STATE OF CONNECTICUT
*CONNECTICUT SITING COUNCIL*
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

May 11, 2012

John Lawrence
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767

RE: **EM-AT&T-064-120427** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 99 Meadow Street, Hartford, Connecticut.

Dear Mr. Lawrence:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated April 23, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of

uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/cm

c: The Honorable Pedro E. Segarra, Mayor, City of Hartford
David B. PanagoreRoger J. O'Brien, Director of Planning, City of Hartford

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April 27, 2012

The Honorable Pedro E. Segarra
Mayor
City of Hartford
Municipal Building
550 Main Street
Hartford, CT 06103

RE: **EM-AT&T-064-120427** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 99 Meadow Street, Hartford, Connecticut.

Dear Mayor Segarra:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by May 11, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/cm

Enclosure: Notice of Intent

c: David B. Panagore, Chief Operating Officer, City of Hartford
Roger J. O'Brien, Director of Planning, City of Hartford



CSC
CONNECTICUT SITING COUNCIL

at&t
Your world. Deliv

**EM-AT&T-064-120427**

**New Cingular Wireless PCS, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067

**John Lawrence**
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767
Phone: (781) 715-5532
jlawrence@clinellc.com



April 23, 2012



Honorable Robert Stein, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

**Re: Notice of Exempt Modification – Existing Telecommunications Facility at 99 Meadow Street**

Dear Chairman Stein and Members of the Council:

New Cingular Wireless PCS, LLC ("AT&T") intends to modify the existing telecommunications antennas and associated equipment at an existing multicarrier telecommunications tower at 99 Meadow Street. AT&T operates under licenses issued by the Federal Communications Commission ("FCC") to provide cellular and PCS mobile telephone service in Hartford County, which includes the area to be served by AT&T's proposed installation.

In order to accommodate technological changes, implement Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to the Mayor of Hartford, Pedro E. Segarra.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

**Existing Facility**

The Hartford facility is located at 99 Meadow Street, Hartford, CT

The facility is owned by American Tower.

The existing facility consists of a 150 foot monopole tower. AT&T currently operates wireless communications equipment at the facility and has six (6) antennas mounted at the tower centerline height of 138 feet.

**Statutory Considerations**

The changes to the tower facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2) because they will not result in any substantial adverse environmental effect.

1. The height of the overall structure will be unaffected.

2. The proposed changes will not affect the property boundaries. All new construction will take place inside the existing fenced compound.

3. The proposed additions will not increase the noise level at the existing facility by six decibels or more.

4. LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully yours,

John Lawrence
Real Estate Consultant

Enclosures:
Pedro E. Segarra, Mayor

**New Cingular Wireless PCS, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067

**John Lawrence**
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767
Phone: (781) 715-5532
jlawrence@clinellc.com

April 24, 2012

Pedro E. Segarra, Mayor
City Hall
550 Main Street
Hartford, CT 06114

**Re: Notice of Exempt Modification – Existing Telecommunications Facility at 99 Meadow Street**

Dear Mayor Segarra,

New Cingular Wireless PCS, LLC ("AT&T") intends to replace telecommunications antennas and associated equipment at an existing telecommunications tower, owned and operated by AT&T.

A Notice of Exempt Modification has been filed with the Connecticut Siting Council as required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73. Please accept this letter as notification to the City of Hartford under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The attached letter fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact John Lawrence at (781) 715-5532 or Linda Roberts, Executive Director of the Connecticut Siting Council, at (860) 827-2935.

Sincerely,

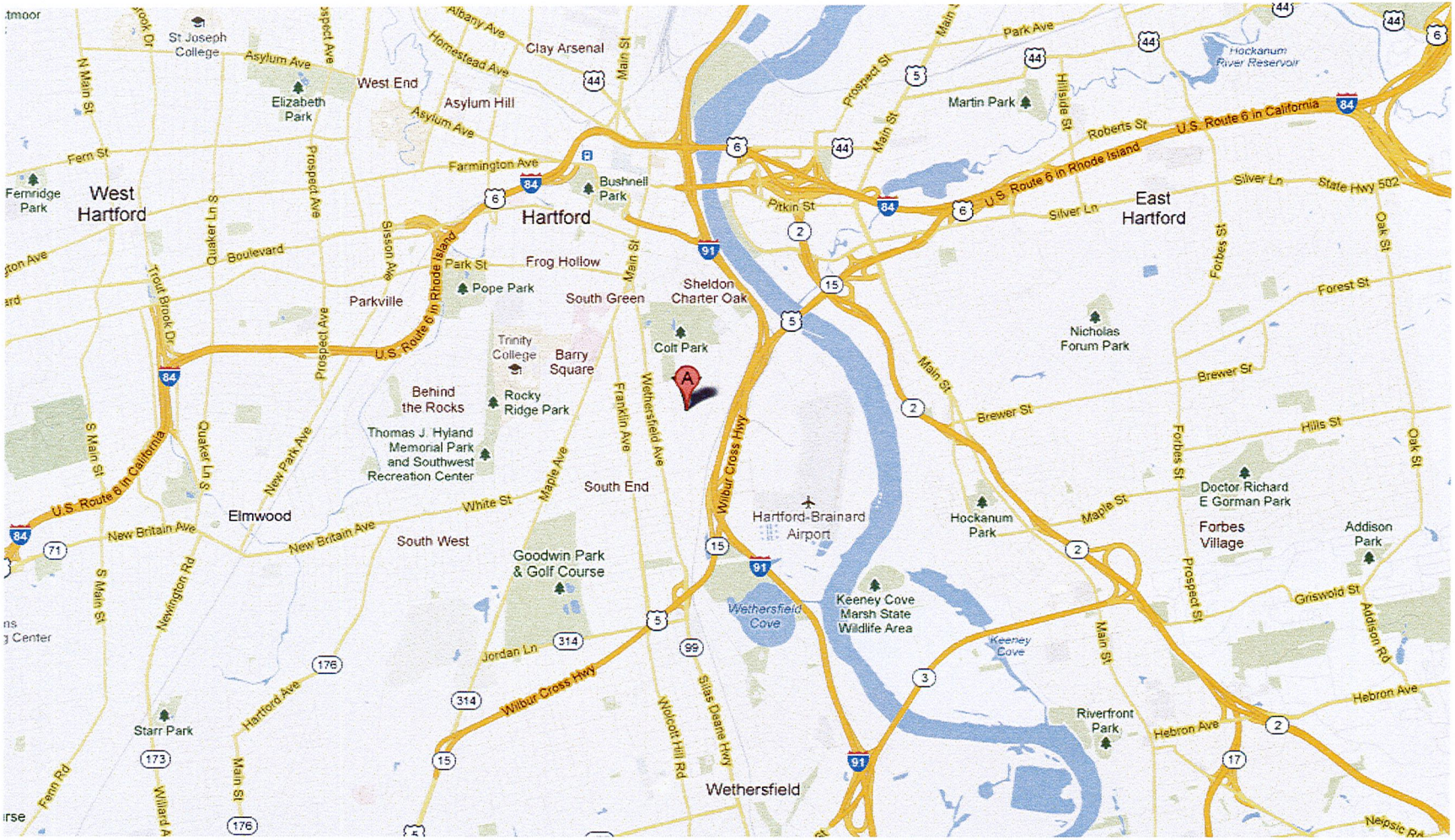
John Lawrence
Real Estate Consultant

Enclosure
CC: Honorable Robert Stein, Chairmen of the Connecticut Siting Council

# CT5127 – 99 Meadow Street, Hartford CT 06114

***Aerial Location Map***

## ***Street Location Map***



## PROJECT INFORMATION

| | | |
|---|---|---|
| SCOPE OF WORK: | UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS | |
| SITE ADDRESS: | 99 MEADOW STREET<br>HARTFORD, CT 06114 | |
| LATITUDE: | 41.7439 N | 41° 44' 38.04" N |
| LONGITUDE: | 72.6683 W | 72° 40' 5.88" W |
| JURISDICTION: | NATIONAL, STATE & LOCAL CODES OR ORDINANCES | |
| CURRENT USE: | TELECOMMUNICATIONS FACILITY | |
| PROPOSED USE: | TELECOMMUNICATIONS FACILITY | |

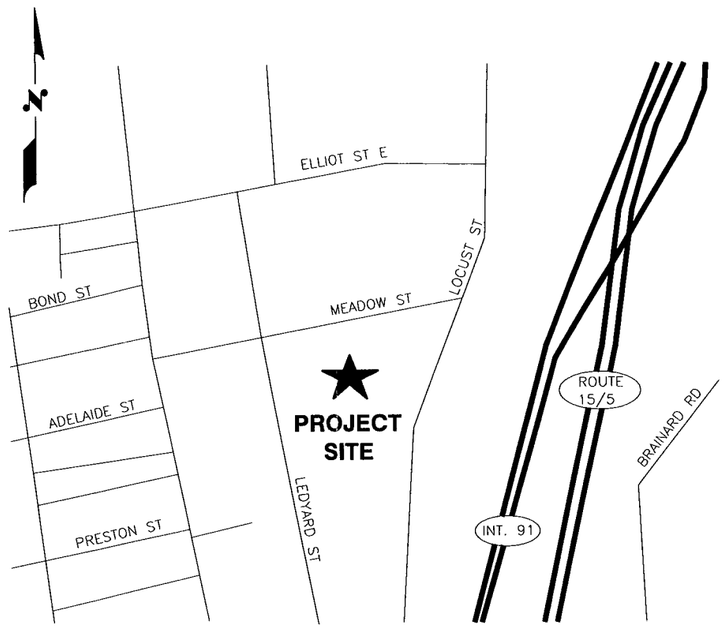
# SITE NUMBER: CT5127
# SITE NAME: AWE - I-91 AND 5 SPLIT

## DRAWING INDEX



## VICINITY MAP

DIRECTIONS TO SITE:
DEPART ENTERPRISE DR TOWARD CAPITOL BLVD 0.4 MI. TURN LEFT ONTO CAPITOL BLVD 0.2 MI. TURN LEFT ONTO WEST ST. 0.2 MI. TAKE RAMP LEFT FOR I-91 NORTH. 6.6 MI. AT EXIT 27, TAKE RAMP RIGHT FOR BRAINARD RD TOWARD BRAINARD AIRPORT / AIRPORT RD. 0.5 MI. TURN LEFT ONTO BRAINARD RD. 0.2 MI. TURN LEFT ONTO AIRPORT RDFORD ON THE CORNER. 0.4 MI. TURN RIGHT ONTO LEDYARD ST BURGER KING ON THE CORNER. 0.4 MI. TURN RIGHT ONTO MEADOW ST. 0.1 MI. ARRIVE AT 99 MEADOW ST, HARTFORD, CT 06114. THE LAST INTERSECTION IS LEDYARD ST. IF YOU REACH LOCUST ST, YOU'VE GONE TOO FAR.




## 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 REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

72 HOURS
BEFORE YOU DIG
CALL TOLL FREE 800-922-4455

UNDERGROUND SERVICE ALERT


Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095


SITE NUMBER: CT5127
SITE NAME: AWE - I-91 AND 5 SPLIT
99 MEADOW ST
HARTFORD, CT 06114
HARTFORD COUNTY


at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067


| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|---|---|---|---|---|---|
| 1 | 04/16/12 | ISSUED FOR CONSTRUCTION | NB | DC | DPH |
| 0 | 03/05/12 | ISSUED FOR REVIEW | NB | DC | DPH |

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: NB

STATE OF CONNECTICUT — DANIEL P. HAMM — No. 24178 — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| 5127.00 | T-1 | 1 |

## 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 THE BRIDGE AND THE TOWER 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 – NEXLINK
   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 UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY 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 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, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER 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 | G.C. | GENERAL CONTRACTOR | RF | RADIO FREQUENCY |
| AWG | AMERICAN WIRE GAUGE | MGB | MASTER GROUND BUS | | |
| BCW | BARE COPPER WIRE | MIN | MINIMUM | TBD | TO BE DETERMINED |
| BTS | BASE TRANSCEIVER STATION | PROPOSED | NEW | TBR | TO BE REMOVED |
| EXISTING | EXISTING | N.T.S. | NOT TO SCALE | TBRR | TO BE REMOVED AND REPLACED |
| EG | EQUIPMENT GROUND | REF | REFERENCE | TYP | TYPICAL |
| EGR | EQUIPMENT GROUND RING | REQ | REQUIRED | | |


Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

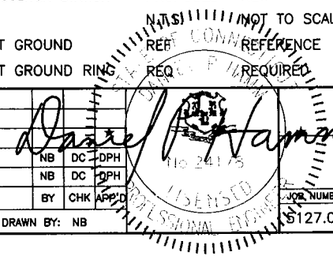
NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095


**SITE NUMBER: CT5127**
**SITE NAME: AWE - I-91 AND 5 SPLIT**
99 MEADOW ST
HARTFORD, CT 06114
HARTFORD COUNTY


at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067


| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|---|---|---|---|---|---|
| 1 | 04/16/12 | ISSUED FOR CONSTRUCTION | NB | DC | DPH |
| 0 | 03/05/12 | ISSUED FOR REVIEW | NB | DC | DPH |

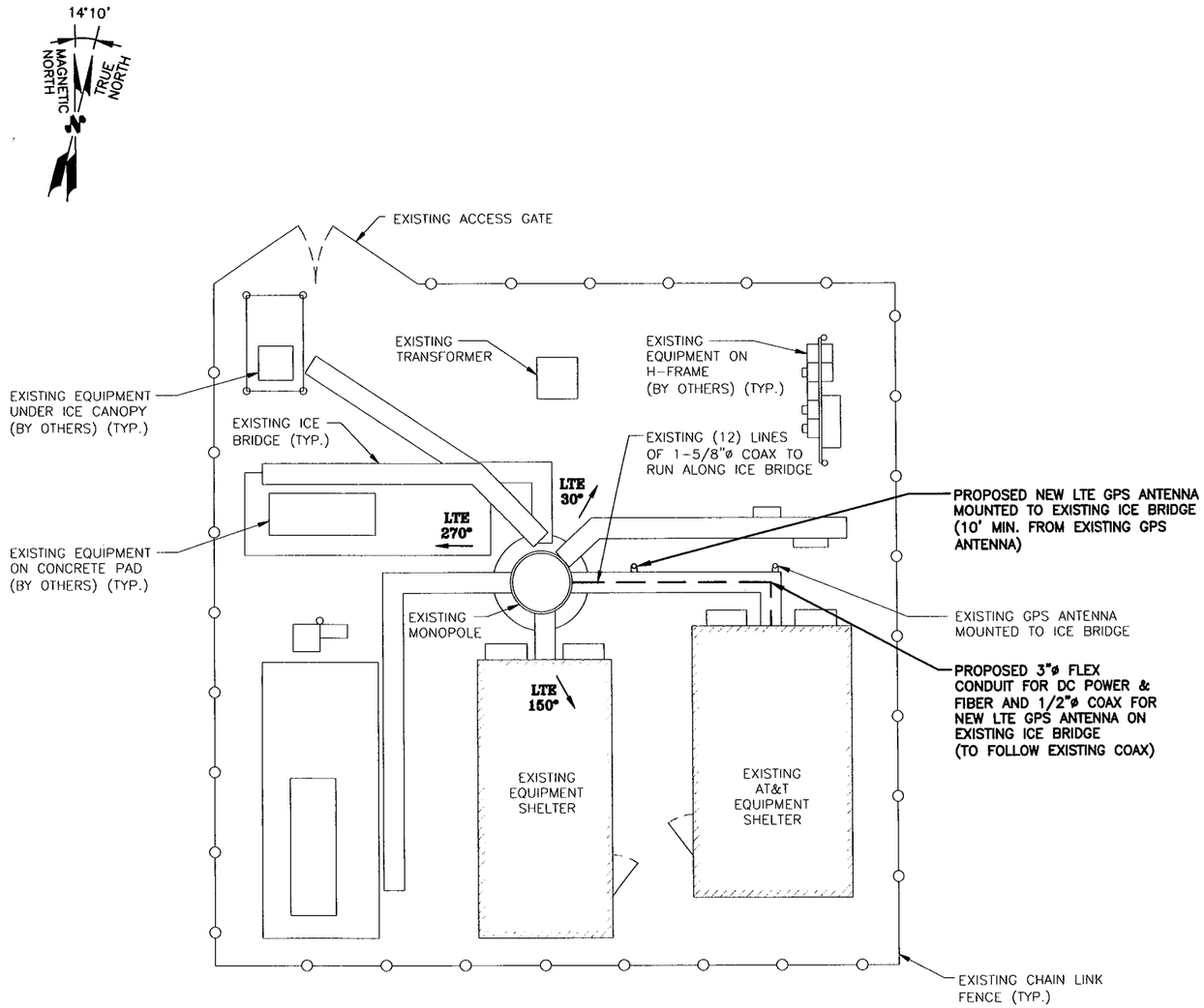
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: NB



AT&T

GENERAL NOTES
(LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| 5127.00 | GN-1 | 1 |




## COMPOUND PLAN

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

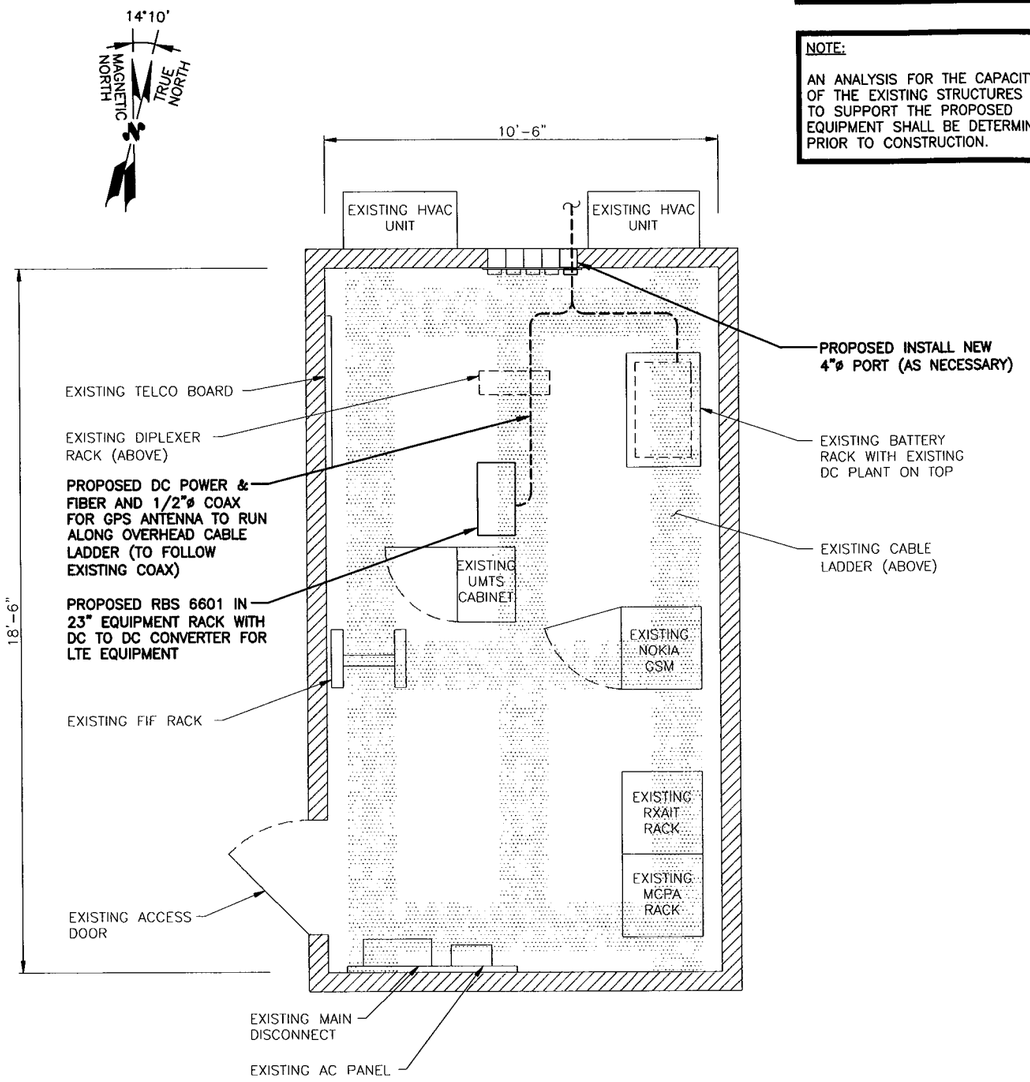
0 2'-8" 5'-4" 10'-8" 16'-0"

NOTE:

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

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.




## EQUIPMENT PLAN

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

0 1'-0" 2'-0" 4'-0" 6'-0"


Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
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**SITE NUMBER: CT5127**
**SITE NAME: AWE - I-91 AND 5 SPLIT**
99 MEADOW ST
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HARTFORD COUNTY


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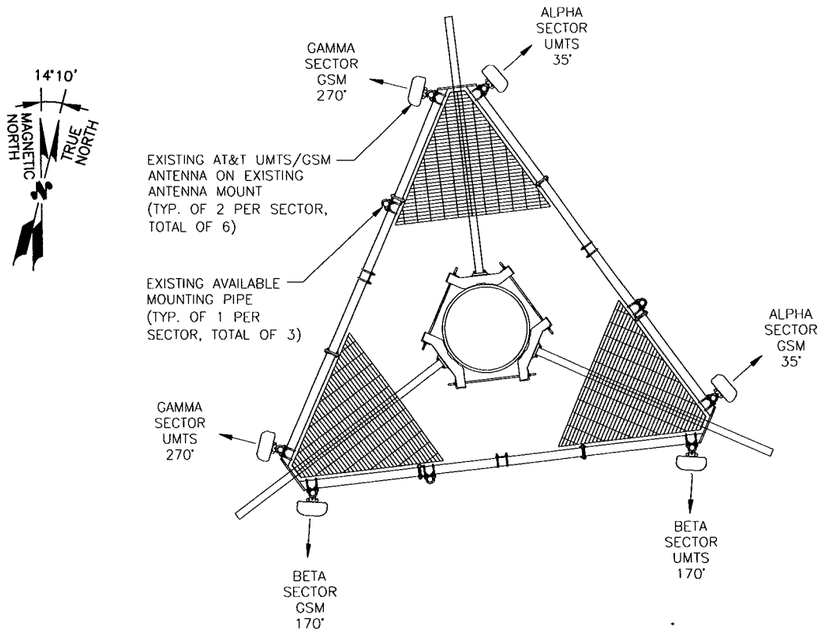
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: NB

STATE OF CONNECTICUT · DANIEL F. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLAN (LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| 5127.00 | A-1 | 1 |




## EXISTING GSM/UMTS ANTENNA PLAN

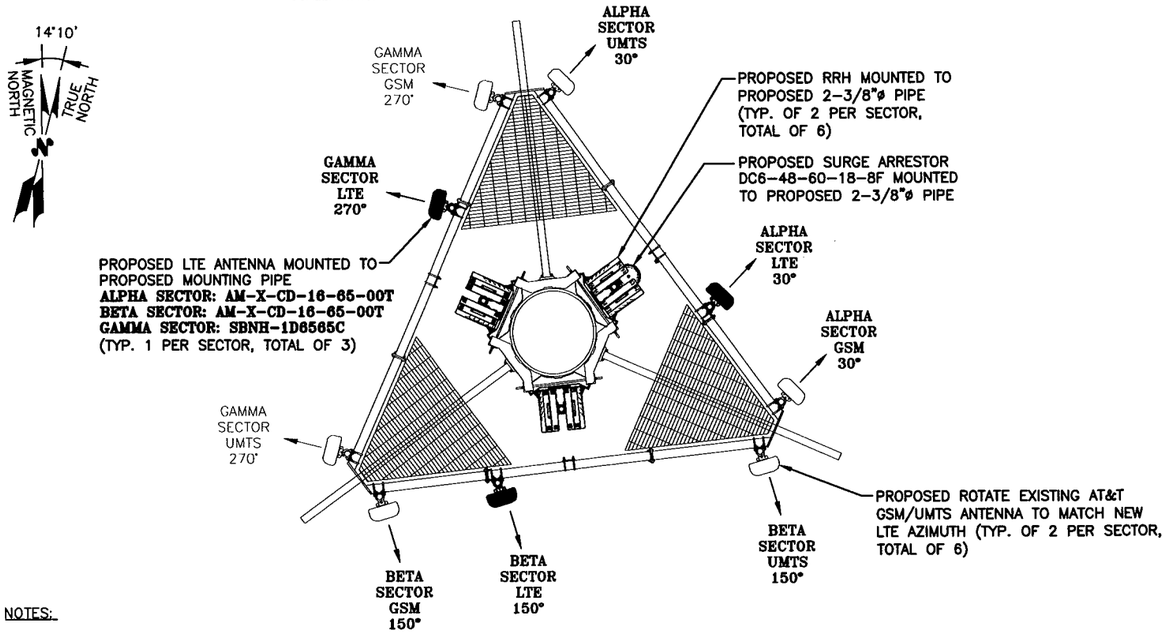
SCALE: N.T.S.

