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

February 24, 2012

Steve Levine, Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-009-120207** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 7 Stoney Hill Road, Bethel, Connecticut.

Dear Mr. Levine:

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 February 6, 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,

LRoberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Matthew S. Knickerbocker, First Selectman, Town of Bethel
Steve Palmer, Planning & Zoning Official, Town of Bethel
Robert D. Gray, Program Administrator, Third Party Attachments Transmission Projects, Northeast Utilities Service Co.

STATE OF CONNECTICUT
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www.ct.gov/csc

February 8, 2012

The Honorable Matthew S. Knickerbocker
First Selectman
Town of Bethel
1 School Street
Bethel Municipal Center
Bethel, CT 06801-2105

RE: **EM-CING-009-120207** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 7 Stoney Hill Road, Bethel, Connecticut.

Dear First Selectman Knickerbocker:

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 February 24, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Steve Palmer, Planning & Zoning Official, Town of Bethel

CSC
CONNECTICUT SITING COUNCIL

EM-CING-009-120207

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

HAND DELIVERED

February 6, 2012

RECEIVED
FEB - 7 2012
CONNECTICUT
SITING COUNCIL

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 7 Stoney Hill Road Bethel, CT (owner Northeast Utilities/CL&P).

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or 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. Please accept this letter and attachments as notification, 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 and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

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.

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.

The changes to the facility do not constitute modifications 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).

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

2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.

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

4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. Moreover, 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).

Please feel free to call me at (860) 463-5511 with questions concerning this matter. Thank you for your consideration.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Attachments

Northeast Utilities System

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(203) 665-5000

February 7, 2012

Mr. Tim Burks
AT&T Wireless.
500 Enterprise Drive
Rocky Hill, CT 06067

RE: AT&T Antenna Site, CT-5176, 7 Stony Hill Rd., Norwalk CT, structure 10254.

Dear Mr. Burks:

Based on our reviews of the site drawings, the structural analysis provided by Centek Engineering and, and the foundation analyses and modification performed by Centek Engineering, we have reviewed for acceptance this modification

Since there are no outstanding structural issues to resolve at this time please contact Mr. Green (860-665-6926) to resolve any lease issues; once the lease amendment is secured you may Mr. Mike McKinnon, DIRECTOR-TRANSMISSION MAINTENANCE & WORK MANAGEMENT, directly (860-665-3839) to begin the construction arrangements.

Sincerely,

Robert Gray
Transmission Line Engineering

ref: CT5013 LTE Structural 1-9-12.pdf
CT5013 LTE CD REV3 01-19-12.pdf

cc: Douglas Culp

NEW CINGULAR WIRELESS PCS, LLC
Equipment Modification

7 Stoney Hill Road Bethel, CT
Site Number CT5176
Exempt Mod

Tower Owner/Manager: Northeast Utilities/CL&P

Equipment configuration: Power Mount of Utility Stanchion

Current and/or approved: Three PowerWave P7770 antennas @ 145 ft
Six PowerWave TMA's @ 145 ft
Six runs 1 5/8 inch coax @ 145 ft
Equipment on Concrete Pad

Planned Modifications: Retain existing PowerWave P7770 Antenna's and TMA's @ 145 ft
Retain all Coax Cabling
Install six 1 5/8" Coax Cabling
Install Three PowerWave P65-16 or equivalent @ 145 ft
Install three PowerWave TMA's TTAW-07BP111-001 @ 145 ft
Install additional Equipment with existing fenced compound

Power Density:

Worst-case calculations for existing wireless operations at the site, using standard parameters for other carriers, indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the Tower, of approximately 12.9 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 14.7 % of the standard.

Existing

Other Users							2.47
AT&T UMTS	145	1900 Band	2	500	0.0171	1.0000	1.71
AT&T UMTS	145	800 Band	1	500	0.0086	0.5867	1.46
AT&T GSM	145	1900 Band	10	427	0.0730	1.0000	7.30
Total							**12.9%**

* Data for other users are from Siting Council records.

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users							2.47
AT&T UMTS	145	800 Band	1	500	0.0086	0.5867	1.46
AT&T UMTS	145	1900 Band	2	500	0.0171	1.0000	1.71
AT&T GSM	145	1900 Band	10	427	0.0730	1.0000	7.30
AT&T LTE	145	740 - 746	1	500	0.0086	0.4933	1.73
Total							**14.7%**

* Data for other users are from Siting Council records.

Structural information:

The attached structural analysis demonstrates that the monopole and foundation have adequate structural capacity to accommodate the proposed modifications. (Centek dated 1-31-12).

WIRELESS COMMUNICATIONS FACILITY

CT5176
STONY HILL
CL&P STRUCT. NO. 10254
7 STONY HILL RD, BETHEL, CT

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT **TO:** 7 STONY HILL ROAD, BETHEL, CONNECTICUT

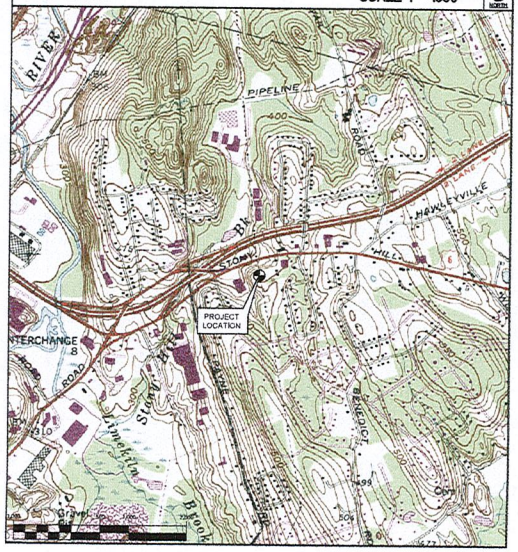
1.	Start out going NE on Enterprise Drive toward Capital Blvd;	0.4 mi.
2.	Turn LEFT onto Capital Blvd;	0.3 mi.
3.	Turn LEFT onto West Street;	0.3 mi.
4.	Merge onto I-91 s via ramp on the Left toward New Haven;	9.1 mi.
5.	Merge onto I-691 W via Exit 18 toward Meriden/Waterbury;	7.9 mi.
6.	Merge onto I-84 W via Exit 1 on the Left toward Waterbury/Danbury;	32.1 mi.
7.	Take Exit 8 toward Newtown Rd/Bethel;	0.2 mi.
8.	Turn slight Right onto US-6 W;	0.2 mi.
9.	Turn slight Left onto Newtown Rd.;	0.1 mi.
10.	Turn sharp Left onto US-6 E.;	0.5 mi.
11.	7 Stony Hill Road is on the Right.	

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2005 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES," 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY, MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK GENERALLY CONSISTS OF THE INSTALLATION OF ONE (1) LTE PANEL ANTENNA & TMA PER SECTOR FOR A TOTAL OF (3) LTE ANTENNAS TO THE EXISTING AT&T ANTENNA ARRAY.
2. ADDITIONALLY, AN LTE BASEBAND EQUIPMENT UNIT (RBS) WILL BE INSTALLED ALONG WITH (2) REMOTE RADIO UNITS (RRUs) PER SECTOR AND ASSOCIATED SURGE ARRESTORS AT GRADE AND ADJACENT TO THE EXISTING AT&T PAD MOUNTED EQUIPMENT. REFER TO THESE ACCOMPANYING DRAWINGS FOR FURTHER INFORMATION.
3. SOIL IMPROVEMENTS WILL BE REQUIRED AS PART OF THIS UPGRADE. REFER TO DRAWINGS S-1 & S-2 PREPARED BY THIS OFFICE (PROJ. NO. 11021.C055, DATED 2/1/12) FOR ADDITIONAL REQUIREMENTS.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5176
AT&T SITE NAME:	STONY HILL
SITE ADDRESS:	7 STONY HILL RD, BETHEL, CT 06801
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°24'56.9" N LONGITUDE: 73°24'6.1" W GROUND ELEVATION: ±430' AMSL

SHEET INDEX

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E-1	ELECTRICAL DETAILS AND NOTES	1
E-2	ELECTRICAL DETAILS	1

DESIGNED BY:	DMD
DRAWN BY:	DMD
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	
1	2/6/12	DEB	CFC	CONSTRUCTION
0	04/01/11	DEB	CFC	CONSTRUCTION - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
SITE NUMBER: CT5176
SITE NAME: STONY HILL
CL&P STRUCT. NO. 10254
7 STONY HILL RD
BETHEL, CT 06801

DATE:	03/29/11
SCALE:	AS NOTED
JOB NO.	11021.C055

TITLE SHEET

T-1

Sheet No. 1 of 6

STRUCTURAL SPECIFICATIONS

DESIGN BASIS

GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT STATE BUILDING CODE AND 2009 AMENDMENTS.

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 F-96 & NU CRITERIA (ANTENNA MOUNTS): 85 MPH (FASTEST MILE). EQUIVALENT TO 105 MPH (3 SECOND GUST).
   - BASIC WIND SPEED (OTHER STRUCTURE): 110 MPH (3 SECOND GUST) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-02) PER 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMMENDMENT.
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-95 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

GENERAL NOTES

1. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
2. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
3. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
4. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.
4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.
5. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
6. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
7. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
8. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

EARTHWORK NOTES

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
2. CRUSHED STONE FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED VIBRATORY PLATE COMPACTOR WITH A MINIMUM OF 2 PAQSSES OF COMPACTOR PER LIFT.
3. COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1 ½"	100
No. 4	40-70
No. 100	5-20
No. 200	4-8

4. CRUSHED STONE TO BE UNIFORMLY GRADED, CLEAN, HARD PROCESS AGGREGATE MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1"	100
¾"	90-100
½"	0-15
⅜"	0-5

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".
6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 8" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.
7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED EQUAL.

FOUNDATION CONSTRUCTION NOTES

1. ALL FOOTINGS SHALL BE PLACED ON SUITABLE, COMPACTED SOIL HAVING ADEQUATE BEARING CAPACITY AND FREE OF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED.
2. SUBGRADE PREPARATION: IF UNSUITABLE SOIL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIALS FROM BELOW PROPOSED STRUCTURE FOUNDATIONS AND COMPACT EXPOSED SOIL SURFACES. PLACE AND COMPACT APPROVED GRAVEL FILL. PLACEMENT OF ALL COMPACTED FILL MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABORATORY. FILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557-70 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167-66 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL. BUT NOT LESS THAN ONE (1) PER LAYER, TO INSURE COMPACTION TO 95% OF MAX. DRY DENSITY.
3. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE KEPT REASONABLY DRY AND PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.
4. WHERE GROUNDWATER IS ENCOUNTERED, DEWATERING SHALL BE ACCOMPLISHED CONTINUOUSLY AND COMPLETELY DURING FOUNDATION CONSTRUCTION. PROVIDE CRUSHED STONE AS REQUIRED TO STABILIZE FOOTING SUBGRADE.
5. ALL FOOTINGS ARE TO REST ON FIRM SOIL, REGARDLESS OF ELEVATIONS SHOWN ON THE DRAWINGS, BUT IN NO CASE MAY FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.

CONCRETE CONSTRUCTION NOTES

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS:

   ACI 211 – STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE.

   ACI 301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.

   ACI 302 – GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION

   ACI 304 – RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.

   ACI 306.1 STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING

   ACI 318 – BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

2. CONCRETE SHALL DEVELOP COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:

SLABS ON GRADE	4,000 PSI
ALL OTHER CONCRETE	3,000 PSI

   - PORTLAND CEMENT: ASTM C150, TYPE II, (540 LBS/CUBIC YARD)
   - AGGREGATE: ASTM C33, No. 67, TYPICAL
   - WATER: POTABLE WITH MAXIMUM WATER CEMENT RATIO OF .55
   - SLUMP: 3" TO 4"
   - ADMIXTURES: USE AIR ENTRAINING ADGENT CONFORMING TO ASTM C260 WITH 4 TO 6% TOTAL AIR. USE WATER REDUCING AGENT CONFORMING TO ASTM C494, TYPE A, IN ALL CONCRETE. CALCIUM CHLORIDE MAY NOT BE USED TO ACCELERATE THE CONCRETE SETTING TIME.

3. REINFORCING STEEL SHALL BE 60,000 PSI YIELD STRENGTH.
4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM- A-185.
5. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, MUST FOLLOW THE LATEST ACI CODE AND LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
6. CONCRETE COVER OVER REINFORCING SHALL CONFORM TO THE FOLLOWING, UNLESS OTHERWISE SHOWN:

BOTTOM OF FOOTINGS	3 INCHES
SURFACES NOT EXPOSED TO EARTH OR WEATHER	1-1/2 INCHES

7. NO STEEL WIRE, METAL FORM TIES, OR ANY OTHER METAL SHALL REMAIN WITHIN THE REQUIRED COVER OF ANY CONCRETE SURFACE.
8. ALL REINFORCEMENT SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. SPLICES SHALL BE WELL STAGGERED. ADDITIONAL BARS AND SPECIAL BENDING DETAILS ARE REQUIRED AT INTERSECTING WALLS AND AT JOINTS. SUCH DETAILS SHALL COMPLY WITH ACI 315 RECOMMENDATIONS UNLESS OTHERWISE SHOWN.
9. NO TACK WELDING OF REINFORCING WILL BE PERMITTED.
10. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 1% CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.
11. UNLESS OTHERWISE NOTED, ALL LAP SPLICES SHALL BE 48 BAR DIAMETERS.
12. SLAB ON GRADE FINISHES:

    EXTERIOR SLAB: NON-SLIP BROOM FINISH
    INTERIOR SLAB: STEEL TROWEL FINISH

GENERAL NOTES (REFERENCE)

1. CONTRACTOR TO REFER TO THE GENERAL NOTES ON SHEET T-1 FOR ADDITIONAL INFORMATION.
2. REFER TO SOIL IMPROVEMENT DRAWINGS S-1 & S-2 PREPEARED BY CENTEK ENGINEERING, INC. (PROJ. NO. 11021.CO55, DATED 2/1/12) FOR JET GROUTING NOTES AND SPECIFICATIONS.

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DRAWN BY:	DMD
CHK'D BY:	CFC

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AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

SITE NUMBER: CT5176

SITE NAME: STONY HILL

CL&P STRUCT. NO. 10254

7 STONY HILL RD
BETHEL, CT 06801

DATE:	03/29/11
SCALE:	AS NOTED
JOB NO.	11021.C055

NOTES AND SPECIFICATIONS

N-1

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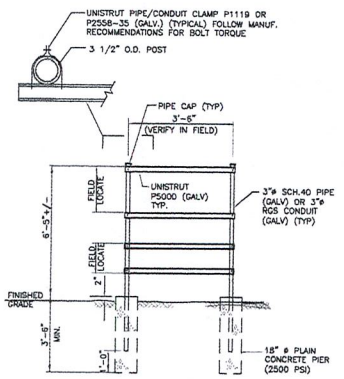
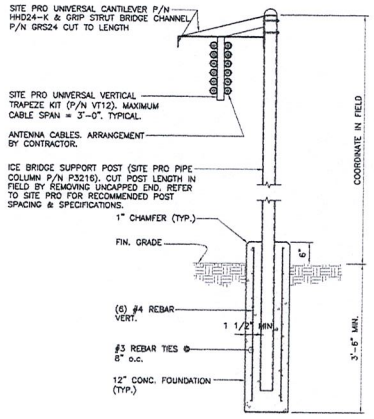
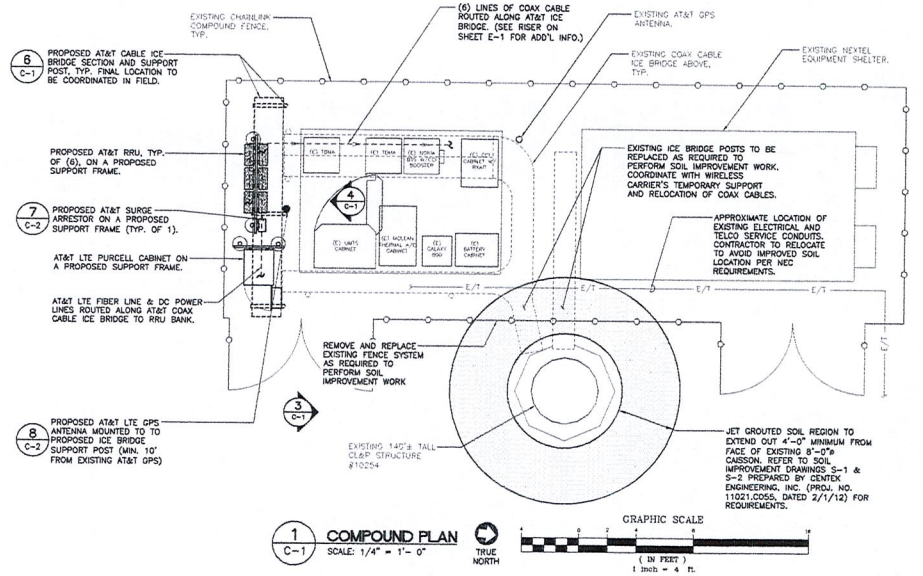


5 C-1 **EQUIPMENT MOUNTING FRAME DETAIL**
NOT TO SCALE



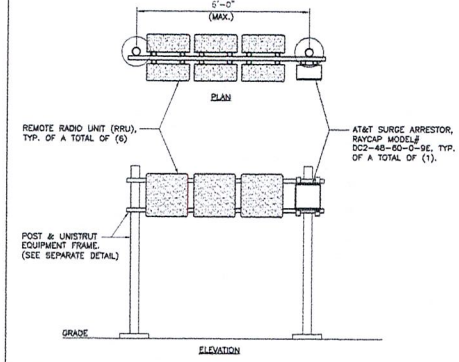
6 C-1 **ICE BRIDGE DETAIL**
NOT TO SCALE



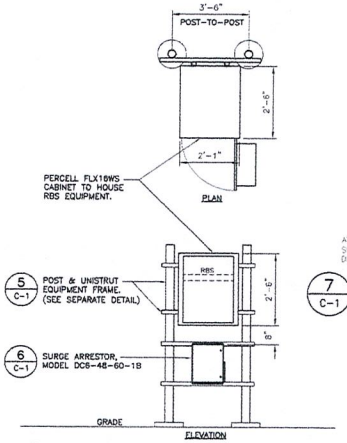
1 C-1 **COMPOUND PLAN**
SCALE: 1/4" = 1'- 0"

TRUE NORTH

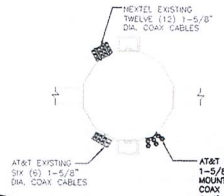
GRAPHIC SCALE
(IN FEET)
1 inch = 4 ft.



4 C-1 **RRU AND SURGE ARRESTOR MOUNTING CONFIG.**
SCALE: 1/2" = 1'- 0"



3 C-1 **PERCELL CABINET MOUNTING DETAIL**
NOT TO SCALE



7 C-1 **COAX CABLE PLAN**
NOT TO SCALE

NEXTEL (EXISTING TO REMAIN):
ANTENNAS: ONE (1) EMS 30"ø STACKED ACCELLERATOR FLUSH MOUNTED ON THE EXISTING MAST WITH A RAD CENTER ELEVATION OF 156'-4" ABOVE TOWER BASE PLATE.
COAX CABLES:
TWELVE (12) 1 5/8"ø COAX CABLES ROUTED ALONG THE EXTERIOR OF THE EXISTING UTILITY STRUCTURE.

AT&T (EXISTING TO BE RELOCATED):
ANTENNAS: THREE (3) POWERWAVE 7770 PANEL ANTENNAS AND SIX (6) POWERWAVE LGP-21401 TMA's TO BE RELOCATED TO VALMONT STANDOFF MOUNT (P/N B1827) WITH A RAD CENTER ELEVATION OF ±145' ABOVE TOWER BASE PLATE.
COAX CABLES:
SIX (6) 1 5/8"ø COAX CABLES ROUTED ALONG THE EXTERIOR OF THE EXISTING UTILITY STRUCTURE.

AT&T (TO BE ADDED):
ANTENNAS: THREE (3) POWERWAVE P65-16-XLH-RR PANEL ANTENNAS AND THREE (3) POWERWAVE TTAW-07BP111-001 TMA's ON VALMONT STANDOFF MOUNT (P/N B1827) WITH A RAD CENTER ELEVATION OF ±145' ABOVE TOWER BASE PLATE.
COAX CABLES: SIX (6) 1 5/8"ø COAX CABLES ROUTED ALONG THE EXTERIOR OF THE EXISTING UTILITY STRUCTURE.

TOWER NOTES:
1. EXISTING ±140' TALL CL&P TRANSMISSION STRUCTURE #10254.
2. REFER TO TOWER STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJECT NO. 11021.C055, DATED 1/31/12 (REV-1) FOR ADDITIONAL REQUIREMENTS.

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

EXISTING ±140' TALL CL&P STRUCTURE #10254
±145' TO ℄ AT&T ANTENNAS
±156'-4" TO ℄ EXISTING NEXTEL ANTENNAS
GRADE VARIES
JET GROUTED SOIL REGION TO EXTEND OUT 4'-0" MINIMUM FROM FACE OF EXISTING 8'-0"ø CAISSON. REFER TO SOIL IMPROVEMENT DRAWINGS S-1 & S-2 PREPARED BY CENTEK ENGINEERING, INC. (PROJ. NO. 11021.C055, DATED 2/1/12) FOR REQUIREMENTS.

2 C-1 **TOWER ELEVATION**
SCALE: 1" = 20'

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

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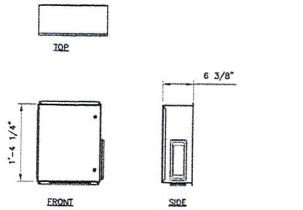
DATE: 03/29/11
SCALE: AS NOTED
JOB NO. 11021.C055

PLANS AND ELEVATION

C-1

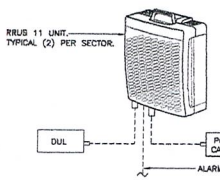
Sheet No. 3 of 6



SURGE ARRESTOR			
SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION
TOWER	MAKE: RAYCAP **MODEL: DC6-48-60-0-18**	(1) PER SITE	SUPPORT FRAME AT GRADE, UNDER PURCEL RBS CABINET

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

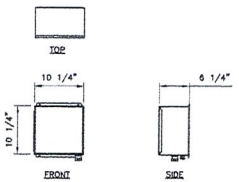
5 / C-2 **SURGE ARRESTOR DETAIL**
NOT TO SCALE



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERRICSON **MODEL: RRUS 11**	17.6"L x 17.3"W x 7.2"D	BAND 4: 44 LBS. BAND 12: 50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. SIDE: 0" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

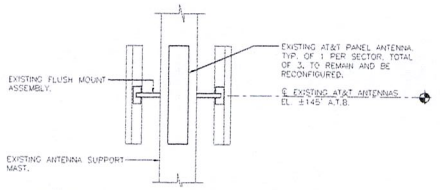
6 / C-2 **RRU DETAIL**
NOT TO SCALE



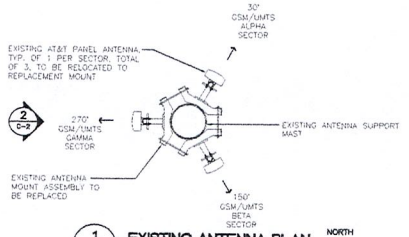
SURGE ARRESTOR				
SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
TOWER	MAKE: RAYCAP **MODEL: DC2-48-60-0-9E**	(1) PER SITE	**SUPPORT FRAME AT GRADE, ADJACENT TO AT&T RRU'S.**	16 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

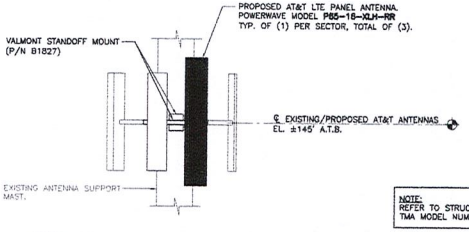
7 / C-2 **SURGE ARRESTOR DETAIL**
NOT TO SCALE



2 / C-2 **EXISTING ANTENNA SECTOR ELEVATION**
SCALE: 3/8" = 1'-0"

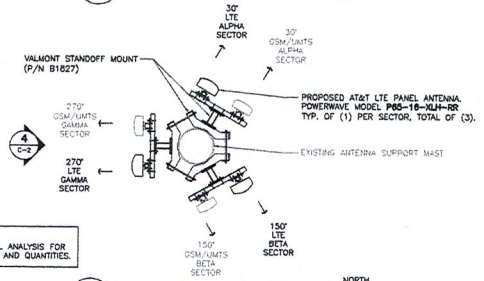


1 / C-2 **EXISTING ANTENNA PLAN**
SCALE: 3/8" = 1'-0"

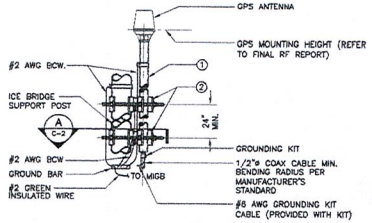


4 / C-2 **PROPOSED ANTENNA SECTOR ELEVATION**
SCALE: 3/8" = 1'-0"

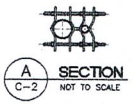
NOTE:
REFER TO STRUCTURAL ANALYSIS FOR TMA MODEL NUMBERS AND QUANTITIES.



3 / C-2 **PROPOSED ANTENNA PLAN**
SCALE: 3/8" = 1'-0"



GPS ANTENNA MOUNTING BRACKET



A / C-2 **SECTION**
NOT TO SCALE

BILL OF MATERIALS		
ITEM	DESCRIPTION	QUANTITY
1	2-1/2"ø SCH. 40 x 8'-0" LG. MAX SS OR GALV. PIPE	1
2	UNIVERSAL CLAMP SET.	2

NOTES:
1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT AND COORDINATED WITH AT&T CONSTRUCTION MANAGER.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 2-1/2" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 24 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
3. ATTACH TO ICE BRIDGE POST NEAREST ANTENNA CABLE PORT AT EQUIPMENT.
4. PRIOR TO INSTALLATION CONTRACTOR SHALL TEST GPS LOCATION WITH HAND HELD AND MOVE GPS ANTENNA TO OTHER ICE BRIDGE POSTS AS REQUIRED TO ACHIEVE ADEQUATE SIGNAL. FAILURE TO ACHIEVE ADEQUATE SIGNAL WITH A HAND HELD GPS SHALL BE REPORTED TO CONSTRUCTION MANAGER AND ENGINEER TO DETERMINE ALTERNATE INSTALLATION LOCATION FOR GPS ANTENNA.

8 / C-2 **GPS GROUNDING/MOUNTING BRACKET DETAILS**
NOT TO SCALE

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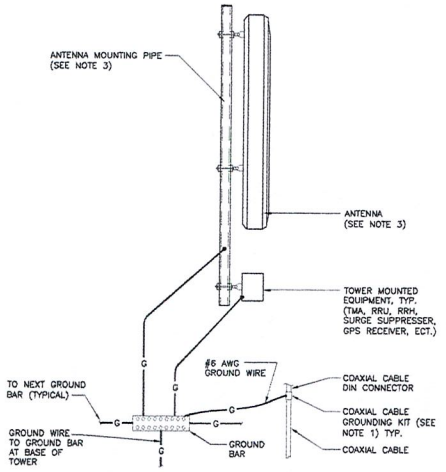
LTE SYSTEM PLANS AND DETAILS

C-2

Sheet No. 4 of 6

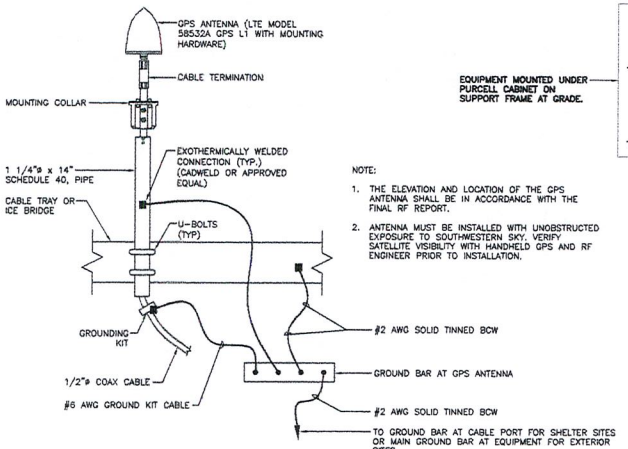


NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 / E-1 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

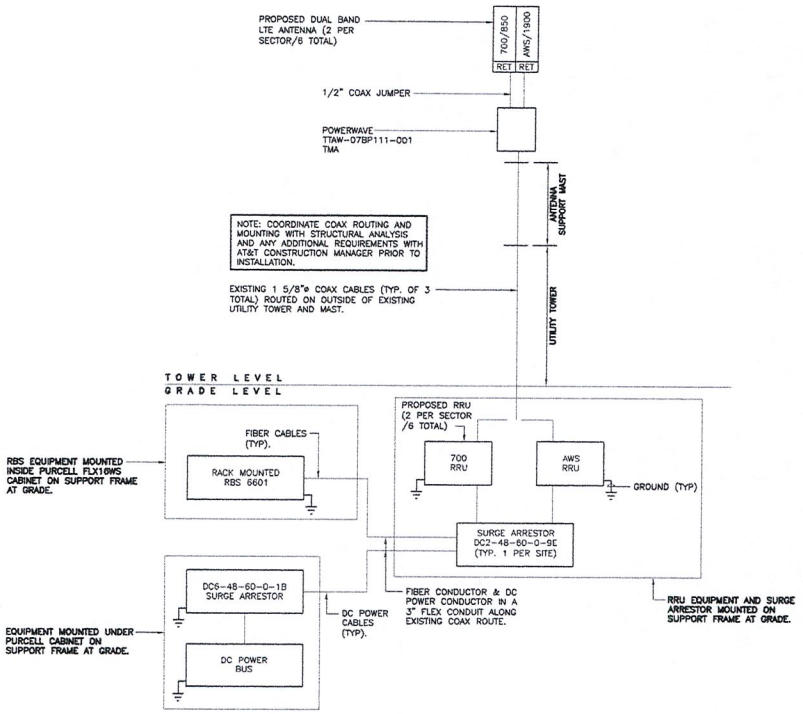


NOTE:

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. ANTENNA MUST BE INSTALLED WITH UNOBSTRUCTED EXPOSURE TO SOUTH-WESTERN SKY. VERIFY SATELLITE VISIBILITY WITH HANDHELD GPS AND RF ENGINEER PRIOR TO INSTALLATION.

3 / E-1 GPS MOUNTED TO CABLE TRAY / ICE BRIDGE

NOT TO SCALE



NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURERS RECOMMENDATIONS.

2 / E-1 LTE SCHEMATIC DIAGRAM

NOT TO SCALE

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION.
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

DESIGNED BY:	CKD
DRAWN BY:	TJB
CHK'D BY:	CKD

REV.	DATE	DRAWN BY	CHK'D BY	
1	2/6/12	DEB	CFC	CONSTRUCTION
0	06/07/11	DMD	CFC	CONSTRUCTION - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY

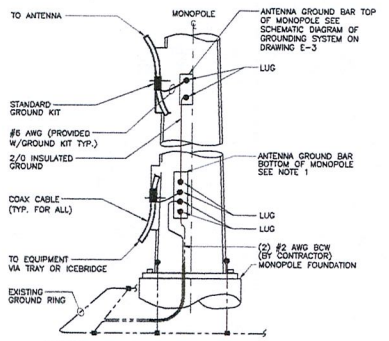
SITE NUMBER: CT5176
SITE NAME: STONY HILL
CL&P STRUCT. NO. 10254
7 STONY HILL RD
BETHEL, CT 06801

DATE:	03/29/11
SCALE:	AS NOTED
JOB NO.	11021.0055

ELECTRICAL DETAILS AND NOTES

E-1

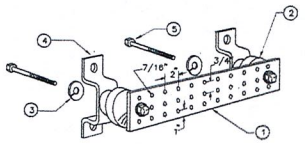
Sheet No. 5 of 6



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

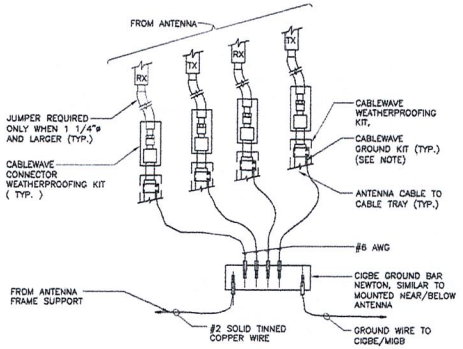
1 / E-2 **ANTENNA CABLE GROUNDING - MONOPOLE**
NOT TO SCALE



LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2, 3061-4.
3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

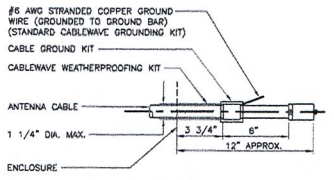
2 / E-2 **GROUND BAR DETAIL**
NOT TO SCALE



NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

3 / E-2 **CONNECTION OF GROUND WIRES TO GROUND BAR**
NOT TO SCALE



NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

4 / E-2 **ANTENNA CABLE GROUNDING DETAIL**
NOT TO SCALE

DESIGNED BY:	CKD
DRAWN BY:	TJB
CHK'D BY:	CKD

REV.	DATE	DRAWN BY	CHK'D BY	
1	7/6/12	KKB	CFC	CONSTRUCTION - CLIENT REVIEW
0	04/07/11	KKB	CFC	CONSTRUCTION

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SAI communications
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AT&T MOBILITY
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7 STONY HILL RD
BETHEL, CT 06801

DATE:	03/29/11
SCALE:	AS NOTED
JOB NO.	11021.0056

ELECTRICAL DETAILS

E-2

Sheet No. 5 of 6

CENTEK engineering

Centered on Solutions℠

Structural Analysis of PCS Mast and CL&P Pole

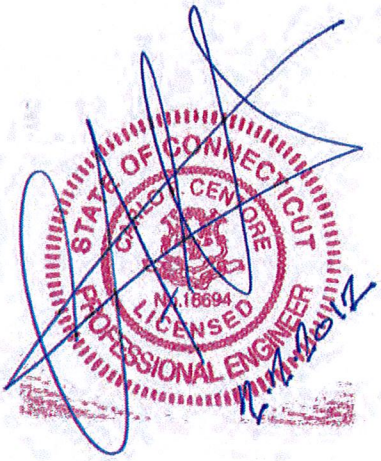
AT&T Site Ref: CT5176: Stony Hill

CL&P Structure No. 10254
140' Electric Transmission Pole

7 Stony Hill Road
Bethel, CT

CENTEK Project No. 11021.CO55

~~Date: August 17, 2011~~
Rev 1: January 31, 2012



Prepared for:
AT&T Mobility
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Rocky Hill, CT 06067

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Table of Contents

Introduction

The purpose of this report is to analyze the existing mast and 140' CL&P pole located at 7 Stony Hill Road in Bethel, CT for the proposed antenna and equipment upgrade by AT&T.

The existing/proposed loads consist of the following:

- NEXTEL (Existing to Remain):

  Antennas: One (1) EMS 30" ∅ Stacked Accellerator flush mounted on the existing mast with a RAD center elevation of 156-ft-4-in above grade level.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the exterior of the CL&P pole and pcs mast.
  Mast: HSS 4"x0.237" 2' long pipe flange connected to a HSS18"x0.375" x 8' long pipe.

- AT&T (Existing to Relocate):

  Antennas: Three (3) Powerwave 7770 panel antennas and six (6) Powerwave LGP-21401 TMAs mounted on three (3) proposed Valmont Dual Standoff Mounts P/N B1827 to the existing mast with a RAD center elevation of 145-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the exterior of the CL&P pole.

- **AT&T (Proposed):**

  Antennas: Three (3) Powerwave P65-16-XLH-RR panel antennas and three (3) Powerwave TTAW-07BP111-001 TMAs mounted on three (3) proposed Valmont Dual Standoff Mounts P/N B1827 to the existing mast with a RAD center elevation of 145-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the exterior of the CL&P pole.

Primary assumptions used in the analysis

- Allowable steel stresses are defined by AISC-ASD 9th edition for design of the PCS Mast and antenna supporting elements.
- ASCE Manual No. 72, "Design of Steel Transmission Pole Structures Second Edition", defines allowable steel stresses for evaluation of the CL&P utility pole.
- All utility pole members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- Pipe mast will be properly installed and maintained.
- No residual stresses exist due to incorrect pole erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Pipe mast and utility pole will be in plumb condition.
- Utility pole was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

Analysis

Structural analysis of the existing *Mast* was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc.

The existing mast consisting of a HSS4"x0.237" x 2' long pipe conforming to ASTM A500 Grade B (Fy = 42ksi) flange connected to a HSS18"x0.375" x 8' long pipe conforming to ASTM A500 Grade B (Fy = 42ksi) connected at one point to the existing pole was analyzed for its ability to resist loads prescribed by the TIA/EIA standard. Section 5 of this report details these gravity and lateral wind loads. NESC prescribed loads were also applied to the mast in order to obtain reactions needed for analyzing the CL&P pole structure. These loads are developed in Section 7 of this report. Load cases and combinations used in RISA-3D for TIA/EIA loading and for NESC/NU loading are listed in report Sections 6 and 8, respectively.

An envelope solution was first made to determine maximum and minimum forces, stresses, and deflections to confirm the selected section as adequate. Additional analyses were then made to determine the NESC forces to be applied to the CL&P pole structure.

The RISA-3D program contains a library of all AISC shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized. The forces calculated in RISA-3D using NESC guidelines were then applied to the CL&P pole using PLS-Pole. Maximum usage for the pole was calculated considering the additional forces from the mast and associated appurtenances.

Design Basis

Our analysis was performed in accordance with TIA/EIA-222-F-1996, ASCE Manual No. 72 – "Design of Steel Transmission Pole Structures Second Edition", NESC C2-2007 and Northeast Utilities Design Criteria.

The CL&P pole structure, considering existing and future conductor and shield wire loading, with the pcs antenna mast was analyzed under two conditions:

- UTILITY POLE ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility pole to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2007 ~ Construction Grade B, and ASCE Manual No. 72.

  Load cases considered:

  Load Case 1: NESC Heavy

Wind Pressure.....	4.0 psf
Vertical Overload Capacity Factor.....	1.50
Wind Overload Capacity Factor.....	2.50
Wire Tension Overload Capacity Factor.....	1.65

  Load Case 2: NESC Extreme

Wind Speed.....	100 mph [(1)]
Radial Ice Thickness.....	0"

  Note 1: NESC C2-2007, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

- MAST ASSEMBLY ANALYSIS

Mast, appurtenances and connections to the utility tower were analyzed and designed in accordance with the NU Design Criteria Table, TIA/EIA-222-F, and AISC-ASD standards.

Load cases considered:

Load Case 1:
Wind Speed..... 85 mph [2]
Radial Ice Thickness..... 0"

Load Case 2:
Wind Pressure..... 75% of 85 mph wind pressure
Radial Ice Thickness..... 0.5"

Note 2: Per NU Mast Design Criteria Exception 1.

Results

- MAST ASSEMBLY

The existing mast was determined to be structurally **adequate**.

Member	Stress Ratio (% of capacity)	Result
HSS4"x0.237" pipe x 2-ft long	13.8%	**PASS**
HSS 18"x0.375" pipe x 8-ft long	20.1%	**PASS**
3/4" ∅ ASTM A325 Bolt	51.5%	**PASS**

- UTILITY POLE

This analysis finds that the subject utility pole is adequate to support the proposed antenna mast and related appurtenances. The pole stresses meet the requirements set forth by the ASCE Manual No. 72, "Design of Steel Transmission Pole Structures Second Edition", for the applied NESC Heavy and NESC Extreme load cases. The detailed analysis results are provided in Section 9 of this report. The analysis results are summarized as follows:

A maximum usage of **96.65%** occurs in the utility pole base plate under the **NESC Extreme** loading condition.

POLE SECTION:

The utility pole was found to be within allowable limits.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
Tube Number 3	0'-41.17' (AGL)	88.85%	**PASS**

BASE PLATE:
The base plate was found to be within allowable limits from the PLS output based on 24 bend lines.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Base Plate	Bending	96.65%	**PASS**

- FOUNDATION AND ANCHORS

The existing foundation consists of a 8-ft ∅ x 20.5-ft long reinforced concrete caisson. The base of the tower is connected to the foundation by means of (20) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 9-ft into the concrete foundation structure. Foundation information was obtained from NUSCO drawing # 01143-60001.

The existing foundation was determined to be structurally inadequate due to deflection limitations. A 16-ft ∅ x 12-ft deep area of soil will be jet grouted in order to increase the amount of soil that is used to resistance the deflection of the caisson. Refer to section 4 of this report for modification details.

Review of the foundation and anchor design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

BASE REACTIONS:

From PLS-Pole analysis of CL&P pole based on NESC/NU prescribed loads.

