



Crown Castle  
3 Corporate Park Drive, Suite 101  
Clifton Park, NY 12065

December 06, 2018

Melanie A. Bachman  
Acting Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**RE: Notice of Exempt Modification for Verizon Macro: 806364**  
**Verizon Site ID: Durham CT**  
**143 R Old Blue Hill Rd., Durham Connecticut 06422**  
**Latitude: 41° 27' 33.67"/ Longitude: 72° 39' 45.83"**

Dear Ms. Bachman:

Verizon currently maintains twelve (12) antennas at the 100-foot level of the existing 120-foot monopole tower at 149 R Old Blue Hill Rd., Durham CT. The tower is owned by Crown Castle. The property is owned by Francis E. Behrens Jr. Verizon now intends to install three (3) RRHs, and three (3) diplexers.

The Connecticut Siting Council approved this facility, an email was sent on 12/06/2018 to the Town of Durham Planning and Zoning Office to ascertain the original zoning approval documents and date.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j- 73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to First Selectman Laura L. Francis, Town of Durham, Geoffrey L. Colegrove, Planning & Zoning Officer, Town of Durham, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

Melanie A. Bachman


September 21, 2018

Page 2

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Verizon respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

  
Jeffrey Barbadora  
Real Estate Specialist  
12 Gill Street, Suite 5800, Woburn, MA 01801  
781-729-0053  
[Jeff.Barbadora@crowncastle.com](mailto:Jeff.Barbadora@crowncastle.com)

Attachments:

- Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
- Tab 2: Exhibit-2: Structural Modification Report
- Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

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cc: The Honorable Laura L. Francis  
Town Hall, 30 Town House Road  
P.O. Box 428  
Durham, Connecticut 06422

Geoffrey Colegrove: Planning & Zoning Officer  
30 Town House Road  
P.O. Box 428  
Durham, Connecticut 06422

Francis E. Behrens  
109 Old Blue Hills Rd.  
Durham, CT 06422-3005



**Property Card: OLD BLUE HILLS RD**  
 Town of Durham, CT



**Parcel ID:** 69-12  
**Account #:** B0016900

**Owner:** BEHRENS FRANCIS E JR  
**Mailing Address:** 109 OLD BLUE HILLS RD  
 DURHAM, CT 06422-3005

General Information		Assessed Value	
<b>State Class:</b> 130 <b>Class:</b> R <b>Census-Tract:</b> 5851 <b>District No.:</b> M <b>Neighborhood:</b> 80 <b>Zone:</b> FR <b>Total Acres:</b> 6.31		<b>Land:</b> \$126,400 <b>Buildings:</b> \$0  <b>Total:</b> \$2,030	
Sale History			
<b>Book/Page:</b> 100-255 <b>Deed Date:</b> 19840824 <b>Sale Date:</b> <b>Sale Type:</b> 0 <b>Sale Price:</b> 0			
Building Details			
<b>Living Units:</b> 0 <b>Style:</b> 0 <b>Year Built:</b> 0 <b>Effective Year Built:</b> 0 <b>Ture TLA:</b> 0 <b>Stories:</b> 0 <b>Total Rooms:</b> 0 <b>Total Bedrooms:</b> 0 <b>Number Full Baths:</b> 0 <b>Number Half Baths:</b> 0 <b>WB/FP Openings:</b> 0 <b>Heating Type:</b> 0 <b>Heating Fuel Type:</b> 0		<b>Basement:</b> 0 <b>FBLA Size:</b> 0 <b>Attic:</b> 0 <b>Exterior Walls:</b> 0 <b>Basement / Garage:</b> 0	



www.cai-tech.com

9/20/2018

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**BUILDING SKETCH**

	<u>Descriptor/Area</u>



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9/20/2018

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Page 2 of 2

Property Information - Durham, CT



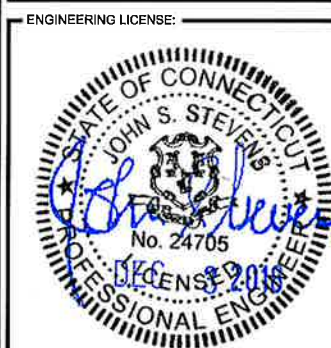
143R Old Blue Hills Road



VERIZON SITE NAME: DURHAM CT  
 CROWN CASTLE SITE NAME: HRT 106(B) 943202  
 CROWN CASTLE BU NUMBER: 806364  
 SITE ADDRESS: 101 OLD BLUE HILL ROAD  
 DURHAM, CT 06422  
 SITE TYPE: MONOPOLE TOWER

PLANS PREPARED FOR:  
**verizon**  
 180 WASHINGTON VALLEY ROAD  
 BEDMINSTER, NJ 07921

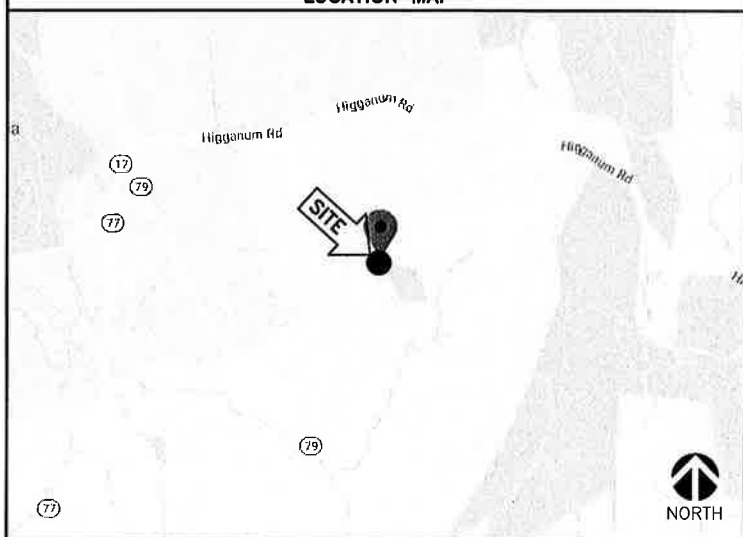
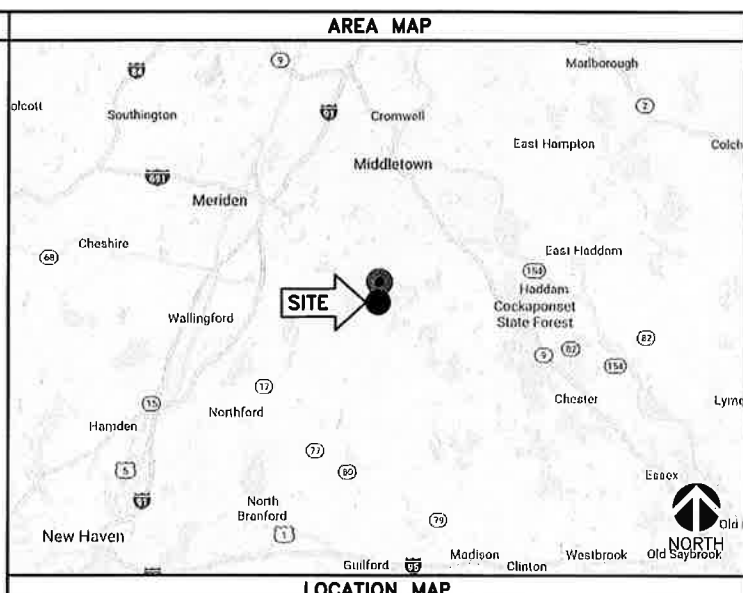
PLANS PREPARED BY:  
**INFINIGY**  
 FROM ZERO TO INFINIGY  
 the solutions are endless  
 1490 W. 121st. Ave., Suite 101  
 Westminster, CO 80234  
 Office # (303) 219-1178  
 Fax # (303) 242-8636  
 JOB NUMBER: TBD



DRAWING NOTICE:  
 THESE DOCUMENTS ARE CONFIDENTIAL AND ARE THE SOLE PROPERTY OF VERIZON AND MAY NOT BE REPRODUCED, DISSEMINATED OR REDISTRIBUTED WITHOUT THE EXPRESS WRITTEN CONSENT OF VERIZON.

REVISIONS:			
DESCRIPTION	DATE	BY	REV
ISSUED FOR REVIEW	11/5/18	SKB	A

**SITE INFORMATION**  
**APPLICANT:**  
 VERIZON  
 180 WASHINGTON VALLEY ROAD  
 BEDMINSTER, NJ 07921  
**CONTACT:**  
 TBD  
**PROPERTY OWNER:**  
 TBD  
  
**TOWER OWNER:**  
 CROWN CASTLE  
**CROWN CASTLE PM:**  
 JEFFREY BARBADORA  
 (781) 970-0053  
**LATITUDE (NAD83):**  
 41° 27' 33.67" N  
 41.459353°  
**LONGITUDE (NAD83):**  
 72° 39' 45.83" W  
 -72.662731°  
**COUNTY:**  
 MIDDLESEX  
**ZONING JURISDICTION:**  
 CONNECTICUT SITING COUNCIL  
**POWER COMPANY:**  
 CL&P  
 (800) 340-9822  
**TELCO PROVIDER:**  
 LIGHTOWER  
 (855) 91-FIBER  
**VERIZON WIRELESS CM:**  
 TBD



**PROJECT DESCRIPTION**  
 VERIZON PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATION FACILITY:  
**VERIZON EQUIPMENT TO BE INSTALLED:**

- INSTALL (3) NOKIA RRU'S P/N: AHCA AIRSCALE RRH 4T4R B5 160W
- INSTALL (3) RFS DIPLEXERS P/N: FDJ85020Q4-S1 WITHIN EXISTING SHELTER
- INSTALL (3) RFS DIPLEXERS P/N: FDJ85020Q4-S1 ON EXISTING TOWER

  
 THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY VERIZON IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY VERIZON. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.

