CONSTRUCTION SERVICES
of Branford, LLC

May 18, 2015

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

RE: **Notice of Exempt Modification to an existing 119' monopole tower located at 467 (457) South Quaker Lane, West Hartford, Connecticut**

Latitude: 41 44 55.75 / Longitude: 72 43 52.75

Dear Ms. Bachman:

Crown Castle International ("Crown") intends to perform work to reinforce the structural integrity of the existing 119'-foot monopole tower facility which it owns at the premises known as 467 South Quaker Lane, West Hartford, Connecticut ("Facility"). This proposed installation constitutes an exempt modification pursuant to the Public Utility Environmental Standards Act, Connecticut General Statutes Section 16-50g et seq. and Connecticut Agencies Regs § 16-50j-72(b)(2). Pursuant to R.C.S.A. 16-50j-73, Crown is providing notice to Scott Slifka, Mayor of the Town of West Hartford.

Under the Council's regulations (Conn. Agencies Regs. Sec 16-50j-72(b)), Crown's plans do not constitute a modification subject to the Council's review because Crown will not change the height of the Tower, will not extend the boundaries of the compound, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

Tower

The Facility consists of a one hundred nineteen foot (119') foot high monopole tower located at 467 South Quaker Lane, West Hartford, Connecticut. The Tower is owned by Crown. The tower currently supports T-Mobile antennas at the one hundred nineteen foot (119') centerline AGL, AT&T at the one hundred ten foot (110') centerline, Verizon Wireless at the one hundred foot (100') centerline, and Clearwire at the eighty foot (80') centerline. The antenna locations are set forth on Drawing S-1 of the attached drawings in Exhibit A.

(203) 488-0712 • FAX (203) 481-1135 • 1-800-870-0106 63-3 North Branford Rd. Branford, CT 06405-2848
www.csofb.com

Structural Analysis

A structural analysis of the Tower was prepared by Tower Engineering Professionals and is attached hereto as Exhibit B. The report indicates that the Tower, with the proposed reinforcements is adequate to support the proposed loading.

The present request does not include any antenna or other RF work and as such, will not adversely impact the health and safety of the surrounding community or the people working on the Tower.

Conclusion

Crown's proposal does not constitute a modification subject to the Council's jurisdiction because:

Crown will not increase the height of the Tower;

Will not extend the boundaries of the site;

Will not increase the noise levels at the existing facility by six decibels or more; and

The total radio frequency electromagnetic radiation power density will stay within all applicable standards.

Respectfully submitted,
Crown Castle

By_____
Raymond J. Lemley, consultant
Ray@iwsllc.net
203-499-8631

cc: West Hartford Mayor, Honorable Scott Slifka
West Hartford Town Planner, Todd Dumais
Property Owner, Church of St. Mark The Evangelist Corp.

EXHIBIT A

STRUCTURAL DESIGN DRAWINGS

SITE NAME:

WEST HARTFORD/I-84/X43

CROWN CASTLE BU NUMBER:

829013

APPLICATION NUMBER:

261528 REV. 3

SITE ADDRESS:

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)
N 41° 44' 55.75", W 72° 43' 52.75"

MODIFICATION PROVISIONS

THE MODIFICATIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL MODIFICATION ANALYSIS REPORT COMPLETED BY TOWER ENGINEERING PROFESSIONALS (TEP), JOB#: 25680.24967 DATED APRIL 23, 2014 (REV 1). THIS REPORT IS BASED ON A SPECIFIC ANTENNA LOADING AND COAX CONFIGURATION. SEE THE REPORT FOR THE ANTENNA AND COAX LOADING INFORMATION. ANY OTHER ANTENNA OR COAX CONFIGURATION REQUIRES REVIEW BY TEP. SATISFACTORY COMPLETION OF THE MODIFICATIONS INDICATED ON THESE DRAWINGS WILL RESULT IN THE STRUCTURE MEETING THE REQUIREMENTS OF THE SPECIFICATIONS UNDER WHICH THE STRUCTURAL WAS COMPLETED.

CONTRACTOR SHALL FIELD VERIFY ALL: DIMENSIONS, QUANTITIES, PART NUMBERS AND COAX/ANTENNA PLACEMENTS PRIOR TO: BIDDING ORDERING MATERIALS, AND CONSTRUCTION.

REVISION NOTES

1	REVISED MODIFICATION DRAWINGS

INDEX OF SHEETS

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PROJECT TEAM

CCI MODIFICATION PROJECT MANAGER:

NAME	CROWN CASTLE
ADDRESS	3530 TORINGDON WAY, SUITE 300
CITY, STATE, ZIP	CHARLOTTE, NC 28277
CONTACT	JOHN MCGEE
PHONE	(980) 209-8253
EMAIL	JOHN.MCGEE@CROWNCASTLE.COM

ENGINEERING FIRM PROJECT MANAGER:

NAME	TOWER ENGINEERING PROFESSIONALS, INC.
ADDRESS	326 TRYON ROAD
CITY, STATE, ZIP	RALEIGH, NC 27603
CONTACT	RYAN J. RIMMELE, P.E.
PHONE	(919) 661-6351
EMAIL	CMRP@TEPGROUP.NET

ATTENTION

ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
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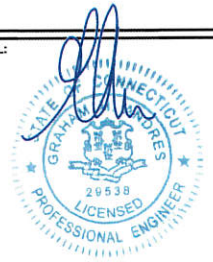
SEAL:



April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

SHEET TITLE:

TITLE SHEET

SHEET NUMBER: **T-1**

REVISION: 1

TEP #: 25680.24967

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVAL
NA	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
X	CONTINUOUS FOUNDATION INSPECTIONS
X	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	GROUT COMP. STRENGTH (ASTM C109)
NA	POST INSTALLED REBAR VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	NON-TENSION CONTROLLED BOLT INSPECTION. SEE SHEET N-4 FOR DETAILS.
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION:
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL IN FIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

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326 TRYON ROAD
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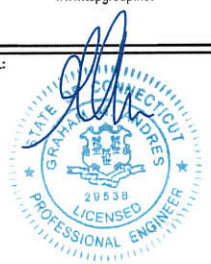

April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

SHEET TITLE:

MI CHECKLIST AND NOTES

SHEET NUMBER: **N-1**

REVISION: 1

TEP #: 25680.24967

GENERAL NOTES:

1. ALL REFERENCES TO THE OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED CROWN CASTLE OR ITS DESIGNATED REPRESENTATIVE.
2. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE OF CONNECTICUT.
3. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 2005 CONNECTICUT STATE BUILDING CODE.
4. UNLESS SHOWN OR NOTED OTHERWISE ON THE CONTRACT DRAWINGS, OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREIN, AND TO THE PROCEDURES TO BE USED ON THIS PROJECT.
5. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
6. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
7. ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS SHOWN ON THE DRAWINGS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING ANY MATERIALS ORDERING, FABRICATION OR CONSTRUCTION WORK ON THIS PROJECT. CONTRACTOR SHALL NOT SCALE CONTRACT DRAWINGS IN LIEU OF FIELD VERIFICATIONS. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND THE OWNER'S ENGINEER. THE DISCREPANCIES MUST BE RESOLVED BEFORE THE CONTRACTOR IS TO PROCEED WITH THE WORK. THE CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE PROCEDURES.
8. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
10. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS, WITH THE RESIDENT LEASING AGENT FOR APPROVAL.
11. ALL PERMITS THAT MUST BE OBTAINED ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
12. IF APPLICABLE, ALL CONCRETE WORK SHALL COMPLY TO LOCAL CODES AND THE ACI 318-02, "BUILDING REQUIREMENTS FOR STRUCTURAL CONCRETE".
13. 24 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, THE CONTRACTOR MUST NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY OR CITY) ENGINEER.
14. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
15. ALL TOWER DIMENSIONS SHALL BE VERIFIED WITH THE PLANS (LATEST REVISION) PRIOR TO COMMENCING CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE DISCOVERED. THE OWNER SHALL HAVE A SET OF APPROVED PLANS AVAILABLE AT THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY GOVERNING AGENCY INSPECTORS.
16. ALL TOWER MODIFICATION WORK SHALL BE IN ACCORDANCE WITH TIA-1019-A STANDARD FOR INSTALLATION, ALTERATION AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
17. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.

PLANS PREPARED FOR:

CROWN CASTLE

3 COPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (585) 899-3442

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
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PLANS PREPARED BY:

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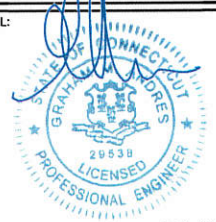


October 07, 2014

REV	DATE	ISSUED FOR:
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RJR

SHEET TITLE:

PROJECT NOTES I

SHEET NUMBER: **N-2**

REVISION: **0**

TEP #: 25680.24967

STRUCTURAL STEEL NOTES:

1. THE FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN (ASD), 9TH EDITION.
2. UNLESS OTHERWISE NOTED, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
   STRUCTURAL STEEL:
   - ANGLE: ASTM A36
   - PIPE/TUBE: ASTM A500-50
   - PLATE: ASTM A36 (SELF SUPPORTING AND GUYED TOWERS)
   - PLATE: ASTM A572-65 (MONOPOLE)

   A. ALL BOLTS, ASTM A325 TYPE I GALVANIZED HIGH STRENGTH BOLTS.
   B. ALL U-BOLTS, ASTM A193 GRADE B7
   C. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.
3. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, ASD, 9TH EDITION.
4. HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER.
5. HOT-DIP GALVANIZE ALL ITEMS UNLESS OTHERWISE NOTED, AFTER FABRICATION WHERE PRACTICABLE. GALVANIZING: ASTM A123, ASTM, A153/A153M OR ASTM A653/A653M, G90, AS APPLICABLE. ADDITIONALLY, ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING STEEL. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.
6. REPAIR DAMAGED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY APPLICATION OF STICK OR THICK PASTED MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING. CLEAN AREAS TO BE REPAIRED AND REMOVE SLAG FROM WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED, WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTED; SPREAD MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE OFF EXCESS MATERIAL. AFTER REPAIR, STEEL SHALL BE REPAINTED TO MATCH EXISTING FINISH (IF APPLICABLE).
7. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS.
8. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXCLUDE THE THREADS FROM THE SHEAR PLANE.
9. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
10. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.

WELDING NOTES:

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M: 2000 "STRUCTURAL WELDING CODE-STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON FIELD WELDS. A LETTER AND REPORT SHALL BE ISSUED TO THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LETTER AND REPORT TO TOWER ENGINEERING PROFESSIONALS.
4. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. GRIND THE SURFACE OF THE ROD TO BE INSTALLED FOR A DISTANCE OF 2" MINIMUM ALL AROUND THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
5. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. THE MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL COMPLY WITH SECTION 3.5.1 AND TABLE 3.2 OF THE AWS D1.1/D1.1M:2000.
6. DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
7. FOR ALL WELDING, USE 70 KSI LOW HYDROGEN ELECTRODES. ELECTRODES SHALL BE APPROPRIATE FOR THE WELDING POSITION REQUIRED TO MAKE THE JOINT.
8. AFTER FINAL INSPECTION, THE AREA OF THE WELDS, THE INSTALLATION AND ALL SURFACES DAMAGED BY WELDING OR GRINDING SHALL RECEIVE A COLD-GALVANIZED COATING. THIS COATING SHALL BE APPLIED BY BRUSH. THE GALVANIZING COMPOUND SHALL CONTAIN A MINIMUM OF 95% ± PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 3 MILS.
9. FOR MONOPOLE TOWERS FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY ULTRASONIC TESTING (UT) IN ACCORDANCE WITH AWS D1.1.
10. FOR MONOPOLE TOWERS PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MAGNETIC PARTICLE (MT) IN ACCORDANCE WITH AWS D1.1.

WORKABLE GAGES

LEG	4	3½	3	2½	2	1¾
G	2½	2	1¾	1⅜	1⅛	1

- WORKABLE GAGES GIVEN IN INCHES
- MATCH EXISTING WHEN APPLICABLE

BOLT TIGHTENING PROCEDURE:

1. TIGHTEN CONNECTION BOLTS BY AISC – "TURN OF THE NUT" METHOD, USING THE CHART BELOW.

BOLT LENGTHS UP TO AND INCLUDING FOUR DIA.

½"	BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅝"	BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
¾"	BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅞"	BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
1"	BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT

BOLT LENGTHS OVER FOUR DIA. BUT NOT EXCEEDING EIGHT DIA.

½"	BOLTS 2.25 TO 4.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅝"	BOLTS 2.75 TO 5.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
¾"	BOLTS 3.25 TO 6.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅞"	BOLTS 3.75 TO 7.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
1"	BOLTS 4.25 TO 8.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT

2. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:
3. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8.2.1 THROUGH 8.2.4.

8.2.1 TURN-OF-THE-NUT TIGHTENING

BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS.

4. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.

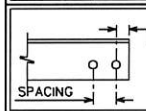
NOMINAL HOLE DIMENSIONS

BOLT DIAMETER	STANDARD HOLE	SHORT SLOT
½	9⁄16	9⁄16 X 1⅛
⅝	11⁄16	11⁄16 X ⅞
¾	13⁄16	13⁄16 X 1
⅞	15⁄16	15⁄16 X 1⅛
1	1⅛	1⅛ X 1 5⁄16

– DIMENSIONS GIVEN IN INCHES

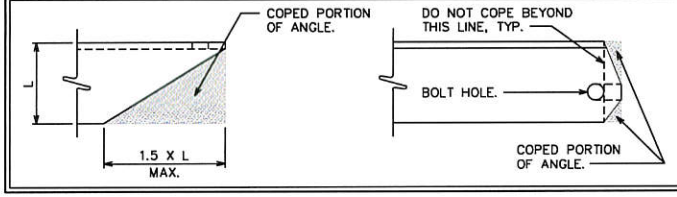
BOLT EDGE AND SPACING

BOLT DIAMETER	MIN. EDGE	SPACING
½	⅞	1½
⅝	1⅛	1⅞
¾	1¼	2¼
⅞	1½	2⅝
1	1¾	3



– DIMENSIONS GIVEN IN INCHES

ALLOWABLE ANGLE COPE



PLANS PREPARED FOR:

CROWN CASTLE

3 COPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (585) 899-3442

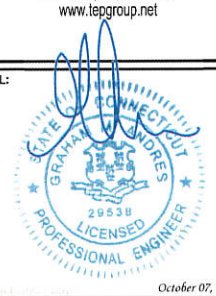
PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



October 07, 2014

REV	DATE	ISSUED FOR:
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RJR

SHEET TITLE:

PROJECT NOTES II

SHEET NUMBER: **N-3**

REVISION: **0**

TEP #: 25680.24967

FOUNDATION NOTES:

GENERAL NOTES:

1. FOUNDATION INSTALLATION SHALL BE SUPERVISED BY PERSONNEL KNOWLEDGEABLE AND EXPERIENCED WITH THE PROPOSED FOUNDATION TYPE. CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERALLY ACCEPTED PRACTICES AND IN A GOOD WORKMANLIKE MANNER.
2. CONTRACTOR SHALL VERIFY DIMENSIONS WITH ORIGINAL DRAWINGS.
3. FOR FOUNDATION AND ANCHOR TOLERANCES, SEE ORIGINAL DRAWINGS.
4. FOUNDATION DESIGN ASSUMES LEVEL GRADE AT THE SITE.
5. THE FOUNDATION DESIGN IS IN ACCORDANCE WITH GENERALLY ACCEPTED PROFESSIONAL ENGINEERING PRINCIPLES AND PRACTICES WITHIN THE LIMITS OF THE SUBSURFACE DATA PROVIDED.
6. FOUNDATION DESIGN MODIFICATIONS MAY BE REQUIRED IN THE EVENT THE DESIGN PARAMETERS ARE NOT APPLICABLE FOR THE SUBSURFACE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.
7. THE FOUNDATION DESIGN ASSUMES FIELD INSPECTIONS WILL BE PERFORMED TO VERIFY THAT CONSTRUCTION MATERIALS, INSTALLATION METHODS, AND ASSUMED DESIGN PARAMETERS ARE ACCEPTABLE BASED ON THE CONDITIONS AT THE SITE.
8. THE FOUNDATION DESIGN ASSUMES NO CONSTRUCTION JOINTS. HOWEVER, CONSTRUCTION JOINTS SHALL BE PERMITTED UPON APPROVAL BY THE OWNER/ENGINEER.

EXCAVATION:

1. WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND SAFETY REGULATIONS. PROCEDURES FOR THE PROTECTION OF EXCAVATIONS, EXISTING CONSTRUCTION, AND UTILITIES SHALL BE ESTABLISHED PRIOR TO BEGINNING WORK.
2. INTIMATE CONTACT BETWEEN THE CONCRETE AND THE SOIL WALLS OF THE DRILLED SHAFT IS ESSENTIAL. THE CONCRETE SHALL BE APPROPRIATELY VIBRATED DURING CONSTRUCTION.
3. THE SIDES OF THE EXCAVATION SHALL BE ROUGH AND FREE OF LOOSE CUTTINGS.
4. LOOSE MATERIAL TO BE REMOVED FROM THE BOTTOM OF EXCAVATION PRIOR TO CONCRETE PLACEMENT.
5. DRILLING FLUID, IF USED, SHALL BE FULLY DISPLACED BY CONCRETE AND SHALL NOT BE DETRIMENTAL TO THE CONCRETE OR SURROUNDING SOIL. CONTAMINATED CONCRETE SHALL BE REMOVED AND REPLACED WITH FRESH CONCRETE.

REINFORCING STEEL:

1. THE REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-615, GRADE 60. IT SHALL BE DEFORMED AND SPLICES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED.
2. WELDING IS PROHIBITED ON REINFORCING STEEL AND EMBEDMENTS.
3. REINFORCING CAGES SHALL BE BRACED TO RETAIN PROPER DIMENSIONS DURING HANDLING AND THROUGHOUT PLACEMENT OF CONCRETE. WHEN TEMPORARY CASING IS UTILIZED, BRACING SHALL BE ADEQUATE TO RESIST FORCES OCCURRING FROM FLOWING CONCRETE DURING CASING EXTRACTION.
4. SPACERS SHALL BE ATTACHED INTERMITTENTLY THROUGHOUT THE ENTIRE LENGTH OF TIEBACK REINFORCING TO INSURE CONCENTRIC PLACEMENT OF CAGES IN EXCAVATIONS.
5. MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE 3" UNLESS OTHERWISE NOTED. APPROVED SPACERS SHALL BE USED TO INSURE A 3" MINIMUM COVER ON REINFORCEMENT.
6. THE CONCRETE COVER FROM THE TOP OF THE FOUNDATION TO THE ENDS OF THE VERTICAL REINFORCEMENT SHALL NOT EXCEED 4" NOR BE LESS THAN 2".
7. THE CONCRETE COVER FROM THE BOTTOM OF THE FOUNDATION TO THE ENDS OF THE VERTICAL REINFORCEMENT SHALL NOT EXCEED 4" NOR BE LESS THAN 3".

CONCRETE:

1. WORK SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE ACI-318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE."
2. THE CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI IN 28-DAYS.
3. PROPORTIONS OF CONCRETE MATERIALS SHALL BE SUITABLE FOR THE INSTALLATION METHOD UTILIZED AND SHALL RESULT IN DURABLE CONCRETE FOR RESISTANCE TO LOCAL ANTICIPATED AGGRESSIVE ACTIONS. THE DURABILITY REQUIREMENTS OF ACI-318 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE.
4. CONCRETE SHALL BE PLACED IN A MANNER THAT WILL PREVENT SEGREGATION OF CONCRETE MATERIALS, INFILTRATION OF WATER OR SOIL, AND OTHER OCCURRENCES THAT MAY DECREASE THE STRENGTH OR DURABILITY OF THE FOUNDATION.

CONCRETE (CONTINUED):

5. FREE FALL CONCRETE MAY BE USED PROVIDED FALL IS VERTICAL DOWN WITHOUT HITTING THE SIDES OF THE EXCAVATION, FORMWORK, REINFORCING BARS, FORM TIES, CAGE BRACING, OR OTHER OBSTRUCTIONS. UNDER NO CIRCUMSTANCES SHALL CONCRETE FALL THROUGH WATER.
6. THE MAXIMUM SIZE OF THE AGGREGATE SHALL NOT EXCEED A SIZE SUITABLE FOR THE INSTALLATION METHOD UTILIZED OR 1/3-CLEAR DISTANCE BEHIND OR BETWEEN REINFORCING. THE MAXIMUM SIZE MAY BE INCREASED TO 2/3-CLEAR DISTANCE PROVIDED WORKABILITY AND METHODS OF CONSOLIDATION SUCH AS VIBRATING WILL PREVENT HONEYCOMBS AND VOIDS.
7. A TEMPORARY PROTECTIVE STEEL CASING WILL BE REQUIRED TO KEEP THE SHAFT OPEN DURING CONSTRUCTION AND INSPECTIONS PRIOR TO PLACING CONCRETE. THIS CASING SHOULD BE EXTRACTED AS THE CONCRETE IS PLACED.