**NOTE:**

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

**NOTE:**

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

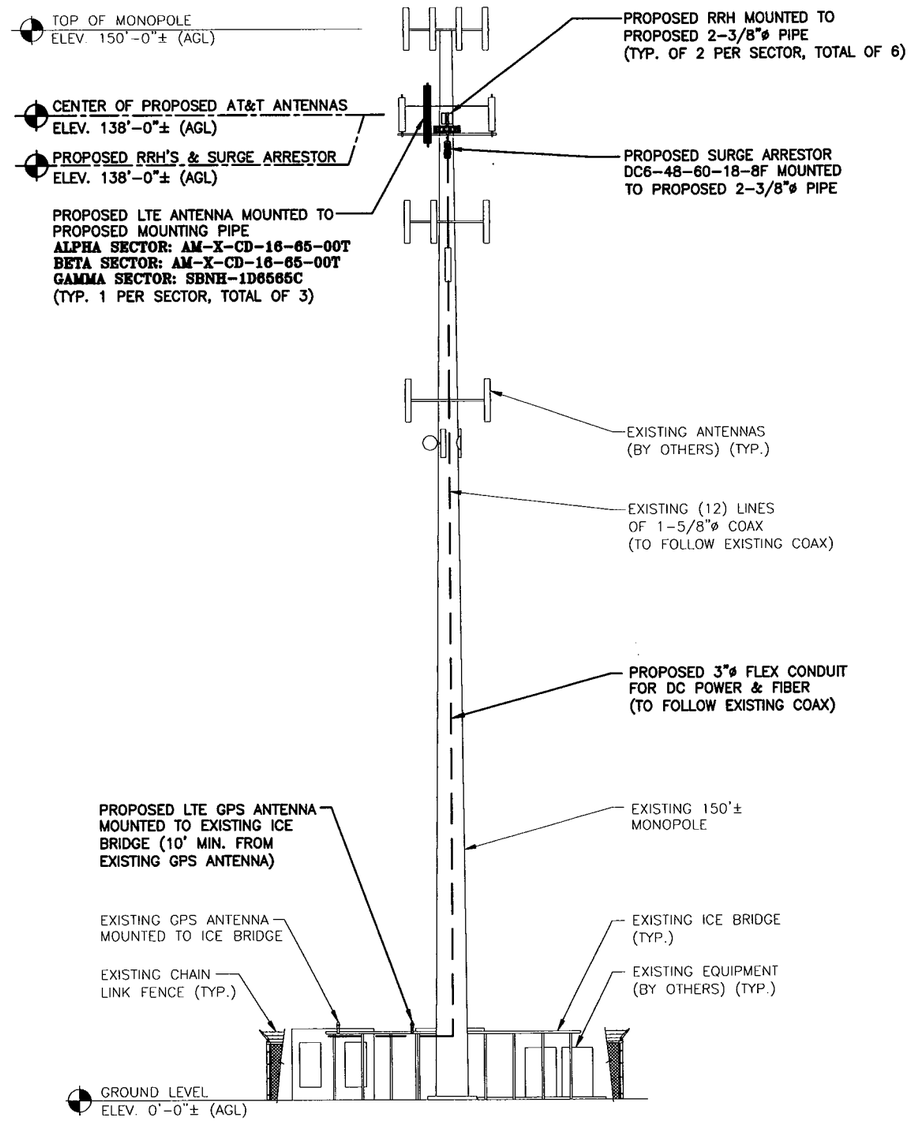



NOTES:

1. REFER TO RF CONFIG & SECTOR SCHEMATICS FOR QUANTITY REQUIRED PER SECTOR

## PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.




## NORTH ELEVATION

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

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

**SITE NUMBER: CT5127**
**SITE NAME: AWE - I-91 AND 5 SPLIT**
99 MEADOW ST
HARTFORD, CT 06114
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|---|---|---|---|---|---|
| 1 | 04/16/12 | ISSUED FOR CONSTRUCTION | NB | DC | DPH |
| 0 | 03/05/12 | ISSUED FOR REVIEW | NB | DC | DPH |

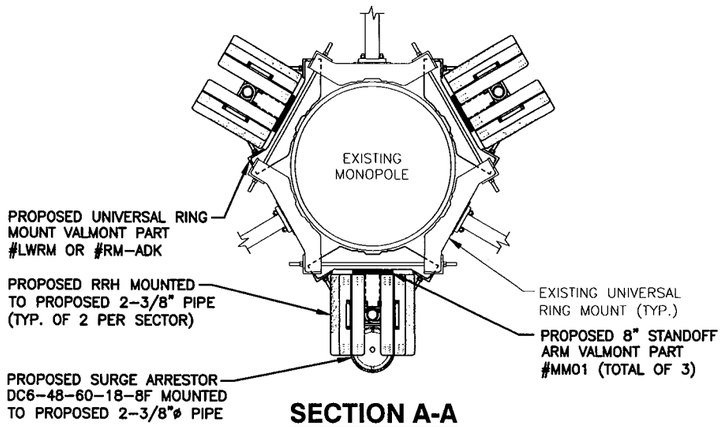
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: NB

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

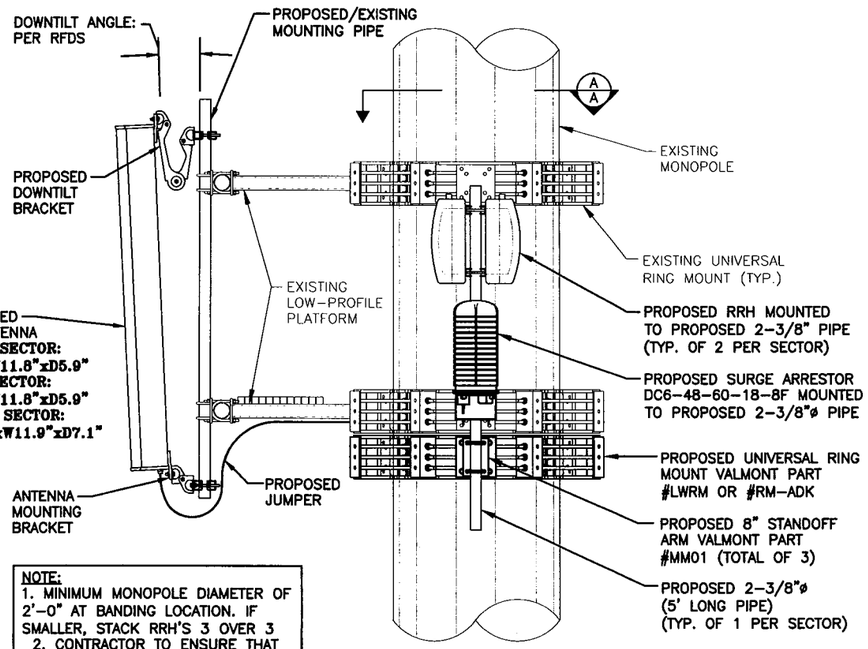
AT&T

ANTENNA LAYOUT & ELEVATION (LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| 5127.00 | A-2 | 1 |




## SECTION A-A




NOTE:
1. MINIMUM MONOPOLE DIAMETER OF 2'-0" AT BANDING LOCATION. IF SMALLER, STACK RRH'S 3 OVER 3
2. CONTRACTOR TO ENSURE THAT RRH MOUNTING DOES NOT INTERFERE WITH CLIMBING LADDER

| PART # | VMI PART # | SIZE RANGE |
|---|---|---|
| LWRM | 801068 | 12"-45" |
| RM-ADK | 157286 | 36"-60" ADAPTER KIT |
| | | |

NOTES:
1. REFER TO RFDS & SECTOR SCHEMATICS FOR ANTENNA MODEL, TYPE & QUANTITY REQUIRED PER SECTOR

## PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL

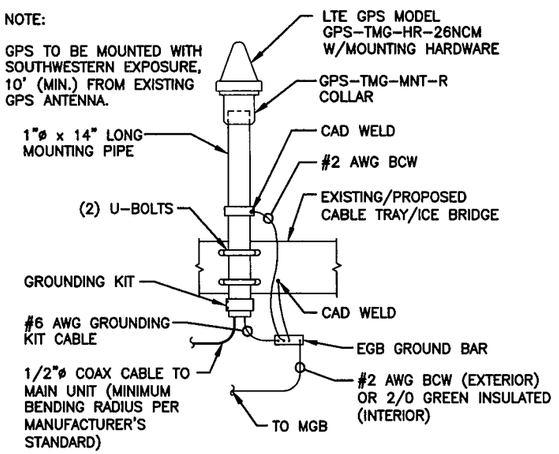
SCALE: N.T.S.

NOTE:

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

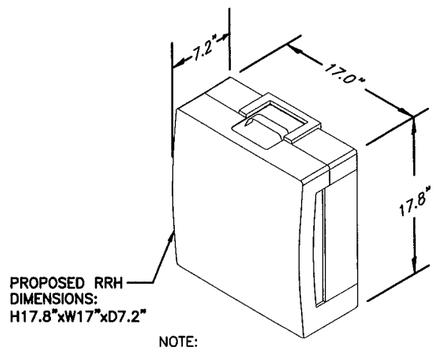
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.




## GPS MOUNTING DETAIL

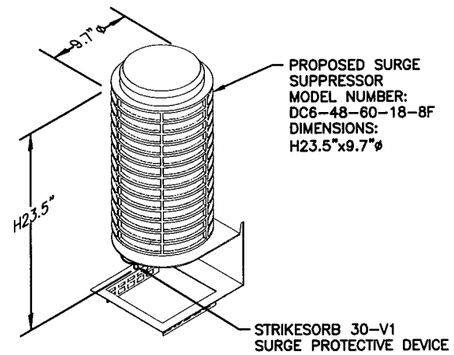
SCALE: N.T.S.




NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

## RRH DETAIL

SCALE: N.T.S.




NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

## DC SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

**SITE NUMBER: CT5127**
**SITE NAME: AWE - I-91 AND 5 SPLIT**
99 MEADOW ST
HARTFORD, CT 06114
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

| NO. | DATE | REVISIONS | BY | CHK | APP'D |
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| 1 | 04/16/12 | ISSUED FOR CONSTRUCTION | NB | DC | DPH |
| 0 | 03/05/12 | ISSUED FOR REVIEW | NB | DC | DPH |

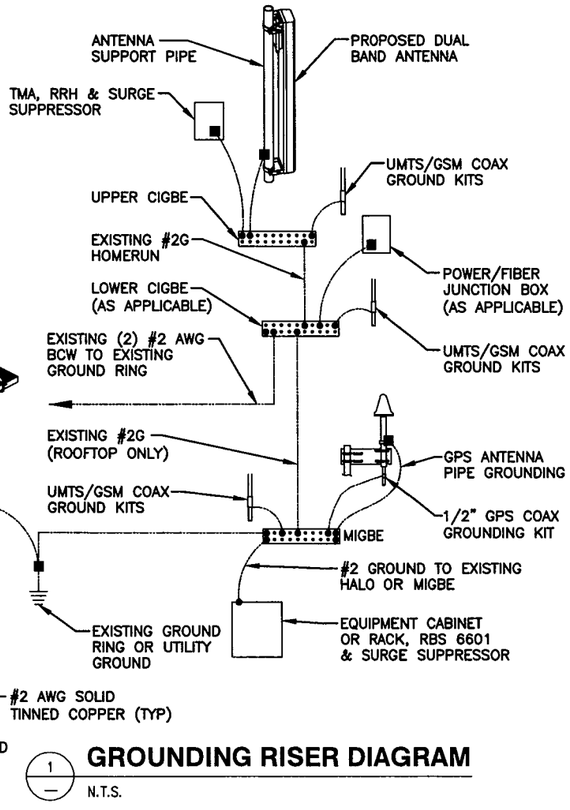
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: NB

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

AT&T

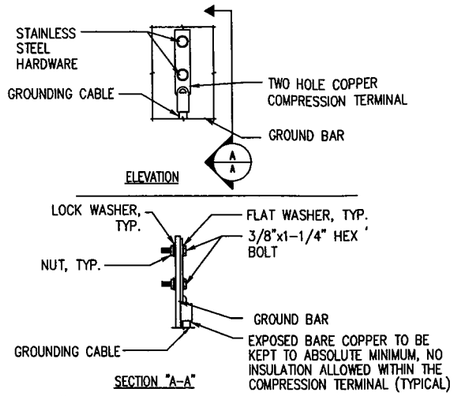
DETAILS (LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| 5127.00 | A-3 | 1 |




## GROUNDING RISER DIAGRAM

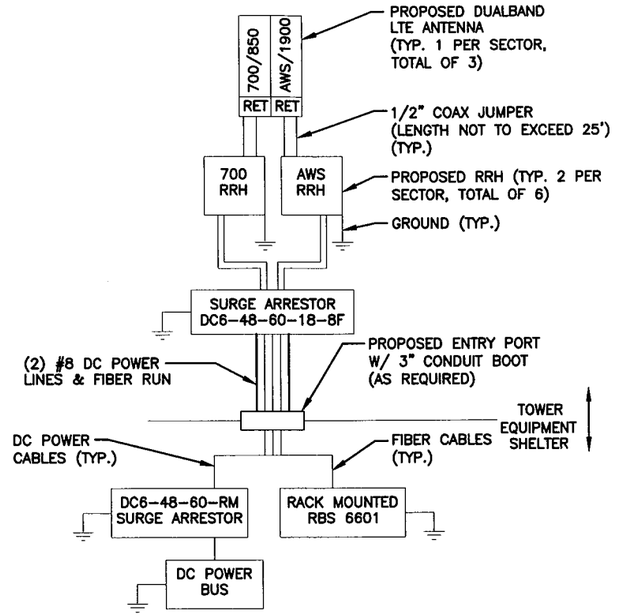
1 — N.T.S.




NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

## TYPICAL GROUND BAR CONNECTION DETAIL

2 — N.T.S.



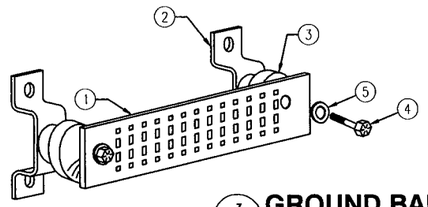

NOTES:

CONTRACTOR TO CONFIRM ALL PARTS & INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

## LTE PLUMBING DIAGRAM

4 — N.T.S.

| WIRELESS SOLUTIONS INC. | | | |
|---|---|---|---|
| NO. | REQ. | PART NO. | DESCRIPTION |
| 1 | 1 | HLGB-0420-IS | SOLID GND. BAR (20"x4"x1/4") |
| 2 | 2 | ——— | WALL MTG. BRKT. |
| 3 | 2 | ——— | INSULATORS |
| 4 | 4 | ——— | 5/8"-11x1" H.H.C.S. |
| 5 | 4 | ——— | 5/8 LOCKWASHER |




## GROUND BAR - DETAIL

3 — N.T.S.

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)

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

**SITE NUMBER: CT5127**
**SITE NAME: AWE - I-91 AND 5 SPLIT**
99 MEADOW ST
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HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

| NO. | DATE | REVISIONS | BY | CHK | APP'D |
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| 1 | 04/16/12 | ISSUED FOR CONSTRUCTION | NB | DC | DPH |
| 0 | 03/05/12 | ISSUED FOR REVIEW | NB | DC | DPH |

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: NB

AT&T

PLUMBING DIAGRAM & GROUNDING DETAILS (LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| 5127.00 | G-1 | 1 |

AMERICAN TOWER®
CORPORATION

# Structural Analysis Report

| | | |
|---|---|---|
| Structure | : | 148 ft FWT Monopole |
| ATC Site Name | : | Petro Lock, CT |
| ATC Site Number | : | 302468 |
| Proposed Carrier | : | AT&T Mobility |
| Carrier Site Name | : | AWE-I91 and 5 Split |
| Carrier Site Number | : | CT5127 |
| County | : | Hartford |
| Eng. Number | : | 49243321 |
| Date | : | April 20, 2012* |
| Usage | : | 73% |
| Portholes Required | : | No |
| Result | : | Pass |

Submitted by:
Joseph R. Johnston
Project Engineer


4/20/12

**American Tower Engineering Services**
400 Regency Forest Drive
Cary, NC 27518
Phone: 919-468-0112

## Introduction

The purpose of this report is to summarize results of the structural analysis performed on the 148 ft FWT Monopole located at 99 Meadow Street, Hartford, Connecticut, 06114, Hartford County (ATC Site No. 302468). The tower was originally designed and manufactured by FWT (Job No. 21719000, Rev.1, dated July 18, 2000).

## Analysis

The tower was analyzed using Semaan Engineering Solutions, Inc., Software.

Basic Wind Speed: 80 mph (Fastest Mile)
Radial Ice: 69 mph (Fastest Mile) w/ 1/2" ice
Code: ANSI/TIA/EIA-222-F / 2003 IBC with 2005 CT Supplements and 2009 CT Amendments

## Antenna Loads

The following antenna loads were used in the tower analysis.

Existing Antennas

| Elev. (ft) | Qty | Antennas | Mount | Coax (in) | Carrier |
|---|---|---|---|---|---|
| 147.9 | 1 | Flash Technology FTB 324-2 | Flush | -- | -- |
| 147.0 | 9 | 48" x 12" Panels | Platform w/ Handrails | (12) 1 5/8 | Sprint Nextel |
| | 3 | 72" x 12" Panels | | | |
| 123.0 | 3 | RFS APX16DWV-16DWVL-C | T-Arms | (18) 1 5/8 | T-Mobile |
| | 6 | RFS APXV18-206516L-C | | | |
| | 3 | RFS ATMAA1412D-1A20 | | | |
| | 3 | RFS ATMPP1412D-1CWA | | | |
| 113.0 | 3 | RFS APXV18-206517 | Flush | (6) 1 5/8 | Youghiogheny |
| 98.0 | 9 | Decibel DB844H90E-A | Low Profile Platform | (18) 1 1/4 | Sprint Nextel |
| 89.0 | 3 | Argus LLPX310R | Side Arms | (6) 5/16<br>(3) 1/2<br>(1) 3" Conduit | Clearwire |
| | 1 | DragonWave A-ANT-11G-2.5-C | | | |
| | 2 | DragonWave A-ANT-18G-2-C | | | |
| | 3 | DragonWave Horizon Compact | | | |
| | 3 | NextNet BTS-2500 | | | |
| 76.0 | 2 | Side Markers | Flush | -- | -- |
| 20.0 | 1 | Lucent KS-24019 | Flush | (1) 1/2 | Sprint Nextel |

Proposed Antennas

| Elev. (ft) | Qty | Antennas | Mount | Coax (in) | Carrier |
|---|---|---|---|---|---|
| 135.0 | 1 | Andrew SBNH-1D6565C | Platform w/ Handrails | (12) 1 5/8<br>(1) 10 mm<br>(2) 19.7 mm<br>(1) 3" Conduit | AT&T Mobility |
| | 6 | Ericsson RRUS 11 | | | |
| | 2 | KMW AM-X-CD-16-65-00T-RET | | | |
| | 6 | Powerwave 7750.00 | | | |
| | 6 | Powerwave LGP21401 | | | |
| | 6 | Powerwave LGP21903 | | | |
| | 1 | Raycap DC6-48-60-18-8F | | | |

Install proposed coax inside monopole.

**Results**

The maximum structure usage is: 73%

Additional exit and/or entry ports may be required to accommodate the running of the proposed lines to the proposed antennas. These additional ports **may not** be installed without installation drawings providing the location, size and welding requirements of each port.

To ensure compliance with all conditions of this structural analysis, port installation drawings shall be provided by American Tower's Engineering Department under a subsequent project.

| Pole Reactions | Current Analysis Reactions |
|---|---|
| Moment (ft-kips) | 2,874.2 |
| Shear (kips) | 27.7 |

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required. These calculations are located after the software output within this analysis.

**Conclusion**

Based on the analysis results, the structure meets the requirements per ANSI/TIA/EIA-222-F and 2003 IBC with 2005 CT Supplements and 2009 CT Amendments standards. The tower and foundation can support the existing and proposed antennas with the TX line distribution as described in this report.

If you have any questions or require additional information, please call 919-466-5030.

**Standard Conditions**

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

-- Information supplied by the client regarding the structure itself, the antenna and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

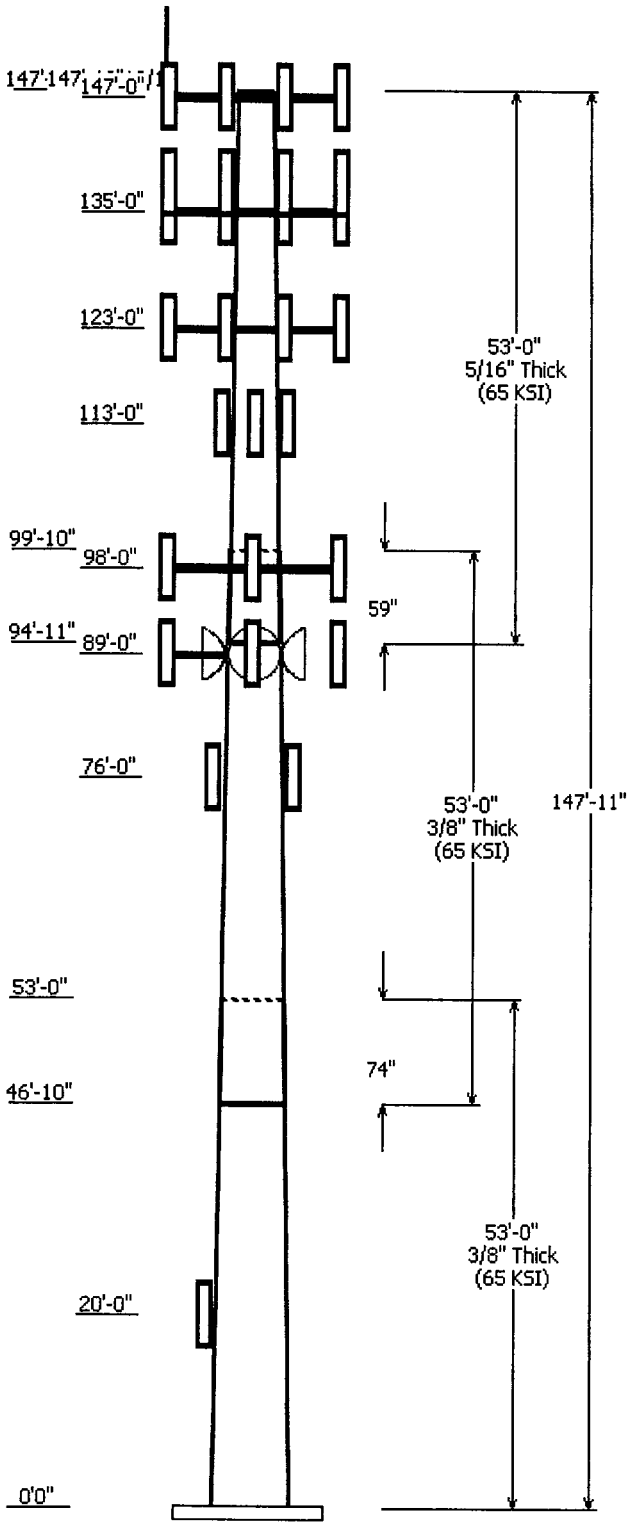
It is the responsibility of the client to ensure that the information provided to ATC Engineering Services and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/EIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Engineering Services is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

## Job Information

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | |
| Description : | 148' FWT Monopole | | |
| Client : | AT&T Mobility | | |
| Location : | Petro Lock, CT | | |
| Shape : | 18 Sides | Base Elev (ft): | 0.00 |
| Height : | 147.92 (ft) | Taper: | 0.214568(in/ft) |




## Sections Properties

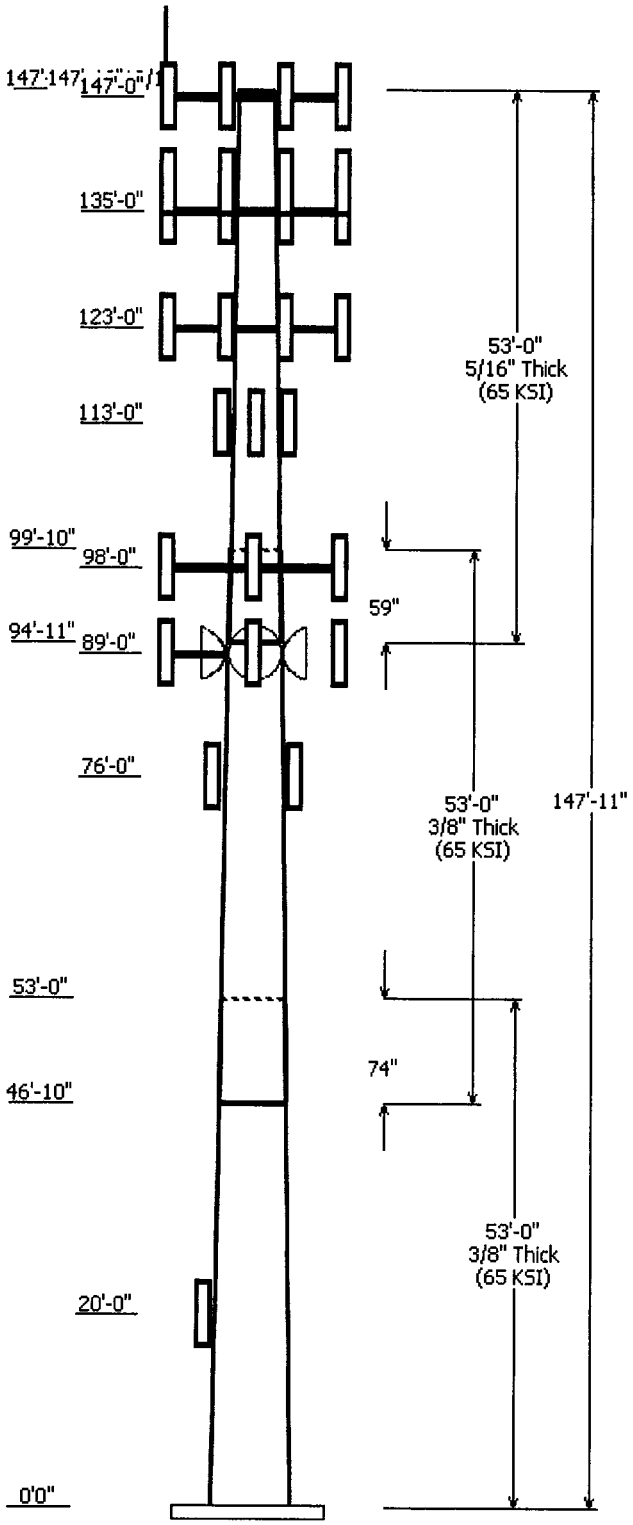
| Shaft Section | Length (ft) | Diameter (in) Across Flats Top | Bottom | Thick (in) | Joint Type | Overlap Length (in) | Taper (in/ft) | Steel Grade (ksi) |
|---|---|---|---|---|---|---|---|---|
| 1 | 53.000 | 45.20 | 56.58 | 0.375 | | 0.000 | 0.214568 | 65 |
| 2 | 53.000 | 35.90 | 47.28 | 0.375 | Slip Joint | 74.000 | 0.214568 | 65 |
| 3 | 53.000 | 26.21 | 37.58 | 0.313 | Slip Joint | 59.000 | 0.214568 | 65 |

## Discrete Appurtenance

| Attach Elev (ft) | Force Elev (ft) | Qty | Description |
|---|---|---|---|
| 147.900 | 149.610 | 1 | Flash Technology FTB 324-2 |
| 147.000 | 147.000 | 1 | Flat Platform w/ Handrails |
| 147.000 | 147.000 | 9 | 48" x 12" Panels |
| 147.000 | 147.000 | 3 | 72" x 12" Panels |
| 135.000 | 136.000 | 1 | Raycap DC6-48-60-18-8F |
| 135.000 | 136.000 | 6 | Ericsson RRUS 11 |
| 135.000 | 135.000 | 1 | Andrew SBNH-1D6565C |
| 135.000 | 135.000 | 2 | KMW AM-X-CD-16-65-00T-RET |
| 135.000 | 136.000 | 6 | Powerwave LGP21903 |
| 135.000 | 136.000 | 6 | Powerwave LGP21401 |
| 135.000 | 135.000 | 1 | Flat Platform w/ Handrails |
| 135.000 | 135.000 | 6 | Powerwave 7750.00 |
| 123.000 | 123.000 | 6 | RFS APXV18-206516L-C |
| 123.000 | 123.000 | 3 | RFS APX16DWV-16DWVL-C |
| 123.000 | 123.000 | 3 | Round T-Arms |
| 123.000 | 123.000 | 3 | RFS ATMAA1412D-1A20 |
| 123.000 | 123.000 | 3 | RFS ATMPP1412D-1CWA |
| 113.000 | 113.000 | 3 | RFS APXV18-206517 |
| 98.000 | 98.000 | 9 | Decibel DB844H90E-A |
| 98.000 | 98.000 | 1 | Round Low Profile Platform |
| 89.000 | 89.000 | 1 | DragonWave A-ANT-11G-2.5-C |
| 89.000 | 89.000 | 1 | Side Arms |
| 89.000 | 89.000 | 3 | NextNet BTS-2500 |
| 89.000 | 89.000 | 3 | Argus LLPX310R |
| 89.000 | 89.000 | 3 | DragonWave Horizon Compact |
| 89.000 | 89.000 | 2 | DragonWave A-ANT-18G-2-C |
| 76.000 | 76.000 | 2 | Side Markers |
| 20.000 | 20.000 | 1 | Lucent KS-24019 |

## Linear Appurtenance

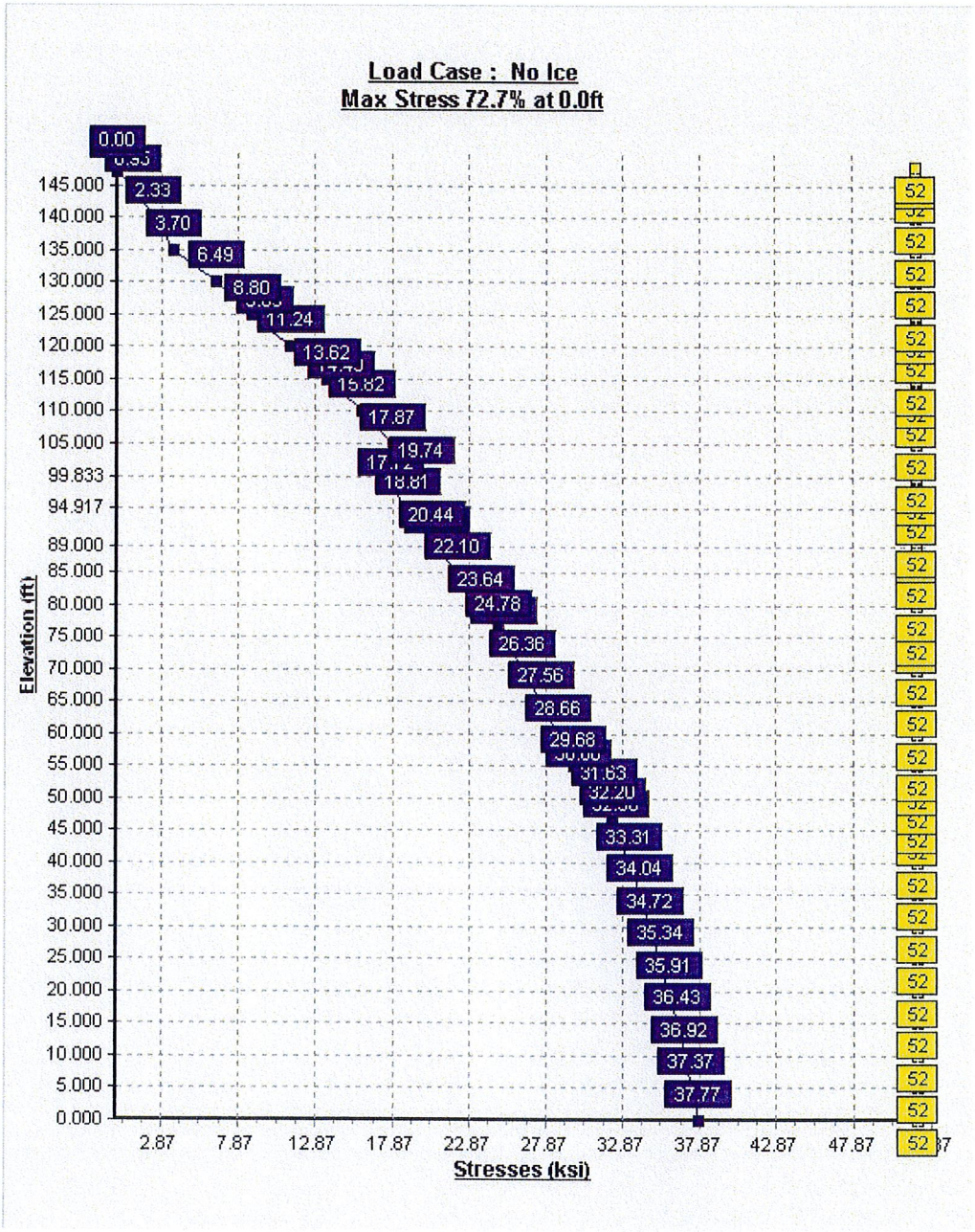
| Elev (ft) From | To | Description | Exposed To Wind |
|---|---|---|---|
| 5.000 | 20.000 | 1/2" Coax | Yes |
| 5.000 | 89.000 | 1/2" Coax | Yes |
| 5.000 | 89.000 | 3" Conduit | Yes |
| 5.000 | 89.000 | 5/16" Coax | Yes |
| 5.000 | 98.000 | 1 1/4" Coax | No |
| 5.000 | 113.0 | 1 5/8" Coax | No |
| 5.000 | 123.0 | 1 5/8" Coax | No |
| 5.000 | 123.0 | 1 5/8" Coax | Yes |
| 5.000 | 135.0 | 1 5/8" Coax | No |
| 5.000 | 135.0 | 10 mm Cable | No |
| 5.000 | 135.0 | 19.7 mm Cable | No |
| 5.000 | 135.0 | 3" Conduit | No |
| 5.000 | 147.0 | 1 5/8" Coax | No |




| Load Cases | |
|---|---|
| No Ice | 80.00 mph Wind with No Ice |
| Ice | 69.28 mph Wind with Ice |
| Twist/Sway | 50.00 mph Wind with No Ice |

| Reactions | | | |
|---|---|---|---|
| Load Case | Moment (Kip-ft) | Shear (Kips) | Axial (Kips) |
| No Ice | 2874.15 | 27.74 | 42.57 |
| Ice | 2408.78 | 22.88 | 50.47 |
| Twist/Sway | 1123.20 | 10.84 | 42.60 |