Load Case	Shear	Axial	Moment
NESC Heavy Wind	35.7 kips	99.6 kips	3890.2 ft-kips
NESC Extreme Wind	51.1 kips	48.9 kips	5121.9 ft-kips

Note 1 – 10% increase applied to tower base reactions per OTRM 051

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
Anchor Bolts	Tension	75.5%	**PASS**

FOUNDATION:

The foundation with the proposed modifications was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading [1]	Result
Reinforced Concrete Caisson	Moment Capacity	31.0% [2]	**PASS**
	Lateral Deflection	3.09 in. [3] [4]	**PASS**
	Bearing Capacity [5]	80.0% [6]	**PASS**

Note 1: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.
Note 2: Based on existing 8-ft ∅ x 20.5-ft long concrete caisson.
Note 3: Based on 8-ft of the caisson taken as 16-ft ∅ due to effects of soil jet grouting. Top 4-ft of jet grouted soil ignored per Northeast Utilities.
Note 4: Lateral deflection approved by Northeast Utilities on 1/25/2012.
Note 5: Factor of safety of 2 applied to the bearing capacity of existing caisson against proposed jet grouted soil.
Note 6: Bearing capacity of existing caisson against proposed jet grouted soil limited to 425 pci.

Conclusions and Recommendations

This analysis shows that the subject utility pole with the proposed foundation modifications **is adequate** to support the proposed AT&T equipment upgrade.

The analysis is based, in part on the information provided to this office by Northeast Utilities and AT&T Mobility. If the existing conditions are different than the information in this report, CENTEK engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

Prepared by:

Timothy J. Lynn, EIT
Structural Engineer

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

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

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to CENTEK engineering, Inc. 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 are in an un-corroded condition and have not deteriorated. It is therefore assumed that its 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 revision of ANSI/ASCE10 & ANSI/EIA-222.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA-3D

RISA-3D Structural Analysis Program is an integrated structural analysis and design software package for buildings, bridges, tower structures, etc.

Modeling Features:

- Comprehensive CAD-like graphic drawing/editing capabilities that let you draw, modify and load elements as well as snap, move, rotate, copy, mirror, scale, split, merge, mesh, delete, apply, etc.
- Versatile drawing grids (orthogonal, radial, skewed)
- Universal snaps and object snaps allow drawing without grids
- Versatile general truss generator
- Powerful graphic select/unselect tools including box, line, polygon, invert, criteria, spreadsheet selection, with locking
- Saved selections to quickly recall desired selections
- Modification tools that modify single items or entire selections
- Real spreadsheets with cut, paste, fill, math, sort, find, etc.
- Dynamic synchronization between spreadsheets and views so you can edit or view any data in the plotted views or in the spreadsheets
- Simultaneous view of multiple spreadsheets
- Constant in-stream error checking and data validation
- Unlimited undo/redo capability
- Generation templates for grids, disks, cylinders, cones, arcs, trusses, tanks, hydrostatic loads, etc.
- Support for all units systems & conversions at any time
- Automatic interaction with RISASection libraries
- Import DXF, RISA-2D, STAAD and ProSteel 3D files
- Export DXF, SDNF and ProSteel 3D files

Analysis Features:

- Static analysis and P-Delta effects
- Multiple simultaneous dynamic and response spectra analysis using Gupta, CQC or SRSS mode combinations
- Automatic inclusion of mass offset (5% or user defined) for dynamic analysis
- Physical member modeling that does not require members to be broken up at intermediate joints
- State of the art 3 or 4 node plate/shell elements
- High-end automatic mesh generation — draw a polygon with any number of sides to create a mesh of well-formed quadrilateral (NOT triangular) elements.
- Accurate analysis of tapered wide flanges - web, top and bottom flanges may all taper independently
- Automatic rigid diaphragm modeling
- Area loads with one-way or two-way distributions
- Multiple simultaneous moving loads with standard AASHTO loads and custom moving loads for bridges, cranes, etc.
- Torsional warping calculations for stiffness, stress and design
- Automatic Top of Member offset modeling
- Member end releases & rigid end offsets
- Joint master-slave assignments
- Joints detachable from diaphragms
- Enforced joint displacements
- 1-Way members, for tension only bracing, slipping, etc.

- 1-Way springs, for modeling soils and other effects
- Euler members that take compression up to their buckling load, then turn off.
- Stress calculations on any arbitrary shape
- Inactive members, plates, and diaphragms allows you to quickly remove parts of structures from consideration
- Story drift calculations provide relative drift and ratio to height
- Automatic self-weight calculations for members and plates
- Automatic subgrade soil spring generator

Graphics Features:

- Unlimited simultaneous model view windows
- Extraordinary "true to scale" rendering, even when drawing
- High-speed redraw algorithm for instant refreshing
- Dynamic scrolling stops right where you want
- Plot & print virtually everything with color coding & labeling
- Rotate, zoom, pan, scroll and snap views
- Saved views to quickly restore frequent or desired views
- Full render or wire-frame animations of deflected model and dynamic mode shapes with frame and speed control
- Animation of moving loads with speed control
- High quality customizable graphics printing

Design Features:

- Designs concrete, hot rolled steel, cold formed steel and wood
- ACI 1999/2002, BS 8110-97, CSA A23.3-94, IS456:2000,EC 2-1992 with consistent bar sizes through adjacent spans
- Exact integration of concrete stress distributions using parabolic or rectangular stress blocks
- Concrete beam detailing (Rectangular, T and L)
- Concrete column interaction diagrams
- Steel Design Codes: AISC ASD 9th, LRFD 2nd & 3rd, HSS Specification, CAN/CSA-S16.1-1994 & 2004, BS 5950-1-2000, IS 800-1984, Euro 3-1993 including local shape databases
- AISI 1999 cold formed steel design
- NDS 1991/1997/2001 wood design, including Structural Composite Lumber, multi-ply, full sawn
- Automatic spectra generation for UBC 1997, IBC 2000/2003
- Generation of load combinations: ASCE, UBC, IBC, BOCA, SBC, ACI
- Unbraced lengths for physical members that recognize connecting elements and full lengths of members
- Automatic approximation of K factors
- Tapered wide flange design with either ASD or LRFD codes
- Optimization of member sizes for all materials and all design codes, controlled by standard or user-defined lists of available sizes and criteria such as maximum depths
- Automatic calculation of custom shape properties
- Steel Shapes: AISC, HSS, CAN, ARBED, British, Euro, Indian, Chilean
- Light Gage Shapes: AISI, SSMA, Dale / Incor, Dietrich, Marino\WARE
- Wood Shapes: Complete NDS species/grade database
- Full seamless integration with RISAFoot (Ver 2 or better) for advanced footing design and detailing
- Plate force summation tool

Results Features:

- Graphic presentation of color-coded results and plotted designs
- Color contours of plate stresses and forces with quadratic smoothing, the contours may also be animated
- Spreadsheet results with sorting and filtering of: reactions, member & joint deflections, beam & plate forces/stresses, optimized sizes, code designs, concrete reinforcing, material takeoffs, frequencies and mode shapes
- Standard and user-defined reports
- Graphic member detail reports with force/stress/deflection diagrams and detailed design calculations and expanded diagrams that display magnitudes at any dialed location
- Saved solutions quickly restore analysis and design results.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-POLE

PLS-POLE provides all of the capabilities a structural engineer requires to design transmission, substation or communications structures. It does so using a simple easy to use graphical interface that rests upon our time tested finite element engine. Regardless of whether you want to model a simple wood pole or a guyed steel X-Frame; PLS-POLE can handle the job simply, reliably and efficiently.

Modeling Features:

- Structures are made of standard reusable components that are available in libraries. You can easily create your own libraries or get them from a manufacturer
- Structure models are built interactively using interactive menus and graphical commands
- Automatic generation of underlying finite element model of structure
- Steel poles can have circular, 4, 6, 8, 12, 16, or 18-sided, regular, elliptical or user input cross sections (flat-to-flat or tip-to-tip orientations)
- Steel and concrete poles can be selected from standard sizes available from manufacturers
- Automatic pole class selection
- Cross brace position optimizer
- Capability to specify pole ground line rotations
- Capability to model foundation displacements
- Can optionally model foundation stiffness
- Guys are easily handled (modeled as exact cable elements in nonlinear analysis)
- Powerful graphics module (members color-coded by stress usage)
- Graphical selection of joints and components allows graphical editing and checking
- Poles can be shown as lines, wire frames or can be rendered as 3-d polygon surfaces

Analysis Features:

- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Design checks for ASCE, ANSI/TIA/EIA 222 (Revisions F and G) or other requirements
- Automatic calculation of dead and wind loads
- Automated loading on structure (wind, ice and drag coefficients) according to:
  - ASCE 74-1991
  - NESC 2002
  - NESC 2007
  - IEC 60826:2003
  - EN50341-1:2001 (CENELEC)
  - EN50341-3-9:2001 (UK NNA)
  - EN50341-3-17:2001 (Portugal NNA)
  - ESAA C(b)1-2003 (Australia)
  - TPNZ (New Zealand)
  - REE (Spain)
  - EIA/TIA 222-F
  - ANSI/TIA 222-G
  - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Detects buckling by nonlinear analysis

Results Features:

- Detects buckling by nonlinear analysis
- Easy to interpret text, spreadsheet and graphics design summaries
- Automatic determination of allowable wind and weight spans
- Automatic determination of interaction diagrams between allowable wind and weight spans
- Automatic tracking of part numbers and costs

LPILE Plus:

LPILE Plus is a special purpose program based on rational procedures for analyzing a pile under lateral loading. The program computes deflection, shear, bending moment, and soil response with respect to depth in nonlinear soils. Components of the stiffness matrix at the pile head may be computed internally by the program to help the users in their super-structure analysis. Several pile lengths may be automatically checked by the program in order to help the user produce a design with an optimum pile penetration.

Soil behavior is modeled with p-y curves internally generated by the computer program following published recommendations for various types of soils; alternatively, the user can manually introduce other p-y curves. Special procedures are programmed for developing p-y curves for layered soils and for rocks.

Several types of pile-head boundary conditions may be selected, and the properties of the pile can also vary as a function of depth. LPILE Plus has capabilities to compute the ultimate-moment capacity of a pile's section and can provide design information for rebar arrangement. The user may optionally ask the program to generate and take into account nonlinear values of flexural stiffness (EI) which are generated internally based on specified pile dimensions, material properties, and cracked/uncracked concrete behavior.

A single, user-friendly interface written for the Microsoft Windows© environment is provided for the preparation of input, analytical run, and for the graphical observation of data contained in the output file. The program has been written in 32-bit programming codes for compatibility with the latest versions of the Microsoft Windows operating system. The program produces plain-text input and output files that may be observed and/or edited for their inclusion in project reports.

Criteria for Design of PCS Facilities On or Extending Above Metal Electric Transmission Towers & Analysis of Transmission Towers Supporting PCS Masts (1)

Introduction

This criteria is the result from an evaluation of the methods and loadings specified by the separate standards, which are used in designing telecommunications towers and electric transmission towers. That evaluation is detailed elsewhere, but in summary; the methods and loadings are significantly different. This criteria specifies the manner in which the appropriate standard is used to design PCS facilities including masts and brackets (hereafter referred to as "masts"), and to evaluate the electric transmission towers to support PCS masts. The intent is to achieve an equivalent level of safety and security under the extreme design conditions expected in Connecticut and Massachusetts.

ANSI Standard TIA/EIA-222 covering the design of telecommunications structures specifies a working strength/allowable stress design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that it does not exceed some defined percentage of failure strength (allowable stress).

ANSI Standard C2-2007 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

Each standard defines the details of how loads are to be calculated differently. Most of the NU effort in "unifying" both codes was to establish what level of strength each approach would provide, and then increasing the appropriate elements of each to achieve a similar level of security under extreme weather loadings.

Two extreme weather conditions are considered. The first is an extreme wind condition (hurricane) based upon a 50-year recurrence (2% annual probability). The second is a winter condition combining wind and ice loadings.

The following sections describe the design criteria for any PCS mast extending above the top of an electric transmission tower, and the analysis criteria for evaluating the loads on the transmission tower from such a mast from the lower portions of such a mast, and loads on the pre-existing electric lower portions of such a mast, and loads on the pre-existing electric transmission tower and the conductors it supports.

Note 1: Prepared from documentation provide from Northeast Utilities.

PCS Mast

The PCS facility (mast, external cable/trays, including the initial and any planned future support platforms, antennas, etc. extending the full height above the top level of the electric transmission structure) shall be designed in accordance with the provisions of TIA/EIA Standard 222 with two exceptions:

1. An 85 mph extreme wind speed shall be used for locations in all counties throughout the NU system.
2. The stress increase of TIA Section 3.1.1.1 is disallowed. The combined wind and ice condition shall consider ½" radial ice in combination with the wind load (0.75 Wi) as specified in TIA section 2.3.16.

ELECTRIC TRANSMISSION TOWER

The electric transmission tower shall be analyzed using yield stress theory in accordance with the attached table titled "NU Design Criteria". This specifies uniform loadings (different from the TIA loadings) on the each of the following components of the installed facility:

- PCS mast for its total height above ground level, including the initial and planned future support platforms, antennas, etc. above the top of an electric transmission structure.
- Conductors are related devices and hardware.
- Electric transmission structure. The loads from the PCS facility and from the electric conductors shall be applied to the structure at conductor and PCS mast attachment points, where those load transfer to the tower.

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

In the event that the electric transmission tower is not sufficient to support the additional loadings of the PCS mast, reinforcement will be necessary to upgrade the strength of the overstressed members.

Northeast Utilities
Overhead Transmission Standards

Attachment A

NU Design Criteria

			Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (75WI)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	----	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole (on two faces)	----	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
High Wind Condtion	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
NESC Extreme Ice with Wind Conditon*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
		* Only for Structures Installed after 2007						

2) STEP 2 - The electric transmission structure analysis and evaluation shall be performed in accordance with NESC requirements and shall include the mast and antenna loads determined from NESC applied loading conditions (not TIA/EIA Loads) on the structure and mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The structure shall be analyzed using yield stress theory in accordance with Attachment A, "NU Design Criteria." This specifies uniform loadings (different from the TIA loadings) on each of the following components of the installed facility:

a) Wireless communication mast for its total height above ground level, including the initial and any planned future equipment (Support Platforms, Antennas, TMA's etc.) above the top of an electric transmission structure.

b) Conductors and related devices and hardware (wire loads will be provided by NU).

c) Electric Transmission Structure

i) The loads from the wireless communication equipment components based on NESC and NU Criteria in Attachment A, and from the electric conductors shall be applied to the structure at conductor and wireless communication mast attachment points, where those loads transfer to the tower.

ii) Shape Factor Multiplier:

NESC Structure Shape	Cd
Polyround (for polygonal steel poles)	1.3
Flat	1.6
Open Lattice	3.2

iii) When Coaxial Cables are mounted along side the pole structure, the shape multiplier shall be:

Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.3

d) The uniform loadings and factors specified for the above components in Attachment A, "NU Design Criteria" are based upon the National Electric Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to the TIA and its loads and factors with the exceptions noted above.

Note: The NESC does not require ice load be included in the supporting structure. (Ice on conductors and shield wire only, and NU will provide these loads).

e) Mast reaction loads shall be evaluated for local effects on the transmission structure members at the attachment points.

If the electric transmission structure is not sufficient to support the additional loadings of the wireless communication mast, reinforcement will be required to upgrade the strength of the overstressed members. Any reinforcement design will be reviewed by NU TL&CE to determine the feasibility of construction and its impact on the use of the structure as a transmission structure.

05/19/2000

NEXTEL - BETHEL
CL&P # 10254

CONDUCTOR LOADS
Original Cable Parameters

sub-cond [redacted]

DIAM = [redacted] in.
WEIGHT [redacted] lb/ft

LOADING PARAMETERS
743 RS

	NESC	1" ICE	HI WIND
WIND (PSF	4	0	20
ICE (IN)	0.5	1	0
OLF ANG	1.65	1.15	1.15
OLF WIND	2.5	1.15	1.15
OLF WT	1.5	1.15	1.15
TENS (#) **	[redacted]	[redacted]	[redacted]

STR		ANGLE	SPAN	WIND SPAN	WGT SPAN	NESC H	NESC V	1" ICE H	1" ICE V	HI WIND H	HI WIND V
10254	A	1.5		820	805	4069	6229	765	8051	4709	2651

TITLE Nextel Bethel Site

05/19/2000

STRUCT CL&P 10254

CONDUCTOR SHIELD WIRE

	AHEAD		BACK	
	3/8 AW		3/8 AW	
	0.000		0.000	
	7 #8 Al Weld		7 #8 Al Weld	
DIAM =	0.385		0.385	
WEIGHT =	0.262		0.262	
TENSION (LBS)	AHEAD	4,200	BACK	4,200

LOADCASE	NESC HEAVY
WIND (PSF)	4
ICE (IN)	0.50
OLF ANG	1.65
OLF WIND	2.50
OLF WT	1.50

STR	ANGLE	WIND SPAN	WGT SPAN	NESC HEAVY H	L	V
BACK	.75	410	403	564	-6929	491
AHEAD	.75	410	403	564	6929	491
TOTALS	1.5	820	806	1128	0	982

TITLE Nextel Bethel Site

05/19/2000

STRUCT CL&P 10254

CONDUCTOR SHIELD WIRE

	AHEAD		BACK	
	3/8 AW		3/8 AW	
	0.000		0.000	
	7 #8 Al Weld		7 #8 Al Weld	
DIAM =	0.385		0.385	
WEIGHT =	0.262		0.262	
TENSION (LBS)	AHEAD	5,615	BACK	5,615

LOADCASE	1" RAD ICE
WIND (PSF)	0
ICE (IN)	1.00
OLF ANG	1.15
OLF WIND	1.15
OLF WT	1.15

STR	ANGLE	WIND SPAN	WGT SPAN	1" RAD ICE H	L	V
BACK	.75	410	403	85	-6457	920
AHEAD	.75	410	403	85	6457	920
TOTALS	1.5	820	806	169	0	1839

TITLE Nextel Bethel Site

05/19/2000

STRUCT CL&P 10254

CONDUCTOR SHIELD WIRE

	AHEAD		BACK	
	3/8 AW		3/8 AW	
	0.000		0.000	
	7 #8 Al Weld		7 #8 Al Weld	
DIAM =	0.385		0.385	
WEIGHT =	0.262		0.262	
TENSION (LBS)	AHEAD	2,583	BACK	2,583

LOADCASE	HI WIND
WIND (PSF)	20
ICE (IN)	0.00
OLF ANG	1.15
OLF WIND	1.15
OLF WT	1.15

STR	ANGLE	WIND SPAN	WGT SPAN	HI WIND H	HI WIND L	HI WIND V
BACK	.75	410	403	341	-2970	121
AHEAD	.75	410	403	341	2970	121
TOTALS	**1.5**	**820**	**806**	**683**	**0**	**243**

℄ NEXTEL ANTENNAS
EL. ±156'-4" AGL

℄ AT&T ANTENNAS
EL. ±145'-0" AGL

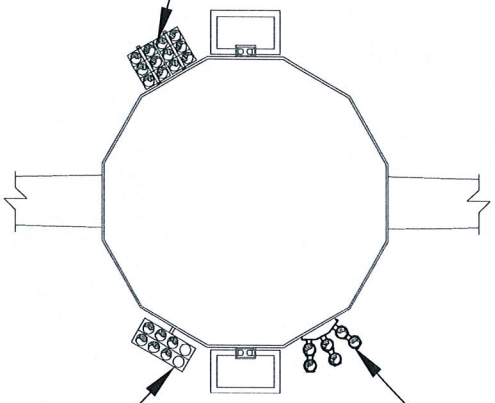
EXISTING EMS 30" ø
STACKED ACCELLERATOR.

PROPOSED THREE (3) POWERWAVE P65-16-XLH-RR PANEL ANTENNAS AND THREE (3) POWERWAVE TTAW-07BP111-001 TMAs MOUNTED ON VALMONT DUAL STANDOFF MOUNT P/N B1827.

EXISTING THREE (3) POWERWAVE 7770 PANEL ANTENNAS AND SIX (6) POWERWAVE LGP-21401 TMAs TO BE RELOCATED TO PROPOSED MOUNT.

2
EL-1

NEXTEL EXISTING TWELVE (12) 1-5/8" DIA. COAX CABLES



EXISTING 140' TALL CL&P STEEL TRANSMISSION STRUCTURE NO. 10254

AT&T EXISTING SIX (6) 1-5/8" DIA. COAX CABLES

AT&T PROPOSED SIX (6) 1-5/8" DIA. COAX CABLES MOUNTED ON EXISTING COAX SUPPORT BRACKETS @ 4'-0" O.C TO THE EXTERIOR OF THE TOWER

AT&T EXISTING SIX (6) 1-5/8" DIA. COAX CABLES MOUNTED ON A COAX SUPPORT BRACKET TO THE EXTERIOR OF THE TOWER

2 / EL-1 COAX CABLE PLAN

SCALE: NOT TO SCALE

EXIST. GRADE

REFER TO DRAWINGS S-1 AND S-2 FOR JET GROUTING DETAILS AND NOTES

1 / EL-1 TOWER & MAST ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
00	8/17/11	ISSUED FOR NU REVIEW
01	1/31/12	CONSTRUCTION

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

CT5176
STONY HILL
CL&P 10254

7 STONY HILL ROAD
BETHEL, CT 06801

PROJECT NO:	11021.CO55
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	8/10/11

TOWER AND MAST ELEVATION

EL-1

DWG. 1 OF 1

DESIGN BASIS

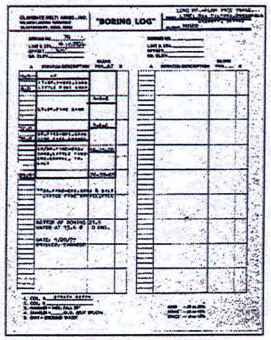
1. THE INFORMATION CONTAINED IN THE S-SERIES DRAWINGS IS LIMITED TO THE STRUCTURAL DESIGN REQUIRED TO ACCOMMODATE REINFORCEMENT OF THE EXISTING NORTHEAST UTILITIES FOUNDATION STRUCTURE.
2. IMPROVEMENTS TO THE EXISTING FOUNDATION STRUCTURE HAVE BEEN DESIGNED IN ACCORDANCE WITH THE CONNECTICUT STATE BUILDING CODE, WHICH IS COMPRISED OF "THE 2003 INTERNATIONAL BUILDING CODE" AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS.
3. EXISTING SUBSURFACE CONDITIONS ARE PROVIDED IN THE BORING LOG PREPARED BY CLARENCE WELTI ASSOCIATES, INC. DATED 1/20/2007 FOR BORING NO. 76 LOCATED AT A 23' OFFSET FROM NU STRUCTURE #10254. THE CONTRACTOR SHALL OBTAIN ADDITIONAL BORINGS FOR VERIFICATION BY A QUALIFIED GEOTECHNICAL ENGINEER FOR USE IN THE FINAL DESIGN OF THE PROPOSED SOIL IMPROVEMENTS.
4. DESIGN WIND LOADS FOR NORTHEAST UTILITIES TRANSMISSION TOWERS USED IN THE DESIGN OF FOUNDATION IMPROVEMENTS:

   -WIND LOAD (PCS MAST):
   BASIC WIND SPEED (V) = 85 MPH (FASTEST MILE); BASED ON TIA/EIA-222F AND NU MAST DESIGN CRITERIA EXCEPTION 1.

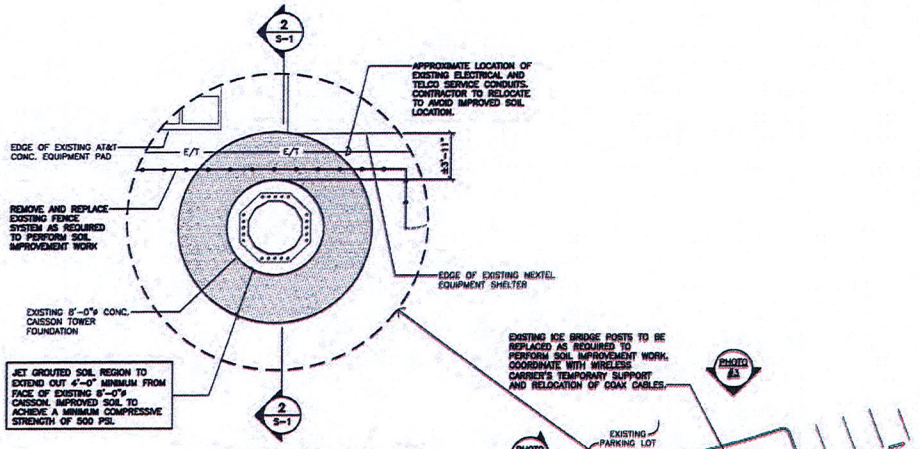
   -WIND LOAD (UTILITY POLE & FOUNDATION):
   BASIC WIND SPEED (V) = 110 MPH (3-SECOND GUST) BASED ON NESC C2-2007, SECTION 23 RULE 250C.

GENERAL NOTES

1. ALL WORK TO CONFORM TO REQUIREMENTS OF ALL PUBLICATIONS AND NOTES LISTED UNDER "DESIGN BASIS".
2. GENERAL CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS AND ALL DIMENSIONS IN FIELD PRIOR TO START OF CONSTRUCTION AND PROTECT AND MAINTAIN ALL EXISTING CONSTRUCTION AFFECTED BY THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
3. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
4. GENERAL CONTRACTOR SHALL MAINTAIN A SET OF LATEST REVIEWED SHOP DRAWINGS ON JOB SITE.
5. THE STRUCTURE HAS BEEN DESIGNED TO BE STABLE AND SELF SUPPORTING AFTER THE CONSTRUCTION IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY FOR THE BUILDING'S STABILITY DURING CONSTRUCTION. THIS RESPONSIBILITY ALSO INCLUDES, BUT IT IS NOT LIMITED TO, METHOD AND SEQUENCE OF ERECTION, TEMPORARY SHORING AND TEMPORARY BRACING.
6. THE CONTRACTOR SHALL LIMIT THE DURATION OF THE FOUNDATION REINFORCEMENT WORK. THE EXISTING CAISSON WITHIN THE SHOWN LIMITS IS STABLE FOR WIND SPEEDS LESS THAN SHOWN WITHOUT ICE LOADING. IF HIGHER WIND SPEED OR ICE EVENT IS EXPECTED, THE EXCAVATION AREA SHALL BE FILLED WITH COMPACT FILL MATERIAL.
7. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES.
9. CONTRACTOR TO COORDINATE WITH NORTHEAST UTILITIES AND AT&T FOR RELOCATION AND/OR RE-ESTABLISHMENT OF EXISTING GROUNDING AND ELECTRICAL/TELCO UTILITIES AS NECESSARY FOR SOIL STABILIZATION OPERATIONS AT THE BASE OF THE EXISTING TOWER.
10. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
11. THERE SHALL BE NO CHANGE TO THE WORK THAT IS INDICATED AND/OR DIRECTED BY THE STRUCTURAL CONTRACT DOCUMENTS WITHOUT A REVISION DESCRIBING THAT CHANGE WHICH SHALL BE ISSUED IN WRITING BY CENTEK ENGINEERING, INC.
12. ALL SECTIONS, DETAILS, NOTES, DIMENSIONS AND CONDITIONS ARE APPLICABLE AT ANY OTHER LOCATION WHERE CONDITIONS AND DETAILS ARE SIMILAR BUT ARE NOT SPECIFICALLY NOTED AS SUCH OR ARE NOT SHOWN.
13. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
14. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
15. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
16. NO DRILLING WELDING OR TAPING ON CL&P OWNED EQUIPMENT.



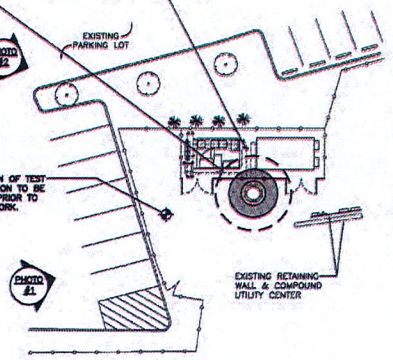
SOIL BORING LOG
BORING #76, CLARENCE WELTI ASSOC. INC. DATED 1/20/1977



ENLARGED PLAN DETAIL
SCALE: 1" = 5'

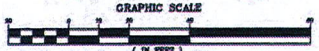
TRUE NORTH

TOWER NOTE:
REFER TO TOWER STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJECT NO. 11021.0055, DATED 1/31/12 (REV-1) FOR ADDITIONAL REQUIREMENTS.



1 S-1 SITE PLAN
SCALE: 1" = 20'

TRUE NORTH



2 S-1 ELEVATION/PROFILE
SCALE: 1" = 10'

PHOTO #1, LOOKING NORTH AT COMPOUND

PHOTO #2, LOOKING NORTHWEST AT COMPOUND

PHOTO #3, LOOKING WEST AT COMPOUND

DESIGNED BY:	CFC
DRAWN BY:	DEB
CHK'D BY:	CFC

NO.	DESCRIPTION	DATE	DRAWN BY	CHK'D BY
0	CONSTRUCTION	3/1/12	DEB	CFC

PROFESSIONAL ENGINEER, INC.

STATE OF CONNECTICUT
CARL F. CENTEK
No. 18894
LICENSED PROFESSIONAL ENGINEER

at&t

SAI

CENTEK engineering
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www.CentekEng.com

AT&T MOBILITY
TOWER FOUNDATION REINFORCEMENTS
CT5176 - STONY HILL
CL&P STRUCT. NO. 10254
71 STONY HILL ROAD
BETHEL, CT 06801

DATE:	1/30/12
SCALE:	AS NOTED
JOB NO.	11021.0055

PLAN, ELEVATION AND NOTES

S-1

Sheet No. 1 of 2

JET GROUTING SOILCRETE STABILIZATION NOTES

1. THE SCOPE OF WORK CONSISTS OF FURNISHING ALL PLANT, LABOR, EQUIPMENT, AND MATERIALS AND OF PERFORMING ALL OPERATIONS AS REQUIRED TO CONSTRUCT THE SOILCRETE STABILIZATION VIA JET GROUTING METHOD.

2. FOLLOWING ARE THE REFERENCED STANDARDS FOR JET GROUTING:

REFERENCE	TITLE OR DESCRIPTION
API SPEC 13A	API SPECIFICATION FOR OIL-WELL DRILLING-FLUID MATERIALS
API RP 13B-1	API RECOMMENDED PRACTICE STANDARD PROCEDURE FOR FIELD TESTING WATER-BASED DRILLING FLUIDS
ASTM C 138	TEST METHOD FOR UNIT WEIGHT OF CONCRETE
ASTM D 422	PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D 1140	MATERIALS FINER THAN NO. 200 SIEVE
ASTM D 4318	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS
ASTM D 4380	DENSITY OF BENTONITE SLURRIES
ASTM D 5084	HYDRAULIC CONDUCTIVITY USING A FLEXIBLE WALL PERMEAMETER

3. FOLLOWING ARE ABBREVIATIONS AND DEFINITIONS USED:

A. API – AMERICAN PETROLEUM INSTITUTE

B. ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS

C. OWNER – THE OWNER AS REFERRED TO HEREIN IS CONNECTICUT LIGHT & POWER (CL&P).

D. OWNER'S REPRESENTATIVE – THE OWNER'S REPRESENTATIVE OR THE ENGINEER IS NORTHEAST UTILITIES ENGINEERING GROUP (NU) DESIGNATED BY THE OWNER TO ACT ON ITS BEHALF IN THE EXECUTION OF THESE SPECIFICATIONS.

E. LESSEE – AT&T WIRELESS

F. LESSEE'S REPRESENTATIVE – THE LESSEE'S REPRESENTATIVE OR THE ENGINEER IS CENTEK ENGINEERING, INC. (CENTEK) DESIGNATED BY THE LESSEE AND APPROVED BY THE OWNER TO ACT ON ITS BEHALF IN THE EXECUTION OF THESE SPECIFICATIONS.

G. JET GROUTING – JET GROUTING IS THE PROCESS OF CREATING SOILCRETE IN SITU WITH STABILIZING FLUIDS OR GROUT MIX DELIVERED AT HIGH PRESSURE THOUGH NOZZLE(S) AT THE END OF A MONITOR INSERTED INTO A BOREHOLE. THE SOILCRETE IS CREATED BY THE EROSION OF THE SOIL BY THE HIGH PRESSURE INJECTED GROUT OR FLUIDS. A JET GROUT COLUMN IS CREATED BY INJECTING THE FLUIDS AT HIGH PRESSURE, ROTATING, AND LIFTING THE MONITOR A CONSTANT RATE. THE SOIL IS ERODED AND MIXED WITH THE FLUIDS OR GROUT AND FORMS CEMENTITOUS GROUT COLUMN. TYPICAL APPLICATIONS INCLUDE SLUDGE STABILIZATION, GROUNDWATER BARRIER WALLS, SOIL IMPROVEMENT, FOUNDATION IMPROVEMENT, AND OTHER GROUND TREATMENT.)

H. SOILCRETE – THE RESULT FROM BINDING OF THE IN-SITU SOILS WITH A CEMENTING AGENT OR GROUT TO FORM A BLEND OF SOILS & GROUT TO MEET A SPECIFIC STANDARD OF STRENGTH OR PERMEABILITY.

I. MONITOR – A FLUID DRILL PIPE DESIGNED TO DELIVER THE ELEMENTS OF THE JET GROUTING PROCESS. THE MONITOR HAS ONE OR MORE INJECTION POINTS. THE NOZZLE(S) INJECTS THE FLUID AT HIGH VELOCITY INTO THE SOIL TO MIX IT WITH THE SLURRY OR GROUT.

J. JET GROUT COLUMN – A CYLINDRICAL MASS OF SOILCRETE FORMED FROM THE JET GROUT PROCESS.

K. JET GROUT SPECIALIST – AN INDIVIDUAL WHO HAS HAD PROVEN AND SUCCESSFUL EXPERIENCE IN JET GROUT CONSTRUCTION AND IS KNOWLEDGEABLE OF: 1. THE PROPER METHODS EMPLOYED; 2. THE USE, TESTING AND CONTROL OF THE SPECIFIED GROUT; 3. CONSTRUCTION EQUIPMENT; 5. TESTING FOR GROUT MIXING QUALITY CONTROL.

4. THE FOLLOWING INFORMATION SHALL BE SUBMITTED AT LEAST FOUR (4) WEEKS PRIOR TO CONSTRUCTION.

A. QUALIFICATIONS OF CONTRACTOR – THE CONTRACTOR WILL DESIGNATE THE ORGANIZATION RESPONSIBLE FOR THE JET GROUTING WORK (THE JET GROUTING CONTRACTOR). THIS ORGANIZATION MAY BE THE CONTRACTOR'S OWN COMPANY, A SPECIALTY SUBCONTRACTOR OR AN ORGANIZATION PROVIDING TECHNICAL ASSISTANCE TO THE CONTRACTOR TO DO THE WORK. IN ANY CASE, THE JET GROUT CONTRACTOR SHALL SUBMIT EVIDENCE THAT IT IS EXPERIENCED AND COMPETENT TO CONSTRUCT IN-SITU SOILCRETE VIA JET GROUTING. THE JET GROUTING CONTRACTOR SHALL HAVE AT LEAST THREE (3) YEARS OF PRIOR EXPERIENCE IN SUCCESSFUL COMPLETION OF JET GROUTING PROJECTS. THIS EVIDENCE WILL INSURE THAT THE CONTRACTOR WILL HAVE SUFFICIENT COMPETENT EXPERIENCED PERSONNEL TO CARRY OUT THE OPERATIONS SPECIFIED.

IN PARTICULAR, A JET GROUT SPECIALIST SHALL SUPERVISE THE CONSTRUCTION, GROUT PREPARATION, AND QUALITY CONTROL. THE JET GROUT SPECIALIST SHALL HAVE AT LEAST FIVE (5) YEARS OF EXPERIENCE AND FIVE (5) OR MORE PROJECTS IN SUCCESSFUL CONSTRUCTION OF JET GROUTING.

THE COMPANY NAME, KEY CONTACT, AND QUALIFICATIONS OF THE CONTRACTOR'S OFF-SITE LABORATORY SHALL BE SUBMITTED. THE LABORATORY WILL HAVE PREVIOUS EXPERIENCE WITH SOILCRETE MATERIALS, EXPERIENCED LABORATORY TECHNICIANS, AND FLEXIBLE WALL PERMEABILITY TESTING EQUIPMENT.

B. WORK PLAN – THE CONTRACTOR SHALL SUBMIT A DETAILED OPERATING PLAN DESCRIBING HIS PROPOSED CONSTRUCTION EQUIPMENT, PROCEDURES, AND SCHEDULES. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE CONTRACTOR'S PLAN FOR:

COORDINATING THE CONSTRUCTION, MAINTENANCE AND REMOVAL OF WORKING PLATFORMS, MIXING PADS, AND HAUL ROADS WITH THE OWNER, GENERAL CONTRACTOR OR OTHER CONTRACTORS ON SITE.

EQUIPMENT SET-UP AND SITE USE LAYOUT INCLUDING STORAGE AREAS, HAUL ROADS AND WORK PLATFORM DIMENSIONS.

EQUIPMENT SPECIFICATIONS INCLUDING: CAPABILITY OF JET GROUT RIG; AND SPECIFICATIONS OF GROUT MIXING EQUIPMENT.

JET GROUTING PROCEDURES– METHOD OF DRILLING, JET GROUTING (I.E. SINGLE, DOUBLE, TRIPLE, JET SYSTEMS), FLUID INJECTION PRESSURE(S), ROTATIONAL SPEED AND WITHDRAW RATE FOR JET GROUTING THROUGH THE SOIL STRATA.

MATERIAL PROPERTIES, SOURCES, AND (MANUFACTURER'S) CERTIFICATES OF QUALITY.

CONTROL OF DRAINAGE, SPILLS, WASTES, ETC.

CLEAN-UP, SPOILS DISPOSAL, GROUT DISPOSAL.

C. MONITORING PLAN – A GROUND MOVEMENT MONITORING PLAN TO MEASURE VERTICAL MOVEMENTS OR HEAVE/SETTLEMENT OF UTILITIES, STRUCTURES, AND ROADWAYS IN THE VICINITY OF THE JET GROUTING OPERATIONS.

D. QUALITY CONTROL PLAN – THE CONTRACTOR SHALL SUBMIT A QUALITY CONTROL PLAN WITH DETAILS ON PERSONNEL, RESPONSIBILITIES, INSPECTIONS, AND ORGANIZATION FOR INSURING THE QUALITY OF CONSTRUCTION REQUIRED BY THESE SPECIFICATIONS. THE PLAN SHALL PROVIDE A TABLE LISTING TESTING METHODS, FREQUENCIES, AND MINIMUM ACCEPTABLE VALUES. THE PLAN SHALL EXPLAIN THE METHODS AND LOCATIONS FOR OBTAINING SAMPLES FOR TESTING AND REPORTING SCHEDULES. COPIES OF QUALITY CONTROL FORMS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

5. THE FOLLOWING INFORMATION SHALL BE SUBMITTED TO THE ENGINEER ON A REGULAR SCHEDULE DURING THE PROGRESS OF THE WORK:

A. DAILY REPORTS SHALL BE SUBMITTED BY NOON OF THE DAY FOLLOWING THE DATE OF THE REPORT.

B. LABORATORY TEST RESULTS SHALL BE SUBMITTED WITHIN 36 HOURS OF RECEIPT OF THE REPORT FROM THE LABORATORY.

C. FINAL REPORTS SHALL BE SUBMITTED WITHIN TWO (2) WEEKS OF THE COMPLETION OF WORK.

D. AS-BUILT PROFILE – A RECORD OF COLUMN CONSTRUCTED INCLUDING THE DEPTH, KEY, AND LOCATION OBTAINED EACH MORNING AND EVENING. THE INFORMATION SHALL BE USED TO GENERATE AN AS-BUILT COLUMN PROFILE, AS CONSTRUCTED.

E. GROUT MIX – A RECORD OF PLANT-MIXED GROUT SLURRY QUANTITIES, PROPORTIONS, PROPERTIES, AND ADMIXTURES MADE DURING CONSTRUCTION. ADJUSTMENTS TO THE SLURRY MIXTURE SHALL BE NOTED.

F. QUALITY CONTROL DATA – A RECORD OF QUALITY CONTROL SAMPLES, TESTS AND TEST RESULTS.

6. MATERIALS

A. JET GROUT SLURRY – THE GROUT SLURRY SHALL CONSIST OF A STABLE HOMOGENEOUS MIXTURE OF CEMENT/BENTONITE IN WATER AND SHALL BE CONTROLLED IN ACCORDANCE WITH THE MOST CURRENT API RECOMMENDED PRACTICE 13B-1, AND THE FOLLOWING REQUIREMENTS:

IF BENTONITE SLURRY IS USED, THE SLURRY SHALL BE A MIXTURE OF NOT LESS THAN 2% BENTONITE IN WATER. ADDITIONAL BENTONITE OR ADMIXTURES MAY BE REQUIRED DEPENDING ON THE HARDNESS AND TEMPERATURE OF THE WATER AND THE QUALITY OF THE BENTONITE. THE SLURRY SHALL HAVE PROPERTIES AS DESCRIBED IN TABLE 1 (ALTERNATIVELY, THE CONTRACTOR MAY USE BENTONITE OR OTHER ADDITIVES AS REQUIRED TO SUSPEND CEMENT PARTICLES AND CONTROL VISCOSITY OF THE MIXED GROUT.)