FINISHING:

1. THE TOP OF THE FOUNDATION SHALL BE SLOPED TO DRAIN WITH A FLOATED FINISH.
2. THE EXPOSED EDGES OF THE CONCRETE SHALL BE CHAMFERED 1" x 1".

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

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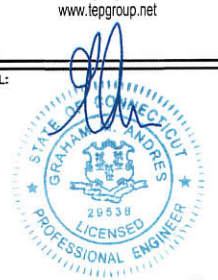
www.tepgroup.net

SEAL:



April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

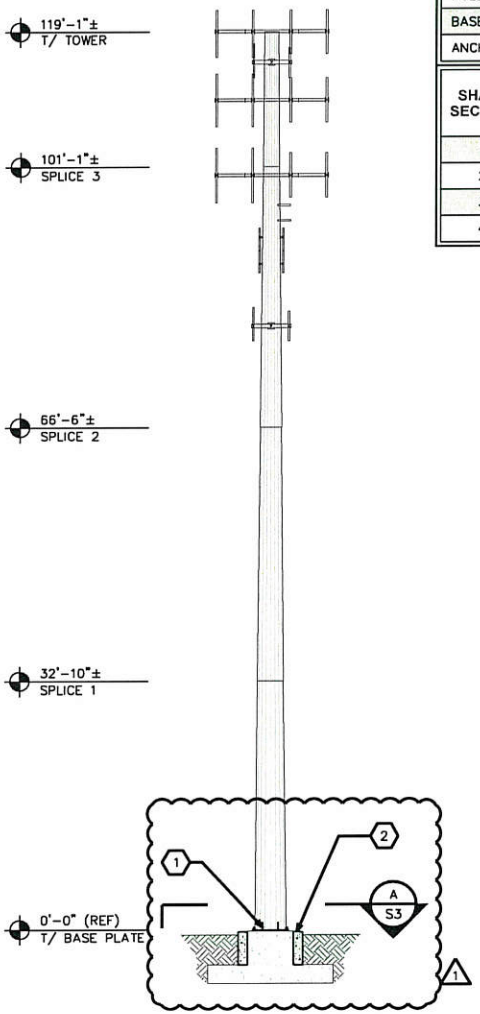
SHEET TITLE:

FOUNDATION NOTES

SHEET NUMBER: **N-4**

REVISION: 1

TEP #: 25680.24967



TOWER ELEVATION

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

POLE SPECIFICATIONS

POLE SHAPE TYPE:	18-SIDED POLYGON
POLE SHAFT GRADE:	ASTM A572-65
BASE PLATE GRADE:	ASTM A572-50
ANCHOR BOLT GRADE:	ASTM A-687

SHAFT SECTION	SECTION LENGTH (FT.)	SHAFT THICKNESS (IN.)	LAP SPLICE (FT.)	OUTER DIAMETER (IN.)	
				TOP	BOTTOM
1	18.00	0.250	2.92	22.130	26.000
2	37.50	0.313	3.83	24.870	36.060
3	37.50	0.375	4.67	32.500	41.750
4	37.50	0.375	–	39.850	49.060

MODIFICATION SCHEDULE

NO.	MODIFICATION DESCRIPTION	ELEVATION (FT.)
1	REINFORCE EXISTING BASE PLATE STIFFENERS. SEE SHEETS S-3 AND S-4 FOR DETAILS.	0
2	INSTALL PROPOSED FOUNDATION REINFORCEMENT. SEE SHEETS S-2, S-3, AND S-5 FOR DETAILS.	0
3	CROWN CASTLE WILL CONTRACT WITH A THIRD PARTY VENDOR TO PERFORM THE MODIFICATION INSPECTION. THE CONTRACTOR SHALL COORDINATE THE INSPECTION WITH THE MODIFICATION INSPECTOR AND CROWN CASTLE PROJECT MANAGER. SEE SHEET N-1 FOR DETAILS.	–

NOTES:

1. IT'S THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE THE MODIFICATION INSPECTOR/ ENGINEER OF RECORD WITH A SEALED CERTIFIED WELD INSPECTION REPORT. THIS REPORT SHALL DOCUMENT THE ENTIRE WELDING PROCESS (PRE/DURING/POST) WITH PROPER PHOTOS. WELDING SHALL CONFORM TO AWS D1.1/D1.1M: 2000 "STRUCTURAL WELDING CODE-STEEL", FOR ADDITIONAL NOTES, SEE WELDING NOTES.
2. ANTENNAS AND OTHER APPURTENANCES MAY NEED TO BE TEMPORARILY REMOVED OR MOVED DURING THE INSTALLATION OF THE MODIFICATIONS SHOWN ABOVE.
3. NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-10033 : TOWER BASE PLATE NDE AND ENG-BUL-10051 : NDE REQUIREMENTS FOR MONOPOLE BASEPLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING MODIFICATIONS THAT HAVE BEEN WELDED TO THE BASE PLATE. FULL PENETRATION WELDING TO THE BASEPLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.
4. DUE TO THE MODIFICATIONS REQUIRED, CONTINUOUS INSPECTIONS AND MATERIAL TESTING WILL NEED TO BE PERFORMED.
5. CONTRACTOR SHALL ORDER AND INSTALL A NEW TOWER TAG IF THE EXISTING TOWER TAG IS MOVED OR DAMAGED DUE TO THE INSTALLATION OF THE MODIFICATION SHOWN ABOVE.
6. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.

ATTENTION

NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSION BEFORE FABRICATING MATERIALS AND PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO TOWER ENGINEERING PROFESSIONALS, INC., AND CROWN CASTLE CONSTRUCTION MANAGER IMMEDIATELY.

1

0 16 32

SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
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www.tepgroup.net

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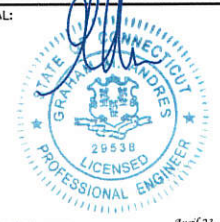


April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ CHECKED BY: RTP

SHEET TITLE:

TOWER ELEVATION AND MODIFICATION SCHEDULE

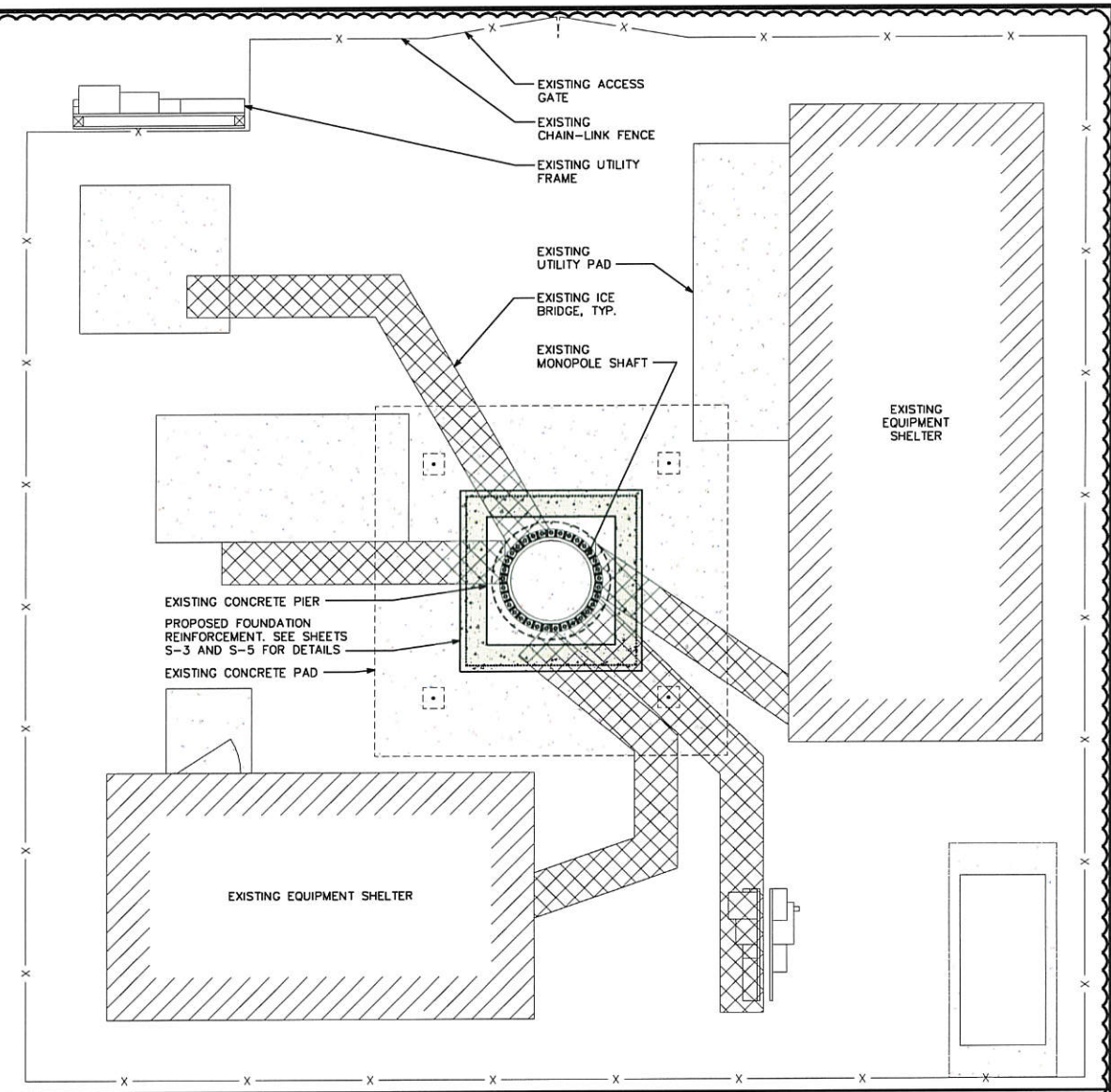
SHEET NUMBER: **S-1**

REVISION: 1

TEP #: 25680.24967

NOTES:

1. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING EQUIPMENT PRIOR TO CONSTRUCTION. COORDINATE WITH TOWER OWNER ANY REQUIRED RELOCATION OF EQUIPMENT THAT MAY INTERFERE WITH THE FOUNDATION REINFORCEMENT.
2. CONTRACTOR SHALL VERIFY AS-BUILT DIMENSIONS OF EXISTING FOUNDATION PRIOR TO CONSTRUCTION.



VERIFY

COMPOUND DETAIL

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

0 4 8

SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

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OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT — GRATHEL MOORES — 29538 — LICENSED PROFESSIONAL ENGINEER

April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

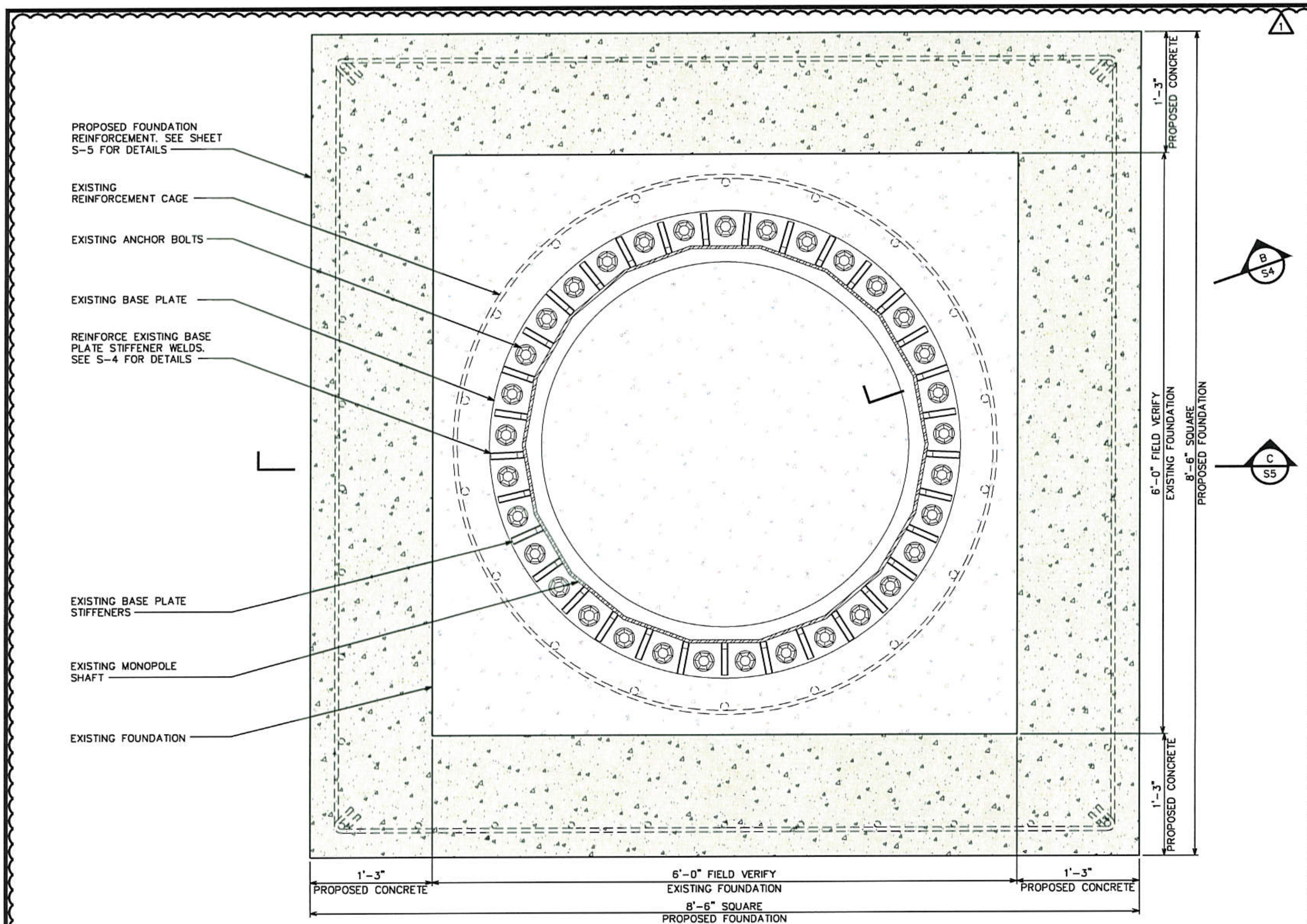
SHEET TITLE:

COMPOUND DETAIL

SHEET NUMBER: **S-2**

REVISION: 1

TEP #: 25680.24967



SECTION (A)

SCALE: 1" = 1'-0"

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
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PLANS PREPARED BY:

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SEAL:

STATE OF CONNECTICUT · GRAHAM ANDRES · 29538 · LICENSED PROFESSIONAL ENGINEER

April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

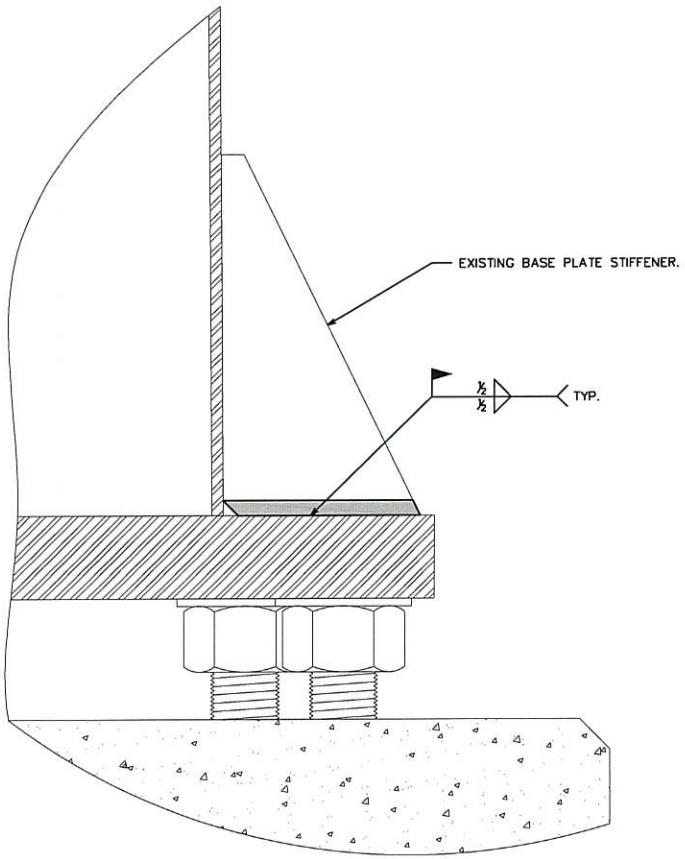
DRAWN BY: EAJ | CHECKED BY: RTP

SHEET TITLE:

BASE SECTION DETAILS

SHEET NUMBER: **S-3** | REVISION: **1**

TEP #: 25680.24967



BASE PLATE STIFFENER DETAILS (B)

SCALE: N.T.S.

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

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SEAL:

STATE OF CONNECTICUT
GRAHAM C. ANDRES
20538
LICENSED
PROFESSIONAL ENGINEER

April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

SHEET TITLE:

BASE PLATE STIFFENER DETAILS

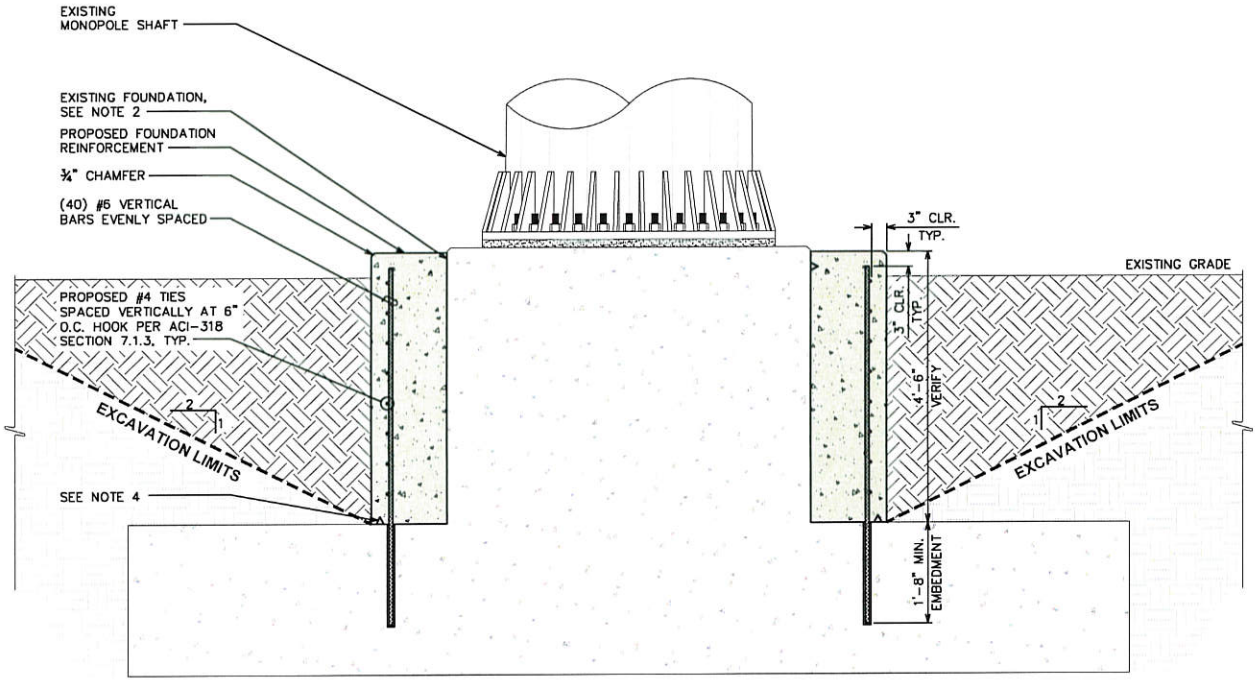
SHEET NUMBER: **S-4**

REVISION: 1

TEP #: 25680.24967

NOTES: 1

1. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING EQUIPMENT PRIOR TO CONSTRUCTION. COORDINATE WITH TOWER OWNER ANY REQUIRED RELOCATION OF EQUIPMENT THAT MAY INTERFERE WITH THE FOUNDATION REINFORCEMENT.
2. CONTRACTOR SHALL VERIFY AS-BUILT DIMENSIONS OF EXISTING FOUNDATION PRIOR TO CONSTRUCTION. EXISTING FOUNDATION SHALL BE ROUGHENED TO A MINIMUM AMPLITUDE OF A ¼" PRIOR TO PLACING PROPOSED CONCRETE. IN ADDITION, THE EXISTING CONCRETE SURFACE SHALL BE CLEANED BY HAND CHIPPING, SCRAPING, SANDING, AND/OR WIRE BRUSHING TO REMOVE ANY LOOSE DETRIMENTAL FOREIGN MATTER PRIOR TO PLACING CONCRETE.
3. DOWELS SHALL BE SECURED IN THE HOLES USING HILTI HIT-HY 200 EPOXY. PRIOR TO INSTALLATION, THE DOWEL HOLES SHALL BE CLEANED ACCORDING TO THE EPOXY MANUFACTURER'S SPECIFICATIONS. ONCE THE DOWELS ARE CENTERED IN THE HOLES, BOTH ENDS OF EACH HOLE SHALL BE SEALED LEAVING AN INJECTION PORT HOLE AT THE TOP OF EACH HOLE. TO SECURE THE DOWEL BARS IN PLACE, THE EPOXY SHALL BE PRESSURE-INJECTED FROM ONE END OF EACH HOLE THROUGHOUT ITS LENGTH UNTIL THE EPOXY BEGINS TO COME OUT OF THE PORT HOLE AT THE OPPOSITE END.
4. CONTRACTOR TO USE SIKASWELL S-2 WATERSTOP BY SIKA CORP., OR APPROVED EQUAL. APPLY PER THE MANUFACTURERS' SPECIFICATIONS. CONTACT SIKA CORPORATION AT (800) 933-7452.
5. PROPOSED CONCRETE SHALL BE POURED MONOLITHICALLY, COLD JOINTS NOT ALLOWED.



