

April 9, 2019

Malden City Council  
Malden City Hall  
110 Pleasant St.  
Malden, MA 02148

RECEIVED  
2019 JUL 30 P 5:27  
CITY CLERK'S OFFICE  
MALDEN, MASS.

RE: Petition of ExteNet Systems, Inc. for Grant of Location for Telecommunications Wires and Appurtenances

Dear Members of the City Council:

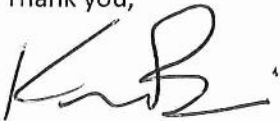
Pursuant to Massachusetts General Laws Chapter 166 section 22, please find enclosed the petition of ExteNet Systems, Inc. for grant of location for telecommunications wires and appurtenances to be attached to a street light pole within the City of Malden. Included with the petition are detailed plans that identify the location where ExteNet's proposed pole attachment will be placed.

ExteNet requests that the City schedule a public hearing on this petition, subject to the requirements of Massachusetts General Laws, Section 22. Those requirements prescribe that the City provide written notice to all owners of real estate, abutting that part of each street upon or across which, wires appurtenances are proposed to be located. It is my understanding that the City Assessor will be able to produce this list, and I will work with the City Clerk to ensure the letters are sent per the requirements of the Town.

For the convenience of the City Council, ExteNet has provided a proposed form of order.

Should you have any questions, or would like any additional information prior to the Public hearing please do not hesitate to contact me at (617) 680-5464. I will be present at the public hearing to answer any questions you may have as well.

Thank you,



Keenan Brinn

NB+C Contractor as agent for ExteNet Systems, Inc.

PETITION FOR LOCATIONS FOR TELECOMMUNICATIONS WIRES AND APPURTENANCES

To the CITY COUNCIL OF THE CITY OF MALDEN, MASSACHUSETTS

Pursuant to Massachusetts General Laws, Chapter 166 and the City Ordinance of the City of Malden, Massachusetts, EXTENET SYSTEMS, INC., requests that it be granted locations for and permission to construct and maintain telecommunications wires and appurtenances, including remote nodes and pole top antennas; to be attached to existing streetlight poles, located upon and along the following public ways within the City of Malden, as indicated on the attached plans.

Wherefore, Petitioner requests that, after due notice and hearing as provided by law, that it be granted locations for and permission to construct the telecommunications wires and appurtenances upon and along the public ways within the City of Malden, shown on the plan, filed herewith. ExteNet Systems, Inc. also submitted additional information in support of this petition.

Respectfully submitted,

ExteNet Systems, Inc.

By: Keenan Brinn  
NB+C Consultant

## **REGULATORY STATUS OF EXTENET SYSTEMS, INC.**

### Description of ExteNet Services and Facilities

ExteNet's primary telecommunications service offering is point-to-point transport of Radio Frequency ("RF") signals for Wireless Service Provider (WSP) customers via ExteNet's antenna system networks which are generally constructed with a number of remote communications nodes that are located to meet the specified needs of one or more WSP customers and connected by fiber optic cabling to a network hub facility containing communications head-end equipment that, in turn, provides bi-directional RF-optical signal conversion and interconnectivity between the network and the WSP customers' base transceiver station or other equipment. These services can be deployed to address long-standing service coverage problems such as "dead spots" in WSPs' cellular and/or PCS networks, and to enhance the WSPs' call-handling capability in the same service areas. ExteNet's network services can also improve wireless access to emergency services.

ExteNet's network telecommunications facilities consist of three primary components:

1. remote communications nodes comprising low elevation, low power equipment (signal converters, transceivers and antennas), to transmit, receive and convert optical signals to RF signals and RF signals to optical signals bi-directionally, typically mounted on existing utility poles;
2. fiber optic cables also typically attached to existing utility poles, but sometimes placed underground in existing or new conduits; and
3. the network head-end equipment, which is typically housed in a hub facility located within or on premises leased from private parties or municipalities.

These primary network elements are supported by various items of ancillary equipment, e.g., primary and back-up power supplies, connectors, enclosures, mounting hardware, etc. Each of these components is integral to any given ExteNet network.

The network equipment employed by ExteNet is not dissimilar in size, weight or overall appearance to items routinely installed on utility poles by Verizon and other telecommunications and electric service providers. For example, ExteNet's communications nodes and battery back-up facilities attached to poles are not unlike power supply boxes attached to poles by cable providers and other providers of telecommunications services. Pole top appurtenances, such as pole top antennas and extenders, also have been installed from time to time by utilities. As discussed below, the combination of wired and wireless technology to transport and deliver telecommunications services has been employed by Verizon and other regulated telecommunications service providers to offer regulated intrastate telecommunications services.

### ExteNet's Regulatory Status as a Telecommunications Service Provider

ExteNet is a Regulated Provider of Intrastate Telecommunications Services Subject to the Requirements of the Massachusetts Department of Telecommunications and Cable and not an Unregulated Provider of Wireless services.

ExteNet is registered with the Massachusetts Department of Telecommunications and Cable ("DTC"), formerly the Department of Telecommunications and Energy ("DTE") as a provider of intrastate telecommunications services. ExteNet has a tariff on file with the DTC. ExteNet is listed on the DTC website as a regulated provider of telecommunications services.

The DTC recognizes ExteNet and similar entities as regulated providers of telecommunications services, subject to its regulation under General Laws Chapters 159 and 166, and related rules and orders. For example, ExteNet is required to adhere to DTC requirements relating to the filing of tariffs. Enclosed is a letter from Michael Isenberg, Director of the DTC, which confirms that ExteNet is and remains subject to DTC jurisdiction as a provider of intrastate telecommunications services.

ExteNet also has been recognized as a regulated provider of intrastate telecommunications services in a number of other states. To date, ExteNet has been authorized to provide intrastate telecommunications services in neighboring states such as Connecticut and Rhode Island, as well as in New York, California and numerous states in all regions of the country.

As a regulated provider of intrastate telecommunications services, ExteNet is authorized under G.L.C.166, §21 to place its wires and related equipment in public ways.

#### Applicable State Law

Municipal Approval of the Construction and Placement of ExteNet's Wires and Related Pole Attachments is governed by Massachusetts General Laws Chapter 166, Sections 21-22.

As a regulated provider of intrastate telecommunications services, ExteNet is authorized under Chapter 166, Section 21 to construct lines and other facilities upon, along, under and across the public ways. Such construction must not incommode the public use of public ways.

In order to obtain municipal permission to construct its telecommunications facilities in public ways, ExteNet must file a written petition with the selectmen of a City or the City Council of alderman or like body of a Town, such as the Malden City Council, pursuant to Chapter 166, Section 22. This same process has been employed routinely by carriers in the case of Verizon, Eversource National Grid, in the case of poles, wires, conduits and related appurtenances. In carrying out the permit-granting authority conferred by the General Court, municipalities act as public officers under a delegation of power from the General Court and not as agents of the municipality. Municipalities may adopt reasonable regulations for the erection of facilities by telecommunications carriers having authority to place their facilities in or under public ways.

ExteNet stands ready, willing and able to comply with the reasonable requirements of the City under General Laws Chapter 166, Sections 21-22 and related requirements imposed by the City applicable to grants of location by the CityCity Council.



**COMMONWEALTH OF MASSACHUSETTS  
DEPARTMENT OF TELECOMMUNICATIONS AND CABLE**

ONE SOUTH STATION  
BOSTON, MA 02110  
(617) 305-3580  
www.mass.gov/dtc

DEVAL L. PATRICK  
GOVERNOR

TIMOTHY P. MURRAY  
LIEUTENANT GOVERNOR

DANIEL O'CONNELL  
SECRETARY OF HOUSING AND  
ECONOMIC DEVELOPMENT

DANIEL C. CRANE  
DIRECTOR OF CONSUMER AFFAIRS  
AND BUSINESS REGULATION

SHARON E. GILLETT  
COMMISSIONER

December 19, 2007

Aian D. Mandl, Esq.  
Smith & Duggan LLP  
Lincoln North  
55 Old Bedford Road  
Lincoln, MA 01773

Re: ExteNet Systems, Inc. Regulatory Status

Dear Mr. Mandl:

This letter verifies that ExteNet Systems, Inc. ("ExteNet") is an authorized provider of intrastate telecommunications services in Massachusetts, subject to state entry and tariffing requirements. ExteNet is duly registered with the Massachusetts Department of Telecommunications and Cable ("Department"). As required by M.G.L. c.159, §19 and the Department's entry policies, ExteNet has a valid registration statement and tariff on file with the Department, which permits it to conduct business in the Commonwealth.

Sincerely,

A handwritten signature in cursive script that reads "Michael Isenberg".

Michael Isenberg  
Director  
Competition Division

## **ADDITIONAL MATERIAL**

### **PROJECT DESCRIPTION**

The ExteNet Systems, Inc. open architecture antenna system will provide wireless voice and data transmission services for all Cellular and PCS Wireless Service Providers. The ExteNet system is an unobtrusive and aesthetically pleasing network architecture that supports all protocols (TDMA, CDMA, GSM, etc.) for all Wireless Service Providers.

Installed telecommunication facilities will include small remote nodes for transmitting RF signal, with an unobtrusive pole top antenna on light poles and utility poles.

The network will be installed using typical and commercially accepted methods. The proposed network will have two components for consideration.

The initial construction of the network deployment will be the actual node equipment installation. In each of the locations, there will be two primary components to each node installation. First, each location will have an antenna installed at the top of the pole. From each antenna installation, there will be two ½-inch diameter RF cables which will be attached to the utility pole using approved "U-Guard," which will carry the RF cable to the Radio and Power back-up modules, also mounted to the existing pole.

