

KENNETH C. BALDWIN

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Also admitted in Massachusetts
and New York

November 17, 2021

Via Electronic Mail

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Request of Cellco Partnership d/b/a Verizon Wireless for an Order to Approve the Shared Use of an Existing Tower at 248 Hall Hill Road, Somers, Connecticut

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes (“C.G.S.”) §16-50aa, as amended, Cellco Partnership d/b/a Verizon Wireless (“Cellco”) hereby requests an order from the Siting Council (“Council”) to approve the shared use of an existing telecommunications tower located on a 38.5-acre parcel at 248 Hall Hill Road in Somers, Connecticut (the “Property”). The Property is owned by John & Debra Romano. The tower is owned by Eco-Site, LLC. Cellco identifies this site as its “Enfield E Facility”. The existing 179-foot monopole tower was approved by the Siting Council (“Council”) in Docket No. 476 (Eco-Site, Inc. as applicant) on February 15, 2018. A copy of the Docket No. 476 Decision and Order is included in [Attachment 1](#).

Cellco requests that the Council find that the proposed shared use of the existing tower satisfies the criteria of C.G.S § 16-50aa and issue an order approving this request. A copy of this filing is being sent to Somers’s First Selectman C.G. Knorr and Jennifer Roy, the Town’s Zoning Enforcement Officer.

Background

Cellco is licensed by the Federal Communications Commission (“FCC”) to provide wireless services throughout the State of Connecticut. Cellco and Eco-Site, LLC have agreed to the proposed shared use of the Hall Hill Road tower pursuant to mutually acceptable terms and

conditions. Likewise, Eco-Site, LLC and Cellco have agreed to the proposed installation of equipment on the ground within the fenced compound area. Eco-Site, LLC has authorized Cellco to apply for all necessary permits and approvals that may be required to share the existing tower. (See Attachment 2).

Cellco proposes to install nine (9) antennas and nine (9) remote radio heads (“RRHs”) on the tower at a centerline height of 165 feet above ground level (“AGL”). Cellco will also install two equipment cabinets and a 50-kW propane-fueled backup generator all within the existing fenced compound. Cellco will also install a 500-gallon propane tank in the southeast corner of the fenced compound. Included in Attachment 3 are Cellco’s project plans showing the location of Cellco’s proposed site improvements. Attachment 4 contains specifications for Cellco’s proposed generator, antennas and RRHs.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, “if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such shared use.” Cellco respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing tower is structurally capable of supporting Cellco’s antennas, RRHs, antenna platform and related equipment. The proposed shared use of this tower is, therefore, technically feasible. A Structural Analysis Report dated November 8, 2021 prepared by Vertical Bridge confirms that the tower can support all of Cellco’s proposed tower loading. A copy of the Structural Analysis Report is included in Attachment 5.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the shared use of an existing tower, such as the existing Hall Hill Road tower. This authority complements the Council’s prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council’s jurisdiction. In addition, § 16-50x(a) directs the Council to “give such consideration to other state laws and municipal regulations as it shall deem appropriate” in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the existing tower would have minimal environmental effects, for the following reasons:

1. The proposed installation of nine (9) antennas and nine (9) RRHs on an antenna platform at a height of 165 feet AGL on the existing 179-foot tower would have an insignificant incremental visual impact on the area around the Property. As mentioned above, Cellco's equipment will be located within a fenced enclosure. Cellco's shared use of the existing tower would, therefore, not cause any significant change or alteration in the physical or environmental characteristics of the existing site.
2. Noise associated with Cellco's proposed facility will comply with State and local noise standards. Noise associated with the backup generator is exempt from these same standards.
3. Operation of Cellco's antennas at this site would not exceed the RF emissions standards adopted by the Federal Communications Commission ("FCC"). Included in Attachment 6 of this filing is a cumulative power density table that demonstrates that the facility will operate well within the FCC's safety standards.
4. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the facility other than periodic maintenance visits to the cell site.

The proposed shared use of the existing tower would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, Cellco has entered into an agreement with Vertical Bridge for the shared use of the existing tower subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Cellco's antennas, antenna mounting frame, RRHs and all related equipment. Cellco is not aware of any public safety concerns relative to the proposed sharing of the existing the Hall

Melanie A. Bachman, Esq.
November 17, 2021
Page 4

Hill Road tower. In fact, the provision of new and improved wireless service through shared use of the existing tower is expected to enhance the safety and welfare of area residents and members of the general public traveling through the Town of Somers.

Conclusion

A Certificate of Mailing verifying that this filing was sent to the municipal officials, the Property owner, and Vertical Bridge is included in Attachment 7.

For the reasons discussed above, the proposed shared use of the existing tower at the Property satisfies the criteria stated in C.G.S. § 16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Thank you for your consideration of this matter.

Very truly yours,



Kenneth C. Baldwin

Enclosures

Copy to:

C. G. Knorr, First Selectman
Jennifer Roy, Zoning Enforcement Officer
John and Debra Romano, Property Owners
Eco-Site, LLC, Tower Owner
Tim Parks

ATTACHMENT 1

DOCKET NO. 476 – Eco-Site, Inc. and T-Mobile Northeast, LLC } Connecticut
application for a Certificate of Environmental Compatibility and }
Public Need for the construction, maintenance, and operation of a } Siting
telecommunications facility located at 248 Hall Hill Road, Somers, }
Connecticut. } Council

February 15, 2018

Decision and Order

Pursuant to Connecticut General Statutes §16-50p, and the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, maintenance, and operation of a telecommunications facility, including effects on the natural environment, ecological balance, public health and safety, scenic, historic, and recreational values, agriculture, forests and parks, air and water purity, and fish, aquaculture and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Eco-Site, Inc., hereinafter referred to as the Certificate Holder, for a telecommunications facility at 248 Hall Hill Road, Somers, Connecticut.

Unless otherwise approved by the Council, the facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole at a height of 180 feet above ground level to provide the proposed wireless services, sufficient to accommodate the antennas of T-Mobile Northeast, LLC and other entities, both public and private. The height of the tower may be extended after the date of this Decision and Order pursuant to regulations of the Federal Communications Commission.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Somers for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
 - a) final site plan(s) for development of the facility that employ the governing standard in the State of Connecticut for tower design in accordance with the currently adopted International Building Code and include specifications for the tower, tower foundation, antennas, and equipment compound including, but not limited to, fencing, radio equipment, access road, utility line, and emergency backup generator;
 - b) construction plans for site clearing, grading, landscaping, water drainage and stormwater control, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended;
 - c) plans for seasonal restrictions to protect the potential vernal pool;
 - d) hours of construction; and
 - e) plans for disposition of 30 cubic yards of net cut.

3. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
4. Upon the establishment of any new federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.
7. Any request for extension of the time period referred to in Condition 6 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Somers
8. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council within 90 days from the one year period of cessation of service. The Certificate Holder may submit a written request to the Council for an extension of the 90 day period not later than 60 days prior to the expiration of the 90 day period.
9. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.
10. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.
11. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.

12. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder/transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.
13. The Certificate Holder shall maintain the facility and associated equipment, including but not limited to, the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line and landscaping in a reasonable physical and operational condition that is consistent with this Decision and Order and a Development and Management Plan to be approved by the Council.
14. If the Certificate Holder is a wholly-owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the Certificate Holder within 30 days of the sale and/or transfer.
15. This Certificate may be surrendered by the Certificate Holder upon written notification and approval by the Council.

We hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed in the Service List, dated September 21, 2017, and notice of issuance published in the Journal Inquirer.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

ATTACHMENT 2

11/16/2021, 2021

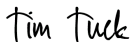
Andrew Candiello
Principal Engineer-RE/Regulatory
Cellco Partnership d/b/a Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

Re: Letter of Authorization - Cellco Partnership d/b/a Verizon Wireless
US-CT-5017/248 Hall Hill Rd. Somers, CT

Dear Mr. Candiello:

Eco-Site, LLC hereby authorizes Cellco Partnership d/b/a Verizon Wireless and/or its authorized agents, to file for all necessary permit and approval applications for the installation of antennas and related equipment at an existing telecommunications facility in Somers, CT.

Sincerely,

DocuSigned by:

6DCD673D644D4BD...

Title: Vice President - Lease Administration

ATTACHMENT 3

SUPPORTING DOCUMENTS

RADIO FREQUENCY (RF) DESIGN DATE: 6/7/21

ANTENNA SUPPORT STRUCTURE (MONOPOLE) STRUCTURAL ANALYSIS DATE: 11/8/21 (BY OTHERS)



20 ALEXANDER DRIVE, WALLINGFORD, CT 06492

ENFIELD EAST CT

248 HALL HILL ROAD
SOMERS, CT 06071

PROJECT TYPE: WIRELESS TELECOMMUNICATIONS
COLLOCATION ON EXISTING 179'± MONOPOLE

SITE INFORMATION:

PARENT PARCEL OWNER:	JOHN A. & DEBRA ROMANO 248 HALL HILL ROAD SOMERS, CT 06071
TOWER OWNER:	VERTICAL BRIDGE 750 PARK OF COMMERCE DRIVE #200 BOCA RATON, FL 33487 877-589-6411
TOWER OWNER ID:	US-CT-5017 (BLUE RIDGE)
APPLICANT:	CELLCO PARTNERSHIP (dba VERIZON WIRELESS) 20 ALEXANDER DRIVE WALLINGFORD, CT 06492
SITE ADDRESS:	248 HALL HILL ROAD SOMERS, CT 06071
COUNTY:	HARTFORD COUNTY, CT
SITE CONTROL POINT:	CENTER OF EXISTING MONOPOLE N 42°-00'-09.33" (42.002592°) (NAD '83) W 72°-29'-06.08" (72.485022°) (NAD '83)
JURISDICTION:	CONNECTICUT SITING COUNCIL
TAX ID PARCEL NUMBER:	MAP 07 LOT 72
ARCHITECT / ENGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
POWER COMPANY:	EVERSOURCE ENERGY 247 STATION DRIVE, SE 210 WESTWOOD, MA 02090 (781)441-3610
TELEPHONE COMPANY:	VERIZON 185 FRANKLIN STREET BOSTON, MA 02107 (800) 941-9900

GENERAL NOTES

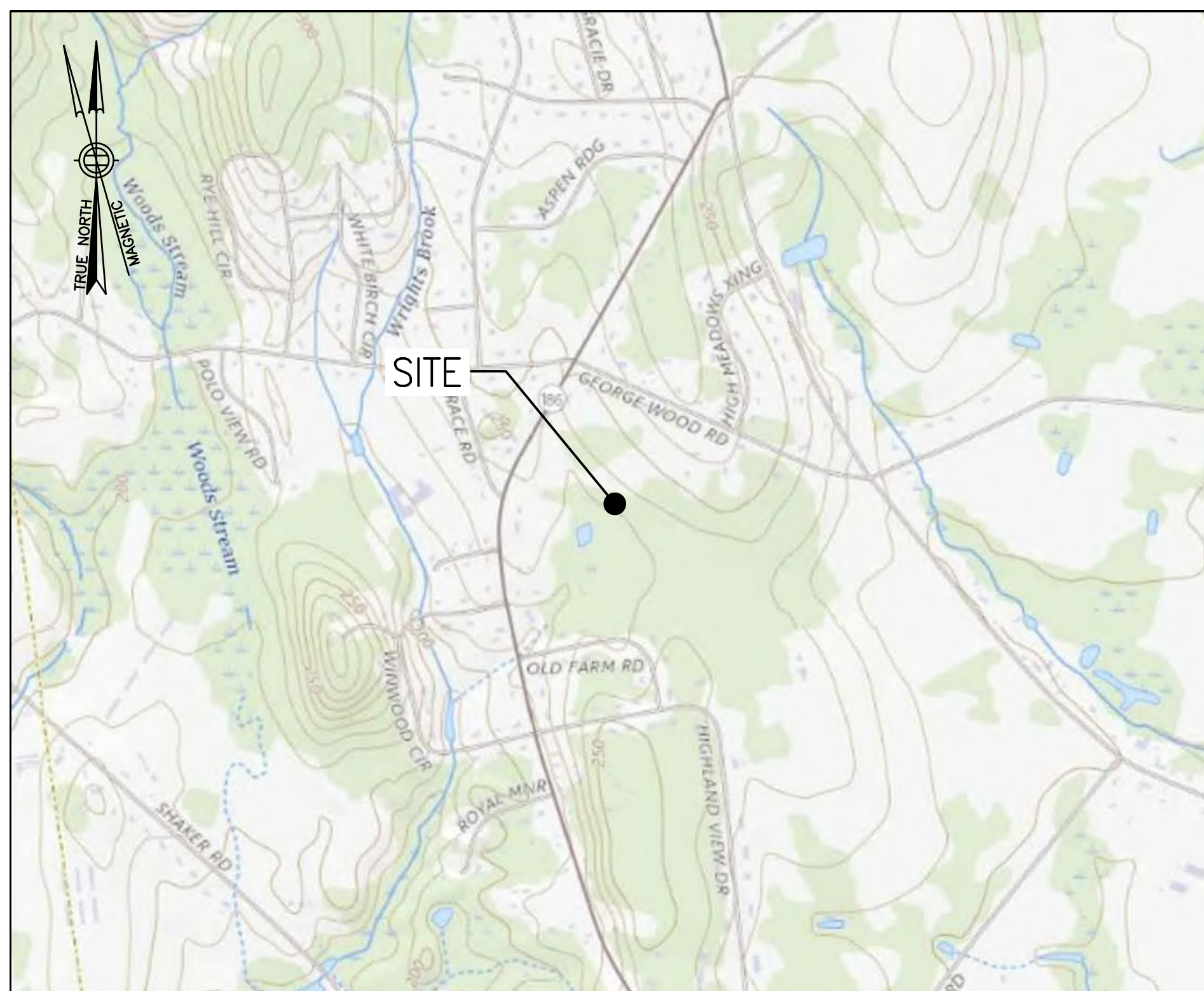
- CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
- NEW CONSTRUCTION SHALL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
 - BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE
 - ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
 - STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

AT LEAST 72 HOURS PRIOR TO DIGGING, THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT 811



VICINITY MAP

SCALE: 1"=1000'



DRIVING DIRECTIONS

FROM WALLINGFORD, TAKE I-91 NORTH. KEEP RIGHT TO STAY ON I-91 NORTH. TAKE EXIT 48 FOR CT-220/ELM STREET TOWARD THOMPSONVILLE. USE THE RIGHT 2 LANES TO TURN RIGHT AFTER FRIENDLYS (ON THE RIGHT). TURN RIGHT ONTO ELM STREET. CONTINUE ONTO MOODY ROAD. CONTINUE ONTO GEORGE WOOD ROAD. TURN RIGHT ONTO BRACE ROAD. TURN RIGHT ONTO CT-186 SOUTH. THE SITE WILL BE ON THE LEFT HAND SIDE.

SHEET INDEX

DWG.	DESCRIPTION	REV.
T01	TITLE SHEET	3
GN01	GENERAL NOTES	3
C01	PROPERTY PLAN	3
A01	EQUIPMENT COMPOUND PLAN	3
A02	EQUIPMENT AREA PLAN & DETAILS	3
A03	WEST AND SOUTH EQUIPMENT COMPOUND ELEVATIONS	3
S01	ICE SHIELD FRAMING PLAN & STRUCTURAL DETAILS	3
RF01	ANTENNA MOUNTING PLAN AND DETAILS	3
RF02	ANTENNA DETAILS AND ANCILLARY EQUIPMENT SPECIFICATIONS	3
RF03	RF BILL OF MATERIALS AND RF CABLE PLUMBING DIAGRAM	3
RF04	RF COLOR CODE SPECIFICATIONS	3
P01	PLUMBING NOTES AND SCHEMATIC	3
E01	ELECTRICAL SPECIFICATIONS AND NOTES	3
E02	EQUIPMENT COMPOUND UTILITY PLAN & DETAILS	3
E03	ELECTRICAL DIAGRAMS & DETAILS	3
E04	SCHEMATIC GROUNDING PLAN & DETAILS	3
E05	GROUNDING DETAILS	3

DO NOT SCALE DRAWINGS

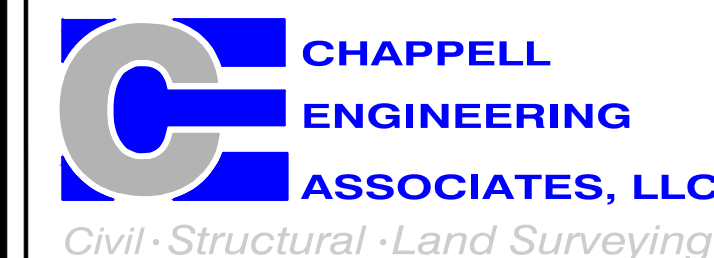
ALL PLANS, EXISTING DIMENSIONS AND CONDITIONS AT THE PROPOSED PROJECT SITE SHALL BE VERIFIED IN THE FIELD DURING THE CONSTRUCTION PHASE. THE PROJECT OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES IMMEDIATELY PRIOR TO PROCEEDING WITH THE PROPOSED WORK AFFECTED BY SUCH DISCREPANCIES. IN THE EVENT OF LACK OF SUCH NOTIFICATION, SUCH DISCREPANCIES SHALL BECOME THE RESPONSIBILITY OF THE PREVAILING CONTRACTOR RESPONSIBLE FOR CONSTRUCTION.

PROJECT DESCRIPTION

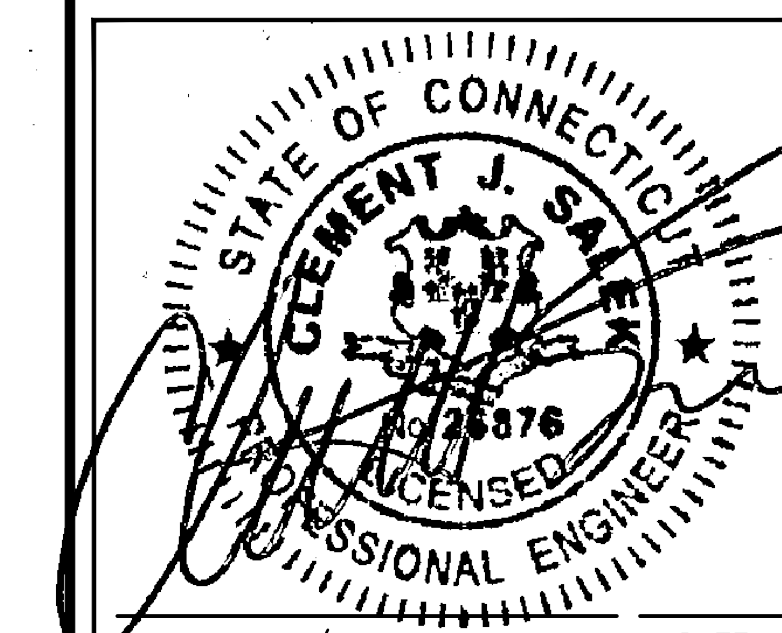
- THIS IS AN UNMANNED AND RESTRICTED ACCESS EQUIPMENT INSTALLATION AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC WIRELESS TELECOMMUNICATIONS SERVICE.
- THIS FACILITY WILL CONSUME NO UNRECOVERABLE ENERGY.
- NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.
- NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.
- NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.



" Because Better Matters "



R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

REVISIONS

NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	9/22/21
1	ISSUED FOR CONSTRUCTION (FINAL)	9/30/21
2	REVISED RRRH UNIT DIMENSIONS	10/15/21
3	REVISED PER ATTORNEY COMMENTS	11/12/21

PROJECT NAME:

ENFIELD EAST CT

248 HALL HILL ROAD
SOMERS, CT 06071

DRAWING TITLE:

TITLE SHEET

DRAWING NO:

T01

SCALE:	DESIGNED BY: GRS	VZW LOCATION CODE:
AS SHOWN	DRAWN BY: NWC	
CEA PROJECT NO.: 96210.402	CHECKED BY: GRS	683673
	ORIGINAL ISSUE DATE: 9/22/21	

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR – VERIZON WIRELESS
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER – VERIZON WIRELESS
 OEM – ORIGINAL EQUIPMENT MANUFACTURER
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.
- SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
- THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
- THE SUBCONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
- SUBCONTRACTOR SHALL NOTIFY CHAPPELL ENGINEERING ASSOCIATES, LLC. 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACK FILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEERING REVIEW.
- CONSTRUCTION SHALL COMPLY WITH VERIZON WIRELESS NETWORK STANDARD #NSTD123 TO THE MAXIMUM EXTENT FEASIBLE UNLESS PRECLUDED OR LIMITED BY DESIGN SHOWN ON THESE DRAWINGS.
- SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
- SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

- THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
- ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING, OWNER AND/OR LOCAL UTILITIES.
- THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
- SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE VERIZON WIRELESS SPECIFICATION FOR SITE SIGNAGE.

CONCRETE AND REINFORCING STEEL NOTES:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
 - ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000PSI) MAY BE USED. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 381 CODE REQUIREMENTS
 - REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE, WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
 - THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 CONCRETE CAST AGAINST EARTH.....3 IN.
 CONCRETE EXPOSED TO EARTH OR WEATHER:
 #6 AND LARGER2 IN.
 #5 AND SMALLER & WWF1½ IN.
 CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
 SLAB AND WALL¾ IN.
 BEAMS AND COLUMNS½ IN.
 - A CHAMFER ¼" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
 - INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ENGINEERING APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
 - CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
 (A) RESULTS OF CONCRETE CYLINDER TEST PERFORMED AT THE SUPPLIERS PLANT.
 (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
 FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
 - AS AN ALTERNATIVE TO ITEM 7. TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
 - EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.
- STRUCTURAL STEEL NOTES:**
- ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS AND VERIZON WIRELESS SPECIFICATION 25252-000-3PS-GET-00001 UNLESS OTHERWISE NOTED. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
 - ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. PAINTED SURFACES SHALL BE TOUCHED UP.
 - BOLTED CONNECTIONS SHALL USE BEARING TYPE ASTM A325 BOLTS (¾") AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
 - NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE ¾" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
 - INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
 - CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL
 - ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

- EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL TO EXPOSE NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.
- COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
- AS AN ALTERNATE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
- COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING #1 SIEVE.
- AS AN ALTERNATE TO ITEMS 2 AND 3, THE SUBGRADE SOILS WITH 5 PASSES OR A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). AND SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL AND COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

- HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

- FIELD VERIFICATION:
 SUBCONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, VERIZON WIRELESS ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
- COORDINATION OF WORK:
 SUBCONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH CONTRACTOR.
- CABLE LADDER RACK:
 SUBCONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

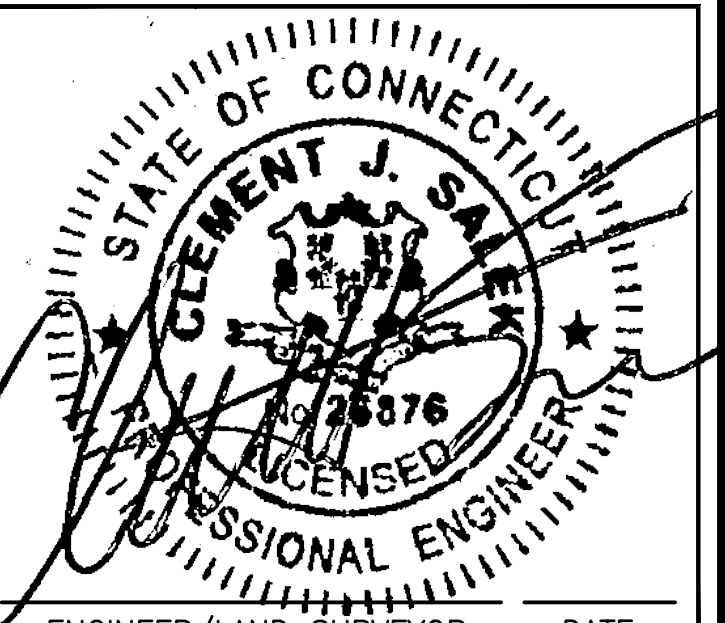
- WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
- SUBCONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. SUBCONTRACTOR SHALL SUBMIT MODIFICATIONS TO CONTRACTOR FOR APPROVAL.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
- CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
- EACH END OF EVERY POWER, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
- POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, ½ INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANEL BOARD AND CIRCUIT ID'S).
- PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #3 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°F IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANS/IEEE, AND NEC.
- NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE
- RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANS/IEEE, AND NEC.
- CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS
- METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON- CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.
- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
- CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.



* Because Better Matters *



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REVISIONS		
NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	9/22/21
1	ISSUED FOR CONSTRUCTION (FINAL)	9/30/21
2	REVISED RRH UNIT DIMENSIONS	10/15/21
3	REVISED PER ATTORNEY COMMENTS	11/12/21

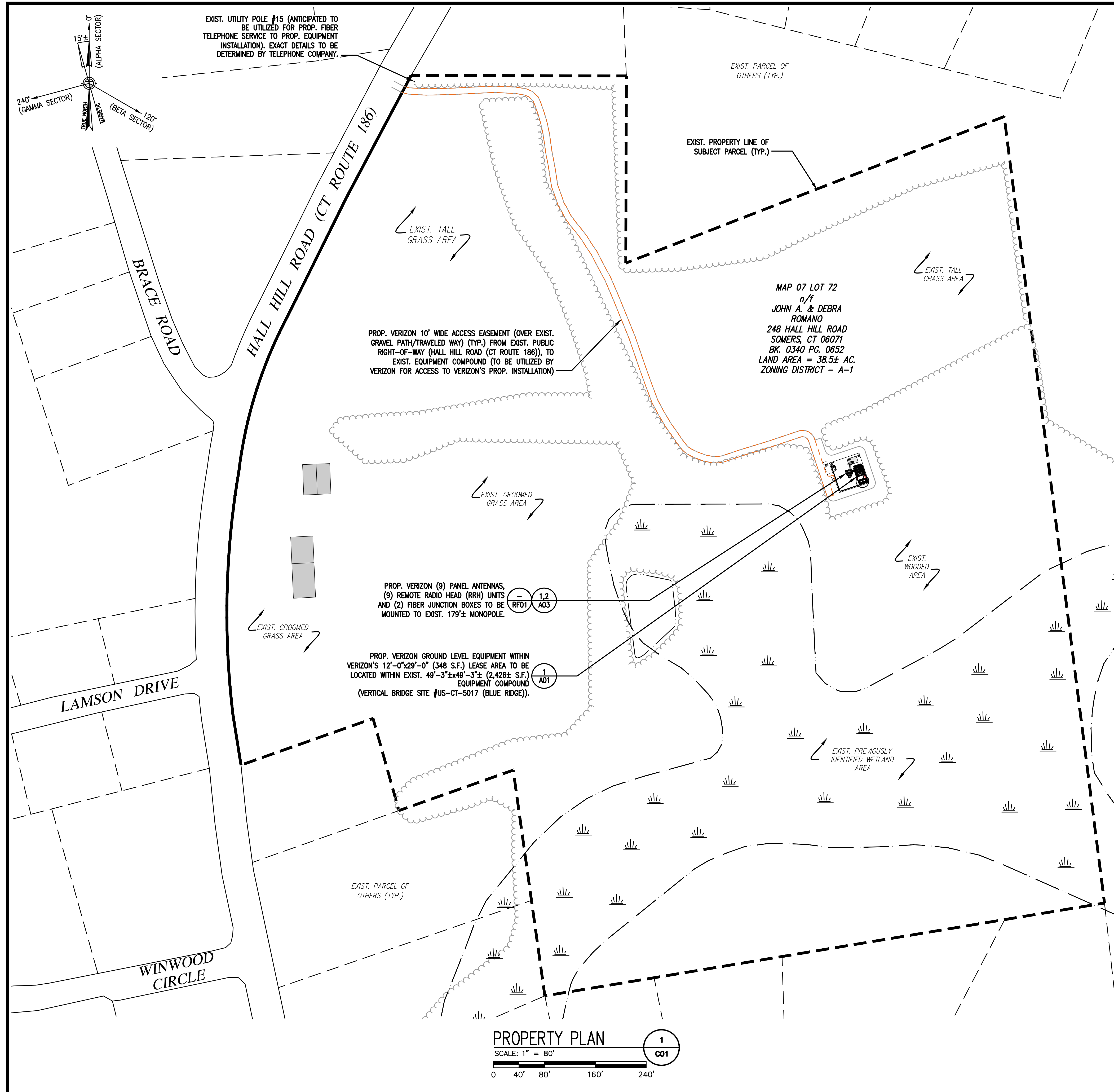
PROJECT NAME:
ENFIELD EAST CT

248 HALL HILL ROAD
SOMERS, CT 06071

DRAWING TITLE:
GENERAL NOTES

DRAWING NO.:
GN01

SCALE: N/A	DESIGNED BY: GRS DRAWN BY: NMC CHECKED BY: GRS	VZW LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	



GENERAL NOTES:

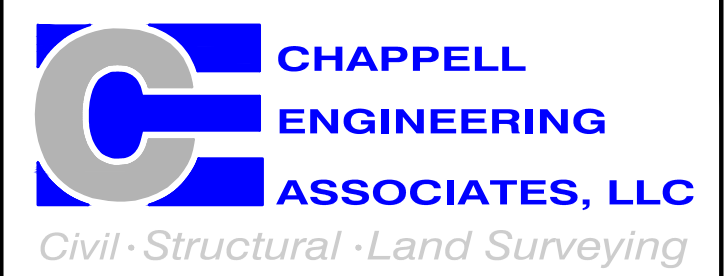
- INITIAL DESIGN VISIT DATE: 6/7/21
- VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)
- HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD '83)
- SITE CONTROL POINT: CENTER OF EXISTING MONOPOLE
LATITUDE: N. 42°-00'-09.33" (42.002592) (NAD '83)
LONGITUDE: W. 72°-29'-06.08" (72.485022) (NAD '83)
- PARENT PARCEL OWNER: JOHN A. & DEBRA ROMANO
248 HALL HILL ROAD
SOMERS, CT 06071
- TOWER OWNER: VERTICAL BRIDGE
750 PARK OF COMMERCE DRIVE #200
BOCA RATON, FL 33487
877-589-6411
- TOWER OWNER ID: US-CT-5017 (BLUE RIDGE)
- SITE ADDRESS: 248 HALL HILL ROAD
SOMERS, CT 06071
- APPLICANT: CELLCO PARTNERSHIP
(dba VERIZON WIRELESS)
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492
- JURISDICTION: CONNECTICUT SITING COUNCIL
- TAX ID: MAP 07 LOT 72
- DEED REFERENCE: BK. 0340 PG. 0652
- PLAN REFERENCES: TOWN OF SOMERS ASSESSOR/GIS MAPS
- ZONING CLASSIFICATION: A-1 (RESIDENTIAL)
- ALL UNDERGROUND UTILITY INFORMATION PRESENTED HEREON WAS DETERMINED FROM SURFACE EVIDENCE AND PLANS OF RECORD. ALL UNDERGROUND UTILITIES SHOULD BE LOCATED IN THE FIELD PRIOR TO THE COMMENCEMENT OF ANY SITE WORK. CALL DIGSAFE 1-888-344-7233 A MINIMUM OF 72 HOURS PRIOR TO PLANNED ACTIVITY.
- THE PROPERTY LINES SHOWN WERE COMPILED UTILIZING TOWN OF SOMERS ASSESSOR'S PLANS, GIS, RECORDED DEEDS AND PLANS OF REFERENCE AS INDICATED. A COMPLETE BOUNDARY SURVEY WAS NOT UTILIZED IN THE PREPARATION OF THESE PLANS.
- THE SITE IS LOCATED IN FLOOD HAZARD ZONE X (AREA OF MINIMAL FLOOD HAZARD) AS SHOWN ON FLOOD INSURANCE RATE MAP FOR THE TOWN OF SOMERS, (MAP NUMBER 0901120007D) EFFECTIVE 8/16/2006.
- BEARING SYSTEM OF THIS PLAN IS BASED ON GRID NORTH. TRUE NORTH WAS ESTABLISHED FROM GPS OBSERVATIONS. IT IS NOT INTENDED TO BE AN EXACT REPRESENTATION OF TRUE NORTH.

LEGEND

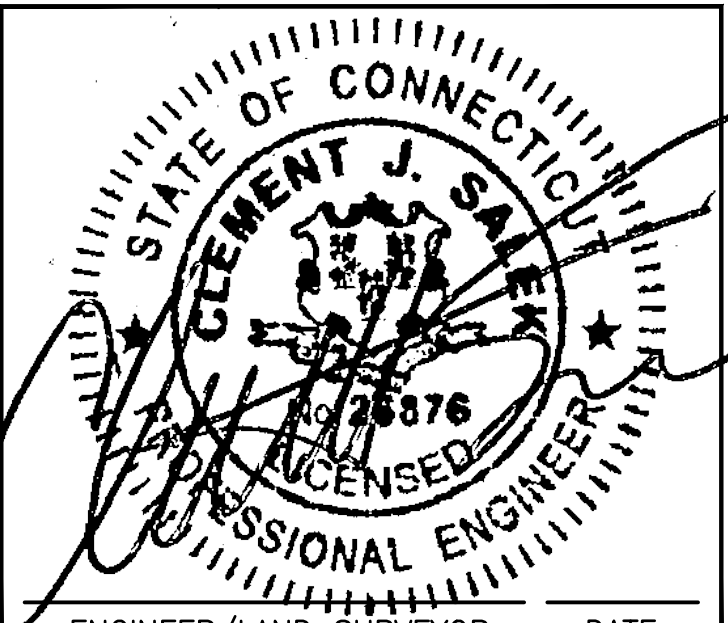
---	OR	STREET	PROPERTY LINE
---			ABUTTING PROPERTY LINE
---			PROPERTY OFFSET/RADIUS
-x-x-x-x-x-			EXIST. EASEMENT
-o-o-o-o-o-			EXIST. CHAIN LINK FENCE
-o-o-o-o-o-			EXIST. STOCKADE FENCE
---			EXIST. EDGE OF PAVEMENT
---			EXIST. OVERHEAD UTILITIES
---			APPROXIMATE ZONING BOUNDARY
---			APPROXIMATE TOWN LINE



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ENGINEER/LAND SURVEYOR DATE

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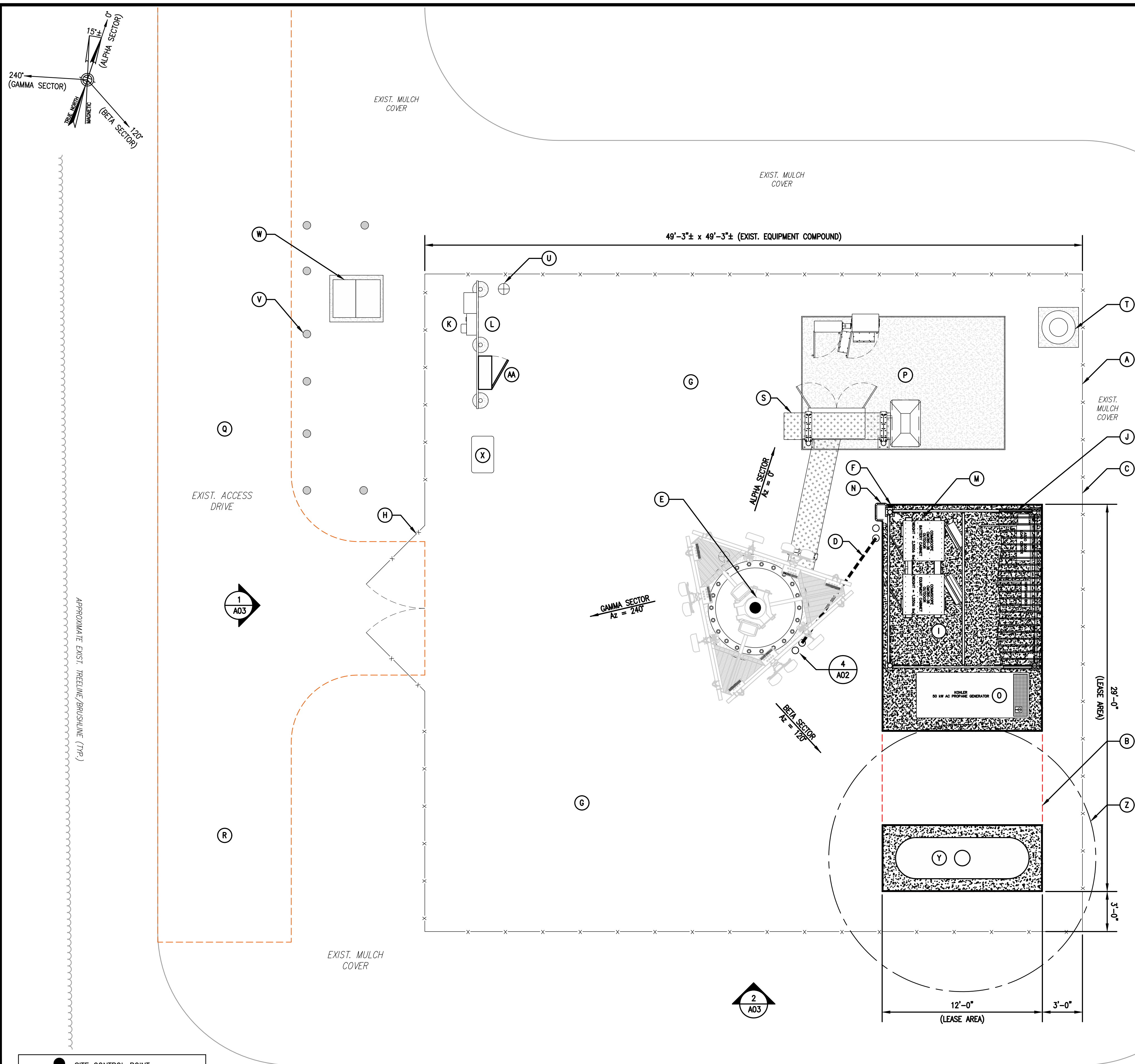
PROJECT NAME:
ENFIELD EAST CT

248 HALL HILL ROAD
SOMERS, CT 06071

DRAWING TITLE:
PROPERTY PLAN

DRAWING NO:
C01

SCALE: 1" = 80'	DESIGNED BY: GRS DRAWN BY: NWC CHECKED BY: GRS	VZW LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	



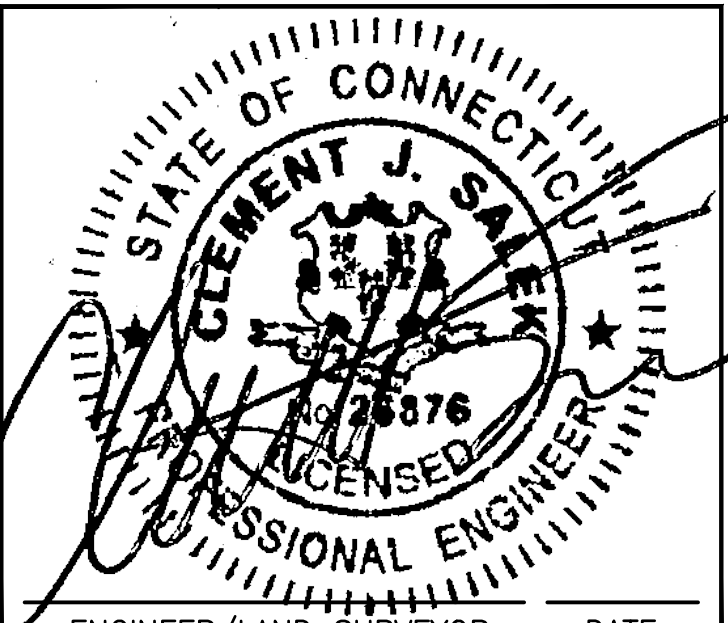
LEGEND	
ITEM	DESCRIPTION
(A)	EXIST. 49'-3"±x49'-3"± (2,426± S.F.) EQUIPMENT COMPOUND (VERTICAL BRIDGE SITE #US-CT-5017 (BLUE RIDGE)) (TYP.)
(B)	LIMITS OF VERIZON'S PROP. 12'-0"x29'-0" (348 S.F.) LEASE AREA (TYP.)
(C)	EXIST. 7"± CHAIN-LINK FENCE SURROUNDING EXIST. 49'-3"±x49'-3"± (2,426± S.F.) EQUIPMENT COMPOUND (TYP.)
(4,5 A02)	PROP. VERIZON (2)-LOW INDUCTANCE 6x12 HYBRID SIGNAL CABLES ROUTED UNDERGROUND WITHIN PROP. PVC CONDUITS (TYP.) FROM VERIZON'S PROP. EQUIPMENT TO EXIST. MONOPOLE AS SHOWN.
(E)	EXIST. 179"± MONOPOLE
(3 RF01)	PROP. VERIZON GPS ANTENNA MOUNTED TO PROP. METAL DECK ICE SHIELD. TOP OF GPS ANTENNA SHALL BE MOUNTED 2'-0" ABOVE TOP OF ICE SHIELD.
(G)	EXIST. GRAVEL COVER WITHIN EXIST. COMPOUND
(H)	EXIST. 12'-6"± DOUBLE LEAF GATE
(6 S01)	PROP. VERIZON 17'-0"x12'-0" (204 S.F.) REINFORCED CONCRETE EQUIPMENT PAD
(1-4 S01)	PROP. VERIZON 11'-10"x12'-0" (142 S.F.) METAL DECK ICE SHIELD (SHOWN TRANSPARENT FOR CLARITY) ABOVE PROP. EQUIPMENT
(K)	EXIST. VACANT METER SOCKET AND DISCONNECT BREAKER KNOCKOUT TO BE UTILIZED FOR VERIZON'S PROP. 200A ELECTRIC SERVICE TO PROP. EQUIPMENT INSTALLATION.
(L)	EXIST. 800A 1Φ-3W 120/240V ELECTRIC METER BANK
(1,2 A02)	PROP. VERIZON EQUIPMENT CABINET MOUNTED TO PROP. W6x15 STEEL SLEEPER BEAMS ON PROP. 12'-0"x17'-0" (204 S.F.) REINFORCED CONCRETE PAD
(3 RF02)	PROP. VERIZON FIBER JUNCTION BOX (TOTAL OF 1) MOUNTED TO PROP. METAL DECK ICE SHIELD (IF REQUIRED)
(1 E01)	PROP. VERIZON 50 KW BACK-UP PROPANE GENERATOR MOUNTED TO PROP. 12'-0"x17'-0" (204 S.F.) REINFORCED CONCRETE PAD
(P)	EXIST. T-MOBILE EQUIPMENT CABINETS AND BACK-UP PROPANE GENERATOR ON EXIST. 15'-3"x10'-0"± (153± S.F.) CONCRETE PAD
(Q)	PROP. VERIZON 10' WIDE ACCESS EASEMENT (OVER EXIST. GRAVEL PATH/TRAVELED WAY) (TYP.) FROM EXIST. PUBLIC RIGHT-OF-WAY (HALL HILL ROAD (CT ROUTE 186)), TO EXIST. EQUIPMENT COMPOUND (TO BE UTILIZED BY VERIZON FOR ACCESS TO VERIZON'S PROP. INSTALLATION). SEE SHEET C01 FOR CONTINUATION TO HALL HILL ROAD (CT ROUTE 186).
(R)	PROP. VERIZON 10'x20' PARKING SPACE OR TURN-AROUND AREA
(S)	EXIST. T-MOBILE OVERHEAD CABLE ICE BRIDGE (TYP.)
(T)	EXIST. T-MOBILE PROPANE TANK ON EXIST. 3'-0"±x3'-0"± (9± S.F.) CONCRETE PAD
(U)	EXIST. GROUND TEST WELL (TYP.)
(V)	EXIST. BOLLARD (TYP.)
(W)	EXIST. ELECTRIC TRANSFORMER ON EXIST. CONCRETE PAD
(X)	EXIST. TELCO/COMMUNICATIONS HANDHOLE
(1 P01)	PROP. 500 GALLON WATER CAPACITY (400 GALLON OPERATING CAPACITY) PROPANE TANK ON PROP. 12'-0"x5'-0" (60 S.F.) REINFORCED CONCRETE PAD
(Z)	EXTENT OF 10' CLEARANCE RADIUS FROM PROP. PROPANE TANK SOURCE OF IGNITION (TYP.)
(AA)	PROP. TELCO CABINET (IF REQUIRED BY TELEPHONE COMPANY) MOUNTED TO EXIST. UNISTRUT RACK

● SITE CONTROL POINT:
 CENTER OF EXISTING MONOPOLE
 N 42°-00'-09.33" (42.002592') (NAD '83)
 W 72°-29'-06.08" (72.485022') (NAD '83)
 ELEV. = 247.0' AMSL (NAVD '88)
 PER GOOGLE EARTH

EQUIPMENT COMPOUND PLAN 1
 SCALE: 1/4" = 1'-0"
 0 4'-0" 8'-0" 12'-0" A01



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DRAWING NO:
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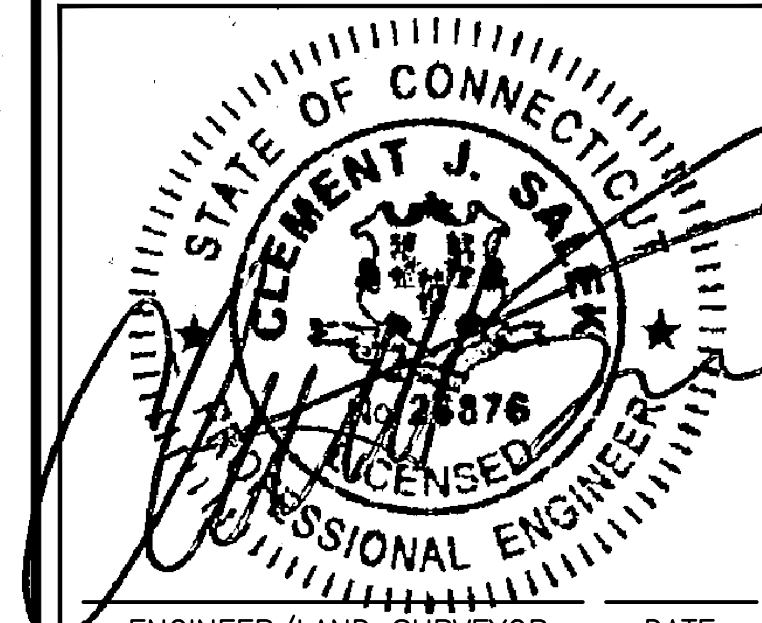
SCALE: 1/4" = 1'-0"	DESIGNED BY: GRS DRAWN BY: NWC CHECKED BY: GRS	VZWL LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	

verizon

"Because Better Matters"

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil · Structural · Land Surveying

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ENGINEER/LAND SURVEYOR DATE
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REVISIONS

NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	9/22/21
1	ISSUED FOR CONSTRUCTION (FINAL)	9/30/21
2	REVISED RRH UNIT DIMENSIONS	10/15/21
3	REVISED PER ATTORNEY COMMENTS	11/12/21

