



QC Development

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Storrs, CT 06268

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Mark.Roberts@QCDevelopment.net

June 8, 2016

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T)

92 Weston Street, Hartford, CT 06120

N 41-47-12.20

W 72-39-44.24

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 90-foot level of the existing 110-foot Monopole at 92 Weston Street, Hartford, CT. The tower is owned by Crown Castle. The property is owned by Albemarle Weston Street LLC. AT&T now intends to replace three (3) of its existing antennas with three (3) new Quintel antennas. These antennas would be installed at the 90-foot level of the tower. AT&T also intends to install three (3) Ericsson RRUS-32-B30 remote radio units and add one Raycap surge arrestor.

This facility was approved by the City of Hartford on November 26, 1996. Communications Towers were a permitted use as of right in the underlying Industrial Zone and a Building Permit was issued, therefore there were no condition(s) that could feasibly be violated by this modification, including total facility height or mounting restrictions. This modification therefore complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Pedro Segarra, Mayor of the City of Hartford, as elected official, as well as the tower and

property owner.

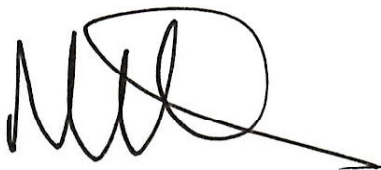
The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark Roberts', with a long horizontal line extending to the right.

Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: The Honorable Pedro Segarra - as elected official (via e-mail)
Albemarle Weston Street LLC – as property owner
Crown Castle - as tower owner (via e-mail)

Power Density

Existing Loading on Tower

| Carrier | # of Channels | ERP/Ch (W) | Antenna Centerline Height (ft) | Power Density (mW/cm ²) | Freq. Band (MHz ^{**}) | Limit S (mW/cm ²) | %MPE |
|-----------------|---------------|------------|--------------------------------|-------------------------------------|---------------------------------|-------------------------------|-------|
| Other Carriers* | | | | | | | 0.35% |
| AT&T LTE | 2 | 1313 | 90 | 0.1388 | 734 | 0.4933 | 2.74% |
| AT&T LTE | 2 | 875 | 90 | 0.0892 | 1900 | 1.0000 | 0.89% |
| AT&T UMTS | 2 | 565 | 90 | 0.0576 | 880 | 0.5867 | 0.98% |
| AT&T UMTS | 4 | 525 | 90 | 0.1070 | 1900 | 1.0000 | 1.07% |
| AT&T GSM | 1 | 283 | 90 | 0.0144 | 880 | 0.5867 | 0.25% |
| Site Total | | | | | | | 6.27% |

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Proposed Loading on Tower

| Carrier | # of Channels | ERP/Ch (W) | Antenna Centerline Height (ft) | Power Density (mW/cm ²) | Freq. Band (MHz ^{**}) | Limit S (mW/cm ²) | %MPE |
|-----------------|---------------|------------|--------------------------------|-------------------------------------|---------------------------------|-------------------------------|-------|
| Other Carriers* | | | | | | | 0.35% |
| AT&T LTE | 2 | 1313 | 90 | 0.1388 | 734 | 0.4893 | 2.74% |
| AT&T LTE | 2 | 875 | 90 | 0.0892 | 1900 | 1.0000 | 0.89% |
| AT&T LTE | 2 | 1791 | 90 | 0.1826 | 2300 | 1.0000 | 1.83% |
| AT&T UMTS | 2 | 565 | 90 | 0.0576 | 880 | 0.5867 | 0.98% |
| AT&T UMTS | 4 | 525 | 90 | 0.1070 | 1900 | 1.0000 | 1.07% |
| AT&T GSM | 1 | 283 | 90 | 0.0144 | 880 | 0.5867 | 0.25% |
| Site Total | | | | | | | 8.10% |

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Note: Proposed Loading may also include corrections to certain Existing Loading values

PROJECT INFORMATION

SCOPE OF WORK: TELECOMMUNICATIONS FACILITY UPGRADE (LTE 3C 2016 UPGRADE):

SITE ADDRESS: 92 WESTON STREET
HARTFORD, CT 06120

LATITUDE: 41.786391 N 41° 47' 11.01" N

LONGITUDE: 72.662498° W 72° 39' 45" W

TYPE OF SITE: MONOPOLE / OUTDOOR EQUIPMENT

TOWER HEIGHT: 110'±

RAD CENTER: 90'±

JURISDICTION: NATIONAL, STATE & LOCAL CODES OR ORDINANCES

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY

NOC# 800-638-2822



SITE NUMBER: CT5152

SITE NAME: HARTFORD NORTH

PROJECT: LTE 3C 2016 UPGRADE

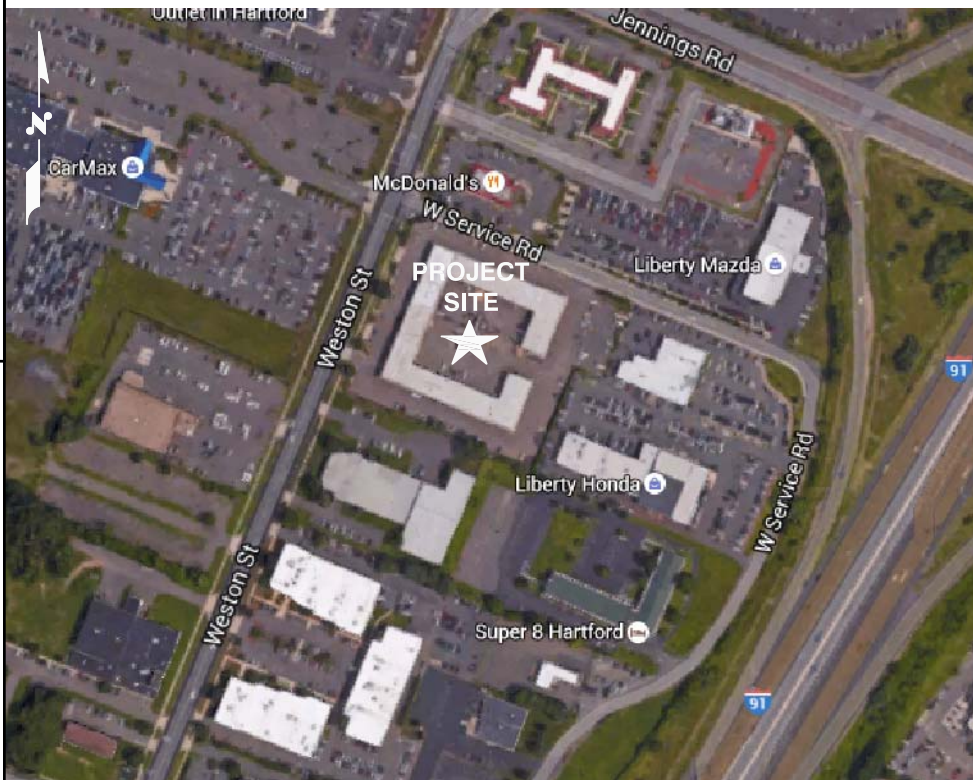
DRAWING INDEX

| SHEET NO. | DESCRIPTION | REV. |
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| T-1 | TITLE SHEET | A |
| GN-1 | GENERAL NOTES | A |
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| A-3 | DETAILS | A |
| RF-1 | RF-PLUMBING DIAGRAM | A |
| G-1 | GROUNDING DETAILS | A |

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.3 MI. TURN LEFT ONTO WEST ST. 0.2 MI. MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD. 10.6 MI. TAKE THE JENNINGS ROAD EXIT, EXIT 33. 0.3 MI. TURN RIGHT ONTO JENNINGS RD. 0.1 MI. TURN LEFT TO STAY ON JENNINGS RD. 0.4 MI. TURN LEFT ONTO WESTON ST. 0.1 MI. END AT 92 WESTON ST HARTFORD, CT 06120.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CROWN CASTLE SITE ID: 876325

SITE NAME: WESTON SQUARE

72 HOURS



CALL BEFORE YOU DIG



CALL TOLL FREE 1-888-DIG-SAFE

OR CALL 811

UNDERGROUND SERVICE ALERT



1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT5152
SITE NAME: HARTFORD NORTH
CROWN SITE ID: 876325

92 WESTON STREET
HARTFORD, CT 06120
HARTFORD COUNTY



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|-----|----------|-------------------|----|-----|-------|
| A | 04/12/16 | ISSUED FOR REVIEW | EB | AT | DPH |

SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: EB

AT&T

TITLE SHEET
(LTE 3C)

| SITE NUMBER | DRAWING NUMBER | REV |
|-------------|----------------|-----|
| 5152.00 | T-1 | A |

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR – SAI
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER – AT&T MOBILITY
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH LTE SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
 SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT, + 2009 & 2013 CT AMENDMENTS
 ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
 LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

- AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;
- TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL
- EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

| | | | | | |
|------|-------------------------------|-----|---------------------------------|------|----------------------------|
| AGL | ABOVE GRADE LEVEL | EQ | EQUAL | REQ | REQUIRED |
| AWG | AMERICAN WIRE GAUGE | GC | GENERAL CONTRACTOR | RF | RADIO FREQUENCY |
| BBU | BATTERY BACKUP UNIT | GRC | GALVANIZED RIGID CONDUIT | TBD | TO BE DETERMINED |
| BTCW | BARE TINNED SOLID COPPER WIRE | MGB | MASTER GROUND BAR | TBR | TO BE REMOVED |
| BGR | BURIED GROUND RING | MIN | MINIMUM | TBRR | TO BE REMOVED AND REPLACED |
| BTS | BASE TRANSCEIVER STATION | P | PROPOSED | TYP | TYPICAL |
| E | EXISTING | NTS | NOT TO SCALE | UG | UNDER GROUND |
| EGB | EQUIPMENT GROUND BAR | RAD | RADIATION CENTER LINE (ANTENNA) | VIF | VERIFY IN FIELD |
| EGR | EQUIPMENT GROUND RING | REF | REFERENCE | | |



1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586



27 NORTHWESTERN DR.
 SALEM, NH 03079

SITE NUMBER: CT5152
SITE NAME: HARTFORD NORTH
CROWN SITE ID: 876325

92 WESTON STREET
 HARTFORD, CT 06120
 HARTFORD COUNTY



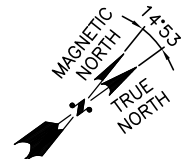
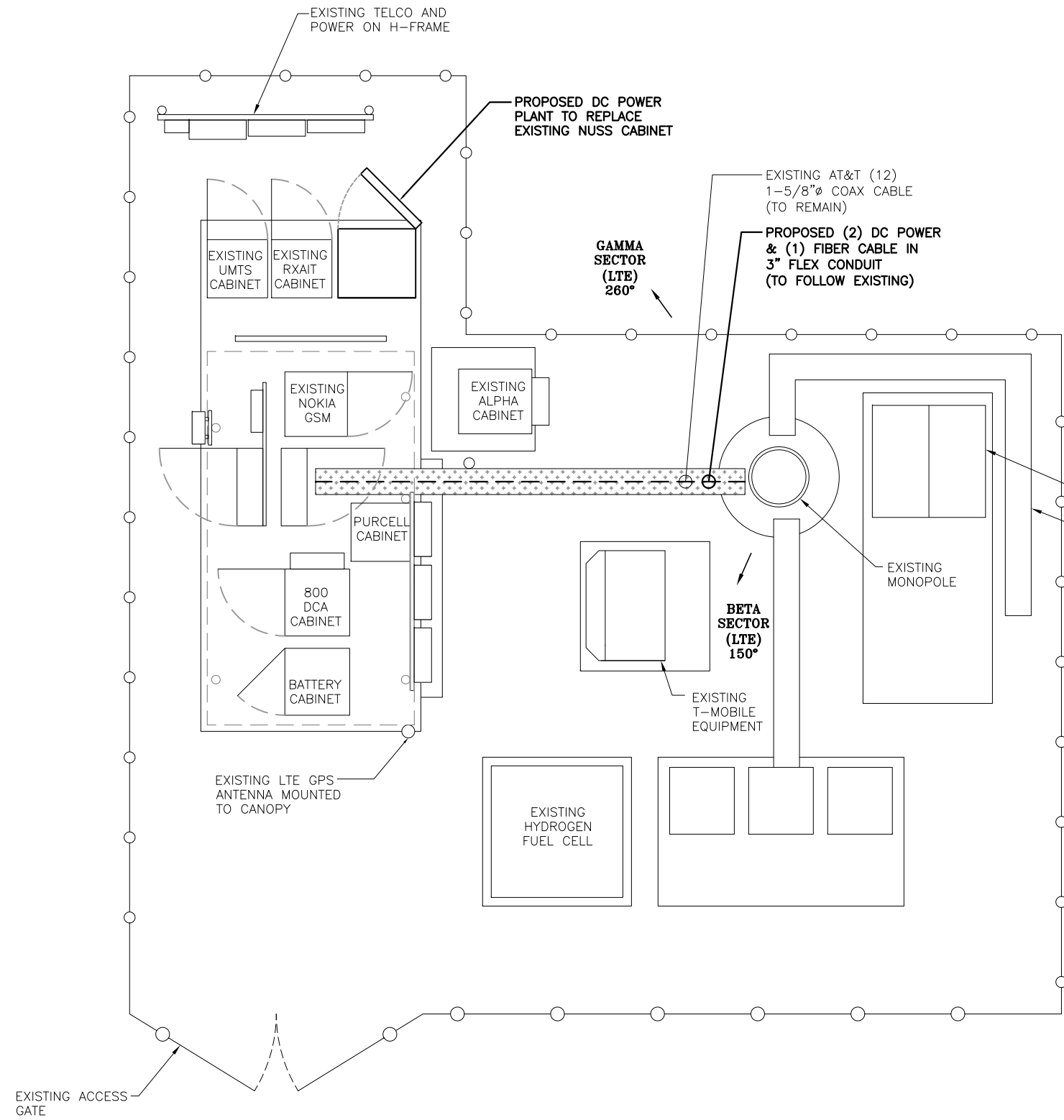
550 COCHITUATE ROAD
 FRAMINGHAM, MA 01701

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| NO. | DATE | REVISIONS | BY | CHK | APP'D |
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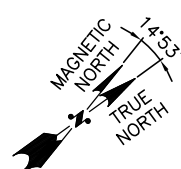
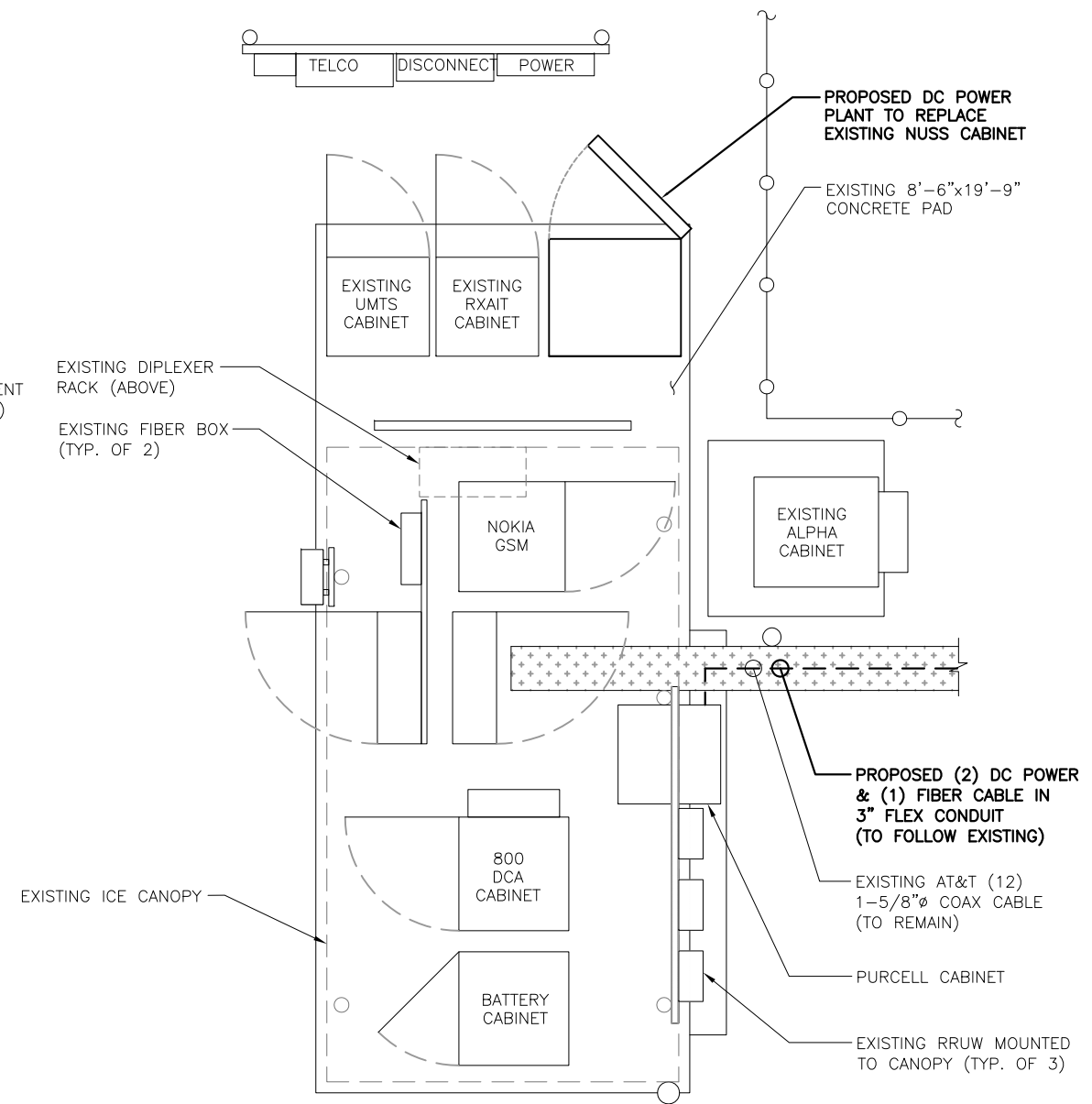
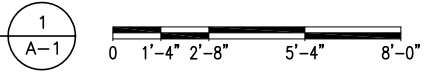
AT&T

GENERAL NOTES
 (LTE 3C)

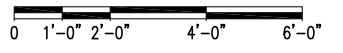
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| SITE NUMBER | DRAWING NUMBER | REV |
| 5152.00 | GN-1 | A |



COMPOUND PLAN
 22x34 SCALE: 3/8"=1'-0"
 11x17 SCALE: 3/16"=1'-0"



EQUIPMENT PLAN
 22x34 SCALE: 1/2"=1'-0"
 11x17 SCALE: 1/4"=1'-0"



NOTE:
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA CONFIGURATION.

