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

June 3, 2016

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

RE: **Tower Share Application for EyeTower TVR Crown Site BU: 841793**
EyeTower Site ID: BDL201
50 Pine Lane, Windsor, CT 06095
Latitude: 41° 49' 11.43"/ Longitude: -72° 40' 1.88"

Dear Ms. Bachman:

EyeTower is applying for tower share to add five (5) antennas and five (5) lines of coax to the existing 148-foot monopole tower at 50 Pine Lane in Windsor, CT. The antennas will be installed at the 85-foot, 83-foot, and 78-foot level of the 148-foot tower. The tower is owned by Crown Castle. The property is owned by the Town of Windsor. Eyetower also intends to perform ground work in the form of adding a 9'x 9' pad with a 6'x 6' building for equipment, as well as a 5' x 8' concrete pad for a 15kw diesel generator.

This facility was approved by the by the Town of Windsor Planning and Zoning Commission on November 30, 2000 in Special Use Permit No. 547. This approval included waivers regarding tower height and no conditional statements.

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 The Honorable Donald S. Trinks, Mayor, Town of Windsor, 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.

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, AT&T 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

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)

cc: The Honorable Donald S. Trinks, Mayor, Town of Windsor
Town of Windsor
275 Broad Street
Windsor, CT 06095

Town of Windsor
275 Broad St.
Attn: Accounts Receivable
Windsor, CT 06095

SUA547

TOWN OF WINDSOR
First in Connecticut. First for its citizens.

RECEIVED
SEP 08 2000
TOWN OF WINDSOR
PLANNING DEPT.

A.M.
TP+ZC
10.10.00

Application for a Special Use

Town Planning and Zoning Commission

Your Name Town of Windsor
AT&T Wireless PCS, LLC

Your Phone # 860-285-1877
203-831-4011

Your Address 275 Broad Street, Windsor, Connecticut 06095
149 Water Street, Norwalk, Connecticut 06854

Are You the..... (X) Owner ( ) Optionee ( ) Buyer ( ) Agent (X) Other

If Other please explain Lessee

Owner's Name (If other than applicant) Town of Windsor

Owner's Phone # 860-285-1877

Owner's Address 275 Broad Street, Windsor, Connecticut 06095

Address of Subject Parcel(s) 50 Pine Lane

Size of Subject Parcel(s) 258,311 Sq. Ft.

Zone of Subject Parcel(s) NZ

Please describe the Special Use

Wilson Firehouse Municipal Tower Facility/Wireless Facility Co-location

Applicable Section(s) of Zoning Regulations 12.2 & 2.2.19E(1)

Please describe how the Special Use will benefit the Town of Windsor (feel free to use the other side).

Additional material to be supplied.

Your Signature Christopher B. Fisher
Attorney for the Applicant

Date September 5, 2000

Owner's Signature Patrick J. McMahon

Date 9/6/00

Office Use Only **********

Fee Paid _____ **Application#** _____ **Application Received By** _____

Date of Action _____ **Approved** _____ **Disapproved** _____

Approved 5/98

I, Anita M. Mips, Chairperson of the Windsor Town Planning and Zoning Commission, hereby certify that on October 10, 2000 the Planning and Zoning Commission of the Town of Windsor granted approval of Special Use Application #547 for a Wireless Telecommunications Tower with a monopole height of 150 feet plus 13-foot Town public service whip antennas for a total height of 163 feet, under Zoning Regulations Sections 12.2 & 2.2.19E(1).

This approval also includes the following waivers in accordance with Zoning Regulations Section 12.1:

1) **a waiver of the fall zone distance requirement for 73 feet in relation to the distance of the tower from the easterly property line, 163 feet being required and 90 feet being proposed;**

2) **a waiver of the fall zone distance requirement for 236 feet in relation to the distance of the tower from I-91 to the east, 326 feet being required and 90 feet being proposed;**

3) **a waiver of the fall zone distance requirement for 245 feet in relation to the distance of the tower from the residential zone to the north, 576 feet being required and 331 feet being proposed; and**

4) **a waiver of the fall zone requirement for 52 feet in relation to the distance of the tower from Putnam Memorial Highway to the south, 326 feet being required and 274 feet being proposed.**

Said Special Use was granted for the property located at: **50 Pine Lane**

The owner of record of said parcel is: **Town of Windsor**

Dated at Windsor, Connecticut, this 30th **day of November, 2000**

_____ **Chairperson**

Public Act #75-317

Received for Record this _____ **day of** _____**, 2000**

_____ **Attest: Town Clerk**

LH 5-14-04

TOWN OF WINDSOR
Town Hall • Windsor, CT 06095-2994

BUILDING PERMIT APPLICATION

PERMIT #: B-041172

ADDRESS OF WORK LOCATION: 50 PINE LANE WINDSOR, CT

TYPE OF PERMIT (Check One)

☒ **BUILDING** (List size or sq. ft.)
Foundation 12' x 20'
Addition NA
Acc. Structure 12' x 20'
Deck NA
Roofing/Siding (# Squares) NA
Pool: Aboveground: NA Inground: NA
Other NA

☐ **ELECTRICAL**
☐ S. Change
☐ New Residential
☐ New Commercial
☐ Addition
☐ Pool Wiring
☐ Temporary Service
☐ Low Voltage
☐ Other

☐ **PLUMBING**
☐ New Residential
☐ New Commercial
☐ Addition
☐ Fire Suppression
☐ Water Heater
☐ Other

☐ **HVAC**
☐ New Residential
☐ New Commercial
☐ Addition
☐ Central Air
☐ Replace/Repair
☐ Other

New Residential (Total Gross Square Feet) NA
Residential Renovation NA
New Commercial (Total Gross Square Feet) 240 SQ FT
Commercial Renovation (Square Feet of Renovated Space) NA
Signs (size & type) NA

Copy to FMO

DESCRIPTION OF WORK (must fill out for all permits): Addition of Cingular Wireless antennas and pre-fab concrete equipment shelter to existing ATT Wireless monopole and Compound.

Retail Market Value $ 40,500 Fee: 550 Work Start Date: 5-24-04

Owner: ATT WIRELESS (Lease), Town of Windsor (Land)
Address: (ATT) 15 East Midland Ave 5th Floor PARAMUS, NJ Zip 07652
Phone # (Days): 201-576-2416

Applicant: CINGULAR WIRELESS (TIM BURKS)
Address: 500 Enterprise Drive Suite 3A ROCKY HILL, CT Zip 06067
Phone # (Days): 860 513 7218
License #: MCO.900137 Type: MA Jour CONTRACTOR Exp.: 6-30-04
CFM CONSTRUCTION ✓OK

I understand that applying for this permit does not guarantee that it will be issued, and no work shall be done prior to the issuance of said permit or the approval of the **Building Official**. I agree to be in compliance with all applicable codes, standards, statutes, and ordinances which may pertain.

Applicant's Signature: Timothy M. Burks Print Name: TIMOTHY M. BURKS Date 5/12/04

STAFF MEMBER Check Pertinent Items and initial:

Zoning 3.90 on Addition OK - TP+Z Taxes Exempt/OK Worker's Comp. OK - CFM Wetlands N/A 6/8/04

Other: _____ Septic _____ Sewer _____ Letter of Authorization ✓ T.O.W.

Use Group: S-1 Construction Type: 2-C

Fee: ☒ Check ☐ Cash Transaction/Receipt #: 1172 Blanket Not Electrical

Special Conditions or Comments: All Work Per '99 CT State Bldg Code Reqmts Incl. Section 114 Threshold Structures & Section 1705 Spec. Insp. All Steel/Mech Work Req's Seper. Permits. Call For Inspections Noted - Allow 48 HR Notice. Completion Letters + Documentation Req'd. for C/O PRIOR TO USE. This Is Cingular Colocate.

Reviewed & Issued By: Stephen Dupre CBO Date: June 17, 2004

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

Crown Castle, does hereby authorize **EyeTower** and its authorized contractors/agents to act as "Applicant" in the processing of all applications, permits, research and other related activities associated with the processing, planning, design review, permitting, entitlement and construction of additional equipment, antennas and site improvements for the Crown Castle existing wireless communications facility described as follows:

Customer Site Name:	**BDL201**	**Crown Castle Site ID Number:**	**841793**
Site Address:	**50 Pine Ln. Windsor, CT 06095**	**Crown Castle Site Name:**	**WINDSOR PINE LANE**

This authorization is fully contingent upon **EyeTower** authorized contractors/agents' compliance with the following conditions:

1. Crown Castle must review the application prior to submittal. Crown Castle must be provided all applications, narratives, drawings and attachments at least 72 hours in advance of their submittal to the locality. Use of email and electronic attachments is encouraged. A Crown Castle Zoning Subject Matter Expert (SME) will review and provide written comment to the customer within 48 hours of receipt of a complete set of application materials. If Crown Castle indicates that changes are required, submissions shall be altered in accordance with Crown Castle comments prior to submission to the locality. Verification of corrections should also be accomplished via emails and attachments.
2. In no event may **EyeTower** encourage, suggest, participate in, or permit the imposition of any restrictions or additional obligations whatsoever on the tower site or Crown Castle's current or future use or ability to license space at the tower site as part of or in exchange for obtaining any approval, permit, exception or variance.
3. A copy of the final permit and/or a written summary of the zoning/entitlement decision rendered by the locality and any/all conditions placed on that decision shall be communicated in detail to Crown Castle well within the appeal period provided by the locality (typically 10-15 days).
4. All conditions of approval pertinent to the construction of the proposed project must be included in the construction drawings for the project. The conditions of approval pertinent to the construction of the project shall be copied verbatim from the zoning permit approval language, and shall be present in the drawings prior to submission for building permits and contractor bidding. Crown Castle shall verify the inclusion of appropriate conditions of approval in the construction drawing redline process.
5. Crown Castle will provide a Notice To Proceed (NTP) to construction to the customer upon receipt of the final approved zoning permit and the approved Building Permit.

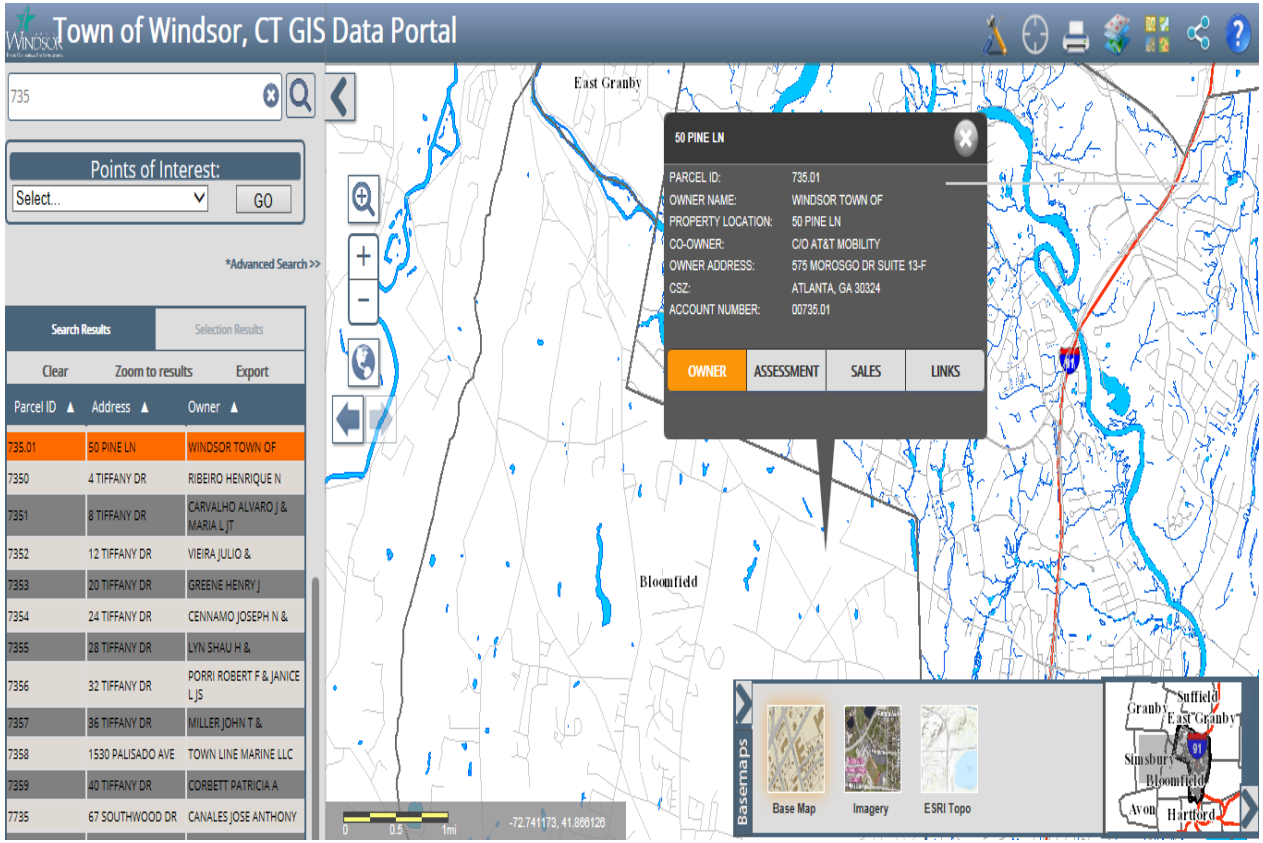
By Crown Castle:

Signature: _____

Printed Name: Zachary Plummer

Title: Real Estate Specialist

Date: June 2, 2016


Town of Windsor, CT GIS Data Portal
735
Points of Interest:
Select...
GO
*Advanced Search >>
Search Results
Selection Results
Clear
Zoom to results
Export
Parcel ID ▲
Address ▲
Owner ▲
735.01 50 PINE LN WINDSOR TOWN OF
7350 4 TIFFANY DR RIBEIRO HENRIQUE N
7351 8 TIFFANY DR CARVALHO ALVARO J & MARIA L JT
7352 12 TIFFANY DR VIEIRA JULIO &
7353 20 TIFFANY DR GREENE HENRY J
7354 24 TIFFANY DR CENNAMO JOSEPH N &
7355 28 TIFFANY DR LYN SHAU H &
7356 32 TIFFANY DR PORRI ROBERT F & JANICE L JS
7357 36 TIFFANY DR MILLER JOHN T &
7358 1530 PALISADO AVE TOWN LINE MARINE LLC
7359 40 TIFFANY DR CORBETT PATRICIA A
7735 67 SOUTHWOOD DR CANALES JOSE ANTHONY
East Granby
Bloomfield
50 PINE LN
PARCEL ID: 735.01
OWNER NAME: WINDSOR TOWN OF
PROPERTY LOCATION: 50 PINE LN
CO-OWNER: C/O AT&T MOBILITY
OWNER ADDRESS: 575 MOROSGO DR SUITE 13-F
CSZ: ATLANTA, GA 30324
ACCOUNT NUMBER: 00735.01
OWNER
ASSESSMENT
SALES
LINKS
Basemaps
Base Map
Imagery
ESRI Topo
0 0.5 1mi
-72.741173, 41.866126

CROWN BU#: **841793**

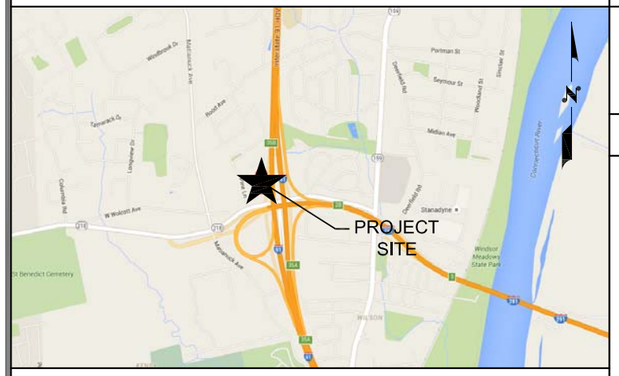
eyeTower, LLC SITE NAME: **BDL201**

PROJECT TYPE: **ADDITION OF EQUIPMENT IN PROPOSED SHELTER AND ANTENNAS TO EXISTING TELECOMUNICATIONS SITE**

PROJECT LOCATION: **50 PINE LANE**
WINDSOR, CT 06095

PROJECT COUNTY: **HARTFORD COUNTY**

VICINITY MAP



DRIVING DIRECTIONS

FROM RALEIGH–DURHAM INTERNATIONAL AIRPORT:

HEAD NORTH–EAST ON AIRPORT BLVD/TERMINAL BLVD. KEEP LEFT TO CONTINUE ON AIRPORT BLVD. CONTINUE STRAIGHT ONTO AIRPORT BLVD/TERMINAL BLVD. KEEP LEFT TO STAY ON AIRPORT BLVD/TERMINAL BLVD. TURN RIGHT ONTO THE AVIATION PKWY N SLIP ROAD TO I–540/US–70. MERGE ONTO AVIATION PKWY. TURN LEFT ONTO GLOBE RD. TURN RIGHT ONTO PAGE RD. CONTINUE ONTO PAGE RD EXT. USE THE LEFT 2 LANES TO TURN LEFT ONTO US–70 W. KEEP RIGHT AT THE FORK TO CONTINUE ON EXIT 285, FOLLOW SIGNS FOR INTERSTATE 85 N/U.S. 15 N/HENDERSON/PETERSBURG AND MERGE ONTO I–85 N/US–15 N. CONTINUE ON I–85 N. TAKE I–95 N, NJ TPKE, I–95 N, CT–15 N AND I–91 N TO EXIT 35B IN WINDSOR.

GENERAL NOTES

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE A/E FIRM IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

811 Know what's below. Call before you dig.

SCOPE OF WORK

INSTALLATION OF NEW eyeTower, LLC EQUIPMENT SHELTER AND ANTENNAS IN EXISTING TELECOMMUNICATIONS COMPOUND.

SITE INFORMATION

APPLICANT :	eyeTower, LLC C/O CORPORATION SERVICE COMPANY 2711 CENTERVILLE RD, STE 400, PMB 160 WILMINGTON, DE 19808
TOWER OWNER :	CROWN CASTLE 100 REGENCY FOREST DRIVE, SUITE 150 CARY, NC 27518
PROPERTY OWNER :	TOWN OF WINDSOR/NEW WILSON FIRE HOUSE 275 BROAD ST WINDSOR, CT 06095
JURISDICTION :	TOWN OF WINDSOR
MAP/PARCEL# :	735
ZONING CLASSIFICATION :	NZ
LATITUDE :	41.819750° (41° 49' 11.1" N)
LONGITUDE :	–72.666972° (72° 40' 1.1"W)
POWER COMPANY :	NORTHEAST UTILITIES (888) 688–7267
FIBER COMPANY :	AT&T 800–331–0500
eyeTower, LLC CONTACT:	TODD CARPENTER eyeTower, LLC 2711 CENTERVILLE RD, STE 400, PMB 160 WILMINGTON, DE 19808
PROFESSIONAL OF RECORD:	ROBERT J. LARA, AIA MORRISON HERSHFIELD CORPORATION RLARA@MORRISONHERSHFIELD.COM PHONE: (954) 577–4655 CT LICENSE#: 11509

CODE COMPLIANCE

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

CONNECTICUT BUILDING PERFORMANCE STANDARDS WITH THE FOLLOWING CODE REFERENCES:

2005 CT STATE BUILDING CODE WITH 2013 AMENDMENTS
- 2003 INTERNATIONAL BUILDING CODE
- 2003 INTERNATIONAL MECHANICAL CODE
- 20011 NATIONAL ELECTRIC CODE (NFPA 70)
- 2003 INTERNATIONAL FIRE CODE

APPROVALS

APPROVED BY:	INITIALS:	DATE:
O.P.E./OPS:		
LEASING:		
RF:		
ZONING:		
CONSTRUCTION:		
POWER/TELCO:		

LIST OF DRAWINGS

ARCHITECTURAL

SHT.	DESCRIPTION	REV. NO.
T–1	COVER SHEET	0
G–1	NOTES	0
A–1	COMPOUND PLAN	0
A–2	EQUIPMENT LOCATION PLAN	0
A–3	TOWER ELEVATION & ANTENNA ORIENTATION	0
A–4	ANTENNA DETAILS	0
A–5	OTA TOWER ELEVATION	0
A–6	ANTENNA SPECS	0
A–7	ANTENNA SPECS	0
A–8	DETAILS	0
A–9	DETAILS	0
A–10	DETAILS	0
A–11	DETAILS	0
A–12	GENERATOR DETAILS	0

STRUCTURAL

S–1	STRUCTURAL NOTES AND CONC. PAD DETAILS	0

ELECTRICAL

E–1	ELECTRICAL NOTES AND ABBREVIATIONS	0
E–2	ELECTRICAL COMPOUND PLAN	0
E–3	ELECTRICAL RISER DIAGRAM	0
E–4	AUTOMATIC TRANSFER SWITCH DETALIS	0
E–5	GROUNDING PLAN	0
E–6	GROUNDING DETAILS	0
E–7	GROUNDING DETAILS	0
E–8	GROUNDING DETAILS	0

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

No.	Date	Action
4	.	.
3	.	.
2	.	.
1	.	.
0	05/16/16	ISSUED FOR PERMIT
A	05/10/16	90% CD SUBMITTAL

Carrier:

eyeTOWER
2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

Tower Owner/Client:

CROWN CASTLE
100 REGENCY FOREST DRIVE, SUITE 150
CARY, NC 27518

A/E Consultant:

MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

841793
BDL201

50 PINE LANE
WINDSOR, CT 06095

Drawing Title:

COVER SHEET

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. T-1

SCALE IS BASE ON 22" X 34" "D" SIZE

ARCHITECTURAL GENERAL NOTES

1. WORK SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS. ALL NECESSARY LICENSES, CERTIFICATES, ETC., REQUIRED BY AUTHORITY HAVING JURISDICTION SHALL BE PROCURED AND PAID FOR BY THE CONTRACTOR.
2. THE GENERAL CONTRACTOR AND EACH SUBCONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING DIMENSIONS AND CONDITIONS AT THE JOB SITE WHICH COULD AFFECT THE WORK UNDER THIS CONTRACT. ALL MANUFACTURERS RECOMMENDED SPECIFICATIONS, EXCEPT THOSE SPECIFICATIONS HEREIN, WHERE MOST STRINGENT SHALL BE COMPLIED WITH.
3. THE CONTRACTOR SHALL VERIFY THAT NO CONFLICTS EXIST BETWEEN THE LOCATIONS OF ANY AND ALL MECHANICAL, ELECTRICAL, PLUMBING, OR STRUCTURAL ELEMENTS, AND THAT ALL REQUIRED CLEARANCES FOR INSTALLATION AND MAINTENANCE ARE MET. NOTIFY THE CONSULTANT OF ANY CONFLICTS. THE CONSULTANT HAS THE RIGHT TO MAKE MINOR MODIFICATIONS IN THE DESIGN OF THE CONTRACT WITHOUT THE CONTRACTOR GETTING ADDITIONAL COMPENSATION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY CLEAN UP OF ALL TRADES AND REMOVE ALL DEBRIS FROM THE CONSTRUCTION SITE. AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL THOROUGHLY CLEAN THE BUILDING, SITE, AND ANY OTHER SURROUNDING AREAS TO A BETTER THAN NEW CONDITION.
5. THE CONTRACTOR IS RESPONSIBLE FOR ADEQUATELY BRACING AND PROTECTING ALL WORK DURING CONSTRUCTION AGAINST DAMAGE, BREAKAGE, COLLAPSE, ETC. ACCORDING TO APPLICABLE CODES, STANDARDS, AND GOOD CONSTRUCTION PRACTICES.
6. WHERE ONE DETAIL IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS, EVEN THOUGH NOT SPECIFICALLY MARKED ON THE DRAWINGS OR REFERRED TO IN THE SPECIFICATIONS, UNLESS NOTED OTHERWISE.
7. WHERE NEW PAVING, CONCRETE SIDEWALKS OR PATHS MEET EXISTING CONSTRUCTION, THE CONTRACTOR SHALL MATCH THE EXISTING PITCH, GRADE, AND ELEVATION SO THE ENTIRE STRUCTURE SHALL HAVE A SMOOTH TRANSITION.
8. THE GENERAL CONTRACTOR SHALL OBTAIN WRITTEN CONFIRMATION OF THE EXPECTED DATE OF COMPLETION OF THE POWER CONNECTION FROM THE POWER COMPANY.
9. IF THE POWER COMPANY IS UNABLE TO PROVIDE THE POWER CONNECTION BY OWNER'S REQUIRED DATE, THE GENERAL CONTRACTOR SHALL PROVIDE AND MAINTAIN A TEMPORARY GENERATOR UNTIL THE POWER COMPANY CONNECTION IS COMPLETED. COSTS ASSOCIATED WITH THE TEMPORARY GENERATOR TO BE APPROVED BY THE OWNER.
10. PLANS PART OF THIS SET ARE COMPLEMENTARY. INFORMATION IS NOT LIMITED TO ONE PLAN. DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF SERVICE AND SHALL REMAIN THE PROPERTY OF THE ARCHITECT, WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THEY ARE NOT TO BE USED BY THE OWNER ON OTHER PROJECTS OR EXTENSION TO THIS PROJECT EXCEPT BY AGREEMENT IN WRITING AND WITH APPROPRIATE COMPENSATION TO MORRISON HERSHFIELD. THESE PLANS WERE PREPARED TO BE SUBMITTED TO GOVERNMENTAL BUILDING AUTHORITIES FOR REVIEW FOR COMPLIANCE WITH APPLICABLE CODES AND IT IS THE SOLE RESPONSIBILITY OF THE OWNER AND/OR CONTRACTOR TO BUILD ACCORDING TO APPLICABLE BUILDING CODES.
11. IF CONTRACTOR OR SUB-CONTRACTOR FIND IT NECESSARY TO DEVIATE FROM ORIGINAL APPROVED PLANS, THEN IT IS THE CONTRACTOR'S AND THE SUB-CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE ARCHITECT WITH 4 COPIES OF THE PROPOSED CHANGES FOR HIS APPROVAL BEFORE PROCEEDING WITH THE WORK. IN ADDITION THE CONTRACTOR AND SUB-CONTRACTORS SHALL BE RESPONSIBLE FOR PROCURING ALL NECESSARY APPROVALS FROM THE BUILDING AUTHORITIES FOR THE PROPOSED CHANGES BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR AND SUB-CONTRACTORS SHALL BE RESPONSIBLE FOR PROCURING ALL NECESSARY INSPECTIONS AND APPROVALS FROM BUILDING AUTHORITIES DURING THE EXECUTION OF THE WORK.
12. IN EVERY EVENT, THESE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS SHALL BE INTERPRETED TO BE A MINIMUM ACCEPTABLE MEANS OF CONSTRUCTION BUT THIS SHALL NOT RELIEVE THE CONTRACTOR, SUB-CONTRACTOR, AND/OR SUPPLIER/MANUFACTURER FROM PROVIDING A COMPLETE AND CORRECT JOB WHEN ADDITIONAL ITEMS ARE REQUIRED TO THE MINIMUM SPECIFICATION. IF ANY ITEMS NEED TO EXCEED THESE MINIMUM SPECIFICATIONS TO PROVIDE A COMPLETE, ADEQUATE AND SAFE WORKING CONDITION, THEN IT SHALL BE THE DEEMED AND UNDERSTOOD TO BE INCLUDED IN THE DRAWINGS. FOR EXAMPLE, IF AN ITEM AND/OR PIECE OF EQUIPMENT REQUIRES A LARGER WIRE SIZE (I.E. ELECTRICAL WIRE), STRONGER OR LARGER PIPING, INCREASED QUANTITY (I.E. STRUCTURAL ELEMENTS), REDUCED SPACING, AND/OR INCREASED LENGTH (I.E. BOLT LENGTHS, BAR LENGTHS) THEN IT SHALL BE DEEMED AND UNDERSTOOD TO BE INCLUDED IN THE BID/PROPOSAL. THESE DOCUMENTS ARE MEANT AS A GUIDE AND ALL ITEMS REASONABLY INFERRED SHALL BE DEEMED TO BE INCLUDED.
13. THESE CONTRACT DOCUMENTS AND SPECIFICATIONS SHALL NOT BE CONSTRUED TO CREATE A CONTRACTUAL RELATIONSHIP OF ANY KIND BETWEEN THE ARCHITECT AND THE CONTRACTOR.

ELECTRICAL GENERAL NOTES

A. GENERAL

1. EXAMINE THE SITE CONDITIONS VERY CAREFULLY AND THE SCOPE OF PROPOSED WORK TOGETHER WITH THE WORK OF ALL OTHER TRADES AND INCLUDE IN THE BID PRICE ALL COSTS FOR WORK SUCH AS EQUIPMENT AND WIRING MADE NECESSARY TO ACCOMMODATE THE ELECTRICAL SYSTEMS SHOWN AND SYSTEMS OF OTHER TRADES.
2. OBTAIN ALL PERMITS, PAY ASSOCIATED FEES AND SCHEDULE INSPECTION.
3. PROVIDE ALL LABOR, MATERIAL, EQUIPMENT, INSURANCE, AND SERVICES TO COMPLETE THIS PROJECT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND PRESENT IT AS FULLY OPERATIONAL TO THE SATISFACTION OF eyeTower, LLC & LAND/TOWER OWNER
4. PRIOR TO BEGINNING WORK COORDINATE ALL POWER AND TELCO WORK WITH THE LOCAL UTILITY COMPANY AS IT MAY APPLY TO THIS SITE. ALL WORK TO COMPLY WITH THE RULES AND REGULATIONS OF THE UTILITIES INVOLVED GENERAL CONTRACTOR IS RESPONSIBLE FOR VED. REQUESTING CONNECTION OF COMMERCIAL POWER FROM THE POWER COMPANY. ELECTRICAL CONTRACTOR SHALL COORDINATE THIS WORK WITH THE GENERAL CONTRACTOR.
5. FABRICATION AND INSTALLATION OF THE COMPLETE ELECTRICAL SYSTEM SHALL BE DONE IN A FIRST CLASS WORKMANSHIP PER NECA STANDARD 1-2000 BY QUALIFIED PERSONNEL EXPERIENCED IN SUCH WORK AND SHALL SCHEDULE THE WORK IN AN ORDERLY MANNER SO AS NOT TO IMPEDE PROGRESS OF THE PROJECT.

B. BASIC MATERIALS AND METHODS

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE EDITION OF THE NEC ACCEPTED BY THE LOCAL JURISDICTION AND TO THE APPLICABLE LOCAL CODES AND REGULATIONS.
2. ARRANGE CONDUIT, WIRING, EQUIPMENT, AND OTHER WORK GENERALLY AS SHOWN, PROVIDING PROPER CLEARANCES AND ACCESS. CAREFULLY EXAMINE ALL CONTRACT DRAWINGS AND FIT THE WORK IN EACH LOCATION WITHOUT SUBSTANTIAL ALTERATION. WHERE DEPARTURES ARE PROPOSED BECAUSE OF FIELD CONDITIONS OR OTHER CAUSES, PREPARE AND SUBMIT DETAILED DRAWINGS FOR ACCEPTANCE.
3. THE CONTRACT DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ALL OFFSETS, BENDS, FITTINGS AND ACCESSORIES ARE NOT NECESSARILY SHOWN. PROVIDE ALL SUCH ITEMS AS MAY BE REQUIRED TO FIT THE WORK TO THE CONDITIONS.
4. SEAL AROUND CONDUITS AND AROUND CONDUCTORS WITHIN CONDUITS ENTERING THE MODULAR CABINETS WHERE PENETRATION OCCURS WITH A SILICONE SEALANT TO PREVENT MOISTURE PENETRATION INTO BUILDING.

C. CONDUCTORS AND CONNECTORS

1. UNLESS NOTED OTHERWISE, ALL CONDUCTORS SHALL BE COPPER, MINIMUM SIZE #12 AWG, WITH THERMOPLASTIC INSULATION CONFORMING TO NEMA WC5 OR CROSS-LINKED POLYETHYLENE INSULATION CONFORMING TO NEMA WC7. (TYPES THHN). INSULATION SHALL BE RATED FOR 90 DEG. CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH NEC.
2. CONDUCTOR LENGTHS SHALL BE CONTINUOUS FROM TERMINATION TO TERMINATION WITHOUT SPLICES. SPLICES ARE NOT ACCEPTABLE. IF SPLICES ARE UNAVOIDABLE PRIOR APPROVAL FROM THE ENGINEER MUST BE OBTAINED.

D. GROUNDING

1. ALL LIGHTNING PROTECTION GROUNDING OF THE ELECTRICAL EQUIPMENT SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT NFPA STANDARDS.
2. ALL GROUND LUG AND COMPRESSION CONNECTIONS SHALL BE COATED WITH ANTI-OXIDANT AGENT, SUCH AS NO-OX, NOALOX, PENETROX OR KOPRSHIELD.
3. ALL EXTERIOR GROUNDING CONDUCTORS INCLUDING EXTERIOR GROUND RING SHALL BE #2 AWG SOLID BARE TINNED COPPER. MAKE ALL GROUND CONNECTIONS AS SHORT AND DIRECT AS POSSIBLE. AVOID SHARP BENDS. THE RADIUS OF ANY BEND SHALL NOT BE LESS THAN 8" AND THE ANGLE OF ANY BEND SHALL NOT EXCEED 90°. GROUNDING CONDUCTORS SHALL BE ROUTED DOWNWARD TOWARD THE BURIED GROUND RING.
4. REPAIR ALL GALVANIZED SURFACES THAT HAVE BEEN DAMAGED BY THERMO-WELDING WITH ERICO T-319 GALVANIZING BAR.
5. ALL EXTERNAL GROUND CONNECTIONS SHALL BE EXOTHERMICALLY WELDED. ALL EXOTHERMIC WELDS TO EXTERIOR GROUND RING SHALL BE THE PARALLEL TYPE, EXCEPT FOR THE GROUND RODS WHICH ARE TEE EXOTHERMIC WELDS. REPAIR ALL GALVANIZED SURFACES THAT HAVE BEEN DAMAGED BY EXOTHERMIC WELDING. USE SPRAY GALVANIZER SUCH AS HOLUB LECTROSOL #15-501.

