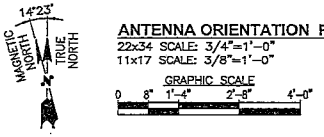
SHEET TITLE
UTILITY POLE PHOTOGRAPH AND ELEVATION

SHEET NUMBER
L-2



ANTENNA ORIENTATION PLAN (1 / L-3)

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



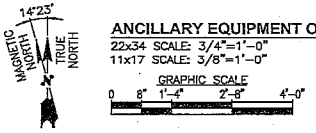
NOTES:
REFER TO RFDS FOR REQUIRED AZIMUTHS.

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

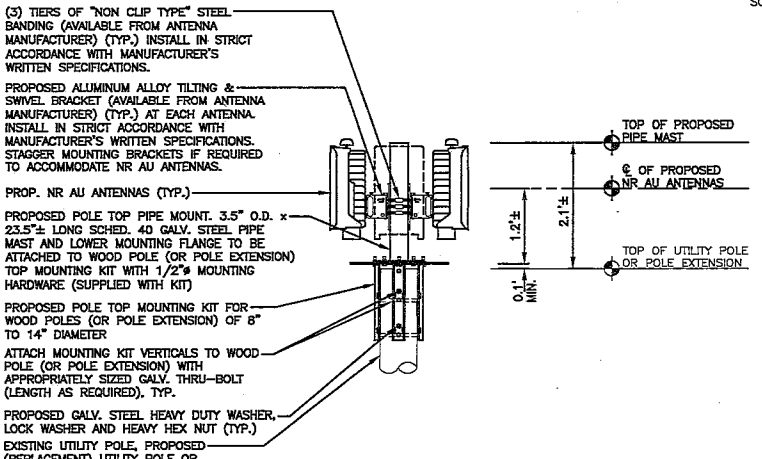
CKT #	1	2	3	4	5	6	7	8
DESCRIPTION	NR AU ANTENNAS	BLANK	BLANK	BLANK	BLANK	BLANK	SURGE ARRESTOR	
AMP	20	–	–	–	–	–	20	

ANCILLARY EQUIPMENT ORIENTATION PLAN (2 / L-3)

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



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

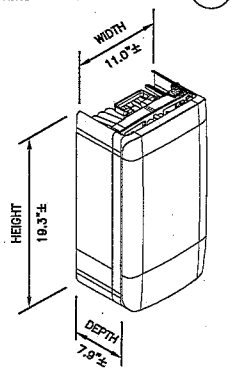


NR AU ANTENNA MOUNT DETAIL (1A / L-3)

22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

ELECTRICAL LOAD CENTER PANEL SCHEDULE (4A / L-3)

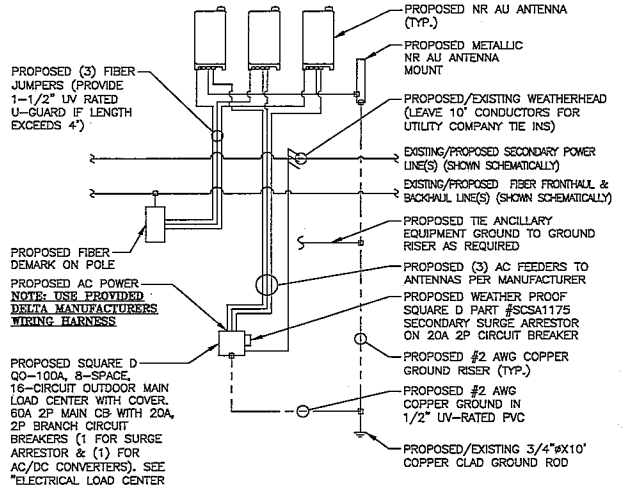
SCALE: N.T.S



TYPICAL ANTENNA
DIMENSIONS: 7.9"X11.0"X19.3"H
WEIGHT: 38.0± LBS

TYPICAL ANTENNA (3 / L-3)

SCALE: N.T.S



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

FIBER/ ELECTRICAL ONE-LINE DIAGRAM (4 / L-3)