**APPLICABLE CODES**  
 ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALL IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

- INTERNATIONAL BUILDING CODE (2015 IBC)
- TIA-EIA-222-G OR LATEST EDITION
- NFPA 780 - LIGHTNING PROTECTION CODE
- 2017 NATIONAL ELECTRIC CODE OR LATEST EDITION
- ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
- CT BUILDING CODE
- LOCAL BUILDING CODE
- CITY/COUNTY ORDINANCES

**DRAWING INDEX**

SHEET NO:	SHEET TITLE	REV
T-1	TITLE SHEET & PROJECT DATA	A
SP-1	VERIZON SPECIFICATIONS	A
A-1	OVERALL SITE PLAN	A
A-2	ENLARGED SITE PLAN	A
A-3	TOWER ELEVATION	A
A-4	ANTENNA LAYOUT & LOADING CHART	A
A-5	EQUIPMENT & MOUNTING DETAILS	A
G-1	GROUNDING PLAN & DETAILS	A

**DRIVING DIRECTIONS**  
 FROM: HARTFORD, CT  
 1. HEAD SOUTH ON MAIN ST TOWARD TOWER SQUARE  
 2. TURN RIGHT ONTO WELLS ST  
 3. AT THE TRAFFIC CIRCLE, TAKE THE 4TH EXIT ONTO WHITEHEAD HWY HEADING TO INTERSTATE 91/CT-15/SPRINGFIELD/NEW HAVEN/NEW YORK  
 4. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-91 S/NEW HAVEN AND MERGE ONTO I-91 S  
 5. FOLLOW I-91 S AND CT-9 S TO CT-17 S IN MIDDLETOWN. TAKE EXIT 13 FROM CT-9 S  
 6. MERGE ONTO I-91 S  
 7. USE THE LEFT LANE TO TAKE EXIT 22S TO MERGE ONTO CT-9 S TOWARD MIDDLETOWN/OLD SAYBROOK  
 8. TAKE EXIT 13 FOR STATE ROUTE 17 S TOWARD NEW HAVEN  
 9. CONTINUE ON CT-17 S. DRIVE TO OLD BLUE HILLS RD IN DURHAM  
 10. CONTINUE ONTO CT-17 S  
 11. TURN LEFT ONTO MADISON RD  
 12. TURN LEFT ONTO OLD BLUE HILLS RD  
 13. DESTINATION WILL BE ON THE RIGHT



**ELECTRICAL NOTES:**

**WORK INCLUDED**

- 1. INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, PLANT SERVICES AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE THE ELECTRICAL WORK SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
A. PREPARE AND SUBMIT SHOP DRAWINGS, DIAGRAMS AND ILLUSTRATIONS.
B. PROCURE ALL NECESSARY PERMITS AND APPROVALS AND PAY ALL REQUIRED FEES AND CHARGES IN CONNECTION WITH THE WORK OF THIS CONTRACT.
C. SUBMIT AS-BUILT DRAWINGS, OPERATING AND MAINTENANCE INSTRUCTIONS AND MANUALS.
D. EXECUTE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING OF EXISTING OR NEWLY INSTALLED CONSTRUCTION REQUIRED FOR THE WORK OF THIS CONTRACT.
E. PROVIDE HANGERS, SUPPORTS, FOUNDATIONS, STRUCTURAL FRAMING SUPPORTS, AND BASES FOR CONDUIT AND EQUIPMENT PROVIDED OR INSTALLED UNDER THE WORK OF HIS CONTRACT.
F. MAINTAIN ALL EXISTING ELECTRICAL SERVICES IN THE BUILDING AREAS NOT AFFECTED BY THE ALTERATION DURING THE PROGRESS OF THE WORK INCLUDING PROVIDING ALL TEMPORARY JUMPERS, CONDUITS, CAPS, PROTECTIVE DEVICES, CONNECTIONS AND EQUIPMENT REQUIRED.
2. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT...
3. LOAD CALCULATIONS ARE BASED ON EXISTING BUILDING INFORMATION/DRAWINGS PROVIDED TO ENGINEERING...
4. EXISTING BUILDING EQUIPMENT IS NOTED ON THE DRAWINGS...
5. GENERAL
A. AFTER CAREFULLY STUDYING THE DRAWINGS AND SPECIFICATIONS, AND BEFORE SUBMITTING THE PROPOSAL, MAKE A MANDATORY SITE VISIT TO ASCERTAIN CONDITIONS OF THE SITE...
6. QUALITY, WORKMANSHIP, MATERIALS AND SAFETY
A. PROVIDE NEW MATERIALS AND EQUIPMENT OF A DOMESTIC MANUFACTURER...
B. WORK SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE...
C. PROVIDE LABOR, MATERIALS, APPARATUS AND APPLIANCES ESSENTIAL TO THE FUNCTIONING OF THE SYSTEMS...
D. MAKE WRITTEN REQUESTS FOR SUPPLEMENTARY INSTRUCTIONS...
E. PERFORMANCE AND MATERIAL REQUIREMENTS SCHEDULED OR SPECIFIED ARE MINIMUM STANDARD ACCEPTABLE...
7. GUARANTEE
1. GUARANTEE MATERIALS, PARTS AND LABOR FOR WORK FOR ONE YEAR FROM THE DATE OF ISSUANCE OF OCCUPANCY PERMIT...

**CLEANING**

- 1. REMOVE ALL CONSTRUCTION DEBRIS RESULTING FROM THE WORK.
2. CLEAN EQUIPMENT AND SYSTEMS FOLLOWING THE COMPLETION OF THE PROJECT TO THE SATISFACTION OF THE ENGINEER.

**COORDINATION AND SUPERVISION**

- 1. CAREFULLY LAY OUT ALL WORK IN ADVANCE TO AVOID UNNECESSARY CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES...
2. ASSIST IN WORKING OUT SPACE CONDITIONS...
3. ASSIST IN COORDINATION WITH OTHER TRADES, OR CAUSES INTERFERENCE, MAKE CHANGES NECESSARY TO CORRECT CONDITIONS WITHOUT EXTRA CHARGE.

**SUBMITTALS**

- 1. AS-BUILT DRAWINGS:
A. UPON COMPLETION OF THE WORK, FURNISH TO THE OWNER "AS-BUILT" DRAWINGS.
2. SERVICE MANUALS:
A. UPON COMPLETION OF THE WORK, FULLY INSTRUCT VERIZON AS TO THE OPERATION AND MAINTENANCE OF ALL MATERIAL, EQUIPMENT AND SYSTEMS.
B. PROVIDE 3 COMPLETE BOUND SETS OF INSTRUCTIONS FOR OPERATING AND MAINTAINING ALL SYSTEMS AND EQUIPMENT.

**CUTTING AND PATCHING**

- 1. PROVIDE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING REQUIRED TO COMPLETE THE WORK.
2. OBTAIN OWNER APPROVAL PRIOR TO CUTTING THROUGH FLOORS OR WALLS FOR PIPING OR CONDUIT.

**TESTS, INSPECTION AND APPROVAL**

- 1. BEFORE ENERGIZING ANY ELECTRICAL INSTALLATION, INSPECT EACH UNIT IN DETAIL...
2. PROVIDE THE COMPLETE ELECTRICAL SYSTEM FREE OF GROUND FAULTS AND SHORT CIRCUITS...
3. MAKE ALL GROUND CONNECTIONS FROM MGB TO ELECTRICAL EQUIPMENT WITH 2 HOLE, CRIMP TYPE, BURNDY COMPRESSION TERMINATIONS, SIZED AS REQUIRED.

**SPECIAL REQUIREMENTS**

- 1. DO NOT LEAVE ANY WORK INCOMPLETE NOR ANY HAZARDOUS SITUATIONS CREATED WHICH WILL AFFECT THE LIFE OR SAFETY OF THE PUBLIC...
2. WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING BUILDING UTILITIES AND SERVICE SYSTEMS...
3. SHUTDOWN NOTE: SCHEDULE AND NOTIFY OWNER 48 HOURS PRIOR TO SHUTDOWN...
4. DISCONNECT SWITCHES AND FUSES
1. DISCONNECT SWITCHES TO BE VOLTAGE-RATED TO SUIT THE CHARACTERISTICS OF THE SYSTEM...
2. PROVIDE HEAVY-DUTY, METAL-ENCLOSED, EXTERNALLY-OPERATED DISCONNECT SWITCHES...
3. PROVIDE NEMA 1 DISCONNECT SWITCHES FOR INTERIOR INSTALLATION...
4. DISCONNECT SWITCHES TO BE MANUFACTURED BY:
A. GENERAL ELECTRIC COMPANY
5. PROVIDE RK-1 TYPE FUSES, UNLESS NOTED OTHERWISE.

**GROUNDING**

- 1. ROUTE ALL GROUNDING CONDUCTORS AS SHOWN ON CONDUIT/GROUNDING RISER.
2. ROUTE 500 KCMIL CU. THIN CONDUCTOR FROM THE MGB LOCATION TO BUILDING STEEL...
3. MAKE ALL GROUND CONNECTIONS FROM MGB TO ELECTRICAL EQUIPMENT WITH 2 HOLE, CRIMP TYPE, BURNDY COMPRESSION TERMINATIONS, SIZED AS REQUIRED.
4. USE 1 HOLE, CRIMP TYPE, BURNDY COMPRESSIONS TERMINATIONS, SIZED AS REQUIRED, AT EQUIPMENT GROUND CONNECTIONS.
5. HIRE AN INDEPENDENT LAB TO PERFORM THE SPECIFIED OHMS TESTING...
6. QUALITY, WORKMANSHIP, MATERIALS AND SAFETY
A. PROVIDE NEW MATERIALS AND EQUIPMENT OF A DOMESTIC MANUFACTURER...
B. WORK SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE...
C. PROVIDE LABOR, MATERIALS, APPARATUS AND APPLIANCES ESSENTIAL TO THE FUNCTIONING OF THE SYSTEMS...
D. MAKE WRITTEN REQUESTS FOR SUPPLEMENTARY INSTRUCTIONS...
E. PERFORMANCE AND MATERIAL REQUIREMENTS SCHEDULED OR SPECIFIED ARE MINIMUM STANDARD ACCEPTABLE...
7. GUARANTEE
1. GUARANTEE MATERIALS, PARTS AND LABOR FOR WORK FOR ONE YEAR FROM THE DATE OF ISSUANCE OF OCCUPANCY PERMIT...