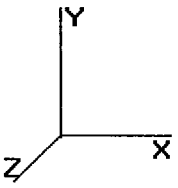
| Dish Deflections | | | |
|---|---|---|---|
| Load Case | Attach Elev (ft) | Deflection (in) | Rotation (deg) |
| Twist/Sway | 89.00 | 9.782 | 1.017 |
| Twist/Sway | 89.00 | 9.782 | 1.017 |


Load Case : No Ice
Max Stress 72.7% at 0.0ft
Elevation (ft)
145.000
140.000
135.000
130.000
125.000
120.000
115.000
110.000
105.000
99.833
94.917
89.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
0.00
2.33
3.70
6.49
8.80
11.24
13.62
15.82
17.87
19.74
18.81
20.44
22.10
23.64
24.78
26.36
27.56
28.66
29.68
31.63
33.31
34.04
34.72
35.34
35.91
36.43
36.92
37.37
37.77
52
2.87
7.87
12.87
17.87
22.87
27.87
32.87
37.87
42.87
47.87
Stresses (ksi)

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)

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Page: 1



## Shaft Section Properties

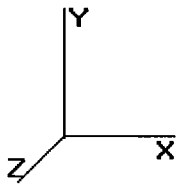
| Sect Info | Length (ft) | Thick (in) | Fy (ksi) | Slip Joint Type | Slip Joint Len (in) | Weight (lb) | Bottom Dia (in) | Bottom Elev (ft) | Bottom Area (sqin) | Bottom Ix (in^4) | Bottom W/t Ratio | Bottom D/t Ratio | Top Dia (in) | Top Elev (ft) | Top Area (sqin) | Top Ix (in^4) | Top W/t Ratio | Top D/t Ratio | Taper (in/ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-18 | 53.000 | 0.3750 | 65 | | 0.00 | 10,844 | 56.58 | 0.00 | 66.90 | 26698.9 | 24.84 | 150.88 | 45.20 | 53.00 | 53.36 | 13550.6 | 19.49 | 120.55 | 0.214568 |
| 2-18 | 53.000 | 0.3750 | 65 | Slip | 74.00 | 8,848 | 47.28 | 46.83 | 55.83 | 15518.7 | 20.47 | 126.08 | 35.90 | 99.83 | 42.29 | 6746.8 | 15.12 | 95.76 | 0.214568 |
| 3-18 | 53.000 | 0.3125 | 65 | Slip | 59.00 | 5,651 | 37.58 | 94.92 | 36.97 | 6490.6 | 19.45 | 120.28 | 26.21 | 147.92 | 25.69 | 2178.2 | 13.03 | 83.89 | 0.214568 |
| | | | | Shaft Weight | | 25,342 | | | | | | | | | | | | | |

## Discrete Appurtenance Properties

| Attach Elev (ft) | Description | Qty | No Ice Weight (lb) | No Ice CaAa (sf) | No Ice CaAa Factor | Ice Weight (lb) | Ice CaAa (sf) | Ice CaAa Factor | Distance From Face (ft) | Vert Ecc (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 147.90 | Flash Technology FTB 324-2 | 1 | 28.00 | 3.700 | 1.00 | 72.30 | 4.010 | 1.00 | 0.000 | 1.710 |
| 147.00 | 48" x 12" Panels | 9 | 30.00 | 5.600 | 0.67 | 63.00 | 6.190 | 0.67 | 0.000 | 0.000 |
| 147.00 | 72" x 12" Panels | 3 | 40.00 | 8.400 | 0.67 | 87.00 | 9.230 | 0.67 | 0.000 | 0.000 |
| 147.00 | Flat Platform w/ Handrails | 1 | 2000.00 | 42.400 | 1.00 | 2,450.00 | 48.400 | 1.00 | 0.000 | 0.000 |
| 135.00 | Andrew SBNH-1D6565C | 1 | 66.10 | 11.440 | 1.00 | 132.00 | 12.370 | 1.00 | 0.000 | 0.000 |
| 135.00 | Ericsson RRUS 11 | 6 | 55.00 | 2.940 | 0.67 | 74.30 | 3.290 | 0.67 | 0.000 | 1.000 |
| 135.00 | Flat Platform w/ Handrails | 1 | 2000.00 | 42.400 | 1.00 | 2,450.00 | 48.400 | 1.00 | 0.000 | 0.000 |
| 135.00 | KMW AM-X-CD-16-65-00T- | 2 | 48.50 | 8.020 | 0.79 | 95.00 | 9.080 | 0.79 | 0.000 | 0.000 |
| 135.00 | Powerwave 7750.00 | 6 | 35.00 | 5.880 | 0.75 | 65.67 | 6.540 | 0.75 | 0.000 | 0.000 |
| 135.00 | Powerwave LGP21401 | 6 | 14.10 | 1.290 | 0.50 | 21.26 | 1.530 | 0.50 | 0.000 | 1.000 |
| 135.00 | Powerwave LGP21903 | 6 | 5.50 | 0.270 | 0.50 | 7.90 | 0.380 | 0.50 | 0.000 | 1.000 |
| 135.00 | Raycap DC6-48-60-18-8F | 1 | 20.00 | 1.260 | 1.00 | 35.10 | 1.460 | 1.00 | 0.000 | 1.000 |
| 123.00 | RFS APX16DWV-16DWVL-C | 3 | 39.60 | 6.700 | 0.65 | 69.38 | 7.350 | 0.65 | 0.000 | 0.000 |
| 123.00 | RFS APXV18-206516L-C | 6 | 18.70 | 3.570 | 0.78 | 38.66 | 4.070 | 0.80 | 0.000 | 0.000 |
| 123.00 | RFS ATMAA1412D-1A20 | 3 | 13.00 | 1.170 | 0.50 | 20.60 | 1.390 | 0.50 | 0.000 | 0.000 |
| 123.00 | RFS ATMPP1412D-1CWA | 3 | 12.00 | 1.170 | 0.50 | 19.50 | 1.400 | 0.50 | 0.000 | 0.000 |
| 123.00 | Round T-Arms | 3 | 250.00 | 9.700 | 0.67 | 314.00 | 12.100 | 0.67 | 0.000 | 0.000 |
| 113.00 | RFS APXV18-206517 | 3 | 22.00 | 5.050 | 0.80 | 48.13 | 5.700 | 0.80 | 0.000 | 0.000 |
| 98.00 | Decibel DB844H90E-A | 9 | 10.00 | 3.970 | 0.86 | 36.30 | 4.530 | 0.86 | 0.000 | 0.000 |
| 98.00 | Round Low Profile Platform | 1 | 1500.00 | 21.700 | 1.00 | 1,700.00 | 27.200 | 1.00 | 0.000 | 0.000 |
| 89.00 | Argus LLPX310R | 3 | 28.60 | 4.830 | 0.72 | 54.50 | 5.360 | 0.72 | 0.000 | 0.000 |
| 89.00 | DragonWave A-ANT-11G-2.5- | 1 | 66.10 | 8.670 | 0.90 | 117.00 | 9.170 | 0.90 | 0.000 | 0.000 |
| 89.00 | DragonWave A-ANT-18G-2-C | 2 | 27.10 | 4.690 | 0.90 | 55.10 | 5.050 | 0.90 | 0.000 | 0.000 |
| 89.00 | DragonWave Horizon | 3 | 10.60 | 0.430 | 0.50 | 17.00 | 0.580 | 0.50 | 0.000 | 0.000 |
| 89.00 | NextNet BTS-2500 | 3 | 35.00 | 2.120 | 0.50 | 48.30 | 2.430 | 0.50 | 0.000 | 0.000 |
| 89.00 | Side Arms | 1 | 560.00 | 8.500 | 1.00 | 680.00 | 10.500 | 1.00 | 0.000 | 0.000 |
| 76.00 | Side Markers | 2 | 20.00 | 0.800 | 1.00 | 31.90 | 0.940 | 1.00 | 0.000 | 0.000 |
| 20.00 | Lucent KS-24019 | 1 | 7.00 | 1.000 | 1.00 | 15.00 | 1.300 | 1.00 | 0.000 | 0.000 |
| | Totals | 90 | 8920.60 | | | 12,191.06 | | | Number of Loadings : | 28 |

## Linear Appurtenance Properties

| Elev From (ft) | Elev To (ft) | Description | No Ice Weight (lb/ft) | No Ice CaAa (sf/ft) | Ice Weight (lb/ft) | Ice CaAa (sf/ft) | Exposed To Wind |
|---|---|---|---|---|---|---|---|
| 5.00 | 147.00 | (12) 1 5/8" Coax | 9.84 | 0.00 | 0.00 | 0.00 | N |
| 5.00 | 135.00 | (12) 1 5/8" Coax | 9.84 | 0.00 | 0.00 | 0.00 | N |
| 5.00 | 135.00 | (1) 10 mm Cable | 0.07 | 0.00 | 0.00 | 0.00 | N |
| 5.00 | 135.00 | (2) 19.7 mm Cable | 0.59 | 0.00 | 0.00 | 0.00 | N |
| 5.00 | 135.00 | (1) 3" Conduit | 7.58 | 0.00 | 0.00 | 0.00 | N |
| 5.00 | 123.00 | (12) 1 5/8" Coax | 14.76 | 0.00 | 0.00 | 0.00 | N |
| 5.00 | 123.00 | (6) 1 5/8" Coax | 4.92 | 0.20 | 9.46 | 0.25 | Y |
| 5.00 | 113.00 | (6) 1 5/8" Coax | 4.92 | 0.00 | 0.00 | 0.00 | N |

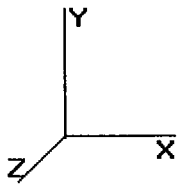







| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5.00 | 98.00 | (18) 1 1/4" Coax | 11.34 | 0.00 | 0.00 | 0.00 | N |
| 5.00 | 89.00 | (3) 1/2" Coax | 0.30 | 0.00 | 0.99 | 0.00 | Y |
| 5.00 | 89.00 | (1) 3" Conduit | 7.58 | 0.35 | 8.80 | 0.40 | Y |
| 5.00 | 89.00 | (6) 5/16" Coax | 0.24 | 0.00 | 1.80 | 0.00 | Y |
| 5.00 | 20.00 | (1) 1/2" Coax | 0.15 | 0.06 | 0.99 | 0.16 | Y |
| | | Total Weight | 8,340.23 (lb) | | 2,104.69 (lb) | | |

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | 4/20/2012 10:53:24 AM |
| Location : | Petro Lock, CT | | Page: 3 |
| Height : | 147.9 (ft) | | |
| Base Dia : | 56.58 (in) | | |
| Top Dia : | 26.21 (in) | Base Elev : 0.000 (ft) | |
| Shape : | 18 Sides | | |
| Taper : | 0.214568 (in/ft) | | |



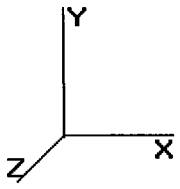



## Segment Properties (Max Len : 5 ft)

| Seg Top Elev (ft) | Description | Thick (in) | Flat Dia (in) | Area (in^2) | Ix (in^4) | W/t Ratio | D/t Ratio | Fy (ksi) | Fb (ksi) | Weight (lb) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.3750 | 56.580 | 66.895 | 26,698.9 | 24.84 | 150.88 | 65 | 52 | 0.0 |
| 5.00 | | 0.3750 | 55.507 | 65.618 | 25,199.0 | 24.34 | 148.02 | 65 | 52 | 1,127.3 |
| 10.00 | | 0.3750 | 54.434 | 64.341 | 23,756.4 | 23.83 | 145.16 | 65 | 52 | 1,105.6 |
| 15.00 | | 0.3750 | 53.361 | 63.065 | 22,369.9 | 23.33 | 142.30 | 65 | 52 | 1,083.8 |
| 20.00 | | 0.3750 | 52.288 | 61.788 | 21,038.4 | 22.82 | 139.44 | 65 | 52 | 1,062.1 |
| 25.00 | | 0.3750 | 51.216 | 60.511 | 19,760.8 | 22.32 | 136.57 | 65 | 52 | 1,040.4 |
| 30.00 | | 0.3750 | 50.143 | 59.234 | 18,536.1 | 21.81 | 133.71 | 65 | 52 | 1,018.7 |
| 35.00 | | 0.3750 | 49.070 | 57.957 | 17,363.0 | 21.31 | 130.85 | 65 | 52 | 996.9 |
| 40.00 | | 0.3750 | 47.997 | 56.680 | 16,240.5 | 20.81 | 127.99 | 65 | 52 | 975.2 |
| 45.00 | | 0.3750 | 46.924 | 55.403 | 15,167.4 | 20.30 | 125.13 | 65 | 52 | 953.5 |
| 46.83 | Bot - Section 2 | 0.3750 | 46.531 | 54.935 | 14,786.1 | 20.12 | 124.08 | 65 | 52 | 344.2 |
| 50.00 | | 0.3750 | 45.851 | 54.126 | 14,142.7 | 19.80 | 122.27 | 65 | 52 | 1,184.8 |
| 53.00 | Top - Section 1 | 0.3750 | 45.958 | 54.253 | 14,242.1 | 19.85 | 122.55 | 65 | 52 | 1,106.4 |
| 55.00 | | 0.3750 | 45.528 | 53.742 | 13,843.6 | 19.64 | 121.41 | 65 | 52 | 367.5 |
| 60.00 | | 0.3750 | 44.456 | 52.465 | 12,880.1 | 19.14 | 118.55 | 65 | 52 | 903.5 |
| 65.00 | | 0.3750 | 43.383 | 51.188 | 11,962.4 | 18.64 | 115.69 | 65 | 52 | 881.8 |
| 70.00 | | 0.3750 | 42.310 | 49.911 | 11,089.3 | 18.13 | 112.83 | 65 | 52 | 860.0 |
| 75.00 | | 0.3750 | 41.237 | 48.634 | 10,259.8 | 17.63 | 109.97 | 65 | 52 | 838.3 |
| 76.00 | | 0.3750 | 41.023 | 48.379 | 10,099.0 | 17.53 | 109.39 | 65 | 52 | 165.1 |
| 80.00 | | 0.3750 | 40.164 | 47.357 | 9,472.7 | 17.12 | 107.10 | 65 | 52 | 651.5 |
| 85.00 | | 0.3750 | 39.091 | 46.081 | 8,726.9 | 16.62 | 104.24 | 65 | 52 | 794.9 |
| 89.00 | | 0.3750 | 38.233 | 45.059 | 8,159.3 | 16.21 | 101.96 | 65 | 52 | 620.3 |
| 90.00 | | 0.3750 | 38.019 | 44.804 | 8,021.4 | 16.11 | 101.38 | 65 | 52 | 152.9 |
| 94.92 | Bot - Section 3 | 0.3750 | 36.964 | 43.548 | 7,365.7 | 15.62 | 98.57 | 65 | 52 | 739.1 |
| 95.00 | | 0.3750 | 36.946 | 43.527 | 7,354.9 | 15.61 | 98.52 | 65 | 52 | 22.8 |
| 98.00 | | 0.3750 | 36.302 | 42.761 | 6,973.3 | 15.31 | 96.81 | 65 | 52 | 814.4 |
| 99.83 | Top - Section 2 | 0.3125 | 36.534 | 35.926 | 5,955.0 | 18.85 | 116.91 | 65 | 52 | 490.6 |
| 100.0 | | 0.3125 | 36.498 | 35.890 | 5,937.4 | 18.83 | 116.79 | 65 | 52 | 20.4 |
| 105.0 | | 0.3125 | 35.425 | 34.826 | 5,424.8 | 18.23 | 113.36 | 65 | 52 | 601.6 |
| 110.0 | | 0.3125 | 34.352 | 33.762 | 4,942.6 | 17.62 | 109.93 | 65 | 52 | 583.5 |
| 113.0 | | 0.3125 | 33.709 | 33.124 | 4,667.5 | 17.26 | 107.87 | 65 | 52 | 341.4 |
| 115.0 | | 0.3125 | 33.279 | 32.698 | 4,489.8 | 17.01 | 106.49 | 65 | 52 | 224.0 |
| 120.0 | | 0.3125 | 32.207 | 31.634 | 4,065.6 | 16.41 | 103.06 | 65 | 52 | 547.3 |
| 123.0 | | 0.3125 | 31.563 | 30.995 | 3,824.4 | 16.05 | 101.00 | 65 | 52 | 319.7 |
| 125.0 | | 0.3125 | 31.134 | 30.570 | 3,669.0 | 15.80 | 99.63 | 65 | 52 | 209.5 |
| 130.0 | | 0.3125 | 30.061 | 29.506 | 3,299.0 | 15.20 | 96.19 | 65 | 52 | 511.1 |
| 135.0 | | 0.3125 | 28.988 | 28.442 | 2,954.8 | 14.59 | 92.76 | 65 | 52 | 493.0 |
| 140.0 | | 0.3125 | 27.915 | 27.377 | 2,635.4 | 13.99 | 89.33 | 65 | 52 | 474.8 |
| 145.0 | | 0.3125 | 26.842 | 26.313 | 2,339.9 | 13.38 | 85.90 | 65 | 52 | 456.7 |
| 147.0 | | 0.3125 | 26.413 | 25.888 | 2,228.2 | 13.14 | 84.52 | 65 | 52 | 177.6 |
| 147.9 | | 0.3125 | 26.220 | 25.696 | 2,179.1 | 13.03 | 83.90 | 65 | 52 | 79.0 |
| 147.9 | | 0.3125 | 26.216 | 25.693 | 2,178.2 | 13.03 | 83.89 | 65 | 52 | 1.5 |
| | | | | | | | | | | 25,342.4 |

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | 4/20/2012 10:53:24 AM |
| Location : | Petro Lock, CT | | Page: 4 |
| Height : | 147.9 (ft) | | |
| Base Dia : | 56.58 (in) | | |
| Top Dia : | 26.21 (in) | Base Elev : 0.000 (ft) | |
| Shape : | 18 Sides | | |
| Taper : | 0.214568 (in/ft) | | |



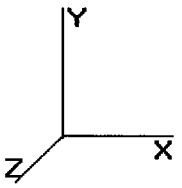



**Load Case:** No Ice — 80.00 mph Wind with No Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Shaft Segment Forces

| Seg Top Elev (ft) | Description | | Kz | qz (psf) | qzGh (psf) | C (mph-ft) | Cf | Ice Thick (in) | Tributary (ft) | Aa (sf) | CfAa (sf) | Wind Force X (lb) | Dead Load Ice (lb) | Tot Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.00 | 1.00 | 16.384 | 27.68 | 377.19 | 0.650 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 0.00 | 1.00 | 16.384 | 27.68 | 370.04 | 0.650 | 0.000 | 5.00 | 23.351 | 15.18 | 420.3 | 0.0 | 1,127.3 |
| 10.00 | | 0.00 | 1.00 | 16.384 | 27.68 | 362.89 | 0.650 | 0.000 | 5.00 | 22.904 | 14.89 | 412.2 | 0.0 | 1,105.6 |
| 15.00 | | 0.00 | 1.00 | 16.384 | 27.68 | 355.74 | 0.650 | 0.000 | 5.00 | 22.457 | 14.60 | 404.2 | 0.0 | 1,083.8 |
| 20.00 | Appertunance(s) | 0.00 | 1.00 | 16.384 | 27.68 | 348.58 | 0.650 | 0.000 | 5.00 | 22.010 | 14.31 | 396.1 | 0.0 | 1,062.1 |
| 25.00 | | 0.00 | 1.00 | 16.384 | 27.68 | 341.43 | 0.650 | 0.000 | 5.00 | 21.563 | 14.02 | 388.1 | 0.0 | 1,040.4 |
| 30.00 | | 0.00 | 1.00 | 16.384 | 27.68 | 334.28 | 0.650 | 0.000 | 5.00 | 21.116 | 13.73 | 380.0 | 0.0 | 1,018.7 |
| 35.00 | | 0.00 | 1.01 | 16.662 | 28.15 | 329.89 | 0.650 | 0.000 | 5.00 | 20.669 | 13.44 | 378.3 | 0.0 | 996.9 |
| 40.00 | | 0.00 | 1.05 | 17.310 | 29.25 | 328.89 | 0.650 | 0.000 | 5.00 | 20.222 | 13.14 | 384.5 | 0.0 | 975.2 |
| 45.00 | | 0.00 | 1.09 | 17.902 | 30.25 | 327.00 | 0.650 | 0.000 | 5.00 | 19.775 | 12.85 | 388.9 | 0.0 | 953.5 |
| 46.83 | Bot - Section 2 | 0.00 | 1.10 | 18.108 | 30.60 | 326.11 | 0.650 | 0.000 | 1.83 | 7.139 | 4.64 | 142.0 | 0.0 | 344.2 |
| 50.00 | | 0.00 | 1.12 | 18.449 | 31.17 | 324.37 | 0.650 | 0.000 | 3.17 | 12.387 | 8.05 | 251.0 | 0.0 | 1,184.8 |
| 53.00 | Top - Section 1 | 0.00 | 1.14 | 18.759 | 31.70 | 322.48 | 0.650 | 0.000 | 3.00 | 11.570 | 7.52 | 238.4 | 0.0 | 1,106.4 |
| 55.00 | | 0.00 | 1.15 | 18.959 | 32.04 | 326.50 | 0.650 | 0.000 | 2.00 | 7.624 | 4.96 | 158.8 | 0.0 | 367.5 |
| 60.00 | | 0.00 | 1.18 | 19.436 | 32.84 | 322.79 | 0.650 | 0.000 | 5.00 | 18.747 | 12.19 | 400.2 | 0.0 | 903.5 |
| 65.00 | | 0.00 | 1.21 | 19.885 | 33.60 | 318.62 | 0.650 | 0.000 | 5.00 | 18.300 | 11.89 | 399.7 | 0.0 | 881.8 |
| 70.00 | | 0.00 | 1.24 | 20.311 | 34.32 | 314.05 | 0.650 | 0.000 | 5.00 | 17.853 | 11.60 | 398.3 | 0.0 | 860.0 |
| 75.00 | | 0.00 | 1.26 | 20.715 | 35.00 | 309.12 | 0.650 | 0.000 | 5.00 | 17.406 | 11.31 | 396.1 | 0.0 | 838.3 |
| 76.00 | Appertunance(s) | 0.00 | 1.26 | 20.794 | 35.14 | 308.09 | 0.650 | 0.000 | 1.00 | 3.427 | 2.23 | 78.3 | 0.0 | 165.1 |
| 80.00 | | 0.00 | 1.28 | 21.101 | 35.66 | 303.87 | 0.650 | 0.000 | 4.00 | 13.531 | 8.80 | 313.6 | 0.0 | 651.5 |
| 85.00 | | 0.00 | 1.31 | 21.469 | 36.28 | 298.32 | 0.650 | 0.000 | 5.00 | 16.512 | 10.73 | 389.4 | 0.0 | 794.9 |
| 89.00 | Appertunance(s) | 0.00 | 1.32 | 21.753 | 36.76 | 293.69 | 0.650 | 0.000 | 4.00 | 12.887 | 8.38 | 308.0 | 0.0 | 620.3 |
| 90.00 | | 0.00 | 1.33 | 21.823 | 36.88 | 292.51 | 0.650 | 0.000 | 1.00 | 3.177 | 2.07 | 76.2 | 0.0 | 152.9 |
| 94.92 | Bot - Section 3 | 0.00 | 1.35 | 22.157 | 37.44 | 286.57 | 0.650 | 0.000 | 4.92 | 15.361 | 9.98 | 373.9 | 0.0 | 739.1 |
| 95.00 | | 0.00 | 1.35 | 22.163 | 37.45 | 286.46 | 0.650 | 0.000 | 0.08 | 0.261 | 0.17 | 6.4 | 0.0 | 22.8 |
| 98.00 | Appertunance(s) | 0.00 | 1.36 | 22.360 | 37.78 | 282.72 | 0.650 | 0.000 | 3.00 | 9.312 | 6.05 | 228.7 | 0.0 | 814.4 |
| 99.83 | Top - Section 2 | 0.00 | 1.37 | 22.479 | 37.99 | 280.40 | 0.650 | 0.000 | 1.83 | 5.612 | 3.65 | 138.6 | 0.0 | 490.6 |
| 100.0 | | 0.00 | 1.37 | 22.490 | 38.00 | 285.07 | 0.650 | 0.000 | 0.17 | 0.507 | 0.33 | 12.5 | 0.0 | 20.4 |
| 105.0 | | 0.00 | 1.39 | 22.806 | 38.54 | 278.63 | 0.650 | 0.000 | 5.00 | 14.984 | 9.74 | 375.4 | 0.0 | 601.6 |
| 110.0 | | 0.00 | 1.41 | 23.111 | 39.05 | 271.99 | 0.650 | 0.000 | 5.00 | 14.537 | 9.45 | 369.1 | 0.0 | 583.5 |
| 113.0 | Appertunance(s) | 0.00 | 1.42 | 23.289 | 39.35 | 267.92 | 0.650 | 0.000 | 3.00 | 8.508 | 5.53 | 217.7 | 0.0 | 341.4 |
| 115.0 | | 0.00 | 1.42 | 23.406 | 39.55 | 265.17 | 0.650 | 0.000 | 2.00 | 5.582 | 3.63 | 143.5 | 0.0 | 224.0 |
| 120.0 | | 0.00 | 1.44 | 23.692 | 40.04 | 258.19 | 0.650 | 0.000 | 5.00 | 13.643 | 8.87 | 355.1 | 0.0 | 547.3 |
| 123.0 | Appertunance(s) | 0.00 | 1.45 | 23.860 | 40.32 | 253.92 | 0.650 | 0.000 | 3.00 | 7.971 | 5.18 | 208.9 | 0.0 | 319.7 |
| 125.0 | | 0.00 | 1.46 | 23.970 | 40.51 | 251.05 | 0.650 | 0.000 | 2.00 | 5.225 | 3.40 | 137.6 | 0.0 | 209.5 |
| 130.0 | | 0.00 | 1.48 | 24.241 | 40.96 | 243.76 | 0.650 | 0.000 | 5.00 | 12.749 | 8.29 | 339.5 | 0.0 | 511.1 |
| 135.0 | Appertunance(s) | 0.00 | 1.49 | 24.503 | 41.41 | 236.33 | 0.650 | 0.000 | 5.00 | 12.302 | 8.00 | 331.1 | 0.0 | 493.0 |
| 140.0 | | 0.00 | 1.51 | 24.759 | 41.84 | 228.77 | 0.650 | 0.000 | 5.00 | 11.855 | 7.71 | 322.4 | 0.0 | 474.8 |
| 145.0 | | 0.00 | 1.52 | 25.009 | 42.26 | 221.08 | 0.650 | 0.000 | 5.00 | 11.408 | 7.42 | 313.4 | 0.0 | 456.7 |
| 147.0 | Appertunance(s) | 0.00 | 1.53 | 25.107 | 42.43 | 217.98 | 0.650 | 0.000 | 2.00 | 4.438 | 2.88 | 122.4 | 0.0 | 177.6 |
| 147.9 | Appertunance(s) | 0.00 | 1.53 | 25.151 | 42.50 | 216.57 | 0.650 | 0.000 | 0.90 | 1.974 | 1.28 | 54.5 | 0.0 | 79.0 |
| 147.9 | | 0.00 | 1.53 | 25.152 | 42.50 | 216.54 | 0.650 | 0.000 | 0.02 | 0.037 | 0.02 | 1.0 | 0.0 | 1.5 |
| | | | | | | | Totals: | | 147.92 | | | 11,154.4 | 0.0 | 25,342.4 |