COMPOUND NOTES

1. THE MINIMUM LOWEST FIRST FLOOR ELEVATION SHALL NOT BE LESS THAN 4" ABOVE CROWN OF ROAD OR THE FEDERAL AND/OR COUNTY FLOOD CRITERIA ELEVATION, WHICHEVER IS HIGHER. CONTRACTOR SHALL SUBMIT AN ELEVATION CERTIFICATE (IF REQUIRE BY THE JURISDICTION) UPON COMPLETION OF PROJECT.
2. WORK OUTSIDE OF THE PROPERTY LINE INCLUDED IN THIS SET OF DRAWINGS SHALL BE, BUT NOT LIMITED TO, DRIVEWAYS, SODDING TO ASPHALT LINE AND UTILITY CONNECTIONS.
3. EXISTING TREES WITHIN CONSTRUCTION FOOTPRINT SHALL BE REMOVED AND PROPERLY DISPOSED OF. CONTRACTOR SHALL PROCURE PERMIT PRIOR TO REMOVAL.
4. CONTRACTOR AND SUBCONTRACTORS SHALL VERIFY ALL UTILITY SERVICE CONNECTION LOCATIONS PRIOR TO SUBMITTING BID AND PROCEEDING WITH WORK. IT IS RECOMMENDED THAT THE CONTRACTOR VISIT THE SITE AND VERIFY ALL DIMENSIONS AND NOTES BEFORE SUBMITTING BID AND PROCEEDING WITH WORK.
5. SOIL AT THIS SITE IS UNDISTURBED ROCK AND SAND ADEQUATE OF SUPPORTING THE DESIGN LOAD OF 2000 P.S.F. IF OTHER CONDITIONS ARE ENCOUNTERED, NOTIFY MIRRISON HERSHFIELD BEFORE PROCEEDING WITH WORK. THIS VALUE IS CONSIDERED SAFE WITH RESPECT TO ACTUAL FAILURE OF THE SUPPORTING GROUND, BUT DOES NOT NECESSARILY ENSURE THE PREVENTION OF EXCESSIVE FOUNDATION MOVEMENTS.
6. BURY PHONE, AND ELECTRIC SERVICE NO LESS THAN 24" BELOW FINISH GRADE WITH 1'-0" RADIUS SAND BACKFILL AROUND PIPES. COORDINATE W/ ELECTRICAL DRAWINGS.
7. IN ORDER TO AVOID ANY CONFLICTS, CONTRACTOR SHALL COORDINATE ALL HIS PRACTICAL TRADES.
8. THE POWER CABINET MUST BE CLEAR OF FLAMMABLE MATERIAL WITHIN 12 INCHES OF THE CABINET, INCLUDING ABOVE THE CABINET.
9. EXHAUST OUTLETS MUST BE LOCATED AT LEAST 10 FEET FROM ANY HVAC AIR INTAKES, WINDOWS, DOORS, AND OTHER OPENINGS INTO A BUILDING – COORDINATE IN FIELD.
10. THE POWER CABINET MUST BE MOUNTED ON THE FOUNDATION TO ALLOW WATER TO DRAIN FROM THE DRAIN OUTLET AND AWAY FROM THE CABINET.
11. TO ENSURE SERVICEABLE ABILITY, THE DOORS OF CABINETS WILL REQUIRE AN OPENING RADIUS OF 36 INCHES OF CLEARANCE FROM THE CLOSED POSITION TO THE OPEN POSITION.

IMPORTANT NOTICE

THE EXISTING CONDITIONS REPRESENTED HEREIN ARE BASED ON VISUAL OBSERVATIONS AND INFORMATION PROVIDED BY OTHERS. MORRISON HERSHFIELD CORPORATION CANNOT GUARANTEE THE CORRECTNESS NOR COMPLETENESS OF THE EXISTING CONDITIONS SHOWN AND ASSUMES NO RESPONSIBILITY THEREOF. CONTRACTOR AND HIS SUB-CONTRACTORS SHALL VISIT THE SITE AND VERIFY ALL EXISTING CONDITIONS AS REQUIRED FOR PROPER EXECUTION OF PROJECT. REPORT ANY CONFLICTS OR DISCREPANCIES TO THE CONSULTANT PRIOR TO CONSTRUCTION.

PROJECT INFORMATION

1. THIS IS AN UNMANNED AND RESTRICTED ACCESS EQUIPMENT AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC 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.
6. **eyeTower, LLC** MAINTENANCE CREW (TYPICALLY ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.

SITE GENERAL NOTES

1. RESTORE EXISTING ASPHALT AND/OR CONCRETE COMPOUND TO IT'S ORIGINAL CONDITION
2. CONTRACTOR SHALL DETECT AND MARK ANY UNDERGROUND LINES, PIPING, PRIOR TO START OF EXCAVATION

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

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1	.	.
0	05/16/16	ISSUED FOR PERMIT
A	05/10/16	90% CD SUBMITTAL
No.	Date	Action

Carrier:

eyeTOWER

2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

Tower Owner/Client:

CROWN CASTLE

100 REGENCY FOREST DRIVE, SUITE 150
CARY, NC 27518

A/E Consultant:

MORRISON HERSHFIELD

8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.8861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

841793
BDL201

50 PINE LANE
WINDSOR, CT 06095

Drawing Title:

NOTES

Project No.: 7160018

Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No.: G-1

SCALE IS BASE ON 22" X 34" "D" SIZE

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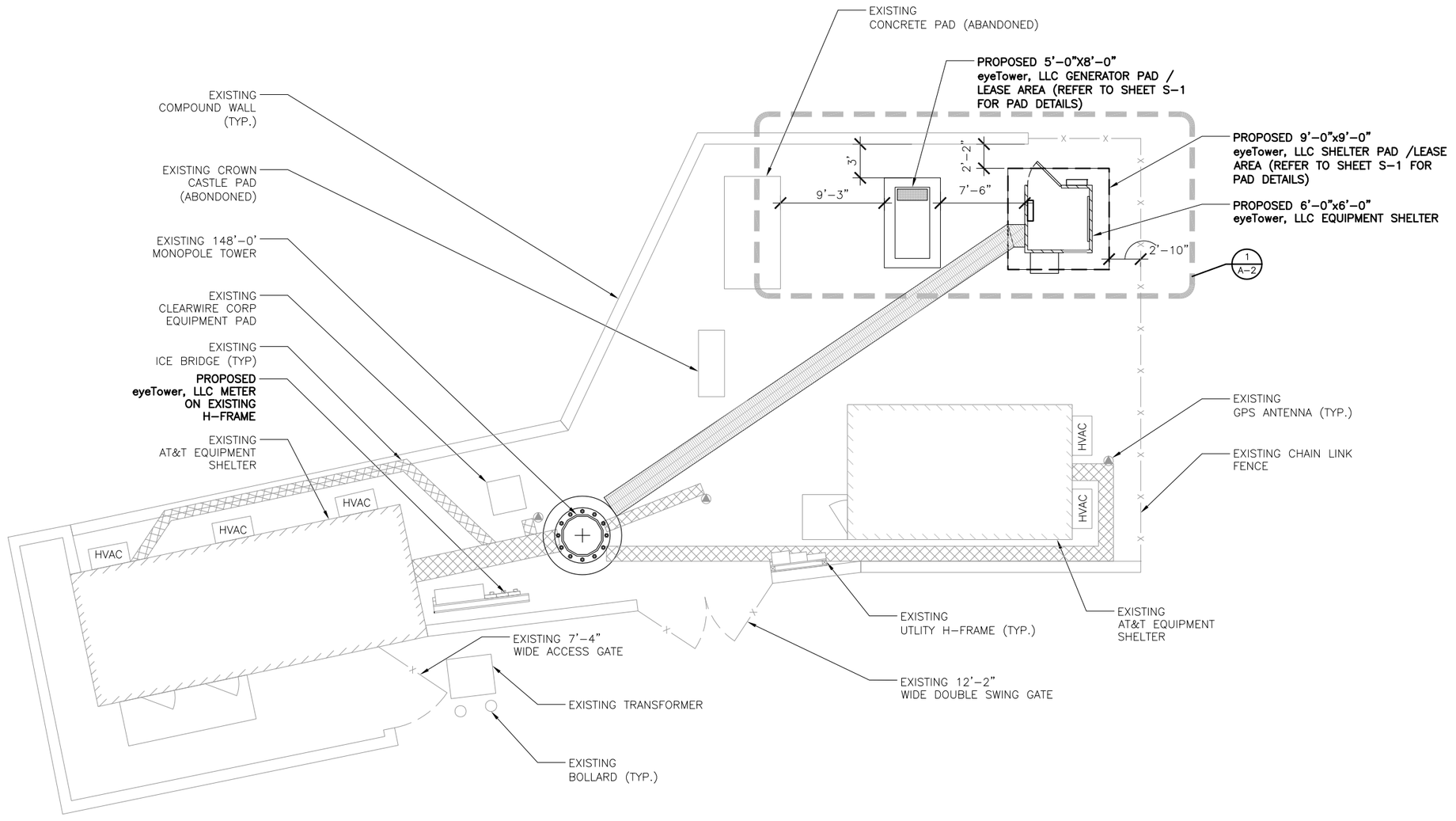

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Know what's **below.**
Call before you dig.

NOTE:
THE NEW CONSTRUCTION WILL NOT DISTURB OR DESTROY EXISTING LANDSCAPING OR TREES.

NOTE:
SITE PLAN INFORMATION CONTAINED HEREIN IS TAKEN FROM THE DOCUMENTS PROVIDED BY CLIENT. NEITHER WARRANTY NOR GUARANTEE IS GIVEN BY THE ARCHITECT NOR MORRISON HERSHFIELD CORPORATION TO THE ACCURACY NOR THE COMPLETENESS OF THE COPIED SURVEY/SITE PLAN INFORMATION.

TRUE NORTH

COMPOUND PLAN

ANSI "D" SCALE: 3/16" = 1'–0"
ANSI "B" SCALE: 3/32" = 1'–0"
4' 2' 0" 4'

1

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

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WINDSOR, CT 06095

Drawing Title:
COMPOUND PLAN

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-1

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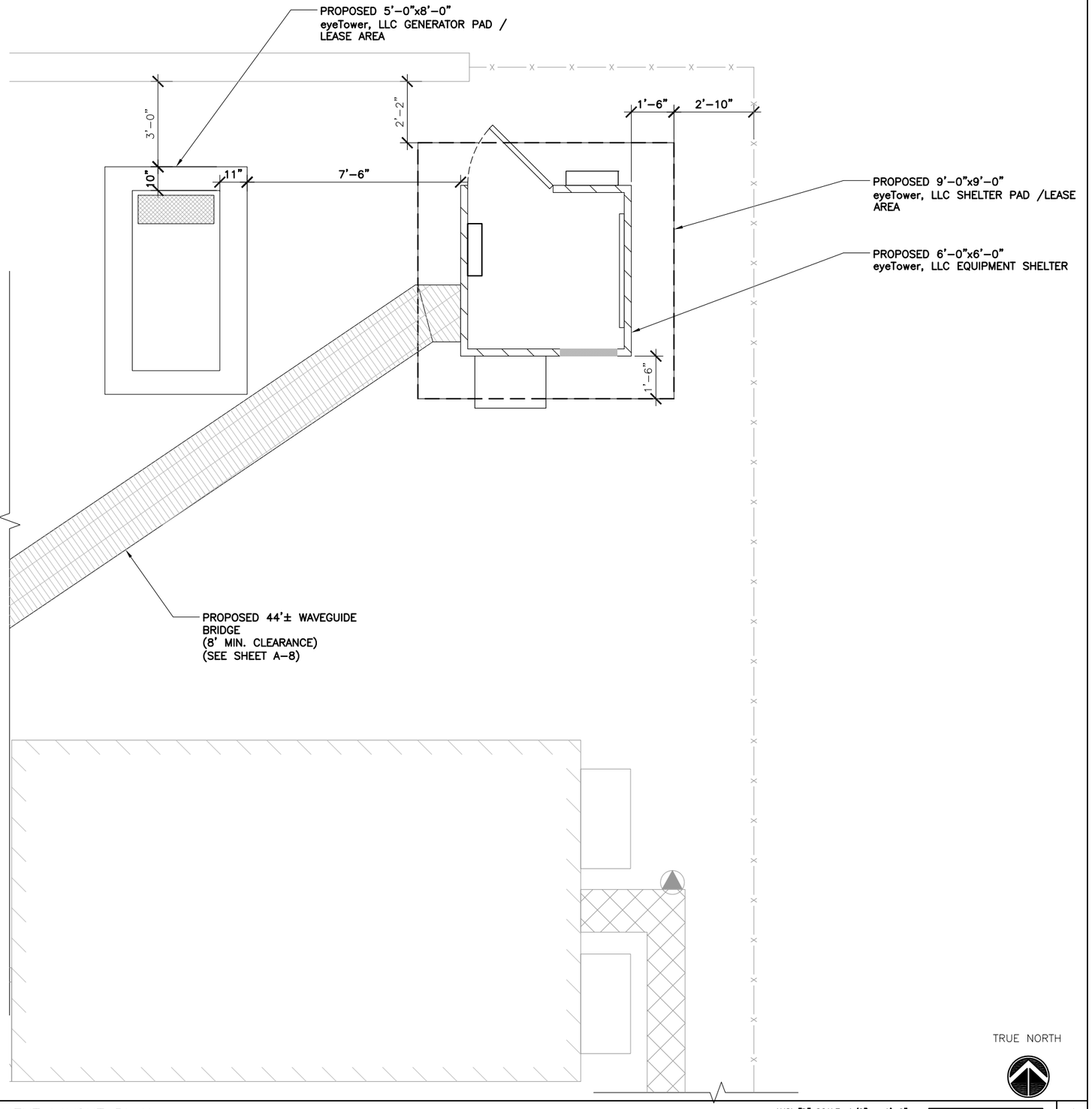
GENERAL REFERENCE NOTES

1. DAMAGE TO ALL UTILITIES, LAND, ACCESS AREAS, AND PROPERTY OF OTHERS DISTURBED DURING CONSTRUCTION SHALL BE RETURNED TO THE ORIGINAL CONDITION AT THE COMPLETION OF THE WORK.
2. REMOVE ANY EXISTING VEGETATION AND ORGANIC MATERIALS FROM THE LEASE AREA.
3. RE-GRADE AROUND THE EQUIPMENT SLAB AS REQUIRED TO ALLOW A MAXIMUM 4" OF PAD THICKNESS EXTENDING ABOVE THE FINISHED GRAVEL SURFACE. REPLACE GRAVEL AROUND SLAB AT COMPLETION OF INSTALLATION.
4. ALL WORK SHALL BE DONE IN A SATISFACTORY AND PROFESSIONAL WORKMANLIKE MANNER. ALL WORK SHALL BE SUBJECT TO INSPECTION DURING CONSTRUCTION AND FINAL APPROVAL BY THE CONSTRUCTION MANAGER.
5. ANY SUBSTITUTIONS OF MATERIALS, EQUIPMENT, OR DEVIATIONS FROM THE DESIGN PLAN OR SPECIFICATIONS SHALL BE COORDINATED AND APPROVED BY THE CONSTRUCTION MANAGER.
6. COLOR SELECTION FOR PAINTED ITEMS SHALL BE MADE BY THE CONSTRUCTION MANAGER.
7. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS SHOWN PRIORTO BID SUBMITTAL. AND CONFLICTS, DISCREPENCIES, ERRORS, AND/OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER.
8. CONTRACTOR SHALL CONTACT A SUBSURFACE UTILIES LOCATOR FOR EXACT LOCATIONS OF ALL EXISTING UTILITES WITHIN DISTURBED AREAS, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL VERIFY THE LOCATIONS OF EXISTING UTILITES BY DIGGING A TEST PIT, AS NECESSARY. THE LOCATIONS OF EXISTING UTILITES SHOWN ON THESE PLANS ARE APPROXIMATE AND ARE FOR PLANNING PURPOSES ONLY.
9. THE CONTRACTOR SHALL PROVIDE ANY NECESSARY PROTECTION FOR EXISTING UTILITES DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL MAINTAIN A CLEAN SET OF CONSTRUCTION DRAWINGS AT THE SITE FOR THE PURPOSE OF DOCUMENTING "AS-BUILT" CONDITIONS AND DEVIATIONS FORM THE ORIGINAL DESIGN. THE REDLINE DRAWINGS SHALL BE TURNED OVER TO THE CONSTRUCTION MANAGER AT THE COMPLETION OF THE PROJECT.
11. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS FOR THE PROJECT FROM ALL APPLICABLE GOVERNMENT AGENCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BE ALL THE CONDITIONS AND REQUIREMENTS OF THE PERMITS.
12. THE CONTRACTOR SHALL PROTECT ALL SURVEY STATIONS AND CONTROL POINTS DURING CONSTRUCTION AND SHALL RE-ESTABLISH ANY DISTURBED CONTROL POINTS.
13. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE GOVERING LOCAL BUILDING CODE AND ALL APPLICABLE AMENDMENTS. THE CONTRACTOR SHALL COORDINATE WITH THE LOCAL GOVERNING LOCAL OFFICAL FOR LOCAL BUILD CODE REQUIREMENTS.
14. THE CONTRACTOR SHALL VISIT THE PROJECT SITE AND FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS INCLUDING SITE ACCESS PRIOR TO BID SUBMITTAL. ANY CHANGES DURING CONSTRUCTION DUE TO AN EXISTING CONDITION WHICH IS VISUALLY ASCERTAINABLE PRIOR RO BID SUBMITTAL, CANNOT BE USED AS THE BASIS FOR A CHANGE ORDER.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL WASTE DEBRIS AND VEGETATION FROM THE SITE. BURIAL AND/OR BURNING OF WASTE MATERIALS IS NOT ACCEPTABLE.

NOTES:

1. CONDUIT ROUTING IS SCHEMATIC ONLY, CONTRACTOR SHALL DETERMINE SUITABLE ROUTING IN THE FIELD.
2. CONTRACTOR TO REUSE EXISTING CONDUITS ROUTED TO EXISTING GENERATOR AS POSSIBLE. FIELD VERIFY.
3. CONTRACTOR SHALL TEST & CERTIFY CONDITION OF EXISTING GAS LINE PRIOR TO CONNECTION OF NEW GENERATOR OR REPLACE W/NEW LINE – SEE ISOMETRIC DIAGRAM DETAIL A/A-4.



EQUIPMENT LAYOUT PLAN

ANSI "D" SCALE: 1/2" = 1'-0"
ANSI "B" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'

1

STATE OF CONNECTICUT
ROBERT J. LARA
LICENSED ARCHITECT
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Project:

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BDL201

50 PINE LANE
WINDSOR, CT 06095

Drawing Title:

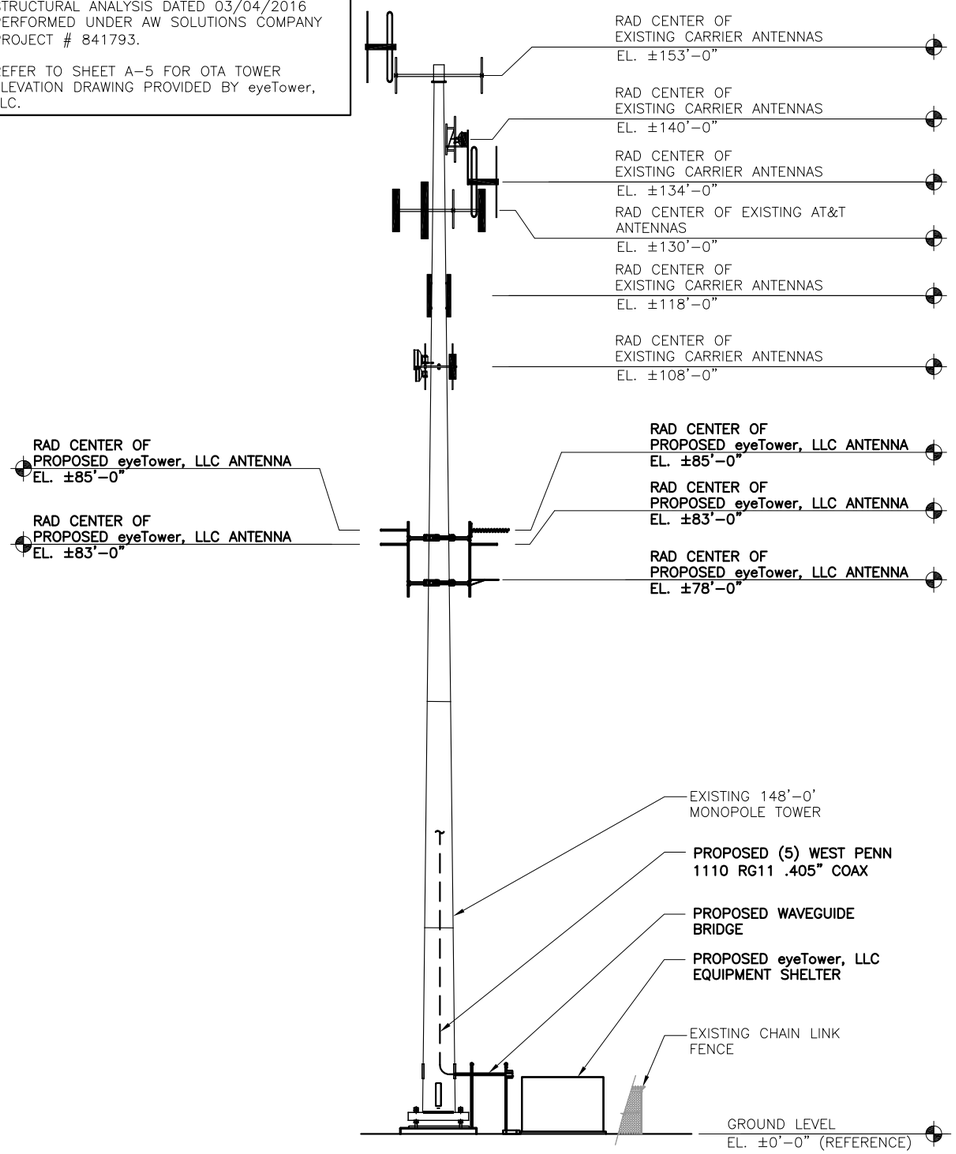
EQUIPMENT LOCATION PLAN

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-2

SCALE IS BASE ON 22" X 34" "D" SIZE

NOTE:
NO WORK SHALL COMMENCE WITHOUT THE APPROVED TOWER/ANTENNA MOUNT STRUCTURAL ANALYSIS REPORT SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER UNDER SEPARATE COVER. IF REQUIRED, THE CONTRACTOR SHALL MODIFY TOWER AND/OR ANTENNA MOUNTS AS INDICATED IN THE ABOVE MENTIONED STRUCTURAL REPORT OR ASSOCIATED MODIFICATION DESIGN DRAWINGS.

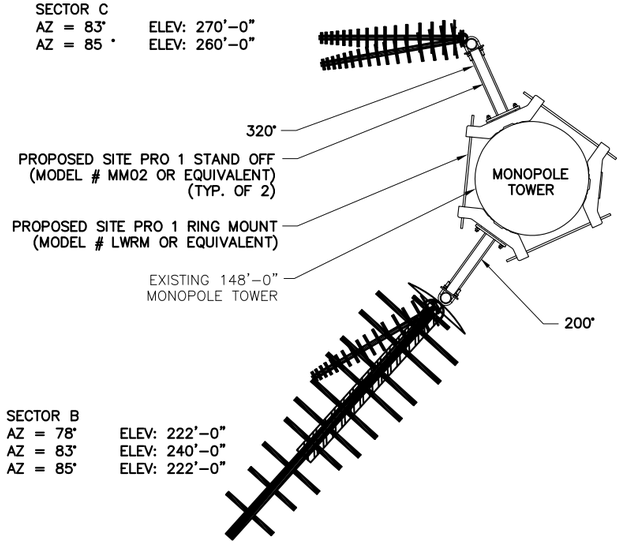
NOTE:
1. REFER TO AW SOLUTIONS PASSING STRUCTURAL ANALYSIS DATED 03/04/2016 PERFORMED UNDER AW SOLUTIONS COMPANY PROJECT # 841793.
2. REFER TO SHEET A-5 FOR OTA TOWER ELEVATION DRAWING PROVIDED BY eyeTower, LLC.



TOWER ELEVATION

ANSI "D" SCALE: 3/32" = 1'-0"
ANSI "B" SCALE: 3/64" = 1'-0"
8' 4' 0" 8'

NOTE:
1. REFER TO ANTENNA SCHEDULE FOR ADDITIONAL INFO.
2. ADJUST ANTENNA MOUNTS AS REQUIRED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT RF SHADOWING.
3. CONTRACTOR TO FIELD VERIFY TOWER DIAMETER PRIOR TO ORDERING MOUNT.



TRUE NORTH

ANTENNA LAYOUT

ANSI "D" SCALE: 1/2" = 1'-0"
ANSI "B" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

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Carrier:
eyeTOWER
2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

Tower Owner/Client:
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www.morrisonhershfield.com

Project:
841793
BDL201
50 PINE LANE
WINDSOR, CT 06095

Drawing Title:
TOWER ELEVATION & ANTENNA ORIENTATION

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-3

SCALE IS BASE ON 22" X 34" "D" SIZE

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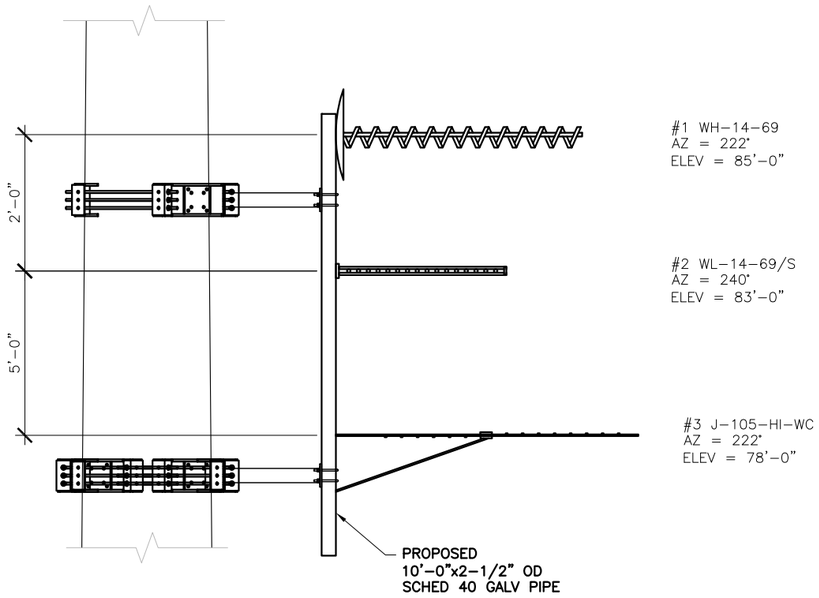
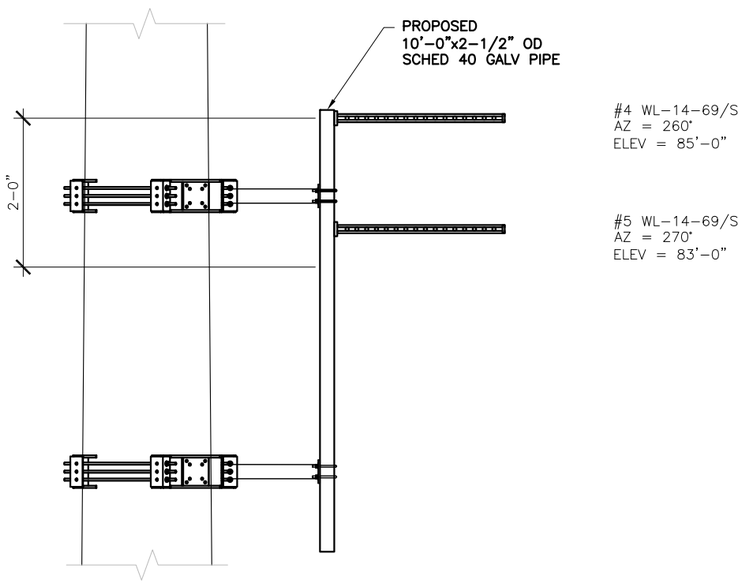


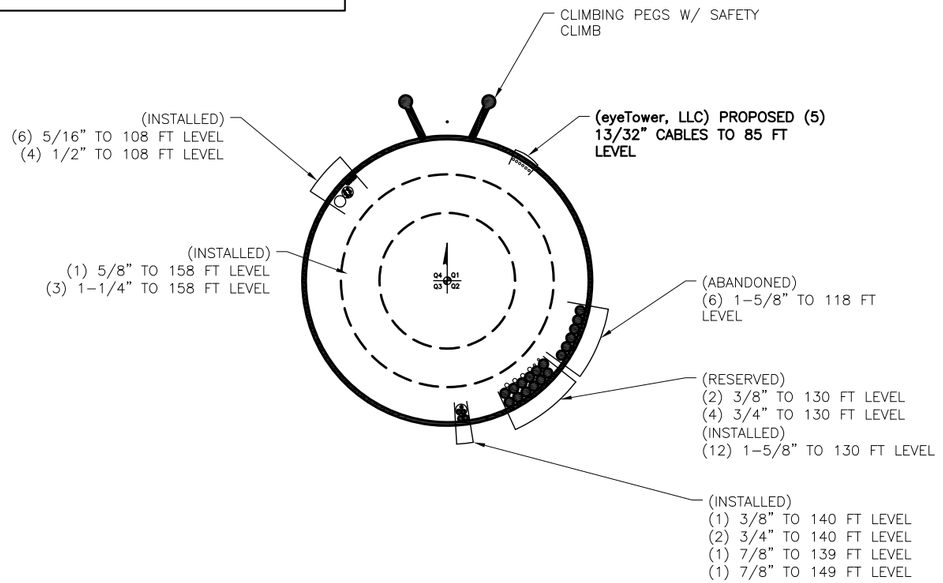
BETA SECTOR



GAMMA SECTOR

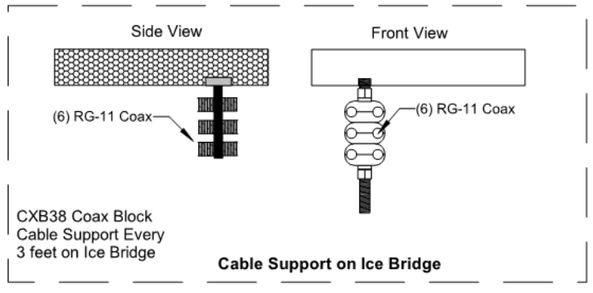
ANTENNA DETAIL — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 1

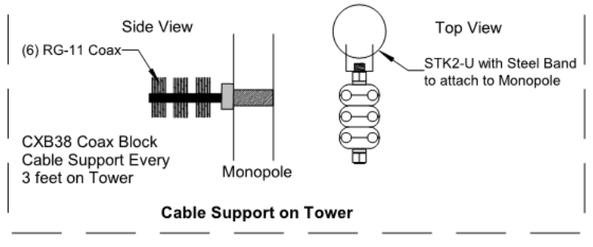
NOTE:
REFER TO AW SOLUTIONS PASSING STRUCTURAL ANALYSIS DATED 03/04/2016 PERFORMED UNDER AW SOLUTIONS COMPANY PROJECT # 841793.