PROJECT NAME:
ENFIELD EAST CT
248 HALL HILL ROAD
SOMERS, CT 06071

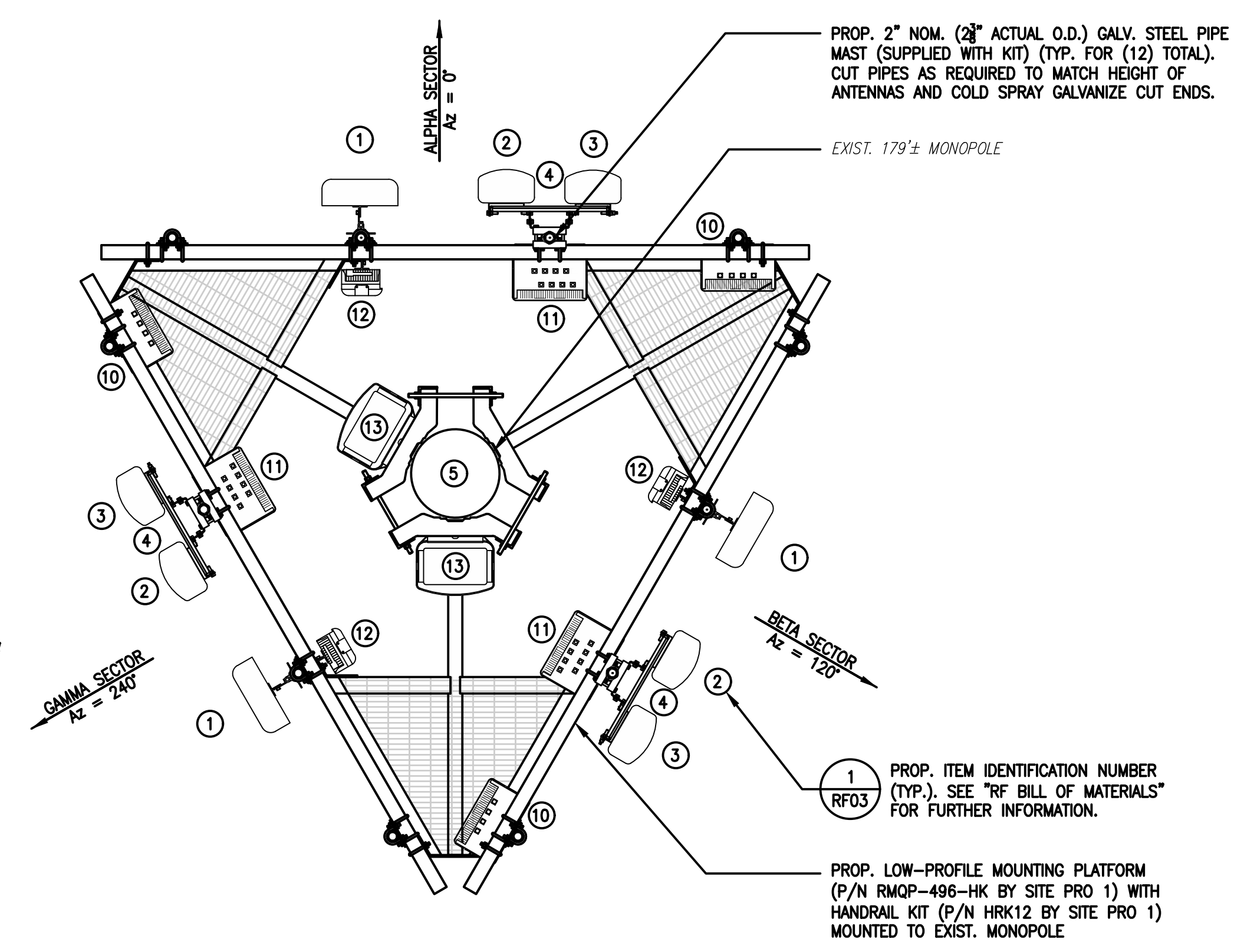
DRAWING TITLE:
ANTENNA MOUNTING PLAN AND DETAILS

DRAWING NO.:
RF01

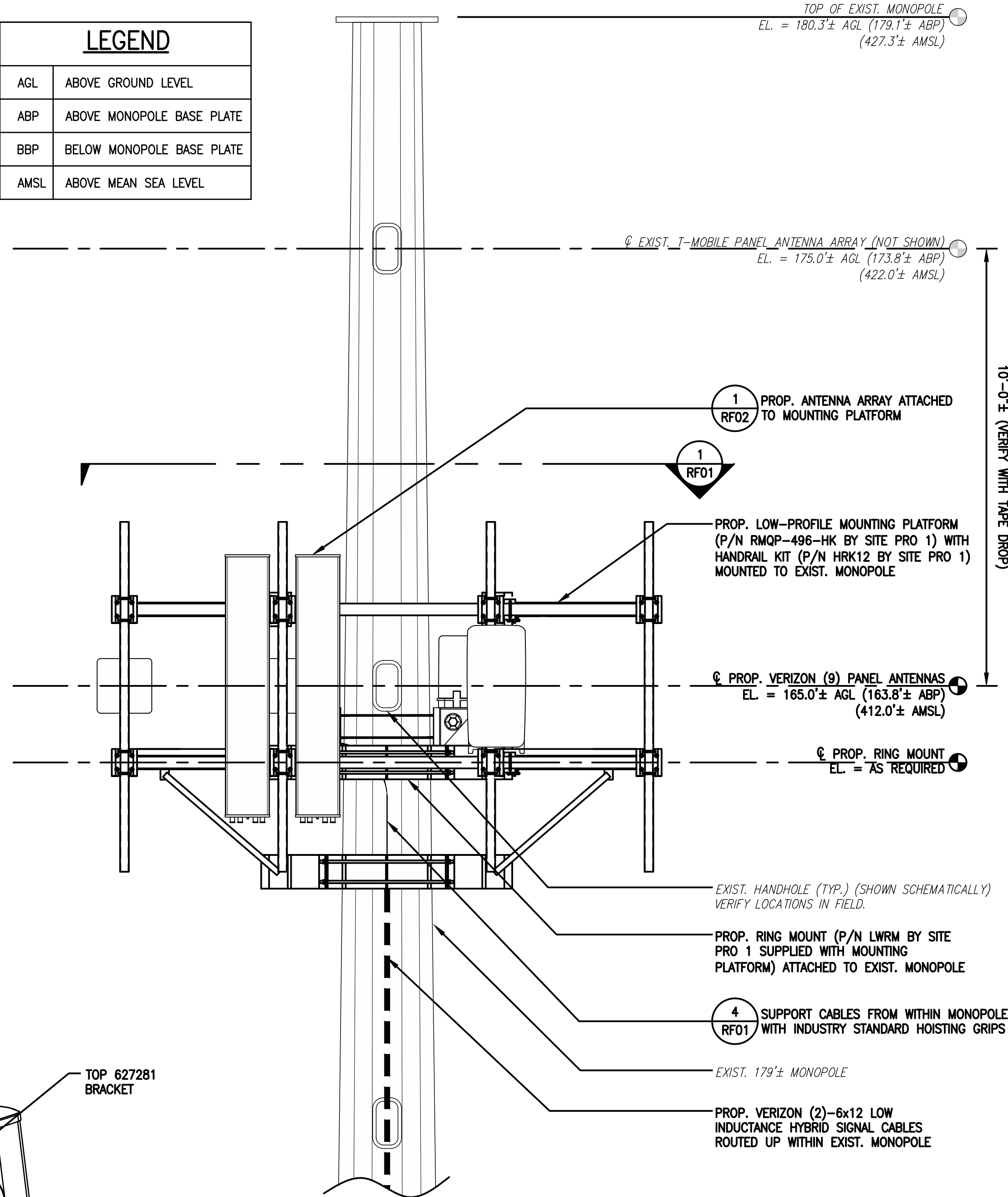
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AS SHOWN	DRAWN BY: NWC	
CEA PROJECT NO.: 96210.402	CHECKED BY: GRS	683673
	ORIGINAL ISSUE DATE: 9/22/21	

LEGEND

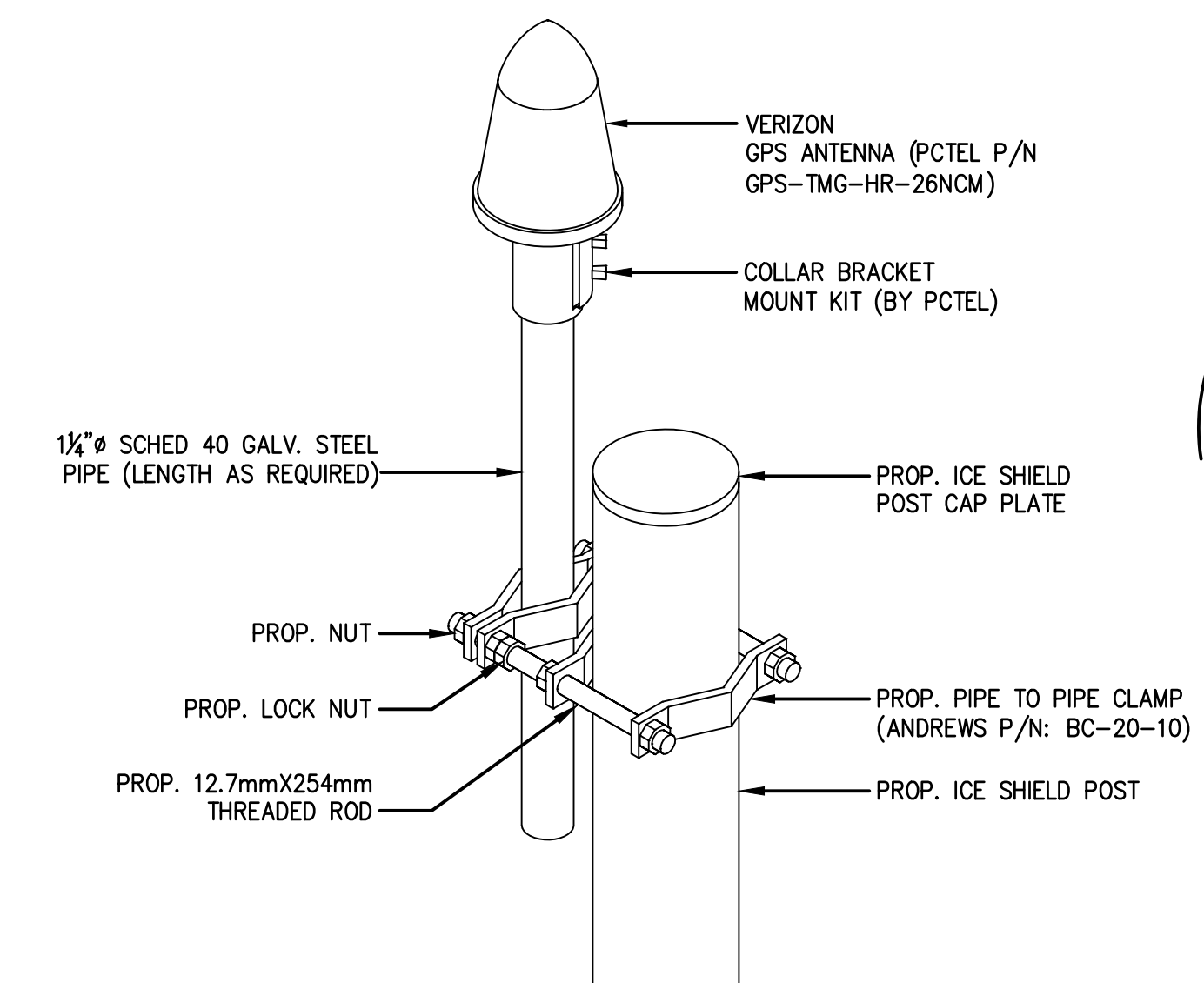
AGL	ABOVE GROUND LEVEL
ABP	ABOVE MONOPOLE BASE PLATE
BBP	BELOW MONOPOLE BASE PLATE
AMSL	ABOVE MEAN SEA LEVEL



(MONOPOLE PLAN VIEW AT ELEVATION 165.0± AGL)
ANTENNA MOUNTING PLAN
SCALE: 1/2" = 1'-0"
0 2'-0" 4'-0" 6'-0"

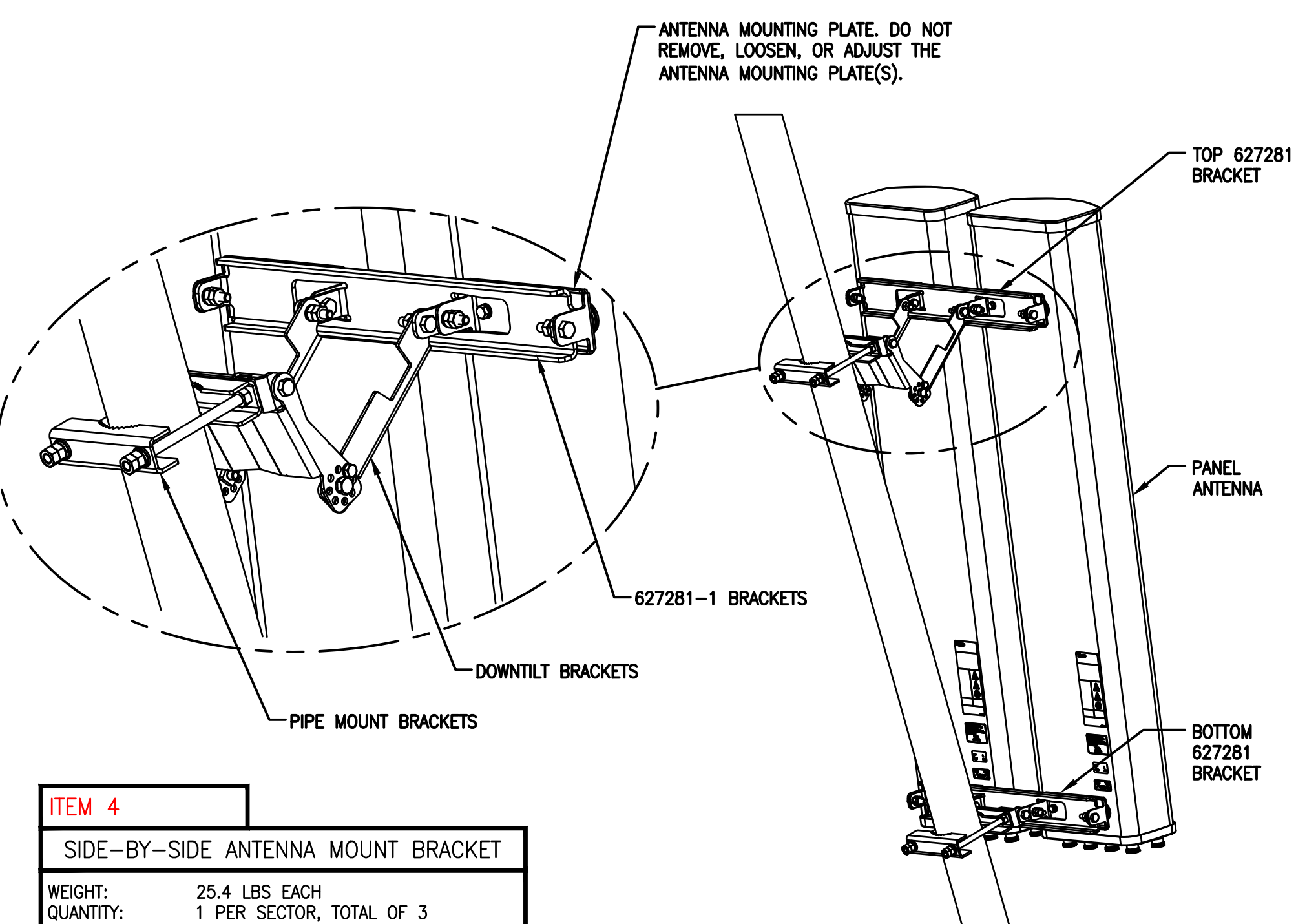


ANTENNA MOUNTING PLATFORM MOUNTING DETAIL
SCALE: 1/2" = 1'-0"



NOTE:
THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1"-1 1/4" DIAMETER GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.

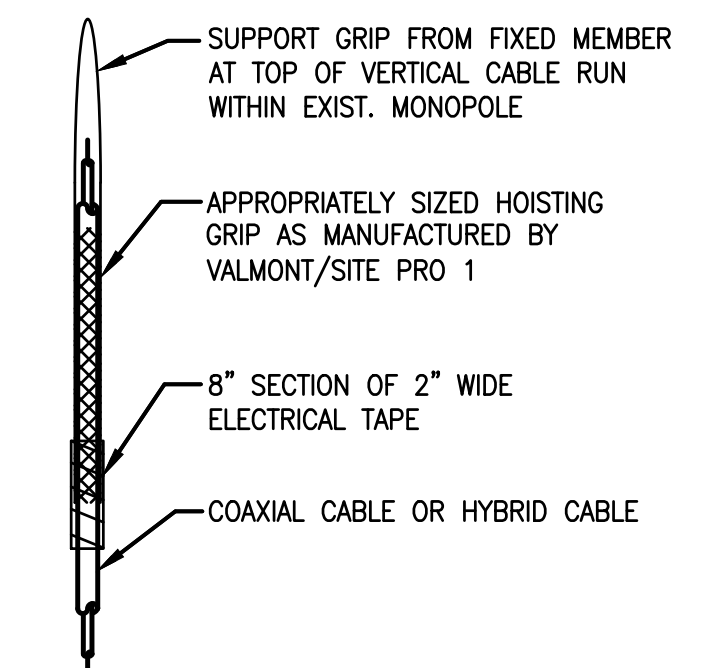
GPS ANTENNA MOUNTING DETAIL
SCALE: N.T.S.



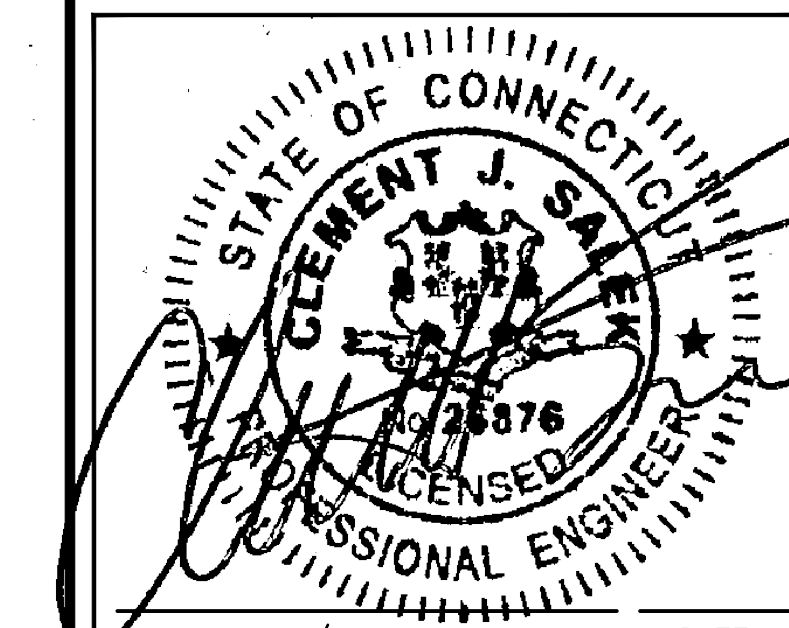
ITEM 4

SIDE-BY-SIDE ANTENNA MOUNT BRACKET	
WEIGHT:	25.4 LBS EACH
QUANTITY:	1 PER SECTOR, TOTAL OF 3
STATUS:	PROPOSED

TYPICAL SIDE-BY-SIDE ANTENNA MOUNT KIT (COMMSCOPE PART #BSAMNT-SBS-1-2)
SCALE: NOT TO SCALE



TYPICAL HOISTING GRIP DETAIL
SCALE: NONE



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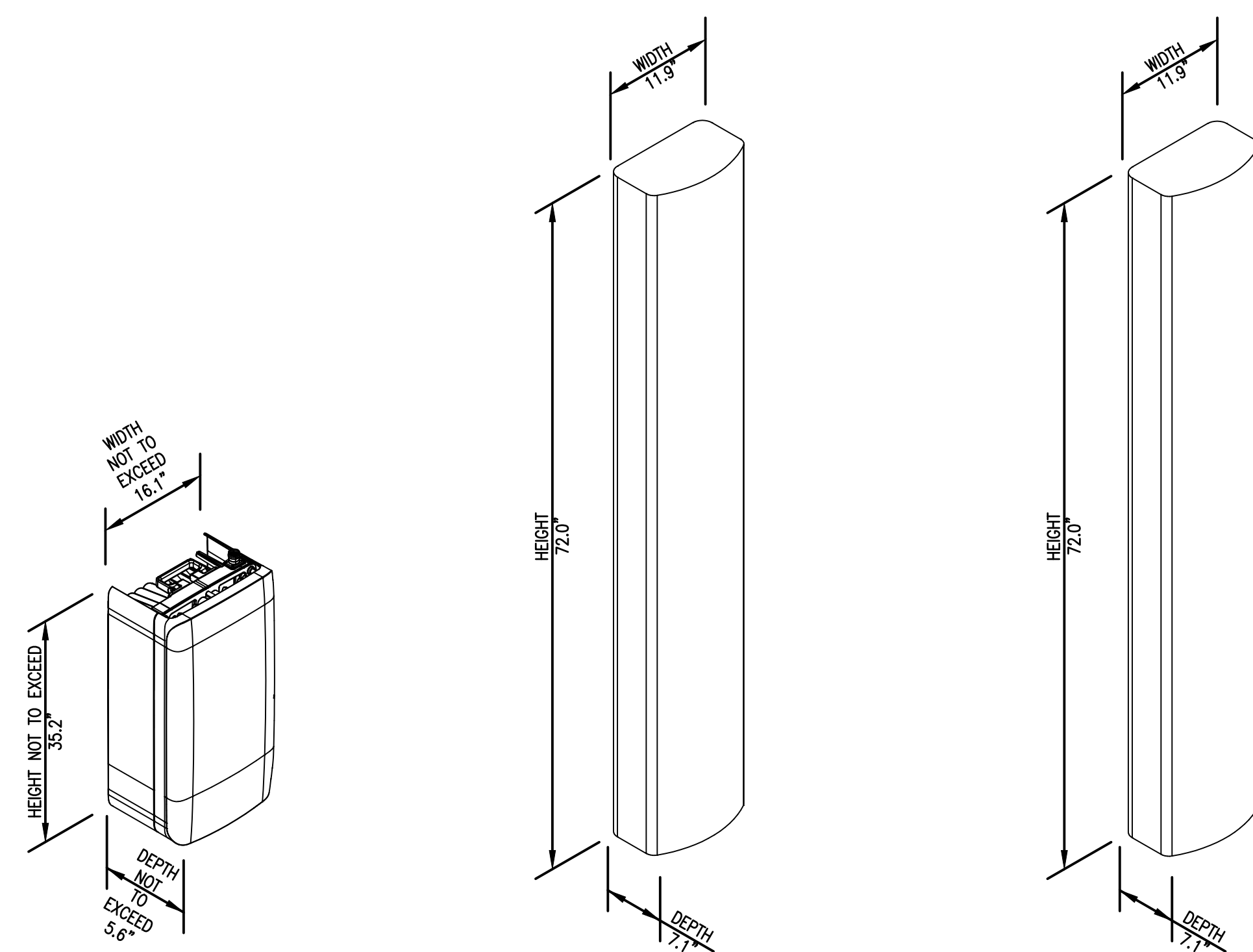
PROJECT NAME:
ENFIELD EAST CT

248 HALL HILL ROAD
SOMERS, CT 06071

DRAWING TITLE:
**ANTENNA DETAILS AND
ANCILLARY EQUIPMENT
SPECIFICATIONS**

DRAWING NO:
RF02

SCALE:	DESIGNED BY: GRS	VZW LOCATION CODE:
AS SHOWN	DRAWN BY: NWC	
CEA PROJECT NO.: 96210.402	CHECKED BY: GRS	683673
	ORIGINAL ISSUE DATE: 9/22/21	

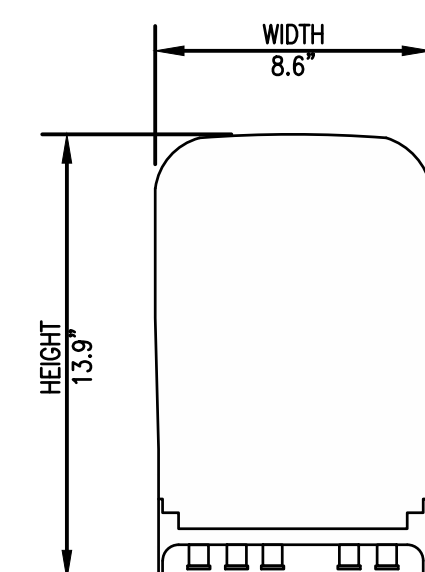
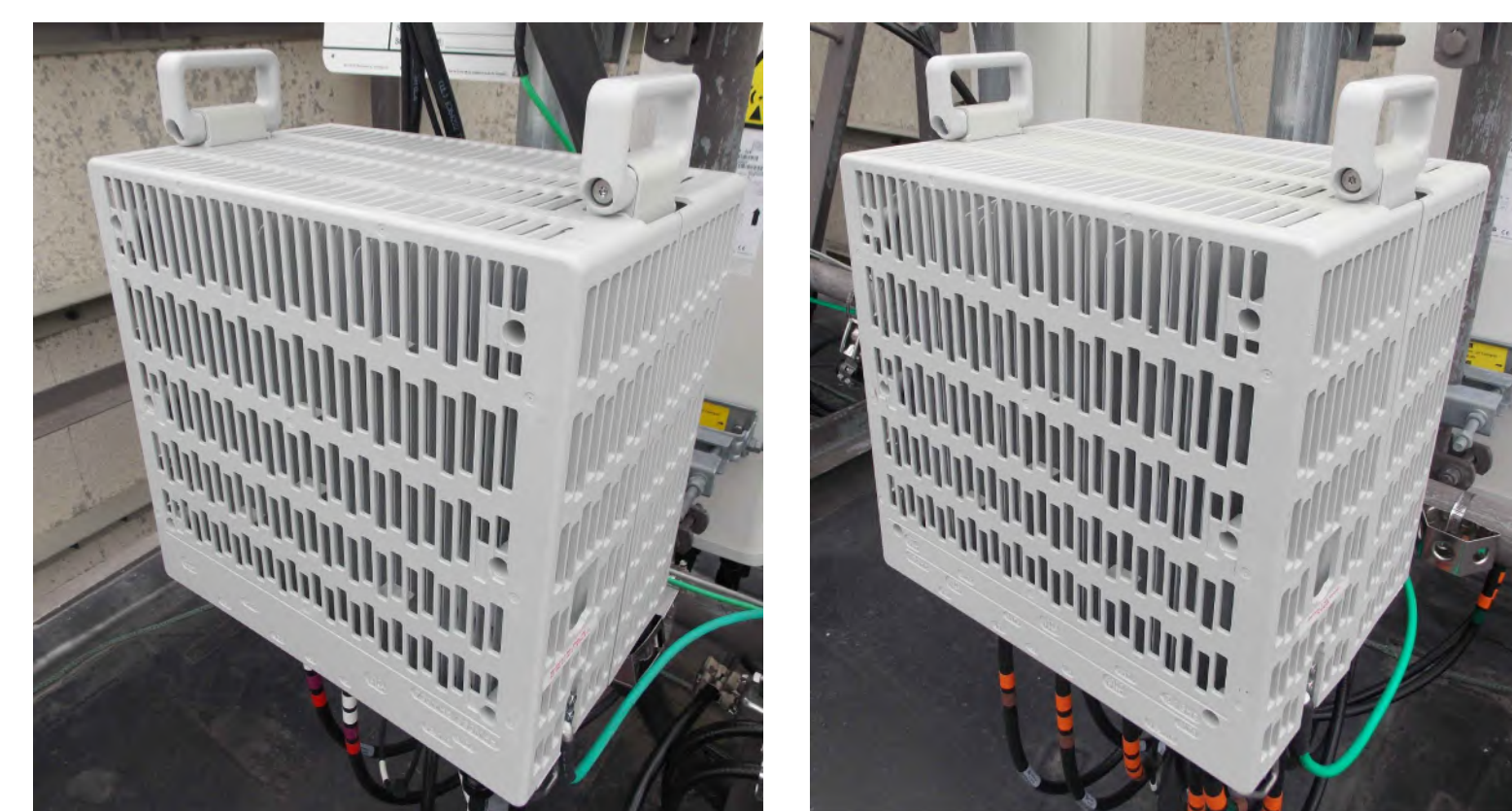


ITEM 1
MT6407-77A ANTENNA
MAX. DIMENSIONS: 35.2"H x 16.1"W x 5.6"D
MAX. WEIGHT: 87.1 LBS EACH
QUANTITY: 1 PER SECTOR, TOTAL OF 3
STATUS: PROPOSED

ITEM 2
LTE (700/850/2100/CBRS MHz) PANEL ANTENNA
DIMENSIONS: 72.0"H x 11.9"W x 7.1"D
WEIGHT: 48.1 LBS EACH
QUANTITY: 1 PER SECTOR, TOTAL OF 3
STATUS: PROPOSED

ITEM 3
LTE (700/850/1900 MHz) PANEL ANTENNA
DIMENSIONS: 72.0"H x 11.9"W x 7.1"D
WEIGHT: 43.7 LBS EACH
QUANTITY: 1 PER SECTOR, TOTAL OF 3
STATUS: PROPOSED

TYPICAL PROP. PANEL ANTENNA SPECIFICATIONS 1
SCALE: N.T.S. RF02



ITEM 10
LTE/CDMA (700/850 MHz) REMOTE RADIO HEAD UNIT
DIMENSIONS: 15.5"H x 15.9"W x 10.0"D
WEIGHT: 70.3 LBS
QUANTITY: 1 PER SECTOR, TOTAL OF 3
STATUS: PROPOSED

ITEM 11
PCS-AWS (1900/2100 MHz) REMOTE RADIO HEAD UNIT
DIMENSIONS: 15.4"H x 15.8"W x 12.0"D
WEIGHT: 84.4 LBS
QUANTITY: 1 PER SECTOR, TOTAL OF 3
STATUS: PROPOSED

ITEM 12
(BAND 48 (3.5 GHz)) NR AU RRH
DIMENSIONS: 13.9"H x 8.6"W x 4.2"D
WEIGHT: 18.6 LBS EACH
QUANTITY: 1 PER SECTOR, TOTAL OF 3
STATUS: PROPOSED

TYPICAL REMOTE RADIO HEAD (RRH) UNIT DIMENSIONS 2
SCALE: N.T.S. RF02

Procedure
Mounting Procedures

4.1 A mounting base is delivered with the unit. The base allows either wall/ladder or pole mounted installation. See picture to identify the holes for each installation method.

4.2 **Option 1: Pole Mount**
Using supplied hardware, mount Bracket to 2" to 4" diameter pole.

4.3 **Option 2: Unistrut**

4.4 **Option 3: Monopole**
Use 1" stainless steel bands (not supplied) through slots on bracket to mount to Monopole.

Gland/Insert Definitions

5.1 See picture to identify Base Gland Assembly Definitions.

Assembled in unit as shipped:

Qty	Connector Size	Pos	Insert P/N	Insert Hole	Cable Type
2	M75	A	190-0760	42mm	6x12 RL
4	M75	B	190-0738	3x 16.5mm	1x2

Included in kit shipped with unit:

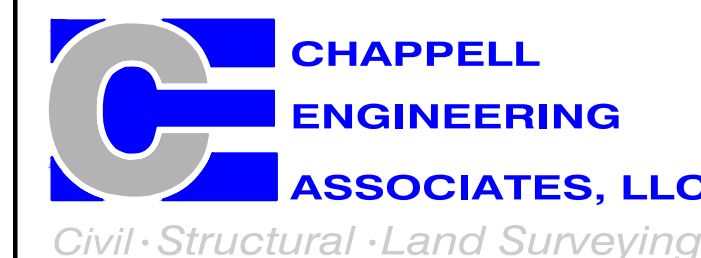
Qty	Connector Size	Insert P/N	Insert Hole	Cable Type	Purpose	Pos
2	M75	190-0760	42mm	6x12 RL	2 glands fit 1 each 6/12 Hyb	B
2	M75	190-0747	2x 24.5mm	2x12 DC	2 glands fit 2 each #6 12 cond DC	B
1	M75	190-0905	2x 10.5mm	2x12 Fiber	1 gland fit 2 x 12 fiber trunk	B
1	M75	190-0912	2x 9.5mm	2 ETH	1 gland fits 2 ethernet cable	B

ITEM 13
FIBER JUNCTION BOX
DIMENSIONS: 29.58"H x 16.5"W x 12.6"D
WEIGHT: 32.0 LBS
QUANTITY: TOTAL OF 2
STATUS: PROPOSED

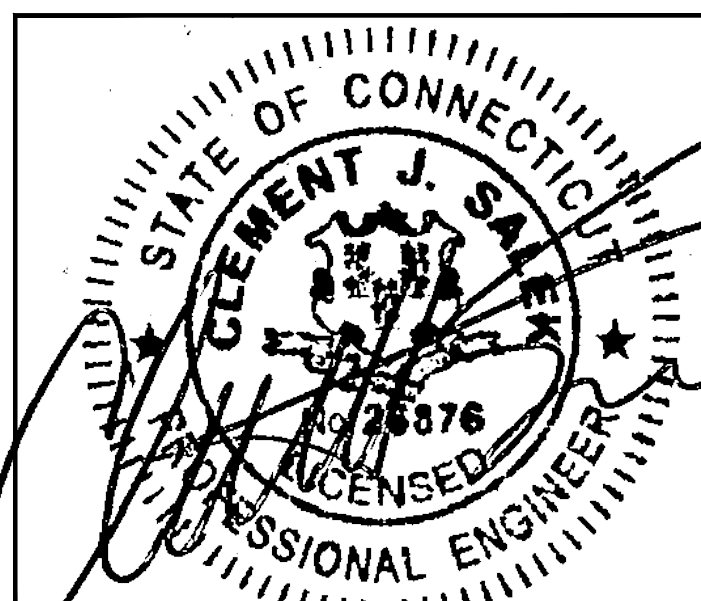
TYPICAL FIBER JUNCTION BOX DIMENSIONS, SCHEMATIC AND MOUNTING PROCEDURE 3
SCALE: N.T.S. RF02



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PROJECT NAME:
ENFIELD EAST CT

248 HALL HILL ROAD
SOMERS, CT 06071

DRAWING TITLE:
RF BILL OF MATERIALS
AND RF CABLE
PLUMBING DIAGRAM

DRAWING NO:
RF03

SCALE: AS SHOWN	DESIGNED BY: GRS DRAWN BY: NMC CHECKED BY: GRS	VZW LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	

RF BILL OF MATERIALS (PROP. (FINAL) CONFIGURATION)

SITE NAME: ENFIELD EAST CT A = ALPHA SECTOR B = BETA SECTOR G = GAMMA SECTOR

ITEM (SEE PLAN)	DESCRIPTION	BAND	QTY	STATUS	CABLE LENGTH/UNIT SIZE	COMMENTS
1	PANEL ANTENNA	3700-3980	3 TOTAL (A,B,G)	PROP.	35.2"H x 16.1"W x 5.6"D (87.1 lbs, each)	MOUNT TO PROP. PIPE MAST
2	PANEL ANTENNA	700/850/2100/CBRS	3 TOTAL (A,B,G)	PROP.	72.0"H x 11.9"W x 7.1"D (48.1 lbs, each)	MOUNT TO PROP. SIDE-BY-SIDE MOUNT
3	PANEL ANTENNA	700/850/1900	3 TOTAL (A,B,G)	PROP.	72.0"H x 11.9"W x 7.1"D (43.7 lbs, each)	MOUNT TO PROP. SIDE-BY-SIDE MOUNT
4	SIDE-BY-SIDE ANTENNA MOUNT KIT	-	3 TOTAL (A,B,G)	PROP.	25.4 lbs, each	MOUNT TO PROP. PIPE MAST
5	6x12 LOW INDUCTANCE HYBRID SIGNAL CABLE (MAIN LINE)	-	2 TOTAL	PROP.	205 FT.±	ROUTE FROM PROP. EQPT., UNDERGROUND TO EXIST. MONOPOLE AND UP WITHIN MONOPOLE TO PROP. FIBER JUNCTION BOXES
6	1x1 HYBRID SIGNAL CABLE (JUMPER)	-	6 TOTAL (2 PER SECTOR)	PROP.	20 FT. MAX. EACH	ROUTE FROM PROP. UPPER FIBER JUNCTION BOXES TO PROP. RRH UNITS
7	1x2 HYBRID SIGNAL CABLE (JUMPER)	-	6 TOTAL (2 PER SECTOR)	PROP.	20 FT. MAX. EACH	ROUTE FROM PROP. UPPER FIBER JUNCTION BOXES TO PROP. CBRS RRH UNITS
8	1/2" COAXIAL CABLE (JUMPER)	-	48 TOTAL (16 PER SECTOR)	PROP.	20 FT. MAX. EACH	ROUTE FROM PROP. REMOTE RADIO HEAD (RRH) UNITS TO PROP. PANEL ANTENNAS
9	RET CONTROL CABLE(S) (JUMPER)	-	PER RF REQ.	PROP.	20 FT. MAX. EACH	ROUTE FROM PROP. REMOTE RADIO HEAD (RRH) UNITS TO PROP. PANEL ANTENNAS
10	REMOTE RADIO HEAD (RRH) UNIT	700/850	3 TOTAL (A,B,G)	PROP.	15.5"H x 15.9"W x 10.0"D (70.3 lbs, each)	MOUNT TO PROP. PIPE MAST
11	REMOTE RADIO HEAD (RRH) UNIT	1900/2100	3 TOTAL (A,B,G)	PROP.	15.4"H x 15.8"W x 12.0"D (84.4 lbs, each)	MOUNT TO PROP. PIPE MAST
12	REMOTE RADIO HEAD (RRH) UNIT	BAND 48	3 TOTAL (A,B,G)	PROP.	13.9"H x 8.6"W x 4.2"D (18.6 lbs, each)	MOUNT TO PROP. PIPE MAST
13	UPPER FIBER JUNCTION BOX W/SURGE	-	2 TOTAL	PROP.	29.58"H x 16.5"W x 12.6"D (32.0 lbs, each)	MOUNT TO EXIST. MONOPOLE
14	LOWER FIBER JUNCTION BOX/RACK	-	1 TOTAL	PROP.	29.58"H x 16.5"W x 12.6"D (32.0 lbs, each)	MOUNT TO PROP. METAL DECK ICE SHIELD POST

THIS RF BILL OF MATERIALS (BOM) HAS BEEN COMPILED FROM ANTENNA RECOMMENDATION DATA SHEET DATED 6/7/2021. CONTRACTOR SHALL CONFIRM ALL FINAL RF MATERIALS/EQUIPMENT TO BE USED WITH VERIZON WIRELESS RF ENGINEER DURING CONSTRUCTION.

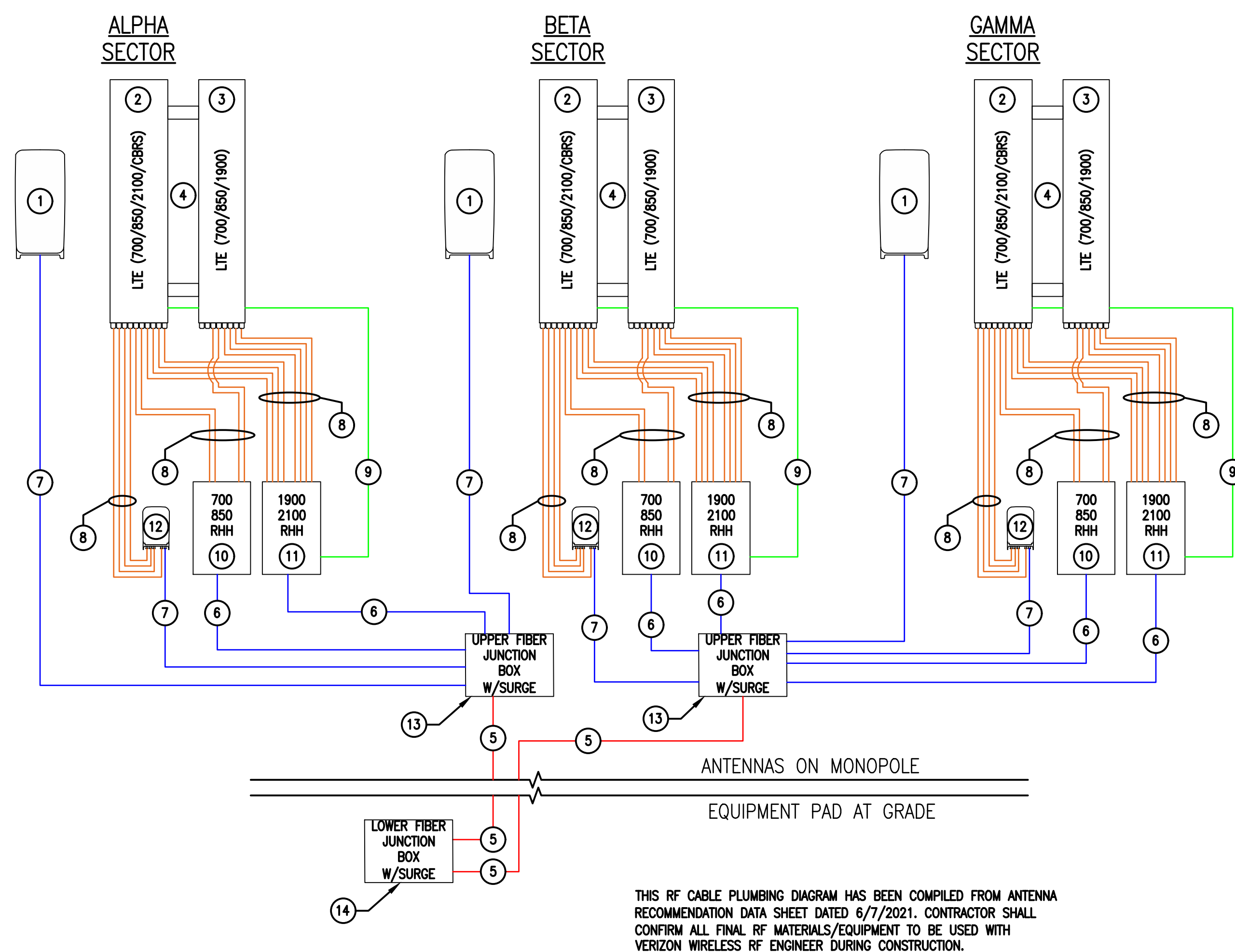
RF BILL OF MATERIALS (FINAL CONFIGURATION)

SCALE: NONE

1
RF03

RADIO FREQUENCY (RF) DESIGN NOTES:
1) ALL RADIO FREQUENCY (RF) DESIGN INFORMATION CONTAINED ON THIS SHEET IS SHOWN SCHEMATICALLY.
2) THE GENERAL CONTRACTOR SHALL CONFIRM ALL RF DESIGN ELEMENTS SHOWN (INCLUDING BUT NOT LIMITED TO PANEL ANTENNA MODELS & ARRANGEMENT, AZIMUTHS, REMOTE RADIO HEAD (RRH) UNIT MODELS & ARRANGEMENT AND CABLING DIAGRAMS/SCHEMATICS) WITH THE VERIZON WIRELESS RF ENGINEER AT THE TIME OF CONSTRUCTION.

NOTE:
ARRANGEMENT OF ANTENNAS, REMOTE RADIO HEAD (RRH) UNITS, FIBER JUNCTION BOXES AND ALL ASSOCIATED WIRING AND ANCILLARY EQUIPMENT SHOWN SCHEMATICALLY ON THIS PLUMBING DIAGRAM. SEE PROP. ANTENNA ORIENTATION PLAN(S) AND CROSS REFERENCE WITH RF BILL OF MATERIALS FOR PROP. ANTENNA/EQUIPMENT PLACEMENT DETAIL.