SECTION C
SCALE: ½" = 1'-0"

0 2 4
SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

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BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
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SEAL:

STATE OF CONNECTICUT GRAHAM C. ANDRES 29538 LICENSED PROFESSIONAL ENGINEER

April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

SHEET TITLE:

FOUNDATION REINFORCEMENT DETAILS

SHEET NUMBER: **S-5**

REVISION: 1

TEP #: 25680.24967

EXHIBIT B

Date: **April 23, 2015**

Andrew Bazinet
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(585) 899-3442

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: **Structural Modification Analysis Report - Revision 1**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11178D
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	829013
	Crown Castle Site Name:	West Hartford/I-84/X43
	Crown Castle JDE Job Number:	302452
	Crown Castle Work Order Number:	1033158
	Crown Castle Application Number:	261528 Rev. 3
Engineering Firm Designation:	**TEP Project Number:**	25680.24967
Site Data:	**467 South Quaker Lane (Church of St. Mark)** **West Hartford, Hartford County, CT 06110** **Latitude *41° 44' 55.75"*, Longitude *-72° 43' 52.75"*** **119 Foot - Monopole Tower**	

Dear Andrew Bazinet,

Tower Engineering Professionals is pleased to submit this **"Structural Modification 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 770630, in accordance with application 261528, revision 3.

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:

LC4.7: Existing + Reserved + Proposed Equipment with Proposed Modifications **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut State Building Code with 2013 Amendment (2003 International Building Code) based upon a wind speed of 80 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Tables 1 and 2 and the attached drawings for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* 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: Rhett Park, E.I. / JLK

Respectfully submitted by:

Graham M. Andres, P.E.

Revision #	Date Issued	Description
0	October 7, 2014	Original Structural Modification Analysis
1	April 23, 2015	Revised Foundation Reinforcement

STATE OF CONNECTICUT
GRAHAM M. ANDRES
29538
LICENSED
PROFESSIONAL ENGINEER
4/23/15

Electronic Copy

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1) INTRODUCTION

This tower is a 119-ft monopole tower designed by Pirod, Inc. in May of 2000. The tower was originally designed for a wind speed of 80 mph per EIA/TIA-222-F for the appurtenances listed in Table 3. The tower has been modified per reinforcement drawings prepared by Natcomm, LLC in November of 2006. TEP visited the site on July of 2014 to perform a Rebar Mapping. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1.0 inch escalating 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
120.0	120.0	3	Commscope	LNX-6515DS-VTM w/ Mount Pipe	-	-	-
		3	Ericsson	RRUS 11 B12			
		1	RFS Celwave	APXV18-206517S-C w/ Mount Pipe			

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
120.0	120.0	3	Andrew	ETW190VS12UB	5	1-5/8	1
		6	Ericsson	Air 21 w/ Mount Pipe			
		2	Andrew	VHLP2-11			
		3	Ericsson	Ericsson Air 21 B2A B4P w/ Mount Pipe	13	1-5/8	2
		3	Ericsson	Ericsson Air 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	KRY 112 144/1			
		1	Tower Mounts	Platform Mount [LP 403-1]			
115.0	115.0	1	Andrew	VHLP2-18	3	1/2	2
		1	Tower Mounts	Side Arm Mount [SO 102-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	110.0	1	Andrew	SBNH-1D6565C w/ Mount Pipe	1 2 12	3/8 7/16 1-5/8	2
		2	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	Powerwave Technologies	7770.00 w/ Mount Pipe			
		1	Raycap	DC6-48-60-18-8F			
		3	Ericsson	RRUS 11			
		4	Powerwave Technologies	LGP21903			
		3	Ericsson	RRUS-11	-	-	3
		1	Tower Mounts	Platform Mount [LP 1303-1]			
100.0	100.0	3	Alcatel Lucent	RRH2X40-AWS	13	1-5/8	2
		3	Amphenol	BXA-80063-4BF-EDIN-X w/ Mount Pipe			
		2	Andrew	LNX-6514DS-T4M w/ Mount Pipe			
		3	Antel	BXA-171063/8CF w/ Mount Pipe			
		3	Antel	BXA-185063/8CF w/ Mount Pipe			
		1	Antel	BXA-70063-6CF-EDIN-0 w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		6	RFS Celwave	FD9R6004/2C-3L			
		1	Tower Mounts	Platform Mount [LP 403-1]			
90.0	90.0	3	Kathrein	742 213 w/ Mount Pipe	6	1-5/8	2
80.0	83.0	1	Andrew	VHLP2-23	3 1 1 3	1/4 5/16 1/2 5/8	2
		1	Clearwire	CW Junction Box			
	81.0	3	Argus Technologies	LLPX310R w/ Mount Pipe			
		3	Samsung Telecommunications	Wimax Dap Head			
	80.0	1	Tower Mounts	Side Arm Mount [SO 101-3]			

Notes:
1) Existing equipment; to be removed
2) Existing equipment
3) 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)
120.0	120.0	12	Generic	1'x4' Panels	12	1-5/8
110.0	110.0	12	Generic	1'x4' Panels	12	1-5/8
100.0	100.0	12	Generic	1'x4' Panels	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Supplemental Geotechnical Report	Tower Engineering Professionals	3636697	CCISites
Tower Foundation Drawings	Pirod, Inc.	3636698	CCISites
Tower Manufacturer Drawings	Pirod, Inc.	3525378	CCISites
Post Modification Inspection	Natcomm Consulting Engineers, Inc.	3974228	CCISites
Tower Reinforcement Drawings	Natcomm Consulting Engineers, Inc.	3525386	CCISites
Previous Structural Analysis Report	Vertical Structures, Inc.	5281651	CCISites

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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.

RISA-3D (version 13.0.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower foundation. Selected output from the analysis is included in Appendix C.

3.2) Assumptions

1) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation 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 "Appendix B – Base Level Drawing".
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by the standard.
5) All tower components are in sufficient condition to carry their full design capacity.
6) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance. See Table 7.
7) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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	119.08 - 101.08	Pole	TP26x22.13x0.25	1	-6.885	1036.362	22.2	Pass
L2	101.08 - 66.5	Pole	TP34.063x24.873x0.313	2	-14.509	1691.870	58.1	Pass
L3	66.5 - 32.83	Pole	TP41.75x32.498x0.375	3	-21.460	2488.938	64.4	Pass
L4	32.83 - 0	Pole	TP49.063x39.849x0.375	4	-31.007	3012.660	72.1	Pass
							Summary	
						Pole (L4)	72.1	Pass
						RATING =	**72.1**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	70.2	Pass
1	Base Plate	-	60.1	Pass
1	Base Foundation Soil Interaction	-	63.4	Pass
1	Base Foundation Structural	-	75.9	Pass
1	Rock Anchors	-	77.8	Pass

Structure Rating (max from all components) =	**75.9%**

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

Table 7 - Dish Twist/Sway Results for 50 mph Service Wind Speed

Elevation (ft)	Dish Model	Beam Deflection		
		Deflection (in)	Tilt (deg)	Twist (deg)
115.0	Andrew VHLP2-18	19.310	1.455	0.023

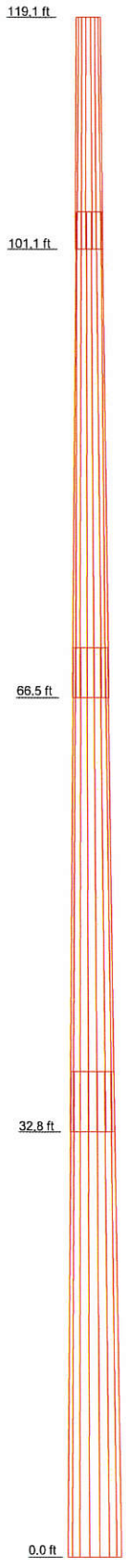
4.1) Recommendations

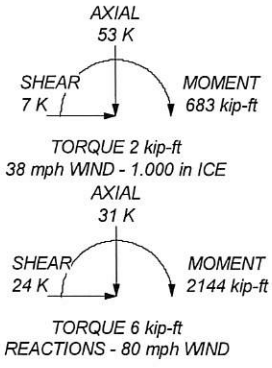
1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The modifications depicted in "Appendix D – Structural Design Drawings" shall be installed and, upon completion, inspection. The tower and its foundation have sufficient capacity to carry the existing, reserved and proposed loads once the proposed modifications are installed.

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	18.000	18	0.250	2.917	22.130	26.000		1.2
2	37.500	18	0.313	3.833	24.873	34.063		3.7
3	37.500	18	0.375	4.667	32.498	41.750	A572-65	5.6
4	37.500	18	0.375		39.849	49.063		6.7





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
2.4-in x 6-ft Mount Pipe	123	DC6-48-60-18-8F	110
LNX-6515DS-VTM w/ Mount Pipe	120	Platform Mount [LP 1303-1]	110
LNX-6515DS-VTM w/ Mount Pipe	120	RRUS 11	110
LNX-6515DS-VTM w/ Mount Pipe	120	BXA-171063/8CF w/ Mount Pipe	100
APXV18-206517S-C w/ Mount Pipe	120	BXA-171063/8CF w/ Mount Pipe	100
RRUS 11 B12	120	BXA-185063/8CF w/ Mount Pipe	100
RRUS 11 B12	120	BXA-185063/8CF w/ Mount Pipe	100
RRUS 11 B12	120	BXA-185063/8CF w/ Mount Pipe	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	LNX-6514DS-T4M w/ Mount Pipe	100
		LNX-6514DS-T4M w/ Mount Pipe	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	120	(2) FD9R6004/2C-3L	100
		(2) FD9R6004/2C-3L	100
KRY 112 144/1	120	(2) FD9R6004/2C-3L	100
KRY 112 144/1	120	DB-T1-6Z-8AB-0Z	100
KRY 112 144/1	120	RRH2X40-AWS	100
2.4" Dia. x 6' Mount Pipe	120	RRH2X40-AWS	100
2.4" Dia. x 6' Mount Pipe	120	RRH2X40-AWS	100
Platform Mount [LP 403-1]	120	Platform Mount [LP 403-1]	100
Side Arm Mount [SO 102-3]	115	BXA-171063/8CF w/ Mount Pipe	100
2.4" Dia. x 6' Mount Pipe	115	2'x3' Ice Shield	97
VHLP2-18	115	2'x3' Ice Shield	95
RRUS 11	110	742 213 w/ Mount Pipe	90
RRUS 11	110	742 213 w/ Mount Pipe	90
(2) 7770.00 w/ Mount Pipe	110	742 213 w/ Mount Pipe	90
(2) 7770.00 w/ Mount Pipe	110	LLPX310R w/ Mount Pipe	80
(2) 7770.00 w/ Mount Pipe	110	LLPX310R w/ Mount Pipe	80
AM-X-CD-16-65-00T-RET w/ Mount Pipe	110	WIMAX DAP HEAD	80
		WIMAX DAP HEAD	80
SBNH-1D6565C w/ Mount Pipe	110	WIMAX DAP HEAD	80
AM-X-CD-16-65-00T-RET w/ Mount Pipe	110	CW JUNCTION BOX	80
		2.4" Dia. x 6' Mount Pipe	80
(2) LGP21903	110	2.4" Dia. x 6' Mount Pipe	80
(2) LGP21903	110	2.4" Dia. x 6' Mount Pipe	80
RRUS-11	110	Side Arm Mount [SO 101-3]	80
RRUS-11	110	LLPX310R w/ Mount Pipe	80
RRUS-11	110	VHLP2-23	80

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for 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: 72.1%

Tower Engineering Professionals
326 Tryon Road
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FAX: (919) 661-6350

Job:	West Hartford/I-84/X43 (BU 829013)
Project:	TEP No. 25680.24967 - Rev. 1
Client: Crown Castle	Drawn by: rtpark / App'd:
Code: TIA/EIA-222-F	Date: 04/21/15 / Scale: NTS
Path:	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:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
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	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination	Use TIA-222-G Tension Splice Capacity Exemption	

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	119.083-101.083	18.000	2.917	18	22.130	26.000	0.250	1.000	A572-65 (65 ksi)
L2	101.083-66.500	37.500	3.833	18	24.873	34.063	0.313	1.250	A572-65 (65 ksi)
L3	66.500-32.833	37.500	4.667	18	32.498	41.750	0.375	1.500	A572-65 (65 ksi)
L4	32.833-0.000	37.500		18	39.849	49.063	0.375	1.500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.471	17.362	1050.090	7.767	11.242	93.407	2101.561	8.683	3.455	13.82
	26.401	20.433	1711.654	9.141	13.208	129.592	3425.561	10.218	4.136	16.544
L2	25.982	24.361	1856.528	8.719	12.635	146.930	3715.500	12.183	3.828	12.248
	34.588	33.476	4817.433	11.981	17.304	278.404	9641.206	16.741	5.445	17.424
L3	33.960	38.235	4984.583	11.404	16.509	301.930	9975.724	19.121	5.060	13.492
	42.394	49.247	10650.982	14.688	21.209	502.192	21315.979	24.628	6.688	17.835
L4	41.628	46.984	9249.061	14.013	20.243	456.899	18510.293	23.496	6.353	16.942
	49.819	57.950	17355.138	17.284	24.924	696.329	34733.112	28.981	7.975	21.267

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
L1 119.083-101.083				1	1	1		
L2 101.083-66.500				1	1	1		
L3 66.500-32.833				1	1	1		
L4 32.833-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
****										

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
Safety Line 3/8	C	No	CaAa (Out Of Face)	119.000 - 0.000	1	No Ice	0.037	0.220
						1/2" Ice	0.137	0.750
						1" Ice	0.238	1.280
						2" Ice	0.437	2.340
						4" Ice	0.838	4.460
Rung 5/8" SR (12.5"w, 16"s)	C	No	CaAa (Out Of Face)	119.000 - 0.000	1	No Ice	0.049	0.816
						1/2" Ice	0.149	1.420
						1" Ice	0.249	2.634
						2" Ice	0.449	6.895
						4" Ice	0.849	22.749
119								
LDF7-50A(1-5/8")	B	No	Inside Pole	119.083 - 0.000	11	No Ice	0.000	0.820

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1/2" Ice	0.000	0.820
						1" Ice	0.000	0.820
						2" Ice	0.000	0.820
						4" Ice	0.000	0.820
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	119.083 - 0.000	1	No Ice	0.198	0.820
						1/2" Ice	0.298	2.335
						1" Ice	0.398	4.461
						2" Ice	0.598	10.545
						4" Ice	0.998	30.044
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	119.083 - 0.000	1	No Ice	0.000	0.820
						1/2" Ice	0.000	2.335
						1" Ice	0.000	4.461
						2" Ice	0.000	10.545
						4" Ice	0.000	30.044
110								
LDF7-50A(1-5/8")	A	No	Inside Pole	110.000 - 0.000	12	No Ice	0.000	0.820
						1/2" Ice	0.000	0.820
						1" Ice	0.000	0.820
						2" Ice	0.000	0.820
						4" Ice	0.000	0.820
WR-VG102ST-BRDA(7/16")	A	No	Inside Pole	110.000 - 0.000	2	No Ice	0.000	0.201
						1/2" Ice	0.000	0.201
						1" Ice	0.000	0.201
						2" Ice	0.000	0.201
						4" Ice	0.000	0.201
WR-VG122ST-BRDA(3/8)	A	No	Inside Pole	110.000 - 0.000	1	No Ice	0.000	0.200
						1/2" Ice	0.000	0.200
						1" Ice	0.000	0.200
						2" Ice	0.000	0.200
						4" Ice	0.000	0.200
3" Flexible Conduit	A	No	Inside Pole	110.000 - 0.000	1	No Ice	0.000	1.040
						1/2" Ice	0.000	1.040
						1" Ice	0.000	1.040
						2" Ice	0.000	1.040
						4" Ice	0.000	1.040
100								
LDF7-50A(1-5/8")	A	No	Inside Pole	100.000 - 0.000	12	No Ice	0.000	0.820
						1/2" Ice	0.000	0.820
						1" Ice	0.000	0.820
						2" Ice	0.000	0.820
						4" Ice	0.000	0.820
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	80.000 - 0.000	1	No Ice	0.000	0.820
						1/2" Ice	0.000	2.335
						1" Ice	0.000	4.461
						2" Ice	0.000	10.545
						4" Ice	0.000	30.044
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	100.000 - 80.000	1	No Ice	0.198	0.820
						1/2" Ice	0.298	2.335
						1" Ice	0.398	4.461
						2" Ice	0.598	10.545
						4" Ice	0.998	30.044
90								
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	90.000 - 0.000	6	No Ice	0.000	0.820
						1/2" Ice	0.000	2.335
						1" Ice	0.000	4.461
						2" Ice	0.000	10.545
						4" Ice	0.000	30.044
80								
FSJ1-50A(1/4")	C	No	Inside Pole	80.000 - 0.000	3	No Ice	0.000	0.045
						1/2" Ice	0.000	0.045
						1" Ice	0.000	0.045

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						2" Ice	0.000	0.045
						4" Ice	0.000	0.045
HJ4.5-50(5/8")	C	No	Inside Pole	80.000 - 0.000	3	No Ice	0.000	0.400
						1/2" Ice	0.000	0.400
						1" Ice	0.000	0.400
						2" Ice	0.000	0.400
						4" Ice	0.000	0.400
9207(5/16")	C	No	Inside Pole	80.000 - 0.000	1	No Ice	0.000	0.600
						1/2" Ice	0.000	0.600
						1" Ice	0.000	0.600
						2" Ice	0.000	0.600
						4" Ice	0.000	0.600
2" Flexible Conduit	C	No	CaAa (Out Of Face)	80.000 - 0.000	1	No Ice	0.000	0.340
						1/2" Ice	0.000	1.867
						1" Ice	0.000	4.005
						2" Ice	0.000	10.114
						4" Ice	0.000	29.662
2" Flexible Conduit	C	No	CaAa (Out Of Face)	80.000 - 0.000	1	No Ice	0.200	0.340
						1/2" Ice	0.300	1.867
						1" Ice	0.400	4.005
						2" Ice	0.600	10.114
						4" Ice	1.000	29.662
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	80.000 - 0.000	4	No Ice	0.000	0.140
						1/2" Ice	0.000	0.763
						1" Ice	0.000	1.997
						2" Ice	0.000	6.298
						4" Ice	0.000	22.229
***								
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	115.000 - 80.000	3	No Ice	0.000	0.140
						1/2" Ice	0.000	0.763
						1" Ice	0.000	1.997
						2" Ice	0.000	6.298
						4" Ice	0.000	22.229
****								

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	119.083-101.083	A	0.000	0.000	0.000	0.000	0.102
		B	0.000	0.000	0.000	3.564	0.192
		C	0.000	0.000	0.000	1.546	0.024
L2	101.083-66.500	A	0.000	0.000	0.000	0.000	0.853
		B	0.000	0.000	0.000	6.847	0.369
		C	0.000	0.000	0.000	9.645	0.104
L3	66.500-32.833	A	0.000	0.000	0.000	0.000	0.911
		B	0.000	0.000	0.000	6.666	0.359
		C	0.000	0.000	0.000	9.639	0.142
L4	32.833-0.000	A	0.000	0.000	0.000	0.000	0.889
		B	0.000	0.000	0.000	6.501	0.350
		C	0.000	0.000	0.000	9.400	0.138

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	119.083-101.083	A	1.155	0.000	0.000	0.000	0.000	0.102
		B		0.000	0.000	0.000	7.723	0.357
		C		0.000	0.000	0.000	9.825	0.196
L2	101.083-66.500	A	1.117	0.000	0.000	0.000	0.000	1.562
		B		0.000	0.000	0.000	14.838	0.686
		C		0.000	0.000	0.000	33.365	0.744
L3	66.500-32.833	A	1.050	0.000	0.000	0.000	0.000	1.937
		B		0.000	0.000	0.000	14.190	0.652
		C		0.000	0.000	0.000	32.210	0.873
L4	32.833-0.000	A	1.000	0.000	0.000	0.000	0.000	1.795
		B		0.000	0.000	0.000	13.394	0.609
		C		0.000	0.000	0.000	30.080	0.774

