Robinson+Cole

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May 24, 2023

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 780 Prospect Hill Road, Windsor, Connecticut**

Dear Attorney 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 5.71-acre parcel at 780 Prospect Hill Road in Windsor (the "Property"). The Property is owned by The Ferraina Company LLC. The tower is owned by Tarpon Towers ("Tarpon"). Cellco identifies this site as its "Windsor 4 Facility". The existing 135-foot monopole tower was approved by the Siting Council ("Council") in June of 2021 (Docket No. 496). A copy of the Council's Docket 496 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 Windsor's Mayor, Donald Trinks and Town Planner, Eric Barz.

Background

Cellco is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. Cellco and Tarpon have agreed to the proposed shared use of the Prospect Hill Road tower pursuant to mutually acceptable terms and conditions. Likewise, Tarpon and Cellco have agreed to the proposed installation of equipment

on the ground near the base of the tower. Tarpon 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 an antenna platform at a centerline height of 105 feet above ground level ("AGL"). Cellco will also install two equipment cabinets and a 50-kW diesel-fueled backup generator on a concrete pad on the ground near the base of the tower. 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 antennas, RRHs and backup generator.

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 ("SA") dated May 9, 2023 prepared by Michael F. Plahovinsak, P.E. confirms that the tower can support Cellco's proposed antennas and related equipment. Likewise, an Antenna Mount Analysis ("MA") dated April 13, 2023 also confirms that the proposed antenna and RRH mounting system can support Cellco's proposed shared use. Copies of the SA and MA are 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 Prospect 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 105 feet AGL on the existing 135-foot tower would have an insignificant incremental visual impact on the area around the Property. As mentioned above, all of Cellco's equipment will be located within a fenced facility compound near the base of the tower. 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 facility.

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 state and local noise 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 Calculated Radio Frequency Emissions Report that demonstrates that the modified 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 Tarpon 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 and antenna mounts are 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 Prospect Hill Road tower. In fact, the provision of new and improved wireless service through Cellco's shared use of the existing tower would enhance the safety and welfare of area residents and members of the general public traveling through the Town of

Windsor.

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

Conclusion

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:
Donald Trinks, Mayor
Eric Barz, Town Planner
The Ferraina Company LLC, Property Owner
Brett Buggeln, Tarpon Towers
Tim Parks, Verizon Wireless

ATTACHMENT 1

DOCKET NO. 496 – Tarpon Towers II, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications facility located at 800 Prospect Hill Road, Windsor, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		June 3, 2021

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 Tarpon Towers II, LLC, hereinafter referred to as the Certificate Holder, for a telecommunications facility located at 800 Prospect Hill Road, Windsor, 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 135 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 submitted to and approved by the Council prior to the commencement of facility construction and shall include:

    a) a certified letter from a wireless telecommunications carrier with a firm commitment to install associated wireless equipment at the facility upon completion of construction;
    b) 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, fence design, landscaping, ground equipment, access road, utility installation and emergency backup power;
    c) the tower shall be designed with a yield point to ensure that the tower setback radius remains within the boundaries of the subject property;
    d) 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; and
    e) construction schedule including hours and days of the week for construction activities.

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 provide the Council with a copy of necessary permits from any other state or federal agency with concurrent jurisdiction prior to the commencement of construction.

6. 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.

7. 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.

8. Any request for extension of the time period referred to in Condition 7 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 Windsor.

9. 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.

10. 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.

11. 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.

12. 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.

13. 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. If construction has not been completed in accordance with Condition 7 of this Decision and Order at the time the Certificate is requested to be transferred, a certified letter from a wireless telecommunications carrier with a firm commitment to install associated wireless equipment at the facility upon completion of construction shall also be provided.

14. 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.

15. 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.

16. This Certificate may be surrendered by the Certificate Holder upon written notification and acknowledgment 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 February 25, 2021, and notice of issuance published in the Hartford Courant.

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

TARPON TOWERS

May 3, 2023

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

Re: Letter of Authorization – **Tarpon Towers II, LLC with site address of 780 / 810 Prospect Hill, Windsor, CT 06095** grants Cellco Partnership d/b/a Verizon Wireless authority to install equipment.

Dear Mr. Candiello:

I, Brett Buggeln, COO of Tarpon Towers II, 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 Bloomfield, CT.

Sincerely,

Brett Buggeln
Chief Operating Officer
Tarpon Towers II, LLC

ATTACHMENT 3

SUPPORTING DOCUMENTS

RADIO FREQUENCY (RF) DESIGN DATE: 4/4/23

ANTENNA MOUNT STRUCTURAL ANALYSIS DATE: 4/13/23

ANTENNA SUPPORT STRUCTURE (135'± MONOPOLE) STRUCTURAL ANALYSIS DATE: 5/9/23 (BY OTHERS)

verizon

20 ALEXANDER DRIVE, 2nd FLOOR, WALLINGFORD, CT 06492

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

PROJECT TYPE: WIRELESS TELECOMMUNICATIONS
COLLOCATION ON EXISTING 135'± MONOPOLE

SITE INFORMATION:

PARENT PARCEL OWNER:	THE FERRAINA COMPANY LLC. 810 PROSPECT HILL ROAD WINDSOR, CT 06095
TOWER OWNER:	TARPON TOWERS II, LLC. 8916 77TH TERRACE EAST, SUITE 103 LAKEWOOD RANCH, FL 34202 (941) 757-5010
TOWER OWNER ID:	CT1209 (WINDSOR)
APPLICANT:	CELLCO PARTNERSHIP (dba VERIZON WIRELESS) 20 ALEXANDER DRIVE WALLINGFORD, CT 06492
SITE ADDRESS:	780 PROSPECT HILL ROAD WINDSOR, CT 06095
COUNTY:	HARTFORD COUNTY, CT
SITE CONTROL POINT:	CENTER OF EXISTING MONOPOLE N 41°-52'-58.47" (41.882908°) (NAD '83) W 72°-42'-29.14" (72.708084°) (NAD '83)
JURISDICTION:	CONNECTICUT SITING COUNCIL
TAX ID PARCEL NUMBER:	MAP 17 BLOCK 135 LOT 1
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

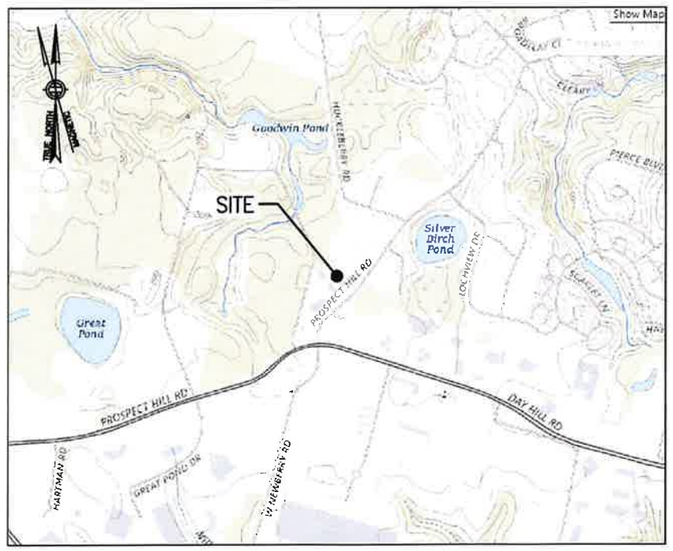
GENERAL NOTES

1. 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.
2. NEW CONSTRUCTION SHALL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
   - BUILDING CODE: 2022 CONNECTICUT STATE BUILDING CODE
   - ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
   - STRUCTURAL CODE: TIA/EIA-222-H 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. TAKE EXIT 37 FOR CT-305/BLOOMFIELD AVENUE TOWARD WINDSOR CENTER. USE LEFT 2 LANES TO TURN LEFT ONTO CT-305 W/BLOOMFIELD AVENUE. TURN RIGHT ONTO MARSHALL PHELPS ROAD. USE THE LEFT 2 LANES TO TURN LEFT ONTO DAY HILL ROAD. TURN RIGHT ONTO PROSPECT HILL ROAD. THE SITE WILL BE ON THE RIGHT HAND SIDE.

SHEET INDEX

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

1. 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.
2. THIS FACILITY WILL CONSUME NO UNRECOVERABLE ENERGY.
3. NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.
4. NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.
5. NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.

CLIENT:
verizon

ARCHITECT/ENGINEER:
CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil, Structural, Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR DATE

DRAWING SCALE NOTE:

THESE DRAWINGS HAVE BEEN PREPARED IN ARCH D (24"x36") FORMAT. AS SUCH, THE WRITTEN SCALES SHOWN ON ANY REPRODUCTIONS OF A COMMENSURATE SIZE SHALL BE RENDERED INVALID. ALL BAR SCALES MAY BE USED REGARDLESS OF REPRODUCTION SIZE. WHERE IN CONFLICT, BAR SCALES SHALL SUPERSEDE WRITTEN SCALES.

REVISIONS

NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

DRAWING TITLE:

TITLE SHEET

DRAWING NO:

T01

SCALE: AS SHOWN	DESIGNED BY: MMC	VZW PROJECT CODE: 20232415628
	DRAWN BY: MMC	
	CHECKED BY: CBS	VZW PROJECT NO.: 10060214
CEA PROJECT NO.: 9821O.416	ORIGINAL ISSUE DATE: 4/28/23	MDG LOCATION ID: 5000207278

GENERAL NOTES:

1. 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

2. 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.

3. 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.

4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

5. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.

9. 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.

10. 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.

11. 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.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. 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.

14. 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.

15. CONSTRUCTION SHALL COMPLY WITH VERIZON WIRELESS NETWORK STANDARD #NSTD123 TO THE MAXIMUM EXTENT FEASIBLE UNLESS PRECLUDED OR LIMITED BY DESIGN SHOWN ON THESE DRAWINGS.

16. 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.

17. 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.

18. 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:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

2. 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.

3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.

6. 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.

7. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

8. 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.

9. 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.

10. 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.

11. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE VERIZON WIRELESS SPECIFICATION FOR SITE SIGNAGE.

CONCRETE AND REINFORCING STEEL NOTES:

1. 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.

2. 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

3. 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.

4. 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 LARGER .....2 IN.
   #5 AND SMALLER & WWF .....1½ IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....¾ IN.
   BEAMS AND COLUMNS .....1½ IN.

5. A CHAMFER ¾" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

6. 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 RAWSET/REDHEAD OR APPROVED EQUAL.

7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 80 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.

8. 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.

9. 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:

1. 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".

2. 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.

3. BOLTED CONNECTIONS SHALL USE BEARING TYPE ASTM A325 BOLTS (⅝"ø) AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.

4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE ⅜" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.

5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURERS 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 RAWSET/REDHEAD OR APPROVED EQUAL.

6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL

7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL TO EXPOSE NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.

2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.

3. 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.

4. 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.

5. 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:

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

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
SUBCONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, VERIZON WIRELESS ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.

2. COORDINATION OF WORK:
SUBCONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH CONTRACTOR.

3. 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:

1. WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.

2. 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.

3. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.

4. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.

5. 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.

6. 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

7. 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).

8. PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.

9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.

10. 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.

11. 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.

12. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #3 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.

13. 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.

14. 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°C IF AVAILABLE).

15. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

16. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

17. 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.

18. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

19. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE

20. 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.

21. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

22. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.

23. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

24. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

25. 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.

26. 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

27. 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.

28. 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.

29. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

30. 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.

31. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.

32. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

CLIENT:

verizon

ARCHITECT/ENGINEER:

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural Land Surveying

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

SEAL:

ENGINEER/LAND SURVEYOR DATE

DRAWING SCALE NOTE:

THESE DRAWINGS HAVE BEEN PREPARED IN ARCH D (24"x36") FORMAT. AS SUCH, THE WRITTEN SCALES SHOWN ON ANY REPRODUCTIONS OF A CONTRADICTORY SIZE SHALL BE DISREGARDED WARILE.
ALL BAR SCALES MAY BE USED REGARDLESS OF REPRODUCTION SIZE. WHERE IN CONFLICT, BAR SCALES SHALL SUPERSEDE WRITTEN SCALES.

REVISIONS

NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/28/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/28/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

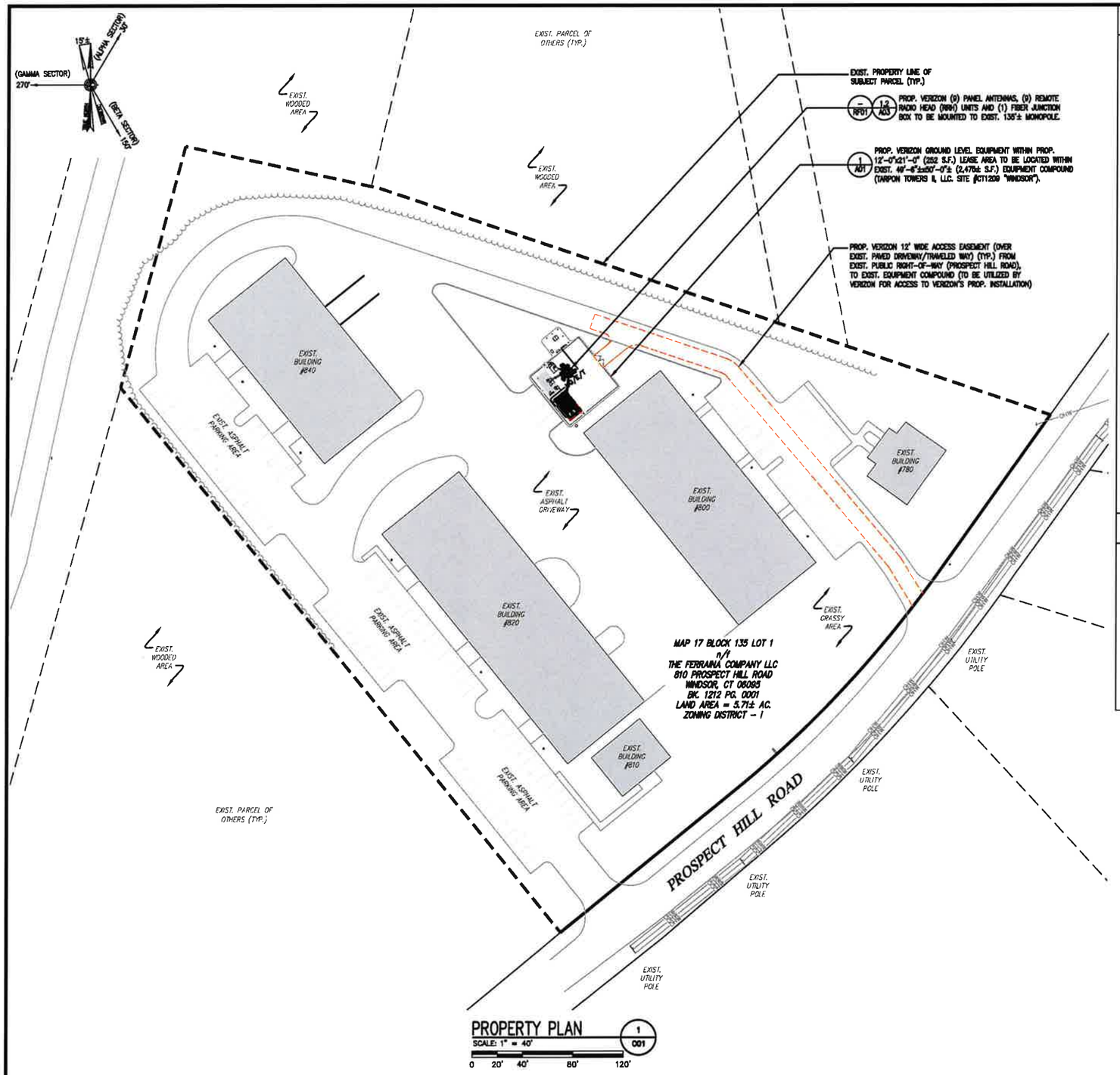
DRAWING TITLE:

GENERAL NOTES

DRAWING NO:

GN01

SCALE: N/A	DESIGNED BY: MRC DRAWN BY: MRC CHECKED BY: CRS	VZW PROJECT CODE: 20232415828
CEA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/28/23	VZW PROJECT NO.: 10006214 MDG LOCATION ID: 5000207278



GENERAL NOTES:

1.	INITIAL DESIGN VISIT DATE:	2/2/23
2.	VERTICAL DATUM:	NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)
3.	HORIZONTAL DATUM:	NORTH AMERICAN DATUM OF 1983 (NAD '83)
4.	SITE CONTROL POINT:	CENTER OF EXISTING MONOPOLE LATITUDE: N. 41°-52'-58.47" (41.882908') (NAD '83) LONGITUDE: W. 72°-42'-29.14" (72.708094') (NAD '83)
5.	PARENT PARCEL OWNER:	THE FERRAINA COMPANY LLC. 810 PROSPECT HILL ROAD WINDSOR, CT 06095
6.	TOWER OWNER:	TARPON TOWERS II, LLC. 8916 77TH TERRACE EAST, SUITE 103 LAKEWOOD RANCH, FL 34202 (941) 757-5010
7.	TOWER OWNER ID:	CT1209 "WINDSOR"
8.	SITE ADDRESS:	780 PROSPECT HILL ROAD WINDSOR, CT 06095
9.	APPLICANT:	CELLCO PARTNERSHIP (dba VERIZON WIRELESS) 20 ALEXANDER DRIVE WALLINGFORD, CT 06492
10.	JURISDICTION:	CONNECTICUT SITING COUNCIL
11.	TAX ID:	MAP 17 BLOCK 135 LOT 1
12.	DEED REFERENCE:	BK. 1212 PG. 0001
13.	PLAN REFERENCES:	TOWN OF WINDSOR ASSESSOR/GIS MAPS
14.	ZONING CLASSIFICATION:	I (INDUSTRIAL ZONE)

15. 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.
16. THE PROPERTY LINES SHOWN WERE COMPILED UTILIZING TOWN OF WINDSOR 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.
17. 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 WINDSOR, (MAP NUMBER 09003C0214F) EFFECTIVE 9/26/2008.
18. 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

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

CLIENT:
verizon

ARCHITECT/ENGINEER:

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SEAL:

ENGINEER/LAND SURVEYOR DATE

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REVISIONS

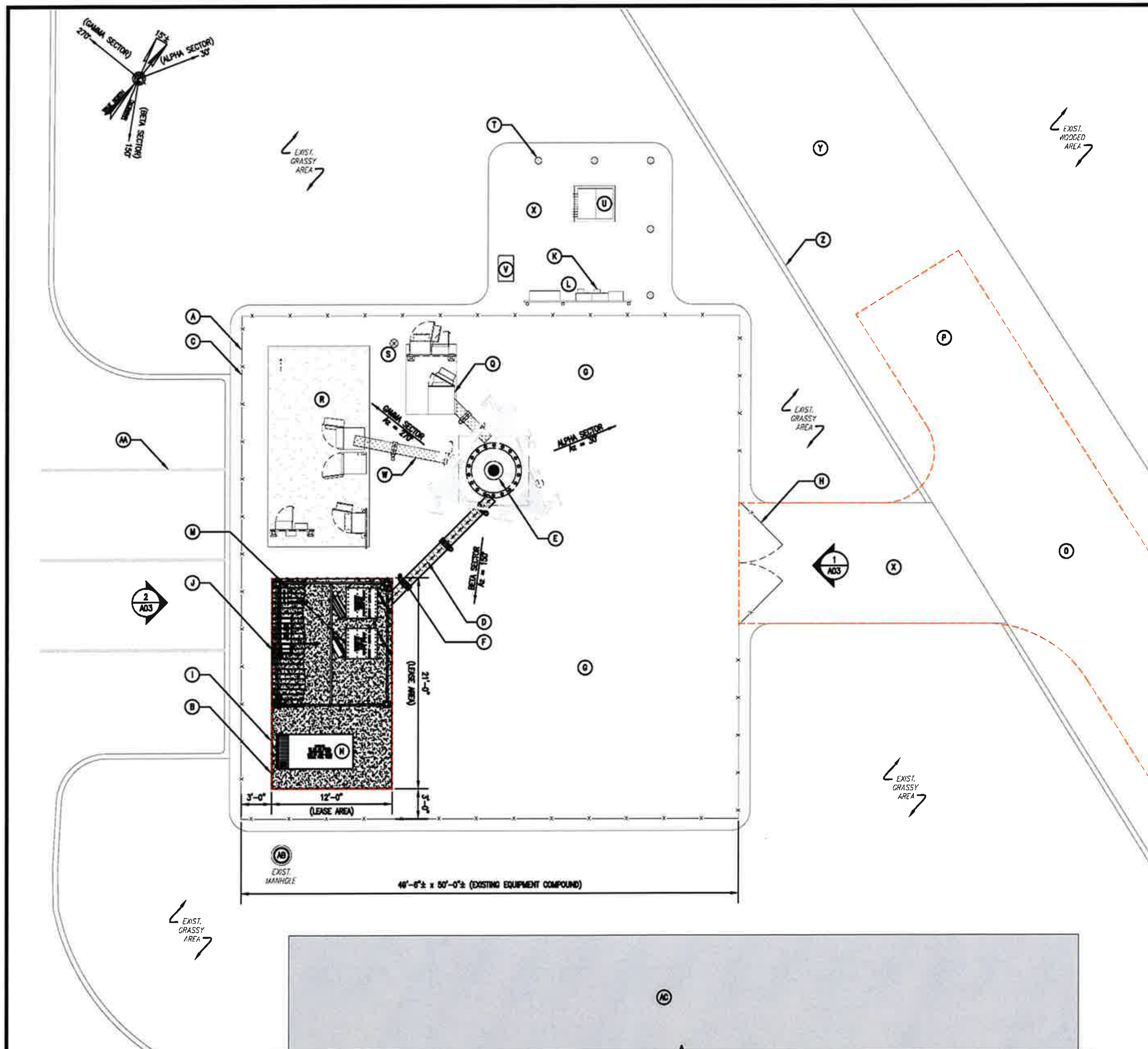
NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:
WINDSOR 4 CT
780 PROSPECT HILL ROAD
WINDSOR, CT 06095

DRAWING TITLE:
PROPERTY PLAN

DRAWING NO:
C01

SCALE: 1" = 40'	DESIGNED BY: MMC	VZW PROJECT CODE: 20032415628
	DRAWN BY: MMC	
	CHECKED BY: GRS	VZW PROJECT NO.: 18999214
CSA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/26/23	MDG LOCATION ID: 5000207278



● SITE CONTROL POINT:
CENTER OF EXISTING MONOPOLE
N 41°-52'-58.47" (41.882908°) (NAD '83)
W 72°-42'-29.14" (72.708094°) (NAD '83)
GROUND ELEVATION – 174.0' AMSL (NAVD '88)

PER 1A SURVEY OF OTHERS

EQUIPMENT COMPOUND PLAN (1 / A01)

SCALE: 3/16" = 1'-0"

0 5'-4" 10'-8" 16'-0"

LEGEND

REF.	ITEM	DESCRIPTION
	A	EXIST. 49'-6"±x50'-0"± (2,475± S.F.) EQUIPMENT COMPOUND (TARPON TOWERS II, LLC. SITE #CT1209 "WINDSOR").
	B	LIMITS OF VERIZON'S PROP. 12'-0"x21'-0" (252 S.F.) LEASE AREA/EQUIPMENT PAD (TYP.)
	C	EXIST. 7'-9"± CHAIN-LINK FENCE SURROUNDING EXIST. 49'-6"±x50'-0"± (2,475± S.F.) EQUIPMENT COMPOUND (TYP.)
3/A02	D	PROP. VERIZON (2)-LOW INDUCTANCE 6x12 HYBRID SIGNAL CABLES ROUTED ALONG PROP. OVERHEAD CABLE ICE BRIDGE (TYP.) FROM VERIZON'S PROP. EQUIPMENT PAD TO EXIST. MONOPOLE AS SHOWN.
	E	EXIST. 135'± MONOPOLE
3/RF01	F	PROP. VERIZON GPS ANTENNA MOUNTED TO PROP. OVERHEAD CABLE ICE BRIDGE. TOP OF GPS ANTENNA SHALL BE MOUNTED 2'-0" ABOVE TOP OF ICE BRIDGE.
	G	EXIST. GRAVEL COVER WITHIN EXIST. COMPOUND
	H	EXIST. 12'± DOUBLE LEAF GATE
6/S01	I	PROP. VERIZON 12'-0"x21'-0" (252 S.F.) REINFORCED CONCRETE EQUIPMENT PAD
1-4/S01	J	PROP. VERIZON 12'-6"x11'-10" (148± 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 1Ø-3W 120/240 VAC ELECTRIC METER BANK
1,2/A02	M	PROP. VERIZON EQUIPMENT CABINET MOUNTED TO PROP. 12'-0"x21'-0" (252 S.F.) REINFORCED CONCRETE EQUIPMENT PAD (TYP.)
1/ED1	N	PROP. VERIZON 50 kW BACK-UP DIESEL GENERATOR MOUNTED TO PROP. 12'-0"x21'-0" (252 S.F.) REINFORCED CONCRETE PAD
	O	PROP. VERIZON 12' WIDE ACCESS EASEMENT (OVER EXIST. PAVED DRIVEWAY/TRAVELED WAY) (TYP.) FROM EXIST. PUBLIC RIGHT-OF-WAY (PROSPECT HILL ROAD), TO EXIST. EQUIPMENT COMPOUND (TO BE UTILIZED BY VERIZON FOR ACCESS TO VERIZON'S PROP. INSTALLATION). SEE SHEET C01 FOR CONTINUATION TO PROSPECT HILL ROAD.
	P	PROP. VERIZON 12'x20' PARKING SPACE OR TURN-AROUND AREA
	Q	EXIST. DISH WIRELESS EQUIPMENT CABINET ON EXIST. 5'-0"±x7'-0"± (35± S.F.) STEEL EQUIPMENT PLATFORM
	R	EXIST. T-MOBILE EQUIPMENT CABINET ON EXIST. 10'-0"±x20'-0"± (200± S.F.) CONCRETE PAD (TYP.)
	S	EXIST. GROUND TEST WELL
	T	EXIST. BOLLARD (TYP.)
	U	EXIST. ELECTRIC TRANSFORMER ON EXIST. CONCRETE PAD/VAULT
	V	EXIST. TELCO HANDHOLE
	W	EXIST. OVERHEAD CABLE ICE BRIDGE OF OTHERS (TYP.)
	X	EXIST. GRAVEL COVER
	Y	EXIST. PAVED ACCESS ROAD
	Z	EXIST. ASPHALT CURB (TYP.)
	AA	EXIST. PARKING STRIPE (TYP.)
	AB	EXIST. MANHOLE
	AC	EXIST. BUILDING #800

CLIENT:

verizon

ARCHITECT/ENGINEER:

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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	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

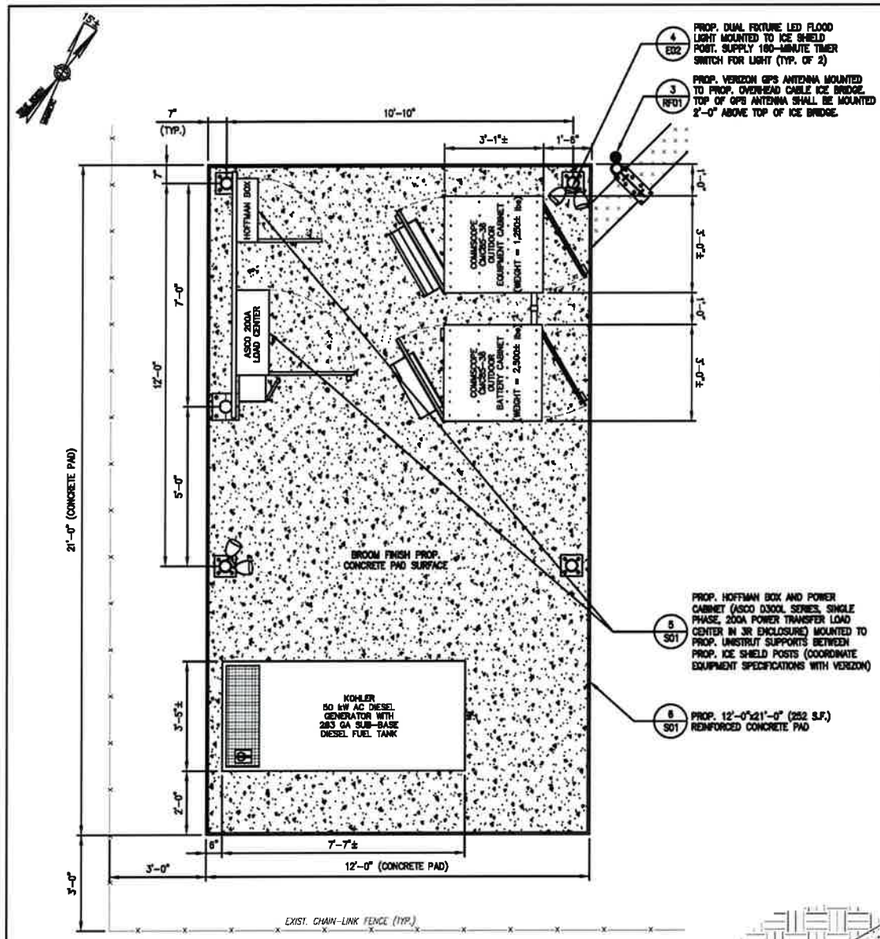
DRAWING TITLE:

EQUIPMENT COMPOUND PLAN

DRAWING NO:

A01

SCALE: 3/16" = 1'-0"	DESIGNED BY: NMC DRAWN BY: NMC CHECKED BY: GRS	VZW PROJECT CODE: 20232415626
CEA PROJECT NO.: 06210.416	ORIGINAL ISSUE DATE: 4/26/23	VZW PROJECT NO.: 16999214
		MDG LOCATION ID: 5000207278

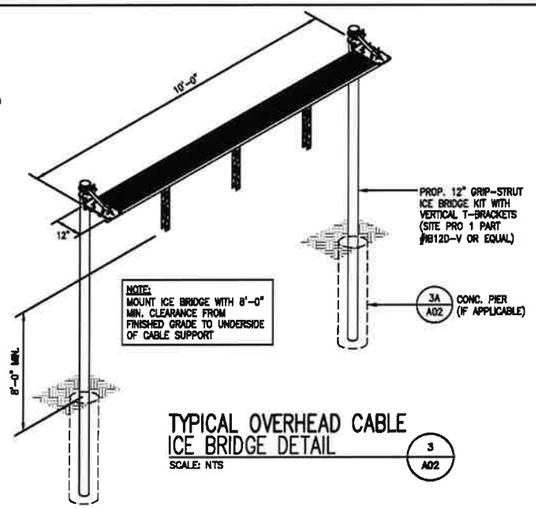


NOTE:
ANTENNAS, CABLE TRAYS, CABLES, CONDUITS, PIPING, ETC. WITHIN VICINITY OF EQUIPMENT PAD NOT SHOWN FOR CLARITY. COORDINATE ALL REQUIRED WORK WITH THAT OF OTHER TRADES.

EQUIPMENT AREA PLAN (1 / A02)

SCALE: ⅜" = 1'-0"

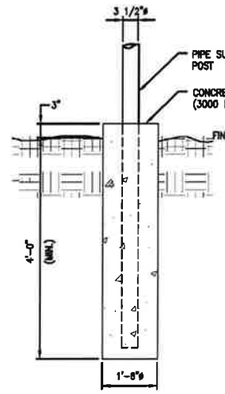
0 2'-0" 4'-0" 8'-0"



NOTE:
MOUNT ICE BRIDGE WITH 8'-0" MIN. CLEARANCE FROM FINISHED GRADE TO UNDERSIDE OF CABLE SUPPORT

TYPICAL OVERHEAD CABLE ICE BRIDGE DETAIL (3 / A02)

SCALE: NTS

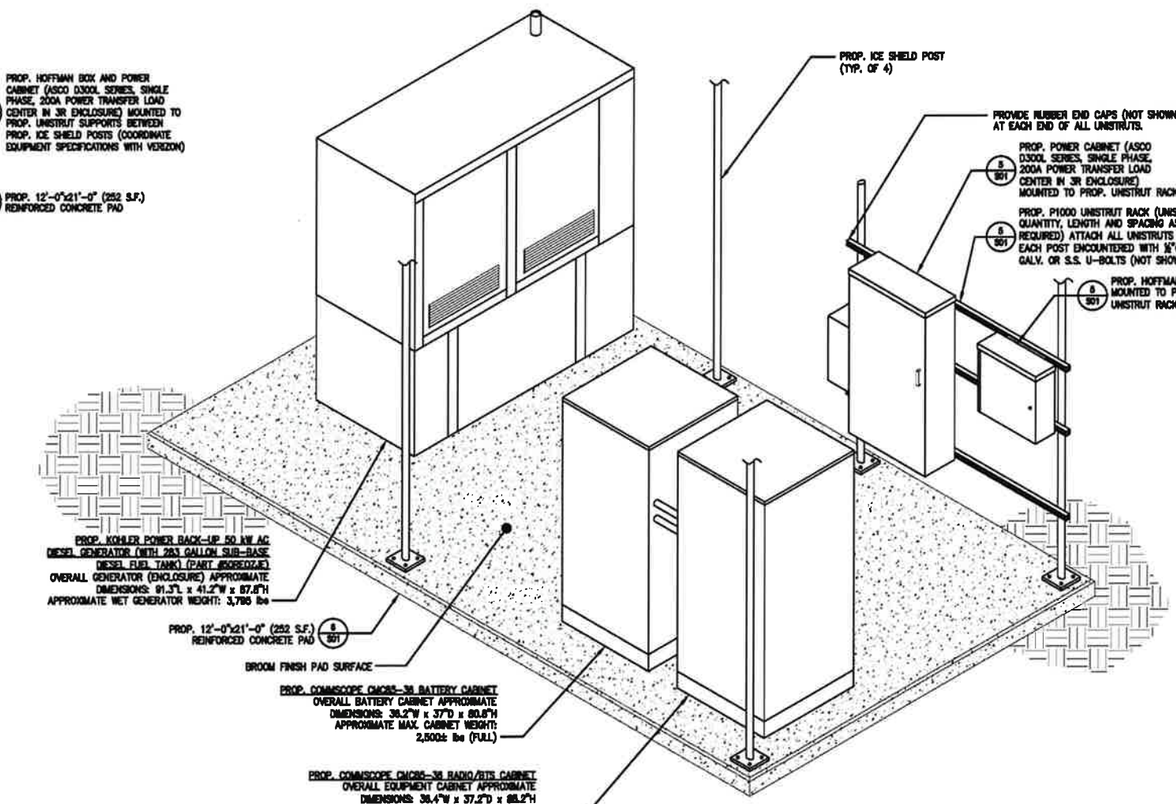


NOTES:

1. FOR EXPOSED LEDGE, PROVIDE GROUT LEVELING PAD. INSTALL (2)-⅝"ø EXPANSION ANCHORS, (6" LONG).
2. FOR BURIED LEDGE AT LESS THAN 3'-8" BELOW FINISH GRADE, CORE 8"ø HOLE INTO LEDGE 18" DEEP. FILL AROUND PIPE WITH NON-SHRINK GROUT. USE COAL TAR ON BURIED LENGTH OF PIPE, AND BACKFILL TO FINISH GRADE
3. FOR CONCRETE, FASTEN BASEPLATE WITH (2)-⅝"ø EXPANSION ANCHORS, (6" LONG).
4. FOR POSTS ON CONCRETE OR EXPOSED LEDGE, PROVIDE 4"x8"x½" BASE PLATE WITH (2)-1⅛"ø HOLES @ 6" O.C.