**PETITION OF EXTENET SYSTEMS, INC. FOR GRANT OF LOCATION TO INSTALL A  
SMALL CELL WIRELESS TELECOMMUNICATIONS FACILITY**

To the **City Council of the City of MALDEN**, Massachusetts

Respectfully represents **EXTENET SYSTEMS, INC.** a company incorporated for the purpose of constructing and operating wireless communications systems that it desires to construct a small cell wireless telecommunications facility in the public way hereinafter specified.

WHEREFORE, your petitioner prays that, after due notice and hearing as provided by law, the City Council may by Order grant to your petitioner permission to construct, and a location for, such a small cell wireless telecommunications facility with necessary cables, said small cell wireless telecommunications facility to be located as shown on the plan made by **Network Building & Consulting** and filed herewith, on the following public way of said City:

**In the public right-of-way at 183 Highland Ave., Malden, MA, Map 038, Block 206, Lot 604**

W/O # \_\_\_\_\_

**EXTENET SYSTEMS, INC.**

BY \_\_\_\_\_  
Keenan Brinn  
Network Building & Consulting, LLC  
Agent for Extenet Systems, Inc.

**Dated this \_\_\_\_ day of \_\_\_\_\_, 2019**

City of **MALDEN**, Massachusetts

Received and filed \_\_\_\_\_, 2019

**ORDER FOR GRANT OF LOCATION TO INSTALL A SMALL CELL WIRELESS  
TELECOMMUNICATIONS FACILITY**

WHEREAS, **EXTENET SYSTEMS, INC.** has petitioned for permission to construct a small cell wireless telecommunications facility to be attached to a street light pole located on a public way of the City of Malden hereinafter specified, and notice has been given and a hearing held on said petition as required by law.

It is ORDERED that **EXTENET SYSTEMS, INC.** be and hereby is granted permission to construct and a location for, a wireless telecommunications facility with necessary wires and cables attached to a street light pole owned by National Grid, located in the public way at

**183-Highland Ave., Malden, MA, Map 038, Block 206, Lot 604.**

W/O # \_\_\_\_\_

All construction work under this Order shall be in accordance with the following conditions:

1. The small cell wireless telecommunications facility shall be located as shown on the plan made by **Network Building & Consulting Engineering Services** on file with said petition.
2. Said shall comply with the requirements of existing by-laws and such as may be adopted governing the construction and maintenance of such wireless telecommunications facilities.
3. All work shall be done to the satisfaction of the City Council or such officer or officers as it may appoint to supervise the work.

1 \_\_\_\_\_  
2 \_\_\_\_\_  
3 \_\_\_\_\_  
4 \_\_\_\_\_  
5 \_\_\_\_\_

City Council  
City of Malden



**CERTIFICATE**

We hereby certify that the foregoing Order was adopted after due notice and a public hearing as prescribed by Section 22 of Chapter 166 of the General Laws and any additions thereto or amendments thereof, to wit: after written notice of the time and place of the hearing mailed at least seven days prior to the date of the hearing by the City Council to all owners of real estate abutting upon that part of the way or ways upon, along or across which the wireless telecommunications facility is to be constructed under said Order, as determined by the last preceding assessment for taxation, and a public hearing held on the \_\_\_\_ day of \_\_\_\_\_, 2019 at \_\_\_\_\_ in said City.

1 \_\_\_\_\_  
2 \_\_\_\_\_  
3 \_\_\_\_\_  
4 \_\_\_\_\_  
5 \_\_\_\_\_

City Council  
City of Malden

**CERTIFICATE**

I hereby certify that the foregoing are true copies of the Order of the **City Council** of the City of **MALDEN**, Massachusetts, duly adopted on the \_\_\_\_ day of \_\_\_\_\_, 2019 and recorded with the records of location Orders of said City, Book \_\_\_\_\_, Page \_\_\_\_\_ and of the certificate of notice of hearing thereon required by Section 22 of Chapter 166 of the General Laws and any additions thereto or amendments thereof, as the same appear of record.

Attest: \_\_\_\_\_  
Clerk of the City of **MALDEN**, Massachusetts



LATITUDE: 42.420197°  
LONGITUDE: -71.079787°

# NE-MA-BSTN2N01-TMO

## NE-MA-BSTN2N01-02404 / NE2067BA\_11LAB

### PROPOSED SMALL CELL NODE

183 HIGHLAND AVENUE, MALDEN, MA 02148  
CITY OF MALDEN, MIDDLESEX COUNTY



Know what's below.  
Call before you dig.

ENGINEERING FIRM



APPLICANT



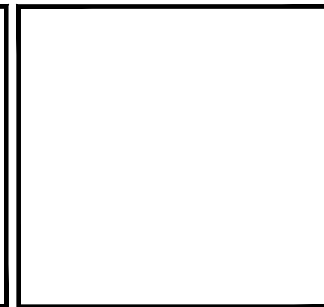
SITE INFORMATION

NE-MA-BSTN2N01-02404  
TMO ID: NE2067BA\_11LAB  
183 HIGHLAND AVENUE  
MALDEN, MA 02148  
MIDDLESEX COUNTY

DESIGN RECORD

REVISIONS			
REV	DATE	DESCRIPTION	BY
2	07/23/19	POLE REPLACEMENT	CJI
1	05/15/19	FOC REVISED	NSB
0	04/17/19	PRELIMINARY	CJI

PROFESSIONAL STAMP



ENGINEER

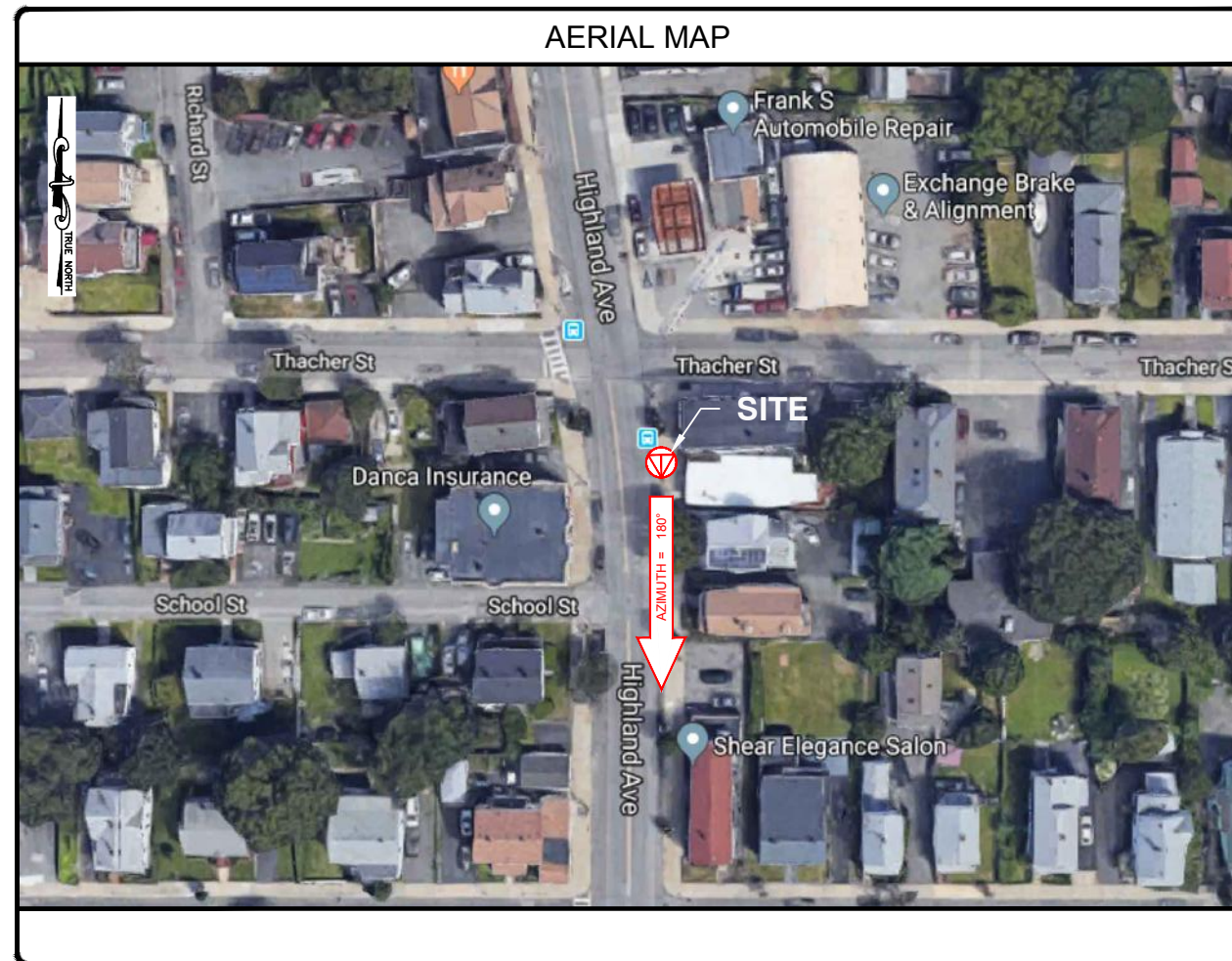
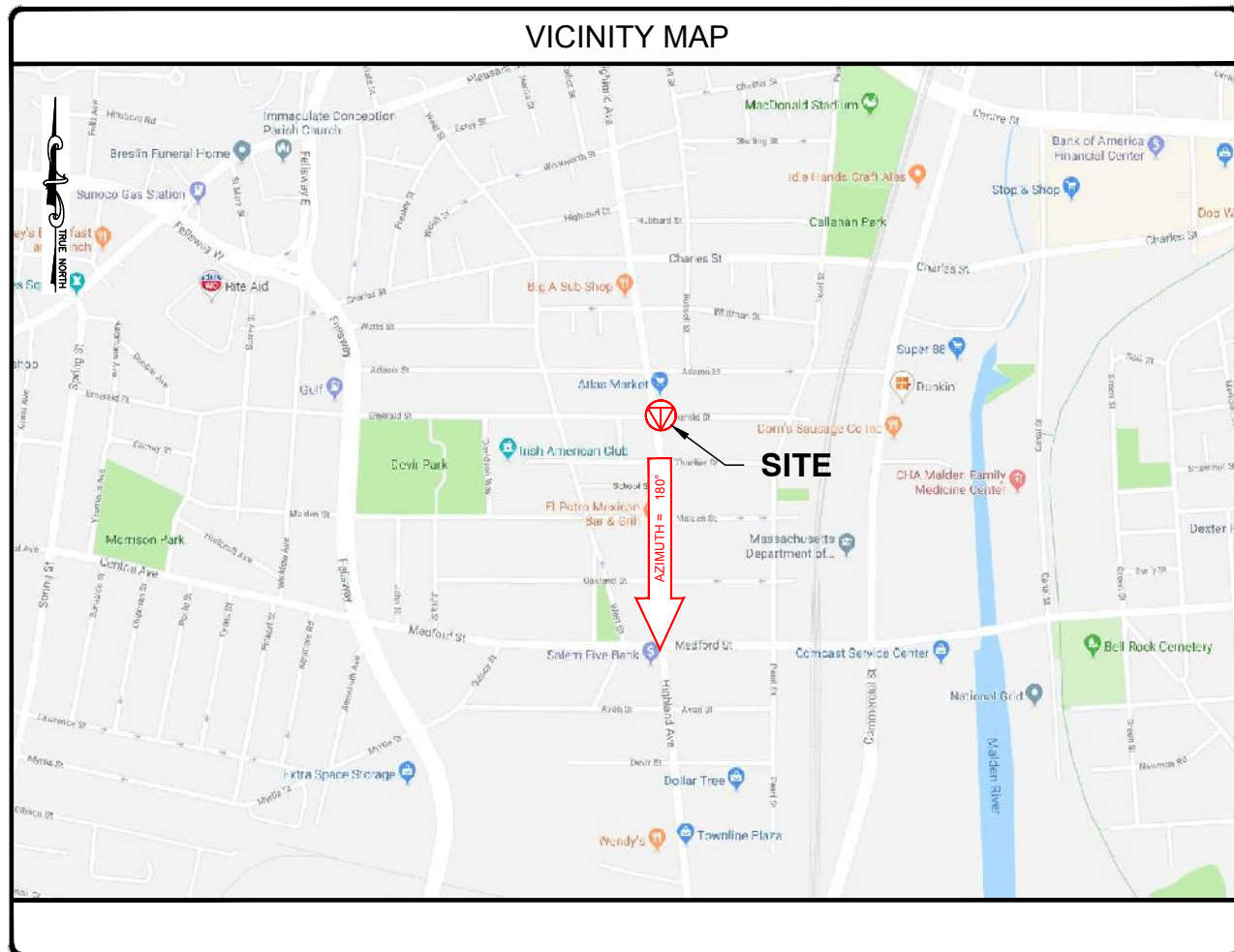
KRUPAKARAN KOLANDAIVELU, P.E.  
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