RF CABLE PLUMBING DIAGRAM (FINAL CONFIGURATION)

SCALE:

2
RF03

LEGEND	
RED	## = HYBRID CABLE (MAIN LINE)
PURPLE	## = COAXIAL CABLE (MAIN LINE)
BLUE	## = 1x1 HYBRID CABLE (JUMPER)
ORANGE	## = 1/2" COAXIAL CABLE (JUMPER)
GREEN	## = RET CONTROL CABLE(S) (JUMPER)

Line Color Code	Band	Tx/Rx	Color Pairs	Sector	Main Line Cable Length/Information
BR	850	Tx0/Rx0	Blue + Red	ALPHA (Az = 0°)	
BY	850	Tx1/Rx1	Blue + Yellow		
BG	1900 CDMA	Tx0/Rx0	Blue + Green		
BBG	1900 CDMA	Tx1/Rx1			
BP	700	Tx0/Rx0	Blue + Purple		
BBP	700	Tx1/Rx1			
BBBP	700	Tx2/Rx2			
BBBBP	700	Tx3/Rx3			
BBr	AWS	Tx0/Rx0	Blue + Brown		
BBBr	AWS	Tx1/Rx1			
BBBBr	AWS	Tx2/Rx2			
BBBBr	AWS	Tx3/Rx3			
BGG	1900 LTE	Tx0/Rx0	Blue + Green		
BBGG	1900 LTE	Tx1/Rx1			
BBBGG	1900 LTE	Tx2/Rx2			
BBBBGG	1900 LTE	Tx3/Rx3			
WR	850	Tx0/Rx0	BETA (Az = 120°)		
WY	850	Tx1/Rx1			White + Yellow
WG	1900 CDMA	Tx0/Rx0			White + Green
WVG	1900 CDMA	Tx1/Rx1			
WP	700	Tx0/Rx0			White + Purple
WWP	700	Tx1/Rx1			
WWWP	700	Tx2/Rx2			
WWWWP	700	Tx3/Rx3			
WBr	AWS	Tx0/Rx0			White + Brown
WWBr	AWS	Tx1/Rx1			
WWWBr	AWS	Tx2/Rx2			
WWWBr	AWS	Tx3/Rx3			
WGG	1900 LTE	Tx0/Rx0	White + Green		
WWGG	1900 LTE	Tx1/Rx1			
WWWGG	1900 LTE	Tx2/Rx2			
WWWGG	1900 LTE	Tx3/Rx3			
OR	850	Tx0/Rx0	GAMMA (Az = 240°)		
OY	850	Tx1/Rx1			Orange + Yellow
OG	1900 CDMA	Tx0/Rx0			Orange + Green
OOG	1900 CDMA	Tx1/Rx1			
OP	700	Tx0/Rx0			Orange + Purple
OOP	700	Tx1/Rx1			
OOP	700	Tx2/Rx2			
OOOP	700	Tx3/Rx3			
OBr	AWS	Tx0/Rx0			Orange + Brown
OOb	AWS	Tx1/Rx1			
OOb	AWS	Tx2/Rx2			
OOb	AWS	Tx3/Rx3			
OGG	1900 LTE	Tx0/Rx0	Orange + Green		
OOGG	1900 LTE	Tx1/Rx1			
OOGG	1900 LTE	Tx2/Rx2			
OOGG	1900 LTE	Tx3/Rx3			

CABLE LENGTH PROVIDED BELOW IS APPROXIMATE IN NATURE AND REFLECTED AS AN ADJUSTED VALUE TO PROVIDE ADEQUATE LENGTH. ANY FIELD MEASUREMENTS OF ANTICIPATED CABLE LENGTH IS ENCOURAGED IN AN EFFORT TO REDUCE SLACK AND TO OPTIMIZE DESIGN. SUCH FIELD MEASUREMENTS MAY SUPERCEDE THE LENGTH PROVIDED BELOW AT THE DISCRETION OF THE GENERAL CONTRACTOR

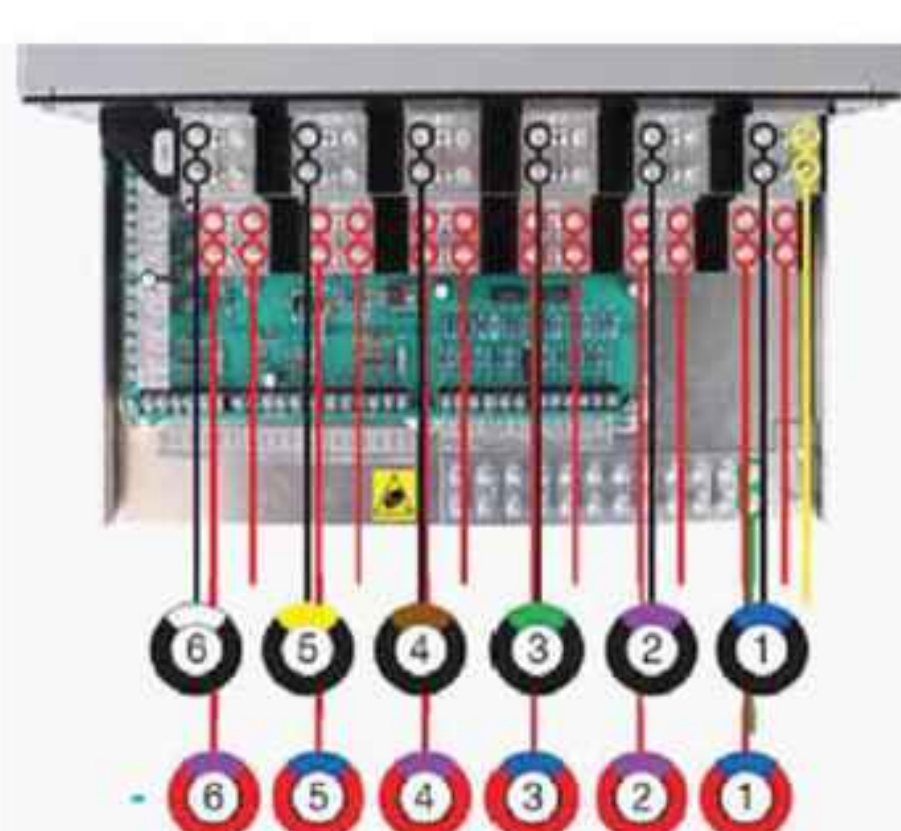
PROPOSED
205' ±

TWO (2) PROP. 6x12 LOW INDUCTANCE HYBRID SIGNAL CABLES

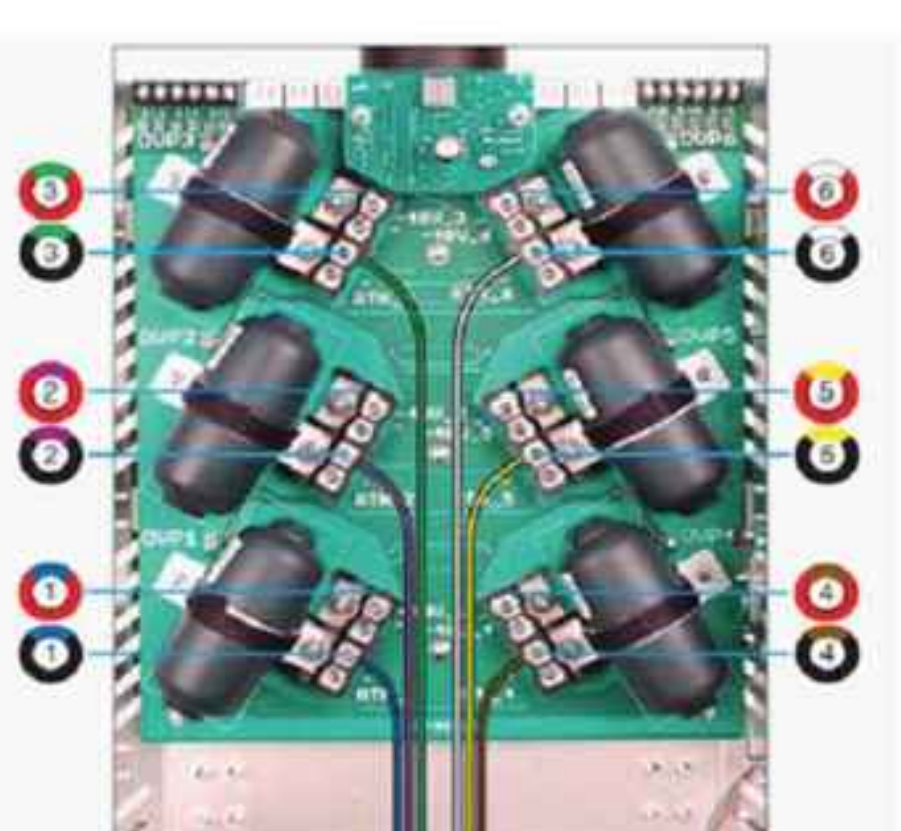
LINE COLOR CODE SPECIFICATIONS 1
RF03

Hybrid Cable on Towers

Hybrid Cable			
Sector	Identification Color	-48V	RTN
700 Alpha	Blue		
AWS Alpha	Violet		
PCS Alpha	Green		
850 Alpha	Brown		
Spare	Yellow		
Spare	White		



Hybrid Cable 2			
Sector	Identification Color	-48V	RTN
700 Beta	Blue		
AWS Beta	Violet		
PCS Beta	Green		
850 Beta	Brown		
Spare	Yellow		
Spare	White		

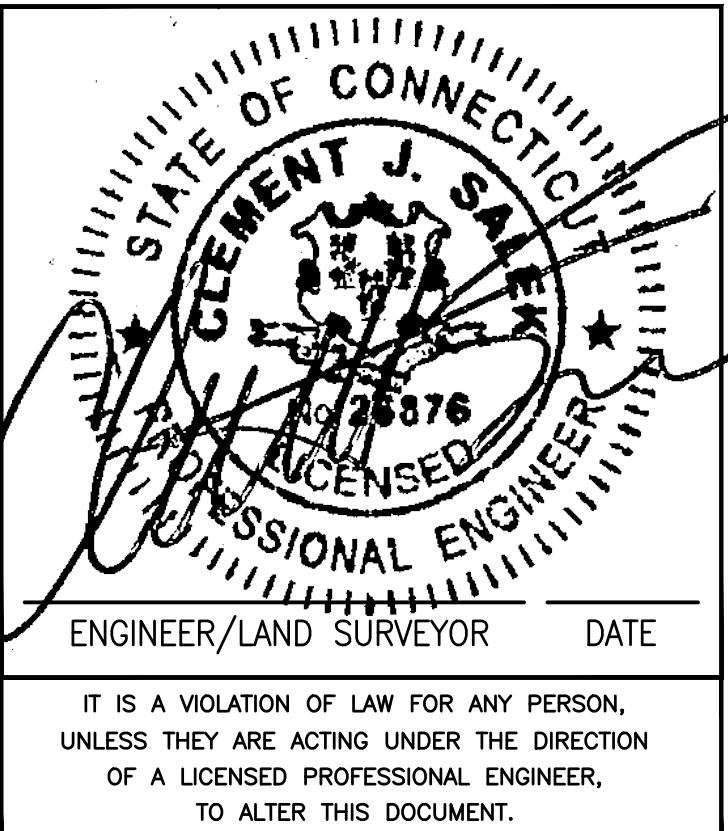


HYBRID CABLE COLOR CODE SPECIFICATIONS 2
RF04



CHAPPELL ENGINEERING ASSOCIATES, LLC
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248 HALL HILL ROAD
SOMERS, CT 06071

DRAWING TITLE:
RF COLOR CODE SPECIFICATIONS

DRAWING NO.:
RF04

SCALE: N/A	DESIGNED BY: GRS DRAWN BY: NWC CHECKED BY: GRS	VZW LOCATION CODE: 683673
GEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	

GENERAL PLUMBING NOTES:

- THE CONTRACTOR SHALL PROVIDE AND INSTALL A COMPLETE AND FULLY OPERATING SYSTEM INCLUDING ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY AS INDICATED ON DRAWINGS AND AS DESCRIBED IN THESE SPECIFICATIONS.
- THE CONTRACTOR SHALL PERFORM ALL CUTTING, DEMOLISHING, REMOVAL, DISPOSAL, PATCHING, SEALING, RESTORATION AND ALL ELSE REQUIRED TO COMPLETE THE PLUMBING INSTALLATION.
- ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE LOCALLY PRESIDING BUILDING CODE AND ALL OTHER AUTHORITIES HAVING JURISDICTION.
- THIS CONTRACTOR SHALL PAY ALL FEES AND TAXES, OBTAIN ALL PERMITS AND APPROVALS, FILE THE REQUIRED DOCUMENTS AND CAUSE ALL INSPECTIONS.
- SHOP DRAWINGS OF THE FOLLOWING SHALL BE SUBMITTED TO THE OWNER'S PROJECT REPRESENTATIVE FOR APPROVAL PRIOR TO INSTALLATION:
 - LAYOUT OF ALL EQUIPMENT
 - DIMENSIONED AND DETAILED PIPING LAYOUT
 - MANUFACTURER'S SPECIFICATIONS OF ALL EQUIPMENT SPECIFIED
 - DETAILED CONTROL WIRING DIAGRAMS
- ALL PIPE HANGERS SHALL BE ATTACHED TO THE BUILDING/SUPPORT STRUCTURE. PROVIDE TRAPEZE SUPPORTS AS REQUIRED.
- THE DIGGING OF HANGERS, CHOPPING, CORE DRILLING, WORK IN OTHER TENANT SPACES OR OCCUPIED AREAS, WORK CREATING FUMES ETC. OR WORK DEEMED BY THE OWNER TO BE A NUISANCE TO OTHER TENANTS SHALL BE DONE AFTER WORKING HOURS.
- ALL PENETRATIONS THROUGH FIRE RATED PARTITIONS AND FLOORS SHALL BE FIRESTOPPED WITH HILTI FIRESTOPPING MATERIAL. PROVIDE PIPE SLEEVES FOR ALL PENETRATIONS SEALED WITH AN APPROVED FIRESTOP.
- THIS CONTRACTOR SHALL FURNISH A ONE (1) YEAR GUARANTEE ON PARTS AND LABOR OF THE INSTALLATION FROM THE DATE OF OWNER ACCEPTANCE AND A FIVE (5) YEAR COMPRESSOR WARRANTY WHERE AVAILABLE.
- CONTRACTOR SHALL FURNISH ALL NECESSARY CONTROLS, STARTERS, PUMPS, MOTORS, PANELS AND RELAYS ETC. FOR A FULLY FUNCTIONING SYSTEM.
- BAKELITE LABELS SHALL BE INSTALLED AT ALL NEW EQUIPMENT FOR IDENTIFICATION PURPOSES.
- ANY REQUIRED SHUTDOWNS OF BASE BUILDING SYSTEMS FOR CONNECTION OF TENANT SYSTEMS MUST BE PRIOR APPROVED AND COORDINATED WITH ALL APPROPRIATE BUILDING/PROPERTY REPRESENTATIVES. THIS CONTRACTOR SHALL ASSUME ALL FEES REQUIRED BY THE OWNER TO ARRANGE AND SUPERVISE THE SHUTDOWN(S).
- THE CONTRACTOR SHALL VISIT THE LOCATIONS OF ALL PROPOSED WORK AND BECOME THOROUGHLY FAMILIAR WITH ALL EXISTING AND FORECASTED CONDITIONS AND LIMITATIONS.
- VERIFY ALL EXISTING CONDITIONS. ALL NEW PIPING AND EQUIPMENT SHALL BE COORDINATED WITH ALL EXISTING DUCTWORK, PIPING, ELECTRICAL AND GENERAL SITE CONDITIONS.
- ALL EXISTING EQUIPMENT, DUCTWORK, PIPING, ELECTRICAL AND GENERAL SITE CONDITIONS SHOWN ARE APPROXIMATE AND EXACT CONDITIONS MUST BE VERIFIED IN THE FIELD THROUGHOUT CONSTRUCTION.
- ALL WORK SHALL CONFORM TO THE GOVERNING BASE BUILDING/PROPERTY STANDARDS.
- THE CONTRACTOR SHALL COORDINATE WITH THE BASE BUILDING/PROPERTY MANAGEMENT AS TO THE DELIVERY OF EQUIPMENT AND SCHEDULING OF WORK SO AS TO NOT INTERFERE WITH THE OPERATION OF THE OCCUPIED FACILITIES. ANY REQUIRED SHUTDOWNS OF THE EXISTING BASE BUILDING/PROPERTY SYSTEMS OR WORK OUTSIDE OF THE DEMISING AREA SHALL BE STRICTLY COORDINATED WITH ALL APPROPRIATE BUILDING/PROPERTY REPRESENTATIVES.
- ALL ANCILLARY POWER AND LINE VOLTAGE WIRING SHALL BE DONE BY A LICENSED AND INSURED ELECTRICAL CONTRACTOR BASED UPON THE DIAGRAMS FURNISHED BY THE MECHANICAL CONTRACTOR.

GENERAL PLUMBING NOTES (CONTINUED):

- ALL MATERIAL AND APPARATUS SHALL BE NEW AND IN FIRST CLASS CONDITION. ALL MATERIAL AND APPARATUS SHALL HAVE MARKINGS OR A NAMEPLATE IDENTIFYING THE MANUFACTURER AND PROVIDING SUFFICIENT REFERENCE TO ESTABLISH QUALITY, SIZE AND CAPACITY. ALL WORKMANSHIP SHALL BE OF THE FINEST POSSIBLE BY EXPERIENCED MECHANICS OF THE PROPER TRADE. IN GENERAL, ALL MATERIALS AND EQUIPMENT SHALL BE OF COMMERCIAL SPECIFICATION GRADE IN QUALITY. LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE CONSIDERED ACCEPTABLE. ALL HOISTS, SCAFFOLDS, STAGING, RUNWAYS, TOOLS, MACHINERY AND EQUIPMENT REQUIRED FOR THE PERFORMANCE OF THE WORK SHALL BE FURNISHED BY THIS CONTRACTOR. MATERIAL AND EQUIPMENT SHALL BE STORED AND MAINTAINED IN CLEAN CONDITION AND PROTECTED FROM WEATHER, MOISTURE AND PHYSICAL DAMAGE.
- THE CONTRACTOR SHALL PERSONALLY INSPECT THE SITE OF THE PROPOSED WORK DURING THE CUSTOMER'S BID WALK OR AS OTHERWISE ARRANGED WITH APPROPRIATE BUILDING/PROPERTY REPRESENTATIVES AND BECOME FULLY INFORMED AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.
- DIRT AND REFUSE RESULTING FROM THE PERFORMANCE OF THE WORK SHALL BE REMOVED FROM THE PREMISES DAILY TO PREVENT ACCUMULATION. THE CONTRACTOR SHALL COOPERATE IN MAINTAINING REASONABLY CLEAN PREMISES AT ALL TIMES THROUGHOUT CONSTRUCTION. IMMEDIATELY PRIOR TO FINAL INSPECTION, THE CONTRACTOR SHALL PERFORM A FINAL CLEANUP OF DIRT AND REFUSE RESULTING FROM THE WORK PERFORMED. THE CONTRACTOR SHALL CLEAN ALL MATERIAL AND EQUIPMENT INSTALLED UNDER THE CONTRACT. DIRT, DUST, PLASTER, STAINS AND ALL FOREIGN MATTER SHALL BE REMOVED FROM ALL SURFACES. DAMAGED FINISHES SHALL BE TOUCHED UP AND RESTORED TO THEIR ORIGINAL CONDITION.
- THE DRAWINGS ARE SCHEMATIC IN NATURE, BUT SHOW THE VARIOUS COMPONENTS OF THE SYSTEMS APPROXIMATELY TO SCALE AND ATTEMPT TO INDICATE HOW THEY ARE TO BE INTEGRATED WITH OTHER PARTS OF THE BUILDING/STRUCTURE. FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS. DETERMINE EXACT LOCATIONS BY FIELD MEASUREMENTS, CHECKING THE REQUIREMENTS OF OTHER TRADES AND BY REVIEWING ALL CONTRACT DOCUMENTS. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ERRORS WHICH COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION.

GAS PIPING NOTES:

- GAS PIPING SHALL BE DESIGNED AND SHALL BE INSTALLED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE LATEST REVISION AND IN ACCORDANCE WITH NFPA 54.
- GAS PIPE SIZING SHALL BE BASED ON TABLE M-805.4.1(2) IN THE BOCA NATIONAL MECHANICAL CODE. A MAXIMUM PIPE LENGTH OF 200 FT. SHALL BE USED FOR THIS DESIGN.
- GAS PIPING SHALL BE OF MATERIAL SPECIFIED ON PLANS WITH ALL INDUSTRY STANDARD FITTINGS. WHERE GAS PIPING CONNECTS TO EQUIPMENT, IT SHALL BE PROVIDED WITH A DRIP LEG THE FULL SIZE OF THE SUPPLY PIPE, A 100% SHUT-OFF GAS COCK AND A UNION.
- GAS PIPING HANGERS AND SUPPORTS SHALL CONFORM TO THE REQUIREMENTS OF "STANDARD PRACTICE FOR PIPE HANGERS AND SUPPORTS - MATERIALS, DESIGN, MANUFACTURE, SELECTION, APPLICATION AND INSTALLATION" (ANSI/MSS SP-58-2009). ALL PIPE SHALL BE SUPPORTED IN A NEAT AND WORKMANLIKE MANNER.
- PORTIONS OF A GAS PIPING SYSTEM INSTALLED IN CONCEALED LOCATIONS SHALL NOT HAVE UNIONS, TUBE FITTINGS OR RUNNING THREADS. NO GAS VALVES SHALL BE INSTALLED IN ABOVE CEILING OR BELOW GRADE LOCATIONS.
- ALL GAS VENTS FROM PRESSURE RELIEF OR PRESSURE LIMITING DEVICES SHALL BE PIPED THE FULL OUTLET SIZE AND SHALL BE FITTED WITH AN AGA APPROVED FITTING WITH INSECT SCREEN. PROVIDE CAULKING OR PROPER FLASHING AT VENTS.
- BRANCH OUTLET PIPES SHALL BE TAKEN FROM THE TOP OR SIDES OF THE HORIZONTAL LINES AND NOT THE BOTTOM.
- USE DIELECTRIC UNIONS WHERE DISSIMILAR METALS ARE JOINED TOGETHER.
- INSPECT, TEST AND PURGE THE GAS PIPING SYSTEM IN ACCORDANCE TO NFPA 54 - PART 4 AND ALL LOCAL REQUIREMENTS. MINIMUM REQUIREMENTS SHALL BE 5 PSIG FOR A PERIOD OF 2 HOURS.

PLUMBING PROCEDURAL, PREPARATION AND TESTING NOTES:

- DUE TO THE NATURE OF THIS SYSTEM AND OTHER SIMILAR SYSTEMS IN USE BY THE OWNER, THE CONTRACTOR SHALL PROVIDE THE SYSTEMS AS SPECIFIED. SUBSTITUTIONS SHALL NOT BE CONSIDERED AT THIS TIME UNLESS DIRECTED BY OWNER.
- ALL WORK WITHIN LIVE ELECTRICAL PANELS SHALL OCCUR DURING HOURS ACCEPTABLE TO THE PANEL OWNER.
- THE CONTRACTOR SHALL PROVIDE TWO (2) DAYS ADVANCED NOTIFICATION OF ALL DELIVERIES TO THE SITE AND SEVEN (7) DAYS ADVANCED NOTIFICATION OF ANY REQUIRED SERVICE SHUT-DOWNS.
- THE CONTRACTOR SHALL MAINTAIN INTERFACE WITH THE OWNER AND WITH ALL OF THEIR CONTRACTORS, VENDORS AND ENGINEERING FIRMS.
- THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING TO BE HELD AT THE JOB SITE OR IN THE AREA WHERE THE INSTALLATION WILL TAKE PLACE.
- PRIOR TO THE START OF CONSTRUCTION, ALL WORKERS SHALL BE BRIEFED ON ALL SAFETY REQUIREMENTS PERTINENT TO THE WORKING ENVIRONMENT.
- THE CONTRACTOR SHALL INSURE THE AVAILABILITY AND ACCESSIBILITY OF ADEQUATE ON-SITE FIRE EXTINGUISHERS, SAFETY EQUIPMENT BOARDS AND FIRST AID STATIONS.
- ALL CONNECTIONS, TEST MEASUREMENTS AND ADJUSTMENTS SHALL BE DIRECTLY WITNESSED BY AN OWNER APPROVED PROJECT SUPERVISOR.
- PRIOR TO THE START-UP OF THE SYSTEMS, THE CONTRACTOR SHALL CHECK ALL COMPONENTS AND DEVICES, LUBRICATE ITEMS ACCORDINGLY AND TIGHTEN ALL CONNECTIONS. AFTER ALL SYSTEMS HAVE BEEN INSPECTED AND ADJUSTED, CONFIRM ALL OPERATING FEATURES REQUIRED BY THE DRAWINGS AND SPECIFICATIONS AND MAKE FINAL ADJUSTMENTS AS NECESSARY.
- APPROPRIATE FACTORY REPRESENTATIVES SHALL BE ON SITE TO COMMISSION THE SYSTEM.
- CONTRACTOR SHALL INSPECT AND TEST ALL PIPING AND EQUIPMENT IN ACCORDANCE WITH APPLICABLE CODE REQUIREMENTS AND EQUIPMENT MANUFACTURER'S INSTRUCTIONS.
- AUTHORIZED PERSONNEL SHALL CONDUCT CLEANING, PURGING AND TESTING PROCEDURES. TESTING OF PIPING SHALL UTILIZE HYDROSTATIC OR PNEUMATIC MEASURES. OXYGEN OR LP GAS IS NOT TO BE USED.
- PURGE PIPING WITH INERT GAS PRIOR TO INTRODUCING LP GAS.
- CONDUCT A FUNCTIONAL TEST OF ALL ISOLATION VALVES, EXCESS FLOW VALVES AND PRESSURE RELIEF VALVES.
- CONTRACTOR SHALL SUBMIT TO THE OWNER THREE (3) COPIES EACH OF MATERIAL FOR MAINTENANCE AND OPERATION INSTRUCTION MANUALS APPROPRIATELY BOUND INTO MANUAL FORM INCLUDING APPROVED COPIES OF MANUFACTURER'S CATALOG SHEETS, WIRING DIAGRAMS, MAINTENANCE INSTRUCTIONS, OPERATING INSTRUCTIONS AND PARTS LISTS (REVISED IF NECESSARY TO SHOW SYSTEM AND EQUIPMENT AS ACTUALLY INSTALLED). CONTRACTOR SHALL ALSO PROVIDE ADEQUATE VERBAL INSTRUCTIONS OF SYSTEM OPERATION AND RE-START TO OWNER'S REPRESENTATIVE AT THE CONCLUSION OF THE WORK.

GENERATOR: TBD SUPPLIED BY VERIZON, INSTALLED BY CONTRACTOR.

CONTRACTOR SHALL OBTAIN FULL SPECIFICATIONS FROM VERIZON PRIOR TO BID.

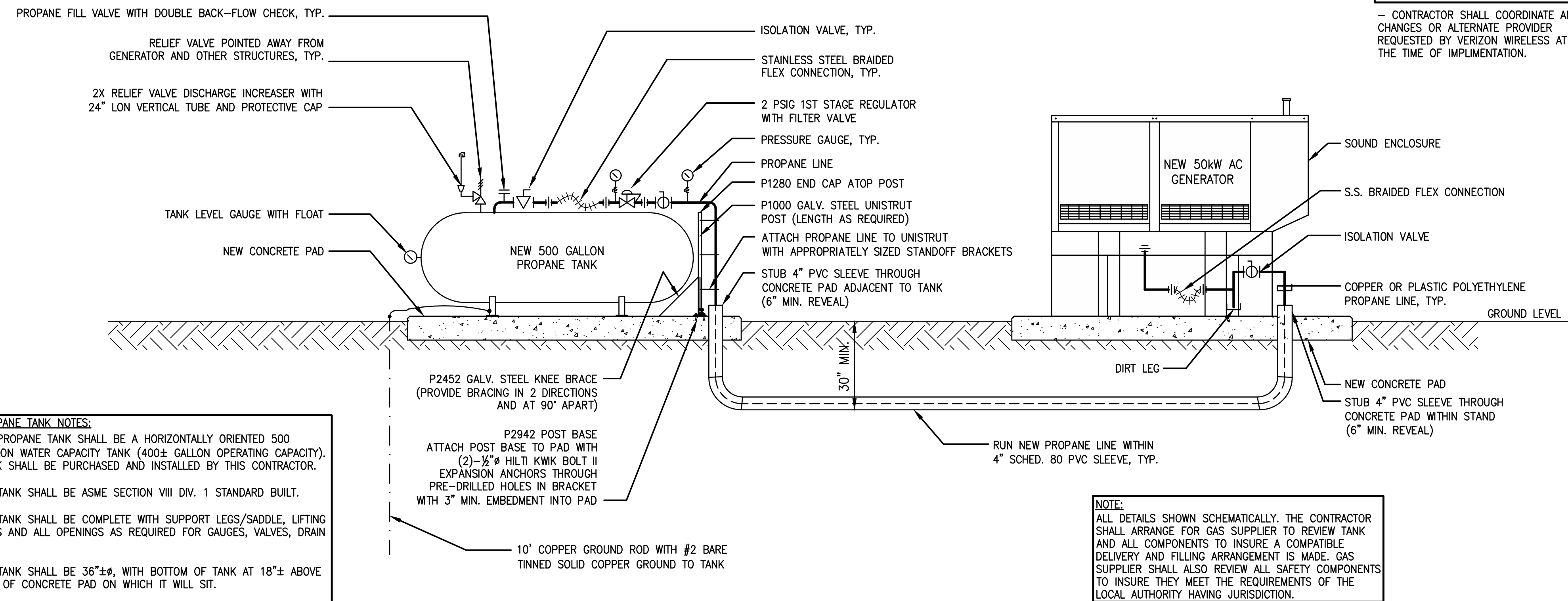
CONTRACTOR SHALL ARRANGE FOR GENERATOR START-UP SERVICES.

PROPANE GAS ACCOUNT:
CONTRACTOR SHALL ARRANGE FOR NEW GAS ACCOUNT TO BE ESTABLISHED WITH CONSUMERS PROPANE. VERIZON TO SUPPLY INFORMATION FOR ACCOUNT.

PARACO GAS
152 BROAD BROOK ROAD
BROAD BROOK, CT 06016
(203) 377-7171

- CONTRACTOR SHALL COORDINATE ANY CHANGES OR ALTERNATE PROVIDER REQUESTED BY VERIZON WIRELESS AT THE TIME OF IMPLEMENTATION.

LEGEND	
	PLUG VALVE
	UNION
	PIPE DROP
	PIPE RISE
	PUSH BUTTON SWITCH

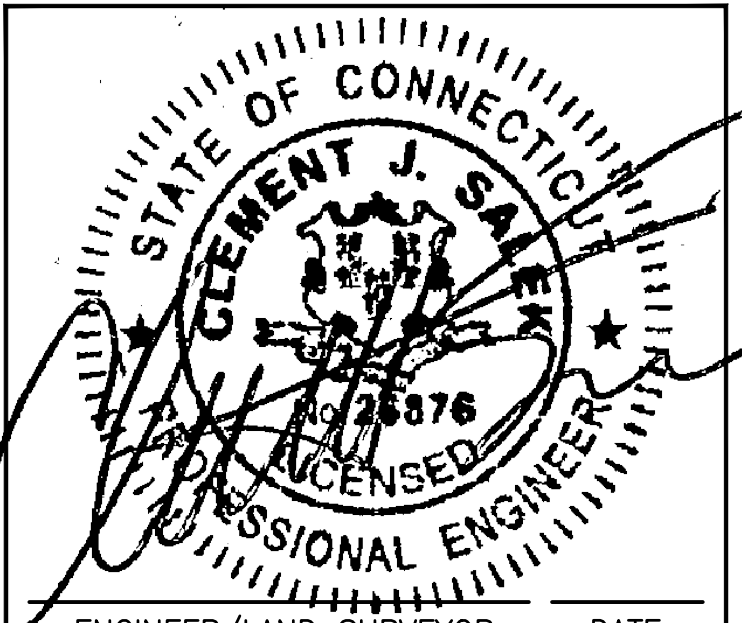


PROPANE PIPING SCHEMATIC 1
SCALE: NOT TO SCALE P01



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ENGINEER/LAND SURVEYOR DATE

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

REVISIONS		
NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	9/22/21
1	ISSUED FOR CONSTRUCTION (FINAL)	9/30/21
2	REVISED RRRH UNIT DIMENSIONS	10/15/21
3	REVISED PER ATTORNEY COMMENTS	11/12/21

PROJECT NAME:
ENFIELD EAST CT

248 HALL HILL ROAD
SOMERS, CT 06071

DRAWING TITLE:
PLUMBING NOTES AND SCHEMATIC

DRAWING NO:
P01

SCALE: NOT TO SCALE	DESIGNED BY: GRS DRAWN BY: NWC CHECKED BY: GRS	VZW LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	

ELECTRICAL SPECIFICATIONS

- FURNISH ALL LABOR, MATERIALS, EQUIPMENT, TOOLS AND INCIDENTALS REQUIRED TO MAKE READY FOR USE THE COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS. MAKE ALL NECESSARY CONNECTIONS AT "PACKAGED" EQUIPMENT.
- THE ELECTRICAL SYSTEMS SHALL BE SUITABLE IN EVERY WAY FOR THE SERVICE REQUIRED. ALL MATERIAL AND ALL WORK WHICH MAY BE REASONABLY IMPLIED AS BEING INCIDENTAL TO THE WORK SHALL BE FURNISHED AT NO EXTRA COST.
- FURNISH AND INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE REQUIREMENTS OF LOCAL, STATE AND NATIONAL CODES AND STANDARDS, INCLUDING BUT NOT LIMITED TO:
THE 2018 CONNECTICUT STATE BUILDING CODE
THE NATIONAL ELECTRICAL CODE (NFPA-70)
THE CONNECTICUT ELECTRIC CODE
THE NATIONAL ELECTRICAL SAFETY CODE (ANSI C-2)
THE LIFE SAFETY CODE (NFPA 101)
THE STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURE AND ANTENNAS (TIA/EIA-222-G)
- MATERIALS AND EQUIPMENT SHALL BE NEW, UNUSED AND UNDERWRITERS' LABORATORIES, INC. LISTED. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS IN A TIMELY FASHION, INCLUDING RESPONSIBILITY FOR DETERMINING AVAILABILITY/LEAD TIME FOR ALL NECESSARY EQUIPMENT.
- CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND PAY ALL FEES FOR PERMITS AND INSPECTIONS. WHERE NEW COMMERCIAL POWER SERVICE IS PROVIDED TO THE SITE, OR EXISTING SERVICE MUST BE MODIFIED, CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH THE ELECTRIC UTILITY, SHALL PERFORM ALL OF HIS WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY, AND SHALL PAY ALL UTILITY SERVICE BACK CHARGES.
- ALL WIRING OUTSIDE SHALL BE INSTALLED IN HEAVY-GAUGE, (SCHEDULE 40) RIGID STEEL CONDUIT, HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE WITH AN ADDITIONAL FACTORY-APPLIED FINISH INSIDE AND OUTSIDE. CUT ENDS SHALL BE REAMED, THREADED AND COLD GALVANIZED. NO COMPRESSION FITTING WILL BE ACCEPTED.
- UNDERGROUND CONDUITS SHALL BE PVC SCHEDULE 40 AND INSTALLED NOT LESS THAN 30 INCHES BELOW FINISHED GRADE.
- WIRING INSTALLED IN THE BUILDING THAT IS SHOWN TO BE IN CONDUIT SHALL BE INSTALLED IN EMT. EMT FITTINGS SHALL BE STEEL COMPRESSION TYPE.
- LIQUID TIGHT, FLEXIBLE METAL CONDUIT SHALL BE USED FOR ALL MOTOR TERMINATIONS AND FOR CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION. FLEXIBLE METAL CONDUIT SHALL CONSIST OF A FLEXIBLE, CORROSION RESISTANT METAL CORE WITH AN EXTRUDED, WATER-TIGHT, SYNTHETIC JACKET. CONDUITS SMALLER THAN 1-1/2" SHALL HAVE A CONTINUOUS GROUND CONDUCTOR UNDER THE JACKET.
- NO CONDUIT SMALLER THAN 3/4" ELECTRICAL TRADE SIZE SHALL BE USED, EXCEPT AS OTHERWISE SHOWN ON THE DRAWINGS. BOX SIZES SHALL BE 4" SQUARE MINIMUM, BUT NOT LESS THAN THAT REQUIRED BY THE CONNECTICUT ELECTRICAL CODE.
- FITTINGS AND EXPOSED SWITCH, OUTLET AND CONTROL STATION BOXES AND OTHER EXPOSED BOXES 4" SQUARE SHALL BE CAST OR MALLEABLE IRON WITH CADMIUM-ZINC FINISH AND CAST COVERS WITH STAINLESS STEEL SCREWS.
- FLUSH SWITCH AND OUTLET BOXES SHALL BE HOT-DIPPED GALVANIZED, PRESSED STEEL WITH NYLON COVER PLATES, COLOR AS DETERMINED BY THE ENGINEER.
- EXCEPT AS OTHERWISE SHOWN, TERMINAL, JUNCTION AND PULL BOXES LARGER THAN 4" SQUARE SHALL BE SHEET STEEL. STEEL BOXES SHALL BE HOT-DIPPED GALVANIZED. BOXES AND COVERS SHALL BE NOT LESS THAN 14 GAUGE METAL. COVERS SHALL BE GASKETED AND FASTENED WITH STAINLESS STEEL HARDWARE.
- FITTINGS USED WITH LIQUID TIGHT, FLEXIBLE CONDUIT SHALL BE OF THE SCREW-IN, COMPRESSION TYPE WITH SEALING RING. FITTINGS LARGER THAN 1-1/4" SHALL BE FURNISHED WITH INTEGRAL GROUND LUGS.
- HANGERS, RODS, BACK PLATES, BEAM CLAMPS, ETC. SHALL BE GALVANIZED IRON OR STEEL. CONDUITS SHALL BE SUPPORTED AT LEAST EVERY 5 FEET.
- EXPOSED CONDUITS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES TO WALLS. CONDUIT RUNS SHALL BE STRAIGHT AND TRUE. CONDUIT SHALL BE SUPPORTED BY MEANS OF TWO-HOLE PIPE CLAMPS. BACK PLATES SHALL BE INSTALLED WHERE REQUIRED TO RAISE CONDUITS FROM THE SURFACE. MULTIPLE, HORIZONTAL RUNS SHALL BE SUPPORTED ON TRAPEZE HANGERS WITH STEEL HORIZONTAL MEMBERS AND THREADED RODS NOT LESS THAN 3/8 INCHES IN DIAMETER. HANGERS SHALL BE ATTACHED TO STRUCTURAL STEEL BY MEANS OF BEAM CLAMPS. SPOT TYPE INSERTS SHALL BE USED IN CONCRETE.
- CONDUIT BENDS SHALL BE CAREFULLY MADE TO PREVENT DISTORTION OF THE CIRCULAR CROSS-SECTION. NO CONDUIT RUN SHALL HAVE MORE THAN THE EQUIVALENT OF THREE 90 DEGREE BENDS BETWEEN PULLING POINTS. CHANGES IN DIRECTION SHALL BE MADE WITH BENDS, STANDARD ELBOWS AND PULLBOXES. BENDS IN PARALLEL RUNS SHALL BE CONCENTRIC.
- CONDUIT SHALL NOT BE SUPPORTED FROM PIPING, PIPING SUPPORTS, DUCTWORK, SUSPENDED CEILING SUPPORTS OR MECHANICAL EQUIPMENT SUBJECT TO VIBRATION OR REMOVAL.
- THE ENDS OF ALL CONDUITS SHALL BE TIGHTLY PLUGGED DURING BUILDING CONSTRUCTION UNTIL WIRES ARE TO BE PULLED. SPARE CONDUITS SHALL BE FURNISHED WITH THREADED CAPS.
- CONDUITS SHALL BE TERMINATED AT UNGASKETED SHEET STEEL BOXES AND ENCLOSURES WITH DOUBLE LOCK NUTS AND SUITABLE BUSHINGS. BUSHINGS INSTALLED ON CONDUITS CONTAINING GROUND WIRES SHALL BE GROUNDING TYPE. CONDUITS SHALL BE TERMINATED AT GASKETED SHEET METAL BOXES AND ENCLOSURES WITH CONDUIT HUBS.
- CONDUCTORS SHALL BE ANNEALED, 98 PERCENT CONDUCTIVITY, SOFT-DRAWN COPPER. NO CONDUCTOR SMALLER THAN NO. 12 AWG SHALL BE USED, EXCEPT AS OTHERWISE NOTED.
- WIRE FOR POWER AND LIGHTING BRANCH CIRCUITS SHALL BE 600 VOLT, TYPE THWN. WIRE FOR CONTROL CIRCUITS SHALL BE 600 VOLT, TYPE THWN, NO. 14 AWG, STRANDED. SERVICE CONDUCTORS AND FEEDERS SHALL BE TYPE XHHW, CONDUCTORS NO. 10 AWG AND SMALLER SHALL BE SOLID. NO. 8 AWG AND LARGER SHALL BE STRANDED.
- ALL CONDUCTORS SHALL BE CAREFULLY HANDLED TO AVOID KINKS OR DAMAGE TO INSULATION. LUBRICANTS SHALL BE USED TO FACILITATE WIRE PULLING. LUBRICANTS SHALL BE UL LISTED FOR USE WITH THE INSULATION SPECIFIED.
- ALL EQUIPMENT AND MATERIALS SHALL BE GROUNDED IN STRICT ACCORDANCE WITH THE CONNECTICUT ELECTRICAL CODE, AND THE STANDARD REQUIREMENTS OF VERIZON WIRELESS AND LUCENT.
- DISCONNECT SWITCHES SHALL BE 480 OR 240 VOLT, HEAVY-DUTY, QUICK-MAKE, QUICK BREAK, VISIBLE BLADE, 2 POLE WITH EXTERNAL OPERATING HANDLE AND FULL COVER INTERLOCK. SWITCHES INSTALLED OUTSIDE SHALL BE NEMA TYPE 3R ENCLOSED.
- WALL SWITCHES SHALL BE SINGLE POLE 3-WAY OR 4-WAY, INDICATING, TOGGLE-ACTION, FLUSH, QUIET TYPE, SPECIFICATION GRADE, RATED 20 AMPERE, 120-277 VOLT. COLOR AS DETERMINED BY ENGINEER.
- GENERAL PURPOSE RECEPTACLES SHALL BE DUPLEX, 2 POLE, 3 WIRE, STRAIGHT BLADE, NYLON FACE, GROUNDING TYPE, 20 AMPERE, 125 VOLT, SPECIFICATION GRADE. COLOR AS DETERMINED BY ENGINEER.
- PANELS SHALL BE PER DIRECTED BY THESE DRAWINGS WITH TYPED DIRECTORIES.
- CIRCUIT BREAKERS SHALL BE MOLDED CASE, THERMAL-MAGNETIC TYPE WITH RMS SYMMETRICAL INTERRUPTING RATING OF NOT LESS THAN 22,000 AMPERE FOR 240 VOLT BREAKERS. ENCLOSED BREAKERS SHALL HAVE PADLOCKING PROVISIONS AND EXTERNAL OPERATING HANDLE WITH FULL COVER INTERLOCK. BREAKERS SHALL BE 1" MODULES MINIMUM.
- NAMEPLATES SHALL BE PROVIDED FOR ALL EQUIPMENT INDICATING VOLTAGE, PHASE, USE AND SOURCE OF ORIGIN. DEVICES SHALL BE LABELED INDICATING VOLTAGE AND BRANCH CIRCUIT. BRANCH CONDUCTORS SHALL BE LABELED INDICATING BRANCH CIRCUIT. FEEDER CONDUCTORS SHALL INDICATE PHASE.
- ALL EXTERIOR CONDUCTOR/LUG TERMINALS SHALL HAVE AN ANTIOXIDANT APPLIED.
- ALL SPRING TYPE WIRE CONDUCTORS USED IN EXTERIOR BOXES SHALL BE SILICON FILLED.

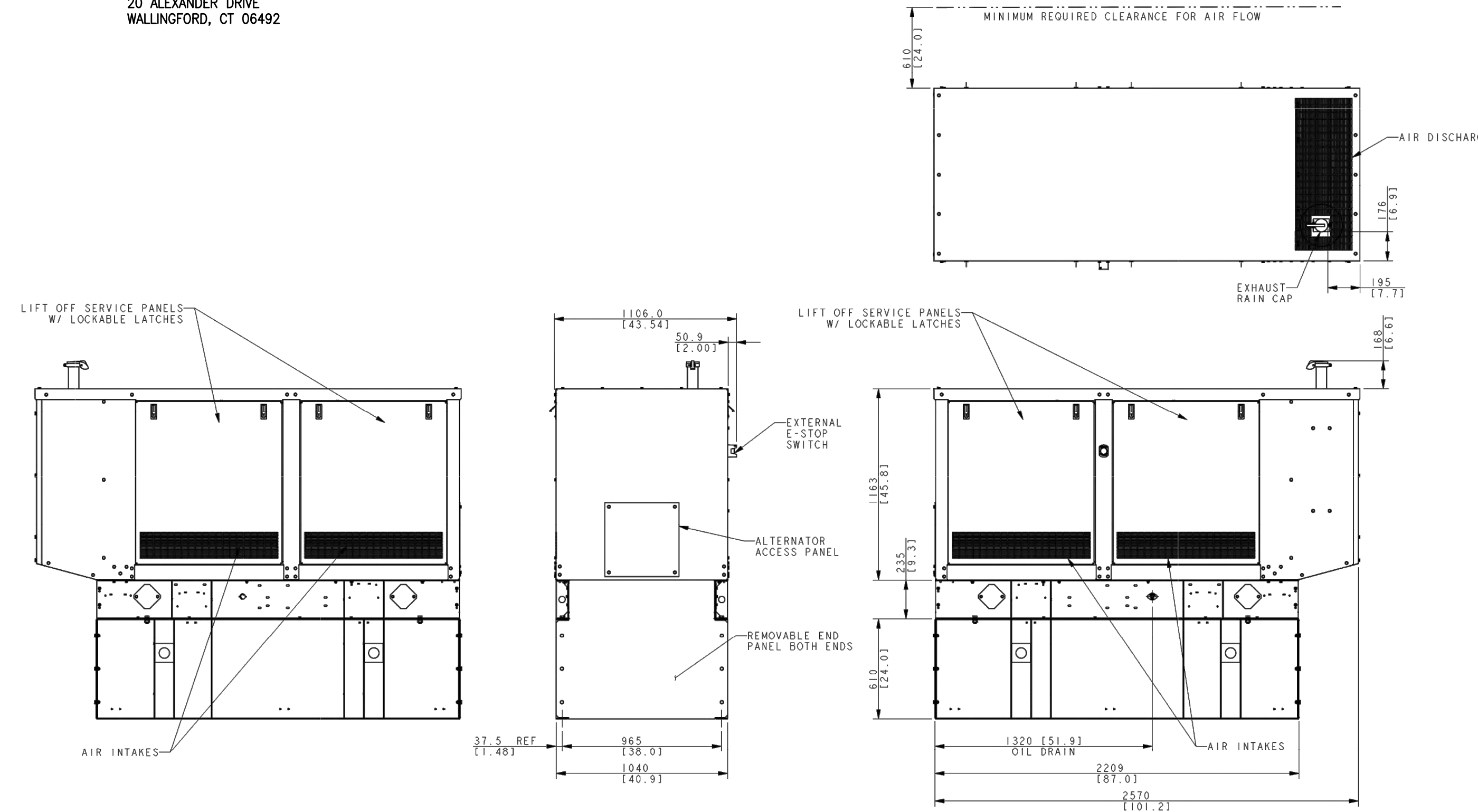
- ELECTRICAL CONTRACTOR SHALL AS PART OF HIS WORK INCLUDE ALL FITTINGS, SLEEVES AND MINOR CUTTING REQUIRED FOR HIS WORK, INCLUDING FIRES-STOPPING.
- THE ELECTRICAL CONTRACTOR, AT HIS OWN EXPENSE, SHALL PROVIDE HIS OWN, WHERE DIRECTED, STORAGE AND OFFICE SPACE.
- FIVE COPIES OF SHOP DRAWINGS OF ALL EQUIPMENT SHALL BE PROVIDED TO THE ENGINEER.
- ELECTRICAL CONTRACTOR'S WORK SHALL INCLUDE ALL LABOR AND MATERIALS, SCAFFOLDING TOOL AND TRANSPORTATION NECESSARY FOR COMPLETE INSTALLATION.
- ELECTRICAL CONTRACTOR TO FURNISH ENGINEER ONE SET OF MYLARS OF "AS BUILT" DRAWINGS.
- ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY POWER & LIGHTING AS REQ'D.

GENERAL NOTES

- CONTRACTOR SHALL VISIT THE SITE TO MAKE HIMSELF AWARE OF THE EXISTING CONDITIONS.
- BRANCH CIRCUIT RUNS 100 FT AND OVER SHALL BE #10 AWG CONDUCTORS.
- THESE DRAWINGS ARE DIAGRAMMATIC ONLY. THE EXACT LOCATION, MOUNTING HEIGHT, SIZE OF EQUIPMENT AND ROUTING OF RACEWAYS SHALL BE COORDINATED AND DETERMINED IN THE FIELD.
- THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE HVAC AND PLUMBING CONTRACTORS AS TO THE EXACT LOCATION OF THEIR RESPECTIVE EQUIPMENT, THE POWER WIRING, THE CONTROL WIRING AND ALL ELECTRICAL CONNECTIONS REQUIRED BY THIS CONTRACTOR FOR COMPLETELY OPERATIVE HVAC AND PLUMBING SYSTEMS IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.
- INTERRUPTIONS TO THE EXISTING ELECTRICAL SERVICE FOR SPLICING CONNECTIONS, RENOVATION OF EXISTING DISTRIBUTION, BRANCH CIRCUITS, INSTALLATION OF NEW ELECTRIC SERVICE, AND SHALL BE AS SHORT AS POSSIBLE, AND TO THE CONVENIENCE OF THE OWNER.
- ALL CONDUIT SHALL BE SURFACE MOUNTED UNLESS OTHERWISE NOTED. NO INTERIOR HORIZONTAL CONDUIT BELOW 7'-8" AFF IN FINISHED SPACES.
- ALL WIRING TO BE 3/4", 2#12 & 1#12 GROUND, UNLESS OTHERWISE NOTED.
- NO BX OR ROMEX CABLE IS PERMITTED.
- ALL WIRING DEVICES AND EQUIPMENT SHALL BE 20A SPECIFICATION GRADE AND UL LISTED.
- ALL OUTLET AND JUNCTION BOXES SHALL BE SECURELY SURFACE MOUNTED.
- ALL RECEPTACLE AND EQUIPMENT CIRCUITS SHALL BE GROUNDED USING A FULL SIZE EQUIPMENT GROUNDING CONDUCTOR RUN WITH THE CURRENT CONDUCTORS.
- ALL WALL PENETRATIONS FOR TELCO, POWER, AND GROUNDING SHALL REQUIRE PVC SLEEVES.
- ALL SWITCHES SHALL BE FORTY-EIGHT (48) INCHES AFF, UNLESS OTHERWISE NOTED.
- ALL RECEPTACLES SHALL BE EIGHTEEN (18) INCHES AFF, UNLESS OTHERWISE NOTED.
- ALL WIRING SHALL BE IN METAL RACEWAY & NO. 12 AWG COPPER MIN. UNLESS OTHERWISE NOTED.
- WIRE COLOR SHALL BE PER STANDARD CODING BY PHASE.
- FOR UTILITY BILLING, PLEASE SEND TO:
VERIZON WIRELESS
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492

GROUNDING GENERAL NOTES

- ALL EXTERIOR CONDUCTORS SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNLESS OTHERWISE NOTED. MINIMUM BEND RADIUS SHALL BE EIGHT (8) INCHES.
- ALL CONNECTIONS TO HALO GROUND RING AND ALL CABLE TRAY JUMPERS SHALL BE #6 AWG, INSULATED, STRANDED, COPPER WIRE.
- ALL WIRE-TO-WIRE CONNECTIONS SHALL BE THREE-CLAMP, C TAP COMPRESSION (T&B #54740 ORANGE OR EQUIVALENT). ALL GROUND BAR CONNECTIONS SHALL BE TWO-HOLE, LONG-BARREL TYPE COMPRESSION LUGS (T&B OR EQUIVALENT). ALL OTHER CONNECTIONS TO STEEL SURFACES SHALL USE LUG-TYPE CONNECTORS.
- MECHANICALLY BOND ANTENNA MOUNTS WITH #2 AWG, BARE, STRANDED CONDUCTORS.
- ALL GROUNDING WORK SHALL COMPLY WITH VERIZON WIRELESS STANDARDS.
- CONNECT GROUND CONDUCTOR TO EXISTING GROUNDING SYSTEM. ATTACH TO WALLS, PARAPET, CABLE TRAY, ETC. WITH A CLAMPS AS NECESSARY. REMOVE PAINT, FIREPROOFING, MILL SCALE, ETC. TO ACHIEVE GOOD CAD WELD GROUND CONNECTION.
- CONNECT TO HALO GROUND USING C-TAP (#54730).
- CONNECT TO ENCLOSURES USING BLUE GROUND LUGS.