FOR CEMENT GROUT, PROPERTIES SHOULD INCLUDE A CALCULATED DESIGN DENSITY AND A PLANNED VISCOSITY

B. BENTONITE – BENTONITE USED IN PREPARING SLURRY SHALL BE PULVERIZED (POWDER OR GRANULAR) PREMIUM GRADE SODIUM-CATION MONTMORILLONITE AND SHALL MEET THE MOST CURRENT API STANDARD 13A, SECTION 4. THE YIELD OF THE BENTONITE SHALL BE [90] BARRELS PER TON.

C. CEMENT – CEMENT USED IN PREPARING GROUT SHALL CONFORM TO ASTM C150, PORTLAND TYPE I OR II OR ASTM C989, GROUND GRANULAR BLAST FURNACE SLAG OR A MIXTURE OF BOTH.

D. WATER – FRESH WATER, FREE OF EXCESSIVE AMOUNTS OF DELETERIOUS SUBSTANCES THAT ADVERSELY AFFECT THE PROPERTIES OF THE GROUT SHALL BE USED TO MANUFACTURER GROUT/ SLURRY. THE WATER SHALL BE POTABLE, CLEAN AND FREE FROM SEWAGE, OIL, ACID, ALKALI, SALTS AND ORGANIC MATERIALS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR THAT THE GROUT/SLURRY RESULTING FROM THE WATER SHALL ALWAYS MEET THE STANDARDS OF THIS SPECIFICATION.

E. ADMIXTURES – FOR BENTONITE SLURRY, ADMIXTURES OF THE TYPE USED IN THE CONTROL OF OIL-FIELD DRILLING SLURRIES SUCH AS SOFTENING AGENTS, DISPERSANTS, RETARDER OR PLUGGING OR BRIDGING AGENTS MAY BE ADDED TO THE WATER OR THE SLURRY TO PERMIT EFFICIENT USE OF BENTONITE AND PROPER WORKABILITY OF THE SLURRY. THE ENGINEER SHALL BE ADVISED OF ALL ADDITIVES USED.

7. JET GROUTING

A. JET GROUTING SHALL BE PERFORMED IN ACCORDANCE WITH THE APPROVED GROUT INJECTION AREA LAYOUT SCHEME TO ACHIEVE THE FOLLOWING ACCEPTANCE CRITERIA IN THE IN SITU SOIL WITHIN THE WORK AREA:

B. USE THE SAME EQUIPMENT, MATERIALS, AND PROCEDURES AS THOSE DETERMINED IN THE TEST PROGRAM TO GIVE SATISFACTORY RESULTS TO PERFORM PRODUCTION JET GROUTING FOR UNDERPINNING AND EXCAVATION SUPPORT.

C. INSTALL SOILCRETE COLUMNS, ENSURING THAT CONTINUOUS SPOIL RETURN UP THE BOREHOLE ANNULUS IS ACHIEVED DURING ALL WORK.

8. TEST SECTION – CONSTRUCT A TEST SECTION EVALUATE THE CONTRACTOR'S PROPOSED METHODS AND THE GROUT MIX'S ABILITY TO PRODUCE SOILCRETE COLUMNS MEETING THE DEPTH, DIAMETER, OVERLAPPING AND MATERIAL PROPERTY REQUIREMENTS SHOWN AND SPECIFIED HEREIN. CONSTRUCT THE TEST SECTION OF THE JET-GROUTED SOILCRETE COLUMNS/PANELS IN A LOCATION NEAR THE PROPOSED JET GROUTING AREA APPROVED BY THE ENGINEER, PRIOR TO STARTING JET GROUTING PRODUCTION WORK AT THE SITE.

THE EFFECTIVENESS OF THE JET GROUTING WILL BE VERIFIED AS FOLLOWS:

A. THE LESSEE MAY RETAIN A SOIL TESTING FIRM OR ASK THE JET GROUTING CONTRACTOR TO PERFORM THE IN SITU TESTING AS DIRECTED BY THE OWNER'S ENGINEER. TEST SECTIONS WILL BE PERFORMED BEFORE AND DURING PRODUCTION WORK.

B. PRIOR TO COMMENCEMENT OF PRODUCTION GROUTING ONE (1) TEST SECTIONS SHALL BE PERFORMED. IF THE PRE-PRODUCTION TEST SECTIONS INDICATE THAT THE REQUIRED GROUND IMPROVEMENT HAS NOT BEEN ACHIEVED, THE GROUTING CONTRACTOR SHALL REVISE THE PROCEDURES IN THE WORK PLAN AND RE-TEST.

C. ALL TESTING TO DETERMINE SPECIFICATION COMPLIANCE WILL BE PROVIDED BY AN INDEPENDENT TESTING AGENCY RETAINED BY THE OWNER. REGARDLESS OF THE METHOD SELECTED, THE SAME TEST METHOD SHALL BE UTILIZED BOTH BEFORE AND AFTER THE SOIL IMPROVEMENT WORK IN ORDER TO PROVIDE THE MOST ACCURATE ASSESSMENT OF THE DEGREE OF IMPROVEMENT OBTAINED.

D. THE METHOD OF INSTALLATION OF THE TEST SECTION SHALL COMPLY WITH THIS SPECIFICATION AND SHALL BE PERFORMED USING THE SAME GROUT LINE SIZES, DRILLING AND GROUTING EQUIPMENT AND PROCEDURES AS THAT TO BE USED FOR PRODUCTION WORK.

E. TEST SECTION LOCATIONS WILL BE AGREED UPON AND LOCATED WITHIN THE TREATMENT AREA. A TEST SECTION SHALL CONSIST OF A SINGLE MODULE COMPRISED OF AT LEAST THREE GROUT INJECTION POINTS. TESTS WILL BE PERFORMED AT THE CENTER OF THE MODULE PRIOR TO AND AFTER GROUTING. SPACING AND DIAMETER OF ELEMENTS SHALL BE PROPOSED BY THE JET GROUTING CONTRACTOR.

9. EQUIPMENT

A. ALL EQUIPMENT USED FOR DRILLING BOREHOLES; LOWERING, RAISING AND ROTATING JET MONITORS; MIXING GROUT; SUPPLYING PRESSURIZED GROUT AND AIR-WATER TO JET MONITORS; AND JET MONITORS USED TO PERFORM THE SEEPAGE BARRIER SHALL HAVE PROVEN PERFORMANCE RECORDS FOR USE IN JET GROUTING WORK.

B. SPARE PARTS AND EQUIPMENT SHALL BE AVAILABLE ON SITE TO MAINTAIN JET GROUTING EQUIPMENT IN SATISFACTORY OPERATION CONDITION AT ALL TIMES DURING EXECUTION OF THE JET GROUTING WORK.

C. DRILLING EQUIPMENT – USE DRILLING EQUIPMENT OF A TYPE AND CAPACITY SUITABLE FOR DRILLING REQUIRED HOLE DIAMETERS AND DEPTHS, AND LOWERING, RAISING, AND ROTATING JET GROUT MONITORS TO THE DEPTHS AND AT THE RATES REQUIRED TO PERFORM THE WORK AS SHOWN ON THE CONTRACT DRAWINGS AND AS SPECIFIED HEREIN.

D. JET GROUTING MONITORS – USE JET GROUTING MONITORS HAVING CAPACITY SUITABLE FOR PRODUCING SOILCRETE COLUMNS IN THE WORK SITE SOIL TYPES IDENTIFIED IN THE GEOTECHNICAL REPORTS, AND OF THE SIZE AND DEPTH SHOWN ON THE CONTRACT DRAWINGS AND AS SPECIFIED HEREIN.

E. BATCHING PLANT – THE GROUT/SLURRY BATCHING PLANT SHALL INCLUDE THE NECESSARY EQUIPMENT INCLUDING A HIGH SHEAR MIXER CAPABLE OF PRODUCING HOMOGENEOUS MIXTURES OF CEMENT/BENTONITE IN WATER, PUMPS, VALVES, HOES, SUPPLY LINES, AND ALL OTHER EQUIPMENT AS REQUIRED TO ADEQUATELY SUPPLY SLURRY TO THE JET GROUT RIG. ALL GROUT/SLURRY FOR USE SHALL BE PREPARED USING A SUITABLE MIXER. MIXING OF WATER AND CEMENT/BENTONITE SHALL CONTINUE UNTIL THE RESULTING GROUT/SLURRY IS HOMOGENEOUS.

9. EXECUTION OF THE WORK

A. JET GROUTING MAY CONSIST OF A SINGLE JET (GROUT INJECTION ONLY), DOUBLE JET (GROUT AIR INJECTION, OR TRIPLE JET (WATER, AIR AND GROUT INJECTION) SYSTEMS. ANY OF THESE SYSTEMS WILL BE ACCEPTABLE, PROVIDING THE PERFORMANCE REQUIREMENTS OF THESE SPECIFICATIONS ARE MET.

B. THE JET GROUTING OPERATIONS FOR INSTALLATION OF TRIAL COLUMNS AND PRODUCTION COLUMNS MUST CONFORM TO THE APPROVED JET GROUTING PLAN.

C. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH SITES, IN PARTICULAR, WITH LOCATION OF THE ABOVE GROUND UTILITIES (E.G., OVERHEAD TELEPHONE AND POWER LINES) THAT MIGHT AFFECT HIS OPERATIONS. DUE TO THE HIGH CONCENTRATION OF UTILITIES AT THE PROJECT SITE, IT IS ANTICIPATED THAT THAT CONTRACTOR WILL BE REQUIRED TO INSTALL A SIGNIFICANT NUMBER OF THE JET GROUT COLUMNS AT AN ANGLE TO AVOID CONFLICTS WITH UTILITIES.

D. EXPOSE ALL NEAR-SURFACE UTILITIES IN THE VICINITY OF THEIR JET GROUTING OPERATIONS TO ENSURE THAT THE DRILL-RIG DOES NOT PENETRATE THESE UTILITIES.

E. MAINTAIN GOOD CONTROL OF THE JET GROUTING PROCESS IN REGARD TO SPOIL RETURN SO AS TO MINIMIZE OR ELIMINATE GROUND HEAVE.

F. AT ALL TIMES DURING AND AT COMPLETION OF JET GROUTING OPERATIONS, THE SITE SHALL BE THOROUGHLY CLEANED OF ALL DEBRIS, WATER, RETURN FLOE AND SPILLED MATERIAL. THE CONTRACTOR SHALL DISPOSE OF ALL SUCH WASTE MATERIALS IN A MANNER ACCEPTABLE TO ALL AGENCIES HAVING JURISDICTION.

G. PREVENT ANY AND ALL MATERIAL FROM ENTERING STORM DRAINS OR OTHER DRAINAGE COURSES, OR LEAVING THE SITE VIA RUNOFF.

H. COMPLY WITH APPLICABLE REQUIREMENTS OF ALL REGULATORY AUTHORITIES HAVING JURISDICTION.

I. COMPLY WITH THE TRAFFIC MAINTENANCE REQUIREMENTS.

10. JET GROUTING

A. JET GROUT COLUMNS SHALL BE INSTALLED AT LOCATIONS WHERE JET GROUTING IS INDICATED ON THE DRAWINGS (I.E. JET GROUTING AREA) TO CREATE A FULLY GROUTED ZONE MEETING THE PERFORMANCE REQUIREMENTS.

B. CREATE SOILCRETE COLUMNS BY JET GROUTING PROCESS FROM THE BOTTOM TO THE TOP OF THE GROUT AREA AS SHOWN ON THE DRAWINGS. THE BOTTOM OF THE JET GROUT AREA IS DEFINED. THE TOP OF THE JET GROUT AREA IS TO BE DETERMINED BY THE CONTRACTOR, MEETING THE APPROVAL OF THE ENGINEER.

C. GROUTING FOR AN INDIVIDUAL JET GROUT COLUMN SHALL BE CONTINUOUS AND WITHOUT INTERRUPTION.

11. CLEAN-UP

A. AT COMPLETION OF DAILY JET GROUTING OPERATIONS, THOROUGHLY CLEAN SITE AND DISPOSE OF ALL SPOIL DEBRIS, WATER, AND SPILLED MATERIAL. SPOIL STOCKPILING OVERNIGHT IS PERMITTED PRIOR TO TRANSFER TO A PREDETERMINED WASTE OR FILL LOCATION.

12. QUALITY CONTROL

A. THE CONTRACTOR SHALL MAINTAIN HIS OWN QUALITY CONTROL FOR THE IMPROVED SOIL REGION UNDER THE DIRECTION OF A QUALIFIED GEOTECHNICAL ENGINEER. TESTING REQUIREMENTS ARE SPECIFIED HEREIN.

13. JET GROUTING OPERATIONS

A. MONITORING AND LOGGING OF JET GROUTING OPERATIONS FOR BOTH TEST AREAS AND PRODUCTION WORK SHALL BE DONE BY THE FIELD QUALITY CONTROL REPRESENTATIVE

B. ANY JET GROUT HOLE LOST OR DAMAGED AS THE RESULT OF MECHANICAL FAILURE OF EQUIPMENT, INADEQUACY OF GROUT OR WATER SUPPLIES, OR IMPROPER DRILLING OR INJECTION PROCEDURES SHALL BE BACKFILLED WITH CEMENT GROUT AND REPLACED BY ANOTHER HOLE, DRILLED AND INJECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

C. GROUT INJECTION AND MONITOR ROTATION AND EXTRACTION RATES SHALL BE SUFFICIENT TO PRODUCE GROUT COLUMNS MEETING THE DIAMETER, DEPTH, OVERLAP, AND MATERIAL PROPERTY REQUIREMENTS SPECIFIED HEREIN. PROPORTION AND INJECT GROUT MIX SO THAT THE SOILCRETE COLUMN PRODUCED MEETS THE REQUIREMENTS LISTED IN TABLE 1

D. EQUIPMENT FOR MIXING, HOLDING, AND PUMPING GROUT SHALL BE IN A SECURE LOCATION AND SHALL BE OPERATED TO MINIMIZE SPILLAGE OF MATERIAL. NO MATERIAL WILL BE ALLOWED TO ENTER STORM DRAINS OR OTHER DRAINAGE COURSES.

E. DAILY RECORDS SHALL BE MAINTAINED BY THE GROUTING CONTRACTOR AND SUBMITTED TO THE OWNER'S REPRESENTATIVE.

F. ENSURE CONTINUOUS SPOIL RETURN DURING ALL JET GROUTING OPERATIONS. THE GROUTING CONTRACTOR WILL MONITOR NEARBY STRUCTURES AND UTILITIES.

14. MATERIALS

A. BENTONITE: CERTIFICATE OF COMPLIANCE WITH THE SPECIFICATION SHALL BE OBTAINED FROM THE MANUFACTURER FOR EACH SHIPMENT OF BENTONITE DELIVERED TO THE SITE.

B. CEMENT: CERTIFICATE OF COMPLIANCE WITH THE SPECIFICATION SHALL BE OBTAINED FROM THE MANUFACTURER FOR EACH SHIPMENT OF BENTONITE DELIVERED TO THE SITE.

C. WATER: WATER FOR SLURRY MIXING SHALL BE TESTED ONCE EACH [CHANGE IN WATER SOURCE].

D. FRESH SLURRY: A COMPLETE SERIES OF TESTS SHALL BE CONDUCTED FROM THE MIXER OR TANK CONTAINING FRESH GROUT SLURRY READY FOR INTRODUCTION IN THE TRENCH AT LEAST TWICE PER SHIFT.

15. FIELD TESTING

A. CORING SAMPLE METHOD– PERFORM CONTINUOUS CORING OF THE JET GROUTED MASS AT SIX [6] LOCATIONS. THE CORE HOLES SHALL BE DRILLED FROM THE SURFACE AFTER THE JET GROUT HAD HAD SUFFICIENT OPPORTUNITY TO SET. BACKFILL CORE HOLES WITH CEMENTITIOUS, NON-SHRINK GROUT UPON COMPLETION. THE EXACT LOCATIONS OF THE CORE HOLES WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

B. THE FOLLOWING REQUIREMENTS APPLY TO SAMPLES:

–THE SOILCRETE SAMPLES SHALL BE PLACED IN BOXES AND PROPERLY LABELED TO INDICATE THE DEPTH AND COLUMNS FROM WHICH THE SAMPLE ORIGINATES.

–THE SAMPLES SHALL BE WRAPPED IN PLASTIC FILM (E.G., CLEAR PLASTIC WRAP) TO PREVENT MOISTURE LOSS.

–THE SAMPLES SHALL BE STORED IN A COOL, DRY LOCATION (PREFERABLY IN A CLIMATE CONTROLLED TRAILER ON SITE THE DAY THAT THEY DRILLED). WET SAMPLES SHALL BE STORED IN MOISTURE CONTROLLED ATMOSPHERE TO BE ALLOWED TO CURE AND STABILIZE FOR SHIPPING TO A LABORATORY FOR TESTING.

–THE SAMPLES SHALL NOT BE ALLOWED TO FREEZE.

–THE CONTRACTOR WILL MAKE THE SAMPLES ACCESSIBLE TO THE ENGINEER FOR VIEWING.

–THE ENGINEER RESERVES THE RIGHT TO SELECT A SMALL AMOUNT OF SAMPLES FOR COMPRESSIVE STRENGTH TESTING.

–STRENGTH BY CORE SAMPLING TO MEET THE REQUIREMENTS LISTED IN TABLE 1.

16. DOCUMENTATION

A. RESULTS OF ALL TESTS PERFORMED SHALL BE RECORDED ON FORMS ACCEPTABLE TO THE ENGINEER AND SIGNED BY THE JET GROUT SPECIALIST. THESE FORMS WILL BE AVAILABLE TO THE ENGINEER AT ALL TIMES FOR HIS INSPECTION. COPIES OF ALL QUALITY CONTROL DOCUMENTS WILL BE SUBMITTED DAILY TO THE ENGINEER FOR HIS VERIFICATION.

B. AN AS-BUILT PROFILE DRAWING SHALL BE CONTINUOUSLY MAINTAINED BY THE CONTRACTOR. THE PROFILE SHALL INDICATE THE EXTENT OF TREATMENT AT THE END OF EACH WORKING DAY. THE DAILY PROFILE SHALL BE DRAWN IN AN ELECTRONIC FORMAT OR BY HAND, AS DIRECTED BY THE ENGINEER.

17. MEASUREMENT AND PAYMENT

A. PAYMENT FOR THE JET GROUTING SHALL BE MADE AT THE CONTRACT PRICE. SUCH PRICE SHALL INCLUDE ALL COSTS FOR THE CONSTRUCTION AND COMPLETION OF THE JET GROUTING. NO SEPARATE PAYMENT WILL BE MADE FOR MATERIALS, EQUIPMENT, SLURRY, RECORDS OR QUALITY CONTROL. FINAL ACCEPTANCE OF THE TREATMENT AREA WILL BE BASED ON MEETING ALL THE REQUIREMENTS OF THE GROUT INJECTION LOCATIONS AND INSTALLATION UNDER THE CONTRACTOR-PROPOSED GROUT INJECTION POINT LAYOUT SCHEME, AND ANY REQUIRED SECONDARY GROUTING WITHIN THE LIMITS INDICATED AS REQUIRING JET GROUTING ON STRUCTURAL DRAWINGS.

DESIGNED BY: CFC
DRAWN BY: DEB
CHK'D BY: CFC

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	2/1/12	DEB	CFC	CONSTRUCTION

at&t

SAI

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CL&P STRUCT. NO. 10254

DATE: 1/30/12
SCALE: AS NOTED
JOB NO. 11021.C055

JET GROUTING NOTES

S-2

Sheet No. 2 of 2

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Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA/EIA

Wind Speeds

Basic Wind Speed	$V := 85$	mph	(User Input per NU Mast Design Criteria Exception 1)
Basic Wind Speed with Ice	$V_i := 74$	mph	(User Input per TIA/EIA-222-F Section 2.3.16)

Heights above ground level, z

Mast 1	$z_{mast1} := 144$	ft	(User Input)
Mast 2	$z_{mast2} := 149$	ft	(User Input)
Nextel	$z_{nextel} := 156.33$	ft	(User Input)
AT&T	$z_{att} := 145$	ft	(User Input)
Coax Cable	$z_{coax} := 145$	ft	(User Input)

Exposure Coefficients, kz

(per TIA/EIA-222-F Section 2.3.3)

Mast 1

$$Kz_{mast1} := \left(\frac{z_{mast1}}{33}\right)^{\frac{2}{7}} = 1.523$$

Mast 2

$$Kz_{mast2} := \left(\frac{z_{mast2}}{33}\right)^{\frac{2}{7}} = 1.538$$

Nextel

$$Kz_{nextel} := \left(\frac{z_{nextel}}{33}\right)^{\frac{2}{7}} = 1.56$$

AT&T

$$Kz_{att} := \left(\frac{z_{att}}{33}\right)^{\frac{2}{7}} = 1.526$$

Coax Cable

$$Kz_{coax} := \left(\frac{z_{coax}}{33}\right)^{\frac{2}{7}} = 1.526$$

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Velocity Pressure without ice, qz (per TIA/EIA-222-F Section 2.3.3)

Mast 1 $qz_{mast1} := 0.00256 \cdot Kz_{mast1} \cdot V^2 = 28.177$

Mast 2 $qz_{mast2} := 0.00256 \cdot Kz_{mast2} \cdot V^2 = 28.453$

Nextel $qz_{nextel} := 0.00256 \cdot Kz_{nextel} \cdot V^2 = 28.846$

AT&T $qz_{att} := 0.00256 \cdot Kz_{att} \cdot V^2 = 28.233$

Coax Cable $qz_{coax} := 0.00256 \cdot Kz_{coax} \cdot V^2 = 28.233$

Velocity Pressure with ice, qzICE (per TIA/EIA-222-F Section 2.3.3)

Mast 1 $qzICE_{mast1} := 0.00256 \cdot Kz_{mast1} \cdot V_i^2 = 21.356$

Mast 2 $qzICE_{mast2} := 0.00256 \cdot Kz_{mast2} \cdot V_i^2 = 21.565$

Nextel $qzICE_{nextel} := 0.00256 \cdot Kz_{nextel} \cdot V_i^2 = 21.863$

AT&T $qzICE_{att} := 0.00256 \cdot Kz_{att} \cdot V_i^2 = 21.398$

Coax Cable $qzICE_{coax} := 0.00256 \cdot Kz_{coax} \cdot V_i^2 = 21.398$

TIA/EIA Common Factors:

Gust Response Factor =	$G_H := 1.69$		(User Input per TIA/EIA-222-F Section 2.3.4)
Gust Response Factor Multiplier =	$m := 1.25$		(User Input per TIA/EIA-222-F Section 2.3.4.4)
Radial Ice Thickness =	$Ir := 0.50$	in	(User Input per TIA/EIA-222-F Section 2.3.1)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)

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Development of Wind & Ice Load on PCS Mast (per TIA/EIA-222-F-1996 Criteria)

Existing Mast Data: (HSS18x0.375) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 18$ in (User Input)

Mast Length = $L_{mast} := 8$ ft (User Input)

Mast Thickness = $t_{mast} := 0.375$ in (User Input)

Mast Aspect Ratio = $Ar_{mast} := \frac{12 L_{mast}}{D_{mast}} = 5.3$

Mast Force Coefficient = $Ca_{mast} = 0.8$ (per TIA/EIA-222-F Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.5$ sf/ft

Total Mast Wind Force = $qz_{mast1} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 57$ plf **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 1.58$ sf/ft

Total Mast Wind Force w/ Ice = $qzICE_{mast1} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 46$ plf **BLC 4**

Gravity Loads (without ice)

Weight of the mast = Self Weight **(Computed internally by Risa-3D)** plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 29.1$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 11$ plf **BLC 3**

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Development of Wind & Ice Load on PCS Mast (per TIA/EIA-222-F-1996 Criteria)

Existing Mast Data: (HSS4.5x0.237) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 4.5$ in (User Input)

Mast Length = $L_{mast} := 2$ ft (User Input)

Mast Thickness = $t_{mast} := 0.237$ in (User Input)

Mast Aspect Ratio = $Ar_{mast} := \frac{12 L_{mast}}{D_{mast}} = 5.3$

Mast Force Coefficient = $Ca_{mast} = 0.8$ (per TIA/EIA-222-F Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.375$ sf/ft

Total Mast Wind Force = $qz_{mast2} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 14$ plf **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.46$ sf/ft

Total Mast Wind Force w/ Ice = $qzICE_{mast2} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 13$ plf **BLC 4**

Gravity Loads (without ice)

Weight of the mast = Self Weight **(Computed internally by Risa-3D)** plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 7.9$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 3$ plf **BLC 3**

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Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

Existing Antenna Data: (Nextel)

Antenna Model = PCS 30" Acellerator Stacked

Antenna Shape = Round (User Input)

Antenna Diameter = $D_{ant} := 30.0$ in (User Input)

Antenna Height = $L_{ant} := 152$ in (User Input)

Antenna Weight = $WT_{ant} := 530$ lbs (User Input)

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{D_{ant}} = 5.1$

Number of Antennas = $N_{ant} := 1$

Antenna Force Coefficient = $Ca_{ant} = 0.8$ (per TIA/EIA-222-F-1996 Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Antenna Projected Surface Area = $A_{ant} := \frac{D_{ant} \cdot L_{ant}}{144} = 31.7$ sf

Total Antenna Wind Force = $qz_{nextel} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1235$ lbs **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Antenna Projected Surface Area w/ Ice = $AICE_{ant} := \frac{(D_{ant} + 2 \cdot Ir) \cdot (L_{ant} + 2 \cdot Ir)}{144} = 32.9$ sf

Total Antenna Wind Force w/ Ice = $qzICE_{nextel} \cdot G_H \cdot Ca_{ant} \cdot AICE_{ant} = 974$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 530$ lbs **BLC 2**

Gravity Loads (ice only)

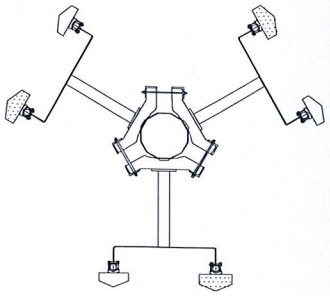
Ice Area per Linear Foot = $Ai_{ant} := \frac{\pi}{4}\left[(D_{ant} + Ir \cdot 2)^2 - D_{ant}^2\right] = 47.9$ sq in

Weight of Ice on Mast = $W_{ICEant} := Id \cdot \frac{Ai_{ant}}{144} \cdot \frac{L_{ant}}{12} = 236$ plf **BLC 3**

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

Existing Antenna Data: (AT&T)

Antenna Model =	Powerwave 7770			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 55$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.0$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 5$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 39$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 5.0$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	



Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 842$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 14$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 709$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 117$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1007$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 33$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 98$	lbs	**BLC 3**

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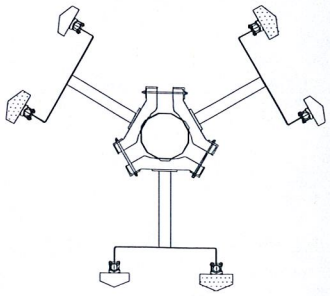
Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

Proposed Antenna Data: (AT&T)

Antenna Model =	Powerwave P65-16-XLH-RR		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 12$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 64$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)



Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 18$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1202$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 1001$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 192$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5184$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1459$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 47$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 142$	lbs	**BLC 3**

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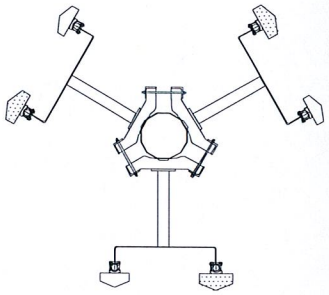
Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Development of Wind & Ice Load on TMA's (per TIA/EIA-222-F-1996 Criteria)

Existing TMA Data: (AT&T)

TMA Model =	Powerwave LGP 21401		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 14.4$	in	(User Input)
TMA Width =	$W_{TMA} := 9.2$	in	(User Input)
TMA Thickness =	$T_{TMA} := 2.6$	in	(User Input)
TMA Weight =	$WT_{TMA} := 14.1$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 6$		(User Input)
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.6$		
TMA Force Coefficient =	$Ca_{TMA} = 1.4$		(per TIA/EIA-222-F Table 3)



Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.9$	sf	
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 5.5$	sf	
Total TMA Wind Force =	$F_{TMA} := qz_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{TMA} = 369$	lbs	**BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 1.1$	sf	
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 6.5$	sf	
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qzICE_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{ICETMA} = 331$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All TMA's =	$WT_{TMA} \cdot N_{TMA} = 85$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 344$	cu in	
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 221$	cu in	
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 7$	lbs	
Weight of Ice on All TMA's	$W_{ICETMA} \cdot N_{TMA} = 43$	lbs	**BLC 3**

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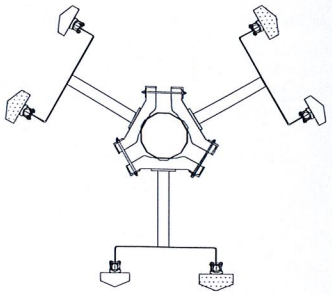
Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Development of Wind & Ice Load on TMA's (per TIA/EIA-222-F-1996 Criteria)

Proposed TMA Data: (AT&T)

TMA Model = Powerwave TTAW-07BP111-001

TMA Shape = Flat (User Input)



TMA Height = $L_{TMA} := 9.9$ in (User Input)

TMA Width = $W_{TMA} := 6.7$ in (User Input)

TMA Thickness = $T_{TMA} := 5.4$ in (User Input)

TMA Weight = $WT_{TMA} := 18$ lbs (User Input)

Number of TMA's = $N_{TMA} := 3$ (User Input)

TMA Aspect Ratio = $Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.5$

TMA Force Coefficient = $Ca_{TMA} = 1.4$ (per TIA/EIA-222-F Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA = $SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.5$ sf

TMA Projected Surface Area = $A_{TMA} := SA_{TMA} \cdot N_{TMA} = 1.4$ sf

Total TMA Wind Force = $F_{TMA} := qz_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{TMA} = 92$ lbs **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice = $SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 0.6$ sf

TMA Projected Surface Area w/ Ice = $A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 1.7$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA} := qzICE_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{ICETMA} = 89$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All TMA's = $WT_{TMA} \cdot N_{TMA} = 54$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each TMA = $V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 358$ cu in

Volume of Ice on Each TMA = $V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 179$ cu in

Weight of Ice on Each TMA = $W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 6$ lbs

Weight of Ice on All TMA's = $W_{ICETMA} \cdot N_{TMA} = 17$ lbs **BLC 3**

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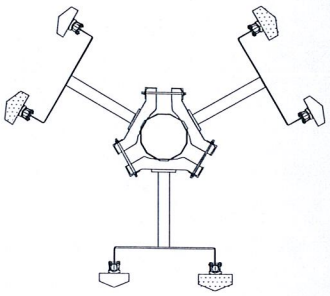
Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Development of Wind & Ice Load on Antenna Mounts (per TIA/EIA-222-F-1996 Criteria)

Mount Data:

Mount Type: (3) Valmont Dual Standoff Mounts P/N B1827

Platform Shape =	Flat		(User Input)
Platform Area =	$A_{plt} := 5.3$	sq ft	(User Input)
Platform Area w/ Ice =	$A_{ICE.plt} := 6.63$	sq ft	(User Input)
Platform Weight =	$WT_{plt} := 640$	lbs	(User Input)
Platform Weight w/ Ice =	$WT_{ICE.plt} := 745$	lbs	(User Input)
Platform Force Coefficient =	$Ca_{plt} := 1.4$		(User Input)



(per TIA/EIA-222-F Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Total Platform Wind Force = $F_{plt} := qz_{att} \cdot G_H \cdot Ca_{plt} \cdot A_{plt} = 354$ lbs **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Total Platform Wind Force w/ Ice = $Fi_{plt} := qzICE_{att} \cdot G_H \cdot Ca_{plt} \cdot A_{ICE.plt} = 336$ lbs **BLC 4**

Gravity Load (without ice)

Weight of Platform = $WT_{plt} = 640$ lbs **BLC 2**

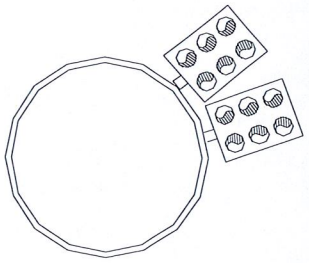
Gravity Loads (ice only)

Weight of Ice on Platform = $WT_{ICE.plt} - WT_{plt} = 105$ lbs **BLC 3**

Development of Wind & Ice Load on Coax Cables — per TIA/EIA-222-F-96 Criteria

Existing Coax Cable Data:

Coax Type =	HELIAX 1-5/8"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)
Coax Cable Length =	$L_{coax} := 10.0$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 12$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 3$		(User Input)



Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 60.6$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$ TIA/EIA-222-F-96 Table 3

Wind Load (without ice) — per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.5$ sf/ft

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{coax} \cdot G_H \cdot A_{coax} = 28$ plf **BLC 5**

Wind Load (with ice) — per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot Ir)}{12} = 0.6$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qzICE_{coax} \cdot G_H \cdot AICE_{coax} = 25$ plf **BLC 4**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 12$ plf **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot Ir)^2 - D_{coax}^2\right] = 3.9$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 18$ plf **BLC 3**

CENTEK engineering, INC.	Subject:	**Analysis of TIA/EIA Wind and Ice Loads for Analysis of Mast Only**
Consulting Engineers		**Tabulated Load Cases**
63-2 North Branford Road	Location:	**Bethel, CT**
Branford, CT 06405	Date: 7/19/11	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55
Ph. 203-488-0580 / Fax. 203-488-8587		

Load Case	Description
1	Self Weight (Mast)
2	Weight of Appurtenances
3	Weight of Ice Only on PCS Structure (1)
4	TIA/EIA Wind with Ice on PCS Structure (1)
5	TIA/EIA Wind on PCS Structure (1)

Footnotes:
(1) PCS Structure includes: Mast and Appurtenances

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Consulting Engineers
63-2 North Branford Road
Branford, CT 06405
Ph. 203-488-0580 / Fax. 203-488-8587

Subject: **Analysis of TIA/EIA Wind and Ice Loads for Analysis of Mast Only**
Load Combinations Table

Location: **Bethel, CT**

Date: 7/19/11 Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Load Combination	Description	Envelope Soultion	Wind Factor	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	TIA/EIA Wind + Ice on PCS Structure		1		1	1	2	1	3	1	4	1		
2	TIA/EIA Wind on PCS Structure		1		1	1	2	1	5	1				

Footnotes:
(1) BLC = Basic Load Case
(2) PCS Structure includes: Mast and Appurtenances

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y
Global Member Orientation Plane	XZ

Hot Rolled Steel Code	AISC 9th: ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05/08: ASD
Aluminum Code	AA ADM1-05: ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ct Exp. X	.75
Ct Exp. Z	.75
Ca	.36
Cv	.54
Nv	1
SD1	1
SDS	1
S1	1
Occupancy Code	4
Seismic Zone	3
Use Group	I
Use Gravity Self Wt in Diaphragm Mass	Yes
Use Deck Self Wt in Diaphragm Mass	Yes
Use Lateral Self Wt in Diaphragm Mass	Yes
Seismic Detailing Code	None
Om X	1
Om Z	1
Rho X	1
Rho Z	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	Kyy	Kzz	Cm-...	Cm-...	Cb	y sw...	z sw...	Function
1	M1	Existing ...	8												Lateral
2	M2	Existing ...	2												Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Existing Lower Mast	HSS18X0.375	Beam	Pipe	A500 Gr.42	Typical	19.4	754	754	1510
2	Existing Upper Mast	4.5" Mast w/ Stiffen...	Beam	Pipe	A500 Gr.42	Typical	7.37	74.86	74.86	14.465

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N2	N3			Existing Lower...	Beam	Pipe	A500 Gr.42	Typical
2	M2	N3	N4			Existing Upper...	Beam	Pipe	A500 Gr.42	Typical
3	M3	N1	N2			RIGID	None	None	RIGID	Typical
4	M4	N4	N5			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	1.5	0	0	
3	N3	0	9.5	0	0	
4	N4	0	11.5	0	0	
5	N5	0	17.83	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N2		Reaction					
2	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
No Data to Print ...			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.53	6.3
2	M1	Y	-.117	5
3	M1	Y	-.192	5
4	M1	Y	-.085	5
5	M1	Y	-.054	5
6	M1	Y	-.64	5

Member Point Loads (BLC 3 : Weight of Ice Only on PCS Struct)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.236	6.3
2	M1	Y	-.098	5
3	M1	Y	-.142	5
4	M1	Y	-.043	5
5	M1	Y	-.017	5
6	M1	Y	-.105	5

Member Point Loads (BLC 4 : TIA/EIA Wind with Ice on PCS Str)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	X	.974	6.3
2	M1	X	.709	5
3	M1	X	1.001	5
4	M1	X	.331	5
5	M1	X	.089	5
6	M1	X	.336	5

Member Point Loads (BLC 5 : TIA/EIA Wind on PCS Structure)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	X	1.235	6.3
2	M1	X	.842	5
3	M1	X	1.202	5
4	M1	X	.369	5
5	M1	X	.092	5
6	M1	X	.354	5

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.012	-.012	0	0
2	M2	Y	-.012	-.012	0	0

Member Distributed Loads (BLC 3 : Weight of Ice Only on PCS Struct)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.011	-.011	0	0
2	M2	Y	-.003	-.003	0	0
3	M1	Y	-.018	-.018	0	0
4	M2	Y	-.018	-.018	0	0

Member Distributed Loads (BLC 4 : TIA/EIA Wind with Ice on PCS Str)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]

Member Distributed Loads (BLC 4 : TIA/EIA Wind with Ice on PCS Str) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.046	.046	0	0
2	M2	X	.013	.013	0	0
3	M1	X	.025	.025	0	0
4	M2	X	.025	.025	0	0

Member Distributed Loads (BLC 5 : TIA/EIA Wind on PCS Structure)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.057	.057	0	0
2	M2	X	.014	.014	0	0
3	M1	X	.028	.028	0	0
4	M2	X	.028	.028	0	0

Basic Load Cases

	BLC Description	Category	X Gravi...	Y Gravi...	Z Gravity	Joint	Point	Distrib...	Area(M...	Surfac...
1	Self Weight (PCS Mast)	None		-1						
2	Weight of Appurtenances	None					6	2		
3	Weight of Ice Only on PCS Struct	None					6	4		
4	TIA/EIA Wind with Ice on PCS Str	None					6	4		
5	TIA/EIA Wind on PCS Structure	None					6	4		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	TIA/EIA Wind + Ice on PCS Stru...	Yes			1	1	2	1	3	1	4	1										
2	TIA/EIA Wind on PCS Structure	Yes			1	1	2	1	5	1												
3	Self Weight				1	1																

Envelope Member Section Forces

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
1	M1	1	max	3.231	1	4.858	2	0	1	0	1	0	1	37.901	2
2			min	2.316	2	4.084	1	0	1	0	1	0	1	31.162	1
3		2	max	3.017	1	4.688	2	0	1	0	1	0	1	28.355	2
4			min	2.16	2	3.942	1	0	1	0	1	0	1	23.136	1
5		3	max	2.803	1	4.518	2	0	1	0	1	0	1	19.149	2
6			min	2.004	2	3.8	1	0	1	0	1	0	1	15.394	1
7		4	max	1.096	1	1.489	2	0	1	0	1	0	1	13.142	2
8			min	.76	2	1.192	1	0	1	0	1	0	1	10.402	1
9		5	max	.882	1	1.319	2	0	1	0	1	0	1	10.334	2
10			min	.604	2	1.05	1	0	1	0	1	0	1	8.16	1
11	M2	1	max	.882	1	1.319	2	0	1	0	1	0	1	10.334	2
12			min	.604	2	1.05	1	0	1	0	1	0	1	8.16	1
13		2	max	.853	1	1.298	2	0	1	0	1	0	1	9.68	2
14			min	.586	2	1.031	1	0	1	0	1	0	1	7.64	1
15		3	max	.824	1	1.277	2	0	1	0	1	0	1	9.036	2
16			min	.567	2	1.012	1	0	1	0	1	0	1	7.129	1
17		4	max	.795	1	1.256	2	0	1	0	1	0	1	8.403	2
18			min	.549	2	.993	1	0	1	0	1	0	1	6.628	1
19		5	max	.766	1	1.235	2	0	1	0	1	0	1	7.78	2
20			min	.53	2	.974	1	0	1	0	1	0	1	6.136	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
21	M3	1	max	0	1	4.858	2	0	1	0	1	0	1	45.188	2
22			min	0	1	4.084	1	0	1	0	1	0	1	37.288	1
23		2	max	0	1	4.858	2	0	1	0	1	0	1	43.367	2
24			min	0	1	4.084	1	0	1	0	1	0	1	35.757	1
25		3	max	0	1	4.858	2	0	1	0	1	0	1	41.545	2
26			min	0	1	4.084	1	0	1	0	1	0	1	34.225	1
27		4	max	0	1	4.858	2	0	1	0	1	0	1	39.723	2
28			min	0	1	4.084	1	0	1	0	1	0	1	32.694	1
29		5	max	0	1	4.858	2	0	1	0	1	0	1	37.901	2
30			min	0	1	4.084	1	0	1	0	1	0	1	31.162	1
31	M4	1	max	.766	1	1.235	2	0	1	0	1	0	1	7.78	2
32			min	.53	2	.974	1	0	1	0	1	0	1	6.136	1
33		2	max	.766	1	1.235	2	0	1	0	1	0	1	5.826	2
34			min	.53	2	.974	1	0	1	0	1	0	1	4.595	1
35		3	max	.766	1	1.235	2	0	1	0	1	0	1	3.872	2
36			min	.53	2	.974	1	0	1	0	1	0	1	3.053	1
37		4	max	.766	1	1.235	2	0	1	0	1	0	1	1.917	2
38			min	.53	2	.974	1	0	1	0	1	0	1	1.512	1
39		5	max	0	1	0	1	0	1	0	1	0	1	0	2
40			min	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Member Section Stresses