BASE LEVEL VIEW — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 2

Cable Support Detail





CABLE SUPPORT DETAIL — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 3

STATE OF CONNECTICUT
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Project:

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BDL201

50 PINE LANE
WINDSOR, CT 06095

Drawing Title:

ANTENNA DETAILS

Project No.:	
7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No.: A-4

SCALE IS BASE ON 22" X 34" "D" SIZE

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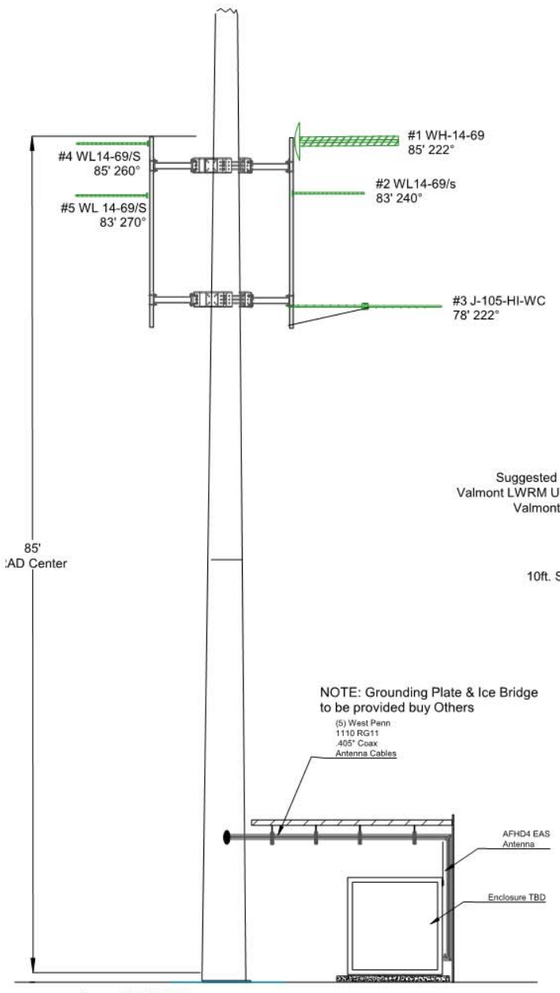

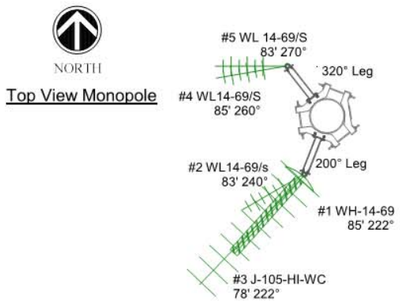

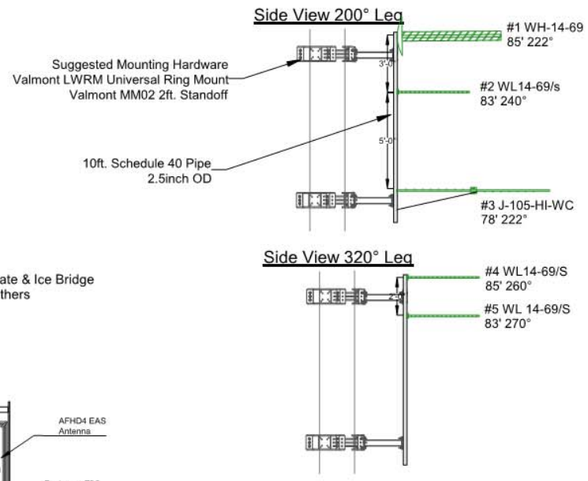

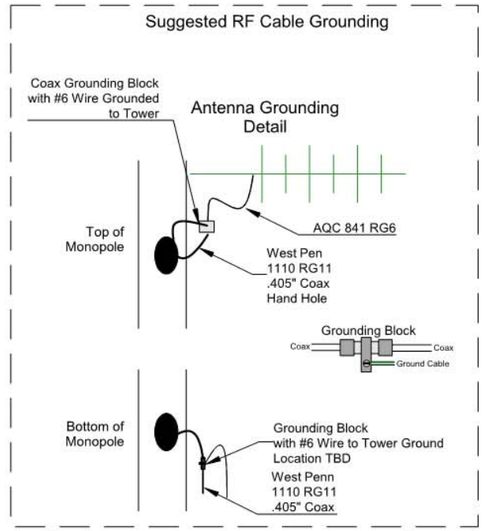

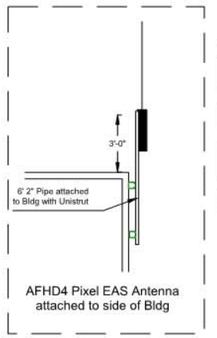

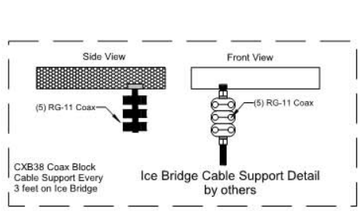

NOTE:

OTA TOWER ELEVATION DRAWING WAS PROVIDED BY eyeTower, LLC.

eye Tower LLC 841793 Hartford
50 Pine Lane Windsor, CT
OTA Monopole Elevations

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CARY, NC 27518

A/E Consultant:
MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
841793
BDL201
50 PINE LANE
WINDSOR, CT 06095

Drawing Title:
OTA TOWER ELEVATION

Project No.: 7160018

Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-5

SCALE IS BASE ON 22" X 34" "D" SIZE

DASCOM SYSTEMS GROUP
2415 Ventura Drive, Woodbury, MN. 55125
Phone: (651) 578-1200 Fax: (651) 578-2555
www.dascom-systems.com

Title: OTA Monopole Elevations	Engineered By:
Customer: eye Tower 841793	Drawn by: KDO
Project: 841793 Hartford	Approved By:
Revision:	Scale: NTS
Job # : 841793	Date: 05/04/16

Project: 841793 Hartford OTA Monopole 050216

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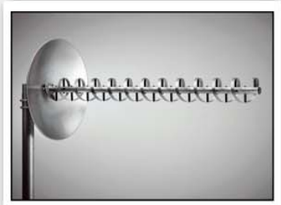
WADE Antenna, Inc.



Helical Antennas

WH14-69/24, WH14-69/32, WH14-69/43

Description

The Wade Helical Antenna is circularly polarized for CATV Off-Air reception. The WH14-69 covers the entire UHF band (470- 806 MHz), channels 14 through 69.

Available as a single antenna or a customized antenna array. Electrical performance of the WH14-69, along with the high quality of materials used in the construction of this antenna, have resulted in a superior performance and longevity even when exposed to the most extreme weather conditions.

ELECTRICAL SPECIFICATIONS

SPECIFICATION	WH14-69/24	WH14-69/32	WH14-69/43
FREQUENCY RANGE	470-806 MHz	470-806 MHz	470-806 MHz
GAIN (dBic)	17	18	19
GAIN (dBi)	14	15	16
NUMBER OF TURNS	12	12	12
VSWR MAX	1.9	1.9	1.9
VSWR TYPICAL	1.4	1.4	1.4
HPBW HORIZONTAL	30	27	24
HPBW VERTICAL	28	25.5	23
POLARIZATION	Circular	Circular	Circular
SIDELOBE SUPPRESSION	15dB	16dB	17dB
F/B RATIO (dB)	>23	>25	>27
CROSS POLARIZATION SUPPRESSION	20dB	20dB	20dB
IMPEDANCE	75 Ohm	75 Ohm	75 Ohm
CONNECTOR	"F" Connector	"F" Connector	"F" Connector
MAX. INPUT POWER	25 W	25 W	25 W
TEMPURATURE (C)	-40 to +70	-40 to +70	-40 to +70

MECHANICAL SPECIFICATIONS

SPECIFICATION	WH14-69/24	WH14-69/32	WH14-69/43
OVERALL LENGTH	65"	65"	65"
HELIX DIAMETER	5.875"	5.875"	5.875"
GROUND PLANE DIAM.	24	32	42.67
STUB LENGTH	6.5"	6.5"	6.5"
STUB OD	1.5"	1.5"	1.5"
ANTENNA WEIGHT (lbs)	12	13	14
MOUNTING OPTION	Mast	Mast	Mast
MAST OD	2.5"	2.5"	2.5"

WIND LOAD SPECIFICATIONS

SPECIFICATION	WH14-69/24	WH14-69/32	WH14-69/43
WIND AREA (Sq. ft.)			
NO ICE *	1.64	1.94	2.32
1" RADIAL ICE **	3.68	4.02	4.42
WIND LOAD (ft. lbs)			
NO ICE *	143	169	203
1" RADIAL ICE **	93	102	122
SURVIVAL WIND SPEED (no ice)	180	165	151

*Wind Speed: 100mph **Half Wind: 50mph

Wade Antenna's ongoing policy of continuing development may result in specification changes to its products.

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29 Sharp Road, Brantford, Ontario, N3T 5L8 Canada
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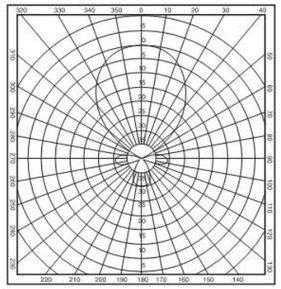
WADE Antenna, Inc.



SINGLE UHF ANTENNA MODEL:

- WL 14-69/S

A single broadband UHF model provides optimum performance over the desired band. The 75 Ohm feed point is sealed within the boom. A short length of cable is fitted with a standard "F" connector for connection to the down lead. This light weight, high quality antenna is small in size and big on performance.

ELECTRICAL SPECIFICATIONS:

MODEL(S)	WL-14-69/S
Frequency Range (MHz)	470-800 MHz
Channels	14 to 69
Gain	11 dBi
Impedence	75 Ohm
VSWR	<1.25:1
FR:BK Ratio	>25 dB
Polarization	H or V
H. Beam Width	46 deg.
V. Beam Width	65 deg.
Side lobe Suppression	>30 dB
Connectors	"F" Connector
Std. Mount	3/8" U-bolts to fit 2-7/8" O.D. Pipe

- Where interfering signals such as co-channel, adjacent channel and ghosting are present, custom arrays can be designed to reduce the level of interference by as much as 40 db in most cases.

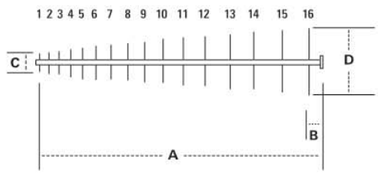
MECHANICAL SPECIFICATIONS:

MODEL(S)	WL-14-69/S
Boom length	45.25"
Weight (lbs):	
No ice	5.8
1" radial ice	35
Wind load (lbs):	
No ice*	23
1" radial ice**	15
Wind torque (ft-lbs):	
No ice*	43.5
1" radial ice**	28.5
Wind load area (sq.ft.)	
No Ice	0.63
1" Radial Ice	1.42

*** WIND SPEED - 100 M.P.H. ** HALF WIND SPEED - 50 M.P.H.**

OVERALL DIMENSIONS

MODEL(S)	WL-14-69/S
Number of Elements	16
Boom Length (A)	45.25"
Boom Length (B)	2.675"
Shortest Length (C)	3.675"
Longest Element (D)	11"



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Fax: 519.756.5056

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www.wadeantenna.com

STATE OF CONNECTICUT
ROBERT J. LARA
LICENSED ARCHITECT
No. 11509

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

No.	Date	Action
4	.	.
3	.	.
2	.	.
1	.	.
0	05/16/16	ISSUED FOR PERMIT
A	05/10/16	90% CD SUBMITTAL

Carrier:

eyeTOWER
2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

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Project:

841793
BDL201

50 PINE LANE
WINDSOR, CT 06095

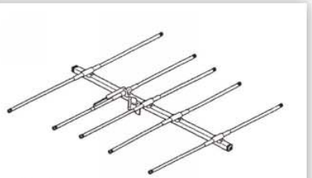
Drawing Title:

ANTENNA SPECS

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-6

SCALE IS BASE ON 22" X 34" "D" SIZE

WADE Antenna, Inc.


J55-*


J105-*

J-Series YAGI and LOG Periodic Antenna

J55-* (Single Channel), J105-* (Single Channel), J55-LO (Log Periodic), J105-HI (Log Periodic)

Description

J-Series system antennas are specifically designed for commercial and industrial master antenna installations. Their heavy-duty construction ensures reliability under severe climatic conditions, providing a durable, trouble-free operation. Available in both cut-to-channel yagi and broadband models. Our single channel antennas feature sharp directivity for high gain, and excellent front-to-back ratios. Broadband models are of true log periodic design assuring extremely flat response and matched output over the entire band. All antennas are available with the exclusive Wade Cantilever Mount. Our J Series antennas are the answer to any system where high reliability or long life is a must.

Features

- Extra heavy-duty construction
- Seamless end-sealed chrome aluminum tubing prevents moisture penetration
- Anti-corrosion ensures maintenance free, weather resistant installation
- Stack vertically or horizontally for increased gain and directivity
- 125 mph wind velocity survival rating
- Cantilever mount available for all models

ELECTRICAL SPECIFICATIONS

	Cut Channel		Broadband	
MODEL	J55-*	J105-*	J55-LO	J105-HI
NO. ELEMENTS	5	10	5	10
CHANNEL*	2 to FM*	7 to 13*	2 Thru FM	7 Thru 13
GAIN	10 dBi	12.5 dBi	10 dBi	10.5 dBi
IMPEDANCE	75 Ohm	75 Ohm	75 Ohm	75 Ohm
VSWR	1.5:1	1.5:1	1.5:1	1.5:1
FR:BK RATIO	18 dB	20 dB	22 dB	22 dB
POLARIZATION	Horiz.	Horiz.	Horiz.	Horiz.
H. BEAM WIDTH	60 deg.	44 deg.	60 deg.	49 deg.
V. BEAM WIDTH	100 deg.	59 deg.	100 deg.	75 deg.
CONNECTOR	"F" Connector	"F" Connector	"F" Connector	"F" Connector
CENTRE MOUNT	Standard	Standard	Standard	Standard
CANTILEVER MOUNT	Optional	Optional	Optional	Optional
PIPE SIZE **	Up to 2.5" O.D.	Up to 2.5" O.D.	Up to 2.5" O.D.	Up to 2.5" O.D.

* Specify Channel ** Larger sizes available on request

** See reverse for Mechanical Specifications and more images. **

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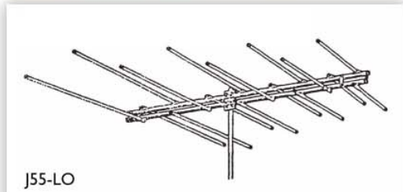
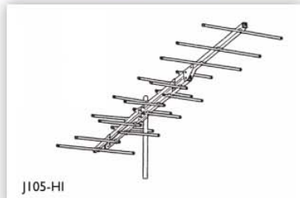
WADE Antenna, Inc.

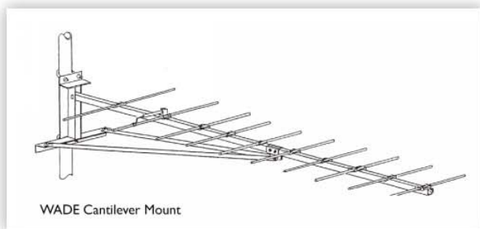

J55-LO


J105-HI

MECHANICAL SPECIFICATIONS

				THRUST (FT-Lbs)	
MODEL	LENGTH (IN.)	WIDTH (IN.)	WEIGHT (LBS)	NO ICE	1/4" ICE
J55-LO	94	54	24	69	109
J105-HI	104	33	19	55	77
J55-2	102	110	18	52	80
J55-3	89	100.5	18	46	72
J55-4	88	89	17	40	66
J55-5	80	77	16	36	60
J55-6	71	70	16	32	54
J55-FM	79	65	16	32	54
J105-7	98	33.5	16	35	55
J105-8	98	32.5	16	33.5	52.5
J105-9	98	31.5	15	31.5	50
J105-10	91	30.5	15	30	48.5
J105-11	91	30	15	28.5	46.3
J105-12	85	28.5	15	27.5	44
J105-13	82	27	15	26	42

* Length of longest element ** Wind speed 100mph


WADE Cantilever Mount

Wade Antenna's ongoing policy of continuing development may result in specification changes to its products.

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sales@wadeantenna.com
www.wadeantenna.com

SPEC0017_A02

STATE OF CONNECTICUT ROBERT J. LARA LICENSED ARCHITECT No. 11509

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

4	.	.
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1	.	.
0	05/16/16	ISSUED FOR PERMIT
A	05/10/16	90% CD SUBMITTAL
No.	Date	Action

Carrier:
eyeTOWER
2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

Tower Owner/Client:
CROWN CASTLE
100 REGENCY FOREST DRIVE, SUITE 150
CARY, NC 27518

A/E Consultant:
MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
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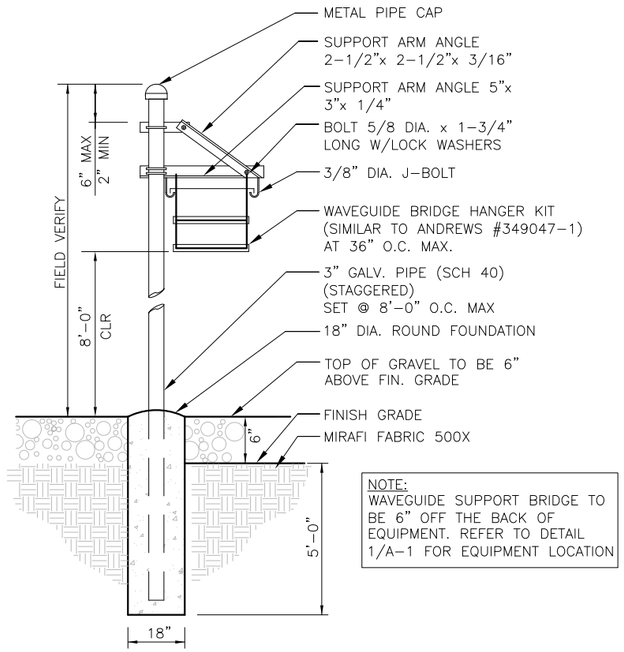
Project:
841793
BDL201
50 PINE LANE
WINDSOR, CT 06095

Drawing Title:
ANTENNA SPECS

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-7

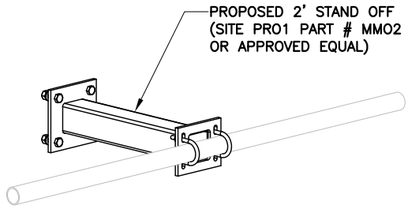
SCALE IS BASE ON 22" X 34" "D" SIZE

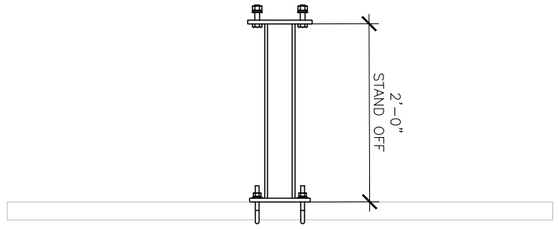


NOTE:
WAVEGUIDE SUPPORT BRIDGE TO BE 6" OFF THE BACK OF EQUIPMENT. REFER TO DETAIL 1/A-1 FOR EQUIPMENT LOCATION

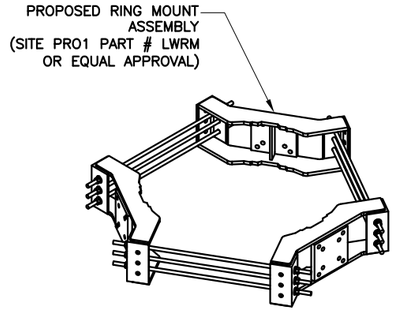
WAVEGUIDE BRIDGE DETAIL — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 1

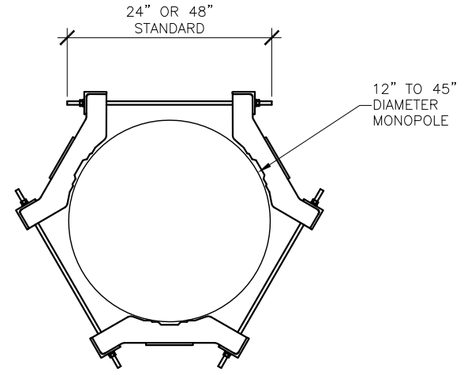
NOT USED — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 2





MOUNT DETAIL — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 3





RING MOUNT DETAIL — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 4

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

No.	Date	Action
4	.	.
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0	05/16/16	ISSUED FOR PERMIT
A	05/10/16	90% CD SUBMITTAL

Carrier:
eyeTOWER
2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

Tower Owner/Client:
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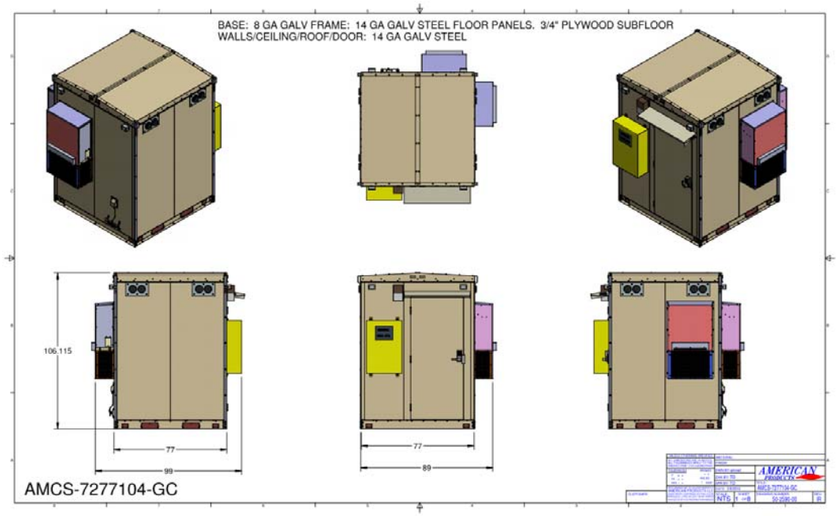
Drawing Title:
DETAILS

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-8

SCALE IS BASE ON 22" X 34" "D" SIZE

1 2 3 4 5 6



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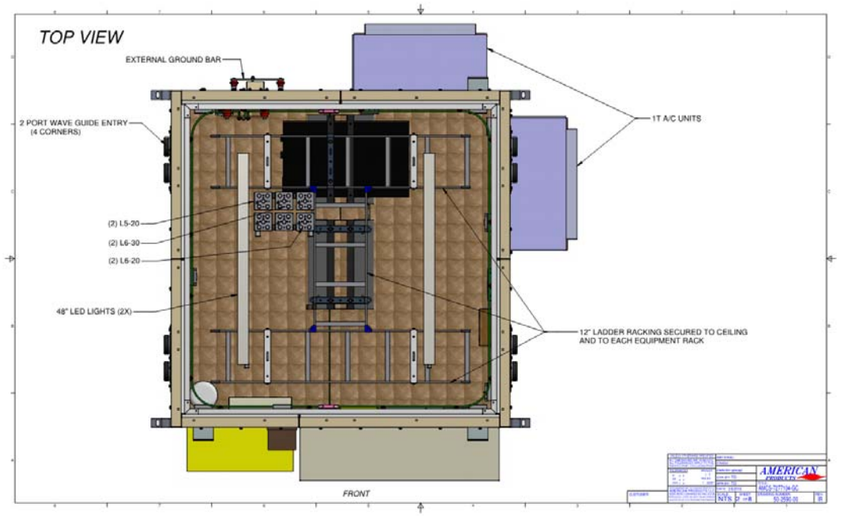

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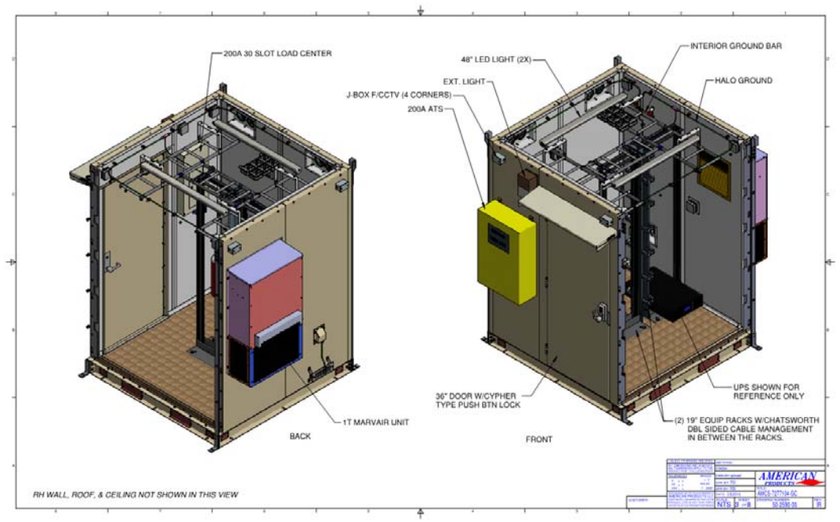

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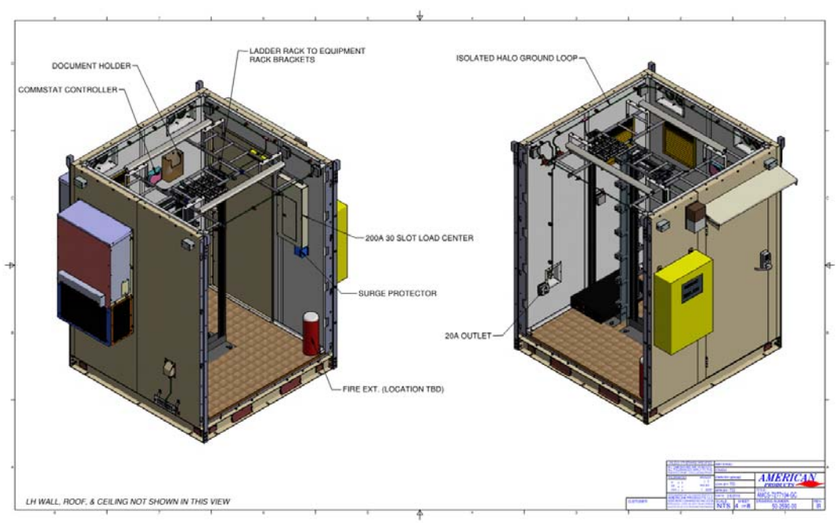

SHELTER DETAIL — 22"x34" SCALE: NOT TO SCALE; 11"x17" SCALE: NOT TO SCALE — 4

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

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Drawing Title:

DETAILS

Project No.:	
7160018	
Designer: CG	Date: 05/10/16
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Issue No.: 0	Drawing No. A-9

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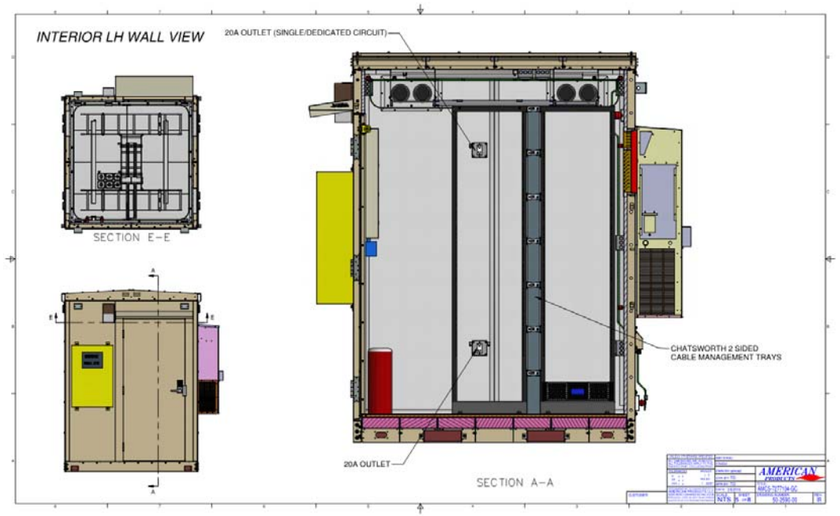
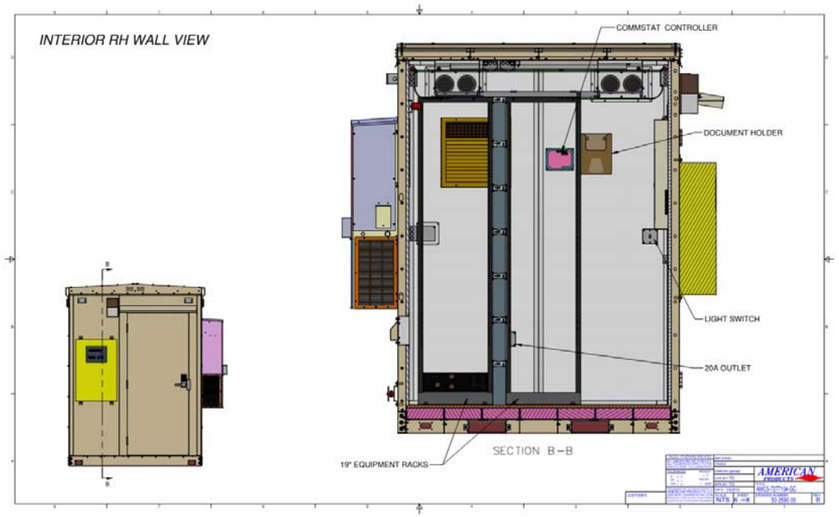


SHELTER DETAIL — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 1



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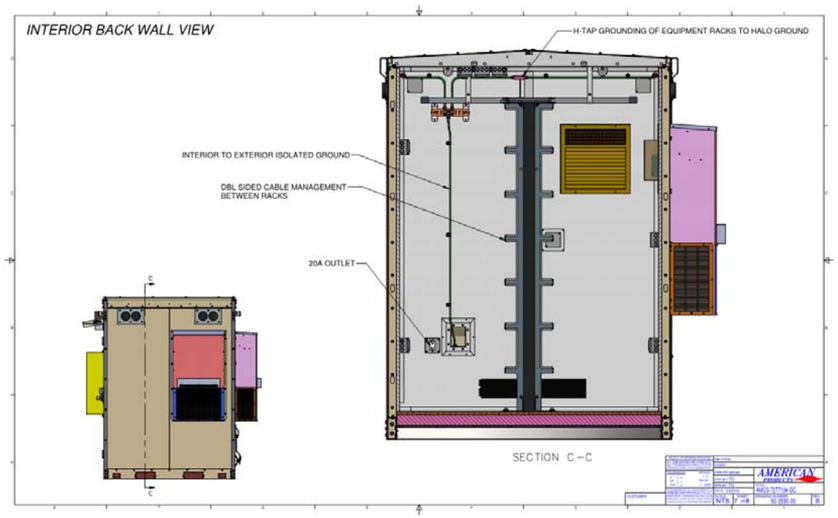

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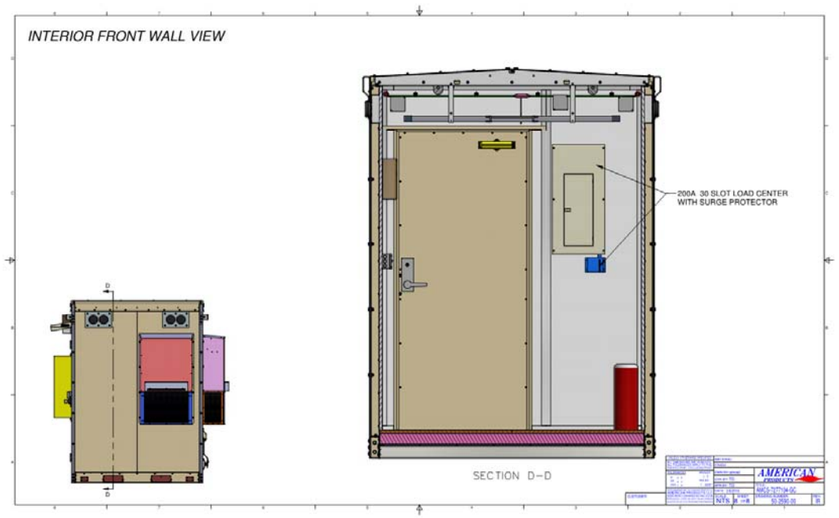

SHELTER DETAIL — 22"x34" SCALE: NOT TO SCALE / 11"x17" SCALE: NOT TO SCALE — 4

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

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Drawing Title:

DETAILS

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PM Review: CG	Client Approval
Issue No.: 0	Drawing No.: A-10

SCALE IS BASE ON 22" X 34" "D" SIZE

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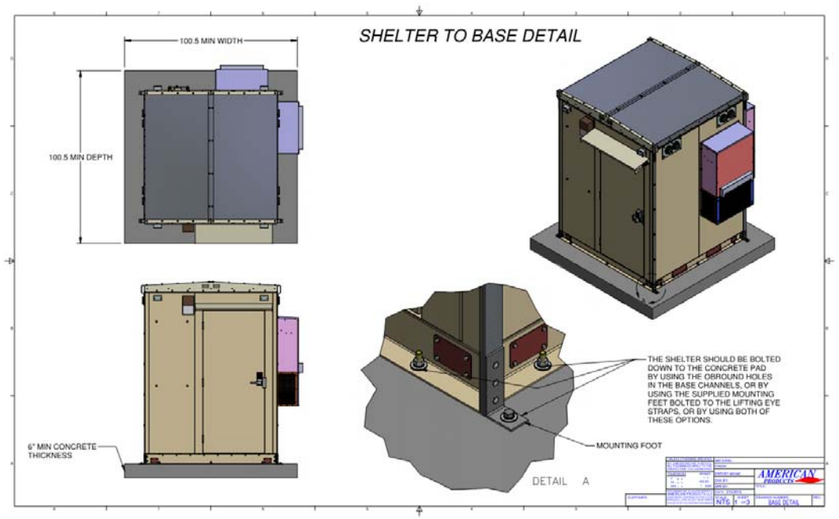
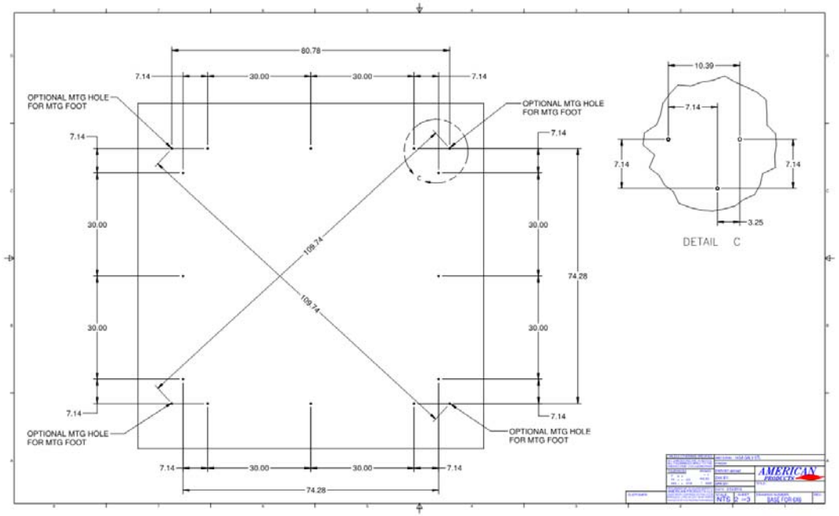