**RACEWAYS**

- 1. ALL WIRING TO BE INSTALLED IN CONDUIT SYSTEMS IN ACCORDANCE WITH THE FOLLOWING:
A. EXTERIOR FEEDERS AND CONTROL, WHERE UNDERGROUND, TO BE IN SCH 40 PVC.
B. EXTERIOR, ABOVE GROUND POWER CONDUITS TO BE GALVANIZED RIGID STEEL (RGS).
C. ALL TELECOMMUNICATION CONDUITS, INTERIOR/EXTERIOR, TO BE EMT.

- ON THIS PROJECT.
E. ALL TELECOM CONDUITS AND PULL BOXES INSTALLED ON THIS PROJECT TO BE LABELED "VERIZON". OWNER WILL PROVIDE LABELS FOR CONTRACTOR TO INSTALL.
F. INTERIOR FEEDERS TO BE INSTALLED IN E.M.T. WITH STEEL COMPRESSION FITTINGS.
G. MINIMUM SIZE CONDUIT TO BE 3/4" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
H. FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT TO BE INSTALLED IN LIQUID-TIGHT FLEXIBLE METAL CONDUIT.

- AREAS OR DRYWALL PARTITIONS, UNLESS OTHERWISE NOTED.
J. THE ROUTING OF CONDUITS INDICATED ON THE DRAWINGS IS DIAGRAMMATIC. BEFORE INSTALLING ANY WORK, EXAMINE THE WORKING LAYOUTS AND SHOP DRAWINGS OF THE OTHER TRADES TO DETERMINE THE EXACT LOCATIONS AND CLEARANCES.
K. ALL EXTERIOR MOUNTING HARDWARE TO BE GALVANIZED STEEL. COORDINATE WITH BUILDING ENGINEER PRIOR TO ATTACHING TO BUILDING STRUCTURE.

**RACEWAYS CONT'D**

- L. PENETRATIONS OF WALLS, FLOORS AND ROOFS, FOR THE PASSAGE OF ELECTRICAL RACEWAYS, TO BE PROPERLY SEALED AFTER INSTALLATION...
M. PROVIDE ALL CONDUIT ENDS WITH INSULATED METALLIC GROUNDING BUSHINGS.
N. CONDUIT TO BE SUPPORTED AT MAXIMUM DISTANCE OF 8'-0", OR AS REQUIRED BY NEC...
O. PROVIDE STAINLESS STEEL BLANK COVER PLATES FOR ALL JUNCTION BOXES AND/OR OUTLET BOXES...
P. WHERE APPLICABLE, PROVIDE ROOFTOP CONDUIT SUPPORT SYSTEM, CONFORMING TO ROOFTOP WARRANTY REQUIREMENTS, PER BUILDING.

**WIRES AND CABLES**

- 1. CONTRACTOR TO COORDINATE WITH EQUIPMENT SUPPLIER AND VENDOR FOR EXACT EQUIPMENT OVER-CURRENT PROTECTION VOLTAGE, WIRE SIZE AND PLUG CONFIGURATION...
2. ALL EQUIPMENT/DEVICES TO BE PROVIDED WITH INSULATED GROUND CONDUCTOR.
3. ALL WIRE AND CABLE TO BE 600VOLT, COPPER, WITH THWN/ THHN INSULATION, EXCEPT AS NOTED.
4. WIRE FOR POWER AND LIGHTING WILL NOT BE LESS THAN NO. 12AWG. ALL WIRE NO. 8 AND LARGER TO BE STRANDED.
5. CONTROL WIRING IS NOT TO BE LESS THAN NO. 14AWG, FLEXIBLE IN SINGLE CONDUCTORS OR MULTI-CONDUCTOR CABLES...
6. WIRE PREVIOUSLY PULLED INTO CONDUIT IS CONSIDERED USED AND IS NOT TO BE RE-PULLED.
7. HOME RUNS AND BRANCH CIRCUIT WIRING FOR 20A, 120V CIRCUITS:
LENGTH (FT.) HOME RUN WIRE SIZE
0 TO 50 NO. 12
51 TO 100 NO. 10
101 TO 150 NO. 8
8. VOLTAGE DROP IS NOT TO EXCEED 3%.

**WIRING DEVICES**

- 1. ALL RECEPTACLES INSTALLED IN THIS PROJECT TO BE GROUNDING TYPE, WITH GROUNDING PIN SLOT CONNECTED TO DEVICE GROUND SCREW FOR GROUND WIRE CONNECTION.

**DISCONNECT SWITCHES AND FUSES**

- 1. DISCONNECT SWITCHES TO BE VOLTAGE-RATED TO SUIT THE CHARACTERISTICS OF THE SYSTEM FROM WHICH THEY ARE SUPPLIED.
2. PROVIDE HEAVY-DUTY, METAL-ENCLOSED, EXTERNALLY-OPERATED DISCONNECT SWITCHES, FUSED OR UNFUSED, OF SUCH TYPE AND SIZE AS REQUIRED TO PROPERLY PROTECT OR DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED.
3. PROVIDE NEMA 1 DISCONNECT SWITCHES FOR INTERIOR INSTALLATION, NEMA 3R FOR EXTERIOR INSTALLATION.
4. DISCONNECT SWITCHES TO BE MANUFACTURED BY:
A. GENERAL ELECTRIC COMPANY
5. PROVIDE RK-1 TYPE FUSES, UNLESS NOTED OTHERWISE.
INSTALLATION
1. INSTALL DISCONNECT SWITCHES WHERE INDICATED ON DRAWINGS.
2. INSTALL FUSES IN FUSIBLE DISCONNECT SWITCHES. FUSES MUST MATCH IN TYPE AND RATING.
3. FUSES TO BE MOUNTED SO THAT THE LABELS SHOWING THEIR RATINGS CAN BE READ WITHOUT REQUIRING FUSE REMOVAL.
4. FURNISH AND DEPOSIT SPARE FUSES AT THE JOB SITE AS FOLLOWS:
A. THREE SPARES FOR EACH TYPE AND SIZE, IN EXCESS OF 60A, USED FOR INITIAL FUSING.
B. TEN PERCENT SPARES FOR EACH TYPE AND SIZE, UP TO AND INCLUDING 60A, USED FOR INITIAL FUSING. IN NO CASE WILL LESS THAN THREE FUSES OF ONE PARTICULAR TYPE AND SIZE BE FURNISHED.

**CONFLICTS**

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATIONS OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK...
2. THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION...
3. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED...
4. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.

**CONTRACTS AND WARRANTIES**

- 1. CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.
2. SEE MASTER CONTRACTION SERVICES AGREEMENT FOR ADDITIONAL DETAILS.

**STORAGE**

- 1. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK...
2. EXTERIOR
A. VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER...
B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES...
C. IF NECESSARY, TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.

**CLEANUP**

- 1. THE CONTRACTORS SHALL, AT ALL TIMES, KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK...
2. INTERIOR
A. VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS, FLOOR, AND CEILING...
B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES...
C. REMOVE PAINT DROPPINGS, SPOTS, STAINS, AND DIRT FROM FINISHED SURFACES.

**CHANGE ORDER PROCEDURE:**

- 1. REFER TO SECTION 17 OF SIGNED MCSA: SEE PROFESSIONAL SERVICE AGREEMENT FOR MCSA.

**RELATED DOCUMENTS AND COORDINATION**

- 1. GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS...
2. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

**SHOP DRAWINGS**

- 1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.
2. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

**PRODUCTS AND SUBSTITUTIONS**

- 1. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST, IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION...
2. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED...
3. QUALITY ASSURANCE
1. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS...
4. ADMINISTRATION
1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT...
2. SUBMIT A BAR TYPE PROGRESS CHART, NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK...
3. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETING WITH ALL MAJOR PARTIES...
4. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER...
5. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES...
6. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER...
7. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION...
8. NOTIFY THE OWNER/PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.

**INSURANCE AND BONDS**

- 1. CONTRACTOR, AT THEIR OWN EXPENSE, SHALL CARRY AND MAINTAIN, FOR THE DURATION OF THE PROJECT, ALL INSURANCE, AS REQUIRED AND LISTED, AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE...
2. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.
3. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

**GENERAL NOTES:**

- 1. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE...
2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY...
3. THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY...
4. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS...
5. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK...
6. CHANGE ORDER PROCEDURE: REFER TO SECTION 17 OF SIGNED MCSA...
7. RELATED DOCUMENTS AND COORDINATION: GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED...
8. SHOP DRAWINGS: CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED...
9. PRODUCTS AND SUBSTITUTIONS: SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION...
10. QUALITY ASSURANCE: ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS...
11. ADMINISTRATION: BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER...