CABLE BRIDGE PIER (3A / A02)

SCALE: NTS



EQUIPMENT AREA ISOMETRIC VIEW (2 / A02)

SCALE: NOT APPLICABLE

CLIENT:
verizon

ARCHITECT/ENGINEER:
CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR DATE

DRAWING SCALE NOTE:
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REVISIONS

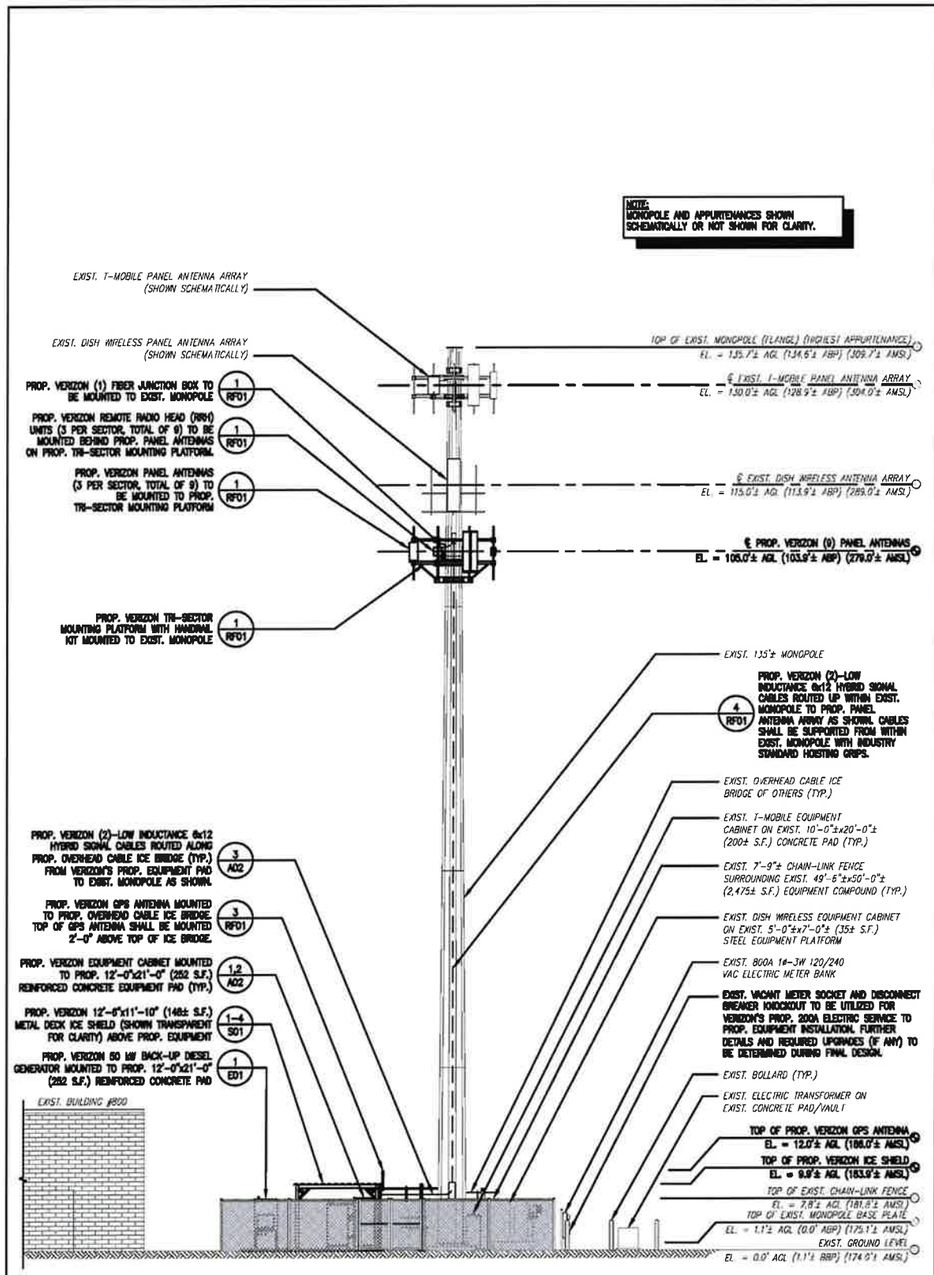
NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/28/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/28/23
2	REVISED PER (5/9/23) TSA	5/10/23

PROJECT NAME:
WINDSOR 4 CT
780 PROSPECT HILL ROAD
WINDSOR, CT 06095

DRAWING TITLE:
EQUIPMENT AREA PLAN & DETAILS

DRAWING NO:
A02

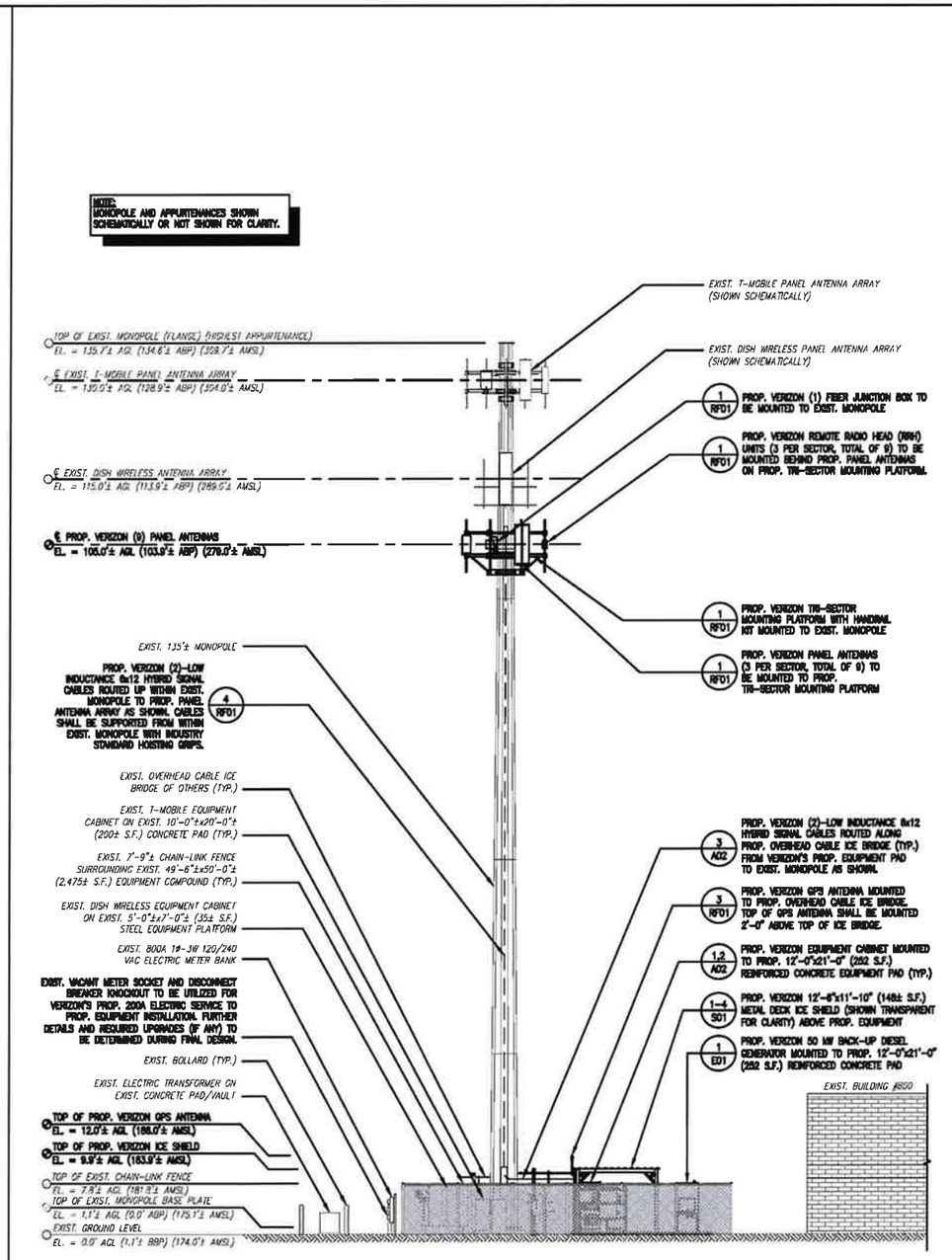
SCALE: AS SHOWN	DESIGNED BY: MMC DRAWN BY: MMC CHECKED BY: CRS	VZW PROJECT CODE: 20232415626
CEA PROJECT NO.: 98210.418	ORIGINAL ISSUE DATE: 4/28/23	VZW PROJECT NO.: 16999214
		MDG LOCATION ID: 5000207278



NORTHEAST EQUIPMENT COMPOUND ELEVATION (1 A03)

SCALE: 1" = 10'

0 5' 10' 20' 30'



SOUTHWEST EQUIPMENT COMPOUND ELEVATION (2 A03)

SCALE: 1" = 10'

0 5' 10' 20' 30'

LEGEND

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

CLIENT:

verizon

ARCHITECT/ENGINEER:

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural Land Surveying
R.K. EXECUTIVE CENTRE
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ENGINEER/LAND SURVEYOR DATE

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NO.	DESCRIPTION	DATE
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1	ISSUED FOR CONSTRUCTION (FINAL)	4/28/23
2	REVISED PER (5/9/23) TSA	5/10/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

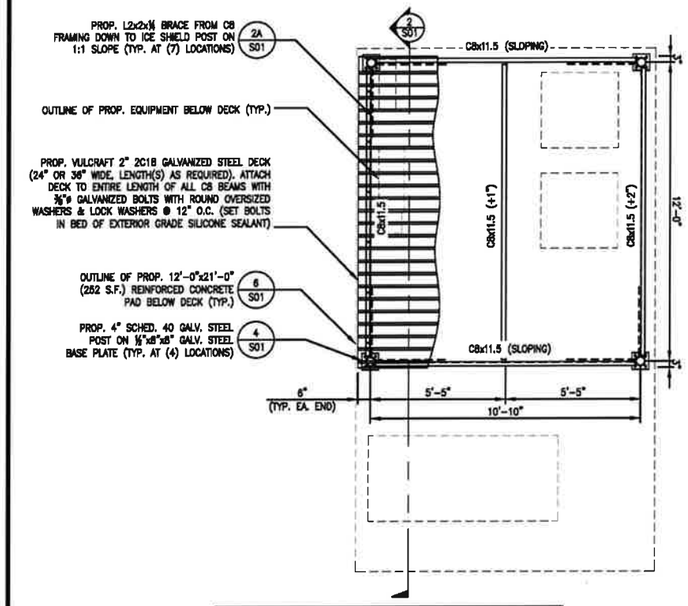
DRAWING TITLE:

NORTHEAST AND SOUTHWEST EQUIPMENT COMPOUND ELEVATIONS

DRAWING NO:

A03

SCALE: 1" = 10'	DESIGNED BY: MMC	VZW PROJECT CODE: 20232415626
	DRAWN BY: MMC	
	CHECKED BY: CRS	VZW PROJECT NO.: 16999214
CEA PROJECT NO.: 96210.416	ORIGINAL ISSUE DATE: 4/28/23	MDG LOCATION ID: 50002072781



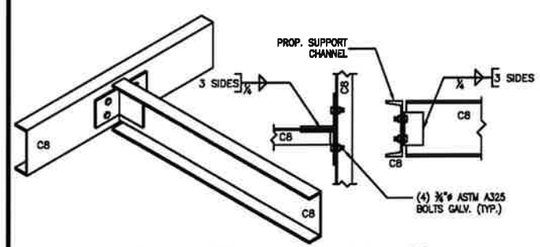
FRAMING PLAN NOTES:
1.) ALL STEEL SHALL BE INSTALLED LEVEL UNLESS OTHERWISE NOTED.
2.) TOP OF NEW STEEL ELEVATION SHALL BE HELD 9'-6" ABOVE EQUIPMENT PAD SURFACE UNLESS OTHERWISE NOTED THUS (±X") INDICATING DISTANCE ABOVE OR BELOW TOP OF STEEL REFERENCE ELEVATION.

ICE SHIELD FRAMING PLAN 1 S01

SCALE: 3/8" = 1'-0"

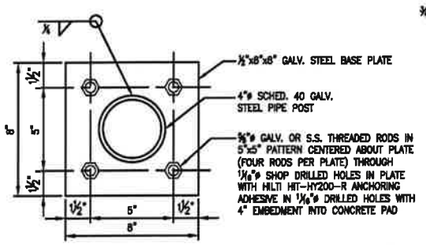
NORTH

0 2'-8" 5'-4" 8'-0"



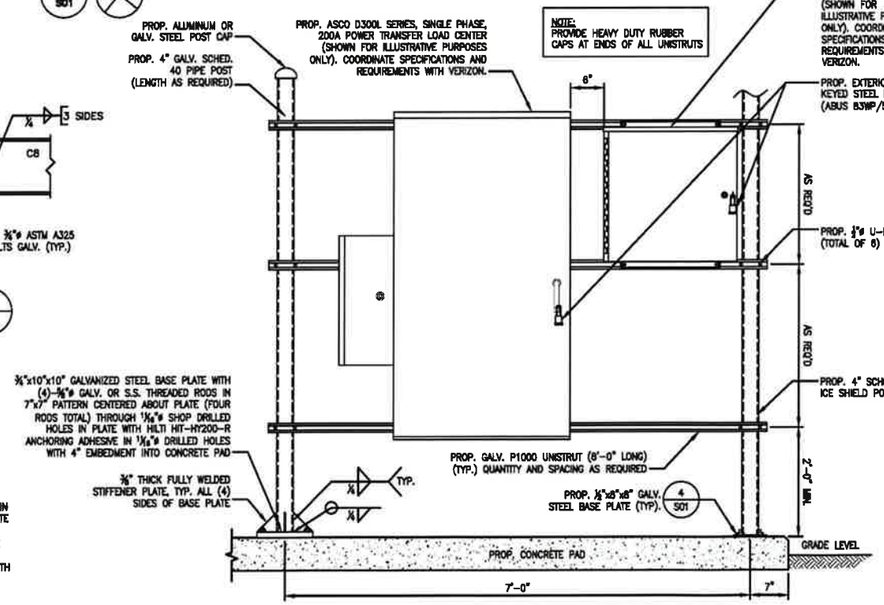
TYPICAL BEAM TO BEAM CONN. 3 S01

SCALE: NOT TO SCALE



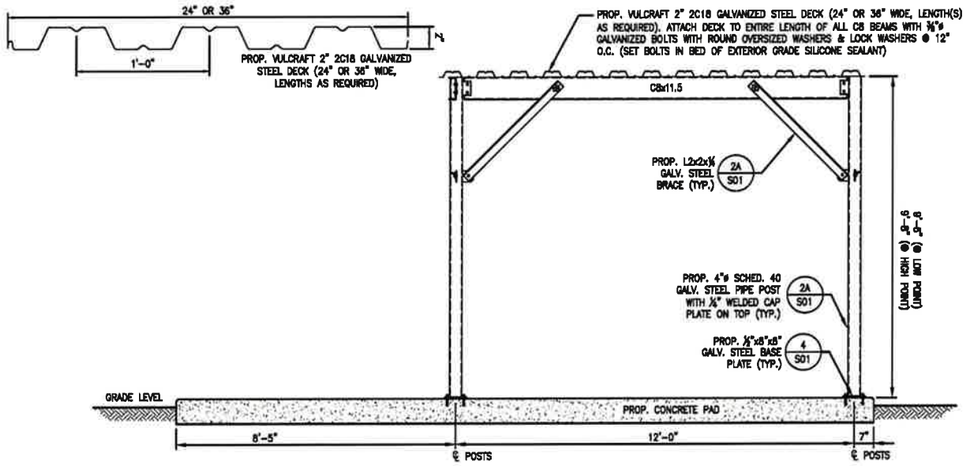
TYPICAL ICE SHIELD POST BASE PLATE 4 S01

SCALE: NONE



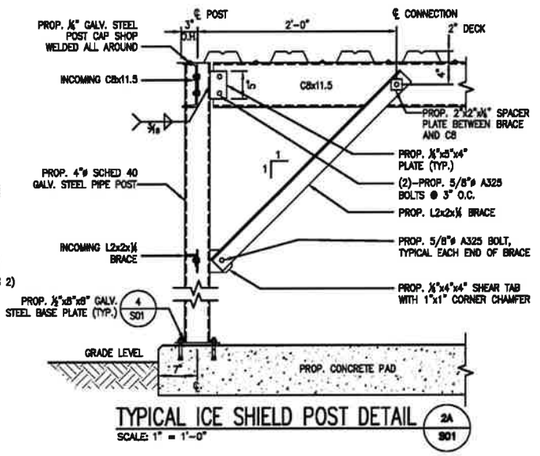
UNISTRUT RACK DETAIL 5 S01

SCALE: N.T.S.



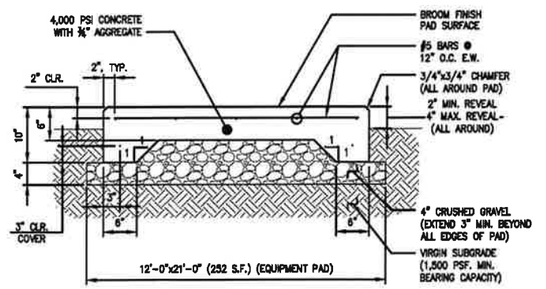
ICE SHIELD SECTION 2 S01

SCALE: 1/2" = 1'-0"



TYPICAL ICE SHIELD POST DETAIL 2A S01

SCALE: 1" = 1'-0"



REINFORCED CONCRETE PAD DETAIL 6 S01

SCALE: NONE

CLIENT:

verizon

ARCHITECT/ENGINEER:

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR DATE

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REVISIONS

NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

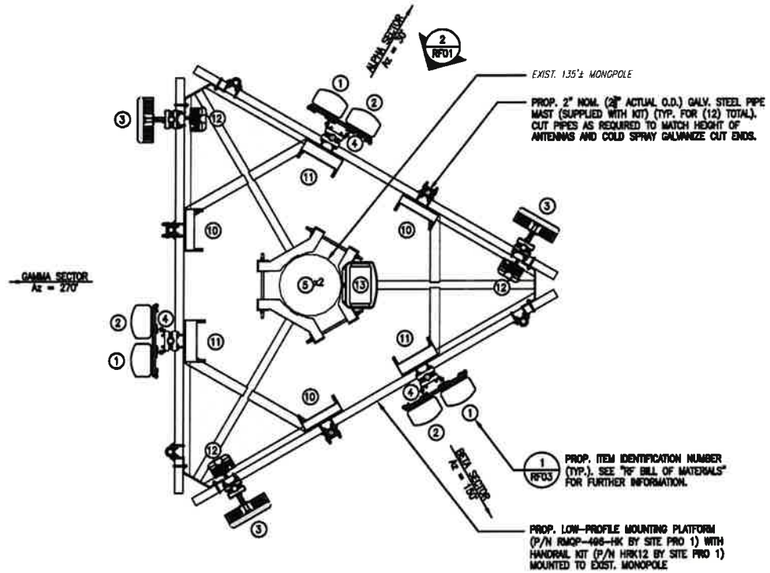
DRAWING TITLE:

ICE SHIELD FRAMING PLAN & STRUCTURAL DETAILS

DRAWING NO:

S01

SCALE: AS SHOWN	DESIGNED BY: MMC	VZW PROJECT CODE: 20233415628
	DRAWN BY: MMC	
	CHECKED BY: DRS	VZW PROJECT NO.: 18999214
CSA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/26/23	MDG LOCATION ID: 500207278



(MONOPOLE PLAN VIEW AT ELEVATION 105.0'± AGL)

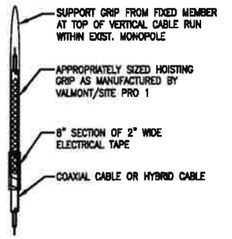
ANTENNA MOUNTING PLAN (1 / RF01)

SCALE: 1/2" = 1'-0"

0 2'-0" 4'-0" 8'-0"

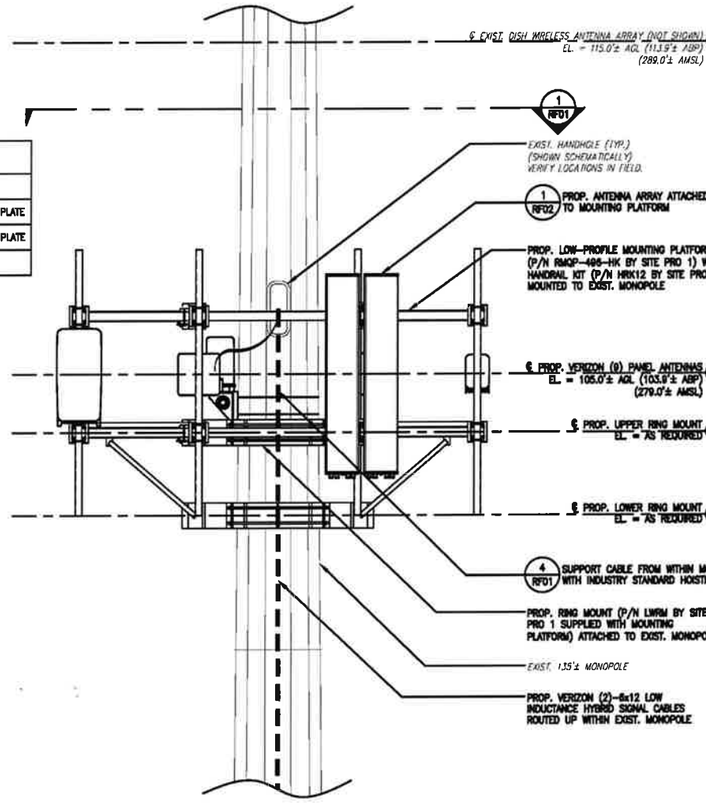
NORTH

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



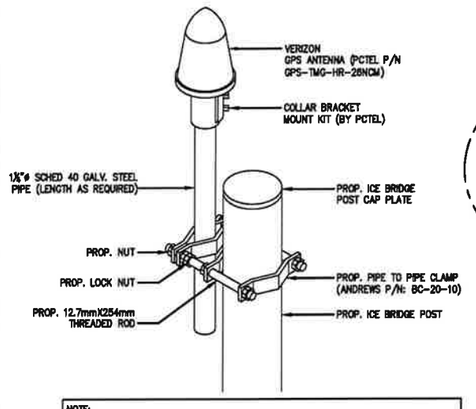
TYPICAL HOISTING GRIP DETAIL (4 / RF01)

SCALE: NONE



ANTENNA MOUNTING PLATFORM MOUNTING DETAIL (2 / RF01)

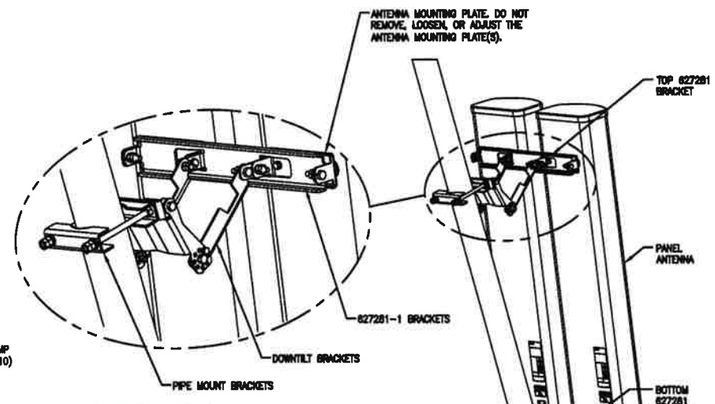
SCALE: 1/2" = 1'-0"



NOTE:
THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1"-1¼" 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 (3 / RF01)

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	

MOUNT ANTENNA IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED PROCEDURE

TYPICAL SIDE-BY-SIDE ANTENNA MOUNT KIT (COMMSCOPE PART #BSAMNT-SBS-1-2) (5 / RF01)

SCALE: NOT TO SCALE

CLIENT:
verizon

ARCHITECT/ENGINEER:
CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR DATE

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REVISIONS

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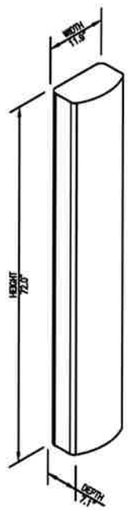
0	ISSUED FOR REVIEW	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:
WINDSOR 4 CT
780 PROSPECT HILL ROAD
WINDSOR, CT 06095

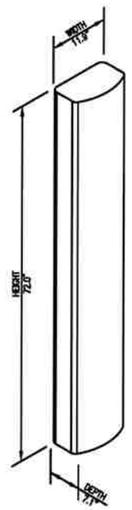
DRAWING TITLE:
ANTENNA MOUNTING PLAN AND DETAILS

DRAWING NO:
RF01

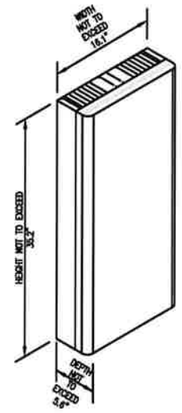
SCALE: AS SHOWN	DESIGNED BY: MMC	VZW PROJECT CODE: 20232415828
	DRAWN BY: MMC	
	CHECKED BY: GRS	VZW PROJECT NO.: 16992214
CEA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/26/23	MDG LOCATION ID: 5000207278



ITEM 1	
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	



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	



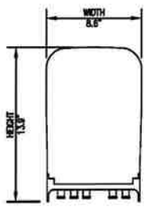
ITEM 3	
MT6407-77A ANTENNA	
MAX. DIMENSIONS:	30.2"H x 16.1"W x 5.8"D
MAX. WEIGHT:	87.1 LBS EACH
QUANTITY:	1 PER SECTOR, TOTAL OF 3
STATUS: PROPOSED	

TYPICAL PROP. PANEL ANTENNA SPECIFICATIONS (1 RF02)

SCALE: N.T.S.

ITEM 10	
LTE/NR (700/850 MHz) REMOTE RADIO HEAD UNIT	
DIMENSIONS:	15.0"H x 15.0"W x 9.0"D
WEIGHT:	70.3 LBS
QUANTITY:	1 PER SECTOR, TOTAL OF 3
STATUS: PROPOSED	

ITEM 11	
LTE/NR (1900/2100 MHz) REMOTE RADIO HEAD UNIT	
DIMENSIONS:	15.0"H x 15.0"W x 10.0"D
WEIGHT:	74.7 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	

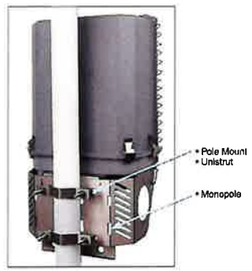
TYPICAL REMOTE RADIO HEAD (RRH) UNIT DIMENSIONS (2 RF02)

SCALE: N.T.S.

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	190-0750	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	190-0750	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 #8 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:	29.56"H x 16.5"W x 12.6"D
WEIGHT:	32.0 LBS
QUANTITY:	TOTAL OF 1
STATUS: PROPOSED	

TYPICAL FIBER JUNCTION BOX DIMENSIONS, SCHEMATIC AND MOUNTING PROCEDURE (3 RF02)

SCALE: N.T.S.

CLIENT:

verizon

ARCHITECT/ENGINEER:

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil, Structural, Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR DATE

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NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/28/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/28/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

DRAWING TITLE:

ANTENNA DETAILS AND ANCILLARY EQUIPMENT SPECIFICATIONS

DRAWING NO:

RF02

SCALE:	DESIGNED BY: MMC	VZW PROJECT CODE:
AS SHOWN	DRAWN BY: MMC	20232415828
	CHECKED BY: GRS	VZW PROJECT NO.:
CEA PROJECT NO.:	ORIGINAL ISSUE DATE:	18999214
06210.416	4/28/23	MDG LOCATION ID: 5000207278

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

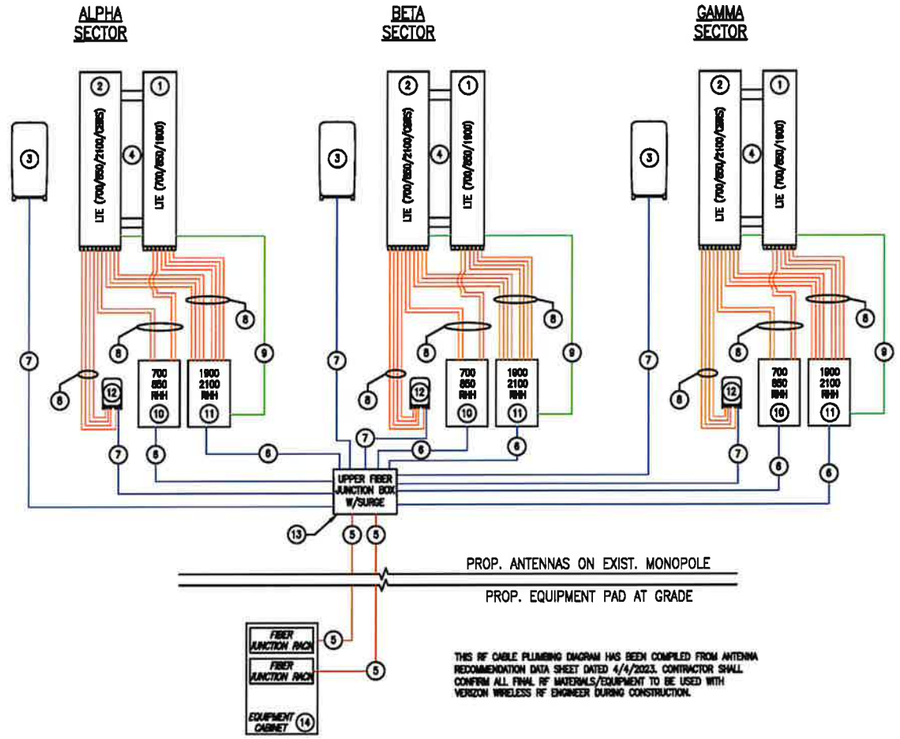
SITE NAME: WINDSOR 4 CT — A = ALPHA SECTOR B = BETA SECTOR G = GAMMA SECTOR

ITEM (SEE PLAN)	DESCRIPTION	BAND	QTY	STATUS	CABLE LENGTH/UNIT SIZE	COMMENTS
1	PANEL ANTENNA	700/850/1900	3 TOTAL (A,B,G)	PROP.	72.0"H x 11.9"W x7.1"D (43.7 lbs, each)	MOUNT TO PROP. SIDE-BY-SIDE MOUNT
2	PANEL ANTENNA	700/850/2100/CBRS	3 TOTAL (A,B,G)	PROP.	72.0"H x 11.9"W x7.1"D (48.1 lbs, each)	MOUNT TO PROP. SIDE-BY-SIDE MOUNT
3	PANEL ANTENNA	3700-3980	3 TOTAL (A,B,G)	PROP.	35.2"H x 16.1"W x 5.6"D (57.1 lbs, each)	MOUNT TO PROP. PIPE MAST
4	SIDE-BY-SIDE ANTENNA MOUNT KIT	-	3 TOTAL (A,B,G)	PROP.	25.4 lbs, each	MOUNT TO PROP. PIPE MAST
5	6x12 HYBRID SIGNAL CABLE (MAIN LINE)	-	2 TOTAL	PROP.	130 FT.±	ROUTE FROM PROP. EQUIPMENT, ALONG PROP. OVERHEAD CABLE ICE BRIDGE TO EXIST. MONOPOLE AND UP WITHIN MONOPOLE TO PROP. FIBER JUNCTION BOX
6	1x1 HYBRID SIGNAL CABLE (JUMPER)	-	6 TOTAL (2 PER SECTOR)	PROP.	20 FT. MAX. EACH	ROUTE FROM PROP. UPPER FIBER JUNCTION BOX 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 BOX TO PROP. ANTENNAS/CBRS RRH UNITS
8	1/2"ø 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.	15.0"H x 16.0"W x 9.0"D (70.3 lbs, each)	MOUNT TO PROP. PIPE MAST
11	REMOTE RADIO HEAD (RRH) UNIT	1900/2100	3 TOTAL (A,B,G)	PROP.	15.0"H x 15.0"W x 10.0"D (74.7 lbs, each)	MOUNT TO PROP. PIPE MAST
12	REMOTE RADIO HEAD (RRH) UNIT	BAND 48	3 TOTAL (A,B,G)	PROP.	13.8"H x 8.6"W x 4.2"D (18.8 lbs, each)	MOUNT TO PROP. PIPE MAST
13	UPPER FIBER JUNCTION BOX W/SURGE	-	1 TOTAL	PROP.	29.58"H x 16.5"W x 12.6"D (32.0 lbs, each)	MOUNT TO EXIST. MONOPOLE
14	LOWER CABINET/FIBER JUNCTION RACK	-	1 TOTAL	PROP.	29.58"H x 16.5"W x 12.6"D (32.0 lbs, each)	MOUNTED TO PROP. CONCRETE PAD

THIS RF BILL OF MATERIALS (BOM) HAS BEEN COMPILED FROM ANTENNA RECOMMENDATION DATA SHEET DATED 4/4/2023. CONTRACTOR SHALL CONFIRM ALL FINAL RF MATERIALS/EQUIPMENT TO BE USED WITH VERIZON WIRELESS RF ENGINEER DURING CONSTRUCTION.

RF BILL OF MATERIALS (FINAL CONFIGURATION) — 1 / RF03
SCALE: NONE

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.



THIS RF CABLE PLUMBING DIAGRAM HAS BEEN COMPILED FROM ANTENNA RECOMMENDATION DATA SHEET DATED 4/4/2023. CONTRACTOR SHALL CONFIRM ALL FINAL RF MATERIALS/EQUIPMENT TO BE USED WITH VERIZON WIRELESS RF ENGINEER DURING CONSTRUCTION.

RF CABLE PLUMBING DIAGRAM (FINAL CONFIGURATION) — 2 / RF03
SCALE:

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.

LEGEND

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

CLIENT: verizon

ARCHITECT/ENGINEER:
CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR — DATE

DRAWING SCALE NOTE:
THESE DRAWINGS HAVE BEEN PREPARED IN ARCH D (24"x36") FORMAT. AS SUCH, THE WRITTEN SCALES SHOWN ON ANY REPRODUCTIONS OF A CONTRADICTORY SIZE SHALL BE REGARDED INVALID. ALL BAR SCALES MAY BE USED REGARDLESS OF REPRODUCTION SIZE. WHERE IN CONFLICT, BAR SCALES SHALL SUPERSEDE WRITTEN SCALES.