SHELTER DETAIL — 22"x34" SCALE: NOT TO SCALE; 11"x17" SCALE: NOT TO SCALE — 1



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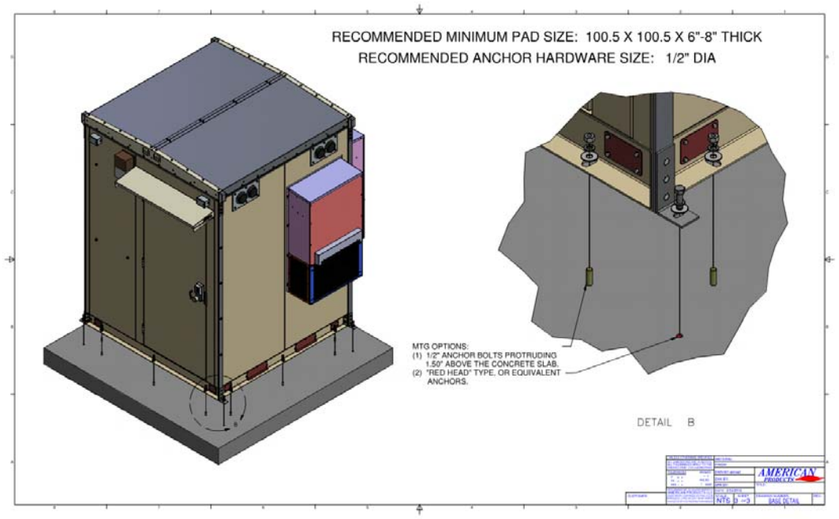
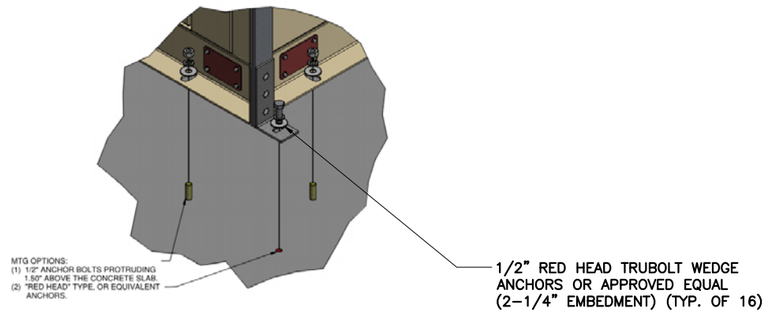
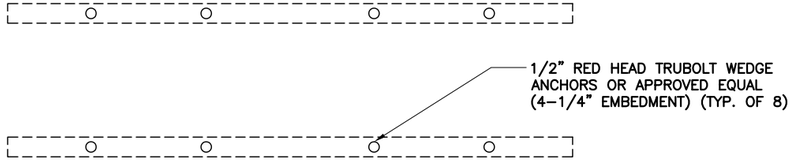


SHELTER DETAIL — 22"x34" SCALE: NOT TO SCALE; 11"x17" SCALE: NOT TO SCALE — 3



SHELTER ANCHORAGE DETAIL — 22"x34" SCALE: NOT TO SCALE; 11"x17" SCALE: NOT TO SCALE — 4



GENERATOR ANCHORAGE DETAIL — 22"x34" SCALE: NOT TO SCALE; 11"x17" SCALE: NOT TO SCALE — 5

STATE OF CONNECTICUT · ROBERT J. LARA · No. 11509 · LICENSED ARCHITECT

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

No.	Date	Action
4	.	.
3	.	.
2	.	.
1	.	.
0	05/16/16	ISSUED FOR PERMIT
A	05/10/16	90% CD SUBMITTAL

Carrier:

eyeTOWER

2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

Tower Owner/Client:

CROWN CASTLE

100 REGENCY FOREST DRIVE, SUITE 150
CARY, NC 27518

A/E Consultant:

MORRISON HERSHFIELD

8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

841793
BDL201

50 PINE LANE
WINDSOR, CT 06095

Drawing Title:

DETAILS

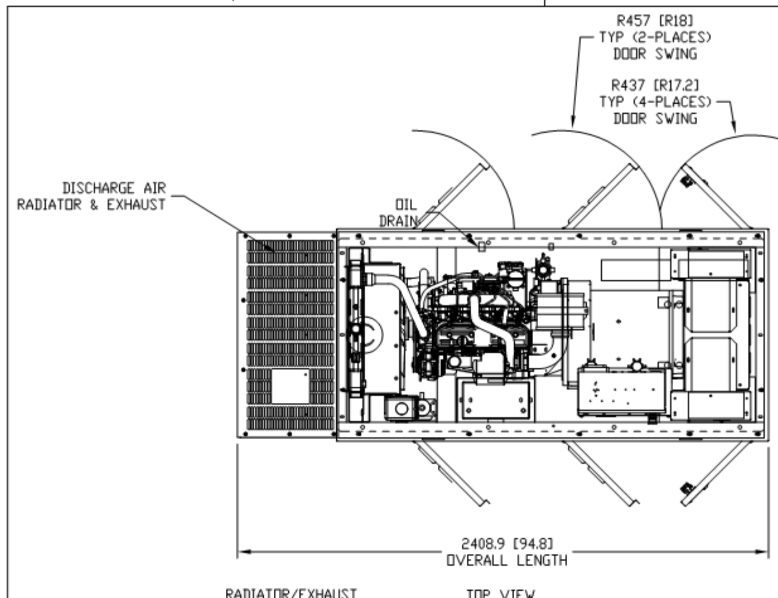
Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-11

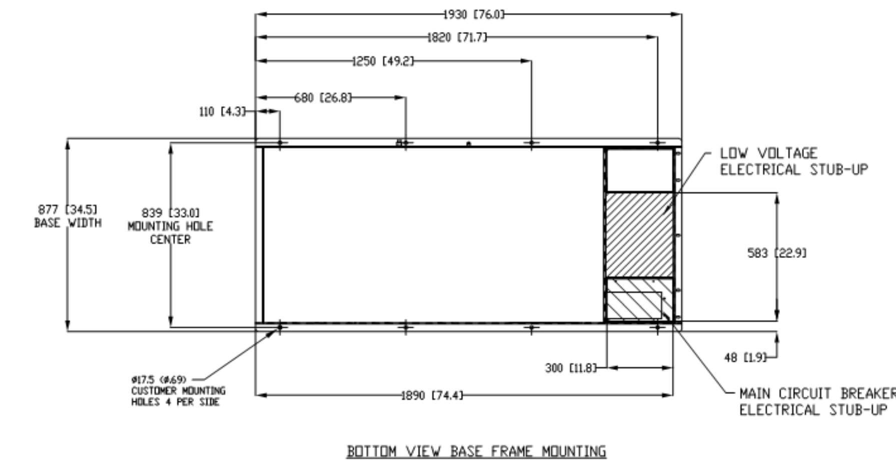
SCALE IS BASE ON 22" X 34" "D" SIZE

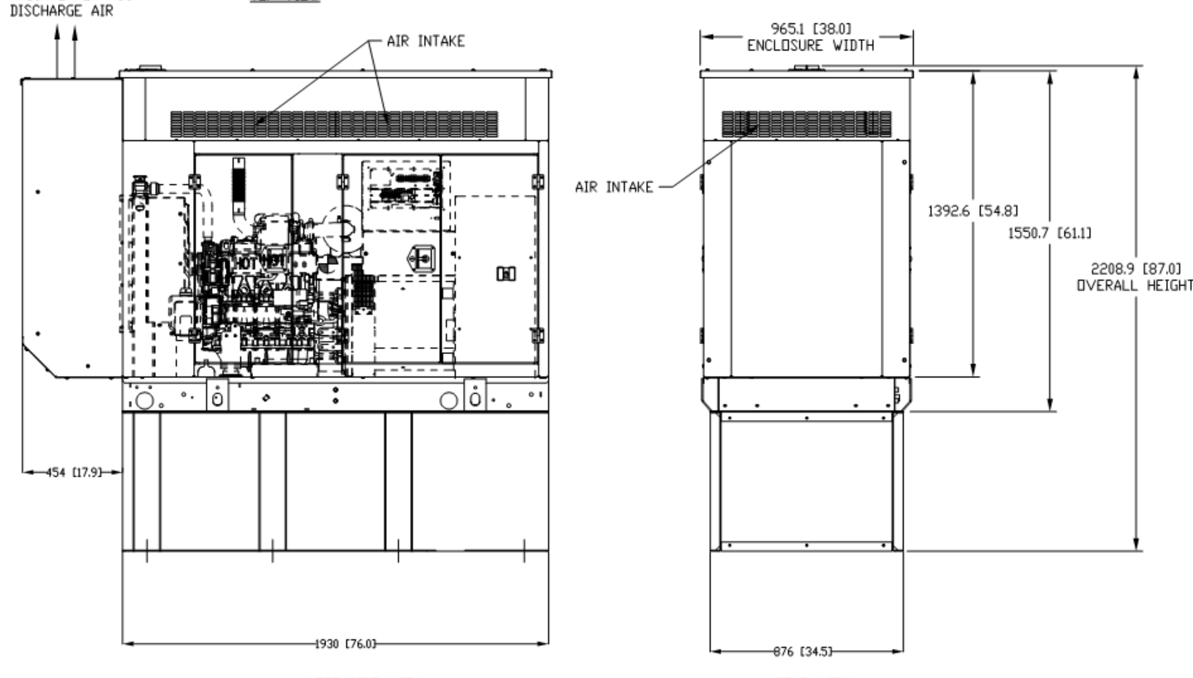
1 2 3 4 5 6

A B C

DO NOT SCALE DRAWINGS, CONTRACTOR MUST VERIFY ALL DIMENSIONS AND ADVISE CONSULTANTS OF ANY ERRORS OR OMISSIONS. NO VARIATIONS OR MODIFICATIONS TO WORK SHOWN SHALL BE IMPLEMENTED WITHOUT PRIOR WRITTEN APPROVAL. ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED BY THE LATEST REVISION. ALL DRAWINGS AND SPECIFICATIONS REMAIN THE PROPERTY OF MORRISON HERSHFIELD CORPORATION. NEITHER MORRISON HERSHFIELD NOR THE ARCHITECT WILL BE PROVIDING CONSTRUCTION REVIEW OF THIS PROJECT.







Notes:
1. CONTROL PANEL, (OPTIONAL BATTERY CHARGER INSIDE).
2. 120V, 20A GFCI & 250V, 15A OUTLET (OPTIONAL).
3. CONNECTION POINTS FOR CONTROL WIRES PROVIDED IN THE LOW VOLTAGE CONNECTION BOX (USE LOW VOLTAGE STUB-UP AREA).
4. BATTERY (12 VOLT NEGATIVE GROUND SYSTEM).
5. MAIN LINE CIRCUIT BREAKER (MLCB), AC LOAD LEADS. (DIMENSIONS MAY VARY DUE TO UNIT CONFIGURATION)
6. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
7. ENGINE SERVICE CONNECTIONS:
   - INLET NATURAL GAS = N/A
   - INLET DIESEL = 1/4" NPT COUPLING
   - RETURN DIESEL = 1/4" NPT COUPLING
   - OIL DRAIN = 1/2" NPT COUPLING
   - RADIATOR DRAIN = N/A
   - FLEX PIPE OUTLET = 2" I.D.
   - EXHAUST OUTLET = N/A

***** SEE GENERATOR SIZING GUIDE FOR FUEL PIPE SIZING TO SUIT APPLICATION *****

8. AUXILARY AC CONNECTION FOR UNIT OPTIONS ARE LOCATED IN HIGH VOLTAGE CONNECTION BOX, UNLESS AN OPTIONAL LOAD CENTER IS INSTALLED.
9. EXHAUST PIPES MAY BE ROTATED TO ALLOW MUFFLER TO POINT OUT TO THE RIGHT OR LEFT SIDE OF GENERATOR. (MAY NOT APPLY TO ALL UNITS)
10. GENERATOR SET MUST BE INSTALLED SUCH THAT FRESH COOLING AIR IS AVAILABLE AND DISCHARGE AIR FROM THE RADIATOR IS NOT RECIRCULATED.
11. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
12. EXHAUST SYSTEM MAXIMUM BACK PRESSUE = 20" H2O.
13. INSTALL EXHAUST BLANKETS ALONG THIS LINE.
14. CONNECT THE OPEN SET EXHAUST PER NFPA 37
15. BOLTS OR STUDS USED TO MOUNT UNIT TO PAD, OR BASE TANK, SHALL BE 5/8"-11 GRADE 5. USE STANDARD SAE TORQUE SPECS. (FOR INSTALLATION OF FUEL TANK TO PAD REFER TO INSTALL DRAWING OF THE BASE TANK)
   ADDITIONAL NOTES:

APPROX. WEIGHT
GENERATOR PACKAGE - 2,169 Lbs.
FUEL TANK BASE DRY - 710 Lbs.
APPROX TOTAL WEIGHT DRY -2,879 Lbs.

DIMENSIONS ARE IN MILLIMETERS [INCHES]
REFERENCE DRAWING: 0J4178, 0J4178C
FUEL TANK 0J4206

DRAWING CREATED FROM PRO/ENGINEER 3D FILE. ECO MODIFICATION TO BE APPLIED TO SOLID MODEL ONLY.

INSTALLATION DRAWING

GENERAC

TITLE: SD015 D2.4L 60HZ WITH LEVEL 2 SOUND ATTENUATED ENCLOSURE AND U.L. 142 FUEL BASE WITH SECONDARY CONTAINMENT

ISSUE DATE: 6/2/14

SIZE	CAGE NO	DWG NO	REV
B	N/A	0J4178-CC	C
SCALE 0.035	WT-KG	SHEET 1 of 1	

SH | REV C

ROBERT JERRY LARA, REGISTERED ARCHITECT, STATE OF CONNECTICUT, No. 11509

No.	Date	Action
4	.	.
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2	.	.
1	.	.
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A	05/10/16	90% CD SUBMITTAL

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2711 CENTERVILLE ROAD, STE 400, PMB 160
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Tower Owner/Client:
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100 REGENCY FOREST DRIVE, SUITE 150
CARY, NC 27518

A/E Consultant:
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Project:
841793
BDL201
50 PINE LANE
WINDSOR, CT 06095

Drawing Title:
GENERATOR DETAILS

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. A-12

SCALE IS BASE ON 22" X 34" "D" SIZE

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CONCRETE:

1. ALL CONCRETE SHALLL BE 4000 PSI MIN. IN 28 DAY AND ALL WORK SHALL CONFORM TO ACI 318, " BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE " AND TO THE PROJECT SPECIFICATIONS.
2. READY-MIX CONCRETE SUPPLIERS TO BE NRMCA-CERTIFIED.
3. ALL CONCRETE IS TO BE NORMAL DENSITY CONCRETE WITH A MAXIMUM SLUMP OF 4 INCHES. MAXIMUM AGGREGATE SIZE 3/4 INCH.
4. NO ADDITIONAL WATER SHALL BE ADDED TO THE CONCRETE AT THE JOB SITE.
5. DO NOT USE CHLORIDE-CONTAINING ADMIXTURES.
6. HOT WEATHER CONCRETE: COMPLY WITH ACI 305R.
7. PROVIDE CHAMFERS, REVEALS, REGLETS, RECESSES AND THE LIKE AS SHOWN ON THE ARCHITECTURAL OR STRUCTURAL DRAWINGS.
8. NO HOLES OR SLEEVES SHALL BE MADE THROUGH CONCRETE WORK OTHER THAN THOSE INDICATED ON THE STRUCTURAL DRAWINGS WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER.
9. PROVIDE CAST-IN-PLACE CONCRETE FOR MECHANICAL AND ELECTRICAL DIVISIONS INCLUDING BUT NOT LIMITED TO: EQUIPMENT BASES, HOUSEKEEPING PADS, CURBS, PITS, UNDERGROUND DUCTBANKS.
10. ALL FORMWORK OFFSET TOLERANCES (PER ACI 117) TO BE CLASS A.
11. FLOOR SLAB TOLERANCE TO ASTM E1155: SPECIFIED OVERALL MINIMUM VALUE OF FLATNESS F_F=25 WITH LOCAL MINIMUM F_F=17, AND MINIMUM VALUE OF LEVELNESS F_L=20 WITH LOCAL MINIMUM F_L=15. MEASURE F_L AND F_F WITHIN 72 HOURS OF SLAB CONSTRUCTION.
12. STEEL FIBER REINFORCED CONCRETE SHALL MEET THE REQUIREMENTS OF ASTM A820 AND WITH 80 LBS/YD OF DOSAGE RATE

REINFORCING STEEL :
(IF APPLICABLE AS PER DETAIL C/S-1)

1. REINFORCING BARS: ASTM A625, GRADE 60, DEFORMED BARS.
2. WELDED WIRE MESH: TO ASTM A185. PROVIDE IN FLAT SHEETS ONLY. VERTICAL PLACEMENT TOLERANCE TO BE 3/8 INCH.
3. REINFORCING STEEL TO BE DETAILED, FABRICATED, BENT AND PLACED IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE AND ACI 315.
4. THE CONTRACTOR SHALL FABRICATE ALL REINFORCEMENT AND FURNISH ALL ACCESSORIES, BOLSTERS, CHAIRS, SPACER BARS AND SUPPORTS NECESSARY TO SECURE THE REINFORCEMENT UNLESS INDICATED OTHERWISE.

GENERATOR PAD:

1. ALLOWABLE BEARING PRESSURE USED IN DESIGN ASSUMED AS 2000 PSF IF SUSPICIOUS SOIL UNCOVERED, NOTIFY DESIGN PROFESSIONAL.

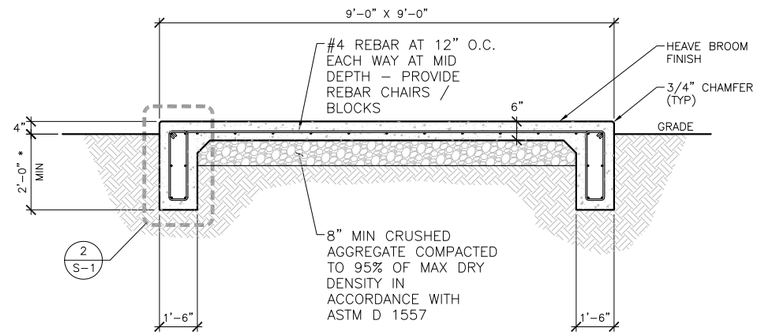
DESIGN NOTES:

DESIGN DATA:
(REFER TO APPENDIX B)

CONCRETE (28 DAYS):

SLAB	4000 PSI
ALL OTHER CONCRETE	4000 PSI
REINFORCING STEEL	A615 GRADE 60
WELDED WIRE FABRIC	A185

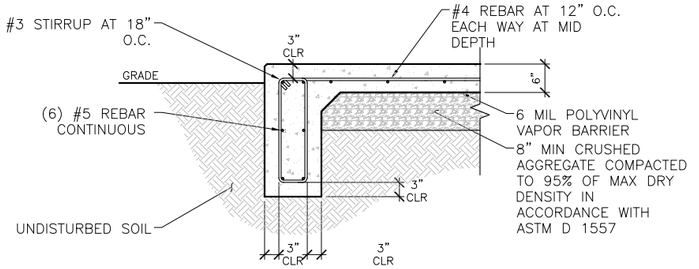
STRUCTURAL GENERAL NOTES



* PLACE BOTTOM OF FOUNDATION MIN 12" BELOW FROST LINE - VERIFY W/ JURISDICTION

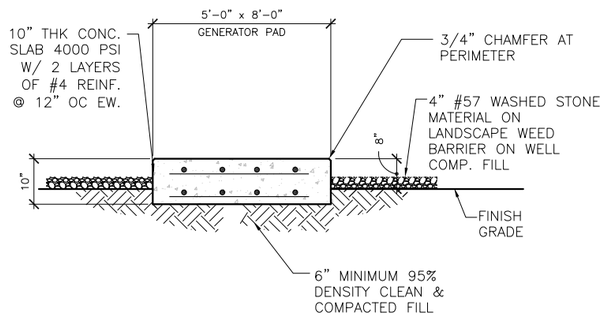
SHELTER FOUNDATION SECTION

NTS | 1



PERIMETER SECTION DETAIL

NTS | 2



GENERATOR FOUNDATION SECTION

NTS | 3

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

No.	Date	Action
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A	05/10/16	90% CD SUBMITTAL

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Project:

841793
BDL201

50 PINE LANE
WINDSOR, CT 06095

Drawing Title:

STRUCTURAL NOTES AND CONC. PAD DETAILS

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. S-1

SCALE IS BASE ON 22" X 34" "D" SIZE

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C B A

ELECTRICAL GENERAL NOTES

1. GENERAL

1. EXAMINE THE SITE CONDITIONS VERY CAREFULLY AND THE SCOPE OF PROPOSED WORK TOGETHER WITH THE WORK OF ALL OTHER TRADES AND INCLUDE IN THE BID PRICE ALL COSTS FOR WORK SUCH AS EQUIPMENT AND WIRING MADE NECESSARY TO ACCOMMODATE THE ELECTRICAL SYSTEMS SHOWN AND SYSTEMS OF OTHER TRADES.

2. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.

3. PERFORM DETAILED VERIFICATION OF WORK PRIOR TO ORDERING THE ELECTRICAL EQUIPMENT AND COMMENCING CONSTRUCTION. ISSUE A WRITTEN NOTICE TO THE CONSULTANT OF ANY DISCREPANCIES.

4. OBTAIN ALL PERMITS, PAY ASSOCIATED FEES AND SCHEDULE INSPECTION.

5. PROVIDE ALL LABOR, MATERIAL, EQUIPMENT, INSURANCE, AND SERVICES TO COMPLETE THIS PROJECT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND PRESENT IT AS FULLY OPERATIONAL TO THE SATISFACTION OF THE OWNER.

6. CARRY OUT WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES AND O.S.H.A.

7. PRIOR TO BEGINNING WORK COORDINATE ALL POWER AND TELCO WORK WITH THE LOCAL UTILITY COMPANY AS IT MAY APPLY TO THIS SITE. ALL WORK TO COMPLY WITH THE RULES AND REGULATIONS OF THE UTILITIES INVOLVED.

8. FABRICATION AND INSTALLATION OF THE COMPLETE ELECTRICAL SYSTEM SHALL BE DONE IN A FIRST CLASS WORKMANSHIP PER NECA STANDARD 1–2000 BY QUALIFIED PERSONNEL EXPERIENCED IN SUCH WORK AND SHALL SCHEDULE THE WORK IN AN ORDERLY MANNER SO AS NOT TO IMPEDE PROGRESS OF THE PROJECT.

9. DURING PROGRESS OF THE WORK, MAINTAIN AN ACCURATE RECORD OF THE INSTALLATION OF THE ELECTRICAL SYSTEMS, LOCATING EACH CIRCUIT PRECISELY AND DIMENSIONING EQUIPMENT, CONDUIT AND CABLE LOCATIONS. UPON COMPLETION OF THE INSTALLATION, TRANSFER ALL RECORD DATA TO BLACK LINE PRINTS OF THE ORIGINAL DRAWINGS AND SUBMIT THESE DRAWINGS AS RECORD DRAWINGS TO THE CONSULTANT.

10. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER. ANY WORK, MATERIAL, OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.

11. GENERAL CONTRACTOR IS RESPONSIBLE FOR REQUESTING CONNECTION OF COMMERCIAL POWER FROM THE POWER COMPANY. ELECTRICAL CONTRACTOR SHALL COORDINATE THIS WORK WITH THE GENERAL CONTRACTOR.

12. COORDINATE EXACT TELEPHONE REQUIREMENTS AND SERVICE ROUTING WITH LOCAL TELEPHONE COMPANY. APPLY FOR TELEPHONE SERVICE IMMEDIATELY UPON AWARD OF CONTRACT.

2. BASIC MATERIALS AND METHODS

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE EDITION OF THE NEC ACCEPTED BY THE LOCAL JURISDICTION AND TO THE APPLICABLE LOCAL CODES AND REGULATIONS.

2. ALL MATERIALS AND EQUIPMENT SHALL BE NEW. MATERIALS AND EQUIPMENT SHALL BE THE STANDARD PRODUCTS OF MANUFACTURER'S CURRENT DESIGN. ANY FIRST–CLASS PRODUCT MADE BY A REPUTABLE MANUFACTURER MAY BE USED PROVIDING IT CONFORMS TO THE CONTRACT REQUIREMENTS AND MEETS THE APPROVAL OF THE CONSULTANT AND THE OWNER.

3. ARRANGE CONDUIT, WIRING, EQUIPMENT, AND OTHER WORK GENERALLY AS SHOWN, PROVIDING PROPER CLEARANCES AND ACCESS. CAREFULLY EXAMINE ALL CONTRACT DRAWINGS AND FIT THE WORK IN EACH LOCATION WITHOUT SUBSTANTIAL ALTERATION. WHERE DEPARTURES ARE PROPOSED BECAUSE OF FIELD CONDITIONS OR OTHER CAUSES, PREPARE AND SUBMIT DETAILED DRAWINGS FOR ACCEPTANCE.

4. THE CONTRACT DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ALL OFFSETS, BENDS, FITTINGS AND ACCESSORIES ARE NOT NECESSARILY SHOWN. PROVIDE ALL SUCH ITEMS AS MAY BE REQUIRED TO FIT THE WORK TO THE CONDITIONS.

5. MAINTAIN ALL CLEARANCES AS REQUIRED BY NEC.

6. SEAL AROUND CONDUITS AND AROUND CONDUCTORS WITHIN CONDUITS ENTERING THE MODULAR CABINETS WHERE PENETRATION OCCURS WITH A SILICONE SEALANT TO PREVENT MOISTURE PENETRATION INTO BUILDING.

7. SILICONE SEAL AROUND ALL BOLTS AND SCREWS USED TO SECURE EQUIPMENT TO EXTERIOR OF BUILDING.

8. MAKE NECESSARY CONNECTIONS FOR BATTERY IN EMERGENCY LIGHT FIXTURE. CONNECT EXTERIOR LIGHT FIXTURE (PROVIDED BY CABINET MANUFACTURER) TO EXTERNAL JUNCTION BOX.

3. CONDUCTORS AND CONNECTORS

1. UNLESS NOTED OTHERWISE, ALL CONDUCTORS SHALL BE COPPER, MINIMUM SIZE #12 AWG, WITH THERMOPLASTIC INSULATION CONFORMING TO NEMA WC5 OR CROSS–LINKED POLYETHYLENE INSULATION CONFORMING TO NEMA WC7. (TYPES THHN OR THWN). INSULATION SHALL BE RATED FOR 90 C CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH NEC.

2. ALL CONDUCTORS USED FOR GROUNDING SHALL BE COPPER AND SHALL HAVE GREEN INSULATION.

3. FOR COPPER CONDUCTORS #6 AWG AND SMALLER USE 3M SCOTCH–LOK OR T&B STA–KON COMPRESSION TYPE CONNECTORS WITH INTEGRAL OR SEPARATE INSULATION CAPS. FOR COPPER CONDUCTORS LARGER THAN #6 AWG USE SOLDERLESS, IDENT HEX SCREW OR BOLT TYPE PRESSURE CONNECTORS OR DOUBLE COMPRESSION C–CLAMP CONNECTORS, UNLESS SPECIFIED OTHERWISE ON DRAWINGS.

4. UNLESS NOTED OTHERWISE ALL LUGS SHALL BE TIN PLATED COPPER, TWO–HOLE, LONG BARREL, COMPRESSION TYPE.

5. CONDUCTOR LENGTHS SHALL BE CONTINUOUS FROM TERMINATION TO TERMINATION WITHOUT SPLICES. SPLICES ARE NOT ACCEPTABLE. IF SPLICES ARE UNAVOIDABLE PRIOR APPROVAL FROM THE ENGINEER MUST BE OBTAINED.

4. RACEWAYS AND BOXES

1. ALL CONDUIT SHALL BE UL LABELED.

2. ALL EMPTY CONDUITS INSTALLED FOR FUTURE USE SHALL HAVE A PULL CORD.

3. SHEET METAL BOXES SHALL CONFORM TO NEMA OS1; CAST–METAL BOXES SHALL CONFORM TO NEMA 81 AND SHALL BE SIZED IN ACCORDANCE WITH NEC UNLESS NOTED OTHERWISE.

5. GROUNDING

1. ALL LIGHTNING PROTECTION GROUNDING OF THE ELECTRICAL EQUIPMENT SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT NFPA STANDARDS.

2. GROUND LUGS ARE SPECIFIED UNDER SECTION 3 "CONDUCTORS AND CONNECTORS".

3. ALL GROUND LUG AND COMPRESSION CONNECTIONS SHALL BE COATED WITH ANTI–OXIDANT AGENT, SUCH AS NO–OX, NOALOX, PENETROX OR KOPRSHIELD.

4. GROUND ALL EXPOSED METALLIC OBJECTS ON BUILDING EXTERIOR INCLUDING BUILDING TIE DOWN BRACKETS.

5. PROVIDE LOCK WASHERS FOR ALL MECHANICAL CONNECTIONS FOR GROUND CONDUCTORS. USE STAINLESS STEEL HARDWARE THROUGHOUT.

6. DO NOT INSTALL GROUND RING OUTSIDE OF PROPERTY LINE.

7. REMOVE ALL PAINT AND CLEAN ALL DIRT FROM SURFACES REQUIRING GROUND CONNECTIONS, REPAINT TO MATCH AFTER CONNECTION IS MADE TO MAINTAIN CORROSION RESISTANCE.

8. ALL EXTERIOR GROUNDING CONDUCTORS INCLUDING EXTERIOR GROUND RING SHALL BE #2 AWG SOLID BARE TINNED COPPER. MAKE ALL GROUND CONNECTIONS AS SHORT AND DIRECT AS POSSIBLE. AVOID SHARP BENDS. THE RADIUS OF ANY BEND SHALL NOT BE LESS THAN 8" AND THE ANGLE OF ANY BEND SHALL NOT EXCEED 90°. GROUNDING CONDUCTORS SHALL BE ROUTED DOWNWARD TOWARD THE BURIED GROUND RING.

9. REPAIR ALL GALVANIZED SURFACES THAT HAVE BEEN DAMAGED BY THERMO–WELDING WITH ERICO T–319 GALVANIZING BAR.

10. ALL GROUND CONNECTIONS SHALL BE APPROVED FOR THE METALS BEING CONNECTED.

11. ALL EXTERNAL GROUND CONNECTIONS SHALL BE EXOTHERMICALLY WELDED. ALL EXOTHERMIC WELDS TO EXTERIOR GROUND RING SHALL BE THE PARALLEL TYPE, EXCEPT FOR THE GROUND RODS WHICH ARE TEE EXOTHERMIC WELDS. REPAIR ALL GALVANIZED SURFACES THAT HAVE BEEN DAMAGED BY EXOTHERMIC WELDING. USE SPRAY GALVANIZER SUCH AS HOLUB LECTROSOL #15–501.

12. CONTRACTOR SHALL NOTIFY eyeTower, LLC WHEN THE BURIED GROUND RING IS INSTALLED SO THE REPRESENTATIVE CAN INSPECT THE GROUND RING BEFORE IT IS BACKFILLED WITH SOIL. CONTACT: eyeTower, LLC PROJECT MGR.

13. FOR METAL FENCE POST GROUNDING, USE A HEAVY DUTY TYPE GROUNDING CLAMP OR EXOTHERMIC WELD CONNECTION TO POST.

14. WHERE MECHANICAL CONNECTORS (TWO–HOLE OR CLAMP) ARE USED, APPLY A LIBERAL PROTECTIVE COATING OF AN ANTI–OXIDE COMPOUND SUCH AS "NO OXIDE A" BY DEARBORN CHEMICAL COMPANY ON ALL CONNECTORS.

15. BOND ALL EXTERIOR CONDUITS, PIPES AND CYLINDRICAL METALLIC OBJECTS WITH A PENN–UNION GT SERIES CLAMP, BLACKBURN GUV SERIES CLAMP OR A BURNDY GAR 3900BU SERIES CLAMP ONLY, NO SUBSTITUTES ACCEPTED.

LEGEND

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON–FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
TR	TRANSFORMER
M	KILOWATT HOUR METER
	DENOTES CABLE OR CONDUIT TURNING UP IN PLAN VIEW
	DENOTES CABLE OR CONDUIT TURNING DOWN IN PLAN VIEW
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
———	ABOVE GROUND SERVICES
- - - -	UNDER GROUND SERVICES
2	DENOTES REFERENCE NOTE
●	EXOTHERMIC WELD CONNECTION
■	MECHANICAL CONNECTION (eg LUG, C–TAP)
	GROUND ROD
	GROUND BAR
	PIN AND SLEEVE RECEPTACLE
	GROUND ROD WITH INSPECTION SLEEVE

ABBREVIATIONS

AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
BFG	BELOW FINISHED GRADE
C	CONDUIT
CRGB	CELL REFERENCE GROUND BAR
CU	COPPER
C/W	COMPLETE WITH
D.T.T.	DRY TYPE TRANSFORMER
EC	EMPTY CONDUIT
G	GROUND
GE	GROUNDING ELECTRODE
GEC	GROUNDING ELECTRODE CONDUCTOR
GRC	GALVANIZED RIGID CONDUIT
MTS	MANUAL TRANSFER SWITCH
NEC	NATIONAL ELECTRICAL CODE
RNC	RIGID NON–METALLIC CONDUIT (SCHEDULE 80 PVC)
SD	SERVICE DISCONNECT SWITCH
SE	SERVICE ENTRANCE
SN	SOLID NEUTRAL
TGB	TELCO GROUND BAR
TEGB	TOWER EXIT GROUND BAR
TR	TRANSFORMER
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
WP	WEATHERPROOF – NEMA 3R
U/G	UNDERGROUND
PPC	POWER PROTECTION CABINET

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

No.	Date	Action
4	.	.
3	.	.
2	.	.
1	.	.
0	05/16/16	ISSUED FOR PERMIT
A	05/10/16	90% CD SUBMITTAL

Carrier:

eyeTOWER

2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

Tower Owner/Client:

CROWN CASTLE

100 REGENCY FOREST DRIVE, SUITE 150
CARY, NC 27518

A/E Consultant:

MORRISON HERSHFIELD

8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.498.8861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

841793
BDL201

50 PINE LANE
WINDSOR, CT 06095

Drawing Title:

ELECTRICAL NOTES AND ABBREVIATIONS

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No.: E-1

SCALE IS BASE ON 22" X 34" "D" SIZE

1 EXISTING 120/240V–1ø–3W, 6–GANG, MULTI–METER CENTER WITH (2) AVAILABLE SLOTS. COORDINATE WITH POWER COMPANY FOR NEW 120/240V–1ø–3W, 200A SERVICE FOR eyeTower, LLC.

2 NEW 66 ALARM BLOCK ON SHELTER TELCO BACKBOARD.

3 NEW (3) #3/0 AWG CU IN 2" PVC SCH. 40 CONDUIT.

4 15 KW (15 KVA) STAND–BY EMERGENCY DIESEL GENERATOR INSTALLED AS PER MANUF. SPECIFICATIONS–DO NOT BOND NEUTRAL TO GROUND AT GEN. SYSTEM NON–SEPARATELY DERIVED.