**ABBREVIATIONS**

ADJ	ADJUSTABLE
AGL	ABOVE GROUND LINE
&	AND
APPROX	APPROXIMATE
@	AT
BTS	BASE TRANSMISSION STATION
CAB	CABINET
CLG	CEILING
CONC	CONCRETE
CONT	CONTINUOUS
DIA OR Ø	DIAMETER
DWG	DRAWING
EA	EACH
ELEC	ELECTRICAL
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EOB	EQUIPMENT GROUND BAR
(E)	EXISTING
EXT	EXTERIOR
FF	FINISHED FLOOR
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GRND	GROUND
LG	LONG
MAX	MAXIMUM
MECH	MECHANICAL
MW	MICROWAVE DISH MANUFACTURER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTL	METAL
(N)	NEW
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
(P)	PROPOSED
PCS	PERSONAL COMMUNICATION SYSTEM
PPC	POWER PROTECTION CABINET
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SS	STAINLESS STEEL
STL	STEEL
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TYP	TYPICAL
VF	VERIFY IN FIELD
UON	UNLESS OTHERWISE NOTED
WWF	WELDED WIRE FABRIC
W/	WITH

PLANS PREPARED FOR:



PLANS PREPARED BY:

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VERIZON SITE NAME:

DURHAM CT

CROWN CASTLE SITE NAME:

HRT 106(B) 943202

CROWN CASTLE BU #:

806346

SITE ADDRESS:

101 OLD BLUE HILL ROAD
DURHAM, CT 06422

SHEET DESCRIPTION:

VERIZON SPECIFICATIONS

SHEET NUMBER:

SP-1

EXISTING FENCED  
EQUIPMENT COMPOUND

EXISTING CARRIER  
EQUIPMENT SHELTER

EXISTING SHARED  
UTILITY H-FRAME

EXISTING DOUBLE  
SWING ACCESS GATE

EXISTING CARRIER  
ICE BRIDGE (TYP.)

EXISTING  
MONOPOLE TOWER

EXISTING BACKUP GENERATOR  
ON CONCRETE PAD

EXISTING VERIZON WIRELESS  
EQUIPMENT SHELTER

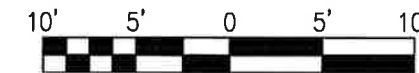
EXISTING VERIZON  
WIRELESS ICE BRIDGE

EXISTING CARRIER  
EQUIPMENT (TYP.)

INFORMATION CONTAINED WITHIN DRAWINGS  
IS BASED ON PROVIDED INFORMATION AND  
IS NOT THE RESULT OF A FIELD SURVEY.  
CONTRACTOR TO VERIFY EXISTING FIELD  
CONDITIONS PRIOR TO ANY CONSTRUCTION

OVERALL SITE PLAN

GRAPHIC SCALE



SCALE: 22"x34" SHEET 1"= 5'  
SCALE: 11"x17" SHEET 1"= 10'

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180 WASHINGTON VALLEY ROAD  
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DURHAM CT

CROWN CASTLE SITE NAME:

HRT 106(B) 943202

CROWN CASTLE BU #:

806346

SITE ADDRESS:

101 OLD BLUE HILL ROAD  
DURHAM, CT 06422

SHEET DESCRIPTION:

OVERALL SITE PLAN

SHEET NUMBER:

A-1

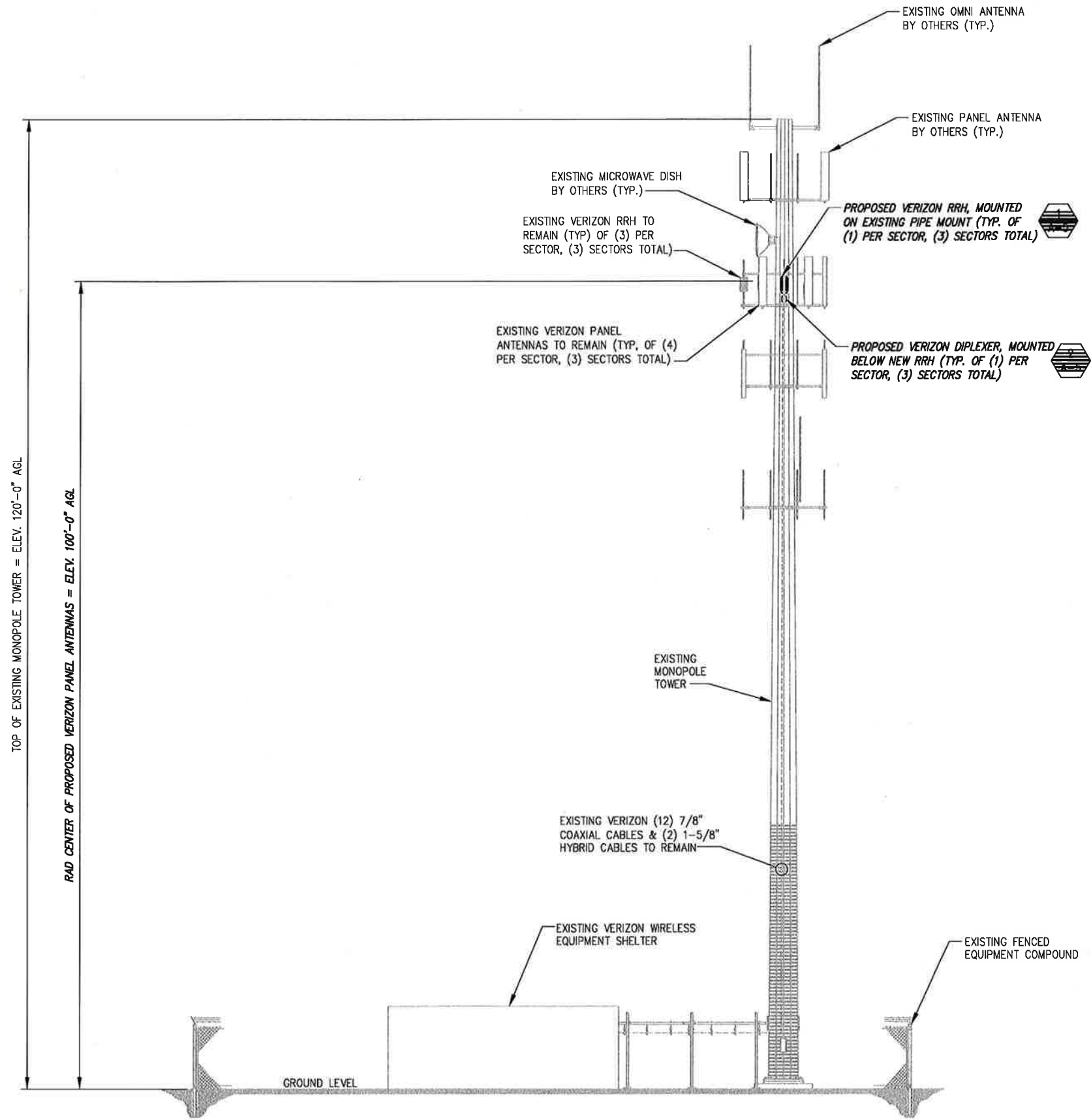
SCALE: AS NOTED

1





INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER OR MOUNT FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS BY OTHERS PRIOR TO ANY CONSTRUCTION.



TOP OF EXISTING MONOPOLE TOWER = ELEV. 120'-0" AGL

RAD CENTER OF PROPOSED VERIZON PANEL ANTENNAS = ELEV. 100'-0" AGL

GROUND LEVEL

**PROPOSED TOWER ELEVATION**

NO SCALE

1

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DURHAM CT

CROWN CASTLE SITE NAME:

HRT 106(B) 943202

CROWN CASTLE BU #:

806346

SITE ADDRESS:

101 OLD BLUE HILL ROAD  
DURHAM, CT 06422

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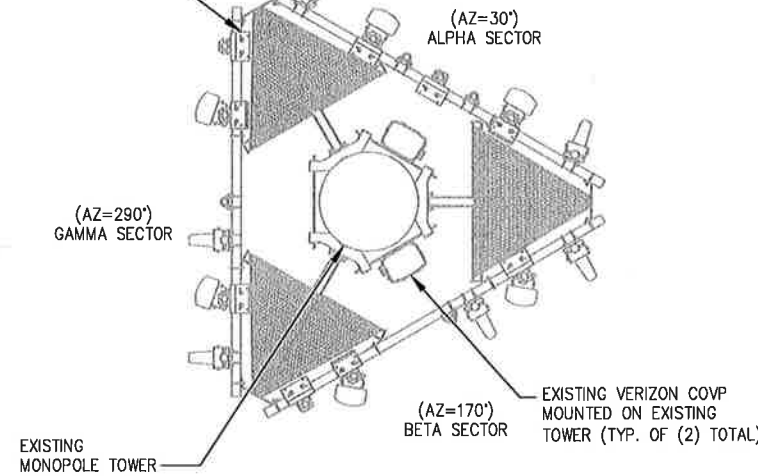
TOWER  
ELEVATION

SHEET NUMBER:

A-3

EXISTING VERIZON PANEL ANTENNAS TO REMAIN (TYP. OF (4) PER SECTOR, (3) SECTORS TOTAL)

EXISTING VERIZON RRH TO REMAIN (TYP. OF (3) PER SECTOR, (3) SECTORS TOTAL)



NOTE:  
CONTRACTOR TO VERIFY EQUIPMENT & MOUNTING HARDWARE DOES NOT TRAP OR INTERFERE WITH SAFETY CLIMB



EXISTING ANTENNA LAYOUT

NO SCALE

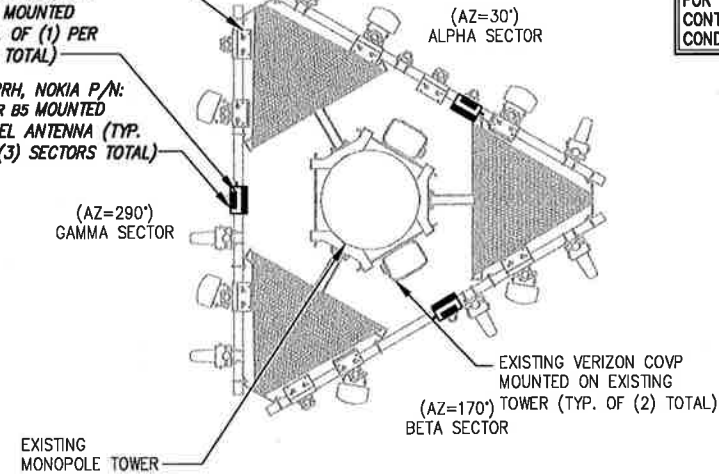
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EXISTING VERIZON PANEL ANTENNAS TO REMAIN (TYP. OF (4) PER SECTOR, (3) SECTORS TOTAL)

EXISTING VERIZON RRH TO REMAIN (TYP. OF (3) PER SECTOR, (3) SECTORS TOTAL)

PROPOSED VERIZON DIPLEXER, RFS P/N: FDJ8502004-S1 MOUNTED BELOW NEW RRH (TYP. OF (1) PER SECTOR, (3) SECTORS TOTAL)

PROPOSED VERIZON RRH, NOKIA P/N: AHCA AIRSCALE RRH 4T4R B5 MOUNTED BEHIND EXISTING PANEL ANTENNA (TYP. OF (1) PER SECTOR, (3) SECTORS TOTAL)



INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER OR MOUNT FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS BY OTHERS PRIOR TO ANY CONSTRUCTION.