REVISIONS

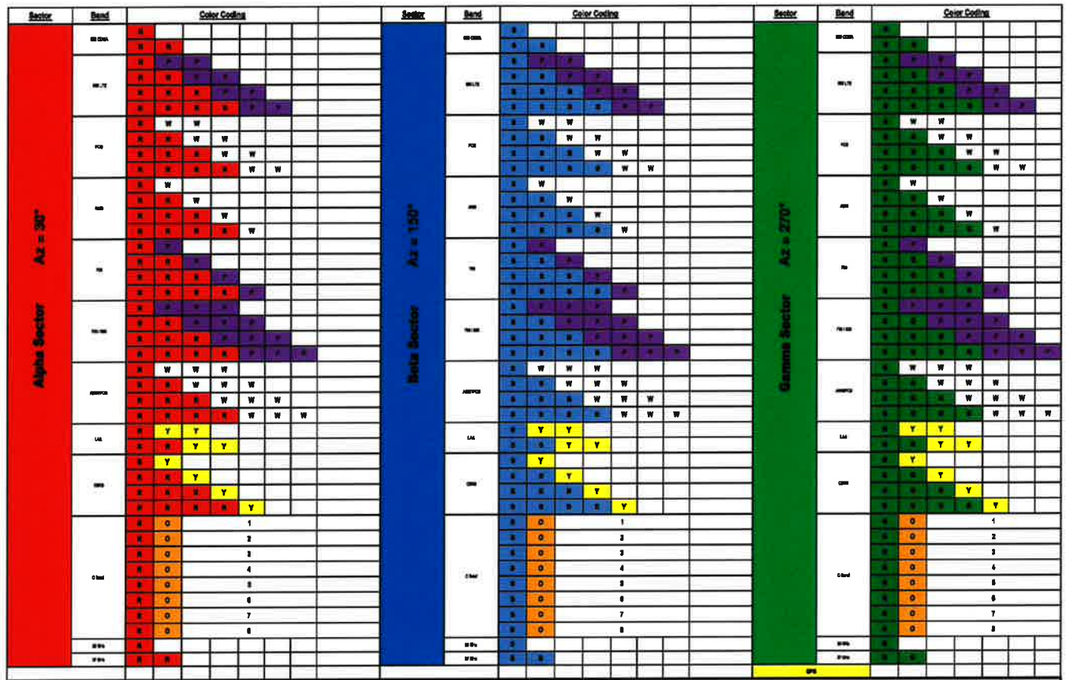
NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:
WINDSOR 4 CT
780 PROSPECT HILL ROAD
WINDSOR, CT 06095

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

DRAWING NO:
RF03

SCALE:	DESIGNED BY: NMC	VZW PROJECT CODE: 20032415626
AS SHOWN	DRAWN BY: NMC	
	CHECKED BY: GRS	VZW PROJECT NO.: 15999214
CEA PROJECT NO.: 96210.416	ORIGINAL ISSUE DATE: 4/26/23	MDG LOCATION ID: 5000207278



Main Line Cable Length/Information

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

130'±

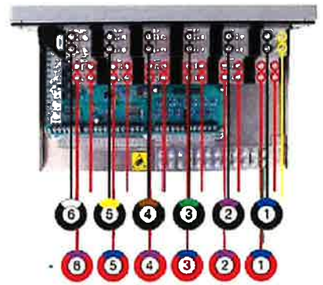
TWO (2) PROPOSED 6x12 HYBRID SIGNAL CABLES

LINE COLOR CODE SPECIFICATIONS 1 RF04

Hybrid Cable on Towers

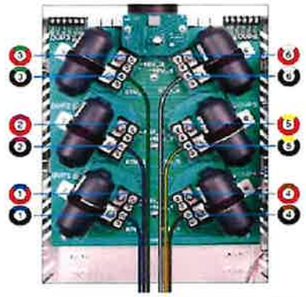
Hybrid Cable 1

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

CLIENT:

verizon

ARCHITECT/ENGINEER:

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil-Structural-Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR DATE

DRAWING SCALE NOTE:

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REVISIONS

NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/28/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/28/23
2	REVISED PER (5/9/23) TSA	5/10/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

DRAWING TITLE:

RF COLOR CODE SPECIFICATIONS

DRAWING NO:

RF04

SCALE: N/A	DESIGNED BY: MMC DRAWN BY: MMC CHECKED BY: DRS	VZW PROJECT CODE: 20232415828 VZW PROJECT NO.: 10099214
CEA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/28/23	MDG LOCATION ID: 500207278

ELECTRICAL SPECIFICATIONS

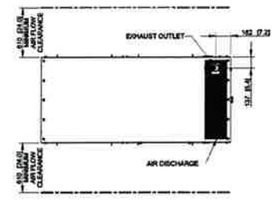
1. FURNISH ALL LABOR, MATERIALS, EQUIPMENT, TOOLS AND INCIDENTALS REQUIRED TO MAKE READY FOR USE THE COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS. MAKE ALL NECESSARY CONNECTIONS AT "PACKAGED" EQUIPMENT.
2. THE ELECTRICAL SYSTEMS SHALL BE SUITABLE IN EVERY WAY FOR THE SERVICE REQUIRED. ALL MATERIAL AND ALL WORK WHICH MAY BE REASONABLY IMPLIED AS BEING INCIDENTAL TO THE WORK SHALL BE FURNISHED AT NO EXTRA COST.
3. 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 2022 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)
4. 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.
5. 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/HER WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY, AND SHALL PAY ALL UTILITY SERVICE BACK CHARGES.
6. 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.
7. UNDERGROUND CONDUITS SHALL BE PVC SCHEDULE 40 AND INSTALLED NOT LESS THAN 30 INCHES BELOW FINISHED GRADE.
8. WIRING INSTALLED IN THE BUILDING THAT IS SHOWN TO BE IN CONDUIT SHALL BE INSTALLED IN EMT. EMT FITTINGS SHALL BE STEEL COMPRESSION TYPE.
9. 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, WATERTIGHT, SYNTHETIC JACKET. CONDUITS SMALLER THAN 1-1/2" SHALL HAVE A CONTINUOUS GROUND CONDUCTOR UNDER THE JACKET.
10. 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.
11. 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.
12. FLUSH SWITCH AND OUTLET BOXES SHALL BE HOT-DIPPED GALVANIZED, PRESSED STEEL WITH NYLON COVER PLATES, COLOR AS DETERMINED BY THE ENGINEER.
13. EXCEPT AS OTHERWISE SHOWN, TERMINAL, JUNCTION AND PULL BOXES LARGER THAT 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.
14. 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.
15. HANGERS, RODS, BACK PLATES, BEAM CLAMPS, ETC. SHALL BE GALVANIZED IRON OR STEEL. CONDUITS SHALL BE SUPPORTED AT LEAST EVERY 5 FEET.
16. 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.
17. 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.
18. CONDUIT SHALL NOT BE SUPPORTED FROM PIPING, PIPING SUPPORTS, DUCTWORK, SUSPENDED CEILING SUPPORTS OR MECHANICAL EQUIPMENT SUBJECT TO VIBRATION OR REMOVAL.
19. 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.
20. 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.
21. CONDUCTORS SHALL BE ANNEALED, 98 PERCENT CONDUCTIVITY, SOFT-DRAWN COPPER. NO CONDUCTOR SMALLER THAT NO. 12 AWG SHALL BE USED, EXCEPT AS OTHERWISE NOTED.
22. 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..
23. ALL CONDUCTORS SHALL BE CAREFULLY HANDLED TO AVOID KINKS OR DAMAGE TO INSULATION. LUBRICATIONS SHALL BE USED TO FACILITATE WIRE PULLING. LUBRICANTS SHALL BE UL LISTED FOR USE WITH THE INSULATION SPECIFIED.
24. ALL EQUIPMENT AND MATERIALS SHALL BE GROUNDED IN STRICT ACCORDANCE WITH THE CONNECTICUT ELECTRICAL CODE, AND THE STANDARD REQUIREMENTS OF VERIZON WIRELESS AND LUCENT.
25. 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.
26. 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.
27. 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.
28. PANELS SHALL BE PER DIRECTED BY THESE DRAWINGS WITH TYPED DIRECTORIES.
29. 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.
30. 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.
31. ALL EXTERIOR CONDUCTOR/LUG TERMINALS SHALL HAVE AN ANTIOXIDANT APPLIED.
32. ALL SPRING TYPE WIRE CONDUCTORS USED IN EXTERIOR BOXES SHALL BE SILICON FILLED.
33. ELECTRICAL CONTRACTOR SHALL AS PART OF HIS/HER WORK INCLUDE ALL FITTINGS, SLEEVES AND MINOR CUTTING REQUIRED FOR HIS/HER WORK, INCLUDING FIRES-STOPPING.
34. THE ELECTRICAL CONTRACTOR, AT HIS/HER OWN EXPENSE, SHALL PROVIDE HIS/HER OWN, WHERE DIRECTED, STORAGE AND OFFICE SPACE.
35. FIVE COPIES OF SHOP DRAWINGS OF ALL EQUIPMENT SHALL BE PROVIDED TO THE ENGINEER.
36. ELECTRICAL CONTRACTOR'S WORK SHALL INCLUDE ALL LABOR AND MATERIALS, SCAFFOLDING TOOL AND TRANSPORTATION NECESSARY FOR COMPLETE INSTALLATION.
37. ELECTRICAL CONTRACTOR TO FURNISH ENGINEER ONE SET OF MYLARS OF "AS BUILT" DRAWINGS.
38. ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY POWER & LIGHTING AS REQ'D.

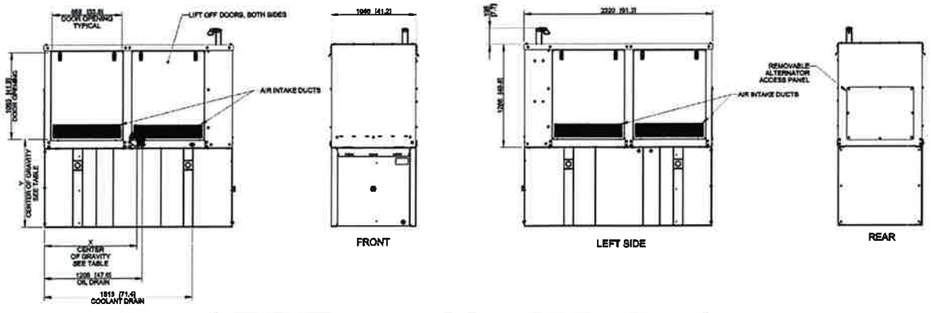
GENERAL NOTES

1. CONTRACTOR SHALL VISIT THE SITE TO MAKE HIMSELF AWARE OF THE EXISTING CONDITIONS.
2. BRANCH CIRCUIT RUNS 100 FT AND OVER SHALL BE #10 AWG CONDUCTORS.
3. 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.
4. 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.
5. 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.
6. ALL CONDUIT SHALL BE SURFACE MOUNTED UNLESS OTHERWISE NOTED. NO INTERIOR HORIZONTAL CONDUIT BELOW 7'-8" AFF IN FINISHED SPACES.
7. ALL WIRING TO BE 3/4"C, 2#12 & 1#12 GROUND, UNLESS OTHERWISE NOTED.
8. NO BX OR ROMEX CABLE IS PERMITTED.
9. ALL WIRING DEVICES AND EQUIPMENT SHALL BE 20A SPECIFICATION GRADE AND UL LISTED.
10. ALL OUTLET AND JUNCTION BOXES SHALL BE SECURELY SURFACE MOUNTED.
11. ALL RECEPTACLE AND EQUIPMENT CIRCUITS SHALL BE GROUNDED USING A FULL SIZE EQUIPMENT GROUNDING CONDUCTOR RUN WITH THE CURRENT CONDUCTORS.
12. ALL WALL PENETRATIONS FOR TELCO, POWER, AND GROUNDING SHALL REQUIRE PVC SLEEVES.
13. ALL SWITCHES SHALL BE FORTY-EIGHT (48) INCHES AFF, UNLESS OTHERWISE NOTED.
14. ALL RECEPTACLES SHALL BE EIGHTEEN (18) INCHES AFF, UNLESS OTHERWISE NOTED.
15. ALL WIRING SHALL BE IN METAL RACEWAY & NO. 12 AWG COPPER MIN. UNLESS OTHERWISE NOTED.
16. WIRE COLOR SHALL BE PER STANDARD CODING BY PHASE.
17. FOR UTILITY BILLING, PLEASE SEND TO:
    VERIZON WIRELESS
    20 ALEXANDER DRIVE, 2nd FLOOR
    WALLINGFORD, CT 06492

GROUNDING GENERAL NOTES

1. ALL EXTERIOR CONDUCTORS SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNLESS OTHERWISE NOTED. MINIMUM BEND RADIUS SHALL BE EIGHT (8) INCHES.
2. ALL CONNECTIONS TO HALO GROUND RING AND ALL CABLE TRAY JUMPERS SHALL BE #6 AWG, INSULATED, STRANDED, COPPER WIRE.
3. 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.
4. MECHANICALLY BOND ANTENNA MOUNTS WITH #2 AWG, BARE, STRANDED CONDUCTORS.
5. ALL GROUNDING WORK SHALL COMPLY WITH VERIZON WIRELESS STANDARDS.
6. 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.
7. CONNECT TO HALO GROUND USING C-TAP (#54730).
8. CONNECT TO ENCLOSURES USING BLUE GROUND LUGS.





KOHLER 50kW DIESEL GENERATOR WITH 283 GA SUB-BASE DIESEL FUEL TANK (PART #50REOZJE)
OVERALL GENERATOR (ENCLOSURE) APPROXIMATE
DIMENSIONS: 91.3"L x 41.2"W x 67.8"H (INCLUDES SUB-BASE DIESEL TANK)
APPROXIMATE MAX. IN-SERVICE WEIGHT: 3,795 lbs

GENERATOR DETAIL (1 / E01)
SCALE: NONE

LEGEND

ELECTRICAL SYMBOLS

- (M) METER
- GROUND ROD/TEST (OBSERVATION) WELL
- GROUND ROD
- CADWELD TYPE CONNECTION
- COMPRESSION TYPE CONNECTION
- GROUNDING WIRE
- (1 / E02) REPRESENTS DETAIL NUMBER
- 1'X4' SURFACE MTD. FLUORESCENT LIGHTING FIXTURE
- SELF CONTAINED EMERG. LIGHTING UNIT
- S 20A-120V-1P TOGGLE SWITCH
- MAGNETIC DOOR SWITCH (DOOR JAMB TYPE)
- 20A-120V QUADRAPLEX RECEPTACLE, GROUNDING TYPE, 2-CKT. NO.
- WP/GFI 20A-120V DUPLEX RECEPTACLE, GROUNDING TYPE. WP = WEATHERPROOF GFI = GROUND FAULT
- TL SIMPLEX RECEPTACLE, GROUNDING TYPE. TL = TWIST LOCK
- JUNCTION BOX
- PANELBOARD 'P1'
- *Φ MOTOR - NUMERAL DENOTES HORSEPOWER
- WEATHER PROOF DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH - '3R' & '1' - NEMA ENCLOSURE
- *Φ THERMOSTAT *Φ$_H$ - HI TEMPERATURE ALARM THERMOSTAT
- *Φ HUMIDISTAT *Φ$_{H/O}$ - HI/LO HUMIDITY ALARM HUMIDISTAT
- COMBINATION SMOKE/HEAT DETECTOR WITH MINI HORN SIMPLEX CAT.#2098-9696 WITH FORM A & C CONTACTS
- P1-2 HOMERUN TO PANEL (FURNISH & INSTALLED BY MECHANICAL)
- SURGE ARRESTOR - JOSLYN CAT. NO. 1455-85
- AFF ABOVE FINISHED FLOOR
- * MOTORIZED DAMPER
- 3#12-3/4"C EXPOSED CONDUIT 2#12-3/4"C.
- TC ALARM TERMINAL CABINET

*EQUIPMENT FURNISHED AND INSTALLED BY OTHERS AND WIRED BY THIS CONTRACTOR

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

CLIENT: verizon

ARCHITECT/ENGINEER:
CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:
ENGINEER/LAND SURVEYOR DATE

DRAWING SCALE NOTE:
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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

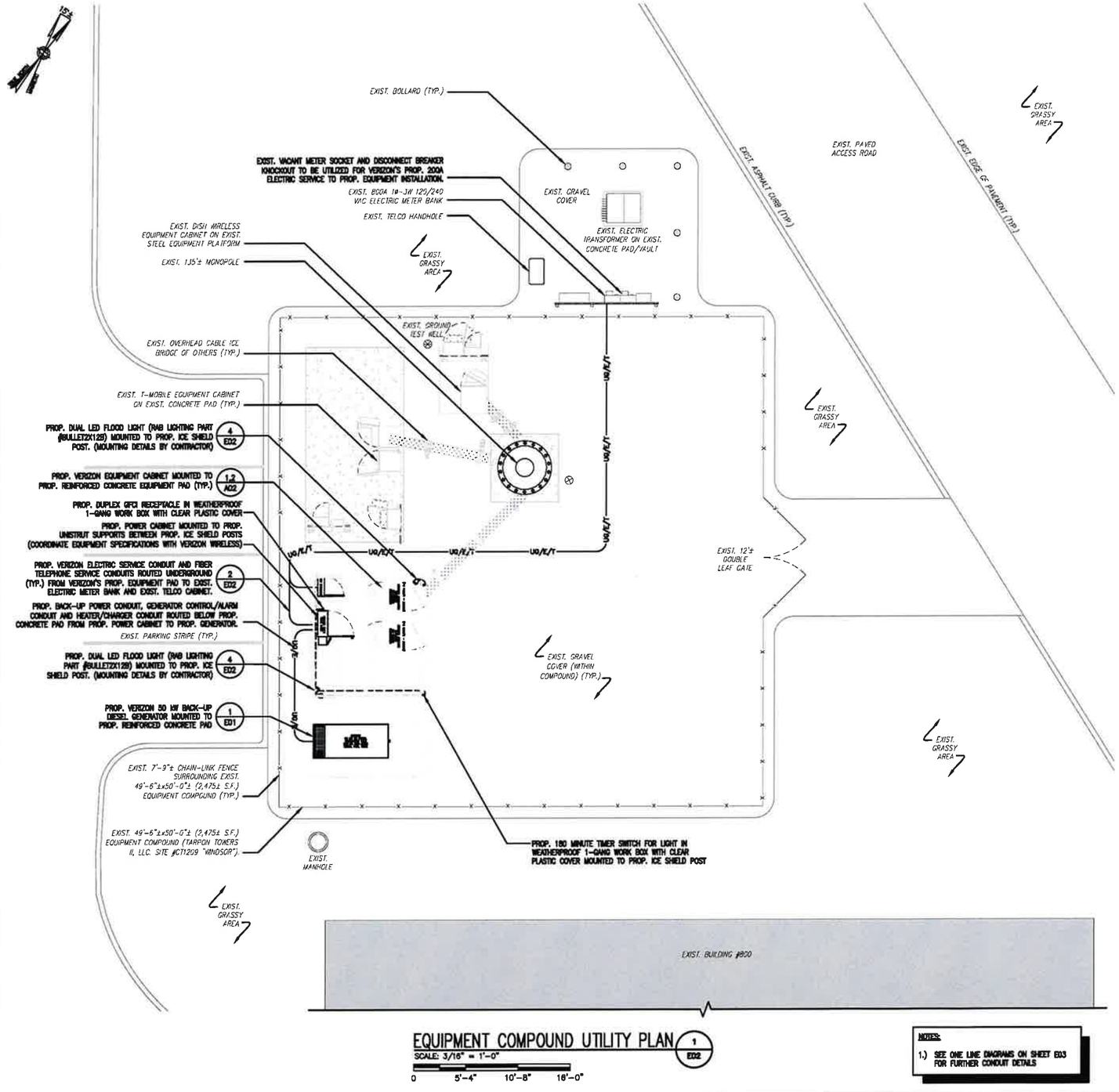
NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:
WINDSOR 4 CT
780 PROSPECT HILL ROAD
WINDSOR, CT 06095

DRAWING TITLE:
ELECTRICAL SPECIFICATIONS AND NOTES

DRAWING NO:
E01

SCALE: AS SHOWN	DESIGNED BY: MMC	VZW PROJECT CODE: 20232415626
	DRAWN BY: MMC	
	CHECKED BY: GMS	VZW PROJECT NO.: 16999214
CEA PROJECT NO.: 96210.416	ORIGINAL ISSUE DATE: 4/26/23	MDG LOCATION ID: 5000207276



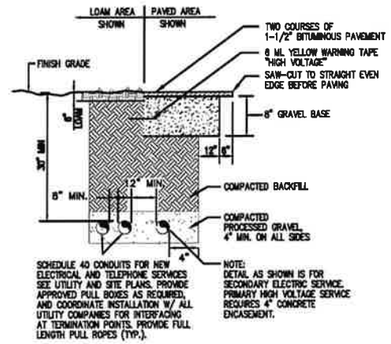
EQUIPMENT COMPOUND UTILITY PLAN 1 E02

SCALE: 3/16" = 1'-0"

0 5'-4" 10'-8" 16'-0"

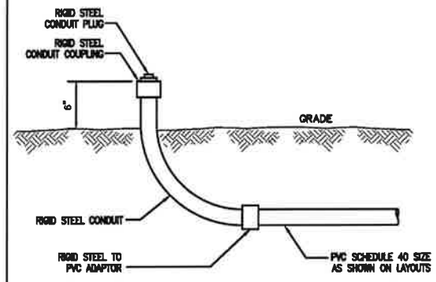
NOTES:

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



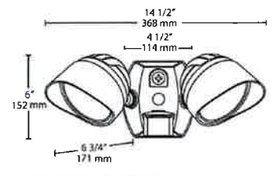
TYPICAL BURIED CONDUIT DETAIL 2 E02

SCALE: NONE



TYPICAL CONDUIT STUB-UP DETAIL 3 E02

SCALE: NONE



RAB LIGHTING - BULLET2X12B
24W
BLACK

MOUNT PER MANUFACTURER'S SPECIFICATIONS

TYPICAL LED FLOOD LIGHT DETAIL 4 E02

SCALE: N.T.S.

CLIENT:

verizon

ARCHITECT/ENGINEER:

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil-Structural-Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
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0	ISSUED FOR REVIEW	4/26/23
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2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

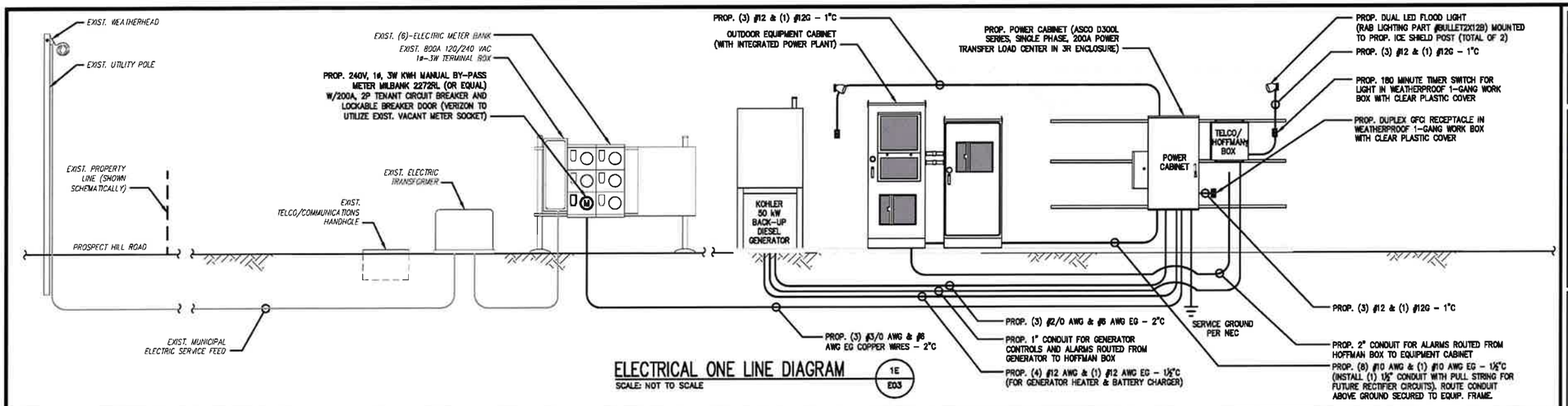
DRAWING TITLE:

EQUIPMENT COMPOUND UTILITY PLAN & DETAILS

DRAWING NO:

E02

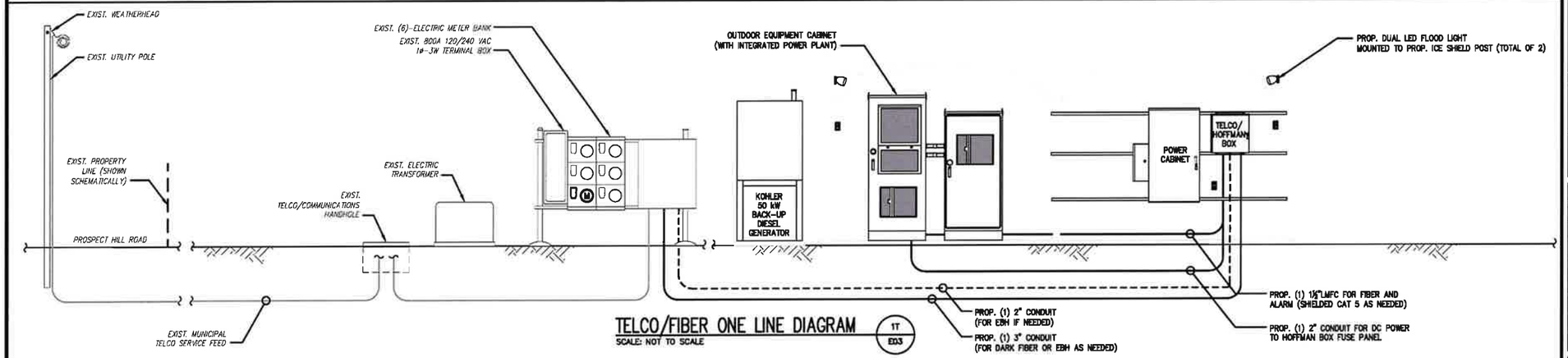
SCALE: AS SHOWN	DESIGNED BY: MRC DRAWN BY: MRC CHECKED BY: GRS	VZW PROJECT CODE: 20232415828
CEA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/26/23	VZW PROJECT NO.: 19996214 MDG LOCATION ID: 5000207278



ELECTRICAL ONE LINE DIAGRAM

SCALE: NOT TO SCALE

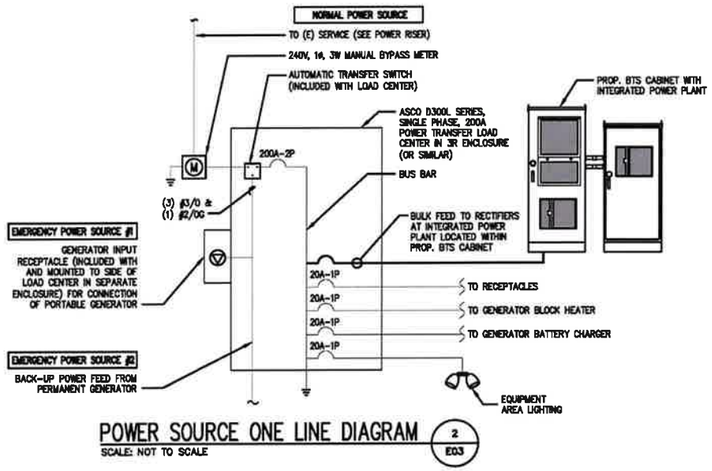
1E / E03



TELCO/FIBER ONE LINE DIAGRAM

SCALE: NOT TO SCALE

1T / E03



POWER SOURCE ONE LINE DIAGRAM

SCALE: NOT TO SCALE

2 / E03

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	RECTIFIER #4	30	-	BLANK	14
15			-	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

ELECTRICAL PANEL SCHEDULE

SCALE: NTS

3 / E03

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) 941-8800

MAKE ALL CONNECTIONS AS PER UTILITY COMPANY'S REQUIREMENTS.

CLIENT:

verizon

ARCHITECT/ENGINEER:

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR — DATE

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0	ISSUED FOR REVIEW	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

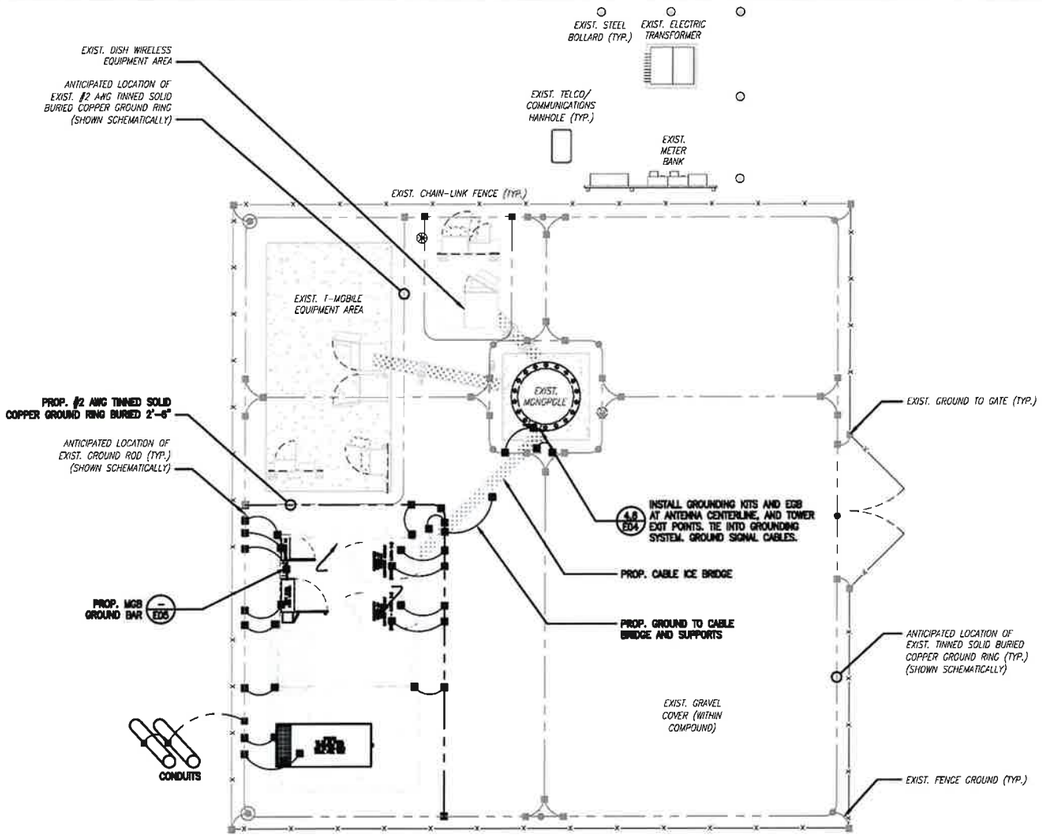
DRAWING TITLE:

ELECTRICAL DIAGRAMS & DETAILS

DRAWING NO:

E03

SCALE: AS SHOWN	DESIGNED BY: MMC	VZW PROJECT CODE: 20232415628
	DRAWN BY: MMC	
	CHECKED BY: CMS	VZW PROJECT NO.: 18999214
CEA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/26/23	MDG LOCATION ID: 500207278

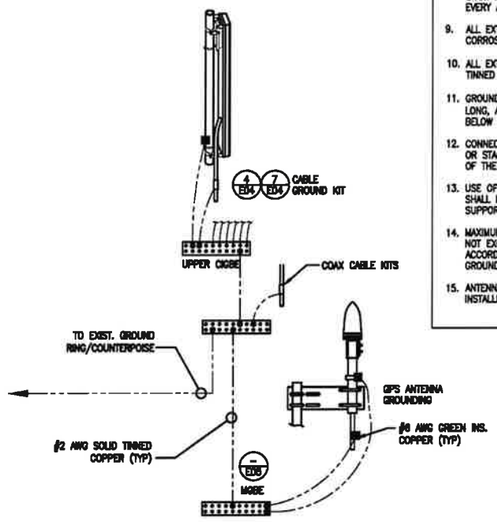


SCHEMATIC GROUNDING PLAN (1 / E04)

SCALE: 3/16" = 1'-0"

GROUNDING LEGEND

- EXOTHERMIC GROUND
- GROUND ROD
- TEST WELL
- PROP. #2 AWG EQUIPMENT GROUNDING
- PROP. GROUND HALO
- EXIST. SITE GROUNDING (SHOWN SCHEMATICALLY)



ANTENNA GROUNDING RISER DIAGRAM (2 / E04)

SCALE: NOT TO SCALE

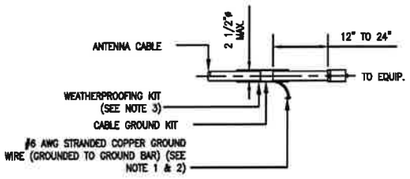
ELECTRICAL AND GROUNDING NOTES:

ELECTRICAL

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND ALL APPLICABLE LOCAL CODES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
3. SERVICE TO EQUIP. SHALL BE 120/240 VAC, 200 AMP, 1Ø, 60 Hz.
4. 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

5. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC (CADWELD) CONNECTIONS.
6. ALL GROUND CONNECTIONS BELOW GRADE SHALL BE EXOTHERMIC (CADWELD).
7. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR & EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
8. ALL EXOTHERMIC CONNECTIONS TO THE GROUND RODS SHALL START AT THE TOP & HAVE A VERTICAL SEPARATION OF 6" FOR EVERY ADDITIONAL CONNECTION.
9. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
10. ALL EXTERIOR GROUND CONDUCTORS SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
11. 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.
12. 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.
13. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
14. 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.
15. ANTENNA GROUND KITS SHALL BE FURNISHED BY VERIZON AND INSTALLED BY CONTRACTOR.



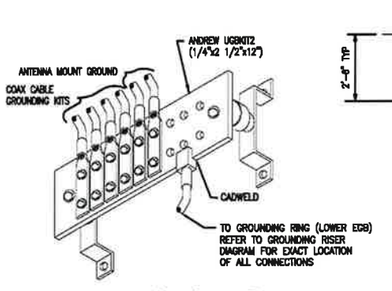
CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NOTES:

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

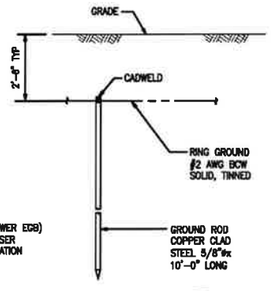
DETAIL (3 / E04)

SCALE: NOT TO SCALE



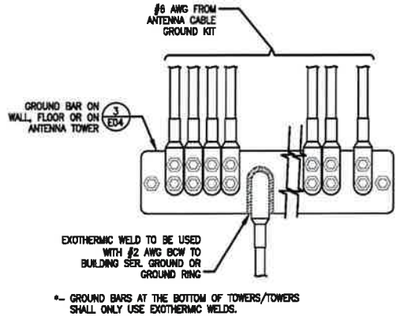
GROUND BAR (EGB) (4 / E04)

SCALE: NOT TO SCALE



GROUND ROD (5 / E04)

SCALE: NOT TO SCALE

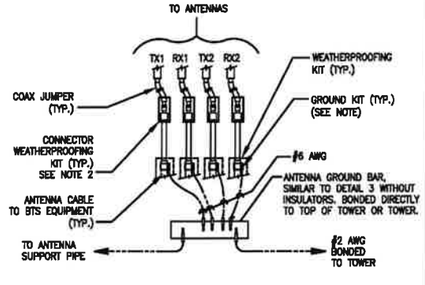


*– GROUND BARS AT THE BOTTOM OF TOWERS/TOWERS SHALL ONLY USE EXOTHERMIC WELDS.