5 NEW 200A RATED, 2–POLE, 240V, NEMA–3R AUTOMATIC TRANSFER SWITCH. REFER TO MANUF. SPECS.

6 NEW PANEL "PP1" WITH BRANCH CIRCUIT BREAKERS, PANEL SHALL BE A 120/240V–1ø–3W, 200A RATED, NEMA–1 42 POLE PANEL.

7 NEW 3/4" THICK, 2'X4' TELCO BACKBOARD, PAINTED BLACK.

8 EXISTING MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR BONDED TO (2) 5/8" DIA. X 10'–0" LONG COPPER CLAD GROUND RODS SPACED A MINIMUM OF 6'–0" APART. (VERIFY IN FIELD)

9 RE–USE EXISTING AVAILABLE 200A, 240V, 1ø, 3W UTILITY METER SOCKET PER UTILITY STANDARDS. PROVIDE MECH. ATTACHED ENGRAVED NAME PLATE INDICATING: "eyeTower, LLC METER".

10 NEW 200A–2P MAIN CIRCUIT BREAKER IN EXISTING METER CENTER AVAILABLE POSITION. (INTERUPTING CAPACITY 65,000 AIC MIN) FOR eyeTOWER.LLC.

11 EXISTING #2 AWG CU. BONDED TO GROUND RING SYSTEM. (VERIFY IN FIELD)

12 NEW MINIMUM (3) #4 AWG CU. & (1) #8 GROUND IN 2" CONDUIT.

13 EXISTING CONDUCTORS IN CONDUIT TO REMAIN.

14 SUPPLY AND INSTALL (1) 4" PVC W/ PULL CORDS FROM EXISTING FIBER DEMARC VAULT TO eyeTower, LLC TELCO BACKBOARD IN SHELTER.

15 NEW (3) #3/0, + (1) #6 GROUND, 2"C.

16 NEW OR EXISTING FIBER DEMARC VAULT LOCATION AT RIGHT OF WAY. COORDINATE WITH FIBER PROVIDER FOR EXACT LOCATION AND ALL REQUIREMENTS.

17 EXISTING MAIN SERVICE H–FRAME WITH METER CENTER.

18 NOT USED.

19 GEN. CONTROLLER.

20 GEN. OUTPUT 70A–2P CIRC. BREAKER.

21 ALARM CIRC. TO GEN CONTROLLER TO ALARM "LOW" FUEL LEVEL 3/4" CONDUIT W/ LOW VOLTAGE CONDUCTORS. REFER TO GEN. SPECS FOR MORE DETAILS (SEE NOTE 2).

22 PROVIDE AND INSTALL NEW (2) 1P–20A BREAKERS IN LOAD CENTER FOR GEN. BATT CHARGER & GEN. BLOCK HEATER.

23 3/4" CONDUIT. W/ LOW VOLTAGE CONDUCTORS TO ATS FOR START/STOP CONTROL & ALARM CIRC. (SEE NOTE 2).

24 (2) SETS OF 3/4" CONDUIT EACH WITH (2) #12 CU AND (1) #12 CU GROUND FOR EACH GEN. CHARGER/HEATER CIRCUIT.

25 ALARM WIRING INSTALLED ON 66 PUNCH DOWN BLOCK ON TELCO BOARD.

26 CONTRACTOR TO ARRANGE AND PAY FOR UNDERGROUND UTILITY SURVEYS FOR ALL TRENCHING. REUSE NATIVE BACKFILL AND REINSTATE TO ORIGINAL CONDITION. INSTALL 6" WIDE METALLIC LINED RED PLASTIC MARKER TAPE 8" ABOVE ALL BURIED CONDUIT.

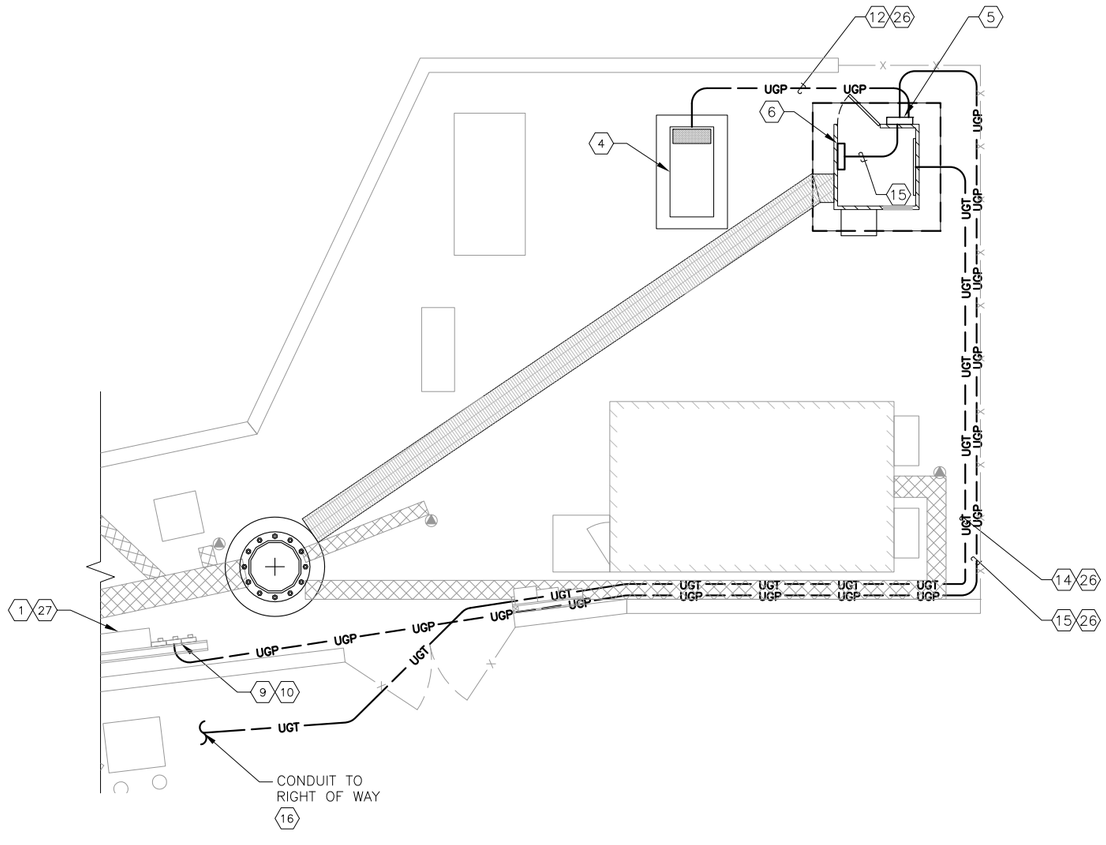
27 CONTRACTOR TO OBTAIN EXISTING LOAD INFORMATION FROM UTILITY COMPANY OR PERFORM A 30 DAY LOAD STUDY USING A TRUE RMS METER PER NEC 220.87 TO DETERMINE ADDITION SPACE CAPACITY OF EXISTING SERVICE METER CENTER. EXISTING PLUS NEW LOAD SHALL NOT EXCEED CAPACITY OF EXISTING METER CENTER FEEDERS.

NOTES:

1. CONDUIT ROUTING IS SCHEMATIC ONLY, CONTRACTOR SHALL DETERMINE SUITABLE ROUTING IN THE FIELD.

2. CONTRACTOR TO REUSE EXISTING CONDUITS ROUTED TO EXISTING GENERATOR AS POSSIBLE. FIELD VERIFY.

3. CONTRACTOR TO PROVIDE PVC CONDUIT BELOW FINISH GRADE AND RGS CONDUIT ABOVE FINISH GRADE.



TRUE NORTH

ELECTRICAL LAYOUT PLAN

ANSI "D" SCALE: 3/16" = 1'–0"
ANSI "B" SCALE: 3/32" = 1'–0"
4' 2' 0" 4'

1

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
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Project:

841793
BDL201

50 PINE LANE
WINDSOR, CT 06095

Drawing Title:

ELECTRICAL COMPOUND PLAN

Project No.: 7160018

Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. E-2

SCALE IS BASE ON 22" X 34" "D" SIZE

S:\716 Series\7160018.00 Crown Carolinas AE Services 2016\9.0 Sites\Windsor Pine\9.2_Design & Development\CAD\7160018.00_841793_BDL201_Final-CDs_Rev 0_2016.05.16.dwg 05/16/2016 2:56pm bfraser

1. EXISTING 120/240V–1ø–3W, 6–GANG, MULTI–METER CENTER WITH (2) AVAILABLE SLOTS. COORDINATE WITH POWER COMPANY FOR NEW 120/240V–1ø–3W, 200A SERVICE FOR eyeTower, LLC.
2. NEW 66 ALARM BLOCK ON SHELTER TELCO BACKBOARD.
3. NEW (3) #3/0 AWG CU IN 2" PVC SCH. 40 CONDUIT.
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7. NEW 3/4" THICK, 2'X4' TELCO BACKBOARD, PAINTED BLACK.
8. EXISTING MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR BONDED TO (2) 5/8" DIA. X 10'–0" LONG COPPER CLAD GROUND RODS SPACED A MINIMUM OF 6'–0" APART. (VERIFY IN FIELD)
9. RE–USE EXISTING AVAILABLE 200A, 240V, 1ø, 3W UTILITY METER SOCKET PER UTILITY STANDARDS. PROVIDE MECH. ATTACHED ENGRAVED NAME PLATE INDICATING: "eyeTower, LLC METER".
10. NEW 200A–2P MAIN CIRCUIT BREAKER IN EXISTING METER CENTER AVAILABLE POSITION. (INTERUPTING CAPACITY 65,000 AIC MIN) FOR eyeTOWER.LLC.
11. EXISTING #2 AWG CU. BONDED TO GROUND RING SYSTEM. (VERIFY IN FIELD)
12. NEW MINIMUM (3) #4 AWG CU. & (1) #8 GROUND IN 2" CONDUIT.
13. EXISTING CONDUCTORS IN CONDUIT TO REMAIN.
14. SUPPLY AND INSTALL (1) 4" PVC W/ PULL CORDS FROM EXISTING FIBER DEMARC VAULT TO eyeTower, LLC TELCO BACKBOARD IN SHELTER.
15. NEW (3) #3/0, + (1) #6 GROUND, 2"C.
16. NEW OR EXISTING FIBER DEMARC VAULT LOCATION AT RIGHT OF WAY. COORDINATE WITH FIBER PROVIDER FOR EXACT LOCATION AND ALL REQUIREMENTS.
17. EXISTING MAIN SERVICE H–FRAME WITH METER CENTER.
18. NOT USED.
19. GEN. CONTROLLER.
20. GEN. OUTPUT 70A–2P CIRC. BREAKER.
21. ALARM CIRC. TO GEN CONTROLLER TO ALARM "LOW" FUEL LEVEL 3/4" CONDUIT W/ LOW VOLTAGE CONDUCTORS. REFER TO GEN. SPECS FOR MORE DETAILS (SEE NOTE 2).
22. PROVIDE AND INSTALL NEW (2) 1P–20A BREAKERS IN LOAD CENTER FOR GEN. BATT CHARGER & GEN. BLOCK HEATER.
23. 3/4" CONDUIT. W/ LOW VOLTAGE CONDUCTORS TO ATS FOR START/STOP CONTROL & ALARM CIRC. (SEE NOTE 2).
24. (2) SETS OF 3/4" CONDUIT EACH WITH (2) #12 CU AND (1) #12 CU GROUND FOR EACH GEN. CHARGER/HEATER CIRCUIT.
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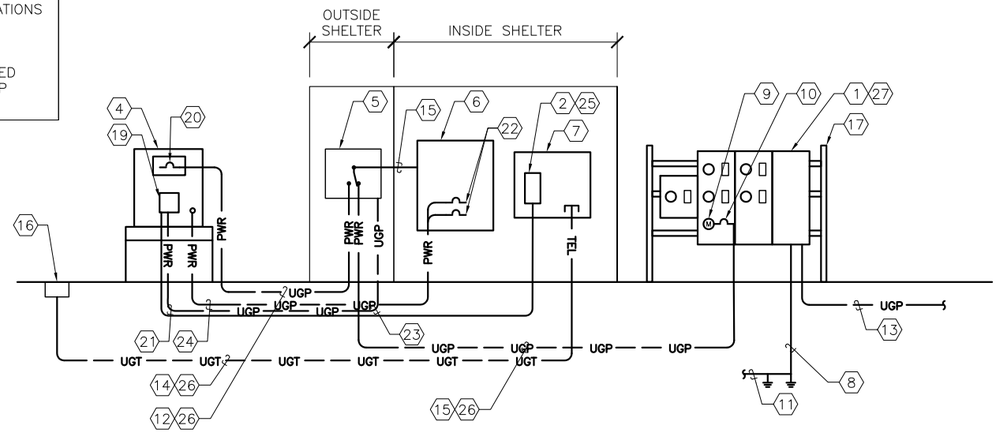
26. CONTRACTOR TO ARRANGE AND PAY FOR UNDERGROUND UTILITY SURVEYS FOR ALL TRENCHING. REUSE NATIVE BACKFILL AND REINSTATE TO ORIGINAL CONDITION. INSTALL 6" WIDE METALLIC LINED RED PLASTIC MARKER TAPE 8" ABOVE ALL BURIED CONDUIT.
27. CONTRACTOR TO OBTAIN EXISTING LOAD INFORMATION FROM UTILITY COMPANY OR PERFORM A 30 DAY LOAD STUDY USING A TRUE RMS METER PER NEC 220.87 TO DETERMINE ADDITION SPACE CAPACITY OF EXISTING SERVICE METER CENTER. EXISTING PLUS NEW LOAD SHALL NOT EXCEED CAPACITY OF EXISTING METER CENTER FEEDERS.

NOTE 1: CONTRACTOR TO USE PVC SCHED 40 FOR UNDER GROUND CONDUIT ROUTING AND GRC FOR ABOVE GROUND ROUTING.
NOTE 2: COOR. GEN. ALARMING OPTIONS TO SHELTER BACKBOARD ALARM BLOCK W/ eyeTower, LLC.
NOTE 3: ALL EXTERIOR ELECTRICAL EQUIPMENT SHALL BE RATED NEMA 3R
NOTE 4: ALL CONDUIT LENGTHS AND ROUTING TO BE VERIFIED IN FIELD BY CONTRACTOR.

ELECTRICAL REFERENCE NOTES

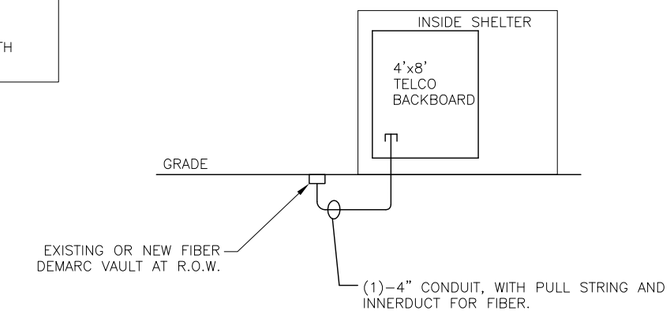
NOTE:
ALL CONDUIT ENTRY LOCATIONS AND SHELTER EQUIPMENT LOCATIONS SHALL BE COORDINATED WITH STATE APPROVED PRE–FABRICATED EQUIPMENT SHELTER SHOP DRAWINGS.



ELECTRICAL RISER DIAGRAM

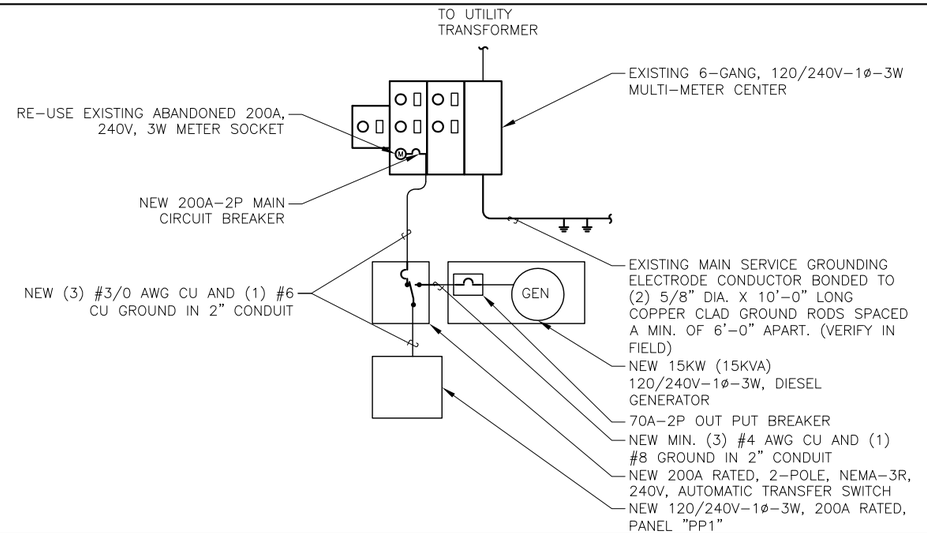
NTS | 1

NOTE:
COORDINATE EXACT REQUIREMENTS FOR NEW FIBER–TELCO SERVICE WITH FIBER PROVIDER.



TELEPHONE RISER DIAGRAM

NTS | 2



ELECTRICAL SINGLE-LINE DIAGRAM

NTS | 3

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509
ROBERT JERRY LARA
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STATE OF CONNECTICUT
11509

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1	.	.
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Carrier:
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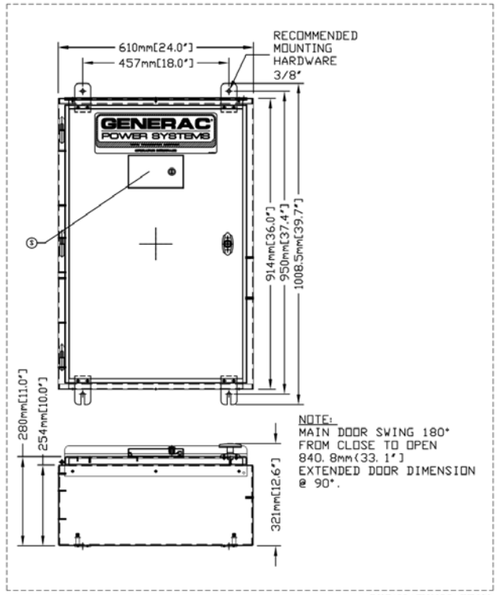
Project:
841793
BDL201
50 PINE LANE
WINDSOR, CT 06095

Drawing Title:
ELECTRICAL RISER DIAGRAM

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No.: E-3

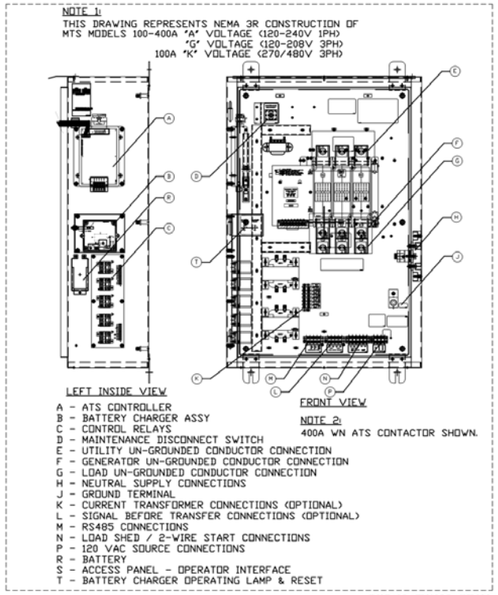
SCALE IS BASE ON 22" X 34" "D" SIZE

GROUP G



INSTALLATION DRAWINGS
MTS 100-400A NEMA 3R TTN
REVISION: *
DATE: 2/28/06
DRAWING #: 0G0633

GROUP G

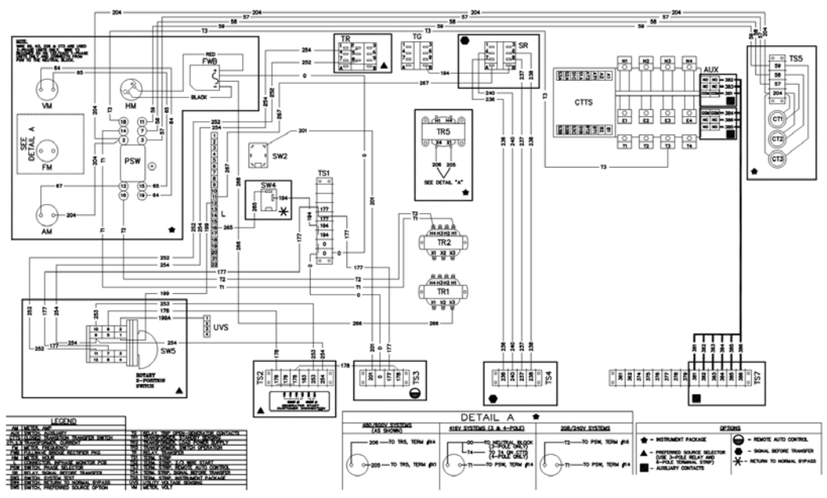


INSTALLATION DRAWINGS
MTS 100-400A NEMA 3R TTN
REVISION: *
DATE: 2/28/06
DRAWING #: 0G0633

INSTALLATION DETAIL

NTS | 1

GROUP G



REVISION: H-1066-B
DATE: 9/7/07

PAGE 1 OF 1

WIRING DIAGRAM
CTTS OPTIONS
DRAWING #: 0C2909

WIRING DIAGRAM

NTS | 2

DO NOT SCALE DRAWINGS. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND ADVISE CONSULTANTS OF ANY ERRORS OR OMISSIONS. NO VARIATIONS OR MODIFICATIONS TO WORK SHOWN SHALL BE IMPLEMENTED WITHOUT PRIOR WRITTEN APPROVAL. ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED BY THE LATEST REVISION. ALL DRAWINGS AND SPECIFICATIONS REMAIN THE PROPERTY OF MORRISON HERSHFIELD CORPORATION. NEITHER MORRISON HERSHFIELD NOR THE ARCHITECT WILL BE PROVIDING CONSTRUCTION REVIEW OF THIS PROJECT.

STATE OF CONNECTICUT
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Drawing Title:

AUTOMATIC TRANSFER SWITCH DETAILS

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. E-4

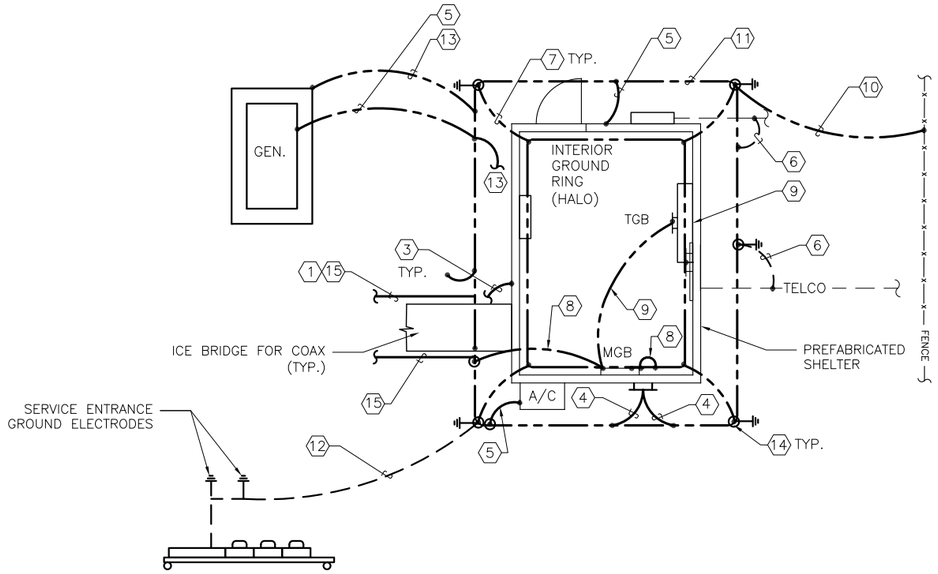
SCALE IS BASE ON 22" X 34" "D" SIZE

1 2 3 4 5 6

A B C

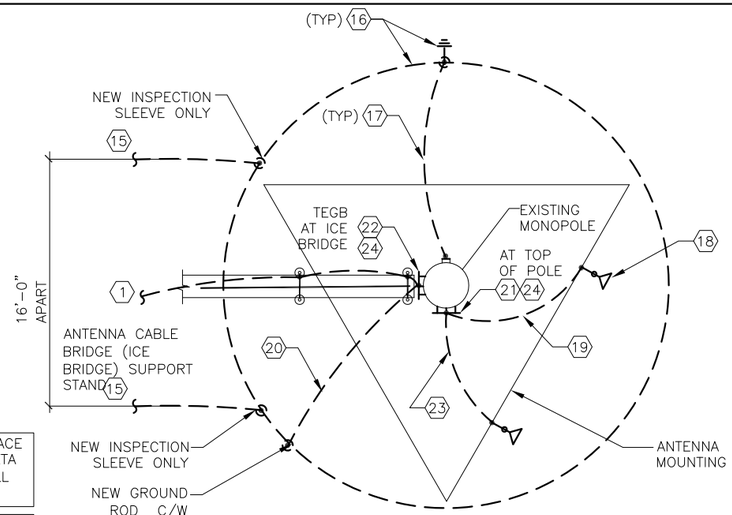
GROUNDING REFERENCE NOTES

1. PROVIDE #2 AWG. SOLID TINNED COPPER CONDUCTOR AND RUN FROM ONE ICE BRIDGE TO THE NEXT. ATTACH TO EACH SUPPORT USING GROUND CLAMP. BOND SUPPORT POST TO GROUND RING.
2. WHERE APPLICABLE, BOND ALL STEEL SUPPORT BEAMS TOGETHER, EXOTHERMICALLY WELD CONNECTIONS TO STEEL SUPPORT BEAMS. TYPICAL FOR ALL. REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF STEEL SUPPORT BEAMS.
3. BOND SHELTER STEEL TIE DOWN TO SHELTER GROUND RING. EXOTHERMICALLY WELD CONNECTION TO GROUND RING. TYPICAL OF FOUR (4).
4. PROVIDE PRIMARY GROUND RING BOND FROM WAVEGUIDE HATCH PLATE BAR NONE SOLUTION TO GROUND RING AT GROUND ROD INSPECTION SLEEVE. SUPPORT GROUND CONDUCTOR ON WALL EVERY 2 FEET. EXOTHERMICALLY WELD CONNECTIONS AT BAR NONE SOLUTION AND GROUND RING.
5. BOND A/C UNITS, DOOR FRAMES, H-FRAME POSTS, DIESEL TANK, GENERATOR HOUSING, MISCELLANEOUS METALLIC EQUIPMENT TO GROUND RING. EXOTHERMICALLY WELD CONNECTION TO EXTERIOR GROUND RING.
6. BOND SERVICE CONDUITS TO GROUND RING OUTSIDE AND HALO GROUND INSIDE SHELTER. CONNECT GROUND CONDUCTOR TO CONDUIT USING PIPE CLAMP. DO NOT EXOTHERMICALLY WELD TO CONDUIT. REFER TO TYPICAL MULTIPLE CONDUIT GROUNDING DETAIL 3/E-5.
7. PROVIDE SECONDARY GROUND RING BOND BY SHELTER DOWNLEAD CONDUCTOR FROM INTERIOR GROUND RING (HALO) SUPPLIED BY BUILDING MANUFACTURER TO THE EXTERIOR GROUND RING. EXOTHERMICALLY WELD CONNECTION TO GROUND RING. TYPICAL IN ALL FOUR (4) CORNERS OF HALO.
8. PROVIDE #2 AWG SOLID BARE TINNED COPPER CONDUCTOR FROM MASTER GROUND BAR (MGB), INSIDE SHELTER TO HALO AND EXTERIOR GROUND RING. EXOTHERMICALLY WELD CONNECTIONS AT GROUND BAR AND GROUND RING.
9. BOND TELCO GROUND BAR (TGB) TO MASTER GROUND BAR (MGB) USING ONE (1) #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR. BOND TO EXTERIOR GROUND RING USING #2 AWG SOLID TINNED COPPER CONDUCTOR. EXOTHERMICALLY WELD CONNECTIONS TO ALL CONNECTION POINTS.
10. BOND EXISTING FENCE POST TO GROUND RING AS SHOWN USING AN EXOTHERMIC WELD. BOND FENCE GATE TO POST WITH A FLEXIBLE COPPER JUMPER STRAP IF NOT ALREADY PROVIDED. PROVIDE EXOTHERMIC WELD TO BOND STRAP TO GATE AND FENCE POST. PROVIDE LENGTH AS REQUIRED TO MAKE CONNECTION.
11. PROVIDE A GROUND RING BURIED 30" BELOW GRADE OR FROST LINE, WHICHEVER IS DEEPER.
12. PROVIDE NEW BOND OR VERIFY EXISTING BOND BETWEEN SERVICE ENTRANCE GROUND ELECTRODE AND GROUND RING SYSTEM W/A #2 AWG SOLID TINNED COPPER CONDUCTOR.
13. BOND REBAR IN CONCRETE FOR SHELTER, GENERATOR PAD (WHERE APPLICABLE) AND STOOP/STEPS TO BURIED GROUND RING. EXOTHERMICALLY WELD A #2 TINNED SOLID COPPER CONDUCTOR TO THE REBAR GROUNDING PIGTAIL AND CONNECT TO THE BURIED GROUND RING. TYPICAL ON 16' CENTERS.
14. PROVIDE 5/8" x 10'-0" LONG COPPER CLAD STEEL (COPPER WELD) GROUND ROD AS SHOWN. PROVIDE INSPECTION SLEEVE AT GROUND ROD TO SHOW BOND TO EXTERIOR BURIED GROUND RING. INSTALL SO THAT TOP OF GROUND ROD IS 30" BELOW GRADE OR FROST LINE, WHICHEVER IS DEEPER. EXACT LOCATION AND NUMBER OF GROUND RODS TO BE ESTABLISHED ON SITE AND BASED ON "FALL OF POTENTIAL GROUND RESISTANCE METHOD" FOR RESISTANCE < 5 OHMS.. UNLESS OTHERWISE NOTED, DRIVEN GROUND RODS ARE BONDED TO THE BURIED GROUND RING AT 16 FEET INTERVALS.
15. SHELTER GROUND RING AND EXISTING TOWER GROUND RING SHALL BE BONDED TOGETHER IN AT LEAST TWO (2) POINTS USING A #2 AWG SOLID BARE TINNED COPPER CONDUCTOR.
16. EXISTING TOWER GROUND RING AND GROUND RODS. (TO BE VERIFIED).
17. EXISTING #2 SOLID BARE TINNED COPPER CONDUCTOR FROM TOWER GROUNDING FLANGE AT BASE OF TOWER LEG TO TOWER GROUND RING. (TO BE VERIFIED)
18. REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF ANTENNA(S) AND ANTENNA SUPPORT FRAMES.
19. EXTEND GROUNDING CONDUCTOR TO ANTENNA LOCATIONS AND BOND TO ANTENNA PIPE MOUNT. USE AN EXOTHERMIC WELD AT ANTENNA PIPE MOUNT. SUPPORT CONDUCTOR AS REQUIRED EVERY TWO (2) FEET MINIMUM.
20. PROVIDE #2 SOLID BARE TINNED COPPER CONDUCTOR FROM BAR NONE SOLUTION TO TOWER GROUND RING. TYPICAL OF TWO (2).
21. PROVIDE ANTENNA CABLE GROUND BAR AT THE TOP OF TOWER ONLY. BOND ANTENNA CABLE GROUNDING KITS AND LIGHTNING ROD TO GROUND BAR. ANTENNA CABLE GROUND KIT CONNECTION SHALL BE THE RESPONSIBILITY OF THE ANTENNA CABLE INSTALLER. PROVIDE A U.L. LISTED CONNECTOR SUITABLE FOR THE MATERIALS BEING CONNECTED. PROVIDE EXOTHERMIC WELDS FOR BONDS TO STEEL BEAM OR SUPPORT POSTS.
22. NEW BAR NONE GROUNDING SOLUTION SHALL BE INSTALLED BELOW THE TRANSMISSION LINE GROUND KITS, NEAR THE AREA OF THE TOWER AT THE POINT WHERE THE ANTENNA TRANSMISSION LINES TRANSITION FROM THE TOWER TO THE SHELTER. VERIFY EXACT LOCATION FOR PROPER CONDUCTOR LENGTH. BAR NONE SOLUTION SHALL BE PROVIDED BY THE ANTENNA CABLE INSTALLER. FINAL EXOTHERMIC WELD FROM THE BURIED GROUND RING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. COORDINATE WITH ANTENNA CABLE INSTALLER FOR SCHEDULE TO MAKE CONNECTION. PROVIDE 3/4" PVC SLEEVE WITH SWEEP BEND FOR CONNECTION OF BAR NONE SOLUTION TO TOWER GROUND RING.
23. EXTEND GROUNDING CONDUCTORS TO REMAINING SECTOR ANTENNA PIPE MOUNT LOCATIONS AND BOND WITH EXOTHERMIC WELDS. SUPPORT CONDUCTOR AS REQUIRED EVERY TWO FEET MINIMUM.
24. THE TOWER STRUCTURE STEEL SHALL BE UTILIZED FOR DISSAPATING THE LIGHTNING ENERGY. THE TOWER GROUND BARS OR BAR NONE SOLUTION FOR ANTENNA GROUNDING SHALL BE DIRECTLY FASTENED TO THE STEEL STRUCTURE WITH STAINLESS STEEL HARDWARE AND/OR ANGLE ADAPTORS (E.G. PIROD/VALMONT PART #167105 OR EQUIVALENT – WITHOUT "CHERRY" INSULATORS). THIS TYPE OF INSTALLATION SPECIFICALLY PRECLUDES THE USE OF INSULATORS BETWEEN THE TOWER STRUCTURE AND THE GROUND BARS OR BAR NONE SOLUTION AND DOES NOT ALLOW ANY DRILLING OR WELDING TO THE TOWER.