THE CONFIGURATION PLAN IS BASED ON PROVIDED INFORMATION AND IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.



PROPOSED ANTENNA LAYOUT

NO SCALE

2

SITE LOADING CHART

SECTOR	POSITION	SECTOR COLOR	TECHNOLOGY	ANTENNA MODEL #	VENDOR	QTY. (REMOVED)	QTY. (NEW)	RRH (QTY/MODEL)	AZIMUTH	DOWNTILT		RAD CENTER	FEED LINE TYPE/LENGTH (FEET + 20%)
										MECHANICAL	ELECTRICAL		
ALPHA	A1	RED	CDMA	LPA-80080/6CF	DB PRODUCTS	---	---	UHBA B13 RRH 4x30 (L700)	20°	0°	0°	±100' AGL	EXISTING COAX
ALPHA	A2	RED	L1900	SBNHH-1D65B	COMMSCOPE	---	---	UHIE B66A RRH 4x45 (AWS) UHFA B25 RRH 4x30 (PCS)	30°	0°	9°	±100' AGL	(1) EXISTING HYBRID CABLE (BETA)
ALPHA	A3	RED	L2100	SBNHH-1D65B	COMMSCOPE	---	---	(1) AHCA AirScale RRH 4T4R B5 (850 LTE) W/ NEW DIPLEXER	30°	0°	5°	±100' AGL	HYBRID SHARED WITH ABOVE (BETA)
ALPHA	A4	RED	CDMA	LPA-80080/6CF	DB PRODUCTS	---	---	UHBA B13 RRH 4x30 (L700)	20°	0°	0°	±100' AGL	EXISTING COAX
BETA	B1	BLUE	CDMA	LPA-80080/6CF	DB PRODUCTS	---	---	UHBA B13 RRH 4x30 (L700)	150°	0°	0°	±100' AGL	EXISTING COAX
BETA	B2	BLUE	L1900	SBNHH-1D65B	COMMSCOPE	---	---	UHIE B66A RRH 4x45 (AWS) UHFA B25 RRH 4x30 (PCS)	170°	0°	0°	±100' AGL	(1) EXISTING HYBRID CABLE (BETA)
BETA	B3	BLUE	850	LPA-80080/6CF	DB PRODUCTS	---	---	(1) AHCA AirScale RRH 4T4R B5 (850 LTE) W/ NEW DIPLEXER	150°	0°	0°	±100' AGL	HYBRID SHARED WITH ABOVE (BETA)
BETA	B4	BLUE	L2100	SBNHH-1D65B	COMMSCOPE	---	---	UHBA B13 RRH 4x30 (L700)	170°	0°	0°	±100' AGL	EXISTING COAX
GAMMA	G1	WHITE	CDMA	LPA-80080/6CF	DB PRODUCTS	---	---	UHBA B13 RRH 4x30 (L700)	270°	0°	0°	±100' AGL	EXISTING COAX
GAMMA	G2	WHITE	L1900	SBNHH-1D65B	COMMSCOPE	---	---	UHIE B66A RRH 4x45 (AWS) UHFA B25 RRH 4x30 (PCS)	290°	1°	11°	±100' AGL	HYBRID SHARED WITH ABOVE (BETA)
GAMMA	G3	WHITE	CDMA	LPA-80080/6CF	DB PRODUCTS	---	---	(1) AHCA AirScale RRH 4T4R B5 (850 LTE) W/ NEW DIPLEXER	270°	1°	5°	±100' AGL	HYBRID SHARED WITH ABOVE (BETA)
GAMMA	G4	WHITE	L2100	SBNHH-1D65B	COMMSCOPE	---	---	UHBA B13 RRH 4x30 (L700)	290°	0°	0°	±100' AGL	EXISTING COAX

NOTE:  
CABLE LENGTHS ARE BASED ON PROVIDED INFORMATION. CONTRACTOR TO VERIFY REQUIRED CABLE LENGTHS PRIOR TO CONSTRUCTION.

SITE LOADING CHART

NO SCALE

3

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VERIZON SITE NAME:

DURHAM CT

CROWN CASTLE SITE NAME:

HRT 106(B) 943202

CROWN CASTLE BU #:

806346

SITE ADDRESS:

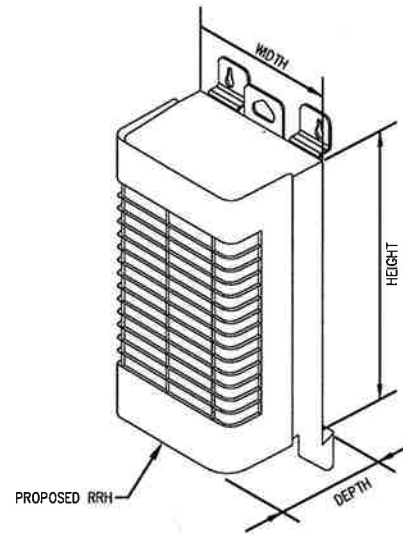
101 OLD BLUE HILL ROAD  
DURHAM, CT 06422

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ANTENNA LAYOUT & LOADING CHART

SHEET NUMBER:

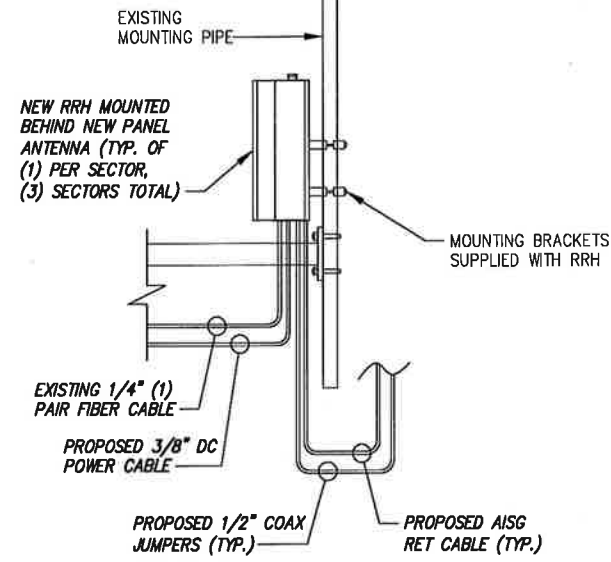
A-4



SIZE AND WEIGHT TABLE				
RRH	WIDTH	DEPTH	HEIGHT	WEIGHT WO BRACKET
AHCA AirScale RRH 4T4R B5	11.8"	4.7"	15.7"	32.6 LBS

**REMOTE RADIO HEAD SPECIFICATIONS**

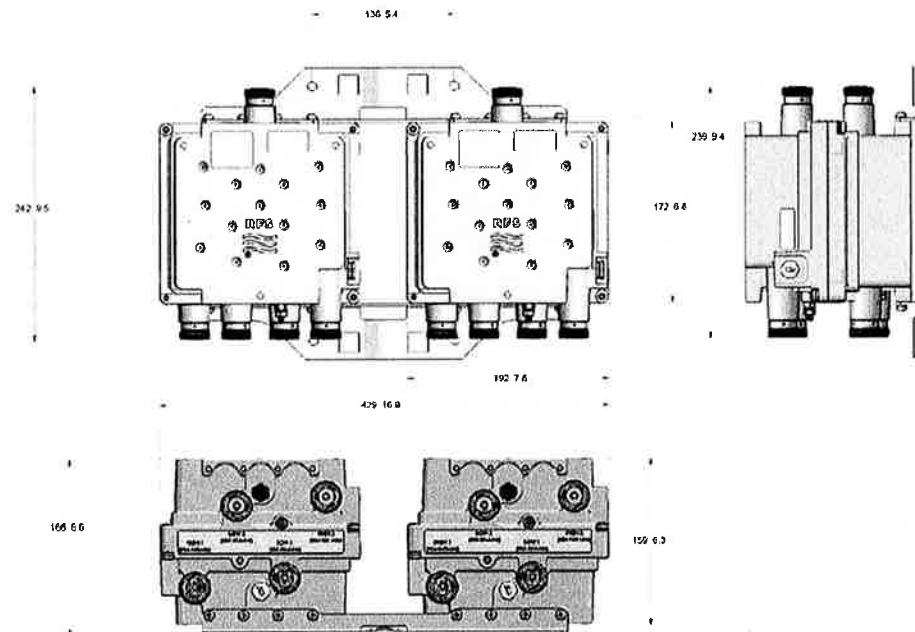
NO SCALE 1



**RRH MOUNTING DETAIL**

NO SCALE 2

RFS DIPLEXER  
 PART NUMBER: FDJ85020Q4-S1  
 DIMENSIONS (HxWxD): 6.8"x16.9"x6.3"



**DIPLEXER DETAIL**

NO SCALE 4

**DETAIL NOT USED**

NO SCALE 3

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CROWN CASTLE SITE NAME:  
**HRT 106(B) 943202**