SCALE: N.T.S

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
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SITE NAME:
BOS SOM 086 MA

SITE ADDRESS:
POLE UNMARKED
42 BOW STREET
SOMERVILLE, MA 02143

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

SHEET NUMBER
L-3

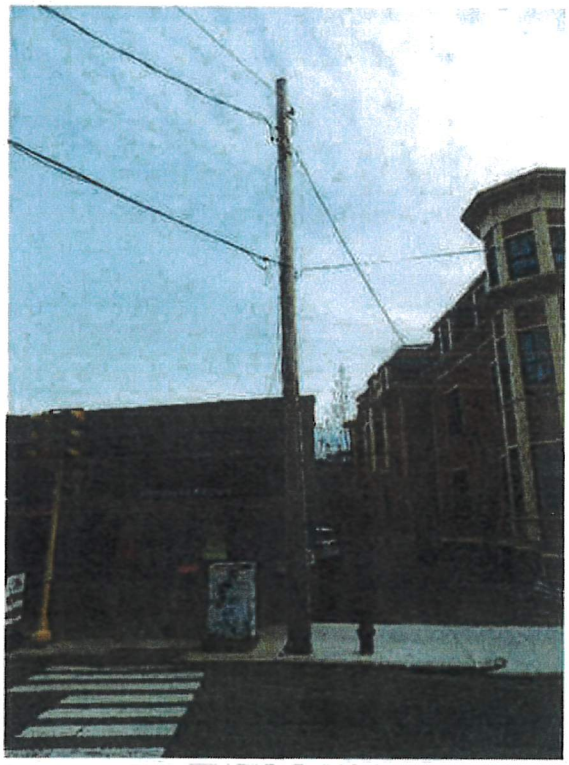
STRUCTURAL ANALYSIS REPORT

For

BOS_SOM_086_MA

42 Bow Street
Somerville, MA 02143

Equipment Mounted on Utility Pole



Prepared for:

verizon

118 Flanders Road
Westborough, MA 01581

Dated: June 5, 2020

COMMONWEALTH OF MASSACHUSETTS
DANIEL P. HAMM
CIVIL
No. 40120
REGISTERED PROFESSIONAL ENGINEER

HUDSON Design Group LLC

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

HUDSON
Design Group LLC

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 86.2%.

APPURTENANCES CONFIGURATION:

Appurtenances	Elev.	Mount
(3) Typical Antennas	35'-2"	Top of Wood Pole
(1) Demarc Box	18'-0"	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)	**86.2%**	**0 – 33.9**	**PASS**

HUDSON
Design Group LLC

DESIGN CRITERIA:

National Electric Safety Code 2017 (NESC) and the Massachusetts State Building Code 9th 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'-2" +/-

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

HUDSON
Design Group LLC

EXISTING STRUCTURE:

The existing 33'-11" +/- 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:

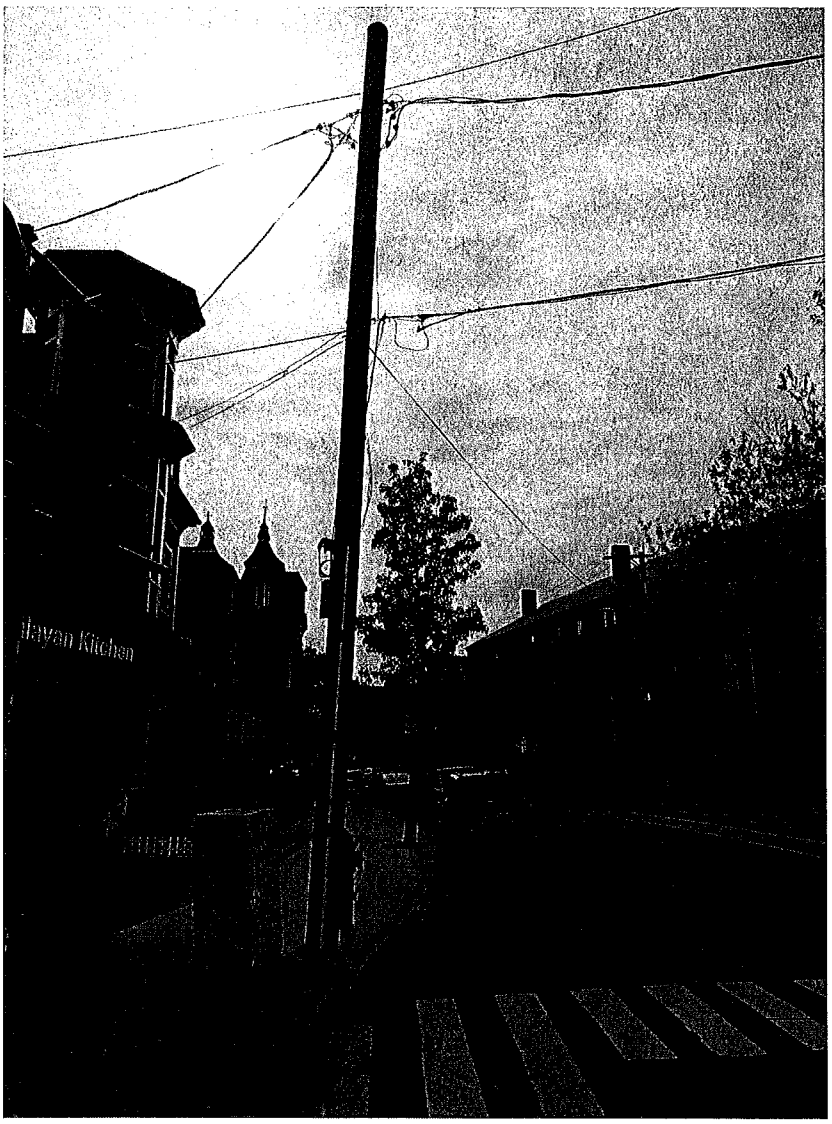
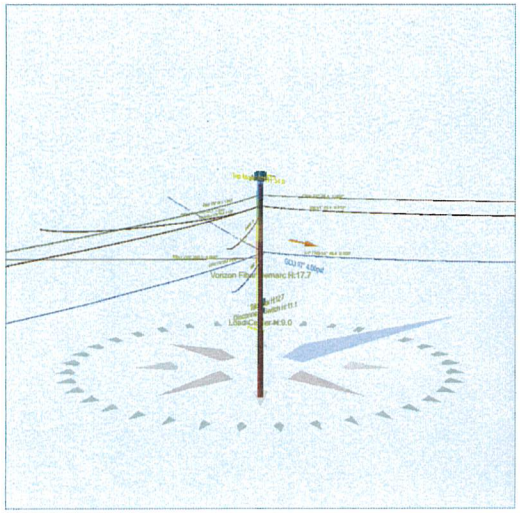


Photo 1: Sample photo illustrating the existing wood pole.

HUDSON
Design Group LLC

Calculations

Pole Num:	**Pole Unmarked**	Pole Length / Class:	**39.29 / 3**	Code:	**NESC**	Structure Type:	**Unguyed Tangent**
Pole Number	**Pole Unmarked**	Species:	**SOUTHERN PINE**	NESC Rule:	**Rule 250B**	Status	**Unguyed**
Site Name	**BOS_SOM_086_MA**	Setting Depth (ft):	**5.42**	Construction Grade:	**C**	Pole Strength Factor:	**0.85**
Site Address	**42 Bow 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	**KM**	Fiber Stress Ht. Reduc:	**No**	Wind Pressure (psf):	**4.00**		
Latitude:	**42.38164**	Longitude:			**-71.09802**	Elevation:	**-7.3M**



Pole Capacity Utilization (%)		Height (ft)	Wind Angle (deg)
Maximum	**86.2**	20.67	97.2
Groundline	**74.4**	0.0	249.3
Vertical	**7.2**	20.83	97.2