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	119.083-101.083	0.128	0.187	-0.096	0.462
L2	101.083-66.500	-0.089	0.301	-0.426	0.639
L3	66.500-32.833	-0.099	0.315	-0.464	0.689
L4	32.833-0.000	-0.102	0.322	-0.472	0.710

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
2.4-in x 6-ft Mount Pipe	C	None		0.000	123.000	No Ice	1.440	1.440	0.022
						1/2" Ice	1.933	1.933	0.033
						1" Ice	2.302	2.302	0.048
						2" Ice	3.068	3.068	0.091
						4" Ice	4.711	4.711	0.232
120									
LNX-6515DS-VTM w/ Mount Pipe	A	From Centroid-Face	4.000 7.000 0.000	30.000	120.000	No Ice	11.683	9.842	0.083
						1/2" Ice	12.404	11.366	0.173
						1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/ Mount Pipe	B	From Centroid-Face	4.000 -3.750 0.000	30.000	120.000	No Ice	11.683	9.842	0.083
						1/2" Ice	12.404	11.366	0.173
						1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/ Mount Pipe	C	From Centroid-Face	4.000 -3.750 0.000	30.000	120.000	No Ice	11.683	9.842	0.083
						1/2" Ice	12.404	11.366	0.173
						1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	17.875	20.139	1.151
APXV18-206517S-C w/ Mount Pipe	B	From Centroid-Face	4.000 7.000 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.404 5.960 6.481 7.547 9.919	4.700 5.860 6.734 8.515 12.277	0.052 0.097 0.150 0.280 0.679
RRUS 11 B12	A	From Centroid-Face	4.000 7.000 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.306 3.550 3.802 4.334 5.501	1.361 1.540 1.728 2.130 3.038	0.051 0.072 0.095 0.153 0.314
RRUS 11 B12	B	From Centroid-Face	4.000 -3.750 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.306 3.550 3.802 4.334 5.501	1.361 1.540 1.728 2.130 3.038	0.051 0.072 0.095 0.153 0.314
RRUS 11 B12	C	From Centroid-Face	4.000 -3.750 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.306 3.550 3.802 4.334 5.501	1.361 1.540 1.728 2.130 3.038	0.051 0.072 0.095 0.153 0.314
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Centroid-Face	4.000 -7.000 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Centroid-Face	4.000 -7.000 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Centroid-Face	4.000 -7.000 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Centroid-Face	4.000 3.750 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Centroid-Face	4.000 3.750 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Centroid-Face	4.000 7.000 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
KRY 112 144/1	A	From Centroid-Face	4.000 -7.000 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.411 0.500 0.597 0.818 1.363	0.189 0.256 0.332 0.510 0.970	0.011 0.014 0.018 0.032 0.081
KRY 112 144/1	B	From	4.000	30.000	120.000	No Ice	0.411	0.189	0.011

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Face	-7.000 0.000			1/2" Ice	0.500	0.256	0.014
						1" Ice	0.597	0.332	0.018
						2" Ice	0.818	0.510	0.032
						4" Ice	1.363	0.970	0.081
KRY 112 144/1	C	From Centroid-Face	4.000 -7.000 0.000	30.000	120.000	No Ice	0.411	0.189	0.011
						1/2" Ice	0.500	0.256	0.014
						1" Ice	0.597	0.332	0.018
						2" Ice	0.818	0.510	0.032
						4" Ice	1.363	0.970	0.081
2.4" Dia. x 6' Mount Pipe	B	From Centroid-Face	4.000 0.000 0.000	0.000	120.000	No Ice	1.425	1.425	0.022
						1/2" Ice	1.931	1.931	0.038
						1" Ice	2.316	2.316	0.056
						2" Ice	3.149	3.149	0.100
						4" Ice	5.058	5.058	0.252
2.4" Dia. x 6' Mount Pipe	C	From Centroid-Face	4.000 0.000 0.000	0.000	120.000	No Ice	1.425	1.425	0.022
						1/2" Ice	1.931	1.931	0.038
						1" Ice	2.316	2.316	0.056
						2" Ice	3.149	3.149	0.100
						4" Ice	5.058	5.058	0.252
Platform Mount [LP 403-1]	C	None		0.000	120.000	No Ice	18.850	18.850	1.500
						1/2" Ice	24.300	24.300	1.797
						1" Ice	29.750	29.750	2.093
						2" Ice	40.650	40.650	2.686
						4" Ice	62.450	62.450	3.872
****115***									
Side Arm Mount [SO 102-3]	C	None		0.000	115.000	No Ice	3.000	3.000	0.081
						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
						2" Ice	4.920	4.920	0.201
						4" Ice	6.840	6.840	0.321
2.4" Dia. x 6' Mount Pipe	C	From Leg	0.500 0.000 0.000	0.000	115.000	No Ice	1.425	1.425	0.022
						1/2" Ice	1.931	1.931	0.038
						1" Ice	2.316	2.316	0.056
						2" Ice	3.149	3.149	0.100
						4" Ice	5.058	5.058	0.252
110									
RRUS 11	A	From Centroid-Face	4.000 6.000 0.000	30.000	110.000	No Ice	3.249	1.373	0.048
						1/2" Ice	3.491	1.551	0.068
						1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS 11	B	From Centroid-Face	4.000 6.000 0.000	20.000	110.000	No Ice	3.249	1.373	0.048
						1/2" Ice	3.491	1.551	0.068
						1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS 11	C	From Centroid-Face	4.000 6.000 0.000	30.000	110.000	No Ice	3.249	1.373	0.048
						1/2" Ice	3.491	1.551	0.068
						1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Face	4.000 -4.000 0.000	30.000	110.000	No Ice	6.119	4.254	0.055
						1/2" Ice	6.626	5.014	0.103
						1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	B	From	4.000	20.000	110.000	No Ice	6.119	4.254	0.055

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Face	-4.000 0.000			1/2" Ice	6.626	5.014	0.103
						1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	C	From Centroid-Face	4.000 -4.000 0.000	30.000	110.000	No Ice	6.119	4.254	0.055
						1/2" Ice	6.626	5.014	0.103
						1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Leg	4.000 6.000 0.000	30.000	110.000	No Ice	8.498	6.304	0.074
						1/2" Ice	9.149	7.479	0.139
						1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
SBNH-1D6565C w/ Mount Pipe	B	From Centroid-Leg	4.000 6.000 0.000	20.000	110.000	No Ice	11.695	9.854	0.099
						1/2" Ice	12.421	11.383	0.189
						1" Ice	13.157	12.936	0.289
						2" Ice	14.630	15.305	0.523
						4" Ice	17.917	20.189	1.169
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Centroid-Leg	4.000 6.000 0.000	30.000	110.000	No Ice	8.498	6.304	0.074
						1/2" Ice	9.149	7.479	0.139
						1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
(2) LGP21903	B	From Centroid-Face	4.000 6.000 0.000	20.000	110.000	No Ice	0.270	0.184	0.011
						1/2" Ice	0.343	0.248	0.013
						1" Ice	0.425	0.322	0.017
						2" Ice	0.616	0.494	0.028
						4" Ice	1.101	0.943	0.072
(2) LGP21903	A	From Centroid-Face	4.000 6.000 0.000	30.000	110.000	No Ice	0.270	0.184	0.011
						1/2" Ice	0.343	0.248	0.013
						1" Ice	0.425	0.322	0.017
						2" Ice	0.616	0.494	0.028
						4" Ice	1.101	0.943	0.072
RRUS-11	A	From Centroid-Face	4.000 -6.000 0.000	30.000	110.000	No Ice	2.942	1.246	0.055
						1/2" Ice	3.172	1.412	0.074
						1" Ice	3.410	1.587	0.097
						2" Ice	3.913	1.963	0.151
						4" Ice	5.023	2.819	0.302
RRUS-11	B	From Centroid-Face	4.000 -6.000 0.000	20.000	110.000	No Ice	2.942	1.246	0.055
						1/2" Ice	3.172	1.412	0.074
						1" Ice	3.410	1.587	0.097
						2" Ice	3.913	1.963	0.151
						4" Ice	5.023	2.819	0.302
RRUS-11	C	From Centroid-Face	4.000 -6.000 0.000	30.000	110.000	No Ice	2.942	1.246	0.055
						1/2" Ice	3.172	1.412	0.074
						1" Ice	3.410	1.587	0.097
						2" Ice	3.913	1.963	0.151
						4" Ice	5.023	2.819	0.302
DC6-48-60-18-8F	B	From Centroid-Face	4.000 -6.000 0.000	20.000	110.000	No Ice	1.266	1.266	0.020
						1/2" Ice	1.456	1.456	0.035
						1" Ice	1.658	1.658	0.053
						2" Ice	2.093	2.093	0.095
						4" Ice	3.098	3.098	0.215
Platform Mount [LP 1303-1]	C	None		0.000	110.000	No Ice	56.800	56.800	2.528
						1/2" Ice	70.800	70.800	3.385
						1" Ice	84.800	84.800	4.242

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	112.800	112.800	5.956
						4" Ice	168.800	168.800	9.384
100									
BXA-171063/8CF w/ Mount Pipe	A	From Centroid-Face	4.000 -7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.140 3.515 3.915 4.804 6.715	3.510 4.130 4.757 6.059 9.095	0.029 0.062 0.100 0.196 0.492
BXA-171063/8CF w/ Mount Pipe	B	From Centroid-Face	4.000 -7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.140 3.515 3.915 4.804 6.715	3.510 4.130 4.757 6.059 9.095	0.029 0.062 0.100 0.196 0.492
BXA-171063/8CF w/ Mount Pipe	C	From Centroid-Face	4.000 -7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.140 3.515 3.915 4.804 6.715	3.510 4.130 4.757 6.059 9.095	0.029 0.062 0.100 0.196 0.492
BXA-185063/8CF w/ Mount Pipe	A	From Centroid-Face	4.000 3.500 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.193 3.564 3.965 4.850 6.761	3.122 3.725 4.346 5.636 8.569	0.039 0.072 0.111 0.205 0.498
BXA-185063/8CF w/ Mount Pipe	B	From Centroid-Face	4.000 3.500 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.193 3.564 3.965 4.850 6.761	3.122 3.725 4.346 5.636 8.569	0.039 0.072 0.111 0.205 0.498
BXA-185063/8CF w/ Mount Pipe	C	From Centroid-Face	4.000 3.500 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.193 3.564 3.965 4.850 6.761	3.122 3.725 4.346 5.636 8.569	0.039 0.072 0.111 0.205 0.498
LNX-6514DS-T4M w/ Mount Pipe	A	From Centroid-Face	4.000 -3.500 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.682 9.312 9.931 11.198 13.852	7.418 8.452 9.345 11.181 15.216	0.079 0.152 0.233 0.420 0.938
LNX-6514DS-T4M w/ Mount Pipe	B	From Centroid-Face	4.000 -3.500 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.682 9.312 9.931 11.198 13.852	7.418 8.452 9.345 11.181 15.216	0.079 0.152 0.233 0.420 0.938
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Centroid-Face	4.000 -3.500 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.969 8.609 9.216 10.459 13.066	5.801 6.953 7.819 9.601 13.366	0.042 0.103 0.171 0.335 0.804
BXA-80063-4BF-EDIN-X w/ Mount Pipe	A	From Centroid-Face	4.000 7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.089 5.515 5.953 6.859 8.816	3.472 4.045 4.640 5.957 8.886	0.030 0.070 0.116 0.227 0.554
BXA-80063-4BF-EDIN-X w/ Mount Pipe	B	From Centroid-Face	4.000 7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.089 5.515 5.953 6.859	3.472 4.045 4.640 5.957	0.030 0.070 0.116 0.227

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	8.816	8.886	0.554
BXA-80063-4BF-EDIN-X w/ Mount Pipe	C	From Centroid-Face	4.000 7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.089 5.515 5.953 6.859 8.816	3.472 4.045 4.640 5.957 8.886	0.030 0.070 0.116 0.227 0.554
(2) FD9R6004/2C-3L	A	From Centroid-Face	4.000 0.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L	B	From Centroid-Face	4.000 0.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L	C	From Centroid-Face	4.000 0.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
DB-T1-6Z-8AB-0Z	A	From Centroid-Face	4.000 7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.600 5.915 6.240 6.914 8.365	2.333 2.558 2.791 3.284 4.373	0.044 0.080 0.120 0.213 0.455
RRH2X40-AWS	A	From Centroid-Face	4.000 -7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2X40-AWS	B	From Centroid-Face	4.000 -7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2X40-AWS	C	From Centroid-Face	4.000 -7.000 0.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
Platform Mount [LP 403-1]	C	None		0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.850 24.300 29.750 40.650 62.450	18.850 24.300 29.750 40.650 62.450	1.500 1.797 2.093 2.686 3.872
90									
742 213 w/ Mount Pipe	A	From Leg	0.500 0.000 0.000	30.000	90.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.094 0.146 0.277 0.683
742 213 w/ Mount Pipe	B	From Leg	0.500 0.000 0.000	0.000	90.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.094 0.146 0.277 0.683

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
742 213 w/ Mount Pipe	C	From Leg	0.500 0.000 0.000	-10.000	90.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.049 0.094 0.146 0.277 0.683
2'x3' Ice Shield	C	From Leg	0.500 0.000 0.000	-10.000	95.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.720 0.990 1.260 1.800 2.880	1.180 1.610 2.040 2.900 4.620	0.072 0.132 0.192 0.312 0.552
2'x3' Ice Shield	C	From Leg	0.500 0.000 0.000	-10.000	97.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.720 0.990 1.260 1.800 2.880	1.180 1.610 2.040 2.900 4.620	0.072 0.132 0.192 0.312 0.552
*** ***80***									
LLPX310R w/ Mount Pipe	A	From Leg	1.000 -2.000 1.000	30.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.982 5.376 5.780 6.618 8.437	2.874 3.398 3.937 5.125 7.894	0.044 0.081 0.123 0.227 0.531
LLPX310R w/ Mount Pipe	B	From Leg	1.000 -2.000 1.000	30.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.982 5.376 5.780 6.618 8.437	2.874 3.398 3.937 5.125 7.894	0.044 0.081 0.123 0.227 0.531
LLPX310R w/ Mount Pipe	C	From Leg	1.000 -2.000 1.000	30.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.982 5.376 5.780 6.618 8.437	2.874 3.398 3.937 5.125 7.894	0.044 0.081 0.123 0.227 0.531
WIMAX DAP HEAD	A	From Leg	1.000 2.000 1.000	30.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
WIMAX DAP HEAD	B	From Leg	1.000 -2.000 1.000	30.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
WIMAX DAP HEAD	C	From Leg	1.000 -2.000 1.000	30.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
CW JUNCTION BOX	A	From Leg	1.000 2.000 3.000	30.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.560 1.728 2.091 2.921	0.700 0.821 0.951 1.236 1.910	0.000 0.010 0.023 0.055 0.153
2.4" Dia. x 6' Mount Pipe	A	From Leg	1.000 2.000 0.000	0.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.931 2.316 3.149 5.058	1.425 1.931 2.316 3.149 5.058	0.022 0.038 0.056 0.100 0.252

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
2.4" Dia. x 6' Mount Pipe	B	From Leg	1.000	2.000	0.000	80.000	No Ice	1.425	1.425	0.022
							1/2" Ice	1.931	1.931	0.038
				0.000			1" Ice	2.316	2.316	0.056
							2" Ice	3.149	3.149	0.100
							4" Ice	5.058	5.058	0.252
2.4" Dia. x 6' Mount Pipe	C	From Leg	1.000	2.000	0.000	80.000	No Ice	1.425	1.425	0.022
							1/2" Ice	1.931	1.931	0.038
				0.000			1" Ice	2.316	2.316	0.056
							2" Ice	3.149	3.149	0.100
							4" Ice	5.058	5.058	0.252
Side Arm Mount [SO 101-3]	C	None			0.000	80.000	No Ice	7.500	7.500	0.252
							1/2" Ice	8.900	8.900	0.333
							1" Ice	10.300	10.300	0.414
							2" Ice	13.100	13.100	0.576
							4" Ice	18.700	18.700	0.900

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
115'												
VHLP2-18	C	Paraboloid w/Shroud (HP)	From Leg	1.000	0.000	0.000		115.000	2.000	No Ice	3.140	0.031
				0.000						1/2" Ice	3.410	0.049
				0.000						1" Ice	3.680	0.066
										2" Ice	4.210	0.101
										4" Ice	5.280	0.171
80'												
VHLP2-23	A	Paraboloid w/Shroud (HP)	From Leg	1.000	0.000	-30.000		80.000	2.180	No Ice	3.730	0.030
				0.000						1/2" Ice	4.020	0.050
				3.000						1" Ice	4.310	0.070
										2" Ice	4.900	0.110
										4" Ice	6.060	0.200
***												

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

Comb. No.	Description
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
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	119.083 - 101.083	Pole	Max Tension	14	0.000	0.000	-0.000
			Max. Compression	14	-14.863	-2.938	2.799
			Max. Mx	5	-6.886	-114.032	1.703
			Max. My	2	-6.896	-1.852	113.056
			Max. Vy	5	10.987	-114.032	1.703
			Max. Vx	2	-10.894	-1.852	113.056
			Max. Torque	7			5.759
L2	101.083 - 66.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-29.304	-2.182	4.584
			Max. Mx	5	-14.493	-651.515	2.949
			Max. My	2	-14.501	-3.977	647.726
			Max. Vy	5	18.690	-651.515	2.949
			Max. Vx	8	18.624	1.283	-644.767
			Max. Torque	6			6.624
L3	66.5 - 32.8333	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-39.666	-1.639	5.631
			Max. Mx	5	-21.422	-1305.473	2.144
			Max. My	2	-21.426	-5.321	1298.912
			Max. Vy	5	21.101	-1305.473	2.144
			Max. Vx	8	21.036	1.190	-1296.428
			Max. Torque	6			6.595

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	32.8333 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-53.155	-0.907	6.864
			Max. Mx	5	-30.940	-2144.333	1.183
			Max. My	2	-30.940	-6.730	2134.724
			Max. Vy	5	23.639	-2144.333	1.183
			Max. Vx	8	23.578	1.149	-2132.699
			Max. Torque	6			6.516

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	53.155	-0.004	7.249
	Max. H_x	11	30.952	23.584	0.010
	Max. H_z	2	30.952	-0.038	23.535
	Max. M_x	2	2134.724	-0.038	23.535
	Max. M_z	5	2144.333	-23.623	-0.033
	Max. Torsion	6	6.440	-20.472	-11.760
	Min. Vert	1	30.952	0.000	0.000
	Min. H_x	5	30.952	-23.623	-0.033
	Min. H_z	8	30.952	-0.002	-23.561
	Min. M_x	8	-2132.699	-0.002	-23.561
	Min. M_z	11	-2138.788	23.584	0.010
	Min. Torsion	12	-6.377	20.428	11.757

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	30.952	0.000	0.000	-1.970	-0.601	0.000
Dead+Wind 0 deg - No Ice	30.952	0.038	-23.535	-2134.724	-6.729	4.723
Dead+Wind 30 deg - No Ice	30.952	11.807	-20.404	-1851.527	-1073.795	1.745
Dead+Wind 60 deg - No Ice	30.952	20.443	-11.792	-1071.679	-1856.345	-1.742
Dead+Wind 90 deg - No Ice	30.952	23.623	0.033	-1.182	-2144.333	-4.732
Dead+Wind 120 deg - No Ice	30.952	20.472	11.760	1061.217	-1858.177	-6.440
Dead+Wind 150 deg - No Ice	30.952	11.795	20.410	1846.819	-1069.342	-6.386
Dead+Wind 180 deg - No Ice	30.952	0.002	23.561	2132.699	1.150	-4.739
Dead+Wind 210 deg - No Ice	30.952	-11.759	20.404	1846.784	1067.732	-1.818
Dead+Wind 240 deg - No Ice	30.952	-20.431	11.751	1063.676	1853.216	1.777
Dead+Wind 270 deg - No Ice	30.952	-23.584	-0.010	-1.229	2138.788	4.738
Dead+Wind 300 deg - No Ice	30.952	-20.428	-11.757	-1065.665	1852.463	6.377
Dead+Wind 330 deg - No Ice	30.952	-11.802	-20.367	-1846.794	1069.527	6.346
Dead+Ice+Temp	53.155	0.000	-0.000	-6.864	-0.907	0.001
Dead+Wind 0 deg+Ice+Temp	53.155	0.004	-7.249	-683.058	-2.092	1.282
Dead+Wind 30 deg+Ice+Temp	53.155	3.623	-6.280	-592.902	-339.547	0.517
Dead+Wind 60 deg+Ice+Temp	53.155	6.279	-3.626	-345.458	-587.089	-0.397
Dead+Wind 90 deg+Ice+Temp	53.155	7.258	0.014	-6.254	-678.303	-1.196
Dead+Wind 120 deg+Ice+Temp	53.155	6.292	3.627	330.665	-588.090	-1.671
Dead+Wind 150 deg+Ice+Temp	53.155	3.630	6.288	579.317	-339.195	-1.688
Dead+Wind 180 deg+Ice+Temp	53.155	0.006	7.255	669.681	-0.935	-1.284
Dead+Wind 210 deg+Ice+Temp	53.155	-3.610	6.280	578.790	336.399	-0.535