INSTALLATION OF GROUND WIRE TO GROUND BAR

DETAIL (6 / E04)

SCALE: NOT TO SCALE



CONNECTION OF GROUND WIRE TO GROUNDING BAR, TOWER

DETAIL (7 / E04)

SCALE: NOT TO SCALE

CLIENT:

verizon

ARCHITECT/ENGINEER:

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil/Structural/Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

SEAL:

ENGINEER/LAND SURVEYOR — DATE

DRAWING SCALE NOTE:

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REVISIONS

NO.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	4/26/23
1	ISSUED FOR CONSTRUCTION (FINAL)	4/26/23
2	REVISED PER (5/9/23) TSA	5/16/23

PROJECT NAME:

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

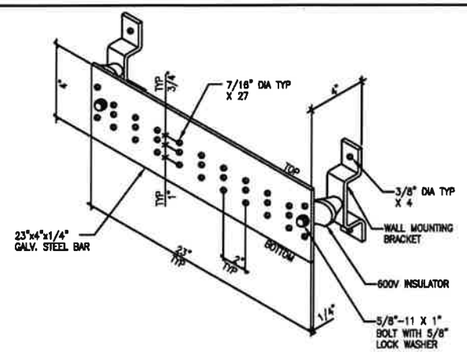
DRAWING TITLE:

SCHEMATIC GROUNDING PLAN & DETAILS

DRAWING NO:

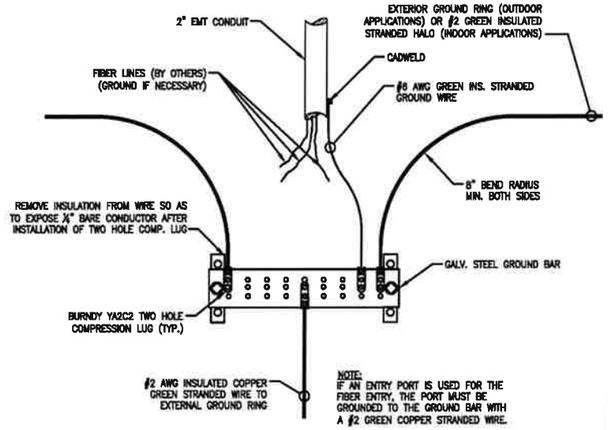
E04

SCALE: AS SHOWN	DESIGNED BY: MWC	VZW PROJECT CODE: 20232415626
	DRAWN BY: MWC	
	CHECKED BY: GRS	VZW PROJECT NO.: 16999214
CEA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/26/23	MDG LOCATION ID: 5000207278

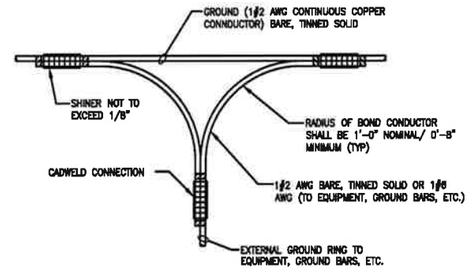


1. SURFACE PREPERATION: ALL CONNECTIONS MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE MADE BARE TO ENSURE PROPER CONTACT. NO WASHERS SHALL BE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS SHALL HAVE AN ANTI-OXIDANT AGENT APPLIED PRIOR TO INSTALLATION.
2. BUSS PREPERATION: ALL GALV. STEEL BUSSES SHALL BE CLEANED, POLISHED AND AN ANTI-OXIDANT APPLIED. NO FINGERPRINTS OR DISCOLORED STEEL WILL BE PERMITTED.
3. TERMINATIONS: ALL EQUIPMENT TERMINATIONS SHALL BE MADE WITH A BURNDY TWO HOLE COMPRESSION LUG WITH 10-24x3/4" LONG S.S. SCREWS, NUTS AND LOCK WASHERS. ALL BUSS TERMINATIONS SHALL BE MADE WITH A CAD-WELD OR BURNDY YC2C2 2 HOLE COMPRESSION LUG OR EQUAL. ALL INTERIOR HALO ATTACHMENTS SHALL BE MADE USING A BURNDY YC2C2 COMPRESSION LUG.

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

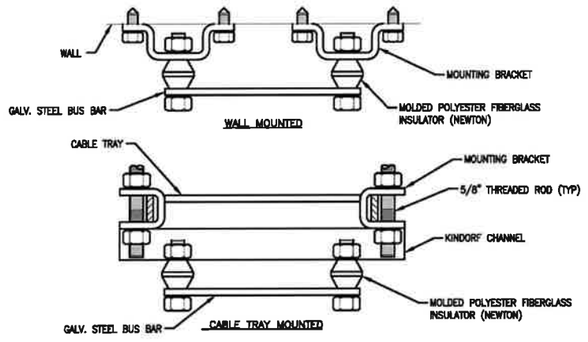


INTERIOR GROUNDING AT TELCO ENTRY
SCALE: N.T.S.

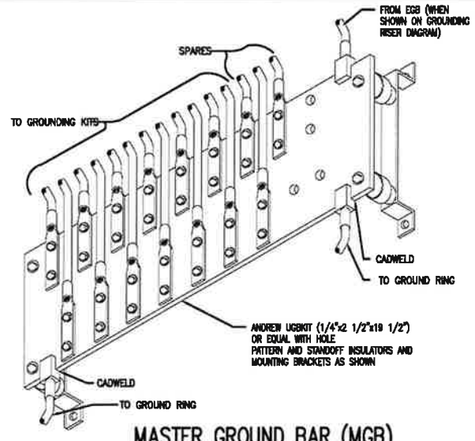


NOTE: ALL CONNECTION TO GROUND SHALL BE NON-DIRECTIONAL

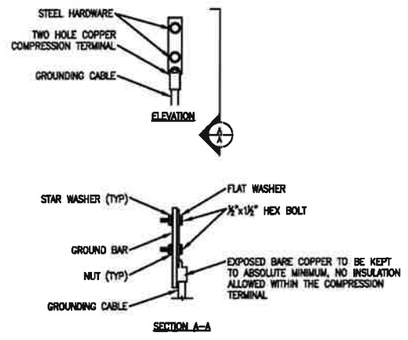
NON-DIRECTIONAL SPLICE
SCALE: N.T.S.



BUS BAR MOUNTING
SCALE: N.T.S.

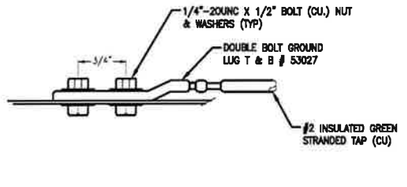


MASTER GROUND BAR (MGB)
SCALE: NOT TO SCALE

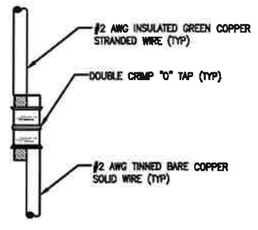


NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

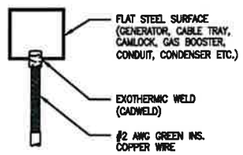
TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



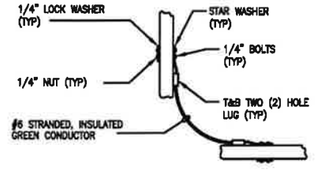
TYPICAL EQUIPMENT GROUND CONNECTION
SCALE: N.T.S.



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.

CLIENT:
verizon

ARCHITECT/ENGINEER:
CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil, Structural, Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST
SUITE 101
MARLBOROUGH, MA 01752
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SEAL:

ENGINEER/LAND SURVEYOR DATE

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REVISIONS

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1	ISSUED FOR CONSTRUCTION (FINAL)	4/28/23
2	REVISED PER (5/8/23) TSA	5/16/23

PROJECT NAME:
WINDSOR 4 CT
780 PROSPECT HILL ROAD
WINDSOR, CT 06095

DRAWING TITLE:
GROUNDING DETAILS

DRAWING NO:
E05

SCALE: AS SHOWN	DESIGNED BY: MWC	VZW PROJECT CODE: 20232415828
	DRAWN BY: MWC	
	CHECKED BY: GRS	VZW PROJECT NO: 15999214
CEA PROJECT NO.: 98210.416	ORIGINAL ISSUE DATE: 4/28/23	MDG LOCATION ID: 5000207278

ATTACHMENT 4

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
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	4.3-10 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

RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	2 female | 2 male
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	2 W
Power Consumption, normal conditions, maximum	13 W

NHH-65B-R2B

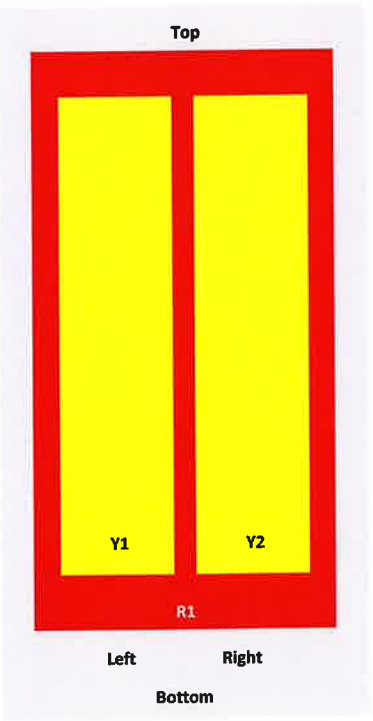
Protocol	3GPP/AISG 2.0 (Single RET)

Dimensions

Width	301 mm | 11.85 in
Depth	180 mm | 7.087 in
Length	1828 mm | 71.969 in
Net Weight, without mounting kit	19.8 kg | 43.651 lb

Array Layout

NHH



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-896	1-2	1	AN[illegible]1
Y1	1695-2360	3-4	2	AN[illegible]2
Y2	1695-2360	5-6		

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

NHH-65B-R2B

Polarization	±45°
Total Input Power, maximum	900 W @ 50 °C

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

Effective Projective Area (EPA), frontal	0.26 m² | 2.799 ft²
Effective Projective Area (EPA), lateral	0.22 m² | 2.368 ft²
Wind Loading @ Velocity, frontal	278.0 N @ 150 km/h (62.5 lbf @ 150 km/h)
Wind Loading @ Velocity, lateral	230.0 N @ 150 km/h (51.7 lbf @ 150 km/h)
Wind Loading @ Velocity, maximum	537.0 N @ 150 km/h (120.7 lbf @ 150 km/h)
Wind Loading @ Velocity, rear	282.0 N @ 150 km/h (63.4 lbf @ 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
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
ROHS	Compliant

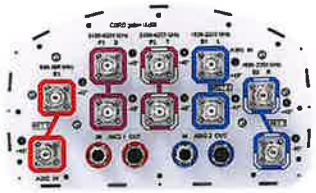
Included Products

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

NHHSS-65B-R2BT4



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
- Low band and mid band performance mirrors the performance of existing NHH hex port antennas
- 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
- One LB RET and one HB RET. Both high bands are controlled by one RET to ensure same tilt level for 4x MIMO

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	Fiberglass, UV resistant
Radiator Material	Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, mid band	4
RF Connector Quantity, low band	2
RF Connector Quantity, total	10

Remote Electrical Tilt (RET) Information

RET Hardware	CommRET v2
RET Interface	4x 8 pin connector as per IEC 60130-9 Daisy chain in: Male / Daisy chain out: Female Pin3: RS485A(AISG_B), Pin5: RS485B(AISG_A), Pin6: DC 10~30V, Pin7: DC_ Return

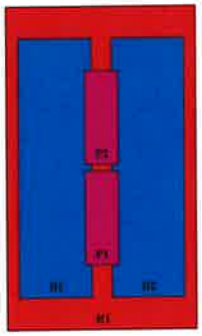
NHHSS-65B-R2BT4

RET Interface, quantity	2 female | 2 male
Input Voltage	10–30 Vdc
Internal RET	High band (1) | Low band (1)
Power Consumption, active state, maximum	10 W
Power Consumption, idle state, maximum	2 W
Protocol	3GPP/AISG 2.0 (Single RET)

Dimensions

Width	301 mm | 11.85 in
Depth	181 mm | 7.126 in
Length	1828 mm | 71.969 in
Net Weight, without mounting kit	23.1 kg | 50.927 lb

Array Layout

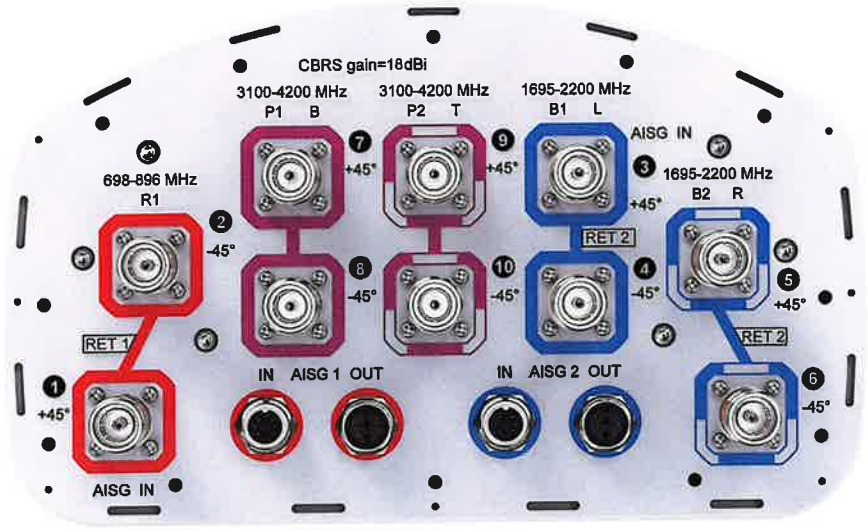


Array ID	Frequency (MHz)	RF Connector	RET (SRET)	AISG No.	AISG RET UID
R2	698-896	1 - 2	1	AISG1	CPxxxxxxxxxxxxxxR1
B1	1695-2200	3 - 4	2	AISG2	CPxxxxxxxxxxxxxxB1
B2	1695-2200	5 - 6			
P1	3100-4200	7 - 8	N/A	NA	N/A
P2	3100-4200	9 - 10			

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

Port Configuration

NHHSS-65B-R2BT4



Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2200 MHz | 3100 – 4200 MHz | 698 – 896 MHz
Polarization	±45°
Total Input Power, maximum	1,000 W @ 50 °C

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2200**	**3100–3550**	**3550–3700**	**3700–4200**
Gain, dBi	14.8	15.2	17.4	17.8	18	17.7	17.3	17.9
Beamwidth, Horizontal, degrees	65	62	66	61	64	54	64	60
Beamwidth, Vertical, degrees	13	11.6	5.5	5.2	4.9	5.7	5.3	4.9
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	4	4	4
USLS (First Lobe), dB	15	15	16	18	18	16	17	18
Front-to-Back Ratio at 180°, dB	26	29	31	28	27	30	33	29
Isolation, Cross Polarization, dB	25	25	25	25	25	25	25	25
Isolation, Inter-band, dB	25	25	25	25	25	28	28	28
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

NHHSS-65B-R2BT4

Input Power per Port at 50°C, maximum, watts	300	300	300	300	300	100	100	100

Electrical Specifications, BASTA

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2200**	**3100–3550**	**3550–3700**	**3700–4200**
Gain by all Beam Tilts, average, dBi	14.6	14.8	17	17.5	17.7	17.3	17	17.2
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.4	±0.6	±0.3	±0.4	±0.6	±0.7	±0.8
Gain by Beam Tilt, average, dBi	0° | 14.6 7° | 14.6 14° | 14.4	0° | 15.0 7° | 14.9 14° | 14.5	0° | 16.9 3° | 17.0 7° | 16.8	0° | 17.4 3° | 17.5 7° | 17.4	0° | 17.5 3° | 17.8 7° | 17.6			
Beamwidth, Horizontal Tolerance, degrees	±1.7	±1.3	±7.2	±3.1	±6.2	±10	±6.7	±10.5
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.8	±0.2	±0.2	±0.4	±0.4	±0.3	±0.4
USLS, beampeak to 20° above beampeak, dB	18	16	14	15	17	14		
Front-to-Back Total Power at 180° ± 30°, dB	22	25	25	25	24	26	25	24
CPR at Boresight, dB	24	17	16	21	19	15	17	14
CPR at Sector, dB	12	6	11	10	8	8	9	7

Mechanical Specifications

Wind Loading @ Velocity, frontal	278.0 N @ 150 km/h (62.5 lbf @ 150 km/h)
Wind Loading @ Velocity, lateral	230.0 N @ 150 km/h (51.7 lbf @ 150 km/h)
Wind Loading @ Velocity, maximum	537.0 N @ 150 km/h (120.7 lbf @ 150 km/h)
Wind Loading @ Velocity, rear	287.0 N @ 150 km/h (64.5 lbf @ 150 km/h)
Wind Speed, maximum	241 km/h | 149.75 mph

Packaging and Weights

Width, packed	1973 mm | 77.677 in
Depth, packed	441 mm | 17.362 in
Length, packed	337 mm | 13.268 in
Weight, gross	35.1 kg | 77.382 lb

Regulatory Compliance/Certifications

Agency	**Classification**
CHINA-ROHS	Above maximum concentration value

NHHSS-65B-R2BT4

ROHS	Compliant/Exempted

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

SAMSUNG

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..

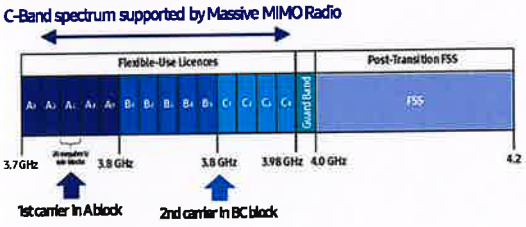
Model Code : MT6407-77A

Points of Differentiation

Wide Bandwidth

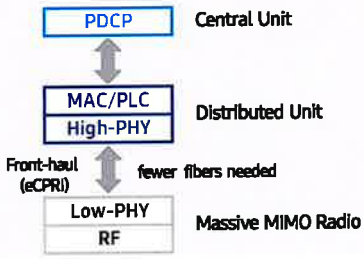
With capability to support up to 2 CC carrier configuration, Samsung C-Band massive MIMO Radio supports 200 MHz bandwidth in the C-Band spectrum.

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



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

About Samsung Electronics Co., Ltd.

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.

129 Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, Korea

SAMSUNG

AWS/PCS MACRO RADIO

DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This AWS/PCS 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code	RF4439d-25A

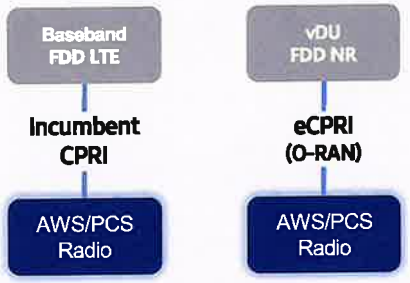
Homepage
samsungnetworks.com

Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

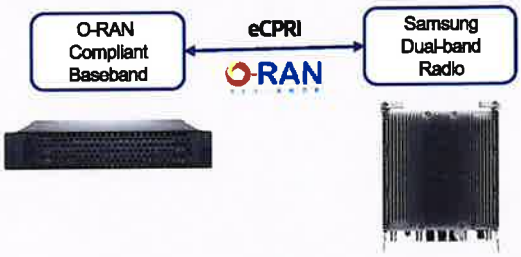
Samsung's AWS/PCS macro radio can support each incumbent CPRI interface as well as advanced eCPRI interfaces. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help in implementing cost-effective networks, which are capable of sending more data without compromising additional investments.

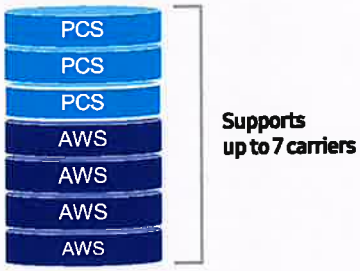
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

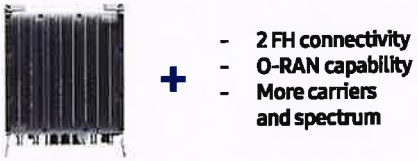
The number of required carriers varies according to site (region). Supporting many carriers is essential for using all frequencies that the operator has available.

The new AWS/PCS dual-band radio can support up to 3 carriers in the PCS (1.9GHz) band and 4 carriers in the AWS (2.1GHz) band, respectively.



Brand New Features in a Compact Size

Samsung's AWS/PCS macro radio offers several features, such as dual connectivity for baseband for both CDU and vDU, O-RAN capability, more carriers and an enlarged PCS spectrum, combined into an incumbent radio volume of 36.8L.



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B25(PCS), B66(AWS)
Frequency Band	DL: 1930 – 1995MHz, UL: 1850 – 1915MHz DL: 2110 – 2200MHz, UL: 1710 – 1780MHz
RF Power	(B25) 4 × 40W or 2 × 60W (B66) 4 × 60W or 2 × 80W
IBW/OBW	(B25) 65MHz / 30MHz (B66) DL 90MHz, UL 70MHz / 60MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 10.04inch (36.8L) / 74.7lb

SAMSUNG

700/850MHZ MACRO RADIO

DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This 700/850MHz 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code	RF4440d-13A

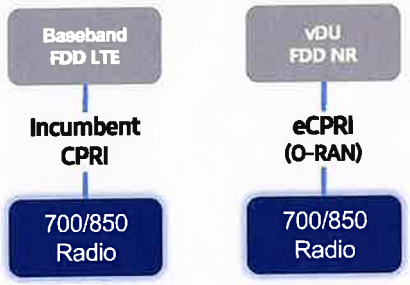
Homepage
samsungnetworks.com

Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

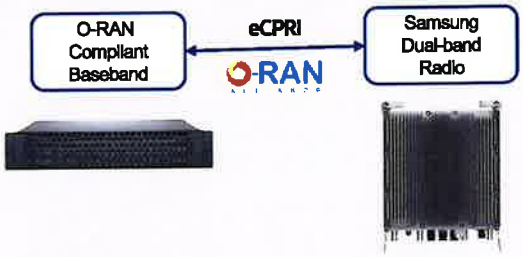
Samsung's 700/850MHz macro radio can support each incumbent CPRI interface as well as an advanced eCPRI interface. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help when implementing cost-effective networks because it is capable of sending more data without compromising additional investments.

Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

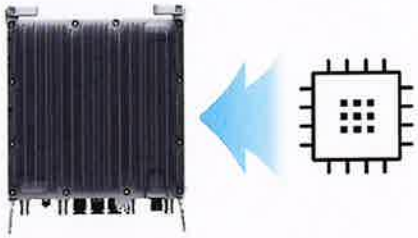
The number of required carriers varies according to site (region). The ability to support many carriers is essential for using all frequencies that the operator has available.

The new 700/850MHz dual-band radio can support up to 2 carriers in the B13 (700MHz) band and 3 carriers in the B5 (850MHz) band, respectively.

Secured Integrity

Access to sensitive data is allowed only to authorized software.

The Samsung radio's CPU can protect root of trust, which is credential information to verify SW integrity, and secure storage provides access control to sensitive data by using dedicated hardware (TPM).



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B13(700MHz), B5(850MHz)
Frequency Band	DL: 746 – 756MHz, UL: 777 – 787MHz DL: 869 – 894MHz, UL: 824 – 849MHz
RF Power	(B13) 4 × 40W or 2 × 60W (B5) 4 × 40W or 2 × 60W
IBW/OBW	(B13) 10MHz / 10MHz (B5) 25MHz / 25MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 9.05inch (33.2L) / 70.33 lb

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 Transportation Vibration	Office 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.

KOHLER.

Model: 50REOZK

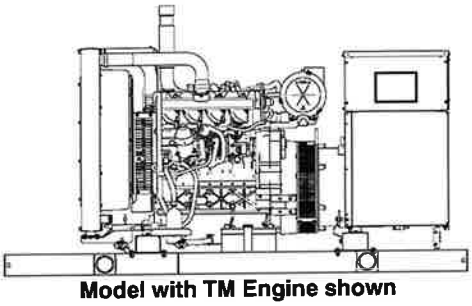
208-600 V **Diesel**

ISO 9001 KOHLER. NATIONALLY REGISTERED

Tier 3 EPA-Certified for Stationary Emergency Applications

Ratings Range

		60 Hz
Standby:	**kW**	44-52
	kVA	44-65
Prime:	**kW**	40-47
	kVA	40-58



Model with TM Engine shown

Generator Set Ratings

				130°C Rise Standby Rating		105°C Rise Prime Rating	
Alternator	**Voltage**	**Ph**	**Hz**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**
4P7BX	120/208	3	60	51/63	176	46/57	159
	127/220	3	60	51/63	167	46/57	150
	120/240	3	60	49/61	147	44/55	132
	120/240	1	60	44/44	183	40/40	166
	139/240	3	60	51/63	153	46/57	138
	220/380	3	60	49/61	93	45/56	85
	277/480	3	60	51/63	76	46/57	69
	347/600	3	60	51/63	61	46/57	55
4P8X	120/208	3	60	52/65	180	47/58	163
	127/220	3	60	52/65	170	47/58	154
	120/240	3	60	50/62	150	45/56	135
	120/240	1	60	50/50	208	45/45	187
	139/240	3	60	52/65	156	47/58	141
	220/380	3	60	52/65	98	47/58	89
	277/480	3	60	52/65	78	47/58	70
	347/600	3	60	52/65	62	47/58	56
4P10X	120/208	3	60	52/65	180	47/58	163
	127/220	3	60	52/65	170	47/58	154
	120/240	3	60	50/62	150	45/56	135
	120/240	1	60	50/50	208	45/45	187
	139/240	3	60	52/65	156	47/58	141
	220/380	3	60	52/65	98	47/58	89
	277/480	3	60	52/65	78	47/58	70
	347/600	3	60	52/65	62	47/58	56
4Q7BX	120/240	1	60	48/48	200	43/43	179
4Q8X	120/240	1	60	50/50	208	45/45	187
4Q10X	120/240	1	60	50/50	208	45/45	187

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. *Standby Ratings:* Standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. *Prime Power Ratings:* At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. For limited running time and continuous ratings, consult the factory. Obtain the technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- The generator set engine is certified to meet the Environmental Protection Agency (EPA) emergency stationary emissions requirements.
- A one-year limited warranty covers all generator set systems and components. Two- and five-year extended limited warranties are also available.
- Alternator features:
  - The unique Fast-Response® X excitation system delivers excellent voltage response and short-circuit capability using a rare-earth, permanent magnet (PM)-excited alternator.
  - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
  - Kohler designed controllers for one-source system integration and remote communication. See Controllers on page 3.
  - The low coolant level shutdown prevents overheating (standard on radiator models only).
  - Integral vibration isolation eliminates the need for under-unit vibration spring isolators.
  - The generator set for 49-state applications is equipped with the KDI 3404 TM engine. The generator set that is CARB compliant/California South Coast Air Quality Management District (SCAQMD) pre-certified is equipped with the KDI 3404 TCR engine.

Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Rare-Earth Permanent Magnet
Leads: quantity, type	12, Reconnectable 4, 110-120/220-240 V
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H
Temperature rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load	Controller Dependent
One-step load acceptance	100% of Rating
Unbalanced load capability	100% of Rated Standby Current

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.

Specifications		Alternator
Peak motor starting kVA:		(35% dip for voltages below)
480 V	4P7BX (12 lead)	180
480 V	4P8X (12 lead)	261
480 V	4P10X (12 lead)	275
240 V	4Q7BX (4 lead)	113
240 V	4Q8X (4 lead)	121
240 V	4Q10X (4 lead)	144

Application Data

Engine

Engine Specifications	49-State Engine	California SCAQMD
Manufacturer	Kohler Diesel	
Engine model	KDI 3404TM	KDI 3404TCR
Engine type	4-Cycle, Turbocharged	
Cylinder arrangement	4 Inline	
Displacement, L (cu. in.)	3.4 (207)	
Bore and stroke, mm (in.)	96 x 116 (3.28 x 4.57)	
Compression ratio	18.5:1	17.0:1
Piston speed, m/min. (ft./min.)	418 (1371)	510 (1673)
Main bearings: quantity, type	5, Replaceable Insert	
Rated rpm	1800	
Max. power at rated rpm, kWm (BHP)	64 (86)	70 (94)
Cylinder head material	Cast Iron	
Crankshaft material	Cast Iron	
Valve material:		
Intake	Chromium-Silicon Steel	
Exhaust	Chromium Steel	
Governor: type, make/model	Mech. (or Electronic *)	Electronic
Frequency regulation, no-load to full-load	Droop, 5% (or Isochr. *)	Isochronous
Frequency regulation, steady state	±0.5%	±0.28%
Frequency	Fixed	
Air cleaner type, all models	Dry	

* Requires available electronic governor option

Exhaust

Exhaust System	49-State Engine	California SCAQMD
Exhaust manifold type	Dry	
Exhaust flow at rated kW, m^3/min. (cfm)	8.8 (310)	
Exhaust temperature at rated kW, dry exhaust, °C (°F)	490 (914)	471 (880)
Minimum/maximum allowable back pressure, kPa (in. Hg)	6 (1.8)/ 9 (2.7)	8 (2.4)/ 13.5 (4.0)
Exhaust outlet size at engine hookup, mm (in.)	63.5 (2.5)	

Engine Electrical

Engine Electrical System	49-State Engine	California SCAQMD
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	12	
Ampere rating	90	
Starter motor rated voltage (DC)	12	
Battery, recommended cold cranking amps (CCA):		
Quantity, CCA rating	One, 650	
Battery voltage (DC)	12	

Fuel

Fuel System	49-State Engine	California SCAQMD
Fuel supply line, min. ID, mm (in.)	8.0 (0.31)	
Fuel return line, min. ID, mm (in.)	6.0 (0.25)	
Max. lift, engine-driven fuel pump, m (ft.)	6.0 (20.0)	3.7 (12.1)
Max. fuel flow, Lph (gph)	46 (12.2)	87.4 (23.1)
Max. return line restriction, kPa (in. Hg)	20 (5.9)	17.7 (5.2)
Fuel filter		
Prefilter	74 Microns	
Primary/Water Separator	5 Microns @ 98% Efficiency	5 Microns @ 95% Efficiency
Recommended fuel	#2 Ultra Low Sulfur Diesel	

Lubrication

Lubricating System	49-State Engine	California SCAQMD
Type	Full Pressure	
Oil pan capacity, L (qt.) §	15.3 (16.2)	
Oil pan capacity with filter, L (qt.) §	15.6 (16.5)	
Oil filter: quantity, type §	1, Cartridge	
Oil cooler	Water-Cooled	

§ Kohler recommends the use of Kohler Genuine oil and filters.

Application Data

Cooling

Radiator System	49-State Engine	California SCAQMD
Ambient temperature, °C (°F) *	50 (122)	
Engine jacket water capacity, L (gal.)	4.5 (1.19)	
Radiator system capacity, including engine, L (gal.)	12.3 (3.2)	
Engine jacket water flow, Lpm (gpm)	125 (33)	120 (32)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	37.8 (2207)	41.3 (2352)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	12 (682)	8.4(477)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	597 (23.5)	
Fan, kWm (HP)	1.8 (2.3)	
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)	

* Enclosure reduces ambient temperature capability by 5°C (9°F).

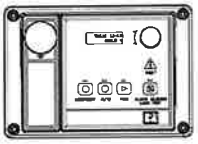
Operation Requirements

Air Requirements	49-State Engine	California SCAQMD
Radiator-cooled cooling air, m^3/min. (scfm) †	96.3 (3400)	
Combustion air, m^3/min. (cfm)	4.8 (170)	4.0 (140)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	13.2 (750)	
Alternator, kW (Btu/min.)	7.6 (435)	
Max. air intake restriction, kPa (in. Hg)	5.2 (1.54)	4.2 (1.24)

† Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

Fuel Consumption	49-State Engine	
Diesel, Lph (gph) at % load	**Standby Rating**	
100%	17.4	(4.6)
75%	13.2	(3.5)
50%	9.1	(2.4)
25%	5.3	(1.4)
Diesel, Lph (gph) at % load	**Prime Rating**	
100%	16.1	(4.2)
75%	12.1	(3.2)
50%	8.3	(2.2)
25%	4.9	(1.3)
Fuel Consumption	**Calif. SCAQMD Engine**	
Diesel, Lph (gph) at % load	**Standby Rating**	
100%	15.2	(4.0)
75%	11.6	(3.1)
50%	8.0	(2.1)
25%	4.6	(1.2)
Diesel, Lph (gph) at % load	**Prime Rating**	
100%	12.3	(3.2)
75%	10.6	(2.8)
50%	6.6	(1.7)
25%	4.1	(1.1)

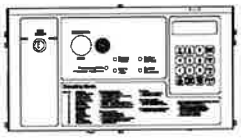
Controllers



APM402 Controller
Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- Digital display and menu control provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or serial configuration
- Controller supports Modbus® protocol
- Integrated hybrid voltage regulator with ±0.5% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-161 for additional controller features and accessories.



(Available with the 49-State generator set only.)

Decision-Maker® 550 Controller
Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities.

- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-46 for additional controller features and accessories.

Modbus® is a registered trademark of Schneider Electric.

KOHLER.

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KOHLERPower.com

Additional Standard Features

- Air Cleaner, Heavy Duty
- Alternator Protection
- Battery Rack and Cables
- Open Crankcase Ventilation
- Oil Drain and Coolant Drain with Hose Barb
- Oil Drain Extension (with narrow skid and enclosure models only)
- Operation and Installation Literature
- Radiator Drain Extension (with enclosure models only)
- Stainless Steel Fasteners on Enclosure (with enclosure models only)

Available Options

Approvals and Listings

- ❑ CSA Certified
- ❑ IBC Seismic Certification
- ❑ UL2200 Listing

Enclosed Unit

- ❑ Sound Enclosure (with enclosed critical silencer)
- ❑ Weather Enclosure (with enclosed critical silencer)
- ❑ Stainless Steel Latches and Hinges

Open Unit

- ❑ Exhaust Silencer, Critical (kit: PA-324470)
- ❑ Flexible Exhaust Connector, Stainless Steel

Fuel System

- ❑ Flexible Fuel Lines
- ❑ Fuel Pressure Gauge (Available with 49-state engine only)
- ❑ Subbase Fuel Tanks

Controller

- ❑ 15-Relay Dry Contact (SCAQMD engine with APM402 controller only)
- ❑ Common Failure Relay (550 controller only)
- ❑ Communication Products and PC Software (550 controller only)
- ❑ Customer Connection (550 controller only)
- ❑ Dry Contact (isolated alarm) (550 controller only)
- ❑ Two Input/Five Output Module (49-state engine with APM402 controller only)
- ❑ Key Switch (SCAQMD engine with APM402 controller only)
- ❑ Manual Speed Adjust (requires Electronic Governor or SCAQMD engine)
- ❑ Remote Annunciator Panel
- ❑ Remote Emergency Stop
- ❑ Run Relay

Cooling System

- ❑ Block Heater (1000 W, 110- 120 V)
  Required for ambient temperatures below 0°C (32°F).
- ❑ Radiator Duct Flange

Electrical System

- ❑ Alternator Strip Heater
- ❑ Battery
- ❑ Battery Charger, Equalize/Float Type
- ❑ Battery Heater
- ❑ Electronic Governor
- ❑ Line Circuit Breaker (NEMA type 1 enclosure)
- ❑ Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure)

Miscellaneous

- ❑ Air Cleaner Restriction Indicator
- ❑ Engine Fluids Added
- ❑ Rated Power Factor Testing
- ❑ Rodent Guards

Literature

- ❑ General Maintenance
- ❑ NFPA 110
- ❑ Overhaul
- ❑ Production

Warranty

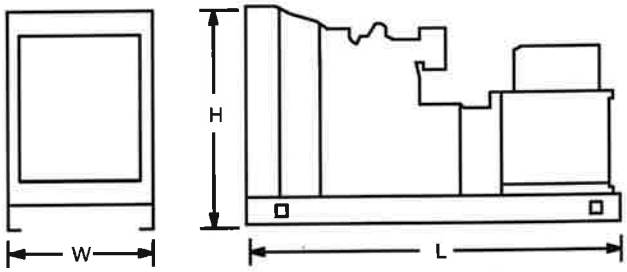
- ❑ 2-Year Basic Limited Warranty
- ❑ 5-Year Basic Limited Warranty
- ❑ 5-Year Comprehensive Limited Warranty

Other Options

- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____

Dimensions and Weights

Overall Size, L x W x H, mm (in.):
Wide Skid: 2300 x 1040 x 1133 (90.6 x 41.0 x 44.6)
Narrow Skid: 1875 x 780 x 1067 (73.8 x 30.7 x 42.0)
Weight (radiator model), wet, kg (lb.): 802 (1769)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

ATTACHMENT 5

Structural Analysis
135-ft Monopole

Prepared For:
Tarpon Towers II, LLC
8916 77th Terrace East, Suite 103
Lakewood Ranch, FL 34202

MFP Project #94122-009

Site Location:
CT1209 Windsor
780 Prospect Hill Road
Windsor, Hartford County, CT
Hartford Co., CT
Lat/Long: 41°52'58.5", -72°42'29.2"

Analysis Type:
TIA-222-H
Structure Rating - 45.6% (Foundation) Passing

May 9, 2023

Michael Plahovinsak

STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
LICENSED PROFESSIONAL ENGINEER

5.9.2023

Michael F. Plahovinsak, P.E.
18301 State Route 161 W, Plain City, OH 43064
614-398-6250 - mike@mfpeng.com

Project Summary:

I have completed a structural analysis of the existing monopole for the following new configuration:

- 105' – Verizon:
  - (3) Commscope NHH-65B-R2B + (3) NHHSS-65B-R2BT4 Antennas
  - (3) Samsung MT6407-77A Antennas
  - (3) Samsung RF4439d-25A + (3) RF4440d-13A RRH's
  - (3) Samsung CBRS RRH-RT4401-48A
  - (1) Raycap RVZDC-6627-PF-48
  - (2) 1 5/8" Hybrid
  - SitePro RMQP-496-HK Mount

The pole has been analyzed in accordance with the requirements of the International Building Code per IBC section 3108, and the recommendations of the Telecommunications Industry Association *"Structural Standard for Steel Antenna Supporting Structures"* **TIA-222-H.**

This analysis may be considered a "Rigorous Structural Analysis" as defined in TIA-222-H.