Pole Moments (ft-lb)		Load Angle (deg)	Wind Angle (deg)
Max Cap Util	**41,589**	97.5	97.2
Groundline	**70,971**	169.1	249.3
GL Allowable	**96,140**		

Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 169.1°

	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	1,519	54.0	**45,174**	63.7	**47.0**	**3,196**	332	3	**3,199**	**47.0**
Comms	1,191	42.3	**23,754**	33.5	**24.7**	**1,680**	1,002	9	**1,689**	**24.8**
GenericEquipments	27	1.0	**666**	0.9	**0.7**	**47**	340	3	**50**	**0.7**
Pole	62	2.2	**1,067**	1.5	**1.1**	**76**	2,136	19	**94**	**1.4**
Risers	14	0.5	**310**	0.4	**0.3**	**22**	88	1	**23**	**0.3**
Insulators	0	0.0	**0**	0.0	**0.0**	**0**	57	1	**1**	**0.0**
Pole Load	2,813	100.0	**70,971**	100.0	**73.8**	**5,021**	3,955	35	**5,056**	**74.3**
Pole Reserve Capacity			**25,169**		**26.2**	**1,779**			**1,744**	**25.7**

Load Summary by Owner - Reporting Angle Mode: Load - Reporting Angle: 169.1°

	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>	2,712	96.4	**68,945**	97.2	**71.7**	**4,877**	1,415	13	**4,890**	**71.9**
Existing	2	0.1	**26**	0.0	**0.0**	**2**	19	0	**2**	**0.0**
Proposed	37	1.3	**933**	1.3	**1.0**	**66**	385	3	**69**	**1.0**
Pole	62	2.2	**1,067**	1.5	**1.1**	**76**	2,136	19	**94**	**1.4**
Totals:	2,813	100.0	**70,971**	100.0	**73.8**	**5,021**	3,955	35	**5,056**	**74.3**

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		29.77	6.74	0.5370		0.071	76.4	50.9	76.4			-12	186	174
Secondary	DUPLEX 6 AWG		29.83	6.74	0.5370		0.071	76.4	50.9	76.4			-12	186	174
Secondary	TRIPLEX 1/0		29.80	6.74	1.0300	1.58	0.399	41.7	191.2	41.9	200	5,523	26	276	5,824
Secondary	TRIPLEX 1/0		29.80	6.74	1.0300	1.92	0.399	99.3	173.4	99.4	1,491	44,363	61	129	44,553
Secondary	TRIPLEX 6 AWG		28.50	6.82	0.5800	1.31	0.113	33.2	143.8	33.4	78	2,013	13	-135	1,890
Secondary	TRIPLEX 6 AWG		28.50	6.82	0.5800	1.31	0.113	33.2	143.8	33.4	78	2,013	13	-135	1,890
Overlashed Bundle	8M		29.80	6.74	0.2720	1.38	0.131	76.4	50.9	76.4	705	-9,922	-13	609	-9,326
											Totals:	**43,989**	**78**	**1,114**	**45,181**

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)
Fiber	TELE 1.0		31.80	6.62	1.0000	1.23	0.400	76.4	50.9	76.4	3,519	-52,898	-27	903	-52,022
Fiber	TELE 1.0		31.80	6.62	1.0000	2.14	0.400	99.3	173.4	99.4	1,698	53,905	-36	135	54,005
Overlashed Bundle	1/4" EHS		21.60	7.23	0.2500	1.20	0.121	76.4	50.9	76.4	1,339	-13,669	-13	424	-13,258
CATV	CATV .50		21.57	7.28	0.5700		0.600	76.4	50.9	76.4			-27	117	90
CATV	CATV .50		21.57	7.18	0.5700		0.600	76.4	50.9	76.4			-24	117	93
Overlashed Bundle	1/4" EHS		21.60	7.23	0.2500	0.27	0.121	70.4	297.0	70.4	3,590	-47,694	-12	-164	-47,870
CATV	CATV .50		21.57	6.95	0.5700		0.600	70.4	297.0	70.4			-23	-45	-68
CATV	CATV .50		21.57	7.51	0.5700		0.600	70.4	297.0	70.4			-25	-45	-70
CATV	CATV .50		21.57	7.02	0.5700	1.94	0.600	99.3	173.4	99.4	1,242	26,739	-46	72	26,766
CATV	CATV .50		21.57	6.95	0.5700	1.32	0.600	33.2	143.8	33.4	132	2,590	-15	-102	2,473
CATV	CATV .50		21.57	6.95	0.5700	1.32	0.600	33.2	143.8	33.4	132	2,590	-15	-102	2,473
Fiber	TELE 1.0		20.60	7.28	1.0000	2.95	0.400	200.0	230.0	200.0	4,941	49,454	151	1,541	51,146
											Totals:	**21,018**	**-111**	**2,851**	**23,757**