NOTE:
 ALL ANTENNAS AND LINES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

Hudson Design Group, Inc.
 1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586

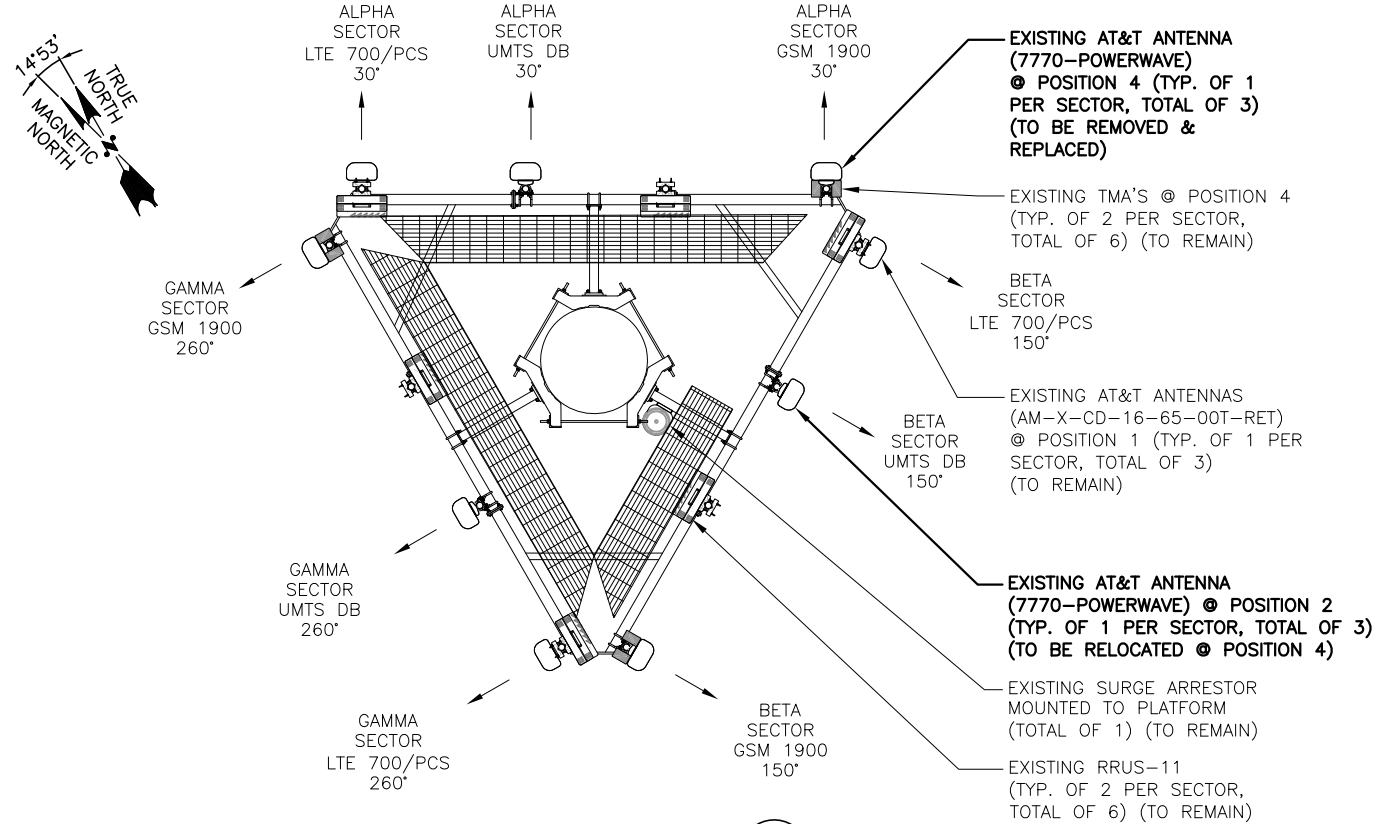
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at&t
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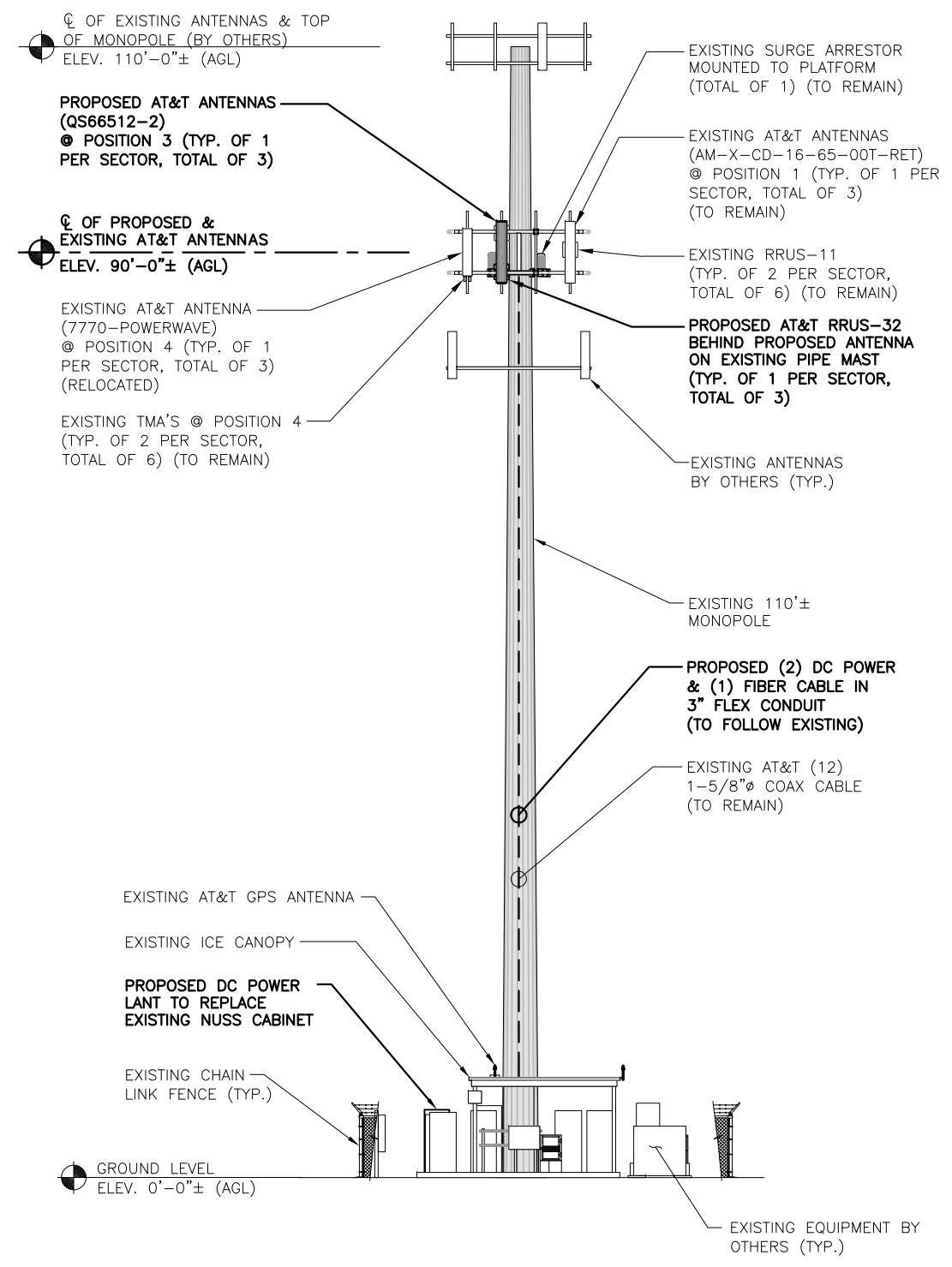
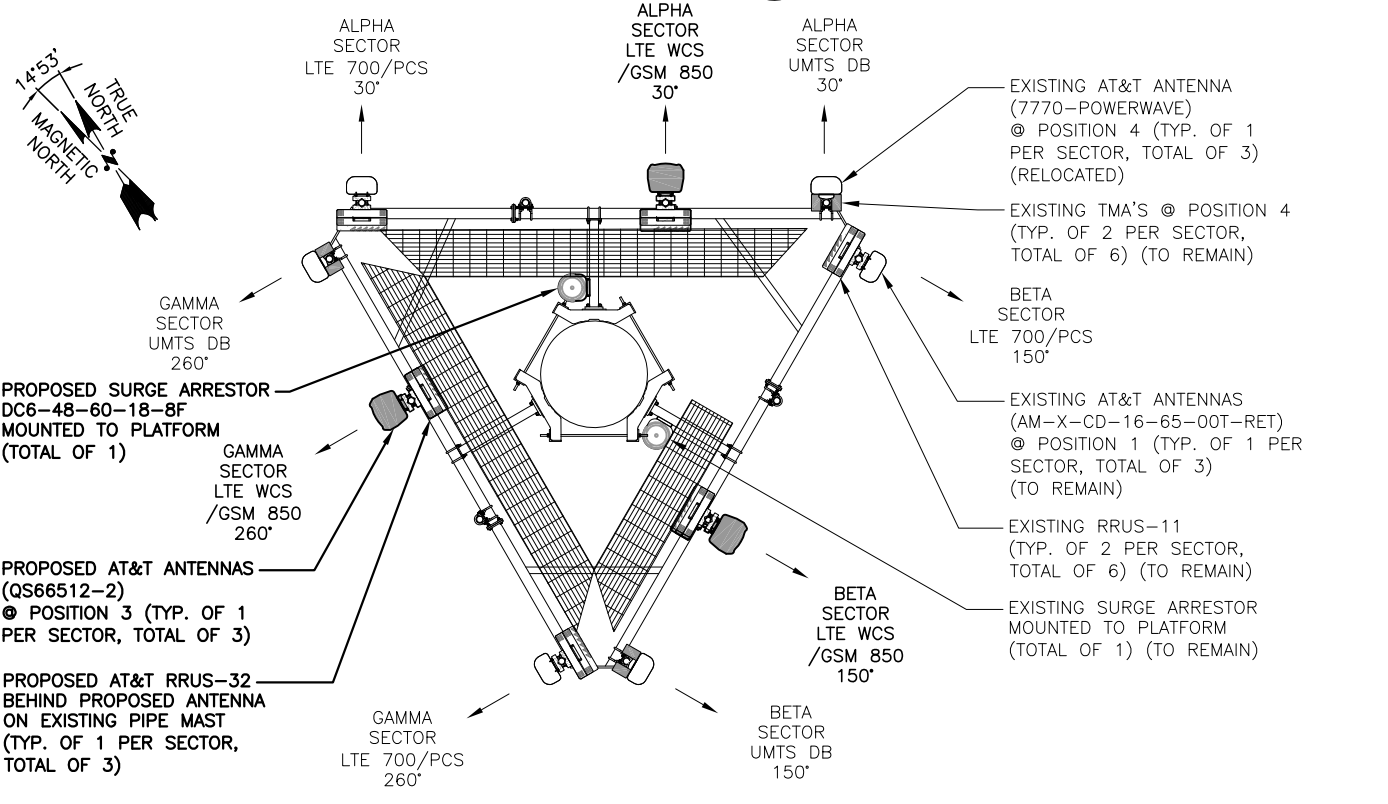
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| | | |
|---------------------------------------|----------------|-----|
| AT&T | | |
| COMPOUND & EQUIPMENT PLANS | | |
| (LTE 3C) | | |
| SITE NUMBER | DRAWING NUMBER | REV |
| 5152.00 | A-1 | A |



NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



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BUILDING 20 NORTH, SUITE 3090
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27 NORTHWESTERN DR.
SALEM, NH 03079

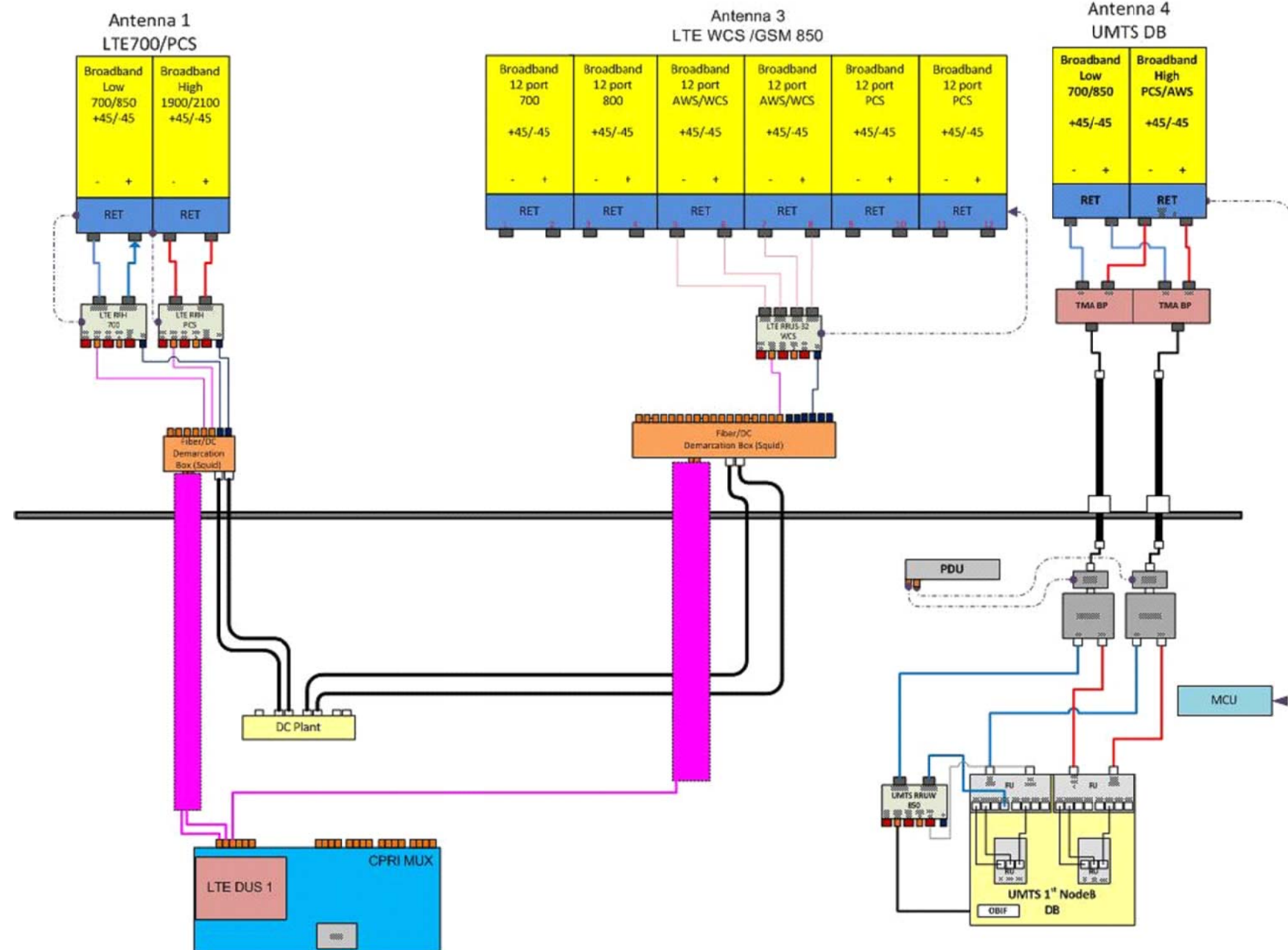
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SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: EB

| AT&T | | |
|--------------------------------------|----------------|-----|
| ANTENNA LAYOUTS & ELEVATION (LTE 3C) | | |
| SITE NUMBER | DRAWING NUMBER | REV |
| 5152.00 | A-2 | A |



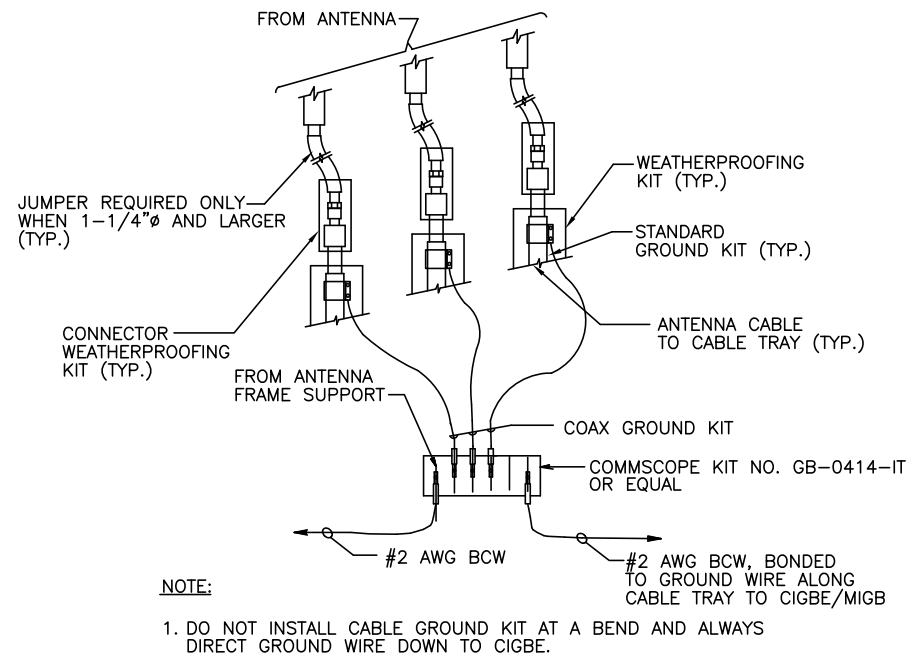
RF PLUMBING DIAGRAM 1
 SCALE: N.T.S. RF-1

NOTE:
 1. CONTRACTOR TO CONFIRM ALL PARTS.
 2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

| | | | | | |
|-----------------|----------|-------------------|--------------|-----|-------|
| NO. | DATE | ISSUED FOR REVIEW | BY | CHK | APP'D |
| A | 04/12/16 | ISSUED FOR REVIEW | EB | AT | DPH |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: EB | | |

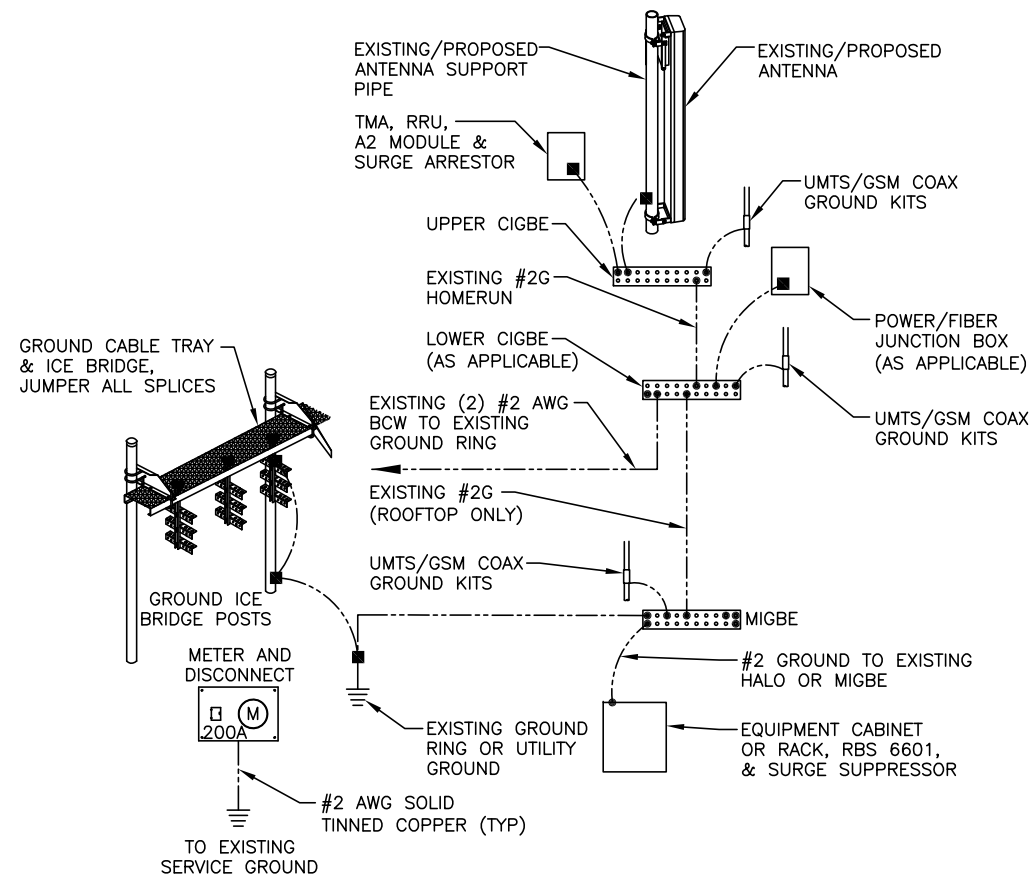
| | | |
|---------------------------------|----------------|-----|
| AT&T | | |
| RF PLUMBING DIAGRAM (LTE 3C) | | |
| SITE NUMBER | DRAWING NUMBER | REV |
| 5152.00 | RF-1 | A |



GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

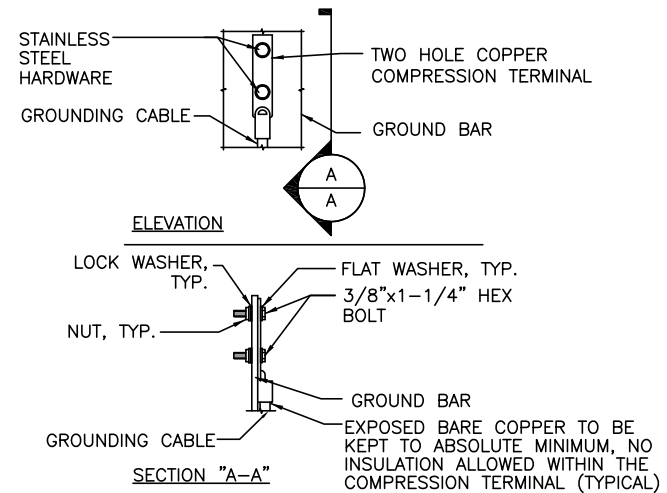
1
G-1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2
G-1



NOTE:

- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
- OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
- CADWELDED DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

3
G-1

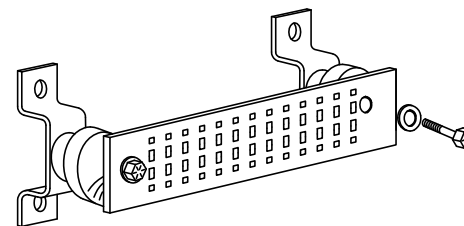
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" - SURGE PRODUCERS

- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- 48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES.

SECTION "A" - SURGE ABSORBERS

- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)



GROUND BAR - DETAIL

SCALE: N.T.S

4
G-1



1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT5152
SITE NAME: HARTFORD NORTH
CROWN SITE ID: 876325

92 WESTON STREET
HARTFORD, CT 06120
HARTFORD COUNTY



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

| | | | | | |
|-----------------|----------|-------------------|--------------|-----|-------|
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| A | 04/12/16 | ISSUED FOR REVIEW | EB | AT | DPH |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: EB | | |

| | | |
|-------------------------------|----------------|-----|
| AT&T | | |
| GROUNDING DETAILS (LTE 3C) | | |
| SITE NUMBER | DRAWING NUMBER | REV |
| 5152.00 | G-1 | A |



Date: April 25, 2016

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
704.405.6565

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jsommer@pjfwweb.com

Subject: Structural Analysis Report

Carrier Designation:

AT&T Mobility Co-Locate
Carrier Site Number:
Carrier Site Name:

CT5152
Hartford North

Crown Castle Designation:

Crown Castle BU Number: 876325
Crown Castle Site Name: WESTON SQUARE
Crown Castle JDE Job Number: 373187
Crown Castle Work Order Number: 1223812
Crown Castle Application Number: 342478 Rev. 0

Engineering Firm Designation:

Paul J. Ford and Company Project Number: 37516-1244.001.7805

Site Data:

92 Weston Street, Hartford, Hartford County, CT
Latitude 41° 47' 12.3", Longitude -72° 39' 44.42"
110 Foot - Monopole Tower

Dear Sean Dempsey,

Paul J. Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 894052, in accordance with application 342478, revision 0.

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

LC7: Existing + Reserved + Proposed Equipment

Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

Sufficient Capacity*

*This report is only valid if the proposed TMA's are installed in such a manner that the largest portion is parallel to the width of the proposed antennas they are mounted behind, thereby, shielding the proposed TMA's from the wind.