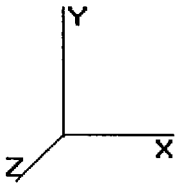



**Load Case:** No Ice — 80.00 mph Wind with No Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Discrete Appurtenance Segment Forces

| Elev (ft) | Description | Qty | qz (psf) | qzGh (psf) | CaAa Factor | Total CaAa (sf) | Horiz Ecc (ft) | Vert Ecc (ft) | Wind FX (lb) | Mom Y (lb-ft) | Mom Z (lb-ft) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.00 | Lucent KS-24019 | 1 | 16.384 | 27.689 | 1.00 | 1.00 | 0.000 | 0.000 | 27.69 | 0.00 | 0.00 | 7.00 |
| 76.00 | Side Markers | 2 | 20.794 | 35.142 | 1.00 | 1.60 | 0.000 | 0.000 | 56.23 | 0.00 | 0.00 | 40.00 |
| 89.00 | Argus LLPX310R | 3 | 21.753 | 36.763 | 0.72 | 10.43 | 0.000 | 0.000 | 383.54 | 0.00 | 0.00 | 85.80 |
| 89.00 | DragonWave A-ANT- | 1 | 21.753 | 36.763 | 0.90 | 7.80 | 0.000 | 0.000 | 286.86 | 0.00 | 0.00 | 66.10 |
| 89.00 | DragonWave A-ANT- | 2 | 21.753 | 36.763 | 0.90 | 8.44 | 0.000 | 0.000 | 310.36 | 0.00 | 0.00 | 54.20 |
| 89.00 | DragonWave Horizon | 3 | 21.753 | 36.763 | 0.50 | 0.64 | 0.000 | 0.000 | 23.71 | 0.00 | 0.00 | 31.80 |
| 89.00 | NextNet BTS-2500 | 3 | 21.753 | 36.763 | 0.50 | 3.18 | 0.000 | 0.000 | 116.91 | 0.00 | 0.00 | 105.00 |
| 89.00 | Side Arms | 1 | 21.753 | 36.763 | 1.00 | 8.50 | 0.000 | 0.000 | 312.49 | 0.00 | 0.00 | 560.00 |
| 98.00 | Decibel DB844H90E-A | 9 | 22.360 | 37.789 | 0.86 | 30.73 | 0.000 | 0.000 | 1,161.18 | 0.00 | 0.00 | 90.00 |
| 98.00 | Round Low Profile Pl | 1 | 22.360 | 37.789 | 1.00 | 21.70 | 0.000 | 0.000 | 820.02 | 0.00 | 0.00 | 1,500.00 |
| 113.0 | RFS APXV18-206517 | 3 | 23.289 | 39.359 | 0.80 | 12.12 | 0.000 | 0.000 | 477.03 | 0.00 | 0.00 | 66.00 |
| 123.0 | RFS APX16DWV- | 3 | 23.860 | 40.324 | 0.65 | 13.06 | 0.000 | 0.000 | 526.83 | 0.00 | 0.00 | 118.80 |
| 123.0 | RFS APXV18-206516L- | 6 | 23.860 | 40.324 | 0.78 | 16.71 | 0.000 | 0.000 | 673.71 | 0.00 | 0.00 | 112.20 |
| 123.0 | RFS ATMAA1412D- | 3 | 23.860 | 40.324 | 0.50 | 1.75 | 0.000 | 0.000 | 70.77 | 0.00 | 0.00 | 39.00 |
| 123.0 | RFS ATMPP1412D- | 3 | 23.860 | 40.324 | 0.50 | 1.75 | 0.000 | 0.000 | 70.77 | 0.00 | 0.00 | 36.00 |
| 123.0 | Round T-Arms | 3 | 23.860 | 40.324 | 0.67 | 19.50 | 0.000 | 0.000 | 786.18 | 0.00 | 0.00 | 750.00 |
| 135.0 | Andrew SBNH- | 1 | 24.503 | 41.411 | 1.00 | 11.44 | 0.000 | 0.000 | 473.74 | 0.00 | 0.00 | 66.10 |
| 135.0 | Ericsson RRUS 11 | 6 | 24.555 | 41.498 | 0.67 | 11.82 | 0.000 | 1.000 | 490.46 | 0.00 | 490.46 | 330.00 |
| 135.0 | Flat Platform w/ Han | 1 | 24.503 | 41.411 | 1.00 | 42.40 | 0.000 | 0.000 | 1,755.81 | 0.00 | 0.00 | 2,000.00 |
| 135.0 | KMW AM-X-CD-16-65- | 2 | 24.503 | 41.411 | 0.79 | 12.67 | 0.000 | 0.000 | 524.74 | 0.00 | 0.00 | 97.00 |
| 135.0 | Powerwave 7750.00 | 6 | 24.503 | 41.411 | 0.75 | 26.46 | 0.000 | 0.000 | 1,095.73 | 0.00 | 0.00 | 210.00 |
| 135.0 | Powerwave LGP21401 | 6 | 24.555 | 41.498 | 0.50 | 3.87 | 0.000 | 1.000 | 160.60 | 0.00 | 160.60 | 84.60 |
| 135.0 | Powerwave LGP21903 | 6 | 24.555 | 41.498 | 0.50 | 0.81 | 0.000 | 1.000 | 33.61 | 0.00 | 33.61 | 33.00 |
| 135.0 | Raycap DC6-48-60-18- | 1 | 24.555 | 41.498 | 1.00 | 1.26 | 0.000 | 1.000 | 52.29 | 0.00 | 52.29 | 20.00 |
| 147.0 | 48" x 12" Panels | 9 | 25.107 | 42.431 | 0.67 | 33.77 | 0.000 | 0.000 | 1,432.80 | 0.00 | 0.00 | 270.00 |
| 147.0 | 72" x 12" Panels | 3 | 25.107 | 42.431 | 0.67 | 16.88 | 0.000 | 0.000 | 716.40 | 0.00 | 0.00 | 120.00 |
| 147.0 | Flat Platform w/ Han | 1 | 25.107 | 42.431 | 1.00 | 42.40 | 0.000 | 0.000 | 1,799.05 | 0.00 | 0.00 | 2,000.00 |
| 147.9 | Flash Technology FTB | 1 | 25.233 | 42.644 | 1.00 | 3.70 | 0.000 | 1.710 | 157.78 | 0.00 | 269.81 | 28.00 |
| | | | | | | | | | 14,797.28 | | | 8,920.60 |





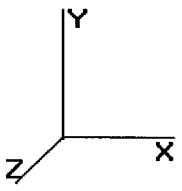



**Load Case:** No Ice — 80.00 mph Wind with No Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Linear Appurtenance Segment Forces

| Seg Top Elev (ft) | Description | Exposed To Wind | Length (ft) | Weight (lb/ft) | CaAa (sf/ft) | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|
| 10.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 16.384 | 27.69 | 24.60 |
| 10.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 16.384 | 0.00 | 1.50 |
| 10.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 16.384 | 48.46 | 37.90 |
| 10.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 16.384 | 0.00 | 1.20 |
| 10.00 | (1) 1/2" Coax | Yes | 5.00 | 0.15 | 0.06 | 16.384 | 8.72 | 0.75 |
| 15.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 16.384 | 27.69 | 24.60 |
| 15.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 16.384 | 0.00 | 1.50 |
| 15.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 16.384 | 48.46 | 37.90 |
| 15.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 16.384 | 0.00 | 1.20 |
| 15.00 | (1) 1/2" Coax | Yes | 5.00 | 0.15 | 0.06 | 16.384 | 8.72 | 0.75 |
| 20.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 16.384 | 27.69 | 24.60 |
| 20.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 16.384 | 0.00 | 1.50 |
| 20.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 16.384 | 48.46 | 37.90 |
| 20.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 16.384 | 0.00 | 1.20 |
| 20.00 | (1) 1/2" Coax | Yes | 5.00 | 0.15 | 0.06 | 16.384 | 8.72 | 0.75 |
| 25.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 16.384 | 27.69 | 24.60 |
| 25.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 16.384 | 0.00 | 1.50 |
| 25.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 16.384 | 48.46 | 37.90 |
| 25.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 16.384 | 0.00 | 1.20 |
| 30.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 16.384 | 27.69 | 24.60 |
| 30.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 16.384 | 0.00 | 1.50 |
| 30.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 16.384 | 48.46 | 37.90 |
| 30.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 16.384 | 0.00 | 1.20 |
| 35.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 16.662 | 28.16 | 24.60 |
| 35.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 16.662 | 0.00 | 1.50 |
| 35.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 16.662 | 49.28 | 37.90 |
| 35.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 16.662 | 0.00 | 1.20 |
| 40.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 17.310 | 29.25 | 24.60 |
| 40.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 17.310 | 0.00 | 1.50 |
| 40.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 17.310 | 51.19 | 37.90 |
| 40.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 17.310 | 0.00 | 1.20 |
| 45.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 17.902 | 30.25 | 24.60 |
| 45.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 17.902 | 0.00 | 1.50 |
| 45.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 17.902 | 52.95 | 37.90 |
| 45.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 17.902 | 0.00 | 1.20 |
| 46.83 | (6) 1 5/8" Coax | Yes | 1.83 | 4.92 | 0.20 | 18.108 | 11.22 | 9.02 |
| 46.83 | (3) 1/2" Coax | Yes | 1.83 | 0.30 | 0.00 | 18.108 | 0.00 | 0.55 |
| 46.83 | (1) 3" Conduit | Yes | 1.83 | 7.58 | 0.35 | 18.108 | 19.64 | 13.90 |
| 46.83 | (6) 5/16" Coax | Yes | 1.83 | 0.24 | 0.00 | 18.108 | 0.00 | 0.44 |
| 50.00 | (6) 1 5/8" Coax | Yes | 3.17 | 4.92 | 0.20 | 18.449 | 19.75 | 15.58 |
| 50.00 | (3) 1/2" Coax | Yes | 3.17 | 0.30 | 0.00 | 18.449 | 0.00 | 0.95 |
| 50.00 | (1) 3" Conduit | Yes | 3.17 | 7.58 | 0.35 | 18.449 | 34.56 | 24.00 |
| 50.00 | (6) 5/16" Coax | Yes | 3.17 | 0.24 | 0.00 | 18.449 | 0.00 | 0.76 |
| 53.00 | (6) 1 5/8" Coax | Yes | 3.00 | 4.92 | 0.20 | 18.759 | 19.02 | 14.76 |
| 53.00 | (3) 1/2" Coax | Yes | 3.00 | 0.30 | 0.00 | 18.759 | 0.00 | 0.90 |
| 53.00 | (1) 3" Conduit | Yes | 3.00 | 7.58 | 0.35 | 18.759 | 33.29 | 22.74 |
| 53.00 | (6) 5/16" Coax | Yes | 3.00 | 0.24 | 0.00 | 18.759 | 0.00 | 0.72 |
| 55.00 | (6) 1 5/8" Coax | Yes | 2.00 | 4.92 | 0.20 | 18.959 | 12.82 | 9.84 |
| 55.00 | (3) 1/2" Coax | Yes | 2.00 | 0.30 | 0.00 | 18.959 | 0.00 | 0.60 |
| 55.00 | (1) 3" Conduit | Yes | 2.00 | 7.58 | 0.35 | 18.959 | 22.43 | 15.16 |
| 55.00 | (6) 5/16" Coax | Yes | 2.00 | 0.24 | 0.00 | 18.959 | 0.00 | 0.48 |





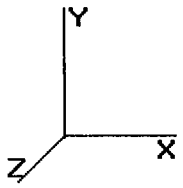



**Load Case:** No Ice — 80.00 mph Wind with No Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 60.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 19.436 | | 32.85 | 24.60 |
| 60.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 19.436 | | 0.00 | 1.50 |
| 60.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 19.436 | | 57.48 | 37.90 |
| 60.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 19.436 | | 0.00 | 1.20 |
| 65.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 19.885 | | 33.61 | 24.60 |
| 65.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 19.885 | | 0.00 | 1.50 |
| 65.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 19.885 | | 58.81 | 37.90 |
| 65.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 19.885 | | 0.00 | 1.20 |
| 70.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 20.311 | | 34.33 | 24.60 |
| 70.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 20.311 | | 0.00 | 1.50 |
| 70.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 20.311 | | 60.07 | 37.90 |
| 70.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 20.311 | | 0.00 | 1.20 |
| 75.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 20.715 | | 35.01 | 24.60 |
| 75.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 20.715 | | 0.00 | 1.50 |
| 75.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 20.715 | | 61.27 | 37.90 |
| 75.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 20.715 | | 0.00 | 1.20 |
| 76.00 | (6) 1 5/8" Coax | Yes | 1.00 | 4.92 | 0.20 | 20.794 | | 7.03 | 4.92 |
| 76.00 | (3) 1/2" Coax | Yes | 1.00 | 0.30 | 0.00 | 20.794 | | 0.00 | 0.30 |
| 76.00 | (1) 3" Conduit | Yes | 1.00 | 7.58 | 0.35 | 20.794 | | 12.30 | 7.58 |
| 76.00 | (6) 5/16" Coax | Yes | 1.00 | 0.24 | 0.00 | 20.794 | | 0.00 | 0.24 |
| 80.00 | (6) 1 5/8" Coax | Yes | 4.00 | 4.92 | 0.20 | 21.101 | | 28.53 | 19.68 |
| 80.00 | (3) 1/2" Coax | Yes | 4.00 | 0.30 | 0.00 | 21.101 | | 0.00 | 1.20 |
| 80.00 | (1) 3" Conduit | Yes | 4.00 | 7.58 | 0.35 | 21.101 | | 49.92 | 30.32 |
| 80.00 | (6) 5/16" Coax | Yes | 4.00 | 0.24 | 0.00 | 21.101 | | 0.00 | 0.96 |
| 85.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 21.469 | | 36.28 | 24.60 |
| 85.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 21.469 | | 0.00 | 1.50 |
| 85.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 21.469 | | 63.50 | 37.90 |
| 85.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 21.469 | | 0.00 | 1.20 |
| 89.00 | (6) 1 5/8" Coax | Yes | 4.00 | 4.92 | 0.20 | 21.753 | | 29.41 | 19.68 |
| 89.00 | (3) 1/2" Coax | Yes | 4.00 | 0.30 | 0.00 | 21.753 | | 0.00 | 1.20 |
| 89.00 | (1) 3" Conduit | Yes | 4.00 | 7.58 | 0.35 | 21.753 | | 51.47 | 30.32 |
| 89.00 | (6) 5/16" Coax | Yes | 4.00 | 0.24 | 0.00 | 21.753 | | 0.00 | 0.96 |
| 90.00 | (6) 1 5/8" Coax | Yes | 1.00 | 4.92 | 0.20 | 21.823 | | 7.38 | 4.92 |
| 94.92 | (6) 1 5/8" Coax | Yes | 4.92 | 4.92 | 0.20 | 22.157 | | 36.82 | 24.19 |
| 95.00 | (6) 1 5/8" Coax | Yes | 0.08 | 4.92 | 0.20 | 22.163 | | 0.62 | 0.41 |
| 98.00 | (6) 1 5/8" Coax | Yes | 3.00 | 4.92 | 0.20 | 22.360 | | 22.67 | 14.76 |
| 99.83 | (6) 1 5/8" Coax | Yes | 1.83 | 4.92 | 0.20 | 22.479 | | 13.93 | 9.02 |
| 100.0 | (6) 1 5/8" Coax | Yes | 0.17 | 4.92 | 0.20 | 22.490 | | 1.27 | 0.82 |
| 105.0 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 22.806 | | 38.54 | 24.60 |
| 110.0 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 23.111 | | 39.06 | 24.60 |
| 113.0 | (6) 1 5/8" Coax | Yes | 3.00 | 4.92 | 0.20 | 23.289 | | 23.62 | 14.76 |
| 115.0 | (6) 1 5/8" Coax | Yes | 2.00 | 4.92 | 0.20 | 23.406 | | 15.82 | 9.84 |
| 120.0 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 23.692 | | 40.04 | 24.60 |
| 123.0 | (6) 1 5/8" Coax | Yes | 3.00 | 4.92 | 0.20 | 23.860 | | 24.19 | 14.76 |
| | | | | | | | Totals: | 1,736.50 | 1,264.89 |

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | 4/20/2012 10:53:25 AM |
| Location : | Petro Lock, CT | | Page: 8 |
| Height : | 147.9 (ft) | | |
| Base Dia : | 56.58 (in) | | |
| Top Dia : | 26.21 (in) | Base Elev : 0.000 (ft) | |
| Shape : | 18 Sides | | |
| Taper : | 0.214568 (in/ft) | | |






**Load Case:** No Ice — 80.00 mph Wind with No Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Applied Segment Forces Summary

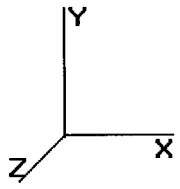
| Seg Elev (ft) | Lateral FX (-) (lb) | Axial FY (-) (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 420.27 | 1,127.29 | 0.00 | 0.00 |
| 10.00 | 497.10 | 1,466.21 | 0.00 | 0.00 |
| 15.00 | 489.05 | 1,444.49 | 0.00 | 0.00 |
| 20.00 | 508.69 | 1,429.76 | 0.00 | 0.00 |
| 25.00 | 464.24 | 1,400.29 | 0.00 | 0.00 |
| 30.00 | 456.19 | 1,378.56 | 0.00 | 0.00 |
| 35.00 | 455.74 | 1,356.84 | 0.00 | 0.00 |
| 40.00 | 464.97 | 1,335.11 | 0.00 | 0.00 |
| 45.00 | 472.09 | 1,313.39 | 0.00 | 0.00 |
| 46.83 | 172.86 | 476.13 | 0.00 | 0.00 |
| 50.00 | 305.35 | 1,412.74 | 0.00 | 0.00 |
| 53.00 | 290.73 | 1,322.31 | 0.00 | 0.00 |
| 55.00 | 194.02 | 511.44 | 0.00 | 0.00 |
| 60.00 | 490.57 | 1,263.40 | 0.00 | 0.00 |
| 65.00 | 492.16 | 1,241.67 | 0.00 | 0.00 |
| 70.00 | 492.72 | 1,219.95 | 0.00 | 0.00 |
| 75.00 | 492.35 | 1,198.22 | 0.00 | 0.00 |
| 76.00 | 153.84 | 277.04 | 0.00 | 0.00 |
| 80.00 | 392.09 | 939.46 | 0.00 | 0.00 |
| 85.00 | 489.19 | 1,154.77 | 0.00 | 0.00 |
| 89.00 | 1,822.71 | 1,811.08 | 0.00 | 0.00 |
| 90.00 | 83.54 | 216.75 | 0.00 | 0.00 |
| 94.92 | 410.70 | 1,053.06 | 0.00 | 0.00 |
| 95.00 | 6.98 | 28.15 | 0.00 | 0.00 |
| 98.00 | 2,232.61 | 2,595.99 | 0.00 | 0.00 |
| 99.83 | 152.50 | 586.92 | 0.00 | 0.00 |
| 100.0 | 13.80 | 29.12 | 0.00 | 0.00 |
| 105.0 | 413.92 | 864.18 | 0.00 | 0.00 |
| 110.0 | 408.11 | 846.07 | 0.00 | 0.00 |
| 113.0 | 718.29 | 564.95 | 0.00 | 0.00 |
| 115.0 | 159.35 | 319.18 | 0.00 | 0.00 |
| 120.0 | 395.11 | 785.27 | 0.00 | 0.00 |
| 123.0 | 2,361.39 | 1,518.47 | 0.00 | 0.00 |
| 125.0 | 137.57 | 265.33 | 0.00 | 0.00 |
| 130.0 | 339.48 | 650.66 | 0.00 | 0.00 |
| 135.0 | 4,918.10 | 3,473.25 | 0.00 | 736.96 |
| 140.0 | 322.43 | 524.05 | 0.00 | 0.00 |
| 145.0 | 313.40 | 505.95 | 0.00 | 0.00 |
| 147.0 | 4,070.65 | 2,587.31 | 0.00 | 0.00 |
| 147.9 | 212.32 | 106.99 | 0.00 | 269.81 |
| 147.9 | 1.03 | 1.49 | 0.00 | 0.00 |
| Totals: | 27,688.20 | 42,603.25 | 0.00 | 1,006.77 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)





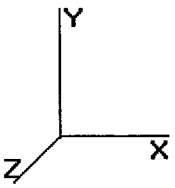



**Load Case:** No Ice — 80.00 mph Wind with No Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Shaft Forces and Deflections

| Seg Elev (ft) | Lateral FX (-) (kips) | Axial FY (-) (kips) | Lateral FZ (kips) | Moment MX (ft-kips) | Torsion MY (ft-kips) | Moment MZ (ft-kips) | X Deflect (in) | Z Deflect (in) | Total Deflect (in) | Rotation (deg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -27.745 | -42.566 | 0.000 | 0.000 | 0.000 | -2,874.150 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5.00 | -27.431 | -41.368 | 0.000 | 0.000 | 0.000 | -2,735.431 | -0.081 | 0.000 | 0.081 | -0.149 |
| 10.00 | -27.033 | -39.832 | 0.000 | 0.000 | 0.000 | -2,598.278 | -0.318 | 0.000 | 0.318 | -0.300 |
| 15.00 | -26.637 | -38.320 | 0.000 | 0.000 | 0.000 | -2,463.114 | -0.714 | 0.000 | 0.714 | -0.452 |
| 20.00 | -26.213 | -36.826 | 0.000 | 0.000 | 0.000 | -2,329.934 | -1.269 | 0.000 | 1.269 | -0.604 |
| 25.00 | -25.827 | -35.362 | 0.000 | 0.000 | 0.000 | -2,198.872 | -1.984 | 0.000 | 1.984 | -0.757 |
| 30.00 | -25.442 | -33.922 | 0.000 | 0.000 | 0.000 | -2,069.741 | -2.860 | 0.000 | 2.860 | -0.911 |
| 35.00 | -25.050 | -32.506 | 0.000 | 0.000 | 0.000 | -1,942.535 | -3.897 | 0.000 | 3.897 | -1.065 |
| 40.00 | -24.642 | -31.114 | 0.000 | 0.000 | 0.000 | -1,817.286 | -5.095 | 0.000 | 5.095 | -1.219 |
| 45.00 | -24.195 | -29.768 | 0.000 | 0.000 | 0.000 | -1,694.077 | -6.454 | 0.000 | 6.454 | -1.372 |
| 46.83 | -24.051 | -29.263 | 0.000 | 0.000 | 0.000 | -1,649.721 | -6.993 | 0.000 | 6.993 | -1.430 |
| 50.00 | -23.755 | -27.819 | 0.000 | 0.000 | 0.000 | -1,573.562 | -7.975 | 0.000 | 7.975 | -1.528 |
| 53.00 | -23.464 | -26.474 | 0.000 | 0.000 | 0.000 | -1,502.298 | -8.966 | 0.000 | 8.966 | -1.621 |
| 55.00 | -23.302 | -25.926 | 0.000 | 0.000 | 0.000 | -1,455.371 | -9.658 | 0.000 | 9.658 | -1.683 |
| 60.00 | -22.834 | -24.622 | 0.000 | 0.000 | 0.000 | -1,338.862 | -11.499 | 0.000 | 11.499 | -1.827 |
| 65.00 | -22.359 | -23.342 | 0.000 | 0.000 | 0.000 | -1,224.691 | -13.488 | 0.000 | 13.488 | -1.968 |
| 70.00 | -21.876 | -22.088 | 0.000 | 0.000 | 0.000 | -1,112.900 | -15.624 | 0.000 | 15.624 | -2.107 |
| 75.00 | -21.368 | -20.880 | 0.000 | 0.000 | 0.000 | -1,003.523 | -17.904 | 0.000 | 17.904 | -2.243 |
| 76.00 | -21.227 | -20.584 | 0.000 | 0.000 | 0.000 | -982.155 | -18.377 | 0.000 | 18.377 | -2.270 |
| 80.00 | -20.838 | -19.619 | 0.000 | 0.000 | 0.000 | -897.247 | -20.325 | 0.000 | 20.325 | -2.376 |
| 85.00 | -20.336 | -18.446 | 0.000 | 0.000 | 0.000 | -793.061 | -22.883 | 0.000 | 22.883 | -2.503 |
| 89.00 | -18.452 | -16.699 | 0.000 | 0.000 | 0.000 | -711.720 | -25.022 | 0.000 | 25.022 | -2.601 |
| 90.00 | -18.379 | -16.463 | 0.000 | 0.000 | 0.000 | -693.268 | -25.570 | 0.000 | 25.570 | -2.626 |
| 94.92 | -17.934 | -15.413 | 0.000 | 0.000 | 0.000 | -602.908 | -28.334 | 0.000 | 28.334 | -2.739 |
| 95.00 | -17.935 | -15.375 | 0.000 | 0.000 | 0.000 | -601.414 | -28.382 | 0.000 | 28.382 | -2.741 |
| 98.00 | -15.591 | -12.875 | 0.000 | 0.000 | 0.000 | -547.609 | -30.125 | 0.000 | 30.125 | -2.807 |
| 99.83 | -15.415 | -12.291 | 0.000 | 0.000 | 0.000 | -519.025 | -31.211 | 0.000 | 31.211 | -2.847 |
| 100.0 | -15.412 | -12.246 | 0.000 | 0.000 | 0.000 | -516.456 | -31.311 | 0.000 | 31.311 | -2.851 |
| 105.0 | -14.977 | -11.375 | 0.000 | 0.000 | 0.000 | -439.395 | -34.358 | 0.000 | 34.358 | -2.965 |
| 110.0 | -14.540 | -10.531 | 0.000 | 0.000 | 0.000 | -364.510 | -37.521 | 0.000 | 37.521 | -3.071 |
| 113.0 | -13.801 | -9.995 | 0.000 | 0.000 | 0.000 | -320.891 | -39.469 | 0.000 | 39.469 | -3.130 |
| 115.0 | -13.634 | -9.670 | 0.000 | 0.000 | 0.000 | -293.290 | -40.788 | 0.000 | 40.788 | -3.168 |
| 120.0 | -13.205 | -8.894 | 0.000 | 0.000 | 0.000 | -225.120 | -44.150 | 0.000 | 44.150 | -3.250 |
| 123.0 | -10.766 | -7.506 | 0.000 | 0.000 | 0.000 | -185.504 | -46.206 | 0.000 | 46.206 | -3.293 |
| 125.0 | -10.618 | -7.242 | 0.000 | 0.000 | 0.000 | -163.973 | -47.591 | 0.000 | 47.591 | -3.319 |
| 130.0 | -10.247 | -6.604 | 0.000 | 0.000 | 0.000 | -110.883 | -51.095 | 0.000 | 51.095 | -3.372 |
| 135.0 | -5.133 | -3.426 | 0.000 | 0.000 | 0.000 | -58.914 | -54.647 | 0.000 | 54.647 | -3.409 |
| 140.0 | -4.781 | -2.920 | 0.000 | 0.000 | 0.000 | -33.248 | -58.228 | 0.000 | 58.228 | -3.431 |
| 145.0 | -4.438 | -2.434 | 0.000 | 0.000 | 0.000 | -9.343 | -61.826 | 0.000 | 61.826 | -3.442 |
| 147.0 | -0.219 | -0.095 | 0.000 | 0.000 | 0.000 | -0.467 | -63.268 | 0.000 | 63.268 | -3.444 |
| 147.9 | -0.001 | -0.001 | 0.000 | 0.000 | 0.000 | 0.000 | -63.917 | 0.000 | 63.917 | -3.444 |
| 147.9 | -0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -63.929 | 0.000 | 63.929 | -3.444 |