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
1	M1	1	max	.167	1	.501	2	0	1	-4.464	1	5.429	2	0	1	0	1
2			min	.119	2	.421	1	0	1	-5.429	2	4.464	1	0	1	0	1
3		2	max	.156	1	.483	2	0	1	-3.314	1	4.062	2	0	1	0	1
4			min	.111	2	.406	1	0	1	-4.062	2	3.314	1	0	1	0	1
5		3	max	.144	1	.466	2	0	1	-2.205	1	2.743	2	0	1	0	1
6			min	.103	2	.392	1	0	1	-2.743	2	2.205	1	0	1	0	1
7		4	max	.057	1	.154	2	0	1	-1.49	1	1.882	2	0	1	0	1
8			min	.039	2	.123	1	0	1	-1.882	2	1.49	1	0	1	0	1
9		5	max	.045	1	.136	2	0	1	-1.169	1	1.48	2	0	1	0	1
10			min	.031	2	.108	1	0	1	-1.48	2	1.169	1	0	1	0	1
11	M2	1	max	.12	1	.358	2	0	1	-2.943	1	3.727	2	0	1	0	1
12			min	.082	2	.285	1	0	1	-3.727	2	2.943	1	0	1	0	1
13		2	max	.116	1	.352	2	0	1	-2.756	1	3.491	2	0	1	0	1
14			min	.079	2	.28	1	0	1	-3.491	2	2.756	1	0	1	0	1
15		3	max	.112	1	.347	2	0	1	-2.571	1	3.259	2	0	1	0	1
16			min	.077	2	.275	1	0	1	-3.259	2	2.571	1	0	1	0	1
17		4	max	.108	1	.341	2	0	1	-2.391	1	3.031	2	0	1	0	1
18			min	.074	2	.269	1	0	1	-3.031	2	2.391	1	0	1	0	1
19		5	max	.104	1	.335	2	0	1	-2.213	1	2.806	2	0	1	0	1
20			min	.072	2	.264	1	0	1	-2.806	2	2.213	1	0	1	0	1
21	M3	1	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
22			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
23		2	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
24			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
25		3	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
26			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
27		4	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
28			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
29		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
30			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
31	M4	1	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
32			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
33		2	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
34			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
35		3	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
36			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
37		4	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
38			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
39		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
40			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N2	max	0	1	3.231	1	0	1	0	1	0	1	0	1
2		min	0	1	2.316	2	0	1	0	1	0	1	0	1
3	N1	max	-4.084	1	0	1	0	1	0	1	0	1	45.188	2
4		min	-4.858	2	0	2	0	1	0	1	0	1	37.288	1
5	Totals:	max	-4.084	1	3.231	1	0	1						
6		min	-4.858	2	2.316	2	0	1						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	2	0	2	0	1	0	1	0	1	0	1
2		min	0	1	0	1	0	1	0	1	0	1	0	2
3	N2	max	0	2	0	2	0	1	0	1	0	1	0	1
4		min	0	1	0	1	0	1	0	1	0	1	0	2
5	N3	max	.068	2	0	2	0	1	0	1	0	1	-8.941e-4	1
6		min	.056	1	0	1	0	1	0	1	0	1	-1.106e-3	2
7	N4	max	.111	2	0	2	0	1	0	1	0	1	-1.841e-3	1
8		min	.09	1	0	1	0	1	0	1	0	1	-2.305e-3	2
9	N5	max	.286	2	0	2	0	1	0	1	0	1	-1.841e-3	1
10		min	.229	1	0	1	0	1	0	1	0	1	-2.305e-3	2

Envelope AISC ASD Steel Code Checks

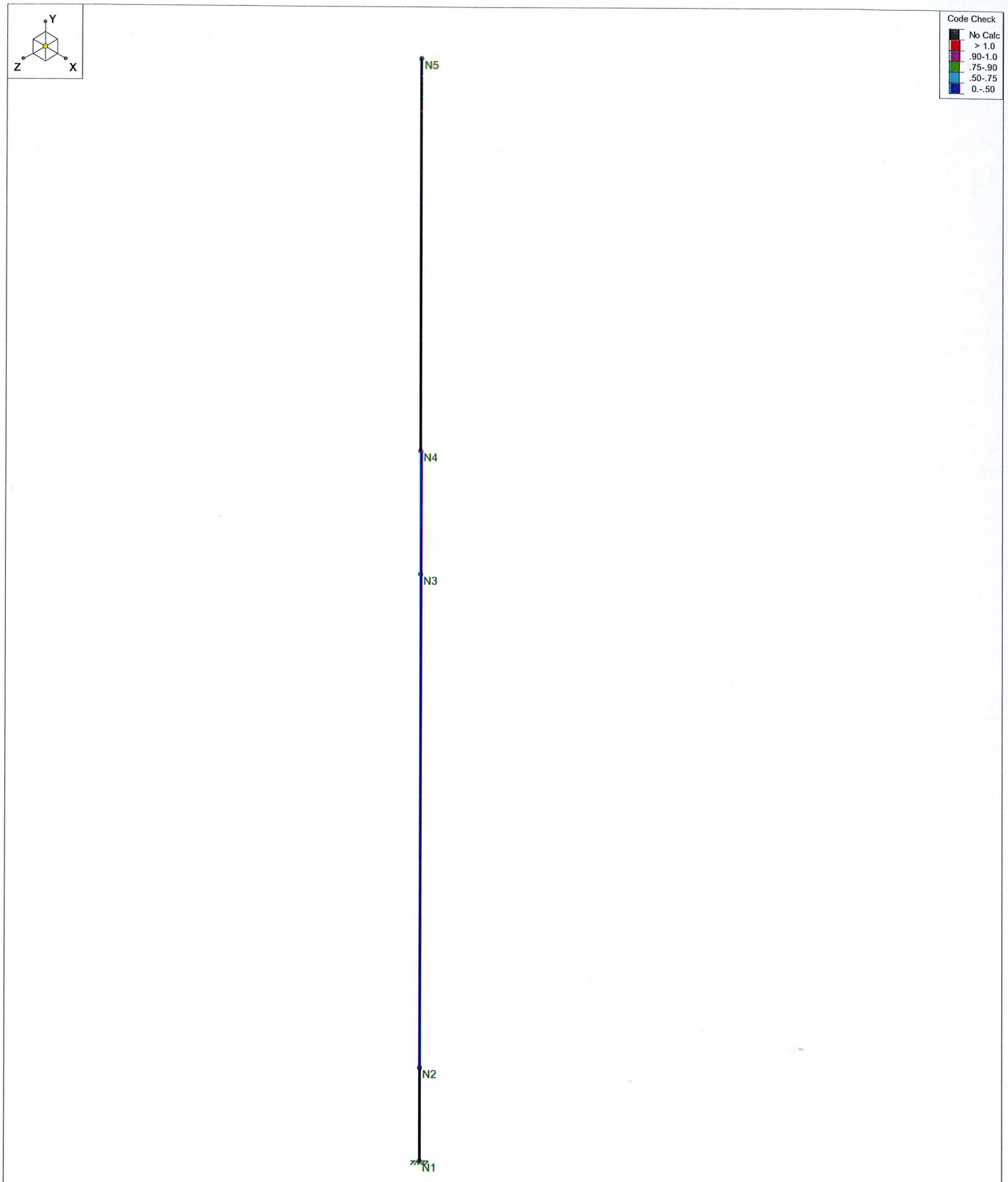
	Member	Shape	Code Check	Loc[ft]	LC	Shea...	Loc[ft]	...	L...	Fa [k...	Ft [ksi]	Fb y-...	Fb z-...	...	C...	C...	ASD ...
1	M1	HSS18X0.375	.201	0	2	.030	0		2	24.265	25.2	27.72	27.72	1...	.6	.85	H1-2
2	M2	4.5" Mast w/ ..	.138	0	2	.021	0		2	24.788	25.2	27.72	27.72	1...	.6	.85	H1-2

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N2	0	3.231	0	0	0	0
2	1	N1	-4.084	0	0	0	0	37.288
3	1	Totals:	-4.084	3.231	0			
4	1	COG (ft):	X: 0	Y: 9.058	Z: 0			

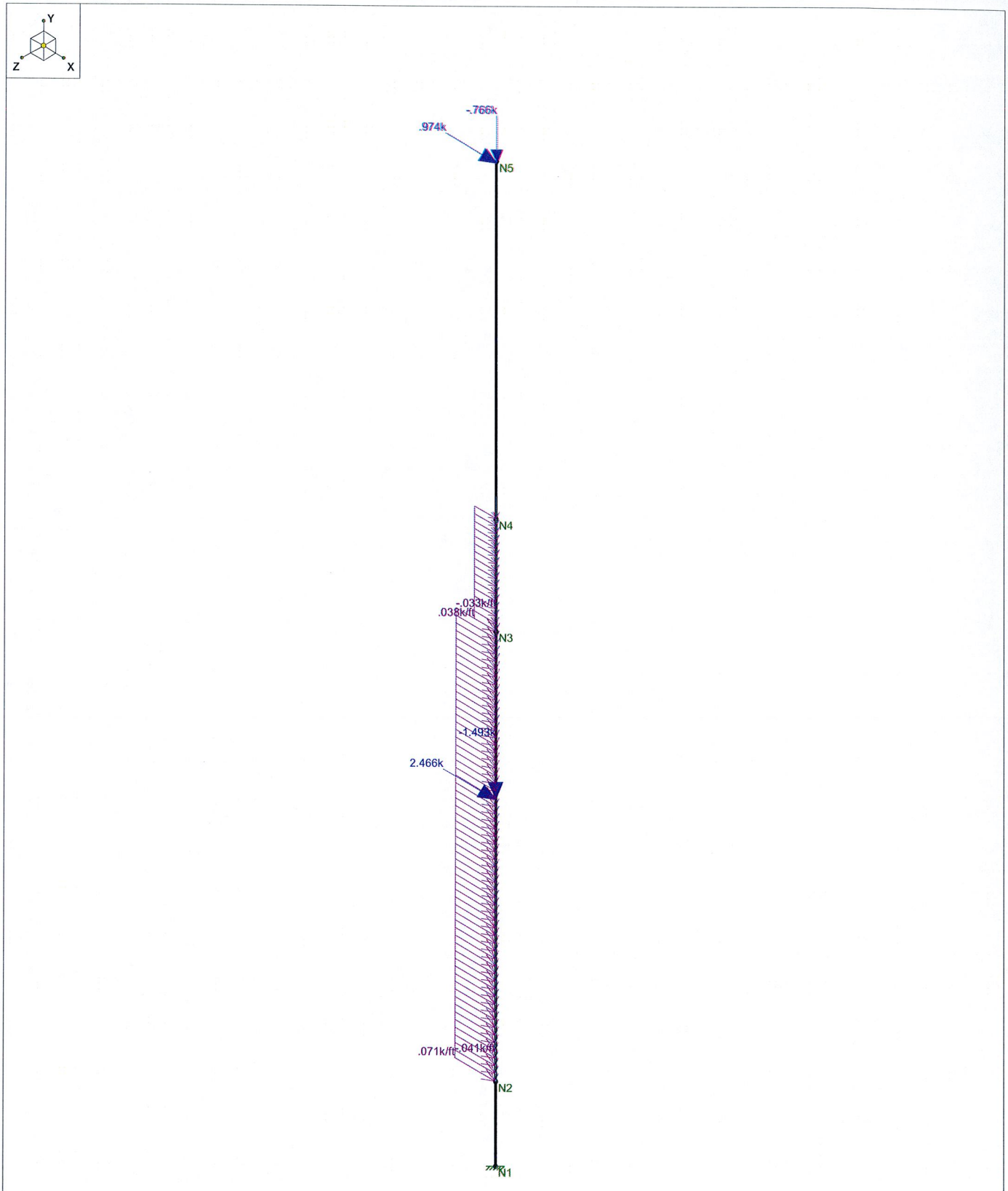
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N2	0	2.316	0	0	0	0
2	2	N1	-4.858	0	0	0	0	45.188
3	2	Totals:	-4.858	2.316	0			
4	2	COG (ft):	X: 0	Y: 8.944	Z: 0			



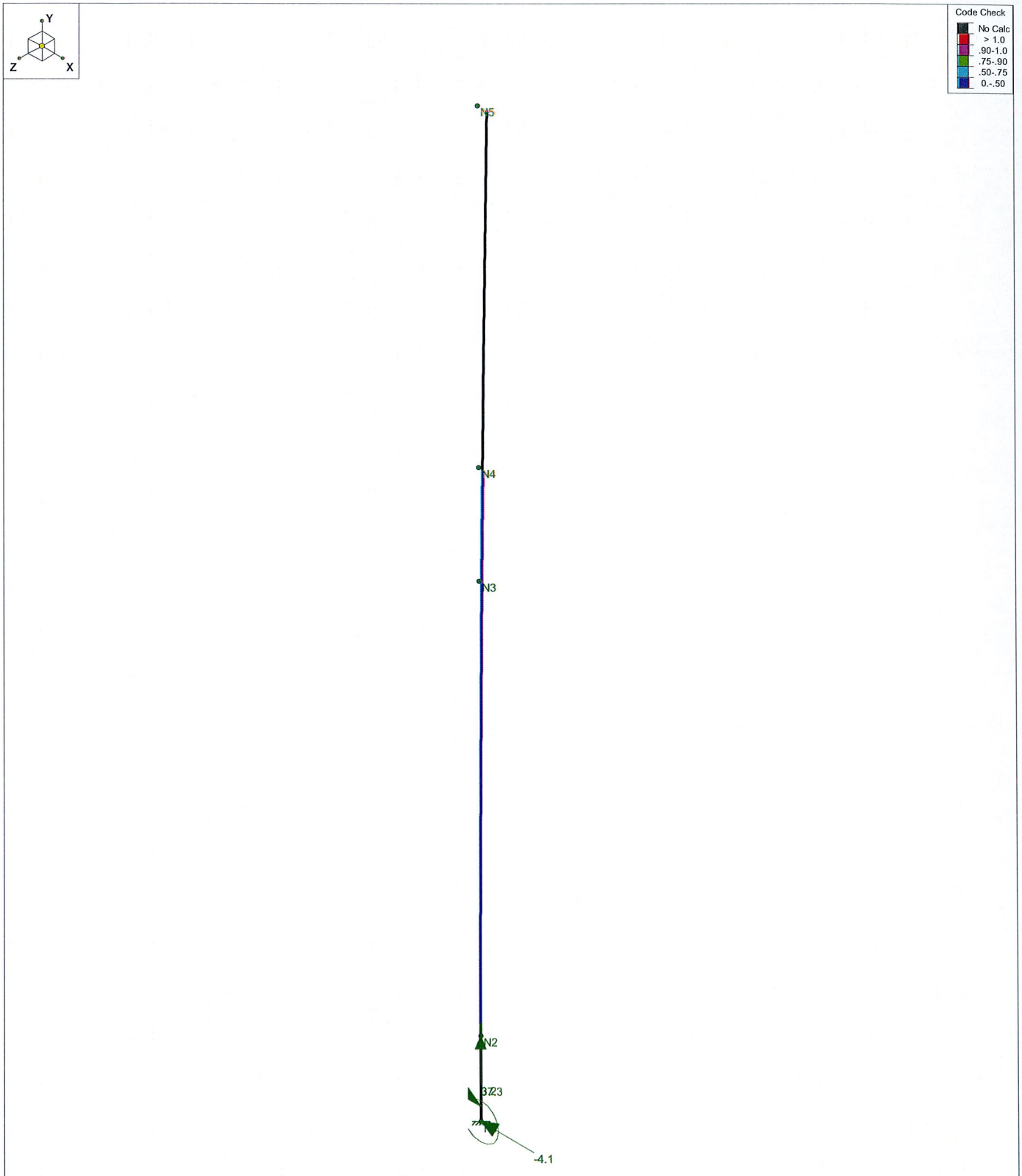
Solution: Envelope

CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 3:01 PM
11021.CO55 /AT&T CT5176	Unity Check	5176 EIA-TIA Loading.r3d



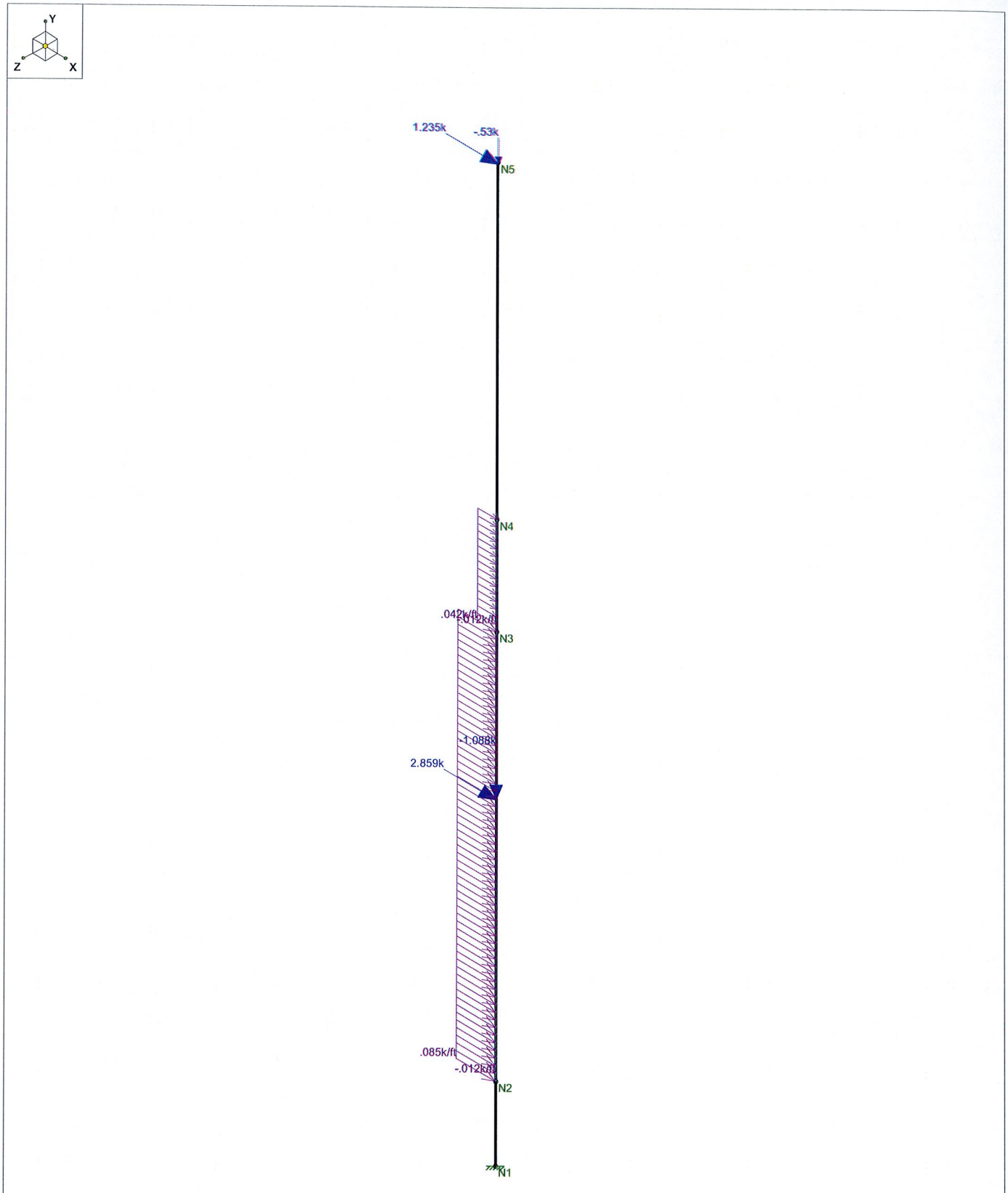
Loads: LC 1, TIA/EIA Wind + Ice on PCS Structure

CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 3:02 PM
11021.CO55 /AT&T CT5176	LC # 1 Loads	5176 EIA-TIA Loading.r3d



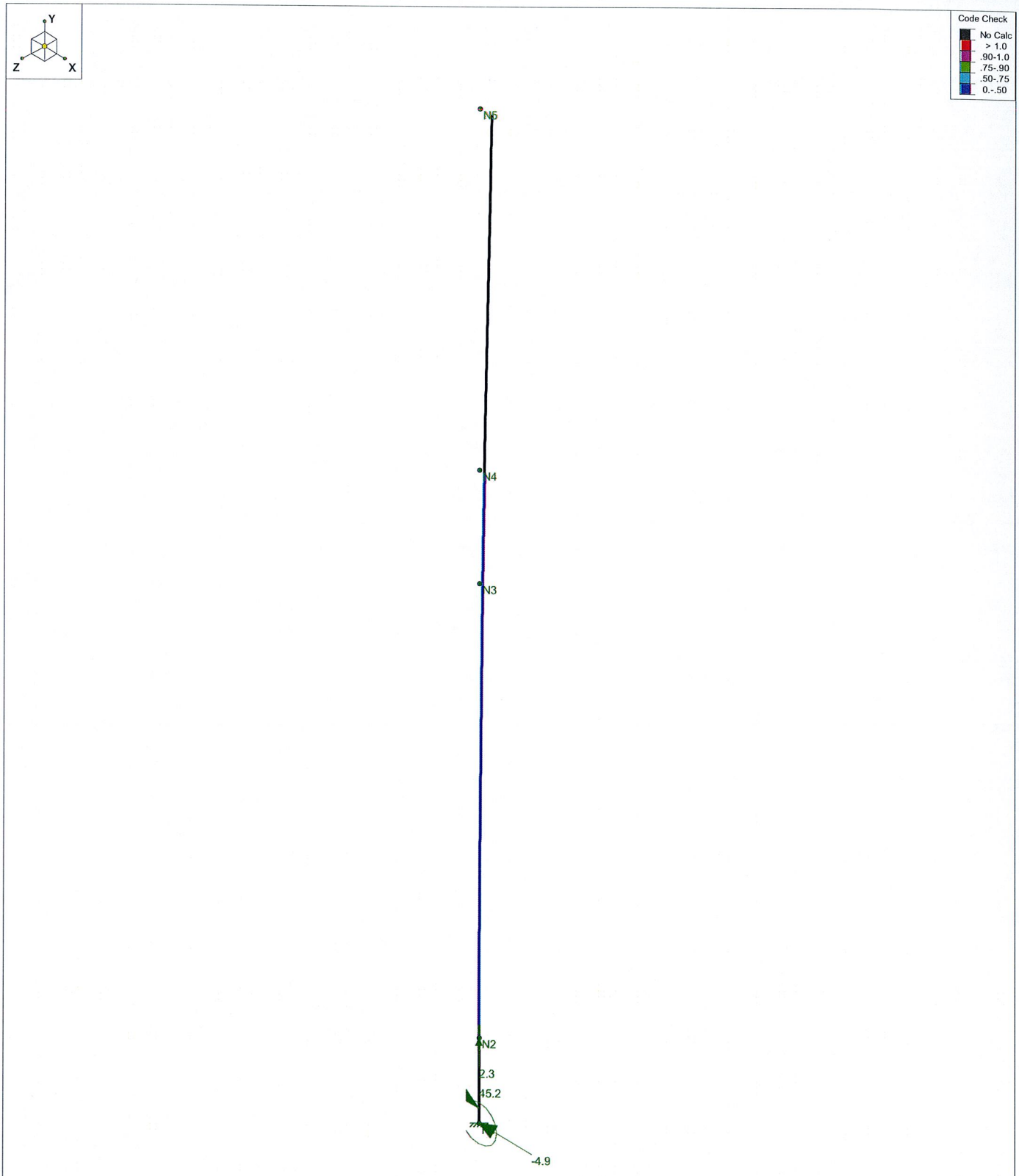
Results for LC 1, TIA/EIA Wind + Ice on PCS Structure
Z-moment Reaction units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 3:04 PM
11021.CO55 /AT&T CT5176	LC # 1 Reactions and Deflected Shape	5176 EIA-TIA Loading.r3d



Loads: LC 2, TIA/EIA Wind on PCS Structure

CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 3:02 PM
11021.CO55 /AT&T CT5176	LC # 2 Loads	5176 EIA-TIA Loading.r3d



Results for LC 2, TIA/EIA Wind on PCS Structure
Z-moment Reaction units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 3:04 PM
11021.CO55 /AT&T CT5176	LC # 2 Reactions and Deflected Shape	5176 EIA-TIA Loading.r3d

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Subject:	Connection of Mast to CL&P Pole # 10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Mast Connection to CL&P Pole:

Reactions:

Moment =	Moment := 45.2·kip·ft	(Input From Risa-3D)
Vertical =	Vertical := 0·kips	(Input From Risa-3D)
Horizontal x-dir =	Horizontal := 4.9·kips	(Input From Risa-3D)

Bolt Data:

Bolt Type =	ASTM A325	(User Input)
Bolt Diameter =	D := 0.75·in	(User Input)
Number of Bolts Per Angle =	$N_b := 4$	(User Input)
Allowable Tensile Strength =	$F_t := 19.9 \cdot kips$	(User Input)
Allowable Shear Strength =	$F_v := 10.6 \cdot kips$	(User Input)
Distance Between Bolts =	$D_{bolt} := 25 \cdot in$	(User Input)

Shear Force =

$$f_v := \sqrt{\left(\frac{Horizontal}{N_b \cdot 2}\right)^2 + \left(\frac{Moment}{D_{bolt} \cdot N_b}\right)^2} = 5.5 \cdot kips$$

Bolt Shear % of Capacity =

$$\frac{f_v}{F_v} = 51.5 \cdot \%$$

Check Bolt Shear =

$$Bolt\_Shear := if\left(\frac{f_v}{F_v} \le 1.00, "OK", "Overstressed"\right)$$

Bolt_Shear = "OK"

Tension Force =

$$f_t := \frac{Horizontal}{N_b} = 1.2 \cdot kips$$

Bolt Tenison % of Capacity =

$$\frac{f_t}{F_t} = 6.16 \cdot \%$$

Check Bolt Tension =

$$Bolt\_Tension := if\left(\frac{f_t}{F_t} \le 1.00, "OK", "Overstressed"\right)$$

Bolt_Tension = "OK"

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Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L Checked by: C.F.C. Job No. 10021.CO55

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2007 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 100	mph	(User Input NESC 2007 Figure 250-2(e))
Radial Ice Thickness =	Ir := 0.50	in	(User Input)
Radial Ice Density =	Id := 56.0	pcf	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of PCS Mast Above Grade =	TME := 162.67	ft	(User Input)
Multiplier Gust Response Factor =	m := 1.25		(User Input - Only for NESC Extreme wind case)
NESC Factor =	kv := 1.43		(User Input from NESC 2007 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2007 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.402$ (NESC 2007 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.292$ (NESC 2007 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.783$ (NESC 2007 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.83$ (NESC 2007 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 29.8$ psf (NESC 2007 Section 250.C.2)

Shape Factors

NUS Design Criteria Issued April 12, 2007

Shape Factor for Round Members =	$Cd_R := 1.3$	(User Input)
Shape Factor for Flat Members =	$Cd_F := 1.6$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.45$	(User Input)

Overload Factors

NU Design Criteria Table

Overload Factors for Wind Loads:

NESC Heavy Loading =	**2.5**	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

Overload Factors for Vertical Loads:

NESC Heavy Loading =	**1.5**	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

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Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
Location:	Bethel, CT
Rev. 1: 1/30/12	Prepared by: T.J.L Checked by: C.F.C. Job No. 10021.CO55

Development of Wind & Ice Load on PCS Mast

Existing PCS Mast Data: (HSS 18.0x0.375)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 18$	in	(User Input)
Mast Length =	$L_{mast} := 8$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.375$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.5$ sf/ft

Total Mast Wind Force = $qz \cdot Cd_R \cdot A_{mast} \cdot m = 73$ plf **BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 1.583$ sf/ft

Total Mast Wind Force w/ Ice = $p \cdot Cd_R \cdot AICE_{mast} = 8$ plf **BLC 4**

Gravity Loads (without ice)

Weight of the mast = Self Weight **(Computed internally by Risa-3D)** plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 29.1$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 11$ plf **BLC 3**

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Subject:	Load Analysis of Pipe Mast on CL&P Structure #10254
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Development of Wind & Ice Load on PCS Mast

Existing PCS Mast Data: (HSS 4.5x0.237)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 4.5$	in	(User Input)
Mast Length =	$L_{mast} := 2$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.237$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.375$ sf/ft

Total Mast Wind Force = $qz \cdot Cd_R \cdot A_{mast} \cdot m = 18$ plf **BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.458$ sf/ft

Total Mast Wind Force w/ Ice = $p \cdot Cd_R \cdot AICE_{mast} = 2$ plf **BLC 4**

Gravity Loads (without ice)

Weight of the mast = Self Weight **(Computed internally by Risa-3D)** plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 7.9$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 3$ plf **BLC 3**

Development of Wind & Ice Load on Antennas

Existing Antenna Data: (Nextel)

Antenna Model =	PCS 30" Acellerator Stacked		(User Input)
Antenna Diameter =	$D_{ant} := 30.0$	in	(User Input)
Antenna Height =	$L_{ant} := 152$	in	(User Input)
Antenna Weight =	$WT_{ant} := 530$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Antenna Projected Surface Area = $A_{ant} := \frac{L_{ant} \cdot D_{ant}}{144} = 31.7$ sf

Total Antenna Wind Force = $qz \cdot Cd_R \cdot A_{ant} \cdot m = 1533$ lbs **BLC 5**

Wind Load (NESE Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Antenna Projected Surface Area w/ Ice = $AICE_{ant} := \frac{(D_{ant} + 2 \cdot Ir) \cdot L_{ant}}{144} = 32.7$ sf

Total Mast Wind Force w/ Ice = $p \cdot Cd_R \cdot AICE_{ant} = 170$ lbs **BLC 4**

Gravity Loads (without ice)

Weight of the Antenna = $WT_{ant} \cdot N_{ant} = 530$ lbs **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{ant} := \frac{\pi}{4}\left[(D_{ant} + Ir \cdot 2)^2 - D_{ant}^2\right] = 47.9$ sq in

Weight of Ice on the Antenna = $W_{ICEant} := Id \cdot \frac{Ai_{ant}}{144} \cdot \frac{L_{ant}}{12} = 236$ lbs **BLC 3**

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Subject: Load Analysis of Pipe Mast on CL&P Structure #10254

Location: Bethel, CT

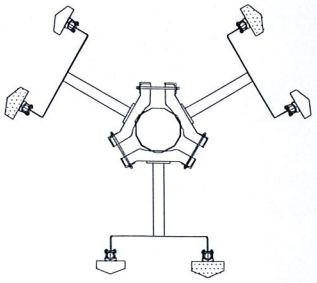
Rev. 1: 1/30/12

Prepared by: T.J.L Checked by: C.F.C.
Job No. 10021.CO55

Development of Wind & Ice Load on Antennas

Existing Antenna Data: (AT&T)

Antenna Model =	Powerwave 7770		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55$	in	(User Input)
Antenna Width =	$W_{ant} := 11.0$	in	(User Input)
Antenna Thickness =	$T_{ant} := 5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 39$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)



Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 751$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 14$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 90$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 117$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1007$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 33$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 98$	lbs	**BLC 3**

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Subject: Load Analysis of Pipe Mast on CL&P Structure #10254

Location: Bethel, CT

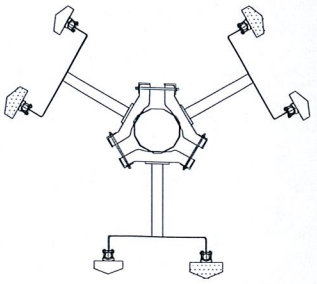
Rev. 1: 1/30/12

Prepared by: T.J.L Checked by: C.F.C.
Job No. 10021.CO55

Development of Wind & Ice Load on Antennas

Proposed Antenna Data: (AT&T)

Antenna Model =	Powerwave P65-16-XLH-RR		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 12$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 64$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)



Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 18$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1072$	lbs	BLC 5

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 127$	lbs	BLC 4

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 192$	lbs	BLC 2

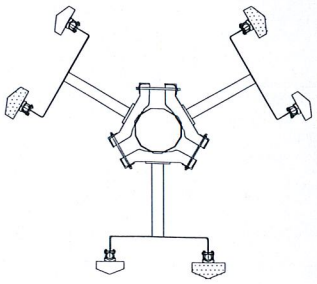
Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5184$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1459$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 47$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 142$	lbs	BLC 3

Development of Wind & Ice Load on TMA's

Existing TMA Data: (AT&T)

TMA Model =	Powerwave LGP 21401		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 14.4$	in	(User Input)
TMA Width =	$W_{TMA} := 9.2$	in	(User Input)
TMA Thickness =	$T_{TMA} := 2.6$	in	(User Input)
TMA Weight =	$WT_{TMA} := 14.1$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 6$		(User Input)



Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.9$	sf	
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 5.5$	sf	
Total TMA Wind Force =	$F_{TMA} := qz \cdot Cd_F \cdot A_{TMA} \cdot m = 329$	lbs	BLC 5

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 1.1$	sf	
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 6.5$	sf	
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := p \cdot Cd_F \cdot A_{ICETMA} = 42$	lbs	BLC 4

Gravity Load (without ice)

Weight of All TMA's =	$WT_{TMA} \cdot N_{TMA} = 85$	lbs	BLC 2

Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 344$	cu in	
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 221$	cu in	
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 7$	lbs	
Weight of Ice on All TMA's	$W_{ICETMA} \cdot N_{TMA} = 43$	lbs	BLC 3

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Subject: Load Analysis of Pipe Mast on CL&P Structure #10254

Location: Bethel, CT

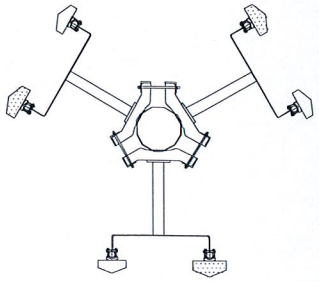
Rev. 1: 1/30/12

Prepared by: T.J.L Checked by: C.F.C.
Job No. 10021.CO55

Development of Wind & Ice Load on TMA's

Proposed TMA Data: (AT&T)

TMA Model =	Powerwave TTAW-07BP111-001		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 9.9$	in	(User Input)
TMA Width =	$W_{TMA} := 6.7$	in	(User Input)
TMA Thickness =	$T_{TMA} := 5.4$	in	(User Input)
TMA Weight =	$WT_{TMA} := 18$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 3$		(User Input)



Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.5$	sf	
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 1.4$	sf	
Total TMA Wind Force =	$F_{TMA} := qz \cdot Cd_F \cdot A_{TMA} \cdot m = 82$	lbs	BLC 5

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 0.6$	sf	
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 1.7$	sf	
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := p \cdot Cd_F \cdot A_{ICETMA} = 11$	lbs	BLC 4

Gravity Load (without ice)

Weight of All TMA's =	$WT_{TMA} \cdot N_{TMA} = 54$	lbs	BLC 2

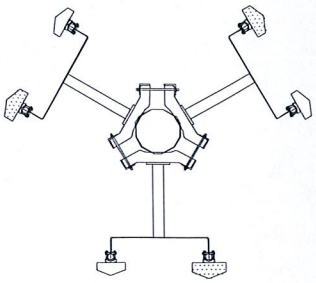
Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 358$	cu in	
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 179$	cu in	
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 6$	lbs	
Weight of Ice on All TMA's	$W_{ICETMA} \cdot N_{TMA} = 17$	lbs	BLC 3

Development of Wind & Ice Load on Mounts

Mount Data: (AT&T)

Mount Type =	(3) Valmont Dual Standoff Mounts P/N B1827		
Mount Shape =	Flat		(User Input)
Mount Area =	$A_{mnt} := 5.3$	sq ft	(User Input)
Mount Area w/ Ice =	$A_{ICEmnt} := 6.63$	sq ft	(User Input)
Mount Weight =	$WT_{mnt} := 640$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{ICEmnt} := 745$	lbs	(User Input)



Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt} := qz \cdot Cd_F \cdot A_{mnt} \cdot m = 316$ lbs **BLC 5**

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt} := p \cdot Cd_F \cdot A_{ICEmnt} = 42$ lbs **BLC 4**

Gravity Load (without ice)

Weight of Mount = $WT_{mnt} = 640$ lbs **BLC 2**

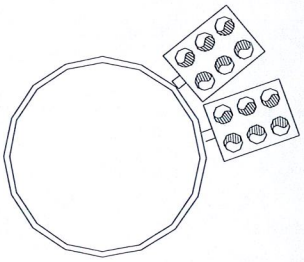
Gravity Load (ice only)

Weight of Ice on Mount = $WT_{ICEmnt} - WT_{mnt} = 105$ lbs **BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-5/8"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)
Coax Cable Length =	$L_{coax} := 10$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 12$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 3$		(User Input)



Wind Load (NESC Extreme)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.5$ sf/ft

Total Coax Wind Force = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 27$ plf **BLC 5**

Wind Load (NESC Heavy)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot Ir)}{12} = 0.6$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 3$ plf **BLC 4**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 12$ plf **BLC 2**

Gravity Load (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot Ir)^2 - D_{coax}^2\right] = 3.9$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 18$ plf **BLC 3**

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Subject: **Analysis of NESC Heavy Wind and NESC Extreme Wind for Obtaining PCS Structure Reactions Applied to CL&P Pole Tabulated Load Cases**

Location: **Bethel, CT**

Date:7/19/11 Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Load Case	Description
1	Self Weight (Mast)
2	Weight of Appurtenances
3	Weight of Ice Only on PCS Structure (1)
4	NESC Heavy Wind on PCS Structure(1)
5	NESC Extreme Wind on PCS Structure(1)

Footnotes:
(1) PCS Structure includes: Mast and Appurtenances

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Subject: **Analysis of NESC Heavy Wind and NESC Extreme Wind for Obtaining PCS Structure Reactions Applied to CL&P Pole Load Combinations Table**

Location: **Bethel, CT**

Date: 7/19/11 Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Load Combination	Description	Envelope Soultion	Wind Factor	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	NESC Heavy Wind on PCS Structure		1		1	1.5	2	1.5	3	1.5	4	2.5		
2	NESC Extreme Wind on PCS Structure		1		1	1	2	1	5	1				

Footnotes:
(1) BLC = Basic Load Case
(2) PCS Structure includes: Mast and Appurtenances

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y
Global Member Orientation Plane	XZ

Hot Rolled Steel Code	AISC 9th: ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05/08: ASD
Aluminum Code	AA ADM1-05: ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ct Exp. X	.75
Ct Exp. Z	.75
Ca	.36
Cv	.54
Nv	1
SD1	1
SDS	1
S1	1
Occupancy Code	4
Seismic Zone	3
Use Group	I
Use Gravity Self Wt in Diaphragm Mass	Yes
Use Deck Self Wt in Diaphragm Mass	Yes
Use Lateral Self Wt in Diaphragm Mass	Yes
Seismic Detailing Code	None
Om X	1
Om Z	1
Rho X	1
Rho Z	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	Kyy	Kzz	Cm-...	Cm-...	Cb	y sw...	z sw...	Function
1	M1	Existing ...	8												Lateral
2	M2	Existing ...	2												Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Existing Lower Mast	HSS18X0.375	Beam	Pipe	A500 Gr.42	Typical	19.4	754	754	1510
2	Existing Upper Mast	4.5" Mast w/ Stiffen...	Beam	Pipe	A500 Gr.42	Typical	7.37	74.86	74.86	14.465

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N2	N3			Existing Lower...	Beam	Pipe	A500 Gr.42	Typical
2	M2	N3	N4			Existing Upper...	Beam	Pipe	A500 Gr.42	Typical
3	M3	N1	N2			RIGID	None	None	RIGID	Typical
4	M4	N4	N5			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	1.5	0	0	
3	N3	0	9.5	0	0	
4	N4	0	11.5	0	0	
5	N5	0	17.83	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N2		Reaction					