CROWN CASTLE BU #:  
**806346**

SITE ADDRESS:  
**101 OLD BLUE HILL ROAD  
 DURHAM, CT 06422**

SHEET DESCRIPTION:  
**EQUIPMENT &  
 MOUNTING DETAILS**

SHEET NUMBER:  
**A-5**

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HRT 106(B) 943202

CROWN CASTLE BU #:

806346

SITE ADDRESS:

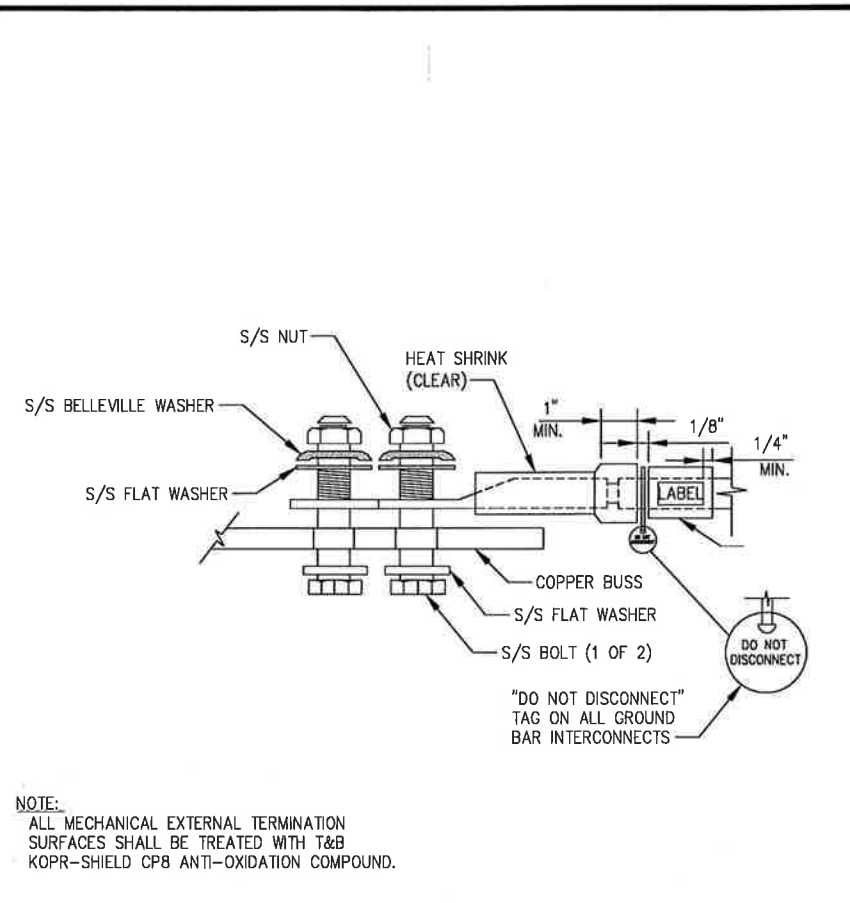
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DURHAM, CT 06422

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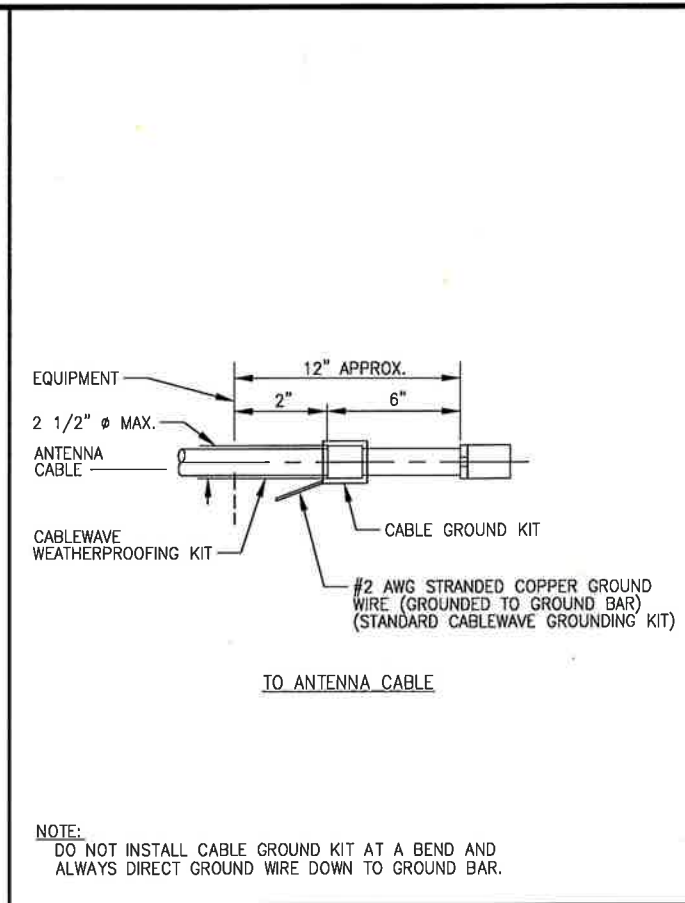
GROUNDING PLANS

SHEET NUMBER:

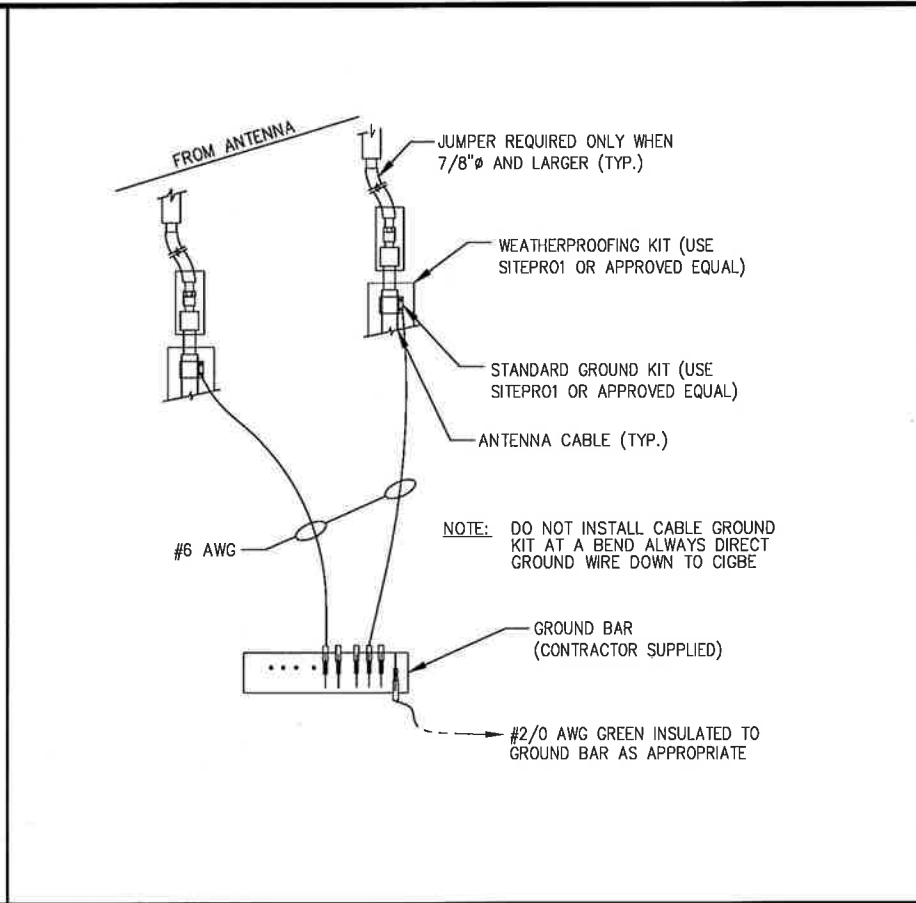
G-1



TYPICAL EQUIPMENT GROUND CONNECTION NO SCALE 1



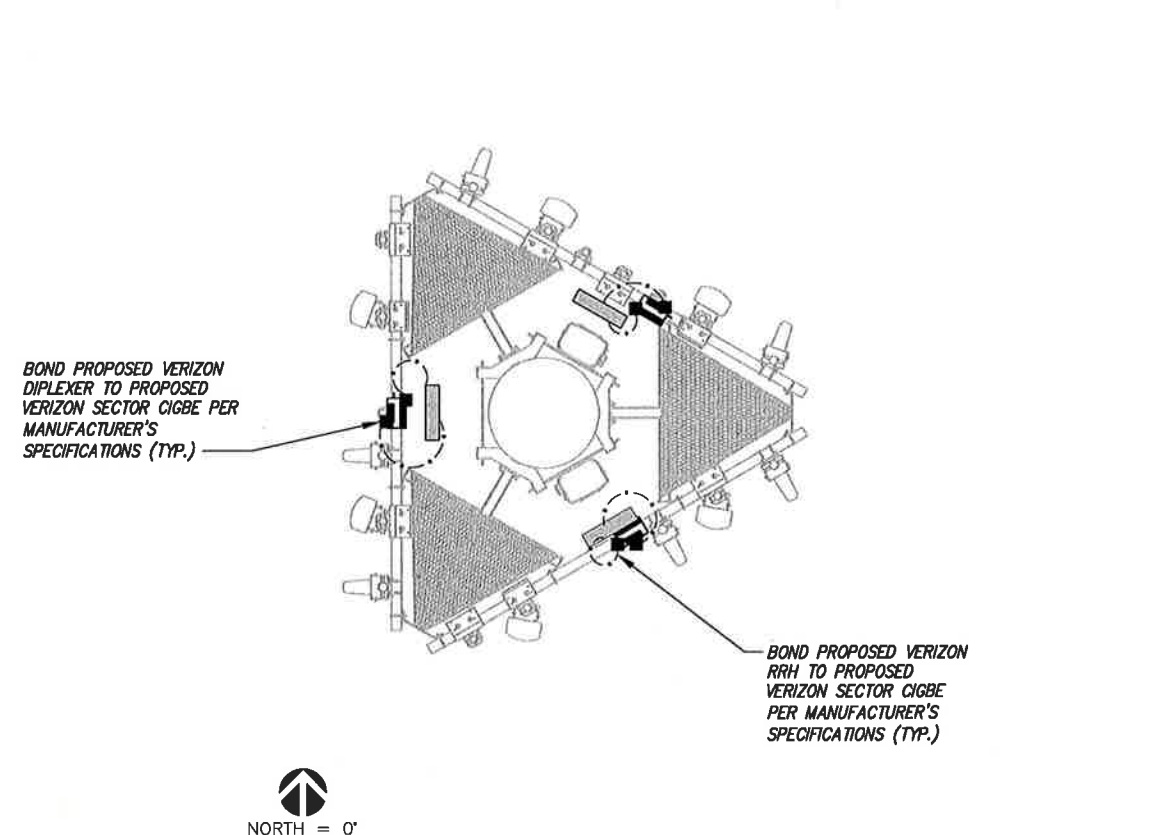
TYPICAL CABLE GROUND KIT CONNECTION NO SCALE 2