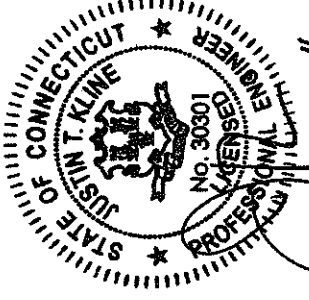
The analysis has been performed in accordance with the TIA/EIA-222-F standard and The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at Paul J. Ford and Company 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.

Respectfully submitted by:


Jonathan Sommer, EI
Structural Designer

trnTower Report - version 7.0.5.1



425-16

Date: April 25, 2016

Sean Dempsey
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Charlotte, NC 28277
704.405.6565

Paul J. Ford and Company
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Columbus, OH 43215
614.221.6679
jsommer@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation:

AT&T Mobility Co-Locate
Carrier Site Number:
Carrier Site Name:

CT5152
Hartford North

Crown Castle Designation:

Crown Castle BU Number:
Crown Castle Site Name:
Crown Castle JDE Job Number:
Crown Castle Work Order Number:
Crown Castle Application Number:

876325
WESTON SQUARE
373187
1223812
342478 Rev. 0

Engineering Firm Designation:

Paul J. Ford and Company Project Number: 37516-1244.001.7805

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Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

***This report is only valid if the proposed TMA's are installed in such a manner that the largest portion is parallel to the width of the proposed antennas they are mounted behind, thereby, shielding the proposed TMA's from the wind.**

The analysis has been performed in accordance with the TIA/EIA-222-F standard and The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J. Ford and Company* 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.

Respectfully submitted by:

Sufficient Capacity*

Jonathan Sommer, EI
Structural Designer

tnxTower Report - version 7.0.5.1

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- 2) ANALYSIS CRITERIA**
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 - Table 5 – Tower Components vs. Capacity
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 - Base Level Drawing
- 7) APPENDIX C**
 - Additional Calculations

1) INTRODUCTION

This tower is a 110 ft Monopole tower designed by ROHN in October of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F standard and The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------|----------------|----------------------|---------------------|------|
| 89.0 | 90.0 | 3 | ericsson | WCS RRU-32-B30 | 1 | 3/8 | - |
| | | 3 | quintel technology | | | 3/4 | |
| | | 1 | raycap | | | DC6-48-60-18-8F | |

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 | |
|---------------------|----------------------------|--------------------|------------------------|---|----------------------|---------------------|------|---|
| 107.0 | 108.0 | 3 | rfs celwave | APXVSP18-C-A20 w/ Mount Pipe | 3 | 1-1/4 | 1 | |
| | | 3 | rfs celwave | IBC1900BB-1 | | | | |
| | | 3 | rfs celwave | IBC1900HG-2A | | | | |
| 105.0 | 107.0 | 3 | rfs celwave | APXVTM14-C-120 w/ Mount Pipe | 1 | 5/8 | 2 | |
| | | 1 | tower mounts | T-Arm Mount [TA 702-3] | | | 3 | |
| | | 1 | tower mounts | Platform Mount [LP 502-1] | | | | |
| 89.0 | 90.0 | 3 | alcatel lucent | PCS 1900MHz 4x45W-65MHz w/Mount Pipe | - | - | 1 | |
| | | 3 | alcatel lucent | 800MHz 2X50W RRH W/FILTER W/Mount pipes | | | | |
| | | 3 | alcatel lucent | PCS 1900MHz 4x45W-65MHz w/Mount Pipe | | | | |
| | | 1 | tower mounts | Side Arm Mount [SO 102-3] | | | | |
| | | 3 | alcatel lucent | TD-RRH8x20-25 | | | | |
| | | 3 | ericsson | RRUS-11 | | | | |
| 80.0 | 89.0 | 3 | kmw communications | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 1 | 3/8* | 1 | |
| | | 3 | powerwave technologies | 7750.00 w/ Mount Pipe | 2 | 3/4* | | |
| | | 6 | powerwave technologies | LGP21401 | 6 | 1-5/8 | | |
| | | 3 | powerwave technologies | 7750.00 w/ Mount Pipe | 6 | 1-5/8 | | 3 |
| | | 6 | powerwave technologies | LGP21903 | | | | |
| | | 3 | ericsson | RRUS-11 | | | | |
| 80.0 | 80.0 | 1 | raycap | DC6-48-60-18-8F | - | - | 1 | |
| | | 1 | tower mounts | Platform Mount [LP 502-1] | | | | |
| | | 3 | ericsson | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | | | | |
| | | 3 | ericsson | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | | | | |
| | | 3 | ericsson | KRY 112 144/1 | | | | |
| | | 1 | tower mounts | Platform Mount [LP 305-1] | | | | |

Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed
 * Installed Inside 2" Conduit

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document | Remarks | Reference | Source |
|--|------------------------------|-----------|----------|
| 4-GEOTECHNICAL REPORTS | FDH, 07-11432G, 01/24/08 | 2192540 | CCISITES |
| 4-POST-MODIFICATION INSPECTION | TEP, 060671, 06/28/06 | 1956491 | CCISITES |
| 4-POST-MODIFICATION INSPECTION | B&T, 79760, 11/24/09 | 2561266 | CCISITES |
| 4-POST-MODIFICATION INSPECTION | TEP, 126558, 10/22/12 | 3355603 | CCISITES |
| 4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS | Rohn, 34738SW, 10/18/96 | 1615433 | CCISITES |
| 4-TOWER MANUFACTURER DRAWINGS | Rohn, 34738SW, 10/17/96 | 1615400 | CCISITES |
| 4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA | B&T, 79760, 11/24/09 | 2356066 | CCISITES |
| 4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA | TEP, 126558, 10/22/12 | 3187227 | CCISITES |
| 4-TOWER STRUCTURAL ANALYSIS REPORTS | PJF, 37512-1239 R1, 10/30/12 | 3361707 | CCISITES |
| 4-POST-MODIFICATION INSPECTION | TEP, 131001.876325, 08/06/13 | 4075332 | CCISITES |

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Monopole was modified in conformance with the referenced modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

| Section No. | Elevation (ft) | Component Type | Size | Critical Element | P (K) | SF*P allow (K) | % Capacity | Pass / Fail |
|-------------|----------------|----------------|--------------------|------------------|--------|----------------|------------|-------------|
| L1 | 110 - 90 | Pole | P24x1/4 | 1 | -2.91 | 589.19 | 24.5 | Pass |
| L2 | 90 - 60 | Pole | P24x3/8 | 2 | -10.57 | 934.94 | 84.9 | Pass |
| L3 | 60 - 39.5 | Pole | 30" x 0.375" | 3 | -13.59 | 1166.57 | 99.4 | Pass |
| L4 | 39.5 - 30 | Pole | RPS 30" x 0.483" | 4 | -15.33 | 1359.81 | 93.5 | Pass |
| L5 | 30 - 18.75 | Pole | P30x1/2 | 5 | -17.82 | 1556.58 | 98.4 | Pass |
| L6 | 18.75 - 8.25 | Pole | RPS 30" x 0.71979" | 6 | -20.53 | 2050.43 | 88.1 | Pass |
| L7 | 8.25 - 0 | Pole | RPS 30" x 0.801" | 7 | -22.86 | 2467.02 | 82.0 | Pass |
| | | | | | | | Summary | |
| | | | | | | Pole (L3) | 99.4 | Pass |
| | | | | | | Rating = | 99.4 | Pass |

Table 5 - Tower Component Stresses vs. Capacity – LC7

| Notes | Component | Elevation (ft) | % Capacity | Pass / Fail |
|-------|----------------------------------|----------------|------------|-------------|
| 1,2 | Anchor Rods | 0 | 93.2 | Pass |
| 1 | Base Plate | 0 | 74.1 | Pass |
| 1 | Base Foundation Steel | 0 | 99.6 | Pass |
| 1 | Base Foundation Soil Interaction | 0 | 25.0 | Pass |
| 1 | Flange | 90 | 12.7 | Pass |
| 1 | Flange | 60 | 84.0 | Pass |
| 1 | Flange | 30 | 92.5 | Pass |

| | |
|---|--------------|
| Structure Rating (max from all components) = | 99.6% |
|---|--------------|

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Worst case scenario between existing and post installed anchors.

4.1) Recommendations

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

This report is only valid if the proposed TMA's are installed in such a manner that the largest portion is parallel to the width of the proposed antennas they are mounted behind, thereby, shielding the proposed TMA's from the wind.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 80 mph.
- 3) Nominal ice thickness of 1.0000 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56.00 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Deflections calculated using a wind speed of 50 mph.
- 8) A non-linear (P-delta) analysis was used.
- 9) Pressures are calculated at each section.
- 10) Stress ratio used in pole design is 1.333.
- 11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | |
|--|--|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification Use Code Stress Ratios Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned Assume Rigid Index Plate Use Clear Spans For Wind Area Use Clear Spans For KL/r Retention Guys To Initial Tension Bypass Mast Stability Checks Use Azimuth Dish Coefficients Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder |
|--|--|
-
- | | |
|--|---|
| <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption | <ul style="list-style-type: none"> Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|---|

Pole Section Geometry

| Section | Elevation ft | Section Length ft | Pole Size | Pole Grade | Socket Length ft |
|---------|----------------------|-------------------------|-----------------------|--------------------------------|---------------------|
| L1 | 110.0000- 90.0000 | 20.0000 | P24x1/4 | A53-B-42 (42 ksi) | |
| L2 | 90.0000-60.0000 | 30.0000 | P24x3/8 | A53-B-42 (42 ksi) | |
| L3 | 60.0000-39.5000 | 20.5000 | 30" x 0.375" | A53-B-42 (42 ksi) | |
| L4 | 39.5000-30.0000 | 9.5000 | RPS 30" x 0.483" | Reinf 37.96 ksi (38 ksi) | |
| L5 | 30.0000-18.7500 | 11.2500 | P30x1/2 | A53-B-42 (42 ksi) | |
| L6 | 18.7500-8.2500 | 10.5000 | RPS 30" x 0.71979" | Reinf 38.72 ksi (39 ksi) | |
| L7 | 8.2500-0.0000 | 8.2500 | RPS 30" x 0.801" | Reinf 41.98 ksi (42 ksi) | |

| Tower Elevation | Gusset Area (per face) | Gusset Thickness | Gusset Grade | Adjust. Factor A _r | Weight Mult. | Double Angle Spacing | | Double Angle Spacing | | Double Angle Redundants |
|---------------------|------------------------|------------------|--------------|-------------------------------|--------------|----------------------|-------------|----------------------|-------------|-------------------------|
| | | | | | | Diagonals | Horizontals | Diagonals | Horizontals | |
| ft | ft ² | in | | | | in | in | in | in | in |
| L1 110.0000-90.0000 | | | | 1 | 1 | | | | | 1 |
| L2 90.0000-60.0000 | | | | 1 | 1 | | | | | 1 |
| L3 60.0000-39.5000 | | | | 1 | 1 | | | | | 1 |
| L4 39.5000-30.0000 | | | | 1 | 1 | | | | | 1 |
| L5 30.0000-18.7500 | | | | 1 | 1 | | | | | 1 |
| L6 18.7500-8.2500 | | | | 1 | 1 | | | | | 1 |
| L7 8.2500-0.0000 | | | | 1 | 1 | | | | | 1 |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement | Total Number | C _A A _A | Weight |
|--|-------------|--------------|--------------------|-------------------|--------------|-------------------------------|--------|
| | | | | ft | | ft ² /ft | plf |
| HB114-1-08U4-M5J(1-1/4") | A | No | Inside Pole | 107.0000 - 0.0000 | 3 | 0.0000 | 1.08 |
| | | | | | | 0.0000 | 1.08 |
| | | | | | | 0.0000 | 1.08 |
| | | | | | | 0.0000 | 1.08 |
| HB058-M12-XXXF(5/8") | A | No | Inside Pole | 107.0000 - 0.0000 | 1 | 0.0000 | 0.24 |
| | | | | | | 0.0000 | 0.24 |
| | | | | | | 0.0000 | 0.24 |
| | | | | | | 0.0000 | 0.24 |
| *** | | | | | | 0.0000 | 0.24 |
| 2" Rigid Conduit (1-1/2" Thick-wall Conduit) | B | No | Inside Pole | 89.0000 - 0.0000 | 1 | 0.0000 | 2.60 |
| | | | | | | 0.0000 | 2.60 |
| | | | | | | 0.0000 | 2.60 |
| | | | | | | 0.0000 | 2.60 |
| WR-VG86ST-BRD (3/4") | B | No | Inside Pole | 89.0000 - 0.0000 | 2 | 0.0000 | 0.88 |
| | | | | | | 0.0000 | 0.88 |
| | | | | | | 0.0000 | 0.88 |
| | | | | | | 0.0000 | 0.88 |
| LDF2-50A (3/8 FOAM) | B | No | Inside Pole | 89.0000 - 0.0000 | 1 | 0.0000 | 0.08 |
| | | | | | | 0.0000 | 0.08 |
| | | | | | | 0.0000 | 0.08 |
| | | | | | | 0.0000 | 0.08 |
| LDF7-50A (1-5/8 FOAM) | B | No | Inside Pole | 89.0000 - 0.0000 | 3 | 0.0000 | 0.82 |
| | | | | | | 0.0000 | 0.82 |
| | | | | | | 0.0000 | 0.82 |
| | | | | | | 0.0000 | 0.82 |
| LDF7-50A (1-5/8 FOAM) | B | No | CaAa (Out Of Face) | 89.0000 - 0.0000 | 1 | 0.1980 | 2.33 |
| | | | | | | 0.2980 | 4.46 |
| | | | | | | 0.3980 | 10.54 |
| | | | | | | 0.5980 | 30.04 |
| 1-5/8 FOAM | B | No | CaAa (Out Of Face) | 89.0000 - 0.0000 | 2 | 0.0000 | 0.82 |
| | | | | | | 0.0000 | 2.33 |
| | | | | | | 0.0000 | 4.46 |
| | | | | | | 0.0000 | 10.54 |
| | | | | | | 0.0000 | 30.04 |
| FB-L98B-002-50000(3/8") | B | No | CaAa (Out Of Face) | 89.0000 - 0.0000 | 1 | 0.0000 | 0.06 |
| | | | | | | 0.0000 | 0.61 |