As indicated in the conclusions of this analysis, I have determined that the existing pole and foundation have *sufficient capacity* to support the existing, reserved and proposed antenna loads as detailed herein. Based on the results of my analysis, structural modifications are not required at this time.

Source of Data:

Resource	Source	Job Number	Date
Pole and Foundation Drawings	Michael F. Plahovinsak, PE	23521-150	06/11/21
Geotechnical Report	Welti Geotechnical	N/A	04/13/21
Erection Book	TAPP	TP-19977	06/15/21

Analysis Criteria:

2022 Connecticut Building Code
Structural Standards for Steel Antenna Supporting Structures **TIA-222-H**

- TIA-222-H Wind Speed 116 mph
- TIA-222-H Wind w/ 1 ½" Ice 50 mph (3-Sec Gust)
- Operational Wind Speed 60 mph (3-Sec Gust)

Risk Category	Exposure Category	Topographic Category
II (I = 1.0)	C	I

Appurtenance Listing:

Status	Elev.	Antenna / Mounting	Coax	Owner
Existing	130'	(3) Ericsson AIR3246 B66 Antennas (3) RFS APXVAARR24_43-U-NA20 Antennas (3) RFS APX16DWV16DWVSEA20 Antennas (3) Ericsson 4415 B66A + (3) 4449 B71+B12 + (3) 4415 B25 RRH's (1) Commscope VHLP1-23-CR4B Dish Platform Mount	(4) 6x12 HCS	T-Mobile
Existing*	115'	(3) JMA MX08FRO665-20_V0F Antennas (3) Fujitsu TA08025-B604 + (3) Fujitsu TA08025-B605 RRH's (1) Raycap RDIDC-9181-PF-48 Valmont SNP8HR-396 Mount	(1) 1.65" Hybrid	Dish Wireless
Proposed	105'	(3) Commscope NHH-65B-R2B + (3) NHHSS-65B-R2BT4 Antennas (3) Samsung MT6407-77A Antennas (3) Samsung RF4439d-25A + (3) RF4440d-13A RRH's (3) Samsung CBRS RRH-RT4401-48A (1) Raycap RVZDC-6627-PF-48 SitePro RMQP-496-HK Mount	(2) 1 5/8" Hybrid	Verizon

* Analysis is based on a leased wind area of 11,000 in2. The 11,000 in2 is greater than the proposed actual equipment wind area.

All antenna lines assumed internally mounted, not exposed to the wind.

Foundation Analysis:

The existing monopole foundation design was analyzed in conjunction with site specific geotechnical report. The existing foundation has sufficient capacity to support the pole with the proposed antenna configuration.

Conclusion:

I have completed a structural analysis of the existing monopole and foundation in accordance with the project specifics outlined above. My analysis indicates that the existing monopole and foundation are structurally adequate when considering the existing plus proposed loading. Please refer to the attached calculations for an itemized listing of all member stress ratios. The existing pole is safe and adequate to support the proposed loads, and no structural reinforcing is required to support the above loading.

Recommendations:

As a part of routine maintenance, I recommend periodic inspection of the pole and foundation structure for signs of fatigue or corrosion.

If you have any questions about the contents of this structural report or require any additional information, please feel free to contact my office.

Sincerely,

Michael F. Plahovinsak, P.E.

mike@mfpeng.com - 614.398-6250

Standard Conditions for Providing Structural Consulting Services on Existing Structures

1. The following standard conditions are a general overview of key issues regarding the work product supplied.

2. If the existing conditions are not as represented in this structural report or attached sketches, I should be contacted to evaluate the significance of the deviation and revise the structural assessment accordingly.

3. The structural analysis has been performed assuming that the structure is in "like new" condition. No allowance was made for excessive corrosion, damaged or missing structural members, loose bolts, etc. If there are any known deficiencies in the structure that potentially compromise structural integrity, I should be made aware of the deficiencies. If I am aware of a deficiency that exists in a structure at the time of my analysis, a general explanation of the structural concern due to the deficiency will be included in the structural report, but the deficiency will not be reflected in capacity calculations.

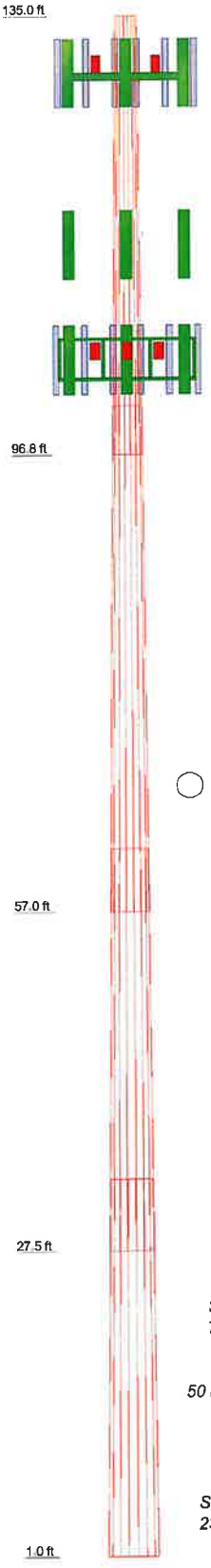
4. The structural analysis provided is an assessment of the primary load carrying capacity of the structure. I provide a limited scope of service in that I have not verified the capacity of every weld, plate, connection detail, etc. In most cases, structural fabrication details are unknown at the time of my analysis, and the detailed field measurement of this information is beyond the scope of my services. In instances where I have not performed connection capacity calculations, it is assumed that existing manufactured connections develop the full capacity of the primary members being connected.

5. The structural integrity of the existing foundation system can only be verified if exact foundation sizes and soils conditions are known. I will not accept any responsibility for the adequacy of the existing foundations unless this site-specific data is supplied.

6. Miscellaneous items such as antenna mounts, coax supports, etc. have not been designed, detailed, or specified as part of my work. It is assumed that material of adequate size and strength will be purchased from a reputable component manufacturer. The attached report and sketches are schematic in nature and should not be used to fabricate or purchase hardware and accessories to be attached to the structure. I recommend field measurement of the structure before fabricating or purchasing new hardware and accessories. I am not responsible for proper fit and clearance of hardware and accessory items in the field.

7. The structural analysis has been performed considering minimum code requirements or recommendations. If alternate wind, ice, or deflection criteria are to be considered, then I shall be made aware of the alternate criteria.

Section	1	2	3	4
Length (ft)	38.25	44.00	35.00	32.75
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.3750	0.4375	0.5000
Socket Length (ft)	4.25	5.50	6.25	
Top Dia (in)	22.0000	29.4907	37.6474	43.4235
Bot Dia (in)	30.8469	39.6698	45.7444	51.0000
Grade	A572-65			
Weight (K)	2.0	6.1	6.8	8.3



ALL REACTIONS ARE FACTORED

AXIAL 62 K
SHEAR 7 K
MOMENT 675 kip-ft
TORQUE 0 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 39 K
SHEAR 23 K
MOMENT 2175 kip-ft
TORQUE 0 kip-ft
REACTIONS - 116 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Ericsson AIR 3246 B66 (T-Mobile)	130	Commscope NHHSS-65B-R2BT4 w/ mount pipe (Verizon)	105
RFS - APXVAARR24_43-U-NA20 (T-Mobile)	130	Samsung MT6407-77A w/ mount pipe (Verizon)	105
RFS APX16VDWV-16DWVS (T-Mobile)	130	Commscope NHH-65B-R2B (Verizon)	105
Ericsson AIR 3246 B66 (T-Mobile)	130	Commscope NHHSS-65B-R2BT4 w/ mount pipe (Verizon)	105
RFS - APXVAARR24_43-U-NA20 (T-Mobile)	130	Samsung MT6407-77A w/ mount pipe (Verizon)	105
RFS APX16VDWV-16DWVS (T-Mobile)	130	Commscope NHH-65B-R2B (Verizon)	105
Ericsson AIR 3246 B66 (T-Mobile)	130	Commscope NHHSS-65B-R2BT4 w/ mount pipe (Verizon)	105
RFS - APXVAARR24_43-U-NA20 (T-Mobile)	130	Samsung MT6407-77A w/ mount pipe (Verizon)	105
RFS APX16VDWV-16DWVS (T-Mobile)	130	(3) Samsung RF4439d-25A (Verizon)	105
(3) Ericsson 4415 B66A (T-Mobile)	130	(3) Samsung RF4440d-13A (Verizon)	105
(3) Ericsson 4449 B12+B71 (T-Mobile)	130	(3) Samsung CBRS RRH-RT4401-48A (Verizon)	105
(3) Ericsson 4415 B25 (T-Mobile)	130	Raycap RVZDC-6627-PF-48 (Verizon)	105
12' Platform w/ Handrail (T-Mobile)	130	SitePro RMQP-496-HK Mount (Verizon)	105
Commscope VHLP1-23 (T-Mobile)	130	Commscope NHH-65B-R2B (Verizon)	105
Antennas + Equipment (EPA 11,000 in2 / 2,000 lbs) (Dish)	115		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 116 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 0.00 ft
8. TOWER RATING: 39.9%

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Job: 135' Monopole - MFP #94122-009			
Project: CT1209 Windsor			
Client: Tarpon Towers	Drawn by: JC	App'd:	
Code: TIA-222-H	Date: 05/09/23	Scale: NTS	
Path: C:\Users\jcrow\Dropbox\MFP Engineering Files\Projects\TIA\1-Tarpon\94122-009\94122-009.eri		Dwg No. E-1	

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 Hartford County, Connecticut.
Tower base elevation above sea level: 175.00 ft.
Basic wind speed of 116 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
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.

Tapered Pole Section Geometry

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	135.00-96.75	38.25	4.25	18	22.0000	30.8489	0.1875	0.7500	A572-65 (65 ksi)
L2	96.75-57.00	44.00	5.50	18	29.4907	39.6698	0.3750	1.5000	A572-65 (65 ksi)
L3	57.00-27.50	35.00	6.25	18	37.6474	45.7444	0.4375	1.7500	A572-65 (65 ksi)
L4	27.50-1.00	32.75		18	43.4235	51.0000	0.5000	2.0000	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	22.3105	12.9812	780.3007	7.7434	11.1760	69.8193	1561.6281	6.4918	3.5420	18.891
	31.2958	18.2474	2167.3087	10.8848	15.6712	138.2986	4337.4693	9.1254	5.0994	27.197
L2	30.8861	34.6549	3711.5567	10.3361	14.9813	247.7466	7427.9971	17.3308	4.5304	12.081
	40.2239	46.7706	9123.8911	13.9496	20.1522	452.7481	18259.7876	23.3897	6.3219	16.858
L3	39.4527	51.6706	9038.5241	13.2095	19.1249	472.6057	18088.9412	25.8402	5.8559	13.385
	46.3826	62.9143	16316.0700	16.0840	23.2382	702.1241	32653.6091	31.4631	7.2810	16.642
L4	45.4845	68.1196	15856.2313	15.2378	22.0591	718.8055	31733.3266	34.0663	6.7625	13.525
	51.7096	80.1435	25821.9188	17.9275	25.9080	996.6774	51677.8148	40.0794	8.0960	16.192

Tower Elevation ft	Gusset Area (per face) ft²	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 135.00-96.75				1	1	1			
L2 96.75-57.00				1	1	1			
L3 57.00-27.50				1	1	1			
L4 27.50-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
1 1/4" (T-Mobile)	C	No	Yes	Inside Pole	130.00 - 1.00	4	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
							2" Ice	0.00	0.66
1.65" (Dish)	C	No	Yes	Inside Pole	115.00 - 1.00	1	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
1 5/8" (Verizon)	C	No	Yes	Inside Pole	105.00 - 1.00	2	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	135.00-96.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.12
L2	96.75-57.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.21
L3	57.00-27.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.16
L4	27.50-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.14

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	135.00-96.75	A	1.699	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.12
L2	96.75-57.00	A	1.631	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.21

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L3	57.00-27.50	A	1.536	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.16
L4	27.50-1.00	A	1.376	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.14

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Ericsson AIR 3246 B66 (T-Mobile)	A	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.04 8.45 8.87 9.72	6.41 7.09 7.78 9.21	0.24 0.31 0.38 0.56
RFS - APXVAARR24_43-U-NA20 (T-Mobile)	A	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.24 20.89 21.55 22.88	10.79 12.21 13.49 15.72	0.16 0.29 0.44 0.76
RFS APX16VDWV-16DWVS (T-Mobile)	A	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.67 7.06 7.47 8.30	3.34 3.99 4.64 6.01	0.06 0.11 0.16 0.29
Ericsson AIR 3246 B66 (T-Mobile)	B	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.04 8.45 8.87 9.72	6.41 7.09 7.78 9.21	0.24 0.31 0.38 0.56
RFS - APXVAARR24_43-U-NA20 (T-Mobile)	B	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.24 20.89 21.55 22.88	10.79 12.21 13.49 15.72	0.16 0.29 0.44 0.76
RFS APX16VDWV-16DWVS (T-Mobile)	B	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.67 7.06 7.47 8.30	3.34 3.99 4.64 6.01	0.06 0.11 0.16 0.29
Ericsson AIR 3246 B66 (T-Mobile)	C	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.04 8.45 8.87 9.72	6.41 7.09 7.78 9.21	0.24 0.31 0.38 0.56
RFS - APXVAARR24_43-U-NA20 (T-Mobile)	C	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.24 20.89 21.55 22.88	10.79 12.21 13.49 15.72	0.16 0.29 0.44 0.76
RFS APX16VDWV-16DWVS (T-Mobile)	C	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.67 7.06 7.47 8.30	3.34 3.99 4.64 6.01	0.06 0.11 0.16 0.29
(3) Ericsson 4415 B66A (T-Mobile)	A	From Face	2.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
(3) Ericsson 4449 B12+B71 (T-Mobile)	B	From Face	2.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.02 1.15 1.29	0.07 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.32	1.58	0.15
(3) Ericsson 4415 B25 (T-Mobile)	C	From Face	2.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
12' Platform w/ Handrail (T-Mobile)	C	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice	30.00 35.00 40.00 50.00	30.00 35.00 40.00 50.00	1.80 2.60 3.40 5.00
** Antennas + Equipment (EPA 11,000 in2 / 2,000 lbs) (Dish)	C	None		0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	76.39 81.39 86.39 96.39	76.39 81.39 86.39 96.39	2.00 2.50 3.00 4.00
**									
** Commscope NHH-65B-R2B (Verizon)	A	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.08 8.53 9.00 9.95	6.77 7.72 8.55 10.26	0.07 0.13 0.21 0.38
Commscope NHHSS-65B-R2BT4 w/ mount pipe (Verizon)	A	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.05 8.50 8.97 9.91	6.78 7.73 8.56 10.27	0.07 0.14 0.21 0.39
Samsung MT6407-77A w/ mount pipe (Verizon)	A	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.71 5.00 5.30 5.92	2.42 2.83 3.26 4.16	0.09 0.13 0.17 0.27
Commscope NHH-65B-R2B (Verizon)	B	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.08 8.53 9.00 9.95	6.77 7.72 8.55 10.26	0.07 0.13 0.21 0.38
Commscope NHHSS-65B-R2BT4 w/ mount pipe (Verizon)	B	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.05 8.50 8.97 9.91	6.78 7.73 8.56 10.27	0.07 0.14 0.21 0.39
Samsung MT6407-77A w/ mount pipe (Verizon)	B	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.71 5.00 5.30 5.92	2.42 2.83 3.26 4.16	0.09 0.13 0.17 0.27
Commscope NHH-65B-R2B (Verizon)	C	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.08 8.53 9.00 9.95	6.77 7.72 8.55 10.26	0.07 0.13 0.21 0.38
Commscope NHHSS-65B-R2BT4 w/ mount pipe (Verizon)	C	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.05 8.50 8.97 9.91	6.78 7.73 8.56 10.27	0.07 0.14 0.21 0.39
Samsung MT6407-77A w/ mount pipe (Verizon)	C	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.71 5.00 5.30 5.92	2.42 2.83 3.26 4.16	0.09 0.13 0.17 0.27
(3) Samsung RF4439d-25A (Verizon)	A	From Face	2.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
(3) Samsung RF4440d-13A	B	From Face	2.00	0.0000	105.00	No Ice	1.88	1.01	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Verizon)			0.00 0.00			1/2" Ice	2.05	1.14	0.09
						1" Ice	2.22	1.28	0.11
						2" Ice	2.60	1.59	0.15
(3) Samsung CBRS RRH-RT4401-48A (Verizon)	C	From Face	2.00 0.00 0.00	0.0000	105.00	No Ice	0.99	0.50	0.02
						1/2" Ice	1.12	0.60	0.03
						1" Ice	1.26	0.70	0.04
						2" Ice	1.55	0.94	0.06
Raycap RVZDC-6627-PF-48 (Verizon)	A	From Face	2.00 0.00 0.00	0.0000	105.00	No Ice	4.06	3.10	0.03
						1/2" Ice	4.32	3.34	0.07
						1" Ice	4.58	3.58	0.11
						2" Ice	5.14	4.09	0.20
SitePro RMQP-496-HK Mount (Verizon)	C	None		0.0000	105.00	No Ice	30.00	30.00	2.00
						1/2" Ice	35.00	35.00	2.20
						1" Ice	40.00	40.00	2.40
						2" Ice	50.00	50.00	2.80

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
Commscope VHLP1-23 (T-Mobile)	C	Paraboloid w/Radome	From Face	1.00 0.00 0.00	0.0000		130.00	1.00	No Ice	0.79	0.02
									1/2" Ice	0.92	0.02
									1" Ice	1.06	0.03
									2" Ice	1.33	0.04

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 90 deg - No Ice
5	0.9 Dead+1.0 Wind 90 deg - No Ice
6	1.2 Dead+1.0 Wind 180 deg - No Ice
7	0.9 Dead+1.0 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	135 - 96.75	Pole	Max Tension	2	0.00	-0.00	-0.00
			Max. Compression	8	-26.24	0.34	1.43
			Max. Mx	4	-12.31	-257.94	0.37
			Max. My	2	-12.31	0.54	259.62
			Max. Vy	4	15.32	-257.94	0.37
			Max. Vx	2	-15.31	0.54	259.62
			Max. Torque	5			0.43
L2	96.75 - 57	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-36.17	0.34	1.43
			Max. Mx	4	-19.34	-904.17	-0.25
			Max. My	2	-19.33	1.39	905.58
			Max. Vy	4	18.28	-904.17	-0.25
			Max. Vx	2	-18.28	1.39	905.58
			Max. Torque	5			0.43
L3	57 - 27.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-46.80	0.34	1.43
			Max. Mx	4	-27.37	-1462.71	-0.72
			Max. My	2	-27.37	2.01	1463.91
			Max. Vy	4	20.54	-1462.71	-0.72
			Max. Vx	2	-20.54	2.01	1463.91
			Max. Torque	5			0.43
L4	27.5 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-61.77	0.34	1.43
			Max. Mx	4	-39.34	-2174.17	-1.25
			Max. My	2	-39.34	2.71	2175.13
			Max. Vy	4	22.81	-2174.17	-1.25
			Max. Vx	2	-22.80	2.71	2175.13
			Max. Torque	5			0.42

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	135 - 96.75	11.199	12	0.7341	0.0001
L2	101 - 57	6.251	12	0.6011	0.0003
L3	62.5 - 27.5	2.302	12	0.3558	0.0001
L4	33.75 - 1	0.652	12	0.1779	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	Commscope VHLP1-23	12	10.432	0.7176	0.0005	56811
115.00	Antennas + Equipment (EPA 11,000 in2 / 2,000 lbs)	12	8.182	0.6641	0.0004	14203
105.00	Commscope NHH-65B-R2B	12	6.779	0.6209	0.0004	9470

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	135 - 96.75	46.919	2	3.0756	0.0006
L2	101 - 57	26.198	2	2.5185	0.0011
L3	62.5 - 27.5	9.647	2	1.4914	0.0004
L4	33.75 - 1	2.734	2	0.7459	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	Commscope VHLP1-23	2	43.706	3.0065	0.0020	13646
115.00	Antennas + Equipment (EPA 11,000 in2 / 2,000 lbs)	2	34.285	2.7822	0.0019	3410
105.00	Commscope NHH-65B-R2B	2	28.410	2.6015	0.0017	2273

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	135 - 96.75 (1)	TP30.8489x22x0.1875	38.25	0.00	0.0	17.6622	-12.31	1033.24	0.012
L2	96.75 - 57 (2)	TP39.6698x29.4907x0.375	44.00	0.00	0.0	45.2561	-19.34	2647.48	0.007
L3	57 - 27.5 (3)	TP45.7444x37.6474x0.4375	35.00	0.00	0.0	60.9065	-27.37	3563.03	0.008
L4	27.5 - 1 (4)	TP51x43.4235x0.5	32.75	0.00	0.0	80.1435	-39.34	4688.40	0.008

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	135 - 96.75 (1)	TP30.8489x22x0.1875	259.62	674.89	0.385	0.00	674.89	0.000
L2	96.75 - 57 (2)	TP39.6698x29.4907x0.375	905.58	2582.00	0.351	0.00	2582.00	0.000
L3	57 - 27.5 (3)	TP45.7444x37.6474x0.4375	1463.92	4019.69	0.364	0.00	4019.69	0.000
L4	27.5 - 1 (4)	TP51x43.4235x0.5	2175.13	6078.80	0.358	0.00	6078.80	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	135 - 96.75 (1)	TP30.8489x22x0.1875	15.31	309.97	0.049	0.28	805.64	0.000
L2	96.75 - 57 (2)	TP39.6698x29.4907x0.375	18.28	794.25	0.023	0.28	2644.68	0.000
L3	57 - 27.5 (3)	TP45.7444x37.6474x0.4375	20.54	1068.91	0.019	0.28	4105.82	0.000
L4	27.5 - 1 (4)	TP51x43.4235x0.5	22.80	1406.52	0.016	0.28	6220.37	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	135 - 96.75 (1)	0.012	0.385	0.000	0.049	0.000	0.399 ✔	1.000	4.8.2 ✔
L2	96.75 - 57 (2)	0.007	0.351	0.000	0.023	0.000	0.359 ✔	1.000	4.8.2 ✔
L3	57 - 27.5 (3)	0.008	0.364	0.000	0.019	0.000	0.372 ✔	1.000	4.8.2 ✔
L4	27.5 - 1 (4)	0.008	0.358	0.000	0.016	0.000	0.366 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	135 - 96.75	Pole	TP30.8489x22x0.1875	1	-12.31	1033.24	39.9	Pass
L2	96.75 - 57	Pole	TP39.6698x29.4907x0.375	2	-19.34	2647.48	35.9	Pass
L3	57 - 27.5	Pole	TP45.7444x37.6474x0.4375	3	-27.37	3563.03	37.2	Pass
L4	27.5 - 1	Pole	TP51x43.4235x0.5	4	-39.34	4688.40	36.6	Pass
							Summary	
						Pole (L1)	39.9	Pass
						RATING =	**39.9**	**Pass**

Michael F. Plahovinsak, P.E.
18301 State Route 161 W
Plain City, OH 43064
Phone: 614-398-6250
email: mike@mfpeng.com

Job	Page
135-ft monopole - MFP #94122-009	BP & AB Calc
Project	**Date**
CT1209 Windsor	5/9/2023
Client	**Designed by**
Tarpon Towers	Mike

Anchor Rod and Base Plate Calculation

TIA-222-H

Factored Base Reactions:		***Pole Shape:***	***Anchor Rods:***	***Base Plate:***
Moment:	2175 ft-kips	18-Sided	(18) 2.25 in. A615 GR. 75	2.5 in. x 64.5 in. Round
Shear:	23 kips	***Pole Dia. (D_f):***	Anchor Rods Evenly Spaced	fy = 50 ksi
Axial:	39 kips	51.00 in	On a 58.5 in Bolt Circle	

Anchor Rod Calculation According to TIA-222-H section 4.9.9

ϕ_t , ϕ_v = 0.75 TIA 4.9.6
I_{bolts} = 7700.06 in^2 Momet of Inertia
P_u = 101 kips Compr Force
V_u = 1.3 kips Shear Force
Rnt = 325.00 kips Nominal Tensile Strength
Rnv = 198.80 kips (0.5 x fu x ag)
Stress Rating = **42.5%** Satisfies TIA-H 4.9.9

Base Plate Calculation According to TIA-222-H

ϕ = 0.90 TIA 4.7
M_{PL} = 235.6 in-kip Plate Moment
L = 8.9 in Section Length
Z = 13.9 Plastic Section Modulus
M_P = 695.4 in-kip Plastic Moment
ϕM_n = 625.9 in-kip Factored Resistance

Calculated Moment vs Factored Resistance
235.62 in-kip $\leq$ 626 in-kip

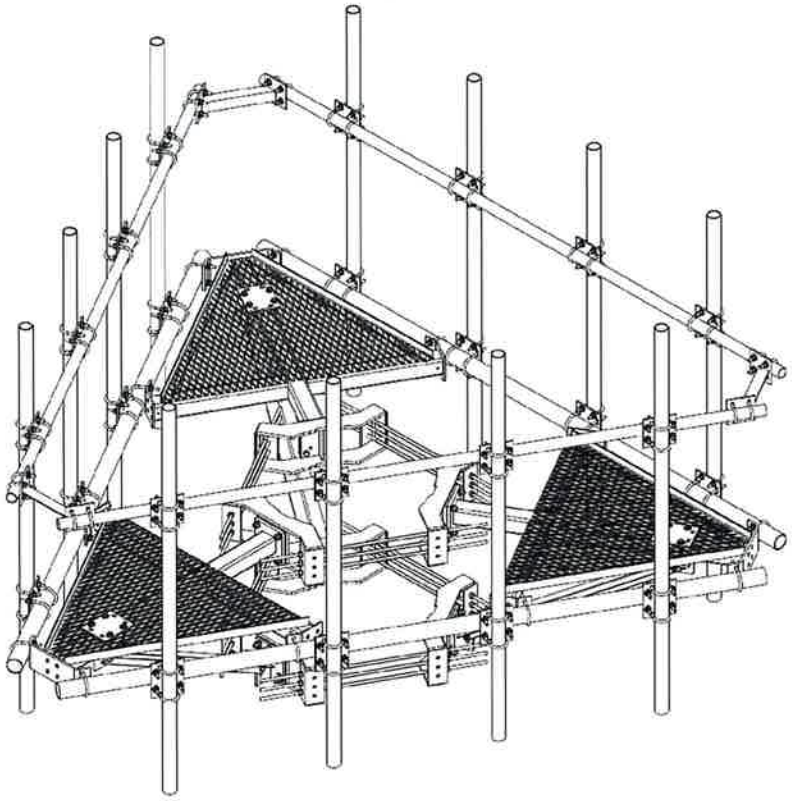
Stress Rating = **37.6%**

Anchor Rods Are Adequate **42.5%** ☑
Base Plate is Adequate **37.6%** ☑

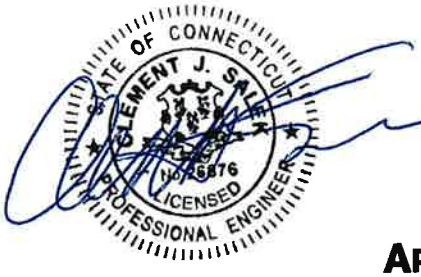
verizon

20 Alexander Drive, 2nd Floor
Wallingford, CT 06492

ANTENNA MOUNT ANALYSIS
WINDSOR 4 CT



Address:
780 PROSPECT HILL ROAD
WINDSOR, CT 06095
LOCATION CODE: 470880



Date:
APRIL 13, 2023 (REVISION 0)

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil • Structural • Land Surveying

R.K. Executive Centre ■ 201 Boston Post Road West ■ Suite 101 ■ Marlborough, MA 01752
t. 508.481.7400 ■ www.chappellengineering.com ■ f. 508.481.7406

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil • Structural • Land Surveying

April 13, 2023

verizon

20 Alexander Drive
2nd Floor
Wallingford, CT 06492

RE:

Applicant Site Name:	Windsor 4 CT
Location Code:	470880
Site Address:	780 Prospect Hill Road, Windsor, CT 06095

To whom it may concern:

Chappell Engineering Associates, LLC has performed a structural analysis of the proposed Verizon braced low-profile antenna mounting platform being proposed at the existing 135'+/- monopole located at the above-referenced address at approximately 105 ft AGL to analyze the effect of the proposed Verizon antenna installation on the subject platform. Our analysis has been performed in accordance with the 2022 Connecticut State Building Code (2021 International Building Code) with Connecticut Amendments.

The proposed antenna support structure will consist of one (1) low-profile antenna frame supporting twelve (12) individual antenna pipes mounts. Our analysis has considered the following total major equipment loads indicated on the antenna design summary (included in this report) to be installed on the proposed low-profile antenna frame:

Appurtenance	Size (HxWXD)(in)	Weight	Location	Status
(3) NHH-65B-R2B Panel Antennas	72.0x11.9x7.1	43.7lbs	Face of Mount	Proposed
(3) NHHSS-65B-R2BT4 Panel Antennas	72.0x11.9x7.1	48.1lbs	Face of Mount	Proposed
(3) Samsung MT6407-77A Panel Antennas	35.2x16.1x5.6	88lbs	Face of Mount	Proposed
(3) Samsung RF4440d-13A B5/B13	15.0x15.0x9.0	71lbs	Face of Mount	Proposed
(3) Samsung RF4439d-25A B2/B66A	15.0x15.0x10.0	75lbs	Face of Mount	Proposed
(3) RT4401-48A RRH	13.9x8.6x4.2	18.6lbs	Face of Mount	Proposed
(1) Fiber Junction Box	29.6x16.5x12.6	32lbs	Face of Mount	Proposed

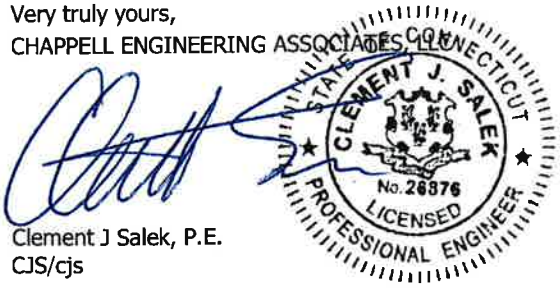
The proposed antennas and ancillary hardware are shown on the enclosed Lease Exhibit.

We have modeled the entire low-profile antenna frame under both wind and wind/ice loads. Our analysis and results are included in this report.

Based upon our analysis of the antenna mounts being proposed, **we consider the proposed RMQP-496-HK low-profile mounting frame assembly has adequate capacity** to support the proposed antenna configuration as shown. **The maximum percentage stress capacity as determined by our analysis are the antenna mounting pipes supporting the combined dual-mount antennas with a capacity of 48%.** Our analysis assumes the proposed antenna mounting platform will be properly installed and maintained according to manufacturers' recommendations.

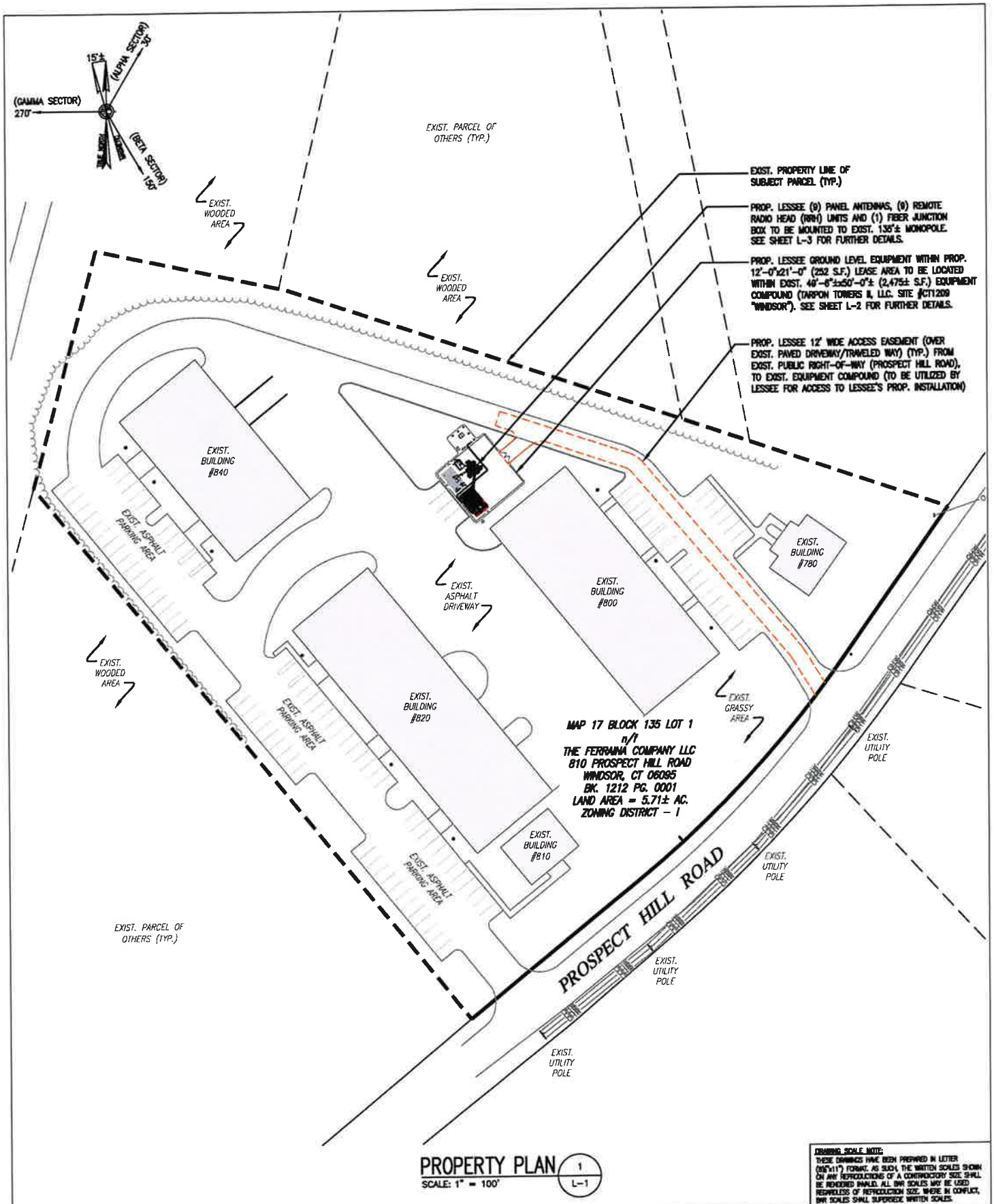
If you have any questions regarding this matter, please do not hesitate to call.