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 240 deg+Ice+Temp	53.155	-6.275	3.615	330.485	584.718	0.407
Dead+Wind 270 deg+Ice+Temp	53.155	-7.247	-0.008	-7.232	675.285	1.199
Dead+Wind 300 deg+Ice+Temp	53.155	-6.280	-3.626	-344.703	585.034	1.656
Dead+Wind 330 deg+Ice+Temp	53.155	-3.631	-6.277	-592.134	337.743	1.679
Dead+Wind 0 deg - Service	30.952	0.015	-9.193	-835.599	-3.014	1.854
Dead+Wind 30 deg - Service	30.952	4.612	-7.970	-724.913	-420.079	0.685
Dead+Wind 60 deg - Service	30.952	7.985	-4.606	-420.109	-725.942	-0.684
Dead+Wind 90 deg - Service	30.952	9.228	0.013	-1.702	-838.505	-1.857
Dead+Wind 120 deg - Service	30.952	7.997	4.594	413.540	-726.659	-2.527
Dead+Wind 150 deg - Service	30.952	4.608	7.972	720.597	-418.340	-2.505
Dead+Wind 180 deg - Service	30.952	0.001	9.204	832.336	0.067	-1.859
Dead+Wind 210 deg - Service	30.952	-4.593	7.970	720.587	416.947	-0.713
Dead+Wind 240 deg - Service	30.952	-7.981	4.590	414.506	723.960	0.697
Dead+Wind 270 deg - Service	30.952	-9.213	-0.004	-1.719	835.577	1.859
Dead+Wind 300 deg - Service	30.952	-7.980	-4.593	-417.759	723.662	2.502
Dead+Wind 330 deg - Service	30.952	-4.610	-7.956	-723.063	417.644	2.490

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-30.952	0.000	0.000	30.952	0.000	0.000%
2	0.038	-30.952	-23.535	-0.038	30.952	23.535	0.000%
3	11.807	-30.952	-20.404	-11.807	30.952	20.404	0.000%
4	20.443	-30.952	-11.792	-20.443	30.952	11.792	0.000%
5	23.623	-30.952	0.033	-23.623	30.952	-0.033	0.000%
6	20.472	-30.952	11.760	-20.472	30.952	-11.760	0.000%
7	11.795	-30.952	20.410	-11.795	30.952	-20.410	0.000%
8	0.002	-30.952	23.561	-0.002	30.952	-23.561	0.000%
9	-11.759	-30.952	20.404	11.759	30.952	-20.404	0.000%
10	-20.431	-30.952	11.751	20.431	30.952	-11.751	0.000%
11	-23.584	-30.952	-0.010	23.584	30.952	0.010	0.000%
12	-20.428	-30.952	-11.757	20.428	30.952	11.757	0.000%
13	-11.802	-30.952	-20.367	11.802	30.952	20.367	0.000%
14	0.000	-53.155	0.000	-0.000	53.155	0.000	0.000%
15	0.004	-53.155	-7.249	-0.004	53.155	7.249	0.000%
16	3.623	-53.155	-6.280	-3.623	53.155	6.280	0.000%
17	6.279	-53.155	-3.626	-6.279	53.155	3.626	0.000%
18	7.258	-53.155	0.014	-7.258	53.155	-0.014	0.000%
19	6.292	-53.155	3.627	-6.292	53.155	-3.627	0.000%
20	3.630	-53.155	6.288	-3.630	53.155	-6.288	0.000%
21	0.006	-53.155	7.255	-0.006	53.155	-7.255	0.000%
22	-3.610	-53.155	6.280	3.610	53.155	-6.280	0.000%
23	-6.275	-53.155	3.615	6.275	53.155	-3.615	0.000%
24	-7.247	-53.155	-0.008	7.247	53.155	0.008	0.000%
25	-6.280	-53.155	-3.626	6.280	53.155	3.626	0.000%
26	-3.631	-53.155	-6.277	3.631	53.155	6.277	0.000%
27	0.015	-30.952	-9.193	-0.015	30.952	9.193	0.000%
28	4.612	-30.952	-7.970	-4.612	30.952	7.970	0.000%
29	7.985	-30.952	-4.606	-7.985	30.952	4.606	0.000%
30	9.228	-30.952	0.013	-9.228	30.952	-0.013	0.000%
31	7.997	-30.952	4.594	-7.997	30.952	-4.594	0.000%
32	4.608	-30.952	7.972	-4.608	30.952	-7.972	0.000%
33	0.001	-30.952	9.204	-0.001	30.952	-9.204	0.000%
34	-4.593	-30.952	7.970	4.593	30.952	-7.970	0.000%
35	-7.981	-30.952	4.590	7.981	30.952	-4.590	0.000%
36	-9.213	-30.952	-0.004	9.213	30.952	0.004	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
37	-7.980	-30.952	-4.593	7.980	30.952	4.593	0.000%
38	-4.610	-30.952	-7.956	4.610	30.952	7.956	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	0.00010513
3	Yes	5	0.00000001	0.00029075
4	Yes	5	0.00000001	0.00028972
5	Yes	5	0.00000001	0.00010182
6	Yes	5	0.00000001	0.00022741
7	Yes	5	0.00000001	0.00035903
8	Yes	5	0.00000001	0.00010122
9	Yes	5	0.00000001	0.00024572
10	Yes	5	0.00000001	0.00024678
11	Yes	5	0.00000001	0.00010055
12	Yes	5	0.00000001	0.00036061
13	Yes	5	0.00000001	0.00023056
14	Yes	4	0.00000001	0.00003790
15	Yes	5	0.00000001	0.00015621
16	Yes	5	0.00000001	0.00019472
17	Yes	5	0.00000001	0.00019361
18	Yes	5	0.00000001	0.00015412
19	Yes	5	0.00000001	0.00018536
20	Yes	5	0.00000001	0.00020270
21	Yes	5	0.00000001	0.00015099
22	Yes	5	0.00000001	0.00017866
23	Yes	5	0.00000001	0.00017853
24	Yes	5	0.00000001	0.00015190
25	Yes	5	0.00000001	0.00020655
26	Yes	5	0.00000001	0.00018944
27	Yes	4	0.00000001	0.00065824
28	Yes	4	0.00000001	0.00088203
29	Yes	4	0.00000001	0.00087223
30	Yes	4	0.00000001	0.00064623
31	Yes	4	0.00000001	0.00081255
32	Yes	5	0.00000001	0.00004785
33	Yes	4	0.00000001	0.00064250
34	Yes	4	0.00000001	0.00063233
35	Yes	4	0.00000001	0.00063105
36	Yes	4	0.00000001	0.00063956
37	Yes	5	0.00000001	0.00004823
38	Yes	4	0.00000001	0.00082337

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119.083 - 101.083	20.563	29	1.467	0.025

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	104 - 66.5	15.999	29	1.406	0.017
L3	70.3333 - 32.8333	7.355	29	0.984	0.007
L4	37.5 - 0	2.110	29	0.517	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.000	2.4-in x 6-ft Mount Pipe	29	20.563	1.467	0.026	20287
120.000	LNX-6515DS-VTM w/ Mount Pipe	29	20.563	1.467	0.026	20287
115.000	VHLP2-18	29	19.311	1.455	0.023	20287
110.000	RRUS 11	29	17.788	1.438	0.020	11167
100.000	BXA-171063/8CF w/ Mount Pipe	29	14.839	1.374	0.015	6221
97.000	2'x3' Ice Shield	29	13.989	1.346	0.014	5887
95.000	2'x3' Ice Shield	29	13.432	1.325	0.013	5685
90.000	742 213 w/ Mount Pipe	29	12.079	1.266	0.011	5235
83.000	VHLP2-23	29	10.282	1.171	0.009	4713
80.000	LLPX310R w/ Mount Pipe	29	9.549	1.128	0.009	4520

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119.083 - 101.083	52.439	5	3.734	0.065
L2	104 - 66.5	40.825	5	3.584	0.042
L3	70.3333 - 32.8333	18.788	5	2.512	0.017
L4	37.5 - 0	5.394	5	1.321	0.006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.000	2.4-in x 6-ft Mount Pipe	5	52.439	3.734	0.065	8138
120.000	LNX-6515DS-VTM w/ Mount Pipe	5	52.439	3.734	0.065	8138
115.000	VHLP2-18	5	49.252	3.706	0.058	8138
110.000	RRUS 11	5	45.380	3.664	0.051	4479
100.000	BXA-171063/8CF w/ Mount Pipe	5	37.872	3.505	0.038	2486
97.000	2'x3' Ice Shield	5	35.707	3.433	0.034	2348
95.000	2'x3' Ice Shield	5	34.289	3.380	0.032	2264
90.000	742 213 w/ Mount Pipe	5	30.839	3.230	0.028	2079
83.000	VHLP2-23	5	26.256	2.990	0.023	1865
80.000	LLPX310R w/ Mount Pipe	5	24.386	2.880	0.022	1786

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	119.083 - 101.083 (1)	TP26x22.13x0.25	18.000	0.000	0.0	39.000	19.935	-6.883	777.466	0.009
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	37.500	0.000	0.0	39.000	32.544	-14.494	1269.220	0.011
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	37.500	0.000	0.0	39.000	47.876	-21.422	1867.170	0.011
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	37.500	0.000	0.0	39.000	57.950	-30.940	2260.060	0.014

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	119.083 - 101.083 (1)	TP26x22.13x0.25	114.653	11.156	39.000	0.286	0.000	0.000	39.000	0.000
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	652.040	29.745	39.000	0.763	0.000	0.000	39.000	0.000
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	1305.475	33.014	39.000	0.847	0.000	0.000	39.000	0.000
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	2144.333	36.954	39.000	0.948	0.000	0.000	39.000	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	119.083 - 101.083 (1)	TP26x22.13x0.25	11.031	0.553	26.000	0.043	0.561	0.027	26.000	0.001
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	18.668	0.574	26.000	0.044	1.852	0.041	26.000	0.002
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	21.101	0.441	26.000	0.034	4.820	0.059	26.000	0.002
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	23.639	0.408	26.000	0.031	4.736	0.040	26.000	0.002

Pole Interaction Design Data

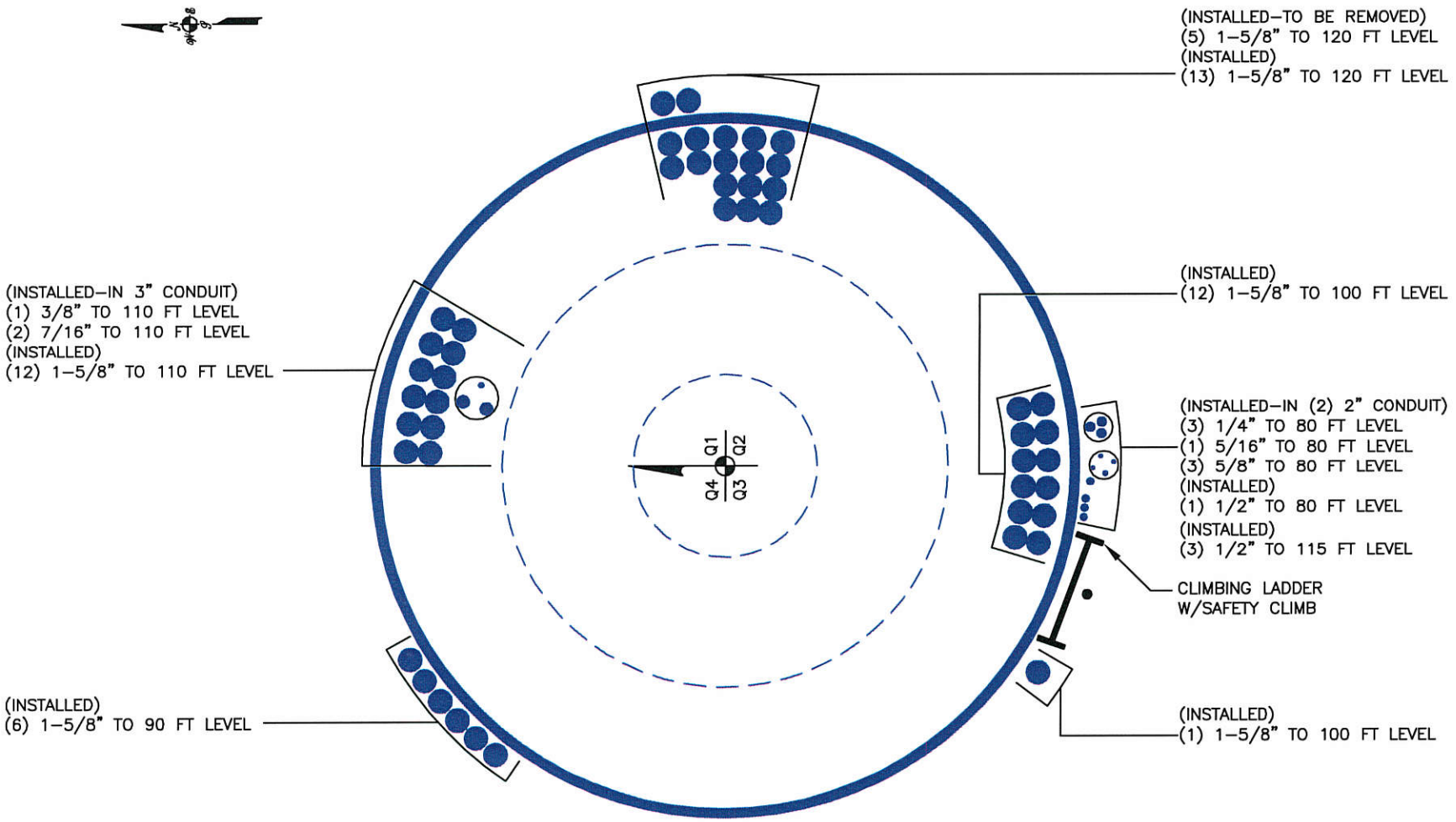
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	119.083 - 101.083 (1)	0.009	0.286	0.000	0.043	0.001	0.295	1.333	H1-3+VT
L2	101.083 - 66.5 (2)	0.011	0.763	0.000	0.044	0.002	0.775	1.333	H1-3+VT
L3	66.5 - 32.8333 (3)	0.011	0.847	0.000	0.034	0.002	0.858	1.333	H1-3+VT
L4	32.8333 - 0 (4)	0.014	0.948	0.000	0.031	0.002	0.962	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	119.083 - 101.083	Pole	TP26x22.13x0.25	1	-6.883	1036.362	22.2	Pass
L2	101.083 - 66.5	Pole	TP34.063x24.873x0.313	2	-14.494	1691.870	58.1	Pass
L3	66.5 - 32.8333	Pole	TP41.75x32.498x0.375	3	-21.422	2488.938	64.4	Pass
L4	32.8333 - 0	Pole	TP49.063x39.849x0.375	4	-30.940	3012.660	72.1	Pass
							Summary	
						Pole (L4)	72.1	Pass
						RATING =	**72.1**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 829013 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *829013*
Site Name: *West Hartford/I-84/X43*
App #: *261528 Rev. 3*

Pole Manufacturer:	Other

Reactions		
Moment:	2144	ft-kips
Axial:	31	kips
Shear:	24	kips

Anchor Rod Data		
Qty:	33	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	54	in

Plate Data		
Diam:	58	in
Thick:	1.5	in
Grade:	50	ksi
Single-Rod B-eff:	4.72	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.25	in
Width:	4	in
Height:	12	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	49.0625	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	56.8 Kips	Service, ASD
Allowable Tension:	81.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	70.2% **Pass**	

Base Plate Results Flexural Check

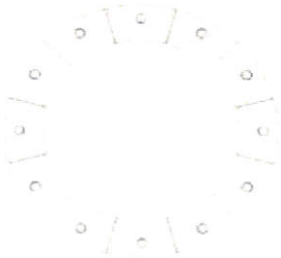
		Stiffened
Base Plate Stress:	30.0 ksi	Service, ASD
Allowable Plate Stress:	50.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	60.1% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	56.8% **Pass**
Vertical Weld:	37.8% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	13.5% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	54.6% **Pass**
Plate Comp. (AISC Bracket):	55.6% **Pass**

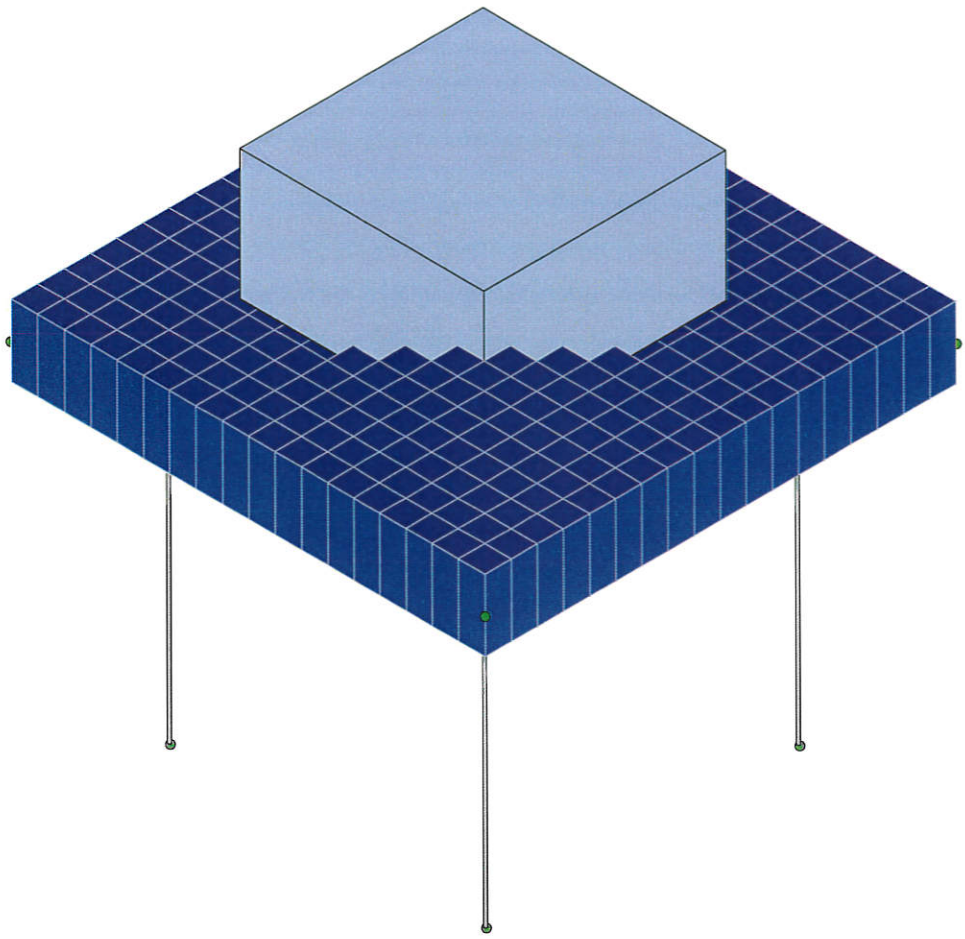
Pole Results

Pole Punching Shear Check:	6.8% **Pass**

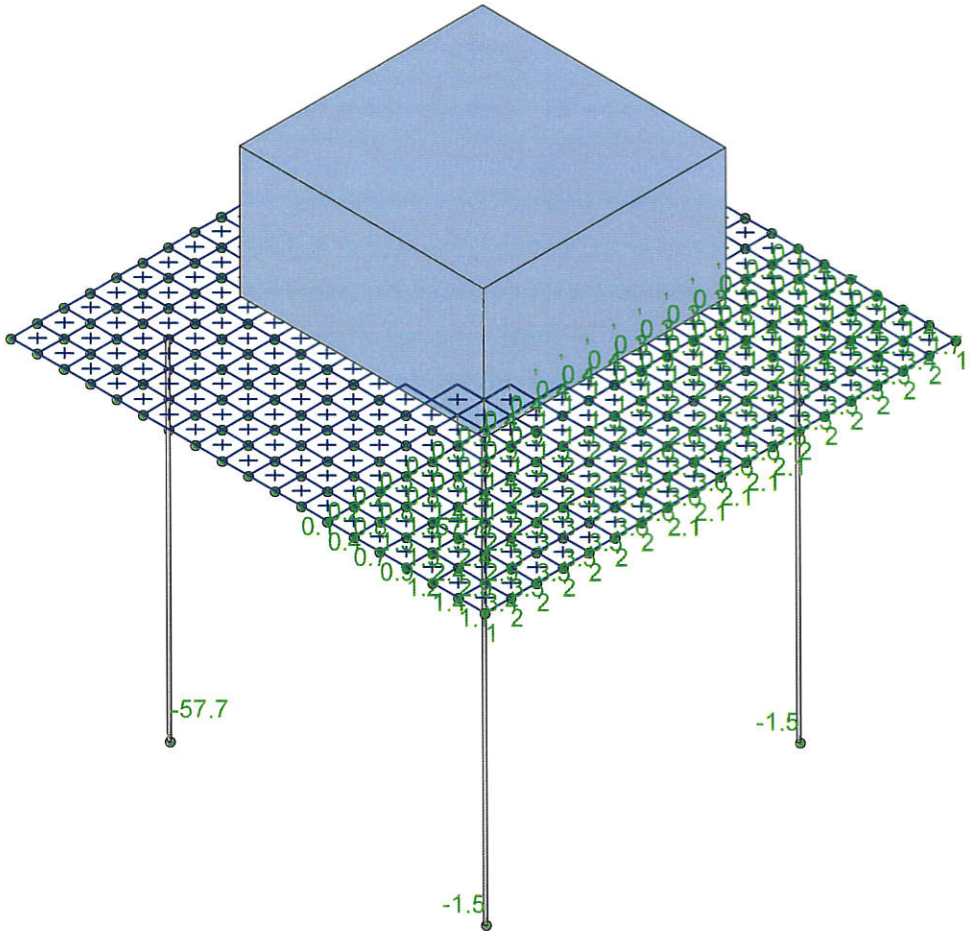


* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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