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
No Data to Print ...			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.53	6.3
2	M1	Y	-.117	5
3	M1	Y	-.192	5
4	M1	Y	-.085	5
5	M1	Y	-.054	5
6	M1	Y	-.64	5

Member Point Loads (BLC 3 : Weight of Ice Only on PCS Struct)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.236	6.3
2	M1	Y	-.098	5
3	M1	Y	-.142	5
4	M1	Y	-.043	5
5	M1	Y	-.017	5
6	M1	Y	-.105	5

Member Point Loads (BLC 4 : NESC Wind with Ice on PCS Str)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	X	.17	6.3
2	M1	X	.09	5
3	M1	X	.127	5
4	M1	X	.042	5
5	M1	X	.011	5
6	M1	X	.042	5

Member Point Loads (BLC 5 : NESC Wind on PCS Structure)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	X	1.533	6.3
2	M1	X	.751	5
3	M1	X	1.072	5
4	M1	X	.329	5
5	M1	X	.082	5
6	M1	X	.316	5

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.012	-.012	0	0
2	M2	Y	-.012	-.012	0	0

Member Distributed Loads (BLC 3 : Weight of Ice Only on PCS Struct)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.011	-.011	0	0
2	M2	Y	-.003	-.003	0	0
3	M1	Y	-.018	-.018	0	0
4	M2	Y	-.018	-.018	0	0

Member Distributed Loads (BLC 4 : NESC Wind with Ice on PCS Str)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]

Member Distributed Loads (BLC 4 : NESC Wind with Ice on PCS Str) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.008	.008	0	0
2	M2	X	.002	.002	0	0
3	M1	X	.003	.003	0	0
4	M2	X	.003	.003	0	0

Member Distributed Loads (BLC 5 : NESC Wind on PCS Structure)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.073	.073	0	0
2	M2	X	.018	.018	0	0
3	M1	X	.027	.027	0	0
4	M2	X	.027	.027	0	0

Basic Load Cases

	BLC Description	Category	X Gravi...	Y Gravi...	Z Gravity	Joint	Point	Distrib...	Area(M...	Surfac...
1	Self Weight (PCS Mast)	None		-1						
2	Weight of Appurtenances	None					6	2		
3	Weight of Ice Only on PCS Struct	None					6	4		
4	NESC Wind with Ice on PCS Str	None					6	4		
5	NESC Wind on PCS Structure	None					6	4		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	NESC Heavy Wind on PCS Stru...	Yes			1	1.5	2	1.5	3	1.5	4	2.5								
2	NESC Extreme Wind on PCS Str...	Yes			1	1	2	1	5	1										
3	Self Weight				1	1														

Envelope Member Section Forces

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
1	M1	1	max	4.847	1	4.973	2	0	1	0	1	0	1	41.748	2
2			min	2.316	2	1.45	1	0	1	0	1	0	1	11.932	1
3		2	max	4.526	1	4.773	2	0	1	0	1	0	1	32.002	2
4			min	2.16	2	1.395	1	0	1	0	1	0	1	9.087	1
5		3	max	4.205	1	4.573	2	0	1	0	1	0	1	22.656	2
6			min	2.004	2	1.34	1	0	1	0	1	0	1	6.352	1
7		4	max	1.644	1	1.823	2	0	1	0	1	0	1	16.26	2
8			min	.76	2	.505	1	0	1	0	1	0	1	4.507	1
9		5	max	1.323	1	1.623	2	0	1	0	1	0	1	12.814	2
10			min	.604	2	.45	1	0	1	0	1	0	1	3.552	1
11	M2	1	max	1.323	1	1.623	2	0	1	0	1	0	1	12.814	2
12			min	.604	2	.45	1	0	1	0	1	0	1	3.552	1
13		2	max	1.28	1	1.6	2	0	1	0	1	0	1	12.008	2
14			min	.586	2	.444	1	0	1	0	1	0	1	3.329	1
15		3	max	1.236	1	1.578	2	0	1	0	1	0	1	11.213	2
16			min	.567	2	.437	1	0	1	0	1	0	1	3.109	1
17		4	max	1.193	1	1.555	2	0	1	0	1	0	1	10.43	2
18			min	.549	2	.431	1	0	1	0	1	0	1	2.892	1
19		5	max	1.149	1	1.533	2	0	1	0	1	0	1	9.658	2
20			min	.53	2	.425	1	0	1	0	1	0	1	2.677	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
21	M3	1	max	0	1	4.973	2	0	1	0	1	0	1	49.207	2
22			min	0	1	1.45	1	0	1	0	1	0	1	14.107	1
23		2	max	0	1	4.973	2	0	1	0	1	0	1	47.343	2
24			min	0	1	1.45	1	0	1	0	1	0	1	13.564	1
25		3	max	0	1	4.973	2	0	1	0	1	0	1	45.478	2
26			min	0	1	1.45	1	0	1	0	1	0	1	13.02	1
27		4	max	0	1	4.973	2	0	1	0	1	0	1	43.613	2
28			min	0	1	1.45	1	0	1	0	1	0	1	12.476	1
29		5	max	0	1	4.973	2	0	1	0	1	0	1	41.748	2
30			min	0	1	1.45	1	0	1	0	1	0	1	11.932	1
31	M4	1	max	1.149	1	1.533	2	0	1	0	1	0	1	9.658	2
32			min	.53	2	.425	1	0	1	0	1	0	1	2.677	1
33		2	max	1.149	1	1.533	2	0	1	0	1	0	1	7.232	2
34			min	.53	2	.425	1	0	1	0	1	0	1	2.005	1
35		3	max	1.149	1	1.533	2	0	1	0	1	0	1	4.806	2
36			min	.53	2	.425	1	0	1	0	1	0	1	1.332	1
37		4	max	1.149	1	1.533	2	0	1	0	1	0	1	2.38	2
38			min	.53	2	.425	1	0	1	0	1	0	1	.66	1
39		5	max	0	1	0	1	0	1	0	1	0	1	0	1
40			min	0	1	0	1	0	1	0	1	0	1	0	2

Envelope Member Section Stresses

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
1	M1	1	max	.25	1	.513	2	0	1	-1.709	1	5.98	2	0	1	0	1
2			min	.119	2	.149	1	0	1	-5.98	2	1.709	1	0	1	0	1
3		2	max	.233	1	.492	2	0	1	-1.302	1	4.584	2	0	1	0	1
4			min	.111	2	.144	1	0	1	-4.584	2	1.302	1	0	1	0	1
5		3	max	.217	1	.471	2	0	1	-.91	1	3.245	2	0	1	0	1
6			min	.103	2	.138	1	0	1	-3.245	2	.91	1	0	1	0	1
7		4	max	.085	1	.188	2	0	1	-.646	1	2.329	2	0	1	0	1
8			min	.039	2	.052	1	0	1	-2.329	2	.646	1	0	1	0	1
9		5	max	.068	1	.167	2	0	1	-.509	1	1.835	2	0	1	0	1
10			min	.031	2	.046	1	0	1	-1.835	2	.509	1	0	1	0	1
11	M2	1	max	.18	1	.44	2	0	1	-1.281	1	4.622	2	0	1	0	1
12			min	.082	2	.122	1	0	1	-4.622	2	1.281	1	0	1	0	1
13		2	max	.174	1	.434	2	0	1	-1.201	1	4.331	2	0	1	0	1
14			min	.079	2	.12	1	0	1	-4.331	2	1.201	1	0	1	0	1
15		3	max	.168	1	.428	2	0	1	-1.121	1	4.044	2	0	1	0	1
16			min	.077	2	.119	1	0	1	-4.044	2	1.121	1	0	1	0	1
17		4	max	.162	1	.422	2	0	1	-1.043	1	3.762	2	0	1	0	1
18			min	.074	2	.117	1	0	1	-3.762	2	1.043	1	0	1	0	1
19		5	max	.156	1	.416	2	0	1	-.966	1	3.483	2	0	1	0	1
20			min	.072	2	.115	1	0	1	-3.483	2	.966	1	0	1	0	1
21	M3	1	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
22			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
23		2	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
24			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
25		3	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
26			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
27		4	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
28			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
29		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
30			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
31	M4	1	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
32			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
33		2	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
34			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
35		3	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
36			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
37		4	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
38			min	0	2	0	1	0	1	0	1	0	1	0	1	0	1
39		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
40			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	-1.45	1	0	1	0	1	0	1	0	1	49.207	2
2		min	-4.973	2	0	2	0	1	0	1	0	1	14.107	1
3	N2	max	0	1	4.847	1	0	1	0	1	0	1	0	1
4		min	0	1	2.316	2	0	1	0	1	0	1	0	1
5	Totals:	max	-1.45	1	4.847	1	0	1						
6		min	-4.973	2	2.316	2	0	1						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	2	0	2	0	1	0	1	0	1	0	1
2		min	0	1	0	1	0	1	0	1	0	1	0	2
3	N2	max	0	2	0	2	0	1	0	1	0	1	0	1
4		min	0	1	0	1	0	1	0	1	0	1	0	2
5	N3	max	.077	2	0	2	0	1	0	1	0	1	-3.617e-4	1
6		min	.022	1	0	1	0	1	0	1	0	1	-1.283e-3	2
7	N4	max	.128	2	0	2	0	1	0	1	0	1	-7.743e-4	1
8		min	.036	1	0	1	0	1	0	1	0	1	-2.772e-3	2
9	N5	max	.338	2	0	2	0	1	0	1	0	1	-7.743e-4	1
10		min	.095	1	0	1	0	1	0	1	0	1	-2.772e-3	2

Envelope AISC ASD Steel Code Checks

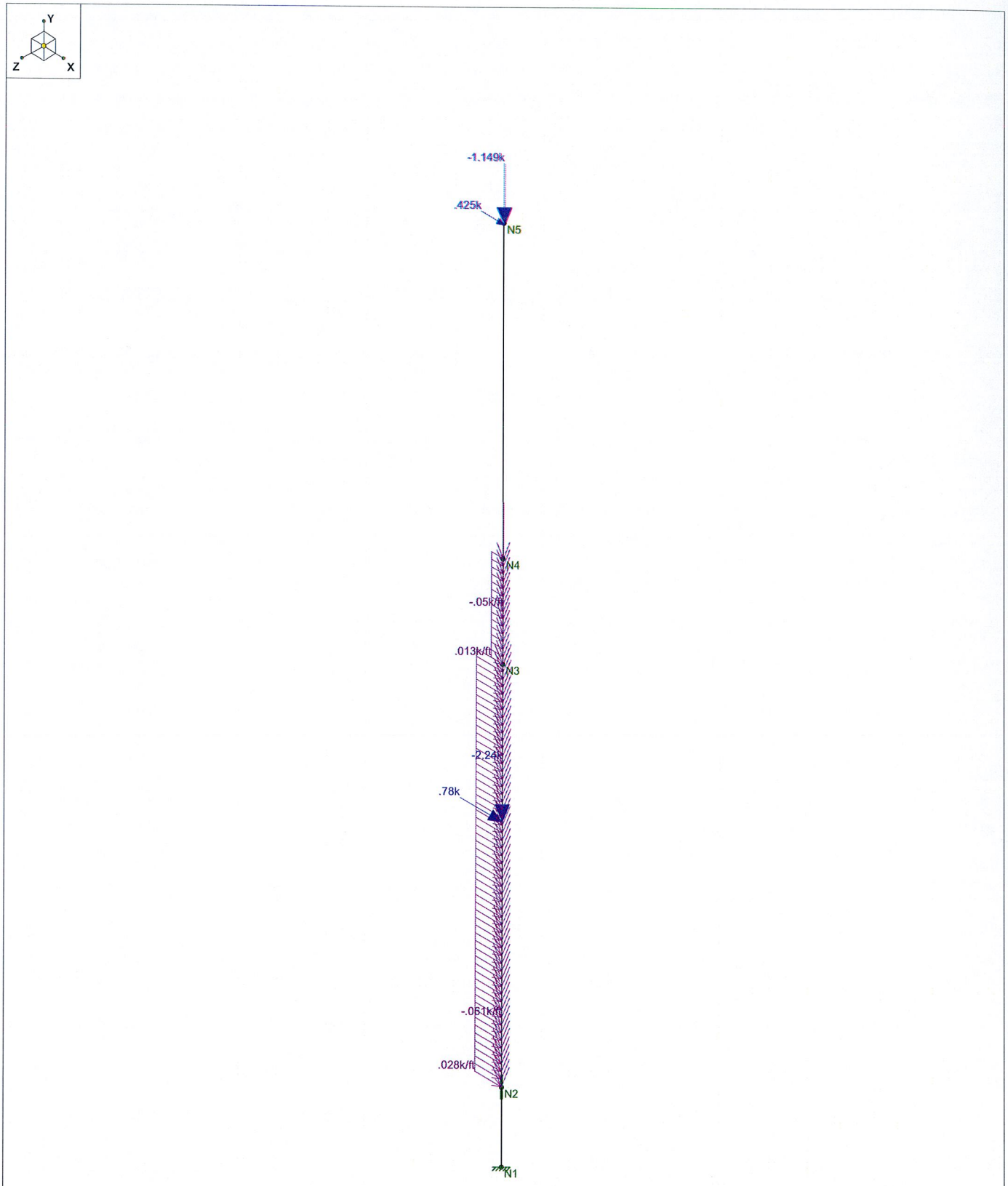
	Member	Shape	Code Check	Loc[ft]	LC	Shea...	Loc[ft]	...	L...	Fa [k...	Ft [ksi]	Fb y-...	Fb z-.....	C...	C...	ASD ...
1	M1	HSS18X0.375	.166	0	2	.023	0		2	32.272	33.516	36.868	36.868	1...	.6	.85	H1-2
2	M2	4.5" Mast w/ ..	.128	0	2	.020	0		2	32.968	33.516	36.868	36.868	1...	.6	.85	H1-2

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-1.45	0	0	0	0	14.107
2	1	N2	0	4.847	0	0	0	0
3	1	Totals:	-1.45	4.847	0			
4	1	COG (ft):	X: 0	Y: 9.058	Z: 0			

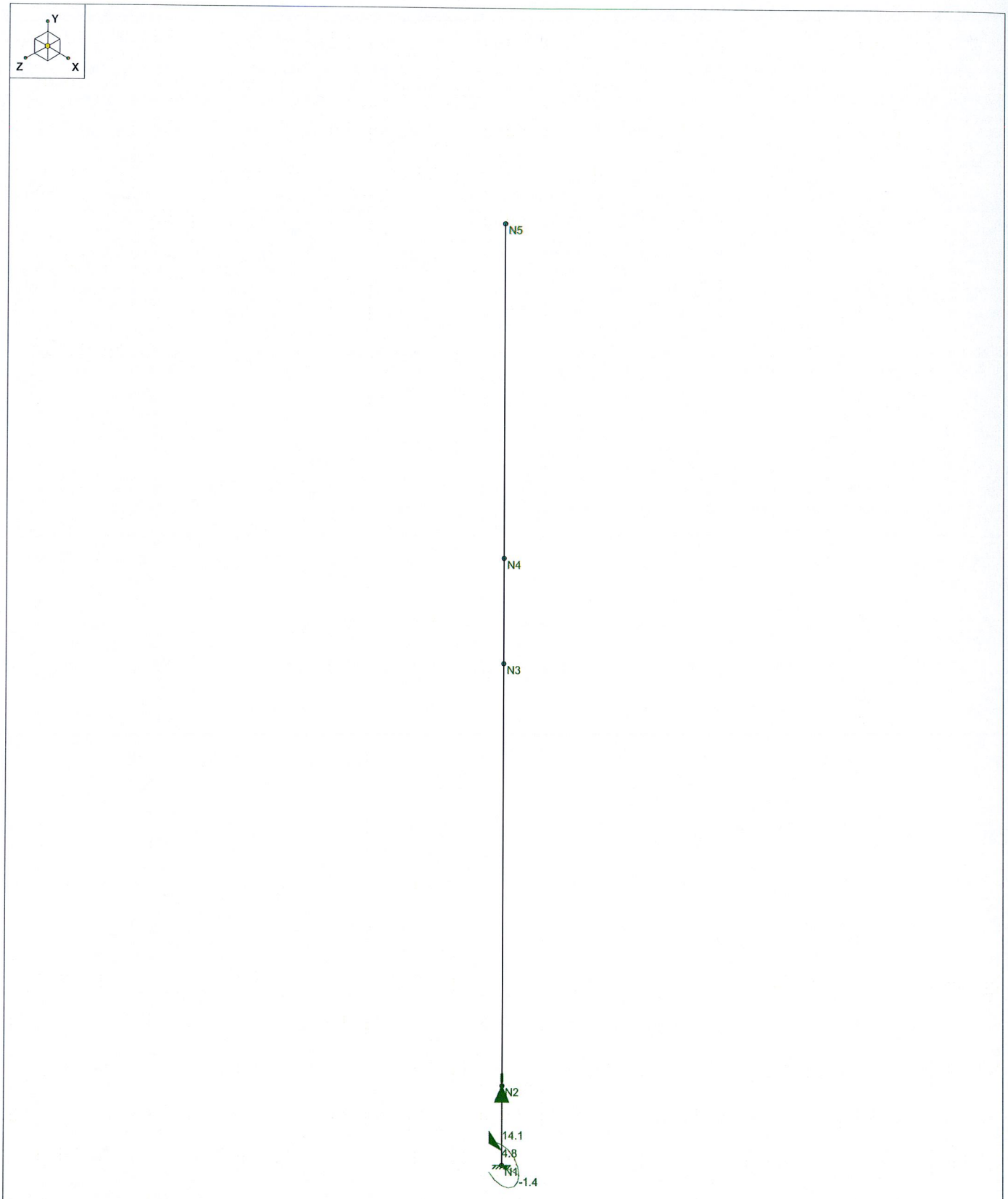
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-4.973	0	0	0	0	49.207
2	2	N2	0	2.316	0	0	0	0
3	2	Totals:	-4.973	2.316	0			
4	2	COG (ft):	X: 0	Y: 8.944	Z: 0			



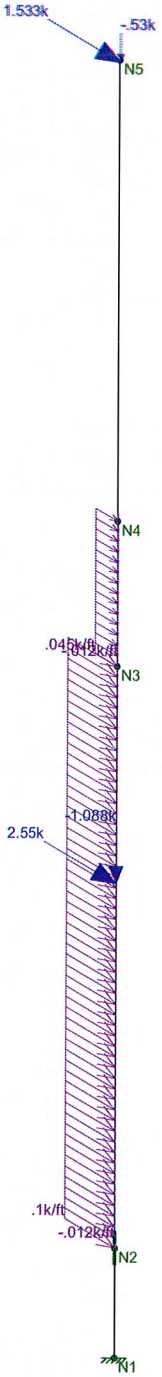
Loads: LC 1, NESC Heavy Wind on PCS Structure

CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 4:01 PM
11021.CO55 /AT&T CT5176	LC # 1 Loads	5176 NESC Loading.r3d



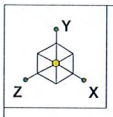
Results for LC 1, NESC Heavy Wind on PCS Structure
Z-moment Reaction units are k and k-ft

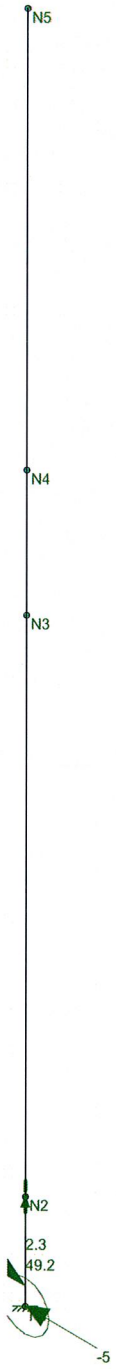
CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 4:03 PM
11021.CO55 /AT&T CT5176	LC # 1 Reactions	5176 NESC Loading.r3d



Loads: LC 2, NESC Extreme Wind on PCS Structure

CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 4:02 PM
11021.CO55 /AT&T CT5176	LC # 2 Loads	5176 NESC Loading.r3d





Results for LC 2, NESC Extreme Wind on PCS Structure
Z-moment Reaction units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	CL&P # 10254 - Mast	Jan 30, 2012 at 4:04 PM
11021.CO55 /AT&T CT5176	LC # 2 Reactions	5176 NESC Loading.r3d

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Subject: Coax Cable on CL&P Pole # 10254

Location: Bethel, CT

Rev. 0: 7/19/11

Prepared by: T.J.L Checked by: C.F.C.
Job No. 11021.CO55

Coax Cable on CL&P Pole

Distance Between Coax Cable Attach Points =

Coaxial Cable Span = $Coax_{Span} := \begin{pmatrix} 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \end{pmatrix} \cdot ft$ *(User Input)*

Diameter of Coax Cable = $D_{coax1} := 1.98 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax1} := 1.04 \cdot plf$ *(User Input)*

Number of Coax Cables = $N_{coax1} := 24$ *(User Input)*

Number of Projected Coax Cables = $NP_{coax1} := 5$ *(User Input)*

Extreme Wind Pressure = $qz := 29.8 \cdot psf$ *(User Input)*

Heavy Wind Pressure = $p := 4 \cdot psf$ *(User Input)*

Radial Ice Thickness = $Ir := 0.5 \cdot in$ *(User Input)*

Radial Ice Density = $Id := 56 \cdot pcf$ *(User Input)*

Shape Factor = $Cd_{coax} := 1.45$ *(User Input)*

Overload Factor for NESC Heavy Wind Load = $OF_{HW} := 2.5$ *(User Input)*

Overload Factor for NESC Extreme Wind Load = $OF_{EW} := 1.0$ *(User Input)*

Overload Factor for NESC Heavy Vertical Load = $OF_{HV} := 1.5$ *(User Input)*

Overload Factor for NESC Extreme Vertical Load = $OF_{EV} := 1.0$ *(User Input)*

Wind Area with Ice = $A_{ice} := \left(NP_{coax1} \cdot D_{coax1} + 2 \cdot Ir\right) = 10.9 \cdot in$

Wind Area without Ice = $A := \left(NP_{coax1} \cdot D_{coax1}\right) = 9.9 \cdot in$

Ice Area per Liner Ft = $Ai_{coax1} := \frac{\pi}{4} \cdot \left[\left(D_{coax1} + 2 \cdot Ir\right)^2 - D_{coax1}^{\ 2}\right] = 0.027\,ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax1} \cdot Id \cdot N_{coax1} = 36 \cdot plf$

Heavy Vertical Load =

$$Heavy_{Vert} := \overrightarrow{\left[\left(N_{coax1} \cdot W_{coax1} + W_{ice}\right) \cdot Coax_{Span} \cdot OF_{HV}\right]}$$

Heavy Transverse Load =

$$Heavy_{Trans} := \overrightarrow{\left(p \cdot A_{ice} \cdot Cd_{coax} \cdot Coax_{Span} \cdot OF_{HW}\right)}$$

$$Heavy_{Vert} = \begin{pmatrix} 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \\ 920 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 132 \\ 132 \\ 132 \\ 132 \\ 132 \\ 132 \\ 132 \\ 132 \\ 132 \\ 132 \\ 132 \\ 132 \\ 132 \end{pmatrix} lb$$

Extreme Vertical Load =

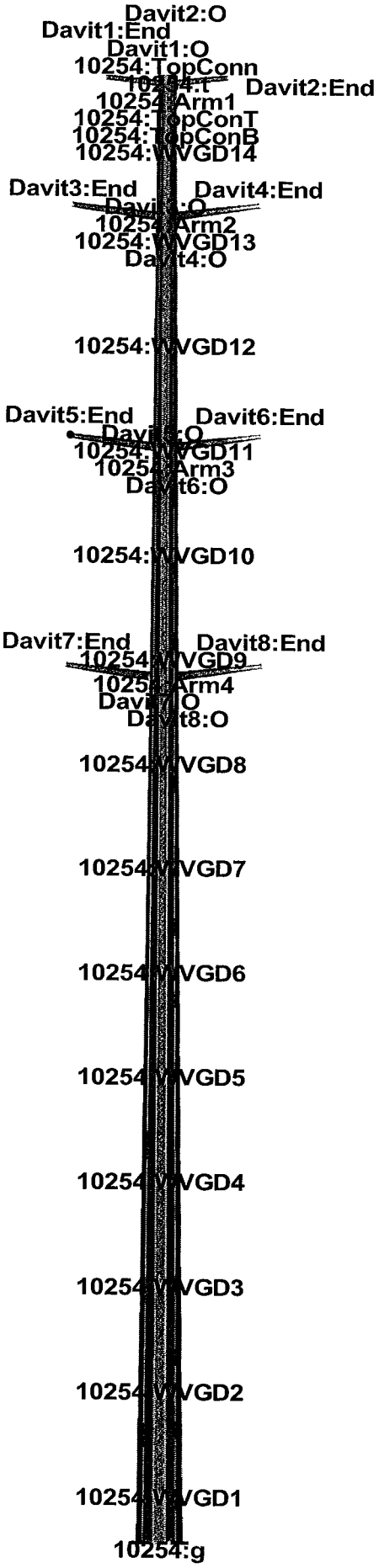
$$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax1} \cdot W_{coax1}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$$

Extreme Transverse Load =

$$Extreme_{Trans} := \overrightarrow{\left[\left(qz \cdot A \cdot Cd_{coax}\right) \cdot Coax_{Span} \cdot OF_{EW}\right]}$$

$$Extreme_{Vert} = \begin{pmatrix} 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \\ 250 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 356 \\ 356 \\ 356 \\ 356 \\ 356 \\ 356 \\ 356 \\ 356 \\ 356 \\ 356 \\ 356 \\ 356 \\ 356 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "cl&p structure # 10254"
PLS-POLE Version 11.11, 4:57:09 PM Monday, January 30, 2012
Undeformed geometry displayed



Project Name : 11021.CO55 - Bethel, CT
Project Notes: CL&P Structure # 10254 / AT&T 5176
Project File : J:\Jobs\1102100.WI\CO-55 - CT5176 - 7 Stony Hill Road, Bethel,CT\Structural\Rev (1)\Calcs\PLS-Pole\cl&p structure # 10254.pol
Date run : 4:55:44 PM Monday, January 30, 2012
by : PLS-POLE Version 11.11
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: j:\jobs\1102100.wi\co-55 - ct5176 - 7 stony hill road, bethel,ct\structural\rev (1)\calcs\pls-pole\cl&p #10254.lca

*** Analysis Results:

Maximum element usage is 96.65% for Base Plate "10254" in load case "NESC Extreme"
Maximum insulator usage is 61.51% for Clamp "Clamp25" in load case "NESC Extreme"

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Vert. Moment (ft-k)	Bending Moment (ft-k)	Found. Usage %
NESC Heavy	10254:g	-0.15	-35.70	99.62	35.70	3890.14	-9.74	-0.00	3890.15	0.00
NESC Extreme	10254:g	-0.05	-51.10	48.90	51.10	5121.93	-2.95	-0.00	5121.93	0.00

Summary of Tip Deflections For All Load Cases:

Note: postive tip load results in positive rotation

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
NESC Heavy	10254:t	0.17	87.97	-3.12	88.03	0.01	-5.41	0.00
NESC Extreme	10254:t	0.05	114.43	-5.23	114.55	0.00	-7.20	0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
10254	1	5023	NESC Extreme	72.52	1037.34
10254	2	10059	NESC Extreme	85.25	3111.27
10254	3	10117	NESC Extreme	88.85	5121.93

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
10254	88.85	NESC Extreme	37	28299.2

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	13.03	NESC Heavy	1	61.2
Davit2	16.73	NESC Heavy	1	61.2
Davit3	68.65	NESC Heavy	1	121.4
Davit4	80.83	NESC Heavy	1	121.4

Davit5	69.39	NESC Heavy	1	121.4
Davit6	81.36	NESC Heavy	1	121.4
Davit7	70.51	NESC Heavy	1	121.4
Davit8	82.17	NESC Heavy	1	121.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	82.17	Davit8	Tubular Davit
NESC Extreme	96.65	10254	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy	68.80	10254	37
NESC Extreme	88.85	10254	37

Summary of Base Plate Usages by Load Case:

Load Case	Pole Label	Bend Line #	Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Moment (ft-k)	Bending Stress (ksi)	Bolt Moment Sum (ft-k)	# Bolts Acting On Bend Line	Max Bolt Load For Bend Line (kips)	Minimum Plate Thickness (in)	Usage %
NESC Heavy	10254	12	40.000	99.624	3890.138	-9.741	45.029	264.235	5	143.053	2.816	75.05
NESC Extreme	10254	12	40.000	48.899	5121.928	-2.953	57.992	340.297	5	184.091	3.195	96.65

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC Heavy	82.17	Davit8	1
NESC Extreme	37.15	Davit8	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	1.87	NESC Heavy	0.0
Clamp2	Clamp	1.87	NESC Heavy	0.0
Clamp3	Clamp	9.30	NESC Heavy	0.0
Clamp4	Clamp	9.30	NESC Heavy	0.0
Clamp5	Clamp	9.30	NESC Heavy	0.0
Clamp6	Clamp	9.30	NESC Heavy	0.0
Clamp7	Clamp	9.30	NESC Heavy	0.0
Clamp8	Clamp	9.30	NESC Heavy	0.0
Clamp9	Clamp	6.06	NESC Heavy	0.0
Clamp10	Clamp	1.16	NESC Heavy	0.0
Clamp11	Clamp	1.16	NESC Heavy	0.0
Clamp12	Clamp	1.16	NESC Heavy	0.0
Clamp13	Clamp	1.16	NESC Heavy	0.0
Clamp14	Clamp	1.16	NESC Heavy	0.0
Clamp15	Clamp	1.16	NESC Heavy	0.0
Clamp16	Clamp	1.16	NESC Heavy	0.0
Clamp17	Clamp	1.16	NESC Heavy	0.0

Clamp18	Clamp	1.16	NESC Heavy	0.0
Clamp19	Clamp	1.16	NESC Heavy	0.0
Clamp20	Clamp	1.16	NESC Heavy	0.0
Clamp21	Clamp	1.16	NESC Heavy	0.0
Clamp22	Clamp	1.16	NESC Heavy	0.0
Clamp23	Clamp	1.16	NESC Heavy	0.0
Clamp24	Clamp	6.22	NESC Extreme	0.0
Clamp25	Clamp	61.51	NESC Extreme	0.0
Clamp26	Clamp	61.51	NESC Extreme	0.0

*** Weight of structure (lbs):

Weight of Tubular Davit Arms:	850.8
Weight of Steel Poles:	28299.2
Total:	29150.0