KOHLER 50KW PROPANE GENERATOR (PART #ADV-9091)
OVERALL GENERATOR (ENCLOSURE) APPROXIMATE
DIMENSIONS: 101.2"L x 40.9"W x 79.1"H
APPROXIMATE MAX. IN-SERVICE WEIGHT: 2,965 lbs

GENERATOR DETAIL

SCALE: NONE

1
E01

LEGEND

ELECTRICAL SYMBOLS

(M)	METER
(X)	GROUND ROD/TEST (OBSERVATION) WELL
(X)	GROUND ROD
(▲)	CADWELD TYPE CONNECTION
(●)	COMPRESSION TYPE CONNECTION
(---	GROUNDING WIRE
(1/E02)	REPRESENTS DETAIL NUMBER
(□)	1'X4' SURFACE MTD. FLOURESCENT LIGHTING FIXTURE
(□)	SELF CONTAINED EMERG. LIGHTING UNIT
(S)	20A-120V-1P TOGGLE SWITCH
(M)	MAGNETIC DOOR SWITCH (DOOR JAMB TYPE)
(●)	20A-120V QUADRAPLEX RECEPTACLE, GROUNDING TYPE, 2-OCT. NO.
(●/wp)	20A-120V DUPLEX RECEPTACLE, GROUNDING TYPE. WP = WEATHERPROOF GFI = GROUND FAULT
(●/TL)	SIMPLEX RECEPTACLE, GROUNDING TYPE. TL = TWIST LOCK
(□)	JUNCTION BOX
(P1)	PANELBOARD 'P1'
(*)	MOTOR - NUMERAL DENOTES HORSEPOWER
(□/wp)	WEATHER PROOF DISCONNECT SWITCH
(□/3R)	FUSED DISCONNECT SWITCH - '3R' & '1' - NEMA ENCLOSURE
(*)	THERMOSTAT *TH - HI TEMPERATURE ALARM THERMOSTAT
(*)	HUMIDISTAT *H - HI/LO HUMIDITY ALARM HUMIDISTAT
(●)	COMBINATION SMOKE/HEAT DETECTOR WITH MINI HORN
(P1-2)	HOMERUN TO PANEL (FURNISH & INSTALLED BY MECHANICAL)
(□)	SURGE ARRESTOR - JOSLYN CAT. NO. 1455-85
(↓)	AFF ABOVE FINISHED FLOOR
(M)	MOTORIZED DAMPER
(2#12-3/4")	EXPOSED CONDUIT 2#12-3/4".
(TC)	ALARM TERMINAL CABINET

ABBREVIATIONS

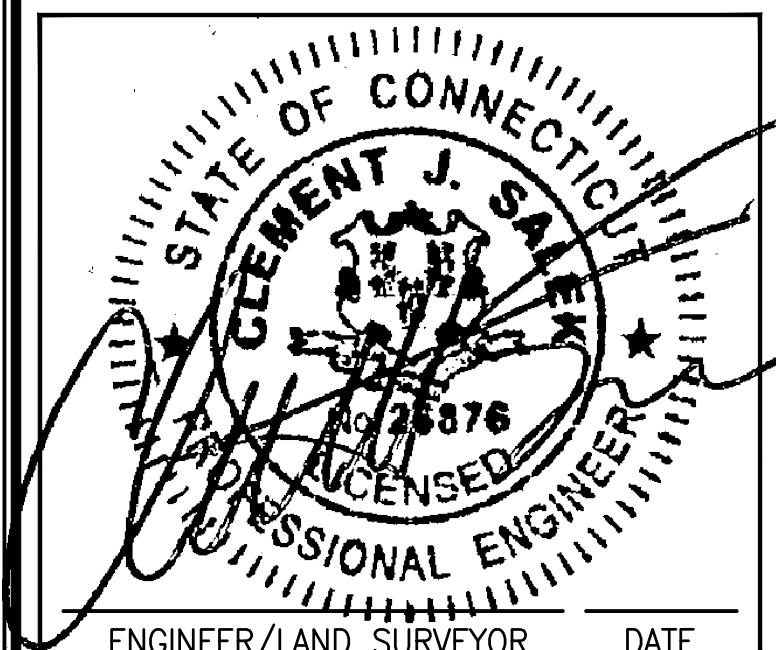
AWG	AMERICAN WIRE GAUGE
BCW	BARE COPPER WIRE
GPS	GLOBAL POSITIONING SYSTEM
PCS	PERSONAL COMMUNICATION SYSTEM
RWY	RACEWAY
TYP.	TYPICAL
RGS	RIGID GALVANIZED STEEL
EMT	ELECTRICAL METALLIC TUBING
DWG	DRAWING
EMT	INTERIOR GROUND RING (HALO)
GEN	GENERATOR
GR	GROWTH
CGBE	COAX GROUND BAR EXTERNAL
CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MGB	MASTER GROUND BAR
PVC	RIGID (SCH. 40) POLYVINYL CHLORIDE CONDUIT
EBH	ETHERNET BACK HAUL

verizon

"Because Better Matters"

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REVISIONS

NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	9/22/21
1	ISSUED FOR CONSTRUCTION (FINAL)	9/30/21
2	REVISED RRH UNIT DIMENSIONS	10/15/21
3	REVISED PER ATTORNEY COMMENTS	11/12/21

PROJECT NAME:

ENFIELD EAST CT

248 HALL HILL ROAD
SOMERS, CT 06071

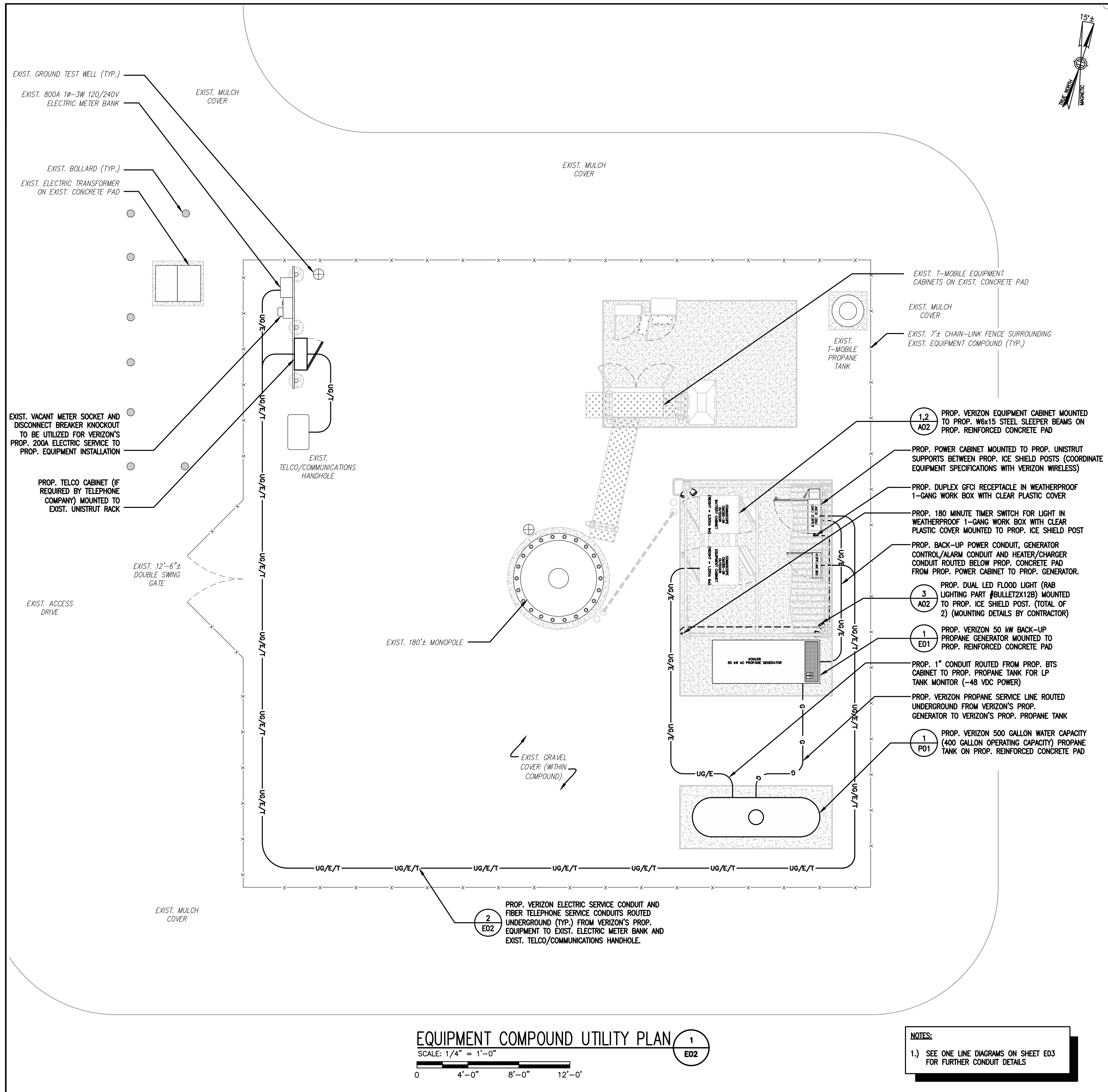
DRAWING TITLE:

**ELECTRICAL
SPECIFICATIONS AND
NOTES**

DRAWING NO.:

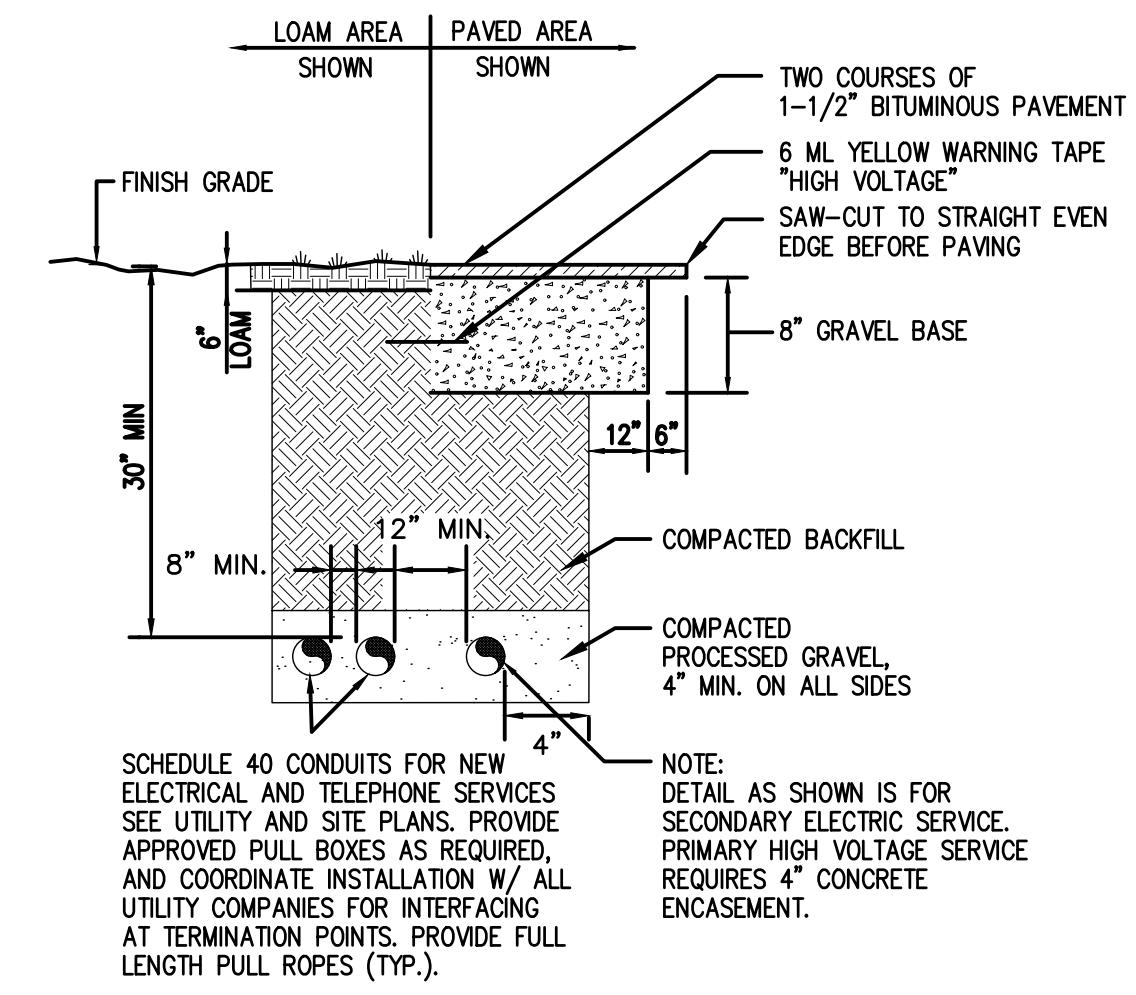
E01

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AS SHOWN	DRAWN BY: NWC	
	CHECKED BY: GRS	
CEA PROJECT NO.:	ORIGINAL ISSUE DATE:	683673
96210.402	9/22/21	

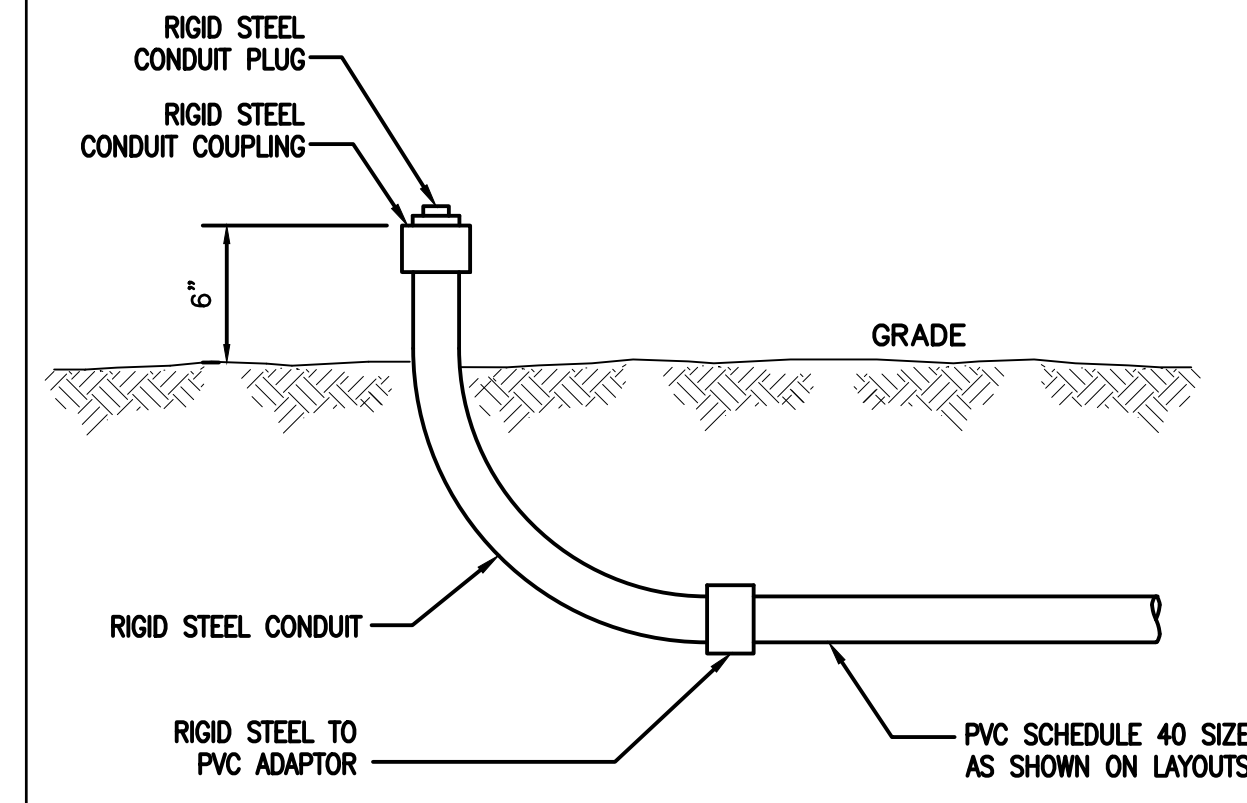


EQUIPMENT COMPOUND UTILITY PLAN 1
 SCALE: 1/4" = 1'-0" E02

NOTES:
 1.) SEE ONE LINE DIAGRAMS ON SHEET E03 FOR FURTHER CONDUIT DETAILS.



TYPICAL BURIED CONDUIT DETAIL 2
 SCALE: NONE E02



TYPICAL CONDUIT STUB-UP DETAIL 3
 SCALE: NONE E02

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 CLEMENT J. SALES
 No. 25876
 LICENSED PROFESSIONAL ENGINEER

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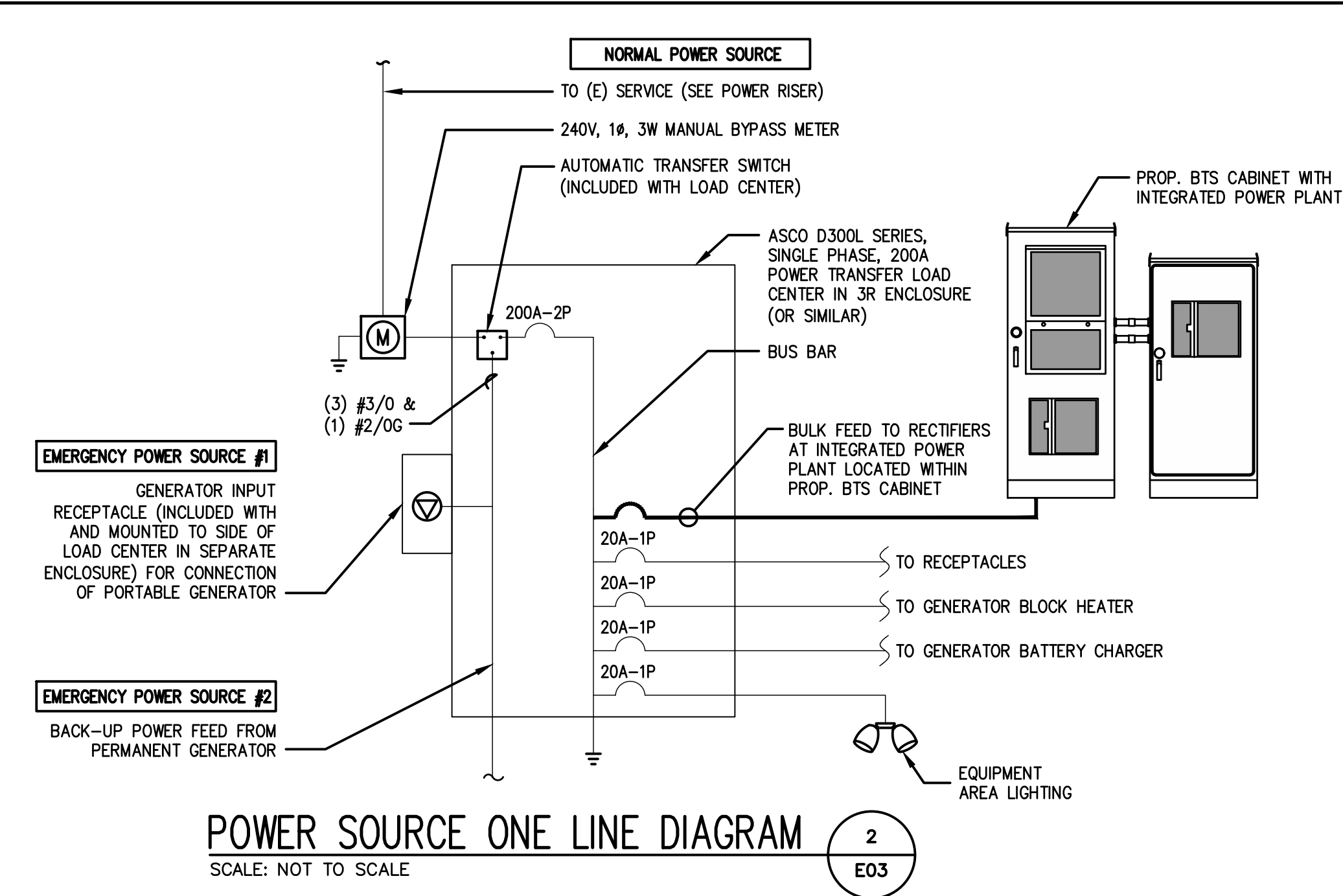
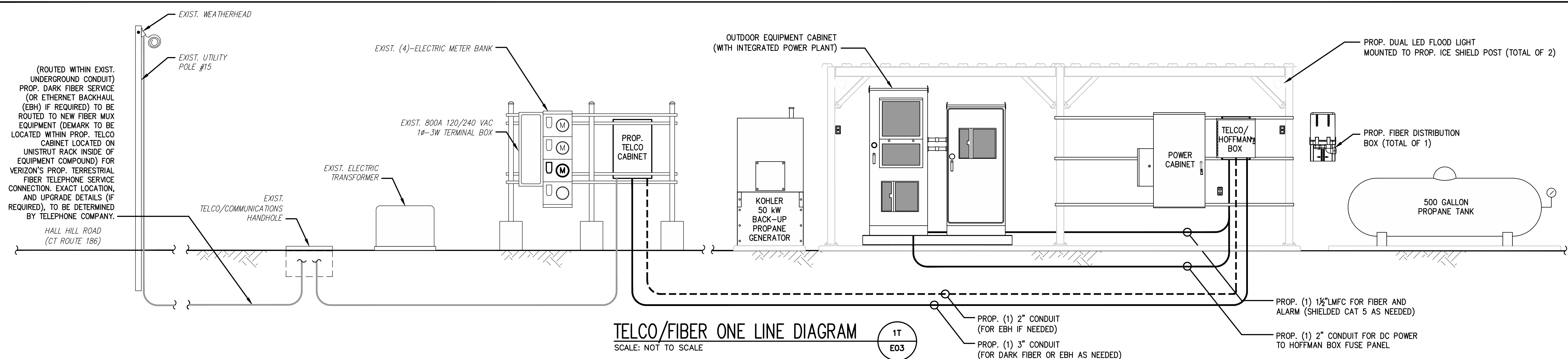
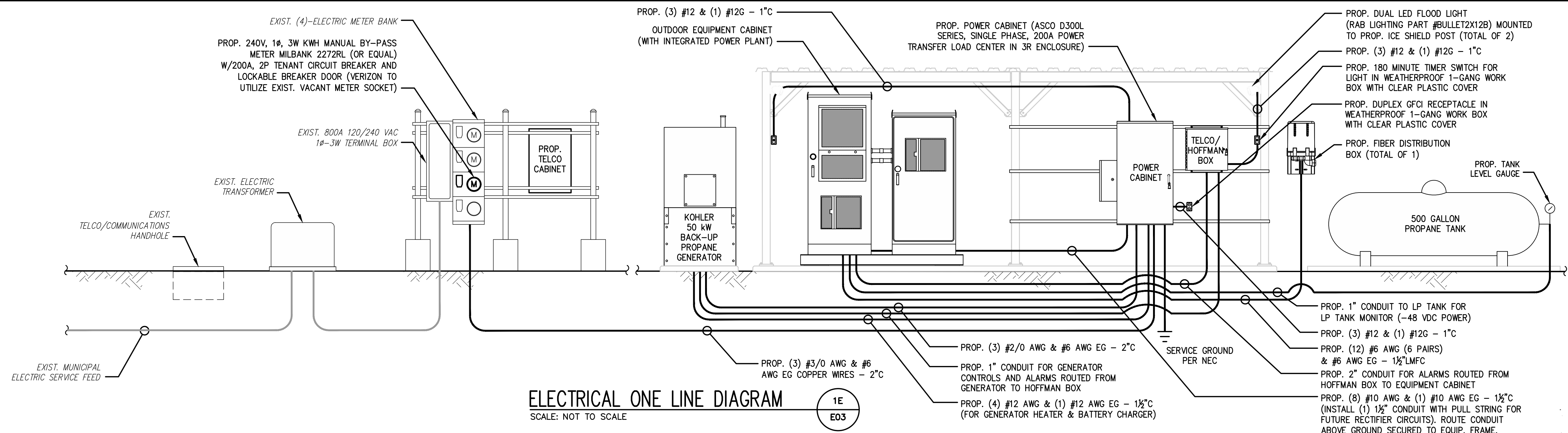
PROJECT NAME:
ENFIELD EAST CT

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DRAWING TITLE:
EQUIPMENT COMPOUND UTILITY PLAN & DETAILS

DRAWING NO.:
E02

SCALE: AS SHOWN	DESIGNED BY: GRS DRAWN BY: NWC CHECKED BY: GRS	VZW LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	



ASCO D300L SERIES, SINGLE PHASE, 200A POWER TRANSFER LOAD CENTER IN 3R ENCLOSURE

ELECTRICAL PANEL SCHEDULE 65,000 A.I.C. NEMA 3R

CKT #	DESCRIPTION	AMP	AMP	DESCRIPTION	CKT #
1	RECTIFIER #1	30	30	FUTURE RECTIFIER	2
3					4
5	RECTIFIER #2	30	30	FUTURE RECTIFIER	6
7					8
9	RECTIFIER #3	30	20	PAD LIGHTING	10
11				BLANK	12
13				BLANK	14
15	RECTIFIER #4	30		BLANK	16
17	GFCI RECEPTACLE/LIGHT	20		BLANK	18
19	GENERATOR BLOCK HEATER	20		BLANK	20
21	GENERATOR BATTERY CHARGER	20		BLANK	22
23	BLANK			BLANK	24
25	BLANK			BLANK	26
27	BLANK			BLANK	28
29	BLANK			BLANK	30

- ONE-LINE DIAGRAM NOTES:**
- 1) PROVIDE WEATHER TIGHT SEAL CONNECTORS ON ALL CONNECTIONS INSIDE AND OUT.
 - 2) COORDINATE ANY FURTHER MISCELLANEOUS WIRING AND CONDUIT REQUIREMENTS WITH VERIZON WIRELESS AND ELECTRIC COMPANY.
 - 3) ALL CONDUIT ROUTING SHOWN ON THESE DIAGRAMS IS SCHEMATIC IN NATURE AND INTENDED TO CONVEY GENERAL INTENT ONLY.
 - 4) ALL PROPOSED UTILITY DESIGN ELEMENTS SHOWN ARE SUBJECT TO CHANGE BASED ON FINAL DESIGN TO BE PROVIDED BY UTILITY PROVIDERS AND VERIZON WIRELESS. CONTRACTOR SHALL OBTAIN A COPY OF THE FINAL UTILITY DESIGN BY UTILITY COMPANY PRIOR TO COMMENCEMENT OF WORK.

UTILITY CONTACTS

ELECTRICAL: EVERSOURCE ENERGY
247 STATION DRIVE, SE 210
WESTWOOD, MA 02090
(781) 441-3610

TELEPHONE: VERIZON
185 FRANKLIN STREET
BOSTON, MA 02107
(800) 941-9900

MAKE ALL CONNECTIONS AS PER UTILITY COMPANY'S REQUIREMENTS.

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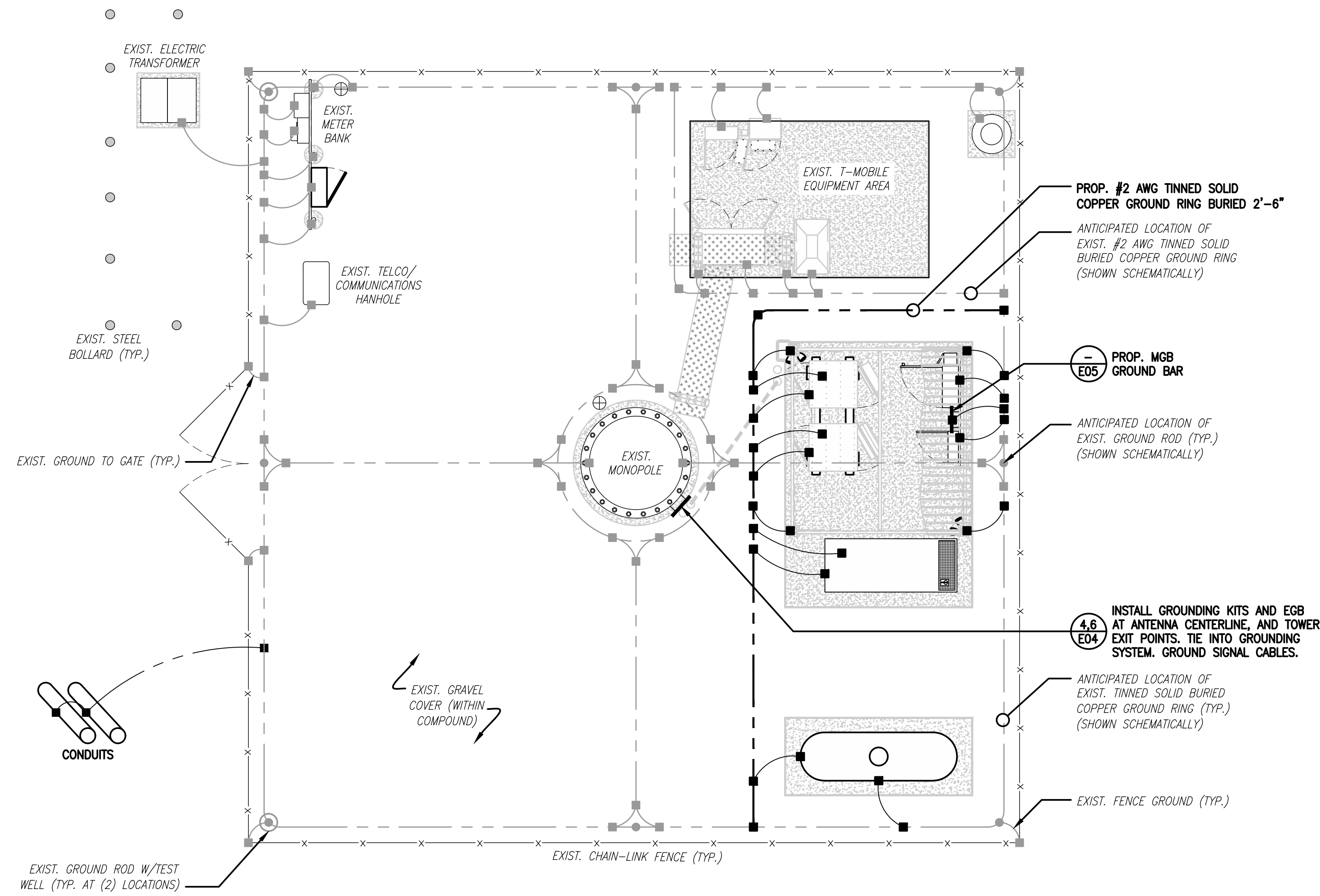
PROJECT NAME:
ENFIELD EAST CT

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SOMERS, CT 06071

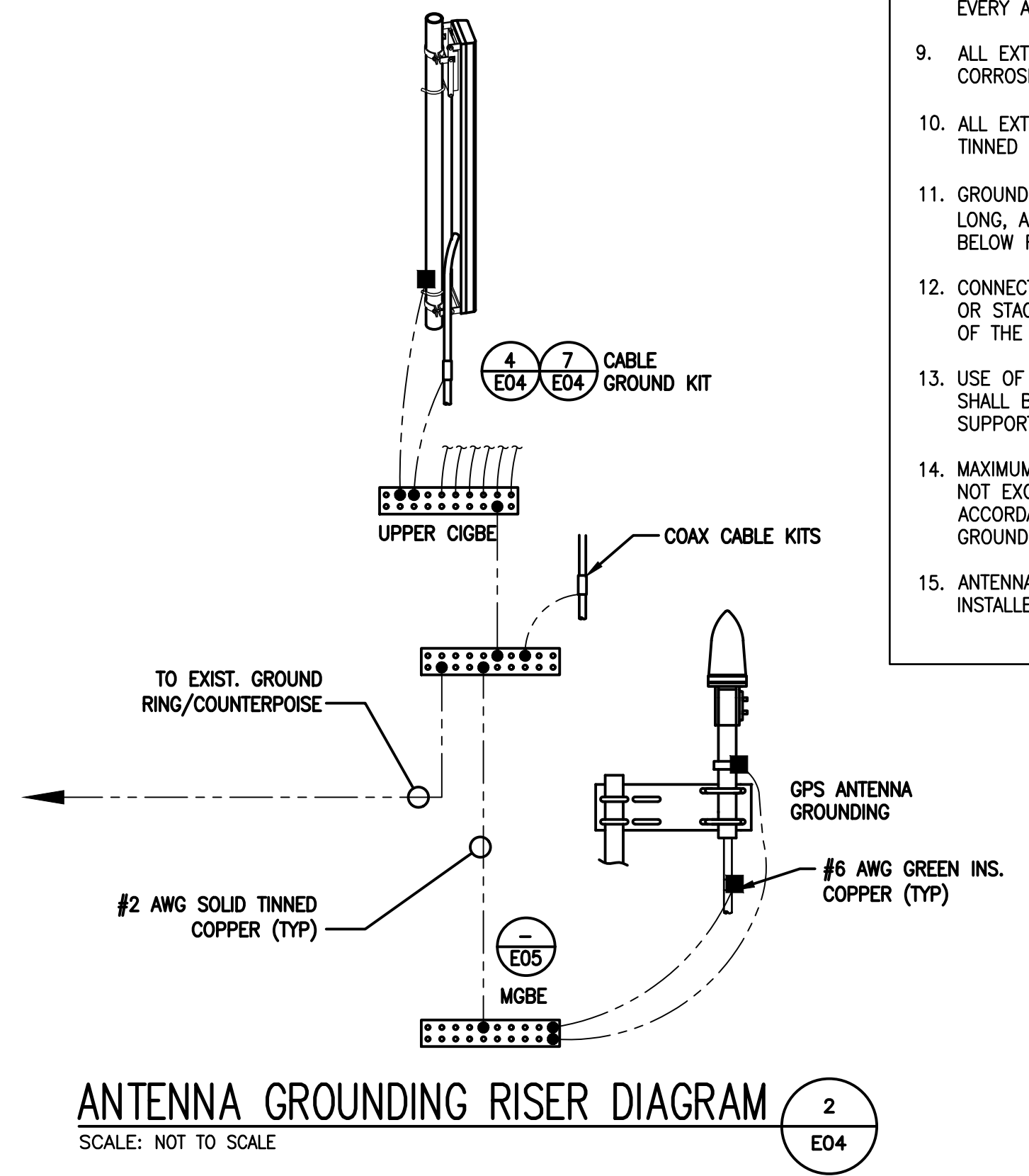
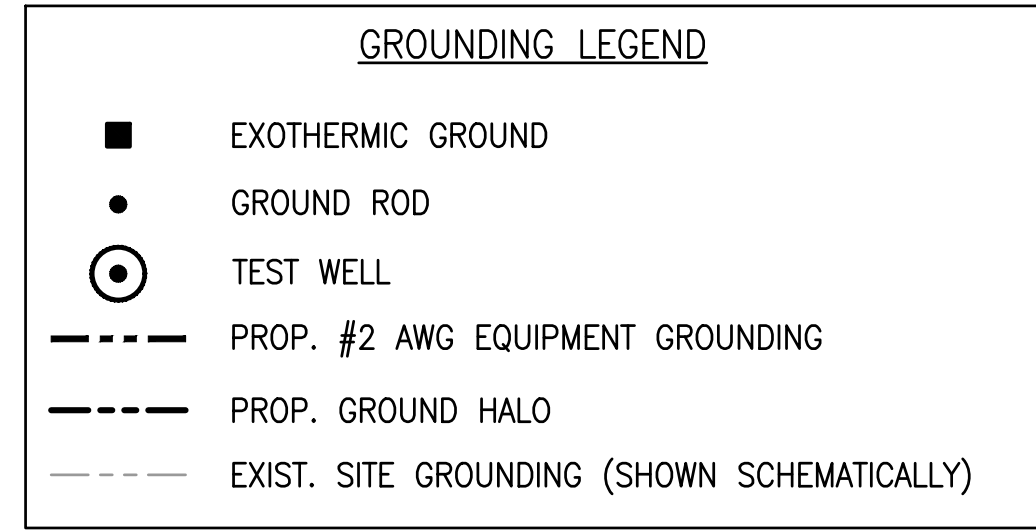
DRAWING TITLE:
ELECTRICAL DIAGRAMS & DETAILS

DRAWING NO.:
E03

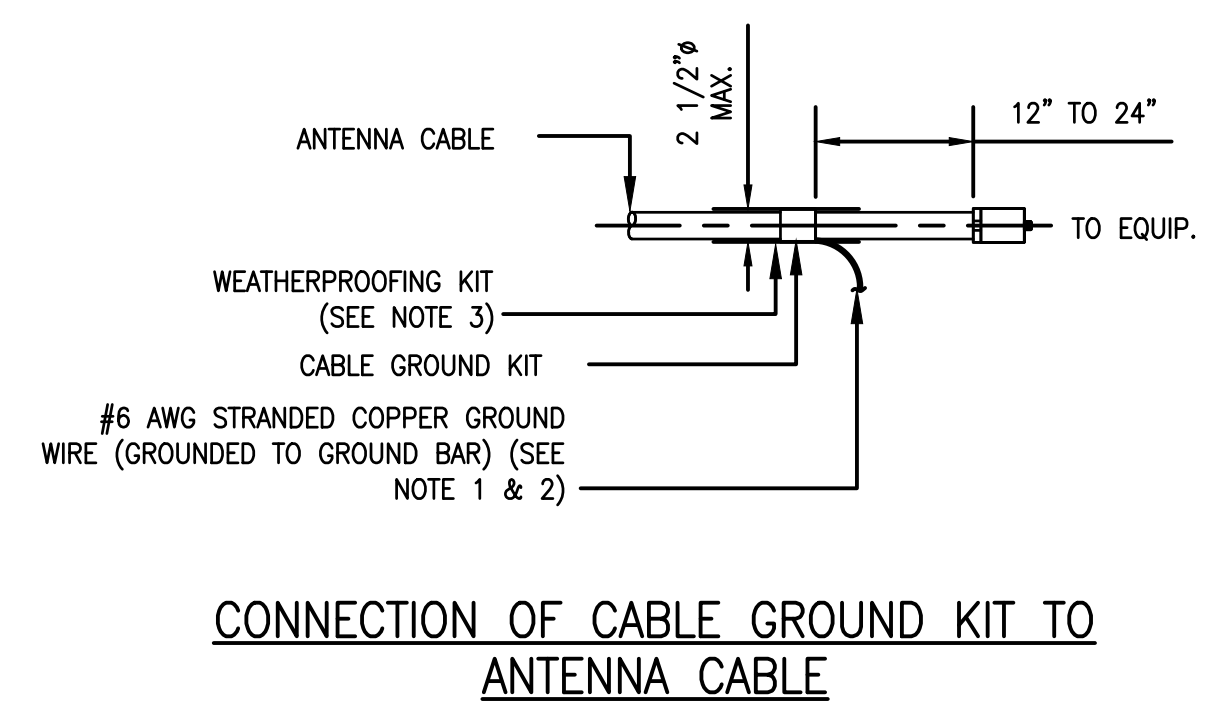
SCALE: AS SHOWN	DESIGNED BY: GRS	VZW LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	DRAWN BY: NWC	
	CHECKED BY: GRS	
	ORIGINAL ISSUE DATE: 9/22/21	



SCHEMATIC GROUNDING PLAN 1 E04
SCALE: 3/16" = 1'-0"
0 5'-4" 10'-8" 16'-0"
NORTH

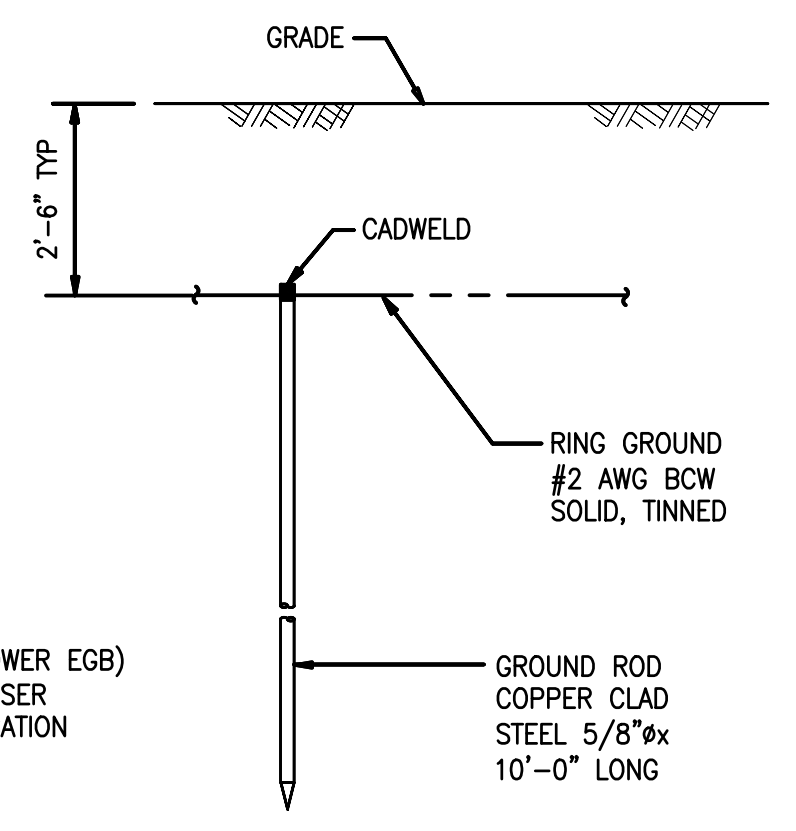
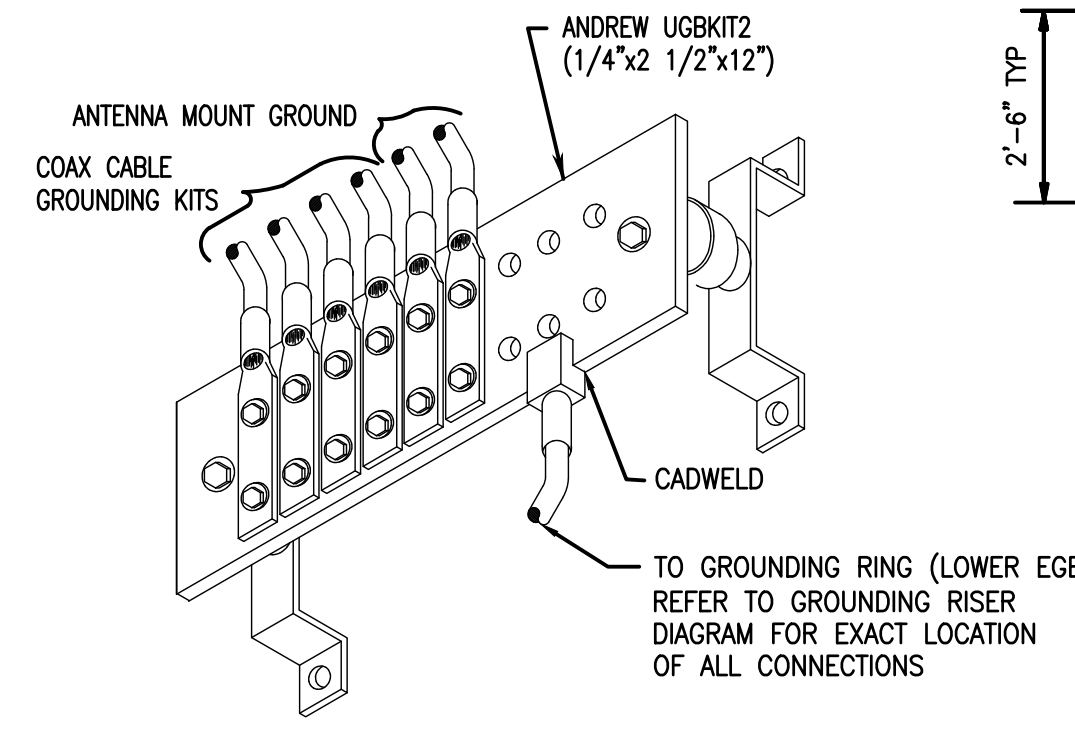


- ELECTRICAL AND GROUNDING NOTES:**
- ELECTRICAL**
- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND ALL APPLICABLE LOCAL CODES.
 - CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
 - SERVICE TO EQUIP. SHALL BE 120/240 VAC, 200 AMP, 1Ø, 60 Hz.
 - THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
- GROUNDING**
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC (CADWELD) CONNECTIONS.
 - ALL GROUND CONNECTIONS BELOW GRADE SHALL BE EXOTHERMIC (CADWELD).
 - ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR & EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
 - ALL EXOTHERMIC CONNECTIONS TO THE GROUND RODS SHALL START AT THE TOP & HAVE A VERTICAL SEPARATION OF 6" FOR EVERY ADDITIONAL CONNECTION.
 - ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
 - ALL EXTERIOR GROUND CONDUCTORS SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
 - GROUND RODS SHALL BE COPPER CLAD STEEL, 5/8"Ø 10-FT. LONG, AND SHALL BE DRIVEN VERTICALLY WITH THEIR TOPS 48" BELOW FINAL GRADE.
 - CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
 - USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
 - MAXIMUM RESISTANCE OF THE COMPLETED GROUND SYSTEM SHALL NOT EXCEED 5 OHMS. TESTING SHALL BE PERFORMED IN ACCORDANCE WITH PROJECT SPECIFICATION FOR FACILITY GROUNDING, USING FALL OF POTENTIAL METHOD.
 - ANTENNA GROUND KITS SHALL BE FURNISHED BY VERIZON AND INSTALLED BY CONTRACTOR.