**TITLE SHEET**

SHEET NUMBER

SHEET  
**01 OF 05**



PROJECT INFORMATION	
PROJECT NAME:	NE-MA-BSTN2N01-TMO
POLE TAG:	421-1
	LATITUDE: 42.420197°
	LONGITUDE: -71.079787°
JURISDICTION:	CITY OF MALDEN MIDDLESEX COUNTY
EXTENET PROJECT MANAGER:	RICK ANGELINI 3030 WARRENVILLE RD, SUITE 340 LISLE, IL 60532 NOC: (866) 892-5327
HUB LOCATION:	HUB: NEH0004A 329 SECOND STREET EVERETT, MA 02149
ELECTRIC COMPANY:	NATIONAL GRID

CODE COMPLIANCE	
ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES.	
<ul style="list-style-type: none"> <li>2015 INTERNATIONAL BUILDING CODE (MASSACHUSETTS AMENDED 9TH EDITION)</li> <li>2017 NATIONAL ELECTRICAL CODE</li> <li>NFPA 1-2015 EDITION</li> <li>2015 IFC - REFERENCE 527 CMR</li> <li>AMERICAN CONCRETE INSTITUTE</li> <li>AMERICAN INSTITUTE OF STEEL CONSTRUCTION</li> <li>MANUAL OF STEEL CONSTRUCTION 13TH EDITION</li> </ul>	<ul style="list-style-type: none"> <li>ANSI/TIA-222-G</li> <li>TIA 607</li> <li>INSTITUTE FOR ELECTRICAL &amp; ELECTRONICS ENGINEER 81</li> <li>IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION</li> <li>TELECORDIA GR-1275</li> <li>ANSI/T 311</li> </ul>

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01	TITLE SHEET
02	NOTES
03	ELEVATION
04	ANTENNA & EQUIPMENT DETAILS
05	ELECTRICAL & GROUNDING DETAILS



**GENERAL NOTES:**

- THE CONTRACTOR SHALL GIVE ALL NOTICE AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES.
- THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
- THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE CONSTRUCTION MANAGER OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
- THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN, EXCEPT FOR FIBER OPTIC CABLE AND OTHER MATERIALS IDENTIFIED BY.
- THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWING/CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATION UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
- THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPONED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
- THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTIONS MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, AND KEEPING A COPY ON SITE, ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
- THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY TO ORIGINAL OR BETTER CONDITION.
- THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
- THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL IS RESOLVED BY THE CONSTRUCTION MANAGER.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE PROJECT.
- OWNER/CONTRACTOR SHALL CONTACT ONE CALL MINIMUM 72 HOURS PRIOR TO THE START OF CONSTRUCTION FOR LOCATION OF EXISTING UNDERGROUND UTILITIES.
- SUBMITTAL OF BID INDICATES THAT THE CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.
- THESE PLANS ARE DIAGRAMMATIC ONLY, FOLLOW AS CLOSELY AS POSSIBLE.
- CONTRACTOR SHALL COORDINATE ALL WORK BETWEEN TRADES AND ALL OTHER SCHEDULING AND PROVISIONARY CIRCUMSTANCES SURROUNDING THE PROJECT.
- CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR COMPLETE AND FUNCTIONALLY OPERATING SYSTEMS ENERGIZED AND READY FOR USE THROUGHOUT AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
- CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION. LEGALLY DISPOSE OF ALL REMOVED, UNUSED AND EXCESS MATERIAL GENERATED BY THE WORK OF THIS CONTRACT. DELIVER ITEMS INDICATED ON THE DRAWINGS TO THE OWNER IN GOOD CONDITION. OBTAIN SIGNED RECEIPT UPON DELIVERY.
- AFTER COMPLETION OF CONSTRUCTION, RED LINED AS-BUILT PLANS SHALL BE PROVIDED TO CONSTRUCTION MANAGER.

**ELECTRICAL NOTES:**

- CONTRACTOR SHALL PERFORM ALL VERIFICATIONS, OBSERVATION TESTS, AND EXAMINATION WORK PRIOR TO ORDERING OF ANY EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE PROJECT MANAGER LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
- VERIFY HEIGHTS WITH PROJECT MANAGER PRIOR TO INSTALLATION.
- ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. ELECTRICAL MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORIES AND SHALL BEAR THE INSPECTION LABEL "I" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION OVER THE CONSTRUCTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH ALL CURRENT APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU. ALL MATERIALS AND EQUIPMENT SHALL BE APPROVED FOR THEIR INTENDED USE AND LOCATION.
- ALL WORK SHALL COMPLY WITH ALL APPLICABLE GOVERNING STATE, COUNTY AND CITY CODES AND OSHA, NFPA, NEC & ASHRAE REQUIREMENTS.
- ENTIRE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE. ALL WORK, MATERIAL AND EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.
- PROPERLY SEAL ALL PENETRATIONS. PROVIDE UL LISTED FIRE-STOPS WHERE PENETRATIONS ARE MADE THROUGH FIRE-RATED ASSEMBLIES. WATER-TIGHT USING SILICONE SEALANT.
- DELIVER ALL BROCHURES, OPERATING MANUALS, CATALOGS AND SHOP DRAWINGS TO THE PROJECT MANAGER AT JOB COMPLETION. PROVIDE MAINTENANCE MANUALS FOR MECHANICAL EQUIPMENT. AFFIX MAINTENANCE LABELS TO MECHANICAL EQUIPMENT.
- ALL CONDUCTORS SHALL BE COPPER. MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG., UNLESS OTHERWISE NOTED. CONDUCTORS SHALL BE TYPE THHW, RATED IN ACCORDANCE WITH NEC 110-14(C).
- ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM INTERRUPTING CURRENT TO WHICH THEY MAY BE SUBJECTED.
- THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE; ARTICLES 250 & 810 AND THE UTILITY COMPANY STANDARDS.
- CONDUIT:**
  - RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR. RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2 LAPPED WRAPPED WITH HUNTS WRAP PROCESS NO. 3.
  - ELECTRICAL METALLIC TUBING SHALL HAVE U.L. LABEL, FITTINGS SHALL BE GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
  - LIQUID-TIGHT FLEXIBLE METAL CONDUIT SHALL BE U.L. LISTED AND SHALL BE USED AT FINAL CONNECTIONS TO MECHANICAL EQUIPMENT & RECTIFIERS AND WHERE PERMITTED BY CODE. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL CONTAIN A FULL-SIZE GROUND CONDUCTOR.