| Description | Face or Leg | Allow or Shield | Component Type | Placement ft | Total Number | C _A A _A ff/ft | Weight plf | |
|--|-------------------|-----------------------|-----------------------|-------------------|-----------------|--|---------------|-------|
| WR-VG86ST- BRD(3/4") | B | No | CaAa (Out Of Face) | 89.0000 - 0.0000 | 2 | 1" Ice | 0.0000 | 1.76 |
| | | | | | | 2" Ice | 0.0000 | 5.91 |
| | | | | | | 4" Ice | 0.0000 | 21.53 |
| | | | | | | 1/2" Ice | 0.0000 | 0.58 |
| | | | | | | 1" Ice | 0.0000 | 1.38 |
| *** | C | No | Inside Pole | 80.0000 - 0.0000 | 1 | 2" Ice | 0.0000 | 2.78 |
| | | | | | | 1" Ice | 0.0000 | 7.41 |
| | | | | | | 4" Ice | 0.0000 | 24.02 |
| | | | | | | No Ice | 0.0000 | 0.33 |
| VXL6-50(1-1/4") | C | No | Inside Pole | 80.0000 - 0.0000 | 6 | 1/2" Ice | 0.0000 | 0.33 |
| | | | | | | 1" Ice | 0.0000 | 0.33 |
| | | | | | | 2" Ice | 0.0000 | 0.33 |
| | | | | | | 4" Ice | 0.0000 | 0.33 |
| | | | | | | No Ice | 0.0000 | 0.50 |
| | | | | | | 1/2" Ice | 0.0000 | 0.50 |
| MLE Hybrid 9Power/18Fiber RL 2(1 5/8) | C | No | CaAa (Out Of Face) | 80.0000 - 0.0000 | 1 | 1" Ice | 0.0000 | 0.50 |
| | | | | | | 2" Ice | 0.0000 | 0.50 |
| | | | | | | 4" Ice | 0.0000 | 0.50 |
| | | | | | | No Ice | 0.1625 | 1.07 |
| | | | | | | 1/2" Ice | 0.2625 | 2.37 |
| | | | | | | 1" Ice | 0.3625 | 4.28 |
| 810921-001(7/8") | C | No | CaAa (Out Of Face) | 80.0000 - 0.0000 | 6 | 2" Ice | 0.5625 | 9.93 |
| | | | | | | 4" Ice | 0.9625 | 28.56 |
| | | | | | | No Ice | 0.0000 | 0.40 |
| | | | | | | 1/2" Ice | 0.0000 | 1.38 |
| | | | | | | 1" Ice | 0.0000 | 2.98 |
| | | | | | | 2" Ice | 0.0000 | 8.00 |
| *** | C | No | CaAa (Out Of Face) | 10.5000 - 0.0000 | 1 | 4" Ice | 0.0000 | 25.38 |
| | | | | | | No Ice | 0.3478 | 0.00 |
| | | | | | | 1/2" Ice | 0.4001 | 0.00 |
| | | | | | | 1" Ice | 0.6566 | 0.00 |
| Aero MP3-05 | C | No | CaAa (Out Of Face) | 21.0000 - 6.0000 | 1 | 2" Ice | 0.8788 | 0.00 |
| | | | | | | 4" Ice | 1.3232 | 0.00 |
| | | | | | | No Ice | 0.3478 | 0.00 |
| | | | | | | 1/2" Ice | 0.4001 | 0.00 |
| *** | C | No | CaAa (Out Of Face) | 40.5000 - 30.0000 | 1 | 1" Ice | 0.6566 | 0.00 |
| | | | | | | 2" Ice | 0.8788 | 0.00 |
| | | | | | | 4" Ice | 1.3232 | 0.00 |
| | | | | | | No Ice | 0.2625 | 0.00 |
| Aero MP3-03 | C | No | CaAa (Out Of Face) | 21.0000 - 6.0000 | 1 | 1" Ice | 0.3736 | 0.00 |
| | | | | | | 2" Ice | 0.4847 | 0.00 |
| | | | | | | 4" Ice | 0.7069 | 0.00 |
| | | | | | | No Ice | 1.1514 | 0.00 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustmen t | Placement | C _A A _A Front | C _A A _A Side | Weight |
|-----------------------------------|-------------------|----------------|-----------------------|------------|---------------------------|-----------|--|---------------------------------------|--------|
| | | | Horz Lateral ft | Vert ft | | | | | |
| ***107*** (2) 4'x2" Pipe Mount | A | From Face | 2.0000 | 0.00 | 0.00 | 107.0000 | 0.7852 | 0.7852 | 0.03 |
| | | | 0.00 | 0.00 | | | 1.0284 | 1.0284 | 0.03 |
| | | | 0.00 | | | | 1.2809 | 1.2809 | 0.04 |
| (2) 4'x2" Pipe Mount | B | From Face | 2.0000 | 0.00 | 0.00 | 107.0000 | 0.7852 | 0.7852 | 0.03 |
| | | | 0.00 | 0.00 | | | 1.0284 | 1.0284 | 0.03 |
| | | | 0.00 | | | | 1.2809 | 1.2809 | 0.04 |
| | | | 0.00 | | | | 1.2809 | 1.2809 | 0.04 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustmen t | Placement | C _A A _A Front | C _A A _A Side | Weight |
|---------------------------------|-------------------|----------------|-----------------------|------------|---------------------------|-----------|--|---------------------------------------|--------|
| | | | Horz Lateral ft | Vert ft | | | | | |
| (2) 4x2" Pipe Mount | C | From Face | 2.0000 | | 0.00 | 107.0000 | 1.8136 | 1.8136 | 0.07 |
| | | | 0.00 | | | | 3.1111 | 3.1111 | 0.16 |
| | | | 0.00 | | | | | | |
| | | | | | | | | | |
| APXVSP18-C-A20 w/ Mount Pipe | A | From Face | 2.0000 | | 0.00 | 107.0000 | 8.4975 | 6.9458 | 0.08 |
| | | | 0.00 | | | | 9.1490 | 8.1266 | 0.15 |
| | | | 1.00 | | | | 9.7672 | 9.0212 | 0.23 |
| | | | | | | | 11.0311 | 10.8440 | 0.41 |
| APXVSP18-C-A20 w/ Mount Pipe | B | From Face | 2.0000 | | 0.00 | 107.0000 | 8.4975 | 6.9458 | 0.08 |
| | | | 0.00 | | | | 9.1490 | 8.1266 | 0.15 |
| | | | 1.00 | | | | 9.7672 | 9.0212 | 0.23 |
| | | | | | | | 11.0311 | 10.8440 | 0.41 |
| APXVSP18-C-A20 w/ Mount Pipe | C | From Face | 2.0000 | | 0.00 | 107.0000 | 8.4975 | 6.9458 | 0.08 |
| | | | 0.00 | | | | 9.1490 | 8.1266 | 0.15 |
| | | | 1.00 | | | | 9.7672 | 9.0212 | 0.23 |
| | | | | | | | 11.0311 | 10.8440 | 0.41 |
| IBC1900HG-2A | A | From Face | 2.0000 | | 0.00 | 107.0000 | 1.1270 | 0.5329 | 0.02 |
| | | | 0.00 | | | | 1.2726 | 0.6471 | 0.03 |
| | | | 1.00 | | | | 1.4269 | 0.7699 | 0.04 |
| | | | | | | | 1.7613 | 1.0415 | 0.06 |
| IBC1900HG-2A | B | From Face | 2.0000 | | 0.00 | 107.0000 | 1.1270 | 0.5329 | 0.02 |
| | | | 0.00 | | | | 1.2726 | 0.6471 | 0.03 |
| | | | 1.00 | | | | 1.4269 | 0.7699 | 0.04 |
| | | | | | | | 1.7613 | 1.0415 | 0.06 |
| IBC1900HG-2A | C | From Face | 2.0000 | | 0.00 | 107.0000 | 1.1270 | 0.5329 | 0.02 |
| | | | 0.00 | | | | 1.2726 | 0.6471 | 0.03 |
| | | | 1.00 | | | | 1.4269 | 0.7699 | 0.04 |
| | | | | | | | 1.7613 | 1.0415 | 0.06 |
| IBC1900BB-1 | A | From Face | 2.0000 | | 0.00 | 107.0000 | 1.1270 | 0.5329 | 0.02 |
| | | | 0.00 | | | | 1.2726 | 0.6471 | 0.03 |
| | | | 1.00 | | | | 1.4269 | 0.7699 | 0.04 |
| | | | | | | | 1.7613 | 1.0415 | 0.06 |
| IBC1900BB-1 | B | From Face | 2.0000 | | 0.00 | 107.0000 | 1.1270 | 0.5329 | 0.02 |
| | | | 0.00 | | | | 1.2726 | 0.6471 | 0.03 |
| | | | 1.00 | | | | 1.4269 | 0.7699 | 0.04 |
| | | | | | | | 1.7613 | 1.0415 | 0.06 |
| IBC1900BB-1 | C | From Face | 2.0000 | | 0.00 | 107.0000 | 1.1270 | 0.5329 | 0.02 |
| | | | 0.00 | | | | 1.2726 | 0.6471 | 0.03 |
| | | | 1.00 | | | | 1.4269 | 0.7699 | 0.04 |
| | | | | | | | 1.7613 | 1.0415 | 0.06 |
| T-Arm Mount [TA 702-3] | C | None | | | 0.00 | 107.0000 | 5.6400 | 5.6400 | 0.34 |
| | | | | | | | 6.5500 | 6.5500 | 0.43 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight |
|--|-------------|-------------|--------------|------|--------------------|-----------------|-------------------------------------|------------------------------------|--------|
| | | | Horz Lateral | Vert | | | | | |
| | | | ft | ft | ft | ft ² | ft ² | K | |
| APXVTM14-C-120 w/ Mount Pipe | A | From Leg | 2.0000 | | 0.00 | 107.0000 | 7.4600 | 7.4600 | 0.52 |
| | | | 0.00 | | | | 9.2800 | 9.2800 | 0.70 |
| | | | 1.00 | | | | 12.9200 | 12.9200 | 1.06 |
| | | | | | | | | | |
| APXVTM14-C-120 w/ Mount Pipe | B | From Leg | 2.0000 | | 0.00 | 107.0000 | 7.1342 | 4.9591 | 0.08 |
| | | | 0.00 | | | | 7.6618 | 5.7544 | 0.13 |
| | | | 1.00 | | | | 8.1830 | 6.4723 | 0.19 |
| | | | | | | | 9.2563 | 8.0099 | 0.34 |
| APXVTM14-C-120 w/ Mount Pipe | C | From Leg | 2.0000 | | 0.00 | 107.0000 | 11.5262 | 11.4120 | 0.75 |
| | | | 0.00 | | | | 7.1342 | 4.9591 | 0.08 |
| | | | 1.00 | | | | 7.6618 | 5.7544 | 0.13 |
| | | | | | | | 8.1830 | 6.4723 | 0.19 |
| ***105*** Side Arm Mount [SO 102- 3] | C | None | 2.0000 | | 0.00 | 105.0000 | 3.0000 | 3.0000 | 0.08 |
| | | | 0.00 | | | | 3.4800 | 3.4800 | 0.11 |
| | | | 1.00 | | | | 3.9600 | 3.9600 | 0.14 |
| | | | | | | | 4.9200 | 4.9200 | 0.20 |
| 800MHz 2X50W RRH W/FILTER W/Mount pipes | A | From Face | 2.0000 | | 0.00 | 105.0000 | 2.7148 | 2.8803 | 0.08 |
| | | | 0.00 | | | | 3.0250 | 3.2839 | 0.11 |
| | | | 1.00 | | | | 3.3485 | 3.7054 | 0.14 |
| | | | | | | | 4.0439 | 4.6191 | 0.23 |
| 800MHz 2X50W RRH W/FILTER W/Mount pipes | B | From Face | 2.0000 | | 0.00 | 105.0000 | 2.7148 | 2.8803 | 0.08 |
| | | | 0.00 | | | | 3.0250 | 3.2839 | 0.11 |
| | | | 1.00 | | | | 3.3485 | 3.7054 | 0.14 |
| | | | | | | | 4.0439 | 4.6191 | 0.23 |
| 800MHz 2X50W RRH W/FILTER W/Mount pipes | C | From Face | 2.0000 | | 0.00 | 105.0000 | 2.7148 | 2.8803 | 0.08 |
| | | | 0.00 | | | | 3.0250 | 3.2839 | 0.11 |
| | | | 1.00 | | | | 3.3485 | 3.7054 | 0.14 |
| | | | | | | | 4.0439 | 4.6191 | 0.23 |
| PCS 1900MHz 4x45W- 65MHz w/Mount Pipe | A | From Face | 2.0000 | | 0.00 | 105.0000 | 3.1217 | 3.4768 | 0.07 |
| | | | 0.00 | | | | 3.4775 | 3.9581 | 0.11 |
| | | | 0.00 | | | | 3.8464 | 4.4572 | 0.15 |
| | | | | | | | 4.6232 | 5.5092 | 0.24 |
| PCS 1900MHz 4x45W- 65MHz w/Mount Pipe | B | From Face | 2.0000 | | 0.00 | 105.0000 | 3.1217 | 3.4768 | 0.07 |
| | | | 0.00 | | | | 3.4775 | 3.9581 | 0.11 |
| | | | 0.00 | | | | 3.8464 | 4.4572 | 0.15 |
| | | | | | | | 4.6232 | 5.5092 | 0.24 |
| PCS 1900MHz 4x45W- 65MHz w/Mount Pipe | C | From Face | 2.0000 | | 0.00 | 105.0000 | 3.1217 | 3.4768 | 0.07 |
| | | | 0.00 | | | | 3.4775 | 3.9581 | 0.11 |
| | | | 0.00 | | | | 3.8464 | 4.4572 | 0.15 |
| | | | | | | | 4.6232 | 5.5092 | 0.24 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement | C _A A _A | | Weight | |
|-----------------------|-------------------|----------------|---|--------------------------------|-----------|-------------------------------|---------|---------|------|
| | | | | | | Front | Side | | |
| 7750.00 w/ Mount Pipe | B | From Face | 4.0000 | 0.00 | 89.0000 | 2" Ice | 10.3599 | 10.4117 | 0.66 |
| | | | 0.00 | | | 4" Ice | | | |
| | | | 1.00 | | | No Ice | 6.1194 | 4.2543 | 0.06 |
| | | | | | | 1/2" | 6.6258 | 5.0137 | 0.10 |
| 7750.00 w/ Mount Pipe | C | From Face | 4.0000 | 0.00 | 89.0000 | 1" Ice | 7.1283 | 5.7109 | 0.16 |
| | | | 0.00 | | | 2" Ice | 8.1643 | 7.1553 | 0.29 |
| | | | 1.00 | | | 4" Ice | 10.3599 | 10.4117 | 0.66 |
| | | | | | | No Ice | 6.1194 | 4.2543 | 0.06 |
| RRUS-11 | A | From Face | 4.0000 | 0.00 | 89.0000 | 1/2" | 6.6258 | 5.0137 | 0.10 |
| | | | 0.00 | | | Ice | 7.1283 | 5.7109 | 0.16 |
| | | | 1.00 | | | 1" Ice | 8.1643 | 7.1553 | 0.29 |
| | | | | | | 2" Ice | 10.3599 | 10.4117 | 0.66 |
| RRUS-11 | B | From Face | 4.0000 | 0.00 | 89.0000 | 4" Ice | 3.2560 | 1.3790 | 0.05 |
| | | | 0.00 | | | No Ice | 3.2560 | 1.3790 | 0.05 |
| | | | 1.00 | | | 1/2" | 3.4982 | 1.5577 | 0.07 |
| | | | | | | Ice | 3.7490 | 1.7450 | 0.09 |
| RRUS-11 | C | From Face | 4.0000 | 0.00 | 89.0000 | 1" Ice | 4.2766 | 2.1455 | 0.15 |
| | | | 0.00 | | | 2" Ice | 5.4355 | 3.0504 | 0.31 |
| | | | 1.00 | | | 4" Ice | 3.2560 | 1.3790 | 0.05 |
| | | | | | | No Ice | 3.2560 | 1.3790 | 0.05 |
| RRUS-11 | A | From Face | 4.0000 | 0.00 | 89.0000 | 1/2" | 3.4982 | 1.5577 | 0.07 |
| | | | 0.00 | | | Ice | 3.7490 | 1.7450 | 0.09 |
| | | | 1.00 | | | 1" Ice | 4.2766 | 2.1455 | 0.15 |
| | | | | | | 2" Ice | 5.4355 | 3.0504 | 0.31 |
| RRUS-11 | B | From Face | 4.0000 | 0.00 | 89.0000 | 4" Ice | 3.2560 | 1.3790 | 0.05 |
| | | | 0.00 | | | No Ice | 3.2560 | 1.3790 | 0.05 |
| | | | 1.00 | | | 1/2" | 3.4982 | 1.5577 | 0.07 |
| | | | | | | Ice | 3.7490 | 1.7450 | 0.09 |
| RRUS-11 | C | From Face | 4.0000 | 0.00 | 89.0000 | 1" Ice | 4.2766 | 2.1455 | 0.15 |
| | | | 0.00 | | | 2" Ice | 5.4355 | 3.0504 | 0.31 |
| | | | 1.00 | | | 4" Ice | 3.2560 | 1.3790 | 0.05 |
| | | | | | | No Ice | 3.2560 | 1.3790 | 0.05 |
| DC6-48-60-18-8F | A | From Face | 4.0000 | 0.00 | 89.0000 | 1/2" | 3.4982 | 1.5577 | 0.07 |
| | | | 0.00 | | | Ice | 3.7490 | 1.7450 | 0.09 |
| | | | 1.00 | | | 1" Ice | 4.2766 | 2.1455 | 0.15 |
| | | | | | | 2" Ice | 5.4355 | 3.0504 | 0.31 |
| (2) LGP21401 | A | From Face | 4.0000 | 0.00 | 89.0000 | 4" Ice | 1.4667 | 1.4667 | 0.02 |
| | | | 0.00 | | | No Ice | 1.4667 | 1.4667 | 0.02 |
| | | | 1.00 | | | 1/2" | 1.6667 | 1.6667 | 0.04 |
| | | | | | | Ice | 1.8778 | 1.8778 | 0.06 |
| (2) LGP21401 | B | From Face | 4.0000 | 0.00 | 89.0000 | 1" Ice | 2.3333 | 2.3333 | 0.11 |
| | | | 0.00 | | | 2" Ice | 3.3778 | 3.3778 | 0.24 |
| | | | 1.00 | | | 4" Ice | 1.2880 | 0.3640 | 0.01 |
| | | | | | | No Ice | 1.2880 | 0.3640 | 0.01 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustmen t | Placement | C _A A _A Front | C _A A _A Side | Weight |
|---------------------------------------|-------------------|----------------|-----------------|--------|---------------------------|-----------|--|---------------------------------------|--------|
| | | | Horz Lateral | Vert | | | | | |
| | | | ft | ft | ° | ft | | | |
| (2) LGP21401 | C | From Face | 4.0000 | 4.0000 | 0.00 | 89.0000 | 1.9690 | 0.8739 | 0.05 |
| | | | 0.00 | 0.00 | | | 2.7882 | 1.5220 | 0.14 |
| | | | 1.00 | | | | | | |
| | | | | | | | 1.2880 | 0.3640 | 0.01 |
| | | | | | | | 1.4453 | 0.4785 | 0.02 |
| QS66512-2 w/ Mount Pipe | A | From Leg | 4.0000 | 4.0000 | 0.00 | 89.0000 | 1.9690 | 0.8739 | 0.05 |
| | | | 0.00 | 0.00 | | | 2.7882 | 1.5220 | 0.14 |
| | | | 1.00 | | | | | | |
| | | | | | | | 8.6375 | 8.4625 | 0.14 |
| | | | | | | | 9.2903 | 9.6573 | 0.21 |
| QS66512-2 w/ Mount Pipe | B | From Leg | 4.0000 | 4.0000 | 0.00 | 89.0000 | 1.9690 | 0.8739 | 0.05 |
| | | | 0.00 | 0.00 | | | 2.7882 | 1.5220 | 0.14 |
| | | | 1.00 | | | | | | |
| | | | | | | | 8.6375 | 8.4625 | 0.14 |
| | | | | | | | 9.2903 | 9.6573 | 0.21 |
| QS66512-2 w/ Mount Pipe | C | From Leg | 4.0000 | 4.0000 | 0.00 | 89.0000 | 1.9690 | 0.8739 | 0.05 |
| | | | 0.00 | 0.00 | | | 2.7882 | 1.5220 | 0.14 |
| | | | 1.00 | | | | | | |
| | | | | | | | 8.6375 | 8.4625 | 0.14 |
| | | | | | | | 9.2903 | 9.6573 | 0.21 |
| DC6-48-60-18-8F | A | From Leg | 4.0000 | 4.0000 | 0.00 | 89.0000 | 1.4667 | 1.4667 | 0.02 |
| | | | 0.00 | 0.00 | | | 1.6667 | 1.6667 | 0.04 |
| | | | 1.00 | | | | 1.8778 | 1.8778 | 0.06 |
| | | | | | | | 2.3333 | 2.3333 | 0.11 |
| | | | | | | | 3.3778 | 3.3778 | 0.24 |
| WCS RRUS-32-B30 | A | From Leg | 4.0000 | 4.0000 | 0.00 | 89.0000 | 0.0000 | 2.7616 | 0.08 |
| | | | 0.00 | 0.00 | | | 0.0000 | 3.0213 | 0.10 |
| | | | 1.00 | | | | 0.0000 | 3.2896 | 0.14 |
| | | | | | | | 0.0000 | 3.8522 | 0.21 |
| | | | | | | | 0.0000 | 5.0811 | 0.41 |
| WCS RRUS-32-B30 | B | From Leg | 4.0000 | 4.0000 | 0.00 | 89.0000 | 0.0000 | 2.7616 | 0.08 |
| | | | 0.00 | 0.00 | | | 0.0000 | 3.0213 | 0.10 |
| | | | 1.00 | | | | 0.0000 | 3.2896 | 0.14 |
| | | | | | | | 0.0000 | 3.8522 | 0.21 |
| | | | | | | | 0.0000 | 5.0811 | 0.41 |
| WCS RRUS-32-B30 | C | From Leg | 4.0000 | 4.0000 | 0.00 | 89.0000 | 0.0000 | 2.7616 | 0.08 |
| | | | 0.00 | 0.00 | | | 0.0000 | 3.0213 | 0.10 |
| | | | 1.00 | | | | 0.0000 | 3.2896 | 0.14 |
| | | | | | | | 0.0000 | 3.8522 | 0.21 |
| | | | | | | | 0.0000 | 5.0811 | 0.41 |
| ***80*** Platform Mount [LP 305-1] | C | None | | | 0.00 | 80.0000 | 18.0100 | 18.0100 | 1.12 |
| | | | | | | | 23.3300 | 23.3300 | 1.35 |
| | | | | | | | 28.6500 | 28.6500 | 1.58 |
| | | | | | | | 39.2900 | 39.2900 | 2.05 |
| | | | | | | | 60.5700 | 60.5700 | 2.97 |
| 6'x2" Pipe Mount | A | From Face | 4.0000 | 4.0000 | 0.00 | 80.0000 | 1.2000 | 1.2000 | 0.07 |
| | | | 0.00 | 0.00 | | | 1.8025 | 1.8025 | 0.08 |
| | | | 0.00 | | | | 2.1698 | 2.1698 | 0.09 |
| | | | | | | | 2.9321 | 2.9321 | 0.13 |
| | | | | | | | 4.5679 | 4.5679 | 0.27 |
| 6'x2" Pipe Mount | B | From Face | 4.0000 | 4.0000 | 0.00 | 80.0000 | 1.2000 | 1.2000 | 0.07 |
| | | | | | | | | | |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight |
|---------------------------------------|-------------|-------------|--------------|------|--------------------|-----------|-------------------------------------|------------------------------------|--------|
| | | | Horz Lateral | Vert | | | | | |
| 6'x2" Pipe Mount | C | From Face | 0.00 | 0.00 | 0.00 | 80.0000 | 1.8025 | 1.8025 | 0.08 |
| | | | 0.00 | 0.00 | | | 2.1698 | 2.1698 | 0.09 |
| | | | | | | | 2.9321 | 2.9321 | 0.13 |
| | | | | | | | 4.5679 | 4.5679 | 0.27 |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | A | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 1.2000 | 1.2000 | 0.07 |
| | | | 0.00 | 0.00 | | | 1.8025 | 1.8025 | 0.08 |
| | | | 0.00 | 0.00 | | | 2.1698 | 2.1698 | 0.09 |
| | | | | | | | 2.9321 | 2.9321 | 0.13 |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | B | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 5.6424 | 5.6424 | 0.11 |
| | | | 0.00 | 0.00 | | | 6.4800 | 6.4800 | 0.17 |
| | | | 1.00 | 0.00 | | | 7.2567 | 7.2567 | 0.23 |
| | | | | | | | 8.8640 | 8.8640 | 0.38 |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | C | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 6.8253 | 6.8253 | 0.11 |
| | | | 0.00 | 0.00 | | | 7.3471 | 7.3471 | 0.17 |
| | | | 1.00 | 0.00 | | | 7.8631 | 7.8631 | 0.23 |
| | | | | | | | 8.9261 | 8.9261 | 0.38 |
| ERICSSON AIR 21 B4A B2P w/ Mount Pipe | A | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 5.6334 | 5.6334 | 0.11 |
| | | | 0.00 | 0.00 | | | 7.3373 | 7.3373 | 0.17 |
| | | | 1.00 | 0.00 | | | 7.8532 | 7.2478 | 0.23 |
| | | | | | | | 8.9160 | 8.8537 | 0.38 |
| ERICSSON AIR 21 B4A B2P w/ Mount Pipe | B | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 6.8155 | 6.8155 | 0.11 |
| | | | 0.00 | 0.00 | | | 7.3373 | 6.4717 | 0.17 |
| | | | 1.00 | 0.00 | | | 7.8532 | 7.2478 | 0.23 |
| | | | | | | | 8.9160 | 8.8537 | 0.38 |
| ERICSSON AIR 21 B4A B2P w/ Mount Pipe | C | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 6.8155 | 6.8155 | 0.11 |
| | | | 0.00 | 0.00 | | | 7.3373 | 6.4717 | 0.17 |
| | | | 1.00 | 0.00 | | | 7.8532 | 7.2478 | 0.23 |
| | | | | | | | 8.9160 | 8.8537 | 0.38 |
| KRY 112 144/1 | A | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 0.4083 | 0.2042 | 0.01 |
| | | | 0.00 | 0.00 | | | 0.4969 | 0.2733 | 0.01 |
| | | | 1.00 | 0.00 | | | 0.5941 | 0.3511 | 0.02 |
| | | | | | | | 0.8145 | 0.5326 | 0.03 |
| KRY 112 144/1 | B | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 0.4083 | 0.2042 | 0.01 |
| | | | 0.00 | 0.00 | | | 0.4969 | 0.2733 | 0.01 |
| | | | 1.00 | 0.00 | | | 0.5941 | 0.3511 | 0.02 |
| | | | | | | | 0.8145 | 0.5326 | 0.03 |
| KRY 112 144/1 | C | From Face | 4.0000 | 0.00 | 0.00 | 80.0000 | 0.4083 | 0.2042 | 0.01 |
| | | | 0.00 | 0.00 | | | 0.4969 | 0.2733 | 0.01 |
| | | | 1.00 | 0.00 | | | 0.5941 | 0.3511 | 0.02 |
| | | | | | | | 0.8145 | 0.5326 | 0.03 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment t | Placement | C _A A _A Front | C _A A _A Side | Weight | |
|--------------------------------------|-------------|-------------|--------------|------|----------------------|-----------------|-------------------------------------|------------------------------------|---------|------|
| | | | Horz Lateral | Vert | | | | | | |
| | | | ft | ft | ft | ft ² | ft ² | ft ² | K | |
| ***30*** | | | | | | | | | | |
| Bridge Stiffener (72" x 11" x 1.25") | C | None | | | 0.00 | 30.0000 | No Ice | 1.2500 | 7.7000 | 0.35 |
| | | | | | | | 1/2" | 1.9344 | 8.2423 | 0.38 |
| | | | | | | | Ice | 2.6312 | 8.7932 | 0.42 |
| | | | | | | | 1" Ice | 3.6599 | 9.9210 | 0.51 |
| | | | | | | | 2" Ice | 5.5091 | 12.2802 | 0.77 |
| | | | | | | | 4" Ice | | | |
| *** | | | | | | | | | | |