*** End of Report

```
*************************************************************************
*                                                                       *
*                              PLS-POLE                                 *
*                    POLE AND FRAME ANALYSIS AND DESIGN                 *
*                Copyright Power Line Systems, Inc. 1999-2011           *
*                                                                       *
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Project Name : 11021.CO55 - Bethel, CT
Project Notes: CL&P Structure # 10254 / AT&T 5176
Project File : J:\Jobs\1102100.WI\CO-55 - CT5176 - 7 Stony Hill Road, Bethel,CT\Structural\Rev (1)\Calcs\PLS-Pole\cl&p structure # 10254.pol
Date run : 4:55:43 PM Monday, January 30, 2012
by : PLS-POLE Version 11.11
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Modeling options:
  Offset Arms from Pole/Mast: Yes
  Offset Braces from Pole/Mast: Yes
  Offset Guys from Pole/Mast: Yes
  Offset Posts from Pole/Mast: Yes
  Offset Strains from Pole/Mast: Yes
  Use Alternate Convergence Process: No
  Steel poles checked with ASCE/SEI 48-05

Default Modulus of Elasticity for Steel = 29000.00 (ksi)
Default Weight Density for Steel = 490.00 (lbs/ft^3)

Steel Pole Properties:

Steel Pole Property Label	Stock Number	Length (ft)	Default Embedded Length (ft)	Base Plate	Shape	Tip Diameter (in)	Base Diameter (in)	Taper (in/ft)	Default Drag Coef.	Tubes	Modulus of Elasticity Override (ksi)	Weight Density Override (lbs/ft^3)	Shape At Base	Strength Check Type	Distance From Tip (ft)	Ultimate Trans. Load (kips)	Ultimate Long. Load (kips)
CL&P10254	10254	140.00	0	Yes	12F	20.19	53.5	0	1.3	3 tubes	0	0		Calculated	0.000	0.0000	0.0000

Steel Tubes Properties:

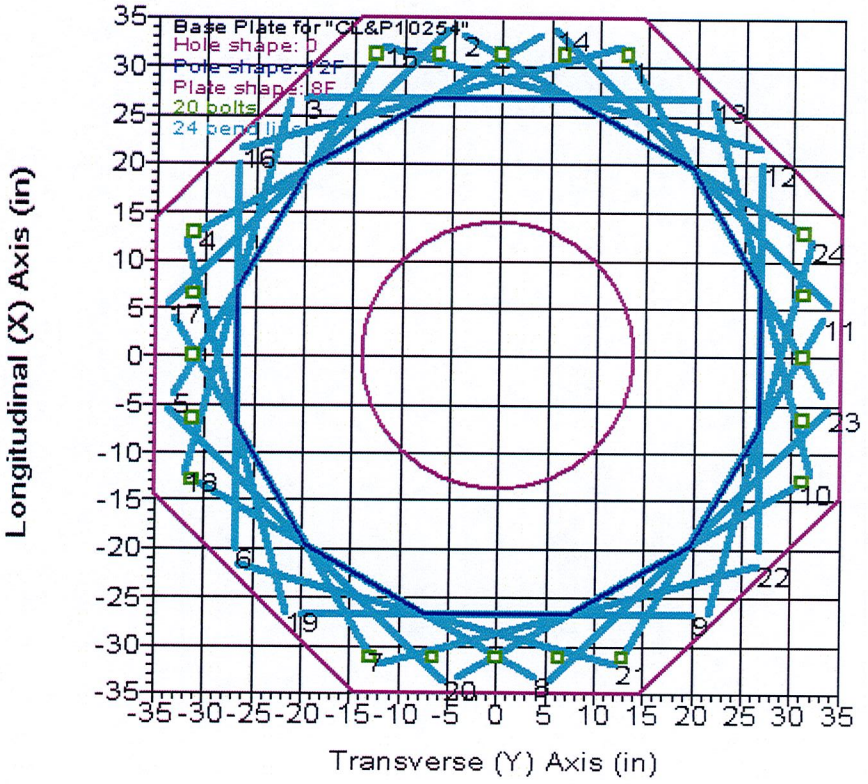
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Gap (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)
CL&P10254	1	55	0.3125	4.670	0.000	65.000	0.000	5023	29.85	0.24866	20.19	33.86	4.15
CL&P10254	2	54.67	0.4375	6.170	0.000	65.000	0.000	10059	28.95	0.24866	32.08	45.67	5.60
CL&P10254	3	41.17	0.46875	0.000	0.000	65.000	0.000	10117	21.32	0.24866	43.26	53.50	0.00

Base Plate Properties:

Pole Property	Plate Diam. (in)	Plate Shape	Plate Thick. (in)	Plate Weight (lbs)	Bend Line Length Override (in)	Hole Diam. (in)	Hole Shape	Steel Density (lbs/ft^3)	Steel Yield Stress (ksi)	Bolt Diam. (in)	Bolt Pattern Diam. (in)	Num. Of Bolts	Bolt Cage X Inertia (in^4)	Bolt Cage Y Inertia (in^4)
CL&P10254	70.000	8F	3.250	3100	40.000	28.000	0	490.00	60.000	2.250	62.375	20	41968.80	41968.80

Base Plate Bolt Coordinates for Property "CL&P10254":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0	1	0
1	0.2064	0
1	0.4128	0
0.4128	1	0
0.2064	1	0
1	0	0



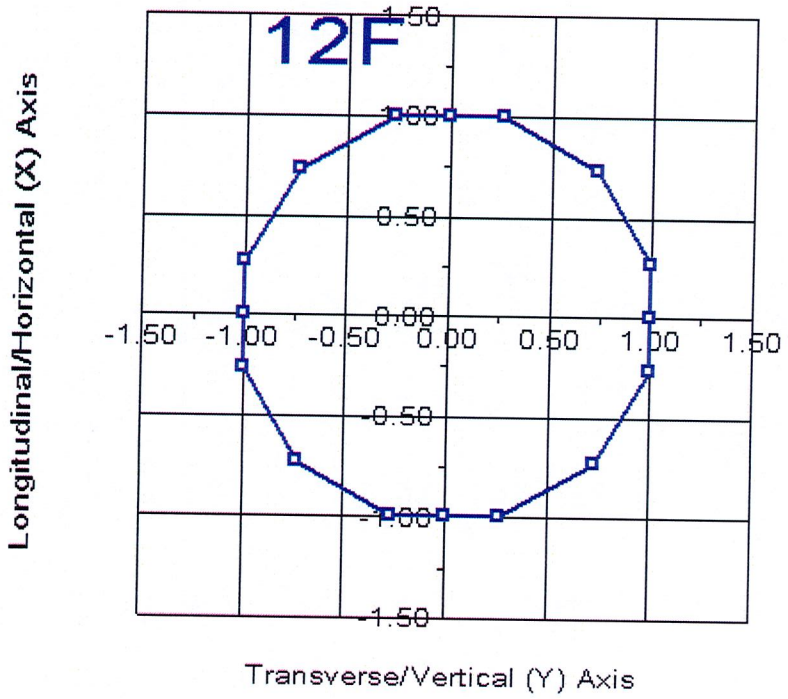
Steel Pole Connectivity:

Pole Label	Tip Joint	Base Joint	X of Base (ft)	Y of Base (ft)	Z of Base (ft)	Inclin. About X (deg)	Inclin. About Y (deg)	Property Set	Attach. Labels	Base Connect	Embed % Override	Embed C. Override (ft)
10254			0	0	0	0	0	CL&P10254	21 labels		0.00	0

Relative Attachment Labels for Steel Pole "10254":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
10254:Arm1	0.00	139.30
10254:Arm2	0.00	126.63
10254:Arm3	0.00	104.63
10254:Arm4	0.00	82.63
10254:TopConn	0.00	138.50
10254:WVGD1	0.00	5.00
10254:WVGD2	0.00	15.00

10254:WVGD3	0.00	25.00
10254:WVGD4	0.00	35.00
10254:WVGD5	0.00	45.00
10254:WVGD6	0.00	55.00
10254:WVGD7	0.00	65.00
10254:WVGD8	0.00	75.00
10254:WVGD9	0.00	85.00
10254:WVGD10	0.00	95.00
10254:WVGD11	0.00	105.00
10254:WVGD12	0.00	115.00
10254:WVGD13	0.00	125.00
10254:WVGD14	0.00	135.00
10254:TopConT	0.00	139.00
10254:TopConB	0.00	138.00



Pole Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	T-Moment Inertia (in^4)	L-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	ASCE Cap Trans. (ft-k)	ASCE Cap Long. (ft-k)
10254	10254:t	10254:t Ori	0.00	20.19	19.97	1009.93	1009.93	0.00	14.6	65.00	65.00	541.96	541.96
10254	10254:Arm1	10254:Arm1 End	0.70	20.36	20.15	1036.69	1036.69	0.00	14.8	65.00	65.00	551.57	551.57
10254	10254:Arm1	10254:Arm1 Ori	0.70	20.36	20.15	1036.69	1036.69	0.00	14.8	65.00	65.00	551.57	551.57
10254	10254:TopConT	10254:TopConT End	1.00	20.44	20.22	1048.30	1048.30	0.00	14.8	65.00	65.00	555.71	555.71
10254	10254:TopConT	10254:TopConT Ori	1.00	20.44	20.22	1048.31	1048.31	0.00	14.8	65.00	65.00	555.71	555.71
10254	10254:TopConn	10254:TopConn End	1.50	20.56	20.35	1067.85	1067.85	0.00	14.9	65.00	65.00	562.65	562.65

10254	10254:TopConn	10254:TopConn	Ori	1.50	20.56	20.35	1067.85	1067.85	0.00	14.9	65.00	65.00	562.65	562.65
10254	10254:TopConB	10254:TopConB	End	2.00	20.68	20.47	1087.64	1087.64	0.00	15.1	65.00	65.00	569.63	569.63
10254	10254:TopConB	10254:TopConB	Ori	2.00	20.68	20.47	1087.64	1087.64	0.00	15.1	65.00	65.00	569.63	569.63
10254	10254:WVGD14	10254:WVGD14	End	5.00	21.43	21.22	1211.53	1211.53	0.00	15.7	65.00	65.00	612.43	612.43
10254	10254:WVGD14	10254:WVGD14	Ori	5.00	21.43	21.22	1211.53	1211.53	0.00	15.7	65.00	65.00	612.43	612.43
10254	#10254:0	Tube 1	End	9.19	22.47	22.27	1399.69	1399.69	0.00	16.6	65.00	65.00	674.76	674.76
10254	#10254:0	Tube 1	Ori	9.19	22.47	22.27	1399.69	1399.69	0.00	16.6	65.00	65.00	674.76	674.76
10254	10254:Arm2	10254:Arm2	End	13.38	23.51	23.31	1606.40	1606.40	0.00	17.5	65.00	65.00	740.12	740.12
10254	10254:Arm2	10254:Arm2	Ori	13.38	23.51	23.31	1606.40	1606.40	0.00	17.5	65.00	65.00	740.12	740.12
10254	10254:WVGD13	10254:WVGD13	End	15.00	23.92	23.72	1691.79	1691.79	0.00	17.8	65.00	65.00	766.29	766.29
10254	10254:WVGD13	10254:WVGD13	Ori	15.00	23.92	23.72	1691.79	1691.79	0.00	17.8	65.00	65.00	766.29	766.29
10254	#10254:1	Tube 1	End	20.00	25.16	24.97	1973.41	1973.41	0.00	18.9	65.00	65.00	849.68	849.68
10254	#10254:1	Tube 1	Ori	20.00	25.16	24.97	1973.41	1973.41	0.00	18.9	65.00	65.00	849.68	849.68
10254	10254:WVGD12	10254:WVGD12	End	25.00	26.40	26.22	2284.67	2284.67	0.00	20.0	65.00	65.00	937.38	937.38
10254	10254:WVGD12	10254:WVGD12	Ori	25.00	26.40	26.22	2284.67	2284.67	0.00	20.0	65.00	65.00	937.38	937.38
10254	#10254:2	Tube 1	End	30.00	27.65	27.47	2627.05	2627.05	0.00	21.0	65.00	65.00	1029.38	1029.38
10254	#10254:2	Tube 1	Ori	30.00	27.65	27.47	2627.05	2627.05	0.00	21.0	65.00	65.00	1029.38	1029.38
10254	10254:WVGD11	10254:WVGD11	End	35.00	28.89	28.72	3002.04	3002.04	0.00	22.1	65.00	65.00	1125.70	1125.70
10254	10254:WVGD11	10254:WVGD11	Ori	35.00	28.89	28.72	3002.04	3002.04	0.00	22.1	65.00	65.00	1125.70	1125.70
10254	10254:Arm3	10254:Arm3	End	35.38	28.98	28.81	3031.52	3031.52	0.00	22.2	65.00	65.00	1133.09	1133.09
10254	10254:Arm3	10254:Arm3	Ori	35.38	28.98	28.81	3031.52	3031.52	0.00	22.2	65.00	65.00	1133.09	1133.09
10254	#10254:3	Tube 1	End	40.19	30.18	30.01	3427.14	3427.14	0.00	23.2	65.00	65.00	1230.17	1230.17
10254	#10254:3	Tube 1	Ori	40.19	30.18	30.01	3427.14	3427.14	0.00	23.2	65.00	65.00	1230.17	1230.17
10254	10254:WVGD10	10254:WVGD10	End	45.00	31.38	31.21	3855.77	3855.77	0.00	24.2	65.00	65.00	1331.24	1331.24
10254	10254:WVGD10	10254:WVGD10	Ori	45.00	31.38	31.21	3855.77	3855.77	0.00	24.2	65.00	65.00	1331.24	1331.24
10254	#10254:4	Tube 1	End	47.67	32.04	31.88	4107.81	4107.81	0.00	24.8	65.00	65.00	1388.93	1388.93
10254	#10254:4	Tube 1	Ori	47.67	32.04	31.88	4107.81	4107.81	0.00	24.8	65.00	65.00	1388.93	1388.93
10254	#10254:5	SpliceT	End	50.33	32.70	32.55	4370.60	4370.60	0.00	25.4	65.00	65.00	1447.84	1447.84
10254	#10254:5	SpliceT	Ori	50.33	32.70	32.55	4370.60	4370.60	0.00	25.4	65.00	65.00	1447.84	1447.84
10254	10254:WVGD9	10254:WVGD9	End	55.00	33.24	46.14	6355.40	6355.40	0.00	17.7	65.00	65.00	2071.37	2071.37
10254	10254:WVGD9	10254:WVGD9	Ori	55.00	33.24	46.14	6355.40	6355.40	0.00	17.7	65.00	65.00	2071.37	2071.37
10254	10254:Arm4	10254:Arm4	End	57.38	33.83	46.97	6704.85	6704.85	0.00	18.0	65.00	65.00	2147.12	2147.12
10254	10254:Arm4	10254:Arm4	Ori	57.38	33.83	46.97	6704.86	6704.86	0.00	18.0	65.00	65.00	2147.12	2147.12
10254	#10254:6	Tube 2	End	61.19	34.78	48.31	7292.22	7292.22	0.00	18.6	65.00	65.00	2271.56	2271.56
10254	#10254:6	Tube 2	Ori	61.19	34.78	48.31	7292.22	7292.22	0.00	18.6	65.00	65.00	2271.56	2271.56
10254	10254:WVGD8	10254:WVGD8	End	65.00	35.73	49.64	7912.93	7912.93	0.00	19.2	65.00	65.00	2399.50	2399.50
10254	10254:WVGD8	10254:WVGD8	Ori	65.00	35.73	49.64	7912.93	7912.93	0.00	19.2	65.00	65.00	2399.50	2399.50
10254	#10254:7	Tube 2	End	70.00	36.97	51.39	8779.05	8779.05	0.00	20.0	65.00	65.00	2572.61	2572.61
10254	#10254:7	Tube 2	Ori	70.00	36.97	51.39	8779.05	8779.05	0.00	20.0	65.00	65.00	2572.61	2572.61
10254	10254:WVGD7	10254:WVGD7	End	75.00	38.21	53.14	9706.17	9706.17	0.00	20.7	65.00	65.00	2751.75	2751.75
10254	10254:WVGD7	10254:WVGD7	Ori	75.00	38.21	53.14	9706.17	9706.17	0.00	20.7	65.00	65.00	2751.75	2751.75
10254	#10254:8	Tube 2	End	80.00	39.46	54.89	10696.37	10696.37	0.00	21.5	65.00	65.00	2936.92	2936.92
10254	#10254:8	Tube 2	Ori	80.00	39.46	54.89	10696.37	10696.37	0.00	21.5	65.00	65.00	2936.92	2936.92
10254	10254:WVGD6	10254:WVGD6	End	85.00	40.70	56.64	11751.73	11751.73	0.00	22.2	65.00	65.00	3128.12	3128.12
10254	10254:WVGD6	10254:WVGD6	Ori	85.00	40.70	56.64	11751.73	11751.73	0.00	22.2	65.00	65.00	3128.12	3128.12
10254	#10254:9	Tube 2	End	90.00	41.94	58.39	12874.33	12874.33	0.00	23.0	65.00	65.00	3325.35	3325.35
10254	#10254:9	Tube 2	Ori	90.00	41.94	58.39	12874.33	12874.33	0.00	23.0	65.00	65.00	3325.35	3325.35
10254	10254:WVGD5	10254:WVGD5	End	95.00	43.19	60.13	14066.23	14066.23	0.00	23.8	65.00	65.00	3528.61	3528.61
10254	10254:WVGD5	10254:WVGD5	Ori	95.00	43.19	60.13	14066.23	14066.23	0.00	23.8	65.00	65.00	3528.61	3528.61
10254	#10254:10	SpliceT	End	98.83	44.14	61.47	15027.40	15027.40	0.00	24.4	65.00	65.00	3688.39	3688.39
10254	#10254:10	SpliceT	Ori	98.83	44.14	61.47	15027.40	15027.40	0.00	24.4	65.00	65.00	3688.39	3688.39
10254	#10254:11	Tube 2	End	101.92	44.03	65.66	15947.74	15947.74	0.00	22.5	65.00	65.00	3923.87	3923.87
10254	#10254:11	Tube 2	Ori	101.92	44.03	65.66	15947.74	15947.74	0.00	22.5	65.00	65.00	3923.87	3923.87
10254	10254:WVGD4	10254:WVGD4	End	105.00	44.80	66.81	16805.12	16805.12	0.00	22.9	65.00	65.00	4064.02	4064.02
10254	10254:WVGD4	10254:WVGD4	Ori	105.00	44.80	66.81	16805.13	16805.13	0.00	22.9	65.00	65.00	4064.02	4064.02
10254	#10254:12	Tube 3	End	110.00	46.04	68.69	18259.08	18259.08	0.00	23.6	65.00	65.00	4296.39	4296.39
10254	#10254:12	Tube 3	Ori	110.00	46.04	68.69	18259.09	18259.09	0.00	23.6	65.00	65.00	4296.39	4296.39
10254	10254:WVGD3	10254:WVGD3	End	115.00	47.28	70.56	19794.58	19794.58	0.00	24.3	65.00	65.00	4535.22	4535.22
10254	10254:WVGD3	10254:WVGD3	Ori	115.00	47.28	70.56	19794.58	19794.58	0.00	24.3	65.00	65.00	4535.22	4535.22
10254	#10254:13	Tube 3	End	120.00	48.53	72.43	21413.84	21413.84	0.00	25.1	65.00	65.00	4780.51	4780.51
10254	#10254:13	Tube 3	Ori	120.00	48.53	72.43	21413.84	21413.84	0.00	25.1	65.00	65.00	4780.51	4780.51
10254	10254:WVGD2	10254:WVGD2	End	125.00	49.77	74.31	23119.09	23119.09	0.00	25.8	65.00	65.00	5032.27	5032.27
10254	10254:WVGD2	10254:WVGD2	Ori	125.00	49.77	74.31	23119.09	23119.09	0.00	25.8	65.00	65.00	5032.27	5032.27
10254	#10254:14	Tube 3	End	130.00	51.01	76.18	24912.54	24912.54	0.00	26.5	65.00	65.00	5290.48	5290.48
10254	#10254:14	Tube 3	Ori	130.00	51.01	76.18	24912.55	24912.55	0.00	26.5	65.00	65.00	5290.48	5290.48
10254	10254:WVGD1	10254:WVGD1	End	135.00	52.26	78.06	26796.44	26796.44	0.00	27.2	65.00	65.00	5555.16	5555.16
10254	10254:WVGD1	10254:WVGD1	Ori	135.00	52.26	78.06	26796.44	26796.44	0.00	27.2	65.00	65.00	5555.16	5555.16

10254 10254:g 10254:g End 140.00 53.50 79.93 28772.99 28772.99 0.00 27.9 65.00 65.00 5826.30 5826.30

Tubular Davit Properties:

Davit Property Label	Stock Number	Steel Shape	Thickness (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry	Strength Check Type	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Density Override (lbs/ft^3)	Steel Shape At End
ARM1		6T	0.1875	6.4	5	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0	
ARM2		6T	0.1875	9	5	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0	

Intermediate Joints for Davit Property "ARM1":

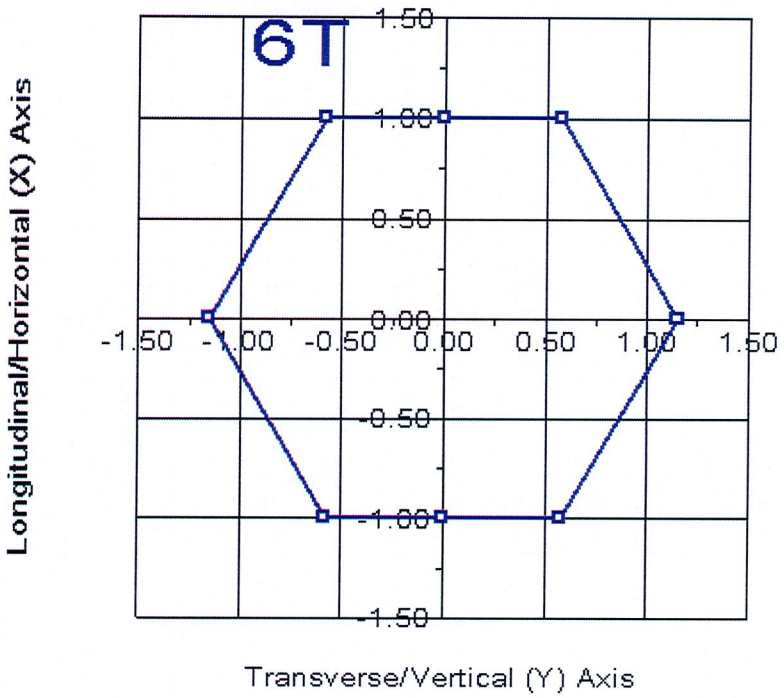
Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	5	-0.5

Intermediate Joints for Davit Property "ARM2":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	8	-1

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	10254:Arm1	ARM1	180
Davit2	10254:Arm1	ARM1	0
Davit3	10254:Arm2	ARM2	180
Davit4	10254:Arm2	ARM2	0
Davit5	10254:Arm3	ARM2	180
Davit6	10254:Arm3	ARM2	0
Davit7	10254:Arm4	ARM2	180
Davit8	10254:Arm4	ARM2	0



Tubular Davit Arm Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	V-Moment Inertia (in^4)	H-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	ASCE Cap V-Mom. (ft-k)	ASCE Cap H-Mom. (ft-k)
Davit1	Davit1:O	Origin	0.00	6.40	4.04	21.65	21.65	0.00	13.9	65.00	65.00	31.74	36.64
Davit1	#Davit1:O	End	2.51	5.70	3.58	15.13	15.13	0.00	11.8	65.00	65.00	24.90	28.75
Davit1	#Davit1:O	Origin	2.51	5.70	3.58	15.13	15.13	0.00	11.8	65.00	65.00	24.90	28.75
Davit1	Davit1:End	End	5.02	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit2	Davit2:O	Origin	0.00	6.40	4.04	21.65	21.65	0.00	13.9	65.00	65.00	31.74	36.64
Davit2	#Davit2:O	End	2.51	5.70	3.58	15.13	15.13	0.00	11.8	65.00	65.00	24.90	28.75
Davit2	#Davit2:O	Origin	2.51	5.70	3.58	15.13	15.13	0.00	11.8	65.00	65.00	24.90	28.75
Davit2	Davit2:End	End	5.02	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit3	Davit3:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit3	#Davit3:O	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit3	#Davit3:O	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit3	Davit3:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit4	Davit4:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit4	#Davit4:O	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit4	#Davit4:O	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit4	Davit4:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82

Davit5	Davit5:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit5	#Davit5:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit5	#Davit5:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit5	Davit5:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit6	Davit6:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit6	#Davit6:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit6	#Davit6:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit6	Davit6:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit7	Davit7:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit7	#Davit7:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit7	#Davit7:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit7	Davit7:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82
Davit8	Davit8:O	Origin	0.00	9.00	5.72	61.76	61.76	0.00	21.9	65.00	65.00	64.38	74.35
Davit8	#Davit8:0	End	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit8	#Davit8:0	Origin	4.03	7.00	4.42	28.54	28.54	0.00	15.8	65.00	65.00	38.25	44.17
Davit8	Davit8:End	End	8.06	5.00	3.13	10.07	10.07	0.00	9.6	65.00	65.00	18.89	21.82

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)
clamp	clamp1	8e+004

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
Clamp1	Davit1:End	clamp	No Limit
Clamp2	Davit2:End	clamp	No Limit
Clamp3	Davit3:End	clamp	No Limit
Clamp4	Davit4:End	clamp	No Limit
Clamp5	Davit5:End	clamp	No Limit
Clamp6	Davit6:End	clamp	No Limit
Clamp7	Davit7:End	clamp	No Limit
Clamp8	Davit8:End	clamp	No Limit
Clamp9	10254:t	clamp	No Limit
Clamp10	10254:WVGD1	clamp	No Limit
Clamp11	10254:WVGD2	clamp	No Limit
Clamp12	10254:WVGD3	clamp	No Limit
Clamp13	10254:WVGD4	clamp	No Limit
Clamp14	10254:WVGD5	clamp	No Limit
Clamp15	10254:WVGD6	clamp	No Limit
Clamp16	10254:WVGD7	clamp	No Limit
Clamp17	10254:WVGD8	clamp	No Limit
Clamp18	10254:WVGD9	clamp	No Limit
Clamp19	10254:WVGD10	clamp	No Limit
Clamp20	10254:WVGD11	clamp	No Limit
Clamp21	10254:WVGD12	clamp	No Limit
Clamp22	10254:WVGD13	clamp	No Limit
Clamp23	10254:WVGD14	clamp	No Limit
Clamp24	10254:TopConn	clamp	No Limit
Clamp25	10254:TopConT	clamp	No Limit
Clamp26	10254:TopConB	clamp	No Limit

*** Loads Data

Loads from file: j:\jobs\1102100.wi\co-55 - ct5176 - 7 stony hill road, bethel,ct\structural\rev (1)\calcs\pls-pole\cl&p #10254.lca

Insulator dead and wind loads are already included in the point loads printed below.

Loading Method Parameters:

Structure Height Summary (used for calculating wind/ice adjust with height):

Z of ground for wind height adjust	0.00	(ft) and structure Z coordinate that will be put on the centerline ground profile in PLS-CADD.
Ground elevation shift	0.00	(ft)
Z of ground with shift	0.00	(ft)
Z of structure top (highest joint)	140.00	(ft)
Structure height	140.00	(ft)
Structure height above ground	140.00	(ft)

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles and Towers	SF for Tubular Arms	SF for Wood Poles	SF for Conc. Ult.	SF for Conc. First Crack	SF for Conc. Zero Tens.	SF for Guys and Cables	SF for Non Tubular Arms	SF for Braces	SF for Insuls.	SF for Found.	SF For Loads	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Pole Deflection Check	Pole Deflection Limit % or (ft)
NESC Heavy	1.5000	2.5000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	26 loads	Wind on All	4	0	0.500	56.000	0.0	No Limit	0
NESC Extreme	1.0000	1.0000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	26 loads	NESC 2007	25.6	0	0.000	0.000	0.0	No Limit	0

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	982	1128	0	
Davit2:End	982	1128	0	
Davit3:End	6229	4069	0	
Davit4:End	6229	4069	0	
Davit5:End	6229	4069	0	
Davit6:End	6229	4069	0	
Davit7:End	6229	4069	0	
Davit8:End	6229	4069	0	
10254:WVGD1	920	132	0	
10254:WVGD2	920	132	0	
10254:WVGD3	920	132	0	
10254:WVGD4	920	132	0	
10254:WVGD5	920	132	0	
10254:WVGD6	920	132	0	
10254:WVGD7	920	132	0	
10254:WVGD8	920	132	0	
10254:WVGD9	920	132	0	
10254:WVGD10	920	132	0	
10254:WVGD11	920	132	0	
10254:WVGD12	920	132	0	
10254:WVGD13	920	132	0	
10254:WVGD14	920	132	0	
10254:t	4847	0	0	

10254:TopConn	0	1450	0
10254:TopConT	0	14107	0
10254:TopConB	0	-14107	0

Detailed Pole Loading Data for Load Case "NESC Heavy":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
10254	10254:t	10254:Arm1	140.00	139.30	139.65	20.275	9.6e+005	1.300	10.00	0.50	71.67	15.38	8.87	0.76	16.13	0.00
10254	10254:Arm1	10254:TopConT	139.30	139.00	139.15	20.399	9.66e+005	1.300	10.00	0.50	30.91	6.63	3.83	0.33	6.95	0.00
10254	10254:TopConT	10254:TopConn	139.00	138.50	138.75	20.498	9.71e+005	1.300	10.00	0.50	51.76	11.10	6.41	0.54	11.65	0.00
10254	10254:TopConn	10254:TopConB	138.50	138.00	138.25	20.623	9.76e+005	1.300	10.00	0.50	52.08	11.17	6.45	0.54	11.71	0.00
10254	10254:TopConB	10254:WVGD14	138.00	135.00	136.50	21.058	9.97e+005	1.300	10.00	0.50	319.19	68.44	39.50	3.25	71.69	0.00
10254	10254:WVGD14		135.00	130.81	132.91	21.951	1.04e+006	1.300	10.00	0.50	464.73	99.59	57.47	4.54	104.12	0.00
10254		10254:Arm2	130.81	126.63	128.72	22.993	1.09e+006	1.300	10.00	0.50	487.09	104.31	60.20	4.54	108.85	0.00
10254	10254:Arm2	10254:WVGD13	126.63	125.00	125.81	23.715	1.12e+006	1.300	10.00	0.50	195.04	41.75	24.09	1.76	43.51	0.00
10254	10254:WVGD13		125.00	120.00	122.50	24.539	1.16e+006	1.300	10.00	0.50	621.26	132.93	76.71	5.42	138.34	0.00
10254		10254:WVGD12	120.00	115.00	117.50	25.782	1.22e+006	1.300	10.00	0.50	653.14	139.66	80.60	5.42	145.08	0.00
10254	10254:WVGD12		115.00	110.00	112.50	27.026	1.28e+006	1.300	10.00	0.50	685.02	146.40	84.48	5.42	151.81	0.00
10254		10254:WVGD11	110.00	105.00	107.50	28.269	1.34e+006	1.300	10.00	0.50	716.90	153.13	88.37	5.42	158.55	0.00
10254	10254:WVGD11	10254:Arm3	105.00	104.63	104.81	28.937	1.37e+006	1.300	10.00	0.50	55.05	11.76	6.78	0.41	12.16	0.00
10254	10254:Arm3		104.63	99.81	102.22	29.582	1.4e+006	1.300	10.00	0.50	722.43	154.24	89.01	5.21	159.45	0.00
10254		10254:WVGD10	99.81	95.00	97.41	30.779	1.46e+006	1.300	10.00	0.50	751.97	160.48	92.61	5.21	165.69	0.00
10254	10254:WVGD10		95.00	92.34	93.67	31.709	1.5e+006	1.300	10.00	0.50	429.12	91.55	52.83	2.89	94.44	0.00
10254			92.34	89.67	91.00	32.371	1.53e+006	1.300	10.00	0.50	438.18	93.46	53.94	2.89	96.35	0.00
10254		10254:WVGD9	89.67	85.00	87.34	32.971	1.56e+006	1.300	10.00	0.50	1870.09	166.81	96.27	5.06	171.87	0.00
10254	10254:WVGD9	10254:Arm4	85.00	82.63	83.81	33.534	1.59e+006	1.300	10.00	0.50	564.40	86.29	49.79	2.57	88.86	0.00
10254	10254:Arm4		82.63	78.81	80.72	34.303	1.62e+006	1.300	10.00	0.50	927.06	141.69	81.77	4.13	145.82	0.00
10254		10254:WVGD8	78.81	75.00	76.91	35.251	1.67e+006	1.300	10.00	0.50	953.01	145.60	84.03	4.13	149.73	0.00
10254	10254:WVGD8		75.00	70.00	72.50	36.347	1.72e+006	1.300	10.00	0.50	1289.19	196.89	113.62	5.42	202.31	0.00
10254		10254:WVGD7	70.00	65.00	67.50	37.590	1.78e+006	1.300	10.00	0.50	1333.83	203.63	117.51	5.42	209.04	0.00
10254	10254:WVGD7		65.00	60.00	62.50	38.834	1.84e+006	1.300	10.00	0.50	1378.46	210.36	121.40	5.42	215.78	0.00
10254		10254:WVGD6	60.00	55.00	57.50	40.077	1.9e+006	1.300	10.00	0.50	1423.10	217.10	125.28	5.42	222.51	0.00
10254	10254:WVGD6		55.00	50.00	52.50	41.320	1.96e+006	1.300	10.00	0.50	1467.73	223.83	129.17	5.42	229.25	0.00
10254		10254:WVGD5	50.00	45.00	47.50	42.564	2.02e+006	1.300	10.00	0.50	1512.37	230.57	133.06	5.42	235.98	0.00
10254	10254:WVGD5		45.00	41.17	43.09	43.661	2.07e+006	1.300	10.00	0.50	1188.67	181.17	104.55	4.15	185.32	0.00
10254			41.17	38.09	39.63	44.084	2.09e+006	1.300	10.00	0.50	2001.23	147.34	85.03	3.34	150.68	0.00
10254		10254:WVGD4	38.09	35.00	36.54	44.413	2.1e+006	1.300	10.00	0.50	2036.01	148.44	85.66	3.34	151.78	0.00
10254	10254:WVGD4		35.00	30.00	32.50	45.419	2.15e+006	1.300	10.00	0.50	1729.01	246.03	141.98	5.42	251.45	0.00
10254		10254:WVGD3	30.00	25.00	27.50	46.662	2.21e+006	1.300	10.00	0.50	1776.83	252.76	145.87	5.42	258.18	0.00
10254	10254:WVGD3		25.00	20.00	22.50	47.905	2.27e+006	1.300	10.00	0.50	1824.66	259.50	149.75	5.42	264.92	0.00
10254		10254:WVGD2	20.00	15.00	17.50	49.148	2.33e+006	1.300	10.00	0.50	1872.48	266.23	153.64	5.42	271.65	0.00
10254	10254:WVGD2		15.00	10.00	12.50	50.392	2.39e+006	1.300	10.00	0.50	1920.31	272.97	157.53	5.42	278.39	0.00
10254		10254:WVGD1	10.00	5.00	7.50	51.635	2.44e+006	1.300	10.00	0.50	1968.13	279.70	161.41	5.42	285.12	0.00
10254	10254:WVGD1	10254:g	5.00	0.00	2.50	52.878	2.5e+006	1.300	10.00	0.50	2015.95	286.44	165.30	5.42	291.86	0.00

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	243	683	0	
Davit2:End	243	683	0	
Davit3:End	2651	4709	0	
Davit4:End	2651	4709	0	
Davit5:End	2651	4709	0	
Davit6:End	2651	4709	0	
Davit7:End	2651	4709	0	
Davit8:End	2651	4709	0	

10254:WVGD1	250	356	0
10254:WVGD2	250	356	0
10254:WVGD3	250	356	0
10254:WVGD4	250	356	0
10254:WVGD5	250	356	0
10254:WVGD6	250	356	0
10254:WVGD7	250	356	0
10254:WVGD8	250	356	0
10254:WVGD9	250	356	0
10254:WVGD10	250	356	0
10254:WVGD11	250	356	0
10254:WVGD12	250	356	0
10254:WVGD13	250	356	0
10254:WVGD14	250	356	0
10254:t	2316	0	0
10254:TopConn	0	4973	0
10254:TopConT	0	49207	0
10254:TopConB	0	-49207	0

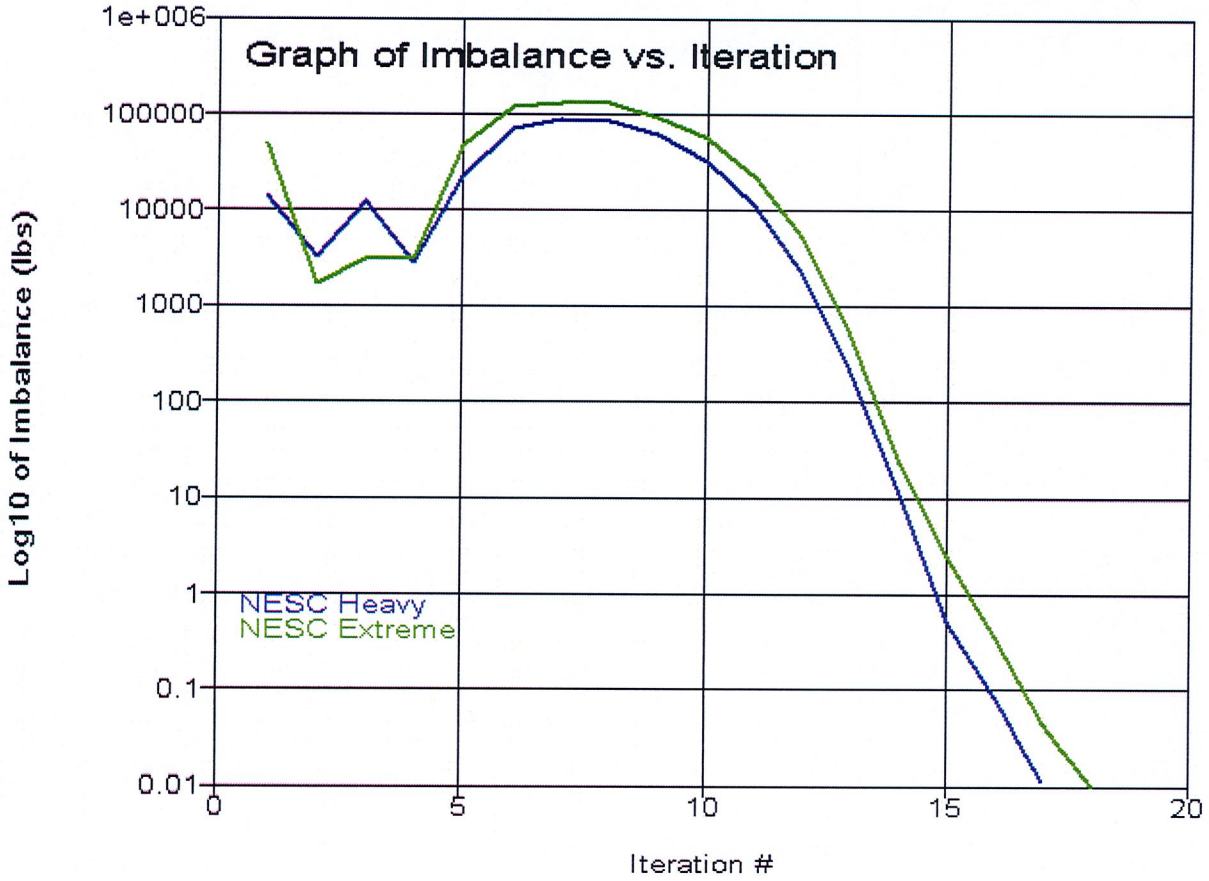
Detailed Pole Loading Data for Load Case "NESC Extreme":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
10254	10254:t	10254:Arm1	140.00	139.30	139.65	20.275	1.57e+006	1.000	26.91	0.00	47.78	31.83	0.00	0.00	31.83	0.00
10254	10254:Arm1	10254:TopConT	139.30	139.00	139.15	20.399	1.58e+006	1.000	26.91	0.00	20.60	13.72	0.00	0.00	13.72	0.00
10254	10254:TopConT	10254:TopConn	139.00	138.50	138.75	20.498	1.59e+006	1.000	26.91	0.00	34.51	22.98	0.00	0.00	22.98	0.00
10254	10254:TopConn	10254:TopConB	138.50	138.00	138.25	20.623	1.6e+006	1.000	26.91	0.00	34.72	23.12	0.00	0.00	23.12	0.00
10254	10254:TopConB	10254:WVGD14	138.00	135.00	136.50	21.058	1.64e+006	1.000	26.91	0.00	212.79	141.67	0.00	0.00	141.67	0.00
10254	10254:WVGD14		135.00	130.81	132.91	21.951	1.7e+006	1.000	26.91	0.00	309.82	206.14	0.00	0.00	206.14	0.00
10254		10254:Arm2	130.81	126.63	128.72	22.993	1.79e+006	1.000	26.91	0.00	324.73	215.92	0.00	0.00	215.92	0.00
10254	10254:Arm2	10254:WVGD13	126.63	125.00	125.81	23.715	1.84e+006	1.000	26.91	0.00	130.03	86.42	0.00	0.00	86.42	0.00
10254	10254:WVGD13		125.00	120.00	122.50	24.539	1.91e+006	1.000	26.91	0.00	414.17	275.15	0.00	0.00	275.15	0.00
10254		10254:WVGD12	120.00	115.00	117.50	25.782	2e+006	1.000	26.91	0.00	435.43	289.09	0.00	0.00	289.09	0.00
10254	10254:WVGD12		115.00	110.00	112.50	27.026	2.1e+006	1.000	26.91	0.00	456.68	303.03	0.00	0.00	303.03	0.00
10254		10254:WVGD11	110.00	105.00	107.50	28.269	2.2e+006	1.000	26.91	0.00	477.94	316.97	0.00	0.00	316.97	0.00
10254	10254:WVGD11	10254:Arm3	105.00	104.63	104.81	28.937	2.25e+006	1.000	26.91	0.00	36.70	24.33	0.00	0.00	24.33	0.00
10254	10254:Arm3		104.63	99.81	102.22	29.582	2.3e+006	1.000	26.91	0.00	481.62	319.26	0.00	0.00	319.26	0.00
10254		10254:WVGD10	99.81	95.00	97.41	30.779	2.39e+006	1.000	26.91	0.00	501.31	332.17	0.00	0.00	332.17	0.00
10254	10254:WVGD10		95.00	92.34	93.67	31.709	2.46e+006	1.000	26.91	0.00	286.08	189.50	0.00	0.00	189.50	0.00
10254			92.34	89.67	91.00	32.371	2.51e+006	1.000	26.91	0.00	292.12	193.46	0.00	0.00	193.46	0.00
10254		10254:WVGD9	89.67	85.00	87.34	32.971	2.56e+006	1.000	26.91	0.00	1246.73	345.29	0.00	0.00	345.29	0.00
10254	10254:WVGD9	10254:Arm4	85.00	82.63	83.81	33.534	2.6e+006	1.000	26.91	0.00	376.26	178.60	0.00	0.00	178.60	0.00
10254	10254:Arm4		82.63	78.81	80.72	34.303	2.66e+006	1.000	26.91	0.00	618.04	293.28	0.00	0.00	293.28	0.00
10254		10254:WVGD8	78.81	75.00	76.91	35.251	2.74e+006	1.000	26.91	0.00	635.34	301.39	0.00	0.00	301.39	0.00
10254	10254:WVGD8		75.00	70.00	72.50	36.347	2.82e+006	1.000	26.91	0.00	859.46	407.55	0.00	0.00	407.55	0.00
10254		10254:WVGD7	70.00	65.00	67.50	37.590	2.92e+006	1.000	26.91	0.00	889.22	421.49	0.00	0.00	421.49	0.00
10254	10254:WVGD7		65.00	60.00	62.50	38.834	3.02e+006	1.000	26.91	0.00	918.97	435.43	0.00	0.00	435.43	0.00
10254		10254:WVGD6	60.00	55.00	57.50	40.077	3.11e+006	1.000	26.91	0.00	948.73	449.37	0.00	0.00	449.37	0.00
10254	10254:WVGD6		55.00	50.00	52.50	41.320	3.21e+006	1.000	26.91	0.00	978.49	463.31	0.00	0.00	463.31	0.00
10254		10254:WVGD5	50.00	45.00	47.50	42.564	3.31e+006	1.000	26.91	0.00	1008.25	477.25	0.00	0.00	477.25	0.00
10254	10254:WVGD5		45.00	41.17	43.09	43.661	3.39e+006	1.000	26.91	0.00	792.44	375.01	0.00	0.00	375.01	0.00
10254			41.17	38.09	39.63	44.084	3.42e+006	1.000	26.91	0.00	1334.15	304.98	0.00	0.00	304.98	0.00
10254		10254:WVGD4	38.09	35.00	36.54	44.413	3.45e+006	1.000	26.91	0.00	1357.34	307.26	0.00	0.00	307.26	0.00
10254	10254:WVGD4		35.00	30.00	32.50	45.419	3.53e+006	1.000	26.91	0.00	1152.67	509.27	0.00	0.00	509.27	0.00
10254		10254:WVGD3	30.00	25.00	27.50	46.662	3.62e+006	1.000	26.91	0.00	1184.56	523.21	0.00	0.00	523.21	0.00
10254	10254:WVGD3		25.00	20.00	22.50	47.905	3.72e+006	1.000	26.91	0.00	1216.44	537.15	0.00	0.00	537.15	0.00
10254		10254:WVGD2	20.00	15.00	17.50	49.148	3.82e+006	1.000	26.91	0.00	1248.32	551.09	0.00	0.00	551.09	0.00
10254	10254:WVGD2		15.00	10.00	12.50	50.392	3.91e+006	1.000	26.91	0.00	1280.20	565.03	0.00	0.00	565.03	0.00
10254		10254:WVGD1	10.00	5.00	7.50	51.635	4.01e+006	1.000	26.91	0.00	1312.09	578.97	0.00	0.00	578.97	0.00
10254	10254:WVGD1	10254:g	5.00	0.00	2.50	52.878	4.11e+006	1.000	26.91	0.00	1343.97	592.91	0.00	0.00	592.91	0.00

*** Analysis Results:

Maximum element usage is 96.65% for Base Plate "10254" in load case "NESC Extreme"
Maximum insulator usage is 61.51% for Clamp "Clamp25" in load case "NESC Extreme"



*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 17

Equilibrium Joint Positions and Rotations for Load Case "NESC Heavy":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
10254:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
10254:t	0.01384	7.331	-0.2604	-5.4068	0.0092	0.0001	0.01384	7.331	139.7
10254:Arm1	0.01373	7.265	-0.2573	-5.4067	0.0092	0.0001	0.01373	7.265	139
10254:TopConT	0.01368	7.237	-0.2559	-5.4066	0.0092	0.0001	0.01368	7.237	138.7
10254:TopConn	0.0136	7.19	-0.2537	-5.4057	0.0092	0.0001	0.0136	7.19	138.2

10254:TopConB	0.01352	7.143	-0.2515	-5.4036	0.0092	0.0001	0.01352	7.143	137.7
10254:WVGD14	0.01304	6.86	-0.2382	-5.3837	0.0092	0.0001	0.01304	6.86	134.8