- CONDUIT RUNS SHALL BE SURFACE MOUNTED ON CEILINGS OR WALLS UNLESS NOTED OTHERWISE. ALL CONDUIT SHALL RUN PARALLEL OR PERPENDICULAR TO WALLS, FLOOR, CEILING, OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH THE PROJECT MANAGER PRIOR TO INSTALLING.
- PVC CONDUIT MAY BE PROVIDED ONLY WHERE SHOWN, OR IN UNDERGROUND INSTALLATIONS. PROVIDE UV-RESISTANT CONDUIT WHERE EXPOSED TO THE ATMOSPHERE. PROVIDE GROUND CONDUCTOR IN ALL PVC RUNS; EXCEPT WHERE PERMITTED BY CODE TO OMIT.
- ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS. BACKGROUND SHALL BE BLACK WITH WHITE LETTERS; EXCEPT AS REQUIRED BY CODE TO FOLLOW A DIFFERENT SCHEME.
- UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO PROJECT MANAGER. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 5 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE PROJECT MANAGER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
- COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS SHALL BE PAID BY THE CONTRACTOR.
- VERIFY ALL EXISTING CIRCUITRY PRIOR TO REMOVAL AND NEW WORK. MAINTAIN POWER TO ALL OTHER AREAS & CIRCUITS NOT SCHEDULED FOR REMOVAL.

**GROUNDING NOTES:**

- GROUNDING SHALL COMPLY WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE.
- ALL GROUNDING DEVICES SHALL BE U.L. APPROVED OR LISTED FOR THEIR INTENDED USE.
- ALL WIRES SHALL BE AWG THHN/THWN COPPER UNLESS NOTED OTHERWISE.
- GROUNDING CONNECTIONS TO GROUND RODS, GROUND RING WIRE, TOWER BASE AND FENCE POSTS SHALL BE EXOTHERMIC ("CADWELDS") UNLESS NOTED OTHERWISE. CLEAN SURFACES TO SHINY METAL. WHERE GROUND WIRES ARE CADWELDED TO GALVANIZED SURFACES, SPRAY CADWELD WITH GALVANIZING PAINT.
- GROUNDING CONNECTIONS TO GROUND BARS ARE TO BE TWO-HOLE BRASS MECHANICAL CONNECTORS WITH STAINLESS STEEL HARDWARE (INCLUDING SCREW SET) CLEAN GROUND BAR TO SHINY METAL. AFTER MECHANICAL CONNECTION, TREAT WITH PROTECTIVE ANTI-OXIDANT COATING.
- GROUND COAXIAL CABLE SHIELDS AT BOTH ENDS WITH MANUFACTURER'S GROUNDING KITS.
- ROUTE GROUNDING CONDUCTORS THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 12" RADIUS.
- INSTALL #2 AWG GREEN-INSULATED STRANDED WIRE FOR ABOVE GRADE GROUNDING AND #2 TINNED SOLID COPPER WIRE FOR BELOW GRADE GROUNDING UNLESS OTHERWISE NOTED.
- REFER TO GROUNDING PLAN FOR GROUND BAR LOCATIONS. GROUNDING CONNECTIONS SHALL BE EXOTHERMIC TYPE ("CADWELDS") TO ANTENNA MOUNTS AND GROUND RING. REMAINING GROUNDING CONNECTIONS SHALL BE COMPRESSION FITTINGS. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO-HOLE LUGS.
- THE GROUND ELECTRODE SYSTEM SHALL CONSIST OF DRIVEN GROUND RODS POSITION ACCORDING TO GROUNDING PLAN. THE GROUND RODS SHALL BE 5/8"x10" COPPER CLAD STEEL INTERCONNECTED WITH #2 TINNED SOLID COPPER WIRE BURIED 36" BELOW GRADE. BURY GROUND RODS A MAXIMUM OF 15' APART, AND A MINIMUM OF 6' APART.
- IF ROCK IS ENCOUNTERED GROUND RODS SHALL BE PLACED AT AN OBLIQUE ANGLE NOT TO EXCEED 45'.
- EXOTHERMIC WELDS SHALL BE MADE IN ACCORDANCE WITH ERICO PRODUCTS BULLETIN A-AT OR EQUAL.
- CONSTRUCTION OF GROUND RING AND CONNECTIONS TO EXISTING GROUND RING SYSTEM SHALL BE DOCUMENTED WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PROVIDE PHOTOS TO THE CONSTRUCTION MANAGER.
- ALL GROUND LEADS EXCEPT THOSE TO THE EQUIPMENT ARE TO BE #2 TINNED SOLID COPPER WIRE. ALL EXTERIOR GROUND BARS TINNED COPPER.
- PRIOR TO INSTALLING LUGS ON GROUND WIRES, APPLY THOMAS & BETTS KOPR-SHIELD (TM OF JET LUBE INC.). PRIOR TO BOLTING GROUND WIRE LUGS TO GROUND BARS, APPLY KOPR-SHIELD OR EQUAL.
- ENGAGE AN INDEPENDENT ELECTRICAL TESTING FIRM TO TEST AND VERIFY THAT IMPEDANCE DOES NOT EXCEED FIVE OHMS TO GROUND BY MEANS OF "FALL OF POTENTIAL TEST". TEST SHALL BE WITNESSED BY A REPRESENTATIVE, AND RECORDED ON THE "GROUND RESISTANCE TEST" FORM.
- WHERE BARE COPPER GROUND WIRES ARE ROUTED FROM ANY CONNECTION ABOVE GRADE TO GROUND RING, INSTALL WIRE IN 3/4" PVC SLEEVE, FROM 1' BELOW GRADE AND SEAL TOP WITH SILICONE MATERIAL.
- PREPARE ALL BONDING SURFACES FOR GROUNDING CONNECTIONS BY REMOVING ALL PAINT AND CORROSION DOWN TO SHINY METAL. FOLLOWING CONNECTION, APPLY APPROPRIATE ANTI-OXIDATION PAINT.
- ANY SITE WHERE THE EQUIPMENT (BTS, CABLE BRIDGE, PPC, GENERATOR, ETC.) IS LOCATED WITHIN 6 FEET OF METAL FENCING, THE GROUND RING SHALL BE BONDED TO THE NEAREST FENCE POST USING (3) RUNS OF #2 BARE TINNED COPPER WIRE.

**GROUNDING GUIDELINES:**

ALL EQUIPMENT THAT IS INSTALLED AND MAY CAUSE ANY KIND OF ELECTRICAL CHARGE OR BUILD UP MUST HAVE PROPER AND ADEQUATE GROUNDING IN PLACE TO PREVENT FROM EQUIPMENT DAMAGE AND SHOCK HAZARDS.

**RRH'S**

MUST BE GROUND TO A MAIN BUSS BAR OR HOME RUN GROUND FROM THE GROUND PIN OR STUD THAT IS ON THE CHASSIS. IF ANY EQUIPMENT HAS A GROUND POINT ON IT, IT SHOULD BE GROUND. THE GROUNDING CABLE SIZE SHOULD FOLLOW LOCAL GUIDELINES ON EQUIPMENT GROUNDING. NORMALLY THE STANDARD IS 6 UV RATED STRANDED GROUND CABLE TO BE USED ON RRH'S. THE LUG NEEDS TO FIT THE PROPER CABLE SIZE AS WELL AS THE HOLE SIZE FOR THE STUD. IF IT'S A SINGLE STUD IT SHOULD BE A ONE HOLE LUG. IF IT HAS A PLACE FOR TWO HOLE LUG THEN THAT SHOULD BE USED. (I.E. COMMSCOPE. ION M HAS A SINGLE STUD GROUND, TE PRISM HAS A GROUND FOR A 2 HOLE LUG.) DO NOT CUT THE LUGS TO FIT. THEY MAKE LUGS IN ALL SHAPES AND SIZES. ORDER THE CORRECT ONE AND ATTACH IT PROPERLY.

**COAX GROUNDS**

IN LINE GROUNDS SHOULD BE INSTALLED WITH THE PROPER SIZE GROUND KITS ON ALL COAX CABLES. THE KITS ARE INSTALLED ON FRONT AND BACK OF COAX RUNS OVER APPROXIMATELY 15 FEET. ANYTHING OVER 300 FEET NEEDS AN ADDITIONAL GROUND AROUND THE 150 FOOT MARK.

**SURGE ARRESTORS**

IF IT HAS A PLACE FOR A GROUND - GROUND IT.

**MAST PIPES**

ALL MAST PIPES SHOULD BE GROUND WITH BEAR METAL ON THE PLACE THE GROUND IS ATTACHED AND THEN COLD GALVANIZATION OVER THE BARE METAL TO PREVENT RUST. THE GROUND CAN BE ATTACHED MECHANICALLY OR AN EXOTHERMIC WELD (CAD WELD) MAY BE USED. IF THE MAST PIPE IS THE TALLEST POINT ON A BUILDING IT SHOULD ALSO HAVE A LIGHTNING ROD ATTACHED TO IT AS WELL.

**DIPLEXERS/DUPLEXERS/SPLITTERS/PASSIVE COMPONENTS**

IF IT HAS A PLACE FOR A GROUND TO BE INSTALLED - INSTALL IT.

ANY STRUCTURE OR FRAME SHOULD HAVE 2 GROUND WIRE, I.E. MAST PIPES, OUTDOOR ENCLOSURES, SHROUDS, BUSS BAR HOME RUN TO EARTH GROUND. ALL EQUIPMENT HAS 6 TO BUSS BARS.