TYPICAL SHELTER AND GENERATOR GROUNDING PLAN — NTS — 1

NOTE: REFER TO ARCHITECTURAL SITE PLAN DRAWING FOR EXACT LOCATION OF CABLE BRIDGE AND ANTENNA SUPPORT STRUCTURE.



NOTE: GROUNDING FOR ONE FACE SHOWN–TYPICAL FOR ALPHA, BETA AND GAMMA FACES (EA. AND ALL ANTENNAS).

NOTE: REFER TO ARCHITECTURAL SITE PLAN DRAWING FOR EXACT LOCATION OF ANTENNA CABLE BRIDGE AND SUPPORT STRUCTURE.

TYPICAL MONOPOLE AND ANTENNA GROUNDING PLAN — NTS — 2

STATE OF CONNECTICUT · ROBERT J. LARA · LICENSED ARCHITECT · No. 11509

ROBERT JERRY LARA
REGISTERED ARCHITECT
STATE OF CONNECTICUT
11509

No.	Date	Action
4	.	.
3	.	.
2	.	.
1	.	.
0	05/16/16	ISSUED FOR PERMIT
A	05/10/16	90% CD SUBMITTAL

Carrier:
eyeTOWER
2711 CENTERVILLE ROAD, STE 400, PMB 160
WILMINGTON, DE 19808

Tower Owner/Client:
CROWN CASTLE
100 REGENCY FOREST DRIVE, SUITE 150
CARY, NC 27518

A/E Consultant:
MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
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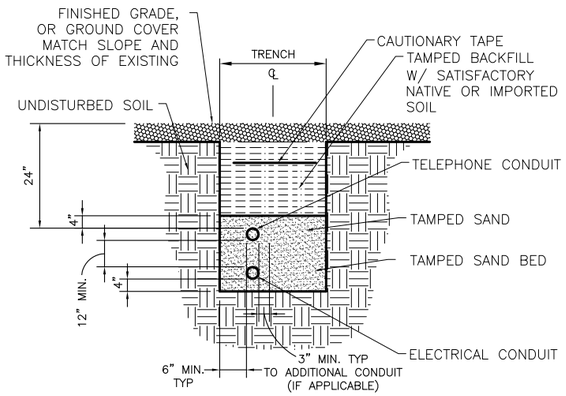
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
841793
BDL201
50 PINE LANE
WINDSOR, CT 06095

Drawing Title:
GROUNDING PLAN

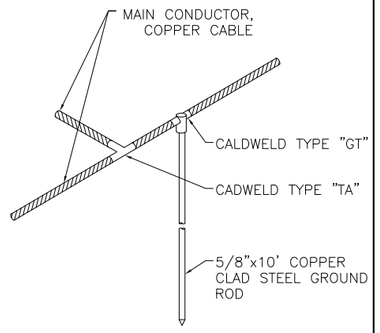
Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No.: E-5

SCALE IS BASE ON 22" X 34" "D" SIZE



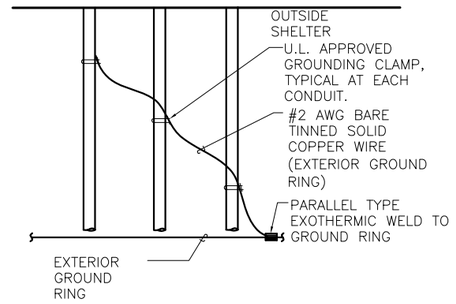
POWER/TELCO TRENCH

NTS | 1



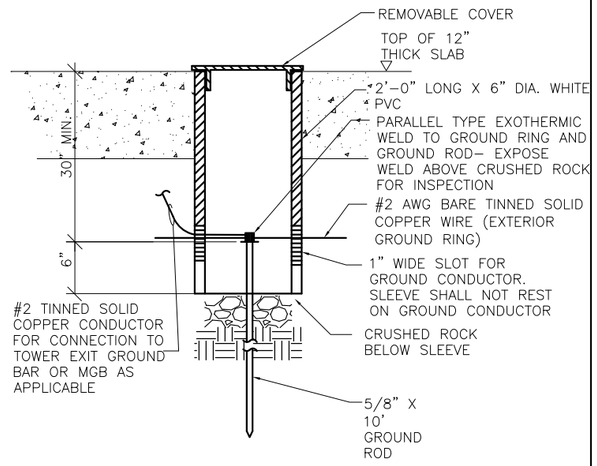
GROUND RING BOND

NTS | 2



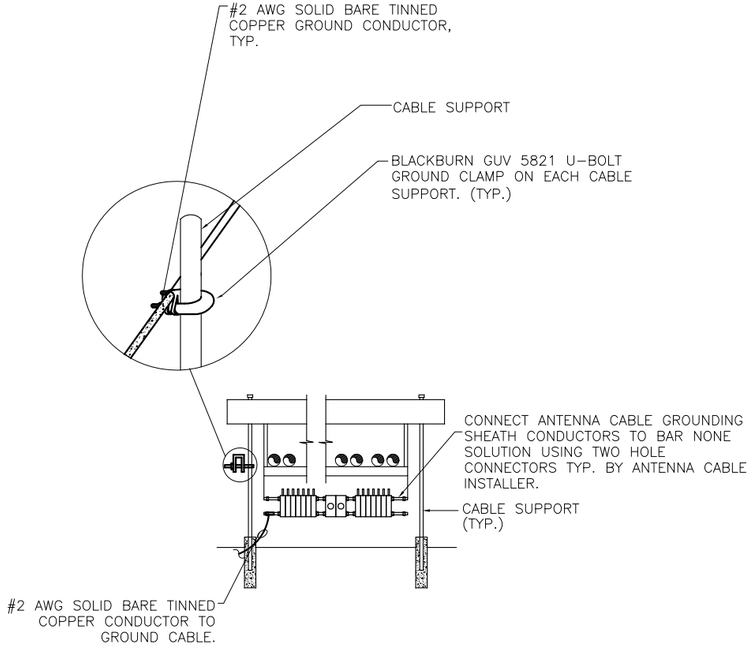
TYPICAL MULTIPLE CONDUITS GROUNDING DETAIL

NTS | 3



GROUNDING ROD INSPECTION SLEEVE DETAIL

NTS | 4



WAVEGUIDE BRIDGE AND CABLE GROUNDING DETAIL

NTS | 5

POWER PANEL 1 SCHEDULE (PANEL PP–1)

BUS VA A	BUS VA B	LOAD	WIRE	GND	COND	AMPS	BUS A B	AMPS	COND	GND	WIRE	LOAD	BUS VA A	BUS VA B
–		SPARE	–	–	–	30	1 – 2	30	3/4"	#10	#10	HVAC #1	2880	
	–						3 – 4							2880
–		SPARE	–	–	–	30	5 – 6	30	3/4"	#10	#10	HVAC #2	2880	
	–						7 – 8							2880
–		SPARE	–	–	–	30	9 – 10	–	–	–	–	SPACE	–	
	–						11 – 12	–	–	–	–	SPACE		–
–		SPACE	–	–	–	–	13 – 14	–	–	–	–	SPACE	–	
	–	SPACE	–	–	–	–	15 – 16	–	–	–	–	SPACE		–
–		SPACE	–	–	–	–	17 – 18	20	1/2"	#12	#12	INTERIOR LIGHTS	355	
	–	SPACE	–	–	–	–	19 – 20	20	1/2"	#12	#12	EXTERIOR LIGHT		109
–		SPACE	–	–	–	–	21 – 22	–	–	–	–	SPACE	–	
	–	SPACE	–	–	–	–	23 – 24	–	–	–	–	SPACE		–
–		SPACE	–	–	–	–	25 – 26	20	1/2"	#12	#12	CORD. REEL & RECEPT.	540	
	–	SPACE	–	–	–	–	27 – 28	20	1/2"	#12	#12	GFCI RECEPTACLE		180
–		SPACE	–	–	–	–	29 – 30	20	1/2"	#12	#12	EXHAUST FAN	180	
	–	SPACE	–	–	–	–	31 – 32	20	1/2"	#12	#12	EXTERIOR GFCI RECEPTACLE		180
–		SPACE	–	–	–	–	33 – 34	–	–	–	–	SPACE	–	
	–	SPACE	–	–	–	–	35 – 36	–	–	–	–	SPACE		–
10		POWER FAIL ALARM	#12	#12	3/4"	20	37 – 38	20	1/2"	#12	#12	GEN. BLOCK HTR	1200	
	10						39 – 40	20	1/2"	#12	#12	GEN. BATT. CHARGE		800
–		SPARE BREAKER	–	–	–	20	41 – 42	–	–	–	–	SPACE	–	

TOTAL VA: BUS A 8045 BUS B 7039 CONNECTED VA: 15084 AMPERES: BUS A 67 BUS B 59 TOTAL 63

RATED VOLTAGE: ☐ 120/208 ■ 120/240 ☐ 277/480 1 PHASE, 3 WIRE BRANCH POLES ☐ 12 ☐ 18 ☐ 20 ☐ 24 ☐ 30 ☐ 36 ■ 42

RATED AMPS: ☐ 100 ■ 200 ☐ 400 CABINET: ■ SURFACE ☐ FLUSH

FULL NEUTRAL BUS ■ GROUND BUS ■ HINGED DOOR ■ KEYED DOOR LATCH ENCLOSURE TYPE NEMA–1

BRANCH DEVICES ☐ FUSED ■ CIRCUIT BREAKER

■ MAIN LUGS ONLY MAIN ☐ BREAKER ☐ FUSED SWITCH

ALL BREAKERS MUST BE RATED TO INTERRUPT A SHORT CIRCUIT CURRENT OF MINIMUM 42,000 AMPS SYMMETRICAL.

NOTES:

ALL UNUSED BREAKERS TO BE LABELED "SPARE"

NOTE: THIS PANEL SCHEDULE IS FOR REFERENCE ONLY. REFER TO STATE APPROVED SHELTER MANUFACTURER DRAWINGS FOR EXACT PANEL SCHEDULE LAYOUT.

PANEL SCHEDULE

NTS | 6

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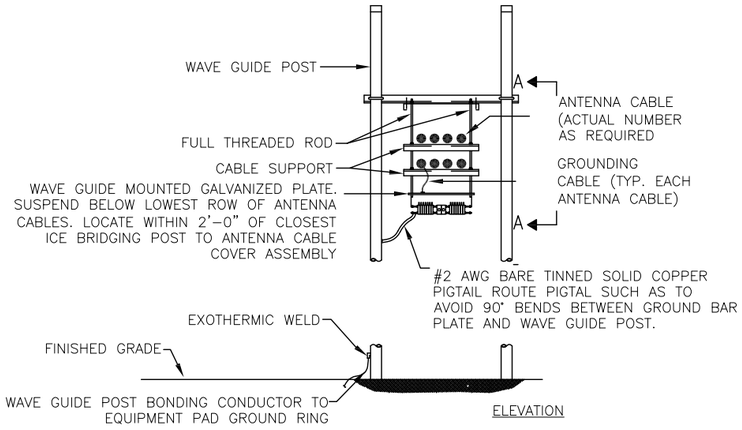
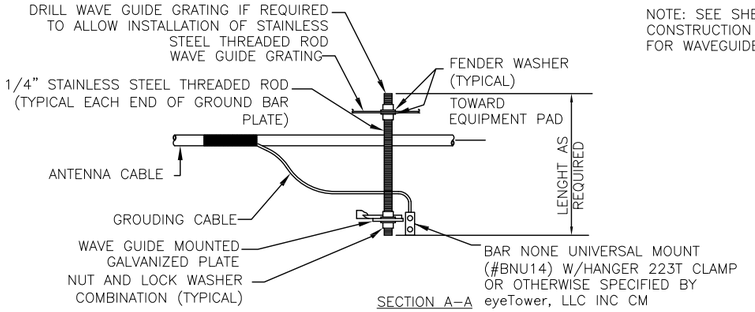
Drawing Title:

GROUNDING DETAILS

Project No.: 7160018	
Designer: CG	Date: 05/10/16
Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No. E-6

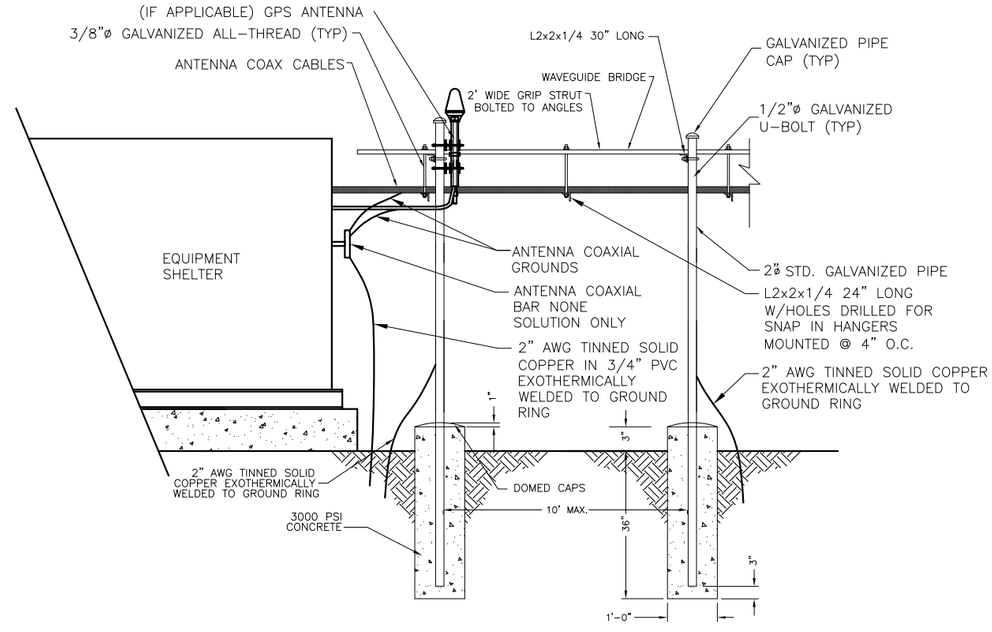
SCALE IS BASE ON 22" X 34" "D" SIZE



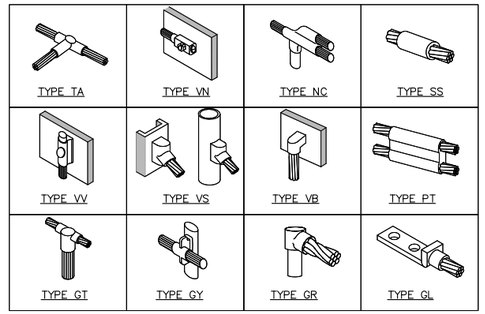


NOTE: SEE SHEET C-3 FOR CONSTRUCTION SPECIFICATIONS FOR WAVEGUIDE SUPPORT

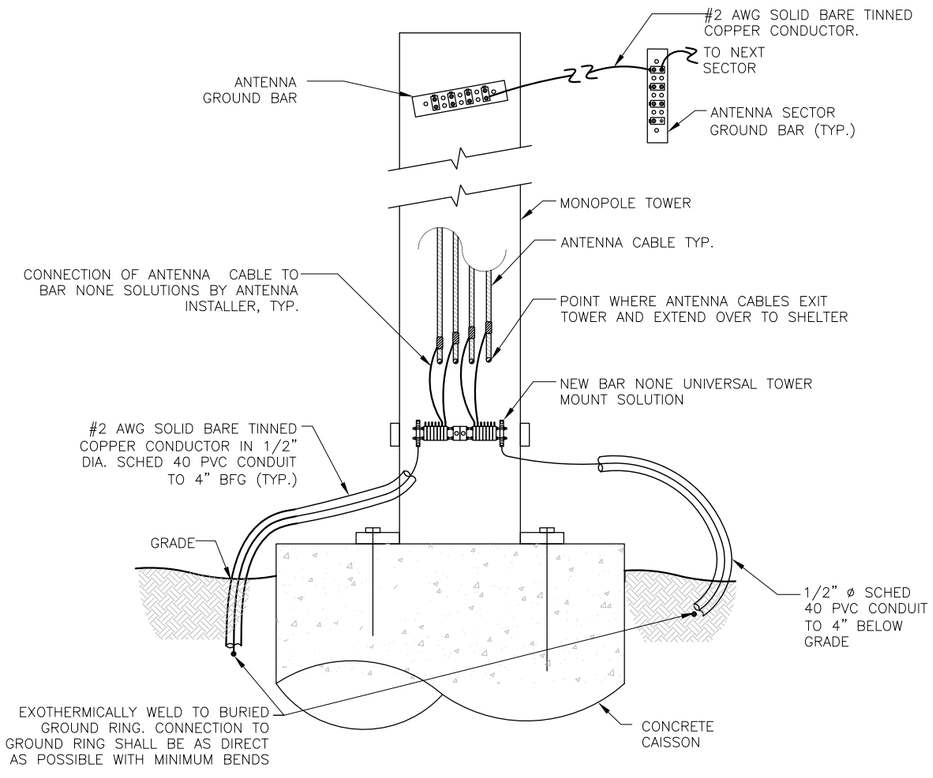
WAVEGUIDE MOUNTED BAR NONE SOLUTION INSTALLATION — NTS — 1



WAVEGUIDE BRIDGE — NTS — 3



CADWELD GROUND CONNECTION DETAIL — NTS — 2



TOWER GROUNDING DETAIL — NTS — 4

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50 PINE LANE
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Drawing Title:

GROUNDING DETAILS

Project No.:	
7160018	
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Drawn By: NK	Checked By: RL
PM Review: CG	Client Approval
Issue No.: 0	Drawing No.: E-7

SCALE IS BASE ON 22" X 34" "D" SIZE

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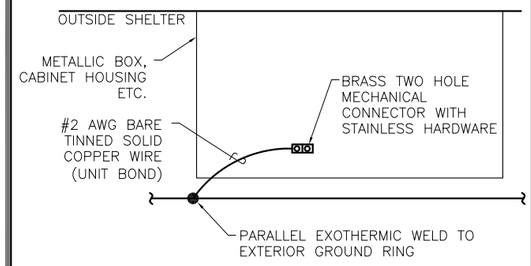
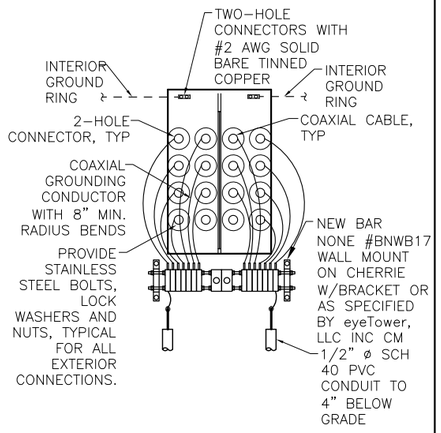
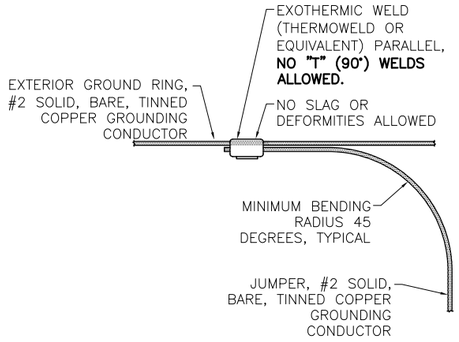
C B A



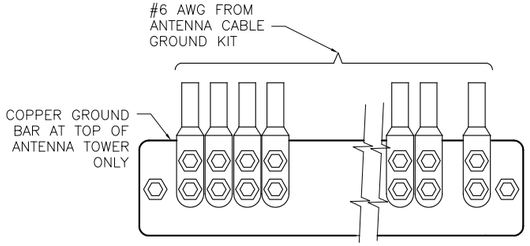
METALLIC CABINET GROUNDING DETAIL — NTS — 1



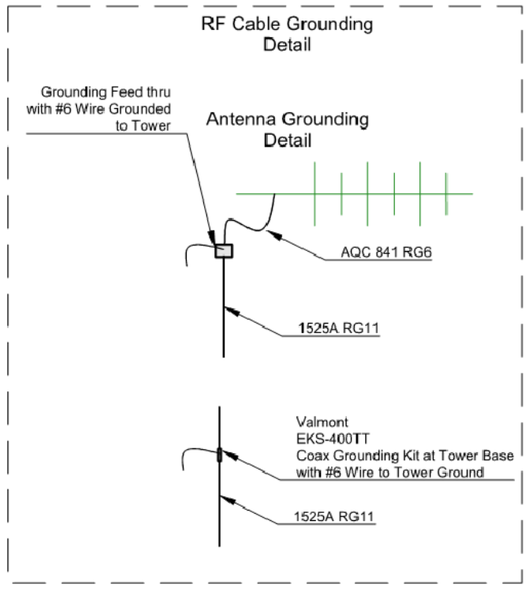
EXT HATCH PLATE GROUNDING DETAIL — NTS — 2



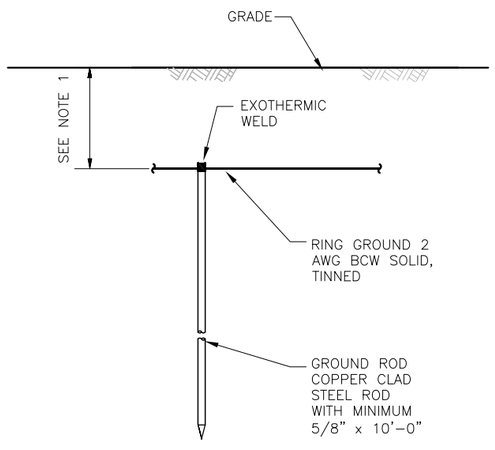
TYPICAL GROUNDING CONNECTION DETAIL — NTS — 3



INSTALLATION OF GROUND WIRE TO GROUND BAR AT TOP OF TOWER — NTS — 4



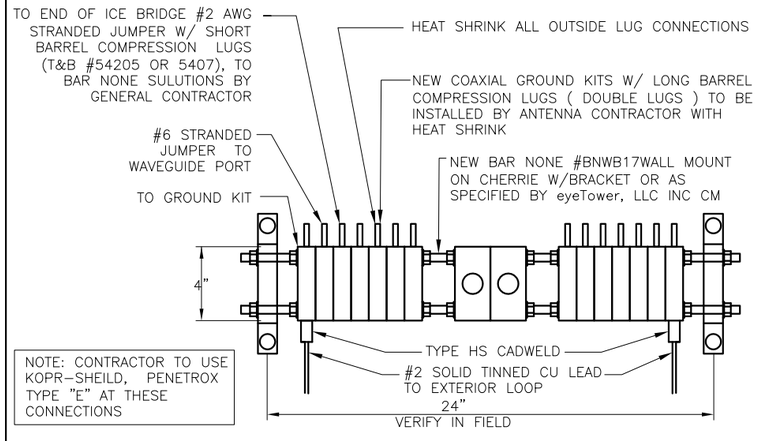
CONNECTION OF GROUND KIT TO ANTENNA CABLE — NTS — 5



NOTES:

1. GROUND LINE TO BE A MIN. OF 30" OR BELOW FROST LINE, WHICHEVER IS DEEPER.
2. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.

GROUND ROD — NTS — 6



NOTES:

1. ALL HARDWARE 8-88 STAINLESS STEEL INCLUDING BELLVILLES COAT MATING SURFACES WITH KOPR-SHEILD BEFORE ATTACHMENT.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".
4. ALL LUGS ARE DOUBLE HOLED 5. HEAT SHRINK ALL OUTSIDE LUG CONNECTIONS

GROUND BAR DETAIL — NTS — 7

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1 2 3 4 5 6

A B C

Date: **May 17, 2016**

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

AW Solutions
300 Crown Oak Centre Dr
Longwood, FL 32750
(407) 260-0231

Subject:	**Structural Analysis Report**	
Carrier Designation:	***eyeTower* Co-Locate**	
	Carrier Site Number:	BDL201
	Carrier Site Name:	BDL201
Crown Castle Designation:	**Crown Castle BU Number:**	841793
	Crown Castle Site Name:	WINDSOR PINE LANE
	Crown Castle JDE Job Number:	366921
	Crown Castle Work Order Number:	1237126
	Crown Castle Application Number:	335256 Rev. 7
Engineering Firm Designation:	**AW Solutions Project Number:**	841793
Site Data:	**50 PINE LANE, WINDSOR, Hartford County, CT** **Latitude *41° 49' 11.43"*, Longitude *-72° 40' 1.88"*** **147.5 Foot - Monopole Tower**	

Mr. McGuirt,

AW Solutions is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 903712, in accordance with application 335256, revision 7.

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:

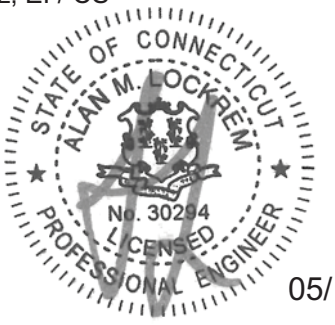
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA-222-F standard and 2005 CT State Building Code based upon a wind speed of 80 mph fastest mile.

We at *AW Solutions* 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.

Structural analysis prepared by: Joseph Jimenez, EI / CS

Respectfully submitted by:



05/19/16

Alan Lockrem, PE
Director of Engineering

tnxTower Report - version 7.0.5.1

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1) INTRODUCTION

This tower is a 147.5 ft Monopole tower designed by SUMMIT in November of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
85.0	85.0	1	miscl	WH 14-69/S	5	13/32	-
		1	miscl	WL 14-69/S			
		1	tower mounts	Side Arm Mount [SO 104-3]			
	83.0	2	miscl	WL 14-69/S			
	78.0	1	miscl	J105-HI			
78.0	78.0	1	tower mounts	Side Arm Mount [SO 104-3]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
149.0	153.0	1	decibel	DB225-C	1	7/8	1
	149.0	1	tower mounts	Platform Mount [LP 1201-1]			
140.0	140.0	1	andrew	HP2-102	1	3/8	1
		1	tower mounts	Pipe Mount [PM 601-1]	2	3/4	
139.0	139.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	7/8	1
	134.0	1	decibel	DB225-C			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
130.0	130.0	6	cci antennas	DTMABP0721VG12A	12	1-5/8	1
		3	ericsson	RRU-11			
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		1	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		2	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	4 2	3/4 3/8	2
		1	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe			
		1	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe			
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 32			
		3	ericsson	RRUS A2			
		2	quintel technology	QS66512-3 w/ Mount Pipe			
		2	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 1201-1]	-	-	1
118.0	118.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
108.0	109.0	2	andrew	VHLP800-11	6 4	5/16 1/2	1
	108.0	3	argus technologies	LLPX310R w/ Mount Pipe			
		3	samsung telecommunications	RRH-2WB			
		1	tower mounts	T-Arm Mount [TA 702-3]			
	107.0	2	andrew	VHLP2-18			

Notes:
1) Existing Equipment
2) Reserved Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	WEI	4469790	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	WEI (Mapping)	4469791	CCISITES
4-TOWER MANUFACTURER DRAWINGS	TEP (Mapping)	6064532	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), 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 in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) The monopole shaft, base plate, and anchor rod material grades have been assumed and can be found in the attached calculations in Appendix C.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	147.5 - 115.42	Pole	TP31.25x24x0.2188	1	-7.55	1088.18	24.2	Pass
L2	115.42 - 74.3	Pole	TP37.75x29.9289x0.2188	2	-13.53	1257.58	77.0	Pass
L3	74.3 - 39.22	Pole	TP44.63x36.4927x0.3125	3	-20.02	2226.39	68.3	Pass
L4	39.22 - 0	Pole	TP51.25x42.8641x0.375	4	-30.86	3148.01	69.3	Pass
							Summary	
						Pole (L2)	77.0	Pass
						RATING =	**77.0**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	58.7	Pass
1	Base Plate	0	90.5	Pass
1	Base Foundation Structural	0	42.4	Pass
1	Base Foundation Soil Interaction	0	83.3	Pass

Structure Rating (max from all components) =	**90.5%**

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

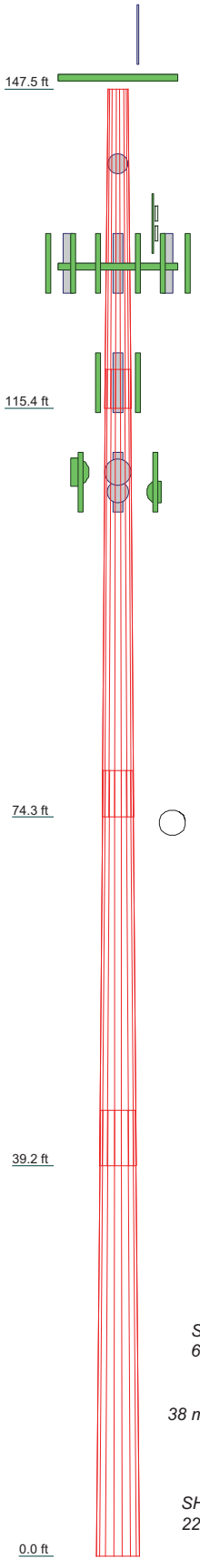
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	32.08	18	0.2188	3.91	24.0000	31.2500	A607-65	2.1
2	45.03	18	0.2188	4.72	29.9289	37.7500		3.6
3	39.80	18	0.3125	5.58	36.4927	44.6300		5.4
4	44.80	18	0.3750		42.8641	51.2500		8.5
								19.5



AXIAL
47 K

SHEAR
6 K

MOMENT
670 kip-ft

TORQUE 1 kip-ft
38 mph WIND - 1.0000 in ICE

AXIAL
31 K

SHEAR
22 K

MOMENT
2251 kip-ft

TORQUE 2 kip-ft
REACTIONS - 80 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB225-C	149	(2) DC6-48-60-18-8F	130
(4) 6' x 2" Mount Pipe	149	TPA-65R-LCUUUU-H8 w/ Mount Pipe	130
(4) 6' x 2" Mount Pipe	149	HPA-65R-BUU-H8 w/ Mount Pipe	130
(4) 6' x 2" Mount Pipe	149	6' x 2" Mount Pipe	130
Platform Mount [LP 1201-1]	149	6' x 2" Mount Pipe	130
Pipe Mount [PM 601-1]	140	6' x 2" Mount Pipe	130
HP2-102	140	AM-X-CD-16-65-00T-RET w/ Mount Pipe	130
Side Arm Mount [SO 701-1]	139		
DB225-C	139	APXV18-206517S-C w/ Mount Pipe	118
AM-X-CD-16-65-00T-RET w/ Mount Pipe	130	APXV18-206517S-C w/ Mount Pipe	118
		Pipe Mount [PM 601-3]	118
P65-17-XLH-RR w/ mount pipe	130	APXV18-206517S-C w/ Mount Pipe	118
(2) DTMABP0721VG12A	130	LLPX310R w/ Mount Pipe	108
(2) DTMABP0721VG12A	130	LLPX310R w/ Mount Pipe	108
(2) DTMABP0721VG12A	130	RRH-2WB	108
RRU-11	130	RRH-2WB	108
RRU-11	130	RRH-2WB	108
RRU-11	130	T-Arm Mount [TA 702-3]	108
Platform Mount [LP 1201-1]	130	LLPX310R w/ Mount Pipe	108
HPA-65R-BUU-H6 w/ Mount Pipe	130	VHLP2-18	108
HPA-65R-BUU-H6 w/ Mount Pipe	130	VHLP800-11	108
QS66512-3 w/ Mount Pipe	130	VHLP2-18	108
QS66512-3 w/ Mount Pipe	130	VHLP800-11	108
RRUS A2	130	Side Arm Mount [SO 104-3]	85
RRUS A2	130	WL 14-69/S	85
RRUS A2	130	WH 14-69/S	85
RRUS 11	130	WL 14-69/S	85
RRUS 11	130	WL 14-69/S	85
RRUS 11	130	J105-HI	85
RRUS 32	130	10' x 3" Pipe Mount	81.5
RRUS 32	130	10' x 3" Pipe Mount	81.5
RRUS 32	130	Side Arm Mount [SO 104-3]	78

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 77%

AW Solutions
300 Crown Oak Centre Dr
Longwood, FL 32750
AW Solutions
Phone: (407) 260-0231
FAX: (407) 260-0749

Job: ***BU841793***			
Project: ***WO1237126***			
Client: Crown Castle	Drawn by: Joseph Jimenez		App'd:
Code: TIA/EIA-222-F	Date: 05/18/16		Scale: NTS
Path: R:\Central_Data\CROWN CASTLE\CRC - STRUCTURAL\BU841793 - WO1237126\ENGINEERING\TNX\BU841793 WO1237126.eri			Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 80 mph.
3) Nominal ice thickness of 1.0000 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
√	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	147.50-115.42	32.08	3.91	18	24.0000	31.2500	0.2188	0.8750	A607-65 (65 ksi)
L2	115.42-74.30	45.03	4.72	18	29.9289	37.7500	0.2188	0.8750	A607-65 (65 ksi)
L3	74.30-39.22	39.80	5.58	18	36.4927	44.6300	0.3125	1.2500	A607-65 (65 ksi)
L4	39.22-0.00	44.80		18	42.8641	51.2500	0.3750	1.5000	A607-65 (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	24.3702	16.5116	1179.7676	8.4423	12.1920	96.7657	2361.0876	8.2574	3.8390	17.55
	31.7321	21.5454	2621.1402	11.0161	15.8750	165.1112	5245.7293	10.7747	5.1150	23.383
L2	31.0801	20.6281	2300.4075	10.5471	15.2039	151.3042	4603.8419	10.3160	4.8825	22.32
	38.3324	26.0584	4637.3676	13.3236	19.1770	241.8192	9280.8371	13.0317	6.2590	28.613
L3	38.0356	35.8862	5934.8139	12.8440	18.5383	320.1382	11877.4369	17.9465	5.8727	18.793
	45.3185	43.9574	10907.3727	15.7327	22.6720	481.0936	21829.0977	21.9829	7.3049	23.376
L4	44.5860	50.5727	11534.7855	15.0836	21.7750	529.7265	23084.7488	25.2912	6.8841	18.358
	52.0406	60.5540	19801.0813	18.0606	26.0350	760.5562	39628.2174	30.2827	8.3600	22.293