10254:Arm2	0.0117	6.08	-0.2016	-5.2931	0.0091	0.0001	0.0117	6.08	126.4
10254:WVGD13	0.01145	5.931	-0.1947	-5.2667	0.0091	0.0001	0.01145	5.931	124.8
10254:WVGD12	0.009882	5.032	-0.1539	-5.0117	0.0088	0.0001	0.009882	5.032	114.8
10254:WVGD11	0.008378	4.188	-0.1178	-4.6572	0.0084	0.0001	0.008378	4.188	104.9
10254:Arm3	0.008323	4.157	-0.1166	-4.6427	0.0084	0.0001	0.008323	4.157	104.5
10254:WVGD10	0.006961	3.412	-0.08722	-4.2144	0.0078	0.0001	0.006961	3.412	94.91
10254:WVGD9	0.005658	2.719	-0.06272	-3.7358	0.0071	0.0001	0.005658	2.719	84.94
10254:Arm4	0.005365	2.566	-0.05771	-3.6384	0.0070	0.0000	0.005365	2.566	82.57
10254:WVGD8	0.004468	2.103	-0.04331	-3.3087	0.0065	0.0000	0.004468	2.103	74.96
10254:WVGD7	0.003398	1.565	-0.02836	-2.8509	0.0058	0.0000	0.003398	1.565	64.97
10254:WVGD6	0.002459	1.107	-0.01744	-2.3822	0.0050	0.0000	0.002459	1.107	54.98
10254:WVGD5	0.001662	0.7314	-0.00993	-1.9153	0.0041	0.0000	0.001662	0.7314	44.99
10254:WVGD4	0.001015	0.4366	-0.005138	-1.4592	0.0033	0.0000	0.001015	0.4366	34.99
10254:WVGD3	0.0005232	0.2199	-0.002348	-1.0198	0.0024	0.0000	0.0005232	0.2199	25
10254:WVGD2	0.0001908	0.07828	-0.000906	-0.5979	0.0014	0.0000	0.0001908	0.07828	15
10254:WVGD1	2.205e-005	0.00876	-0.0002226	-0.1946	0.0005	0.0000	2.205e-005	0.00876	5
Davit1:O	0.01374	7.269	-0.1773	-5.4067	0.0092	0.0001	0.01374	6.42	139.1
Davit1:End	0.01391	7.336	0.2822	-5.2369	0.0092	0.0002	0.01391	1.488	140.1
Davit2:O	0.01371	7.261	-0.3372	-5.4067	0.0092	0.0001	0.01371	8.11	139
Davit2:End	0.0137	7.286	-0.823	-5.6281	0.0092	0.0001	0.0137	13.13	139
Davit3:O	0.01172	6.085	-0.1113	-5.2931	0.0091	0.0001	0.01172	5.105	126.5
Davit3:End	0.012	6.186	0.5038	-3.8271	0.0092	0.0002	0.012	-2.793	128.1
Davit4:O	0.01169	6.076	-0.292	-5.2931	0.0091	0.0001	0.01169	7.056	126.3
Davit4:End	0.01169	6.138	-1.177	-7.0210	0.0091	0.0001	0.01169	15.12	126.4
Davit5:O	0.008339	4.161	-0.01885	-4.6427	0.0084	0.0001	0.008339	2.954	104.6
Davit5:End	0.00858	4.245	0.5051	-3.1602	0.0084	0.0001	0.00858	-4.963	106.1
Davit6:O	0.008307	4.153	-0.2144	-4.6427	0.0084	0.0001	0.008307	5.361	104.4
Davit6:End	0.008325	4.213	-1.009	-6.3828	0.0084	0.0001	0.008325	13.42	104.6
Davit7:O	0.005377	2.569	0.03174	-3.6384	0.0070	0.0000	0.005377	1.159	82.66
Davit7:End	0.005557	2.627	0.4147	-2.1309	0.0070	0.0001	0.005557	-6.783	84.04
Davit8:O	0.005353	2.563	-0.1472	-3.6384	0.0070	0.0000	0.005353	3.973	82.48
Davit8:End	0.005389	2.618	-0.8023	-5.3968	0.0070	0.0000	0.005389	12.03	82.82

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
10254:g	-0.15	0.0	-35.70	0.0	99.62	0.0	0.0	105.83	0.0	3890.14	0.0	-9.7	0.0	-0.00	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Heavy":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
10254	10254:t	Origin	0.00	87.97	0.17	-3.12	-0.00	-0.00	0.0	-4.87	0.47	-0.00	-0.24	0.00	0.05	0.00	0.26	0.4	5
10254	10254:Arm1	End	0.70	87.18	0.16	-3.09	0.33	-0.00	0.0	-4.87	0.47	-0.00	-0.24	0.04	0.01	0.00	0.28	0.4	2
10254	10254:Arm1	Origin	0.70	87.18	0.16	-3.09	1.53	-0.00	0.0	-6.85	2.93	-0.00	-0.34	0.05	0.29	0.00	0.63	1.0	4
10254	10254:TopConT	End	1.00	86.84	0.16	-3.07	2.41	-0.00	0.0	-6.85	2.93	-0.00	-0.34	0.21	0.21	0.00	0.66	1.0	3
10254	10254:TopConT	Origin	1.00	86.84	0.16	-3.07	2.41	-0.00	0.0	-5.56	16.99	-0.00	-0.28	0.00	1.71	0.00	2.98	4.6	5
10254	10254:TopConn	End	1.50	86.28	0.16	-3.04	10.90	-0.00	0.0	-5.56	16.99	-0.00	-0.27	0.00	1.70	0.00	2.96	4.6	5
10254	10254:TopConn	Origin	1.50	86.28	0.16	-3.04	10.90	-0.00	0.0	-5.48	18.45	-0.00	-0.27	0.00	1.85	0.00	3.21	4.9	5
10254	10254:TopConB	End	2.00	85.71	0.16	-3.02	20.13	-0.00	0.0	-5.48	18.45	-0.00	-0.27	0.62	1.78	0.00	3.20	4.9	4
10254	10254:TopConB	Origin	2.00	85.71	0.16	-3.02	20.13	-0.00	0.0	-7.02	4.47	-0.00	-0.34	2.30	0.12	0.00	2.65	4.1	2
10254	10254:WVGD14	End	5.00	82.33	0.16	-2.86	33.53	-0.01	0.0	-7.02	4.47	-0.00	-0.33	3.56	0.11	0.00	3.89	6.0	2
10254	10254:WVGD14	Origin	5.00	82.33	0.16	-2.86	33.53	-0.01	0.0	-8.37	4.81	-0.01	-0.39	3.56	0.12	0.00	3.96	6.1	2
10254	Tube 1	End	9.19	77.63	0.15	-2.64	53.67	-0.04	0.0	-8.37	4.81	-0.01	-0.38	5.17	0.11	0.00	5.55	8.5	2
10254	Tube 1	Origin	9.19	77.63	0.15	-2.64	53.67	-0.04	0.0	-8.90	4.96	-0.01	-0.40	5.17	0.12	0.00	5.57	8.6	2
10254	10254:Arm2	End	13.38	72.97	0.14	-2.42	74.43	-0.08	0.0	-8.90	4.96	-0.01	-0.38	6.54	0.11	0.00	6.92	10.7	2
10254	10254:Arm2	Origin	13.38	72.97	0.14	-2.42	82.51	-0.08	0.0	-21.30	14.35	-0.01	-0.91	7.25	0.33	0.00	8.18	12.6	2
10254	10254:WVGD13	End	15.00	71.17	0.14	-2.34	105.83	-0.10	0.0	-21.30	14.35	-0.01	-0.90	8.98	0.32	0.00	9.89	15.2	2

10254	10254:WVGD13	Origin	15.00	71.17	0.14	-2.34	105.83	-0.10	0.0	-22.68	14.67	-0.02	-0.96	8.98	0.33	0.00	9.95	15.3	2
10254	Tube 1	End	20.00	65.71	0.13	-2.09	179.18	-0.18	0.0	-22.68	14.67	-0.02	-0.91	13.71	0.31	0.00	14.63	22.5	2
10254	Tube 1	Origin	20.00	65.71	0.13	-2.09	179.18	-0.18	0.0	-23.43	14.82	-0.02	-0.94	13.71	0.31	0.00	14.66	22.6	2
10254	10254:WVGD12	End	25.00	60.39	0.12	-1.85	253.30	-0.28	0.0	-23.43	14.82	-0.02	-0.89	17.57	0.30	0.00	18.47	28.4	2
10254	10254:WVGD12	Origin	25.00	60.39	0.12	-1.85	253.30	-0.28	0.0	-25.12	15.18	-0.02	-0.96	17.57	0.31	0.00	18.54	28.5	2
10254	Tube 1	End	30.00	55.23	0.11	-1.62	329.21	-0.40	0.0	-25.12	15.18	-0.02	-0.91	20.79	0.29	0.00	21.72	33.4	2
10254	Tube 1	Origin	30.00	55.23	0.11	-1.62	329.21	-0.40	0.0	-25.95	15.32	-0.03	-0.94	20.79	0.30	0.00	21.75	33.5	2
10254	10254:WVGD11	End	35.00	50.25	0.10	-1.41	405.83	-0.53	0.0	-25.95	15.32	-0.03	-0.90	23.44	0.28	0.00	24.35	37.5	2
10254	10254:WVGD11	Origin	35.00	50.25	0.10	-1.41	405.83	-0.53	0.0	-27.32	15.60	-0.03	-0.95	23.44	0.29	0.00	24.40	37.5	2
10254	10254:Arm3	End	35.38	49.89	0.10	-1.40	411.68	-0.55	0.0	-27.32	15.60	-0.03	-0.95	23.62	0.29	0.00	24.58	37.8	2
10254	10254:Arm3	Origin	35.38	49.89	0.10	-1.40	419.63	-0.55	0.0	-39.92	24.80	-0.03	-1.39	24.08	0.46	0.00	25.48	39.2	2
10254	Tube 1	End	40.19	45.31	0.09	-1.21	538.99	-0.71	0.0	-39.92	24.80	-0.03	-1.33	28.49	0.44	0.00	29.83	45.9	2
10254	Tube 1	Origin	40.19	45.31	0.09	-1.21	538.99	-0.71	0.0	-40.84	24.88	-0.04	-1.36	28.49	0.44	0.00	29.86	45.9	2
10254	10254:WVGD10	End	45.00	40.94	0.08	-1.05	658.71	-0.90	0.0	-40.84	24.88	-0.04	-1.31	32.17	0.42	0.00	33.49	51.5	2
10254	10254:WVGD10	Origin	45.00	40.94	0.08	-1.05	658.71	-0.90	0.0	-42.49	25.12	-0.04	-1.36	32.17	0.43	0.00	33.54	51.6	2
10254	Tube 1	End	47.67	38.63	0.08	-0.96	725.66	-1.01	0.0	-42.49	25.12	-0.04	-1.33	33.97	0.42	0.00	35.31	54.3	2
10254	Tube 1	Origin	47.67	38.63	0.08	-0.96	725.66	-1.01	0.0	-43.03	25.15	-0.04	-1.35	33.97	0.42	0.00	35.33	54.4	2
10254	SpliceT	End	50.33	36.38	0.08	-0.88	792.69	-1.13	0.0	-43.03	25.15	-0.04	-1.32	35.60	0.41	0.00	36.93	56.8	2
10254	SpliceT	Origin	50.33	36.38	0.08	-0.88	792.69	-1.13	0.0	-44.33	25.24	-0.05	-1.36	35.60	0.41	0.00	36.97	56.9	2
10254	10254:WVGD9	End	55.00	32.63	0.07	-0.75	910.56	-1.35	0.0	-44.33	25.24	-0.05	-0.96	28.58	0.29	0.00	29.55	45.5	2
10254	10254:WVGD9	Origin	55.00	32.63	0.07	-0.75	910.56	-1.35	0.0	-46.60	25.52	-0.05	-1.01	28.58	0.29	0.00	29.60	45.5	2
10254	10254:Arm4	End	57.38	30.79	0.06	-0.69	971.17	-1.48	0.0	-46.60	25.52	-0.05	-0.99	29.41	0.29	0.00	30.41	46.8	2
10254	10254:Arm4	Origin	57.38	30.79	0.06	-0.69	978.92	-1.48	0.0	-59.75	34.51	-0.06	-1.27	29.65	0.39	0.00	30.93	47.6	2
10254	Tube 2	End	61.19	27.95	0.06	-0.60	1110.47	-1.69	0.0	-59.75	34.51	-0.06	-1.24	31.79	0.38	0.00	33.03	50.8	2
10254	Tube 2	Origin	61.19	27.95	0.06	-0.60	1110.47	-1.69	0.0	-60.88	34.54	-0.06	-1.26	31.79	0.38	0.00	33.06	50.9	2
10254	10254:WVGD8	End	65.00	25.24	0.05	-0.52	1242.15	-1.92	0.0	-60.88	34.54	-0.06	-1.23	33.66	0.37	0.00	34.89	53.7	2
10254	10254:WVGD8	Origin	65.00	25.24	0.05	-0.52	1242.15	-1.92	0.0	-63.12	34.76	-0.06	-1.27	33.66	0.37	0.00	34.94	53.8	2
10254	Tube 2	End	70.00	21.89	0.05	-0.42	1415.94	-2.24	0.0	-63.12	34.76	-0.06	-1.23	35.79	0.36	0.00	37.02	57.0	2
10254	Tube 2	Origin	70.00	21.89	0.05	-0.42	1415.94	-2.24	0.0	-64.69	34.78	-0.07	-1.26	35.79	0.36	0.00	37.05	57.0	2
10254	10254:WVGD7	End	75.00	18.77	0.04	-0.34	1589.86	-2.59	0.0	-64.69	34.78	-0.07	-1.22	37.57	0.35	0.00	38.79	59.7	2
10254	10254:WVGD7	Origin	75.00	18.77	0.04	-0.34	1589.86	-2.59	0.0	-67.21	34.98	-0.07	-1.26	37.57	0.35	0.00	38.84	59.8	2
10254	Tube 2	End	80.00	15.91	0.03	-0.27	1764.75	-2.96	0.0	-67.21	34.98	-0.07	-1.22	39.08	0.34	0.00	40.30	62.0	2
10254	Tube 2	Origin	80.00	15.91	0.03	-0.27	1764.75	-2.96	0.0	-68.88	34.99	-0.08	-1.25	39.08	0.34	0.00	40.33	62.1	2
10254	10254:WVGD6	End	85.00	13.29	0.03	-0.21	1939.69	-3.36	0.0	-68.88	34.99	-0.08	-1.22	40.32	0.33	0.00	41.54	63.9	2
10254	10254:WVGD6	Origin	85.00	13.29	0.03	-0.21	1939.69	-3.36	0.0	-71.51	35.16	-0.09	-1.26	40.32	0.33	0.00	41.59	64.0	2
10254	Tube 2	End	90.00	10.91	0.02	-0.16	2115.50	-3.79	0.0	-71.51	35.16	-0.09	-1.22	41.37	0.32	0.00	42.60	65.5	2
10254	Tube 2	Origin	90.00	10.91	0.02	-0.16	2115.50	-3.79	0.0	-73.27	35.16	-0.09	-1.25	41.37	0.32	0.00	42.63	65.6	2
10254	10254:WVGD5	End	95.00	8.78	0.02	-0.12	2291.30	-4.25	0.0	-73.27	35.16	-0.09	-1.22	42.23	0.31	0.00	43.45	66.8	2
10254	10254:WVGD5	Origin	95.00	8.78	0.02	-0.12	2291.30	-4.25	0.0	-75.78	35.32	-0.10	-1.26	42.23	0.31	0.00	43.49	66.9	2
10254	SpliceT	End	98.83	7.31	0.02	-0.09	2426.56	-4.62	0.0	-75.78	35.32	-0.10	-1.23	42.78	0.30	0.00	44.02	67.7	2
10254	SpliceT	Origin	98.83	7.31	0.02	-0.09	2426.56	-4.62	0.0	-77.57	35.32	-0.10	-1.26	42.78	0.30	0.00	44.05	67.8	2
10254	Tube 2	End	101.92	6.23	0.01	-0.08	2535.52	-4.93	0.0	-77.57	35.32	-0.10	-1.18	42.02	0.28	0.00	43.21	66.5	2
10254	Tube 2	Origin	101.92	6.23	0.01	-0.08	2535.52	-4.93	0.0	-79.76	35.34	-0.10	-1.21	42.02	0.28	0.00	43.24	66.5	2
10254	10254:WVGD4	End	105.00	5.24	0.01	-0.06	2644.55	-5.25	0.0	-79.76	35.34	-0.10	-1.19	42.32	0.28	0.00	43.52	66.9	2
10254	10254:WVGD4	Origin	105.00	5.24	0.01	-0.06	2644.55	-5.25	0.0	-82.78	35.49	-0.11	-1.24	42.32	0.28	0.00	43.56	67.0	2
10254	Tube 3	End	110.00	3.82	0.01	-0.04	2822.01	-5.80	0.0	-82.78	35.49	-0.11	-1.21	42.72	0.27	0.00	43.93	67.6	2
10254	Tube 3	Origin	110.00	3.82	0.01	-0.04	2822.01	-5.80	0.0	-84.81	35.47	-0.12	-1.23	42.72	0.27	0.00	43.95	67.6	2
10254	10254:WVGD3	End	115.00	2.64	0.01	-0.03	2999.34	-6.38	0.0	-84.81	35.47	-0.12	-1.20	43.01	0.27	0.00	44.22	68.0	2
10254	10254:WVGD3	Origin	115.00	2.64	0.01	-0.03	2999.34	-6.37	0.0	-87.81	35.59	-0.12	-1.24	43.01	0.27	0.00	44.26	68.1	2
10254	Tube 3	End	120.00	1.68	0.00	-0.02	3177.27	-6.98	0.0	-87.81	35.59	-0.12	-1.21	43.23	0.26	0.00	44.44	68.4	2
10254	Tube 3	Origin	120.00	1.68	0.00	-0.02	3177.27	-6.98	0.0	-89.95	35.56	-0.13	-1.24	43.23	0.26	0.00	44.47	68.4	2
10254	10254:WVGD2	End	125.00	0.94	0.00	-0.01	3355.04	-7.62	0.0	-89.95	35.56	-0.13	-1.21	43.36	0.25	0.00	44.57	68.6	2
10254	10254:WVGD2	Origin	125.00	0.94	0.00	-0.01	3355.04	-7.62	0.0	-93.04	35.67	-0.13	-1.25	43.36	0.25	0.00	44.62	68.6	2
10254	Tube 3	End	130.00	0.42	0.00	-0.01	3533.36	-8.30	0.0	-93.04	35.67	-0.13	-1.22	43.44	0.25	0.00	44.66	68.7	2
10254	Tube 3	Origin	130.00	0.42	0.00	-0.01	3533.36	-8.30	0.0	-95.27	35.63	-0.14	-1.25	43.44	0.25	0.00	44.69	68.8	2
10254	10254:WVGD1	End	135.00	0.11	0.00	-0.00	3711.51	-9.00	0.0	-95.27	35.63	-0.14	-1.22	43.46	0.24	0.00	44.68	68.7	2
10254	10254:WVGD1	Origin	135.00	0.11	0.00	-0.00	3711.51	-9.00	0.0	-98.47	35.73	-0.15	-1.26	43.46	0.24	0.00	44.72	68.8	2
10254	10254:g	End	140.00	0.00	0.00	0.00	3890.14	-9.74	0.0	-98.47	35.73	-0.15	-1.23	43.43	0.24	0.00	44.66	68.7	2

Detailed Tubular Davit Arm Usages for Load Case "NESC Heavy":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
Davit1	Davit1:O	Origin	0.00	87.23	0.16	-2.13	-3.98	0.00	0.0	-1.31	0.81	-0.00	-0.32	8.15	0.00	0.00	8.47	13.0	1

Davit1	#Davit1:0	End	2.51	87.64	0.17	0.65	-1.94	0.00	0.0	-1.31	0.81	-0.00	-0.37	5.05	0.00	0.00	5.42	8.3	1
Davit1	#Davit1:0	Origin	2.51	87.64	0.17	0.65	-1.94	0.00	0.0	-1.30	0.77	-0.00	-0.36	5.05	0.00	0.00	5.42	8.3	1
Davit1	Davit1:End	End	5.02	88.04	0.17	3.39	-0.00	0.00	0.0	-1.30	0.77	-0.00	-0.42	0.00	0.53	0.00	1.00	1.5	3
Davit2	Davit2:O	Origin	0.00	87.14	0.16	-4.05	-5.17	-0.00	-0.0	1.12	1.05	0.00	0.28	10.60	0.00	0.00	10.88	16.7	1
Davit2	#Davit2:0	End	2.51	87.29	0.16	-6.93	-2.53	-0.00	-0.0	1.12	1.05	0.00	0.31	6.60	0.00	0.00	6.91	10.6	1
Davit2	#Davit2:0	Origin	2.51	87.29	0.16	-6.93	-2.53	-0.00	0.0	1.13	1.01	0.00	0.31	6.60	0.00	0.00	6.91	10.6	1
Davit2	Davit2:End	End	5.02	87.44	0.16	-9.88	0.00	0.00	0.0	1.13	1.01	0.00	0.36	0.00	0.69	0.00	1.24	1.9	3
Davit3	Davit3:O	Origin	0.00	73.02	0.14	-1.34	-43.28	0.01	0.0	-5.30	5.38	-0.00	-0.93	43.70	0.00	0.00	44.62	68.7	1
Davit3	#Davit3:0	End	4.03	73.69	0.14	2.68	-21.61	0.00	0.0	-5.30	5.38	-0.00	-1.20	36.72	0.00	0.00	37.92	58.3	1
Davit3	#Davit3:0	Origin	4.03	73.69	0.14	2.68	-21.61	0.00	0.0	-5.21	5.36	-0.00	-1.18	36.72	0.00	0.00	37.90	58.3	1
Davit3	Davit3:End	End	8.06	74.24	0.14	6.05	-0.00	0.00	0.0	-5.21	5.36	-0.00	-1.67	0.00	3.67	0.00	6.56	10.1	3
Davit4	Davit4:O	Origin	0.00	72.92	0.14	-3.50	-51.36	-0.01	-0.0	3.93	6.45	0.00	0.69	51.85	0.00	0.00	52.54	80.8	1
Davit4	#Davit4:0	End	4.03	73.28	0.14	-8.42	-25.37	-0.00	-0.0	3.93	6.45	0.00	0.89	43.10	0.00	0.00	43.99	67.7	1
Davit4	#Davit4:0	Origin	4.03	73.28	0.14	-8.42	-25.37	-0.00	0.0	4.03	6.29	0.00	0.91	43.10	0.00	0.00	44.01	67.7	1
Davit4	Davit4:End	End	8.06	73.65	0.14	-14.13	-0.00	0.00	0.0	4.03	6.29	0.00	1.29	0.00	4.30	0.00	7.56	11.6	3
Davit5	Davit5:O	Origin	0.00	49.94	0.10	-0.23	-43.77	0.01	0.0	-5.24	5.44	-0.00	-0.91	44.19	0.00	0.00	45.10	69.4	1
Davit5	#Davit5:0	End	4.03	50.50	0.10	3.25	-21.85	0.00	0.0	-5.24	5.44	-0.00	-1.18	37.13	0.00	0.00	38.32	58.9	1
Davit5	#Davit5:0	Origin	4.03	50.50	0.10	3.25	-21.85	0.00	0.0	-5.14	5.42	-0.00	-1.16	37.13	0.00	0.00	38.29	58.9	1
Davit5	Davit5:End	End	8.06	50.94	0.10	6.06	-0.00	0.00	0.0	-5.14	5.42	-0.00	-1.65	0.00	3.71	0.00	6.63	10.2	3
Davit6	Davit6:O	Origin	0.00	49.84	0.10	-2.57	-51.72	-0.01	-0.0	3.85	6.49	0.00	0.67	52.21	0.00	0.00	52.89	81.4	1
Davit6	#Davit6:0	End	4.03	50.19	0.10	-6.94	-25.55	-0.00	-0.0	3.85	6.49	0.00	0.87	43.41	0.00	0.00	44.28	68.1	1
Davit6	#Davit6:0	Origin	4.03	50.19	0.10	-6.94	-25.55	-0.00	0.0	3.96	6.34	0.00	0.90	43.41	0.00	0.00	44.30	68.2	1
Davit6	Davit6:End	End	8.06	50.56	0.10	-12.11	-0.00	0.00	0.0	3.96	6.34	0.00	1.27	0.00	4.33	0.00	7.61	11.7	3
Davit7	Davit7:O	Origin	0.00	30.82	0.06	0.38	-44.51	0.01	0.0	-5.14	5.53	-0.00	-0.90	44.93	0.00	0.00	45.83	70.5	1
Davit7	#Davit7:0	End	4.03	31.23	0.07	3.02	-22.22	0.00	0.0	-5.14	5.53	-0.00	-1.16	37.76	0.00	0.00	38.92	59.9	1
Davit7	#Davit7:0	Origin	4.03	31.23	0.07	3.02	-22.22	0.00	0.0	-5.04	5.51	-0.00	-1.14	37.76	0.00	0.00	38.90	59.8	1
Davit7	Davit7:End	End	8.06	31.52	0.07	4.98	-0.00	0.00	0.0	-5.04	5.51	-0.00	-1.61	0.00	3.77	0.00	6.73	10.3	3
Davit8	Davit8:O	Origin	0.00	30.76	0.06	-1.77	-52.26	-0.01	-0.0	3.74	6.56	0.00	0.65	52.76	0.00	0.00	53.41	82.2	1
Davit8	#Davit8:0	End	4.03	31.07	0.06	-5.29	-25.82	-0.00	-0.0	3.74	6.56	0.00	0.84	43.87	0.00	0.00	44.71	68.8	1
Davit8	#Davit8:0	Origin	4.03	31.07	0.06	-5.29	-25.82	-0.00	0.0	3.85	6.40	0.00	0.87	43.87	0.00	0.00	44.74	68.8	1
Davit8	Davit8:End	End	8.06	31.41	0.06	-9.63	-0.00	0.00	0.0	3.85	6.40	0.00	1.23	0.00	4.38	0.00	7.68	11.8	3

Summary of Clamp Capacities and Usages for Load Case "NESC Heavy":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	1.496	80.00	80.00	1.87
Clamp2	1.496	80.00	80.00	1.87
Clamp3	7.440	80.00	80.00	9.30
Clamp4	7.440	80.00	80.00	9.30
Clamp5	7.440	80.00	80.00	9.30
Clamp6	7.440	80.00	80.00	9.30
Clamp7	7.440	80.00	80.00	9.30
Clamp8	7.440	80.00	80.00	9.30
Clamp9	4.847	80.00	80.00	6.06
Clamp10	0.929	80.00	80.00	1.16
Clamp11	0.929	80.00	80.00	1.16
Clamp12	0.929	80.00	80.00	1.16
Clamp13	0.929	80.00	80.00	1.16
Clamp14	0.929	80.00	80.00	1.16
Clamp15	0.929	80.00	80.00	1.16
Clamp16	0.929	80.00	80.00	1.16
Clamp17	0.929	80.00	80.00	1.16
Clamp18	0.929	80.00	80.00	1.16
Clamp19	0.929	80.00	80.00	1.16
Clamp20	0.929	80.00	80.00	1.16

Clamp21	0.929	80.00	80.00	1.16
Clamp22	0.929	80.00	80.00	1.16
Clamp23	0.929	80.00	80.00	1.16
Clamp24	1.450	80.00	80.00	1.81
Clamp25	14.107	80.00	80.00	17.63
Clamp26	14.107	80.00	80.00	17.63

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 18

Equilibrium Joint Positions and Rotations for Load Case "NESC Extreme":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
10254:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
10254:t	0.004064	9.536	-0.4357	-7.1984	0.0027	0.0001	0.004064	9.536	139.6
10254:Arm1	0.004031	9.448	-0.4302	-7.1983	0.0027	0.0001	0.004031	9.448	138.9
10254:TopConT	0.004017	9.41	-0.4278	-7.1982	0.0027	0.0001	0.004017	9.41	138.6
10254:TopConn	0.003994	9.347	-0.4238	-7.1963	0.0027	0.0001	0.003994	9.347	138.1
10254:TopConB	0.003971	9.285	-0.4199	-7.1910	0.0027	0.0001	0.003971	9.285	137.6
10254:WVGD14	0.003832	8.91	-0.3964	-7.1428	0.0027	0.0001	0.003832	8.91	134.6
10254:Arm2	0.003445	7.881	-0.3329	-6.9632	0.0026	0.0001	0.003445	7.881	126.3
10254:WVGD13	0.00337	7.684	-0.3209	-6.9177	0.0026	0.0001	0.00337	7.684	124.7
10254:WVGD12	0.002916	6.51	-0.2516	-6.5334	0.0026	0.0001	0.002916	6.51	114.7
10254:WVGD11	0.002478	5.413	-0.1911	-6.0375	0.0025	0.0000	0.002478	5.413	104.8
10254:Arm3	0.002462	5.374	-0.189	-6.0176	0.0024	0.0000	0.002462	5.374	104.4
10254:WVGD10	0.002064	4.41	-0.1404	-5.4431	0.0023	0.0000	0.002064	4.41	94.86
10254:WVGD9	0.001682	3.516	-0.1002	-4.8161	0.0021	0.0000	0.001682	3.516	84.9
10254:Arm4	0.001596	3.319	-0.09199	-4.6894	0.0021	0.0000	0.001596	3.319	82.53
10254:WVGD8	0.001331	2.723	-0.06849	-4.2636	0.0019	0.0000	0.001331	2.723	74.93
10254:WVGD7	0.001015	2.029	-0.04418	-3.6772	0.0017	0.0000	0.001015	2.029	64.96
10254:WVGD6	0.0007363	1.439	-0.02651	-3.0787	0.0015	0.0000	0.0007363	1.439	54.97
10254:WVGD5	0.0004989	0.9525	-0.01447	-2.4818	0.0012	0.0000	0.0004989	0.9525	44.99
10254:WVGD4	0.0003055	0.5699	-0.006919	-1.8966	0.0010	0.0000	0.0003055	0.5699	34.99
10254:WVGD3	0.0001578	0.2877	-0.002708	-1.3300	0.0007	0.0000	0.0001578	0.2877	25
10254:WVGD2	5.769e-005	0.1027	-0.0007667	-0.7827	0.0004	0.0000	5.769e-005	0.1027	15
10254:WVGD1	6.687e-006	0.01154	-0.0001183	-0.2557	0.0001	0.0000	6.687e-006	0.01154	5
Davit1:O	0.004037	9.454	-0.3239	-7.1983	0.0027	0.0001	0.004037	8.606	139
Davit1:End	0.004097	9.556	0.2975	-7.1758	0.0027	0.0001	0.004097	3.708	140.1
Davit2:O	0.004025	9.441	-0.5365	-7.1983	0.0027	0.0001	0.004025	10.29	138.8
Davit2:End	0.004013	9.464	-1.17	-7.2519	0.0027	0.0001	0.004013	15.31	138.6
Davit3:O	0.003452	7.888	-0.2141	-6.9632	0.0026	0.0001	0.003452	6.908	126.4
Davit3:End	0.003553	8.061	0.7157	-6.5570	0.0027	0.0001	0.003553	-0.9192	128.3
Davit4:O	0.003438	7.874	-0.4516	-6.9632	0.0026	0.0001	0.003438	8.853	126.2
Davit4:End	0.003428	7.936	-1.489	-7.6892	0.0026	0.0001	0.003428	16.92	126.1
Davit5:O	0.002468	5.38	-0.06241	-6.0176	0.0024	0.0000	0.002468	4.173	104.6
Davit5:End	0.002554	5.521	0.736	-5.5874	0.0025	0.0001	0.002554	-3.686	106.4
Davit6:O	0.002456	5.367	-0.3156	-6.0176	0.0024	0.0000	0.002456	6.575	104.3
Davit6:End	0.002454	5.429	-1.222	-6.7645	0.0024	0.0000	0.002454	14.64	104.4
Davit7:O	0.0016	3.324	0.02325	-4.6894	0.0021	0.0000	0.0016	1.914	82.65
Davit7:End	0.001663	3.425	0.6363	-4.2257	0.0021	0.0000	0.001663	-5.985	84.26
Davit8:O	0.001591	3.314	-0.2072	-4.6894	0.0021	0.0000	0.001591	4.724	82.42
Davit8:End	0.001598	3.372	-0.9289	-5.4653	0.0021	0.0000	0.001598	12.78	82.7

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
10254:g	-0.05	0.0	-51.10	0.0	48.90	0.0	0.0	70.73	0.0	5121.93	0.0	-3.0	0.0	-0.00	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Extreme":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
10254	10254:t	Origin	0.00	114.43	0.05	-5.23	-0.00	-0.00	0.0	-2.32	0.31	-0.00	-0.12	0.00	0.03	0.00	0.13	0.2	5
10254	10254:Arm1	End	0.70	113.37	0.05	-5.16	0.22	-0.00	0.0	-2.32	0.31	-0.00	-0.12	0.03	0.01	0.00	0.14	0.2	2

10254	10254:Arm1	Origin	0.70	113.37	0.05	-5.16	0.94	-0.00	0.0	-2.78	1.77	-0.00	-0.14	0.03	0.17	0.00	0.34	0.5	4
10254	10254:TopConT	End	1.00	112.92	0.05	-5.13	1.47	-0.00	0.0	-2.78	1.77	-0.00	-0.14	0.05	0.17	0.00	0.35	0.5	4
10254	10254:TopConT	Origin	1.00	112.92	0.05	-5.13	1.47	-0.00	0.0	3.37	50.61	-0.00	0.17	0.00	5.10	0.00	8.83	13.6	5
10254	10254:TopConn	End	1.50	112.17	0.05	-5.09	26.77	-0.00	0.0	3.37	50.61	-0.00	0.17	0.00	5.07	0.00	8.78	13.5	5
10254	10254:TopConn	Origin	1.50	112.17	0.05	-5.09	26.77	-0.00	0.0	3.95	55.57	-0.00	0.19	0.00	5.56	0.00	9.64	14.8	5
10254	10254:TopConB	End	2.00	111.42	0.05	-5.04	54.56	-0.00	0.0	3.95	55.57	-0.00	0.19	0.00	5.53	0.00	9.58	14.7	5
10254	10254:TopConB	Origin	2.00	111.42	0.05	-5.04	54.56	-0.00	0.0	-2.35	6.85	-0.00	-0.11	6.23	0.18	0.00	6.35	9.8	2
10254	10254:WVGD14	End	5.00	106.92	0.05	-4.76	75.09	-0.00	0.0	-2.35	6.85	-0.00	-0.11	7.97	0.17	0.00	8.09	12.4	2
10254	10254:WVGD14	Origin	5.00	106.92	0.05	-4.76	75.09	-0.00	0.0	-2.82	7.43	-0.00	-0.13	7.97	0.19	0.00	8.11	12.5	2
10254	Tube 1	End	9.19	100.71	0.04	-4.37	106.21	-0.01	0.0	-2.82	7.43	-0.00	-0.13	10.23	0.18	0.00	10.36	15.9	2
10254	Tube 1	Origin	9.19	100.71	0.04	-4.37	106.21	-0.01	0.0	-3.15	7.67	-0.00	-0.14	10.23	0.18	0.00	10.38	16.0	2
10254	10254:Arm2	End	13.38	94.57	0.04	-3.99	138.34	-0.02	0.0	-3.15	7.67	-0.00	-0.13	12.15	0.17	0.00	12.29	18.9	2
10254	10254:Arm2	Origin	13.38	94.57	0.04	-3.99	147.93	-0.02	0.0	-7.74	17.87	-0.00	-0.33	12.99	0.41	0.00	13.34	20.5	2
10254	10254:WVGD13	End	15.00	92.21	0.04	-3.85	176.96	-0.03	0.0	-7.74	17.87	-0.00	-0.33	15.01	0.40	0.00	15.35	23.6	2
10254	10254:WVGD13	Origin	15.00	92.21	0.04	-3.85	176.96	-0.03	0.0	-8.25	18.45	-0.00	-0.35	15.01	0.41	0.00	15.38	23.7	2
10254	Tube 1	End	20.00	85.07	0.04	-3.42	269.18	-0.05	0.0	-8.25	18.45	-0.00	-0.33	20.59	0.39	0.00	20.93	32.2	2
10254	Tube 1	Origin	20.00	85.07	0.04	-3.42	269.18	-0.05	0.0	-8.73	18.74	-0.01	-0.35	20.59	0.40	0.00	20.95	32.2	2
10254	10254:WVGD12	End	25.00	78.12	0.03	-3.02	362.91	-0.08	0.0	-8.73	18.74	-0.01	-0.33	25.17	0.38	0.00	25.51	39.2	2
10254	10254:WVGD12	Origin	25.00	78.12	0.03	-3.02	362.91	-0.08	0.0	-9.46	19.43	-0.01	-0.36	25.17	0.39	0.00	25.54	39.3	2
10254	Tube 1	End	30.00	71.41	0.03	-2.64	460.08	-0.11	0.0	-9.46	19.43	-0.01	-0.34	29.05	0.37	0.00	29.40	45.2	2
10254	Tube 1	Origin	30.00	71.41	0.03	-2.64	460.08	-0.11	0.0	-10.01	19.75	-0.01	-0.36	29.05	0.38	0.00	29.42	45.3	2
10254	10254:WVGD11	End	35.00	64.95	0.03	-2.29	558.82	-0.15	0.0	-10.01	19.75	-0.01	-0.35	32.27	0.36	0.00	32.62	50.2	2
10254	10254:WVGD11	Origin	35.00	64.95	0.03	-2.29	558.82	-0.15	0.0	-10.52	20.30	-0.01	-0.37	32.27	0.37	0.00	32.64	50.2	2
10254	10254:Arm3	End	35.38	64.48	0.03	-2.27	566.43	-0.15	0.0	-10.52	20.30	-0.01	-0.37	32.50	0.37	0.00	32.87	50.6	2
10254	10254:Arm3	Origin	35.38	64.48	0.03	-2.27	575.94	-0.15	0.0	-15.37	30.41	-0.01	-0.53	33.04	0.56	0.00	33.59	51.7	2
10254	Tube 1	End	40.19	58.56	0.03	-1.96	722.28	-0.20	0.0	-15.37	30.41	-0.01	-0.51	38.17	0.54	0.00	38.69	59.5	2
10254	Tube 1	Origin	40.19	58.56	0.03	-1.96	722.28	-0.20	0.0	-16.01	30.70	-0.01	-0.53	38.17	0.54	0.00	38.71	59.6	2
10254	10254:WVGD10	End	45.00	52.92	0.02	-1.69	870.03	-0.25	0.0	-16.01	30.70	-0.01	-0.51	42.48	0.52	0.00	43.01	66.2	2
10254	10254:WVGD10	Origin	45.00	52.92	0.02	-1.69	870.03	-0.25	0.0	-16.75	31.31	-0.01	-0.54	42.48	0.53	0.00	43.03	66.2	2
10254	Tube 1	End	47.67	49.93	0.02	-1.54	953.47	-0.28	0.0	-16.75	31.31	-0.01	-0.53	44.62	0.52	0.00	45.16	69.5	2
10254	Tube 1	Origin	47.67	49.93	0.02	-1.54	953.47	-0.28	0.0	-17.13	31.47	-0.01	-0.54	44.62	0.52	0.00	45.17	69.5	2
10254	SpliceT	End	50.33	47.04	0.02	-1.41	1037.34	-0.32	0.0	-17.13	31.47	-0.01	-0.53	46.57	0.51	0.00	47.11	72.5	2
10254	SpliceT	Origin	50.33	47.04	0.02	-1.41	1037.34	-0.32	0.0	-18.03	31.74	-0.01	-0.55	46.57	0.52	0.00	47.14	72.5	2
10254	10254:WVGD9	End	55.00	42.19	0.02	-1.20	1185.55	-0.38	0.0	-18.03	31.74	-0.01	-0.39	37.21	0.36	0.00	37.60	57.8	2
10254	10254:WVGD9	Origin	55.00	42.19	0.02	-1.20	1185.55	-0.38	0.0	-19.17	32.38	-0.02	-0.42	37.21	0.37	0.00	37.63	57.9	2
10254	10254:Arm4	End	57.38	39.83	0.02	-1.10	1262.45	-0.42	0.0	-19.17	32.38	-0.02	-0.41	38.22	0.37	0.00	38.63	59.4	2
10254	10254:Arm4	Origin	57.38	39.83	0.02	-1.10	1271.82	-0.42	0.0	-24.52	42.43	-0.02	-0.52	38.51	0.48	0.00	39.04	60.1	2
10254	Tube 2	End	61.19	36.17	0.02	-0.96	1433.57	-0.48	0.0	-24.52	42.43	-0.02	-0.51	41.03	0.47	0.00	41.54	63.9	2
10254	Tube 2	Origin	61.19	36.17	0.02	-0.96	1433.57	-0.48	0.0	-25.31	42.68	-0.02	-0.52	41.03	0.47	0.00	41.56	63.9	2
10254	10254:WVGD8	End	65.00	32.67	0.02	-0.82	1596.29	-0.55	0.0	-25.31	42.68	-0.02	-0.51	43.25	0.46	0.00	43.76	67.3	2
10254	10254:WVGD8	Origin	65.00	32.67	0.02	-0.82	1596.29	-0.55	0.0	-26.46	43.35	-0.02	-0.53	43.25	0.46	0.00	43.79	67.4	2
10254	Tube 2	End	70.00	28.36	0.01	-0.67	1813.02	-0.64	0.0	-26.46	43.35	-0.02	-0.51	45.81	0.45	0.00	46.33	71.3	2
10254	Tube 2	Origin	70.00	28.36	0.01	-0.67	1813.02	-0.64	0.0	-27.56	43.68	-0.02	-0.54	45.81	0.45	0.00	46.36	71.3	2
10254	10254:WVGD7	End	75.00	24.35	0.01	-0.53	2031.43	-0.75	0.0	-27.56	43.68	-0.02	-0.52	47.99	0.44	0.00	48.51	74.6	2
10254	10254:WVGD7	Origin	75.00	24.35	0.01	-0.53	2031.43	-0.75	0.0	-28.92	44.39	-0.02	-0.54	47.99	0.44	0.00	48.54	74.7	2
10254	Tube 2	End	80.00	20.65	0.01	-0.41	2253.38	-0.86	0.0	-28.92	44.39	-0.02	-0.53	49.88	0.43	0.00	50.41	77.6	2
10254	Tube 2	Origin	80.00	20.65	0.01	-0.41	2253.38	-0.86	0.0	-30.08	44.73	-0.02	-0.55	49.88	0.43	0.00	50.43	77.6	2
10254	10254:WVGD6	End	85.00	17.26	0.01	-0.32	2477.04	-0.98	0.0	-30.08	44.73	-0.02	-0.53	51.48	0.42	0.00	52.01	80.0	2
10254	10254:WVGD6	Origin	85.00	17.26	0.01	-0.32	2477.04	-0.98	0.0	-31.51	45.45	-0.03	-0.56	51.48	0.42	0.00	52.04	80.1	2
10254	Tube 2	End	90.00	14.19	0.01	-0.24	2704.28	-1.11	0.0	-31.51	45.45	-0.03	-0.54	52.87	0.41	0.00	53.41	82.2	2
10254	Tube 2	Origin	90.00	14.19	0.01	-0.24	2704.28	-1.11	0.0	-32.74	45.80	-0.03	-0.56	52.87	0.41	0.00	53.43	82.2	2
10254	10254:WVGD5	End	95.00	11.43	0.01	-0.17	2933.27	-1.25	0.0	-32.74	45.80	-0.03	-0.54	54.04	0.40	0.00	54.59	84.0	2
10254	10254:WVGD5	Origin	95.00	11.43	0.01	-0.17	2933.27	-1.25	0.0	-34.09	46.48	-0.03	-0.57	54.04	0.41	0.00	54.61	84.0	2
10254	SpliceT	End	98.83	9.53	0.01	-0.13	3111.27	-1.36	0.0	-34.09	46.48	-0.03	-0.55	54.84	0.40	0.00	55.39	85.2	2
10254	SpliceT	Origin	98.83	9.53	0.01	-0.13	3111.27	-1.36	0.0	-35.31	46.73	-0.03	-0.57	54.84	0.40	0.00	55.41	85.3	2
10254	Tube 2	End	101.92	8.12	0.00	-0.11	3255.44	-1.45	0.0	-35.31	46.73	-0.03	-0.54	53.93	0.38	0.00	54.48	83.8	2
10254	Tube 2	Origin	101.92	8.12	0.00	-0.11	3255.44	-1.45	0.0	-36.81	46.98	-0.03	-0.56	53.93	0.38	0.00	54.50	83.8	2
10254	10254:WVGD4	End	105.00	6.84	0.00	-0.08	3400.35	-1.55	0.0	-36.81	46.98	-0.03	-0.55	54.39	0.37	0.00	54.95	84.5	2
10254	10254:WVGD4	Origin	105.00	6.84	0.00	-0.08	3400.35	-1.55	0.0	-38.49	47.64	-0.03	-0.58	54.39	0.38	0.00	54.97	84.6	2
10254	Tube 3	End	110.00	5.00	0.00	-0.05	3638.53	-1.72	0.0	-38.49	47.64	-0.03	-0.56	55.05	0.37	0.00	55.62	85.6	2
10254	Tube 3	Origin	110.00	5.00	0.00	-0.05	3638.53	-1.72	0.0	-39.89	47.99	-0.04	-0.58	55.05	0.37	0.00	55.64	85.6	2
10254	10254:WVGD3	End	115.00	3.45	0.00	-0.03	3878.48	-1.90	0.0	-39.89	47.99	-0.04	-0.57	55.59	0.36	0.00	56.16	86.4	2
10254	10254:WVGD3	Origin	115.00	3.45	0.00	-0.03	3878.48	-1.90	0.0	-41.57	48.71	-0.04	-0.59	55.59	0.36	0.00	56.19	86.4	2
10254	Tube 3	End	120.00	2.20	0.00	-0.02	4122.04	-2.09	0.0	-41.57	48.71	-0.04	-0.57	56.05	0.36	0.00	56.63	87.1	2
10254	Tube 3	Origin	120.00	2.20	0.00	-0.02	4122.04	-2.09	0.0	-43.04	49.08	-0.04	-0.59	56.05	0.36	0.00	56.65	87.2	2
10254	10254:WVGD2	End	125.00	1.23	0.00	-0.01	4367.43	-2.29	0.0	-43.04	49.08	-0.04	-0.58	56.42	0.35	0.00	57.00	87.7	2
10254	10254:WVGD2	Origin	125.00	1.23	0.00	-0.01	4367.43	-2.29	0.0	-44.78	49.81	-0.04	-0.60	56.42	0.35	0.00	57.03	87.7	2

10254	Tube 3	End	130.00	0.55	0.00	-0.00	4616.45	-2.50	0.0	-44.78	49.81	-0.04	-0.59	56.73	0.35	0.00	57.32	88.2	2
10254	Tube 3	Origin	130.00	0.55	0.00	-0.00	4616.45	-2.50	0.0	-46.30	50.18	-0.04	-0.61	56.73	0.35	0.00	57.34	88.2	2
10254	10254:WVGD1	End	135.00	0.14	0.00	-0.00	4867.35	-2.72	0.0	-46.30	50.18	-0.04	-0.59	56.96	0.34	0.00	57.56	88.5	2
10254	10254:WVGD1	Origin	135.00	0.14	0.00	-0.00	4867.35	-2.72	0.0	-48.11	50.92	-0.05	-0.62	56.96	0.34	0.00	57.58	88.6	2
10254	10254:g	End	140.00	0.00	0.00	0.00	5121.93	-2.95	0.0	-48.11	50.92	-0.05	-0.60	57.15	0.34	0.00	57.76	88.9	2

Detailed Tubular Davit Arm Usages for Load Case "NESC Extreme":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
Davit1	Davit1:O	Origin	0.00	113.45	0.05	-3.89	-0.56	0.00	0.0	-0.73	0.13	-0.00	-0.18	1.15	0.00	0.00	1.33	2.0	1