**Load Case:** No Ice — 80.00 mph Wind with No Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Stresses

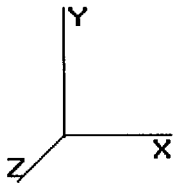
| Seg Elev (ft) | Applied Stresses Axial (Y) (ksi) | Shear (X) (ksi) | Shear (Z) (ksi) | Torsion (ksi) | Bending (X) (ksi) | Bending (Z) (ksi) | Combined (ksi) | Allowable Stress (Fb) (ksi) | | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.64 | 0.84 | 0.00 | 0.00 | 0.00 | 37.11 | 37.77 | 52.0 | 0.0 | 0.727 |
| 5.00 | 0.63 | 0.84 | 0.00 | 0.00 | 0.00 | 36.71 | 37.37 | 52.0 | 0.0 | 0.719 |
| 10.00 | 0.62 | 0.85 | 0.00 | 0.00 | 0.00 | 36.27 | 36.92 | 52.0 | 0.0 | 0.710 |
| 15.00 | 0.61 | 0.85 | 0.00 | 0.00 | 0.00 | 35.80 | 36.43 | 52.0 | 0.0 | 0.701 |
| 20.00 | 0.60 | 0.86 | 0.00 | 0.00 | 0.00 | 35.28 | 35.91 | 52.0 | 0.0 | 0.691 |
| 25.00 | 0.58 | 0.86 | 0.00 | 0.00 | 0.00 | 34.72 | 35.34 | 52.0 | 0.0 | 0.680 |
| 30.00 | 0.57 | 0.87 | 0.00 | 0.00 | 0.00 | 34.11 | 34.72 | 52.0 | 0.0 | 0.668 |
| 35.00 | 0.56 | 0.87 | 0.00 | 0.00 | 0.00 | 33.45 | 34.04 | 52.0 | 0.0 | 0.655 |
| 40.00 | 0.55 | 0.88 | 0.00 | 0.00 | 0.00 | 32.72 | 33.31 | 52.0 | 0.0 | 0.641 |
| 45.00 | 0.54 | 0.88 | 0.00 | 0.00 | 0.00 | 31.93 | 32.50 | 52.0 | 0.0 | 0.625 |
| 46.83 | 0.53 | 0.88 | 0.00 | 0.00 | 0.00 | 31.63 | 32.20 | 52.0 | 0.0 | 0.619 |
| 50.00 | 0.51 | 0.88 | 0.00 | 0.00 | 0.00 | 31.08 | 31.63 | 52.0 | 0.0 | 0.609 |
| 53.00 | 0.49 | 0.87 | 0.00 | 0.00 | 0.00 | 29.54 | 30.06 | 52.0 | 0.0 | 0.578 |
| 55.00 | 0.48 | 0.87 | 0.00 | 0.00 | 0.00 | 29.16 | 29.68 | 52.0 | 0.0 | 0.571 |
| 60.00 | 0.47 | 0.88 | 0.00 | 0.00 | 0.00 | 28.15 | 28.66 | 52.0 | 0.0 | 0.551 |
| 65.00 | 0.46 | 0.88 | 0.00 | 0.00 | 0.00 | 27.06 | 27.56 | 52.0 | 0.0 | 0.530 |
| 70.00 | 0.44 | 0.88 | 0.00 | 0.00 | 0.00 | 25.87 | 26.36 | 52.0 | 0.0 | 0.507 |
| 75.00 | 0.43 | 0.89 | 0.00 | 0.00 | 0.00 | 24.57 | 25.05 | 52.0 | 0.0 | 0.482 |
| 76.00 | 0.43 | 0.88 | 0.00 | 0.00 | 0.00 | 24.31 | 24.78 | 52.0 | 0.0 | 0.477 |
| 80.00 | 0.41 | 0.89 | 0.00 | 0.00 | 0.00 | 23.18 | 23.64 | 52.0 | 0.0 | 0.455 |
| 85.00 | 0.40 | 0.89 | 0.00 | 0.00 | 0.00 | 21.64 | 22.10 | 52.0 | 0.0 | 0.425 |
| 89.00 | 0.37 | 0.83 | 0.00 | 0.00 | 0.00 | 20.32 | 20.74 | 52.0 | 0.0 | 0.399 |
| 90.00 | 0.37 | 0.83 | 0.00 | 0.00 | 0.00 | 20.02 | 20.44 | 52.0 | 0.0 | 0.393 |
| 94.92 | 0.35 | 0.83 | 0.00 | 0.00 | 0.00 | 18.43 | 18.84 | 52.0 | 0.0 | 0.362 |
| 95.00 | 0.35 | 0.83 | 0.00 | 0.00 | 0.00 | 18.41 | 18.81 | 52.0 | 0.0 | 0.362 |
| 98.00 | 0.30 | 0.73 | 0.00 | 0.00 | 0.00 | 17.37 | 17.72 | 52.0 | 0.0 | 0.341 |
| 99.83 | 0.34 | 0.86 | 0.00 | 0.00 | 0.00 | 19.40 | 19.80 | 52.0 | 0.0 | 0.381 |
| 100.00 | 0.34 | 0.87 | 0.00 | 0.00 | 0.00 | 19.34 | 19.74 | 52.0 | 0.0 | 0.380 |
| 105.00 | 0.33 | 0.87 | 0.00 | 0.00 | 0.00 | 17.48 | 17.87 | 52.0 | 0.0 | 0.344 |
| 110.00 | 0.31 | 0.87 | 0.00 | 0.00 | 0.00 | 15.44 | 15.82 | 52.0 | 0.0 | 0.304 |
| 113.00 | 0.30 | 0.84 | 0.00 | 0.00 | 0.00 | 14.12 | 14.49 | 52.0 | 0.0 | 0.279 |
| 115.00 | 0.30 | 0.84 | 0.00 | 0.00 | 0.00 | 13.24 | 13.62 | 52.0 | 0.0 | 0.262 |
| 120.00 | 0.28 | 0.84 | 0.00 | 0.00 | 0.00 | 10.87 | 11.24 | 52.0 | 0.0 | 0.216 |
| 123.00 | 0.24 | 0.70 | 0.00 | 0.00 | 0.00 | 9.33 | 9.65 | 52.0 | 0.0 | 0.186 |
| 125.00 | 0.24 | 0.70 | 0.00 | 0.00 | 0.00 | 8.48 | 8.80 | 52.0 | 0.0 | 0.169 |
| 130.00 | 0.22 | 0.70 | 0.00 | 0.00 | 0.00 | 6.16 | 6.49 | 52.0 | 0.0 | 0.125 |
| 135.00 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 | 3.52 | 3.70 | 52.0 | 0.0 | 0.071 |
| 140.00 | 0.11 | 0.35 | 0.00 | 0.00 | 0.00 | 2.15 | 2.33 | 52.0 | 0.0 | 0.045 |
| 145.00 | 0.09 | 0.34 | 0.00 | 0.00 | 0.00 | 0.65 | 0.95 | 52.0 | 0.0 | 0.018 |
| 147.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.03 | 0.05 | 52.0 | 0.0 | 0.001 |
| 147.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 52.0 | 0.0 | 0.000 |
| 147.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 52.0 | 0.0 | 0.000 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)








**Load Case:** Ice — 69.28 mph Wind with Ice — 23 Iterations

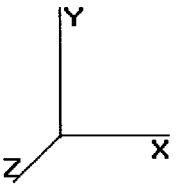
Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Shaft Segment Forces

| Seg Top Elev (ft) | Description | | Kz | qz (psf) | qzGh (psf) | C (mph-ft) | Cf | Ice Thick (in) | Tributary (ft) | Aa (sf) | CfAa (sf) | Wind Force X (lb) | Dead Load Ice (lb) | Tot Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.00 | 1.00 | 12.287 | 20.76 | 326.65 | 0.650 | 0.500 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 0.00 | 1.00 | 12.287 | 20.76 | 320.46 | 0.650 | 0.500 | 5.00 | 23.768 | 15.45 | 320.8 | 172.8 | 1,300.1 |
| 10.00 | | 0.00 | 1.00 | 12.287 | 20.76 | 314.26 | 0.650 | 0.500 | 5.00 | 23.321 | 15.16 | 314.8 | 169.5 | 1,275.1 |
| 15.00 | | 0.00 | 1.00 | 12.287 | 20.76 | 308.07 | 0.650 | 0.500 | 5.00 | 22.874 | 14.87 | 308.7 | 166.2 | 1,250.0 |
| 20.00 | Appertunance(s) | 0.00 | 1.00 | 12.287 | 20.76 | 301.87 | 0.650 | 0.500 | 5.00 | 22.427 | 14.58 | 302.7 | 162.9 | 1,225.0 |
| 25.00 | | 0.00 | 1.00 | 12.287 | 20.76 | 295.68 | 0.650 | 0.500 | 5.00 | 21.980 | 14.29 | 296.7 | 159.6 | 1,200.0 |
| 30.00 | | 0.00 | 1.00 | 12.287 | 20.76 | 289.49 | 0.650 | 0.500 | 5.00 | 21.533 | 14.00 | 290.6 | 156.3 | 1,174.9 |
| 35.00 | | 0.00 | 1.01 | 12.496 | 21.11 | 285.68 | 0.650 | 0.500 | 5.00 | 21.086 | 13.71 | 289.4 | 153.0 | 1,149.9 |
| 40.00 | | 0.00 | 1.05 | 12.982 | 21.93 | 284.82 | 0.650 | 0.500 | 5.00 | 20.639 | 13.42 | 294.3 | 149.6 | 1,124.9 |
| 45.00 | | 0.00 | 1.09 | 13.426 | 22.69 | 283.18 | 0.650 | 0.500 | 5.00 | 20.192 | 13.12 | 297.8 | 146.3 | 1,099.8 |
| 46.83 | Bot - Section 2 | 0.00 | 1.10 | 13.580 | 22.95 | 282.41 | 0.650 | 0.500 | 1.83 | 7.292 | 4.74 | 108.8 | 53.2 | 397.4 |
| 50.00 | | 0.00 | 1.12 | 13.836 | 23.38 | 280.90 | 0.650 | 0.500 | 3.17 | 12.651 | 8.22 | 192.3 | 92.0 | 1,276.9 |
| 53.00 | Top - Section 1 | 0.00 | 1.14 | 14.068 | 23.77 | 279.27 | 0.650 | 0.500 | 3.00 | 11.820 | 7.68 | 182.7 | 86.0 | 1,192.4 |
| 55.00 | | 0.00 | 1.15 | 14.218 | 24.02 | 282.75 | 0.650 | 0.500 | 2.00 | 7.791 | 5.06 | 121.7 | 56.8 | 424.3 |
| 60.00 | | 0.00 | 1.18 | 14.576 | 24.63 | 279.54 | 0.650 | 0.500 | 5.00 | 19.163 | 12.46 | 306.8 | 138.7 | 1,042.2 |
| 65.00 | | 0.00 | 1.21 | 14.913 | 25.20 | 275.93 | 0.650 | 0.500 | 5.00 | 18.716 | 12.17 | 306.6 | 135.4 | 1,017.2 |
| 70.00 | | 0.00 | 1.24 | 15.232 | 25.74 | 271.97 | 0.650 | 0.500 | 5.00 | 18.269 | 11.88 | 305.7 | 132.1 | 992.1 |
| 75.00 | | 0.00 | 1.26 | 15.536 | 26.25 | 267.70 | 0.650 | 0.500 | 5.00 | 17.822 | 11.58 | 304.2 | 128.8 | 967.1 |
| 76.00 | Appertunance(s) | 0.00 | 1.26 | 15.594 | 26.35 | 266.81 | 0.650 | 0.500 | 1.00 | 3.511 | 2.28 | 60.1 | 25.6 | 190.7 |
| 80.00 | | 0.00 | 1.28 | 15.825 | 26.74 | 263.15 | 0.650 | 0.500 | 4.00 | 13.864 | 9.01 | 241.0 | 100.4 | 751.9 |
| 85.00 | | 0.00 | 1.31 | 16.101 | 27.21 | 258.35 | 0.650 | 0.500 | 5.00 | 16.928 | 11.00 | 299.4 | 122.2 | 917.0 |
| 89.00 | Appertunance(s) | 0.00 | 1.32 | 16.314 | 27.57 | 254.34 | 0.650 | 0.500 | 4.00 | 13.221 | 8.59 | 236.9 | 95.6 | 715.9 |
| 90.00 | | 0.00 | 1.33 | 16.366 | 27.65 | 253.32 | 0.650 | 0.500 | 1.00 | 3.260 | 2.12 | 58.6 | 23.8 | 176.7 |
| 94.92 | Bot - Section 3 | 0.00 | 1.35 | 16.617 | 28.08 | 248.16 | 0.650 | 0.500 | 4.92 | 15.771 | 10.25 | 287.9 | 113.7 | 852.8 |
| 95.00 | | 0.00 | 1.35 | 16.621 | 28.09 | 248.08 | 0.650 | 0.500 | 0.08 | 0.268 | 0.17 | 4.9 | 2.0 | 24.8 |
| 98.00 | Appertunance(s) | 0.00 | 1.36 | 16.769 | 28.34 | 244.84 | 0.650 | 0.500 | 3.00 | 9.562 | 6.22 | 176.1 | 69.3 | 883.7 |
| 99.83 | Top - Section 2 | 0.00 | 1.37 | 16.858 | 28.49 | 242.83 | 0.650 | 0.500 | 1.83 | 5.764 | 3.75 | 106.8 | 41.9 | 532.5 |
| 100.0 | | 0.00 | 1.37 | 16.866 | 28.50 | 246.87 | 0.650 | 0.500 | 0.17 | 0.521 | 0.34 | 9.7 | 3.8 | 24.2 |
| 105.0 | | 0.00 | 1.39 | 17.103 | 28.90 | 241.29 | 0.650 | 0.500 | 5.00 | 15.401 | 10.01 | 289.3 | 110.9 | 712.4 |
| 110.0 | | 0.00 | 1.41 | 17.332 | 29.29 | 235.54 | 0.650 | 0.500 | 5.00 | 14.954 | 9.72 | 284.7 | 107.5 | 691.0 |
| 113.0 | Appertunance(s) | 0.00 | 1.42 | 17.466 | 29.51 | 232.02 | 0.650 | 0.500 | 3.00 | 8.758 | 5.69 | 168.0 | 63.3 | 404.7 |
| 115.0 | | 0.00 | 1.42 | 17.554 | 29.66 | 229.64 | 0.650 | 0.500 | 2.00 | 5.749 | 3.74 | 110.9 | 41.7 | 265.7 |
| 120.0 | | 0.00 | 1.44 | 17.768 | 30.02 | 223.59 | 0.650 | 0.500 | 5.00 | 14.060 | 9.14 | 274.4 | 100.9 | 648.2 |
| 123.0 | Appertunance(s) | 0.00 | 1.45 | 17.894 | 30.24 | 219.90 | 0.650 | 0.500 | 3.00 | 8.221 | 5.34 | 161.6 | 59.4 | 379.0 |
| 125.0 | | 0.00 | 1.46 | 17.977 | 30.38 | 217.41 | 0.650 | 0.500 | 2.00 | 5.391 | 3.50 | 106.5 | 39.0 | 248.5 |
| 130.0 | | 0.00 | 1.48 | 18.179 | 30.72 | 211.10 | 0.650 | 0.500 | 5.00 | 13.166 | 8.56 | 262.9 | 94.3 | 605.4 |
| 135.0 | Appertunance(s) | 0.00 | 1.49 | 18.376 | 31.05 | 204.66 | 0.650 | 0.500 | 5.00 | 12.719 | 8.27 | 256.7 | 91.0 | 583.9 |
| 140.0 | | 0.00 | 1.51 | 18.568 | 31.38 | 198.11 | 0.650 | 0.500 | 5.00 | 12.272 | 7.98 | 250.3 | 87.7 | 562.5 |
| 145.0 | | 0.00 | 1.52 | 18.755 | 31.69 | 191.46 | 0.650 | 0.500 | 5.00 | 11.825 | 7.69 | 243.6 | 84.4 | 541.1 |
| 147.0 | Appertunance(s) | 0.00 | 1.53 | 18.829 | 31.82 | 188.77 | 0.650 | 0.500 | 2.00 | 4.605 | 2.99 | 95.2 | 33.2 | 210.8 |
| 147.9 | Appertunance(s) | 0.00 | 1.53 | 18.862 | 31.87 | 187.55 | 0.650 | 0.500 | 0.90 | 2.049 | 1.33 | 42.4 | 14.8 | 93.8 |
| 147.9 | | 0.00 | 1.53 | 18.863 | 31.87 | 187.53 | 0.650 | 0.500 | 0.02 | 0.039 | 0.03 | 0.8 | 0.3 | 1.8 |
| | | | | | | | Totals: | | 147.92 | | | 8,573.5 | 3,786.0 | 29,128.4 |

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | 4/20/2012 10:53:25 AM |
| Location : | Petro Lock, CT | | Page: 12 |
| Height : | 147.9 (ft) | | |
| Base Dia : | 56.58 (in) | | |
| Top Dia : | 26.21 (in) | Base Elev : 0.000 (ft) | |
| Shape : | 18 Sides | | |
| Taper : | 0.214568 (in/ft) | | |






**Load Case:** Ice — 69.28 mph Wind with Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

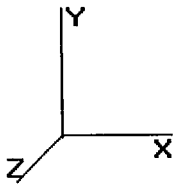
## Discrete Appurtenance Segment Forces

| Elev (ft) | Description | Qty | qz (psf) | qzGh (psf) | CaAa Factor | Total CaAa (sf) | Horiz Ecc (ft) | Vert Ecc (ft) | Wind FX (lb) | Mom Y (lb-ft) | Mom Z (lb-ft) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.00 | Lucent KS-24019 | 1 | 12.287 | 20.766 | 1.00 | 1.30 | 0.000 | 0.000 | 27.00 | 0.00 | 0.00 | 15.00 |
| 76.00 | Side Markers | 2 | 15.594 | 26.355 | 1.00 | 1.88 | 0.000 | 0.000 | 49.55 | 0.00 | 0.00 | 63.80 |
| 89.00 | Argus LLPX310R | 3 | 16.314 | 27.571 | 0.72 | 11.58 | 0.000 | 0.000 | 319.20 | 0.00 | 0.00 | 163.50 |
| 89.00 | DragonWave A-ANT- | 1 | 16.314 | 27.571 | 0.90 | 8.25 | 0.000 | 0.000 | 227.54 | 0.00 | 0.00 | 117.00 |
| 89.00 | DragonWave A-ANT- | 2 | 16.314 | 27.571 | 0.90 | 9.09 | 0.000 | 0.000 | 250.62 | 0.00 | 0.00 | 110.20 |
| 89.00 | DragonWave Horizon | 3 | 16.314 | 27.571 | 0.50 | 0.87 | 0.000 | 0.000 | 23.99 | 0.00 | 0.00 | 51.00 |
| 89.00 | NextNet BTS-2500 | 3 | 16.314 | 27.571 | 0.50 | 3.64 | 0.000 | 0.000 | 100.50 | 0.00 | 0.00 | 144.90 |
| 89.00 | Side Arms | 1 | 16.314 | 27.571 | 1.00 | 10.50 | 0.000 | 0.000 | 289.49 | 0.00 | 0.00 | 680.00 |
| 98.00 | Decibel DB844H90E-A | 9 | 16.769 | 28.340 | 0.86 | 35.06 | 0.000 | 0.000 | 993.67 | 0.00 | 0.00 | 326.70 |
| 98.00 | Round Low Profile Pl | 1 | 16.769 | 28.340 | 1.00 | 27.20 | 0.000 | 0.000 | 770.85 | 0.00 | 0.00 | 1,700.00 |
| 113.0 | RFS APXV18-206517 | 3 | 17.466 | 29.517 | 0.80 | 13.68 | 0.000 | 0.000 | 403.80 | 0.00 | 0.00 | 144.39 |
| 123.0 | RFS APX16DWV- | 3 | 17.894 | 30.241 | 0.65 | 14.33 | 0.000 | 0.000 | 433.43 | 0.00 | 0.00 | 208.14 |
| 123.0 | RFS APXV18-206516L- | 6 | 17.894 | 30.241 | 0.80 | 19.54 | 0.000 | 0.000 | 590.79 | 0.00 | 0.00 | 231.96 |
| 123.0 | RFS ATMAA1412D- | 3 | 17.894 | 30.241 | 0.50 | 2.09 | 0.000 | 0.000 | 63.05 | 0.00 | 0.00 | 61.80 |
| 123.0 | RFS ATMPP1412D- | 3 | 17.894 | 30.241 | 0.50 | 2.10 | 0.000 | 0.000 | 63.51 | 0.00 | 0.00 | 58.50 |
| 123.0 | Round T-Arms | 3 | 17.894 | 30.241 | 0.67 | 24.32 | 0.000 | 0.000 | 735.49 | 0.00 | 0.00 | 942.00 |
| 135.0 | Andrew SBNH- | 1 | 18.376 | 31.056 | 1.00 | 12.37 | 0.000 | 0.000 | 384.16 | 0.00 | 0.00 | 132.00 |
| 135.0 | Ericsson RRUS 11 | 6 | 18.415 | 31.122 | 0.67 | 13.23 | 0.000 | 1.000 | 411.61 | 0.00 | 411.61 | 445.80 |
| 135.0 | Flat Platform w/ Han | 1 | 18.376 | 31.056 | 1.00 | 48.40 | 0.000 | 0.000 | 1,503.12 | 0.00 | 0.00 | 2,450.00 |
| 135.0 | KMW AM-X-CD-16-65- | 2 | 18.376 | 31.056 | 0.79 | 14.35 | 0.000 | 0.000 | 445.54 | 0.00 | 0.00 | 190.00 |
| 135.0 | Powerwave 7750.00 | 6 | 18.376 | 31.056 | 0.75 | 29.43 | 0.000 | 0.000 | 913.98 | 0.00 | 0.00 | 394.02 |
| 135.0 | Powerwave LGP21401 | 6 | 18.415 | 31.122 | 0.50 | 4.59 | 0.000 | 1.000 | 142.85 | 0.00 | 142.85 | 127.56 |
| 135.0 | Powerwave LGP21903 | 6 | 18.415 | 31.122 | 0.50 | 1.14 | 0.000 | 1.000 | 35.48 | 0.00 | 35.48 | 47.40 |
| 135.0 | Raycap DC6-48-60-18- | 1 | 18.415 | 31.122 | 1.00 | 1.46 | 0.000 | 1.000 | 45.44 | 0.00 | 45.44 | 35.10 |
| 147.0 | 48" x 12" Panels | 9 | 18.829 | 31.821 | 0.67 | 37.33 | 0.000 | 0.000 | 1,187.74 | 0.00 | 0.00 | 567.00 |
| 147.0 | 72" x 12" Panels | 3 | 18.829 | 31.821 | 0.67 | 18.55 | 0.000 | 0.000 | 590.35 | 0.00 | 0.00 | 261.00 |
| 147.0 | Flat Platform w/ Han | 1 | 18.829 | 31.821 | 1.00 | 48.40 | 0.000 | 0.000 | 1,540.14 | 0.00 | 0.00 | 2,450.00 |
| 147.9 | Flash Technology FTB | 1 | 18.924 | 31.981 | 1.00 | 4.01 | 0.000 | 1.710 | 128.25 | 0.00 | 219.30 | 72.30 |
| | | | | | | | | | 12,671.13 | | | 12,191.06 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)






4/20/2012 10:53:25 AM


**Load Case:** Ice — 69.28 mph Wind with Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Linear Appurtenance Segment Forces

| Seg Top Elev (ft) | Description | Exposed To Wind | Length (ft) | Weight (lb/ft) | CaAa (sf/ft) | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|
| 10.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 12.287 | 25.96 | 47.30 |
| 10.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 12.287 | 0.00 | 4.95 |
| 10.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 12.287 | 41.53 | 44.00 |
| 10.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 12.287 | 0.00 | 9.00 |
| 10.00 | (1) 1/2" Coax | Yes | 5.00 | 0.99 | 0.16 | 12.287 | 16.61 | 4.95 |
| 15.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 12.287 | 25.96 | 47.30 |
| 15.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 12.287 | 0.00 | 4.95 |
| 15.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 12.287 | 41.53 | 44.00 |
| 15.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 12.287 | 0.00 | 9.00 |
| 15.00 | (1) 1/2" Coax | Yes | 5.00 | 0.99 | 0.16 | 12.287 | 16.61 | 4.95 |
| 20.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 12.287 | 25.96 | 47.30 |
| 20.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 12.287 | 0.00 | 4.95 |
| 20.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 12.287 | 41.53 | 44.00 |
| 20.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 12.287 | 0.00 | 9.00 |
| 20.00 | (1) 1/2" Coax | Yes | 5.00 | 0.99 | 0.16 | 12.287 | 16.61 | 4.95 |
| 25.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 12.287 | 25.96 | 47.30 |
| 25.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 12.287 | 0.00 | 4.95 |
| 25.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 12.287 | 41.53 | 44.00 |
| 25.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 12.287 | 0.00 | 9.00 |
| 30.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 12.287 | 25.96 | 47.30 |
| 30.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 12.287 | 0.00 | 4.95 |
| 30.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 12.287 | 41.53 | 44.00 |
| 30.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 12.287 | 0.00 | 9.00 |
| 35.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 12.496 | 26.40 | 47.30 |
| 35.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 12.496 | 0.00 | 4.95 |
| 35.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 12.496 | 42.24 | 44.00 |
| 35.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 12.496 | 0.00 | 9.00 |
| 40.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 12.982 | 27.42 | 47.30 |
| 40.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 12.982 | 0.00 | 4.95 |
| 40.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 12.982 | 43.88 | 44.00 |
| 40.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 12.982 | 0.00 | 9.00 |
| 45.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 13.426 | 28.36 | 47.30 |
| 45.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 13.426 | 0.00 | 4.95 |
| 45.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 13.426 | 45.38 | 44.00 |
| 45.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 13.426 | 0.00 | 9.00 |
| 46.83 | (6) 1 5/8" Coax | Yes | 1.83 | 9.46 | 0.25 | 13.580 | 10.52 | 17.34 |
| 46.83 | (3) 1/2" Coax | Yes | 1.83 | 0.99 | 0.00 | 13.580 | 0.00 | 1.82 |
| 46.83 | (1) 3" Conduit | Yes | 1.83 | 8.80 | 0.40 | 13.580 | 16.83 | 16.13 |
| 46.83 | (6) 5/16" Coax | Yes | 1.83 | 1.80 | 0.00 | 13.580 | 0.00 | 3.30 |
| 50.00 | (6) 1 5/8" Coax | Yes | 3.17 | 9.46 | 0.25 | 13.836 | 18.51 | 29.96 |
| 50.00 | (3) 1/2" Coax | Yes | 3.17 | 0.99 | 0.00 | 13.836 | 0.00 | 3.13 |
| 50.00 | (1) 3" Conduit | Yes | 3.17 | 8.80 | 0.40 | 13.836 | 29.62 | 27.87 |
| 50.00 | (6) 5/16" Coax | Yes | 3.17 | 1.80 | 0.00 | 13.836 | 0.00 | 5.70 |
| 53.00 | (6) 1 5/8" Coax | Yes | 3.00 | 9.46 | 0.25 | 14.068 | 17.83 | 28.38 |
| 53.00 | (3) 1/2" Coax | Yes | 3.00 | 0.99 | 0.00 | 14.068 | 0.00 | 2.97 |
| 53.00 | (1) 3" Conduit | Yes | 3.00 | 8.80 | 0.40 | 14.068 | 28.53 | 26.40 |
| 53.00 | (6) 5/16" Coax | Yes | 3.00 | 1.80 | 0.00 | 14.068 | 0.00 | 5.40 |
| 55.00 | (6) 1 5/8" Coax | Yes | 2.00 | 9.46 | 0.25 | 14.218 | 12.01 | 18.92 |
| 55.00 | (3) 1/2" Coax | Yes | 2.00 | 0.99 | 0.00 | 14.218 | 0.00 | 1.98 |
| 55.00 | (1) 3" Conduit | Yes | 2.00 | 8.80 | 0.40 | 14.218 | 19.22 | 17.60 |
| 55.00 | (6) 5/16" Coax | Yes | 2.00 | 1.80 | 0.00 | 14.218 | 0.00 | 3.60 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)