ALL BUSS BARS NEED TO HAVE A LINK TO AN EARTH GROUND SYSTEM AND MUST BE ISOLATED IF MOUNTED ON ANYTHING THAT MAY RETAIN AN ELECTRIC CHARGE. NO EXCEPTIONS. ALL EQUIPMENT SHOULD RUN TO BUSS BARS. LUGS ON BUSS BARS SHOULD HAVE FRONT AND BACK FLAT WASHERS SANDWICHING THE LUG(S) TO THE BAR AND NOT OVERLAPPING CAUSING IT TO HOLD OR PIN DOWN OTHER LUGS ON THE BAR. THERE SHOULD ALWAYS BE A LOCK WASHER CLOSEST TO THE NUT ON THE BOLT FOR A LUG. NEVER IS IT OK TO STACK LUGS ON TOP OF EACH OTHER. IF THERE IS NOT ENOUGH SPACE, GET A BIGGER BUSS BAR. THEY SHOULD ALL HAVE A DIRECT CONTACT TO A BUSS BAR WITH NO-OX COATED BETWEEN THE LUG AND THE BUSS BAR. ALL GROUNDS SHOULD HAVE HEAT SHRINK OVER THE LUG (UNLESS IT'S NON-JACKETED WIRE). ALL LUGS NEED TO BE CRIMPED ON SECURELY WITH THE PROPER DYE AND TOOL (NOT CHANNEL LOCK CRIMPED). THERE SHOULD BE NO MORE THAN 1/16 INCH BARE CABLE SHOWING (SHINER) BETWEEN THE JACKET AND THE LUG. INSIDE LUGS SHOULD HAVE CLEAR HEAT SHRINK TO INSPECT THE CRIMPS AND SHINERS. INSIDE LUGS SHOULD HAVE INSPECTION WINDOWS TO SHOW THE GROUND WIRE IS INSERTED INTO THE LUG ALL THE WAY AND IS PROPERLY INSTALLED. OUTDOOR LUGS MAY HAVE BLACK OR GREEN HEAT SHRINK.

**WEATHER SEAL GUIDELINES:**

**BUTYL**

- PRE WRAP ALL CONNECTIONS WITH BLACK ELECTRICAL TAPE TO COVER ALL METAL SHOWING TO PREVENT DAMAGE TO CONNECTOR WHEN WEATHER SEAL IS TO BE REMOVED. 3/4 INCH OR 2 INCH TAPE CAN BE USED FOR THIS PROCESS.
- WRAP CONNECTIONS WITH BUTYL WEATHER SEALANT WITH TWO LAYERS TO FORM A CONE LIKE SHAPE. OVER LAPPING THE LAYERS BY AT LEAST 50%. MOLD SEALANT TO PROPER SHAPE. THIS STEP IS CRUCIAL OR THE BUTYL WILL LEAK OVER TIME.
- WRAP SEALANT WITH 2 LAYERS OF 2 INCH TAP. (YOU CAN CUT INTO STRIPS IN TIGHT AREAS). FIRST WRAP SHOULD BE PULLED SMOOTH TO MAKE FINAL WRAPS CLEAN AND CRISP. 2ND WRAP SHOULD BE PULLED TIGHTER THAN FIRST TO HOLD SEALANT INTO PROPER (CONE LIKE) SHAPE. OVER LAPPING TAPE SHOULD COVER AT LEAST 50% OF EACH LAYER OF TAPE PRIOR.
- UPON COMPLETION OF 2 LAYERS OF 2 INCH TAPE FINALIZE WITH AT LEAST 3 LAYERS OF 3/4 INCH TAPE. EACH WRAP OF TAPE SHOULD BE PULLED TIGHTER THAN WRAP BEFORE TO SQUEEZE SEALANT INTO A MOLD AND WILL PREVENT ANY SEALANT FROM LEAKING OUT THE SIDES OVER TIME. EACH LAYER SHOULD COVER PRIOR LAYERS AT LEAST 50%.
- OVERLAP THE TAPE 50% OF THE PREVIOUS LAYER.
- ALWAYS FINISH THE LAST WRAP OF TAPE GOING UP TO CREATE A SHINGLING OF THE TAPE SO IN THE WEATHER ANYTHING THAT RUNS DOWN THE CABLE WILL NOT LEAK INTO THE SEALANT. CUT THE END OF THE TAPE AND LAY IT ONTO THE FINISH. DO NOT STRETCH THE END OF THE TAPE. THIS WILL CAUSE THE TAPE TO PULL OFF OVER TIME AND CREATE A FLAGGING AFFECT.

**FUSION TAPE**

- CHECK TO MAKE SURE ALL CONNECTORS ARE TORQUED TO PROPER SPECIFICATIONS BEFORE YOU BEGIN.
- NOTE: THIS STEP DOES NOT NEED A CURTSY WRAP BECAUSE THE TAPE DOES NOT ACTUALLY ADHERE TO THE CONNECTOR ITSELF BUT BINDS TO ITSELF. ALSO KNOWN AS "SELF-AMALGAMATING TAPE."
- WRAP CONNECTIONS FUSION TAPE SEALANT WITH TWO LAYERS TO FORM A CONE LIKE SHAPE. FUSION TAPE MUST OVER LAP AT LEAST 50% TO FORM A PROPER SEAL. COVER ALL OF THE BARE METAL SHOWING (AT LEAST 1-1/2 INCH PAST END OF CONNECTOR.)
- IF THIS "TAPE" IS NOT PULLED TIGHT WHILE WRAPPING YOU WILL NOT CREATE A PROPER SEAL, IT MUST BE STRETCHED TO CREATE BOND TO ITSELF.
- WRAP AT LEAST 2 LAYERS OF 3/4 INCH TAPE. EACH LAYER SHOULD COVER AT LEAST 50% OF PREVIOUS TAPE WRAP.
- ALWAYS FINISH THE LAST WRAP OF TAPE GOING UP TO CREATE A SHINGLING OF THE TAPE SO IN THE WEATHER ANYTHING THAT RUNS DOWN THE CABLE WILL NOT LEAK INTO THE SEALANT. CUT THE END OF THE TAPE AND LAY IT ONTO THE FINISH. DO NOT STRETCH THE END OF THE TAPE. THIS WILL CAUSE THE TAPE TO PULL OFF OVER TIME AND CREATE A FLAGGING AFFECT.

**HEAT SHRINK**

- PRE WRAP ALL CONNECTIONS WITH BLACK ELECTRICAL TAPE TO COVER ALL METAL SHOWING TO PREVENT DAMAGE TO CONNECTOR WHEN WEATHER SEAL IS TO BE REMOVED. 3/4 INCH OR 2 INCH TAPE CAN BE USED FOR THIS PROCESS.
- USE ONLY OUTDOOR RATED HEAT SHRINK THAT HAS THE SELF-ADHESIVE WHEN HEATED PROPERLY. THIS IS WHAT WILL CREATE THE SEAL TO THE CONNECTOR.
- MAKE SURE HEAT SHRINK COVERS ALL OF THE COUPLERS AND CONNECTIONS. HEAT THE HEAT SHRINK TO SHRINK TIGHTLY TO THE CONNECTIONS AND CABLE. MAKE SURE THE HEAT SHRINK IS SEALED TOP AND BOTTOM OF THE CONNECTIONS. ALSO CHECK TO MAKE SURE HEAT SHRINK WAS NOT OVER HEATED AND THERE ARE NO BREAKS IN SEAL THROUGH-OUT THE SHRINK TUBING.

**ANDREWS CLAM SHALL**

- PROPERLY TORQUE CONNECTOR TO SPECIFICATION.
- APPLY ONE LAYER OF 3/4 INCH BLACK TAPE AROUND ENTIRE CONNECTOR ENDING AT LEAST 1-1/2 INCHES PAST TOP AND BOTTOM OF CONNECTOR TO PREVENT ANY MOISTURE FROM STICKING TO THE CONNECTOR.
- INSPECT THE DEVICE TO MAKE SURE IT IS NOT CHIPPED, CRACKED OR ANY SIGNS OF NEGLECT THAT WILL TAKE AWAY FROM MAKING A FULL SEAL AROUND THE CONNECTOR.
- USE ONLY CORRECT SIZE PER CABLE AND CONNECTOR TYPE - I.E. 1/2 INCH FOR 1/2 INCH NOT 7/8TH FOR 1/2 INCH.
- FOLLOW DIRECTIONS THAT COME WITH PRODUCT - MOST CLAM SHELL TYPE SEALANT DEVICES WRAP AROUND OR CLAMP AROUND A CONNECTION POINT.
- BE CAREFUL WHEN SETTING LOCKING DEVICE INTO PLACE ON CLAM SHELL STYLE SEALANTS (THEY ARE PLASTIC AND TEND TO BREAK OR CRACK IN EXTREME WEATHER CONDITIONS WHEN LOCKING DEVICE CLOSED TO CREATE THE SEAL.) IF THE LOCKING MECHANISM CRACKS OR BREAKS, REPLACE IT. DO NOT TAPE THE CLAMP CLOSED OR TRY TO RE-ENGINEER IT.
- ONCE THE CLAMP IS ON AND LOCKED AROUND THE CONNECTOR THE PROCESS IS COMPLETE.

**PPC BOOT**

- PLACE BOOT OVER CABLE BEFORE CONNECTOR IS ATTACHED TO CABLE. THIS IS ONLY RATED FOR PPC TYPE CONNECTORS. (NOTE: IF THIS STEP IS SKIPPED OR NOT COMPLETED BEFORE MAKING A CONNECTOR THE SUBCONTRACTOR WILL NOT BE ABLE TO USE THE BOOT STYLE DEVICE TO SEAL THE CONNECTOR. IT IS NOT RECOMMENDED TO WASTE A CONNECTOR AND CUT IT OFF AND START AT STEP NO. 1 AGAIN. SINCE PPC CONNECTORS ARE NOT REUSABLE AND CAN GET QUITE EXPENSIVE. DO NOT TRY TO STRETCH THE BOOT TO SLIDE IT OVER THE CONNECTION.)
- PLACE THE BOOT OVER THE CABLE, AND THEN MAKE THE CONNECTOR.
- TORQUE THE CONNECTION TO PROPER SPECIFICATIONS.
- SLIDE BOOT UP TO COVER THE ENTIRE CONNECTOR, FOLLOWING THE PPC GUIDELINES.
- THIS PROCESS IS COMPLETE AT THIS TIME.