GenericEquipment		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	Telco Box	Existing	12.70	8.25	80.0	0.0	10.00	14.00	6.00	--	6.00	0	26	26
Cylinder	Top Mount Kit	Proposed	34.90	0.31	0.0	0.0	15.16	24.00	--	3.50	--	1	44	45
Box	Antenna	Proposed	35.23	7.39	0.0	0.0	38.00	19.30	7.90	--	11.00	-44	149	105
Box	Antenna	Proposed	35.23	7.86	122.0	0.0	38.00	19.30	7.90	--	11.00	32	229	261
Box	Antenna	Proposed	35.23	7.86	238.0	0.0	38.00	19.30	7.90	--	11.00	17	83	100
Box	Verizon Fiber Demarc	Proposed	17.70	6.66	136.0	0.0	3.00	12.30	3.40	--	3.00	3	13	16
Box	Disconnect Switch	Proposed	11.10	7.45	90.0	0.0	17.00	12.60	4.20	--	8.80	4	24	27
Box	Load Center	Proposed	9.00	7.32	136.0	0.0	19.80	15.50	3.70	--	11.30	19	66	86
											Totals:	**32**	**634**	**666**

Riser		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)
Conduit 110.0° H:12.5	Conduit		12.50	6.08	110.0	110.0	12.50	150.00	3.50	3.50	150.00	3	15	18
2" U-Guard 180.0° H:33.9	2" U-Guard	Proposed	33.90	6.08	180.0	180.0	33.90	406.80	2.00	2.00	406.80	17	276	292
											Totals:	**20**	**290**	**310**

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		31.80	0.00	290.0	290.0	5.00	3.00	0.00	0	0	0
Bolt	Single Bolt		29.80	0.00	40.0	40.0	5.00	3.00	0.00	0	0	0
Bolt	Single Bolt		29.80	0.00	200.0	200.0	5.00	3.00	0.00	0	0	0
J-Hook	J-Hook		28.50	0.00	150.0	150.0	5.00	3.00	0.00	0	0	0

Bolt	Single Bolt	21.60	0.00	40.0	40.0	5.00	3.00	0.00	0	0	0
Bolt	Single Bolt	20.60	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	20.85	33.08	11.19	6.22	8.00	12.01	2.13e+6	60.00	57.00	33.90	54,851	**549.29**	**13.89**