Very truly yours,
CHAPPELL ENGINEERING ASSOCIATES, LLC



Clement J Salek, P.E.
CJS/cjs

Appendix A – Lease Exhibit



PROPERTY PLAN

SCALE: 1" = 100'

1 / L-1

DRAWING SCALE NOTE:
THESE DRAWINGS HAVE BEEN PREPARED IN LETTER (8½"x11") FORMAT. AS SUCH, THE WRITTEN SCALES SHOWN ON ANY REPRODUCTIONS OF A CONTRADICTORY SIZE SHALL BE REGARDED INVALID. ALL BAR SCALES MAY BE USED REGARDLESS OF REPRODUCTION SIZE. WHERE IN CONFLICT, BAR SCALES SHALL SUPERSEDE WRITTEN SCALES.

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil · Structural · Land Surveying

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	4/5/23	REVISED RRH COUNT	NWC	GRS	GRS
1	4/5/23	REVISED ELEVATIONS	NWC	GRS	GRS
0	2/7/23	ISSUED FOR REVIEW	NWC	GRS	GRS

SCALE: 1" = 100' | DESIGNED BY: GRS | DRAWN BY: NWC

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

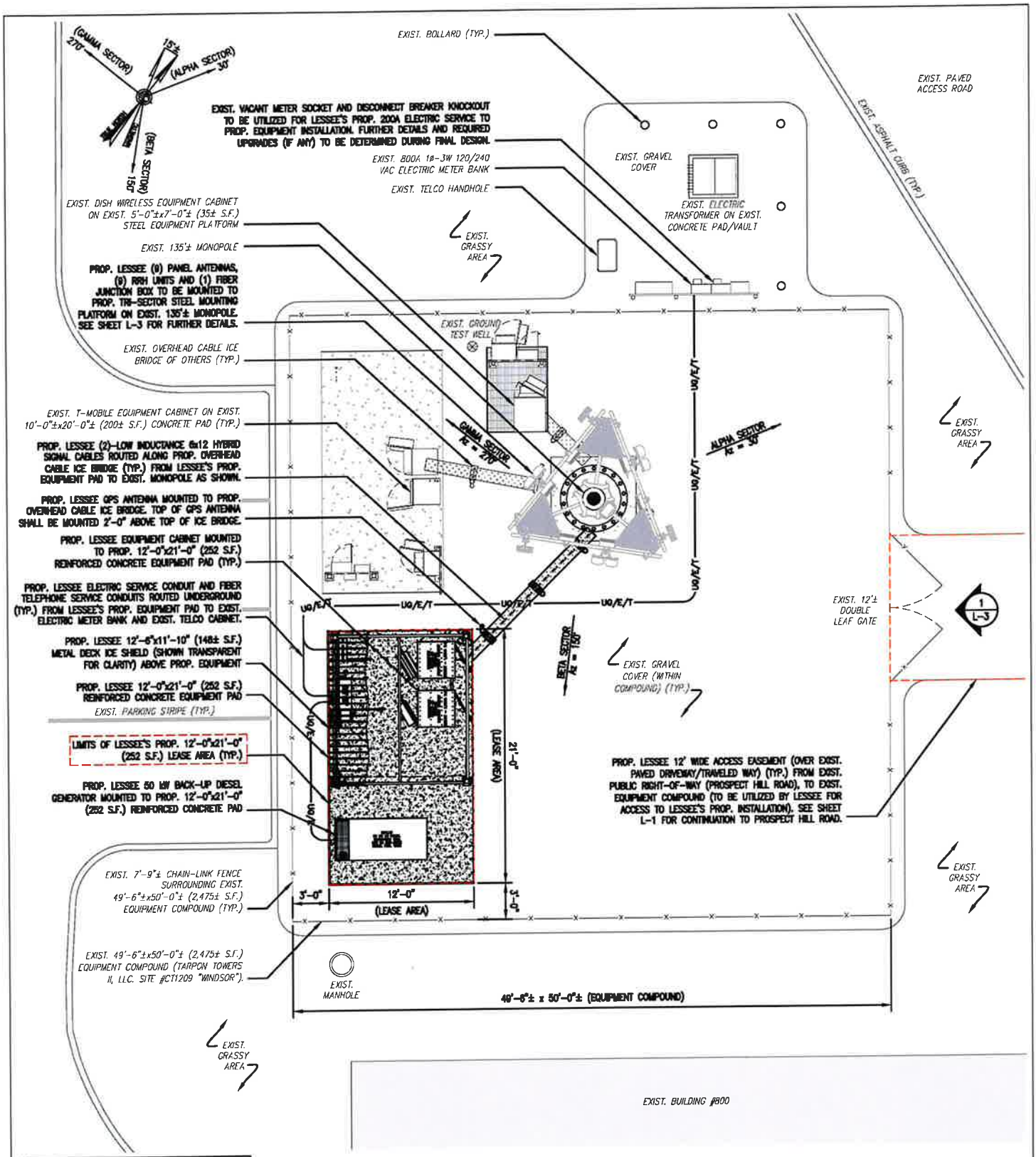
LEASE EXHIBIT
NOT FOR CONSTRUCTION

LEASE AREA

EQUIPMENT LEASE AREA: 12'-0"x21'-0" (252 S.F.)

TOTAL = 252 S.F.

PROJECT NO.	DRAWING NAME	DATE	LOC. CODE	REV
96210.416	L-1	4/5/23	470880	2



SITE CONTROL POINT:
CENTER OF EXISTING MONOPOLE
N 41°-52'-58.47" (41.882908°) (NAD '83)
W 72°-42'-29.14" (72.708094°) (NAD '83)
GROUND ELEVATION = 174.0' AMSL (NAVD '88)

PER 1A SURVEY OF OTHERS

EQUIPMENT COMPOUND PLAN

1 L-2

SCALE: 3/32" = 1'-0"

DRAWING SCALE NOTE:
THESE DRAWINGS HAVE BEEN PREPARED IN LETTER (8½"x11") FORMAT. AS SUCH, THE WRITTEN SCALES SHOWN ON ANY REPRODUCTIONS OF A CONTRADICTORY SIZE SHALL BE REGARDED INVALID. ALL BAR SCALES MAY BE USED REGARDLESS OF REPRODUCTION SIZE. WHERE IN CONFLICT, BAR SCALES SHALL SUPERSEDE WRITTEN SCALES.

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil · Structural · Land Surveying

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	4/5/23	REVISED RRH COUNT	NWC	GRS	GRS
1	4/5/23	REVISED ELEVATIONS	NWC	GRS	GRS
0	2/7/23	ISSUED FOR REVIEW	NWC	GRS	GRS

SCALE: 3/32" = 1'-0" | DESIGNED BY: GRS | DRAWN BY: NWC

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

LEASE EXHIBIT
NOT FOR CONSTRUCTION

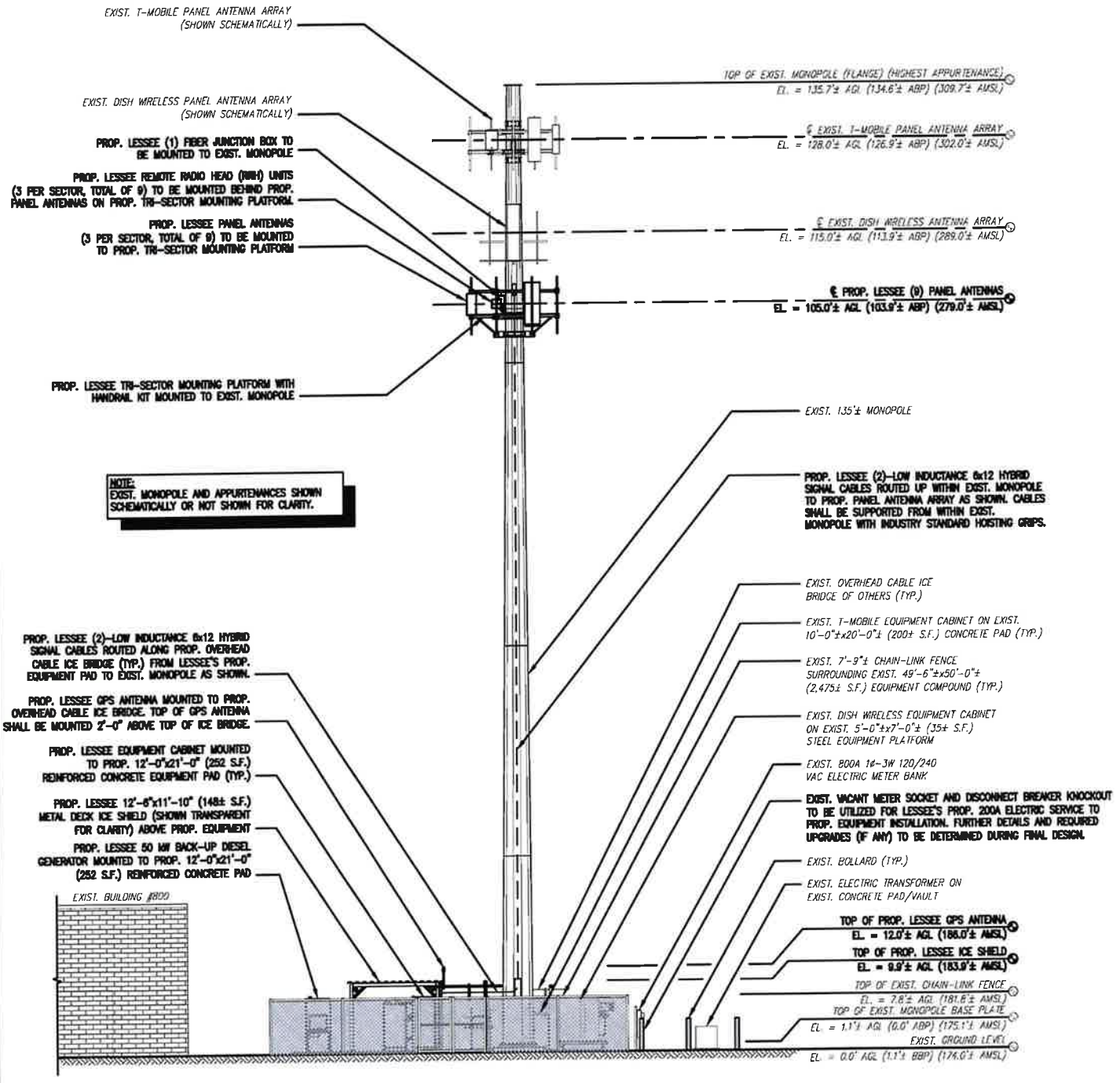
LEASE AREA

EQUIPMENT LEASE AREA: 12'-0"x21'-0" (252 S.F.)

TOTAL = 252 S.F.

PROJECT NO.	DRAWING NAME	DATE	LOC. CODE	REV
98210.416	L-2	4/5/23	470880	2

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



NORTHEAST EQUIPMENT COMPOUND ELEVATION

1 / L-3

SCALE: 1" = 20'

DRAWING SCALE NOTE: THESE DRAWINGS HAVE BEEN PREPARED IN LETTER (8½"x11") FORMAT. AS SUCH, THE WRITTEN SCALES SHOWN ON ANY REPRODUCTIONS OF A CONTRADICTORY SIZE SHALL BE RENDERED INVALID. ALL BAR SCALES MAY BE USED REGARDLESS OF REPRODUCTION SIZE. WHERE IN CONFLICT, BAR SCALES SHALL SUPERSEDE WRITTEN SCALES.

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil · Structural · Land Surveying

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	4/5/23	REVISED RRH COUNT	NWC	GRS	GRS
1	4/5/23	REVISED ELEVATIONS	NWC	GRS	GRS
0	2/7/23	ISSUED FOR REVIEW	NWC	GRS	GRS

SCALE: 1" = 20' | DESIGNED BY: GRS | DRAWN BY: NWC

WINDSOR 4 CT

780 PROSPECT HILL ROAD
WINDSOR, CT 06095

LEASE EXHIBIT
NOT FOR CONSTRUCTION

LEASE AREA

EQUIPMENT LEASE AREA: 12'-0"x21'-0" (252 S.F.)

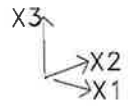
TOTAL = 252 S.F.

PROJECT NO.	DRAWING NAME	DATE	LOC. CODE	REV
98210.416	L-3	4/5/23	470880	2

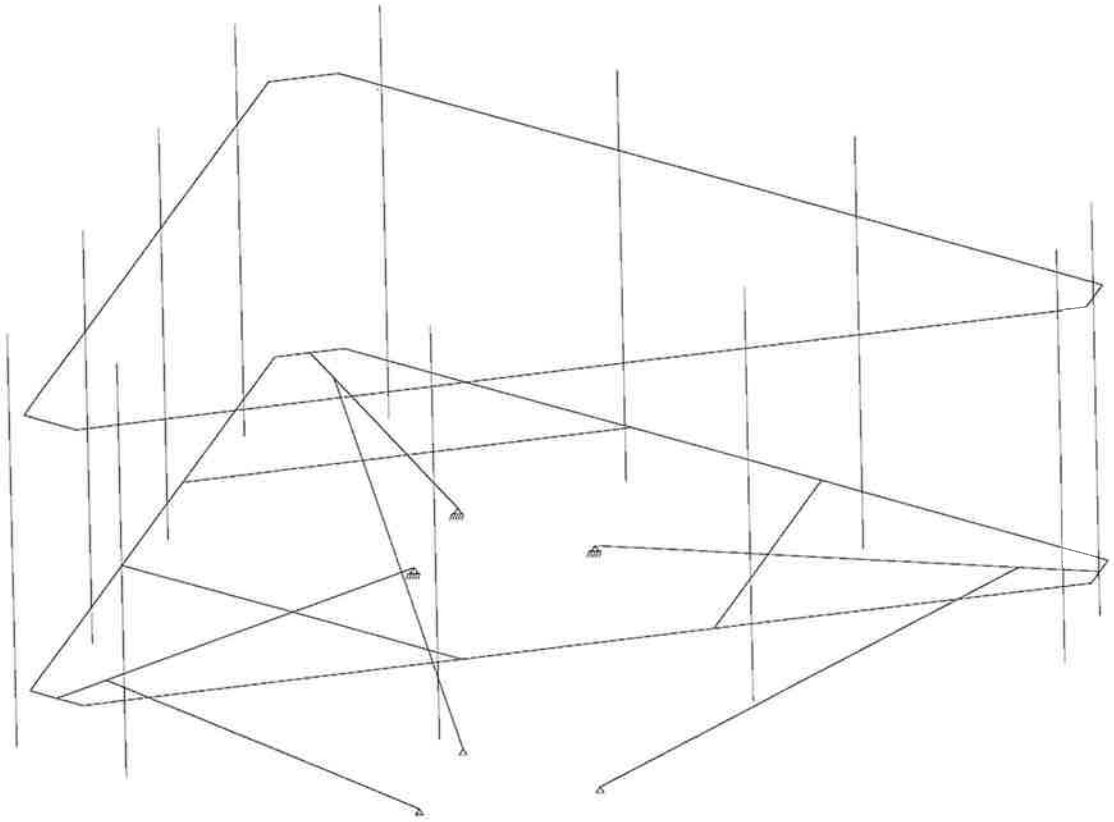
Appendix B – Mount Analysis

Windsor 4 CT Mount Analysis

View: Steel Beam Design



SCALE = 1:30 | UNITS: kip ft | DATE: 4/10/23

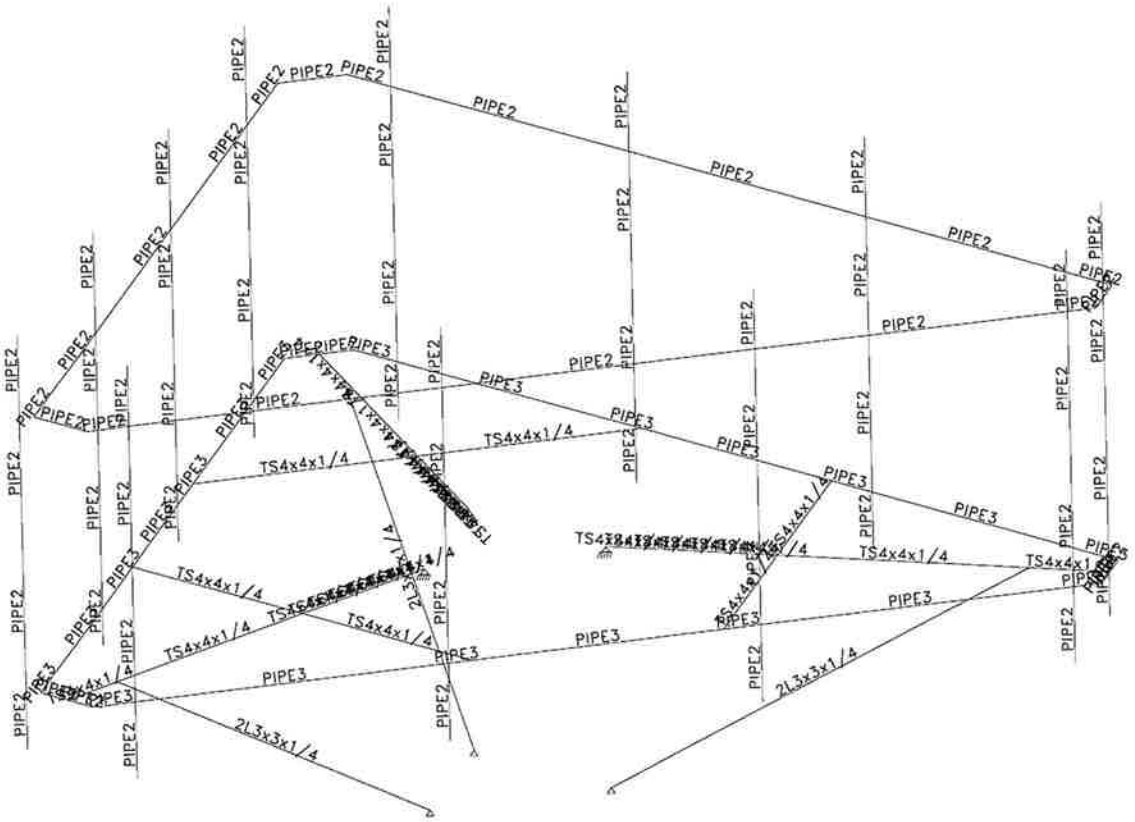


Windsor 4 CT Mount Analysis

View: Steel Beam Design

X3
X2
X1

SCALE = 1:30	UNITS: kip ft	DATE: 4/10/23



Windsor 4 CT Mount Analysis

Prepared by:

Load no. 1: Front No Ice (units - kips ft.)

/ JOINT LOADS
/ BEAM LOADS
/ JOINT LOADS
/ BEAM LOADS
/ JOINT LOADS

/ BEAM LOADS
/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS

FX2 0.073 FX3 -0.045 N 70 26
FX2 0.025 FX3 -0.045 N 84 54 76 38
FX2 0.047 FX3 -0.023 N 132
FX2 0.047 FX3 -0.023 N 133 135
FX2 0.22 FX3 -0.045 N 28 27

FX2 0.143 FX3 -0.045 N 48 47 64 63
FX2 0.57 FX3 -0.084 N 126 131 127 136 125 134
/ END

F O R C E S U M M A T I O N

FX1=0. kip
FX2=4.819 kip
FX3=-1.113 kip

Load no. 2: Side No Ice (units - kips ft.)

/ JOINT LOADS
/ BEAM LOADS
/ JOINT LOADS
/ BEAM LOADS
/ JOINT LOADS

/ BEAM LOADS
/ JOINT LOADS
/ BEAM LOADS
/ JOINT LOADS
/ JOINT LOADS

/ JOINT LOADS
FX1 0.025 FX3 -0.044 N 70 26 76 38 84 54
FX1 0.047 FX3 -0.023 N 132 135 133
FX1 0.143 FX3 -0.045 N 28 27 48 47 64 63
FX1 0.057 FX3 -0.084 N 126 127 125

FX1 0.057 FX3 -0.084 N 131 136 134
/ END

F O R C E S U M M A T I O N

FX1=1.491 kip
FX2=0. kip
FX3=-1.107 kip

Load no. 3: Front Ice (units - kips ft.)
/ JOINT LOADS / BEAM LOADS / JOINT LOADS / BEAM LOADS / JOINT LOADS
/ JOINT LOADS / BEAM LOADS / JOINT LOADS / JOINT LOADS / JOINT LOADS
FX2 0.021 FX3 -0.075 N 70 26 FX2 0.01 FX3 -0.075 N 76 38 84 54 FX2 0.016 FX3 -0.049 N 132 135 133 FX2 0.065 FX3 -0.156 N 28 27 48 47 64 63 FX2 0.02 FX3 -0.123 N 126 127 125 134 131 136
/ END
F O R C E S U M M A T I O N FX1=0. kip FX2=0.64 kip FX3=-2.271 kip

Load no. 4: Side Ice (units - kips ft.)
/ JOINT LOADS / BEAM LOADS / JOINT LOADS / BEAM LOADS / JOINT LOADS
/ BEAM LOADS / JOINT LOADS / JOINT LOADS / JOINT LOADS FX1 0.01 FX3 -0.075 N 70 26 38 76 84 54
FX1 0.01 FX3 -0.049 N 132 135 133 FX1 0.048 FX3 -0.156 N 28 27 48 47 64 63 FX1 0.014 FX3 -0.123 N 126 127 125 134 131 136 / END
F O R C E S U M M A T I O N FX1=0.462 kip FX2=0. kip FX3=-2.271 kip

Load no. 5: Selfweight (units - kips ft.)

```
/ BEAM LOADS
SELF  X3 -1. B 1 TO 138 142 TO 150
/ GLOBAL LOADS
/ GLOBAL LOADS
/ GLOBAL LOADS
DIST FX3 -0.003 PLANE -7.25 4.763 0.   -1.805 4.763 0.   -5.028 -0.818
0.   PT -0.5 0.866 BEAMS
DIST FX3 -0.003 PLANE 1.805 4.763 0.   7.25 4.763 0.   7.75 3.897 0.   PT
3.223 5.581 BEAMS
DIST FX3 -0.003 PLANE -3.222 -3.945 0.   3.222 -3.945 0.   0.5 -8.66
0.   PT 2.722 4.715 BEAMS
/ END

F O R C E   S U M M A T I O N

FX1=0. kip
FX2=0. kip
FX3=-1.4597 kip
```

Load no. 6: Front Frame Ice (units - kips ft.)

```
/ BEAM LOADS
DIST GL FX2 -0.002 B 1 4 5 13 TO 35 BY 2 49 TO 51 55 56 63 64 66 71 TO 74
76 TO 81 83 TO 88 90 TO 115 117 133 TO 135 142 TO 150
/ END

F O R C E   S U M M A T I O N

FX1=0. kip
FX2=-0.3127 kip
FX3=0. kip
```

Load no. 7: Side Frame Ice (units - kips ft.)

```
/ BEAM LOADS
/ BEAM LOADS
DIST GL FX1 -0.002 B 4 5 13 TO 35 BY 2 50 51 63 64 66 71 72 TO 78 BY 2
79 TO 81 83 TO 88 90 91 93 94 TO 100 BY 2 101 TO 115 117 133 TO 135
142 TO 150
/ END

F O R C E   S U M M A T I O N

FX1=-0.2564 kip
FX2=0. kip
FX3=0. kip
```

Load no. 8: Front Frame No Ice (units - kips ft.)

/ BEAM LOADS
/ BEAM LOADS
DIST GL FX2 -0.005 B 1 4 5 13 TO 35 BY 2 49 TO 51 55 56 63 64 66 71 TO 74
76 TO 81 83 TO 88 90 TO 115 117 133 TO 135 142 TO 150
/ END

F O R C E S U M M A T I O N

FX1=0. kip
FX2=-0.7817 kip
FX3=0. kip

Load no. 9: Side Frame No Ice (units - kips ft.)

/ BEAM LOADS
/ BEAM LOADS
/ BEAM LOADS
DIST GL FX1 -0.005 B 4 5 13 TO 35 BY 2 50 51 63 64 66 71 72 TO 78 BY 2
79 TO 81 83 TO 88 90 91 93 94 TO 100 BY 2 101 TO 115 117 133 TO 135
142 TO 150
/ END STATIC