**ENGINEERING FIRM**



**TOTALLY COMMITTED.**

**NB+C ENGINEERING SERVICES, LLC.**  
 100 APOLLO DRIVE, SUITE 303  
 CHELMSFORD, MA 01824  
 (978) 856-8308

**APPLICANT**



**extenet**  
 SYSTEMS  
 YOUR NETWORK EVERYWHERE.

3030 WARRENVILLE ROAD, SUITE 340  
 LISLE, IL 60532  
 (630) 505-3800

**SITE INFORMATION**

NE-MA-BSTN2N01-02404  
 TMO ID: NE2067BA\_11LAB  
 183 HIGHLAND AVENUE  
 MALDEN, MA 02148  
 MIDDLESEX COUNTY

**DESIGN RECORD**

REVISIONS			
REV	DATE	DESCRIPTION	BY
2	07/23/19	POLE REPLACEMENT	CJI
1	05/15/19	FOC REVISED	NSB
0	04/17/19	PRELIMINARY	CJI

**PROFESSIONAL STAMP**

Blank area for professional stamp.

**ENGINEER**

KRUPAKARAN KOLANDAIVELU, P.E.  
 MA PROFESSIONAL ENGINEER LIC. #501919

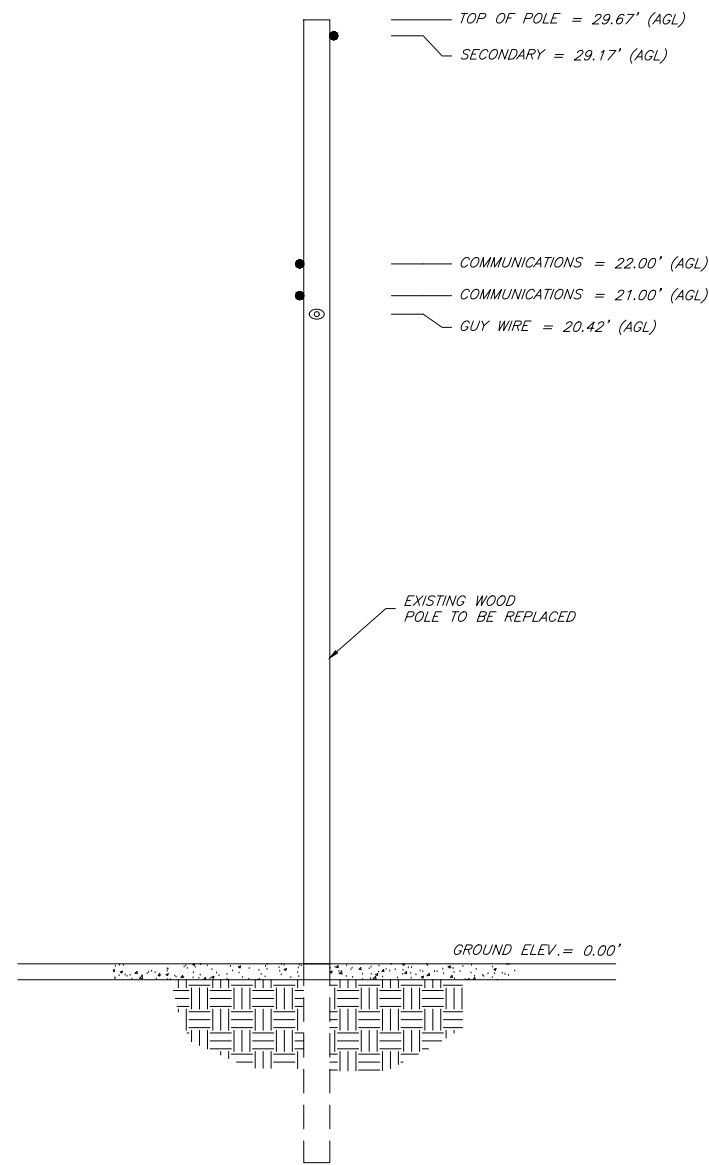
**SHEET TITLE**

**NOTES**

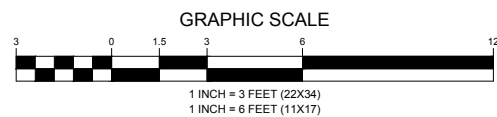
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SHEET  
**02 OF 05**

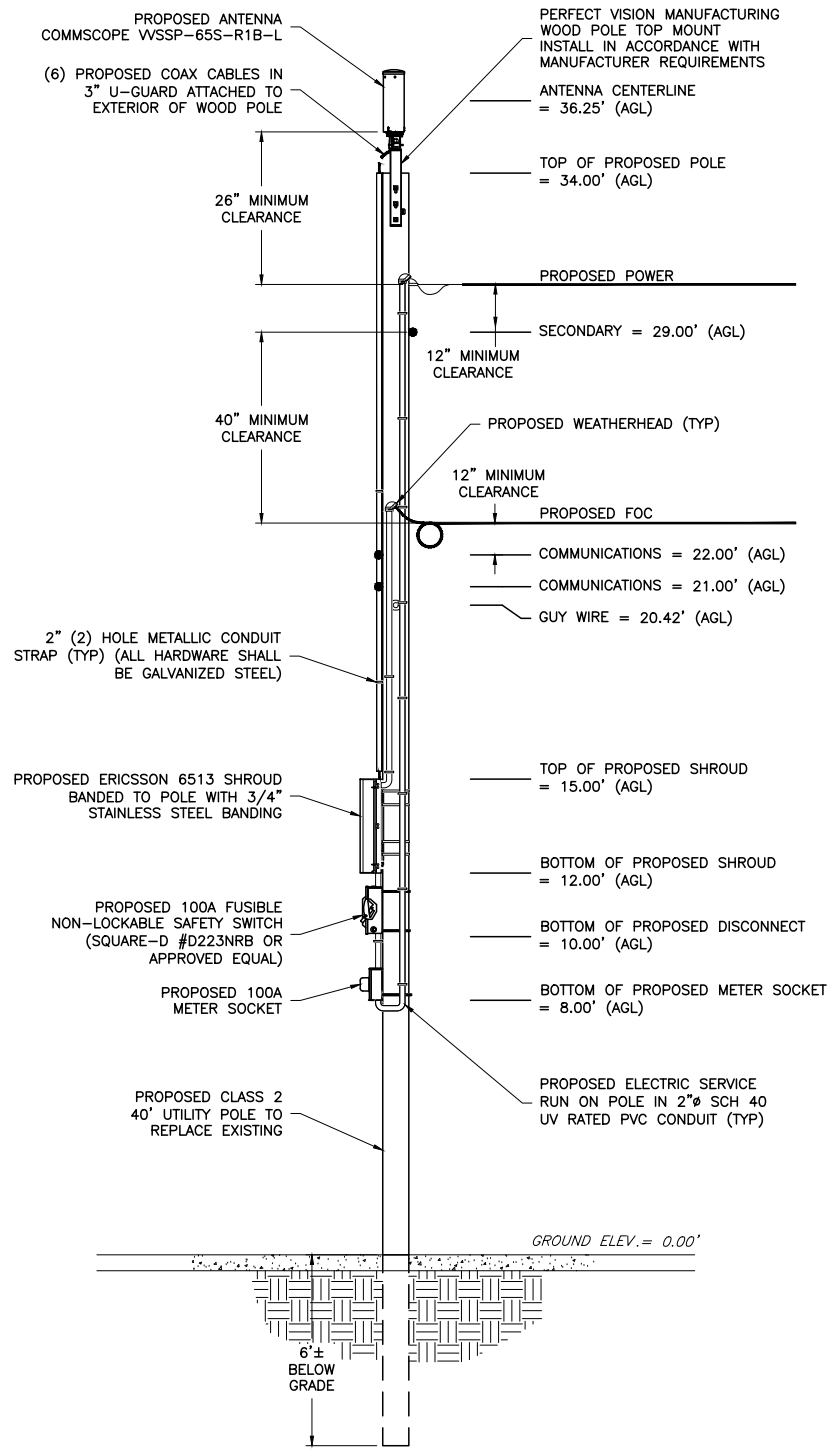




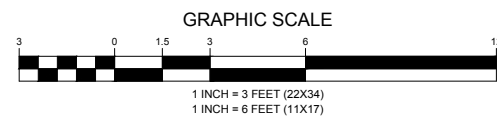
EXISTING ELEVATION (LOOKING EAST)



ATTACHMENT HEIGHTS, ANTENNA AND EQUIPMENT LOCATIONS  
PENDING MAKE-READY AND STRUCTURAL ANALYSIS



PROPOSED ELEVATION (LOOKING EAST)



EXISTING CONDITIONS

NOTES:

- EQUIPMENT ELEVATION IS SUBJECT TO MAKE READY PERFORMED BY POLE OWNER.
- NEW PLACARD SHALL BE OSHA COMPLIANT AND DISPLAY THE FOLLOWING INFORMATION: TRANSMITTING SYSTEM, EQUIPMENT OWNER & PROPER CONTACT INFORMATION. INSTALL PER UTILITY COMPANY REQUIREMENTS AND VERIFY EXACT MOUNTING HEIGHT IN FIELD.
- MAINTAIN MINIMUM OF 30" FROM NEAREST COMMUNICATIONS LINE TO TOP OF PROPOSED SHROUD.
- MAINTAIN MINIMUM OF 40" FROM TOP COMMUNICATION ATTACHMENT TO BOTTOM SECONDARY POWER ATTACHMENT.
- MAINTAIN MINIMUM OF 12" CLEARANCE IN ANY DIRECTION FROM ANTENNA TO NEAREST 15KV POWER CONNECTION.
- MAINTAIN MINIMUM OF 26" CLEARANCE IN ANY DIRECTION FROM ANTENNA TO NEAREST 35KV POWER CONNECTION.
- MAINTAIN MINIMUM OF 30" CLEARANCE FROM TOP SECONDARY POWER CONNECTION TO NEAREST PRIMARY POWER CONNECTION.
- MAINTAIN MINIMUM OF 12" FROM TOP SECONDARY POWER CONNECTION TO ANY ADDITIONAL SECONDARY POWER CONNECTION.
- MAINTAIN MINIMUM OF 12" FROM TOP COMMUNICATIONS LINE TO ANY ADDITIONAL COMMUNICATIONS LINE.
- MAINTAIN MINIMUM OF 8' & MAXIMUM OF 9' FROM GROUND LEVEL TO BOTTOM OF METER LOCATION.
- EQUIPMENT TO BE INSTALLED ON OPPOSITE SIDE OF TRAFFIC FLOW.