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 147.50-115.42				1	1	1			
L2 115.42-74.30				1	1	1			
L3 74.30-39.22				1	1	1			
L4 39.22-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF5-50A(7/8)	C	No	Inside Pole	147.50 - 6.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
***								
LDF2-50(3/8)	C	No	Inside Pole	140.00 - 6.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
WR-VG86T(3/4")	C	No	Inside Pole	140.00 - 6.00	2	No Ice	0.00	0.53
						1/2" Ice	0.00	0.53
						1" Ice	0.00	0.53
						2" Ice	0.00	0.53
						4" Ice	0.00	0.53
2" Conduit	C	No	Inside Pole	140.00 - 6.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16
						2" Ice	0.00	1.16
						4" Ice	0.00	1.16
***								
LDF5-50A(7/8)	C	No	Inside Pole	139.00 - 6.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
***								
LDF7-50A(1-5/8)	C	No	Inside Pole	130.00 - 6.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	130.00 - 0.00	2	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4")	C	No	Inside Pole	130.00 - 0.00	4	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
						2" Ice	0.00	0.58
						4" Ice	0.00	0.58
***								
LDF7-50A(1-5/8)	B	No	Inside Pole	118.00 - 1.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
LDF4-50A(1/2")	A	No	Inside Pole	108.00 - 6.00	4	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
9207(5/16")	A	No	Inside Pole	108.00 - 6.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
						2" Ice	0.00	0.60
						4" Ice	0.00	0.60
2" Conduit	A	No	Inside Pole	108.00 - 6.00	2	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16
						2" Ice	0.00	1.16
						4" Ice	0.00	1.16
***								
1110(13/32")	B	No	Inside Pole	85.00 - 0.00	5	No Ice	0.00	0.05
						1/2" Ice	0.00	0.05
						1" Ice	0.00	0.05
						2" Ice	0.00	0.05
						4" Ice	0.00	0.05
***								
Safety Line 5/8	A	No	CaAa (Out Of Face)	147.50 - 7.00	1	No Ice	0.09	0.40
						1/2" Ice	0.19	1.24
						1" Ice	0.29	2.70
						2" Ice	0.49	7.44
						4" Ice	0.89	24.25

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	147.50-115.42	A	0.000	0.000	0.000	2.823	0.01
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.25
L2	115.42-74.30	A	0.000	0.000	0.000	3.619	0.24
		B	0.000	0.000	0.000	0.000	0.21
		C	0.000	0.000	0.000	0.000	0.63
L3	74.30-39.22	A	0.000	0.000	0.000	3.087	0.24
		B	0.000	0.000	0.000	0.000	0.18
		C	0.000	0.000	0.000	0.000	0.54
L4	39.22-0.00	A	0.000	0.000	0.000	2.835	0.23
		B	0.000	0.000	0.000	0.000	0.20
		C	0.000	0.000	0.000	0.000	0.52

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	147.50-115.42	A	1.180	0.000	0.000	0.000	10.393	0.11
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.25
L2	115.42-74.30	A	1.135	0.000	0.000	0.000	13.321	0.37
		B		0.000	0.000	0.000	0.000	0.21
		C		0.000	0.000	0.000	0.000	0.63
L3	74.30-39.22	A	1.067	0.000	0.000	0.000	11.047	0.35
		B		0.000	0.000	0.000	0.000	0.18
		C		0.000	0.000	0.000	0.000	0.54
L4	39.22-0.00	A	1.000	0.000	0.000	0.000	9.711	0.31
		B		0.000	0.000	0.000	0.000	0.20
		C		0.000	0.000	0.000	0.000	0.52

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	147.50-115.42	0.0000	-0.1271	0.0000	-0.3963
L2	115.42-74.30	0.0000	-0.1280	0.0000	-0.4108
L3	74.30-39.22	0.0000	-0.1287	0.0000	-0.4117
L4	39.22-0.00	0.0000	-0.1050	0.0000	-0.3308

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Level 149									
DB225-C	A	From Leg	4.00 0.00 4.00	0.000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.32 4.18 6.03 9.74 17.17	2.32 4.18 6.03 9.74 17.17	0.03 0.04 0.04 0.06 0.10
(4) 6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(4) 6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(4) 6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
Platform Mount [LP 1201-1]	C	None		0.000	149.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50 37.90	23.10 26.80 30.50 37.90	2.10 2.50 2.90 3.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice 4" Ice	52.70	52.70	5.30
Level 140 Pipe Mount [PM 601-1]	A	From Leg	1.00 0.00 0.00	0.000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
Level 139 DB225-C	B	From Leg	3.00 0.00 -5.00	0.000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.32 4.18 6.03 9.74 17.17	2.32 4.18 6.03 9.74 17.17	0.03 0.04 0.04 0.06 0.10
Side Arm Mount [SO 701-1]	B	From Leg	3.00 0.00 0.00	0.000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
Level 130l AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
P65-17-XLH-RR w/ mount pipe	B	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.70 12.42 13.15 14.64 17.91	8.94 10.45 11.99 14.31 19.14	0.06 0.15 0.25 0.47 1.10
(2) DTMABP0721VG12A	A	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.34 0.43 0.54 0.77 1.34	0.02 0.03 0.04 0.06 0.14
(2) DTMABP0721VG12A	B	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.34 0.43 0.54 0.77 1.34	0.02 0.03 0.04 0.06 0.14
(2) DTMABP0721VG12A	C	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.34 0.43 0.54 0.77 1.34	0.02 0.03 0.04 0.06 0.14
RRU-11	A	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.91 2.10 2.30 2.72 3.68	1.47 1.65 1.83 2.22 3.10	0.04 0.06 0.08 0.12 0.25

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRU-11	B	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.91 2.10 2.30 2.72 3.68	1.47 1.65 1.83 2.22 3.10	0.04 0.06 0.08 0.12 0.25
RRU-11	C	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.91 2.10 2.30 2.72 3.68	1.47 1.65 1.83 2.22 3.10	0.04 0.06 0.08 0.12 0.25
Platform Mount [LP 1201-1]	C	None		0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.10 26.80 30.50 37.90 52.70	23.10 26.80 30.50 37.90 52.70	2.10 2.50 2.90 3.70 5.30
Level 130R HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	8.11 9.30 10.21 12.17 16.35	0.08 0.16 0.25 0.46 1.02
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	8.11 9.30 10.21 12.17 16.35	0.08 0.16 0.25 0.46 1.02
QS66512-3 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	8.46 9.66 10.62 12.61 16.81	0.13 0.21 0.29 0.49 1.02
QS66512-3 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	8.46 9.66 10.62 12.61 16.81	0.13 0.21 0.29 0.49 1.02
RRUS A2	A	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.41 2.62 2.84 3.30 4.32	0.53 0.67 0.81 1.11 1.83	0.02 0.03 0.05 0.09 0.20
RRUS A2	B	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.41 2.62 2.84 3.30 4.32	0.53 0.67 0.81 1.11 1.83	0.02 0.03 0.05 0.09 0.20
RRUS A2	C	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.41 2.62 2.84 3.30 4.32	0.53 0.67 0.81 1.11 1.83	0.02 0.03 0.05 0.09 0.20
RRUS 11	A	From Leg	4.00 0.00 0.00	0.000	130.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74 4.27	1.37 1.55 1.74 2.14	0.05 0.07 0.10 0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	5.43	3.04	0.31
						4" Ice			
RRUS 11	B	From Leg	4.00	0.000	130.00	No Ice	3.25	1.37	0.05
			0.00			1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.10
						1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
RRUS 11	C	From Leg	4.00	0.000	130.00	No Ice	3.25	1.37	0.05
			0.00			1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.10
						1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
RRUS 32	A	From Leg	4.00	0.000	130.00	No Ice	3.33	1.98	0.06
			0.00			1/2"	3.60	2.21	0.08
			0.00			Ice	3.87	2.45	0.10
						1" Ice	4.44	2.96	0.16
						2" Ice	5.68	4.07	0.34
						4" Ice			
RRUS 32	B	From Leg	4.00	0.000	130.00	No Ice	3.33	1.98	0.06
			0.00			1/2"	3.60	2.21	0.08
			0.00			Ice	3.87	2.45	0.10
						1" Ice	4.44	2.96	0.16
						2" Ice	5.68	4.07	0.34
						4" Ice			
RRUS 32	C	From Leg	4.00	0.000	130.00	No Ice	3.33	1.98	0.06
			0.00			1/2"	3.60	2.21	0.08
			0.00			Ice	3.87	2.45	0.10
						1" Ice	4.44	2.96	0.16
						2" Ice	5.68	4.07	0.34
						4" Ice			
(2) DC6-48-60-18-8F	B	From Leg	4.00	0.000	130.00	No Ice	1.27	1.27	0.02
			0.00			1/2"	1.46	1.46	0.04
			0.00			Ice	1.66	1.66	0.05
						1" Ice	2.09	2.09	0.10
						2" Ice	3.10	3.10	0.21
						4" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.000	130.00	No Ice	13.68	10.96	0.11
			0.00			1/2"	14.50	12.49	0.22
			0.00			Ice	15.33	14.04	0.33
						1" Ice	16.94	16.39	0.59
						2" Ice	20.27	21.28	1.30
						4" Ice			
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.000	130.00	No Ice	13.53	9.58	0.10
			0.00			1/2"	14.34	11.05	0.20
			0.00			Ice	15.14	12.50	0.30
						1" Ice	16.71	14.75	0.55
						2" Ice	19.95	19.46	1.22
						4" Ice			
6' x 2" Mount Pipe	A	From Leg	4.00	0.000	130.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
6' x 2" Mount Pipe	B	From Leg	4.00	0.000	130.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00	0.000	130.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
Level 118									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
Pipe Mount [PM 601-3]	C	None		0.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
Level 108									
LLPX310R w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
LLPX310R w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
LLPX310R w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
RRH-2WB	A	From Leg	3.00 0.00 0.00	0.000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.69 2.91 3.14 3.63 4.72	0.85 1.01 1.18 1.55 2.38	0.04 0.06 0.08 0.12 0.25
RRH-2WB	B	From Leg	3.00 0.00 0.00	0.000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.69 2.91 3.14 3.63 4.72	0.85 1.01 1.18 1.55 2.38	0.04 0.06 0.08 0.12 0.25
RRH-2WB	C	From Leg	3.00 0.00 0.00	0.000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.69 2.91 3.14 3.63 4.72	0.85 1.01 1.18 1.55 2.38	0.04 0.06 0.08 0.12 0.25

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
T-Arm Mount [TA 702-3]	C	None		0.000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.64 6.55 7.46 9.28 12.92	5.64 6.55 7.46 9.28 12.92	0.34 0.43 0.52 0.70 1.06
Level 85P									
WL 14-69/S	B	From Leg	2.00 0.00 -2.00	0.000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.63 1.02 1.42 2.21 3.79	0.63 1.02 1.42 2.21 3.79	0.01 0.02 0.04 0.06 0.12
WH 14-69/S	B	From Leg	2.00 0.00 0.00	0.000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.32 3.37 4.42 6.52 10.72	2.32 3.37 4.42 6.52 10.72	0.00 0.00 0.00 0.01 0.01
WL 14-69/S	C	From Leg	2.00 0.00 0.00	0.000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.63 1.02 1.42 2.21 3.79	0.63 1.02 1.42 2.21 3.79	0.01 0.02 0.04 0.06 0.12
WL 14-69/S	C	From Leg	2.00 0.00 -2.00	0.000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.63 1.02 1.42 2.21 3.79	0.63 1.02 1.42 2.21 3.79	0.01 0.02 0.04 0.06 0.12
J105-HI	B	From Leg	2.00 0.00 -7.00	0.000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.32 0.42 0.52 0.75 1.32	4.84 5.21 5.59 6.37 8.03	0.01 0.03 0.06 0.12 0.32
Side Arm Mount [SO 104-3]	C	None		0.000	85.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 4.13 4.96 6.62 9.94	3.30 4.13 4.96 6.62 9.94	0.29 0.32 0.35 0.41 0.53
Side Arm Mount [SO 104-3]	C	None		0.000	78.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 4.13 4.96 6.62 9.94	3.30 4.13 4.96 6.62 9.94	0.29 0.32 0.35 0.41 0.53
10' x 3" Pipe Mount	B	From Leg	2.00 0.00 0.00	0.000	81.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.03 5.03 6.26 8.83	3.00 4.03 5.03 6.26 8.83	0.08 0.10 0.13 0.21 0.45
10' x 3" Pipe Mount	C	From Leg	2.00 0.00 0.00	0.000	81.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.03 5.03 6.26 8.83	3.00 4.03 5.03 6.26 8.83	0.08 0.10 0.13 0.21 0.45

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
HP2-102	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.000		140.00	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	0.03 0.04 0.06 0.09 0.16
***											
VHLP2-18	A	Paraboloid w/Shroud (HP)	From Leg	2.00 0.00 -1.00	0.000		108.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.20
VHLP800-11	A	Paraboloid w/Shroud (HP)	From Leg	2.00 0.00 1.00	0.000		108.00	2.80	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.16 6.53 6.90 7.65 9.13	0.05 0.08 0.12 0.18 0.32
VHLP2-18	B	Paraboloid w/Shroud (HP)	From Leg	2.00 0.00 -1.00	0.000		108.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.20
VHLP800-11	C	Paraboloid w/Shroud (HP)	From Leg	2.00 0.00 1.00	0.000		108.00	2.80	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.16 6.53 6.90 7.65 9.13	0.05 0.08 0.12 0.18 0.32

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service

Comb. No.	Description
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	147.5 - 115.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14.77	-0.74	-0.32
			Max. Mx	5	-7.57	-155.95	0.78
			Max. My	8	-7.56	0.59	-157.91
			Max. Vy	5	10.32	-155.95	0.78
			Max. Vx	8	10.40	0.59	-157.91
			Max. Torque	9			0.95
L2	115.42 - 74.3	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.74	-0.68	-0.59
			Max. Mx	5	-13.55	-710.31	5.93
			Max. My	8	-13.53	5.07	-718.89
			Max. Vy	5	16.16	-710.31	5.93
			Max. Vx	8	16.43	5.07	-718.89
			Max. Torque	9			1.91
L3	74.3 - 39.22	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.26	-0.68	-0.40
			Max. Mx	5	-20.03	-1309.48	13.65
			Max. My	8	-20.02	11.50	-1327.40
			Max. Vy	5	18.69	-1309.48	13.65
			Max. Vx	8	18.96	11.50	-1327.40
			Max. Torque	9			1.91
L4	39.22 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-46.75	-0.68	-0.18
			Max. Mx	5	-30.86	-2210.95	23.64
			Max. My	8	-30.86	19.82	-2240.93
			Max. Vy	5	21.51	-2210.95	23.64
			Max. Vx	8	21.78	19.82	-2240.93
			Max. Torque	9			1.89

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	22	46.75	3.06	-5.35
	Max. H_x	11	30.88	21.47	-0.14
	Max. H_z	2	30.88	-0.21	21.67
	Max. M_x	2	2229.48	-0.21	21.67
	Max. M_z	5	2210.95	-21.50	0.22
	Max. Torsion	9	1.88	10.87	-18.96
	Min. Vert	1	30.88	0.00	0.00
	Min. H_x	5	30.88	-21.50	0.22
	Min. H_z	8	30.88	0.18	-21.76
	Min. M_x	8	-2240.93	0.18	-21.76
	Min. M_z	11	-2207.32	21.47	-0.14
	Min. Torsion	3	-1.87	-10.91	18.86

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	30.88	0.00	0.00	0.03	-0.41	0.00
Dead+Wind 0 deg - No Ice	30.88	0.21	-21.67	-2229.48	-23.31	1.36
Dead+Wind 30 deg - No Ice	30.88	10.91	-18.86	-1940.69	-1123.46	1.87
Dead+Wind 60 deg - No Ice	30.88	18.67	-11.02	-1134.14	-1921.05	1.55
Dead+Wind 90 deg - No Ice	30.88	21.50	-0.22	-23.64	-2210.95	0.77
Dead+Wind 120 deg - No Ice	30.88	18.51	10.77	1108.16	-1903.41	0.27
Dead+Wind 150 deg - No Ice	30.88	10.57	18.81	1936.98	-1087.20	-0.42
Dead+Wind 180 deg - No Ice	30.88	-0.18	21.76	2240.93	19.82	-1.34
Dead+Wind 210 deg - No Ice	30.88	-10.87	18.96	1953.18	1119.57	-1.88
Dead+Wind 240 deg - No Ice	30.88	-18.64	11.08	1142.93	1917.01	-1.63
Dead+Wind 270 deg - No Ice	30.88	-21.47	0.14	16.14	2207.32	-0.75
Dead+Wind 300 deg - No Ice	30.88	-18.50	-10.71	-1099.97	1901.52	-0.21
Dead+Wind 330 deg - No Ice	30.88	-10.61	-18.68	-1921.32	1089.36	0.41
Dead+Ice+Temp	46.75	0.00	0.00	0.18	-0.68	0.00
Dead+Wind 0 deg+Ice+Temp	46.75	0.05	-6.12	-665.47	-6.66	0.56
Dead+Wind 30 deg+Ice+Temp	46.75	3.06	-5.32	-578.85	-334.03	0.66
Dead+Wind 60 deg+Ice+Temp	46.75	5.25	-3.10	-337.63	-571.58	0.50
Dead+Wind 90 deg+Ice+Temp	46.75	6.05	-0.06	-5.91	-657.98	0.20
Dead+Wind 120 deg+Ice+Temp	46.75	5.21	3.04	331.36	-566.98	-0.03
Dead+Wind 150 deg+Ice+Temp	46.75	2.98	5.31	578.33	-324.62	-0.28
Dead+Wind 180 deg+Ice+Temp	46.75	-0.05	6.14	668.91	4.50	-0.55
Dead+Wind 210 deg+Ice+Temp	46.75	-3.06	5.35	582.60	331.76	-0.66
Dead+Wind 240 deg+Ice+Temp	46.75	-5.24	3.12	340.39	569.31	-0.53
Dead+Wind 270 deg+Ice+Temp	46.75	-6.04	0.04	4.42	655.79	-0.20
Dead+Wind 300 deg+Ice+Temp	46.75	-5.21	-3.03	-328.75	565.19	0.05
Dead+Wind 330 deg+Ice+Temp	46.75	-2.99	-5.28	-573.80	323.85	0.29
Dead+Wind 0 deg - Service	30.88	0.08	-8.46	-871.48	-9.38	0.54
Dead+Wind 30 deg - Service	30.88	4.26	-7.37	-758.59	-439.43	0.73
Dead+Wind 60 deg - Service	30.88	7.29	-4.30	-443.31	-751.20	0.60
Dead+Wind 90 deg - Service	30.88	8.40	-0.09	-9.22	-864.51	0.30
Dead+Wind 120 deg - Service	30.88	7.23	4.21	433.19	-744.29	0.11
Dead+Wind 150 deg - Service	30.88	4.13	7.35	757.18	-425.25	-0.16
Dead+Wind 180 deg - Service	30.88	-0.07	8.50	876.00	7.48	-0.52
Dead+Wind 210 deg - Service	30.88	-4.25	7.41	763.52	437.37	-0.74
Dead+Wind 240 deg - Service	30.88	-7.28	4.33	446.79	749.08	-0.65
Dead+Wind 270 deg - Service	30.88	-8.39	0.05	6.33	862.56	-0.30
Dead+Wind 300 deg - Service	30.88	-7.23	-4.18	-429.95	743.01	-0.08
Dead+Wind 330 deg - Service	30.88	-4.14	-7.30	-751.01	425.55	0.17

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-30.88	0.00	0.00	30.88	0.00	0.000%
2	0.21	-30.88	-21.67	-0.21	30.88	21.67	0.000%
3	10.91	-30.88	-18.86	-10.91	30.88	18.86	0.000%
4	18.67	-30.88	-11.02	-18.67	30.88	11.02	0.000%
5	21.50	-30.88	-0.22	-21.50	30.88	0.22	0.000%
6	18.51	-30.88	10.77	-18.51	30.88	-10.77	0.000%
7	10.57	-30.88	18.81	-10.57	30.88	-18.81	0.000%
8	-0.18	-30.88	21.76	0.18	30.88	-21.76	0.000%
9	-10.87	-30.88	18.96	10.87	30.88	-18.96	0.000%
10	-18.64	-30.88	11.08	18.64	30.88	-11.08	0.000%
11	-21.47	-30.88	0.14	21.47	30.88	-0.14	0.000%
12	-18.50	-30.88	-10.71	18.50	30.88	10.71	0.000%
13	-10.61	-30.88	-18.68	10.61	30.88	18.68	0.000%
14	0.00	-46.75	0.00	0.00	46.75	0.00	0.000%
15	0.05	-46.75	-6.12	-0.05	46.75	6.12	0.000%
16	3.06	-46.75	-5.32	-3.06	46.75	5.32	0.000%
17	5.25	-46.75	-3.10	-5.25	46.75	3.10	0.000%
18	6.05	-46.75	-0.06	-6.05	46.75	0.06	0.000%
19	5.21	-46.75	3.04	-5.21	46.75	-3.04	0.000%
20	2.98	-46.75	5.31	-2.98	46.75	-5.31	0.000%
21	-0.05	-46.75	6.14	0.05	46.75	-6.14	0.000%
22	-3.06	-46.75	5.35	3.06	46.75	-5.35	0.000%
23	-5.24	-46.75	3.12	5.24	46.75	-3.12	0.000%
24	-6.04	-46.75	0.04	6.04	46.75	-0.04	0.000%
25	-5.21	-46.75	-3.03	5.21	46.75	3.03	0.000%
26	-2.99	-46.75	-5.28	2.99	46.75	5.28	0.000%
27	0.08	-30.88	-8.46	-0.08	30.88	8.46	0.000%
28	4.26	-30.88	-7.37	-4.26	30.88	7.37	0.000%
29	7.29	-30.88	-4.30	-7.29	30.88	4.30	0.000%
30	8.40	-30.88	-0.09	-8.40	30.88	0.09	0.000%
31	7.23	-30.88	4.21	-7.23	30.88	-4.21	0.000%
32	4.13	-30.88	7.35	-4.13	30.88	-7.35	0.000%
33	-0.07	-30.88	8.50	0.07	30.88	-8.50	0.000%
34	-4.25	-30.88	7.41	4.25	30.88	-7.41	0.000%
35	-7.28	-30.88	4.33	7.28	30.88	-4.33	0.000%
36	-8.39	-30.88	0.05	8.39	30.88	-0.05	0.000%
37	-7.23	-30.88	-4.18	7.23	30.88	4.18	0.000%
38	-4.14	-30.88	-7.30	4.14	30.88	7.30	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005068
3	Yes	5	0.00000001	0.00055253
4	Yes	5	0.00000001	0.00050560
5	Yes	4	0.00000001	0.00018795
6	Yes	5	0.00000001	0.00050980
7	Yes	5	0.00000001	0.00051766
8	Yes	4	0.00000001	0.00064182
9	Yes	5	0.00000001	0.00050307
10	Yes	5	0.00000001	0.00054764
11	Yes	4	0.00000001	0.00060793
12	Yes	5	0.00000001	0.00050284
13	Yes	5	0.00000001	0.00049717
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00019893
16	Yes	5	0.00000001	0.00025897
17	Yes	5	0.00000001	0.00025124

18	Yes	5	0.00000001	0.00019552
19	Yes	5	0.00000001	0.00024864
20	Yes	5	0.00000001	0.00025349
21	Yes	5	0.00000001	0.00019971
22	Yes	5	0.00000001	0.00025207
23	Yes	5	0.00000001	0.00025572
24	Yes	5	0.00000001	0.00019440
25	Yes	5	0.00000001	0.00024722
26	Yes	5	0.00000001	0.00024605
27	Yes	4	0.00000001	0.00022396
28	Yes	5	0.00000001	0.00005474
29	Yes	5	0.00000001	0.00004550
30	Yes	4	0.00000001	0.00008286
31	Yes	5	0.00000001	0.00004709
32	Yes	5	0.00000001	0.00004872
33	Yes	4	0.00000001	0.00017382
34	Yes	5	0.00000001	0.00004482
35	Yes	5	0.00000001	0.00005331
36	Yes	4	0.00000001	0.00011362
37	Yes	5	0.00000001	0.00004605
38	Yes	5	0.00000001	0.00004486

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 115.42	28.98	34	1.635	0.004
L2	119.33 - 74.3	19.49	34	1.549	0.004
L3	79.02 - 39.22	8.33	34	1.006	0.002
L4	44.8 - 0	2.68	34	0.543	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	DB225-C	34	28.98	1.635	0.004	40541
140.00	HP2-102	34	26.40	1.628	0.004	27027
139.00	DB225-C	34	26.05	1.627	0.004	23847
130.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	34	23.00	1.606	0.004	11582
118.00	APXV18-206517S-C w/ Mount Pipe	34	19.07	1.538	0.004	7000
109.00	VHLP800-11	34	16.27	1.446	0.003	5775
108.00	LLPX310R w/ Mount Pipe	34	15.97	1.434	0.003	5666
107.00	VHLP2-18	34	15.67	1.422	0.003	5562
85.00	WL 14-69/S	34	9.72	1.098	0.002	3950
81.50	10' x 3" Pipe Mount	34	8.89	1.044	0.002	3780
78.00	Side Arm Mount [SO 104-3]	34	8.11	0.991	0.002	3678

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 115.42	74.06	9	4.183	0.011
L2	119.33 - 74.3	49.83	9	3.962	0.009
L3	79.02 - 39.22	21.31	9	2.574	0.005
L4	44.8 - 0	6.85	9	1.388	0.002

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	DB225-C	9	74.06	4.183	0.011	16097
140.00	HP2-102	9	67.47	4.165	0.010	10731
139.00	DB225-C	9	66.59	4.162	0.010	9468
130.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	9	58.79	4.109	0.010	4597
118.00	APXV18-206517S-C w/ Mount Pipe	9	48.74	3.935	0.009	2775
109.00	VHLP800-11	9	41.60	3.699	0.008	2281
108.00	LLPX310R w/ Mount Pipe	9	40.83	3.668	0.008	2237
107.00	VHLP2-18	9	40.06	3.636	0.008	2195
85.00	WL 14-69/S	9	24.85	2.809	0.005	1553
81.50	10' x 3" Pipe Mount	9	22.74	2.671	0.005	1485
78.00	Side Arm Mount [SO 104-3]	9	20.74	2.535	0.005	1445

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	147.5 - 115.42 (1)	TP31.25x24x0.2188	32.08	0.00	0.0	39.00	20.9319	-7.55	816.34	0.009
L2	115.42 - 74.3 (2)	TP37.75x29.9289x0.2188	45.03	0.00	0.0	37.01	25.4892	-13.53	943.42	0.014
L3	74.3 - 39.22 (3)	TP44.63x36.4927x0.3125	39.80	0.00	0.0	39.00	42.8258	-20.02	1670.21	0.012
L4	39.22 - 0 (4)	TP51.25x42.8641x0.375	44.80	0.00	0.0	39.00	60.5540	-30.86	2361.60	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	147.5 - 115.42 (1)	TP31.25x24x0.2188	158.26	12.19	39.00	0.313	0.00	0.00	39.00	0.000
L2	115.42 - 74.3 (2)	TP37.75x29.9289x0.2188	721.64	37.43	37.01	1.011	0.00	0.00	37.01	0.000
L3	74.3 - 39.22 (3)	TP44.63x36.4927x0.3125	1333.47	35.05	39.00	0.899	0.00	0.00	39.00	0.000
L4	39.22 - 0 (4)	TP51.25x42.8641x0.375	2251.30	35.52	39.00	0.911	0.00	0.00	39.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	147.5 - 115.42 (1)	TP31.25x24x0.2188	10.46	0.50	26.00	0.038	0.95	0.04	26.00	0.001
L2	115.42 - 74.3 (2)	TP37.75x29.9289x0.2188	16.53	0.65	26.00	0.050	1.91	0.05	26.00	0.002
L3	74.3 - 39.22 (3)	TP44.63x36.4927x0.3125	19.06	0.45	26.00	0.034	1.90	0.02	26.00	0.001
L4	39.22 - 0 (4)	TP51.25x42.8641x0.375	21.88	0.36	26.00	0.028	1.88	0.01	26.00	0.001

Pole Interaction Design Data

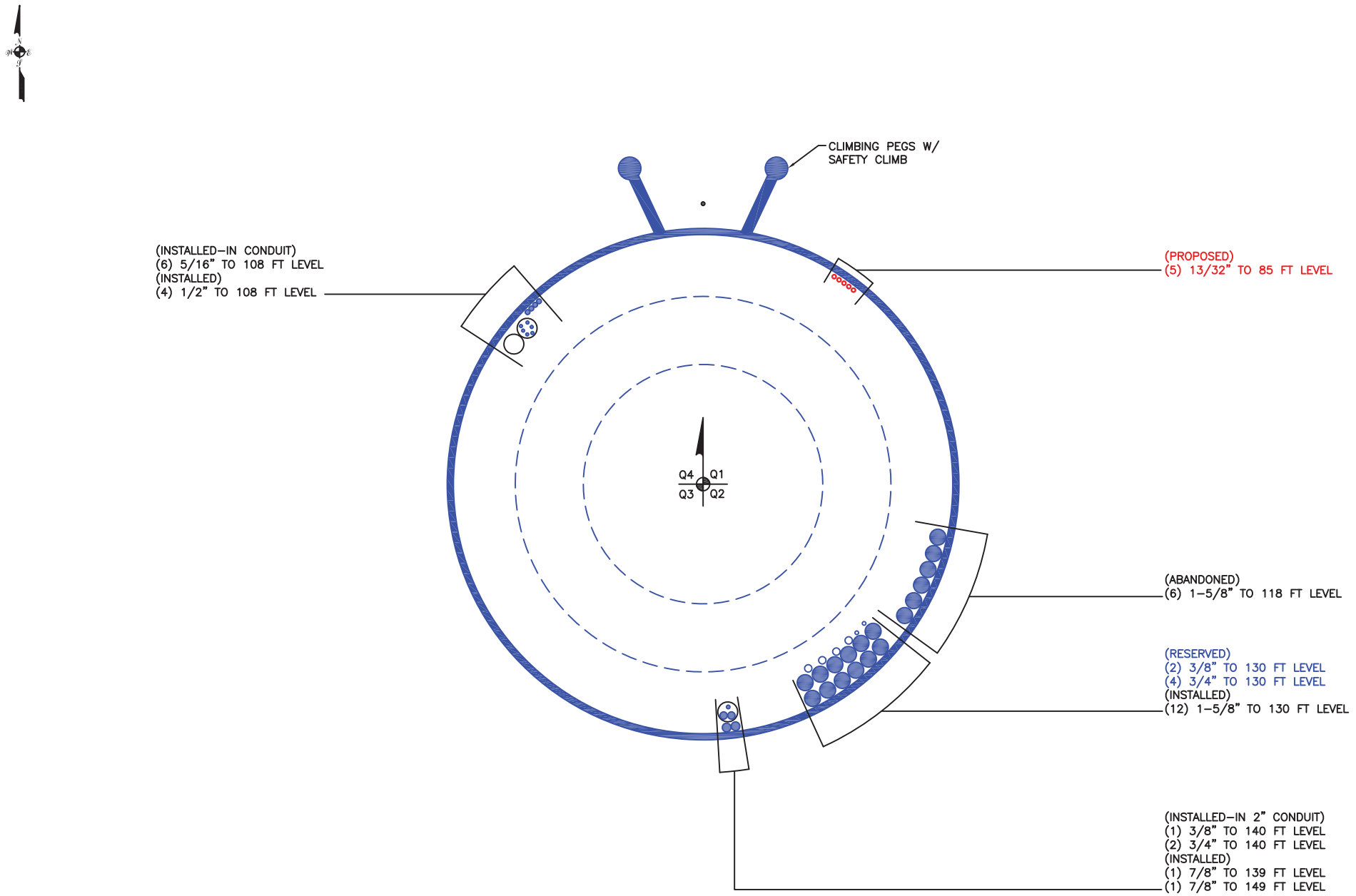
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147.5 - 115.42 (1)	0.009	0.313	0.000	0.038	0.001	0.322 ✔	1.333	H1-3+VT ✔
L2	115.42 - 74.3 (2)	0.014	1.011	0.000	0.050	0.002	1.026 ✔	1.333	H1-3+VT ✔
L3	74.3 - 39.22 (3)	0.012	0.899	0.000	0.034	0.001	0.911 ✔	1.333	H1-3+VT ✔
L4	39.22 - 0 (4)	0.013	0.911	0.000	0.028	0.001	0.924 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	147.5 - 115.42	Pole	TP31.25x24x0.2188	1	-7.55	1088.18	24.2	Pass
L2	115.42 - 74.3	Pole	TP37.75x29.9289x0.2188	2	-13.53	1257.58	77.0	Pass
L3	74.3 - 39.22	Pole	TP44.63x36.4927x0.3125	3	-20.02	2226.39	68.3	Pass
L4	39.22 - 0	Pole	TP51.25x42.8641x0.375	4	-30.86	3148.01	69.3	Pass
							Summary	
						Pole (L2)	77.0	Pass
						RATING =	**77.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841793 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *841793*
Site Name: *Windsor Pine Lane*
App #: *335256 Rev. 7*

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	58	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	57	in
Thick:	2.75	in
Grade:	36	ksi
Clip Distance:	15	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	51.25	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2251	ft-kips
Unfactored Axial, P:	31	kips
Unfactored Shear, V:	22	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	114.5	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	58.7%	**Pass**

Base Plate Results — Flexural Check

Base Plate Stress:	32.6	ksi
Allowable PL Bending Stress:	36.0	ksi
Base Plate Stress Ratio:	90.5%	**Pass**

PL Ref. Data	
Yield Line (in):	29.36
Max PL Length:	29.36

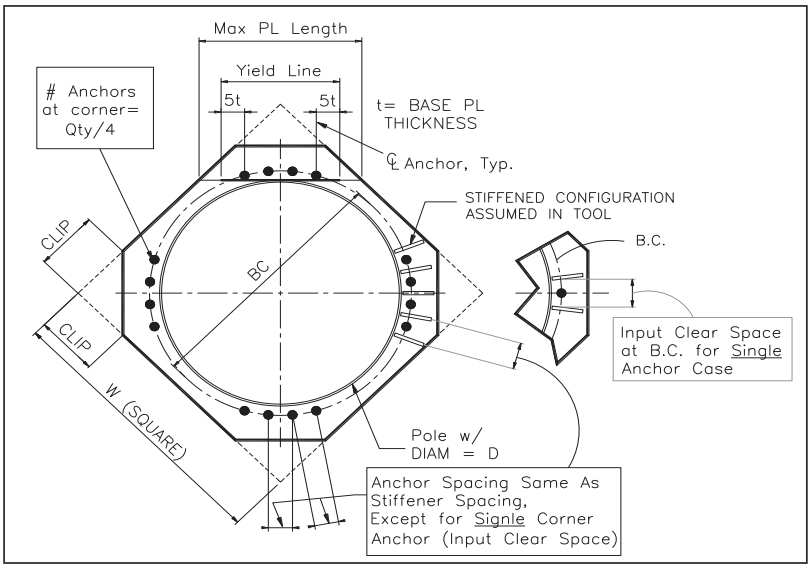
N/A - Unstiffened

Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check:	N/A



** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

CCI Foundation Tool Suite - Monopole Pier

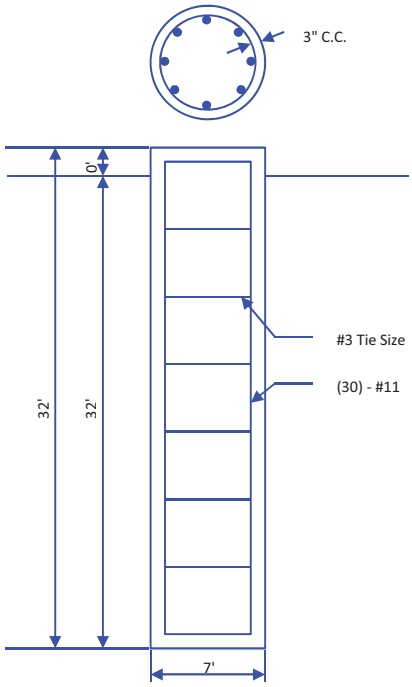
CCIFTS 1.2.108.14286 - Phase 1-2 Date: 5/18/2016

BU:	841793
Site Name:	Windsor Pine Lane
App Number:	335256 Rev. 7
Work Order:	1237126

Monopole Drilled Pier

Input

Criteria		
TIA Revision:	F	
ACI 318 Revision:	2002	
Seismic Category:	B	
Forces		
Compression	31	kips
Shear	22	kips
Moment	2251	k-ft
Swelling Force	0	kips
Foundation Dimensions		
Pier Diameter:	7	ft
Ext. above grade:	0	ft
Depth below grade:	32	ft
Material Properties		
Number of Rebar:	30	
Rebar Size:	11	
Tie Size	3	
Rebar tensile strength:	60	ksi
Concrete Strength:	3000	psi
Ultimate Concrete Strain	0.003	in/in
Clear Cover to Ties:	3	in



Soil Profile: 1

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3	0	3	120	0	0	0	0	0	
2	4	3	7	120	0	30	0	0	0	
3	25	7	32	50	500	0	0	0	3	

Analysis Results

Soil Lateral Capacity		
Depth to Zero Shear:	4.79	ft
Max Moment, Mu:	2341.60	k-ft
Soil Safety Factor:	2.40	
Safety Factor Req'd:	2	
RATING:	83.3%	

Soil Axial Capacity		
Skin Friction (k):	0.00	kips
End Bearing (k):	57.73	kips
Comp. Capacity (k), ϕCn:	57.73	kips
Comp. (k), Cu:	40.30	kips
RATING:	69.8%	

Concrete/Steel Check		
Mu (from soil analysis)	3044.08	k-ft
ϕMn	7171.61	k-ft
RATING:	42.4%	
rho provided	0.84	
rho required	0.33	OK
Rebar Spacing	6.53	
Spacing required	22.56	OK
Dev. Length required	26.96	
Dev. Length provided	61.78	OK

Overall Foundation Rating: 83.3%

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RF COMPLIANCE EXPERTS
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200 North Glebe Road, Suite 1000, Arlington, VA 22203-3728
703.276.1100 ● 703.276.1169 fax
info@sitesafe.com ● www.sitesafe.com

Crown Castle on behalf of eyeTower
BU – 841793
Site Name – Windsor Pine Lane
eyeTower Application ID – 335256
Site Compliance Report

50 Pine Lane
Windsor, CT 06095

Latitude: N41-49-11.43
Longitude: W72-40-01.88
Structure Type: Monopole

Report generated date: May 31, 2016
Report by: Kevin Smith
Customer Contact: Joe Franzen

The Site Will Be Compliant based on FCC Rules and Regulations.