TYPICAL CONNECTION OF GROUND WIRES TO GROUNDING BARS & ANTENNAS NO SCALE 3

GENERAL GROUNDING NOTES:

- TO ENSURE PROPER BONDING, ALL CONNECTIONS SHALL BE AS FOLLOWS:  
- #2 BARE TINNED SOLID COPPER CONDUCTOR: EXOTHERMIC WELD TO RODS OR GROUND RING  
- LUGS AND BUS BAR (UNLESS NOTED OTHERWISE): SANDED CLEAN, COATED WITH OXIDE INHIBITOR AND BOLTED FOR MAXIMUM SURFACE CONTACT. ALL LUGS SHALL BE COPPER (NO ALUMINUM SHALL BE PERMITTED). PROVIDE LOCK WASHERS FOR ALL MECHANICAL CONNECTIONS FOR GROUND CONDUCTORS. USE STAINLESS STEEL HARDWARE THROUGHOUT.
- ALL GROUNDING CABLE IN CONCRETE OR THROUGH WALLS SHALL BE IN 3/4" PVC CONDUIT. SEAL AROUND CONDUIT THROUGH WALLS. NO METALLIC CONDUIT SHALL BE USED FOR GROUNDING CONDUCTORS.
- OWNER'S REPRESENTATIVE WILL INSPECT EXOTHERMIC WELD AND CONDUCT MEGGER TEST PRIOR TO BURIAL. MAXIMUM 5 OHMS RESISTANCE IS REQUIRED.
- CONTRACTOR TO INSTALL GROUNDING IN CLOSE PROXIMITY TO EQUIPMENT PLATFORM OR PAD.
- MAKE ALL GROUND CONNECTIONS AS SHORT AND DIRECT AS POSSIBLE. AVOID SHARP BENDS. ALL BENDS SHALL BE A MINIMUM 8" RADIUS AND NO GREATER THAN 90 DEGREES.
- ALL CADWELDS TO BURIED GROUND RING SHALL BE THE PARALLEL TYPE, EXCEPT FOR THE GROUND RODS WHICH SHALL BE THE TEE TYPE.
- BOND SERVICE CONDUITS TO GROUND RING AS THEY CROSS. DO NOT EXOTHERMICALLY WELD TO CONDUITS.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER WHEN THE GROUNDING SYSTEM IS COMPLETE. THE CONSTRUCTION MANAGER SHALL INSPECT THE GROUNDING SYSTEM PRIOR TO BACKFILLING.
- THE MINIMUM SPACING BETWEEN GROUND RODS SHALL BE 10'-0" (MAX. 15'-0").
- BOND GIGBE TO EXTERNAL GROUND RING WITH 2 RUNS OF #2 BARE, TINNED, SOLID COPPER CONDUCTOR IN PVC. CONNECT BAR END WITH 2 HOLE LUG, AND "CADWELD" THE OTHER END TO THE EXTERNAL GROUND ROD.
- THE PREFERRED LOCATION FOR COAX GROUNDING IS AT THE BASE OF THE TOWER PRIOR TO THE COAX BEND.
- BONDING OF THE GROUNDED CONDUCTOR (NEUTRAL) AND THE GROUNDING CONDUCTOR SHALL BE AT THE SERVICE DISCONNECTING MEANS. BONDING JUMPER SHALL BE INSTALLED PER N.E.C. ARTICLE 250-30.



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 1

GROUNDING SYMBOLS:

⊗	GROUND ROD
□	ACCESS WELL
⊠	GROUND ROD WITH ACCESS
■	COMPRESSION TYPE CONNECTION
●	EXOTHERMIC WELD TYPE CONNECTION
—G—	#2/0 BTS COPPER CONDUCTOR BURIED GROUND CABLE
#	INDICATES CODED NOTE



Date: **October 10, 2018**

Charles McGuirt  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277  
[Charles.McGuirt@crowncastle.com](mailto:Charles.McGuirt@crowncastle.com)

Engineered Tower Solutions, PLLC  
8120 Sheridan Blvd, Suite A-311  
Westminster, CO 80003  
(919) 782-2710  
[brandon.little@ets-pllc.com](mailto:brandon.little@ets-pllc.com)

**Subject:** **Mount Structural Analysis**

**Contractor Designation:** **Verizon Wireless Co-Locate**  
**Carrier Site Number:** 1907  
**Carrier Site Name:** Durham CT

**Crown Castle Designation:** **Crown Castle BU Number:** 806364  
**Crown Castle Site Name:** HRT 106(B) 943202  
**Crown Castle JDE Number:** 528160  
**Crown Castle PO Number:** 1263868  
**Crown Castle Application Number:** 457533 Rev. 0

**Engineering Firm Designation:** **ETS Project No.:** 184434.14

**Site Data:** **143 R Old Blue Hill Road, Durham, Middlesex County, CT 06422**  
**Latitude: 41° 27' 33.67" Longitude: -72° 39' 45.83"**

**Structure Information:** **Tower Height & Type:** 120.0-ft Monopole  
**Mount Elevation:** 100.0-ft  
**Mount Width & Type:** 12.0-ft Platform Mount

Dear Charles McGuirt,

Engineered Tower Solutions, PLLC is pleased to submit this "**Mount Structural Analysis Report**" to determine the structural integrity of *Verizon Wireless's* antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

Based upon our analysis, we have determined the adequacy of the antenna mounting system that will support the existing and proposed loading to be for the following Load Case:

**Platform Mount**

**Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2016 Connecticut State Building Code (2012 IBC). Applicable Standard references and design criteria are listed in Section 2 – Analysis Criteria.

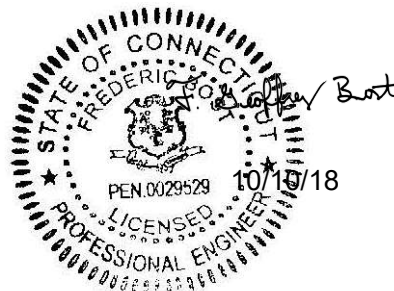
We at Engineered Tower Solutions, PLLC appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount structural analysis prepared by:

Bach S. Tran, EI  
Structural Engineer I

Respectfully Submitted by:

Frederic G. Bost, PE  
Owner/President



## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 – Proposed Equipment Configuration

### 3) ANALYSIS PROCEDURE

Table 2 – Documents Provided

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 3 – Mount Component Stresses vs. Capacity

4.1) Recommendations

### 5) APPENDIX A)

Wire Frame and Rendered Models

### 6) APPENDIX B)

Software Input Calculations

### 7) APPENDIX C)

Software Analysis Output

### 8) APPENDIX D)

ASCE 7 Hazards Report

**1) INTRODUCTION**

This mount is an existing 12.0 ft Platform mount installed at the 100.0 ft elevation of the 120.0 ft Monopole. Engineered Tower Solutions, PLLC, did not visit the site. A mapping and/or mount manufacturer drawings were not provided. Therefore, per direction of Crown Castle, photos of the tower were compared with other mounts within our database and a similar and comparable mount was used to perform this mount analysis.

**2) ANALYSIS CRITERIA**

**Building Code:** 2012 IBC  
**TIA-222 Revision:** TIA-222-H  
**Risk Category:** II  
**Ultimate Wind Speed:** 130 mph  
**Exposure Category:** B  
**Topographic Factor:** 1  
**Ice Thickness:** 1.50 in  
**Wind Speed with Ice:** 50 mph  
**Seismic Ss:** 0.179  
**Seismic S1:** 0.062  
**Service Wind Speed:** 30 mph  
**Man Live Load at Mid/End-Point:** 250 lb  
**Man Live Load At Mount Pipes:** 500 lb

**Table 1 – Proposed Equipment Configuration**

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
100.0	101.0	6	Andrew	SBNHH-1D65B	12.0 ft Platform Mount
		6	Antel	LPA-80080/6CF	
		3	Nokia	AIRSCALE RRH 4T4R B5 160W	
		3	RFS/Celwave	FDJ85020Q4-S1	
	100.0	3	Alcatel Lucent	B13 RRH4X30-4R	
		3	Alcatel Lucent	B25 RRH4X30	
		3	Alcatel Lucent	B66A RRH4X45	
		2	Raycap	RXXDC-3315-PF-48	



### 3) ANALYSIS PROCEDURE

**Table 2 – Documents Provided**

Document	Remarks	Reference	Source
Carrier Application	App # 457533 Rev. 0	08/21/2018	CCI Sites
Structural Level Drawings (Installed)	Crown Castle	08/31/2018	CCI Sites
Structural Level Drawing (Proposed)	Crown Castle	08/31/2018	CCI Sites
Structural Analysis Report	Jacobs Engineering Group. Inc.	7813699	CCI Sites

#### 3.1) Analysis Method

RISA-3D (version 17.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix C.