TEP	West Hartford/I-84/X43	SK - 1
RTP		Apr 23, 2015 at 10:44 AM
25680.24967 - Rev. 1		829013.02S_Foundation.r3d



Results for LC 4, 0.6D+W0
Y-direction Reaction Units are k and k-ft

TEP	West Hartford/I-84/X43	SK - 2
RTP		Apr 23, 2015 at 10:45 AM
25680.24967 - Rev. 1		829013.02S_Foundation.r3d

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..	Density[lb/f...	f'c[ksi]	Lambda	Flex Steel[...	Shear Stee...
1	Conc3000NW	3156	1372	.15	.6	145	3	1	60	60
2	Conc3500NW	3409	1482	.15	.6	145	3.5	1	60	60
3	Conc4000NW	3644	1584	.15	.6	145	4	1	60	60
4	Conc3000LW	2085	907	.15	.6	109.999	3	.75	60	60
5	Conc3500LW	2252	979	.15	.6	109.999	3.5	.75	60	60
6	Conc4000LW	2408	1047	.15	.6	109.999	4	.75	60	60

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N8	N12			1" WF Rock	Column	None	A722	Typical
2	M2	N7	N11			1" WF Rock	Column	None	A722	Typical
3	M3	N6	N10			1" WF Rock	Column	None	A722	Typical
4	M4	N5	N9			1" WF Rock	Column	None	A722	Typical
5	M5	TL1	N367			CRECT102X1...	Column	Rectangular	Conc3000...	Typical
6	M6	N367	TOWER			6' rigid offset	Column	None	RIGID	Typical

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	TL1	L	Y	-31

Joint Loads and Enforced Displacements (BLC 2 : Wind 0)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	TL1	L	X	24
2	TL1	L	Mz	-2144

Joint Loads and Enforced Displacements (BLC 3 : Wind 90)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	TL1	L	Z	24
2	TL1	L	Mx	2144

Basic Load Cases

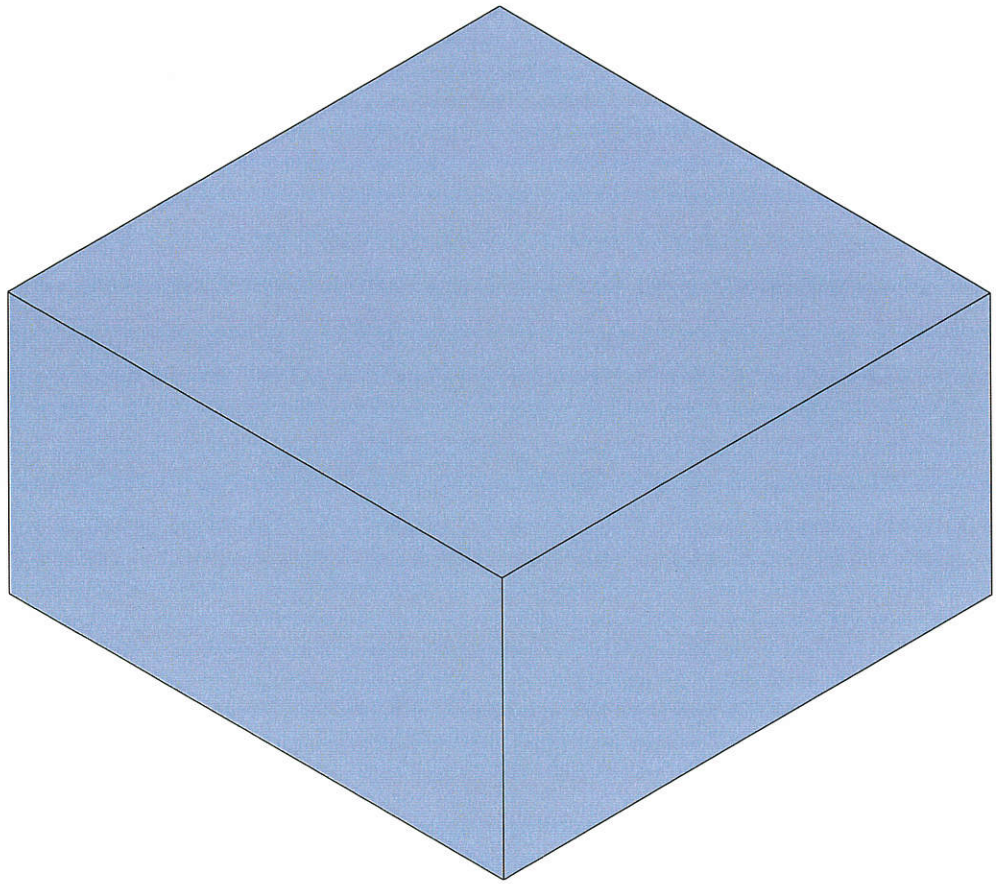
	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Member)	Surface(...
1	Dead	None		-1		1				324
2	Wind 0	None				2				
3	Wind 90	None				2				
4	Prestress	None						4		

Load Combinations

	Description	Sol..	PD..	SR...	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact...
1	D+W0	Yes	Y		1	1	2	1	4	1																
2	D-W0	Yes	Y		1	1	2	-1	4	1																
3	Prestress	Yes	Y				4	1																		
4	0.6D+W0	Yes	Y		1	.6	2	1	4	1																
5	0.6D-W0	Yes	Y		1	.6	2	-1	4	1																

Load Combinations (Continued)

	Description	Sol..	PD..	SR...	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact...
6	D+W90	Yes	Y		1	1	3	1	4	1																
7	D-W90	Yes	Y		1	1	3	-1	4	1																
8	0.6D+W90	Yes	Y		1	.6	3	1	4	1																
9	0.6D-W90	Yes	Y		1	.6	3	-1	4	1																
10	D+0.707(...	Yes	Y		1	1	2	.707	3	.707	4	1														
11	D+0.707(...	Yes	Y		1	1	2	.707	3	-.707	4	1														
12	D-0.707(...	Yes	Y		1	1	2	-.707	3	.707	4	1														
13	D+0.707(-..	Yes	Y		1	1	2	-.707	3	-.707	4	1														
14	0.6D+0.70..	Yes	Y		1	.6	2	.707	3	.707	4	1														
15	0.6D+0.70..	Yes	Y		1	.6	2	.707	3	-.707	4	1														
16	0.6D-0.70..	Yes	Y		1	.6	2	-.707	3	.707	4	1														
17	0.6D+0.70..	Yes	Y		1	.6	2	-.707	3	-.707	4	1														

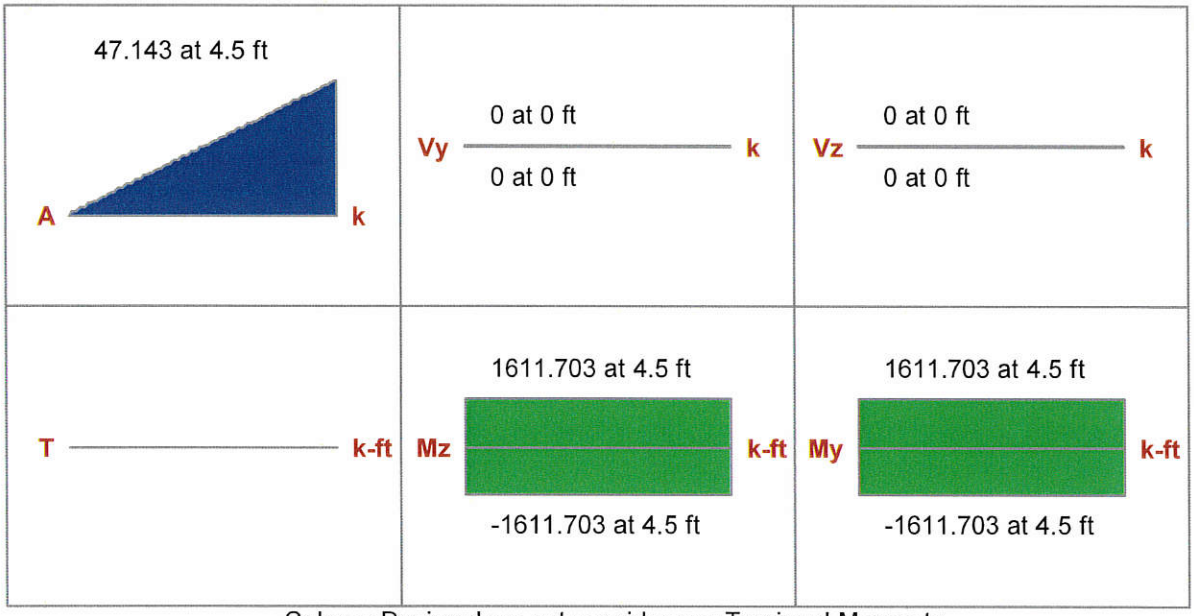


TEP	West Hartford/I-84/X43	SK - 1
RTP		Apr 23, 2015 at 3:10 PM
25680.24967 - Rev. 1		Collar.r3d

Column: ***M5***

Shape:	**CRECT102X102**	Concrete Stress Block:	**Rectangular**
Material:	**Conc3000NW**	Cracked Sections Used:	**Yes**
Length:	**4.5 ft**	Cracked 'I' Factor:	**.70**
I Joint:	**TL1**	Effective 'I':	**6.31419e+6 in^4**
J Joint:	**N367**	Biaxial Bending Solution:	**PCA Load Contour**

Code Check: **0.415 (bending)**
Report Based On 97 Sections



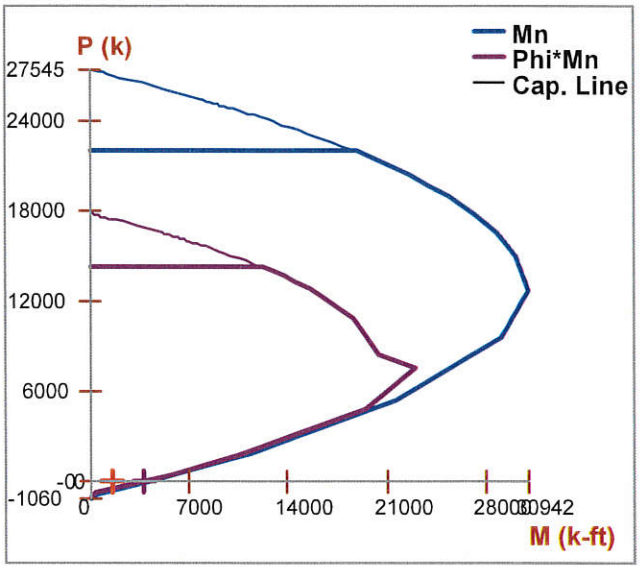
Column Design does not consider any Torsional Moments

Warning: Exact Integration selected but PCA method used
Custom rebar layout does not meet min steel (As,min) per Global Parameters

ACI 318-05 Code Check

		Bending Check	**0.415**	Shear Check	**0.000 (y)**
Gov LC	**7**	Location	**4.5 ft**	Location	**0 ft**
Gov Pu	**0 k**	Gov Muy	**1611.703 k-ft**	Gov Vuy	**0 k**
phi*Pn		Gov Muz	**0 k-ft**	Gov Vuz	**0 k**
Phi eff.	**.9**	phi*Mnoy	**-.9 k-ft**	phi*Vny	**1111.305 k**
		phi*Mnoz		phi*Vnz	**1111.305 k**
Tension Bar Fy	**60 ksi**	Concrete Weight	**145 lb/ft^3**		
Shear Bar Fy	**60 ksi**	Concrete Type	**Normal WT**	Sway yy	**No**
F'c	**3 ksi**	E_Concrete	**3156 ksi**	Sway zz	**No**
Flex. Rebar Set	**ASTM A615**	Shear Rebar Set	**ASTM A615**	Thres. Torsion	**917.543k-ft(LC:1)**
Flex. Bars	**9 #6 , 9 #6 , 11 #6 , 11 #6**				
Shear Bars	**#4 @6in**				

Column Interaction Diagram



Span Information

Span	Span Length (ft)	I-Face Dist. (in)	J-Face Dist. (in)
1	0 - 4.5	0	0

Column Steel

Span	Main Bars	UC Max	Gov LC	Loc (ft)	Pu (k)	Muy (k-ft)	Muz (k-ft)
1	40 #6	0.415	7	4.5 ft	0	1611.703	0

Axial Span Results

Span	Phi_eff	Pn (k)	Po (k)	Rho Gross	As Prvd (in^2)
1	.9		27545.425	.0017	17.671

Bending Span Results

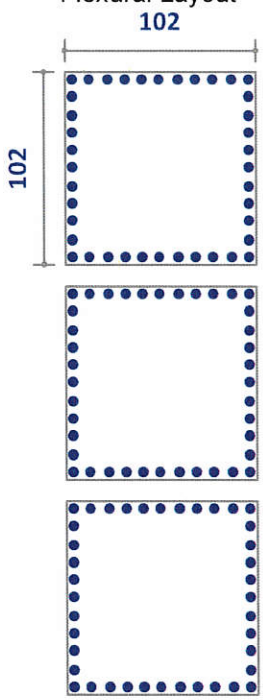
Span	ecc. y (ft)	ecc. z (ft)	NA y-y (ft)	NA z-z (ft)	Mny (k-ft)	Mnz (k-ft)	Mnoy (k-ft)	Mnoz (k-ft)
1	0	0		3.949	4319.59			

Slender Bending Span Results

Span	KL/r yy	KL/r zz	Cm yy	Cm zz	Lu yy (ft)	Lu zz (ft)	Mcy (k-ft)	Mcz (k-ft)
1	2	2	0	1	4.5	4.5		

Rebar Detailing

Span	Region(ft)	Shear Steel
1	4.5 -	9 #4 @6in
	0 -	



Flexural Layout

Total No. of Bars - Top : 4.5 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Total No. of Bars - Middle : 2.25 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Total No. of Bars - Bottom : 0 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Monopole on Mat Foundation with Rock Anchors - TIA-222-F

Site Data	
Site Name:	West Hartford/I-84/X43
CCI Number:	829013
TEP Job Number:	25680.24967 - Rev. 1

ASIF	1.333

Unfactored Reactions from TNX		
Axial	31	k
Shear	24	k
Moment	2144	k-ft

Soil Properties		
Allowable Bearing q_a	8.1	ksf
Mat Subgrade, ks	293	kcf
Wt Soil Above Mat	113	pcf

Mat and Pier Properties		
Mat Width	16.5	ft
Mat Length	16.5	ft
Mat Depth	2.5	ft
Pier Type	Square	
Pier Width/Diam.	8.5	ft
Pier Height	4.5	ft

Rock Anchor Properties		
Diameter	1	in
Net Area	0.85	in^2
Yield Stress	127.7	ksi

Rock Geotechnical Properties		
Wt of Rock	160	pcf
Angle of Rock Cone	30	deg
Steel/Grout Bond[1]	190	psi
Grout/Rock Bond[1]	50	psi
Drilled Shaft Diam.	3.75	in

[1]Allowable Bond Values

Mat Foundation Results

Bearing Stress	6.9	ksf
Allowable Bearing	10.8	ksf
% Capacity	63.4%	Pass

Mat Structural Results

Bending Moment	874.2	kft
Allowable Bending	1151.0	kft
% Capacity	75.9%	Pass

Rock Anchor Steel Results

Load Reaction	67.54	k
Allowable Design Load	86.84	k
% Capacity	77.8%	Pass

Rock Anchor Pullout Results

Req. Bond Length, ld	9.56	ft
Load Reaction	67.54	k
Allowable Pullout	112.48	k
% Capacity	60.0%	Pass

	PASS	PASS	West Hartford/I-84/X43 (BU 829013)
Results Summary:	LC1	LC2	TEP #: 25680.24967 - Rev. 1
Soil Interaction:	N/A	N/A	Analysis: RTP 4/22/2015
Drilled Caisson Tool - Pier	Foundation Structural: 32.7%	10.0%	Check: JLK 4/22/2015

Code Revisions: TIA-222-F ACI 318-02

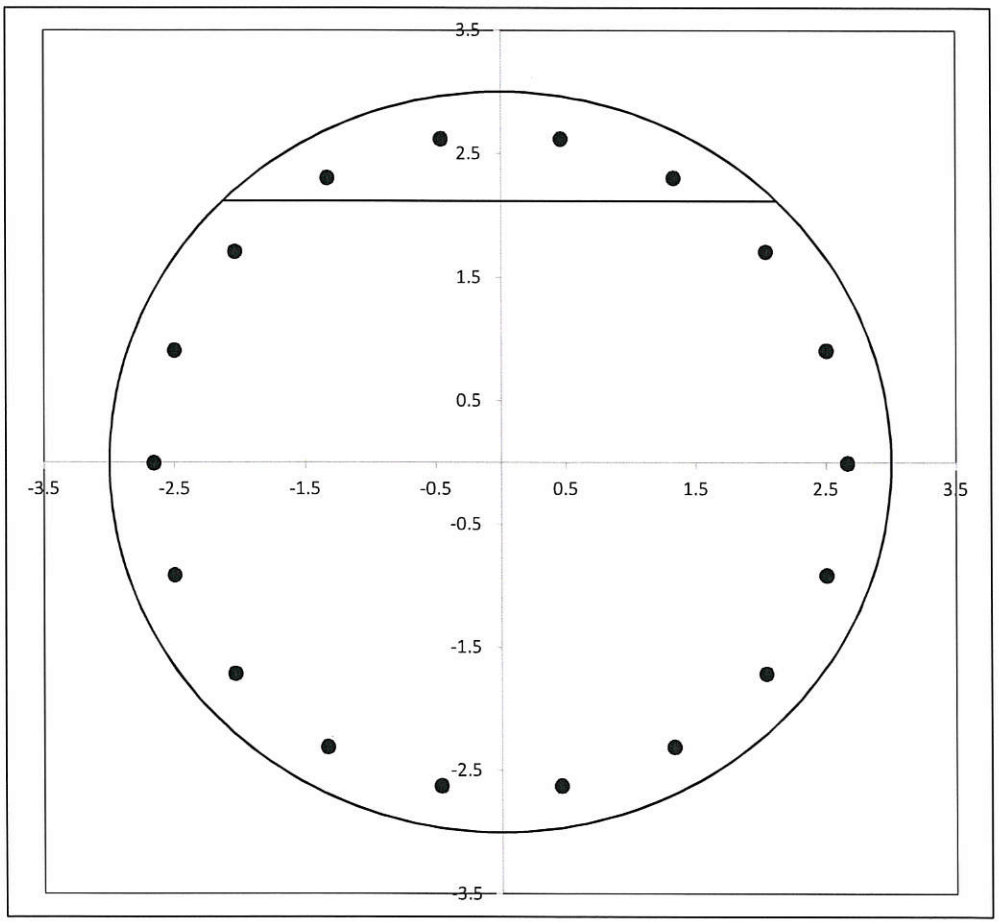
Tower Type: Monopole

	LC1	LC2	
Moment:	640.30	201.10	kip-ft
Axial (download):	31.00	54.00	kip
Shear:	24.00	7.00	kip
Axial (uplift):			kip

Shaft Information		
Diameter:	6.00	ft
Projection:	0.50	ft
Caisson Length:	4.50	ft
f'c:	3.000	ksi
Max εc:	0.003	in/in

Cage 1 Reinforcement		
Tie Bar Size:	4	*(fy = 60.0 ksi)*
Clear Cover to Tie:	3.00	*in (Cage Ø = 63.87in)*
Tie Bar Spacing:	6.00	in
Vertical Bar Size:	9	
Vertical Bar Quantity:	18	*(ρ =0.442%)*
fy:	60.0	ksi
E:	29,000	ksi

Reinforcement Capacity



		LC1	LC2	
	Vu =	31.2	31.2	kip
	Vc =	447.7	449.0	kip
fy,tie = 60.0	Vs =	269.8	269.8	kip
	ϕVn =	538.1	539.1	kip
	Capacity =	5.8%	5.8%	
		PASS	PASS	

	LC1	LC2	
Mu =	832.4	261.4	kip-ft
ϕMn =	2543.6	2609.0	kip-ft
Capacity =	32.7%	10.0%	
	PASS	PASS	

APPENDIX D

STRUCTURAL DESIGN DRAWINGS

STRUCTURAL DESIGN DRAWINGS

SITE NAME:

WEST HARTFORD/I-84/X43

CROWN CASTLE BU NUMBER:

829013

APPLICATION NUMBER:

261528 REV. 3

SITE ADDRESS:

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)
N 41° 44' 55.75", W 72° 43' 52.75"

MODIFICATION PROVISIONS

THE MODIFICATIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL MODIFICATION ANALYSIS REPORT COMPLETED BY TOWER ENGINEERING PROFESSIONALS (TEP), JOB#: 25680.24967 DATED APRIL 23, 2014 (REV 1). THIS REPORT IS BASED ON A SPECIFIC ANTENNA LOADING AND COAX CONFIGURATION. SEE THE REPORT FOR THE ANTENNA AND COAX LOADING INFORMATION. ANY OTHER ANTENNA OR COAX CONFIGURATION REQUIRES REVIEW BY TEP. SATISFACTORY COMPLETION OF THE MODIFICATIONS INDICATED ON THESE DRAWINGS WILL RESULT IN THE STRUCTURE MEETING THE REQUIREMENTS OF THE SPECIFICATIONS UNDER WHICH THE STRUCTURAL WAS COMPLETED.