HUDSON
Design Group LLC

June 2, 2020

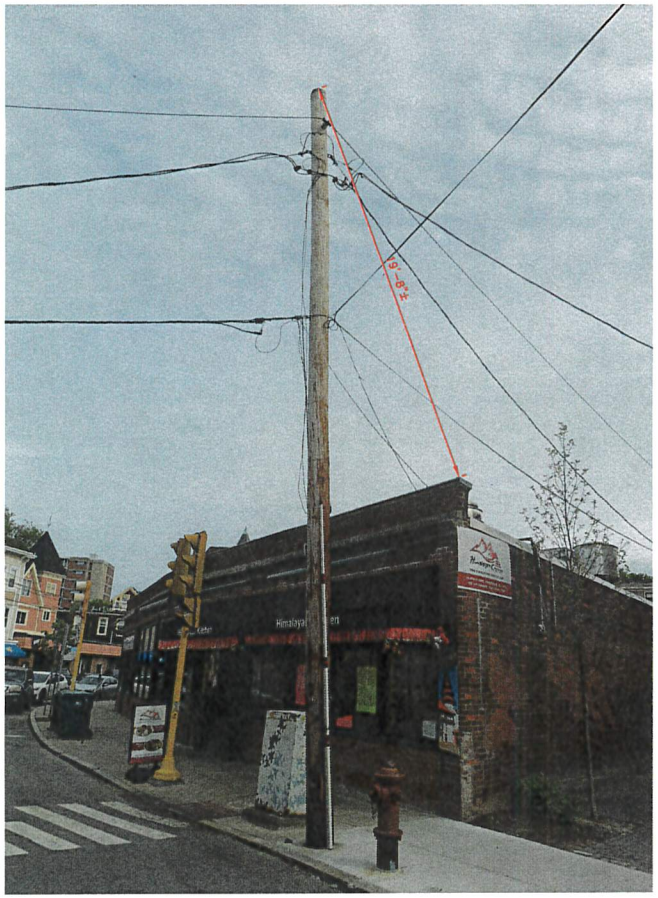
Nicole O'Brien
Verizon Wireless
118 Flanders Rd, 3Rd Fl.
Westborough, MA 01581

RE: BOS SOM 086 MA
Pole Unmarked
42 Bow Street
Somerville, MA 02143
Lat: N42.381606
Long: W71.097958

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

p: 978.557.5553 f: 978.336.5586 a: 45 Beechwood Drive, North Andover, MA 01845
p: 203.208.3919 f: 203.234.6398 a: 110 Washington Avenue, 4th Floor, North Haven, CT 06473



TOP OF POLE ABUTTERS (1 / SK-1)
SCALE: N.T.S

HUDSON
Design Group LLC
45 BIRCHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	05/22/20	TOP OF POLE ABUTTERS	SF

SITE NAME:
BOS SOM 086 MA

SITE ADDRESS:
POLE UNMARKED
42 BOW STREET
SOMERVILLE, MA 02143

SHEET TITLE
TOP OF POLE ABUTTERS

SHEET NUMBER
SK-1

2349402

Form 1

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** BosSom086MA-525028
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 JO[1] pole _____ attachment to FO[2] pole, _____ attachment to JU[3] 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 A Comeau

(AGREEMENT ID #)

Title Supervisor

Date 3/24/2020

Tel. No. _____

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

FORM 3 – EVERSOURCE ITEMIZED Pole Make-Ready Work Charges ***PAGE___ OF___***

RCE to Complete: Total Poles Surveyed _____ Total Poles Requiring NSTAR Make-Ready _____

Appendix IV Form 3

FIELD SURVEY / MAKE READY WORK FORM																
SURVEYORS:				***DATE OF SURVEY:***							CWO #:					
Verizon				***MUNIC:***				***STATE:***			Exch Code: Munic Code:					
Licensee	Barbara Kassabian			***LICENSEE NAME: Verizon Wireless***							***LICENSEE APPLICATION #:*** BosSom086MA-525028					
EVERSOURCE				***ELCO NAME:*** EVERSOURCE							**NSTAR APPLICATION #**					
LOCATION		***POLE #***		***ATT***	***OWNERSHIP***						CHARGE		WORK DESCRIPTION			
TEL RTE / STREET NAME ***List one pole per line***		***Tel***	***El***	***F/C P.S. Riser***	***J.O.***		***J.U.***		***F.O.***		YES	NO	TASK #S / REMARKS		* Height of Att.	
					Tel	***El***	***Tel***	***El***	***Tel***	***El***						
42 Bow St 42.381606/-71.097958		N/A	N/A												*	
39/5-A															*	
															*	
															*	
															*	
															*	
TOTALS:																

- **Height of Attachment = Height of Licensee Attachment shall be 40" below ELCO MGN unless otherwise noted here by Verizon and EVERSOURCE surveyor.**

Revised 03/06/2015