ENGINEERING FIRM



APPLICANT



SITE INFORMATION

NE-MA-BSTN2N01-02404  
TMO ID: NE2067BA\_11LAB  
183 HIGHLAND AVENUE  
MALDEN, MA 02148  
MIDDLESEX COUNTY

DESIGN RECORD

REVISIONS

REV	DATE	DESCRIPTION	BY
2	07/23/19	POLE REPLACEMENT	CJI
1	05/15/19	FOC REVISED	NSB
0	04/17/19	PRELIMINARY	CJI

PROFESSIONAL STAMP

ENGINEER

KRUPAKARAN KOLANDAIVELU, P.E.  
MA PROFESSIONAL ENGINEER LIC. #50019

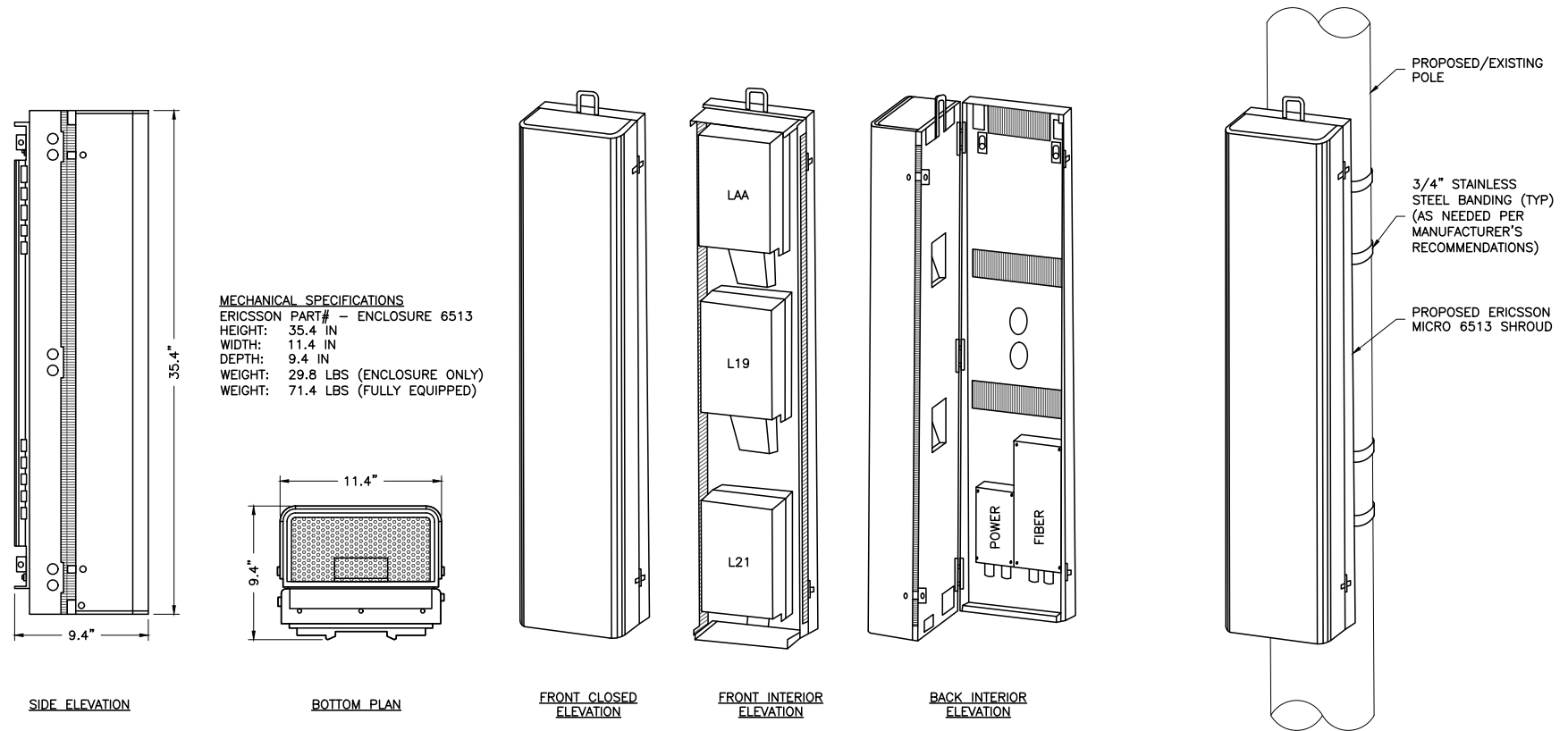
SHEET TITLE

ELEVATION

SHEET NUMBER

SHEET  
03 OF 05





**MECHANICAL SPECIFICATIONS**  
 ERICSSON PART# - ENCLOSURE 6513  
 HEIGHT: 35.4 IN  
 WIDTH: 11.4 IN  
 DEPTH: 9.4 IN  
 WEIGHT: 29.8 LBS (ENCLOSURE ONLY)  
 WEIGHT: 71.4 LBS (FULLY EQUIPPED)

SIDE ELEVATION

BOTTOM PLAN

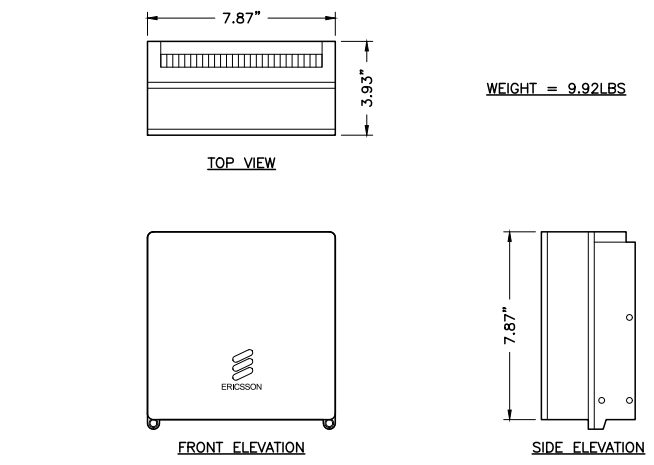
FRONT CLOSED ELEVATION

FRONT INTERIOR ELEVATION

BACK INTERIOR ELEVATION

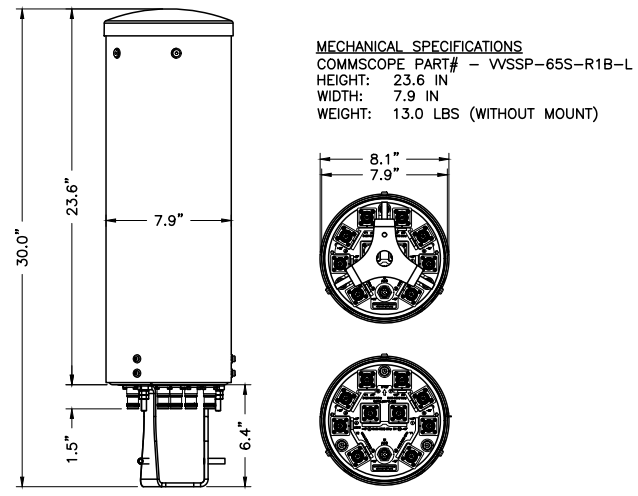
2 EQUIPMENT MOUNTING DETAIL  
 04 NTS

1 ERICSSON MICRO 6513 SHROUD DETAIL  
 04 NTS



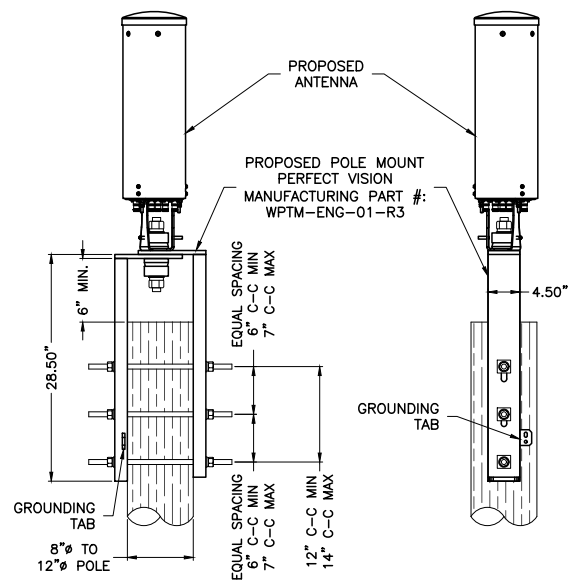
ERICSSON RADIO				
2203 B66 & B25	AC: 100-250V	NORMAL VOLTAGE RANGE AT RADIO INPUT CONNECTOR DC: -36 TO -58.5	NOMINAL VOLTAGE: -48V DC	95W TYPICAL / 130W MAX
2205 B46	AC: 100-250V	NORMAL VOLTAGE RANGE AT RADIO INPUT CONNECTOR DC: -36 TO -58.5	NOMINAL VOLTAGE: -48V DC	75W TYPICAL / 130W MAX