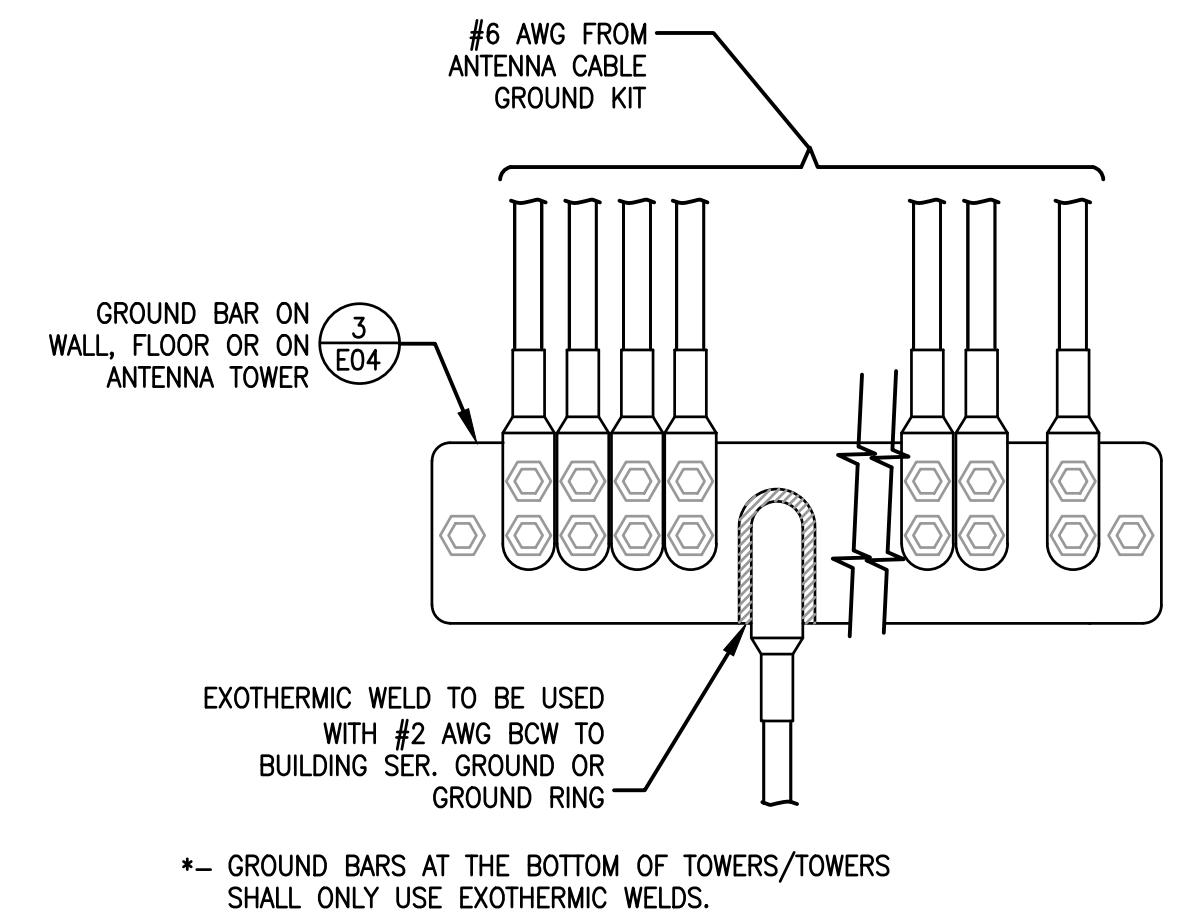


- NOTES:**
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
 - GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
 - WEATHER PROOFING SHALL BE TWO-PART TAPE SUPPLIED WITH KIT. COLD SHRINK SHALL NOT BE USED.

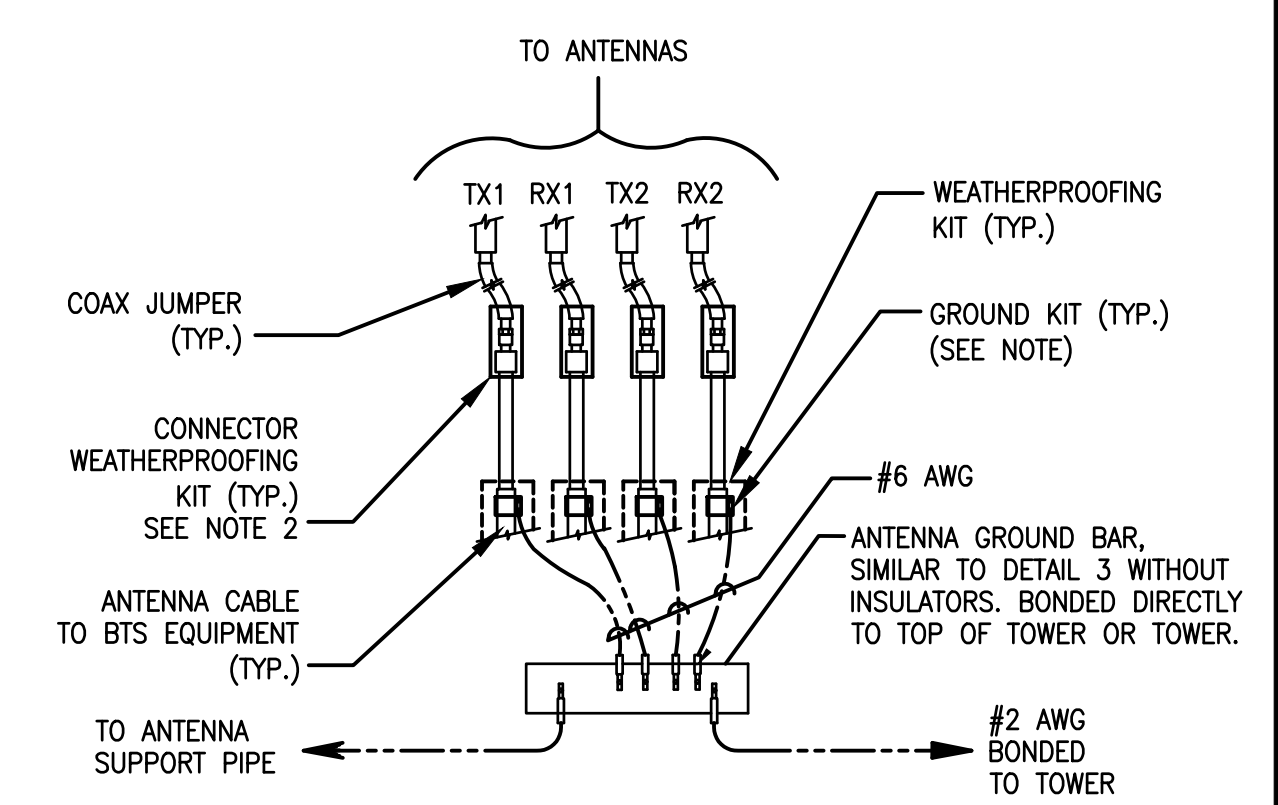
DETAIL 3 E04
SCALE: NOT TO SCALE



GROUND ROD 5 E04
SCALE: NOT TO SCALE



INSTALLATION OF GROUND WIRE TO GROUND BAR 6 E04
SCALE: NOT TO SCALE



CONNECTION OF GROUND WIRE TO GROUNDING BAR, TOWER 7 E04
SCALE: NOT TO SCALE

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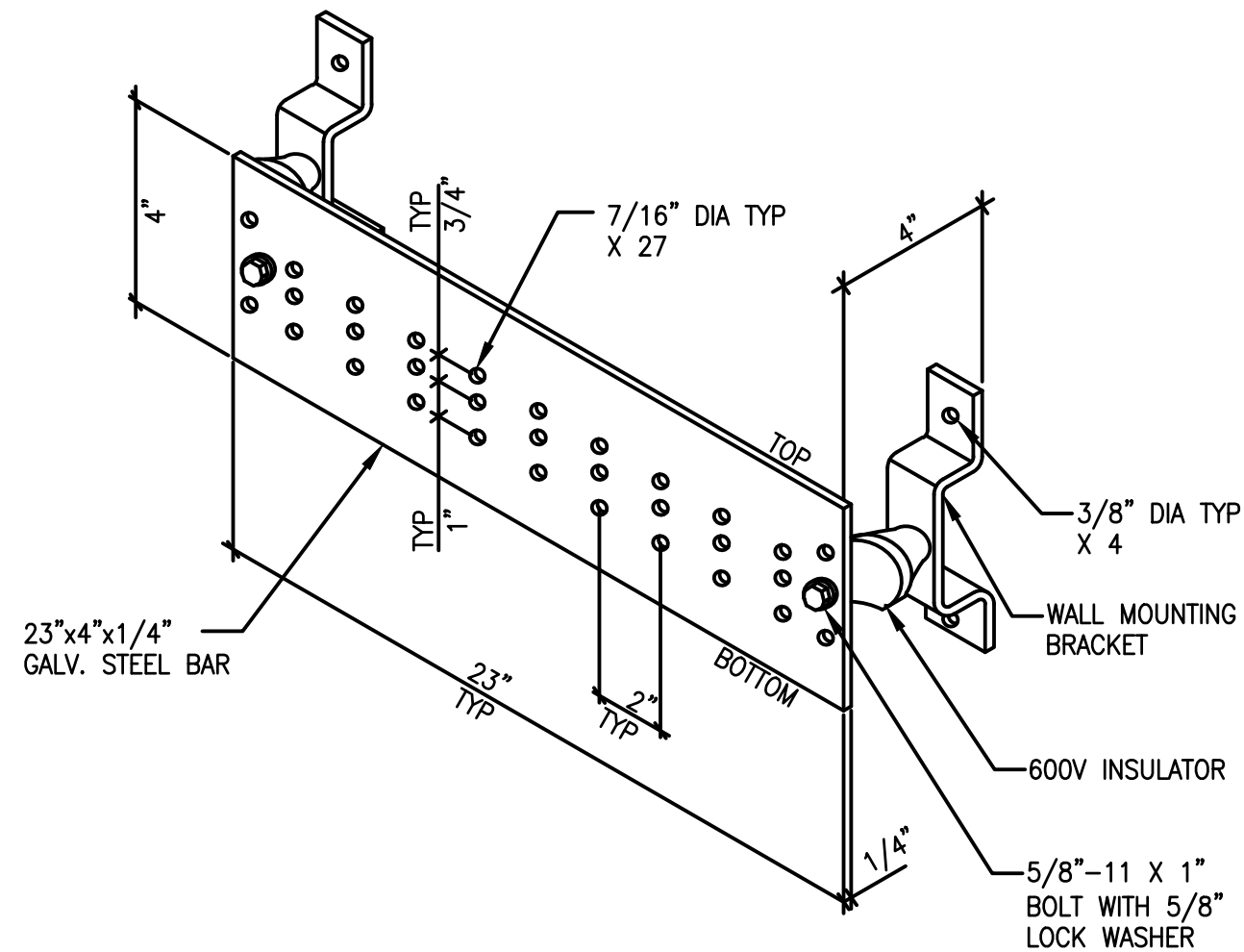
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PROJECT NAME:
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DRAWING TITLE:
SCHEMATIC GROUNDING PLAN & DETAILS

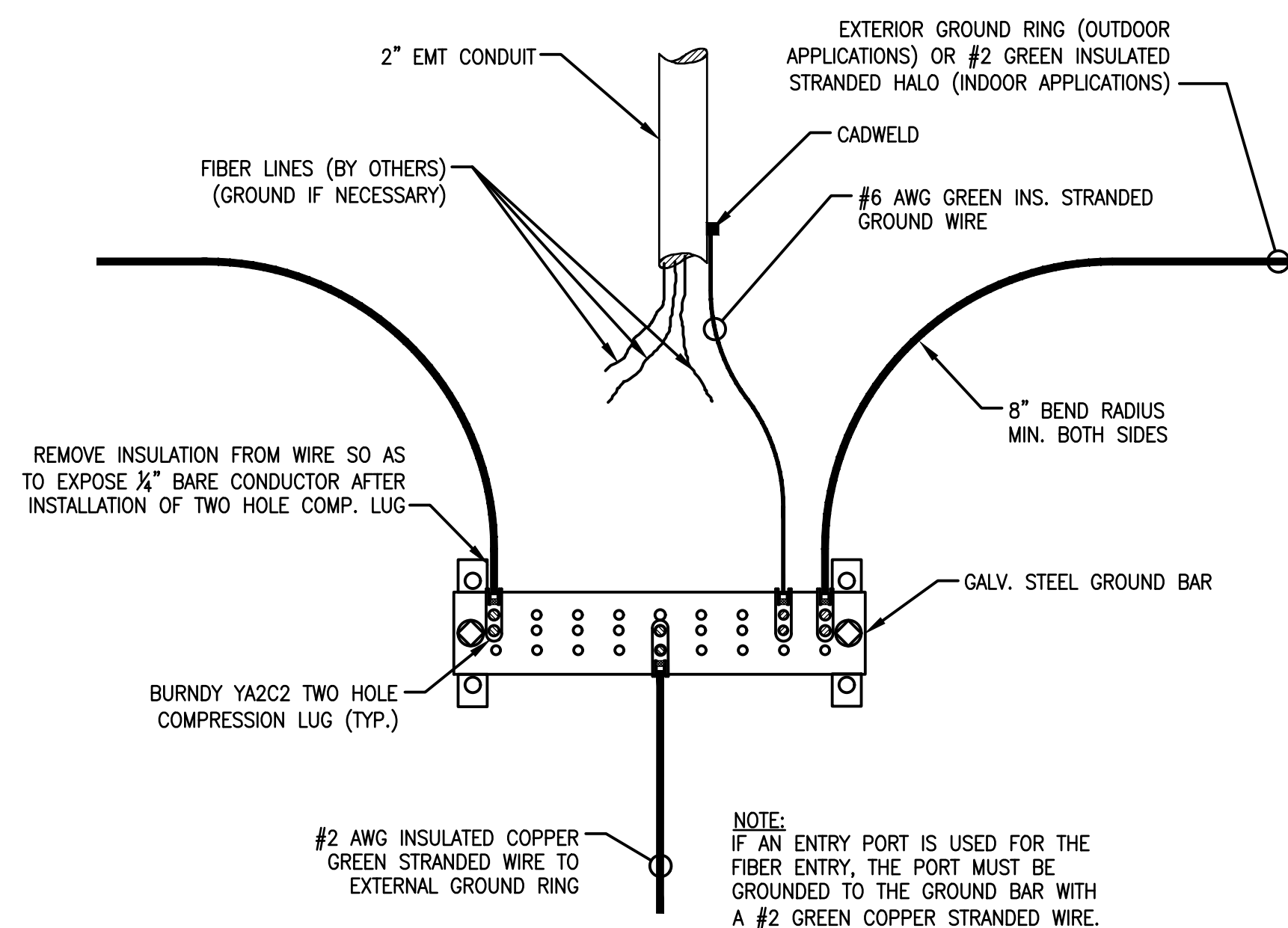
DRAWING NO.:
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SCALE: AS SHOWN	DESIGNED BY: GRS DRAWN BY: NWC CHECKED BY: GRS	VZW LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	

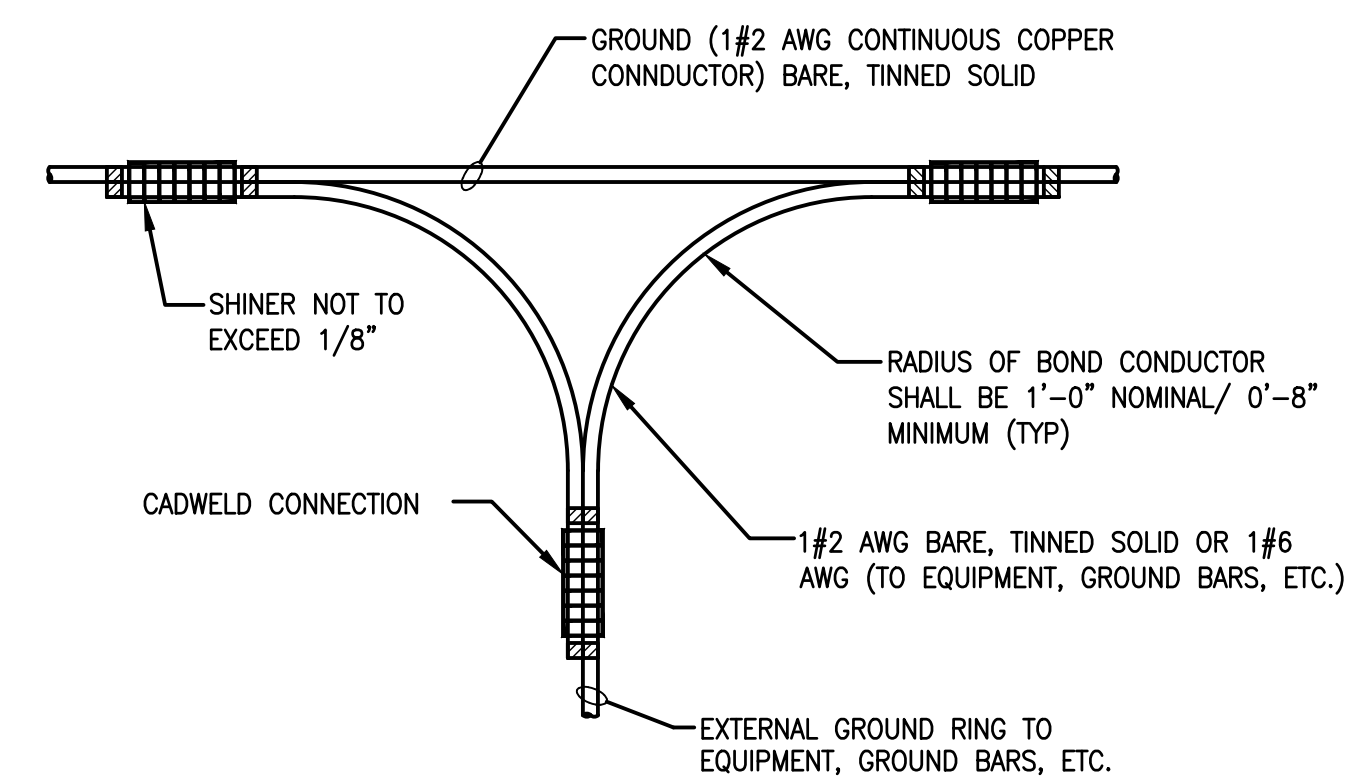


- SURFACE PREPARATION:** ALL CONNECTIONS MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE MADE BARE TO ENSURE PROPER CONTACT. NO WASHERS SHALL BE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS SHALL HAVE AN ANTI-OXIDANT AGENT APPLIED PRIOR TO INSTALLATION.
- BUSS PREPARATION:** ALL GALV. STEEL BUSSES SHALL BE CLEANED, POLISHED AND AN ANTI-OXIDANT APPLIED. NO FINGERPRINTS OR DISCOLORED STEEL WILL BE PERMITTED.
- TERMINATIONS:** ALL EQUIPMENT TERMINATIONS SHALL BE MADE WITH A BURNDY TWO HOLE COMPRESSION LUG WITH 10-24x3/4\"/>

TYP. INTERIOR & EXTERIOR GROUND BAR
SCALE: N.T.S.

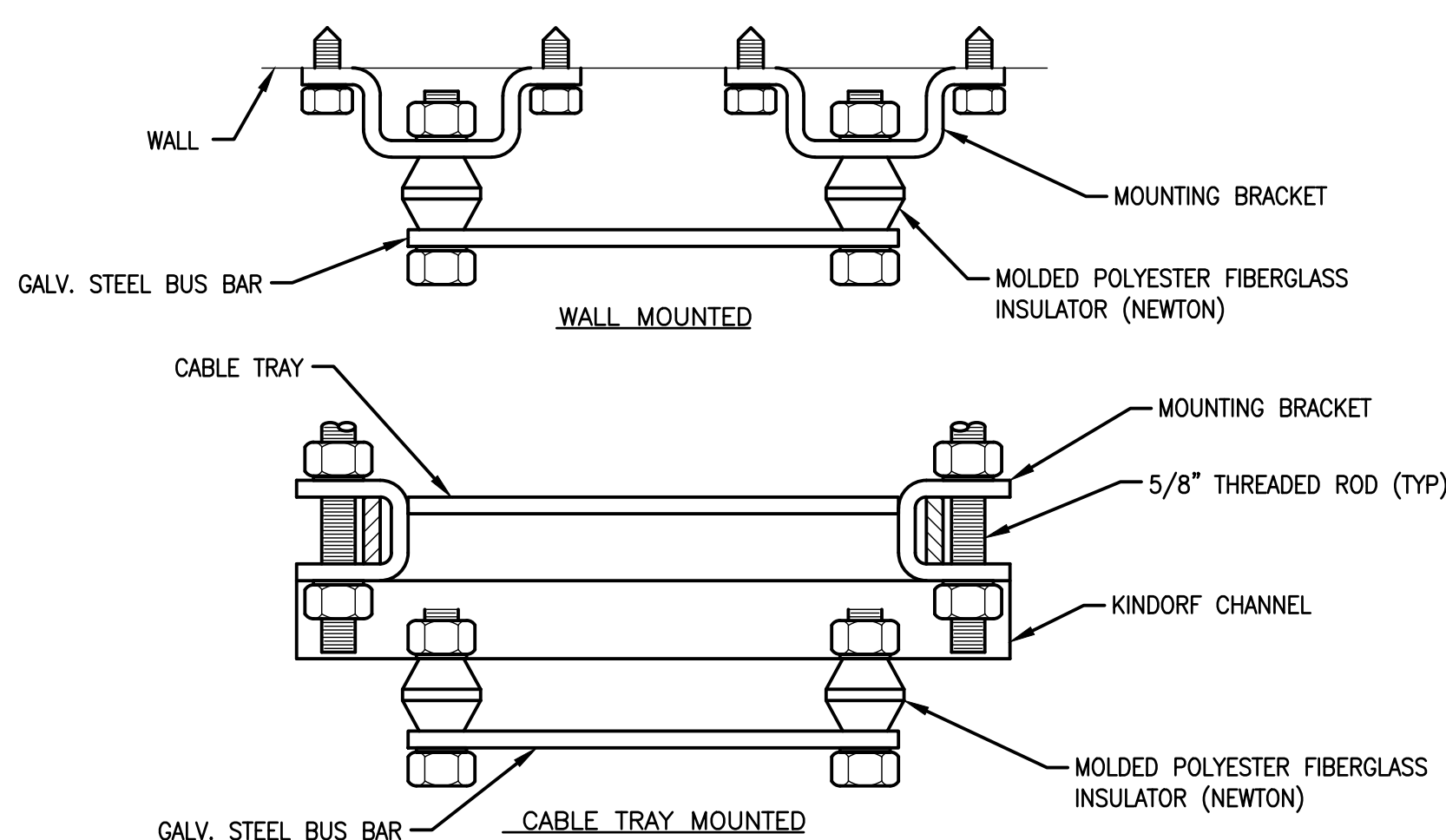


INTERIOR GROUNDING AT TELCO ENTRY
SCALE: N.T.S.

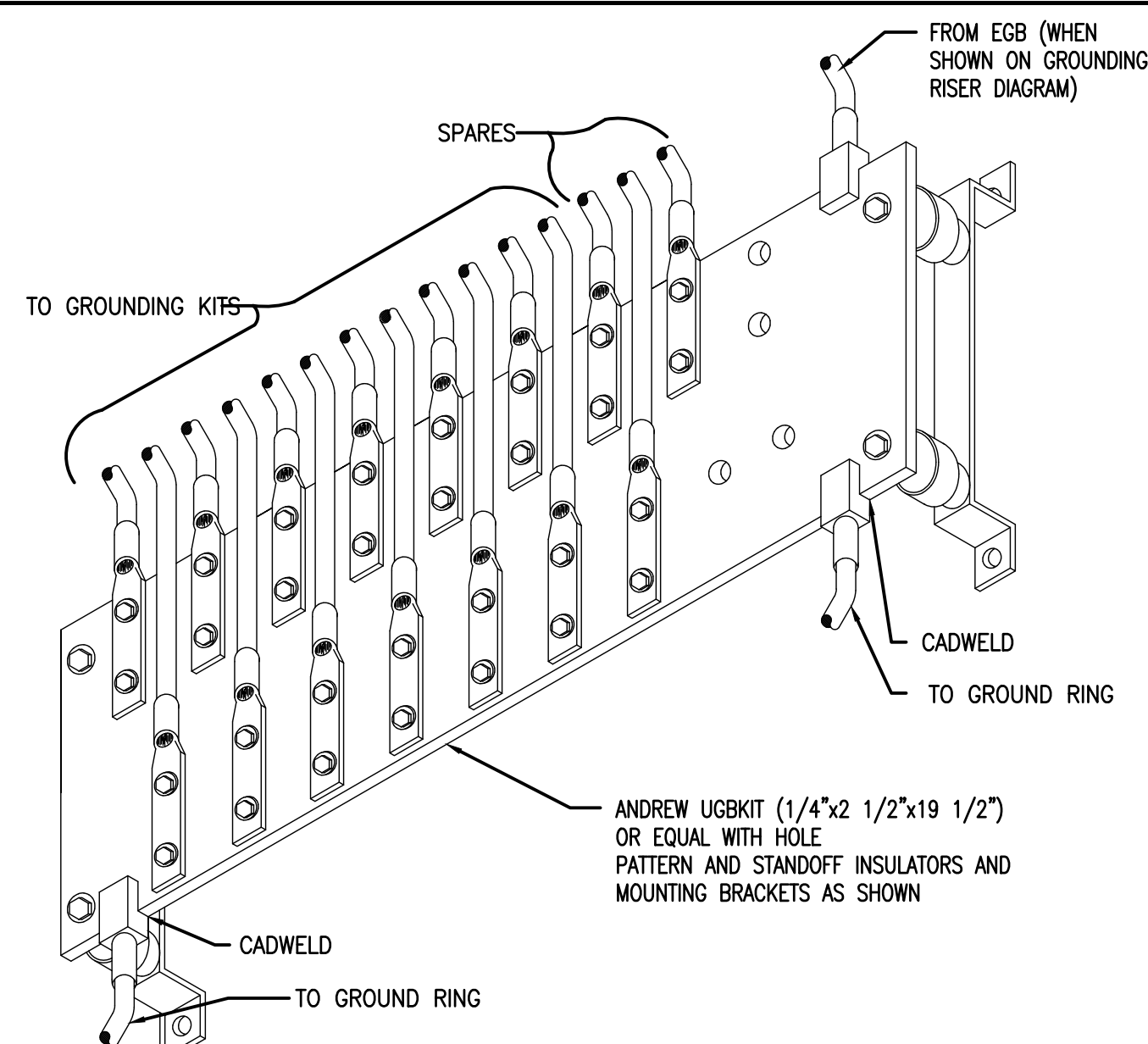


NOTE: ALL CONNECTION TO GROUND SHALL BE NON-DIRECTIONAL.

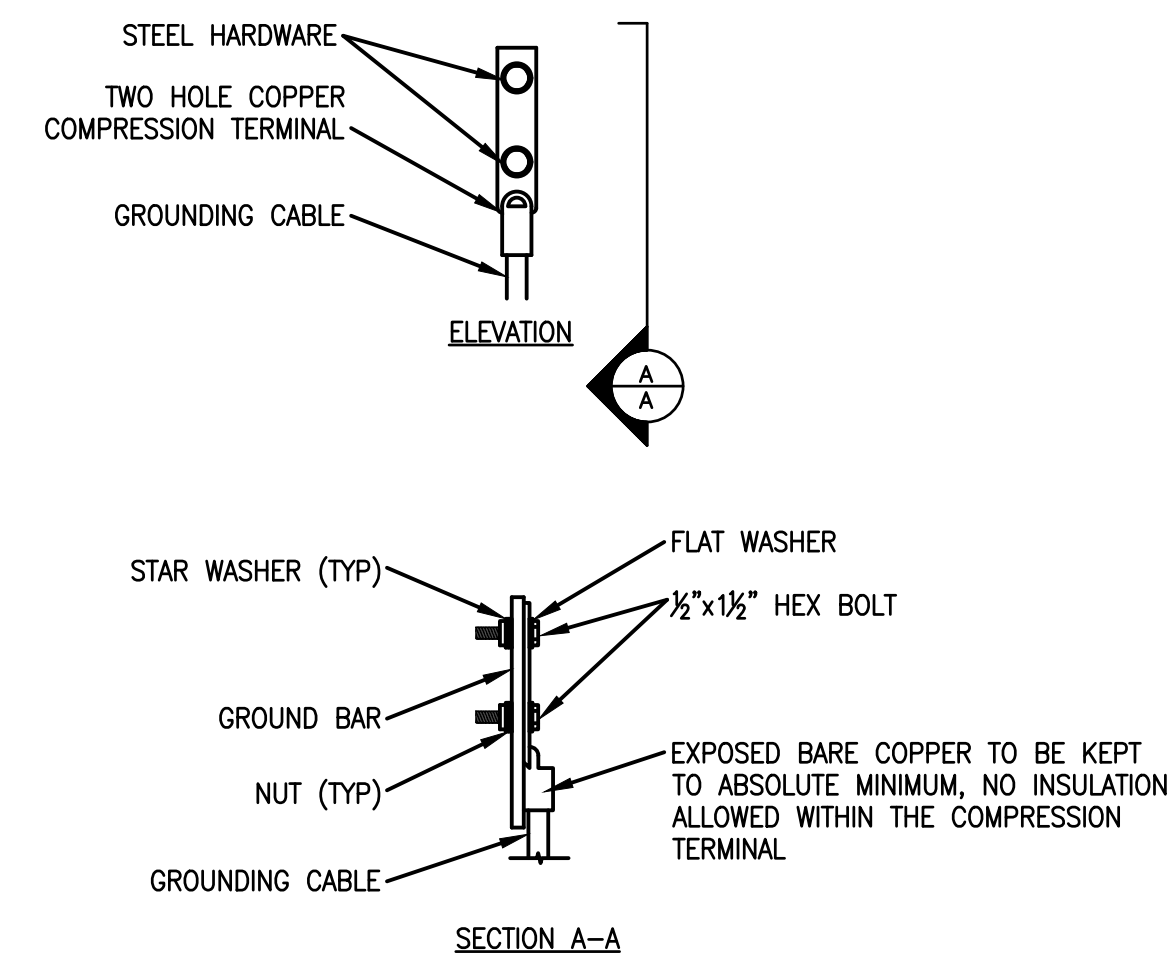
NON-DIRECTIONAL SPLICE
SCALE: N.T.S.



BUS BAR MOUNTING
SCALE: N.T.S.

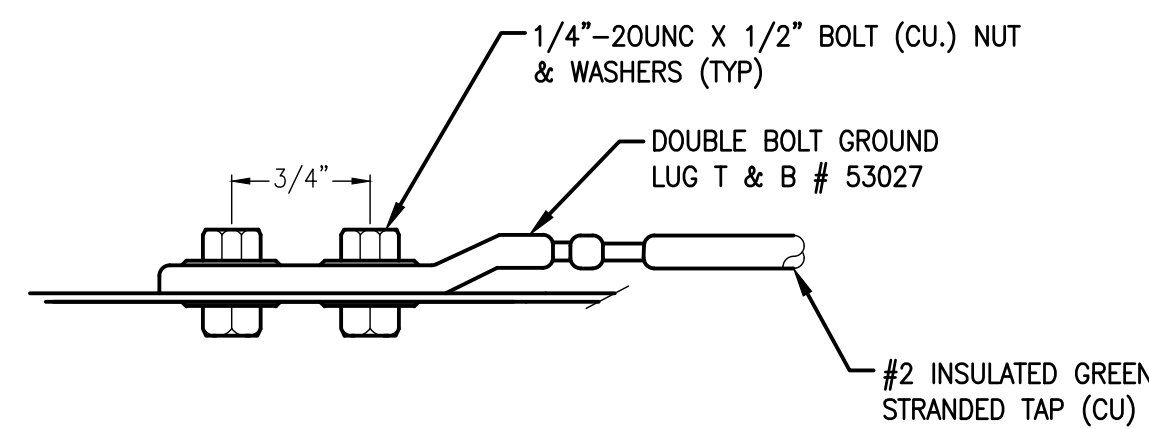


MASTER GROUND BAR (MGB)
SCALE: NOT TO SCALE

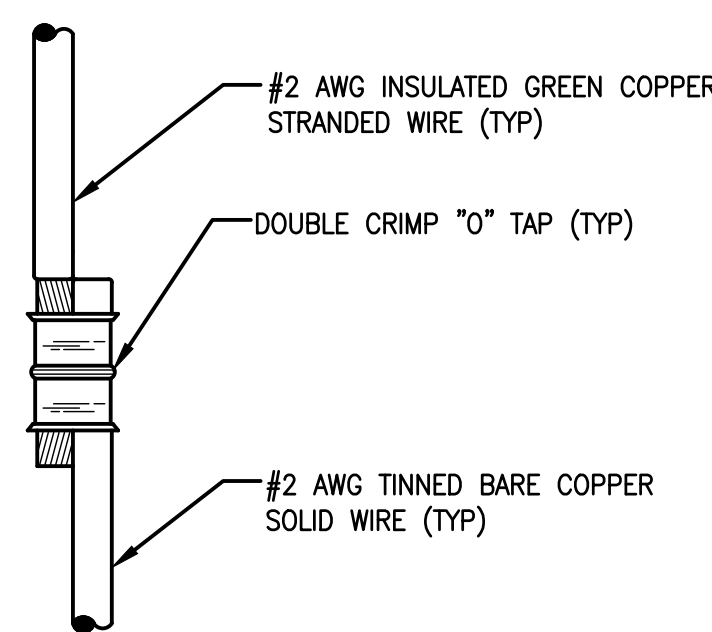


- NOTE:
- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 - OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

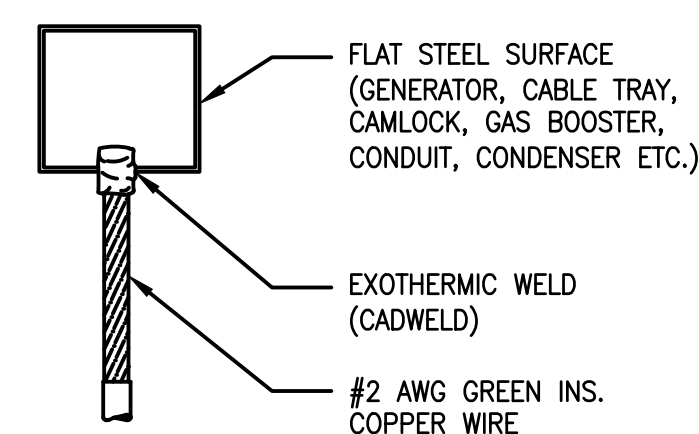
TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



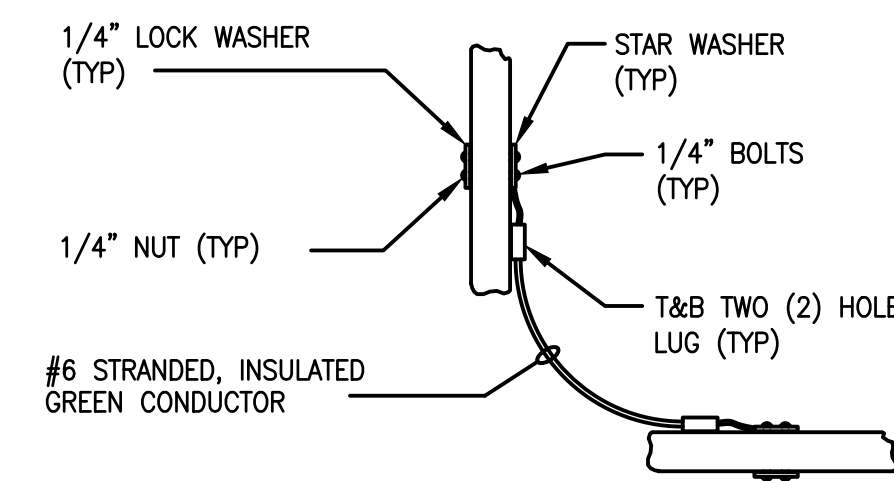
TYPICAL EQUIPMENT GROUND CONNECTION
SCALE: N.T.S.



TYPICAL GROUND CONNECTION SPLICE DETAIL
SCALE: N.T.S.



TYP. CADWELD #2 GREEN TO FLAT STEEL SURFACE
SCALE: NOT TO SCALE



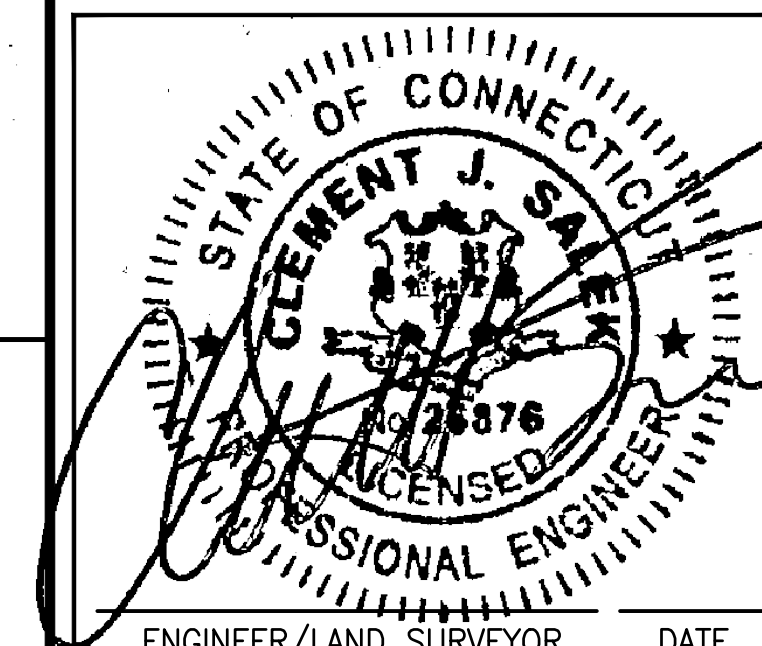
CABLE TRAY GROUNDING
SCALE: N.T.S.

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SOMERS, CT 06071

DRAWING TITLE:

GROUNDING DETAILS

DRAWING NO:

E05

SCALE: AS SHOWN	DESIGNED BY: GRS DRAWN BY: NWC CHECKED BY: GRS	VZW LOCATION CODE: 683673
CEA PROJECT NO.: 96210.402	ORIGINAL ISSUE DATE: 9/22/21	

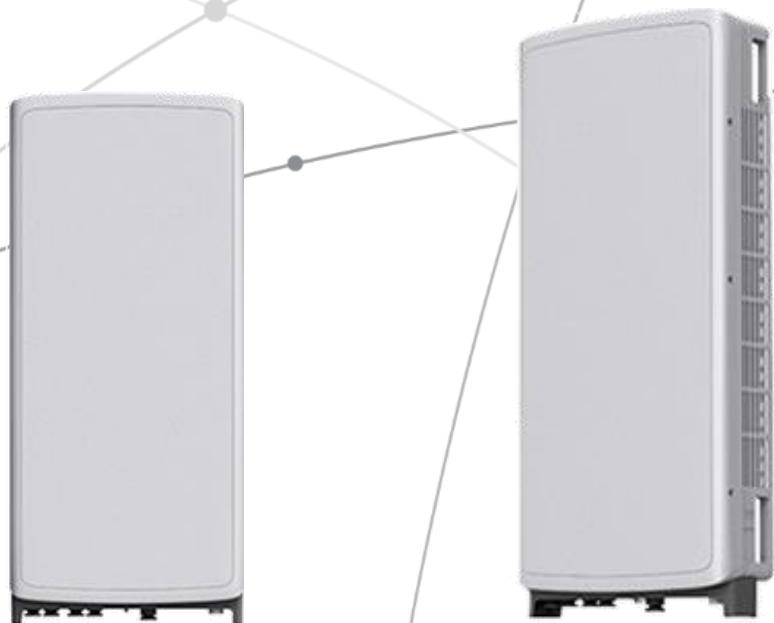
ATTACHMENT 4

SAMSUNG C-Band 64T64R Massive MIMO Radio

for High Capacity and Wide Coverage

Samsung C-Band 64T64R Massive MIMO Radio enables mobile operators to increase coverage range, boost data speeds and ultimately offer enriched 5G experiences to users in the U.S..

Model Code : MT6407-77A



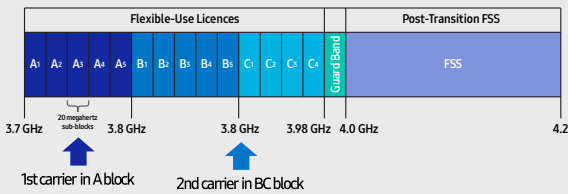
Points of Differentiation

Wide Bandwidth

With capability to support up to 2 CC carrier configuration, Samsung C-Band massive MIMO Radio supports 200 MHz bandwidth in the C-Band spectrum.

Samsung C-Band massive MIMO Radio covers the entire C-Band 280 MHz spectrum, so it can meet the operator's needs in current A block and future B/C blocks

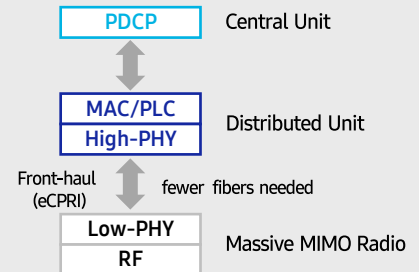
C-Band spectrum supported by Massive MIMO Radio



Future Proof Product

Samsung C-Band 64T64R Massive MIMO radio supports not only CPRI but also eCPRI as front-haul interface.

It enables operators can cut down on OPEX/CAPEX by reducing front-haul bandwidth through low layer split and using ethernet based higher efficient line.

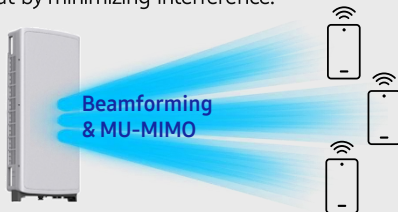


Enhanced Performance

C-Band massive MIMO Radio creates sharp beams and extends networks' coverage on the critical mid-band spectrum using a large number of antenna elements and high output power to boost data speeds.

This helps operators reduce their CAPEX as they now need less products to cover the same area than before.

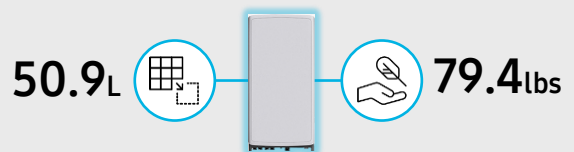
Furthermore, as C-Band massive MIMO Radio supports MU-MIMO (Multi-user MIMO), it enables to increase user throughput by minimizing interference.



Well Matched Design

Samsung C-Band Massive MIMO radio utilizes 64 antennas, supports up to 280MHz bandwidth, and delivers a 200W output power. despite the above advanced performance, the Radio has a compact size of 50.9L and 79.4lbs. This makes it easy to install the Radio.

It is designed to look solid and compact, with a low profile appearance so that, when installed, harmonizes well with the surrounding environment.



Technical Specifications

Item	Specification
Tech	NR
Band	n77
Frequency Band	3700 - 3980 MHz
EIRP	78.5dBm (53.0 dBm+25.5 dBi)
IBW/OBW	280 MHz / 200 MHz
Installation	Pole/Wall
Size/ Weight	16.06 x 35.06 x 5.51 inch (50.86L)/ 79.4 lbs



SAMSUNG



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Samsung inspires the world and shapes the future with transformative ideas and technologies. The company is redefining the worlds of TVs, smartphones, wearable devices, tablets, digital appliances, network systems, and memory, system LSI, foundry and LED solutions.

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SAMSUNG

Dual-Band Radio Unit 700/850MHz (B13/B5) RFV01U-D2A

Samsung's RFV01U-D2A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.



The RFV01U-D2A RU targets dual-band support across Band 13 (700MHz) and Band 5 (850MHz), making it an ideal product for broad coverage footprints across multiple common low-end, long-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B13: DL(746-756MHz)/UL(777-787MHz)
B5: DL(869-894MHz)/UL(824-849MHz)
Instantaneous Bandwidth: 10MHz(B13) + 25MHz(B5)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 207mm (29.9L)
Weight: 31.9kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

SAMSUNG

Dual-Band Radio Unit AWS/PCS (B66/B2)

RFV01U-D1A

Samsung's RFV01U-D1A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.



The RFV01U-D1A RU targets dual-band support across Band 66 (AWS) and Band 2 (PCS), making it an ideal product for broad coverage footprints across multiple common mid-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation
- Built-in Broadcast Auxiliary Services (BAS) filter ensures compliant AWS operation without impacting footprint

Key Technical Specifications

Duplex Type: FDD

Operating Frequencies:

B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)

B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)

Instantaneous Bandwidth:

70MHz(B66) + 60MHz(B2)

RF Chain: 4T4R/2T4R/2T2R

Output Power: Total 320W

DU-RU Interface: CPRI (10Gbps)

Dimensions: 380 x 380 x 255mm (36.8L)

Weight: 38.3kg

Input Power: -48V DC

Operating Temp.: -40 - 55°(w/o solar load)

Cooling: Natural convection

Specifications

The table below outlines the main specifications of the RRH.

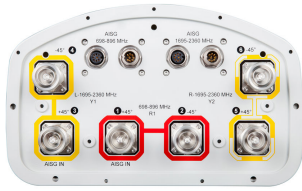
Table 1. Specifications

Item	RT4401-48A
Air Technology	LTE
Band	Band 48 (3.5 GHz)
Operating Frequency (MHz)	3550 to 3700
RF Chain	4TX/4RX
Input Power	-48 V DC (-38 to -57 V DC, 1 SKU), with clip-on AC-DC converter (Option)
Dimension (W × D × H) (mm)	8.55 in. (217.4) × 4.15 in. (105.5) × 13.91 in. (353.5) * RRH only 11.39 in. (289.4) × 5.45 in. (138.5) × 16.16 in. (410.5) * with Clip-on antenna, AC-DC power unit
Cooling	Natural convection
Unwanted Emission	3GPP 36.104 Category A [B48]: FCC 47 CFR 96.41 e)
Spectrum Analyzer	TX/RX Support
Antenna Type	Integrated (Clip-on) antenna (Option), External antenna (Option)
Operating Humidity	5 to 100 [%] (RH), condensing, not to exceed 30 g/m ³ absolute humidity
Altitude	-60 to 1,800 m
Earthquake	Telcordia Earthquake Risk Zone4 (Telcordia GR-63-CORE)
Vibration in Use	Office Vibration
Transportation Vibration	Transportation Vibration
Noise	Fanless (natural convection cooling)
Wind Resistance	Telcordia GR-487-CORE, Section 3.34
EMC	FCC Title 47, CFR Part 96
Safety	UL 60950-1 2nd ED

Item	RT4401-48A
	UL 62368-1 UL 60950-22
RF	FCC Title 47, CFR Part 96

The table below outlines the AC/DC power unit specifications of the RRH system.