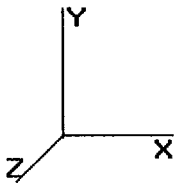
**Load Case:** Ice — 69.28 mph Wind with Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 60.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 14.576 | 30.79 | 47.30 |
| 60.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 14.576 | 0.00 | 4.95 |
| 60.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 14.576 | 49.27 | 44.00 |
| 60.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 14.576 | 0.00 | 9.00 |
| 65.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 14.913 | 31.50 | 47.30 |
| 65.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 14.913 | 0.00 | 4.95 |
| 65.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 14.913 | 50.41 | 44.00 |
| 65.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 14.913 | 0.00 | 9.00 |
| 70.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 15.232 | 32.18 | 47.30 |
| 70.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 15.232 | 0.00 | 4.95 |
| 70.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 15.232 | 51.49 | 44.00 |
| 70.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 15.232 | 0.00 | 9.00 |
| 75.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 15.536 | 32.82 | 47.30 |
| 75.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 15.536 | 0.00 | 4.95 |
| 75.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 15.536 | 52.51 | 44.00 |
| 75.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 15.536 | 0.00 | 9.00 |
| 76.00 | (6) 1 5/8" Coax | Yes | 1.00 | 9.46 | 0.25 | 15.594 | 6.59 | 9.46 |
| 76.00 | (3) 1/2" Coax | Yes | 1.00 | 0.99 | 0.00 | 15.594 | 0.00 | 0.99 |
| 76.00 | (1) 3" Conduit | Yes | 1.00 | 8.80 | 0.40 | 15.594 | 10.54 | 8.80 |
| 76.00 | (6) 5/16" Coax | Yes | 1.00 | 1.80 | 0.00 | 15.594 | 0.00 | 1.80 |
| 80.00 | (6) 1 5/8" Coax | Yes | 4.00 | 9.46 | 0.25 | 15.825 | 26.74 | 37.84 |
| 80.00 | (3) 1/2" Coax | Yes | 4.00 | 0.99 | 0.00 | 15.825 | 0.00 | 3.96 |
| 80.00 | (1) 3" Conduit | Yes | 4.00 | 8.80 | 0.40 | 15.825 | 42.79 | 35.20 |
| 80.00 | (6) 5/16" Coax | Yes | 4.00 | 1.80 | 0.00 | 15.825 | 0.00 | 7.20 |
| 85.00 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 16.101 | 34.01 | 47.30 |
| 85.00 | (3) 1/2" Coax | Yes | 5.00 | 0.99 | 0.00 | 16.101 | 0.00 | 4.95 |
| 85.00 | (1) 3" Conduit | Yes | 5.00 | 8.80 | 0.40 | 16.101 | 54.42 | 44.00 |
| 85.00 | (6) 5/16" Coax | Yes | 5.00 | 1.80 | 0.00 | 16.101 | 0.00 | 9.00 |
| 89.00 | (6) 1 5/8" Coax | Yes | 4.00 | 9.46 | 0.25 | 16.314 | 27.57 | 37.84 |
| 89.00 | (3) 1/2" Coax | Yes | 4.00 | 0.99 | 0.00 | 16.314 | 0.00 | 3.96 |
| 89.00 | (1) 3" Conduit | Yes | 4.00 | 8.80 | 0.40 | 16.314 | 44.11 | 35.20 |
| 89.00 | (6) 5/16" Coax | Yes | 4.00 | 1.80 | 0.00 | 16.314 | 0.00 | 7.20 |
| 90.00 | (6) 1 5/8" Coax | Yes | 1.00 | 9.46 | 0.25 | 16.366 | 6.91 | 9.46 |
| 94.92 | (6) 1 5/8" Coax | Yes | 4.92 | 9.46 | 0.25 | 16.617 | 34.52 | 46.51 |
| 95.00 | (6) 1 5/8" Coax | Yes | 0.08 | 9.46 | 0.25 | 16.621 | 0.59 | 0.79 |
| 98.00 | (6) 1 5/8" Coax | Yes | 3.00 | 9.46 | 0.25 | 16.769 | 21.26 | 28.38 |
| 99.83 | (6) 1 5/8" Coax | Yes | 1.83 | 9.46 | 0.25 | 16.858 | 13.06 | 17.34 |
| 100.0 | (6) 1 5/8" Coax | Yes | 0.17 | 9.46 | 0.25 | 16.866 | 1.19 | 1.58 |
| 105.0 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 17.103 | 36.13 | 47.30 |
| 110.0 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 17.332 | 36.61 | 47.30 |
| 113.0 | (6) 1 5/8" Coax | Yes | 3.00 | 9.46 | 0.25 | 17.466 | 22.14 | 28.38 |
| 115.0 | (6) 1 5/8" Coax | Yes | 2.00 | 9.46 | 0.25 | 17.554 | 14.83 | 18.92 |
| 120.0 | (6) 1 5/8" Coax | Yes | 5.00 | 9.46 | 0.25 | 17.768 | 37.54 | 47.30 |
| 123.0 | (6) 1 5/8" Coax | Yes | 3.00 | 9.46 | 0.25 | 17.894 | 22.68 | 28.38 |
| | | | | | | Totals: | 1,579.23 | 2,104.69 |

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | 4/20/2012 10:53:25 AM |
| Location : | Petro Lock, CT | | Page: 15 |
| Height : | 147.9 (ft) | | |
| Base Dia : | 56.58 (in) | | |
| Top Dia : | 26.21 (in) | Base Elev : 0.000 (ft) | |
| Shape : | 18 Sides | | |
| Taper : | 0.214568 (in/ft) | | |






**Load Case:** Ice — 69.28 mph Wind with Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Applied Segment Forces Summary

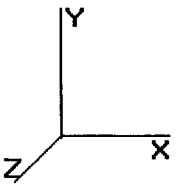
| Seg Elev (ft) | | Lateral FX (-) (lb) | Axial FY (-) (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) |
|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | | 320.81 | 1,300.11 | 0.00 | 0.00 |
| 10.00 | | 398.88 | 1,679.97 | 0.00 | 0.00 |
| 15.00 | | 392.84 | 1,654.94 | 0.00 | 0.00 |
| 20.00 | | 413.81 | 1,644.90 | 0.00 | 0.00 |
| 25.00 | | 364.16 | 1,599.92 | 0.00 | 0.00 |
| 30.00 | | 358.13 | 1,574.88 | 0.00 | 0.00 |
| 35.00 | | 358.07 | 1,549.84 | 0.00 | 0.00 |
| 40.00 | | 365.62 | 1,524.81 | 0.00 | 0.00 |
| 45.00 | | 371.54 | 1,499.77 | 0.00 | 0.00 |
| 46.83 | | 136.12 | 544.03 | 0.00 | 0.00 |
| 50.00 | | 240.41 | 1,530.15 | 0.00 | 0.00 |
| 53.00 | | 229.03 | 1,432.35 | 0.00 | 0.00 |
| 55.00 | | 152.91 | 584.27 | 0.00 | 0.00 |
| 60.00 | | 386.90 | 1,442.17 | 0.00 | 0.00 |
| 65.00 | | 388.52 | 1,417.13 | 0.00 | 0.00 |
| 70.00 | | 389.36 | 1,392.10 | 0.00 | 0.00 |
| 75.00 | | 389.48 | 1,367.06 | 0.00 | 0.00 |
| 76.00 | | 126.82 | 334.47 | 0.00 | 0.00 |
| 80.00 | | 310.55 | 1,071.88 | 0.00 | 0.00 |
| 85.00 | | 387.85 | 1,316.99 | 0.00 | 0.00 |
| 89.00 | | 1,519.96 | 2,302.43 | 0.00 | 0.00 |
| 90.00 | | 65.53 | 245.06 | 0.00 | 0.00 |
| 94.92 | | 322.39 | 1,189.05 | 0.00 | 0.00 |
| 95.00 | | 5.48 | 30.48 | 0.00 | 0.00 |
| 98.00 | | 1,961.92 | 3,115.60 | 0.00 | 0.00 |
| 99.83 | | 119.81 | 637.15 | 0.00 | 0.00 |
| 100.0 | | 10.84 | 33.68 | 0.00 | 0.00 |
| 105.0 | | 325.48 | 997.73 | 0.00 | 0.00 |
| 110.0 | | 321.32 | 976.32 | 0.00 | 0.00 |
| 113.0 | | 593.96 | 720.30 | 0.00 | 0.00 |
| 115.0 | | 125.69 | 369.95 | 0.00 | 0.00 |
| 120.0 | | 311.96 | 908.89 | 0.00 | 0.00 |
| 123.0 | | 2,070.55 | 2,037.85 | 0.00 | 0.00 |
| 125.0 | | 106.47 | 304.38 | 0.00 | 0.00 |
| 130.0 | | 262.92 | 744.96 | 0.00 | 0.00 |
| 135.0 | | 4,138.92 | 4,545.43 | 0.00 | 635.38 |
| 140.0 | | 250.31 | 611.73 | 0.00 | 0.00 |
| 145.0 | | 243.62 | 590.32 | 0.00 | 0.00 |
| 147.0 | | 3,413.48 | 3,508.53 | 0.00 | 0.00 |
| 147.9 | | 170.70 | 166.13 | 0.00 | 219.30 |
| 147.9 | | 0.80 | 1.77 | 0.00 | 0.00 |
| | Totals: | 22,823.89 | 50,499.48 | 0.00 | 854.68 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)








**Load Case:** Ice — 69.28 mph Wind with Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Shaft Forces and Deflections

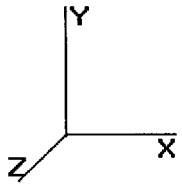
| Seg Elev (ft) | Lateral FX (-) (kips) | Axial FY (-) (kips) | Lateral FZ (kips) | Moment MX (ft-kips) | Torsion MY (ft-kips) | Moment MZ (ft-kips) | X Deflect (in) | Z Deflect (in) | Total Deflect (in) | Rotation (deg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -22.880 | -50.474 | 0.000 | 0.000 | 0.000 | -2,408.784 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5.00 | -22.666 | -49.124 | 0.000 | 0.000 | 0.000 | -2,294.387 | -0.068 | 0.000 | 0.068 | -0.125 |
| 10.00 | -22.366 | -47.396 | 0.000 | 0.000 | 0.000 | -2,181.062 | -0.267 | 0.000 | 0.267 | -0.252 |
| 15.00 | -22.066 | -45.694 | 0.000 | 0.000 | 0.000 | -2,069.234 | -0.599 | 0.000 | 0.599 | -0.379 |
| 20.00 | -21.738 | -44.004 | 0.000 | 0.000 | 0.000 | -1,958.907 | -1.065 | 0.000 | 1.065 | -0.507 |
| 25.00 | -21.454 | -42.360 | 0.000 | 0.000 | 0.000 | -1,850.218 | -1.665 | 0.000 | 1.665 | -0.636 |
| 30.00 | -21.168 | -40.742 | 0.000 | 0.000 | 0.000 | -1,742.953 | -2.401 | 0.000 | 2.401 | -0.765 |
| 35.00 | -20.877 | -39.150 | 0.000 | 0.000 | 0.000 | -1,637.114 | -3.272 | 0.000 | 3.272 | -0.895 |
| 40.00 | -20.571 | -37.585 | 0.000 | 0.000 | 0.000 | -1,532.734 | -4.279 | 0.000 | 4.279 | -1.025 |
| 45.00 | -20.226 | -36.061 | 0.000 | 0.000 | 0.000 | -1,429.883 | -5.422 | 0.000 | 5.422 | -1.154 |
| 46.83 | -20.120 | -35.497 | 0.000 | 0.000 | 0.000 | -1,392.803 | -5.875 | 0.000 | 5.875 | -1.203 |
| 50.00 | -19.894 | -33.945 | 0.000 | 0.000 | 0.000 | -1,329.091 | -6.702 | 0.000 | 6.702 | -1.286 |
| 53.00 | -19.669 | -32.496 | 0.000 | 0.000 | 0.000 | -1,269.410 | -7.535 | 0.000 | 7.535 | -1.364 |
| 55.00 | -19.551 | -31.885 | 0.000 | 0.000 | 0.000 | -1,230.073 | -8.118 | 0.000 | 8.118 | -1.417 |
| 60.00 | -19.191 | -30.413 | 0.000 | 0.000 | 0.000 | -1,132.322 | -9.668 | 0.000 | 9.668 | -1.538 |
| 65.00 | -18.823 | -28.969 | 0.000 | 0.000 | 0.000 | -1,036.370 | -11.343 | 0.000 | 11.343 | -1.658 |
| 70.00 | -18.448 | -27.551 | 0.000 | 0.000 | 0.000 | -942.258 | -13.143 | 0.000 | 13.143 | -1.775 |
| 75.00 | -18.046 | -26.176 | 0.000 | 0.000 | 0.000 | -850.020 | -15.065 | 0.000 | 15.065 | -1.890 |
| 76.00 | -17.934 | -25.828 | 0.000 | 0.000 | 0.000 | -831.974 | -15.463 | 0.000 | 15.463 | -1.914 |
| 80.00 | -17.630 | -24.737 | 0.000 | 0.000 | 0.000 | -760.239 | -17.106 | 0.000 | 17.106 | -2.003 |
| 85.00 | -17.234 | -23.406 | 0.000 | 0.000 | 0.000 | -672.092 | -19.262 | 0.000 | 19.262 | -2.111 |
| 89.00 | -15.647 | -21.149 | 0.000 | 0.000 | 0.000 | -603.158 | -21.067 | 0.000 | 21.067 | -2.194 |
| 90.00 | -15.594 | -20.890 | 0.000 | 0.000 | 0.000 | -587.512 | -21.529 | 0.000 | 21.529 | -2.215 |
| 94.92 | -15.241 | -19.702 | 0.000 | 0.000 | 0.000 | -510.843 | -23.861 | 0.000 | 23.861 | -2.311 |
| 95.00 | -15.245 | -19.664 | 0.000 | 0.000 | 0.000 | -509.573 | -23.901 | 0.000 | 23.901 | -2.312 |
| 98.00 | -13.170 | -16.621 | 0.000 | 0.000 | 0.000 | -463.840 | -25.372 | 0.000 | 25.372 | -2.369 |
| 99.83 | -13.029 | -15.985 | 0.000 | 0.000 | 0.000 | -439.695 | -26.289 | 0.000 | 26.289 | -2.403 |
| 100.0 | -13.031 | -15.940 | 0.000 | 0.000 | 0.000 | -437.524 | -26.373 | 0.000 | 26.373 | -2.406 |
| 105.0 | -12.687 | -14.937 | 0.000 | 0.000 | 0.000 | -372.370 | -28.945 | 0.000 | 28.945 | -2.503 |
| 110.0 | -12.340 | -13.961 | 0.000 | 0.000 | 0.000 | -308.934 | -31.614 | 0.000 | 31.614 | -2.592 |
| 113.0 | -11.723 | -13.260 | 0.000 | 0.000 | 0.000 | -271.915 | -33.259 | 0.000 | 33.259 | -2.642 |
| 115.0 | -11.592 | -12.886 | 0.000 | 0.000 | 0.000 | -248.470 | -34.373 | 0.000 | 34.373 | -2.674 |
| 120.0 | -11.248 | -11.983 | 0.000 | 0.000 | 0.000 | -190.511 | -37.211 | 0.000 | 37.211 | -2.743 |
| 123.0 | -9.087 | -10.043 | 0.000 | 0.000 | 0.000 | -156.767 | -38.947 | 0.000 | 38.947 | -2.780 |
| 125.0 | -8.972 | -9.738 | 0.000 | 0.000 | 0.000 | -138.593 | -40.116 | 0.000 | 40.116 | -2.802 |
| 130.0 | -8.678 | -9.001 | 0.000 | 0.000 | 0.000 | -93.736 | -43.076 | 0.000 | 43.076 | -2.847 |
| 135.0 | -4.319 | -4.667 | 0.000 | 0.000 | 0.000 | -49.709 | -46.075 | 0.000 | 46.075 | -2.878 |
| 140.0 | -4.040 | -4.067 | 0.000 | 0.000 | 0.000 | -28.112 | -49.098 | 0.000 | 49.098 | -2.897 |
| 145.0 | -3.767 | -3.490 | 0.000 | 0.000 | 0.000 | -7.914 | -52.137 | 0.000 | 52.137 | -2.906 |
| 147.0 | -0.180 | -0.159 | 0.000 | 0.000 | 0.000 | -0.381 | -53.355 | 0.000 | 53.355 | -2.907 |
| 147.9 | -0.001 | -0.002 | 0.000 | 0.000 | 0.000 | 0.000 | -53.902 | 0.000 | 53.902 | -2.907 |
| 147.9 | -0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -53.913 | 0.000 | 53.913 | -2.907 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)








**Load Case:** Ice — 69.28 mph Wind with Ice — 23 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

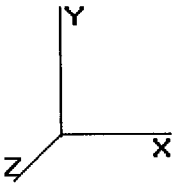
## Calculated Stresses

| Seg Elev (ft) | Applied Stresses | | | | | | | Allowable Stress (Fb) (ksi) | | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| | Axial (Y) (ksi) | Shear (X) (ksi) | Shear (Z) (ksi) | Torsion (ksi) | Bending (X) (ksi) | Bending (Z) (ksi) | Combined (ksi) | | | |
| 0.00 | 0.75 | 0.69 | 0.00 | 0.00 | 0.00 | 31.10 | 31.88 | 52.0 | 0.0 | 0.614 |
| 5.00 | 0.75 | 0.70 | 0.00 | 0.00 | 0.00 | 30.79 | 31.56 | 52.0 | 0.0 | 0.607 |
| 10.00 | 0.74 | 0.70 | 0.00 | 0.00 | 0.00 | 30.45 | 31.21 | 52.0 | 0.0 | 0.600 |
| 15.00 | 0.72 | 0.71 | 0.00 | 0.00 | 0.00 | 30.07 | 30.82 | 52.0 | 0.0 | 0.593 |
| 20.00 | 0.71 | 0.71 | 0.00 | 0.00 | 0.00 | 29.66 | 30.40 | 52.0 | 0.0 | 0.585 |
| 25.00 | 0.70 | 0.71 | 0.00 | 0.00 | 0.00 | 29.22 | 29.94 | 52.0 | 0.0 | 0.576 |
| 30.00 | 0.69 | 0.72 | 0.00 | 0.00 | 0.00 | 28.73 | 29.44 | 52.0 | 0.0 | 0.566 |
| 35.00 | 0.68 | 0.73 | 0.00 | 0.00 | 0.00 | 28.19 | 28.89 | 52.0 | 0.0 | 0.556 |
| 40.00 | 0.66 | 0.73 | 0.00 | 0.00 | 0.00 | 27.60 | 28.29 | 52.0 | 0.0 | 0.544 |
| 45.00 | 0.65 | 0.74 | 0.00 | 0.00 | 0.00 | 26.95 | 27.63 | 52.0 | 0.0 | 0.532 |
| 46.83 | 0.65 | 0.74 | 0.00 | 0.00 | 0.00 | 26.70 | 27.38 | 52.0 | 0.0 | 0.527 |
| 50.00 | 0.63 | 0.74 | 0.00 | 0.00 | 0.00 | 26.25 | 26.91 | 52.0 | 0.0 | 0.518 |
| 53.00 | 0.60 | 0.73 | 0.00 | 0.00 | 0.00 | 24.96 | 25.59 | 52.0 | 0.0 | 0.492 |
| 55.00 | 0.59 | 0.73 | 0.00 | 0.00 | 0.00 | 24.65 | 25.27 | 52.0 | 0.0 | 0.486 |
| 60.00 | 0.58 | 0.74 | 0.00 | 0.00 | 0.00 | 23.81 | 24.42 | 52.0 | 0.0 | 0.470 |
| 65.00 | 0.57 | 0.74 | 0.00 | 0.00 | 0.00 | 22.90 | 23.50 | 52.0 | 0.0 | 0.452 |
| 70.00 | 0.55 | 0.74 | 0.00 | 0.00 | 0.00 | 21.90 | 22.49 | 52.0 | 0.0 | 0.433 |
| 75.00 | 0.54 | 0.75 | 0.00 | 0.00 | 0.00 | 20.82 | 21.39 | 52.0 | 0.0 | 0.412 |
| 76.00 | 0.53 | 0.75 | 0.00 | 0.00 | 0.00 | 20.59 | 21.16 | 52.0 | 0.0 | 0.407 |
| 80.00 | 0.52 | 0.75 | 0.00 | 0.00 | 0.00 | 19.64 | 20.20 | 52.0 | 0.0 | 0.389 |
| 85.00 | 0.51 | 0.75 | 0.00 | 0.00 | 0.00 | 18.34 | 18.90 | 52.0 | 0.0 | 0.364 |
| 89.00 | 0.47 | 0.70 | 0.00 | 0.00 | 0.00 | 17.22 | 17.73 | 52.0 | 0.0 | 0.341 |
| 90.00 | 0.47 | 0.70 | 0.00 | 0.00 | 0.00 | 16.97 | 17.47 | 52.0 | 0.0 | 0.336 |
| 94.92 | 0.45 | 0.71 | 0.00 | 0.00 | 0.00 | 15.62 | 16.12 | 52.0 | 0.0 | 0.310 |
| 95.00 | 0.45 | 0.71 | 0.00 | 0.00 | 0.00 | 15.60 | 16.09 | 52.0 | 0.0 | 0.310 |
| 98.00 | 0.39 | 0.62 | 0.00 | 0.00 | 0.00 | 14.71 | 15.14 | 52.0 | 0.0 | 0.291 |
| 99.83 | 0.44 | 0.73 | 0.00 | 0.00 | 0.00 | 16.43 | 16.93 | 52.0 | 0.0 | 0.326 |
| 100.00 | 0.44 | 0.73 | 0.00 | 0.00 | 0.00 | 16.39 | 16.88 | 52.0 | 0.0 | 0.325 |
| 105.00 | 0.43 | 0.73 | 0.00 | 0.00 | 0.00 | 14.82 | 15.30 | 52.0 | 0.0 | 0.294 |
| 110.00 | 0.41 | 0.74 | 0.00 | 0.00 | 0.00 | 13.08 | 13.56 | 52.0 | 0.0 | 0.261 |
| 113.00 | 0.40 | 0.71 | 0.00 | 0.00 | 0.00 | 11.96 | 12.43 | 52.0 | 0.0 | 0.239 |
| 115.00 | 0.39 | 0.71 | 0.00 | 0.00 | 0.00 | 11.22 | 11.68 | 52.0 | 0.0 | 0.225 |
| 120.00 | 0.38 | 0.72 | 0.00 | 0.00 | 0.00 | 9.19 | 9.65 | 52.0 | 0.0 | 0.186 |
| 123.00 | 0.32 | 0.59 | 0.00 | 0.00 | 0.00 | 7.88 | 8.27 | 52.0 | 0.0 | 0.159 |
| 125.00 | 0.32 | 0.59 | 0.00 | 0.00 | 0.00 | 7.17 | 7.55 | 52.0 | 0.0 | 0.145 |
| 130.00 | 0.31 | 0.59 | 0.00 | 0.00 | 0.00 | 5.20 | 5.60 | 52.0 | 0.0 | 0.108 |
| 135.00 | 0.16 | 0.31 | 0.00 | 0.00 | 0.00 | 2.97 | 3.18 | 52.0 | 0.0 | 0.061 |
| 140.00 | 0.15 | 0.30 | 0.00 | 0.00 | 0.00 | 1.81 | 2.03 | 52.0 | 0.0 | 0.039 |
| 145.00 | 0.13 | 0.29 | 0.00 | 0.00 | 0.00 | 0.55 | 0.85 | 52.0 | 0.0 | 0.016 |
| 147.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 52.0 | 0.0 | 0.001 |
| 147.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 52.0 | 0.0 | 0.000 |
| 147.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 52.0 | 0.0 | 0.000 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)








**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 22 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Shaft Segment Forces

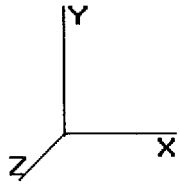
| Seg Top Elev (ft) | Description | | Kz | qz (psf) | qzGh (psf) | C (mph-ft) | Cf | Ice Thick (in) | Tributary (ft) | Aa (sf) | CfAa (sf) | Wind Force X (lb) | Dead Load Ice (lb) | Tot Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.00 | 1.00 | 6.400 | 10.81 | 235.74 | 0.650 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 0.00 | 1.00 | 6.400 | 10.81 | 231.27 | 0.650 | 0.000 | 5.00 | 23.351 | 15.18 | 164.2 | 0.0 | 1,127.3 |
| 10.00 | | 0.00 | 1.00 | 6.400 | 10.81 | 226.80 | 0.650 | 0.000 | 5.00 | 22.904 | 14.89 | 161.0 | 0.0 | 1,105.6 |
| 15.00 | | 0.00 | 1.00 | 6.400 | 10.81 | 222.33 | 0.650 | 0.000 | 5.00 | 22.457 | 14.60 | 157.9 | 0.0 | 1,083.8 |
| 20.00 | Appertunance(s) | 0.00 | 1.00 | 6.400 | 10.81 | 217.86 | 0.650 | 0.000 | 5.00 | 22.010 | 14.31 | 154.7 | 0.0 | 1,062.1 |
| 25.00 | | 0.00 | 1.00 | 6.400 | 10.81 | 213.39 | 0.650 | 0.000 | 5.00 | 21.563 | 14.02 | 151.6 | 0.0 | 1,040.4 |
| 30.00 | | 0.00 | 1.00 | 6.400 | 10.81 | 208.92 | 0.650 | 0.000 | 5.00 | 21.116 | 13.73 | 148.5 | 0.0 | 1,018.7 |
| 35.00 | | 0.00 | 1.01 | 6.509 | 10.99 | 206.18 | 0.650 | 0.000 | 5.00 | 20.669 | 13.44 | 147.8 | 0.0 | 996.9 |
| 40.00 | | 0.00 | 1.05 | 6.762 | 11.42 | 205.56 | 0.650 | 0.000 | 5.00 | 20.222 | 13.14 | 150.2 | 0.0 | 975.2 |
| 45.00 | | 0.00 | 1.09 | 6.993 | 11.81 | 204.37 | 0.650 | 0.000 | 5.00 | 19.775 | 12.85 | 151.9 | 0.0 | 953.5 |
| 46.83 | Bot - Section 2 | 0.00 | 1.10 | 7.073 | 11.95 | 203.82 | 0.650 | 0.000 | 1.83 | 7.139 | 4.64 | 55.5 | 0.0 | 344.2 |
| 50.00 | | 0.00 | 1.12 | 7.207 | 12.17 | 202.73 | 0.650 | 0.000 | 3.17 | 12.387 | 8.05 | 98.1 | 0.0 | 1,184.8 |
| 53.00 | Top - Section 1 | 0.00 | 1.14 | 7.328 | 12.38 | 201.55 | 0.650 | 0.000 | 3.00 | 11.570 | 7.52 | 93.1 | 0.0 | 1,106.4 |
| 55.00 | | 0.00 | 1.15 | 7.406 | 12.51 | 204.06 | 0.650 | 0.000 | 2.00 | 7.624 | 4.96 | 62.0 | 0.0 | 367.5 |
| 60.00 | | 0.00 | 1.18 | 7.592 | 12.83 | 201.74 | 0.650 | 0.000 | 5.00 | 18.747 | 12.19 | 156.3 | 0.0 | 903.5 |
| 65.00 | | 0.00 | 1.21 | 7.768 | 13.12 | 199.14 | 0.650 | 0.000 | 5.00 | 18.300 | 11.89 | 156.1 | 0.0 | 881.8 |
| 70.00 | | 0.00 | 1.24 | 7.934 | 13.40 | 196.28 | 0.650 | 0.000 | 5.00 | 17.853 | 11.60 | 155.6 | 0.0 | 860.0 |
| 75.00 | | 0.00 | 1.26 | 8.092 | 13.67 | 193.20 | 0.650 | 0.000 | 5.00 | 17.406 | 11.31 | 154.7 | 0.0 | 838.3 |
| 76.00 | Appertunance(s) | 0.00 | 1.26 | 8.123 | 13.72 | 192.56 | 0.650 | 0.000 | 1.00 | 3.427 | 2.23 | 30.6 | 0.0 | 165.1 |
| 80.00 | | 0.00 | 1.28 | 8.242 | 13.93 | 189.91 | 0.650 | 0.000 | 4.00 | 13.531 | 8.80 | 122.5 | 0.0 | 651.5 |
| 85.00 | | 0.00 | 1.31 | 8.387 | 14.17 | 186.45 | 0.650 | 0.000 | 5.00 | 16.512 | 10.73 | 152.1 | 0.0 | 794.9 |
| 89.00 | Appertunance(s) | 0.00 | 1.32 | 8.497 | 14.36 | 183.56 | 0.650 | 0.000 | 4.00 | 12.887 | 8.38 | 120.3 | 0.0 | 620.3 |
| 90.00 | | 0.00 | 1.33 | 8.525 | 14.40 | 182.82 | 0.650 | 0.000 | 1.00 | 3.177 | 2.07 | 29.8 | 0.0 | 152.9 |
| 94.92 | Bot - Section 3 | 0.00 | 1.35 | 8.655 | 14.62 | 179.10 | 0.650 | 0.000 | 4.92 | 15.361 | 9.98 | 146.0 | 0.0 | 739.1 |
| 95.00 | | 0.00 | 1.35 | 8.657 | 14.63 | 179.04 | 0.650 | 0.000 | 0.08 | 0.261 | 0.17 | 2.5 | 0.0 | 22.8 |
| 98.00 | Appertunance(s) | 0.00 | 1.36 | 8.735 | 14.76 | 176.70 | 0.650 | 0.000 | 3.00 | 9.312 | 6.05 | 89.3 | 0.0 | 814.4 |
| 99.83 | Top - Section 2 | 0.00 | 1.37 | 8.781 | 14.84 | 175.25 | 0.650 | 0.000 | 1.83 | 5.612 | 3.65 | 54.1 | 0.0 | 490.6 |
| 100.0 | | 0.00 | 1.37 | 8.785 | 14.84 | 178.17 | 0.650 | 0.000 | 0.17 | 0.507 | 0.33 | 4.9 | 0.0 | 20.4 |
| 105.0 | | 0.00 | 1.39 | 8.908 | 15.05 | 174.14 | 0.650 | 0.000 | 5.00 | 14.984 | 9.74 | 146.6 | 0.0 | 601.6 |
| 110.0 | | 0.00 | 1.41 | 9.028 | 15.25 | 169.99 | 0.650 | 0.000 | 5.00 | 14.537 | 9.45 | 144.2 | 0.0 | 583.5 |
| 113.0 | Appertunance(s) | 0.00 | 1.42 | 9.097 | 15.37 | 167.45 | 0.650 | 0.000 | 3.00 | 8.508 | 5.53 | 85.0 | 0.0 | 341.4 |
| 115.0 | | 0.00 | 1.42 | 9.143 | 15.45 | 165.73 | 0.650 | 0.000 | 2.00 | 5.582 | 3.63 | 56.1 | 0.0 | 224.0 |
| 120.0 | | 0.00 | 1.44 | 9.255 | 15.64 | 161.37 | 0.650 | 0.000 | 5.00 | 13.643 | 8.87 | 138.7 | 0.0 | 547.3 |
| 123.0 | Appertunance(s) | 0.00 | 1.45 | 9.320 | 15.75 | 158.70 | 0.650 | 0.000 | 3.00 | 7.971 | 5.18 | 81.6 | 0.0 | 319.7 |
| 125.0 | | 0.00 | 1.46 | 9.363 | 15.82 | 156.90 | 0.650 | 0.000 | 2.00 | 5.225 | 3.40 | 53.7 | 0.0 | 209.5 |
| 130.0 | | 0.00 | 1.48 | 9.469 | 16.00 | 152.35 | 0.650 | 0.000 | 5.00 | 12.749 | 8.29 | 132.6 | 0.0 | 511.1 |
| 135.0 | Appertunance(s) | 0.00 | 1.49 | 9.572 | 16.17 | 147.71 | 0.650 | 0.000 | 5.00 | 12.302 | 8.00 | 129.3 | 0.0 | 493.0 |
| 140.0 | | 0.00 | 1.51 | 9.672 | 16.34 | 142.98 | 0.650 | 0.000 | 5.00 | 11.855 | 7.71 | 125.9 | 0.0 | 474.8 |
| 145.0 | | 0.00 | 1.52 | 9.769 | 16.51 | 138.18 | 0.650 | 0.000 | 5.00 | 11.408 | 7.42 | 122.4 | 0.0 | 456.7 |
| 147.0 | Appertunance(s) | 0.00 | 1.53 | 9.807 | 16.57 | 136.23 | 0.650 | 0.000 | 2.00 | 4.438 | 2.88 | 47.8 | 0.0 | 177.6 |
| 147.9 | Appertunance(s) | 0.00 | 1.53 | 9.824 | 16.60 | 135.35 | 0.650 | 0.000 | 0.90 | 1.974 | 1.28 | 21.3 | 0.0 | 79.0 |
| 147.9 | | 0.00 | 1.53 | 9.825 | 16.60 | 135.34 | 0.650 | 0.000 | 0.02 | 0.037 | 0.02 | 0.4 | 0.0 | 1.5 |
| | | | | | | | Totals: | | 147.92 | | | 4,357.2 | 0.0 | 25,342.4 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)