#### 3.2) Assumptions

- 1) Engineered Tower Solutions, PLLC, did not visit the site. A mapping and/or mount manufacturer drawings were not provided. Therefore, per direction of Crown Castle, photos of the tower were compared with other mounts within our database and a similar and comparable mount was used to perform this mount analysis
- 2) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specification.
- 3) The configuration of antennas, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 5) This Structural Analysis is not a condition assessment of the mount and is an evaluation of the theoretical structural capacity.
- 6) This analysis is based from the information supplied, and therefore, this report's results are as accurate as the supplied data.
- 7) Engineered Tower Solutions, PLLC makes no warranties, expressed and/or implied, in connection with this report, and disclaims any liability associated with material, fabrication, or erection of the mount. Engineered Tower Solutions, PLLC will not be held responsible from any consequential or incidental damages sustained by any person, firm, or organization as a result of the contents of this report. The maximum liability of Engineered Tower Solutions, PLLC pursuant to this report will be limited to the total fee received for compilation of this report.
- 8) It is the tower owner's responsibility to verify that the mount modeled and analyzed is the correct structure modeled.
- 9) The use of this report shall be limited to the purpose for which it was commissioned and may not be used for any other purposes without the written consent of Engineered Tower Solutions, PLLC.
- 10) Member connections are assumed to have been designed to meet or exceed the theoretical capacity of the connected member.
- 11) Steel grades have been assumed as follows:
 

a) Channel, Solid Round, Angle, Plate	ASTM A36 (Gr 36)
b) HSS (Rectangular)	ASTM 500 (Gr B-46)
c) HSS (Round)	ASTM 500 (Gr B-42)
d) Pipe	ASTM A53 (Gr 35)
e) Connection Bolts	ASTM A325
f) U-Bolts	SAE 429 Gr.2

This analysis may be affected if any assumptions are not valid or have been made in error. Engineered Tower Solutions, PLLC should be notified to determine the effect on the structural integrity of the tower.

**4) ANALYSIS RESULTS**

**Table 3 – Mount Component Stresses vs. Capacity**

Mount Centerline (ft)	Component	% Capacity	Pass/Fail	Notes
100.0	Face Mount – Horizontal	31.2	PASS	1
	Handrail – Horizontal	53.0	PASS	1
	Mount Pipe – Vertical	56.7	PASS	1
	Sidearm – Horizontal	78.3	PASS	1
	Brace - Horizontal	14.9	PASS	1

Notes:

- 1) See additional documentation in “Appendix C – Software Analysis Output” for calculations supporting the % capacity consumed.

<b>Tower Mount Rating (max from all components) =</b>	<b>78.3%</b>
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<b>Verizon Mount Classification</b>	<b>M300R(300)-4[6]</b>
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**4.1) Recommendations**

The tower mount has sufficient capacity to carry the existing and proposed load configuration. No modifications are required at this time.

Site Name: **DURHAM, CT**  
**Cumulative Power Density**

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissible Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )	(%)
VZW 700	746	1	1074	1074	100	0.0386	0.4973	7.77%
VZW Cellular	876	3	370	1110	100	0.0399	0.5840	6.84%
VZW 850 LTE	869	1	1059	1059	100	0.0381	0.5793	6.57%
VZW PCS	1970	1	2456	2456	100	0.0883	1.0000	8.83%
VZW AWS	2145	1	3518	3518	100	0.1265	1.0000	12.65%
<b>Total Percentage of Maximum Permissible Exposure</b>								<b>42.66%</b>

\*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz

mW/cm<sup>2</sup> = milliwatts per square centimeter

ERP = Effective Radiated Power

Absolute worst case maximum values used.

Date: **September 11, 2018**

Heather Simeone  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277

**JACOBS**<sup>®</sup>  
Jacobs Engineering Group, Inc.  
5449 Bells Ferry Road  
Acworth, GA 30102  
770-701-2500

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **Verizon Wireless Co-Locate**  
**Carrier Site Number:** 1907  
**Carrier Site Name:** Durham CT

**Crown Castle Designation:** **Crown Castle BU Number:** 806364  
**Crown Castle Site Name:** HRT 106(B) 943202  
**Crown Castle JDE Job Number:** 528160  
**Crown Castle Work Order Number:** 1626719  
**Crown Castle Application Number:** 457533 Rev. 0

**Engineering Firm Designation:** **Jacobs Engineering Group, Inc. Project Number:** 1626719

**Site Data:** **143 R Old Blue Hill Road, DURHAM, Middlesex County, CT**  
**Latitude 41° 27' 33.67", Longitude -72° 39' 45.83"**  
**120 Foot - Monopole Tower**

Dear Heather Simeone,

Jacobs Engineering Group, Inc. is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration

**Sufficient Capacity**

The analysis has been performed in accordance with the TIA-222-H Standard. This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2016 Connecticut State Building Code. Exposure Category B and Risk Category II were used in this analysis.

Structural analysis prepared by:



Don Martin Serrano  
Structural Engineer

Respectfully submitted by:

Paul L. Mucci P.E.  
Senior Project Engineer



## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Other Considered Equipment

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 - Tower Component Stresses vs. Capacity

4.1) Recommendations

### 5) APPENDIX A

tnxTower Output

### 6) APPENDIX B

Base Level Drawing

### 7) APPENDIX C

Additional Calculations

## 1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by Valmont.

## 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2012 IBC
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	130 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	60 mph

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
100.0	101.0	6	andrew	SBNHH-1D65B w/ Mount Pipe	12 2	7/8 1-5/8
		6	antel	LPA-80080/6CF w/ Mount Pipe		
		3	nokia	AIRSCALE RRH 4T4R B5 160W		
	100.0	3	rfs celwave	FDJ85020Q4-S1		
		3	alcatel lucent	B13 RRH4X30-4R		
		3	alcatel lucent	B25 RRH4X30		
		3	alcatel lucent	B66A RRH4X45		
		2	raycap	RXXDC-3315-PF-48		
1	tower mounts	Platform Mount [LP 713-1]				

**Table 2 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
119.0	125.0	1	decibel	DB809MT3-XT	2	7/8
	123.0	1	decibel	DB201-A		
	119.0	1	tower mounts	Side Arm Mount [SO 102-3]		
		2	tower mounts	Side Arm Mount [SO 701-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
116.0	116.0	9	andrew	SBNHH-1D65A w/ Mount Pipe	2 4 12	3/8 3/4 7/8
		1	tower mounts	Platform Mount [LP 602-1]		
		3	ericsson	RRUS 11		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32		
	110.0	3	ericsson	RRUS 32 B2		
		1	raycap	DC6-48-60-18-8C		
107.0	107.0	1	tower mounts	Pipe Mount [PM 601-1]	1	7/8
		1	gabriel electronics	GLF6-450		
87.0	89.0	3	alcatel lucent	PCS 1900MHZ 4X45W-65MHZ	3 1	1-1/4 7/8
		6	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8X20-25		
		3	commscope	NNVV-65B-R4 w/ Mount Pipe		
	3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe			
87.0	1	tower mounts	Platform Mount [LP 713-1]			
73.0	79.0	1	decibel	DB636-C	1 1 4	7/8 1/2 1-5/8
	73.0	1	commscope	SHP2-13		
		3	ericsson	AIR 21 B2A/B4P		
		3	ericsson	AIR32 DB B66Aa B2a		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449		
		3	rfs celwave	APXVAA24_43-U-A20		
	1	tower mounts	Platform Mount [LP 1301-1]			
50.0	57.0	1	rfs celwave	PD1142-1	1 3	1/2 7/8
	54.0	1	decibel	ASP-655		
	53.0	1	rfs celwave	PD1121-6		
	50.0	2	tower mounts	Side Arm Mount [SO 702-1]		
		1	decibel	DB492A		
40.0	41.0	1	tekelec systemes	EPSILON GPS ANTENNA 35 DB	1	1/2
	40.0	1	tower mounts	Side Arm Mount [SO 701-1]		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Inc.	262150	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	SAC Engineering, Inc.	297341	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	262153	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Valmont	942187	CCISITES

#### 3.1) Analysis Method

tnxTower (version 8.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

#### 3.2) Assumptions

- 1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 3) The baseplate grout was not considered in this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 100	Pole	TP20.263x15.403x0.1875	1	-4.12	813.65	32.2	Pass
L2	100 - 47.0833	Pole	TP33.13x20.263x0.2813	2	-20.92	1883.04	94.5	Pass
L3	47.0833 - 0	Pole	TP44x31.372x0.375	3	-34.68	3407.81	88.3	Pass
							Summary	
						Pole (L2)	94.5	Pass
						Rating =	94.5	Pass



**Table 5 - Tower Component Stresses vs. Capacity - LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	84.5	Pass
1	Base Plate	0	43.9	Pass
1	Flange Bolts	100	46.8	Pass
	Top Flange Plate		14.1	Pass
	Bottom Flange Plate		14.1	Pass
1	Base Foundation Structural	0	9.5	Pass
1	Base Foundation Soil Interaction	0	38.9	Pass

<b>Structure Rating (max from all components) =</b>	<b>94.5%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity consumed.

**4.1) Recommendations**

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.



December 7, 2018

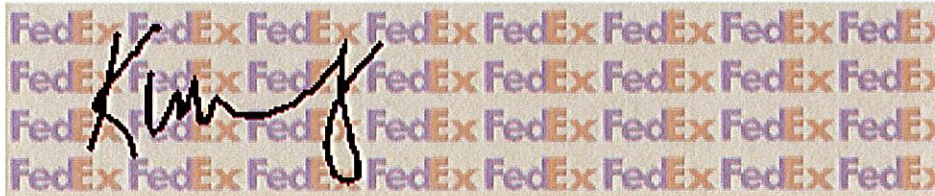
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