Tower Pressures - No Ice

G_H = 1.690

| Section Elevation | z | K _Z | q _Z | A _G | F | | | A _R | A _{leg} | Leg % | C _A A _A In Face | C _A A _A Out Face |
|---------------------|----------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|---------------------------------------|--|
| | | | | | a | c | e | | | | | |
| ft | ft | | psf | ft ² | ft ² | ft ² | ft ² | ft ² | % | ft ² | ft ² | |
| L1 110.0000-90.0000 | 100.0000 | 1.373 | 22.49 | 40.000 | A | 0.000 | 40.000 | 40.000 | 100.00 | 0.000 | 0.000 | |
| | | | | | B | 0.000 | 40.000 | 40.000 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 40.000 | 40.000 | 100.00 | 0.000 | 0.000 | |
| L2 90.0000-60.0000 | 75.0000 | 1.264 | 20.72 | 60.000 | A | 0.000 | 60.000 | 60.000 | 100.00 | 0.000 | 0.000 | |
| | | | | | B | 0.000 | 60.000 | 60.000 | 100.00 | 0.000 | 5.742 | |
| | | | | | C | 0.000 | 60.000 | 60.000 | 100.00 | 0.000 | 3.250 | |
| L3 60.0000-39.5000 | 49.7500 | 1.124 | 18.42 | 51.250 | A | 0.000 | 51.250 | 51.250 | 100.00 | 0.000 | 0.000 | |
| | | | | | B | 0.000 | 51.250 | 51.250 | 100.00 | 0.000 | 4.059 | |
| | | | | | C | 0.000 | 51.250 | 51.250 | 100.00 | 0.000 | 3.594 | |
| L4 39.5000-30.0000 | 34.7500 | 1.015 | 16.63 | 23.750 | A | 0.000 | 23.750 | 23.750 | 100.00 | 0.000 | 0.000 | |
| | | | | | B | 0.000 | 23.750 | 23.750 | 100.00 | 0.000 | 1.881 | |
| | | | | | C | 0.000 | 23.750 | 23.750 | 100.00 | 0.000 | 4.037 | |
| L5 30.0000-18.7500 | 24.3750 | 1 | 16.38 | 28.125 | A | 0.000 | 28.125 | 28.125 | 100.00 | 0.000 | 0.000 | |
| | | | | | B | 0.000 | 28.125 | 28.125 | 100.00 | 0.000 | 2.228 | |
| | | | | | C | 0.000 | 28.125 | 28.125 | 100.00 | 0.000 | 2.611 | |
| L6 18.7500-8.2500 | 13.5000 | 1 | 16.38 | 26.250 | A | 0.000 | 26.250 | 26.250 | 100.00 | 0.000 | 0.000 | |
| | | | | | B | 0.000 | 26.250 | 26.250 | 100.00 | 0.000 | 2.079 | |
| | | | | | C | 0.000 | 26.250 | 26.250 | 100.00 | 0.000 | 6.141 | |
| L7 8.2500-0.0000 | 4.1250 | 1 | 16.38 | 20.625 | A | 0.000 | 20.625 | 20.625 | 100.00 | 0.000 | 0.000 | |
| | | | | | B | 0.000 | 20.625 | 20.625 | 100.00 | 0.000 | 1.634 | |
| | | | | | C | 0.000 | 20.625 | 20.625 | 100.00 | 0.000 | 4.992 | |

Tower Pressure - With Ice

G_H = 1.690

| Section Elevation | z | K _Z | q _Z | t _Z | A _G | F | | | A _R | A _{leg} | Leg % | C _A A _A In Face | C _A A _A Out Face |
|---------------------|----------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|---------------------------------------|--|
| | | | | | | a | c | e | | | | | |
| ft | ft | | psf | in | ft ² | ft ² | ft ² | ft ² | ft ² | % | ft ² | ft ² | |
| L1 110.0000-90.0000 | 100.0000 | 1.373 | 4.97 | 1.1423 | 43.808 | A | 0.000 | 43.808 | 43.808 | 100.00 | 0.000 | 0.000 | |
| | | | | | | B | 0.000 | 43.808 | 43.808 | 100.00 | 0.000 | 0.000 | |
| | | | | | | C | 0.000 | 43.808 | 43.808 | 100.00 | 0.000 | 0.000 | |
| L2 90.0000-60.0000 | 75.0000 | 1.264 | 4.58 | 1.1035 | 65.518 | A | 0.000 | 65.518 | 65.518 | 100.00 | 0.000 | 0.000 | |
| | | | | | | B | 0.000 | 65.518 | 65.518 | 100.00 | 0.000 | 12.142 | |
| | | | | | | C | 0.000 | 65.518 | 65.518 | 100.00 | 0.000 | 7.664 | |
| L3 60.0000-39.5000 | 49.7500 | 1.124 | 4.07 | 1.0505 | 54.839 | A | 0.000 | 54.839 | 54.839 | 100.00 | 0.000 | 0.000 | |
| | | | | | | B | 0.000 | 54.839 | 54.839 | 100.00 | 0.000 | 8.366 | |
| | | | | | | C | 0.000 | 54.839 | 54.839 | 100.00 | 0.000 | 8.134 | |
| L4 39.5000-30.0000 | 34.7500 | 1.015 | 3.67 | 1.0062 | 25.343 | A | 0.000 | 25.343 | 25.343 | 100.00 | 0.000 | 0.000 | |
| | | | | | | B | 0.000 | 25.343 | 25.343 | 100.00 | 0.000 | 0.000 | |
| | | | | | | C | 0.000 | 25.343 | 25.343 | 100.00 | 0.000 | 3.793 | |

| Section Elevation ft | z ft | K _z | q _z psf | t _z in | A _G ft ² | F a c e | A _F ft ² | A _R ft ² | A _{leg} ft ² | Leg % | C _A A _A In Face ft ² | C _A A _A Out Face ft ² |
|-------------------------|---------|----------------|-----------------------|----------------------|-----------------------------------|------------------|-----------------------------------|-----------------------------------|-------------------------------------|----------|--|---|
| L5 30.0000- 18.7500 | 24.3750 | 1 | 3.62 | 1.0000 | 30.000 | C | 0.000 | 25.343 | 30.000 | 100.00 | 0.000 | 8.073 |
| L6 18.7500- 8.2500 | 13.5000 | 1 | 3.62 | 1.0000 | 28.000 | A B C | 0.000 0.000 0.000 | 30.000 30.000 30.000 | 28.000 | 100.00 | 0.000 0.000 0.000 | 0.000 4.478 5.555 |
| L7 8.2500- 0.0000 | 4.1250 | 1 | 3.62 | 1.0000 | 22.000 | A B C | 0.000 0.000 0.000 | 28.000 28.000 22.000 | 22.000 | 100.00 | 0.000 0.000 0.000 | 0.000 12.177 0.000 |
| | | | | | | | | 22.000 | 22.000 | 100.00 | 0.000 | 0.000 |
| | | | | | | | | 22.000 | 22.000 | 100.00 | 0.000 | 3.284 |
| | | | | | | | | 22.000 | 22.000 | 100.00 | 0.000 | 9.884 |

Tower Pressure - Service

G_H = 1.690

| Section Elevation ft | z ft | K _z | q _z psf | A _G ft ² | F a c e | A _F ft ² | A _R ft ² | A _{leg} ft ² | Leg % | C _A A _A In Face ft ² | C _A A _A Out Face ft ² | |
|-------------------------|----------|----------------|-----------------------|-----------------------------------|------------------|-----------------------------------|-----------------------------------|-------------------------------------|----------|--|---|-------|
| L1 110.0000- 90.0000 | 100.0000 | 1.373 | 8.79 | 40.000 | A B | 0.000 0.000 | 40.000 40.000 | 40.000 | 100.00 | 0.000 | 0.000 | |
| L2 90.0000- 60.0000 | 75.0000 | 1.264 | 8.09 | 60.000 | A B C | 0.000 0.000 0.000 | 60.000 60.000 60.000 | 60.000 | 100.00 | 0.000 | 0.000 | |
| L3 60.0000- 39.5000 | 49.7500 | 1.124 | 7.20 | 51.250 | A B C | 0.000 0.000 0.000 | 60.000 51.250 51.250 | 51.250 | 100.00 | 0.000 | 0.000 | |
| L4 39.5000- 30.0000 | 34.7500 | 1.015 | 6.50 | 23.750 | A B C | 0.000 0.000 0.000 | 23.750 23.750 23.750 | 23.750 | 100.00 | 0.000 | 0.000 | |
| L5 30.0000- 18.7500 | 24.3750 | 1 | 6.40 | 28.125 | A B C | 0.000 0.000 0.000 | 28.125 28.125 28.125 | 28.125 | 100.00 | 0.000 | 0.000 | |
| L6 18.7500- 8.2500 | 13.5000 | 1 | 6.40 | 26.250 | A B C | 0.000 0.000 0.000 | 26.250 26.250 26.250 | 26.250 | 100.00 | 0.000 | 0.000 | |
| L7 8.2500- 0.0000 | 4.1250 | 1 | 6.40 | 20.625 | A B C | 0.000 0.000 0.000 | 20.625 20.625 20.625 | 20.625 | 100.00 | 0.000 | 0.000 | |
| | | | | | | | | 20.625 | 20.625 | 100.00 | 0.000 | 1.634 |
| | | | | | | | | 20.625 | 20.625 | 100.00 | 0.000 | 4.992 |

Load Combinations

| Comb. No. | Description |
|-----------|-------------|
|-----------|-------------|

- 1 Dead Only
- 2 Dead+Wind 0 deg - No Ice
- 3 Dead+Wind 30 deg - No Ice
- 4 Dead+Wind 60 deg - No Ice
- 5 Dead+Wind 90 deg - No Ice
- 6 Dead+Wind 120 deg - No Ice
- 7 Dead+Wind 150 deg - No Ice
- 8 Dead+Wind 180 deg - No Ice
- 9 Dead+Wind 210 deg - No Ice
- 10 Dead+Wind 240 deg - No Ice
- 11 Dead+Wind 270 deg - No Ice
- 12 Dead+Wind 300 deg - No Ice
- 13 Dead+Wind 330 deg - No Ice
- 14 Dead+Ice
- 15 Dead+Wind 0 deg+Ice
- 16 Dead+Wind 30 deg+Ice
- 17 Dead+Wind 60 deg+Ice

| Comb. No. | Description |
|-----------|-----------------------------|
| 18 | Dead+Wind 90 deg+Ice |
| 19 | Dead+Wind 120 deg+Ice |
| 20 | Dead+Wind 150 deg+Ice |
| 21 | Dead+Wind 180 deg+Ice |
| 22 | Dead+Wind 210 deg+Ice |
| 23 | Dead+Wind 240 deg+Ice |
| 24 | Dead+Wind 270 deg+Ice |
| 25 | Dead+Wind 300 deg+Ice |
| 26 | Dead+Wind 330 deg+Ice |
| 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

| Sectio n No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|--------------------|-----------------|-------------------|------------------|-----------------------|------------|--------------------------------|--------------------------------|
| L1 | 110 - 90 | Pole | Max Tension | 21 | 0.00 | -0.00 | 0.00 |
| | | | Max. Compression | 14 | -6.03 | 0.00 | 0.00 |
| | | | Max. Mx | 11 | -2.91 | 69.09 | 0.00 |
| | | | Max. My | 2 | -2.91 | 0.00 | 69.09 |
| | | | Max. Vy | 11 | -4.49 | 69.09 | 0.00 |
| | | | Max. Vx | 2 | -4.49 | 0.00 | 69.09 |
| L2 | 90 - 60 | Pole | Max. Torque | 25 | 0.00 | 0.00 | 0.00 |
| | | | Max Tension | 14 | -20.35 | 0.12 | -0.13 |
| | | | Max. Compression | 11 | -10.57 | 416.49 | 0.05 |
| | | | Max. Mx | 2 | -10.57 | 0.05 | 416.50 |
| | | | Max. My | 11 | -13.12 | 416.49 | 0.05 |
| | | | Max. Vx | 8 | 13.12 | 0.05 | -416.37 |
| L3 | 60 - 39.5 | Pole | Max. Torque | 4 | 0.00 | 0.00 | 0.46 |
| | | | Max Tension | 1 | -24.83 | 0.16 | -0.73 |
| | | | Max. Compression | 14 | -13.59 | 696.94 | -0.03 |
| | | | Max. Mx | 8 | -13.59 | 0.05 | -696.92 |
| | | | Max. My | 11 | -14.23 | 696.94 | -0.03 |
| | | | Max. Vx | 8 | 14.23 | 0.05 | -696.92 |
| L4 | 39.5 - 30 | Pole | Max. Torque | 4 | 0.00 | 0.00 | 0.43 |
| | | | Max Tension | 1 | -27.18 | 0.17 | -0.98 |
| | | | Max. Compression | 14 | -15.33 | 834.46 | -0.08 |
| | | | Max. Mx | 8 | -15.33 | 0.05 | -834.48 |
| | | | Max. My | 11 | -14.73 | 834.46 | -0.08 |
| | | | Max. Vx | 8 | 14.73 | 0.05 | -834.48 |
| L5 | 30 - 18.75 | Pole | Max. Torque | 4 | 0.00 | 0.00 | 0.41 |
| | | | Max Tension | 1 | -30.43 | 0.19 | -1.29 |
| | | | Max. Compression | 14 | -17.82 | 1005.24 | -0.13 |
| | | | Max. Mx | 8 | -17.82 | 0.05 | -1005.32 |
| | | | Max. My | 11 | -15.41 | 1005.24 | -0.13 |
| | | | Max. Vx | 8 | 15.41 | 0.05 | -1005.32 |
| L6 | 18.75 - 8.25 | Pole | Max. Torque | 4 | 0.00 | 0.00 | 0.40 |
| | | | Max Tension | 1 | -33.79 | 0.21 | -1.57 |
| | | | Max. Compression | 14 | -20.53 | 1169.84 | -0.17 |
| | | | Max. Mx | 8 | -20.53 | 0.04 | -1169.97 |
| | | | Max. My | 11 | -15.94 | 1169.84 | -0.17 |
| | | | Max. Vx | 8 | 15.94 | 0.04 | -1169.84 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|--------------|----------------|---|--|--|--|---|
| L7 | 8.25 - 0 | Pole | Max. Vx Max. Torque Max. Tension Max. Compression Max. Mx Max. My Max. Vy Max. Vx Max. Torque | 8 4 1 14 11 8 11 8 4 | 15.94 0.00 -36.63 -22.86 -22.86 -16.33 16.33 | 0.04 0.00 0.22 1302.94 0.04 1302.94 0.04 | -1169.97 0.39 0.00 -1.79 -0.21 -1303.10 -0.21 -1303.10 0.38 |

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|--------------|--------------------|-----------------|--------|---------|
| L1 | 110 - 90 | 21.15 | 36 | 1.49 | 0.00 |
| L2 | 90 - 60 | 14.95 | 36 | 1.44 | 0.00 |
| L3 | 60 - 39.5 | 6.81 | 34 | 1.05 | 0.00 |
| L4 | 39.5 - 30 | 2.96 | 33 | 0.72 | 0.00 |
| L5 | 30 - 18.75 | 1.69 | 33 | 0.55 | 0.00 |
| L6 | 18.75 - 8.25 | 0.65 | 33 | 0.32 | 0.00 |
| L7 | 8.25 - 0 | 0.13 | 33 | 0.14 | 0.00 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|--------------|--------------------------------------|-----------------|---------------|--------|---------|------------------------|
| 107.0000 | (2) 4"x2" Pipe Mount | 36 | 20.21 | 1.49 | 0.00 | 43613 |
| 105.0000 | Side Arm Mount [SO 102-3] | 36 | 19.59 | 1.49 | 0.00 | 43613 |
| 89.0000 | Platform Mount [LP 502-1] | 36 | 14.65 | 1.44 | 0.00 | 9893 |
| 80.0000 | Platform Mount [LP 305-1] | 34 | 12.00 | 1.35 | 0.00 | 5846 |
| 30.0000 | Bridge Stiffener (72" x 11" x 1.25") | 33 | 1.69 | 0.55 | 0.00 | 2974 |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|--------------|--------------------|-----------------|--------|---------|
| L1 | 110 - 90 | 54.06 | 11 | 3.82 | 0.00 |
| L2 | 90 - 60 | 38.23 | 11 | 3.69 | 0.00 |
| L3 | 60 - 39.5 | 17.40 | 8 | 2.68 | 0.00 |
| L4 | 39.5 - 30 | 7.56 | 8 | 1.84 | 0.00 |
| L5 | 30 - 18.75 | 4.31 | 8 | 1.41 | 0.00 |
| L6 | 18.75 - 8.25 | 1.66 | 8 | 0.83 | 0.00 |
| L7 | 8.25 - 0 | 0.33 | 8 | 0.37 | 0.00 |

Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--------------------------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 107.0000 | (2) 4"x2" Pipe Mount | 11 | 51.66 | 3.81 | 0.00 | 17224 |
| 105.0000 | Side Arm Mount [SO 102-3] | 11 | 50.06 | 3.81 | 0.00 | 17224 |
| 89.0000 | Platform Mount [LP 502-1] | 11 | 37.46 | 3.68 | 0.00 | 3904 |
| 80.0000 | Platform Mount [LP 305-1] | 8 | 30.68 | 3.45 | 0.00 | 2303 |
| 30.0000 | Bridge Stiffener (72" x 11" x 1.25") | 8 | 4.31 | 1.41 | 0.00 | 1164 |

Compression Checks

Pole Design Data

| Section No. | Elevation ft | Size | L ft | L _u ft | K/lr | F _a ksi | A in ² | Actual | | Allow. | | Ratio $\frac{P}{P_a}$ |
|----------------|---------------------|--------------------|---------|----------------------|------|-----------------------|----------------------|--------|---------|---------------------|-------|--------------------------|
| | | | | | | | | P K | K | P _a K | K | |
| L1 | 110 - 90 (1) | P24x1/4 | 20.0000 | 0.0000 | 0.0 | 23.70 | 18.6532 | -2.91 | 442.00 | 0.007 | 0.007 | |
| L2 | 90 - 60 (2) | P24x3/8 | 30.0000 | 0.0000 | 0.0 | 25.20 | 27.8325 | -10.57 | 701.38 | 0.015 | 0.015 | |
| L3 | 60 - 39.5 (3) | 30" x 0.375" | 20.5000 | 0.0000 | 0.0 | 25.07 | 34.9011 | -13.59 | 875.15 | 0.016 | 0.016 | |
| L4 | 39.5 - 30 (4) | RPS 30" x 0.483" | 9.5000 | 0.0000 | 0.0 | 22.78 | 44.7888 | -15.33 | 1020.11 | 0.015 | 0.015 | |
| L5 | 30 - 18.75 (5) | P30x1/2 | 11.2500 | 0.0000 | 0.0 | 25.20 | 46.3385 | -17.82 | 1167.73 | 0.015 | 0.015 | |
| L6 | 18.75 - 8.25 (6) | RPS 30" x 0.71979" | 10.5000 | 0.0000 | 0.0 | 23.23 | 66.2110 | -20.53 | 1538.21 | 0.013 | 0.013 | |
| L7 | 8.25 - 0 (7) | RPS 30" x 0.801" | 8.2500 | 0.0000 | 0.0 | 25.19 | 73.4768 | -22.86 | 1850.73 | 0.012 | 0.012 | |

Pole Bending Design Data

| Section No. | Elevation ft | Size | Actual M _v 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 $\frac{f_{by}}{F_{by}}$ |
|----------------|---------------------|--------------------|------------------------------------|----------------------------------|----------------------------------|----------------------------------|------------------------------------|----------------------------------|----------------------------------|----------------------------------|
| | | | | | | | | | | |
| L2 | 90 - 60 (2) | P24x3/8 | 416.51 | 30.88 | 27.72 | 1.114 | 0.00 | 0.00 | 27.72 | 0.000 |
| L3 | 60 - 39.5 (3) | 30" x 0.375" | 696.95 | 32.76 | 25.07 | 1.306 | 0.00 | 0.00 | 25.07 | 0.000 |
| L4 | 39.5 - 30 (4) | RPS 30" x 0.483" | 834.50 | 30.79 | 25.05 | 1.229 | 0.00 | 0.00 | 25.05 | 0.000 |
| L5 | 30 - 18.75 (5) | P30x1/2 | 1005.3 | 35.89 | 27.72 | 1.295 | 0.00 | 0.00 | 27.72 | 0.000 |
| L6 | 18.75 - 8.25 (6) | RPS 30" x 0.71979" | 1169.9 | 29.66 | 25.56 | 1.161 | 0.00 | 0.00 | 25.56 | 0.000 |
| L7 | 8.25 - 0 (7) | RPS 30" x 0.801" | 1303.1 | 29.93 | 27.71 | 1.080 | 0.00 | 0.00 | 27.71 | 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 $\frac{f_{vt}}{F_{vt}}$ |
|----------------|---------------------|--------------------|------------------|---------------------------------|---------------------------------|----------------------------|-----------------------|----------------------------------|----------------------------------|----------------------------------|
| | | | | | | | | | | |
| L2 | 90 - 60 (2) | P24x3/8 | 13.12 | 0.94 | 16.80 | 0.056 | 0.22 | 0.01 | 16.80 | 0.000 |
| L3 | 60 - 39.5 (3) | 30" x 0.375" | 14.23 | 0.82 | 16.80 | 0.049 | 0.41 | 0.01 | 15.64 | 0.001 |
| L4 | 39.5 - 30 (4) | RPS 30" x 0.483" | 14.73 | 0.66 | 15.18 | 0.043 | 0.36 | 0.01 | 15.18 | 0.000 |
| L5 | 30 - 18.75 (5) | P30x1/2 | 15.41 | 0.67 | 16.80 | 0.040 | 0.36 | 0.01 | 16.80 | 0.000 |
| L6 | 18.75 - 8.25 (6) | RPS 30" x 0.71979" | 15.94 | 0.48 | 15.49 | 0.031 | 0.36 | 0.00 | 15.49 | 0.000 |
| L7 | 8.25 - 0 (7) | RPS 30" x 0.801" | 16.33 | 0.44 | 16.79 | 0.026 | 0.27 | 0.00 | 16.79 | 0.000 |