**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 22 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

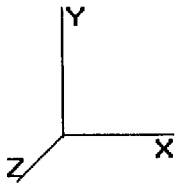
## Discrete Appurtenance Segment Forces

| Elev (ft) | Description | Qty | qz (psf) | qzGh (psf) | CaAa Factor | Total CaAa (sf) | Horiz Ecc (ft) | Vert Ecc (ft) | Wind FX (lb) | Mom Y (lb-ft) | Mom Z (lb-ft) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.00 | Lucent KS-24019 | 1 | 6.400 | 10.816 | 1.00 | 1.00 | 0.000 | 0.000 | 10.82 | 0.00 | 0.00 | 7.00 |
| 76.00 | Side Markers | 2 | 8.123 | 13.727 | 1.00 | 1.60 | 0.000 | 0.000 | 21.96 | 0.00 | 0.00 | 40.00 |
| 89.00 | Argus LLPX310R | 3 | 8.497 | 14.361 | 0.72 | 10.43 | 0.000 | 0.000 | 149.82 | 0.00 | 0.00 | 85.80 |
| 89.00 | DragonWave A-ANT- | 1 | 8.497 | 14.361 | 0.90 | 7.80 | 0.000 | 0.000 | 112.06 | 0.00 | 0.00 | 66.10 |
| 89.00 | DragonWave A-ANT- | 2 | 8.497 | 14.361 | 0.90 | 8.44 | 0.000 | 0.000 | 121.23 | 0.00 | 0.00 | 54.20 |
| 89.00 | DragonWave Horizon | 3 | 8.497 | 14.361 | 0.50 | 0.64 | 0.000 | 0.000 | 9.26 | 0.00 | 0.00 | 31.80 |
| 89.00 | NextNet BTS-2500 | 3 | 8.497 | 14.361 | 0.50 | 3.18 | 0.000 | 0.000 | 45.67 | 0.00 | 0.00 | 105.00 |
| 89.00 | Side Arms | 1 | 8.497 | 14.361 | 1.00 | 8.50 | 0.000 | 0.000 | 122.07 | 0.00 | 0.00 | 560.00 |
| 98.00 | Decibel DB844H90E-A | 9 | 8.735 | 14.761 | 0.86 | 30.73 | 0.000 | 0.000 | 453.59 | 0.00 | 0.00 | 90.00 |
| 98.00 | Round Low Profile Pl | 1 | 8.735 | 14.761 | 1.00 | 21.70 | 0.000 | 0.000 | 320.32 | 0.00 | 0.00 | 1,500.00 |
| 113.0 | RFS APXV18-206517 | 3 | 9.097 | 15.374 | 0.80 | 12.12 | 0.000 | 0.000 | 186.34 | 0.00 | 0.00 | 66.00 |
| 123.0 | RFS APX16DWV- | 3 | 9.320 | 15.751 | 0.65 | 13.06 | 0.000 | 0.000 | 205.79 | 0.00 | 0.00 | 118.80 |
| 123.0 | RFS APXV18-206516L- | 6 | 9.320 | 15.751 | 0.78 | 16.71 | 0.000 | 0.000 | 263.17 | 0.00 | 0.00 | 112.20 |
| 123.0 | RFS ATMAA1412D- | 3 | 9.320 | 15.751 | 0.50 | 1.75 | 0.000 | 0.000 | 27.64 | 0.00 | 0.00 | 39.00 |
| 123.0 | RFS ATMPP1412D- | 3 | 9.320 | 15.751 | 0.50 | 1.75 | 0.000 | 0.000 | 27.64 | 0.00 | 0.00 | 36.00 |
| 123.0 | Round T-Arms | 3 | 9.320 | 15.751 | 0.67 | 19.50 | 0.000 | 0.000 | 307.10 | 0.00 | 0.00 | 750.00 |
| 135.0 | Andrew SBNH- | 1 | 9.572 | 16.176 | 1.00 | 11.44 | 0.000 | 0.000 | 185.05 | 0.00 | 0.00 | 66.10 |
| 135.0 | Ericsson RRUS 11 | 6 | 9.592 | 16.210 | 0.67 | 11.82 | 0.000 | 1.000 | 191.58 | 0.00 | 191.58 | 330.00 |
| 135.0 | Flat Platform w/ Han | 1 | 9.572 | 16.176 | 1.00 | 42.40 | 0.000 | 0.000 | 685.86 | 0.00 | 0.00 | 2,000.00 |
| 135.0 | KMW AM-X-CD-16-65- | 2 | 9.572 | 16.176 | 0.79 | 12.67 | 0.000 | 0.000 | 204.98 | 0.00 | 0.00 | 97.00 |
| 135.0 | Powerwave 7750.00 | 6 | 9.572 | 16.176 | 0.75 | 26.46 | 0.000 | 0.000 | 428.02 | 0.00 | 0.00 | 210.00 |
| 135.0 | Powerwave LGP21401 | 6 | 9.592 | 16.210 | 0.50 | 3.87 | 0.000 | 1.000 | 62.73 | 0.00 | 62.73 | 84.60 |
| 135.0 | Powerwave LGP21903 | 6 | 9.592 | 16.210 | 0.50 | 0.81 | 0.000 | 1.000 | 13.13 | 0.00 | 13.13 | 33.00 |
| 135.0 | Raycap DC6-48-60-18- | 1 | 9.592 | 16.210 | 1.00 | 1.26 | 0.000 | 1.000 | 20.42 | 0.00 | 20.42 | 20.00 |
| 147.0 | 48" x 12" Panels | 9 | 9.807 | 16.574 | 0.67 | 33.77 | 0.000 | 0.000 | 559.69 | 0.00 | 0.00 | 270.00 |
| 147.0 | 72" x 12" Panels | 3 | 9.807 | 16.574 | 0.67 | 16.88 | 0.000 | 0.000 | 279.84 | 0.00 | 0.00 | 120.00 |
| 147.0 | Flat Platform w/ Han | 1 | 9.807 | 16.574 | 1.00 | 42.40 | 0.000 | 0.000 | 702.75 | 0.00 | 0.00 | 2,000.00 |
| 147.9 | Flash Technology FTB | 1 | 9.857 | 16.658 | 1.00 | 3.70 | 0.000 | 1.710 | 61.63 | 0.00 | 105.40 | 28.00 |
| | | | | | | | | | 5,780.19 | | | 8,920.60 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)




4/20/2012 10:53:26 AM
Page: 20



**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 22 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

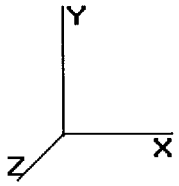
## Linear Appurtenance Segment Forces

| Seg Top Elev (ft) | Description | Exposed To Wind | Length (ft) | Weight (lb/ft) | CaAa (sf/ft) | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|
| 10.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 6.400 | 10.82 | 24.60 |
| 10.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 6.400 | 0.00 | 1.50 |
| 10.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 6.400 | 18.93 | 37.90 |
| 10.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 6.400 | 0.00 | 1.20 |
| 10.00 | (1) 1/2" Coax | Yes | 5.00 | 0.15 | 0.06 | 6.400 | 3.41 | 0.75 |
| 15.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 6.400 | 10.82 | 24.60 |
| 15.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 6.400 | 0.00 | 1.50 |
| 15.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 6.400 | 18.93 | 37.90 |
| 15.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 6.400 | 0.00 | 1.20 |
| 15.00 | (1) 1/2" Coax | Yes | 5.00 | 0.15 | 0.06 | 6.400 | 3.41 | 0.75 |
| 20.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 6.400 | 10.82 | 24.60 |
| 20.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 6.400 | 0.00 | 1.50 |
| 20.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 6.400 | 18.93 | 37.90 |
| 20.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 6.400 | 0.00 | 1.20 |
| 20.00 | (1) 1/2" Coax | Yes | 5.00 | 0.15 | 0.06 | 6.400 | 3.41 | 0.75 |
| 25.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 6.400 | 10.82 | 24.60 |
| 25.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 6.400 | 0.00 | 1.50 |
| 25.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 6.400 | 18.93 | 37.90 |
| 25.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 6.400 | 0.00 | 1.20 |
| 30.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 6.400 | 10.82 | 24.60 |
| 30.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 6.400 | 0.00 | 1.50 |
| 30.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 6.400 | 18.93 | 37.90 |
| 30.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 6.400 | 0.00 | 1.20 |
| 35.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 6.509 | 11.00 | 24.60 |
| 35.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 6.509 | 0.00 | 1.50 |
| 35.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 6.509 | 19.25 | 37.90 |
| 35.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 6.509 | 0.00 | 1.20 |
| 40.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 6.762 | 11.43 | 24.60 |
| 40.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 6.762 | 0.00 | 1.50 |
| 40.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 6.762 | 20.00 | 37.90 |
| 40.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 6.762 | 0.00 | 1.20 |
| 45.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 6.993 | 11.82 | 24.60 |
| 45.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 6.993 | 0.00 | 1.50 |
| 45.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 6.993 | 20.68 | 37.90 |
| 45.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 6.993 | 0.00 | 1.20 |
| 46.83 | (6) 1 5/8" Coax | Yes | 1.83 | 4.92 | 0.20 | 7.073 | 4.38 | 9.02 |
| 46.83 | (3) 1/2" Coax | Yes | 1.83 | 0.30 | 0.00 | 7.073 | 0.00 | 0.55 |
| 46.83 | (1) 3" Conduit | Yes | 1.83 | 7.58 | 0.35 | 7.073 | 7.67 | 13.90 |
| 46.83 | (6) 5/16" Coax | Yes | 1.83 | 0.24 | 0.00 | 7.073 | 0.00 | 0.44 |
| 50.00 | (6) 1 5/8" Coax | Yes | 3.17 | 4.92 | 0.20 | 7.207 | 7.71 | 15.58 |
| 50.00 | (3) 1/2" Coax | Yes | 3.17 | 0.30 | 0.00 | 7.207 | 0.00 | 0.95 |
| 50.00 | (1) 3" Conduit | Yes | 3.17 | 7.58 | 0.35 | 7.207 | 13.50 | 24.00 |
| 50.00 | (6) 5/16" Coax | Yes | 3.17 | 0.24 | 0.00 | 7.207 | 0.00 | 0.76 |
| 53.00 | (6) 1 5/8" Coax | Yes | 3.00 | 4.92 | 0.20 | 7.328 | 7.43 | 14.76 |
| 53.00 | (3) 1/2" Coax | Yes | 3.00 | 0.30 | 0.00 | 7.328 | 0.00 | 0.90 |
| 53.00 | (1) 3" Conduit | Yes | 3.00 | 7.58 | 0.35 | 7.328 | 13.00 | 22.74 |
| 53.00 | (6) 5/16" Coax | Yes | 3.00 | 0.24 | 0.00 | 7.328 | 0.00 | 0.72 |
| 55.00 | (6) 1 5/8" Coax | Yes | 2.00 | 4.92 | 0.20 | 7.406 | 5.01 | 9.84 |
| 55.00 | (3) 1/2" Coax | Yes | 2.00 | 0.30 | 0.00 | 7.406 | 0.00 | 0.60 |
| 55.00 | (1) 3" Conduit | Yes | 2.00 | 7.58 | 0.35 | 7.406 | 8.76 | 15.16 |
| 55.00 | (6) 5/16" Coax | Yes | 2.00 | 0.24 | 0.00 | 7.406 | 0.00 | 0.48 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)







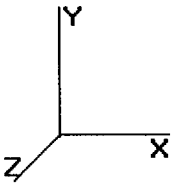

**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 22 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 60.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 7.592 | 12.83 | 24.60 |
| 60.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 7.592 | 0.00 | 1.50 |
| 60.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 7.592 | 22.45 | 37.90 |
| 60.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 7.592 | 0.00 | 1.20 |
| 65.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 7.768 | 13.13 | 24.60 |
| 65.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 7.768 | 0.00 | 1.50 |
| 65.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 7.768 | 22.97 | 37.90 |
| 65.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 7.768 | 0.00 | 1.20 |
| 70.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 7.934 | 13.41 | 24.60 |
| 70.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 7.934 | 0.00 | 1.50 |
| 70.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 7.934 | 23.46 | 37.90 |
| 70.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 7.934 | 0.00 | 1.20 |
| 75.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 8.092 | 13.68 | 24.60 |
| 75.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 8.092 | 0.00 | 1.50 |
| 75.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 8.092 | 23.93 | 37.90 |
| 75.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 8.092 | 0.00 | 1.20 |
| 76.00 | (6) 1 5/8" Coax | Yes | 1.00 | 4.92 | 0.20 | 8.123 | 2.75 | 4.92 |
| 76.00 | (3) 1/2" Coax | Yes | 1.00 | 0.30 | 0.00 | 8.123 | 0.00 | 0.30 |
| 76.00 | (1) 3" Conduit | Yes | 1.00 | 7.58 | 0.35 | 8.123 | 4.80 | 7.58 |
| 76.00 | (6) 5/16" Coax | Yes | 1.00 | 0.24 | 0.00 | 8.123 | 0.00 | 0.24 |
| 80.00 | (6) 1 5/8" Coax | Yes | 4.00 | 4.92 | 0.20 | 8.242 | 11.14 | 19.68 |
| 80.00 | (3) 1/2" Coax | Yes | 4.00 | 0.30 | 0.00 | 8.242 | 0.00 | 1.20 |
| 80.00 | (1) 3" Conduit | Yes | 4.00 | 7.58 | 0.35 | 8.242 | 19.50 | 30.32 |
| 80.00 | (6) 5/16" Coax | Yes | 4.00 | 0.24 | 0.00 | 8.242 | 0.00 | 0.96 |
| 85.00 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 8.387 | 14.17 | 24.60 |
| 85.00 | (3) 1/2" Coax | Yes | 5.00 | 0.30 | 0.00 | 8.387 | 0.00 | 1.50 |
| 85.00 | (1) 3" Conduit | Yes | 5.00 | 7.58 | 0.35 | 8.387 | 24.80 | 37.90 |
| 85.00 | (6) 5/16" Coax | Yes | 5.00 | 0.24 | 0.00 | 8.387 | 0.00 | 1.20 |
| 89.00 | (6) 1 5/8" Coax | Yes | 4.00 | 4.92 | 0.20 | 8.497 | 11.49 | 19.68 |
| 89.00 | (3) 1/2" Coax | Yes | 4.00 | 0.30 | 0.00 | 8.497 | 0.00 | 1.20 |
| 89.00 | (1) 3" Conduit | Yes | 4.00 | 7.58 | 0.35 | 8.497 | 20.10 | 30.32 |
| 89.00 | (6) 5/16" Coax | Yes | 4.00 | 0.24 | 0.00 | 8.497 | 0.00 | 0.96 |
| 90.00 | (6) 1 5/8" Coax | Yes | 1.00 | 4.92 | 0.20 | 8.525 | 2.88 | 4.92 |
| 94.92 | (6) 1 5/8" Coax | Yes | 4.92 | 4.92 | 0.20 | 8.655 | 14.38 | 24.19 |
| 95.00 | (6) 1 5/8" Coax | Yes | 0.08 | 4.92 | 0.20 | 8.657 | 0.24 | 0.41 |
| 98.00 | (6) 1 5/8" Coax | Yes | 3.00 | 4.92 | 0.20 | 8.735 | 8.86 | 14.76 |
| 99.83 | (6) 1 5/8" Coax | Yes | 1.83 | 4.92 | 0.20 | 8.781 | 5.44 | 9.02 |
| 100.0 | (6) 1 5/8" Coax | Yes | 0.17 | 4.92 | 0.20 | 8.785 | 0.49 | 0.82 |
| 105.0 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 8.908 | 15.06 | 24.60 |
| 110.0 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 9.028 | 15.26 | 24.60 |
| 113.0 | (6) 1 5/8" Coax | Yes | 3.00 | 4.92 | 0.20 | 9.097 | 9.22 | 14.76 |
| 115.0 | (6) 1 5/8" Coax | Yes | 2.00 | 4.92 | 0.20 | 9.143 | 6.18 | 9.84 |
| 120.0 | (6) 1 5/8" Coax | Yes | 5.00 | 4.92 | 0.20 | 9.255 | 15.64 | 24.60 |
| 123.0 | (6) 1 5/8" Coax | Yes | 3.00 | 4.92 | 0.20 | 9.320 | 9.45 | 14.76 |
| | | | | | | Totals: | 678.32 | 1,264.89 |

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | 4/20/2012 10:53:26 AM |
| Location : | Petro Lock, CT | | Page: 22 |
| Height : | 147.9 (ft) | | |
| Base Dia : | 56.58 (in) | | |
| Top Dia : | 26.21 (in) | Base Elev : 0.000 (ft) | |
| Shape : | 18 Sides | | |
| Taper : | 0.214568 (in/ft) | | |






**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 22 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

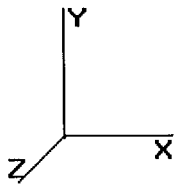
## Applied Segment Forces Summary

| Seg Elev (ft) | Lateral FX (-) (lb) | Axial FY (-) (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) |
|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | 164.17 | 1,127.29 | 0.00 | 0.00 |
| 10.00 | 194.18 | 1,466.21 | 0.00 | 0.00 |
| 15.00 | 191.04 | 1,444.49 | 0.00 | 0.00 |
| 20.00 | 198.71 | 1,429.76 | 0.00 | 0.00 |
| 25.00 | 181.34 | 1,400.29 | 0.00 | 0.00 |
| 30.00 | 178.20 | 1,378.56 | 0.00 | 0.00 |
| 35.00 | 178.03 | 1,356.84 | 0.00 | 0.00 |
| 40.00 | 181.63 | 1,335.11 | 0.00 | 0.00 |
| 45.00 | 184.41 | 1,313.39 | 0.00 | 0.00 |
| 46.83 | 67.52 | 476.13 | 0.00 | 0.00 |
| 50.00 | 119.28 | 1,412.74 | 0.00 | 0.00 |
| 53.00 | 113.57 | 1,322.31 | 0.00 | 0.00 |
| 55.00 | 75.79 | 511.44 | 0.00 | 0.00 |
| 60.00 | 191.63 | 1,263.40 | 0.00 | 0.00 |
| 65.00 | 192.25 | 1,241.67 | 0.00 | 0.00 |
| 70.00 | 192.47 | 1,219.95 | 0.00 | 0.00 |
| 75.00 | 192.33 | 1,198.22 | 0.00 | 0.00 |
| 76.00 | 60.10 | 277.04 | 0.00 | 0.00 |
| 80.00 | 153.16 | 939.46 | 0.00 | 0.00 |
| 85.00 | 191.09 | 1,154.77 | 0.00 | 0.00 |
| 89.00 | 712.00 | 1,811.08 | 0.00 | 0.00 |
| 90.00 | 32.63 | 216.75 | 0.00 | 0.00 |
| 94.92 | 160.43 | 1,053.06 | 0.00 | 0.00 |
| 95.00 | 2.73 | 28.15 | 0.00 | 0.00 |
| 98.00 | 872.11 | 2,595.99 | 0.00 | 0.00 |
| 99.83 | 59.57 | 586.92 | 0.00 | 0.00 |
| 100.0 | 5.39 | 29.12 | 0.00 | 0.00 |
| 105.0 | 161.69 | 864.18 | 0.00 | 0.00 |
| 110.0 | 159.42 | 846.07 | 0.00 | 0.00 |
| 113.0 | 280.58 | 564.95 | 0.00 | 0.00 |
| 115.0 | 62.25 | 319.18 | 0.00 | 0.00 |
| 120.0 | 154.34 | 785.27 | 0.00 | 0.00 |
| 123.0 | 922.42 | 1,518.47 | 0.00 | 0.00 |
| 125.0 | 53.74 | 265.33 | 0.00 | 0.00 |
| 130.0 | 132.61 | 650.66 | 0.00 | 0.00 |
| 135.0 | 1,921.13 | 3,473.25 | 0.00 | 287.87 |
| 140.0 | 125.95 | 524.05 | 0.00 | 0.00 |
| 145.0 | 122.42 | 505.95 | 0.00 | 0.00 |
| 147.0 | 1,590.10 | 2,587.31 | 0.00 | 0.00 |
| 147.9 | 82.94 | 106.99 | 0.00 | 105.40 |
| 147.9 | 0.40 | 1.49 | 0.00 | 0.00 |
| Totals: | 10,815.70 | 42,603.25 | 0.00 | 393.27 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)








**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 22 Iterations

Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Shaft Forces and Deflections

| Seg Elev (ft) | Lateral FX (-) (kips) | Axial FY (-) (kips) | Lateral FZ (kips) | Moment MX (ft-kips) | Torsion MY (ft-kips) | Moment MZ (ft-kips) | X Deflect (in) | Z Deflect (in) | Total Deflect (in) | Rotation (deg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -10.837 | -42.598 | 0.000 | 0.000 | 0.000 | -1,123.195 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5.00 | -10.714 | -41.459 | 0.000 | 0.000 | 0.000 | -1,069.012 | -0.031 | 0.000 | 0.031 | -0.058 |
| 10.00 | -10.559 | -39.983 | 0.000 | 0.000 | 0.000 | -1,015.441 | -0.124 | 0.000 | 0.124 | -0.117 |
| 15.00 | -10.404 | -38.528 | 0.000 | 0.000 | 0.000 | -962.646 | -0.279 | 0.000 | 0.279 | -0.176 |
| 20.00 | -10.239 | -37.088 | 0.000 | 0.000 | 0.000 | -910.625 | -0.496 | 0.000 | 0.496 | -0.236 |
| 25.00 | -10.089 | -35.678 | 0.000 | 0.000 | 0.000 | -859.430 | -0.776 | 0.000 | 0.776 | -0.296 |
| 30.00 | -9.939 | -34.290 | 0.000 | 0.000 | 0.000 | -808.988 | -1.118 | 0.000 | 1.118 | -0.356 |
| 35.00 | -9.786 | -32.924 | 0.000 | 0.000 | 0.000 | -759.295 | -1.523 | 0.000 | 1.523 | -0.416 |
| 40.00 | -9.627 | -31.581 | 0.000 | 0.000 | 0.000 | -710.366 | -1.991 | 0.000 | 1.991 | -0.476 |
| 45.00 | -9.453 | -30.262 | 0.000 | 0.000 | 0.000 | -662.231 | -2.523 | 0.000 | 2.523 | -0.536 |
| 46.83 | -9.397 | -29.782 | 0.000 | 0.000 | 0.000 | -644.901 | -2.733 | 0.000 | 2.733 | -0.559 |
| 50.00 | -9.282 | -28.364 | 0.000 | 0.000 | 0.000 | -615.146 | -3.117 | 0.000 | 3.117 | -0.597 |
| 53.00 | -9.168 | -27.038 | 0.000 | 0.000 | 0.000 | -587.301 | -3.504 | 0.000 | 3.504 | -0.634 |
| 55.00 | -9.105 | -26.521 | 0.000 | 0.000 | 0.000 | -568.966 | -3.775 | 0.000 | 3.775 | -0.658 |
| 60.00 | -8.923 | -25.252 | 0.000 | 0.000 | 0.000 | -523.440 | -4.494 | 0.000 | 4.494 | -0.714 |
| 65.00 | -8.738 | -24.004 | 0.000 | 0.000 | 0.000 | -478.825 | -5.272 | 0.000 | 5.272 | -0.769 |
| 70.00 | -8.550 | -22.779 | 0.000 | 0.000 | 0.000 | -435.137 | -6.107 | 0.000 | 6.107 | -0.824 |
| 75.00 | -8.352 | -21.579 | 0.000 | 0.000 | 0.000 | -392.389 | -6.999 | 0.000 | 6.999 | -0.877 |
| 76.00 | -8.297 | -21.299 | 0.000 | 0.000 | 0.000 | -384.038 | -7.184 | 0.000 | 7.184 | -0.887 |
| 80.00 | -8.145 | -20.356 | 0.000 | 0.000 | 0.000 | -350.850 | -7.945 | 0.000 | 7.945 | -0.929 |
| 85.00 | -7.950 | -19.199 | 0.000 | 0.000 | 0.000 | -310.125 | -8.945 | 0.000 | 8.945 | -0.979 |
| 89.00 | -7.213 | -17.397 | 0.000 | 0.000 | 0.000 | -278.327 | -9.782 | 0.000 | 9.782 | -1.017 |
| 90.00 | -7.185 | -17.178 | 0.000 | 0.000 | 0.000 | -271.114 | -9.996 | 0.000 | 9.996 | -1.026 |
| 94.92 | -7.012 | -16.125 | 0.000 | 0.000 | 0.000 | -235.788 | -11.077 | 0.000 | 11.077 | -1.071 |
| 95.00 | -7.012 | -16.095 | 0.000 | 0.000 | 0.000 | -235.203 | -11.096 | 0.000 | 11.096 | -1.071 |
| 98.00 | -6.096 | -13.514 | 0.000 | 0.000 | 0.000 | -214.167 | -11.777 | 0.000 | 11.777 | -1.097 |
| 99.83 | -6.027 | -12.927 | 0.000 | 0.000 | 0.000 | -202.991 | -12.202 | 0.000 | 12.202 | -1.113 |
| 100.0 | -6.027 | -12.896 | 0.000 | 0.000 | 0.000 | -201.987 | -12.241 | 0.000 | 12.241 | -1.115 |
| 105.0 | -5.857 | -12.031 | 0.000 | 0.000 | 0.000 | -171.855 | -13.433 | 0.000 | 13.433 | -1.159 |
| 110.0 | -5.686 | -11.185 | 0.000 | 0.000 | 0.000 | -142.571 | -14.670 | 0.000 | 14.670 | -1.201 |
| 113.0 | -5.397 | -10.624 | 0.000 | 0.000 | 0.000 | -125.513 | -15.432 | 0.000 | 15.432 | -1.224 |
| 115.0 | -5.332 | -10.304 | 0.000 | 0.000 | 0.000 | -114.719 | -15.948 | 0.000 | 15.948 | -1.238 |
| 120.0 | -5.165 | -9.521 | 0.000 | 0.000 | 0.000 | -88.056 | -17.262 | 0.000 | 17.262 | -1.270 |
| 123.0 | -4.211 | -8.022 | 0.000 | 0.000 | 0.000 | -72.562 | -18.066 | 0.000 | 18.066 | -1.287 |
| 125.0 | -4.153 | -7.757 | 0.000 | 0.000 | 0.000 | -64.140 | -18.608 | 0.000 | 18.608 | -1.297 |
| 130.0 | -4.008 | -7.108 | 0.000 | 0.000 | 0.000 | -43.373 | -19.979 | 0.000 | 19.979 | -1.318 |
| 135.0 | -2.008 | -3.680 | 0.000 | 0.000 | 0.000 | -23.045 | -21.368 | 0.000 | 21.368 | -1.333 |
| 140.0 | -1.870 | -3.159 | 0.000 | 0.000 | 0.000 | -13.006 | -22.769 | 0.000 | 22.769 | -1.341 |
| 145.0 | -1.736 | -2.656 | 0.000 | 0.000 | 0.000 | -3.655 | -24.176 | 0.000 | 24.176 | -1.346 |
| 147.0 | -0.086 | -0.106 | 0.000 | 0.000 | 0.000 | -0.183 | -24.740 | 0.000 | 24.740 | -1.346 |
| 147.9 | 0.000 | -0.001 | 0.000 | 0.000 | 0.000 | 0.000 | -24.994 | 0.000 | 24.994 | -1.346 |
| 147.9 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -24.999 | 0.000 | 24.999 | -1.346 |