F O R C E S U M M A T I O N

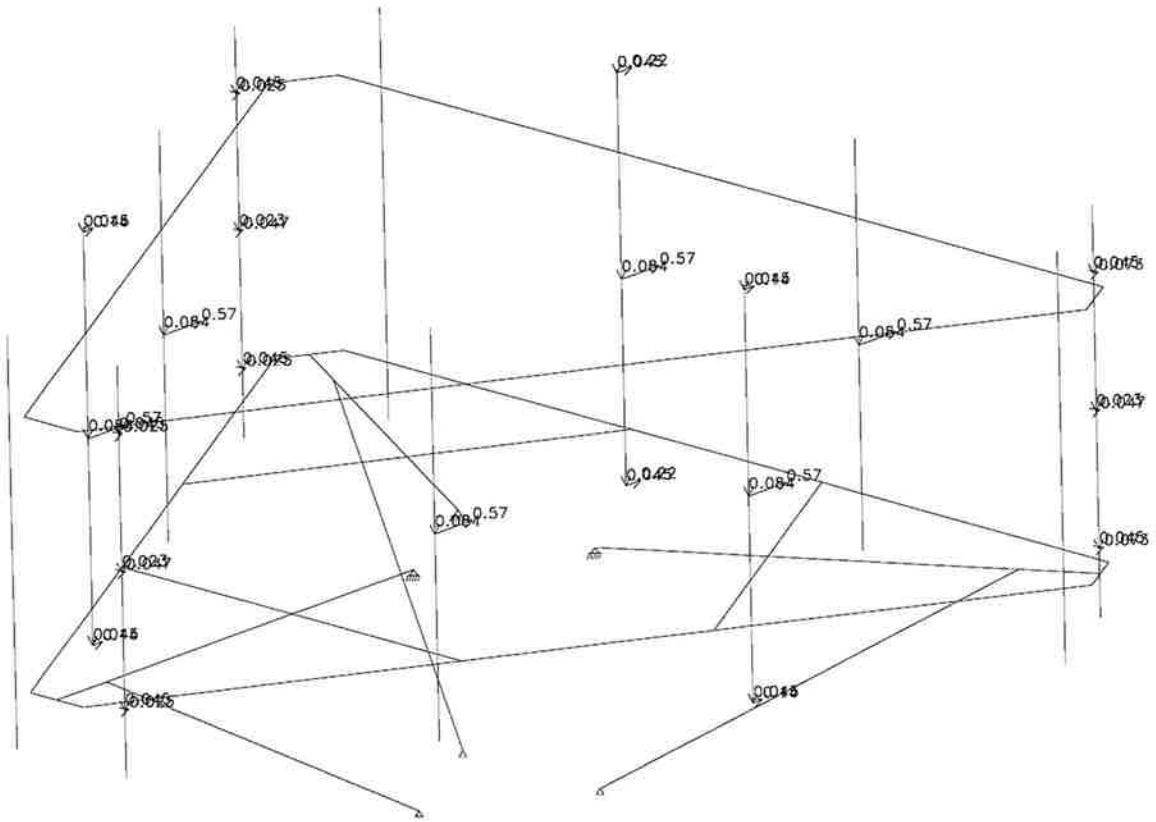
FX1=-0.6411 kip
FX2=0. kip
FX3=0. kip

Windsor 4 CT Mount Analysis

Load 1: Front No Ice
View: Steel Beam Design

X3
X2
X1

SCALE = 1:30	UNITS: kip ft	DATE: 4/10/23

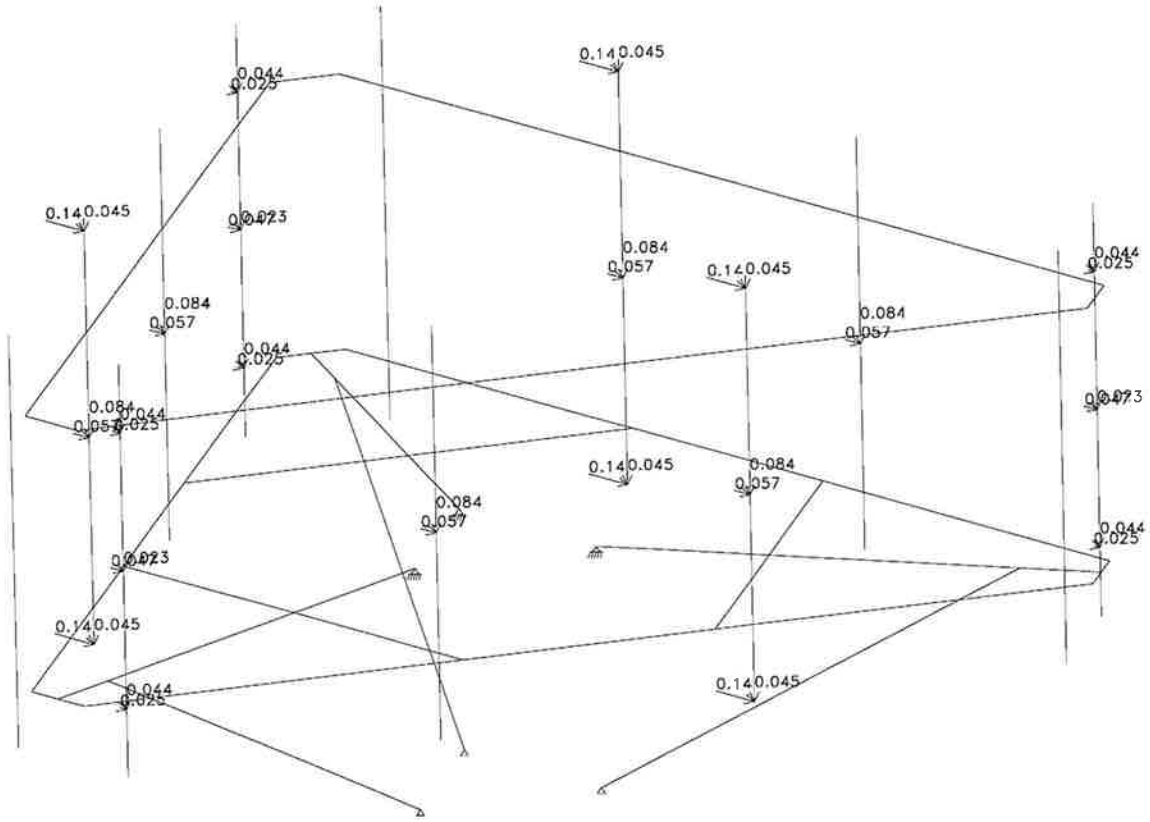


Windsor 4 CT Mount Analysis

Load 2: Side No Ice
View: Steel Beam Design

X3
X2
X1

SCALE = 1:30 | UNITS: kip ft | DATE: 4/10/23

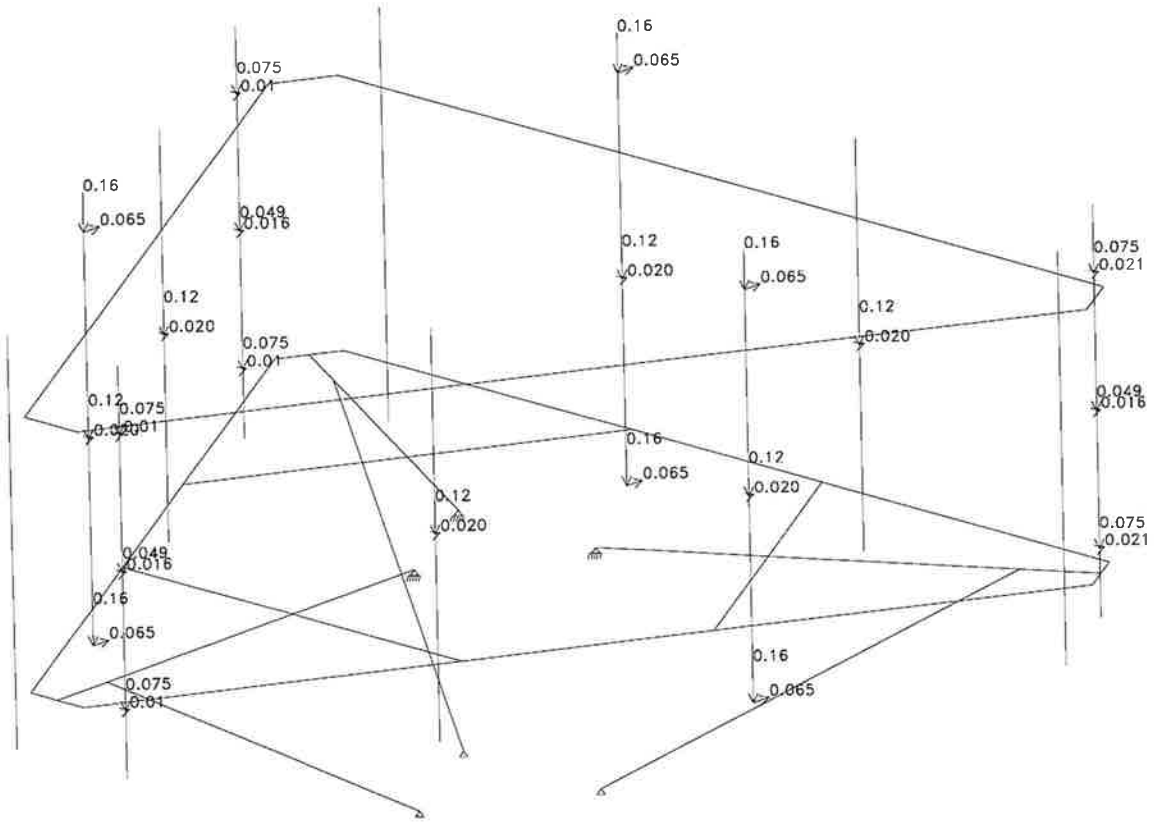


Windsor 4 CT Mount Analysis

Load 3: Front Ice
View: Steel Beam Design

X3
X2
X1

SCALE = 1:30 | UNITS: kip ft | DATE: 4/10/23

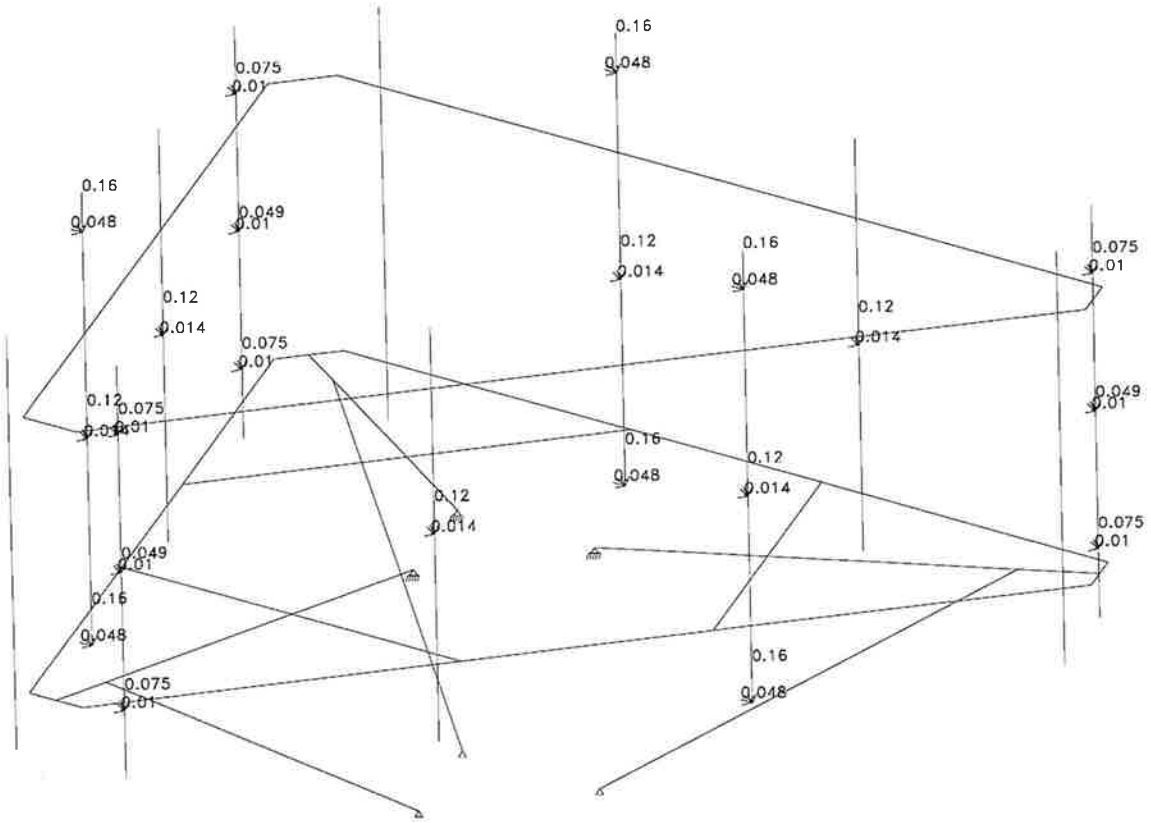


Windsor 4 CT Mount Analysis

Load 4: Side Ice
View: Steel Beam Design

X3
X2
X1

SCALE = 1:30 | UNITS: kip ft | DATE: 4/10/23

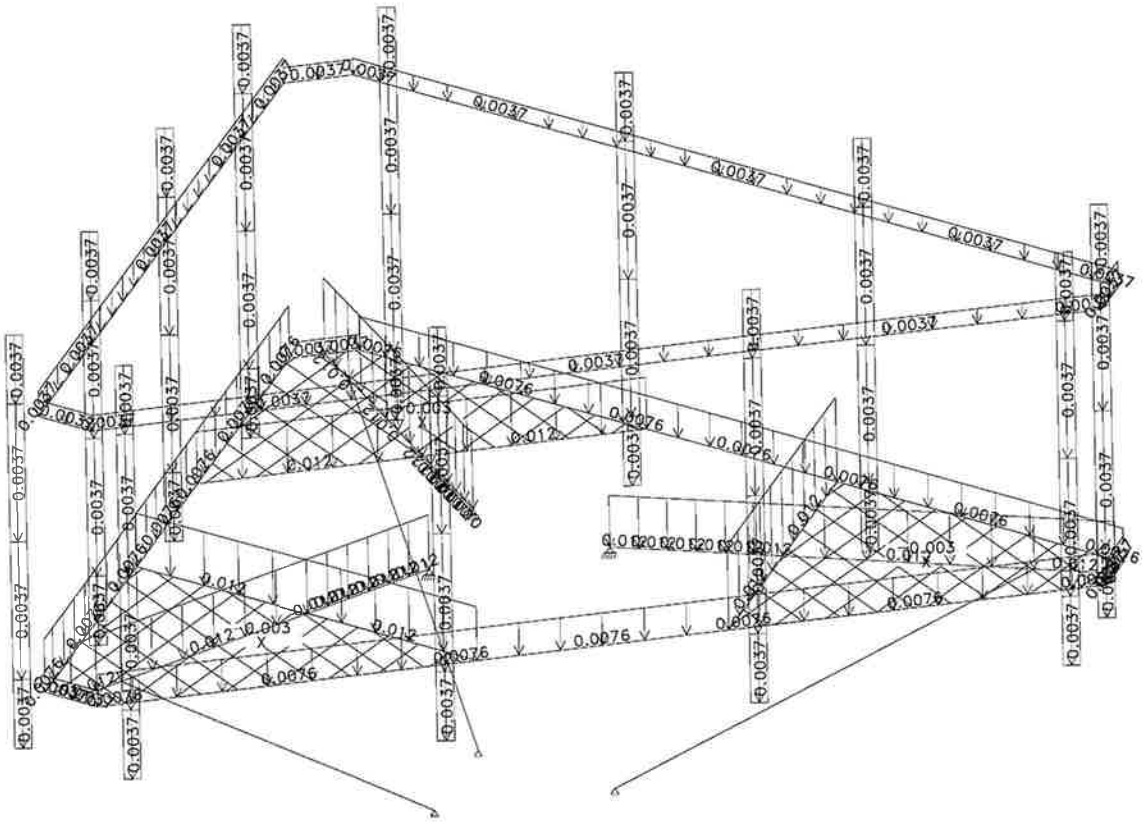


Windsor 4 CT Mount Analysis

Load 5: Selfweight
View: Steel Beam Design

X3
X2
X1

SCALE = 1:30 | UNITS: kip ft | DATE: 4/10/23

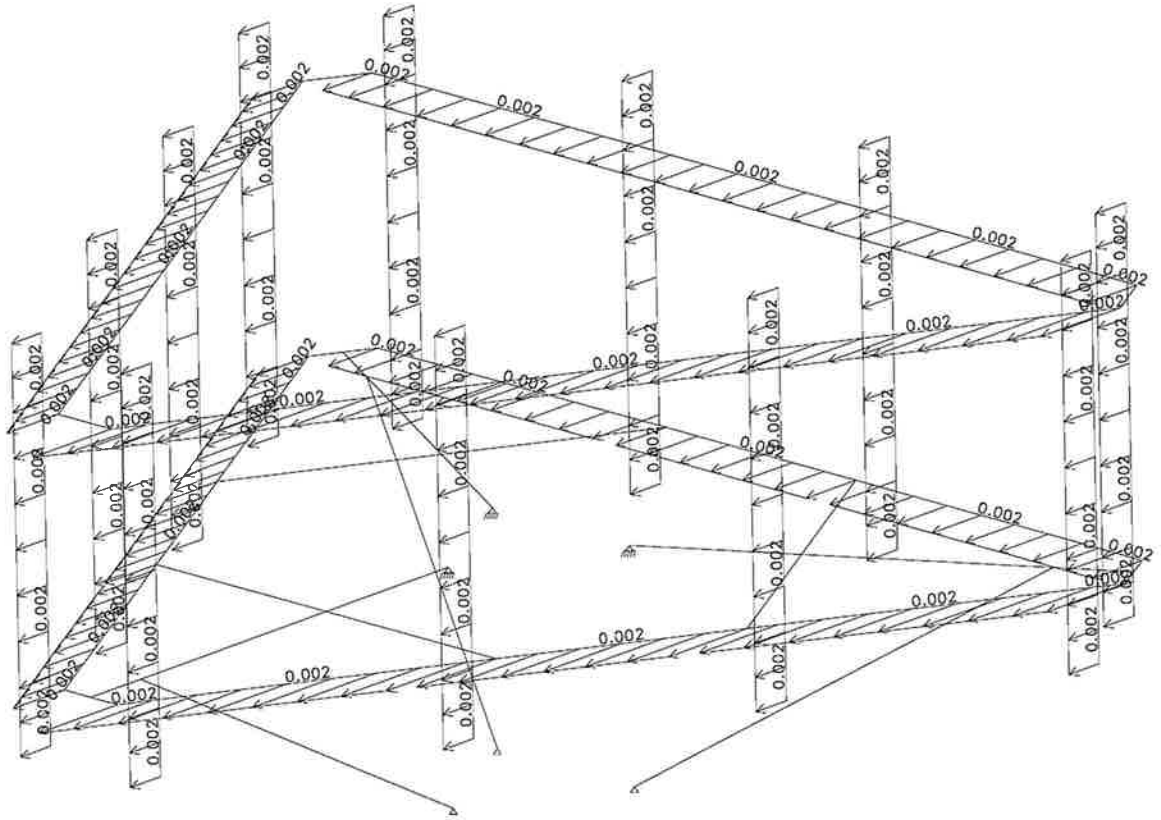


Windsor 4 CT Mount Analysis

Load 6: Front Frame Ice
View: Steel Beam Design

X3
X2
X1

SCALE = 1:30	UNITS: kip ft	DATE: 4/10/23

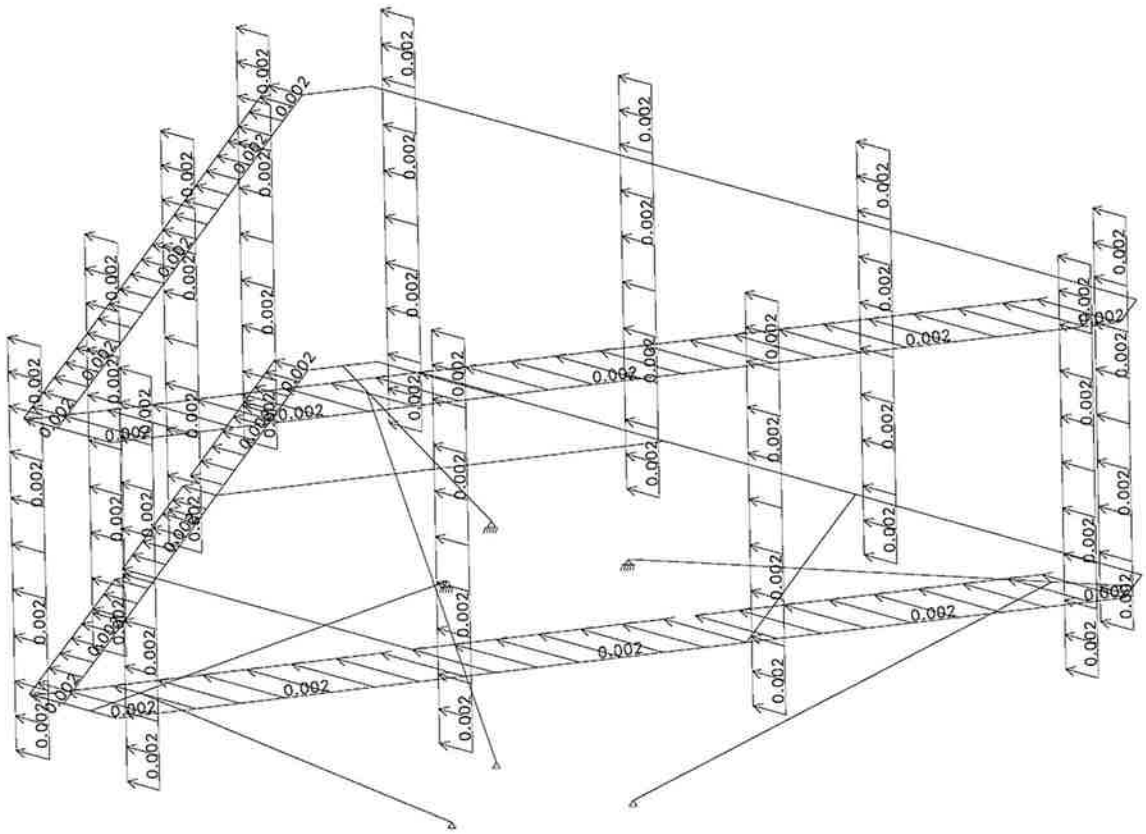


Windsor 4 CT Mount Analysis

Load 7: Side Frame Ice
View: Steel Beam Design

X3
X2
X1

SCALE = 1:30 | UNITS: kip ft | DATE: 4/10/23

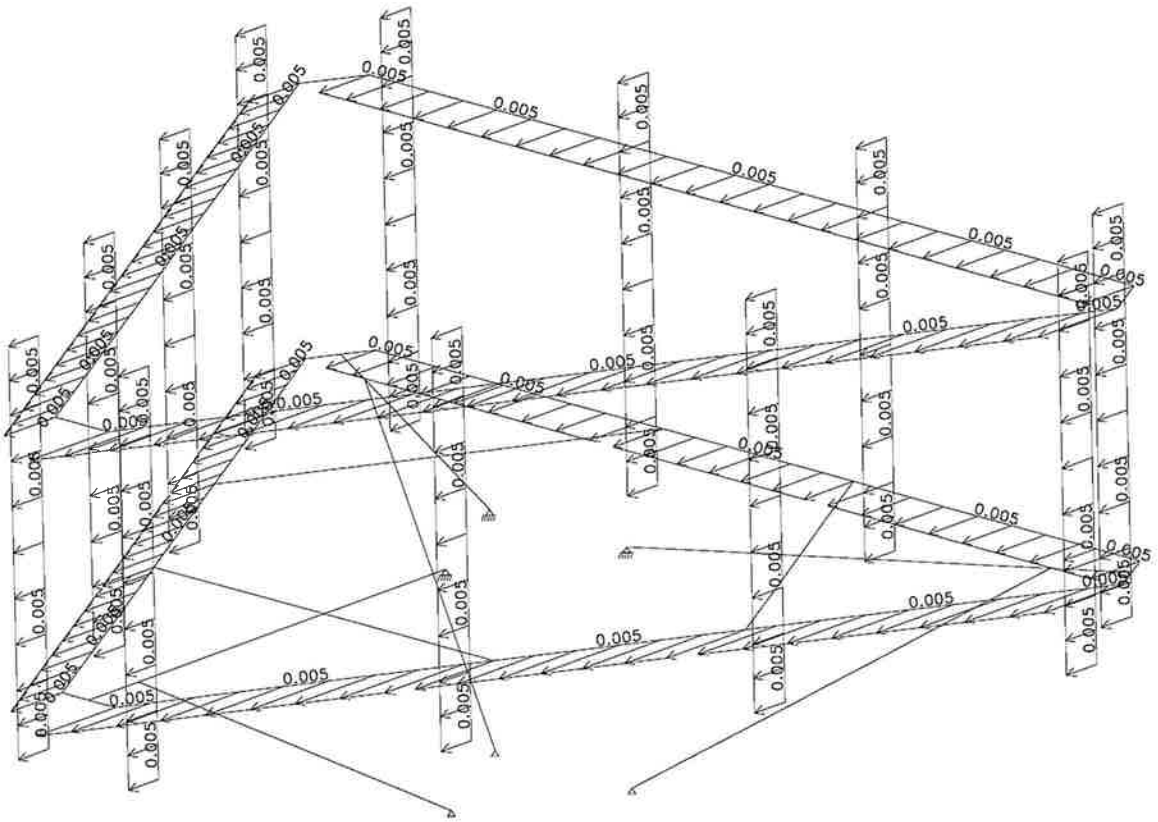


Windsor 4 CT Mount Analysis

Load 8: Front Frame No Ice
View: Steel Beam Design

X3
X2
X1

SCALE = 1:30 | UNITS: kip ft | DATE: 4/10/23

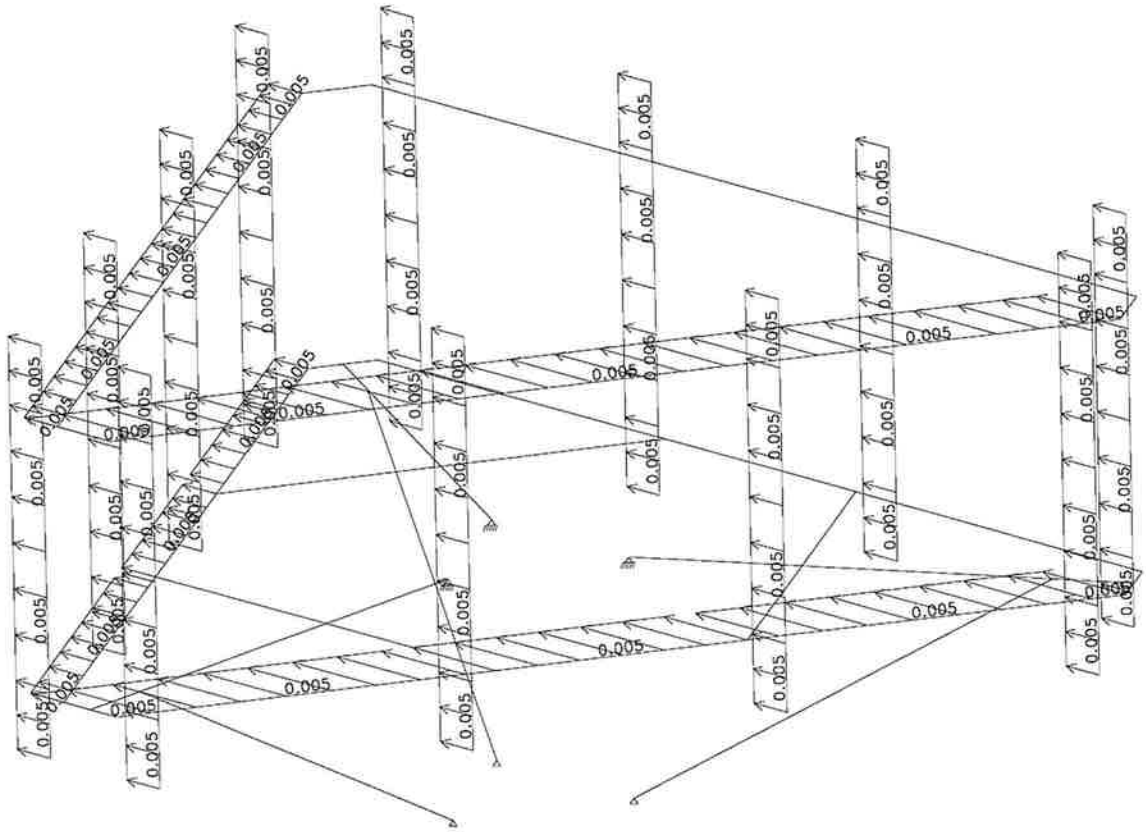


Windsor 4 CT Mount Analysis

Load 9: Side Frame No Ice
View: Steel Beam Design

X3
X2
X1

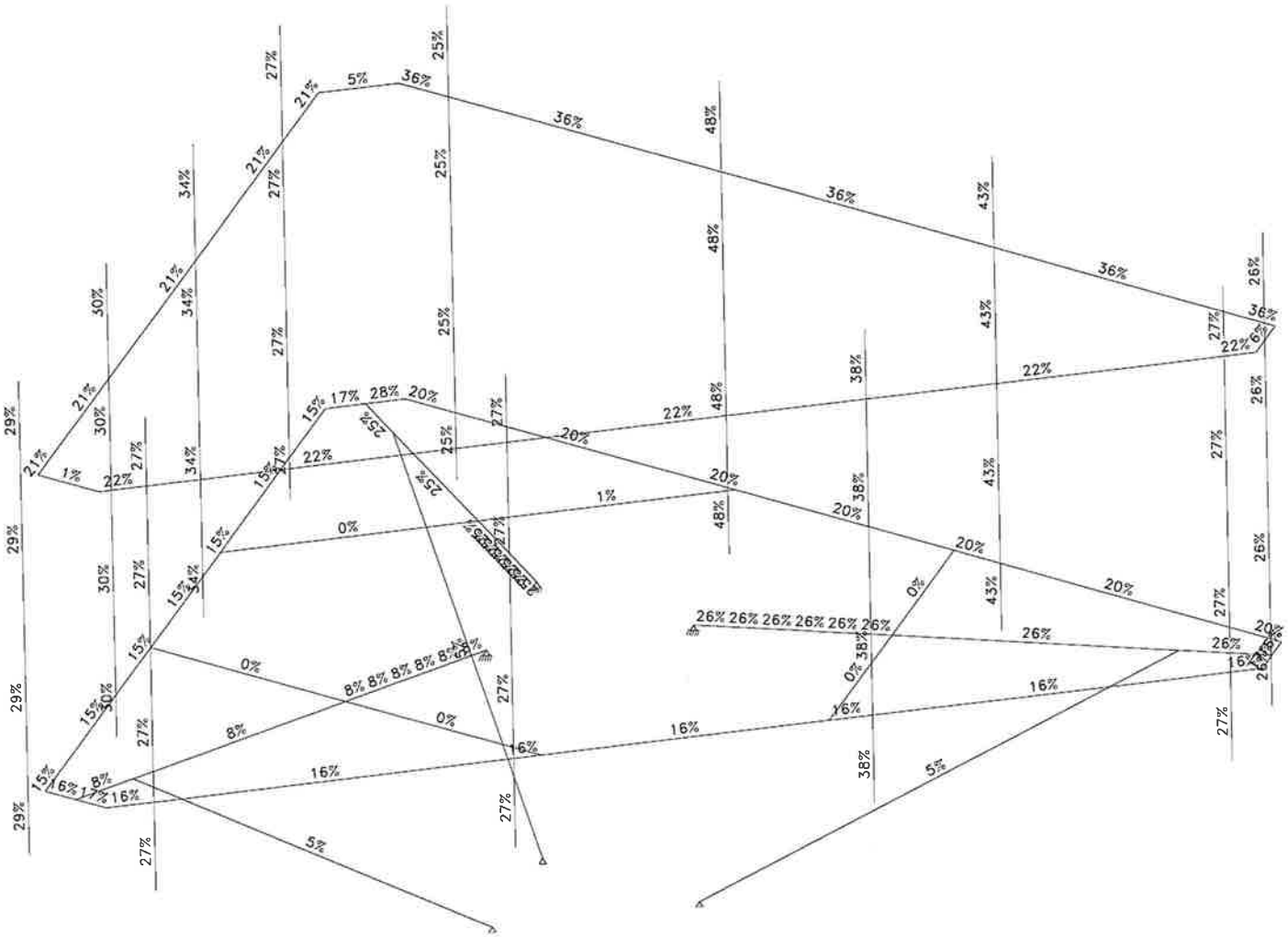
SCALE = 1:30 | UNITS: kip ft | DATE: 4/10/23



Windsor 4 CT Mount Analysis

SCALE = 1:24

DATE: 4/10/23



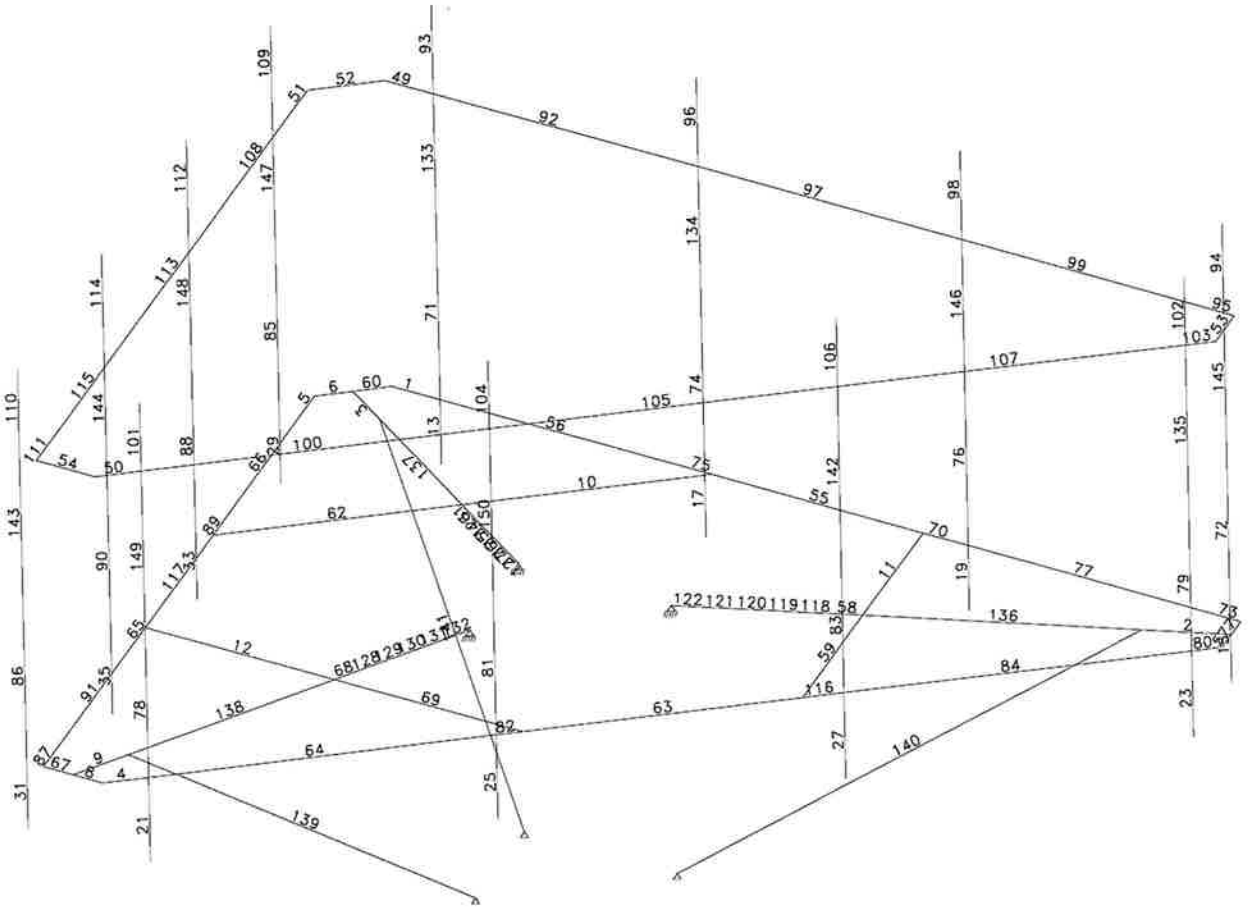
Actual/allowable Moment+Axial

Windsor 4 CT Mount Analysis

View: Steel Beam Design

SCALE = 1:27

DATE: 4/10/23



Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Results Summary Table

Beam	Section	Com	Defl L/	Slen	CAPACITY Axial	Dir	Shear	Mom	LTB	Combined Axial+Mom	
1	PIPE 3	1	518	150	0.01	MJ	0.02	0.13	0.13	0.20	
						MI	0.02	0.07	0.00		
2	TS 4x4x1/4	1	2962	57	0.02	MJ	0.03	0.08	0.08	0.26	
						MI	0.03	0.19	0.00		
3	TS 4x4x1/4	1	3294	57	0.02	MJ	0.03	0.08	0.08	0.25	
						MI	0.03	0.18	0.00		
6	PIPE 2	1	7444	8	-0.01	MJ	0.04	0.13	0.13	0.17	
						MI	0.01	0.04	0.00		
7	PIPE 2	3	9999	8	0.00	MJ	0.04	0.13	0.13	0.16	
						MI	0.01	0.03	0.00		
8	PIPE 2	1	9999	8	0.01	MJ	0.04	0.12	0.12	0.17	
						MI	0.04	0.13	0.00		
9	TS 4x4x1/4	4	3861	46	-0.01	MJ	0.03	0.07	0.07	0.08	
						MI	0.00	0.03	0.00		
10	TS 4x4x1/4	3	9999	26	0.01	MI	0.00	0.00	0.00	0.01	
11	TS 4x4x1/4	4	9999	26	0.00	MI	0.00	0.00	0.00	0.00	
12	TS 4x4x1/4	1	9999	26	0.00	MI	0.00	0.00	0.00	0.00	
49	PIPE 2	1	403	201	-0.06	MJ	0.02	0.16	0.16	0.36	***
						MI	0.01	0.17	0.00		
52	PIPE 2	1	9999	15	0.00	MJ	0.02	0.05	0.05	0.05	
53	PIPE 2	1	9999	15	0.00	MJ	0.02	0.06	0.06	0.06	
54	PIPE 2	2	9999	15	0.00	MJ	0.00	0.01	0.01	0.01	
57	PIPE 2	1	6219	8	0.00	MJ	0.03	0.14	0.14	0.17	
						MI	0.01	0.03	0.00		
59	TS 4x4x1/4	1	9999	26	0.00	MI	0.00	0.00	0.00	0.00	
60	PIPE 2	1	4173	8	-0.01	MJ	0.04	0.24	0.24	0.28	
						MI	0.01	0.04	0.00		
62	TS 4x4x1/4	1	9999	26	0.00	MI	0.00	0.00	0.00	0.00	
67	PIPE 2	1	9999	8	0.01	MJ	0.03	0.10	0.10	0.16	
						MI	0.04	0.13	0.00		
69	TS 4x4x1/4	1	9999	26	0.00	MI	0.00	0.00	0.00	0.00	
80	PIPE 3	4	643	150	0.01	MJ	0.02	0.13	0.13	0.16	
						MI	0.01	0.05	0.00		
87	PIPE 3	4	645	150	0.01	MJ	0.02	0.13	0.13	0.15	
						MI	0.01	0.04	0.00		
93	PIPE 2	1	177	88	-0.02	MJ	0.01	0.20	0.20	0.25	***
						MI	0.00	0.04	0.00		
94	PIPE 2	1	157	88	-0.02	MJ	0.01	0.19	0.19	0.26	***
						MI	0.00	0.07	0.00		
96	PIPE 2	1	87	69	0.00	MJ	0.01	0.13	0.13	0.48	***
						MI	0.03	0.36	0.00		
98	PIPE 2	1	92	91	0.00	MJ	0.01	0.13	0.13	0.43	***
						MI	0.03	0.29	0.00		
101	PIPE 2	1	427	86	-0.01	MJ	0.01	0.13	0.13	0.27	
						MI	0.01	0.13	0.00		
102	PIPE 2	1	193	91	-0.01	MJ	0.01	0.08	0.08	0.27	***
						MI	0.02	0.25	0.00		
103	PIPE 2	4	680	205	-0.05	MJ	0.02	0.15	0.15	0.22	***
						MI	0.01	0.06	0.00		
104	PIPE 2	1	225	68	0.00	MJ	0.01	0.08	0.08	0.27	***
						MI	0.03	0.24	0.00		
106	PIPE 2	1	175	69	0.00	MJ	0.01	0.09	0.09	0.38	***
						MI	0.03	0.31	0.00		
109	PIPE 2	1	227	91	-0.01	MJ	0.01	0.07	0.07	0.27	***
						MI	0.02	0.24	0.00		
110	PIPE 2	1	411	87	-0.01	MJ	0.01	0.13	0.13	0.29	
						MI	0.01	0.15	0.00		
111	PIPE 2	3	686	209	-0.06	MJ	0.02	0.15	0.15	0.21	***
						MI	0.01	0.05	0.00		
112	PIPE 2	1	195	66	0.00	MJ	0.00	0.05	0.05	0.34	***
						MI	0.03	0.29	0.00		
114	PIPE 2	1	214	74	0.00	MJ	0.01	0.11	0.11	0.30	***
						MI	0.03	0.25	0.00		

Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Results Summary Table

					CAPACITY						
Beam	Section	Com	Defl L/	Slen	Axial	Dir	Shear	Mom	LTB	Combined Axial+Mom	
139	2L 3x3x1/4	4	9999	91	-0.05	MI	0.00	0.00	0.00	0.05	
140	2L 3x3x1/4	4	9999	90	-0.05	MI	0.00	0.00	0.00	0.05	
141	2L 3x3x1/4	3	9999	90	-0.05	MI	0.00	0.00	0.00	0.05	

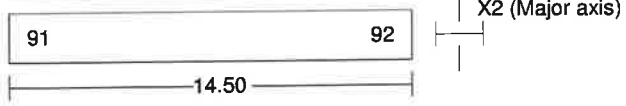
Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 49 - 95

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

Beam: 49, 92, 97, 99, 95



CONSTRAINTS

- Sections : Check
- Steel Grade: A500C

DESIGN DATA

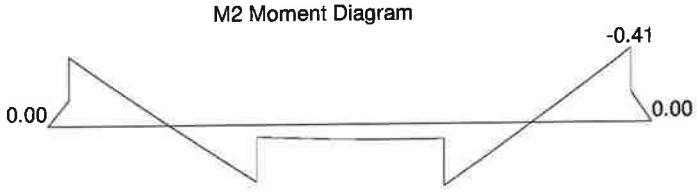
- Kx = 1.00 - Ky = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: PIPE 2

Ix = 0.67 Iy = 0.67in4 Zx = 0.76 Zy = 0.76in3 Area = 1.07
D = 2.37 t = 0.15in
J = 1.33 Cw = 0.00in6

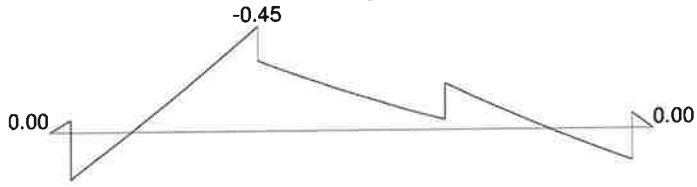
DESIGN COMBINATION = 1

M2 Moment Diagram



Max. AXIAL Force = 0.08 (tens.), -0.25 (compr.) Max. SHEAR Force = 0.34

M3 Moment Diagram



Max. AXIAL Force = 0.08 (tens.), -0.25 (compr.) Max. SHEAR Force = 0.16

SECTION CLASSIFICATION: *** COMPACT ***

Limiting Ratios: Compact Non-Compact
d/t= 15.46 < 45.0 71.7 (Fy= 46.0 R = 0.005)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 0.64	Vu = 0.16 Vn = 17.81	0.01
M3 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.45 Mn = 2.92	0.17
V3 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 0.64	Vu = 0.34 Vn = 17.81	0.02

Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 49 - 95

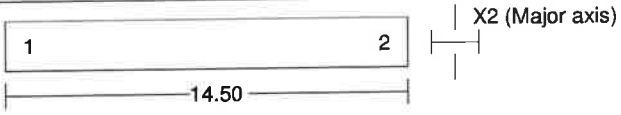
*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

DESIGN	EQUATION	FACTORS	VALUES	RESULT
M2 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.41 Mn = 2.92	0.16
Deflection	$\frac{defl.}{L/240} < 1.00$		defl = 0.43143	0.60
Axial Force (E2-1)	$\frac{Pu}{0.85AgFcr} < 1.00$	(kL/r)x =192 (kL/r)y =192 λc = 2.43	Pu = 0.25 Ag = 1.07 Fcr = 6.83	0.04
Combined Forces (compress.) (H1-1b)	$\frac{Pu}{2\phi Pn} + \frac{Mux}{\phi Mnx} + \frac{Muy}{\phi Mny} < 1.00$	Cmx = 1.00 Cmy = 1.00 Pex = 8.38 Pey = 8.38	Mux = 0.42 Muy = 0.47 B1x = 1.03 B1y = 1.03	0.36

Detailed Results Table for Beam 1 - 73

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

Beam: 1, 56, 75, 55, 70, 77, 73



CONSTRAINTS

- Sections : Check
- Steel Grade: A500C

DESIGN DATA

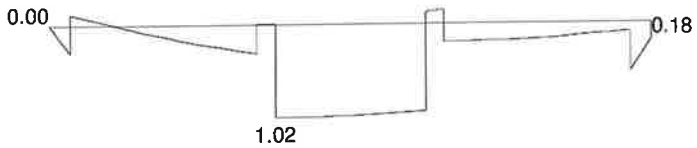
- Kx = 1.00 - Ky = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: PIPE 3

Ix = 3.02 Iy = 3.02in4 Zx = 2.33 Zy = 2.33in3 Area = 2.23
D = 3.50 t = 0.22in
J = 6.03 Cw = 0.00in6