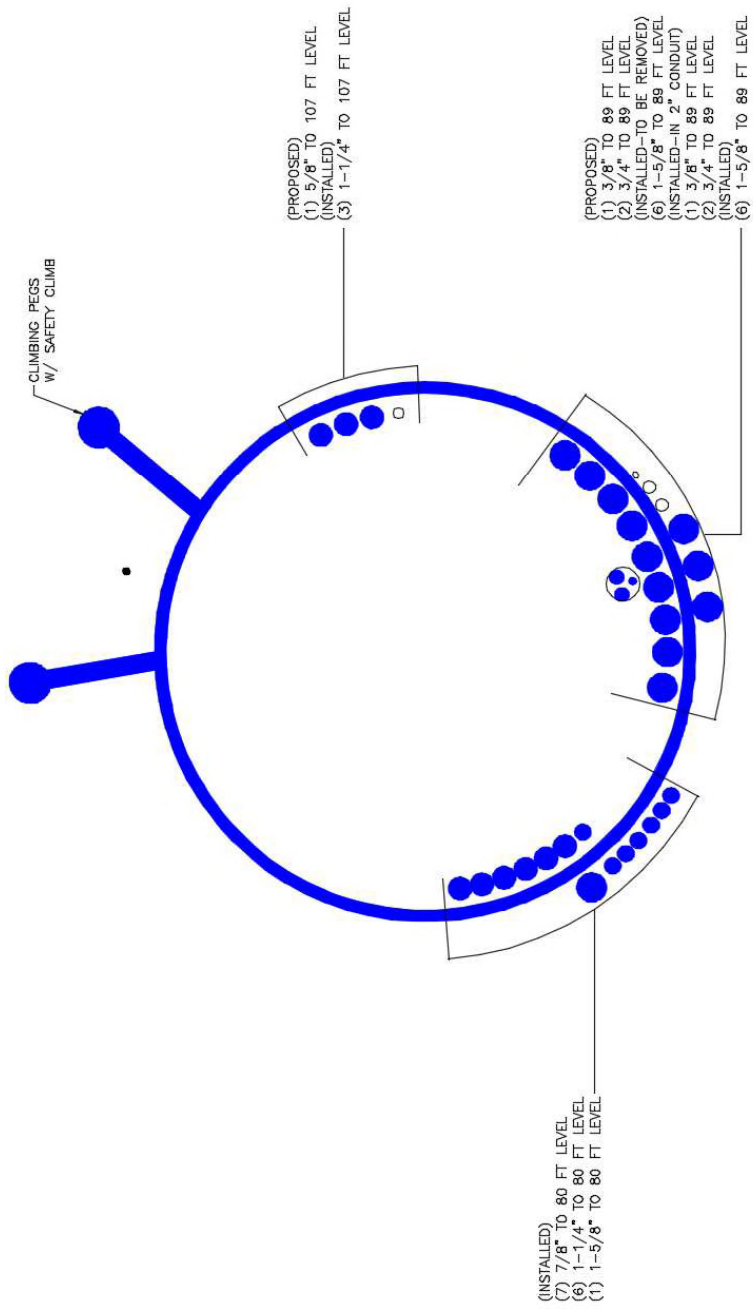
Pole Interaction Design Data

| Section No. | Elevation ft | Ratio | | Ratio | | Ratio | | Ratio | | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|------------------|-----------------|-------------------------|-------------------------|-------------------|-------------------------|-------------------------|-------|-------|--------------------|---------------------|-----------|
| | | $\frac{P}{P_a}$ | $\frac{f_{bx}}{F_{bx}}$ | $\frac{f_{by}}{F_{by}}$ | $\frac{f_v}{F_v}$ | $\frac{f_{vt}}{F_{vt}}$ | $\frac{f_{vt}}{F_{vt}}$ | | | | | |
| L1 | 110 - 90 (1) | 0.007 | 0.319 | 0.000 | 0.029 | 0.000 | 0.000 | 0.327 | 1.333 | | 1.333 | H1-3+VT ✓ |
| L2 | 90 - 60 (2) | 0.015 | 1.114 | 0.000 | 0.056 | 0.000 | 0.000 | 1.132 | 1.333 | | 1.333 | H1-3+VT ✓ |
| L3 | 60 - 39.5 (3) | 0.016 | 1.306 | 0.000 | 0.049 | 0.001 | 0.001 | 1.324 | 1.333 | | 1.333 | H1-3+VT ✓ |
| L4 | 39.5 - 30 (4) | 0.015 | 1.229 | 0.000 | 0.043 | 0.000 | 0.000 | 1.246 | 1.333 | | 1.333 | H1-3+VT ✓ |
| L5 | 30 - 18.75 (5) | 0.015 | 1.295 | 0.000 | 0.040 | 0.000 | 0.000 | 1.312 | 1.333 | | 1.333 | H1-3+VT ✓ |
| L6 | 18.75 - 8.25 (6) | 0.013 | 1.161 | 0.000 | 0.031 | 0.000 | 0.000 | 1.175 | 1.333 | | 1.333 | H1-3+VT ✓ |
| L7 | 8.25 - 0 (7) | 0.012 | 1.080 | 0.000 | 0.026 | 0.000 | 0.000 | 1.093 | 1.333 | | 1.333 | H1-3+VT ✓ |

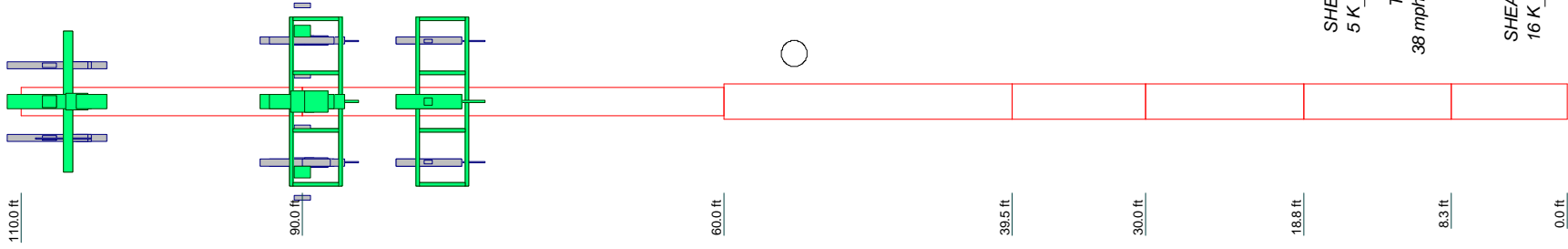
Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | SF*P _{allow} K | % Capacity | Pass Fail |
|-----------------|--------------|----------------|--------------------|------------------|--------|-------------------------|------------|-------------|
| L1 | 110 - 90 | Pole | P24x1/4 | 1 | -2.91 | 589.19 | 24.5 | Pass |
| L2 | 90 - 60 | Pole | P24x3/8 | 2 | -10.57 | 934.94 | 84.9 | Pass |
| L3 | 60 - 39.5 | Pole | 30" x 0.375" | 3 | -13.59 | 1166.57 | 99.4 | Pass |
| L4 | 39.5 - 30 | Pole | RPS 30" x 0.483" | 4 | -15.33 | 1359.81 | 93.5 | Pass |
| L5 | 30 - 18.75 | Pole | P30x1/2 | 5 | -17.82 | 1556.58 | 98.4 | Pass |
| L6 | 18.75 - 8.25 | Pole | RPS 30" x 0.71979" | 6 | -20.53 | 2050.43 | 88.1 | Pass |
| L7 | 8.25 - 0 | Pole | RPS 30" x 0.801" | 7 | -22.86 | 2467.02 | 82.0 | Pass |
| Summary | | | | | | | | |
| Pole (L3) | | | | | | | | 99.4 |
| RATING = | | | | | | | | 99.4 |

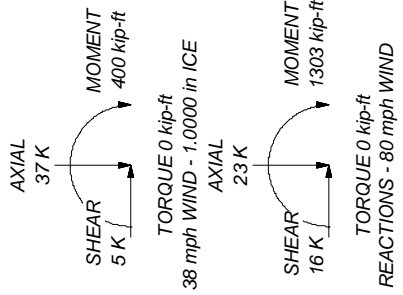
APPENDIX B BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS



| Section | Size | Length (ft) | Grade | Weight (k) |
|---------|--------------------|-------------|------------------------------------|------------|
| 1 | P24x1/4 | 20.0000 | | 1.3 |
| 2 | P24x3/8 | 30.0000 | A53-B-42 | 2.8 |
| 3 | 30" x 0.375" | 20.5000 | | 2.4 |
| 4 | RPS 30" x 0.483" | 9.5000 | Reinf 37.96 ksi | 1.4 |
| 5 | P30x1/2 | 11.2500 | A53-B-42 | 1.8 |
| 6 | RPS 30" x 0.71979" | 10.5000 | Reinf 41.98 ksi Reinf 38.72 ksi | 2.4 |
| 7 | RPS 30" x 0.801" | 8.2500 | | 2.1 |
| | | | | 14.2 |



DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|-----------|---------------------------------------|-----------|
| (2) 4x2" Pipe Mount | 107 | 7750.00 w/ Mount Pipe | 89 |
| (2) 4x2" Pipe Mount | 107 | 7750.00 w/ Mount Pipe | 89 |
| (2) 4x2" Pipe Mount | 107 | 7750.00 w/ Mount Pipe | 89 |
| APXSPP18-C-A20 w/ Mount Pipe | 107 | RRUS-11 | 89 |
| APXSPP18-C-A20 w/ Mount Pipe | 107 | RRUS-11 | 89 |
| APXSPP18-C-A20 w/ Mount Pipe | 107 | RRUS-11 | 89 |
| IBC1900HG-2A | 107 | RRUS-11 | 89 |
| IBC1900HG-2A | 107 | RRUS-11 | 89 |
| IBC1900HG-2A | 107 | RRUS-11 | 89 |
| IBC1900BB-1 | 107 | DC6-48-60-18-8F | 89 |
| IBC1900BB-1 | 107 | (2) LGP21401 | 89 |
| IBC1900BB-1 | 107 | (2) LGP21401 | 89 |
| T-Arm Mount [TA 702-3] | 107 | (2) LGP21401 | 89 |
| APXVTM14-C-120 w/ Mount Pipe | 107 | OS66512-2 w/ Mount Pipe | 89 |
| APXVTM14-C-120 w/ Mount Pipe | 107 | OS66512-2 w/ Mount Pipe | 89 |
| APXVTM14-C-120 w/ Mount Pipe | 107 | OS66512-2 w/ Mount Pipe | 89 |
| Side Arm Mount [SO 102-3] | 105 | DC6-48-60-18-8F | 89 |
| 800MHz 2X50W RRR W/FILTER W/Mount pipes | 105 | WCS RRU32-B30 | 89 |
| 800MHz 2X50W RRR W/FILTER W/Mount pipes | 105 | WCS RRU32-B30 | 89 |
| 800MHz 2X50W RRR W/FILTER W/Mount pipes | 105 | WCS RRU32-B30 | 89 |
| PCS 1900MHz 4x45W-65MHz w/Mount Pipe | 105 | Platform Mount [LP 305-1] | 80 |
| PCS 1900MHz 4x45W-65MHz w/Mount Pipe | 105 | 6x2" Pipe Mount | 80 |
| PCS 1900MHz 4x45W-65MHz w/Mount Pipe | 105 | 6x2" Pipe Mount | 80 |
| PCS 1900MHz 4x45W-65MHz w/Mount Pipe | 105 | 6x2" Pipe Mount | 80 |
| PCS 1900MHz 4x45W-65MHz w/Mount Pipe | 105 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 80 |
| PCS 1900MHz 4x45W-65MHz w/Mount Pipe | 105 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 80 |
| TD-RRH8x20-25 | 105 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 80 |
| TD-RRH8x20-25 | 105 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 80 |
| TD-RRH8x20-25 | 105 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 80 |
| Platform Mount [LP 502-1] | 89 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 80 |
| 6x2" Pipe Mount | 89 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 80 |
| 6x2" Pipe Mount | 89 | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 80 |
| AIM-X-CD-16-65-00T-RET w/ Mount Pipe | 89 | KRY 112 144/1 | 80 |
| AIM-X-CD-16-65-00T-RET w/ Mount Pipe | 89 | KRY 112 144/1 | 80 |
| AIM-X-CD-16-65-00T-RET w/ Mount Pipe | 89 | KRY 112 144/1 | 80 |
| AIM-X-CD-16-65-00T-RET w/ Mount Pipe | 89 | Bridge Stiffener (72" x 11" x 1.25") | 30 |

MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|-----------------|--------|--------|-----------------|--------|--------|
| A53-B-42 | 42 ksi | 63 ksi | Reinf 38.72 ksi | 39 ksi | 49 ksi |
| Reinf 37.96 ksi | 38 ksi | 48 ksi | Reinf 41.98 ksi | 42 ksi | 53 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: 99.4%



Paul J. Ford and Company
 250 E. Broad Street Suite 600
 Columbus, OH 43215
 Phone: 614.221.6679
 FAX: 614.448.4105

Job: **110' MP / WESTON SQUARE**
 Project: **PJF# 37516-1244 / BU# 876325**
 Client: CCI
 Code: TIA/EIA-222-F
 Date: 04/25/16
 Drawn by: Jonathan Sommer
 Appr:
 Scale: NTS
 Dwg No. E-1

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

| |
|---------------------------------|
| BU#: 876325 |
| Site Name: <i>Weston Square</i> |
| App #: |

| | |
|--------------------|------|
| Pole Manufacturer: | Rohn |
|--------------------|------|

| Reactions | |
|------------|---------------|
| Moment: | 69.09 ft-kips |
| Axial: | 2.91 kips |
| Shear: | 4.49 kips |
| Elevation: | 90 feet |

| Bolt Data | |
|-----------------|------|
| Qty: | 20 |
| Diameter (in.): | 1 |
| Bolt Material: | A325 |
| N/A: | 0 |
| N/A: | 0 |
| Circle (in.): | 29 |
| Bolt Fu: | 120 |
| Bolt Fy: | 92 |
| <-- Disregard | |
| <-- Disregard | |

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

Flange Bolt Results

Bolt Tension Capacity, **B**: 46.08 kips
 Max Bolt directly applied T: 5.57 Kips
 Min. PL "tc" for **B** cap. **w/o** Pry: 2.018 in
 Min PL "treq" for actual **T w/** Pry: 0.535 in
 Min PL "t" for actual **T w/o** Pry: 0.702 in
 T allowable with Prying: 35.76 kips
 Prying Force, Q: 0.00 kips
 Total Bolt Tension=T+Q: 5.57 kips
 Prying Bolt Stress Ratio=(T+Q)/(B): 12.1% **Pass**

| |
|--------------|
| Rigid |
| Service, ASD |
| Fy*ASIF |

0≤d'≤1 case

| Plate Data | |
|-------------------|---------|
| Diam: | 32 in |
| Thick, t: | 1.5 in |
| Grade (Fy): | 36 ksi |
| Strength, Fu: | 58 ksi |
| Single-Rod B-eff: | 3.77 in |

Exterior Flange Plate Results

Flexural Check: OK
 Compression Side Plate Stress: 36.0 ksi
 Allowable Plate Stress: Rohn/Pitrod, OK
 Compression Plate Stress Ratio: Rohn/Pitrod, OK

| |
|--------------------|
| Rigid |
| Service ASD |
| 0.75*Fy*ASIF |
| Comp. Y.L. Length: |
| 16.28 |

| Stiffener Data (Welding at Both Sides) | |
|--|-----------------|
| Config: | 0 * |
| Weld Type: | 0 |
| Groove Depth: | 0 in ** |
| Groove Angle: | 0 degrees |
| Fillet H. Weld: | 0 <-- Disregard |
| Fillet V. Weld: | 0 in |
| Width: | 0 in |
| Height: | 0 in |
| Thick: | 0 in |
| Notch: | 0 in |
| Grade: | 0 ksi |
| Weld str.: | 0 ksi |

Tension Side Stress Ratio, (treq/t)²: 12.7% **Pass**

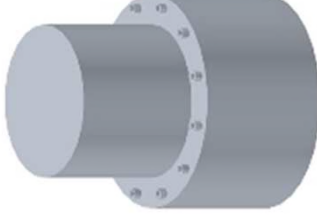
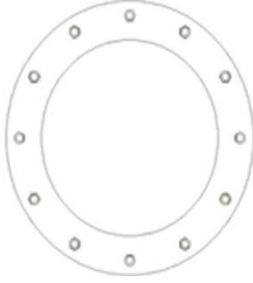
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



| Pole Data | |
|--------------------|----------------|
| Diam: | 24 in |
| Thick: | 0.25 in |
| Grade: | 42 ksi |
| # of Sides: | 0 "0" IF Round |
| Fu | 63 ksi |
| Reinf. Fillet Weld | 0 "0" if None |

| Stress Increase Factor | |
|------------------------|-----------|
| ASIF: | 1.3333333 |

* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: 876325
 Site Name: *Weston Square*
 App #:

| | |
|--------------------|------|
| Pole Manufacturer: | Rohn |
|--------------------|------|

| Bolt Data | |
|-----------------|------|
| Qty: | 20 |
| Diameter (in.): | 1 |
| Bolt Material: | A325 |
| N/A: | 0 |
| N/A: | 0 |
| Circle (in.): | 29 |
| Bolt Fu: | |
| Bolt Fy: | |
| <-- Disregard | |
| <-- Disregard | |

| |
|-----------|
| 120 |
| 92 |
| Bolt Fty: |
| 44.00 |

| Plate Data | |
|-------------------|---------|
| Diam: | 32 in |
| Thick, t: | 1.5 in |
| Grade (Fy): | 36 ksi |
| Strength, Fu: | 58 ksi |
| Single-Rod B-eff: | 3.77 in |

| Stiffener Data (Welding at Both Sides) | |
|--|-----------------|
| Config: | 0 * |
| Weld Type: | 0 |
| Groove Depth: | 0 in ** |
| Groove Angle: | 0 degrees |
| Fillet H. Weld: | 0 <-- Disregard |
| Fillet V. Weld: | 0 in |
| Width: | 0 in |
| Height: | 0 in |
| Thick: | 0 in |
| Notch: | 0 in |
| Grade: | 0 ksi |
| Weld str.: | 0 ksi |

| Pole Data | |
|--------------------|----------------|
| Diam: | 24 in |
| Thick: | 0.375 in |
| Grade: | 42 ksi |
| # of Sides: | 0 "0" IF Round |
| Fu | 63 ksi |
| Reint. Fillet Weld | 0 "0" if None |

| Stress Increase Factor | |
|------------------------|-----------|
| ASIF: | 1.3333333 |

* 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

| Reactions | |
|------------|---------------|
| Moment: | 69.09 ft-kips |
| Axial: | 2.91 kips |
| Shear: | 4.49 kips |
| Elevation: | 90 feet |

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

Flange Bolt Results

Bolt Tension Capacity, **B**: 46.08 kips
 Max Bolt directly applied T: 5.57 Kips
 Min. PL "tc" for **B** cap. **w/o** Pry: 2.018 in
 Min PL "treq" for actual **T w/** Pry: 0.535 in
 Min PL "t" for actual **T w/o** Pry: 0.702 in
 T allowable with Prying: 35.76 kips
 Prying Force, Q: 0.00 kips
 Total Bolt Tension=T+Q: 5.57 kips
 Prying Bolt Stress Ratio=(T+Q)/(B): 12.1% **Pass**

| |
|--------------|
| Rigid |
| Service, ASD |
| Fy*ASIF |

0≤d'≤1 case

Exterior Flange Plate Results

Flexural Check
 Rohn/Pitrod, OK
 Compression Side Plate Stress: 36.0 ksi
 Allowable Plate Stress:
 Rohn/Pitrod, OK

| |
|--------------------|
| Rigid |
| Service ASD |
| 0.75*Fy*ASIF |
| Comp. Y.L. Length: |
| 16.28 |

No Prying

Tension Side Stress Ratio, (treq/t)²: 12.7% **Pass**

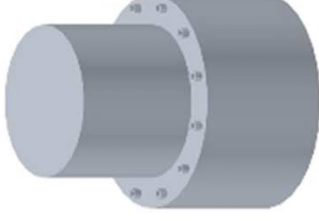
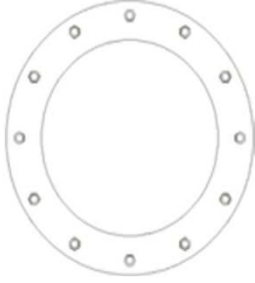
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

| |
|---------------------------------|
| BU#: 876325 |
| Site Name: <i>Weston Square</i> |
| App #: |

| | |
|--------------------|------|
| Pole Manufacturer: | Rohn |
|--------------------|------|

| Bolt Data | |
|-----------------|------|
| Qty: | 12 |
| Diameter (in.): | 1.5 |
| Bolt Material: | A325 |
| N/A: | 0 |
| N/A: | 0 |
| Circle (in.): | 35 |
| Bolt Fu: | |
| Bolt Fy: | |
| <-- Disregard | |
| <-- Disregard | |

| |
|-----------|
| 105 |
| 81 |
| Bolt Fty: |
| 44.00 |

| Plate Data | |
|-------------------|---------|
| Diam: | 41 in |
| Thick, t: | 2 in |
| Grade (Fy): | 36 ksi |
| Strength, Fu: | 58 ksi |
| Single-Rod B-eff: | 6.28 in |

| Stiffener Data (Welding at Both Sides) | |
|--|-----------------|
| Config: | 0 * |
| Weld Type: | 0 |
| Groove Depth: | 0 in ** |
| Groove Angle: | 0 degrees |
| Fillet H. Weld: | 0 <-- Disregard |
| Fillet V. Weld: | 0 in |
| Width: | 0 in |
| Height: | 0 in |
| Thick: | 0 in |
| Notch: | 0 in |
| Grade: | 0 ksi |
| Weld str.: | 0 ksi |

| Pole Data | |
|--------------------|----------------|
| Diam: | 24 in |
| Thick: | 0.375 in |
| Grade: | 42 ksi |
| # of Sides: | 0 "0" IF Round |
| Fu | 63 ksi |
| Reint. Fillet Weld | 0 "0" if None |

| Stress Increase Factor | |
|------------------------|-----------|
| ASIF: | 1.3333333 |