NHH-65B-R2B



6-port sector antenna, 2x 698–896 and 4x 1695–2360 MHz, 65° HPBW, 2x RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- Separate RS-485 RET input/output for low and high band
- One RET for low band and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Effective Projective Area (EPA), frontal	0.26 m ² 2.799 ft ²
Effective Projective Area (EPA), lateral	0.22 m ² 2.368 ft ²
Grounding Type	RF connector body grounded to reflector and mounting bracket
Performance Note	Outdoor usage Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN
Radome Material	Fiberglass, UV resistant
Radiator Material	Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, low band	2
RF Connector Quantity, total	6

Remote Electrical Tilt (RET) Information, General

RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	2 female 2 male

Dimensions

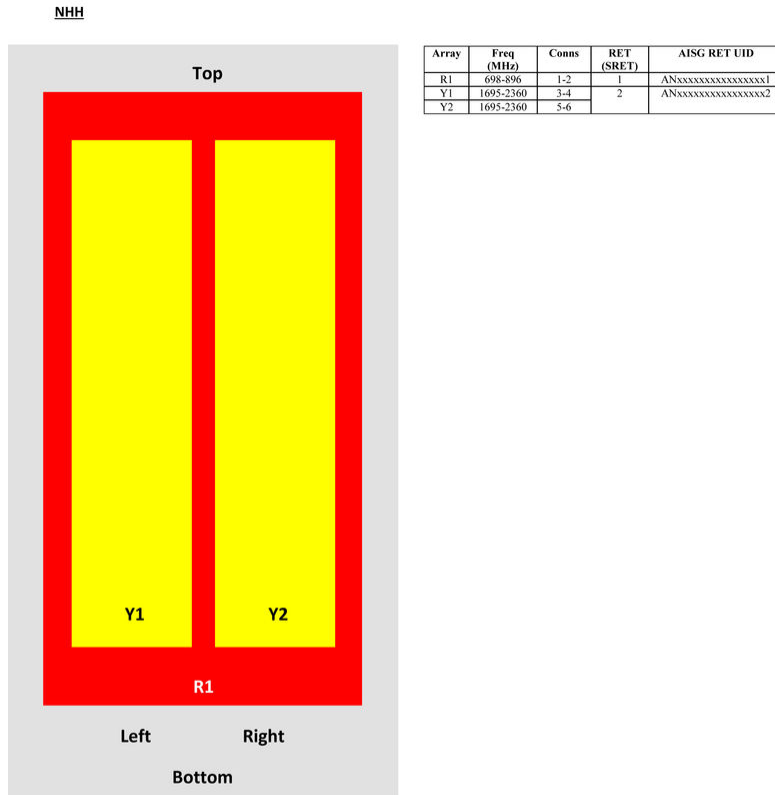
Width	301 mm 11.85 in
Length	1828 mm 71.969 in

NHH-65B-R2B

Depth

180 mm | 7.087 in

Array Layout



View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2360 MHz 698 – 896 MHz
Polarization	±45°
Total Input Power, maximum	900 W @ 50 °C

Remote Electrical Tilt (RET) Information, Electrical

Protocol	3GPP/AISG 2.0 (Single RET)
Power Consumption, idle state, maximum	2 W

NHH-65B-R2B

Power Consumption, normal conditions, maximum	13 W
Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 Port 3
Internal RET	High band (1) Low band (1)

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	15	17.7	17.9	18.4	18.7
Beamwidth, Horizontal, degrees	65	60	71	69	64	57
Beamwidth, Vertical, degrees	12.4	11.2	5.7	5.2	4.9	4.6
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	13	14	18	18	19	18
Front-to-Back Ratio at 180°, dB	30	29	31	30	29	31
Isolation, Cross Polarization, dB	25	25	25	25	25	25
Isolation, Inter-band, dB	30	30	30	30	30	30
VSWR Return loss, dB	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50° C, maximum, watts	300	300	300	300	300	300

Electrical Specifications, BASTA

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.5	17.3	17.7	18.1	18.5
Gain by all Beam Tilts Tolerance, dB	±0.6	±1.1	±0.4	±0.4	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0° 14.4 7° 14.6 14° 14.3	0° 14.7 7° 14.7 14° 14.1	0° 17.2 4° 17.3 7° 17.3	0° 17.6 4° 17.7 7° 17.7	0° 18.0 4° 18.2 7° 18.1	0° 18.3 4° 18.5 7° 18.6
Beamwidth, Horizontal Tolerance, degrees	±2	±2.1	±3	±4.1	±6.5	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.7	±0.7	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	13	14	16	16	17	15
Front-to-Back Total Power at 180° ± 30°, dB	23	22	27	27	25	25
CPR at Boresight, dB	22	21	23	23	22	19

NHH-65B-R2B

CPR at Sector, dB 10 7 16 13 11 4

Mechanical Specifications

Wind Loading at Velocity, frontal	278.0 N @ 150 km/h 63.6 lbf @ 150 km/h
Wind Loading at Velocity, lateral	230.0 N @ 150 km/h 51.7 lbf @ 150 km/h
Wind Loading at Velocity, maximum	120.7 lbf @ 150 km/h 537.0 N @ 150 km/h
Wind Speed, maximum	241 km/h 149.75 mph

Packaging and Weights

Width, packed	409 mm 16.102 in
Depth, packed	299 mm 11.772 in
Length, packed	1952 mm 76.85 in
Net Weight, without mounting kit	19.8 kg 43.651 lb
Weight, gross	32.3 kg 71.209 lb

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
REACH-SVHC	Compliant as per SVHC revision on www.commscope.com/ProductCompliance
ROHS	Compliant



Included Products

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note Severe environmental conditions may degrade optimum performance

CommScope—Proprietary and Confidential. Preliminary specifications are for illustrative purposes only and will be updated prior to publication.



10-port sector antenna, 2x 698–896, 4x 1695–2200 and 4x 3100–4200 MHz, 65° HPBW, 2x RETs and 2x SBTs. Both high bands share the same electrical tilt.

- Perfect antenna to add 3.5GHz CBRS to macro sites
- 15dBi max CBRS gain to align with FCC max EIRP limitations
- Low band and mid band performance mirrors the performance of existing NHH hex port antennas
- Narrow beamwidth capacity antenna for higher level of densification and enhanced data throughput
- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- Separate RS-485 RET input/output for low and high band
- One LB RET and one HB RET. Both high bands are controlled by one RET to ensure same tilt level for 4x Rx or 4x MIMO
- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	3100–3300	3300–3800	3800–4200
Gain, dBi	14.7	14.7	17.1	17.6	18.4	14.4	14.4	14.5
Beamwidth, Horizontal, degrees	66	61	72	67	64	58	65	60
Beamwidth, Vertical, degrees	12.4	11.1	5.6	5.2	5.0	11.3	10.0	9.0
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	5	5	5
USLS (First Lobe), dB	14	13	15	15	15	15	15	15
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	25	25	25
Isolation, Cross Polarization, dB	25	25	25	25	25	25	25	25
Isolation, Inter-band, dB	25	25	25	25	25	30	30	30
VSWR Return Loss, dB	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-140	-140	-140
Input Power per Port at 50°C, maximum, watts	300	300	300	300	300	100	100	100
Polarization	±45°	±45°	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

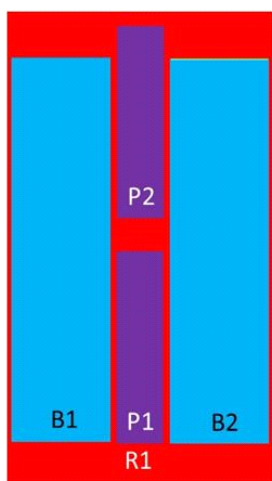
Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	3100–3300	3300–3800	3800–4200
Gain by all Beam Tilts, average, dBi	14.3	14.3	16.6	17.4	17.9	14.2	14.2	14.3
Gain by all Beam Tilts Tolerance, dB	±0.6	±1.1	±0.4	±0.4	±0.5	±0.4	±0.4	±0.4
Gain by Beam Tilt, average, dBi	0° 14.4 7° 14.4 14° 14.0	0° 14.4 7° 14.4 14° 13.9	0° 16.6 3° 16.6 7° 16.6	0° 17.4 3° 17.5 7° 17.4	0° 17.9 3° 18.0 7° 17.9			
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±7.2	±4.6	±6.5	±6.6	±6.6	±6.6
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.7	±0.3	±0.2	±0.3	±0.4	±0.4	±0.4

NHHSS-65B-R2B

USLS, beampeak to 20° above beampeak, dB	13	14	14	14	14	14	14	14
Front-to-Back Total Power at 180° ± 30°, dB	23	22	24	26	25	25	25	25
CPR at Boresight, dB	22	21	18	20	20	20	20	20
CPR at Sector, dB	10	6	6	6	5	5	5	5

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

Array Layout



Left Bottom Right

Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-896	1-2	1	ANxxxxxxxxxxxxxxxxxx1
B1	1695-2200	3-4	2	ANxxxxxxxxxxxxxxxxxx2
B2	1695-2200	5-6		
P1	3100-4200	7-8	n/a	n/a
P2	3100-4200	9-10	n/a	n/a

(Sizes of colored boxes are not true depictions of array sizes)

General Specifications

Operating Frequency Band	1695 – 2200 MHz 3100 – 4200 MHz 698 – 896 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN

Mechanical Specifications

RF Connector Quantity, total	10
RF Connector Quantity, low band	2
RF Connector Quantity, high band	8
RF Connector Interface	4.3-10 Female
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket

NHHSS-65B-R2B

Radiator Material	Aluminum Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	278.0 N @ 150 km/h 63.6 lbf @ 150 km/h
Wind Loading, lateral	230.0 N @ 150 km/h 51.7 lbf @ 150 km/h
Wind Loading, maximum	120.7 lbf @ 150 km/h
Effective Projected Area (EPA), frontal	0.26 m ² 2.80 ft ²
Effective Projected Area (EPA), lateral	0.22 m ² 2.37 ft ²
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Length	1828.0 mm 72.0 in
Width	301.0 mm 11.9 in
Depth	181.0 mm 7.1 in
Net Weight, without mounting kit	21.8 kg 48.1 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 Port 3
Internal RET	High band (1) Low band (1)
Power Consumption, idle state, maximum	1 W
Power Consumption, normal conditions, maximum	10 W
Protocol	3GPP/AISG 2.0 (Single RET)
RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	2 female 2 male

Packed Dimensions

Length	1952.0 mm 76.9 in
Width	409.0 mm 16.1 in
Depth	299.0 mm 11.8 in
Shipping Weight	34.3 kg 75.6 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
China RoHS SJ/T 11364-2014	Above Maximum Concentration Value (MCV)



Included Products

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

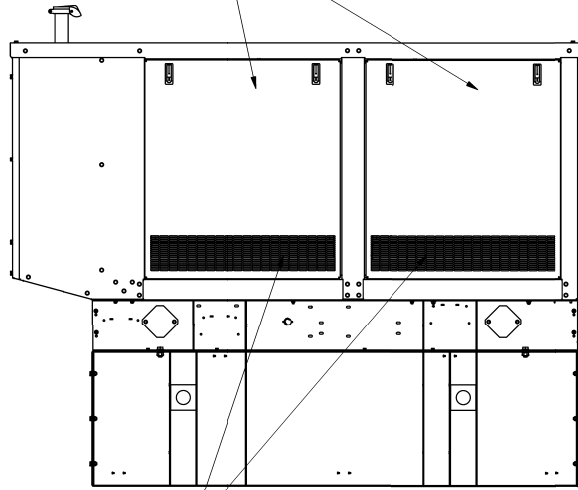
* Footnotes

Performance Note Severe environmental conditions may degrade optimum performance

NOTES:

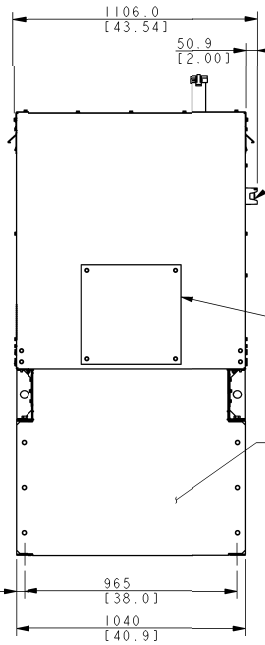
1. BOTH SIDES OF THE GENERATOR ARE SERVICE ACCESSIBLE W/EASY ACCESS SERVICE PANELS.
2. 6 AMP BATTERY CHARGER.
3. 120VAC ENGINE BLOCK HEATER.
4. GENERATOR MUST BE GROUNDED.
5. SOUND ATTENUATED ENCLOSURE STANDARD WITH GENERATOR.
6. MUST ALLOW FREE FLOW OF DISCHARGE AIR AND EXHAUST.
7. MUST ALLOW FREE FLOW OF INTAKE AIR.
8. IT IS THE RESPONSIBILITY OF THE INSTALLATION TECHNICIAN TO ENSURE THAT THE GENERATOR INSTALLATION COMPLIES WITH ALL APPLICABLE CODES, STANDARDS, AND REGULATIONS.

LIFT OFF SERVICE PANELS W/ LOCKABLE LATCHES



AIR INTAKES

37.5 REF [1.48]

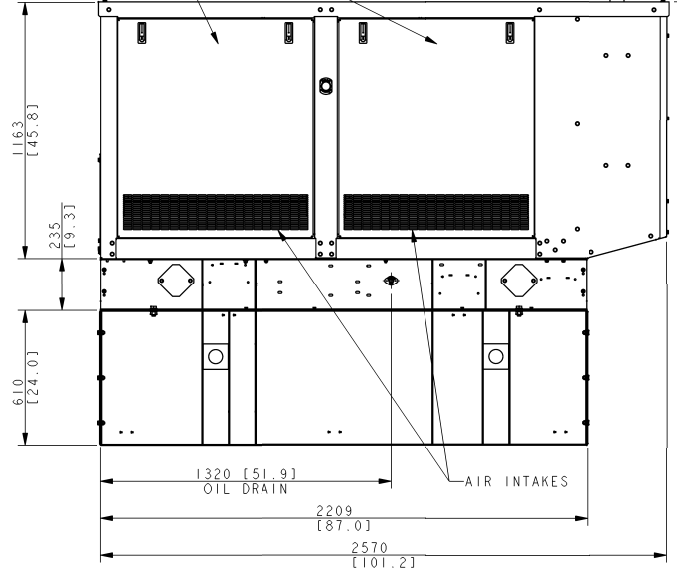


EXTERNAL E-STOP SWITCH

ALTERNATOR ACCESS PANEL

REMOVABLE END PANEL BOTH ENDS

LIFT OFF SERVICE PANELS W/ LOCKABLE LATCHES



EXHAUST RAIN CAP

AIR DISCHARGE

MINIMUM REQUIRED CLEARANCE FOR AIR FLOW

DIMENSIONS IN \square ARE INCH EQUIVALENTS.

MODEL	ALTERNATOR	GENSET WEIGHT (WET)	GENSET WEIGHT (WET) WITH ENCLOSURE	GENSET WEIGHT (WET) WITH ENCLOSURE & BASE
40-60KW	4P7/4Q7	807 KG [1780 LBS]	1051 KG [2318 LBS]	1290 KG [2844 LBS]
45-60KW	4P10/4Q10	862 KG [1900 LBS]	1106 KG [2438 LBS]	1345 KG [2965 LBS]

40-60KG KOHLER NG/LP W/ SOUND ENCLOSURE

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	DO NOT SCALE. REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS
1	10-11-18	NEW DRAWING (CT192924)	AWK	UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN MILLIMETERS
				GENERAL TOLERANCES: X.XX ± 0.25 X.X ± 0.5 X ± 1.0
				ANGLES ± 0.5° MAX
				SURFACE FINISH: $\sqrt{\text{MAX}}$
				THIRD ANGLE PROJECTION
				APPROVALS
				DATE
				SCALE
				CAD NO.
				DATE
				REV. NO.

KOHLER
 KOHLER WISCONSIN 83044
 THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.

TITLE: **DIMENSION PRINT, KG40/60 6.2L VERIZON, ENCLOSED**

SCALE: 0.09

CAD NO. **ADV-9091**

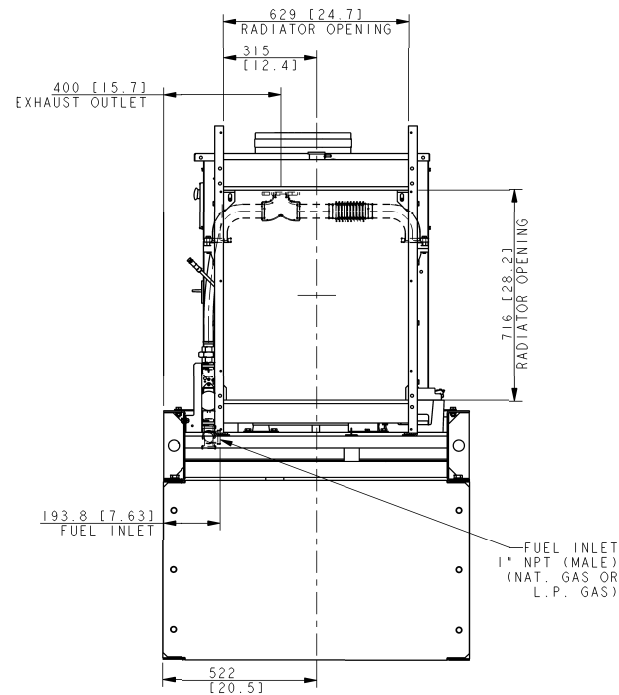
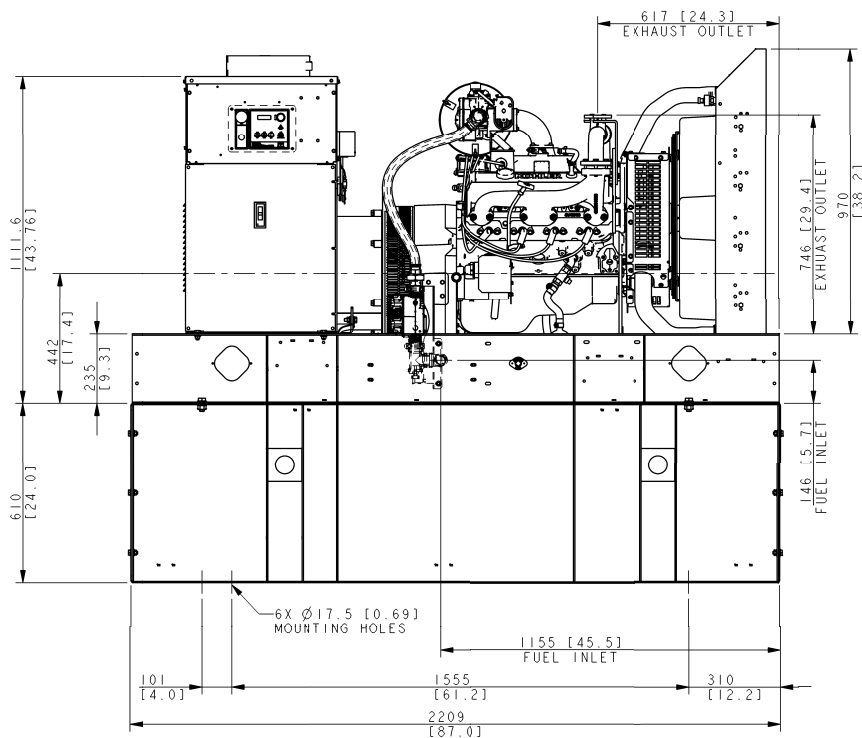
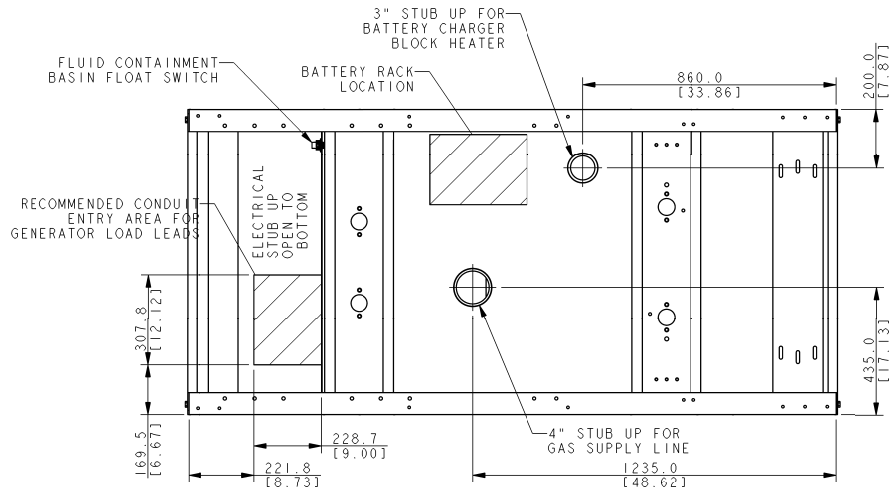
DATE: 10-11-18

REV. NO. **D**

SHEET 1 of 3

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1



DIMENSIONS IN \square ARE INCH EQUIVALENTS.

40-60KG KOHLER NG/LP W/ SOUND ENCLOSURE

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	DO NOT SCALE. REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS
1	10-12-18	NEW DRAWING (CT192924)	AWK	UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN MILLIMETERS
				GENERAL TOLERANCES:
				X 33 ± 0.25
				X 2.5 ± 1.0
				ANGLES ± 1.5
				THIRD ANGLE PROJECTION
				APPROVALS
				DATE
				SCALE
				CAD NO.
				FIG. NO.
				SHEET 2 of 3

KOHLER
 KOHLER WISCONSIN 83044
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TITLE: **DIMENSION PRINT, KG40/60 6.2L VERIZON, ENCLOSED**

SCALE: 0.12

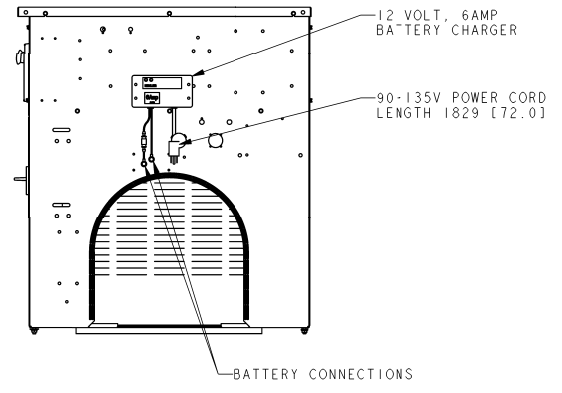
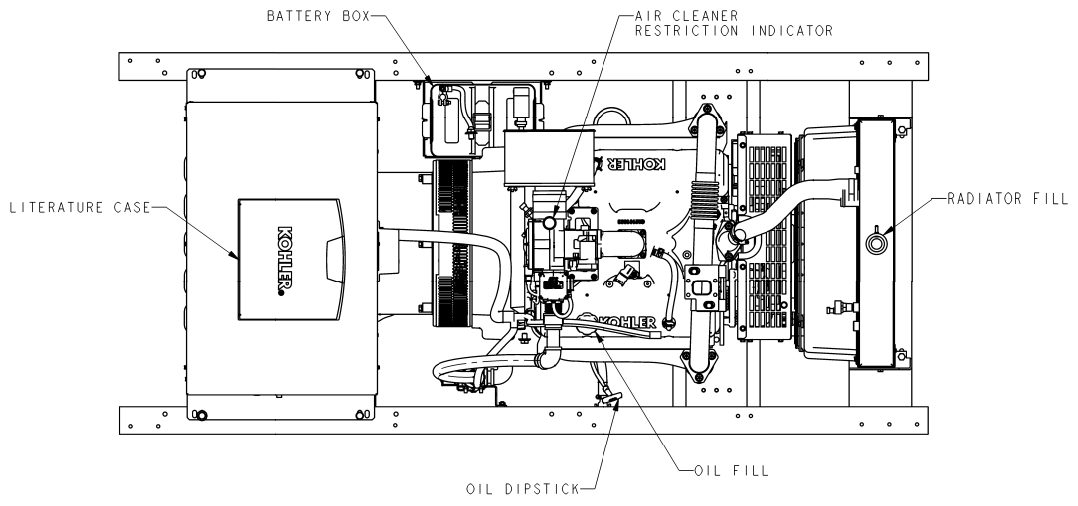
CAD NO. ADV-9091

SHEET 2 of 3

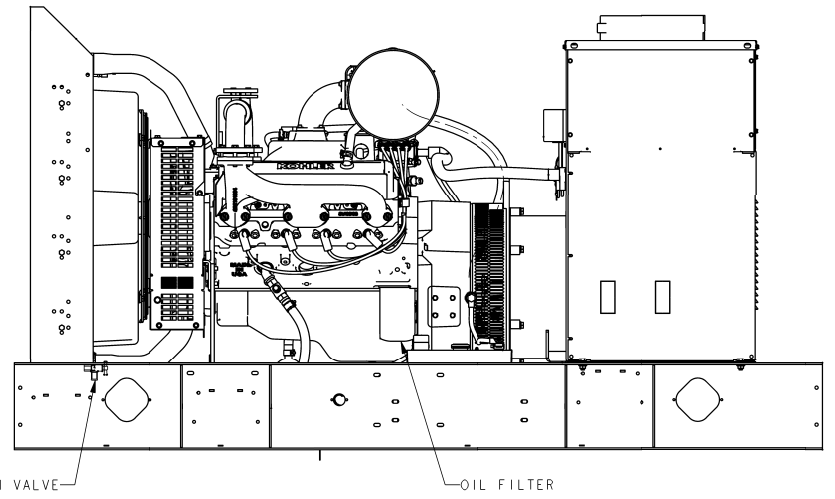
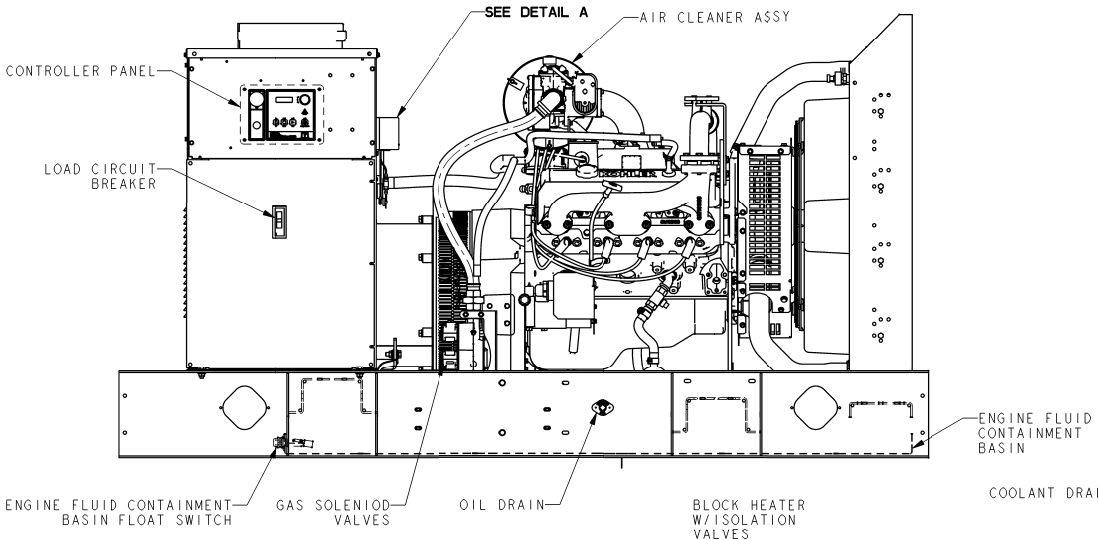
D

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1



DETAIL A
JUNCTION BOX FRONT



NOTE: BASE REMOVED FOR CLARITY

40-60KG KOHLER NG/LP
W/ SOUND ENCLOSURE

DIMENSIONS IN \square ARE INCH EQUIVALENTS.

REV	DATE	ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL	BY	DO NOT SCALE. REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS
1	10-12-18	NEW DRAWING (CT192924)	AWK	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN MILLIMETERS GENERAL TOLERANCES: X 33 ± 0.25 X 2.5 ± 1.0 SURFACE FINISH X 1.5 ± 1.5 MAX ANGLES 90° ± 30° THIRD ANGLE PROJECTION
				KOHLER KOHLER WISCONSIN 83044 THIS DRAWING IN DESIGN AND DETAIL IS KOHLER CO. PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH KOHLER CO. WORK. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.
				TITLE: DIMENSION PRINT, KG40/60 6.2L VERIZON, ENCLOSED
				SCALE: 0.15
				CAD NO. ADV-9091
				SHEET 3 of 3
				D

8 7 6 5 4 3 2 1

ATTACHMENT 5



Structural Analysis Report

Structure : 180 Foot Monopole
VB Site Name : Blue Ridge
VB Site Number : US-CT-5017
VB Deal Number : P-016478
Proposed Carrier : Verizon Wireless
Carrier Site Name : Enfield East CT
Carrier Site Number : 683673
Site Location : 248 Hall Hill Road
Somers, CT 06071 (Tolland County)
42.0026, -72.4850
Date : November 8, 2021
Max Member Stress Level : 65% (Foundation)
61% (Tower)
59% (Base Plate)
55% (Anchor Rods)
Result : **PASS**



Prepared by:



VERTICAL BRIDGE ENGINEERING, LLC

Table of Contents

Introduction1

Existing Structural Information1

Final Proposed Equipment Loading for Verizon Wireless1

Design Criteria2

Analysis Results2

Assumptions2

Conclusions3

Standard Conditions4

Disclaimer of Warranties4

Calculations..... Attached

Collocation Application Attached

Introduction

We have completed our structural analysis of the proposed equipment installation on the foregoing tower to determine its ability to support the new loads proposed by **Verizon Wireless**. The objective of the analysis was to determine if the tower meets the current structural codes and standards with the proposed equipment installation.

Existing Structural Information

The following documents for the existing structure were made available for our structural analysis.

Tower Information	Sabre Tower Calculations Job No. 18-6446-JDS Dated April 6, 2018
Foundation Information	Sabre Foundation Calculations Job No. 18-6446-JDS, Dated April 6, 2018
Geotechnical Information	Delta Oaks Geotechnical Report Job No. GEO17-01159-08 Rev. 0, Dated July 18, 2017
Equipment Information	Vertical Bridge Collocation Application Version 3.
Tower Reinforcement Information	This tower has not been previously modified.

Final Proposed Equipment Loading for Verizon Wireless

The following proposed loading was obtained from the Vertical Bridge Collocation Application:

Antenna/Equipment					Coax	
Mount (Ft.)	RAD (Ft.)	Qty.	Antenna	Type	Qty.	Size/Type
165.0	-	3	Sector Frames	Mount	2	1-5/8" Hybrid
	165.0	3	CommScope NHHSS-65B-R2-BTO	Panel		
		3	Samsung MT6407-77A	Panel		
		3	Samsung B5/B13 RRH-BR04C (RFV01U-D2A)	RRU		
		3	CommScope NHH-65B-R2B	Panel		
		3	Samsung B2/B66a RRH-BR049 (RFV01U-D1A)	RRU		
		2	Raycap RC3DC-3315-PF-48	OVP		
		3	Samsung RT4401-48A	RRU		

Note: Proposed equipment shown in bold.

Note: Other existing loading can be found on the tower profile attached.

Design Criteria

The tower was analyzed using tnxTower (Version 8.1.1.0) tower analysis software using the following design criteria.

State	Connecticut
City/County Building Code	Tolland County (CSBC 2018)
TIA/EIA Standard Code	TIA-222-H
Basic Wind Speed	125 MPH (V_{ult})
Basic Wind Speed w/ Ice	50 MPH w/ 1.50" Ice
Steel Grade	65 ksi Pole / 50 ksi Baseplate / A615-75 ksi Anchor Rods
Exposure Category	C
Topographic Category (height)	1 (0.0 Ft.)
Risk Category	II
S_s	0.173
Seismic Design Category	B

Analysis Results

Based on the foregoing information, our structural analysis determined that **the existing tower is structurally capable of supporting the proposed equipment loads without modification.** The existing tower baseplate, anchor rods, and base foundation have also been evaluated and **are structurally capable of supporting the proposed equipment loads.** A seismic analysis has been performed on this structure and **does not control.**

Assumptions

The below assumptions are true, complete, and accurate.

1. The existing tower has been maintained to manufacturer's specifications and is in good condition.
2. Foundations are considered to have been properly designed for the original design loads.
3. All member connections are considered to have been designed to meet the load carrying capacity of the connected member.
4. Antenna mount loads have been estimated based on generally accepted industry standards.
5. The mounts for the proposed antennas have been analyzed and designed by others.
6. See additional assumptions contained in the report attached.
7. Tower is within acceptable engineering tolerance at 105%.
8. Foundations are within acceptable engineering tolerance at 110%.

Conclusions

The existing tower described above **has sufficient capacity** to support the proposed loading based on the governing Building Code. The existing tower baseplate, anchor rods, and foundation have also been evaluated and are acceptable. A **seismic analysis** has been performed on this structure and **does not control**.

We appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance, please call us anytime at 561-948-6367.

Sincerely,

Analysis by:



Tyler Heitman, EIT
Design Engineer

Reviewed by:



Thomas F. Ireland, PE
Engineer



Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but not necessarily limited, to:

- Information supplied by the client regarding the structure itself, the antenna and transmission line loading on the structure and its components, or relevant information.
- Information from drawings in possession of Vertical Bridge Engineering, LLC, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Vertical Bridge Engineering, LLC and used in the performance of our engineering services is correct and complete. In the absence of information contrary, we consider that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated; and we, therefore consider that their capacity has not significantly changed from the original design condition.

All services will be performed to the codes and standards specified by the client, and we do not imply to meet any other code and standard requirements unless explicitly agreed to in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes and standards, the client shall specify the exact requirements. In the absence of information to the contrary, all work will be performed in accordance with the revision of ANSI/TIA/EIA-222-H requested.

All services are performed, results obtained, and recommendations made in accordance with the generally accepted engineering principles and practices. Vertical Bridge Engineering LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

Disclaimer of Warranties

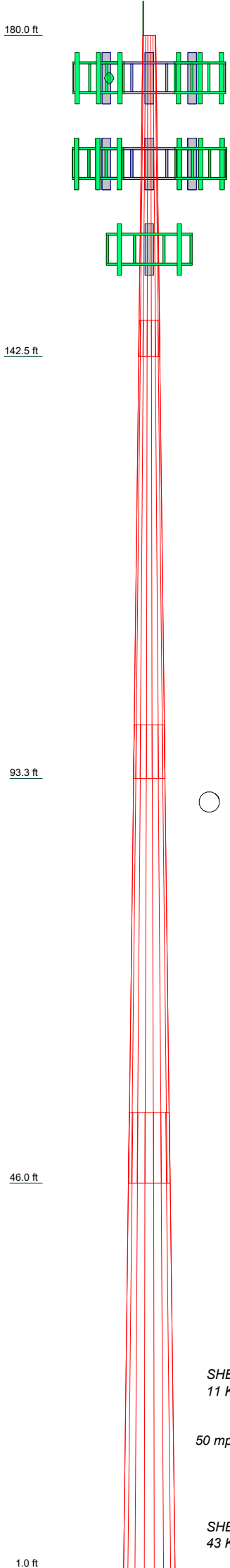
The engineering services by Vertical Bridge Engineering, LLC in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size, and capacity of its members. Vertical Bridge Engineering, LLC does not analyze the fabrication, including welding, except as may be expressly included in this report.

The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines. Any mention of structural modifications are reasonable estimates and should not be used a precise construction document. Precise modification drawings are obtainable from Vertical Bridge Engineering, LLC but are beyond the scope of this report.

Vertical Bridge Engineering, LLC makes no warranties, express or implied, in connection with this report and disclaims any liability arising from material, fabrication and erection of this tower, or installation and compliance with legal and permitting requirements of the proposed equipment. Vertical Bridge Engineering, LLC will not be responsible whatsoever for or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of Vertical Bridge Engineering, LLC pursuant to this report will be limited to the total fee received for preparation of this report.

Attachment 1: Calculations

Section	1	2	3	4	
Length (ft)	37.500	53.500	53.500	53.250	
Number of Sides	18	18	18	18	
Thickness (in)	0.2500	0.3750	0.4375	0.4375	
Socket Length (ft)	4.250	6.250	8.250	8.250	
Top Dia (in)	18.7500	28.4733	42.2575	55.2885	
Bot Dia (in)	30.2800	44.9300	58.7000	71.8700	
Grade					A572-65
Weight (K)	2.5	7.9	12.7	15.9	38.8



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	180	NHH-65B-R2B w/ MP (96x11.9x7.1) (VZW)	165
Sector Frames (TMO)	175	B2/B66a RFV01DU-D1A (15.5x15.9x12) (VZW)	165
APXV18-206517S-C w/ Mount Pipe (TMO)	175	B2/B66a RFV01DU-D1A (15.5x15.9x12) (VZW)	165
APXV18-206517S-C w/ Mount Pipe (TMO)	175	B2/B66a RFV01DU-D1A (15.5x15.9x12) (VZW)	165
(2) LNX-6515DS-A1M w/ pipe mount (TMO)	175	RC3DC-3315-PF-48 (Rect 28.93x15.73x10.3) (VZW)	165
(2) LNX-6515DS-A1M w/ pipe mount (TMO)	175	RC3DC-3315-PF-48 (Rect 28.93x15.73x10.3) (VZW)	165
(2) LNX-6515DS-A1M w/ pipe mount (TMO)	175	RT4401-48A (13.91x8.55x4.15x18.60lbs) (VZW)	165
(2) RRRUS 11 (TMO)	175	RT4401-48A (13.91x8.55x4.15x18.60lbs) (VZW)	165
(2) RRRUS 11 (TMO)	175	RT4401-48A (13.91x8.55x4.15x18.60lbs) (VZW)	165
(2) RRRUS 11 (TMO)	175	RT4401-48A (13.91x8.55x4.15x18.60lbs) (VZW)	165
1/3 Remaining Reserve Rights (TMO)	175	Sector Frame (VZW)	165
1/3 Remaining Reserve Rights (TMO)	175	MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	155
1/3 Remaining Reserve Rights (TMO)	175	MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	155
VHLP1-23 (TMO)	175	MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	155
Sector Frame (VZW)	165	MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	155
Sector Frame (VZW)	165	MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	155
NHHSS-65B-R2 BTO w/ MP (96x11.85x7.1) (VZW)	165	TA08025-B604 (15.75x14.96x7.87) (Dish)	155
NHHSS-65B-R2 BTO w/ MP (96x11.85x7.1) (VZW)	165	TA08025-B604 (15.75x14.96x7.87) (Dish)	155
NHHSS-65B-R2 BTO w/ MP (96x11.85x7.1) (VZW)	165	TA08025-B604 (15.75x14.96x7.87) (Dish)	155
MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs) (VZW)	165	TA08025-B605 (15.75x14.96x9.06) (Dish)	155
MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs) (VZW)	165	TA08025-B605 (15.75x14.96x9.06) (Dish)	155
MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs) (VZW)	165	TA08025-B605 (15.75x14.96x9.06) (Dish)	155
B5/B13 RRH-BRO4C RFV01U-D2 (15x15x8.1) (VZW)	165	RDIDC-9181-PF-48 (16x14x8) (Dish)	155
B5/B13 RRH-BRO4C RFV01U-D2 (15x15x8.1) (VZW)	165	1/3 Remaining Reserve Rights (Dish)	155
B5/B13 RRH-BRO4C RFV01U-D2 (15x15x8.1) (VZW)	165	1/3 Remaining Reserve Rights (Dish)	155
NHH-65B-R2B w/ MP (96x11.9x7.1) (VZW)	165	1/3 Remaining Reserve Rights (Dish)	155
NHH-65B-R2B w/ MP (96x11.9x7.1) (VZW)	165	SNP8HR-3xx (0.67 Ka included) (Dish)	155

MATERIAL STRENGTH

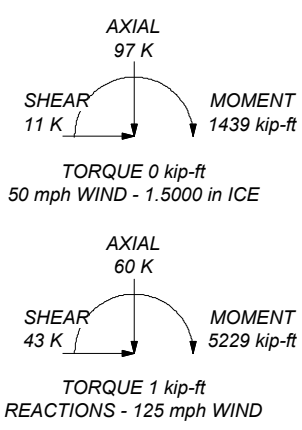
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 60.7%



ALL REACTIONS ARE FACTORED

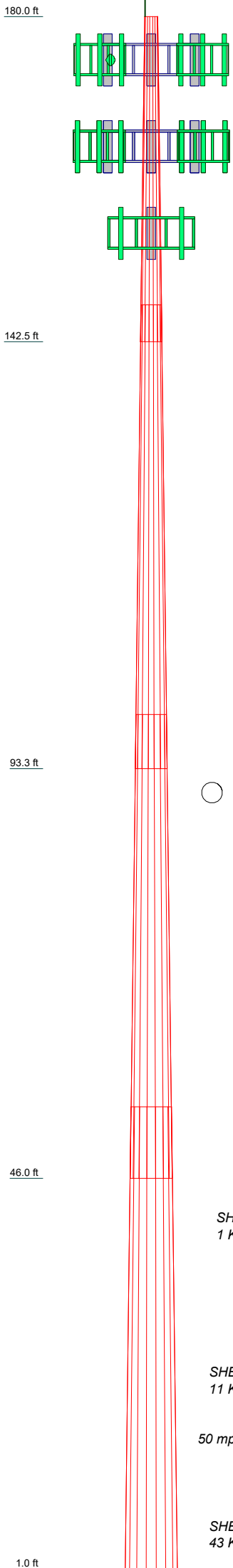


Vertical Bridge Engineering, LLC
 750 Park of Commerce Dr. Suite 200
 Boca Raton, FL 33487
 Phone: 561-948-6367
 FAX:

Job: US-CT-5017	Project: 180' Monopole	Client: Verizon Wireless	Drawn by: THeitman	App'd:
Code: TIA-222-H	Date: 10/29/21	Path:	Scale: NTS	Dwg No. E-1

C:\Users\THeitman\Documents\US-CT-5017_SA_102921_VZW\mxd\US-CT-5017_SA_102921_VZW.dwg

Section	1	2	3	4	
Length (ft)	37.500	53.500	53.500	53.250	
Number of Sides	18	18	18	18	
Thickness (in)	0.2500	0.3750	0.4375	0.4375	
Socket Length (ft)	4.250	6.250	8.250		
Top Dia (in)	18.7500	28.4733	42.2575	55.2885	
Bot Dia (in)	30.2800	44.9300	58.7000	71.8700	
Grade			A572-65		
Weight (K)	2.5	7.9	12.7	15.9	38.8



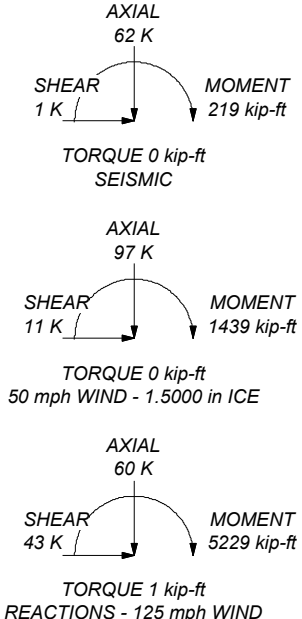
MATERIAL STRENGTH			MATERIAL STRENGTH		
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. CCISeismic Note: Seismic loads generated by CCISeismic 3.3.6
9. CCISeismic Note: Seismic calculations are in accordance with TIA-222-H
10. TOWER RATING: 60.7%



ALL REACTIONS ARE FACTORED



Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job: US-CT-5017 Project: 180' Monopole	
	Client: Verizon Wireless Code: TIA-222-H Path:	Drawn by: THEITMAN Date: 10/29/21
	App'd:	Scale: NTS
	Dwg No. E-1	

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job US-CT-5017	Page 1 of 30
	Project 180' Monopole	Date 10:23:23 10/29/21
	Client Verizon Wireless	Designed by Theitman

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- Tower is located in Tolland County, Connecticut.
- Tower base elevation above sea level: 234.000 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- CCISEismic Note: Seismic loads generated by CCISEismic 3.3.6.
- CCISEismic Note: Seismic calculations are in accordance with TIA-222-H.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known |
|--|---|---|

Tapered Pole Section Geometry

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job US-CT-5017	Page 2 of 30
	Project 180' Monopole	Date 10:23:23 10/29/21
	Client Verizon Wireless	Designed by Theitman

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	180.000-142.500	37.500	4.250	18	18.7500	30.2800	0.2500	1.0000	A572-65 (65 ksi)
L2	142.500-93.250	53.500	6.250	18	28.4733	44.9300	0.3750	1.5000	A572-65 (65 ksi)
L3	93.250-46.000	53.500	8.250	18	42.2575	58.7000	0.4375	1.7500	A572-65 (65 ksi)
L4	46.000-1.000	53.250		18	55.2895	71.6700	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	19.0007	14.6798	634.7454	6.5675	9.5250	66.6399	1270.3260	7.3413	2.8600	11.44
L2	30.7086	23.8288	2714.8784	10.6607	15.3822	176.4943	5433.3291	11.9167	4.8893	19.557
	30.1821	33.4440	3335.9094	9.9749	14.4644	230.6286	6676.2082	16.7252	4.3513	11.603
L3	45.5653	53.0316	13300.4086	15.8170	22.8244	582.7266	26618.3183	26.5208	7.2477	19.327
	44.7924	58.0723	12831.3992	14.8461	21.4668	597.7322	25679.6823	29.0417	6.6673	15.24
L4	59.5381	80.9048	34696.8284	20.6832	29.8196	1163.5578	69439.3117	40.4601	9.5612	21.854
	58.6519	76.1688	28953.3731	19.4725	28.0871	1030.8442	57944.8438	38.0916	8.9609	20.482
	72.7081	98.9152	63409.8886	25.2875	36.4084	1741.6299	126903.213	49.4670	11.8439	27.072

6

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.000-142.500				1	1	1			
L2 142.500-93.250				1	1	1			
L3 93.250-46.000				1	1	1			
L4 46.000-1.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
Safety Line 3/8	C	No	Surface Ar (CaAa)	180.000 - 6.000	1	1	0.000 0.000	0.3750		0.000
Step Pegs	C	No	Surface Ar (CaAa)	180.000 - 6.000	1	1	0.000 0.000	0.7500		0.002

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job US-CT-5017	Page 3 of 30
	Project 180' Monopole	Date 10:23:23 10/29/21
	Client Verizon Wireless	Designed by Theitman

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
*175 TMO									
1 5/8 Hybrid Flex (1.98" 1.3lbs) (TMO)	C	No	No	Inside Pole	175.000 - 6.000	3	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
LDF5-50A(7/8") (TMO)	C	No	No	Inside Pole	175.000 - 6.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
*165									
1 5/8 Hybrid Flex (1.98" 1.3lbs) (VZW)	C	No	No	Inside Pole	165.000 - 6.000	2	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
*155 Dish									
1 5/8 Hybrid Flex (1.98" 1.3lbs) (Dish)	C	No	No	Inside Pole	165.000 - 6.000	1	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	180.000-142.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	4.219	0.000	0.290
L2	142.500-93.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	5.541	0.000	0.485
L3	93.250-46.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	5.316	0.000	0.465
L4	46.000-1.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	4.500	0.000	0.394

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	180.000-142.500	A	1.756	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	4 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L2	142.500-93.250	C		0.000	0.000	30.565	0.000	0.663
		A	1.702	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
L3	93.250-46.000	C		0.000	0.000	40.142	0.000	0.975
		A	1.615	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
L4	46.000-1.000	C		0.000	0.000	37.476	0.000	0.910
		A	1.451	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	30.335	0.000	0.738

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	180.000-142.500	0.0000	0.8705	0.0000	2.7995
L2	142.500-93.250	0.0000	0.8841	0.0000	3.1270
L3	93.250-46.000	0.0000	0.8913	0.0000	3.2571
L4	46.000-1.000	0.0000	0.7887	0.0000	2.8885