CONTRACTOR SHALL FIELD VERIFY ALL: DIMENSIONS, QUANTITIES, PART NUMBERS AND COAX/ANTENNA PLACEMENTS PRIOR TO: BIDDING ORDERING MATERIALS, AND CONSTRUCTION.

REVISION NOTES

1	REVISED MODIFICATION DRAWINGS

INDEX OF SHEETS

NO.	SHEET TITLE	REV
T-1	TITLE SHEET	1
N-1	MI CHECKLIST AND NOTES	1
N-2	PROJECT NOTES I	0
N-3	PROJECT NOTES II	0
N-4	FOUNDATION NOTES	1
S-1	TOWER ELEVATION AND MODIFICATION SCHEDULE	1
S-2	COMPOUND DETAIL	1
S-3	BASE SECTION DETAILS	1
S-4	BASE PLATE STIFFENER DETAILS	1
S-5	FOUNDATION REINFORCEMENT DETAILS	1

PROJECT TEAM

CCI MODIFICATION PROJECT MANAGER:

NAME	CROWN CASTLE
ADDRESS	3530 TORINGDON WAY, SUITE 300
CITY, STATE, ZIP	CHARLOTTE, NC 28277
CONTACT	JOHN MCGEE
PHONE	(980) 209-8253
EMAIL	JOHN.MCGEE@CROWNCASTLE.COM

ENGINEERING FIRM PROJECT MANAGER:

NAME	TOWER ENGINEERING PROFESSIONALS, INC.
ADDRESS	326 TRYON ROAD
CITY, STATE, ZIP	RALEIGH, NC 27603
CONTACT	RYAN J. RIMMELE, P.E.
PHONE	(919) 661-6351
EMAIL	CMRP@TEPGROUP.NET

ATTENTION

ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
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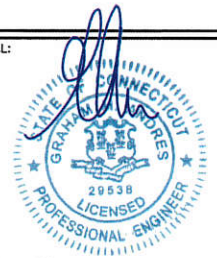

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April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

SHEET TITLE:

TITLE SHEET

SHEET NUMBER: **T-1**

REVISION: 1

TEP #: 25680.24967

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVAL
NA	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
X	CONTINUOUS FOUNDATION INSPECTIONS
X	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	GROUT COMP. STRENGTH (ASTM C109)
NA	POST INSTALLED REBAR VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	NON-TENSION CONTROLLED BOLT INSPECTION. SEE SHEET N-4 FOR DETAILS.
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION:
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL IN FIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS. PLEASE REFER TO ENG-SOW-10007.

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

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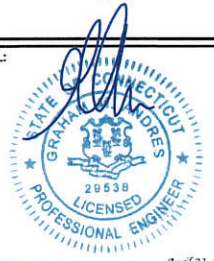

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April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

SHEET TITLE:

MI CHECKLIST AND NOTES

SHEET NUMBER: **N-1**

REVISION: 1

TEP #: 25680.24967

GENERAL NOTES:

1. ALL REFERENCES TO THE OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED CROWN CASTLE OR ITS DESIGNATED REPRESENTATIVE.
2. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE OF CONNECTICUT.
3. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 2005 CONNECTICUT STATE BUILDING CODE.
4. UNLESS SHOWN OR NOTED OTHERWISE ON THE CONTRACT DRAWINGS, OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREIN, AND TO THE PROCEDURES TO BE USED ON THIS PROJECT.
5. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
6. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
7. ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS SHOWN ON THE DRAWINGS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING ANY MATERIALS ORDERING, FABRICATION OR CONSTRUCTION WORK ON THIS PROJECT. CONTRACTOR SHALL NOT SCALE CONTRACT DRAWINGS IN LIEU OF FIELD VERIFICATIONS. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND THE OWNER'S ENGINEER. THE DISCREPANCIES MUST BE RESOLVED BEFORE THE CONTRACTOR IS TO PROCEED WITH THE WORK. THE CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE PROCEDURES.
8. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
10. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS, WITH THE RESIDENT LEASING AGENT FOR APPROVAL.
11. ALL PERMITS THAT MUST BE OBTAINED ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
12. IF APPLICABLE, ALL CONCRETE WORK SHALL COMPLY TO LOCAL CODES AND THE ACI 318-02, "BUILDING REQUIREMENTS FOR STRUCTURAL CONCRETE".
13. 24 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, THE CONTRACTOR MUST NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY OR CITY) ENGINEER.
14. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
15. ALL TOWER DIMENSIONS SHALL BE VERIFIED WITH THE PLANS (LATEST REVISION) PRIOR TO COMMENCING CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE DISCOVERED. THE OWNER SHALL HAVE A SET OF APPROVED PLANS AVAILABLE AT THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY GOVERNING AGENCY INSPECTORS.
16. ALL TOWER MODIFICATION WORK SHALL BE IN ACCORDANCE WITH TIA-1019-A STANDARD FOR INSTALLATION, ALTERATION AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
17. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.

PLANS PREPARED FOR:

CROWN CASTLE

3 COPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (585) 899-3442

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

Electronic Seals *October 07, 2014*

REV	DATE	ISSUED FOR:
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RJR

SHEET TITLE:

PROJECT NOTES I

SHEET NUMBER: **N-2**

REVISION: **0**

TEP #: 25680.24967

STRUCTURAL STEEL NOTES:

1. THE FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN (ASD), 9TH EDITION.
2. UNLESS OTHERWISE NOTED, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
   STRUCTURAL STEEL:
   - ANGLE: ASTM A36
   - PIPE/TUBE: ASTM A500-50
   - PLATE: ASTM A36 (SELF SUPPORTING AND GUYED TOWERS)
   - PLATE: ASTM A572-65 (MONOPOLE)

   A. ALL BOLTS, ASTM A325 TYPE I GALVANIZED HIGH STRENGTH BOLTS.
   B. ALL U-BOLTS, ASTM A193 GRADE B7
   C. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.
3. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, ASD, 9TH EDITION.
4. HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER.
5. HOT-DIP GALVANIZE ALL ITEMS UNLESS OTHERWISE NOTED, AFTER FABRICATION WHERE PRACTICABLE. GALVANIZING: ASTM A123, ASTM, A153/A153M OR ASTM A653/A653M, G90, AS APPLICABLE. ADDITIONALLY, ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING STEEL. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.
6. REPAIR DAMAGED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY APPLICATION OF STICK OR THICK PASTED MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING. CLEAN AREAS TO BE REPAIRED AND REMOVE SLAG FROM WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED, WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTED; SPREAD MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE OFF EXCESS MATERIAL. AFTER REPAIR, STEEL SHALL BE REPAINTED TO MATCH EXISTING FINISH (IF APPLICABLE).
7. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS.
8. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXCLUDE THE THREADS FROM THE SHEAR PLANE.
9. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
10. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.

WELDING NOTES:

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M: 2000 "STRUCTURAL WELDING CODE-STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON FIELD WELDS. A LETTER AND REPORT SHALL BE ISSUED TO THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LETTER AND REPORT TO TOWER ENGINEERING PROFESSIONALS.
4. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. GRIND THE SURFACE OF THE ROD TO BE INSTALLED FOR A DISTANCE OF 2" MINIMUM ALL AROUND THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
5. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. THE MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL COMPLY WITH SECTION 3.5.1 AND TABLE 3.2 OF THE AWS D1.1/D1.1M:2000.
6. DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
7. FOR ALL WELDING, USE 70 KSI LOW HYDROGEN ELECTRODES. ELECTRODES SHALL BE APPROPRIATE FOR THE WELDING POSITION REQUIRED TO MAKE THE JOINT.
8. AFTER FINAL INSPECTION, THE AREA OF THE WELDS, THE INSTALLATION AND ALL SURFACES DAMAGED BY WELDING OR GRINDING SHALL RECEIVE A COLD-GALVANIZED COATING. THIS COATING SHALL BE APPLIED BY BRUSH. THE GALVANIZING COMPOUND SHALL CONTAIN A MINIMUM OF 95% ± PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 3 MILS.
9. FOR MONOPOLE TOWERS FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY ULTRASONIC TESTING (UT) IN ACCORDANCE WITH AWS D1.1.
10. FOR MONOPOLE TOWERS PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MAGNETIC PARTICLE (MT) IN ACCORDANCE WITH AWS D1.1.

WORKABLE GAGES

LEG	4	3½	3	2½	2	1¾
G	2½	2	1¾	1⅜	1⅛	1

- WORKABLE GAGES GIVEN IN INCHES
- MATCH EXISTING WHEN APPLICABLE

BOLT TIGHTENING PROCEDURE:

1. TIGHTEN CONNECTION BOLTS BY AISC – "TURN OF THE NUT" METHOD, USING THE CHART BELOW.

BOLT LENGTHS UP TO AND INCLUDING FOUR DIA.

½"	BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅝"	BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
¾"	BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅞"	BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
1"	BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT

BOLT LENGTHS OVER FOUR DIA. BUT NOT EXCEEDING EIGHT DIA.

½"	BOLTS 2.25 TO 4.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅝"	BOLTS 2.75 TO 5.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
¾"	BOLTS 3.25 TO 6.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅞"	BOLTS 3.75 TO 7.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
1"	BOLTS 4.25 TO 8.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT

2. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:
3. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8.2.1 THROUGH 8.2.4.

8.2.1 TURN-OF-THE-NUT TIGHTENING

BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS.

4. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.

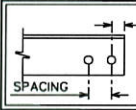
NOMINAL HOLE DIMENSIONS

BOLT DIAMETER	STANDARD HOLE	SHORT SLOT
½	9/16	9/16 X 1/16
⅝	11/16	11/16 X ⅞
¾	13/16	13/16 X 1
⅞	15/16	15/16 X 1⅛
1	1 1/16	1 1/16 X 1 5/16

– DIMENSIONS GIVEN IN INCHES

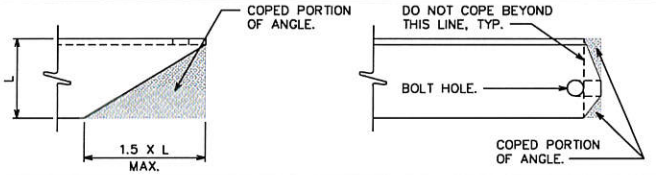
BOLT EDGE AND SPACING

BOLT DIAMETER	MIN. EDGE	SPACING
½	⅞	1½
⅝	1⅛	1⅞
¾	1¼	2¼
⅞	1½	2⅝
1	1¾	3



– DIMENSIONS GIVEN IN INCHES

ALLOWABLE ANGLE COPE



PLANS PREPARED FOR:

CROWN CASTLE

3 COPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065
OFFICE: (585) 899-3442

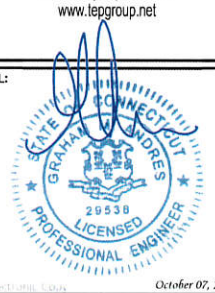
PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



October 07, 2014

REV	DATE	ISSUED FOR:
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RJR

SHEET TITLE:

PROJECT NOTES II

SHEET NUMBER: **N-3**

REVISION: **0**

TEP #: 25680.24967

FOUNDATION NOTES:

GENERAL NOTES:

1. FOUNDATION INSTALLATION SHALL BE SUPERVISED BY PERSONNEL KNOWLEDGEABLE AND EXPERIENCED WITH THE PROPOSED FOUNDATION TYPE. CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERALLY ACCEPTED PRACTICES AND IN A GOOD WORKMANLIKE MANNER.
2. CONTRACTOR SHALL VERIFY DIMENSIONS WITH ORIGINAL DRAWINGS.
3. FOR FOUNDATION AND ANCHOR TOLERANCES, SEE ORIGINAL DRAWINGS.
4. FOUNDATION DESIGN ASSUMES LEVEL GRADE AT THE SITE.
5. THE FOUNDATION DESIGN IS IN ACCORDANCE WITH GENERALLY ACCEPTED PROFESSIONAL ENGINEERING PRINCIPLES AND PRACTICES WITHIN THE LIMITS OF THE SUBSURFACE DATA PROVIDED.
6. FOUNDATION DESIGN MODIFICATIONS MAY BE REQUIRED IN THE EVENT THE DESIGN PARAMETERS ARE NOT APPLICABLE FOR THE SUBSURFACE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.
7. THE FOUNDATION DESIGN ASSUMES FIELD INSPECTIONS WILL BE PERFORMED TO VERIFY THAT CONSTRUCTION MATERIALS, INSTALLATION METHODS, AND ASSUMED DESIGN PARAMETERS ARE ACCEPTABLE BASED ON THE CONDITIONS AT THE SITE.
8. THE FOUNDATION DESIGN ASSUMES NO CONSTRUCTION JOINTS. HOWEVER, CONSTRUCTION JOINTS SHALL BE PERMITTED UPON APPROVAL BY THE OWNER/ENGINEER.

EXCAVATION:

1. WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND SAFETY REGULATIONS. PROCEDURES FOR THE PROTECTION OF EXCAVATIONS, EXISTING CONSTRUCTION, AND UTILITIES SHALL BE ESTABLISHED PRIOR TO BEGINNING WORK.
2. INTIMATE CONTACT BETWEEN THE CONCRETE AND THE SOIL WALLS OF THE DRILLED SHAFT IS ESSENTIAL. THE CONCRETE SHALL BE APPROPRIATELY VIBRATED DURING CONSTRUCTION.
3. THE SIDES OF THE EXCAVATION SHALL BE ROUGH AND FREE OF LOOSE CUTTINGS.
4. LOOSE MATERIAL TO BE REMOVED FROM THE BOTTOM OF EXCAVATION PRIOR TO CONCRETE PLACEMENT.
5. DRILLING FLUID, IF USED, SHALL BE FULLY DISPLACED BY CONCRETE AND SHALL NOT BE DETRIMENTAL TO THE CONCRETE OR SURROUNDING SOIL. CONTAMINATED CONCRETE SHALL BE REMOVED AND REPLACED WITH FRESH CONCRETE.

REINFORCING STEEL:

1. THE REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-615, GRADE 60. IT SHALL BE DEFORMED AND SPLICES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED.
2. WELDING IS PROHIBITED ON REINFORCING STEEL AND EMBEDMENTS.
3. REINFORCING CAGES SHALL BE BRACED TO RETAIN PROPER DIMENSIONS DURING HANDLING AND THROUGHOUT PLACEMENT OF CONCRETE. WHEN TEMPORARY CASING IS UTILIZED, BRACING SHALL BE ADEQUATE TO RESIST FORCES OCCURRING FROM FLOWING CONCRETE DURING CASING EXTRACTION.
4. SPACERS SHALL BE ATTACHED INTERMITTENTLY THROUGHOUT THE ENTIRE LENGTH OF TIEBACK REINFORCING TO INSURE CONCENTRIC PLACEMENT OF CAGES IN EXCAVATIONS.
5. MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE 3" UNLESS OTHERWISE NOTED. APPROVED SPACERS SHALL BE USED TO INSURE A 3" MINIMUM COVER ON REINFORCEMENT.
6. THE CONCRETE COVER FROM THE TOP OF THE FOUNDATION TO THE ENDS OF THE VERTICAL REINFORCEMENT SHALL NOT EXCEED 4" NOR BE LESS THAN 2".
7. THE CONCRETE COVER FROM THE BOTTOM OF THE FOUNDATION TO THE ENDS OF THE VERTICAL REINFORCEMENT SHALL NOT EXCEED 4" NOR BE LESS THAN 3".

CONCRETE:

1. WORK SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE ACI-318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE."
2. THE CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI IN 28-DAYS.
3. PROPORTIONS OF CONCRETE MATERIALS SHALL BE SUITABLE FOR THE INSTALLATION METHOD UTILIZED AND SHALL RESULT IN DURABLE CONCRETE FOR RESISTANCE TO LOCAL ANTICIPATED AGGRESSIVE ACTIONS. THE DURABILITY REQUIREMENTS OF ACI-318 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE.
4. CONCRETE SHALL BE PLACED IN A MANNER THAT WILL PREVENT SEGREGATION OF CONCRETE MATERIALS, INFILTRATION OF WATER OR SOIL, AND OTHER OCCURRENCES THAT MAY DECREASE THE STRENGTH OR DURABILITY OF THE FOUNDATION.

CONCRETE (CONTINUED):

5. FREE FALL CONCRETE MAY BE USED PROVIDED FALL IS VERTICAL DOWN WITHOUT HITTING THE SIDES OF THE EXCAVATION, FORMWORK, REINFORCING BARS, FORM TIES, CAGE BRACING, OR OTHER OBSTRUCTIONS. UNDER NO CIRCUMSTANCES SHALL CONCRETE FALL THROUGH WATER.
6. THE MAXIMUM SIZE OF THE AGGREGATE SHALL NOT EXCEED A SIZE SUITABLE FOR THE INSTALLATION METHOD UTILIZED OR 1/3-CLEAR DISTANCE BEHIND OR BETWEEN REINFORCING. THE MAXIMUM SIZE MAY BE INCREASED TO 2/3-CLEAR DISTANCE PROVIDED WORKABILITY AND METHODS OF CONSOLIDATION SUCH AS VIBRATING WILL PREVENT HONEYCOMBS AND VOIDS.
7. A TEMPORARY PROTECTIVE STEEL CASING WILL BE REQUIRED TO KEEP THE SHAFT OPEN DURING CONSTRUCTION AND INSPECTIONS PRIOR TO PLACING CONCRETE. THIS CASING SHOULD BE EXTRACTED AS THE CONCRETE IS PLACED.

FINISHING:

1. THE TOP OF THE FOUNDATION SHALL BE SLOPED TO DRAIN WITH A FLOATED FINISH.
2. THE EXPOSED EDGES OF THE CONCRETE SHALL BE CHAMFERED 1" x 1".