* 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

| Reactions | |
|------------|----------------|
| Moment: | 416.51 ft-kips |
| Axial: | 10.57 kips |
| Shear: | 13.12 kips |
| Elevation: | 60 feet |

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

Flange Bolt Results

| |
|--------------|
| Rigid |
| Service, ASD |
| Fty*ASIF |

103.67 kips
 46.72 Kips
 3.614 in

Bolt Tension Capacity, **B**:
 Max Bolt directly applied T:
 Min. PL "tc" for **B** cap. **w/o** Pry:
 Min PL "treq" for actual **T w/ Pry**:
 Min PL "t1" for actual **T w/o Pry**:
 T allowable with Prying:
 Prying Force, Q:
 Total Bolt Tension=T+Q:
 Prying Bolt Stress Ratio=(T+Q)/(B):

55.60 kips
 18.97 kips
 65.69 kips
 63.4% **Pass**

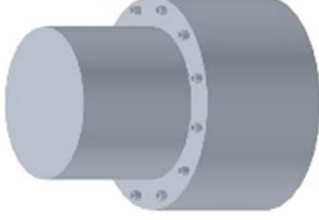
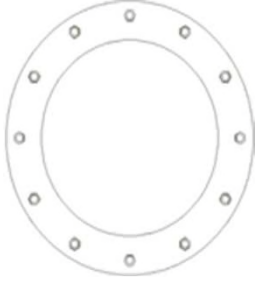
| |
|-----------------------------|
| Rigid |
| Service, ASD |
| 0.75*Fy*ASIF |
| Comp. Y.L. Length: 25.48 |

Exterior Flange Plate Results
 Flexural Check
 Rohn/Pitrod, OK
 Compression Side Plate Stress:
 Allowable Plate Stress:
 36.0 ksi
 Rohn/Pitrod, OK
Prying Occurs, PL Check:
 Tension Side Stress Ratio, (treq/t)²:
 84.0% **Pass**

n/a

Stiffener Results

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



Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

| |
|---------------------------------|
| BU#: 876325 |
| Site Name: <i>Weston Square</i> |
| App #: |

| | |
|--------------------|------|
| Pole Manufacturer: | Rohn |
|--------------------|------|

| Bolt Data | |
|-----------------|------|
| Qty: | 12 |
| Diameter (in.): | 1.5 |
| Bolt Material: | A325 |
| N/A: | 0 |
| N/A: | 0 |
| Circle (in.): | 35 |
| Bolt Fu: | |
| Bolt Fy: | |
| <-- Disregard | |
| <-- Disregard | |

| |
|-----------|
| 105 |
| 81 |
| Bolt Fty: |
| 44.00 |

| Plate Data | |
|-------------------|---------|
| Diam: | 41 in |
| Thick, t: | 2 in |
| Grade (Fy): | 36 ksi |
| Strength, Fu: | 58 ksi |
| Single-Rod B-eff: | 7.85 in |

| Stiffener Data (Welding at Both Sides) | |
|--|-----------------|
| Config: | 0 * |
| Weld Type: | 0 |
| Groove Depth: | 0 in ** |
| Groove Angle: | 0 degrees |
| Fillet H. Weld: | 0 <-- Disregard |
| Fillet V. Weld: | 0 in |
| Width: | 0 in |
| Height: | 0 in |
| Thick: | 0 in |
| Notch: | 0 in |
| Grade: | 0 ksi |
| Weld str.: | 0 ksi |

| Pole Data | |
|--------------------|----------------|
| Diam: | 30 in |
| Thick: | 0.375 in |
| Grade: | 42 ksi |
| # of Sides: | 0 "0" IF Round |
| Fu | 63 ksi |
| Reint. Fillet Weld | 0 "0" if None |

| Stress Increase Factor | |
|------------------------|-----------|
| ASIF: | 1.3333333 |

* 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

| Reactions | |
|------------|----------------|
| Moment: | 416.51 ft-kips |
| Axial: | 10.57 kips |
| Shear: | 13.12 kips |
| Elevation: | 60 feet |

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

Flange Bolt Results

| |
|--------------|
| Rigid |
| Service, ASD |
| Fy*ASIF |

Bolt Tension Capacity, **B**: 103.67 kips
 Max Bolt directly applied T: 46.72 Kips
 Min. PL "tc" for **B** cap. **w/o** Pry: 1.962 in
 Min PL "treq" for actual **T w/** Pry: 0.981 in
 Min PL "t" for actual **T w/o** Pry: 1.317 in
 T allowable w/o Prying: 103.67 kips
 Prying Force, Q: 0.00 kips
 Total Bolt Tension=T+Q: 46.72 kips
 Non-Prying Bolt Stress Ratio, T/B: 45.1% **Pass**

d'<0 case

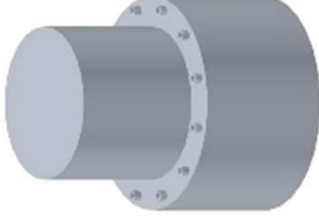
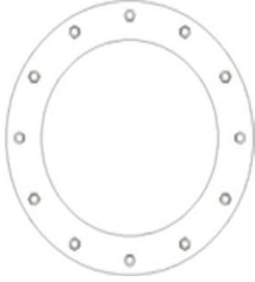
| |
|--------------------|
| Rigid |
| Service, ASD |
| 0.75*Fy*ASIF |
| Comp. Y.L. Length: |
| 18.03 |

Exterior Flange Plate Results
 Flexural Check
 Compression Side Plate Stress: Rohn/Pitrod, OK
 Allowable Plate Stress: 36.0 ksi
 Compression Plate Stress Ratio: Rohn/Pitrod, OK
No Prying
 Tension Side Stress Ratio, (treq/t)^2: 24.1% **Pass**

n/a

Stiffener Results

Horizontal Weld : N/A for Rohn / Pitrod
 Vertical Weld: N/A
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: N/A
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: N/A
 Plate Comp. (AISC Bracket): N/A
Pole Results
 Pole Punching Shear Check: N/A



Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)

General Parameters and Loading:

| | |
|----------------------------|-----------------|
| Flange Elevation: | 30.00 ft |
| TIA Reference Standard: | TIA/EIA-222-F |
| AISC Manual: | 9th Ed. (Green) |
| Method: | ASD |
| ASD Stress Increase, ASIF: | 1.3333333333 |
| Moment, Mf: | 834.5 k-ft |
| Axial, Pf: | 15.3 kips |
| Shear, Vf: | 14.7 kips |

Pole Parameters:

| | Upper Pole | Lower Pole |
|----------------------|------------|------------|
| Pole Diameter, Dp: | 30.00 in | 30.00 in |
| Pole Thickness, tp: | 0.3750 in | 0.5000 in |
| Pole Fy: | 42 ksi | 42 ksi |
| Pole Fu: | 63 ksi | 63 ksi |
| Flange Diameter, Df: | 41.00 in | 41.00 in |

Bridge Stiffener Parameters:

| | Stiffener Type 1 | Stiffener Type 2 |
|--------------------------------|--------------------------------------|--------------------------------------|
| Qty. Stiffeners: | 3 | 0 |
| Upper Weld Length, L1: | 34.00 in | 0.00 in |
| Lower Weld Length, L2: | 32.38 in | 0.00 in |
| Weld Size, w: | 0.3750 in | 0.0000 in |
| Electrode: | E70 | E70 |
| Effective Stiffener Width, Ws: | 5.00 in | 0.00 in |
| Stiffener Thickness, ts: | 1.25 in | 0.00 in |
| Notch, n: | 0.50 in | 0.00 in |
| Stiffener Fy: | 65 ksi | 0 ksi |
| Stiffener Fu: | 80 ksi | 0 ksi |
| Unbraced Length, L: | 5.63 in | 0.00 in |
| K: | 0.80 | 0.00 |
| Stiffener Spacing: | Symmetric | Symmetric |
| Start Angle, for Symmetric: | 0 degrees | 0 degrees |
| Stiffener Circle: | 47.00 in = Df + 2 n + Ws | 41.00 in = Df + 2 n + Ws |
| Upper Eccentricity, e1: | 8.50 in = (Df - Dp) / 2 + n + Ws / 2 | 5.50 in = (Df - Dp) / 2 + n + Ws / 2 |
| Lower Eccentricity, e2: | 8.50 in = (Df - Dp) / 2 + n + Ws / 2 | 5.50 in = (Df - Dp) / 2 + n + Ws / 2 |

Flange Bolt Parameters:

Number of Bolt Circles: **(1) Bolt Circle**

| | Bolt Circle 1 | Bolt Circle 2 |
|-----------------------------|------------------------|------------------------|
| Qty. Bolts: | 0 | 0 |
| Bolt Diameter: | 1.50 in | 0.00 in |
| Bolt Circle: | 35.00 in | 0.00 in |
| Bolt Spacing: | Symmetric | Symmetric |
| Start Angle, for Symmetric: | 0 degrees | 0 degrees |
| Bolt Area, Ag: | 0.0000 in ² | 0.0000 in ² |
| Max. Tension: | 0.00 kips | 0.00 kips |
| Max. Net Tension: | 0.00 kips | 0.00 kips |
| Max. Net Compression: | 0.00 kips | 0.00 kips |
| Moment to Bolt Circle: | 0.00 k-ft | 0.00 k-ft |
| Axial to Bolt Circle: | 0.00 kips | 0.00 kips |
| Shear to Bolt Circle: | 0.00 kips | 0.00 kips |
| Equivalent Bolt Circle: | 0.00 in | 0.00 in |

Weld Analysis per AISC Table XIX & pg. 4-72:

| | Stiffener Type 1 | Stiffener Type 2 |
|----------------------|----------------------------|--------------------------|
| D: | 6 | 0 |
| a: | 0.2500 in = e1 / L1 | 0.0000 in = e1 / L1 |
| k: | 0 | 0 |
| C: | 1.2600 | 0.0000 |
| C1: | 1.0000 | 1.0000 |
| ASIF: | 1.3333 | 1.3333 |
| Stiffener Axial, Ps: | 289.3 kips | 0.0 kips |
| Allowable Axial, Pa: | 342.7 kips = ASIF C C1 D L | 0.0 kips = ASIF C C1 D L |
| Ratio: | 84.4% | 0.0% |

Pole Analysis per AISC Sect. F4:

| | Upper Pole | Stiffener Type 1 | Stiffener Type 2 |
|-----------------------|---|---|---|
| Stiffener Axial, P: | 289.3 kips | 0.0 kips | 0.0 kips |
| Effective Throat, te: | 0.2651 in = 0.707 w | 0.0000 in = 0.707 w | 0.0000 in = 0.707 w |
| Shear Stress, fv: | 4.3 ksi = P / (2 L1) | 0.0 ksi = P / (2 L1) | 0.0 ksi = P / (2 L1) |
| Section Modulus, S: | 385.3 in ³ = L ³ / 3 | 0.0 in ³ = L ³ / 3 | 0.0 in ³ = L ³ / 3 |
| Bending Stress, fb: | 6.4 ksi = P e1 / S | 0.0 ksi = P e1 / S | 0.0 ksi = P e1 / S |
| Combined Stress, f: | 7.7 ksi = (fv ² + fb ²) ^{1/2} | 0.0 ksi = (fv ² + fb ²) ^{1/2} | 0.0 ksi = (fv ² + fb ²) ^{1/2} |
| ASIF: | 1.3333 | 0.0000 | 0.0000 |
| Allowable Stress, F: | 8.4 ksi = ASIF (0.4 Fy) tp | 0.0 ksi = ASIF (0.4 Fy) tp | 0.0 ksi = ASIF (0.4 Fy) tp |
| Ratio: | 91.3% | 0.0% | 0.0% |

| | Stiffener Type 1 | Stiffener Type 2 |
|----------------------|----------------------------|--------------------------|
| D: | 6 | 0 |
| a: | 0.2625 in = e2 / L2 | 0.0000 in = e2 / L2 |
| k: | 0 | 0 |
| C: | 1.2289 | 0.0000 |
| C1: | 1.0000 | 1.0000 |
| ASIF: | 1.3333 | 1.3333 |
| Stiffener Axial, Ps: | 289.3 kips | 0.0 kips |
| Allowable Axial, Pa: | 318.5 kips = ASIF C C1 D L | 0.0 kips = ASIF C C1 D L |
| Ratio: | 90.8% | 0.0% |

| | Upper Pole | Stiffener Type 1 | Stiffener Type 2 |
|-----------------------|---|---|---|
| Stiffener Axial, P: | 289.3 kips | 0.0 kips | 0.0 kips |
| Effective Throat, te: | 0.2651 in = 0.707 w | 0.0000 in = 0.707 w | 0.0000 in = 0.707 w |
| Shear Stress, fv: | 4.5 ksi = P / (2 L2) | 0.0 ksi = P / (2 L2) | 0.0 ksi = P / (2 L2) |
| Section Modulus, S: | 349.4 in ³ = L2 ³ / 3 | 0.0 in ³ = L2 ³ / 3 | 0.0 in ³ = L2 ³ / 3 |
| Bending Stress, fb: | 7.0 ksi = P e2 / S | 0.0 ksi = P e2 / S | 0.0 ksi = P e2 / S |
| Combined Stress, f: | 8.3 ksi = (fv ² + fb ²) ^{1/2} | 0.0 ksi = (fv ² + fb ²) ^{1/2} | 0.0 ksi = (fv ² + fb ²) ^{1/2} |
| ASIF: | 1.3333 | 0.0000 | 0.0000 |
| Allowable Stress, F: | 11.2 ksi = ASIF (0.4 Fy) tp | 0.0 ksi = ASIF (0.4 Fy) tp | 0.0 ksi = ASIF (0.4 Fy) tp |
| Ratio: | 74.4% | 0.0% | 0.0% |

Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B

| | Stiffener Type 1 | Stiffener Type 2 |
|----------------------------|--|---|
| Gross Area, Ag: | 6.2500 in ² | 0.0000 in ² |
| Net Area, An: | 6.2500 in ² | 0.0000 in ² |
| Stiffener Axial, P: | 289.3 kips | 0.0 kips |
| Stiffener Stress, f: | 46.3 ksi = P / Ag | 0.0 ksi = P / Ag |
| b: | 11.0000 in = (Df - Dp) / 2 + n + Ws, Upper Pole | 0.0000 in = (Df - Dp) / 2 + n + Ws, Upper Pole |
| b / ts: | 8.8000 in | 0.0000 in |
| Q, Where Qa = 1.0: | 1.0000 | 0.0000 |
| r: | 0.3608 in ³ | 0.0000 in ³ |
| K L / r: | 12.4708 | 0.0000 |
| ASIF: | 1.3333 | 0.0000 |
| Allowable Axial, Fa: | 50.05 ksi = ASIF (1 - (K L / r) / 2 Cc ²) Fy / (5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³) | 0.0000 ksi = ASIF (1 - (K L / r) / 2 Cc ²) Fy / (5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³) |
| ASIF: | 1.3333 | 0.0000 |
| Allowable Bending, Fb: | 52.00 ksi = ASIF 0.6 Fy | 0.0000 ksi = ASIF 0.6 Fy |
| ASIF: | 1.3333 | 0.0000 |
| Allowable Net Tension, Ft: | 53.33 ksi = ASIF 0.5 Fu | 0.0000 ksi = ASIF 0.5 Fu |
| Ratio: | 92.5% | 0.0% |

Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B

| | Stiffener Type 2 | Stiffener Type 2 |
|----------------------------|---|---|
| Gross Area, Ag: | 0.0000 in ² | 0.0000 in ² |
| Net Area, An: | 0.0000 in ² | 0.0000 in ² |
| Stiffener Axial, P: | 0.0 kips | 0.0 kips |
| Stiffener Stress, f: | 0.0 ksi = P / Ag | 0.0 ksi = P / Ag |
| b: | 0.0000 in = (Df - Dp) / 2 + n + Ws, Upper Pole | 0.0000 in = (Df - Dp) / 2 + n + Ws, Upper Pole |
| b / ts: | 0.0000 in | 0.0000 in |
| Q, Where Qa = 1.0: | 0.0000 | 0.0000 |
| r: | 0.0000 in ³ | 0.0000 in ³ |
| K L / r: | 0.0000 | 0.0000 |
| ASIF: | 0.0000 | 0.0000 |
| Allowable Axial, Fa: | 0.0000 ksi = ASIF (1 - (K L / r) / 2 Cc ²) Fy / (5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³) | 0.0000 ksi = ASIF (1 - (K L / r) / 2 Cc ²) Fy / (5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³) |
| ASIF: | 0.0000 | 0.0000 |
| Allowable Bending, Fb: | 0.0000 ksi = ASIF 0.6 Fy | 0.0000 ksi = ASIF 0.6 Fy |
| ASIF: | 0.0000 | 0.0000 |
| Allowable Net Tension, Ft: | 0.0000 ksi = ASIF 0.5 Fu | 0.0000 ksi = ASIF 0.5 Fu |
| Ratio: | 0.0% | 0.0% |

Analysis Summary:

Bridge Stiffener Type 1
 Weld Analysis Ratio: 90.8% PASS
 Pole Analysis Ratio: 91.3% PASS
 Stiffener Analysis Ratio: 92.5% PASS

Bridge Stiffener Type 2
 Weld Analysis Ratio: 0.0% PASS
 Pole Analysis Ratio: 0.0% PASS
 Stiffener Analysis Ratio: 0.0% PASS

v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment = 1303 k-ft
 Axial = 23.0 kips
 Shear = 16.0 kips
 Anchor Qty = 15

T/A Ref. F
 ASIF = 1.3333
 Max Ratio = 100.0%

Location = Base Plate
 η = N/A for BP, Rev. G Sect. 4.9.9
 Threads = N/A for FP, Rev. G

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

| Item | Nominal Anchor Dia, in | Spec | Fy, ksi | Fu, ksi | Location, degrees | Anchor Circle, in | Area Override, in ² | Max Net Compression, kips | Max Net Tension, kips | Load for Capacity Calc, kips | Capacity Override, kips | Capacity, kips | Capacity Ratio |
|------|------------------------|--------------------|---------|---------|-------------------|-------------------|--------------------------------|---------------------------|-----------------------|------------------------------|-------------------------|----------------|----------------|
| 1 | 1.500 | A354 Gr BC | 109 | 125 | 0.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 2 | 1.500 | A354 Gr BC | 109 | 125 | 30.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 3 | 1.500 | A354 Gr BC | 109 | 125 | 60.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 4 | 1.500 | A354 Gr BC | 109 | 125 | 90.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 5 | 1.500 | A354 Gr BC | 109 | 125 | 120.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 6 | 1.500 | A354 Gr BC | 109 | 125 | 150.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 7 | 1.500 | A354 Gr BC | 109 | 125 | 180.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 8 | 1.500 | A354 Gr BC | 109 | 125 | 210.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 9 | 1.500 | A354 Gr BC | 109 | 125 | 240.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 10 | 1.500 | A354 Gr BC | 109 | 125 | 270.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 11 | 1.500 | A354 Gr BC | 109 | 125 | 300.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 12 | 1.500 | A354 Gr BC | 109 | 125 | 330.0 | 35.00 | 0.00 | 93.30 | 90.53 | 90.53 | 0.00 | 97.19 | 93.1% |
| 13 | 1.750 | Dwywidag (150 ksi) | 127.7 | 150 | 15.0 | 44.50 | 0.00 | 181.46 | 177.21 | 177.21 | 0.00 | 178.99 | 99.0% |
| 14 | 1.750 | Dwywidag (150 ksi) | 127.7 | 150 | 135.0 | 44.50 | 0.00 | 181.46 | 177.21 | 177.21 | 0.00 | 178.99 | 99.0% |
| 15 | 1.750 | Dwywidag (150 ksi) | 127.7 | 150 | 255.0 | 44.50 | 0.00 | 181.46 | 177.21 | 177.21 | 0.00 | 178.99 | 99.0% |

29.34

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

TIA Rev F

Site Data

| |
|---------------------------------|
| BU#: 876325 |
| Site Name: |
| App #: |
| Pole Manufacturer: <i>Other</i> |

| Reactions | | Moment adjusted to account for additional anchor rods. |
|-----------|-------|--|
| Moment: | 804.2 | ft-kips |
| Axial: | 16.6 | kips |
| Shear: | 11.6 | kips |

| Anchor Rod Data | |
|-----------------|---------|
| Qty: | 12 |
| Diam: | 1.5 in |
| Rod Material: | Other |
| Strength (Fu): | 125 ksi |
| Yield (Fy): | 109 ksi |
| Bolt Circle: | 35 in |

If No stiffeners, Criteria: **AISC ASD**

<-Only Applicable to Unstiffened Cases

Anchor Rod Results
 Maximum Rod Tension: 90.5 Kips
 Allowable Tension: 97.2 Kips
 Anchor Rod Stress Ratio: 93.2% **Pass**

| |
|--------------|
| Stiffened |
| Service, ASD |
| Fly*ASIF |

| Plate Data | |
|-------------------|---------|
| Diam: | 41 in |
| Thick: | 2 in |
| Grade: | 36 ksi |
| Single-Rod B-eff: | 7.85 in |

Base Plate Results
 Base Plate Stress: 26.7 ksi
 Allowable Plate Stress: 36.0 ksi
 Base Plate Stress Ratio: 74.1% **Pass**

| |
|--------------|
| Stiffened |
| Service, ASD |
| 0.75*Fy*ASIF |
| Y.L. Length: |
| N/A, Roark |

| Stiffener Data (Welding at both sides) | |
|--|--------------------|
| Config: | 1 * |
| Weld Type: | Fillet |
| Groove Depth: | 0.25 <-- Disregard |
| Groove Angle: | 45 <-- Disregard |
| Fillet H. Weld: | 0.375 in |
| Fillet V. Weld: | 0.375 in |
| Width: | 5 in |
| Height: | 10 in |
| Thick: | 0.5 in |
| Notch: | 0.75 in |
| Grade: | 65 ksi |
| Weld str.: | 70 ksi |