DESIGN COMBINATION = 1

M2 Moment Diagram



Max. AXIAL Force = 0.47 (tens.), -0.30 (compr.) Max. SHEAR Force = 0.70

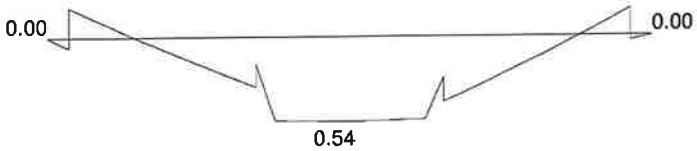
Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 1 - 73

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

M3 Moment Diagram



Max. AXIAL Force = 0.47 (tens.), -0.30 (compr.) Max. SHEAR Force = 0.82

SECTION CLASSIFICATION: *** COMPACT ***

Limiting Ratios: Compact Non-Compact
d/t= 16.16 < 45.0 71.7 (Fy= 46.0 R = -0.005)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 1.34	Vu = 0.82 Vn = 36.95	0.02
M3 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 2.33	M = 0.54 Mn = 8.95	0.07
V3 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 1.34	Vu = 0.70 Vn = 36.95	0.02
M2 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 2.33	M = 1.02 Mn = 8.95	0.13
Deflection	$\frac{defl.}{L / 240} < 1.00$		defl = 0.33567	0.46
Axial Force (D1-1)	$\frac{Pu}{0.90AgFy} < 1.00$	(kL/r)x =61 (kL/r)y =61	Pu = 0.47 Ag = 2.23 Fy = 46.00	0.01
Combined Forces (compress.) (H1-1b)	$\frac{Pu}{2\phi Pn} + \frac{Mux}{\phi Mnx} + \frac{Muy}{\phi Mny} < 1.00$	Cmx = 1.00 Cmy = 1.00 Pex = 172.22 Pey = 172.22	Mux = 1.02 Muy = 0.54 B1x = 1.00 B1y = 1.00	0.20

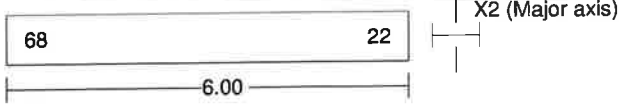
Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 93 - 13

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

Beam: 93, 71, 133, 13



CONSTRAINTS

- Sections : Check
- Steel Grade: A500C

DESIGN DATA

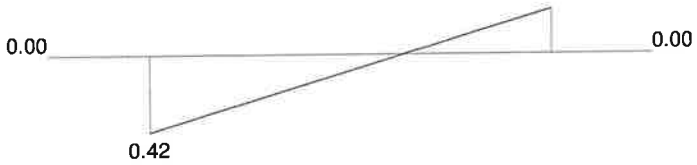
- Kx = 1.00 - Ky = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: PIPE 2

Ix = 0.67 Iy = 0.67in4 Zx = 0.76 Zy = 0.76in3 Area = 1.07
D = 2.37 t = 0.15in
J = 1.33 Cw = 0.00in6

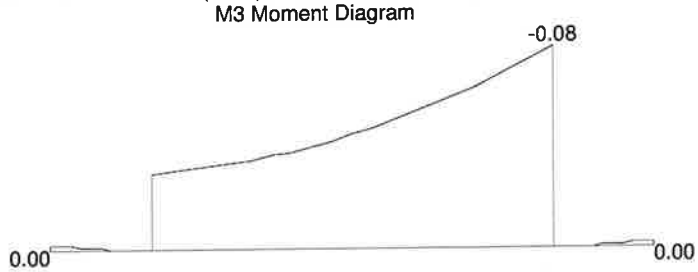
DESIGN COMBINATION = 1

M2 Moment Diagram



Max. AXIAL Force = 0.00 (tens.), -0.47 (compr.) Max. SHEAR Force = 0.16

M3 Moment Diagram



Max. AXIAL Force = 0.00 (tens.), -0.47 (compr.) Max. SHEAR Force = 0.02

SECTION CLASSIFICATION: *** COMPACT ***

Limiting Ratios: Compact Non-Compact
d/t= 15.46 < 45.0 71.7 (Fy= 46.0 R = 0.010)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
M3 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.08 Mn = 2.92	0.03
V3 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 0.64	Vu = 0.16 Vn = 17.81	0.01
M2 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.42 Mn = 2.92	0.16

Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 93 - 13

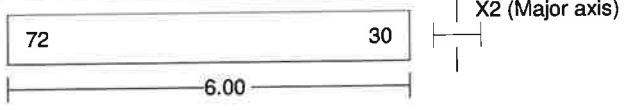
*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

DESIGN	EQUATION	FACTORS	VALUES	RESULT
Deflection	$\frac{\text{defl.}}{L/240} < 1.00$		defl = 0.40660	1.36
Axial Force (E2-1)	$\frac{Pu}{0.85AgFcr} < 1.00$	(kL/r)x =88 (kL/r)y =88 λc = 1.11	Pu = 0.47 Ag = 1.07 Fcr = 27.37	0.02
Combined Forces (compress.) (H1-1b)	$\frac{Pu}{2\phi Pn} + \frac{Mux}{\phi Mnx} + \frac{Muy}{\phi Mny} < 1.00$	Cmx = 1.00 Cmy = 1.00 Pex = 39.88 Pey = 39.88	Mux = 0.42 Muy = 0.08 B1x = 1.01 B1y = 1.01	0.20

Detailed Results Table for Beam 96 - 17

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

Beam: 96, 74, 134, 17



CONSTRAINTS

- Sections : Check
- Steel Grade: A500C

DESIGN DATA

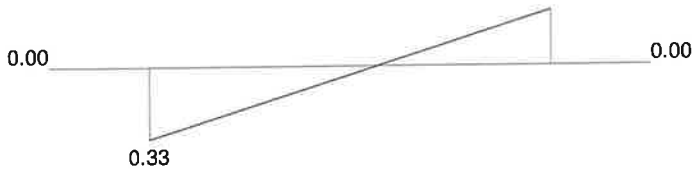
- Kx = 1.00 - Ky = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: PIPE 2

Ix = 0.67 Iy = 0.67in4 Zx = 0.76 Zy = 0.76in3 Area = 1.07
D = 2.37 t = 0.15in
J = 1.33 Cw = 0.00in6

DESIGN COMBINATION = 1

M2 Moment Diagram



Max. AXIAL Force = 0.09 (tens.), -0.05 (compr.) Max. SHEAR Force = 0.15

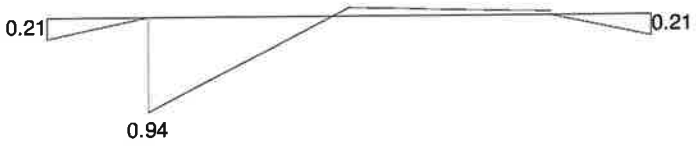
Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 96 - 17

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

M3 Moment Diagram



Max. AXIAL Force = 0.09 (tens.), -0.05 (compr.) Max. SHEAR Force = 0.52

SECTION CLASSIFICATION: *** COMPACT ***

Limiting Ratios: Compact Non-Compact
d/t= 15.46 < 45.0 71.7 (Fy= 46.0 R = -0.002)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 0.64	Vu = 0.52 Vn = 17.81	0.03
M3 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.94 Mn = 2.92	0.36
V3 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 0.64	Vu = 0.15 Vn = 17.81	0.01
M2 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.33 Mn = 2.92	0.13
Deflection	$\frac{defl.}{L / 240} < 1.00$		defl = 0.82553	2.75
Axial Force (D1-1)	$\frac{Pu}{0.90AgFy} < 1.00$	(kL/r)x =31 (kL/r)y =31	Pu = 0.09 Ag = 1.07 Fy = 46.00	0.00
Combined Forces (compress.) (H1-1b)	$\frac{Pu}{2\phi Pn} + \frac{Mux}{\phi Mnx} + \frac{Muy}{\phi Mny} < 1.00$	Cmx = 1.00 Cmy = 1.00 Pex = 321.36 Pey = 321.36	Mux = 0.33 Muy = 0.94 B1x = 1.00 B1y = 1.00	0.48

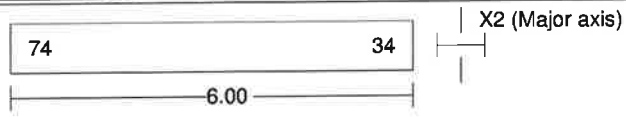
Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 98 - 19

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

Beam: 98, 76, 146, 19



CONSTRAINTS

- Sections : Check
- Steel Grade: A500C

DESIGN DATA

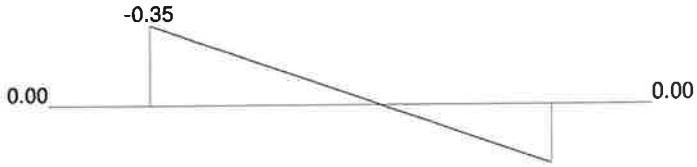
- Kx = 1.00 - Ky = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: PIPE 2

Ix = 0.67 Iy = 0.67in4 Zx = 0.76 Zy = 0.76in3 Area = 1.07
D = 2.37 t = 0.15in
J = 1.33 Cw = 0.00in6

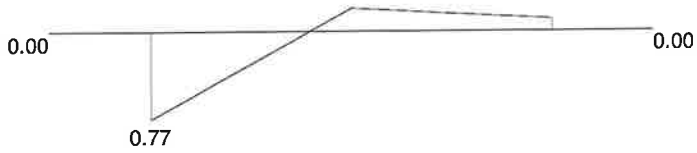
DESIGN COMBINATION = 1

M2 Moment Diagram



Max. AXIAL Force = 0.15 (tens.), 0.00 (compr.) Max. SHEAR Force = 0.15

M3 Moment Diagram



Max. AXIAL Force = 0.15 (tens.), 0.00 (compr.) Max. SHEAR Force = 0.49

SECTION CLASSIFICATION: *** COMPACT ***

Limiting Ratios:		Compact	Non-Compact	
d/t= 15.46	<	45.0	71.7	(Fy= 46.0 R = -0.003)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 0.64	Vu = 0.49 Vn = 17.81	0.03
M3 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.77 Mn = 2.92	0.29
V3 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 0.64	Vu = 0.15 Vn = 17.81	0.01

Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 98 - 19

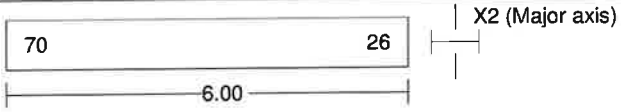
*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

DESIGN	EQUATION	FACTORS	VALUES	RESULT
M2 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.35 Mn = 2.92	0.13
Deflection	$\frac{defl.}{L / 240} < 1.00$		defl = 0.78578	2.62
Axial Force (D1-1)	$\frac{Pu}{0.90AgFy} < 1.00$	(kL/r)x =91 (kL/r)y =91	Pu = 0.15 Ag = 1.07 Fy = 46.00	0.00
Combined Forces (compress.) (H1-1b)	$\frac{Pu}{2\phi Pn} + \frac{Mux}{\phi Mnx} + \frac{Muy}{\phi Mny} < 1.00$	Cmx = 1.00 Cmy = 1.00 Pex = 37.29 Pey = 37.29	Mux = 0.35 Muy = 0.77 B1x = 1.00 B1y = 1.00	0.43

Detailed Results Table for Beam 94 - 15

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

Beam: 94, 72, 145, 15



CONSTRAINTS

- Sections : Check
- Steel Grade: A500C

DESIGN DATA

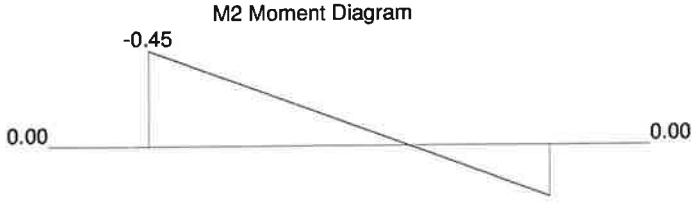
- Kx = 1.00 - Ky = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: PIPE 2

Ix = 0.67 Iy = 0.67in4 Zx = 0.76 Zy = 0.76in3 Area = 1.07
D = 2.37 t = 0.15in
J = 1.33 Cw = 0.00in6

DESIGN COMBINATION = 1

M2 Moment Diagram



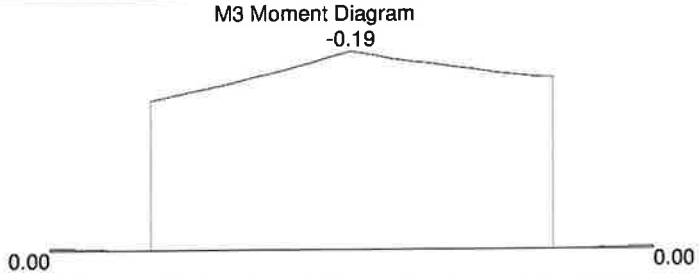
Max. AXIAL Force = 0.00 (tens.), -0.60 (compr.) Max. SHEAR Force = 0.17

Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 94 - 15

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*



Max. AXIAL Force = 0.00 (tens.), -0.60 (compr.) Max. SHEAR Force = 0.03

SECTION CLASSIFICATION: *** COMPACT ***

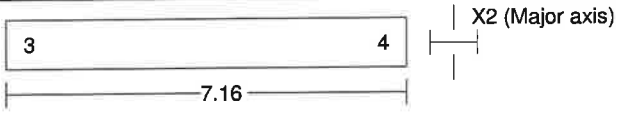
Limiting Ratios: Compact Non-Compact
d/t= 15.46 < 45.0 71.7 (Fy= 46.0 R = 0.012)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
M3 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.19 Mn = 2.92	0.07
V3 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 0.64	Vu = 0.17 Vn = 17.81	0.01
M2 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 0.76	M = 0.45 Mn = 2.92	0.17
Deflection	$\frac{defl.}{L / 240} < 1.00$		defl = 0.45714	1.52
Axial Force (E2-1)	$\frac{Pu}{0.85AgFcr} < 1.00$	(kL/r)x =88 (kL/r)y =88 λc = 1.11	Pu = 0.60 Ag = 1.07 Fcr = 27.37	0.02
Combined Forces (compress.) (H1-1b)	$\frac{Pu}{2\phi Pn} + \frac{Mux}{\phi Mnx} + \frac{Muy}{\phi Mny} < 1.00$	Cmx = 1.00 Cmy = 1.00 Pex = 39.88 Pey = 39.88	Mux = 0.45 Muy = 0.19 B1x = 1.02 B1y = 1.02	0.26

Detailed Results Table for Beam 2 - 122

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

Beam:
2, 136, 58,
118, 119, 120,
121, 122



CONSTRAINTS

- Sections : Check
- Steel Grade: A500B

DESIGN DATA

- Kx = 1.00 - Ky = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 2 - 122

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

INTERMEDIATE SUPPORTS

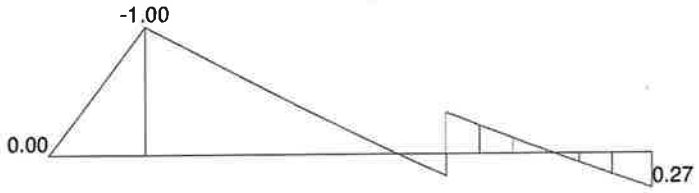
L =	1.17	4.71	5.12	5.50	5.92	6.29	6.71
Lat.-Tors.							
Compress.	X	X	X	X	X	X	X

Section: TS 4x4x1/4

Ix = 8.22 Iy = 8.22in4 Zx = 4.97 Zy = 4.97in3 Area = 3.59
h = 4.00 b = 4.00in t = 0.25in
J = 13.50 Cw = 0.00in6

DESIGN COMBINATION = 1

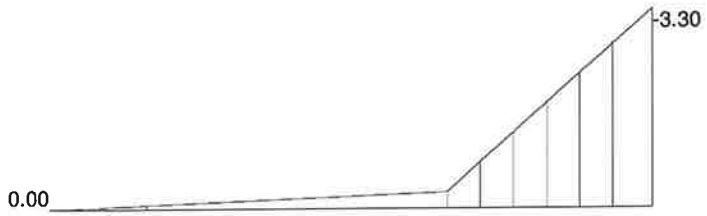
M2 Moment Diagram



Moments at Intermediate Supports:
-0.99 0.17 -0.13 0.07
-0.22 -0.02 0.16

Max. AXIAL Force = 2.38 (tens.) Max. SHEAR Force = 0.87

M3 Moment Diagram



Moments at Intermediate Supports:
-0.07 -0.27 -1.24 -2.22
-0.78 -1.76 -2.74

Max. AXIAL Force = 2.38 (tens.) Max. SHEAR Force = 1.24

SECTION CLASSIFICATION: *** COMPACT ***

Limiting Ratios:		Compact	Non-Compact
d/t= 13.13	<	35.2	35.2
b/t= 13.13	<	28.1	35.2

(Fy= 46.0 R = -0.014)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 1.79	Vu = 1.24 Vn = 49.60	0.03
M3 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 4.97	M = 3.30 Mn = 19.07	0.19
V3 Shear (F2-1)	Vu/(.9*Vn)<1.00 Vn=0.6*Fy*Av	Av = 1.79	Vu = 0.87 Vn = 49.60	0.02

Windsor 4 CT Mount Analysis **Code:** AISC-LRFD

Prepared by: **Date:** 4/10/23

Detailed Results Table for Beam 2 - 122

*Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch*

DESIGN	EQUATION	FACTORS	VALUES	RESULT
M2 Moment (A-F1-1) without LTB	$\frac{M}{0.9Mn} < 1.00$	Z = 4.97	M = 1.00 Mn = 19.07	0.06
Deflection	$\frac{defl.}{L / 240} < 1.00$		defl = 0.02900	0.08
Axial Force (D1-1)	$\frac{Pu}{0.90AgFy} < 1.00$	(kL/r)x =28 (kL/r)y =57	Pu = 2.38 Ag = 3.59 Fy = 46.00	0.02
Lateral Torsional Buckling	$\frac{M}{0.9Mn} < 1.00$ Critical Segment from 0.00 to 7.16 on -z flange Segment End Moments: 0.00 and 0.27	Lb = 7.16 Lp = 14.40	M = 1.00 Mn = 19.07	0.06
Combined Forces (tension) (H1-1b)	$\frac{Pu}{2\phi Pn} + \frac{Mux}{\phi Mnx} + \frac{Muy}{\phi Mny} < 1.00$		Mux = 1.00 Muy = 3.30	0.26

ATTACHMENT 6

C Squared Systems, LLC
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Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

verizon

Windsor 4

780 Prospect Hill Road, Windsor, CT 06095

May 23, 2023

Table of Contents

List of Figures

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed installation of Verizon's antenna arrays to be mounted at 105' AGL on an existing monopole located at 780 Prospect Hill Road in Windsor, CT. The coordinates of the monopole tower are 41° 52' 58.476" N, 72° 42' 29.196" W.

Verizon is proposing the following:

1) Install nine (9) multi-band antennas, three (3) per sector to support its commercial LTE network.

This report considers the planned antenna configuration for Verizon[1] and the existing antennas for DISH[2] and T-Mobile[3] to derive the resulting % MPE of its proposed installation.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment C of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment C contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to Verizon's Radio Frequency Design Sheet updated 4/4/2023.

[2] As referenced to Dish's Radio Frequency Emissions Analysis Report by Fox Hill Telecom, dated 1/11/2022.

[3] As referenced to Connecticut Siting Council, Tower Share Application – 780 Prospect Hill Road, Windsor CT, Dated 1/31/2022

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Off Beam Loss is determined by the selected antenna patterns

Ground reflection factor of 1.6

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Antenna Inventory

Table 1 below outlines Verizon's proposed antenna configuration for the site. The associated data sheets and antenna patterns for these specific antenna models are included in Attachments C.

Operator	Sector / Call Sign	TX Freq (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Tilt	Length (ft)	Antenna Centerline Height (ft)
Verizon	Alpha / 30°	700	160	14.9	4944	NHH-65B-R2B	65	0	5.99	105
		850	160	15	5060		60			
		1900	160	17.9	9866		69			
		2100	240	18.4	16604		64			
		3500	20	17.7	1178	NHHSS-65B-R2BT4	54	0	5.99	105
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	105
	Beta / 150°	700	160	14.9	4944	NHH-65B-R2B	65	0	5.99	105
		850	160	15	5060		60			
		1900	160	17.9	9866		69			
		2100	240	18.4	16604		64			
		3500	20	17.7	1178	NHHSS-65B-R2BT4	54	0	5.99	105
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	105
	Gamma / 270°	700	160	14.9	4944	NHH-65B-R2B	65	0	5.99	105
		850	160	15	5060		60			
		1900	160	17.9	9866		69			
		2100	240	18.4	16604		64			
		3500	20	17.7	1178	NHHSS-65B-R2BT4	54	0	5.99	105
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	105

Table 1: Proposed Antenna Inventory[4] [5]

[4] Antenna heights are in reference to Verizon's Radio Frequency Design Sheet updated 4/26/2023.

[5] Transmit power assumes 0 dB of cable loss.

5. Calculation Results

The calculated power density results are shown in Figure 1 below. For completeness, the calculations for this analysis range from 0 feet horizontal distance (directly below the antennas) to a value of 3,000 feet horizontal distance from the site. In addition to the other worst-case scenario considerations that were previously mentioned, the power density calculations to each horizontal distance point away from the antennas was completed using a local maximum off beam antenna gain (within ± 5 degrees of the true mathematical angle) to incorporate a realistic worst-case scenario.

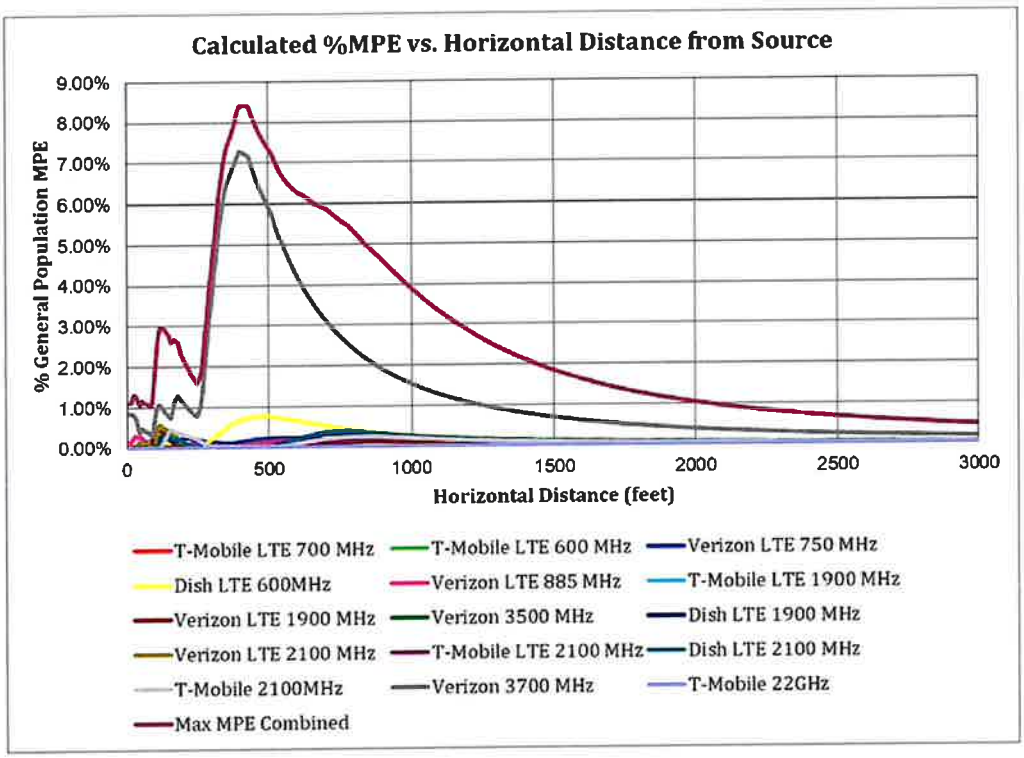


Figure 1: Graph of General Population % MPE vs. Distance

The highest percent of MPE (8.39% of the General Population limit) is calculated to occur at a horizontal distance of 410 feet from antennas. Please note that the percent of MPE calculations close to the site take into account off beam loss, which is determined from the vertical pattern of the antennas used. Therefore, RF power density levels may increase as the distance from the site increases. At distances of approximately 1500 feet and beyond, one would now be in the main beam of the antenna pattern and off beam loss is no longer considered. Beyond this point, RF levels become calculated solely on distance from the site and the percent of MPE decreases significantly as distance from the site increases.

Table 2 below lists percent of MPE values as well as the associated parameters that were included in the calculations. The highest percent of MPE value was calculated to occur at a horizontal distance of 410 feet from the site (reference Figure 1).

As stated in Section 3, all calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. In addition, a six foot height offset was considered in this analysis to account for average human height. As a result, the predicted signal levels are significantly higher than the actual signal levels will be from the final configuration. The results presented in Figure 1 and Table 2 assume level ground elevation from the base of the tower out to the horizontal distances calculated.

Carrier	Number of Transmitters	Power out of Base Station Per Transmitter (Watts)	Antenna Height (Feet)	Distance to the Base of Antennas (Feet)	Power Density (mW/cm^2)	Limit (mW/cm^2)	% MPE
Dish LTE 1900 MHz	1	160.0	115.0	410	0.000199	1.000	0.02%
Dish LTE 2100 MHz	1	160.0	115.0	410	0.000145	1.000	0.01%
Dish LTE 600MHz	1	246.0	115.0	410	0.002855	0.400	0.71%
T-Mobile 2100MHz	1	160.0	130.0	410	0.000258	1.000	0.03%
T-Mobile 22GHz	1	1.0	130.0	410	0.000002	1.000	0.00%
T-Mobile LTE 1900 MHz	1	160.0	130.0	410	0.000046	1.000	0.00%
T-Mobile LTE 2100 MHz	1	160.0	130.0	410	0.000036	1.000	0.00%
T-Mobile LTE 600 MHz	1	160.0	130.0	410	0.000120	0.400	0.03%
T-Mobile LTE 700 MHz	1	160.0	130.0	410	0.000188	0.467	0.04%
Verizon 3500 MHz	1	20.0	105.0	410	0.000276	1.000	0.03%
Verizon 3700 MHz	1	200.0	105.0	410	0.072386	1.000	7.24%
Verizon LTE 1900 MHz	1	160.0	105.0	410	0.000185	1.000	0.02%
Verizon LTE 2100 MHz	1	240.0	105.0	410	0.000271	1.000	0.03%
Verizon LTE 750 MHz	1	160.0	105.0	410	0.000779	0.500	0.16%
Verizon LTE 885 MHz	1	160.0	105.0	410	0.000398	0.567	0.07%
						Total	**8.39%**

Table 2: Maximum Percent of General Population Exposure Values

6. Conclusion

The above analysis verifies that RF exposure levels from the site with Verizon's proposed antenna configuration will be well below the maximum permissible levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods and parameters detailed above, the maximum cumulative percent of MPE in consideration of all transmitters is calculated to be **8.39% of the FCC limit (General Population/Uncontrolled)**. This maximum cumulative percent of MPE value is calculated to occur 410 feet away from the site.

7. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Report Prepared By: Ram Acharya
RF Engineer 1
C Squared Systems, LLC

May 22, 2023
Date

Reviewed/Approved By: Martin J. Lavin
Senior RF Engineer
C Squared Systems, LLC

May 23, 2023
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Verizon's Radio Frequency Design Sheet updated 10/21/2022

AT&T's filing, Connecticut Siting Council Notice of Exempt Modification – Antenna Add - 780 Prospect Hill Road (aka 1 Service Road) Windsor, CT, dated 9/23/2022

As referenced to Dish Wireless LLC's filing, Connecticut Siting Council Tower Share Application – 780 Prospect Hill Road, Windsor, CT, dated 11/19/2021

T-Mobile's filing, Connecticut Siting Council Notice of Exempt Modification – 780 Prospect Hill Road, Windsor, CT, dated 10/1/2020

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[6]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[7]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 3: FCC Limits for Maximum Permissible Exposure

[6] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[7] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

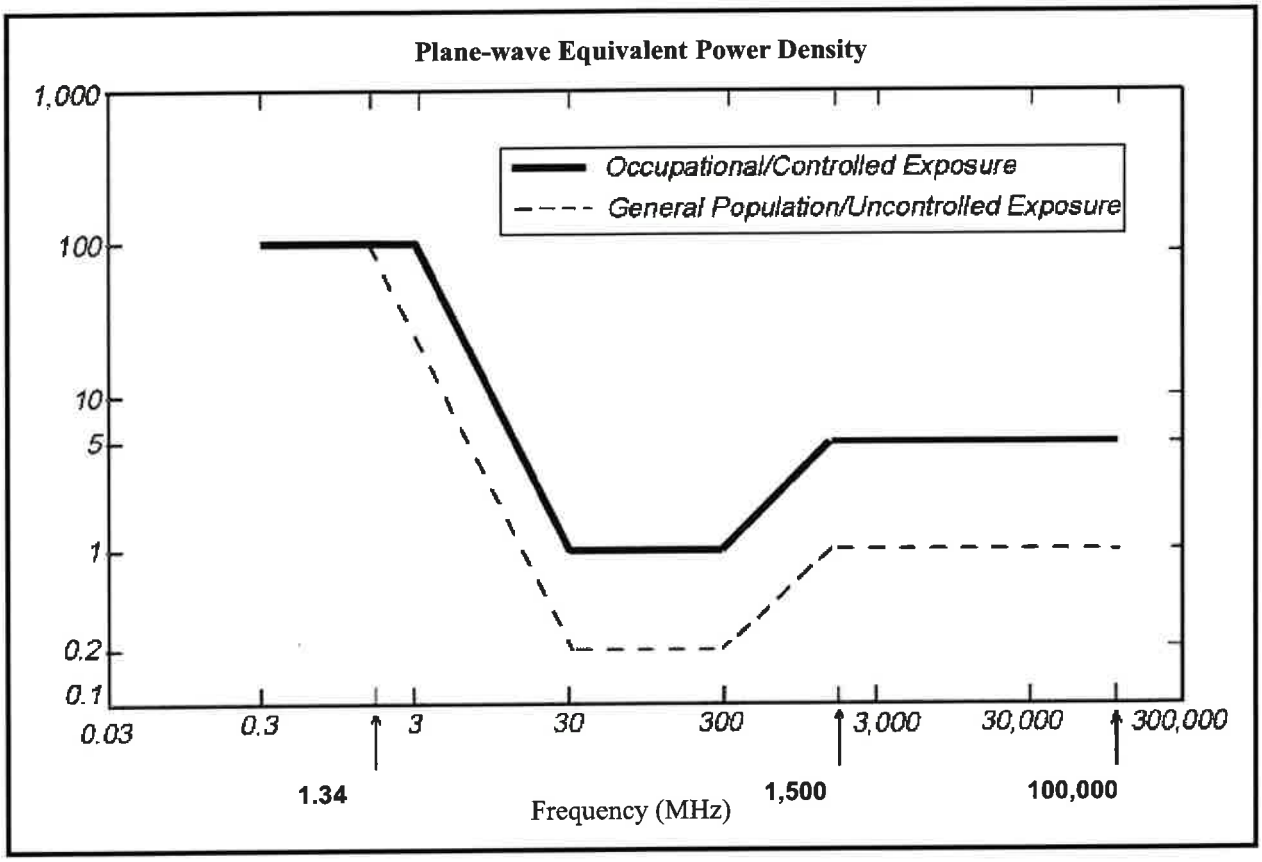
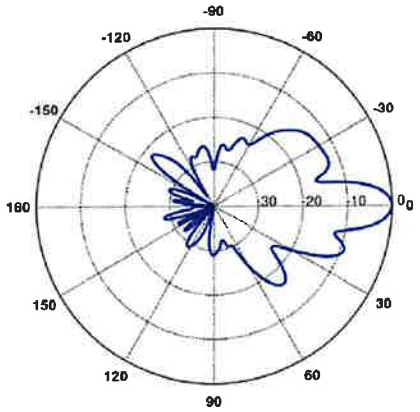


Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Verizon Antenna Model Data Sheets and Electrical Patterns

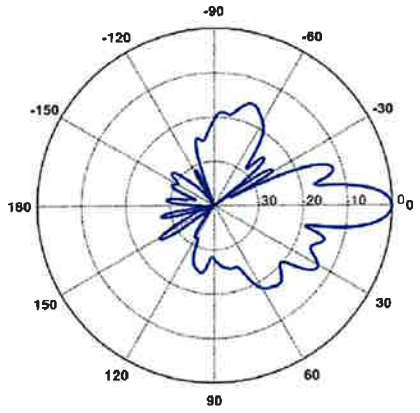
750 MHz

Manufacturer:	COMMSCOPE
Model #:	NHH-65B-R2B
Frequency Band:	698-806 MHz
Gain:	14.9 dBi
Vertical Beamwidth:	12.4°
Horizontal Beamwidth:	65°
Polarization:	±45°
Dimensions (L x W x D):	71.9" x 7.1" x 11.85"



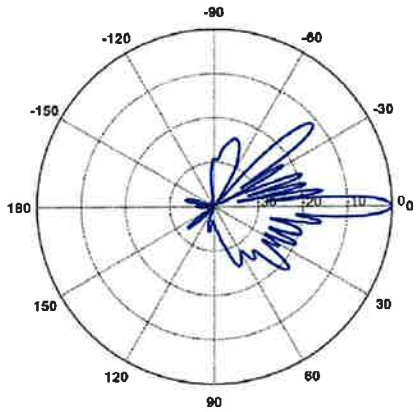
885 MHz

Manufacturer:	COMMSCOPE
Model #:	NHH-65B-R2B
Frequency Band:	806-896 MHz
Gain:	15 dBi
Vertical Beamwidth:	11.2°
Horizontal Beamwidth:	65°
Polarization:	±45°
Dimensions (L x W x D):	71.9" x 7.1" x 11.85"



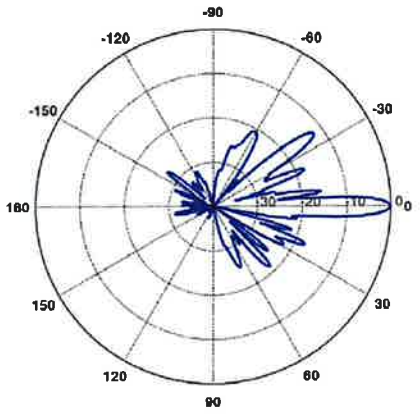
1900 MHz

Manufacturer:	COMMSCOPE
Model #:	NHH-65B-R2B
Frequency Band:	1850-1990 MHz
Gain:	17.9 dBi
Vertical Beamwidth:	5.2°
Horizontal Beamwidth:	69°
Polarization:	±45°
Dimensions (L x W x D):	71.9" x 7.1" x 11.85"



2100 MHz

Manufacturer:	COMMSCOPE
Model #:	NHH-65B-R2B
Frequency Band:	1920-2200 MHz
Gain:	18.4 dBi
Vertical Beamwidth:	4.9°
Horizontal Beamwidth:	64°
Polarization:	±45°
Dimensions (L x W x D):	71.9" x 7.1" x 11.85"



ATTACHMENT 7

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	4	4	neopost 05/24/2023 US POSTAGE $003.55⁰ ZIP 06103 041L12203937 OLD STATE HOUSE STATION 06103 MAY 24 2023 USPS
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Donald Trinks, Mayor Town of Windsor 275 Broad Street Windsor, CT 06095				
2.	Eric Barz, Town Planner Town of Windsor 275 Broad Street Windsor, CT 06095				
3.	The Ferraina Company LLC 810 Prospect Hill Road Windsor, CT 06095				
4.	Tarpon Towers Attn: Brett Buggeln 8916 77th Terrace East, Suite 103 Lakewood Ranch, FL 34202				
5.					
6.					

See Reverse for Instructions