3 ERICSSON REMOTE RADIO UNIT (RRU)  
 04 NTS

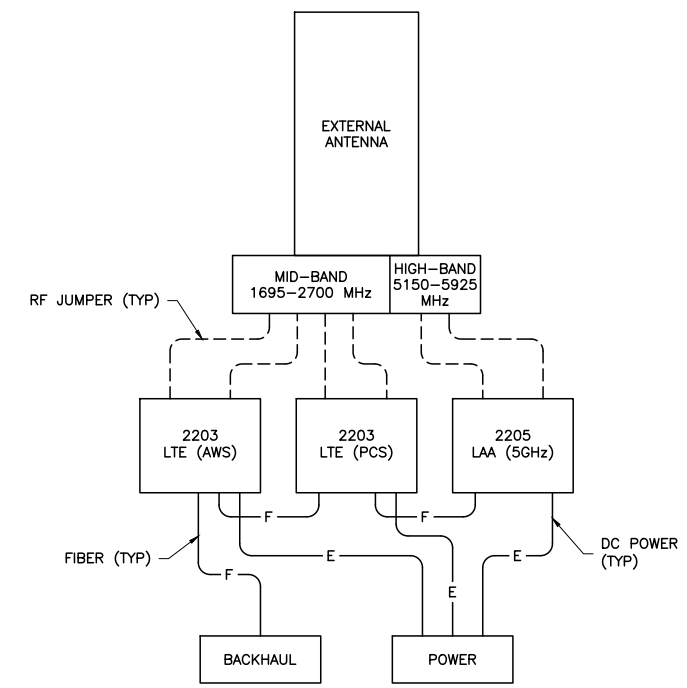


**MECHANICAL SPECIFICATIONS**  
 COMMSCOPE PART# - WVSP-65S-R1B-L  
 HEIGHT: 23.6 IN  
 WIDTH: 7.9 IN  
 WEIGHT: 13.0 LBS (WITHOUT MOUNT)

4 ANTENNA DETAIL  
 04 NTS

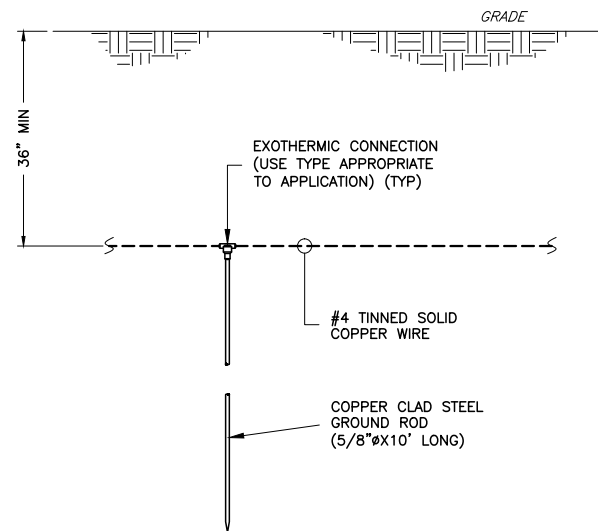


5 ANTENNA MOUNT DETAIL  
 04 NTS

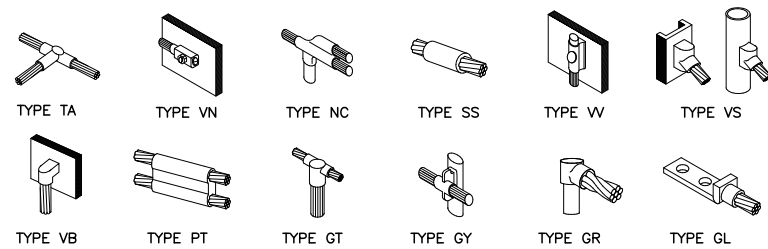


6 WIRING DIAGRAM  
 04 NTS

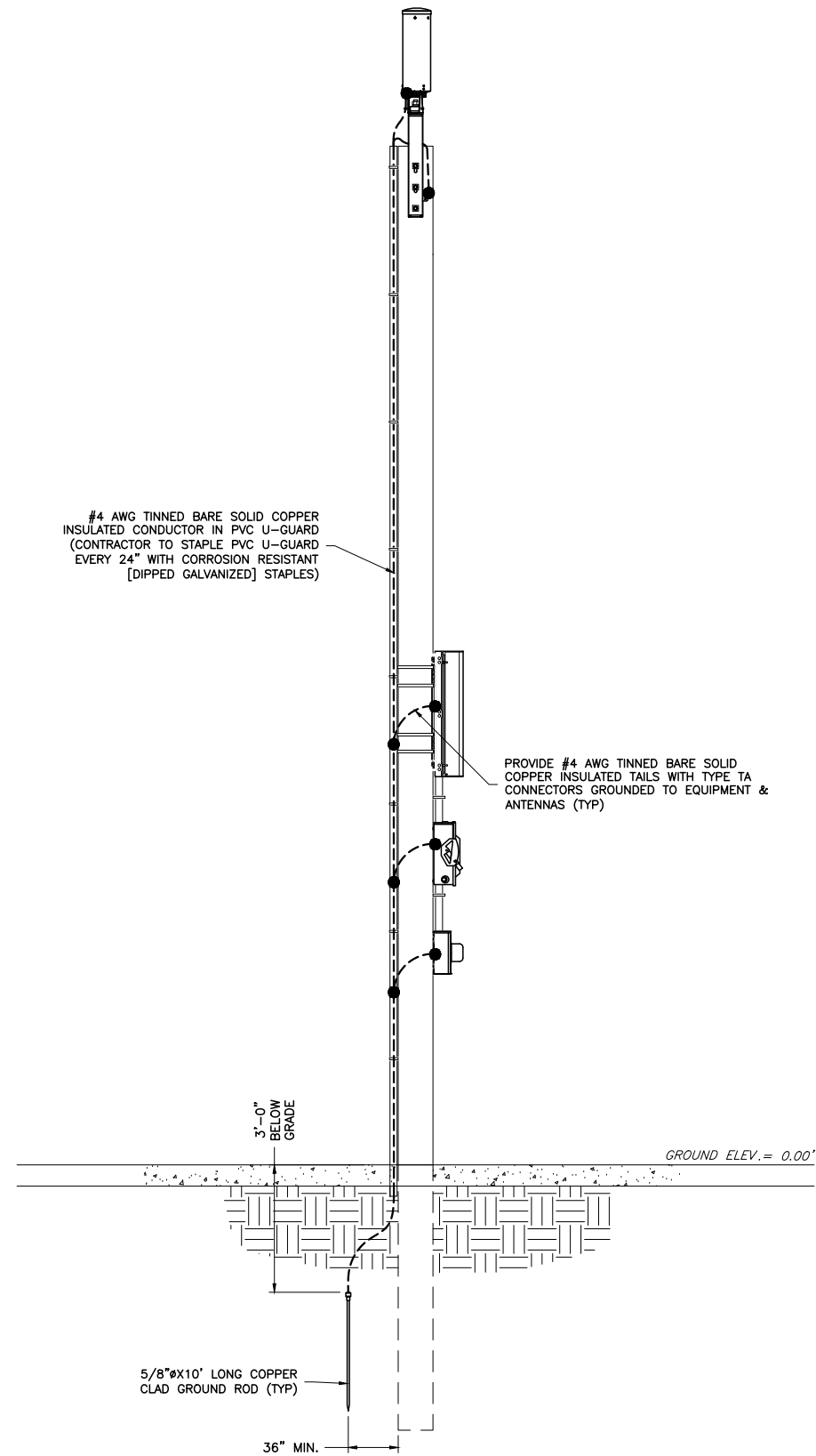
ENGINEERING FIRM	<b>TOTALLY COMMITTED.</b> <b>NB+C ENGINEERING SERVICES, LLC.</b> <small>100 APOLLO DRIVE, SUITE 303        CHELMSFORD, MA 01824        (978) 856-8308</small>																				
APPLICANT	<b>YOUR NETWORK. EVERYWHERE.</b> <b>SYSTEMS</b> <small>3030 WARRENVILLE ROAD, SUITE 340        LISLE, IL 60532        (630) 505-3800</small>																				
SITE INFORMATION	NE-MA-BSTN2N01-02404 TMO ID: NE2067BA_11LAB 183 HIGHLAND AVENUE MALDEN, MA 02148 MIDDLESEX COUNTY																				
DESIGN RECORD	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>07/23/19</td> <td>POLE REPLACEMENT</td> <td>CJI</td> </tr> <tr> <td>1</td> <td>05/15/19</td> <td>FOC REVISED</td> <td>NSB</td> </tr> <tr> <td>0</td> <td>04/17/19</td> <td>PRELIMINARY</td> <td>CJI</td> </tr> </tbody> </table>	REVISIONS				REV	DATE	DESCRIPTION	BY	2	07/23/19	POLE REPLACEMENT	CJI	1	05/15/19	FOC REVISED	NSB	0	04/17/19	PRELIMINARY	CJI
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ENGINEER	KRUPAKARAN KOLANDAIVELU, P.E. MA PROFESSIONAL ENGINEER LIC. #50019																				
SHEET TITLE	<b>ANTENNA &amp; EQUIPMENT DETAILS</b>																				
SHEET NUMBER	SHEET <b>04 OF 05</b>																				



1 TYPICAL GROUND ROD DETAIL  
05 NTS



2 GROUNDING CONNECTION DETAILS  
05 NTS



3 ELECTRICAL & GROUNDING RISER DIAGRAM  
05 NTS

NOTE:  
EXISTING/PROPOSED UTILITY WIRES,  
SIGNS, AND EXISTING EQUIPMENT  
NOT SHOWN FOR CLARITY.

ENGINEERING FIRM

**NB+C**  
TOTALLY COMMITTED.  
NB+C ENGINEERING SERVICES, LLC.  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
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PROFESSIONAL STAMP

ENGINEER

KRUPAKARAN KOLANDAIVELU, P.E.  
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

**ELECTRICAL  
& GROUNDING  
DETAILS**

SHEET NUMBER

SHEET  
**05 OF 05**