Stiffener Results

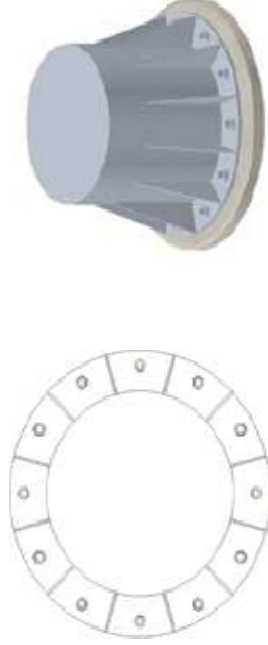
Horizontal Weld : 70.0% **Pass**
 Vertical Weld: 37.8% **Pass**
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: 19.9% **Pass**
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: 42.4% **Pass**
 Plate Comp. (AISC Bracket): 54.2% **Pass**

Pole Results

Pole Punching Shear Check: 15.6% **Pass**

| Pole Data | |
|--------------------|----------------|
| Diam: | 30 in |
| Thick: | 0.5 in |
| Grade: | 42 ksi |
| # of Sides: | 0 "0" IF Round |
| Fu | 63 ksi |
| Reinf. Fillet Weld | 0 "0" if None |

| Stress Increase Factor | |
|------------------------|-------|
| ASIF: | 1.333 |



* 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

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISAs

| | Comp. (+) | Tension (-) |
|-----------------|----------------------|-------------------|
| Moment, M = | 1303.0 k-ft | |
| Shear, V = | 16.0 kips | |
| Axial Load, P = | 23.0 kips | |
| OTM = | 1311.0 k-ft @ Ground | 0.0 k-ft @ Ground |

Safety Factors / Load Factors / ϕ Factors

| | |
|---------------------------|---------------|
| Tower Type = | Monopole DP |
| ACI Code = | ACI318-02 |
| Seismic Design Category = | D |
| Reference Standard = | TIA/EIA-222-F |
| Use 1.3 Load Factor? | Yes |
| Load Factor = | 1.30 |

Drilled Pier Parameters

| | |
|----------------------|-------------|
| Diameter = | 5 ft |
| Height Above Grade = | 0.5 ft |
| Depth Below Grade = | 37 ft |
| f'_c = | 3 ksi |
| ϵ_c = | 0.003 in/in |
| L / D Ratio = | 7.50 > 6 |

Mat Fdn. Cap Width = ft
 Mat Fdn. Cap Length = ft
 Depth Below Grade = ft

Steel Parameters

| | |
|----------------------------|-----------|
| Number of Bars = | 16 |
| Rebar Size = | #9 |
| Rebar F_y = | 60 ksi |
| Rebar MOE = | 29000 ksi |
| Tie Size = | #4 |
| Side Clear Cover to Ties = | 3 in |

Direct Embed Pole Shaft Parameters

| | |
|---------------------------|-----|
| Dia @ Grade = | in |
| Dia @ Depth Below Grade = | in |
| Number of Sides = | in |
| Thickness = | in |
| F_y = | ksi |
| Backfill Condition = | |

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

| Layer | Thickness ft | Unit Weight pcf | Cohesion psf | Friction Angle degrees | Soil Type | Ultimate End Bearing psf | Comp. Ult. Skin Friction psf | Tension Ult. Skin Friction psf | Depth ft |
|-------|--------------|-----------------|--------------|------------------------|-----------|--------------------------|------------------------------|--------------------------------|----------|
| 1 | 2 | 120 | 1000 | | Clay | 946 | 946 | 946 | 2 |
| 2 | 4 | 110 | | 30 | Sand | 946 | 946 | 946 | 6 |
| 3 | 7 | 110 | 750 | | Clay | 946 | 946 | 946 | 13 |
| 4 | 2 | 105 | | 30 | Sand | 946 | 946 | 946 | 15 |
| 5 | 13 | 115 | | 32 | Sand | 946 | 946 | 946 | 28 |
| 6 | 5 | 100 | 750 | | Clay | 946 | 946 | 946 | 33 |
| 7 | 7 | 120 | 1500 | | Clay | 946 | 946 | 946 | 40 |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |

*Note: The drilled pier foundation was analyzed using the methodology in the software PLS-Caisson (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based on the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

Soil Parameters

| | |
|---|----------|
| Water Table Depth = | 15.00 ft |
| Depth to Ignore Soil = | 3.33 ft |
| Depth to Full Cohesion = | 0 ft |
| Full Cohesion Starts at?* | Ground |
| Above Full Cohesion Lateral Resistance = $4(Cohesion)/(Dia)(H)$ | |
| Below Full Cohesion Lateral Resistance = $8(Cohesion)/(Dia)(H)$ | |

Maximum Capacity Ratios

| | |
|-----------------------|--------|
| Maximum Soil Ratio = | 100.0% |
| Maximum Steel Ratio = | 100.0% |

| Safety Factor | ϕ Factor |
|------------------------------|---------------|
| Soil Lateral Resistance = | 2.00 |
| Skin Friction = | 2.00 |
| End Bearing = | 2.00 |
| Concrete Wt. Resist Uplift = | 1.25 |

Load Combinations Checked per TIA/EIA-222-F

1. Ult. Skin Friction/2.00 + Ult. End Bearing/2.00 + Effective Soil Wt. - Buoyant Conc. Wt. \geq Comp.
2. Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 \geq Uplift
3. Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 \geq Uplift

Soil Results: Overturning

| | |
|------------------------|------------------------|
| Depth to COR = | 22.57 ft, from Grade |
| Bending Moment, M = | 1672.16 k-ft, from COR |
| Resisting Moment, Ma = | 6688.99 k-ft, from COR |
| MOMENT RATIO = | 25.0% OK |

| | |
|-----------------------|-----------------|
| Shear, V = | 16.00 kips |
| Resisting Shear, Va = | 64.00 kips |
| SHEAR RATIO = | 25.0% OK |

Soil Results: Uplift

| | |
|-----------------------------|----------------|
| Uplift, T = | 0.00 kips |
| Allowable Uplift Cap., Ta = | 316.93 kips |
| UPLIFT RATIO = | 0.0% OK |

| | |
|----------------------------------|----------------|
| Soil Results: Compression | |
| Compression, C = | 23.00 kips |
| Allowable Comp. Cap., Ca = | 310.22 kips |
| COMPRESSION RATIO = | 7.4% OK |

Steel Results (ACI 318-02):

| | |
|---------------------------|---------------------------------|
| Minimum Steel Area = | 9.42 sq in |
| Actual Steel Area = | 16.00 sq in |
| Allowable Min Axial, Pa = | -664.62 kips, Where Ma = 0 k-ft |
| Allowable Max Axial, Pa = | 3251.66 kips, Where Ma = 0 k-ft |

| | |
|------------------------|------------------------------------|
| Axial Load, P = | 33.22 kips @ 8.25 ft Below Grade |
| Moment, M = | 1405.82 k-ft @ 8.25 ft Below Grade |
| Allowable Moment, Ma = | 1411.76 k-ft |
| MOMENT RATIO = | 99.6% OK |

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

| |
|---------------------------------|
| BU#: 876325 |
| Site Name: <i>Weston Square</i> |
| App #: |

| | |
|---------------------------|-------------------------|
| Enter Load Factors Below: | |
| For M (WL) | 1.3 <----- Enter Factor |
| For P (DL) | 1.3 <----- Enter Factor |

| | |
|----------------------------|------------------------|
| Concrete: | |
| Pier Diameter = | 5.0 ft |
| Concrete Area = | 2827.4 in ² |
| Reinforcement: | |
| Clear Cover to Tie= | 3.00 in |
| Horiz. Tie Bar Size= | 4 |
| Vert. Cage Diameter = | 4.32 ft |
| Vert. Cage Diameter = | 51.87 in |
| Vertical Bar Size = | |
| Bar Diameter = | 1.13 in |
| Bar Area = | 1 in ² |
| Number of Bars = | 16 |
| As Total= | 16 in ² |
| A s / Aconc, Rho: | 0.0057 0.57% |

| | |
|--|--------------------------|
| Maximum Shaft Superimposed Forces | |
| TIA Revision: | F |
| Max. Service Shaft M: | 1405.82 ft-kips (* Note) |
| Max. Service Shaft P: | 33.22 kips |
| Max Axial Force Type: | Comp. |

(* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

| | |
|--------------------|----------------------|
| Load Factor | |
| 1.30 | Mu: 1827.566 ft-kips |
| 1.30 | Pu: 43.186 kips |

| | |
|--|-----------|
| Material Properties | |
| Concrete Comp. strength, f'c = | 3000 psi |
| Reinforcement yield strength, Fy = | 60 ksi |
| Reinforcing Modulus of Elasticity, E = | 29000 ksi |
| Reinforcement yield strain = | 0.00207 |
| Limiting compressive strain = | 0.003 |
| ACI 318 Code | |
| Select Analysis ACI Code= | 2002 |
| Seismic Properties | |
| Seismic Design Category = | D |
| Seismic Risk = | High |

Solve (Run)

<-- Press Upon Completing All Input

ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

$$(3) * (\text{Sqrt}(f'c) / F_y) = 0.0027$$

$$200 / F_y = 0.0033$$

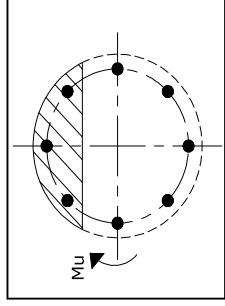
Minimum Rho Check:

| | |
|------------------------|-----------------|
| Actual Req'd Min. Rho: | 0.33% Flexural |
| Provided Rho: | 0.57% OK |

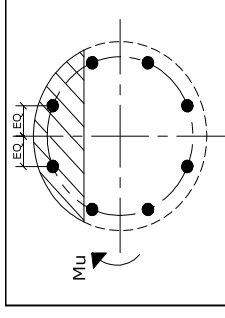
| | |
|--|-----------------|
| Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn): | |
| Max Pu = ($\phi=0.65$) Pn: | |
| Pn per ACI 318 (10-2) | 4227.16 kips |
| at Mu=($\phi=0.65$)Mn= | 1823.95 ft-kips |
| Max Tu, ($\phi=0.9$) Tn = | 864 kips |
| at Mu= $\phi=(0.90)$ Mn= | 0.00 ft-kips |

Results:

Governing Orientation Case: 1



Case 1



Case 2

Dist. From Edge to Neutral Axis: 10.00 in

Extreme Steel Strain, ϵ_t : 0.0138

$\epsilon_t > 0.0050$, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension
 For Axial Compression, ϕ Pn = Pu: 43.19 kips
 Drilled Shaft Moment Capacity, ϕ Mn: **1835.29** ft-kips
 Drilled Shaft Superimposed Mu: **1827.57** ft-kips

| | |
|---|--------------|
| (Mu/ϕMn, Drilled Shaft Flexure CSR): | 99.6% |
|---|--------------|



LUKE BRONIN
MAYOR

CITY OF HARTFORD

DEPARTMENT OF DEVELOPMENT SERVICES
Division of Development Services
250 Constitution Plaza, 4th Floor
Hartford, Connecticut 06103

Telephone: (860) 757- 9040
Fax: (860) 722-6402
www.hartford.gov



SEAN FITZPATRICK
DIRECTOR OF
DEVELOPMENT SERVICES

JAMIE BRÄTT
DIRECTOR OF PLANNING &
ECONOMIC DEVELOPMENT
DIVISION

June 7, 2016

Mr. Mark Roberts
QC Development
PO Box 916
Storrs, CT 06268
860-670-9068

RE: 92 Weston Street Cell Tower Approvals

Dear Mr. Roberts:

Regarding your inquiry relative to the Cell Tower located at 92 Weston Street, the Planning Division was unable to produce an original Zoning Approval Document. However, at the time of the tower installation in 1996, the Zoning Regulations in effect permitted communications towers as a matter of right in the Industrial Zones. A building permit was issued 11/26/1996 for said tower. A copy of the building permit is attached for your convenience.

Should you require any further assistance relative to this matter, please do not hesitate to contact me at 860-757-9015.

Sincerely,

James S. Tanner

CITY OF HARTFORD - Live 11.1
APPLICATION PROFILE

06/07/2016 10:17
9861fitzc002

GENERAL APPLICATION

Application ref 19964013 Fee Effective Dt 10/08/1996
 Department *UNKNOWN
 Location 92 WESTON ST
 Parcel 286173007
 Cross streets
 Add'l loc desc
 Municipality CITY OF HARTFORD Lot
 Subdivision
 Existing use OTHER STORAGE, WAREHOUSE FACIL
 Current Zoning memo C1 STILL TAX DELQN. AS OF 7/9/14 PYMT PLAN TERMINATED PER TAX
 Flood zone
 Applicant **UNKNOWN
 Proj/Activity HISTORICAL BUILDING PERMIT
 Class of work OTHER
 Description

Proposed use
 memo
 Proposed zoning
 Flood zone
 Non-conforming N
 Applic received 10/08/96
 Estimated cost 98,000
 Estim start/end
 Actual start/end 11/26/96 11/26/96
 Impervious Surf
 Assigned to
 Status COMPLETE
 Status code desc *UNKNOWN
 Next action Multiple submissions N
 memo Government owned N
 Ordinance ref
 Reason for app
 Parent app

PROGRESS

*ERROR RETRIEVING PROGRESS DATA

PERMITS

| Type | Permit Number | Status | Issued | Fee | Unpaid Amt |
|------------|---------------|--------|----------|-----|------------|
| HST_BLDG P | 19964785 | ISSUED | 11/26/96 | .00 | .00 |

APPLICATION NOTES

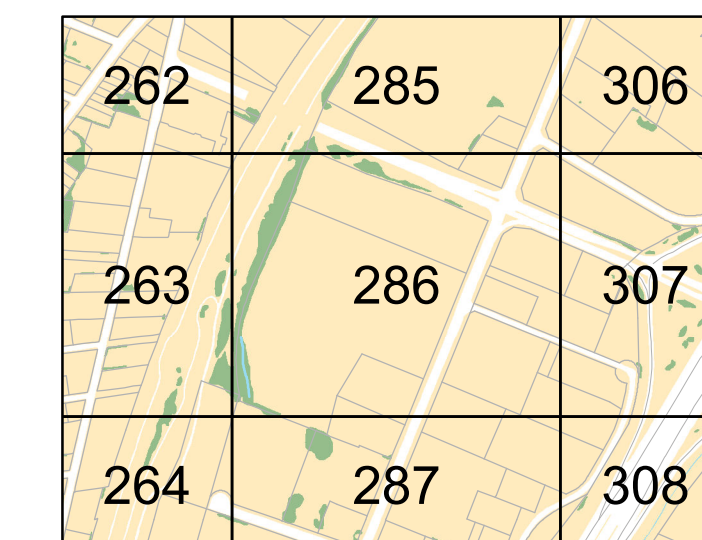
Installation Of 110ft Monopole With 6 Antennas Andassociated Infrast
 ructure.



City of Hartford Assessor Map

Legend

- ▲ Parcel ID
- ◆ Duplicate Parcel ID
- Exempt ID
- Building ID
- Air Right ID
- Parcels
- Tax Map Grid
- City Boundary Line
- Building
- Building Under Construction
- House Trailer
- Foundation
- Cement Pad
- Deck
- Patio
- Pool
- Swamp
- Water
- River or Stream
- Tree
- Hedge
- Vegetation
- 161507165 Parcel ID
- 7500 sf or Ac Parcel Area
- 88 Street Address
- 11-19 Condo Lot Range
- 11D Condo Unit
- Road Edge Paved
- Road Edge Unpaved
- Driveway and Parking Lot Paved
- Driveway and Parking Lot Unpaved
- Sidewalk
- Private Sidewalk and Steps
- Runway
- Bridge
- Wharf and Pier
- Fuel Tank
- Water Tank
- Tunnel
- Trail
- Railroad
- Abandoned Railroad
- Fence
- Ruins



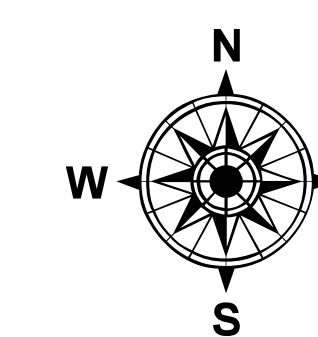
Key Map

DISCLAIMER:

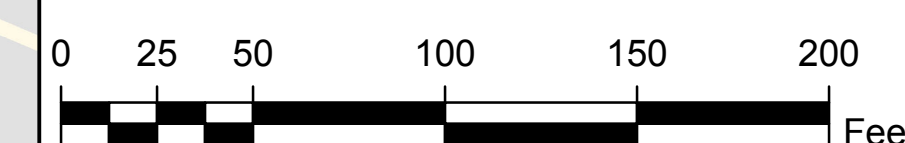
The planimetric and topographic information depicted on this map was compiled by The James Sewell Company and is based on an aerial flight performed in April 2006. In addition, the City's GIS staff has been updating limited planimetric features based on information on file in various City departments. The parcel and property information depicted on this map has been compiled from recorded deeds, maps, assessor records, and other public records on file in the City of Hartford. The intent of this map is to depict a graphical representation of real property information relative to the planimetric features for the City of Hartford and is subject to change as a more accurate survey may disclose. The City of Hartford and the mapping company assume no legal responsibility for the information contained in this data.

THIS MAP IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY.

Horizontal Datum: Connecticut State Plane Coordinates (NAD 83 feet)
Vertical Datum: North American Vertical Datum (NAVD 88 feet)

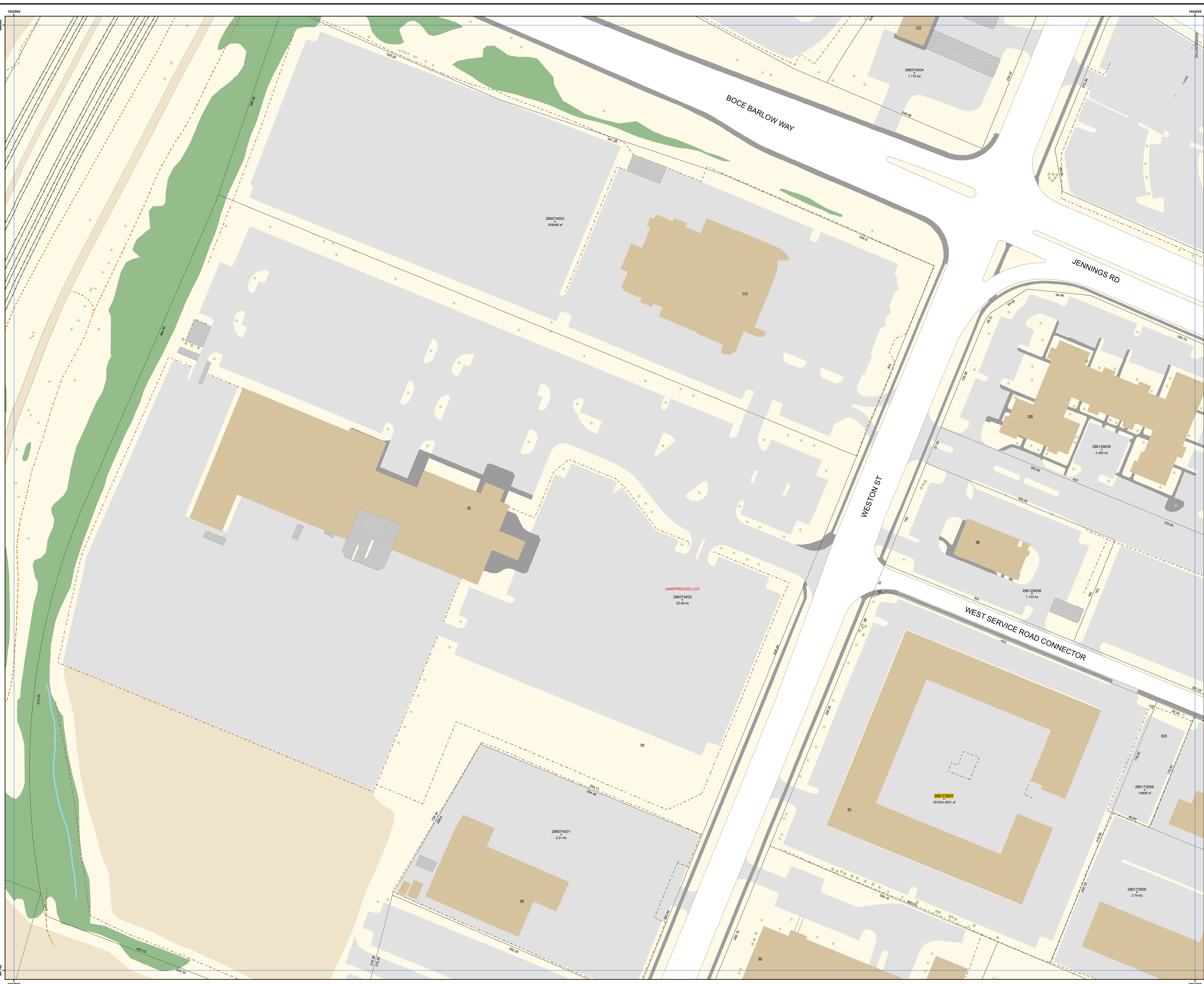


Date: September 7, 2012



1 inch = 50 feet

Map Sheet 286



UNAPPROVED LOT