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor K_a

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	142.50 - 180.00	1.0000	1.0000
L1	2	Step Pegs	142.50 - 180.00	1.0000	1.0000
L2	1	Safety Line 3/8	93.25 - 142.50	1.0000	1.0000
L2	2	Step Pegs	93.25 - 142.50	1.0000	1.0000
L3	1	Safety Line 3/8	46.00 - 93.25	1.0000	1.0000
L3	2	Step Pegs	46.00 - 93.25	1.0000	1.0000
L4	1	Safety Line 3/8	6.00 - 46.00	1.0000	1.0000
L4	2	Step Pegs	6.00 - 46.00	1.0000	1.0000

User Defined Loads - Seismic

<i>tnxTower</i> Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	5 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

<i>Description</i>	<i>Elevation</i>	<i>Offset From Centroid</i>	<i>Azimuth Angle</i>	E_v	E_{hx}	E_{hz}	E_h
	<i>ft</i>	<i>ft</i>	$^{\circ}$	<i>K</i>	<i>K</i>	<i>K</i>	<i>K</i>
CCISeismic Tower Section 1 - 1	176.250	0.000	0.0000	0.015	0.000	0.000	0.035
CCISeismic Tower Section 1 - 2	167.500	0.000	0.0000	0.022	0.000	0.000	0.047
CCISeismic Tower Section 1 - 3	157.500	0.000	0.0000	0.025	0.000	0.000	0.048
CCISeismic Tower Section 1 - 4	147.500	0.000	0.0000	0.028	0.000	0.000	0.047
CCISeismic Tower Section 2 - 1	145.000	0.000	0.0000	0.015	0.000	0.000	0.024
CCISeismic Tower Section 2 - 2	138.250	0.000	0.0000	0.046	0.000	0.000	0.066
CCISeismic Tower Section 2 - 3	128.250	0.000	0.0000	0.051	0.000	0.000	0.063
CCISeismic Tower Section 2 - 4	118.250	0.000	0.0000	0.055	0.000	0.000	0.058
CCISeismic Tower Section 2 - 5	108.250	0.000	0.0000	0.060	0.000	0.000	0.053
CCISeismic Tower Section 2 - 6	98.250	0.000	0.0000	0.064	0.000	0.000	0.047
CCISeismic Tower Section 3 - 1	97.750	0.000	0.0000	0.026	0.000	0.000	0.019
CCISeismic Tower Section 3 - 2	91.000	0.000	0.0000	0.077	0.000	0.000	0.048
CCISeismic Tower Section 3 - 3	81.000	0.000	0.0000	0.083	0.000	0.000	0.041
CCISeismic Tower Section 3 - 4	71.000	0.000	0.0000	0.088	0.000	0.000	0.033
CCISeismic Tower Section 3 - 5	61.000	0.000	0.0000	0.094	0.000	0.000	0.026
CCISeismic Tower Section 3 - 6	51.000	0.000	0.0000	0.099	0.000	0.000	0.019
CCISeismic Tower Section 4 - 1	52.625	0.000	0.0000	0.031	0.000	0.000	0.006
CCISeismic Tower Section 4 - 2	46.000	0.000	0.0000	0.100	0.000	0.000	0.016
CCISeismic Tower Section 4 - 3	36.000	0.000	0.0000	0.105	0.000	0.000	0.010
CCISeismic Tower Section 4 - 4	26.000	0.000	0.0000	0.111	0.000	0.000	0.005
CCISeismic Tower Section 4 - 5	16.000	0.000	0.0000	0.116	0.000	0.000	0.002
CCISeismic Tower Section 4 - 6	6.000	0.000	0.0000	0.122	0.000	0.000	0.000
CCISeismic tower mounts	180.000	0.000	0.0000	0.001	0.000	0.000	0.003
Lightning Rod 5/8x4'							
CCISeismic Sector Frames	175.000	0.000	0.0000	0.074	0.000	0.000	0.172
CCISeismic rfs celwave	175.000	0.000	0.0000	0.002	0.000	0.000	0.004
APXV18-206517S-C w/ Mount Pipe							
CCISeismic rfs celwave	175.000	0.000	0.0000	0.002	0.000	0.000	0.004
APXV18-206517S-C w/ Mount Pipe							
CCISeismic rfs celwave	175.000	0.000	0.0000	0.002	0.000	0.000	0.004
APXV18-206517S-C w/ Mount Pipe							
CCISeismic (2) andrew LNX-6515DS-A1M w/ pipe mount	175.000	0.000	0.0000	0.004	0.000	0.000	0.011
CCISeismic (2) andrew LNX-6515DS-A1M w/ pipe mount	175.000	0.000	0.0000	0.004	0.000	0.000	0.011
CCISeismic (2) andrew LNX-6515DS-A1M w/ pipe mount	175.000	0.000	0.0000	0.004	0.000	0.000	0.011
CCISeismic (2) ericsson RRUS 11	175.000	0.000	0.0000	0.004	0.000	0.000	0.009
CCISeismic (2) ericsson RRUS 11	175.000	0.000	0.0000	0.004	0.000	0.000	0.009
CCISeismic (2) ericsson RRUS 11	175.000	0.000	0.0000	0.004	0.000	0.000	0.009
CCISeismic 1/3 Remaining Reserve Rights	175.000	0.000	0.0000	0.010	0.000	0.000	0.023
CCISeismic 1/3 Remaining Reserve Rights	175.000	0.000	0.0000	0.010	0.000	0.000	0.023
CCISeismic 1/3 Remaining Reserve Rights	175.000	0.000	0.0000	0.010	0.000	0.000	0.023
CCISeismic Sector Frame	165.000	0.000	0.0000	0.027	0.000	0.000	0.056
CCISeismic Sector Frame	165.000	0.000	0.0000	0.027	0.000	0.000	0.056
CCISeismic Sector Frame	165.000	0.000	0.0000	0.027	0.000	0.000	0.056
CCISeismic commscope	165.000	0.000	0.0000	0.002	0.000	0.000	0.005
NHSS-65B-R2 BTO w/ MP							

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	<p style="text-align: center;">Project</p> <p style="text-align: center;">180' Monopole</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">10:23:23 10/29/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">Verizon Wireless</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Theitman</p>

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
(96x11.85x7.1) CCISeismic commscope NHHSS-65B-R2 BTO w/ MP	165.000	0.000	0.0000	0.002	0.000	0.000	0.005
(96x11.85x7.1) CCISeismic commscope NHHSS-65B-R2 BTO w/ MP	165.000	0.000	0.0000	0.002	0.000	0.000	0.005
(96x11.85x7.1) CCISeismic samsung (vb) MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs)	165.000	0.000	0.0000	0.004	0.000	0.000	0.009
(96x11.85x7.1) CCISeismic samsung (vb) MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs)	165.000	0.000	0.0000	0.004	0.000	0.000	0.009
(96x11.85x7.1) CCISeismic samsung (vb) MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs)	165.000	0.000	0.0000	0.004	0.000	0.000	0.009
(15x15x8.1) CCISeismic samsung B5/B13 RRH-BRO4C RFV01U-D2	165.000	0.000	0.0000	0.003	0.000	0.000	0.005
(15x15x8.1) CCISeismic samsung B5/B13 RRH-BRO4C RFV01U-D2	165.000	0.000	0.0000	0.003	0.000	0.000	0.005
(15x15x8.1) CCISeismic samsung B5/B13 RRH-BRO4C RFV01U-D2	165.000	0.000	0.0000	0.003	0.000	0.000	0.005
(96x11.9x7.1) CCISeismic commscope NHH-65B-R2B w/ MP	165.000	0.000	0.0000	0.003	0.000	0.000	0.006
(96x11.9x7.1) CCISeismic commscope NHH-65B-R2B w/ MP	165.000	0.000	0.0000	0.003	0.000	0.000	0.006
(96x11.9x7.1) CCISeismic commscope NHH-65B-R2B w/ MP	165.000	0.000	0.0000	0.003	0.000	0.000	0.006
(15.5x15.9x12) CCISeismic samsung B2/B66a RFV01DU-D1A	165.000	0.000	0.0000	0.003	0.000	0.000	0.007
(15.5x15.9x12) CCISeismic samsung B2/B66a RFV01DU-D1A	165.000	0.000	0.0000	0.003	0.000	0.000	0.007
(15.5x15.9x12) CCISeismic samsung B2/B66a RFV01DU-D1A	165.000	0.000	0.0000	0.003	0.000	0.000	0.007
CCISeismic raycap RC3DC-3315-PF-48 (Rect 28.93x15.73x10.3)	165.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic raycap RC3DC-3315-PF-48 (Rect 28.93x15.73x10.3)	165.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic samsung (vb) RT4401-48A (13.91x8.55x4.15x18.60lbs)	165.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic samsung (vb) RT4401-48A (13.91x8.55x4.15x18.60lbs)	165.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic samsung (vb) RT4401-48A (13.91x8.55x4.15x18.60lbs)	165.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic site pro 1 SNP8HR-3xx (0.67 Ka included)	155.000	0.000	0.0000	0.054	0.000	0.000	0.099
CCISeismic jma MX08FRO665-20_V0F w/ MP (72x20x8)	155.000	0.000	0.0000	0.002	0.000	0.000	0.004

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	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic jma MX08FRO665-20_V0F w/ MP (72x20x8)	155.000	0.000	0.0000	0.002	0.000	0.000	0.004
CCISeismic jma MX08FRO665-20_V0F w/ MP (72x20x8)	155.000	0.000	0.0000	0.002	0.000	0.000	0.004
CCISeismic fujitsu TA08025-B604 (15.75x14.96x7.87)	155.000	0.000	0.0000	0.002	0.000	0.000	0.004
CCISeismic fujitsu TA08025-B604 (15.75x14.96x7.87)	155.000	0.000	0.0000	0.002	0.000	0.000	0.004
CCISeismic fujitsu TA08025-B604 (15.75x14.96x7.87)	155.000	0.000	0.0000	0.002	0.000	0.000	0.004
CCISeismic fujitsu TA08025-B605 (15.75x14.96x9.06)	155.000	0.000	0.0000	0.003	0.000	0.000	0.005
CCISeismic fujitsu TA08025-B605 (15.75x14.96x9.06)	155.000	0.000	0.0000	0.003	0.000	0.000	0.005
CCISeismic fujitsu TA08025-B605 (15.75x14.96x9.06)	155.000	0.000	0.0000	0.003	0.000	0.000	0.005
CCISeismic raycap RDIDC-9181-PF-48 (16x14x8)	155.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic 1/3 Remaining Reserve Rights	155.000	0.000	0.0000	0.002	0.000	0.000	0.004
CCISeismic 1/3 Remaining Reserve Rights	155.000	0.000	0.0000	0.002	0.000	0.000	0.004
CCISeismic 1/3 Remaining Reserve Rights	155.000	0.000	0.0000	0.002	0.000	0.000	0.004
CCISeismic andrew VHL P1-23	175.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p	175.000	0.000	0.0000	0.000	0.000	0.000	0.000
database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (169ft to179ft)	165.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (159ft to169ft)	155.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (149ft to159ft)	145.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (139ft to149ft)	135.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (129ft to139ft)	125.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (119ft to129ft)	115.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (109ft	115.000	0.000	0.0000	0.000	0.000	0.000	0.000

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	<p style="text-align: center;">Project</p> <p style="text-align: center;">180' Monopole</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">10:23:23 10/29/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">Verizon Wireless</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Theitman</p>

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
to119ft) CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (99ft to109ft)	105.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (89ft to99ft)	95.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (79ft to89ft)	85.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (69ft to79ft)	75.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (59ft to69ft)	65.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (49ft to59ft)	55.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (39ft to49ft)	45.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (29ft to39ft)	35.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (19ft to29ft)	25.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (9ft to19ft)	15.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (169ft to179ft)	175.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (159ft to169ft)	165.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (149ft to159ft)	155.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (139ft to149ft)	145.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (129ft	135.000	0.000	0.0000	0.001	0.000	0.000	0.001

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	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

<i>Description</i>	<i>Elevation</i>	<i>Offset From Centroid</i>	<i>Azimuth Angle</i>	<i>E_v</i>	<i>E_{hx}</i>	<i>E_{hz}</i>	<i>E_h</i>
	<i>ft</i>	<i>ft</i>	<i>°</i>	<i>K</i>	<i>K</i>	<i>K</i>	<i>K</i>
to139ft) CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (119ft to129ft)	125.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (109ft to119ft)	115.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (99ft to109ft)	105.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (89ft to99ft)	95.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (79ft to89ft)	85.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (69ft to79ft)	75.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (59ft to69ft)	65.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (49ft to59ft)	55.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (39ft to49ft)	45.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (29ft to39ft)	35.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (19ft to29ft)	25.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (9ft to19ft)	15.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Step Pegs From 5 to 179 (5ft to9ft)	8.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic (3) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (169ft to174ft)	172.500	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic (3) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (159ft to169ft)	165.000	0.000	0.0000	0.001	0.000	0.000	0.003
CCISeismic (3) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (149ft to159ft)	155.000	0.000	0.0000	0.001	0.000	0.000	0.003
CCISeismic (3) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (139ft to149ft)	145.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic (3) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (129ft to139ft)	135.000	0.000	0.0000	0.001	0.000	0.000	0.002

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	<p style="text-align: center;">Project</p> <p style="text-align: center;">180' Monopole</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">10:23:23 10/29/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">Verizon Wireless</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Theitman</p>

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (129ft to139ft) CCISeismic (3) b&p	125.000	0.000	0.0000	0.001	0.000	0.000	0.002
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (119ft to129ft) CCISeismic (3) b&p	115.000	0.000	0.0000	0.001	0.000	0.000	0.001
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (109ft to119ft) CCISeismic (3) b&p	105.000	0.000	0.0000	0.001	0.000	0.000	0.001
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (99ft to109ft) CCISeismic (3) b&p	95.000	0.000	0.0000	0.001	0.000	0.000	0.001
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (89ft to99ft) CCISeismic (3) b&p	85.000	0.000	0.0000	0.001	0.000	0.000	0.001
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (79ft to89ft) CCISeismic (3) b&p	75.000	0.000	0.0000	0.001	0.000	0.000	0.001
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (69ft to79ft) CCISeismic (3) b&p	65.000	0.000	0.0000	0.001	0.000	0.000	0.001
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (59ft to69ft) CCISeismic (3) b&p	55.000	0.000	0.0000	0.001	0.000	0.000	0.000
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (49ft to59ft) CCISeismic (3) b&p	45.000	0.000	0.0000	0.001	0.000	0.000	0.000
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (39ft to49ft) CCISeismic (3) b&p	35.000	0.000	0.0000	0.001	0.000	0.000	0.000
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (29ft to39ft) CCISeismic (3) b&p	25.000	0.000	0.0000	0.001	0.000	0.000	0.000
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (19ft to29ft) CCISeismic (3) b&p	15.000	0.000	0.0000	0.001	0.000	0.000	0.000
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (9ft to19ft) CCISeismic (3) b&p	8.000	0.000	0.0000	0.001	0.000	0.000	0.000
database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (5ft to9ft) CCISeismic andrew	172.500	0.000	0.0000	0.000	0.000	0.000	0.000
LDF5-50A(7/8") From 5 to 174 (169ft to174ft) CCISeismic andrew	165.000	0.000	0.0000	0.000	0.000	0.000	0.000
LDF5-50A(7/8") From 5 to 174							

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Vertical Bridge Engineering, LLC</p> <p style="text-align: center;">750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:</p>	<p>Job</p> <p style="text-align: center;">US-CT-5017</p>	<p>Page</p> <p style="text-align: center;">11 of 30</p>
	<p>Project</p> <p style="text-align: center;">180' Monopole</p>	<p>Date</p> <p style="text-align: center;">10:23:23 10/29/21</p>
	<p>Client</p> <p style="text-align: center;">Verizon Wireless</p>	<p>Designed by</p> <p style="text-align: center;">Theitman</p>

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
(159ft to169ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (149ft to159ft)	155.000	0.000	0.0000	0.000	0.000	0.000	0.000
(149ft to159ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (139ft to149ft)	145.000	0.000	0.0000	0.000	0.000	0.000	0.000
(139ft to149ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (129ft to139ft)	135.000	0.000	0.0000	0.000	0.000	0.000	0.000
(129ft to139ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (119ft to129ft)	125.000	0.000	0.0000	0.000	0.000	0.000	0.000
(119ft to129ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (109ft to119ft)	115.000	0.000	0.0000	0.000	0.000	0.000	0.000
(109ft to119ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (99ft to109ft)	105.000	0.000	0.0000	0.000	0.000	0.000	0.000
(99ft to109ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (89ft to99ft)	95.000	0.000	0.0000	0.000	0.000	0.000	0.000
(89ft to99ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (79ft to89ft)	85.000	0.000	0.0000	0.000	0.000	0.000	0.000
(79ft to89ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (69ft to79ft)	75.000	0.000	0.0000	0.000	0.000	0.000	0.000
(69ft to79ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (59ft to69ft)	65.000	0.000	0.0000	0.000	0.000	0.000	0.000
(59ft to69ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (49ft to59ft)	55.000	0.000	0.0000	0.000	0.000	0.000	0.000
(49ft to59ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (39ft to49ft)	45.000	0.000	0.0000	0.000	0.000	0.000	0.000
(39ft to49ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (29ft to39ft)	35.000	0.000	0.0000	0.000	0.000	0.000	0.000
(29ft to39ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (19ft to29ft)	25.000	0.000	0.0000	0.000	0.000	0.000	0.000
(19ft to29ft) CCISeismic andrew LDF5-50A(7/8") From 5 to 174 (9ft to19ft)	15.000	0.000	0.0000	0.000	0.000	0.000	0.000
(9ft to19ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (159ft to164ft)	162.500	0.000	0.0000	0.001	0.000	0.000	0.001
(159ft to164ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (149ft to159ft)	155.000	0.000	0.0000	0.001	0.000	0.000	0.002
(149ft to159ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (139ft to149ft)	145.000	0.000	0.0000	0.001	0.000	0.000	0.002
(139ft to149ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	135.000	0.000	0.0000	0.001	0.000	0.000	0.001

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Vertical Bridge Engineering, LLC</p> <p style="text-align: center;">750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:</p>	<p style="text-align: center;">Job</p> <p style="text-align: center;">US-CT-5017</p>	<p style="text-align: center;">Page</p> <p style="text-align: center;">12 of 30</p>
	<p style="text-align: center;">Project</p> <p style="text-align: center;">180' Monopole</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">10:23:23 10/29/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">Verizon Wireless</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Theitman</p>

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (129ft to139ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	125.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (119ft to129ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	115.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (109ft to119ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	105.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (99ft to109ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	95.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (89ft to99ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	85.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (79ft to89ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	75.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (69ft to79ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	65.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (59ft to69ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	55.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (49ft to59ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	45.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (39ft to49ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	35.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (29ft to39ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	25.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (19ft to29ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	15.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (9ft to19ft) CCISeismic (2) b&p database_mike-laptop_1 1 5/8	8.000	0.000	0.0000	0.000	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (5ft to9ft) CCISeismic b&p database_mike-laptop_1 1 5/8	162.500	0.000	0.0000	0.000	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (159ft to164ft) CCISeismic b&p database_mike-laptop_1 1 5/8	155.000	0.000	0.0000	0.001	0.000	0.000	0.001

<p style="text-align: center;"><i>tnxTower</i></p> <p style="text-align: center;">Vertical Bridge Engineering, LLC</p> <p style="text-align: center;">750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:</p>	<p style="text-align: center;">Job</p> <p style="text-align: center;">US-CT-5017</p>	<p style="text-align: center;">Page</p> <p style="text-align: center;">13 of 30</p>
	<p style="text-align: center;">Project</p> <p style="text-align: center;">180' Monopole</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">10:23:23 10/29/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">Verizon Wireless</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Theitman</p>

<i>Description</i>	<i>Elevation</i>	<i>Offset From Centroid</i>	<i>Azimuth Angle</i>	<i>E_v</i>	<i>E_{hx}</i>	<i>E_{hz}</i>	<i>E_h</i>
	<i>ft</i>	<i>ft</i>	<i>°</i>	<i>K</i>	<i>K</i>	<i>K</i>	<i>K</i>
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (149ft to159ft) CCISeismic b&p database_mike-laptop_1 1 5/8	145.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (139ft to149ft) CCISeismic b&p database_mike-laptop_1 1 5/8	135.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (129ft to139ft) CCISeismic b&p database_mike-laptop_1 1 5/8	125.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (119ft to129ft) CCISeismic b&p database_mike-laptop_1 1 5/8	115.000	0.000	0.0000	0.001	0.000	0.000	0.001
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (109ft to119ft) CCISeismic b&p database_mike-laptop_1 1 5/8	105.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (99ft to109ft) CCISeismic b&p database_mike-laptop_1 1 5/8	95.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (89ft to99ft) CCISeismic b&p database_mike-laptop_1 1 5/8	85.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (79ft to89ft) CCISeismic b&p database_mike-laptop_1 1 5/8	75.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (69ft to79ft) CCISeismic b&p database_mike-laptop_1 1 5/8	65.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (59ft to69ft) CCISeismic b&p database_mike-laptop_1 1 5/8	55.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (49ft to59ft) CCISeismic b&p database_mike-laptop_1 1 5/8	45.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (39ft to49ft) CCISeismic b&p database_mike-laptop_1 1 5/8	35.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (29ft to39ft) CCISeismic b&p database_mike-laptop_1 1 5/8	25.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (19ft to29ft) CCISeismic b&p database_mike-laptop_1 1 5/8	15.000	0.000	0.0000	0.001	0.000	0.000	0.000
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (9ft to19ft) CCISeismic b&p database_mike-laptop_1 1 5/8	8.000	0.000	0.0000	0.000	0.000	0.000	0.000

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	14 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Description	Elevation	Offset From Centroid	Azimuth Angle	E _v	E _{hx}	E _{hz}	E _h
	ft	ft	°	K	K	K	K
Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (5ft to9ft)							

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	K	
Lightning Rod 5/8x4'	C	From Leg	0.000	0.0000	180.000	No Ice	0.250	0.250	0.031
			0.000			1/2" Ice	0.664	0.664	0.034
			2.000			1" Ice	0.973	0.973	0.039
						2" Ice	1.494	1.494	0.059

Sector Frames (TMO)	C	None		0.0000	175.000	No Ice	30.000	30.000	2.000
						1/2" Ice	35.000	35.000	3.000
						1" Ice	40.000	40.000	4.000
						2" Ice	50.000	50.000	6.000
APXV18-206517S-C w/ Mount Pipe (TMO)	A	From Leg	4.000	0.0000	175.000	No Ice	5.404	4.700	0.052
			0.000			1/2" Ice	5.960	5.860	0.097
			0.000			1" Ice	6.481	6.734	0.150
						2" Ice	7.547	8.515	0.280
APXV18-206517S-C w/ Mount Pipe (TMO)	B	From Leg	4.000	0.0000	175.000	No Ice	5.404	4.700	0.052
			0.000			1/2" Ice	5.960	5.860	0.097
			0.000			1" Ice	6.481	6.734	0.150
						2" Ice	7.547	8.515	0.280
APXV18-206517S-C w/ Mount Pipe (TMO)	C	From Leg	4.000	0.0000	175.000	No Ice	5.404	4.700	0.052
			0.000			1/2" Ice	5.960	5.860	0.097
			0.000			1" Ice	6.481	6.734	0.150
						2" Ice	7.547	8.515	0.280
(2) LNX-6515DS-A1M w/ pipe mount (TMO)	A	From Leg	4.000	0.0000	175.000	No Ice	8.634	7.305	0.061
			0.000			1/2" Ice	9.295	8.591	0.132
			0.000			1" Ice	9.925	9.728	0.212
						2" Ice	11.122	11.675	0.400
(2) LNX-6515DS-A1M w/ pipe mount (TMO)	B	From Leg	4.000	0.0000	175.000	No Ice	8.634	7.305	0.061
			0.000			1/2" Ice	9.295	8.591	0.132
			0.000			1" Ice	9.925	9.728	0.212
						2" Ice	11.122	11.675	0.400
(2) LNX-6515DS-A1M w/ pipe mount (TMO)	C	From Leg	4.000	0.0000	175.000	No Ice	8.634	7.305	0.061
			0.000			1/2" Ice	9.295	8.591	0.132
			0.000			1" Ice	9.925	9.728	0.212
						2" Ice	11.122	11.675	0.400
(2) RRUS 11 (TMO)	A	From Leg	4.000	0.0000	175.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.071
			0.000			1" Ice	3.207	1.490	0.095
						2" Ice	3.658	1.833	0.153
(2) RRUS 11 (TMO)	B	From Leg	4.000	0.0000	175.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.071
			0.000			1" Ice	3.207	1.490	0.095
						2" Ice	3.658	1.833	0.153
(2) RRUS 11 (TMO)	C	From Leg	4.000	0.0000	175.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.071

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	15 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
			0.000				1" Ice 3.207	1.490	0.095
							2" Ice 3.658	1.833	0.153
1/3 Remaining Reserve Rights (TMO)	A	From Leg	4.000	0.000	0.0000	175.000	No Ice 24.867	24.867	0.265
			0.000				1/2" Ice 29.094	29.094	0.398
			0.000				1" Ice 33.321	33.321	0.531
							2" Ice 41.775	41.775	0.797
1/3 Remaining Reserve Rights (TMO)	B	From Leg	4.000	0.000	0.0000	175.000	No Ice 24.867	24.867	0.265
			0.000				1/2" Ice 29.094	29.094	0.398
			0.000				1" Ice 33.321	33.321	0.531
							2" Ice 41.775	41.775	0.797
1/3 Remaining Reserve Rights (TMO)	C	From Leg	4.000	0.000	0.0000	175.000	No Ice 24.867	24.867	0.265
			0.000				1/2" Ice 29.094	29.094	0.398
			0.000				1" Ice 33.321	33.321	0.531
							2" Ice 41.775	41.775	0.797
*165 Sector Frame (VZW)	A	From Leg	2.000	0.000	0.0000	165.000	No Ice 13.200	9.200	0.738
			0.000				1/2" Ice 19.500	14.600	1.033
			0.000				1" Ice 25.800	19.500	1.328
							2" Ice 38.400	30.800	1.918
Sector Frame (VZW)	B	From Leg	2.000	0.000	0.0000	165.000	No Ice 13.200	9.200	0.738
			0.000				1/2" Ice 19.500	14.600	1.033
			0.000				1" Ice 25.800	19.500	1.328
							2" Ice 38.400	30.800	1.918
Sector Frame (VZW)	C	From Leg	2.000	0.000	0.0000	165.000	No Ice 13.200	9.200	0.738
			0.000				1/2" Ice 19.500	14.600	1.033
			0.000				1" Ice 25.800	19.500	1.328
							2" Ice 38.400	30.800	1.918
NHHSS-65B-R2 BTO w/ MP (96x11.85x7.1) (VZW)	A	From Leg	4.000	0.000	0.0000	165.000	No Ice 11.588	9.793	0.065
			0.000				1/2" Ice 12.306	11.311	0.154
			0.000				1" Ice 13.035	12.854	0.253
							2" Ice 14.406	15.192	0.485
NHHSS-65B-R2 BTO w/ MP (96x11.85x7.1) (VZW)	B	From Leg	4.000	0.000	0.0000	165.000	No Ice 11.588	9.793	0.065
			0.000				1/2" Ice 12.306	11.311	0.154
			0.000				1" Ice 13.035	12.854	0.253
							2" Ice 14.406	15.192	0.485
NHHSS-65B-R2 BTO w/ MP (96x11.85x7.1) (VZW)	C	From Leg	4.000	0.000	0.0000	165.000	No Ice 11.588	9.793	0.065
			0.000				1/2" Ice 12.306	11.311	0.154
			0.000				1" Ice 13.035	12.854	0.253
							2" Ice 14.406	15.192	0.485
MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs) (VZW)	A	From Leg	4.000	0.000	0.0000	165.000	No Ice 5.915	3.743	0.116
			0.000				1/2" Ice 6.728	4.793	0.167
			0.000				1" Ice 7.450	5.696	0.223
							2" Ice 8.695	7.172	0.358
MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs) (VZW)	B	From Leg	4.000	0.000	0.0000	165.000	No Ice 5.915	3.743	0.116
			0.000				1/2" Ice 6.728	4.793	0.167
			0.000				1" Ice 7.450	5.696	0.223
							2" Ice 8.695	7.172	0.358
MT6407-77A w/ Mount Pipe (35.10x16.1x5.51x87.1lbs) (VZW)	C	From Leg	4.000	0.000	0.0000	165.000	No Ice 5.915	3.743	0.116
			0.000				1/2" Ice 6.728	4.793	0.167
			0.000				1" Ice 7.450	5.696	0.223
							2" Ice 8.695	7.172	0.358
B5/B13 RRH-BRO4C RFV01U-D2 (15x15x8.1) (VZW)	A	From Leg	4.000	0.000	0.0000	165.000	No Ice 1.875	1.013	0.070
			0.000				1/2" Ice 2.045	1.145	0.086
			0.000				1" Ice 2.223	1.284	0.106
							2" Ice 2.601	1.585	0.152
B5/B13 RRH-BRO4C RFV01U-D2 (15x15x8.1)	B	From Leg	4.000	0.000	0.0000	165.000	No Ice 1.875	1.013	0.070
			0.000				1/2" Ice 2.045	1.145	0.086

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	16 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight K
(VZW)			0.000			1" Ice 2.223	1.284	0.106
						2" Ice 2.601	1.585	0.152
B5/B13 RRH-BRO4C	C	From Leg	4.000	0.0000	165.000	No Ice 1.875	1.013	0.070
RFV01U-D2 (15x15x8.1)			0.000			1/2" Ice 2.045	1.145	0.086
(VZW)			0.000			1" Ice 2.223	1.284	0.106
						2" Ice 2.601	1.585	0.152
NHH-65B-R2B w/ MP	A	From Leg	4.000	0.0000	165.000	No Ice 11.626	9.793	0.084
(96x11.9x7.1)			0.000			1/2" Ice 12.346	11.311	0.174
(VZW)			0.000			1" Ice 13.074	12.854	0.273
						2" Ice 14.443	15.192	0.506
NHH-65B-R2B w/ MP	B	From Leg	4.000	0.0000	165.000	No Ice 11.626	9.793	0.084
(96x11.9x7.1)			0.000			1/2" Ice 12.346	11.311	0.174
(VZW)			0.000			1" Ice 13.074	12.854	0.273
						2" Ice 14.443	15.192	0.506
NHH-65B-R2B w/ MP	C	From Leg	4.000	0.0000	165.000	No Ice 11.626	9.793	0.084
(96x11.9x7.1)			0.000			1/2" Ice 12.346	11.311	0.174
(VZW)			0.000			1" Ice 13.074	12.854	0.273
						2" Ice 14.443	15.192	0.506
B2/B66a RFV01DU-D1A	A	From Leg	4.000	0.0000	165.000	No Ice 2.054	1.550	0.087
(15.5x15.9x12)			0.000			1/2" Ice 2.232	1.706	0.109
(VZW)			0.000			1" Ice 2.417	1.870	0.133
						2" Ice 2.811	2.220	0.192
B2/B66a RFV01DU-D1A	B	From Leg	4.000	0.0000	165.000	No Ice 2.054	1.550	0.087
(15.5x15.9x12)			0.000			1/2" Ice 2.232	1.706	0.109
(VZW)			0.000			1" Ice 2.417	1.870	0.133
						2" Ice 2.811	2.220	0.192
B2/B66a RFV01DU-D1A	C	From Leg	4.000	0.0000	165.000	No Ice 2.054	1.550	0.087
(15.5x15.9x12)			0.000			1/2" Ice 2.232	1.706	0.109
(VZW)			0.000			1" Ice 2.417	1.870	0.133
						2" Ice 2.811	2.220	0.192
RC3DC-3315-PF-48 (Rect	B	From Leg	4.000	0.0000	165.000	No Ice 3.792	2.512	0.032
28.93x15.73x10.3)			0.000			1/2" Ice 4.044	2.725	0.063
(VZW)			0.000			1" Ice 4.303	2.945	0.099
						2" Ice 4.844	3.414	0.181
RC3DC-3315-PF-48 (Rect	C	From Leg	4.000	0.0000	165.000	No Ice 3.792	2.512	0.032
28.93x15.73x10.3)			0.000			1/2" Ice 4.044	2.725	0.063
(VZW)			0.000			1" Ice 4.303	2.945	0.099
						2" Ice 4.844	3.414	0.181
RT4401-48A	A	From Leg	4.000	0.0000	165.000	No Ice 0.991	0.496	0.019
(13.91x8.55x4.15x18.60lbs)			0.000			1/2" Ice 1.120	0.596	0.026
(VZW)			0.000			1" Ice 1.255	0.704	0.036
						2" Ice 1.549	0.942	0.062
RT4401-48A	B	From Leg	4.000	0.0000	165.000	No Ice 0.991	0.496	0.019
(13.91x8.55x4.15x18.60lbs)			0.000			1/2" Ice 1.120	0.596	0.026
(VZW)			0.000			1" Ice 1.255	0.704	0.036
						2" Ice 1.549	0.942	0.062
RT4401-48A	C	From Leg	4.000	0.0000	165.000	No Ice 0.991	0.496	0.019
(13.91x8.55x4.15x18.60lbs)			0.000			1/2" Ice 1.120	0.596	0.026
(VZW)			0.000			1" Ice 1.255	0.704	0.036
						2" Ice 1.549	0.942	0.062
*155 Dish								
SNP8HR-3xx (0.67 Ka	C	None		0.0000	155.000	No Ice 17.930	17.340	1.472
included)						1/2" Ice 21.040	20.450	1.714
(Dish)						1" Ice 23.830	23.100	2.002
						2" Ice 30.370	29.780	2.440
MX08FRO665-20_V0F w/	A	From Centroid-Le	4.000	0.0000	155.000	No Ice 12.489	5.867	0.054
MP (72x20x8)			0.000			1/2" Ice 12.986	6.325	0.128

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	17 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight K
(Dish)		g	0.000			1" Ice 13.490	6.790	0.208
						2" Ice 14.519	7.743	0.390
MX08FRO665-20_V0F w/ MP (72x20x8)	B	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 12.489	5.867	0.054
(Dish)		g	0.000			1/2" Ice 12.986	6.325	0.128
						1" Ice 13.490	6.790	0.208
						2" Ice 14.519	7.743	0.390
MX08FRO665-20_V0F w/ MP (72x20x8)	C	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 12.489	5.867	0.054
(Dish)		g	0.000			1/2" Ice 12.986	6.325	0.128
						1" Ice 13.490	6.790	0.208
						2" Ice 14.519	7.743	0.390
TA08025-B604 (15.75x14.96x7.87)	A	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 1.964	1.033	0.063
(Dish)		g	0.000			1/2" Ice 2.138	1.168	0.080
						1" Ice 2.320	1.310	0.099
						2" Ice 2.705	1.617	0.147
TA08025-B604 (15.75x14.96x7.87)	B	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 1.964	1.033	0.063
(Dish)		g	0.000			1/2" Ice 2.138	1.168	0.080
						1" Ice 2.320	1.310	0.099
						2" Ice 2.705	1.617	0.147
TA08025-B604 (15.75x14.96x7.87)	C	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 1.964	1.033	0.063
(Dish)		g	0.000			1/2" Ice 2.138	1.168	0.080
						1" Ice 2.320	1.310	0.099
						2" Ice 2.705	1.617	0.147
TA08025-B605 (15.75x14.96x9.06)	A	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 1.964	1.189	0.075
(Dish)		g	0.000			1/2" Ice 2.138	1.331	0.093
						1" Ice 2.320	1.480	0.114
						2" Ice 2.705	1.800	0.164
TA08025-B605 (15.75x14.96x9.06)	B	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 1.964	1.189	0.075
(Dish)		g	0.000			1/2" Ice 2.138	1.331	0.093
						1" Ice 2.320	1.480	0.114
						2" Ice 2.705	1.800	0.164
TA08025-B605 (15.75x14.96x9.06)	C	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 1.964	1.189	0.075
(Dish)		g	0.000			1/2" Ice 2.138	1.331	0.093
						1" Ice 2.320	1.480	0.114
						2" Ice 2.705	1.800	0.164
RDIDC-9181-PF-48 (16x14x8)	C	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 1.867	1.067	0.022
(Dish)		g	0.000			1/2" Ice 2.037	1.204	0.038
						1" Ice 2.215	1.348	0.057
						2" Ice 2.593	1.659	0.104
1/3 Remaining Reserve Rights (Dish)	A	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 5.774	5.774	0.062
		g	0.000			1/2" Ice 6.755	6.755	0.092
						1" Ice 7.736	7.736	0.122
						2" Ice 9.698	9.698	0.182
1/3 Remaining Reserve Rights (Dish)	B	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 5.774	5.774	0.062
		g	0.000			1/2" Ice 6.755	6.755	0.092
						1" Ice 7.736	7.736	0.122
						2" Ice 9.698	9.698	0.182
1/3 Remaining Reserve Rights (Dish)	C	From Centroid-Le	4.000 0.000	0.0000	155.000	No Ice 5.774	5.774	0.062
		g	0.000			1/2" Ice 6.755	6.755	0.092
						1" Ice 7.736	7.736	0.122
						2" Ice 9.698	9.698	0.182

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job US-CT-5017	Page 18 of 30
	Project 180' Monopole	Date 10:23:23 10/29/21
	Client Verizon Wireless	Designed by Theitman

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz	Lateral Vert						
				ft	°	°	ft	ft	ft ²	K	
VHLP1-23 (TMO)	C	Paraboloid w/Radome	From Leg	4.000 0.000 0.000	0.0000		175.000	1.275	No Ice 1/2" Ice 1" Ice 2" Ice	1.277 1.449 1.621 1.966	0.014 0.021 0.029 0.044

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	19 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

<i>Comb. No.</i>	<i>Description</i>
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service
51	1.2 Dead+1.0 Ev+1.0 Eh 0 deg
52	0.9 Dead-1.0 Ev+1.0 Eh 0 deg
53	1.2 Dead+1.0 Ev+1.0 Eh 30 deg
54	0.9 Dead-1.0 Ev+1.0 Eh 30 deg
55	1.2 Dead+1.0 Ev+1.0 Eh 60 deg
56	0.9 Dead-1.0 Ev+1.0 Eh 60 deg
57	1.2 Dead+1.0 Ev+1.0 Eh 90 deg
58	0.9 Dead-1.0 Ev+1.0 Eh 90 deg
59	1.2 Dead+1.0 Ev+1.0 Eh 120 deg
60	0.9 Dead-1.0 Ev+1.0 Eh 120 deg
61	1.2 Dead+1.0 Ev+1.0 Eh 150 deg
62	0.9 Dead-1.0 Ev+1.0 Eh 150 deg
63	1.2 Dead+1.0 Ev+1.0 Eh 180 deg
64	0.9 Dead-1.0 Ev+1.0 Eh 180 deg
65	1.2 Dead+1.0 Ev+1.0 Eh 210 deg
66	0.9 Dead-1.0 Ev+1.0 Eh 210 deg
67	1.2 Dead+1.0 Ev+1.0 Eh 240 deg
68	0.9 Dead-1.0 Ev+1.0 Eh 240 deg
69	1.2 Dead+1.0 Ev+1.0 Eh 270 deg
70	0.9 Dead-1.0 Ev+1.0 Eh 270 deg
71	1.2 Dead+1.0 Ev+1.0 Eh 300 deg
72	0.9 Dead-1.0 Ev+1.0 Eh 300 deg
73	1.2 Dead+1.0 Ev+1.0 Eh 330 deg
74	0.9 Dead-1.0 Ev+1.0 Eh 330 deg

Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	180 - 142.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-33.782	0.588	-1.694
			Max. Mx	8	-12.415	-471.801	-0.138
			Max. My	14	-12.433	0.246	-470.016
			Max. Vy	8	23.107	-471.801	-0.138
			Max. Vx	2	-23.008	-0.218	469.829
			Max. Torque	11			-0.859
L2	142.5 - 93.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.445	0.605	-2.643
			Max. Mx	8	-21.999	-1692.190	0.546
			Max. My	2	-22.008	-1.400	1685.401
			Max. Vy	8	28.779	-1692.190	0.546
			Max. Vx	2	-28.680	-1.400	1685.401
			Max. Torque	11			-0.858
L3	93.25 - 46	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-67.545	0.605	-3.733
			Max. Mx	8	-36.914	-3141.811	1.168
			Max. My	2	-36.919	-2.537	3130.371
			Max. Vy	8	35.344	-3141.811	1.168
			Max. Vx	2	-35.246	-2.537	3130.371
			Max. Torque	11			-0.856
L4	46 - 1	Pole	Max Tension	1	0.000	0.000	0.000

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	20 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-97.423	0.605	-5.085
			Max. M _x	8	-59.980	-5229.371	1.871
			Max. M _y	2	-59.980	-3.857	5212.522
			Max. V _y	8	42.764	-5229.371	1.871
			Max. V _x	2	-42.669	-3.857	5212.522
			Max. Torque	11			-0.854

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	97.423	0.002	-11.474
	Max. H _x	20	60.001	42.714	-0.018
	Max. H _z	2	60.001	-0.024	42.640
	Max. M _x	2	5212.522	-0.024	42.640
	Max. M _z	8	5229.371	-42.735	0.018
	Max. Torsion	23	0.814	36.969	21.298
	Min. Vert	64	43.154	0.000	-1.500
	Min. H _x	8	60.001	-42.735	0.018
	Min. H _z	14	60.001	0.014	-42.620
	Min. M _x	14	-5211.042	0.014	-42.620
	Min. M _z	20	-5226.001	42.714	-0.018
	Min. Torsion	11	-0.854	-36.991	-21.299

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	50.001	0.000	0.000	0.813	0.156	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	60.001	0.024	-42.640	-5212.522	-3.857	-0.361
0.9 Dead+1.0 Wind 0 deg - No Ice	45.001	0.024	-42.640	-5172.458	-3.874	-0.361
1.2 Dead+1.0 Wind 30 deg - No Ice	60.001	21.383	-36.949	-4517.741	-2617.096	0.041
0.9 Dead+1.0 Wind 30 deg - No Ice	45.001	21.383	-36.949	-4483.043	-2596.892	0.043
1.2 Dead+1.0 Wind 60 deg - No Ice	60.001	37.017	-21.342	-2609.437	-4530.000	0.491
0.9 Dead+1.0 Wind 60 deg - No Ice	45.001	37.017	-21.342	-2589.502	-4494.994	0.493
1.2 Dead+1.0 Wind 90 deg - No Ice	60.001	42.735	-0.018	-1.871	-5229.371	0.810
0.9 Dead+1.0 Wind 90 deg - No Ice	45.001	42.735	-0.018	-2.108	-5188.959	0.812
1.2 Dead+1.0 Wind 120 deg - No Ice	60.001	36.991	21.299	2604.262	-4525.642	0.852
0.9 Dead+1.0 Wind 120 deg - No Ice	45.001	36.991	21.299	2583.866	-4490.673	0.854
1.2 Dead+1.0 Wind 150 deg - No Ice	60.001	21.345	36.899	4511.136	-2610.871	0.653

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Vertical Bridge Engineering, LLC</p> <p style="text-align: center;">750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:</p>	<p style="text-align: center;">Job</p> <p style="text-align: center;">US-CT-5017</p>	<p style="text-align: center;">Page</p> <p style="text-align: center;">21 of 30</p>
	<p style="text-align: center;">Project</p> <p style="text-align: center;">180' Monopole</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">10:23:23 10/29/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">Verizon Wireless</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Theitman</p>

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 150 deg - No Ice	45.001	21.345	36.899	4475.992	-2590.719	0.654
1.2 Dead+1.0 Wind 180 deg - No Ice	60.001	-0.014	42.620	5211.042	2.299	0.321
0.9 Dead+1.0 Wind 180 deg - No Ice	45.001	-0.014	42.620	5170.487	2.230	0.320
1.2 Dead+1.0 Wind 210 deg - No Ice	60.001	-21.372	36.931	4516.524	2615.577	-0.076
0.9 Dead+1.0 Wind 210 deg - No Ice	45.001	-21.372	36.931	4481.332	2595.287	-0.077
1.2 Dead+1.0 Wind 240 deg - No Ice	60.001	-37.006	21.336	2610.297	4528.382	-0.491
0.9 Dead+1.0 Wind 240 deg - No Ice	45.001	-37.006	21.336	2589.850	4493.290	-0.493
1.2 Dead+1.0 Wind 270 deg - No Ice	60.001	-42.714	0.018	3.855	5226.001	-0.775
0.9 Dead+1.0 Wind 270 deg - No Ice	45.001	-42.714	0.018	3.571	5185.520	-0.777
1.2 Dead+1.0 Wind 300 deg - No Ice	60.001	-36.969	-21.298	-2602.178	4522.024	-0.812
0.9 Dead+1.0 Wind 300 deg - No Ice	45.001	-36.969	-21.298	-2582.304	4486.988	-0.814
1.2 Dead+1.0 Wind 330 deg - No Ice	60.001	-21.328	-36.909	-4510.917	2608.139	-0.653
0.9 Dead+1.0 Wind 330 deg - No Ice	45.001	-21.328	-36.909	-4476.277	2587.913	-0.654
1.2 Dead+1.0 Ice+1.0 Temp	97.423	-0.000	0.000	5.085	0.605	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	97.423	0.005	-11.478	-1428.197	-0.210	-0.093
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	97.423	5.751	-9.945	-1236.983	-718.200	-0.006
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	97.423	9.957	-5.744	-712.212	-1243.816	0.097
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	97.423	11.496	-0.003	4.781	-1436.062	0.174
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	97.423	9.952	5.735	721.378	-1242.879	0.190
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	97.423	5.744	9.934	1245.686	-716.906	0.152
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	97.423	-0.002	11.474	1438.025	1.024	0.083
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	97.423	-5.749	9.941	1246.877	719.021	-0.002
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	97.423	-9.955	5.742	722.622	1244.613	-0.097
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	97.423	-11.491	0.003	5.908	1436.425	-0.165
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	97.423	-9.947	-5.735	-710.664	1243.182	-0.180
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	97.423	-5.739	-9.937	-1235.435	717.431	-0.152
Dead+Wind 0 deg - Service	50.001	0.005	-8.790	-1069.454	-0.667	-0.075
Dead+Wind 30 deg - Service	50.001	4.408	-7.617	-926.823	-537.145	0.009
Dead+Wind 60 deg - Service	50.001	7.631	-4.400	-535.064	-929.852	0.103
Dead+Wind 90 deg - Service	50.001	8.810	-0.004	0.251	-1073.430	0.169
Dead+Wind 120 deg - Service	50.001	7.626	4.391	535.271	-928.955	0.178
Dead+Wind 150 deg - Service	50.001	4.400	7.607	926.733	-535.864	0.136
Dead+Wind 180 deg - Service	50.001	-0.003	8.786	1070.419	0.596	0.067
Dead+Wind 210 deg - Service	50.001	-4.406	7.613	927.842	537.081	-0.016
Dead+Wind 240 deg - Service	50.001	-7.629	4.398	536.510	929.767	-0.103
Dead+Wind 270 deg - Service	50.001	-8.805	0.004	1.427	1072.985	-0.162