Pole : 302468
Location : Petro Lock, CT
Height : 147.9 (ft)
Base Dia : 56.58 (in)
Top Dia : 26.21 (in)
Shape : 18 Sides
Taper : 0.214568 (in/ft)

Code: TIA/EIA-222 Rev F

Base Elev : 0.000 (ft)





**Load Case:** Twist/Sway — 50.00 mph Wind with No Ice — 22 Iterations

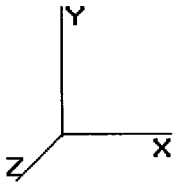
Gust Response Factor : 1.69
Dead Load Factor : 1.00
Wind Load Factor : 1.00

## Calculated Stresses

| Seg Elev (ft) | Applied Stresses Axial (Y) (ksi) | Shear (X) (ksi) | Shear (Z) (ksi) | Torsion (ksi) | Bending (X) (ksi) | Bending (Z) (ksi) | Combined (ksi) | Allowable Stress (Fb) (ksi) | | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.64 | 0.33 | 0.00 | 0.00 | 0.00 | 14.50 | 15.15 | 52.0 | 0.0 | 0.292 |
| 5.00 | 0.63 | 0.33 | 0.00 | 0.00 | 0.00 | 14.35 | 14.99 | 52.0 | 0.0 | 0.288 |
| 10.00 | 0.62 | 0.33 | 0.00 | 0.00 | 0.00 | 14.18 | 14.81 | 52.0 | 0.0 | 0.285 |
| 15.00 | 0.61 | 0.33 | 0.00 | 0.00 | 0.00 | 13.99 | 14.61 | 52.0 | 0.0 | 0.281 |
| 20.00 | 0.60 | 0.33 | 0.00 | 0.00 | 0.00 | 13.79 | 14.40 | 52.0 | 0.0 | 0.277 |
| 25.00 | 0.59 | 0.34 | 0.00 | 0.00 | 0.00 | 13.57 | 14.17 | 52.0 | 0.0 | 0.273 |
| 30.00 | 0.58 | 0.34 | 0.00 | 0.00 | 0.00 | 13.33 | 13.92 | 52.0 | 0.0 | 0.268 |
| 35.00 | 0.57 | 0.34 | 0.00 | 0.00 | 0.00 | 13.07 | 13.65 | 52.0 | 0.0 | 0.263 |
| 40.00 | 0.56 | 0.34 | 0.00 | 0.00 | 0.00 | 12.79 | 13.36 | 52.0 | 0.0 | 0.257 |
| 45.00 | 0.55 | 0.34 | 0.00 | 0.00 | 0.00 | 12.48 | 13.04 | 52.0 | 0.0 | 0.251 |
| 46.83 | 0.54 | 0.34 | 0.00 | 0.00 | 0.00 | 12.36 | 12.92 | 52.0 | 0.0 | 0.249 |
| 50.00 | 0.52 | 0.35 | 0.00 | 0.00 | 0.00 | 12.15 | 12.69 | 52.0 | 0.0 | 0.244 |
| 53.00 | 0.50 | 0.34 | 0.00 | 0.00 | 0.00 | 11.55 | 12.06 | 52.0 | 0.0 | 0.232 |
| 55.00 | 0.49 | 0.34 | 0.00 | 0.00 | 0.00 | 11.40 | 11.91 | 52.0 | 0.0 | 0.229 |
| 60.00 | 0.48 | 0.34 | 0.00 | 0.00 | 0.00 | 11.01 | 11.50 | 52.0 | 0.0 | 0.221 |
| 65.00 | 0.47 | 0.34 | 0.00 | 0.00 | 0.00 | 10.58 | 11.06 | 52.0 | 0.0 | 0.213 |
| 70.00 | 0.46 | 0.35 | 0.00 | 0.00 | 0.00 | 10.11 | 10.59 | 52.0 | 0.0 | 0.204 |
| 75.00 | 0.44 | 0.35 | 0.00 | 0.00 | 0.00 | 9.61 | 10.07 | 52.0 | 0.0 | 0.194 |
| 76.00 | 0.44 | 0.35 | 0.00 | 0.00 | 0.00 | 9.50 | 9.96 | 52.0 | 0.0 | 0.192 |
| 80.00 | 0.43 | 0.35 | 0.00 | 0.00 | 0.00 | 9.06 | 9.51 | 52.0 | 0.0 | 0.183 |
| 85.00 | 0.42 | 0.35 | 0.00 | 0.00 | 0.00 | 8.46 | 8.90 | 52.0 | 0.0 | 0.171 |
| 89.00 | 0.39 | 0.32 | 0.00 | 0.00 | 0.00 | 7.95 | 8.35 | 52.0 | 0.0 | 0.161 |
| 90.00 | 0.38 | 0.32 | 0.00 | 0.00 | 0.00 | 7.83 | 8.23 | 52.0 | 0.0 | 0.158 |
| 94.92 | 0.37 | 0.32 | 0.00 | 0.00 | 0.00 | 7.21 | 7.60 | 52.0 | 0.0 | 0.146 |
| 95.00 | 0.37 | 0.32 | 0.00 | 0.00 | 0.00 | 7.20 | 7.59 | 52.0 | 0.0 | 0.146 |
| 98.00 | 0.32 | 0.29 | 0.00 | 0.00 | 0.00 | 6.79 | 7.13 | 52.0 | 0.0 | 0.137 |
| 99.83 | 0.36 | 0.34 | 0.00 | 0.00 | 0.00 | 7.59 | 7.97 | 52.0 | 0.0 | 0.153 |
| 100.00 | 0.36 | 0.34 | 0.00 | 0.00 | 0.00 | 7.56 | 7.95 | 52.0 | 0.0 | 0.153 |
| 105.00 | 0.35 | 0.34 | 0.00 | 0.00 | 0.00 | 6.84 | 7.21 | 52.0 | 0.0 | 0.139 |
| 110.00 | 0.33 | 0.34 | 0.00 | 0.00 | 0.00 | 6.04 | 6.40 | 52.0 | 0.0 | 0.123 |
| 113.00 | 0.32 | 0.33 | 0.00 | 0.00 | 0.00 | 5.52 | 5.87 | 52.0 | 0.0 | 0.113 |
| 115.00 | 0.32 | 0.33 | 0.00 | 0.00 | 0.00 | 5.18 | 5.53 | 52.0 | 0.0 | 0.106 |
| 120.00 | 0.30 | 0.33 | 0.00 | 0.00 | 0.00 | 4.25 | 4.59 | 52.0 | 0.0 | 0.088 |
| 123.00 | 0.26 | 0.27 | 0.00 | 0.00 | 0.00 | 3.65 | 3.94 | 52.0 | 0.0 | 0.076 |
| 125.00 | 0.25 | 0.27 | 0.00 | 0.00 | 0.00 | 3.32 | 3.60 | 52.0 | 0.0 | 0.069 |
| 130.00 | 0.24 | 0.27 | 0.00 | 0.00 | 0.00 | 2.41 | 2.69 | 52.0 | 0.0 | 0.052 |
| 135.00 | 0.13 | 0.14 | 0.00 | 0.00 | 0.00 | 1.38 | 1.53 | 52.0 | 0.0 | 0.029 |
| 140.00 | 0.12 | 0.14 | 0.00 | 0.00 | 0.00 | 0.84 | 0.98 | 52.0 | 0.0 | 0.019 |
| 145.00 | 0.10 | 0.13 | 0.00 | 0.00 | 0.00 | 0.26 | 0.42 | 52.0 | 0.0 | 0.008 |
| 147.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 52.0 | 0.0 | 0.000 |
| 147.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 52.0 | 0.0 | 0.000 |
| 147.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 52.0 | 0.0 | 0.000 |

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | 4/20/2012 10:53:26 AM |
| Location : | Petro Lock, CT | | Page: 25 |
| Height : | 147.9 (ft) | | |
| Base Dia : | 56.58 (in) | | |
| Top Dia : | 26.21 (in) | Base Elev : 0.000 (ft) | |
| Shape : | 18 Sides | | |
| Taper : | 0.214568 (in/ft) | | |



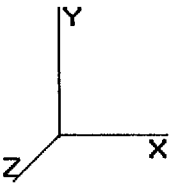



## Analysis Summary

| | Reactions | | | | | | Max Stresses | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Load Case | Shear FX (kips) | Shear FZ (kips) | Axial FY (kips) | Moment MX (ft-kips) | Moment MY (ft-kips) | Moment MZ (ft-kips) | Combined Stress (ksi) | Allowable Stress (ksi) | Elev (ft) | Stress Ratio |
| No Ice | 27.7 | 0.00 | 42.57 | 0.00 | 0.00 | 2874.15 | 37.77 | 52.0 | 0.00 | 0.727 |
| Ice | 22.9 | 0.00 | 50.47 | 0.00 | 0.00 | 2408.78 | 31.88 | 52.0 | 0.00 | 0.614 |
| Twist/Sway | 10.8 | 0.00 | 42.60 | 0.00 | 0.00 | 1123.20 | 15.15 | 52.0 | 0.00 | 0.292 |

| | | | |
|---|---|---|---|
| Pole : | 302468 | Code: TIA/EIA-222 Rev F | |
| Location : | Petro Lock, CT | | 4/20/2012 10:53:26 AM |
| Height : | 147.9 (ft) | | Page: 26 |
| Base Dia : | 56.58 (in) | | |
| Top Dia : | 26.21 (in) | Base Elev : 0.000 (ft) | |
| Shape : | 18 Sides | | |
| Taper : | 0.214568 (in/ft) | | |






## Base Summary

### Reactions

| Original Design | | | Analysis | | | |
|---|---|---|---|---|---|---|
| Moment (kip-ft) | Axial (kip) | Shear (kip) | Moment (kip-ft) | Axial (kip) | Shear (kip) | Moment Design % |
| 2,489.00 | 36.10 | 23.90 | 2,874.15 | 50.47 | 27.74 | 115.47 |

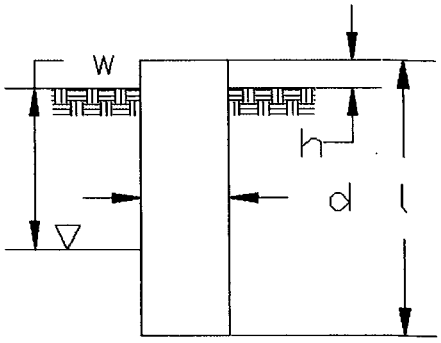
### Base Plate

| Yield (ksi) | Thick (in) | Width (in) | Style | Poly Sides | Clip Len (in) | Effective Len (in) | Moment (kip-in) | Allow Stress (ksi) | Applied Stress (ksi) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| 60.0 | 2.500 | 69.000 | Round | 0 | 0.00 | 11.224 | 449.48 | 60.00 | 38.45 | 0.64 |

### Anchor Bolts

| | | | | | | | | Start | Compression | | | Tension | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bolt Circle | Num Bolts | Bolt Type | Bolt Dia (in) | Yield (ksi) | Ultimate (ksi) | Arrange | Cluster Dist (in) | Angle (deg) | Force (kip) | Allow (kip) | Ratio | Force (kip) | Allow (kip) | Ratio |
| 63.00 | 16 | 2.25" 18J | 2.25 | 75.00 | 100.00 | Radial | 0.00 | 0.0 | 140.02 | 195.00 | 0.72 | 133.71 | 195.00 | 0.69 |

| | | |
|---|---|---|
| Site Name: | Petro Lock, CT | *Program Last 8/3/2011* |
| Site Number: | 302468 | *American Tower Corporation* |
| Engineer: | J. Johnston | |
| Engineering Number: | 49243321 | |
| Date: | 04/20/12 | |




**Design Base Loads (Unfactored) - Analysis per TIA-222-F Standards**

| | |
|---|---|
| Analyze or Design a Foundation? | Analyze |
| Foundation Mapped: | N |
| Moment (M): | 2874.2 k-ft |
| Shear/Leg (V): | 27.7 k |
| Axial Load (P): | 50.5 k |
| Uplift/Leg (U): | 0.0 k |
| Tower Type (GT / SST / MP): | MP |
| Diameter of Caisson (d): | 7.0 ft |
| Caisson Embedment (L-h): | 34.0 ft |
| Caisson Height Above Ground (h): | 0.5 ft |
| Depth Below Ground Surface to Water Table (w): | 7.5 ft |
| Unit Weight of Concrete: | 150.0 pcf |
| Unit Weight of Water: | 62.4 pcf |
| Tension Skin Friction/Compression Skin Friction: | 1.00 |
| Pullout Angle: | 30.0 degrees |

**Soil Mechanical Properties**

| Depth (ft) Top | Depth (ft) Bottom | $\gamma_{Soil}$ (pcf) | Cohesion (psf) | $\phi$ (degree) | Allowable Skin Friction (psf) | Allowable Bearing Pressure (psf) |
|---|---|---|---|---|---|---|
| 0.0 | 2.0 | 110 | 0 | 0 | 0 | 0 |
| 2.0 | 7.0 | 110 | 0 | 25 | 0 | 0 |
| 7.0 | 10.0 | 110 | 0 | 20 | 0 | 0 |
| 10.0 | 14.0 | 110 | 0 | 20 | 0 | 0 |
| 14.0 | 17.0 | 110 | 0 | 20 | 0 | 0 |
| 17.0 | 26.0 | 110 | 0 | 25 | 0 | 0 |
| 26.0 | 30.0 | 110 | 0 | 20 | 0 | 0 |
| 30.0 | 35.0 | 110 | 0 | 20 | 0 | 20000 |

| | |
|---|---|
| Required Embedment: | 30.3 ft - OK, Caisson Embedment Satisfactory |
| Volume of Concrete: | 1327.7 $ft^3$ = 49.2 $yd^3$ |
| Weight of Concrete (Buoyancy Effect Considered): | 135.5 k |
| Average Soil Unit Weight: | 61.4 pcf |
| Skin Friction Resistance: | 0.0 k |
| Compressive Bearing Resistance: | 769.7 k |
| Pullout Weight (Minus Concrete Weight): | 1292.2 k |
| Allowable Uplift Capacity ($U_{Allow}$): | 90.3 k |
| Allowable Compressive Capacity ($P_{Allow}$): | 769.7 k |
| Compressive Design Load (P): | 102.8 k |
| $U / U_{Allow}$: | 0.00 Result: OK |
| $P / P_{Allow}$: | 0.13 Result: OK |
| Total Lateral Resistance: | 1636.6 k |
| Inflection Point (Below Ground Surface): | 22.6 ft |
| Design Overturning Moment At Inflection Point ($M_D$): | 3515.7 k-ft |
| Nominal Moment Capacity ($M_{Allow}$): | 11169.3 k-ft |
| $M_{Allow} / M_D$ Factor of Safety: | 3.18 Result: OK |

**Caisson Strength Capacity**

| | | |
|---|---|---|
| Concrete Compressive Strength ($f'_c$): | 3000 | psi |
| Vertical Steel Rebar Size #: | 11 | |
| Vertical Steel Rebar Area: | 1.56 | $in^2$ |
| Design # of Vertical Steel Rebars: | 21 | |
| Vertical Steel Rebar Yield Strength ($F_y$): | 60 | ksi |
| Horizontal Tie / Stirrup Size #: | 5 | |
| Horizontal Tie / Stirrup Area: | 0.31 | $in^2$ |
| Design Horizontal Tie / Stirrup Spacing: | 18.0 | in |
| Horizontal Tie / Stirrup Steel Yield Strength ($F_y$): | 40 | ksi |
| Rebar Cage Diameter: | 76.0 | in |
| Strength Bending/Tension Reduction Factor ($\phi_B$): | 0.90 | ACI318-05 - 9.3.2.1 |
| Strength Shear Reduction Factor ($\phi_V$): | 0.75 | ACI318-05 - 9.3.2.3 |
| Strength Compression Reduction Factor ($\phi_P$): | 0.65 | ACI318-05 - 9.3.2.2 |
| Wind Design Factor: | 1.30 | ACI318-05 - 9.2.1 |
| Steel Elastic Modulus: | 29000 | ksi |
| Design Moment ($M_u$): | 3761.9 | k-ft |
| Nominal Moment Capacity ($\phi_B M_n$): | 4963.4 | k-ft - ACI318-005 - 10.2 |
| $M_u/\phi_B M_n$: | 0.76 | Result: OK |
| Design Shear ($V_u$): | 261.6 | k |
| Nominal Shear Capacity ($\phi_V V_n$): | 457.4 | k - ACI318-05 - 11.3.1.1 or 11.5.7.2 |
| $V_u/\phi_V V_n$: | 0.57 | Result: OK |
| Design Tension ($T_u$): | 0.0 | k |
| Nominal Tension Capacity ($\phi_T T_n$): | 1769.0 | k - ACI318-05 - 10.2 |
| $T_u/\phi_T T_n$: | 0.00 | Result: OK |
| Design Compression ($P_u$): | 133.7 | k |
| Nominal Compression Capacity ($\phi_P P_n$): | 7304.9 | k - ACI318-05 - 10.3.6.2 |
| $P_u/\phi_P P_n$: | 0.02 | Result: OK |
| $M_u/\phi_B M_n + T_u/\phi_T T_n$: | 0.76 | Result: OK |

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# Calculated Radio Frequency Emissions

at&t

## CT5127 (I-91 and 5 Split)

## 99 Meadow Street, Hartford, CT 06114

April 24, 2012

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# List of Tables



# List of Figures

## 1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the monopole located at 99 Meadow Street in Hartford, CT. The coordinates of the tower are: 41° 44' 38.04" N, 72° 40' 5.88" W.

AT&T is proposing the following modifications:

1) Install three new panel antenna for LTE
2) Add 3 RRUs for LTE

## 2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

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

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

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

## 3. RF Exposure Prediction Methods

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

$$\text{Power Density} \frac{2.6^2 \cdot EIRP}{4\pi \cdot R^2} \text{ Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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

## 4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

| Carrier | Antenna Height (Feet) | Operating Frequency (MHz) | Number of Trans. | ERP Per Transmitter (Watts) | Power Density ($mw/cm^2$) | Limit | %MPE |
|---|---|---|---|---|---|---|---|
| Cingular UMTS | 138 | 1935 | 1 | 500 | 0.0094 | 1.0000 | 0.94% |
| AT&T | 138 | 1945 | N/A | N/A | 0.0158 | 1.0000 | 1.58% |
| T-Mobile GSM | 123 | 1945 | 8 | 169 | 0.0321 | 1.0000 | 3.21% |
| T-Mobile UMTS | 123 | 2100 | 2 | 740 | 0.0352 | 1.0000 | 3.52% |
| Pocket | 113 | 2130 | 3 | 631 | 0.0533 | 1.0000 | 5.33% |
| Nextel | 155 | 851 | 9 | 100 | 0.0135 | 0.5673 | 2.37% |
| Clearwire | 89 | 2496 | 2 | 153 | 0.0139 | 1.0000 | 1.39% |
| Clearwire | 89 | 11 GHz | 1 | 211 | 0.0096 | 1.0000 | 0.96% |
| Sprint | 98 | 1962.5 | N/A | N/A | 0.2511 | 1.0000 | 25.11% |
| AT&T UMTS | 138 | 880 | 2 | 649 | 0.0025 | 0.5867 | 0.42% |
| AT&T UMTS | 138 | 1900 | 2 | 1387 | 0.0052 | 1.0000 | 0.52% |
| AT&T LTE | 138 | 734 | 1 | 1313 | 0.0025 | 0.4893 | 0.51% |
| AT&T GSM | 138 | 880 | 1 | 324 | 0.0006 | 0.5867 | 0.10% |
| AT&T GSM | 138 | 1900 | 4 | 832 | 0.0063 | 1.0000 | 0.63% |
| | | | | | | **Total** | **44.07%** |

**Table 1: Carrier Information[1],[2]**

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 1/10/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

## 5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **44.07% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

## 6. Statement of Certification

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

Daniel L. Goulet
C Squared Systems, LLC

April 24, 2012
Date

## Attachment A: References

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

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

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

### (A) Limits for Occupational/Controlled Exposure[3]

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

### (B) Limits for General Population/Uncontrolled Exposure[4]

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

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

**Table 2: FCC Limits for Maximum Permissible Exposure (MPE)**

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

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

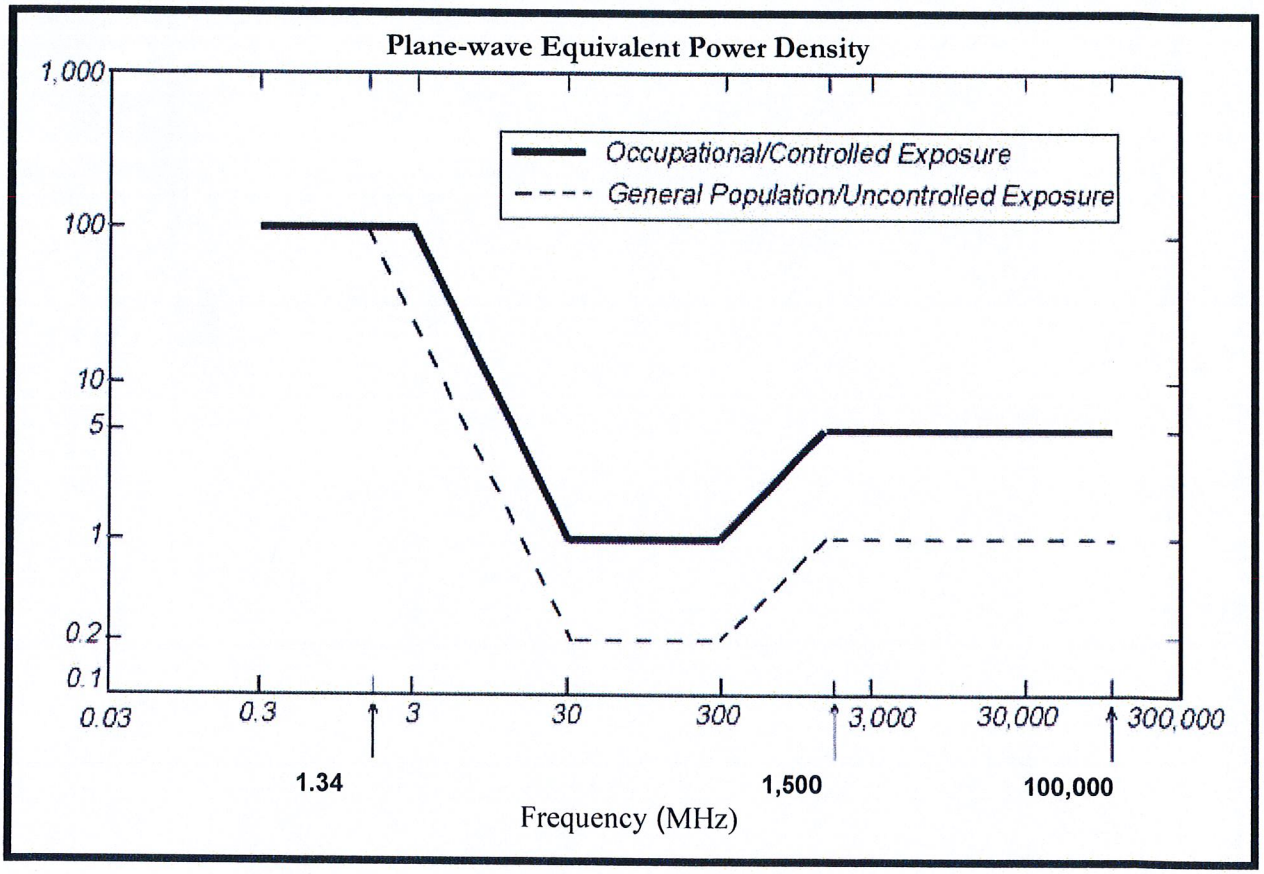
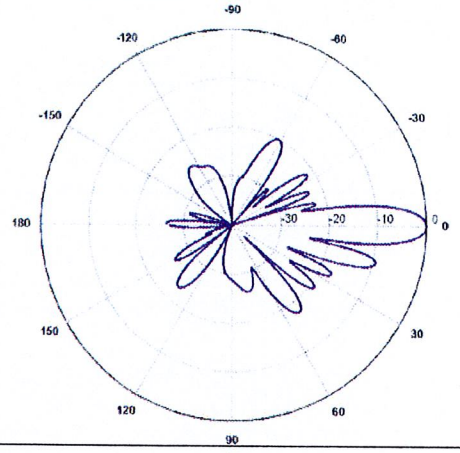



**Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)**

## Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

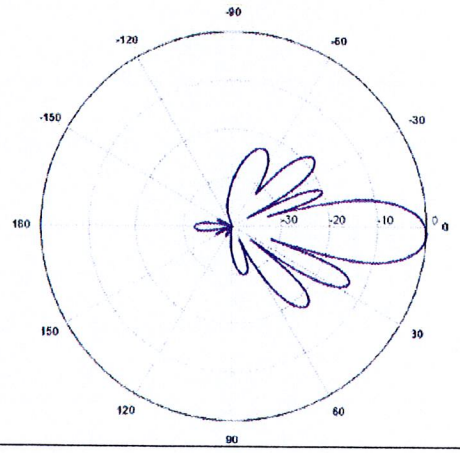
### 700 MHz

| | |
|---|---|
| Manufacturer: | Commscope |
| Model #: | SBNH-1D6565C |
| Frequency Band: | 698-806 MHz |
| Gain: | 13.6 dBd |
| Vertical Beamwidth: | 8.6° |
| Horizontal Beamwidth: | 71° |
| Polarization: | Dual Linear ± 45° |
| Size L x W x D: | 96.42" x 11.85" x 7.1" |




### 850 MHz GSM

| | |
|---|---|
| Manufacturer: | Powerwave |
| Model #: | 7750 |
| Frequency Band: | 824-960 MHz |
| Gain: | 12.1 dBd |
| Vertical Beamwidth: | 14.3° |
| Horizontal Beamwidth: | 69° |
| Polarization: | Dual Linear ±45° |
| Size L x W x D: | 55"x11"x5" |




### 1900 MHz GSM

| | |
|---|---|
| Manufacturer: | Powerwave |
| Model #: | 7750 |
| Frequency Band: | 1710-2170 MHz |
| Gain: | 15.4 dBd |
| Vertical Beamwidth: | 6.6° |
| Horizontal Beamwidth: | 63° |
| Polarization: | Dual Linear ±45° |
| Size L x W x D: | 55"x11"x5" |