Crown Castle on behalf of eyeTower
Windsor Pine Lane - 841793
Radio Frequency (RF) Site Compliance Report

50 Pine Lane, Windsor, CT 06095

200 N. Glebe Road · Suite 1000 · Arlington, VA 22203-3728
703.276.1100 · info@sitesafe.com

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1 Executive Summary

Crown Castle on behalf of eyeTower has contracted with Sitesafe, Inc. (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine whether the proposed communications site, 841793 - Windsor Pine Lane, located at 50 Pine Lane, Windsor, CT, is in compliance with Federal Communication Commission (FCC) Rules and Regulations for RF emissions.

This report contains a detailed summary of the RF environment at the site including:

- diagram of the site;
- inventory of the make / model of all antennas
- theoretical MPE based on modeling.

This report addresses exposure to radio frequency electromagnetic fields in accordance with the FCC Rules and Regulations for all individuals, classified in two groups, "Occupational or Controlled" and "General Public or Uncontrolled." This **site will be compliant** with the FCC rules and regulations, as described in OET Bulletin 65. The corrective actions needed to make this site compliant are located in Section 3.2.

This document and the conclusions herein are based on the information provided by eyeTower.

If you have any questions regarding RF safety and regulatory compliance, please do not hesitate to contact Sitesafe's Customer Support Department at (703) 276-1100.

2 Regulatory Basis

2.1 FCC Rules and Regulations

In 1996, the Federal Communication Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

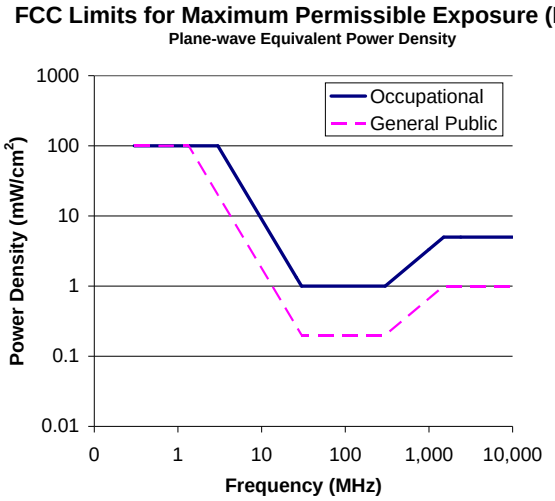
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (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

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (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

2.2 OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

3 Site Compliance

3.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, Sitesafe has determined that:

This **site will be compliant** with the FCC rules and regulations, as described in OET Bulletin 65. The corrective actions needed to make this site compliant are located in Section 3.2.

The compliance determination is based on theoretical modeling, RF signage placement recommendations, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the eyeTower's proposed deployment plan could result in the site being rendered non-compliant.

3.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. RF alert signage recommendations have been proposed based on theoretical analysis of MPE levels. Barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

Sitesafe found one or more issues that led to our determination. The site will be made compliant if the following changes are implemented:

Tower Access Location

Yellow caution sign recommended.

4 Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 5 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

5 Analysis

5.1 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC General Population Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Gray represents areas predicted to be at 5% of the MPE limits, or below.
- Green represents areas predicted to be between 5% and 100% of the MPE limits.
- Blue represents areas predicted to be between 100% and 500% of the MPE limits.
- Yellow represents areas predicted to be between 500% and 5000% of the MPE limits.
- Red areas indicated predicted levels greater than 5000% of the MPE limits.

General Population diagrams are specified when an area is accessible to the public; i.e. personnel that do not meet Occupational or RF Safety trained criteria, could gain access.

If trained occupational personnel require access to areas that are delineated as **Blue** or above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the carriers to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

The key at the bottom also indicates the level or height of the modeling with respect to the main level. The origin is typically referenced to the main rooftop level, or ground level for a structure without access to the antenna level. For example:

Average from 0 feet above to 6 feet above origin

and

Average from 20 feet above to 26 feet above origin

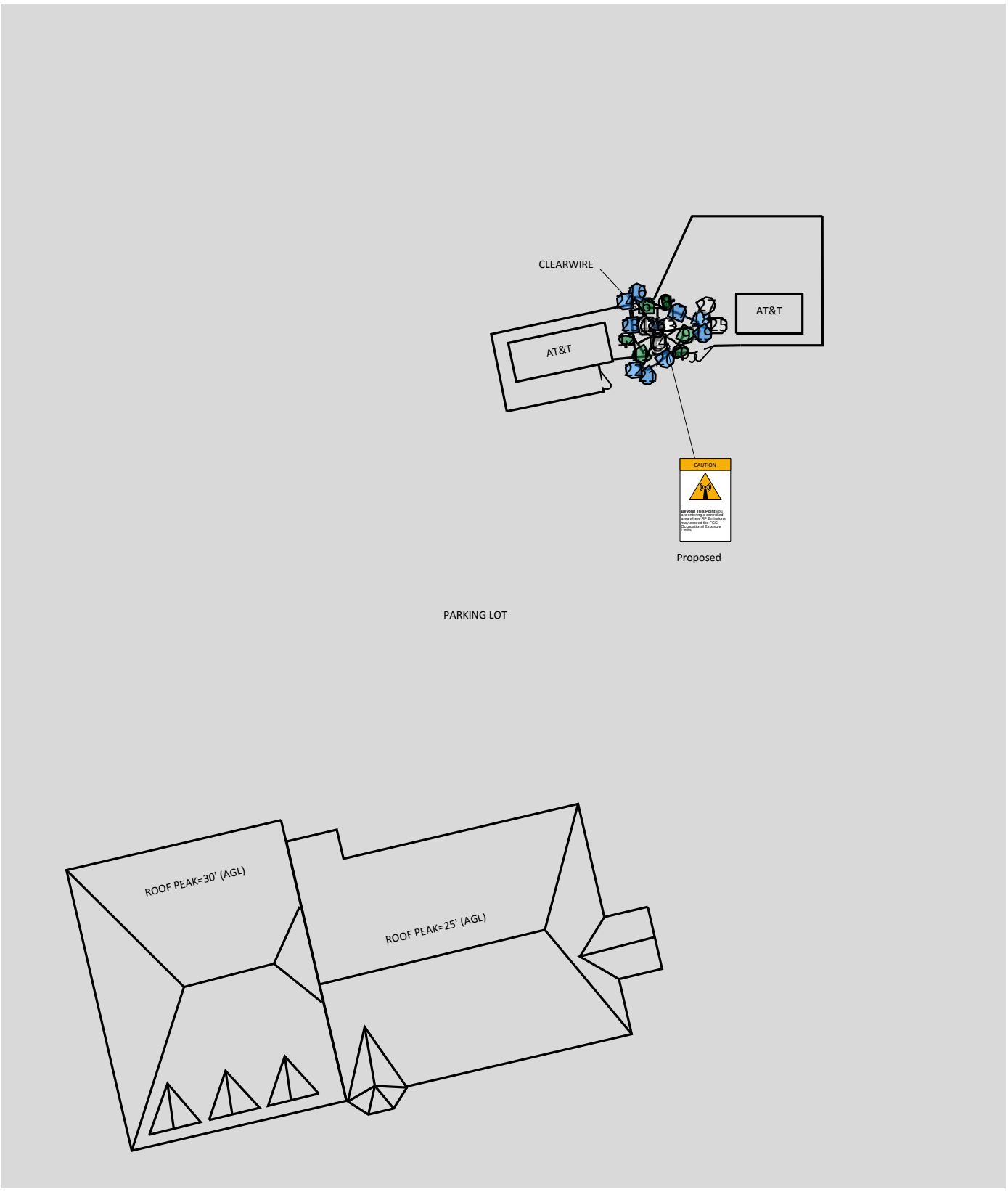
The first indicates modeling at the main rooftop (or ground) level averaged over 6 feet. The second indicates modeling at a higher level (possibly a penthouse level) of 20 feet averaged over 6 feet.

Abbreviations used in the RF Emissions Diagrams

PH=##'	Penthouse at ## feet above main roof

Additional Information in the RF Emissions Diagrams Key

Composite View
RF Exposure Simulation For: Windsor Pine Lane



% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)

0 20.9 41.9

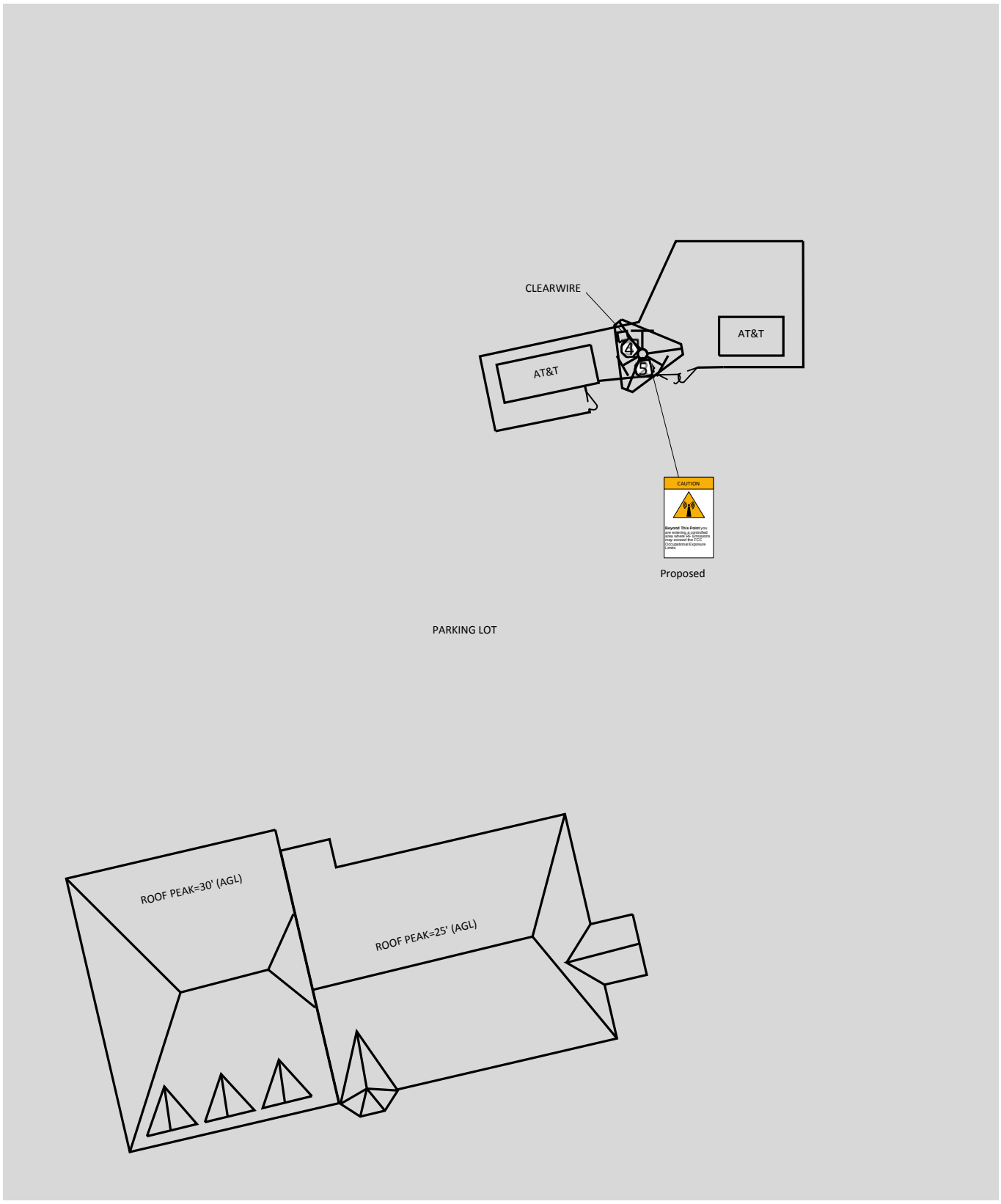
www.sitesafe.com
Site Name:Windsor Pine Lane
5/31/2016 5:18:19 PM

>= 5000	>= 500	>= 100	>= 5	< 5

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

SitesafeTC Version:1.0.0.0 - 0.0.0.247
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

eyeTower Contribution
RF Exposure Simulation For: Windsor Pine Lane



% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)

0 21.7 43.4

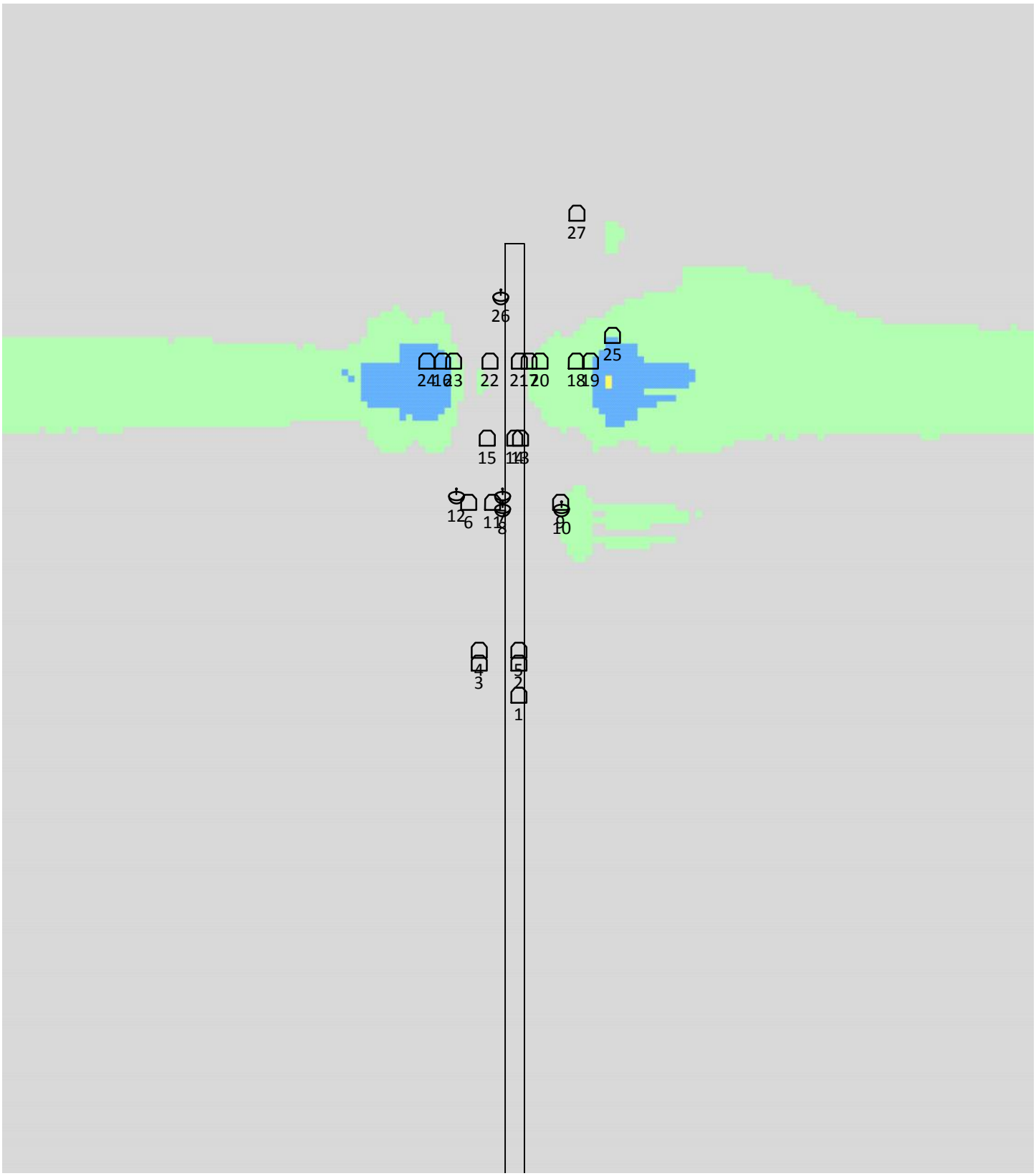
www.sitesafe.com
Site Name:Windsor Pine Lane
5/31/2016 5:19:38 PM

>= 5000	>= 500	>= 100	>= 5	< 5

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

SitesafeTC Version:1.0.0.0 - 0.0.0.247
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

Elevation View
RF Exposure Simulation For: Windsor Pine Lane



% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 10.7 21.4
www.sitesafe.com
Site Name:Windsor Pine Lane
5/31/2016 5:24:34 PM

>= 5000	>= 500	>= 100	>= 5	< 5

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

SitesafeTC Version:1.0.0.0 - 0.0.0.247
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

6 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was provided by the customer, and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 841793 - Windsor Pine Lane. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP") in Watts
- Antenna manufacturer make, model, and gain

For other carriers at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to carrier, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

The following antenna inventory, on this and the following page, were provided by the customer and were utilized to create the site model diagrams:

Table 3: Antenna Inventory												
Ant #	Operated By	TX Freq (MHz)	ERP (Watts)	Antenna Gain (dBd)	Az (Deg)	Antenna Model	Ant Type	Len (ft)	Horizontal Half Power Beamwidth (Deg)	Location		
										X	Y	Z (AGL)
1	eyeTower	174	0*	9.11	222	Wade Antenna J105-HI (Proposed)	Yagi	3	76	261.2'	326.3'	78'
2	eyeTower	470	0*	9.97	240	Wade Antenna WL 14-69/S (Proposed)	Yagi	1.2	60	261.2'	326.3'	83'
3	eyeTower	470	0*	9.97	270	Wade Antenna WL 14-69/S (Proposed)	Yagi	1.2	60	256.9'	332.5'	83'
4	eyeTower	470	0*	9.97	222	Wade Antenna WH14-69/S (Proposed)	Yagi	1.2	60	256.9'	332.4'	85'
5	eyeTower	470	0*	9.97	260	Wade Antenna WL 14-69/S (Proposed)	Yagi	1.2	60	261.2'	326.3'	85'
6	CLEARWIRE	2500	355	15.15	0	Andrew LLPX310R	Panel	3.5	65	257.6'	338.7'	108'
7	CLEARWIRE	11265	100.6	31.16	74.2	Andrew VHLP800-11	Aperture	2.5	2	263.6'	339.8'	109'
8	CLEARWIRE	18000	58.3	37.66	0	Andrew VHLP2-18	Aperture	2	2	263.6'	339.8'	107'
9	CLEARWIRE	2500	355	15.15	120	Andrew LLPX310R	Panel	3.5	65	269.5'	329.9'	108'
10	CLEARWIRE	17815	16.5	37.66	160.2	Andrew VHLP2-18	Aperture	2	2	267.7'	324.7'	107'
11	CLEARWIRE	2500	355	15.15	240	Andrew LLPX310R	Panel	3.5	65	255.8'	323.8'	108'
12	CLEARWIRE	11505	100.6	31.16	187.2	Andrew VHLP800-11	Aperture	2.5	2	251.6'	328.4'	109'
13	CROWN CASTLE	1900	0	16.97	60	RFS APXV18-206517S-C-A20	Panel	6	65.9	263.8'	332.5'	118'
14	CROWN CASTLE	1900	0	16.97	180	RFS APXV18-206517S-C-A20	Panel	6	65.9	261'	327.8'	118'
15	CROWN CASTLE	1900	0	16.97	300	RFS APXV18-206517S-C-A20	Panel	6	65.9	258.3'	332.5'	118'
16	AT&T MOBILITY LLC	737	883.4	11.68	23	CCI Antennas HPA-65R-BUU-H6	Panel	6	66.2	254.8'	342.8'	130'
16	AT&T MOBILITY LLC	1900	1702.8	14.53	23	CCI Antennas HPA-65R-BUU-H6	Panel	6	61.1	254.8'	342.8'	130'
17	AT&T MOBILITY LLC	850	2477.9	14.91	23	Powerwave P65-17-XLH-RR	Panel	8	63	266.9'	336.8'	130'
17	AT&T MOBILITY LLC	1900	2259.9	14.51	23	Powerwave P65-17-XLH-RR	Panel	8	63	266.9'	336.8'	130'
18	AT&T MOBILITY LLC	2300	1919.3	15.05	23	Quintel QS66512-3	Panel	6	58	274'	334.7'	130'
19	AT&T MOBILITY LLC	737	883.4	11.68	143	CCI Antennas HPA-65R-BUU-H6	Panel	6	66.2	274.6'	330.2'	130'

Table 3: Antenna Inventory												
Ant #	Operated By	TX Freq (MHz)	ERP (Watts)	Antenna Gain (dBd)	Az (Deg)	Antenna Model	Ant Type	Len (ft)	Horizontal Half Power Beamwidth (Deg)	Location		
										X	Y	Z (AGL)
19	AT&T MOBILITY LLC	1900	1702.8	14.53	143	CCI Antennas HPA-65R-BUU-H6	Panel	6	61.1	274.6'	330.2'	130'
20	AT&T MOBILITY LLC	850	1945.8	13.86	143	KMW AM-X-CD-16-65-00T	Panel	6	63	263.3'	322.6'	130'
20	AT&T MOBILITY LLC	1900	2685.9	15.26	143	KMW AM-X-CD-16-65-00T	Panel	6	67	263.3'	322.6'	130'
21	AT&T MOBILITY LLC	2300	1919.3	15.05	143	Quintel QS66512-3	Panel	6	58	257.9'	317.5'	130'
22	AT&T MOBILITY LLC	737	1271	13.26	263	CCI Antennas HPA-65R-BUU-H8	Panel	7.7	64.9	253.7'	319.4'	130'
22	AT&T MOBILITY LLC	1900	1795.4	14.76	263	CCI Antennas HPA-65R-BUU-H8	Panel	7.7	63.1	253.7'	319.4'	130'
23	AT&T MOBILITY LLC	850	1945.8	13.86	263	KMW AM-X-CD-16-65-00T	Panel	6	63	252.8'	332.8'	130'
23	AT&T MOBILITY LLC	1900	2685.9	15.26	263	KMW AM-X-CD-16-65-00T	Panel	6	67	252.8'	332.8'	130'
24	AT&T MOBILITY LLC	2300	1637.4	14.36	263	CCI Antennas TPA-65R-LCUUUU-H8	Panel	8	65	251.1'	340'	130'
25	Town of Windsor	45	100	5	90	Andrew DB225-C	Yagi	10	120	279.3'	332.8'	134'
26	Town of Windsor	22817	402.4	37.96	1.9	Andrew HP2-102	Aperture	2	2	260.6'	332.7'	140'
27	Town of Windsor	45	100	5	60	Andrew DB225-C	Yagi	10	120	275.6'	338.8'	153'

NOTE: X, Y and Z indicate relative position of the antenna to the origin location on the site, displayed in the model results diagram. **Specifically, the Z reference indicates antenna height above the ground level.** ERP values provided by the client and used in the modeling may be greater than are currently deployed. For other carriers at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to carrier, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

* *Antennas are operating as receive only and have been modeled with "Zero" ERP.*

7 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms that:

I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Kevin Smith.

May 31, 2016

Appendix A – Statement of Limiting Conditions

Sitesafe will not be responsible for matters of a legal nature that affect the site or property.

Due to the complexity of some wireless sites, Sitesafe performed this analysis and created this report utilizing best industry practices and due diligence. Sitesafe cannot be held accountable or responsible for anomalies or discrepancies due to actual site conditions (i.e., mislabeling of antennas or equipment, inaccessible cable runs, inaccessible antennas or equipment, etc.) or information or data supplied by eyeTower, the site manager, or their affiliates, subcontractors or assigns.

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, observed during the survey of the subject property or that Sitesafe became aware of during the normal research involved in performing this survey. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data provided by a second party and physical data collected by Sitesafe, the physical data will be used.

Appendix B – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Sitesafe believes this to be a *worst-case* analysis, based on best available data. Areas modeled to predict emissions greater than 100% of the applicable MPE level may not actually occur, but are shown as a *worst-case* prediction that could be realized real time. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Thus, at any time, if power density measurements were made, we believe the real-time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modeling in this way, Sitesafe has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where RFR exposure may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

***OSHA* (Occupational Safety and Health Administration)** – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency Radiation – Electromagnetic waves that are propagated from antennas through space.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy an average sized human body will absorb while present in an electromagnetic field of energy.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix C – Rules & Regulations

Explanation of Applicable Rules and Regulations

The FCC has set forth guidelines in OET Bulletin 65 for human exposure to radio frequency electromagnetic fields. Specific regulations regarding this topic are listed in Part 1, Subpart I, of Title 47 in the Code of Federal Regulations. Currently, there are two different levels of MPE - General Public MPE and Occupational MPE. An individual classified as Occupational can be defined as an individual who has received appropriate RF training and meets the conditions outlined below. General Public is defined as anyone who does not meet the conditions of being Occupational. FCC and OSHA Rules and Regulations define compliance in terms of total exposure to total RF energy, regardless of location of or proximity to the sources of energy.

It is the responsibility of all licensees to ensure these guidelines are maintained at all times. It is the ongoing responsibility of all licensees composing the site to maintain ongoing compliance with FCC rules and regulations. Individual licensees that contribute less than 5% MPE to any total area out of compliance are not responsible for corrective actions.

OSHA has adopted and enforces the FCC's exposure guidelines. A building owner or site manager can use this report as part of an overall RF Health and Safety Policy. It is important for building owners/site managers to identify areas in excess of the General Population MPE and ensure that only persons qualified as Occupational are granted access to those areas.

Occupational Environment Explained

The FCC definition of Occupational exposure limits apply to persons who:

- are exposed to RF energy as a consequence of their employment;
- have been made aware of the possibility of exposure; and
- can exercise control over their exposure.

OSHA guidelines go further to state that persons must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

In order to consider this site an Occupational Environment, the site must be controlled to prevent access by any individuals classified as the General Public. Compliance is also maintained when any non-occupational individuals (the General Public) are prevented from accessing areas indicated as Red or Yellow in the attached RF Emissions diagram. In addition, a person must be aware of the RF environment into which they are entering. This can be accomplished by an RF Safety Awareness class, and by appropriate written documentation such as this Site Compliance Report.

All eyeTower employees who require access to this site must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

Appendix D – General Safety Recommendations

The following are *general recommendations* appropriate for any site with accessible areas in excess of 100% General Public MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

1. All individuals needing access to the main site (or the area indicated to be in excess of General Public MPE) should wear a personal RF Exposure monitor, successfully complete proper RF Safety Awareness training, and have and be trained in the use of appropriate personal protective equipment.

2. All individuals needing access to the main site should be instructed to read and obey all posted placards and signs.

3. The site should be routinely inspected and this or similar report updated with the addition of any antennas or upon any changes to the RF environment including:

- adding new antennas that may have been located on the site
- removing of any existing antennas
- changes in the radiating power or number of RF emitters

4. Post the appropriate **NOTICE**, **CAUTION,** or **WARNING** sign at the main site access point(s) and other locations as required. Note: Please refer to RF Exposure Diagrams in Appendix B, to inform <u>everyone</u> who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC. The signs below are examples of signs meeting FCC guidelines.

5. Ensure that the site door remains locked (or appropriately controlled) to deny access to the general public if deemed as policy by the building/site owner.

6. For a General Public environment the four color levels identified in this analysis can be interpreted in the following manner:

- Gray represents area at below 5% of the General Public MPE limits or below. This level is safe for a worker to be in at any time.
- Green represents areas predicted to be between 5% and 100% of the General Public MPE limits. This level is safe for a worker to be in at any time.

- Blue represents areas predicted to be between 100% and 500% of the General Public MPE limits. This level is safe for a worker to be in at any time.
- Yellow represents areas predicted to be between 500% and 5000% of the General Public MPE limits. This level is safe for a worker to be in.
- Red areas indicated predicted levels greater than 5000% of the General Public MPE limits. This level is not safe for the General Public to be in.

7. For an Occupational environment the four color levels identified in this analysis can be interpreted in the following manner:

- Areas indicated as Gray are at 5% of the Occupational MPE limits or below. This level is safe for a worker to be in at any time.
- Green represents areas predicted to be between 5% and 20% of the Occupational MPE limits. This level is safe for a worker to be in at any time.
- Yellow represents areas predicted to be between 20% and 100% of the Occupational MPE limits. Only individuals that have been properly trained in RF Health and Safety should be allowed to work in this area. This is not an area that is suitable for the General Public to be in.
- Red areas indicated predicted levels greater than 100% of the Occupational MPE limits. This level is not safe for the Occupational worker to be in for prolonged periods of time. Special procedures must be adhered to such as lock out tag out procedures to minimize the workers exposure to EME.

8. Use of a Personal Protective Monitor: When working around antennas, Sitesafe strong recommends the use of a Personal Protective Monitor (PPM). Wearing a PPM will properly forewarn the individual prior to entering an RF exposure area.

Keep a copy of this report available for all persons who must access the site. They should read this report and be aware of the potential hazards with regards to RF and MPE limits.

Additional Information

Additional RF information is available by visiting both www.Sitesafe.com and www.fcc.gov/oet/rfsafety. OSHA has additional information available at: http://www.osha-slc.gov/SLTC/radiofrequencyradiation.