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

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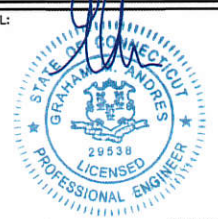


April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

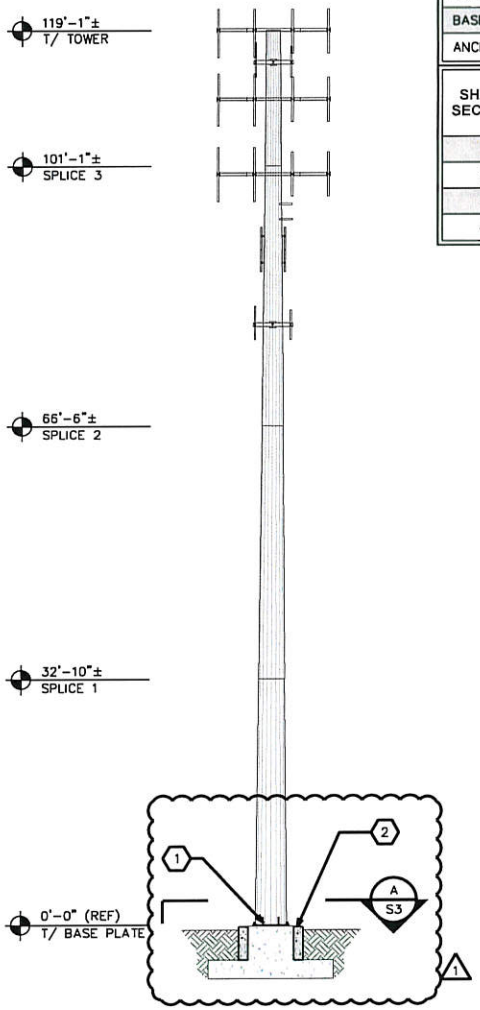
SHEET TITLE:

FOUNDATION NOTES

SHEET NUMBER: **N-4**

REVISION: 1

TEP #: 25680.24967



TOWER ELEVATION

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

POLE SPECIFICATIONS

POLE SHAPE TYPE:	18-SIDED POLYGON
POLE SHAFT GRADE:	ASTM A572-65
BASE PLATE GRADE:	ASTM A572-50
ANCHOR BOLT GRADE:	ASTM A-687

SHAFT SECTION	SECTION LENGTH (FT.)	SHAFT THICKNESS (IN.)	LAP SPLICE (FT.)	OUTER DIAMETER (IN.)	
				TOP	BOTTOM
1	18.00	0.250	2.92	22.130	26.000
2	37.50	0.313	3.83	24.870	36.060
3	37.50	0.375	4.67	32.500	41.750
4	37.50	0.375	–	39.850	49.060

MODIFICATION SCHEDULE

NO.	MODIFICATION DESCRIPTION	ELEVATION (FT.)
1	REINFORCE EXISTING BASE PLATE STIFFENERS. SEE SHEETS S-3 AND S-4 FOR DETAILS.	0
2	INSTALL PROPOSED FOUNDATION REINFORCEMENT. SEE SHEETS S-2, S-3, AND S-5 FOR DETAILS.	0
3	CROWN CASTLE WILL CONTRACT WITH A THIRD PARTY VENDOR TO PERFORM THE MODIFICATION INSPECTION. THE CONTRACTOR SHALL COORDINATE THE INSPECTION WITH THE MODIFICATION INSPECTOR AND CROWN CASTLE PROJECT MANAGER. SEE SHEET N-1 FOR DETAILS.	–

NOTES:

1. IT'S THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE THE MODIFICATION INSPECTOR/ ENGINEER OF RECORD WITH A SEALED CERTIFIED WELD INSPECTION REPORT. THIS REPORT SHALL DOCUMENT THE ENTIRE WELDING PROCESS (PRE/DURING/POST) WITH PROPER PHOTOS. WELDING SHALL CONFORM TO AWS D1.1/D1.1M: 2000 "STRUCTURAL WELDING CODE-STEEL". FOR ADDITIONAL NOTES, SEE WELDING NOTES.
2. ANTENNAS AND OTHER APPURTENANCES MAY NEED TO BE TEMPORARILY REMOVED OR MOVED DURING THE INSTALLATION OF THE MODIFICATIONS SHOWN ABOVE.
3. NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-10033 : TOWER BASE PLATE NDE AND ENG-BUL-10051 : NDE REQUIREMENTS FOR MONOPOLE BASEPLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING MODIFICATIONS THAT HAVE BEEN WELDED TO THE BASE PLATE. FULL PENETRATION WELDING TO THE BASEPLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.
4. DUE TO THE MODIFICATIONS REQUIRED, CONTINUOUS INSPECTIONS AND MATERIAL TESTING WILL NEED TO BE PERFORMED.
5. CONTRACTOR SHALL ORDER AND INSTALL A NEW TOWER TAG IF THE EXISTING TOWER TAG IS MOVED OR DAMAGED DUE TO THE INSTALLATION OF THE MODIFICATION SHOWN ABOVE.
6. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.

ATTENTION

NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSION BEFORE FABRICATING MATERIALS AND PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO TOWER ENGINEERING PROFESSIONALS, INC., AND CROWN CASTLE CONSTRUCTION MANAGER IMMEDIATELY.

1

0 16 32

SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
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OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
GRAHAM C. ANDRES
29538
LICENSED
PROFESSIONAL ENGINEER

Electronic Copy

April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ CHECKED BY: RTP

SHEET TITLE:

TOWER ELEVATION AND MODIFICATION SCHEDULE

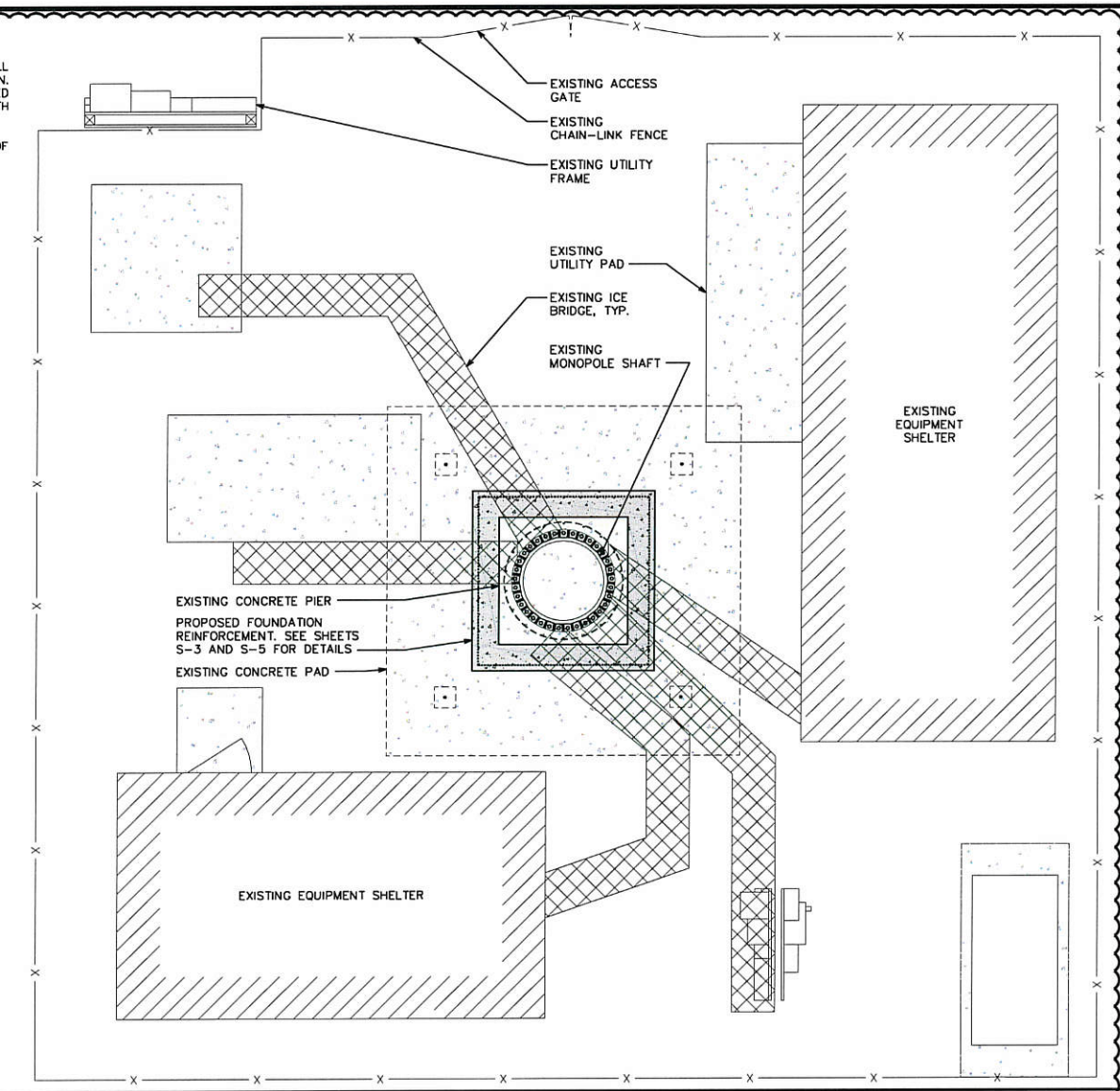
SHEET NUMBER: **S-1**

REVISION: 1

TEP #: 25680.24967

NOTES: 1

1. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING EQUIPMENT PRIOR TO CONSTRUCTION. COORDINATE WITH TOWER OWNER ANY REQUIRED RELOCATION OF EQUIPMENT THAT MAY INTERFERE WITH THE FOUNDATION REINFORCEMENT.
2. CONTRACTOR SHALL VERIFY AS-BUILT DIMENSIONS OF EXISTING FOUNDATION PRIOR TO CONSTRUCTION.



VERIFY

COMPOUND DETAIL

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

0 4 8

SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
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WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

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PROFESSIONAL ENGINEER

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April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

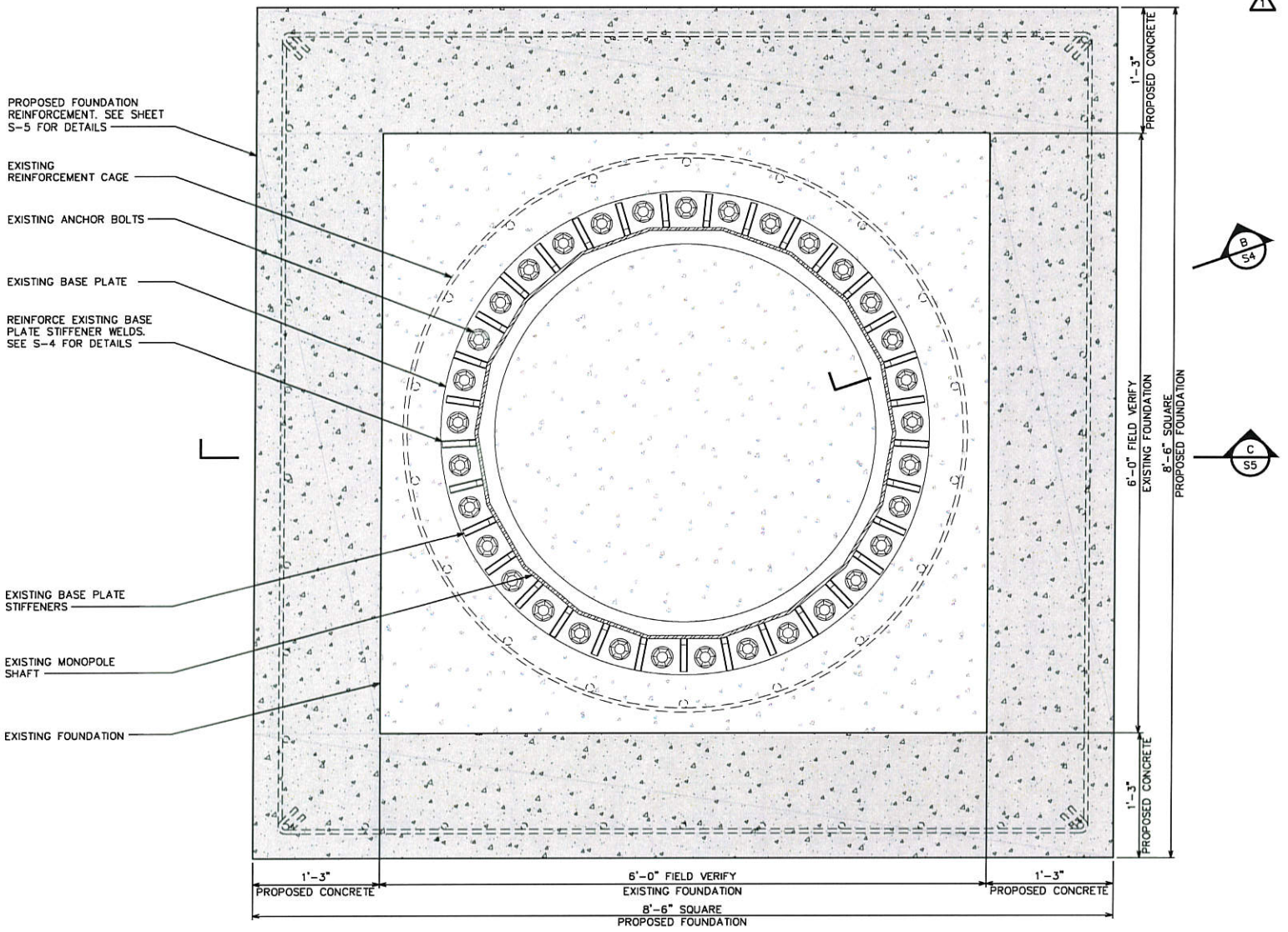
SHEET TITLE:

COMPOUND DETAIL

SHEET NUMBER: **S-2**

REVISION: 1

TEP #: 25680.24967



SECTION (A)
SCALE: 1" = 1'-0"

0 1 2
SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

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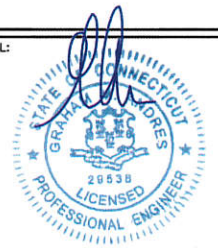

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April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

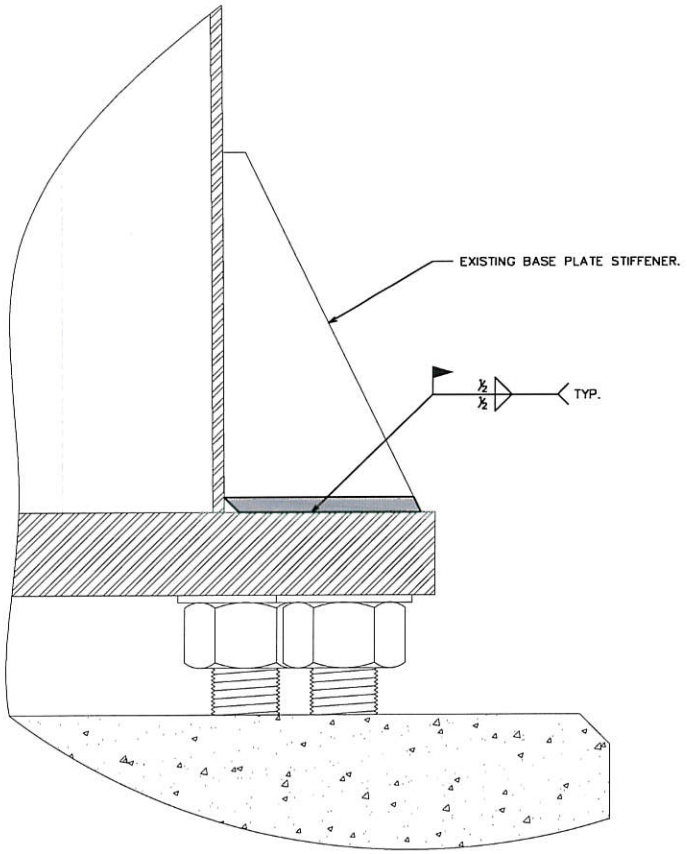
SHEET TITLE:

BASE SECTION DETAILS

SHEET NUMBER: **S-3**

REVISION: 1

TEP #: 25680.24967



BASE PLATE STIFFENER DETAILS (B)

SCALE: N.T.S.

1

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

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SEAL:

STATE OF CONNECTICUT
GRAHAM C. ANDRES
29538
LICENSED
PROFESSIONAL ENGINEER

Eugene Lee
April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: RTP

SHEET TITLE:

BASE PLATE STIFFENER DETAILS

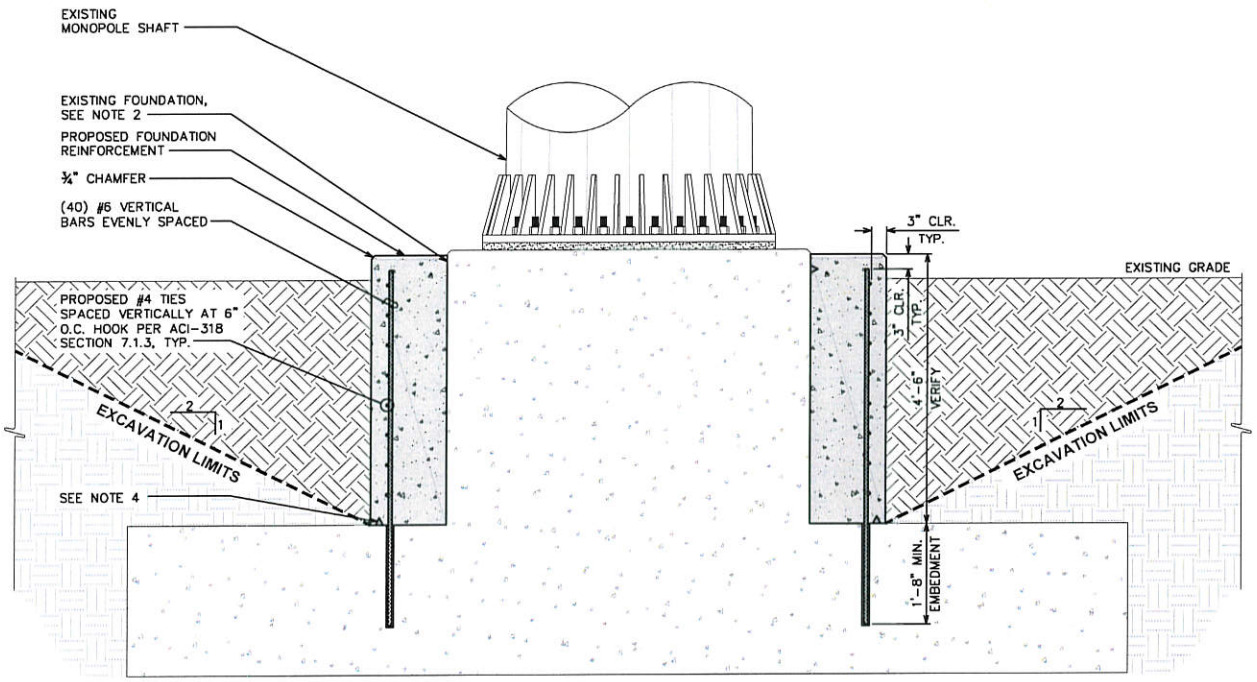
SHEET NUMBER: **S-4**

REVISION: 1

TEP #: 25680.24967

NOTES:

1. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING EQUIPMENT PRIOR TO CONSTRUCTION. COORDINATE WITH TOWER OWNER ANY REQUIRED RELOCATION OF EQUIPMENT THAT MAY INTERFERE WITH THE FOUNDATION REINFORCEMENT.
2. CONTRACTOR SHALL VERIFY AS-BUILT DIMENSIONS OF EXISTING FOUNDATION PRIOR TO CONSTRUCTION. EXISTING FOUNDATION SHALL BE ROUGHENED TO A MINIMUM AMPLITUDE OF A ¼" PRIOR TO PLACING PROPOSED CONCRETE. IN ADDITION, THE EXISTING CONCRETE SURFACE SHALL BE CLEANED BY HAND CHIPPING, SCRAPING, SANDING, AND/OR WIRE BRUSHING TO REMOVE ANY LOOSE DETRIMENTAL FOREIGN MATTER PRIOR TO PLACING CONCRETE.
3. DOWELS SHALL BE SECURED IN THE HOLES USING HILTI HIT-HY 200 EPOXY. PRIOR TO INSTALLATION, THE DOWEL HOLES SHALL BE CLEANED ACCORDING TO THE EPOXY MANUFACTURER'S SPECIFICATIONS. ONCE THE DOWELS ARE CENTERED IN THE HOLES, BOTH ENDS OF EACH HOLE SHALL BE SEALED LEAVING AN INJECTION PORT HOLE AT THE TOP OF EACH HOLE. TO SECURE THE DOWEL BARS IN PLACE, THE EPOXY SHALL BE PRESSURE-INJECTED FROM ONE END OF EACH HOLE THROUGHOUT ITS LENGTH UNTIL THE EPOXY BEGINS TO COME OUT OF THE PORT HOLE AT THE OPPOSITE END.
4. CONTRACTOR TO USE SIKASWELL S-2 WATERSTOP BY SIKA CORP., OR APPROVED EQUAL. APPLY PER THE MANUFACTURERS' SPECIFICATIONS. CONTACT SIKA CORPORATION AT (800) 933-7452.
5. PROPOSED CONCRETE SHALL BE POURED MONOLITHICALLY, COLD JOINTS NOT ALLOWED.



SECTION (C)
SCALE: ½" = 1'-0"

0 2 4
SCALE IN FEET

PLANS PREPARED FOR:

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
OFFICE: (980) 209-8253

PROJECT INFORMATION:

WEST HARTFORD/I-84/X43
BU #: 829013
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT GRAHAM CHARLES ANDRES 29538 LICENSED PROFESSIONAL ENGINEER

Electronic Copy

April 23, 2015

REV	DATE	ISSUED FOR:
1	04-23-15	REVISED MOD. DRAWINGS
0	10-07-14	MODIFICATION DRAWINGS

DRAWN BY: EAJ CHECKED BY: RTP

SHEET TITLE:

FOUNDATION REINFORCEMENT DETAILS

SHEET NUMBER: **S-5**

REVISION: 1

TEP #: 25680.24967