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	22 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 300 deg - Service	50.001	-7.621	-4.391	-533.571	928.459	-0.169
Dead+Wind 330 deg - Service	50.001	-4.397	-7.609	-925.418	535.553	-0.136
1.2 Dead+1.0 Ev+1.0 Eh 0 deg	61.847	0.000	-1.500	-216.680	0.201	-0.000
0.9 Dead-1.0 Ev+1.0 Eh 0 deg	43.154	0.000	-1.500	-214.781	0.147	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 30 deg	61.847	0.750	-1.299	-187.513	-108.649	-0.000
0.9 Dead-1.0 Ev+1.0 Eh 30 deg	43.154	0.750	-1.299	-185.905	-107.621	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 60 deg	61.847	1.299	-0.750	-107.830	-188.333	-0.000
0.9 Dead-1.0 Ev+1.0 Eh 60 deg	43.154	1.299	-0.750	-107.013	-186.512	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 90 deg	61.847	1.500	0.000	1.020	-217.499	-0.000
0.9 Dead-1.0 Ev+1.0 Eh 90 deg	43.154	1.500	0.000	0.755	-215.389	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 120 deg	61.847	1.299	0.750	109.871	-188.333	-0.000
0.9 Dead-1.0 Ev+1.0 Eh 120 deg	43.154	1.299	0.750	108.523	-186.512	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 150 deg	61.847	0.750	1.299	189.554	-108.649	-0.000
0.9 Dead-1.0 Ev+1.0 Eh 150 deg	43.154	0.750	1.299	187.414	-107.621	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 180 deg	61.847	0.000	1.500	218.721	0.201	0.000
0.9 Dead-1.0 Ev+1.0 Eh 180 deg	43.154	0.000	1.500	216.291	0.147	0.000
1.2 Dead+1.0 Ev+1.0 Eh 210 deg	61.847	-0.750	1.299	189.554	109.051	0.000
0.9 Dead-1.0 Ev+1.0 Eh 210 deg	43.154	-0.750	1.299	187.414	107.915	0.000
1.2 Dead+1.0 Ev+1.0 Eh 240 deg	61.847	-1.299	0.750	109.871	188.735	0.000
0.9 Dead-1.0 Ev+1.0 Eh 240 deg	43.154	-1.299	0.750	108.523	186.807	0.000
1.2 Dead+1.0 Ev+1.0 Eh 270 deg	61.847	-1.500	0.000	1.020	217.901	0.000
0.9 Dead-1.0 Ev+1.0 Eh 270 deg	43.154	-1.500	0.000	0.755	215.683	0.000
1.2 Dead+1.0 Ev+1.0 Eh 300 deg	61.847	-1.299	-0.750	-107.830	188.735	0.000
0.9 Dead-1.0 Ev+1.0 Eh 300 deg	43.154	-1.299	-0.750	-107.013	186.807	0.000
1.2 Dead+1.0 Ev+1.0 Eh 330 deg	61.847	-0.750	-1.299	-187.513	109.051	0.000
0.9 Dead-1.0 Ev+1.0 Eh 330 deg	43.154	-0.750	-1.299	-185.905	107.915	0.000

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-50.001	0.000	0.000	50.001	0.000	0.000%
2	0.024	-60.001	-42.640	-0.024	60.001	42.640	0.000%
3	0.024	-45.001	-42.640	-0.024	45.001	42.640	0.000%
4	21.383	-60.001	-36.949	-21.383	60.001	36.949	0.000%
5	21.383	-45.001	-36.949	-21.383	45.001	36.949	0.000%
6	37.017	-60.001	-21.342	-37.017	60.001	21.342	0.000%
7	37.017	-45.001	-21.342	-37.017	45.001	21.342	0.000%
8	42.735	-60.001	-0.018	-42.735	60.001	0.018	0.000%
9	42.735	-45.001	-0.018	-42.735	45.001	0.018	0.000%
10	36.991	-60.001	21.299	-36.991	60.001	-21.299	0.000%

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Vertical Bridge Engineering, LLC</p> <p style="text-align: center;">750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:</p>	Job	US-CT-5017	Page	23 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
11	36.991	-45.001	21.299	-36.991	45.001	-21.299	0.000%
12	21.345	-60.001	36.899	-21.345	60.001	-36.899	0.000%
13	21.345	-45.001	36.899	-21.345	45.001	-36.899	0.000%
14	-0.014	-60.001	42.620	0.014	60.001	-42.620	0.000%
15	-0.014	-45.001	42.620	0.014	45.001	-42.620	0.000%
16	-21.372	-60.001	36.931	21.372	60.001	-36.931	0.000%
17	-21.372	-45.001	36.931	21.372	45.001	-36.931	0.000%
18	-37.006	-60.001	21.336	37.006	60.001	-21.336	0.000%
19	-37.006	-45.001	21.336	37.006	45.001	-21.336	0.000%
20	-42.714	-60.001	0.018	42.714	60.001	-0.018	0.000%
21	-42.714	-45.001	0.018	42.714	45.001	-0.018	0.000%
22	-36.969	-60.001	-21.298	36.969	60.001	21.298	0.000%
23	-36.969	-45.001	-21.298	36.969	45.001	21.298	0.000%
24	-21.328	-60.001	-36.909	21.328	60.001	36.909	0.000%
25	-21.328	-45.001	-36.909	21.328	45.001	36.909	0.000%
26	0.000	-97.423	0.000	0.000	97.423	-0.000	0.000%
27	0.005	-97.423	-11.478	-0.005	97.423	11.478	0.000%
28	5.751	-97.423	-9.945	-5.751	97.423	9.945	0.000%
29	9.957	-97.423	-5.744	-9.957	97.423	5.744	0.000%
30	11.496	-97.423	-0.003	-11.496	97.423	0.003	0.000%
31	9.952	-97.423	5.735	-9.952	97.423	-5.735	0.000%
32	5.744	-97.423	9.934	-5.744	97.423	-9.934	0.000%
33	-0.002	-97.423	11.474	0.002	97.423	-11.474	0.000%
34	-5.749	-97.423	9.941	5.749	97.423	-9.941	0.000%
35	-9.955	-97.423	5.742	9.955	97.423	-5.742	0.000%
36	-11.491	-97.423	0.003	11.491	97.423	-0.003	0.000%
37	-9.947	-97.423	-5.735	9.947	97.423	5.735	0.000%
38	-5.739	-97.423	-9.937	5.739	97.423	9.937	0.000%
39	0.005	-50.001	-8.790	-0.005	50.001	8.790	0.000%
40	4.408	-50.001	-7.617	-4.408	50.001	7.617	0.000%
41	7.631	-50.001	-4.400	-7.631	50.001	4.400	0.000%
42	8.810	-50.001	-0.004	-8.810	50.001	0.004	0.000%
43	7.626	-50.001	4.391	-7.626	50.001	-4.391	0.000%
44	4.400	-50.001	7.607	-4.400	50.001	-7.607	0.000%
45	-0.003	-50.001	8.786	0.003	50.001	-8.786	0.000%
46	-4.406	-50.001	7.613	4.406	50.001	-7.613	0.000%
47	-7.629	-50.001	4.398	7.629	50.001	-4.398	0.000%
48	-8.805	-50.001	0.004	8.805	50.001	-0.004	0.000%
49	-7.621	-50.001	-4.391	7.621	50.001	4.391	0.000%
50	-4.397	-50.001	-7.609	4.397	50.001	7.609	0.000%
51	0.000	-61.847	-1.500	0.000	61.847	1.500	0.000%
52	0.000	-43.154	-1.500	0.000	43.154	1.500	0.000%
53	0.750	-61.847	-1.299	-0.750	61.847	1.299	0.000%
54	0.750	-43.154	-1.299	-0.750	43.154	1.299	0.000%
55	1.299	-61.847	-0.750	-1.299	61.847	0.750	0.000%
56	1.299	-43.154	-0.750	-1.299	43.154	0.750	0.000%
57	1.500	-61.847	0.000	-1.500	61.847	0.000	0.000%
58	1.500	-43.154	0.000	-1.500	43.154	0.000	0.000%
59	1.299	-61.847	0.750	-1.299	61.847	-0.750	0.000%
60	1.299	-43.154	0.750	-1.299	43.154	-0.750	0.000%
61	0.750	-61.847	1.299	-0.750	61.847	-1.299	0.000%
62	0.750	-43.154	1.299	-0.750	43.154	-1.299	0.000%
63	0.000	-61.847	1.500	0.000	61.847	-1.500	0.000%
64	0.000	-43.154	1.500	0.000	43.154	-1.500	0.000%
65	-0.750	-61.847	1.299	0.750	61.847	-1.299	0.000%
66	-0.750	-43.154	1.299	0.750	43.154	-1.299	0.000%
67	-1.299	-61.847	0.750	1.299	61.847	-0.750	0.000%
68	-1.299	-43.154	0.750	1.299	43.154	-0.750	0.000%
69	-1.500	-61.847	0.000	1.500	61.847	0.000	0.000%
70	-1.500	-43.154	0.000	1.500	43.154	0.000	0.000%
71	-1.299	-61.847	-0.750	1.299	61.847	0.750	0.000%

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	24 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
72	-1.299	-43.154	-0.750	1.299	43.154	0.750	0.000%
73	-0.750	-61.847	-1.299	0.750	61.847	1.299	0.000%
74	-0.750	-43.154	-1.299	0.750	43.154	1.299	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	4	0.0000001	0.00012907
3	Yes	4	0.0000001	0.00006029
4	Yes	5	0.0000001	0.00031166
5	Yes	5	0.0000001	0.00013251
6	Yes	5	0.0000001	0.00030909
7	Yes	5	0.0000001	0.00013125
8	Yes	4	0.0000001	0.00021740
9	Yes	4	0.0000001	0.00012439
10	Yes	5	0.0000001	0.00031516
11	Yes	5	0.0000001	0.00013424
12	Yes	5	0.0000001	0.00030706
13	Yes	5	0.0000001	0.00013045
14	Yes	4	0.0000001	0.00013831
15	Yes	4	0.0000001	0.00006756
16	Yes	5	0.0000001	0.00031088
17	Yes	5	0.0000001	0.00013213
18	Yes	5	0.0000001	0.00031423
19	Yes	5	0.0000001	0.00013366
20	Yes	4	0.0000001	0.00023098
21	Yes	4	0.0000001	0.00013331
22	Yes	5	0.0000001	0.00030610
23	Yes	5	0.0000001	0.00013001
24	Yes	5	0.0000001	0.00031320
25	Yes	5	0.0000001	0.00013345
26	Yes	4	0.0000001	0.00001251
27	Yes	5	0.0000001	0.00021982
28	Yes	5	0.0000001	0.00026721
29	Yes	5	0.0000001	0.00026713
30	Yes	5	0.0000001	0.00022141
31	Yes	5	0.0000001	0.00027059
32	Yes	5	0.0000001	0.00026919
33	Yes	5	0.0000001	0.00022217
34	Yes	5	0.0000001	0.00027073
35	Yes	5	0.0000001	0.00027133
36	Yes	5	0.0000001	0.00022179
37	Yes	5	0.0000001	0.00026681
38	Yes	5	0.0000001	0.00026756
39	Yes	4	0.0000001	0.00002817
40	Yes	4	0.0000001	0.00010733
41	Yes	4	0.0000001	0.00010447
42	Yes	4	0.0000001	0.00002122
43	Yes	4	0.0000001	0.00011249
44	Yes	4	0.0000001	0.00010350
45	Yes	4	0.0000001	0.00001886
46	Yes	4	0.0000001	0.00010712
47	Yes	4	0.0000001	0.00011081
48	Yes	4	0.0000001	0.00002112

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job US-CT-5017	Page 25 of 30
	Project 180' Monopole	Date 10:23:23 10/29/21
	Client Verizon Wireless	Designed by Theitman

49	Yes	4	0.00000001	0.00010236
50	Yes	4	0.00000001	0.00011230
51	Yes	4	0.00000001	0.00000591
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000650
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000651
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000593
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000658
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000659
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000596
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000662
66	Yes	4	0.00000001	0.00000001
67	Yes	4	0.00000001	0.00000661
68	Yes	4	0.00000001	0.00000001
69	Yes	4	0.00000001	0.00000596
70	Yes	4	0.00000001	0.00000001
71	Yes	4	0.00000001	0.00000654
72	Yes	4	0.00000001	0.00000001
73	Yes	4	0.00000001	0.00000653
74	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 142.5	20.662	47	1.1534	0.0014
L2	146.75 - 93.25	13.038	47	0.9622	0.0007
L3	99.5 - 46	5.472	47	0.5545	0.0002
L4	54.25 - 1	1.543	47	0.2677	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.000	Lightning Rod 5/8x4'	47	20.662	1.1534	0.0014	37265
176.250	CCISEismic Tower Section 1 - 1	47	19.758	1.1346	0.0013	37265
175.000	VHLP1-23	47	19.458	1.1284	0.0013	37265
172.500	CCISEismic (3) b&p	47	18.858	1.1157	0.0012	24843
	database_mike-laptop_1 1 5/8					
	Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (169ft to174ft)					
167.500	CCISEismic Tower Section 1 - 2	47	17.669	1.0897	0.0011	14906
165.000	Sector Frame	47	17.081	1.0763	0.0011	12421
162.500	CCISEismic (2) b&p	47	16.499	1.0625	0.0010	10647
	database_mike-laptop_1 1 5/8					
	Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (159ft to164ft)					
157.500	CCISEismic Tower Section 1 - 3	47	15.358	1.0334	0.0009	8281

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job	US-CT-5017	Page	26 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
155.000	SNP8HR-3xx (0.67 Ka included)	47	14.801	1.0180	0.0008	7452
147.500	CCISeismic Tower Section 1 - 4	47	13.193	0.9676	0.0007	5844
145.000	CCISeismic Tower Section 2 - 1	47	12.682	0.9492	0.0006	5716
138.250	CCISeismic Tower Section 2 - 2	47	11.367	0.8958	0.0005	5931
135.000	CCISeismic b&p	47	10.767	0.8685	0.0005	6067
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (129ft to139ft)					
128.250	CCISeismic Tower Section 2 - 3	47	9.587	0.8092	0.0004	6371
125.000	CCISeismic b&p	47	9.050	0.7799	0.0004	6528
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (119ft to129ft)					
118.250	CCISeismic Tower Section 2 - 4	47	7.996	0.7184	0.0003	6881
115.000	CCISeismic b&p	47	7.517	0.6888	0.0003	7065
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (109ft to119ft)					
108.250	CCISeismic Tower Section 2 - 5	47	6.579	0.6284	0.0003	7480
105.000	CCISeismic b&p	47	6.154	0.6002	0.0002	7698
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (99ft to109ft)					
98.250	CCISeismic Tower Section 2 - 6	47	5.323	0.5445	0.0002	8081
97.750	CCISeismic Tower Section 3 - 1	47	5.264	0.5406	0.0002	8093
95.000	CCISeismic b&p	47	4.947	0.5193	0.0002	8128
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (89ft to99ft)					
91.000	CCISeismic Tower Section 3 - 2	47	4.506	0.4897	0.0002	8158
85.000	CCISeismic b&p	47	3.888	0.4479	0.0002	8203
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (79ft to89ft)					
81.000	CCISeismic Tower Section 3 - 3	47	3.506	0.4215	0.0001	8233
75.000	CCISeismic b&p	47	2.975	0.3841	0.0001	8279
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (69ft to79ft)					
71.000	CCISeismic Tower Section 3 - 4	47	2.651	0.3603	0.0001	8309
65.000	CCISeismic b&p	47	2.208	0.3261	0.0001	8355
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (59ft to69ft)					
61.000	CCISeismic Tower Section 3 - 5	47	1.941	0.3040	0.0001	8386
55.000	CCISeismic b&p	47	1.584	0.2717	0.0001	8511
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (49ft to59ft)					
52.625	CCISeismic Tower Section 4 - 1	47	1.456	0.2591	0.0001	8746
51.000	CCISeismic Tower Section 3 - 6	47	1.374	0.2506	0.0001	8994
46.000	CCISeismic Tower Section 4 - 2	47	1.141	0.2245	0.0001	9986
45.000	CCISeismic b&p	47	1.098	0.2193	0.0001	10213
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (39ft to49ft)					
36.000	CCISeismic Tower Section 4 - 3	42	0.763	0.1732	0.0000	12839
35.000	CCISeismic b&p	42	0.731	0.1682	0.0000	13217
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (29ft to39ft)					
26.000	CCISeismic Tower Section 4 - 4	42	0.478	0.1230	0.0000	17975
25.000	CCISeismic b&p	42	0.454	0.1180	0.0000	18724
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (19ft to29ft)					
16.000	CCISeismic Tower Section 4 - 5	42	0.260	0.0735	0.0000	29958
15.000	CCISeismic b&p	42	0.241	0.0686	0.0000	32098
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (9ft to19ft)					
8.000	CCISeismic b&p	42	0.116	0.0342	0.0000	64195
	database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (5ft to9ft)					

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job US-CT-5017	Page 27 of 30
	Project 180' Monopole	Date 10:23:23 10/29/21
	Client Verizon Wireless	Designed by Theitman

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
6.000	CCISeismic Tower Section 4 - 6	42	0.082	0.0245	0.0000	89874

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 142.5	100.641	8	5.6180	0.0069
L2	146.75 - 93.25	63.540	8	4.6909	0.0033
L3	99.5 - 46	26.672	8	2.7038	0.0010
L4	54.25 - 1	7.518	8	1.3051	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.000	Lightning Rod 5/8x4'	8	100.641	5.6180	0.0069	7794
176.250	CCISeismic Tower Section 1 - 1	8	96.244	5.5274	0.0065	7794
175.000	VHLP1-23	8	94.781	5.4970	0.0063	7794
172.500	CCISeismic (3) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 174 (169ft to174ft)	8	91.863	5.4357	0.0060	5196
167.500	CCISeismic Tower Section 1 - 2	8	86.076	5.3099	0.0054	3116
165.000	Sector Frame	8	83.216	5.2448	0.0051	2596
162.500	CCISeismic (2) b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 5 to 164 (159ft to164ft)	8	80.386	5.1778	0.0049	2225
157.500	CCISeismic Tower Section 1 - 3	8	74.833	5.0366	0.0043	1729
155.000	SNP8HR-3xx (0.67 Ka included)	8	72.120	4.9619	0.0041	1555
147.500	CCISeismic Tower Section 1 - 4	8	64.293	4.7173	0.0034	1218
145.000	CCISeismic Tower Section 2 - 1	8	61.804	4.6279	0.0031	1191
138.250	CCISeismic Tower Section 2 - 2	8	55.402	4.3679	0.0026	1233
135.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (129ft to139ft)	8	52.480	4.2347	0.0024	1260
128.250	CCISeismic Tower Section 2 - 3	8	46.732	3.9461	0.0020	1321
125.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (119ft to129ft)	8	44.115	3.8033	0.0019	1352
118.250	CCISeismic Tower Section 2 - 4	8	38.978	3.5032	0.0016	1423
115.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (109ft to119ft)	8	36.644	3.3589	0.0015	1460
108.250	CCISeismic Tower Section 2 - 5	8	32.072	3.0644	0.0012	1543
105.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (99ft to109ft)	8	29.999	2.9270	0.0012	1586
98.250	CCISeismic Tower Section 2 - 6	8	25.947	2.6551	0.0010	1663
97.750	CCISeismic Tower Section 3 - 1	8	25.660	2.6359	0.0010	1665

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job US-CT-5017	Page 28 of 30
	Project 180' Monopole	Date 10:23:23 10/29/21
	Client Verizon Wireless	Designed by Theitman

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
95.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (89ft to99ft)	8	24.114	2.5322	0.0009	1672
91.000	CCISeismic Tower Section 3 - 2	8	21.963	2.3876	0.0008	1678
85.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (79ft to89ft)	8	18.952	2.1837	0.0007	1686
81.000	CCISeismic Tower Section 3 - 3	8	17.087	2.0553	0.0007	1692
75.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (69ft to79ft)	8	14.503	1.8727	0.0006	1701
71.000	CCISeismic Tower Section 3 - 4	8	12.921	1.7567	0.0005	1707
65.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (59ft to69ft)	8	10.760	1.5896	0.0005	1716
61.000	CCISeismic Tower Section 3 - 5	8	9.460	1.4819	0.0004	1722
55.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (49ft to59ft)	8	7.718	1.3245	0.0004	1747
52.625	CCISeismic Tower Section 4 - 1	8	7.098	1.2632	0.0003	1795
51.000	CCISeismic Tower Section 3 - 6	8	6.695	1.2214	0.0003	1846
46.000	CCISeismic Tower Section 4 - 2	8	5.562	1.0942	0.0003	2049
45.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (39ft to49ft)	8	5.353	1.0689	0.0003	2096
36.000	CCISeismic Tower Section 4 - 3	8	3.718	0.8443	0.0002	2635
35.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (29ft to39ft)	8	3.561	0.8197	0.0002	2712
26.000	CCISeismic Tower Section 4 - 4	8	2.331	0.5995	0.0001	3688
25.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (19ft to29ft)	8	2.212	0.5752	0.0001	3842
16.000	CCISeismic Tower Section 4 - 5	8	1.268	0.3583	0.0001	6146
15.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (9ft to19ft)	8	1.175	0.3343	0.0001	6585
8.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 5 to 179 (5ft to9ft)	8	0.565	0.1669	0.0000	13170
6.000	CCISeismic Tower Section 4 - 6	8	0.401	0.1192	0.0000	18438

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 142.5 (1)	TP30.28x18.75x0.25	37.500	179.000	210.7	22.7919	-12.415	116.032	0.107
L2	142.5 - 93.25 (2)	TP44.93x28.4733x0.375	53.500	179.000	141.9	50.7433	-21.999	569.099	0.039
L3	93.25 - 46 (3)	TP58.7x42.2575x0.4375	53.500	179.000	108.6	77.3839	-36.914	1482.890	0.025
L4	46 - 1 (4)	TP71.67x55.2895x0.4375	53.250	179.000	84.9	98.9152	-59.980	2914.510	0.021

tnxTower Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:	Job US-CT-5017	Page 29 of 30
	Project 180' Monopole	Date 10:23:23 10/29/21
	Client Verizon Wireless	Designed by Theitman

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
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Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	180 - 142.5 (1)	TP30.28x18.75x0.25	471.801	949.625	0.497	0.000	949.625	0.000
L2	142.5 - 93.25 (2)	TP44.93x28.4733x0.375	1692.192	3147.725	0.538	0.000	3147.725	0.000
L3	93.25 - 46 (3)	TP58.7x42.2575x0.4375	3141.808	6054.425	0.519	0.000	6054.425	0.000
L4	46 - 1 (4)	TP71.67x55.2895x0.4375	5229.375	8950.833	0.584	0.000	8950.833	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u kip-ft	φT _n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	180 - 142.5 (1)	TP30.28x18.75x0.25	23.107	399.998	0.058	0.814	1006.175	0.001
L2	142.5 - 93.25 (2)	TP44.93x28.4733x0.375	28.779	890.545	0.032	0.811	3324.883	0.000
L3	93.25 - 46 (3)	TP58.7x42.2575x0.4375	35.344	1358.090	0.026	0.810	6627.858	0.000
L4	46 - 1 (4)	TP71.67x55.2895x0.4375	42.764	1735.960	0.025	0.810	10829.250	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 142.5 (1)	0.107	0.497	0.000	0.058	0.001	0.607	1.000	4.8.2 ✓
L2	142.5 - 93.25 (2)	0.039	0.538	0.000	0.032	0.000	0.577	1.000	4.8.2 ✓
L3	93.25 - 46 (3)	0.025	0.519	0.000	0.026	0.000	0.545	1.000	4.8.2 ✓
L4	46 - 1 (4)	0.021	0.584	0.000	0.025	0.000	0.605	1.000	4.8.2 ✓

Section Capacity Table

<p><i>tnxTower</i></p> <p>Vertical Bridge Engineering, LLC 750 Park of Commerce Dr. Suite 200 Boca Raton, FL 33487 Phone: 561-948-6367 FAX:</p>	Job	US-CT-5017	Page	30 of 30
	Project	180' Monopole	Date	10:23:23 10/29/21
	Client	Verizon Wireless	Designed by	Theitman

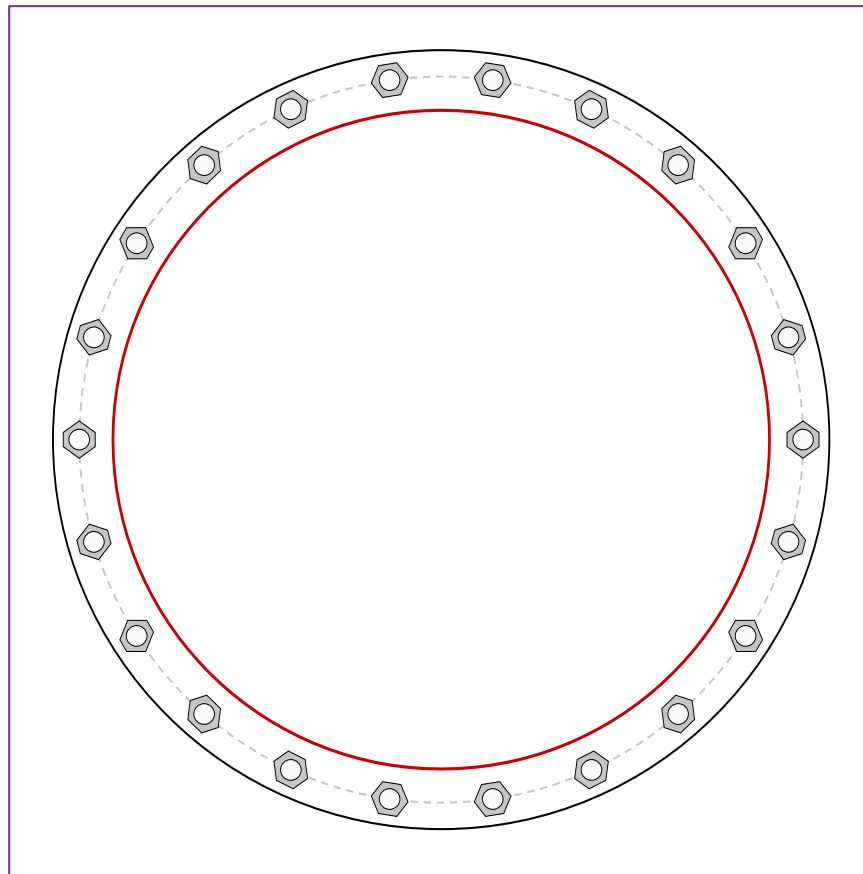
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	180 - 142.5	Pole	TP30.28x18.75x0.25	1	-12.415	116.032	60.7	Pass	
L2	142.5 - 93.25	Pole	TP44.93x28.4733x0.375	2	-21.999	569.099	57.7	Pass	
L3	93.25 - 46	Pole	TP58.7x42.2575x0.4375	3	-36.914	1482.890	54.5	Pass	
L4	46 - 1	Pole	TP71.67x55.2895x0.4375	4	-59.980	2914.510	60.5	Pass	
							Summary		
							Pole (L1)	60.7	Pass
							RATING =	60.7	Pass

Monopole Base Plate Connection

Site Info	
BU #	US-CT-5017
Site Name	
Order #	

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1

Applied Loads	
Moment (kip-ft)	5229.37
Axial Force (kips)	59.98
Shear Force (kips)	42.76



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data	
(22) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 79" BC	
Base Plate Data	
84.75" OD x 2.25" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi)	
Stiffener Data	
N/A	
Pole Data	
71.67" x 0.4375" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)	

Anchor Rod Summary		
<i>(units of kips, kip-in)</i>		
$P_{u_c} = 147.1$	$\phi P_{n_c} = 268.39$	Stress Rating
$V_u = 1.94$	$\phi V_n = 120.77$	54.8%
$M_u = n/a$	$\phi M_n = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	26.69	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	59.3%	Pass

Pier and Pad Foundation

BU #: US-CT-5017
 Site Name:
 App. Number:

TIA-222 Revision: H
 Tower Type: Monopole

Top & Bot. Pad Rein. Different?:
 Block Foundation?:
 Rectangular Pad?:

Superstructure Analysis Reactions		
Compression, P_{comp} :	60	kips
Base Shear, Vu_{comp} :	43	kips
Moment, M_u :	5229	ft-kips
Tower Height, H :	179	ft
BP Dist. Above Fdn, bp_{dist} :	3	in

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
<i>Lateral (Sliding) (kips)</i>	351.19	43.00	12.2%	Pass
<i>Bearing Pressure (ksf)</i>	23.00	1.95	8.5%	Pass
<i>Overturning (kip*ft)</i>	9102.15	5519.25	60.6%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	9326.25	5422.50	58.1%	Pass
<i>Pier Compression (kip)</i>	35992.10	100.72	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	5226.35	2106.21	40.3%	Pass
<i>Pad Shear - 1-way (kips)</i>	687.76	298.53	43.4%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.201	0.087	43.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	4982.71	3253.50	65.3%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$:	8	ft
Ext. Above Grade, E :	0.5	ft
Pier Rebar Size, Sc :	9	
Pier Rebar Quantity, mc :	50	
Pier Tie/Spiral Size, St :	5	
Pier Tie/Spiral Quantity, mt :	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Soil Rating: 60.6%
 Structural Rating: 65.3%

Pad Properties		
Depth, D :	6	ft
Pad Width, W_1 :	29.5	ft
Pad Thickness, T :	2	ft
Pad Rebar Size (Bottom dir. 2), Sp_2 :	9	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	65	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4.5	ksi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	110	pcf
Ultimate Net Bearing, Q_{net} :	30.000	ksf
Cohesion, C_u :		ksf
Friction Angle, ϕ :	40	degrees
SPT Blow Count, N_{blows} :	41	
Base Friction, μ :		
Neglected Depth, N :	4.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	7.5	ft

<--Toggle between Gross and Net

BU: US-CT-5017
 WO:
 Order:

Structure: A
 Rev:

Location

	Decimal Degrees	Deg	Min	Sec
Lat:		+		
Long:		-		

Code and Site Parameters

Seismic Design Code:	TIA-222-H	
Site Soil:	D (Default)	Default
Risk Category:	II	
<u>USGS Seismic Reference</u>		
S _s :	0.1730	g
S ₁ :	0.0550	g
T _L :	6	s

Seismic Design Category Determination

Importance Factor, I _e :	1
Acceleration-based site coefficient, F _a :	1.6000
Velocity-based site coefficient, F _v :	2.4000
Design spectral response acceleration short period, S _{DS} :	0.1845 g
Design spectral response acceleration 1 s period, S _{D1} :	0.0880 g
Seismic Design Category Based on S _{DS} :	B
Seismic Design Category Based on S _{D1} :	B
Seismic Design Category Based on S ₁ :	N/A
Controlling Seismic Design Category:	B

BU: US-CT-5017
 WO:
 Order:

Structure: A
 Rev:

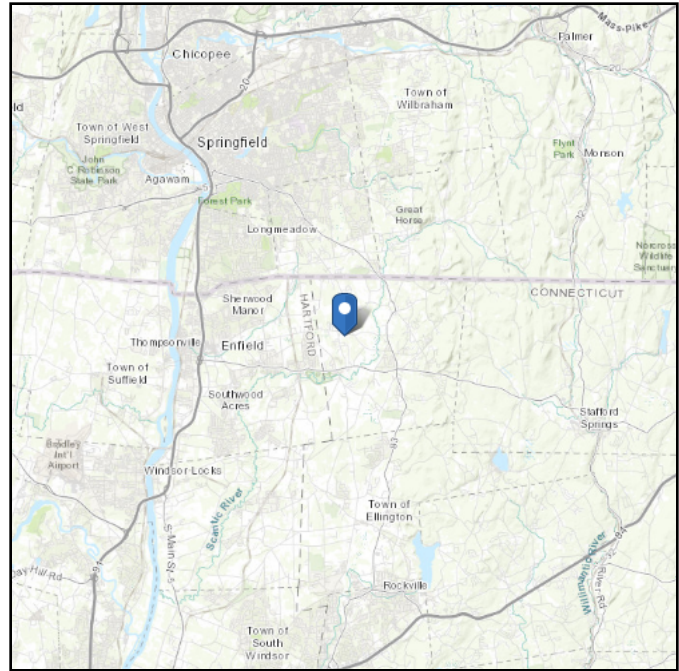
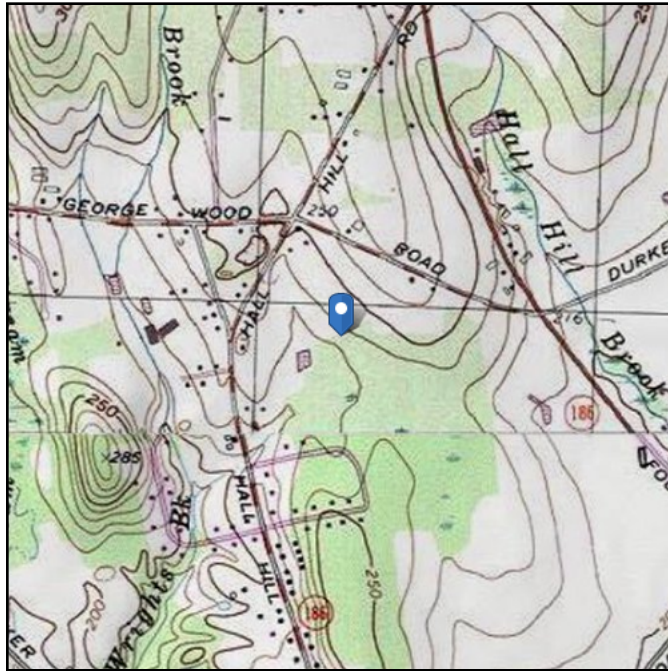
Tower Details		
Tower Type:	Tapered Monopole	
Height, h:	179	ft
Effective Seismic Weight, W:	50.00	kips
Amplification Factor, A _s :	1.0	2.7.8.1
Seismic Base Shear		
Response Modification Factor, R:	1.5	
Discrete Appurtenance Weight in Top 1/3 of Structure, W _u :	9.52518	kips
W _L :	40.47387476	kips
E:	29000.0	ksi
g:	386.088	in/s ²
Average Moment of Inertia, I _{avg} :	20507.84597	in ⁴
F _a :	0.303791986	hz
Approximate Fundamental Period Monopole, T _a :	3.2917	s
		2.7.7.1.3.3
Seismic Response Coefficient, C _s :	0.1230	2.7.7.1.1
Seismic Response Coefficient Max 1, C _{smax} :	0.0178	2.7.7.1.1
Seismic Response Coefficient Max 2, C _{smax} :	N/A	2.7.7.1.1
Seismic Response Coefficient Min 1, C _{smin} :	0.0300	2.7.7.1.1
Seismic Response Coefficient Min 2, C _{smin} :	N/A	2.7.7.1.1
Controlling Seismic Response Coefficient, C _{sc} :	0.0300	
Seismic Base Shear, V:	1.500	kips
		2.7.7.1.1
Vertical Distribution Factors		
Period Related Exponent, k:	2.000	2.7.7.1.2
Sum of w _i h _i ^k :	529176.99	2.7.7.1.2

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 234.15 ft (NAVD 88)
Latitude: 42.002594
Longitude: -72.484997



Wind

Results:

Wind Speed:	116 Vmph
10-year MRI	75 Vmph
25-year MRI	83 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Fri Oct 29 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

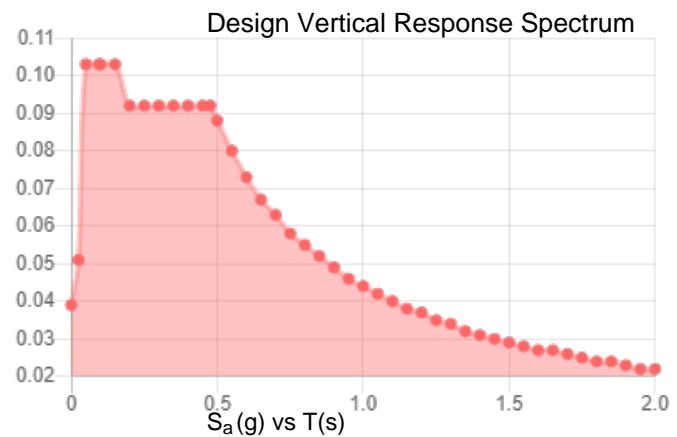
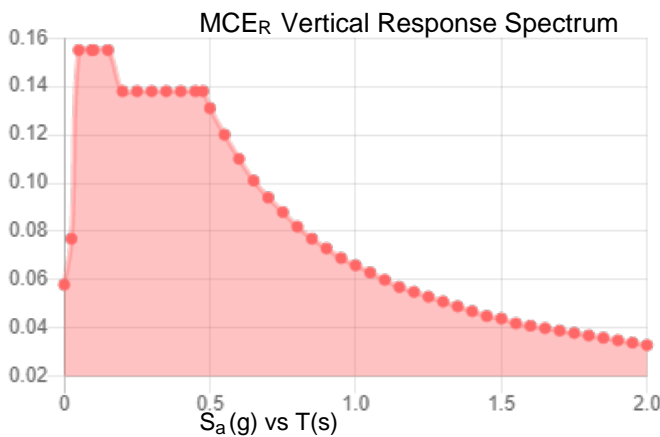
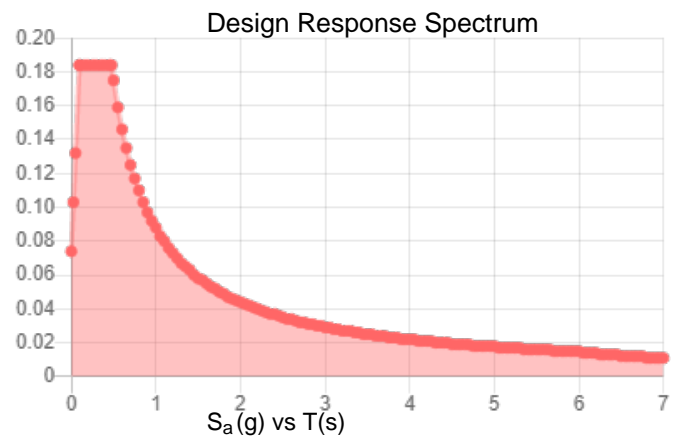
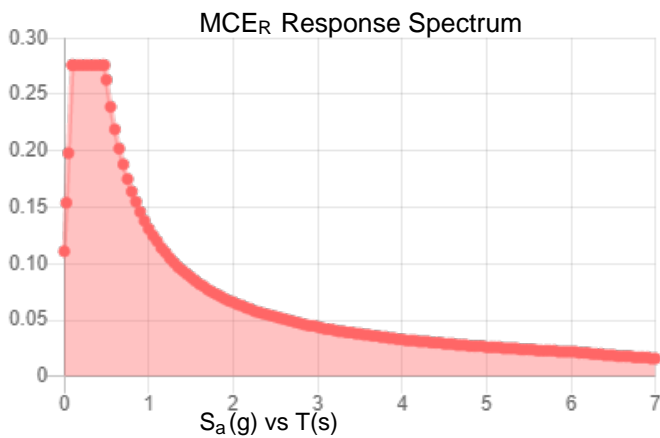
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_s :	0.173	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.091
F_v :	2.4	PGA _M :	0.145
S_{MS} :	0.276	F_{PGA} :	1.6
S_{M1} :	0.131	I_e :	1
S_{DS} :	0.184	C_v :	0.7

Seismic Design Category B



Data Accessed:

Fri Oct 29 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 1.50 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Fri Oct 29 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Attachment 2: Collocation Application



SUMMARY

PRIMARY INFO

Application #: P-016478
Application Version: 3 (Submitted: 10/13/2021 10:45:00 AM)
Application Type: Broadband
Application Name: Enfield East CT
Lease Type: New Lease
Description:
 Adding (9) antennas and (6) RRUs and 1 Junction Box on tower with 12x24 ground equipment space

VERTICAL BRIDGE SITE INFO

VB Site #: US-CT-5017
VB Site Name: Blue Ridge
Latitude: 42.00259444
Longitude: -72.48499722
Structure Type: Monopole
Structure Height: 181.0000
Site Address: 248 Hall Hill Road -
 Somers, CT 06071

VERTICAL BRIDGE DEAL TEAM

RLM: Floyd Jenkins
 FJenkins@verticalbridge.com
 (301) 667-0069

RLS: Sam Bowden
 SBowden@verticalbridge.com

ROM: Joe Bascelli
 JBascelli@verticalbridge.com
 (484) 288-9586

TENANT LEGAL INFO

Tenant Legal Name: Cellco Partnership d/b/a Verizon Wireless
State of Registration: Delaware
Type of Entity:
Carrier NOC #: 8002646620
Tenant Site #: 683673
Tenant Site Name: Enfield East CT

APPLICANT

Name: David Vivian
Address: 20 Alexander DR.
 2nd Floor
 Wallingford, CT 06492
Phone Number::: (860) 706-4373
Email Address: dvivian@structureconsulting.net

FINAL LEASED RIGHTS CONFIGURATION TOTALS

This is a summary of your remaining existing equipment plus the new equipment.

FINAL EQUIPMENT

Qty	Equipment Type
2	Surge Arrestor/Raycap/Squid
9	RRU
9	Panel

FINAL LINES

Qty	Line Type
2	Hybrid



COLOCATION APPLICATION
 US-CT-5017
 Version 3
 Cellco Partnership d/b/a Verizon Wireless

Vertical Bridge REIT, LLC.
 750 Park of Commerce Drive
 Suite 200
 Boca Raton, FL 33487

FREQUENCY & TECHNOLOGY INFO

Type of Technology:	Broadband Wireless
Is TX Frequency Licensed:	Yes
TX Frequency:	746-757/824-835/1710-1730/1890-1902.5
Is RX Frequency Licensed:	Yes
RX Frequency:	776-787/869-880/2110-2130/1970-1982.5

MOUNT & STRUCTURAL ANALYSIS

<p>MOUNT ANALYSIS</p> <hr style="border: 0.5px solid #008000;"/> <p>Provided by Tenant: Yes</p> <p>To Be Run by VB:</p> <p>Include Mount Mapping:</p>	<p>STRUCTURAL HARD COPIES</p> <hr style="border: 0.5px solid #008000;"/> <p>Required: No</p> <p>Number of Hard Copies</p>
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CONTACTS

INVOICE CONTACT

Attention To	Name	Address	Phone Number 1	Phone Number 2	Email 1	Email 2
	David Vivian	22 Ruth Drive Wilbraham, MA 01095	(860) 706-4373		dvivian@structureconsulting.net	

PO CONTACT

Name	Phone Number	Email
David Vivian	(860) 706-4373	dvivian@structureconsulting.net

LEASING CONTACT

Name	Phone Number	Email
David Vivian	(860) 706-4373	dvivian@structureconsulting.net

RF CONTACT

Name	Phone Number	Email
Mark Brauer	(860) 214-8648	mark.brauer2@erizonwireless.com

TENANT CONSTRUCTION MANAGER CONTACT

Name	Phone Number	Email
Bryon Morawski	(860) 604-9142	bmorawski@structureconsulting.net

LINE & EQUIPMENT



NEW LINE(S)				
Qty	Line Type	Line Size(in.)	Line Location	Comments
2	Hybrid	1.625	Interior	

NEW EQUIPMENT										
Qty	Equipment Type	RAD Height	Mount (H')	Mount Type	Manufacturer	Model Number	Dimensions (H"xW"xD")	Weight (Lbs.)	Azimuth	Comments
3	RRU	165.00	165.00	Sector Frames	Samsung	RT4401-48A	13.90 x 8.55 x 4.15	18.64	0/120/240	
3	RRU	165.00	165.00	Sector Frames	Samsung	B5/B13 RRH-B R04C (RFV01 U-D2A)	15.00 x 15.00 x 8.00	70.30	0/120/240	
3	Panel	165.00	165.00	Sector Frames	Commscope	NHHSS-65B-R2 BTO	96.00 x 11.85 x 7.10	61.70	0/120/240	
3	Panel	165.00	165.00	Sector Frames	Commscope	NHH-65 B-R2B	72.00 x 11.90 x 7.10	43.70	0/120/240	
3	Panel	165.00	165.00	Sector Frames	Samsung	MT6407-77A	35.10 x 16.00 x 5.50	87.10	0/120/240	
3	RRU	165.00	165.00	Sector Frames	Samsung	B2/B66a RRH-B R049 (RFV01 U-D1A)	15.00 x 15.00 x 10.00	84.90	0/120/240	
2	Surge Arrestor/Raycap/Squid	165.00	165.00	Sector Frames	Commscope	RC3DC-3315-PF-48	28.90 x 15.70 x 10.30	32.00	N/A	

ADDITIONAL SITE REQUIREMENTS

GROUND & INTERIOR SPACE REQUIREMENTS						
Requirement Type	Total Lease Area (L x W)	Cabinet Required	Cabinet Area (L x W)	Shelter Required	Shelter Pad (L x W)	Comments
New	24.00 x 12.00	Yes	24.00 x 12.00		x	Radio equipment & 50kW generator included on 12x24 concrete pad

GENERATOR REQUIREMENTS						
Requirement Type	Fuel Type	Kilowatt Size	Pad Dimensions (L x D)	Generator Manufacturer	Fuel Tank Manufacturer	Comments
New	Diesel	50KW	8.00 x 4.00	Kohler	50KW	

AC POWER REQUIREMENTS		
Meter Type	Additional Details	Comments
New Tenant Meter		



COLOCATION APPLICATION
US-CT-5017
Version 3
Cellco Partnership d/b/a Verizon Wireless

Vertical Bridge REIT, LLC.
750 Park of Commerce Drive
Suite 200
Boca Raton, FL 33487

BACKHAUL REQUIREMENTS

Requirement Type	Cable Type	Number Of Points Of Entry	Riser Size (Inches)	Comments
No Changes				

ATTACHMENT 6

	General	Power	Density					
Site Name: Enfield E								
Tower Height: Verizon @ 165ft								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	FREQ.	CALC. POWER DENS	MAX. PERMISS. EXP.	FRACTION MPE	Total
*T-Mobile	2	599	175	2100	0.0151	1.0000	0.15%	
*T-Mobile	2	1197	175	2100	0.0301	1.0000	0.30%	
*T-Mobile	1	865	175	700	0.0109	0.4667	0.23%	
VZW 700	4	631	165	751	0.0033	0.5007	0.67%	
VZW Cellular	4	692	165	874	0.0037	0.5827	0.63%	
VZW PCS	4	1374	165	1975	0.0073	1.0000	0.73%	
VZW AWS	4	1348	165	2120	0.0071	1.0000	0.71%	
VZW CBRS	4	35	165	3560.3	0.0002	1.0000	0.02%	
VZW CBAND	4	6531	165	3730.08	0.0345	1.0000	3.45%	
								6.90%
* Source: Siting Council								

ATTACHMENT 6



ENFIELD EAST
Certificate of Mailing — Firm

Name and Address of Sender Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	TOTAL NO. of Pieces Listed by Sender 	TOTAL NO. of Pieces Received at Post Office™ <div style="text-align: center; font-size: 2em;">4</div>	Affix Stamp Here <i>Postmark with Date of Receipt.</i> <div style="text-align: right; color: magenta;"> neopost® 11/17/2021 US POSTAGE \$003.35⁰ </div> <div style="text-align: right; color: magenta; margin-top: 10px;"> ZIP 06103 041L12203937 </div>
Postmaster, per (name of receiving employee) <div style="text-align: center; font-size: 2em;">10</div>			

USPS® Tracking Number Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	C. G. Knorr, First Selectman Town of Somers 600 Main Street Somers, CT 06071				
2.	Jennifer Roy, Zoning Enforcement Officer Town of Somers 600 Main Street Somers, CT 06071				
3.	John and Debra Romano 248 Hall Hill Road Somers, CT 06071				
4.	Vertical Bridge 750 Park of Commerce Drive, #200 Boca Raton, FL 33487				
5.					
6.					