Davit1	#Davit1:0	End	2.51	114.07	0.05	-0.16	-0.25	0.00	0.0	-0.73	0.13	-0.00	-0.20	0.64	0.00	0.00	0.84	1.3	1
Davit1	#Davit1:0	Origin	2.51	114.07	0.05	-0.16	-0.25	0.00	0.0	-0.72	0.10	-0.00	-0.20	0.64	0.00	0.00	0.84	1.3	1
Davit1	Davit1:End	End	5.02	114.68	0.05	3.57	-0.00	0.00	0.0	-0.72	0.10	-0.00	-0.23	0.00	0.07	0.00	0.26	0.4	3
Davit2	Davit2:O	Origin	0.00	113.29	0.05	-6.44	-1.28	-0.00	-0.0	0.69	0.27	0.00	0.17	2.62	0.00	0.00	2.79	4.3	1
Davit2	#Davit2:0	End	2.51	113.43	0.05	-10.23	-0.60	-0.00	-0.0	0.69	0.27	0.00	0.19	1.57	0.00	0.00	1.76	2.7	1
Davit2	#Davit2:0	Origin	2.51	113.43	0.05	-10.23	-0.60	-0.00	0.0	0.69	0.24	0.00	0.19	1.57	0.00	0.00	1.76	2.7	1
Davit2	Davit2:End	End	5.02	113.57	0.05	-14.04	0.00	0.00	0.0	0.69	0.24	0.00	0.22	0.00	0.16	0.00	0.36	0.6	3
Davit3	Davit3:O	Origin	0.00	94.66	0.04	-2.57	-12.07	0.00	0.0	-5.23	1.51	-0.00	-0.91	12.18	0.00	0.00	13.10	20.2	1
Davit3	#Davit3:0	End	4.03	95.71	0.04	3.10	-5.97	0.00	0.0	-5.23	1.51	-0.00	-1.18	10.14	0.00	0.00	11.32	17.4	1
Davit3	#Davit3:0	Origin	4.03	95.71	0.04	3.10	-5.97	0.00	0.0	-5.21	1.48	-0.00	-1.18	10.14	0.00	0.00	11.31	17.4	1
Davit3	Davit3:End	End	8.06	96.73	0.04	8.59	-0.00	0.00	0.0	-5.21	1.48	-0.00	-1.67	0.00	1.01	0.00	2.42	3.7	3
Davit4	Davit4:O	Origin	0.00	94.48	0.04	-5.42	-21.65	-0.00	-0.0	4.71	2.73	0.00	0.82	21.86	0.00	0.00	22.68	34.9	1
Davit4	#Davit4:0	End	4.03	94.86	0.04	-11.48	-10.64	-0.00	-0.0	4.71	2.73	0.00	1.06	18.08	0.00	0.00	19.14	29.4	1
Davit4	#Davit4:0	Origin	4.03	94.86	0.04	-11.48	-10.64	-0.00	0.0	4.73	2.64	0.00	1.07	18.08	0.00	0.00	19.14	29.5	1
Davit4	Davit4:End	End	8.06	95.23	0.04	-17.87	-0.00	0.00	0.0	4.73	2.64	0.00	1.51	0.00	1.80	0.00	3.47	5.3	3
Davit5	Davit5:O	Origin	0.00	64.56	0.03	-0.75	-12.78	0.00	0.0	-5.20	1.60	-0.00	-0.91	12.90	0.00	0.00	13.81	21.2	1
Davit5	#Davit5:0	End	4.03	65.43	0.03	4.14	-6.32	0.00	0.0	-5.20	1.60	-0.00	-1.18	10.74	0.00	0.00	11.91	18.3	1
Davit5	#Davit5:0	Origin	4.03	65.43	0.03	4.14	-6.32	0.00	0.0	-5.18	1.57	-0.00	-1.17	10.74	0.00	0.00	11.91	18.3	1
Davit5	Davit5:End	End	8.06	66.26	0.03	8.83	-0.00	0.00	0.0	-5.18	1.57	-0.00	-1.66	0.00	1.07	0.00	2.49	3.8	3
Davit6	Davit6:O	Origin	0.00	64.40	0.03	-3.79	-22.27	-0.00	-0.0	4.67	2.81	0.00	0.82	22.48	0.00	0.00	23.30	35.8	1
Davit6	#Davit6:0	End	4.03	64.77	0.03	-9.05	-10.95	-0.00	-0.0	4.67	2.81	0.00	1.05	18.60	0.00	0.00	19.65	30.2	1
Davit6	#Davit6:0	Origin	4.03	64.77	0.03	-9.05	-10.95	-0.00	0.0	4.69	2.72	0.00	1.06	18.60	0.00	0.00	19.66	30.2	1
Davit6	Davit6:End	End	8.06	65.15	0.03	-14.66	-0.00	0.00	0.0	4.69	2.72	0.00	1.50	0.00	1.86	0.00	3.55	5.5	3
Davit7	Davit7:O	Origin	0.00	39.89	0.02	0.28	-13.76	0.00	0.0	-5.17	1.72	-0.00	-0.90	13.90	0.00	0.00	14.80	22.8	1
Davit7	#Davit7:0	End	4.03	40.51	0.02	4.06	-6.81	0.00	0.0	-5.17	1.72	-0.00	-1.17	11.58	0.00	0.00	12.75	19.6	1
Davit7	#Davit7:0	Origin	4.03	40.51	0.02	4.06	-6.81	0.00	0.0	-5.15	1.69	-0.00	-1.16	11.58	0.00	0.00	12.74	19.6	1
Davit7	Davit7:End	End	8.06	41.10	0.02	7.64	-0.00	0.00	0.0	-5.15	1.69	-0.00	-1.65	0.00	1.16	0.00	2.59	4.0	3
Davit8	Davit8:O	Origin	0.00	39.77	0.02	-2.49	-23.13	-0.00	-0.0	4.60	2.92	0.00	0.80	23.35	0.00	0.00	24.15	37.2	1
Davit8	#Davit8:0	End	4.03	40.11	0.02	-6.64	-11.37	-0.00	-0.0	4.60	2.92	0.00	1.04	19.32	0.00	0.00	20.36	31.3	1
Davit8	#Davit8:0	Origin	4.03	40.11	0.02	-6.64	-11.37	-0.00	0.0	4.62	2.82	0.00	1.05	19.32	0.00	0.00	20.37	31.3	1
Davit8	Davit8:End	End	8.06	40.46	0.02	-11.15	-0.00	0.00	0.0	4.62	2.82	0.00	1.48	0.00	1.93	0.00	3.65	5.6	3

Summary of Clamp Capacities and Usages for Load Case "NESC Extreme":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	0.725	80.00	80.00	0.91
Clamp2	0.725	80.00	80.00	0.91
Clamp3	5.404	80.00	80.00	6.75
Clamp4	5.404	80.00	80.00	6.75
Clamp5	5.404	80.00	80.00	6.75

Clamp6	5.404	80.00	80.00	6.75
Clamp7	5.404	80.00	80.00	6.75
Clamp8	5.404	80.00	80.00	6.75
Clamp9	2.316	80.00	80.00	2.89
Clamp10	0.435	80.00	80.00	0.54
Clamp11	0.435	80.00	80.00	0.54
Clamp12	0.435	80.00	80.00	0.54
Clamp13	0.435	80.00	80.00	0.54
Clamp14	0.435	80.00	80.00	0.54
Clamp15	0.435	80.00	80.00	0.54
Clamp16	0.435	80.00	80.00	0.54
Clamp17	0.435	80.00	80.00	0.54
Clamp18	0.435	80.00	80.00	0.54
Clamp19	0.435	80.00	80.00	0.54
Clamp20	0.435	80.00	80.00	0.54
Clamp21	0.435	80.00	80.00	0.54
Clamp22	0.435	80.00	80.00	0.54
Clamp23	0.435	80.00	80.00	0.54
Clamp24	4.973	80.00	80.00	6.22
Clamp25	49.207	80.00	80.00	61.51
Clamp26	49.207	80.00	80.00	61.51

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
10254	88.85	NESC Extreme	37	28299.2

Base Plate Results by Bend Line:

Pole Label	Load Case	Bend Line #	Start X (ft)	Start Y (ft)	End X (ft)	End Y (ft)	Length (in)	Bending Stress (ksi)	Bolt Mom. Sum (ft-k)	# Bolts Acting	Bolt Max Load (kips)	Min Plate Thickness (in)	Actual Thickness (in)	Usage %
10254	NESC Heavy	1	2.558	1.097	-0.329	2.764	40.000	21.157	124.149	3	142.910	1.930	3.250	35.26
10254	NESC Heavy	2	2.764	-0.329	1.097	2.558	40.000	7.507	44.053	3	61.573	1.150	3.250	12.51
10254	NESC Heavy	3	2.229	-1.667	2.229	1.667	40.000	11.056	64.879	5	61.573	1.395	3.250	18.43
10254	NESC Heavy	4	1.097	-2.558	2.764	0.329	40.000	6.168	36.192	3	-52.301	1.042	3.250	10.28
10254	NESC Heavy	5	-0.329	-2.764	2.558	-1.097	40.000	19.715	115.688	3	-133.090	1.863	3.250	32.86
10254	NESC Heavy	6	-1.667	-2.229	1.667	-2.229	40.000	41.890	245.815	5	-133.090	2.716	3.250	69.82
10254	NESC Heavy	7	-2.558	-1.097	0.329	-2.764	40.000	19.681	115.488	3	-132.948	1.861	3.250	32.80
10254	NESC Heavy	8	-2.764	0.329	-1.097	-2.558	40.000	6.070	35.622	3	-51.610	1.034	3.250	10.12
10254	NESC Heavy	9	-2.229	1.667	-2.229	-1.667	40.000	11.100	65.134	5	62.264	1.398	3.250	18.50
10254	NESC Heavy	10	-1.097	2.558	-2.764	-0.329	40.000	7.610	44.654	3	62.264	1.157	3.250	12.68
10254	NESC Heavy	11	0.329	2.764	-2.558	1.097	40.000	21.191	124.350	3	143.053	1.931	3.250	35.32
10254	NESC Heavy	12	1.667	2.229	-1.667	2.229	40.000	45.029	264.235	5	143.053	2.816	3.250	75.05
10254	NESC Heavy	13	2.207	1.798	-1.013	2.661	40.000	26.484	155.407	4	142.981	2.159	3.250	44.14
10254	NESC Heavy	14	2.810	0.453	0.453	2.810	40.000	10.048	58.964	2	142.767	1.330	3.250	16.75
10254	NESC Heavy	15	2.661	-1.013	1.798	2.207	40.000	7.385	43.333	4	61.573	1.140	3.250	12.31
10254	NESC Heavy	16	1.798	-2.207	2.661	1.013	40.000	6.187	36.306	4	-52.301	1.044	3.250	10.31
10254	NESC Heavy	17	0.453	-2.810	2.810	-0.453	40.000	9.117	53.497	2	-133.090	1.267	3.250	15.19
10254	NESC Heavy	18	-1.013	-2.661	2.207	-1.798	40.000	24.666	144.743	4	-133.090	2.084	3.250	41.11
10254	NESC Heavy	19	-2.207	-1.798	1.013	-2.661	40.000	24.636	144.567	4	-133.019	2.083	3.250	41.06
10254	NESC Heavy	20	-2.810	-0.453	-0.453	-2.810	40.000	9.069	53.215	2	-132.805	1.264	3.250	15.11
10254	NESC Heavy	21	-2.661	1.013	-1.798	-2.207	40.000	6.122	35.922	4	-51.610	1.038	3.250	10.20
10254	NESC Heavy	22	-1.798	2.207	-2.661	-1.013	40.000	7.498	43.997	4	62.264	1.149	3.250	12.50
10254	NESC Heavy	23	-0.453	2.810	-2.810	0.453	40.000	10.096	59.246	2	143.053	1.333	3.250	16.83
10254	NESC Heavy	24	1.013	2.661	-2.207	1.798	40.000	26.514	155.583	4	143.053	2.160	3.250	44.19
10254	NESC Extreme	1	2.558	1.097	-0.329	2.764	40.000	27.264	159.986	3	184.048	2.191	3.250	45.44
10254	NESC Extreme	2	2.764	-0.329	1.097	2.558	40.000	9.327	54.730	3	77.306	1.281	3.250	15.54
10254	NESC Extreme	3	2.229	-1.667	2.229	1.667	40.000	14.320	84.031	5	77.306	1.588	3.250	23.87
10254	NESC Extreme	4	1.097	-2.558	2.764	0.329	40.000	8.651	50.762	3	-72.626	1.234	3.250	14.42
10254	NESC Extreme	5	-0.329	-2.764	2.558	-1.097	40.000	26.550	155.795	3	-179.202	2.162	3.250	44.25
10254	NESC Extreme	6	-1.667	-2.229	1.667	-2.229	40.000	56.451	331.256	5	-179.202	3.152	3.250	94.08
10254	NESC Extreme	7	-2.558	-1.097	0.329	-2.764	40.000	26.539	155.734	3	-179.158	2.161	3.250	44.23
10254	NESC Extreme	8	-2.764	0.329	-1.097	-2.558	40.000	8.621	50.589	3	-72.416	1.232	3.250	14.37
10254	NESC Extreme	9	-2.229	1.667	-2.229	-1.667	40.000	14.333	84.108	5	77.515	1.588	3.250	23.89
10254	NESC Extreme	10	-1.097	2.558	-2.764	-0.329	40.000	9.358	54.912	3	77.515	1.283	3.250	15.60
10254	NESC Extreme	11	0.329	2.764	-2.558	1.097	40.000	27.274	160.046	3	184.091	2.191	3.250	45.46
10254	NESC Extreme	12	1.667	2.229	-1.667	2.229	40.000	57.992	340.297	5	184.091	3.195	3.250	96.65
10254	NESC Extreme	13	2.207	1.798	-1.013	2.661	40.000	34.122	200.229	4	184.070	2.451	3.250	56.87
10254	NESC Extreme	14	2.810	0.453	0.453	2.810	40.000	12.850	75.404	2	184.005	1.504	3.250	21.42
10254	NESC Extreme	15	2.661	-1.013	1.798	2.207	40.000	9.107	53.440	4	77.306	1.266	3.250	15.18
10254	NESC Extreme	16	1.798	-2.207	2.661	1.013	40.000	8.502	49.892	4	-72.626	1.223	3.250	14.17
10254	NESC Extreme	17	0.453	-2.810	2.810	-0.453	40.000	12.384	72.667	2	-179.202	1.476	3.250	20.64
10254	NESC Extreme	18	-1.013	-2.661	2.207	-1.798	40.000	33.224	194.962	4	-179.202	2.418	3.250	55.37
10254	NESC Extreme	19	-2.207	-1.798	1.013	-2.661	40.000	33.215	194.908	4	-179.180	2.418	3.250	55.36
10254	NESC Extreme	20	-2.810	-0.453	-0.453	-2.810	40.000	12.369	72.582	2	-179.115	1.476	3.250	20.61
10254	NESC Extreme	21	-2.661	1.013	-1.798	-2.207	40.000	8.483	49.776	4	-72.416	1.222	3.250	14.14
10254	NESC Extreme	22	-1.798	2.207	-2.661	-1.013	40.000	9.141	53.641	4	77.515	1.269	3.250	15.24
10254	NESC Extreme	23	-0.453	2.810	-2.810	0.453	40.000	12.864	75.489	2	184.091	1.505	3.250	21.44
10254	NESC Extreme	24	1.013	2.661	-2.207	1.798	40.000	34.131	200.282	4	184.091	2.451	3.250	56.89

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	13.03	NESC Heavy	1	61.2
Davit2	16.73	NESC Heavy	1	61.2
Davit3	68.65	NESC Heavy	1	121.4
Davit4	80.83	NESC Heavy	1	121.4
Davit5	69.39	NESC Heavy	1	121.4
Davit6	81.36	NESC Heavy	1	121.4
Davit7	70.51	NESC Heavy	1	121.4
Davit8	82.17	NESC Heavy	1	121.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	82.17	Davit8	Tubular Davit
NESC Extreme	96.65	10254	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy	68.80	10254	37
NESC Extreme	88.85	10254	37

Summary of Base Plate Usages by Load Case:

Load Case	Pole Label	Bend Line #	Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Moment (ft-k)	Bending Stress (ksi)	Bolt Moment Sum (ft-k)	# Bolts Acting On Bend Line	Max Bolt Load For Bend Line (kips)	Minimum Plate Thickness (in)	Usage %
NESC Heavy	10254	12	40.000	99.624	3890.138	-9.741	45.029	264.235	5	143.053	2.816	75.05
NESC Extreme	10254	12	40.000	48.899	5121.928	-2.953	57.992	340.297	5	184.091	3.195	96.65

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC Heavy	82.17	Davit8	1
NESC Extreme	37.15	Davit8	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	1.87	NESC Heavy	0.0
Clamp2	Clamp	1.87	NESC Heavy	0.0
Clamp3	Clamp	9.30	NESC Heavy	0.0
Clamp4	Clamp	9.30	NESC Heavy	0.0
Clamp5	Clamp	9.30	NESC Heavy	0.0
Clamp6	Clamp	9.30	NESC Heavy	0.0
Clamp7	Clamp	9.30	NESC Heavy	0.0

Clamp8	Clamp	9.30	NESC Heavy	0.0
Clamp9	Clamp	6.06	NESC Heavy	0.0
Clamp10	Clamp	1.16	NESC Heavy	0.0
Clamp11	Clamp	1.16	NESC Heavy	0.0
Clamp12	Clamp	1.16	NESC Heavy	0.0
Clamp13	Clamp	1.16	NESC Heavy	0.0
Clamp14	Clamp	1.16	NESC Heavy	0.0
Clamp15	Clamp	1.16	NESC Heavy	0.0
Clamp16	Clamp	1.16	NESC Heavy	0.0
Clamp17	Clamp	1.16	NESC Heavy	0.0
Clamp18	Clamp	1.16	NESC Heavy	0.0
Clamp19	Clamp	1.16	NESC Heavy	0.0
Clamp20	Clamp	1.16	NESC Heavy	0.0
Clamp21	Clamp	1.16	NESC Heavy	0.0
Clamp22	Clamp	1.16	NESC Heavy	0.0
Clamp23	Clamp	1.16	NESC Heavy	0.0
Clamp24	Clamp	6.22	NESC Extreme	0.0
Clamp25	Clamp	61.51	NESC Extreme	0.0
Clamp26	Clamp	61.51	NESC Extreme	0.0

Loads At Insulator Attachments For All Load Cases:

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC Heavy	Clamp1	Clamp	Davit1:End	0.000	1.128	0.982	1.496
NESC Heavy	Clamp2	Clamp	Davit2:End	0.000	1.128	0.982	1.496
NESC Heavy	Clamp3	Clamp	Davit3:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp4	Clamp	Davit4:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp5	Clamp	Davit5:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp6	Clamp	Davit6:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp7	Clamp	Davit7:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp8	Clamp	Davit8:End	0.000	4.069	6.229	7.440
NESC Heavy	Clamp9	Clamp	10254:t	0.000	0.000	4.847	4.847
NESC Heavy	Clamp10	Clamp	10254:WVGD1	0.000	0.132	0.920	0.929
NESC Heavy	Clamp11	Clamp	10254:WVGD2	0.000	0.132	0.920	0.929
NESC Heavy	Clamp12	Clamp	10254:WVGD3	0.000	0.132	0.920	0.929
NESC Heavy	Clamp13	Clamp	10254:WVGD4	0.000	0.132	0.920	0.929
NESC Heavy	Clamp14	Clamp	10254:WVGD5	0.000	0.132	0.920	0.929
NESC Heavy	Clamp15	Clamp	10254:WVGD6	0.000	0.132	0.920	0.929
NESC Heavy	Clamp16	Clamp	10254:WVGD7	0.000	0.132	0.920	0.929
NESC Heavy	Clamp17	Clamp	10254:WVGD8	0.000	0.132	0.920	0.929
NESC Heavy	Clamp18	Clamp	10254:WVGD9	0.000	0.132	0.920	0.929
NESC Heavy	Clamp19	Clamp	10254:WVGD10	0.000	0.132	0.920	0.929
NESC Heavy	Clamp20	Clamp	10254:WVGD11	0.000	0.132	0.920	0.929
NESC Heavy	Clamp21	Clamp	10254:WVGD12	0.000	0.132	0.920	0.929
NESC Heavy	Clamp22	Clamp	10254:WVGD13	0.000	0.132	0.920	0.929
NESC Heavy	Clamp23	Clamp	10254:WVGD14	0.000	0.132	0.920	0.929
NESC Heavy	Clamp24	Clamp	10254:TopConn	0.000	1.450	0.000	1.450
NESC Heavy	Clamp25	Clamp	10254:TopConT	0.000	14.107	0.000	14.107
NESC Heavy	Clamp26	Clamp	10254:TopConB	0.000	-14.107	0.000	14.107
NESC Extreme	Clamp1	Clamp	Davit1:End	0.000	0.683	0.243	0.725
NESC Extreme	Clamp2	Clamp	Davit2:End	0.000	0.683	0.243	0.725
NESC Extreme	Clamp3	Clamp	Davit3:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp4	Clamp	Davit4:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp5	Clamp	Davit5:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp6	Clamp	Davit6:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp7	Clamp	Davit7:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp8	Clamp	Davit8:End	0.000	4.709	2.651	5.404
NESC Extreme	Clamp9	Clamp	10254:t	0.000	0.000	2.316	2.316
NESC Extreme	Clamp10	Clamp	10254:WVGD1	0.000	0.356	0.250	0.435
NESC Extreme	Clamp11	Clamp	10254:WVGD2	0.000	0.356	0.250	0.435
NESC Extreme	Clamp12	Clamp	10254:WVGD3	0.000	0.356	0.250	0.435
NESC Extreme	Clamp13	Clamp	10254:WVGD4	0.000	0.356	0.250	0.435
NESC Extreme	Clamp14	Clamp	10254:WVGD5	0.000	0.356	0.250	0.435

NESC Extreme	Clamp15	Clamp	10254:WVGD6	0.000	0.356	0.250	0.435
NESC Extreme	Clamp16	Clamp	10254:WVGD7	0.000	0.356	0.250	0.435
NESC Extreme	Clamp17	Clamp	10254:WVGD8	0.000	0.356	0.250	0.435
NESC Extreme	Clamp18	Clamp	10254:WVGD9	0.000	0.356	0.250	0.435
NESC Extreme	Clamp19	Clamp	10254:WVGD10	0.000	0.356	0.250	0.435
NESC Extreme	Clamp20	Clamp	10254:WVGD11	0.000	0.356	0.250	0.435
NESC Extreme	Clamp21	Clamp	10254:WVGD12	0.000	0.356	0.250	0.435
NESC Extreme	Clamp22	Clamp	10254:WVGD13	0.000	0.356	0.250	0.435
NESC Extreme	Clamp23	Clamp	10254:WVGD14	0.000	0.356	0.250	0.435
NESC Extreme	Clamp24	Clamp	10254:TopConn	0.000	4.973	0.000	4.973
NESC Extreme	Clamp25	Clamp	10254:TopConT	0.000	49.207	0.000	49.207
NESC Extreme	Clamp26	Clamp	10254:TopConB	0.000	-49.207	0.000	49.207

Overturning Moments For User Input Concentrated Loads:

Moments are static equivalents based on central axis of 0,0 (i.e. a single pole).

Load Case	Total Tran. Load (kips)	Total Long. Load (kips)	Total Vert. Load (kips)	Transverse Overturning Moment (ft-k)	Longitudinal Overturning Moment (ft-k)
NESC Heavy	29.968	0.000	57.065	3238.410	-0.000
NESC Extreme	39.577	0.000	22.208	4262.143	-0.000

*** Weight of structure (lbs):
Weight of Tubular Davit Arms: 850.8
Weight of Steel Poles: 28299.2
Total: 29150.0

*** End of Report

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Subject:	Anchor Bolt Analysis CL&P Pole #10254
Location:	Bethel, CT
Rev. 0: 7/19/11	Prepared by: T.J.L. Checked by: C.F.C. Job No. 11021.CO55

Anchor Bolt Analysis:

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 184 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use ASTM A615 Grade 75

Number of Anchor Bolts = $N := 25$ (User Input)

Bolt "Column" Distance = $l := 3.0 \cdot in$ (User Input)

Bolt Ultimate Strength = $F_u := 100 \cdot ksi$ (User Input)

Bolt Yeild Strength= $F_y := 75 \cdot ksi$ (User Input)

Bolt Modulus = $E := 29000 \cdot ksi$ (User Input)

Diameter of Anchor Bolts = $D := 2.25 \cdot in$ (User Input)

Threads per Inch = $n := 4.5$ (User Input)

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 3.248 \cdot in^2$

Bolt Tension Check:

Allowable Tensile Force (Net Area) = $T_{ALL.Net} := 1.0 \cdot \left(A_n \cdot F_y\right) = 243.576 \cdot kips$

Bolt Tension % of Capacity = $\frac{T_{Max}}{T_{ALL.Net}} = 75.54 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{T_{ALL.Net}} \le 1.00, "OK", "Overstressed"\right)$

Condition1 = "OK"

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Subject: CAISSON FOUNDATION ANALYSIS

Location: Bethel, CT

Rev. 1: 1/30/12

Prepared by: TJL Checked by: C.F.C.
Job No. 11021.CO55

Caisson Foundation:

Input Data:

Shear Force =	$S := 51.1k \cdot 1.1 = 56.2 \cdot kips$	*USER INPUT-FROM PLS-Pole*
Overturning Moment =	$M := 5121.9ft \cdot k \cdot 1.1 = 5634 \cdot ft \cdot k$	*USER INPUT-FROM PLS-Pole*
Applied Axial Load =	$A1 := 48.9k \cdot 1.1 = 53.8 \cdot kips$	*USER INPUT-FROM PLS-Pole*
Bending Moment =	$Mu := 5813.1ft \cdot k$	*USER INPUT–FROM LPILE*
Moment Capacity =	$Mn := 24488.3ft \cdot k$	*USER INPUT–FROM LPILE*
Foundation Diameter =	$d := 8ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 20.5ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 0.5ft$	*USER INPUT*
Number of Rebar =	$n := 38$	*USER INPUT*
Area of Rebar =	$Ar := 1.27in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 3.5ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{Mn}{Mu} = 4.2$

Factor of Safety Required = $FS_{reqd} := 1.3$

$FOSCheck := if(FS \geq FS_{reqd}, "OK", "NO GOOD")$

FOSCheck = "OK"

LPILE Plus for Windows, Version 5.0 (5.0.39)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This program is licensed to:

TJL
Centek Engineering Inc

Path to file locations: J:\Jobs\1102100.WI\CO-55 - CT5176 - 7 Stony Hill Road, Bethel,CT\Structural\Rev (1)\Calcs\L-Pile\Existing Caisson\
Name of input data file: Caisson Analysis - Existing Caisson.lpd
Name of output file: Caisson Analysis - Existing Caisson.lpo
Name of plot output file: Caisson Analysis - Existing Caisson.lpp
Name of runtime file: Caisson Analysis - Existing Caisson.lpr

Time and Date of Analysis

Date: January 30, 2012 Time: 17:38:08

Problem Title

11021.CO55 / CT5176 - Stony Hill / CL&P # 10254

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output summary table of values for pile-head deflection, maximum bending moment, and shear force only
- Analysis includes effects of soil movement on pile response
- Additional p-y curves computed at specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 250
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Only summary tables of pile-head deflection, maximum bending moment, and maximum shear force are to be printed in output file.

Pile Structural Properties and Geometry

Pile Length = 246.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = .00 deg.

Structural properties of pile defined using 2 points

Point	Depth X	Pile Diameter	Moment of Inertia	Pile Area	Modulus of Elasticity

	in	in	in**4	Sq.in	lbs/Sq.in
1	0.0000	96.00000000	4169220.	7238.2000	3300000.
2	246.0000	96.00000000	4169220.	7238.2000	3300000.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 6.000 in
Distance from top of pile to bottom of layer = 90.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 90.000 in
Distance from top of pile to bottom of layer = 144.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 144.000 in
Distance from top of pile to bottom of layer = 186.000 in
p-y subgrade modulus k for top of soil layer = 225.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 225.000 lbs/in**3

Layer 4 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 186.000 in
Distance from top of pile to bottom of layer = 246.000 in
p-y subgrade modulus k for top of soil layer = 125.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 125.000 lbs/in**3

(Depth of lowest layer extends .00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 8 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	.06700
2	90.00	.06700
3	90.00	.06700
4	144.00	.06700
5	144.00	.07500
6	186.00	.07500
7	186.00	.03900
8	246.00	.03900

Shear Strength of Soils

Shear strength parameters with depth defined using 8 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	.00000	30.00	------	------
2	90.000	.00000	30.00	------	------
3	90.000	.00000	30.00	------	------
4	144.000	.00000	30.00	------	------
5	144.000	.00000	40.00	------	------
6	186.000	.00000	40.00	------	------
7	186.000	.00000	40.00	------	------
8	246.000	.00000	40.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.

(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Lateral Soil Movements

Profile of soil movement with depth defined using 2 points

Point No.	Depth X in	Soil Movement in
1	.000	.000
2	.000	.000

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 56210.000 lbs
Bending moment at pile head = 67609476.000 in-lbs
Axial load at pile head = 53790.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Output of p-y Curves at Specified Depths

---

p-y curves are generated and printed for verification at 1 depths.

Depth No.	Depth Below Pile Head in	Depth Below Ground Surface in
1	144.000	138.000

Depth of ground surface below top of pile = 6.00 in

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Number of sections = 1

Pile Section No. 1

**** WARNING ****

An unreasonable input value for concrete cover thickness has been specified.
The input value is either smaller than 0.8 inches or larger than 8 inches.
You should check your input for correctness.

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 192.0000 in

Material Properties:

Compressive Strength of Concrete = 3.500 kip/in**2

Yield Stress of Reinforcement	=	60.	kip/in**2
Modulus of Elasticity of Reinforcement	=	29000.	kip/in**2
Number of Reinforcing Bars	=	38	
Area of Single Bar	=	1.27000	in**2
Number of Rows of Reinforcing Bars	=	19	
Area of Steel	=	48.260	in**2
Area of Shaft	=	28952.918	in**2
Percentage of Steel Reinforcement	=	.167	percent
Cover Thickness (edge to bar center)	=	53.635	in

Unfactored Axial Squash Load Capacity = 88886.96 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.540	42.220
2	2.540	41.069
3	2.540	38.797
4	2.540	35.467
5	2.540	31.169
6	2.540	26.021
7	2.540	20.164
8	2.540	13.756
9	2.540	6.973
10	2.540	0.000
11	2.540	-6.973
12	2.540	-13.756
13	2.540	-20.164
14	2.540	-26.021
15	2.540	-31.169
16	2.540	-35.467
17	2.540	-38.797
18	2.540	-41.069
19	2.540	-42.220

Axial Thrust Force = 53790.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
71076502.	2.274448E+14	3.125000E-07	.00003066	98.11165094	101.71175	401.75832
1.413224E+08	2.261158E+14	6.250000E-07	.00006077	97.22823000	199.84066	787.50464
2.107392E+08	2.247885E+14	9.375000E-07	.00009088	96.93335867	296.26348	1173.24015
2.793269E+08	2.234615E+14	.00000125	.00012098	96.78562117	390.98025	1558.96472
2.793269E+08	1.787692E+14	.00000156	.00004961	31.75282717	158.11064	4824.30746
2.793269E+08	1.489743E+14	.00000188	.00005852	31.20862627	185.85485	5818.75987
2.793269E+08	1.276923E+14	.00000219	.00006743	30.82362127	213.48835	6812.97694
2.793269E+08	1.117308E+14	.00000250	.00007635	30.53813124	241.01089	7806.95738
2.793269E+08	9.931623E+13	.00000281	.00008527	30.31899977	268.42220	8800.69997
2.793269E+08	8.938461E+13	.00000313	.00009421	30.14633131	295.72200	9794.20360
2.793269E+08	8.125874E+13	.00000344	.00010315	30.00746584	322.91002	10787.46711
2.793269E+08	7.448717E+13	.00000375	.00011210	29.89396620	349.98601	11780.48902
2.793269E+08	6.875739E+13	.00000406	.00012106	29.79999018	376.94971	12773.26799
2.793269E+08	6.384615E+13	.00000438	.00013003	29.72136068	403.80079	13765.80319
2.793269E+08	5.958974E+13	.00000469	.00013901	29.65501928	430.53900	14758.09313
2.793269E+08	5.586538E+13	.00000500	.00014799	29.59867144	457.16408	15750.13644
2.793269E+08	5.257918E+13	.00000531	.00015699	29.55056334	483.67575	16741.93162
2.793269E+08	4.965812E+13	.00000563	.00016599	29.50932741	510.07370	17733.47774
2.793269E+08	4.704453E+13	.00000594	.00017500	29.47388792	536.35766	18724.77318
2.793269E+08	4.469230E+13	.00000625	.00018402	29.44338083	562.52733	19715.81697
2.793269E+08	4.256410E+13	.00000656	.00019305	29.41711092	588.58244	20706.60731
2.793269E+08	4.062937E+13	.00000688	.00020209	29.39450598	614.52269	21697.14309
2.793269E+08	3.886287E+13	.00000719	.00021113	29.37509394	640.34777	22687.42307
2.793269E+08	3.724359E+13	.00000750	.00022019	29.35848284	666.05739	23677.44568
2.793269E+08	3.575384E+13	.00000781	.00022925	29.34434366	691.65128	24667.20932
2.793269E+08	3.437870E+13	.00000813	.00023833	29.33239603	717.12911	25656.71285
2.793269E+08	3.310541E+13	.00000844	.00024741	29.32240248	742.49058	26645.95480
2.793269E+08	3.192307E+13	.00000875	.00025650	29.31415987	767.73540	27634.93358
2.793269E+08	3.082228E+13	.00000906	.00026560	29.30749369	792.86328	28623.64745
2.793269E+08	2.979487E+13	.00000938	.00027471	29.30224943	817.87386	29612.09555
2.793269E+08	2.883374E+13	.00000969	.00028383	29.29829550	842.76685	30600.27621
2.793269E+08	2.793269E+13	.00001000	.00029296	29.29551744	867.54196	31588.18753
2.793269E+08	2.708625E+13	.00001031	.00030209	29.29381227	892.19884	32575.82835
2.793269E+08	2.628959E+13	.00001063	.00031124	29.29308844	916.73712	33563.19769
2.793269E+08	2.553846E+13	.00001094	.00032040	29.29327154	941.15663	34550.29249
2.793269E+08	2.482906E+13	.00001125	.00032956	29.29428720	965.45691	35537.11234
2.793269E+08	2.415800E+13	.00001156	.00033874	29.29607248	989.63764	36523.65573
2.793269E+08	2.352227E+13	.00001188	.00034792	29.29857302	1013.69856	37509.92043
2.793269E+08	2.291913E+13	.00001219	.00035711	29.30173731	1037.63928	38495.90522
2.793269E+08	2.180112E+13	.00001281	.00037553	29.30988264	1085.15887	40467.02771
2.793269E+08	2.078712E+13	.00001344	.00039399	29.32019663	1132.19370	42437.00983
2.793269E+08	1.986325E+13	.00001406	.00041249	29.33242464	1178.74105	44405.83750
2.793269E+08	1.901800E+13	.00001469	.00043102	29.34635210	1224.79800	46373.49806

2.793269E+08	1.824176E+13	.00001531	.00044960	29.36180162	1270.36164	48339.97784
2.793269E+08	1.752639E+13	.00001594	.00046822	29.37863016	1315.42925	50305.26022
2.793269E+08	1.686502E+13	.00001656	.00048688	29.39671183	1359.99785	52269.33068
2.793269E+08	1.625175E+13	.00001719	.00050559	29.41593504	1404.06419	54232.17668
2.793269E+08	1.568151E+13	.00001781	.00052433	29.43621683	1447.62552	56193.77902
2.793269E+08	1.514993E+13	.00001844	.00054312	29.45747423	1490.67851	58154.12450
2.793269E+08	1.465321E+13	.00001906	.00056192	29.47798491	1533.14523	60000.00000
2.793269E+08	1.418803E+13	.00001969	.00057981	29.45052767	1572.85085	60000.00000
2.793269E+08	1.375148E+13	.00002031	.00059703	29.39241171	1610.48876	60000.00000
2.793269E+08	1.334099E+13	.00002094	.00061378	29.31509829	1646.53599	60000.00000
2.793269E+08	1.295429E+13	.00002156	.00063021	29.22691011	1681.35801	60000.00000
2.793269E+08	1.258938E+13	.00002219	.00064648	29.13723135	1715.40038	60000.00000
2.793269E+08	1.224447E+13	.00002281	.00066234	29.03409433	1748.07343	60000.00000
2.793269E+08	1.191795E+13	.00002344	.00067815	28.93454790	1780.22063	60000.00000
2.793269E+08	1.160839E+13	.00002406	.00069371	28.82951689	1811.39563	60000.00000
2.793269E+08	1.131451E+13	.00002469	.00071100	28.79999971	1845.79334	60000.00000
2.793269E+08	1.103514E+13	.00002531	.00072900	28.79999971	1881.14053	60000.00000
2.793269E+08	1.076923E+13	.00002594	.00074671	28.78893042	1915.34283	60000.00000
2.793269E+08	1.051584E+13	.00002656	.00076127	28.65952635	1942.68524	60000.00000
2.793269E+08	1.027409E+13	.00002719	.00077585	28.53691149	1969.71540	60000.00000
2.793269E+08	1.004321E+13	.00002781	.00079040	28.41885138	1996.33509	60000.00000
2.793269E+08	9.822484E+12	.00002844	.00080448	28.28926420	2021.68241	60000.00000
2.793269E+08	9.611248E+12	.00002906	.00081857	28.16595984	2046.73633	60000.00000
2.793269E+08	9.408906E+12	.00002969	.00083269	28.04854631	2071.49553	60000.00000
2.793269E+08	9.214908E+12	.00003031	.00084683	27.93666887	2095.95898	60000.00000
2.793269E+08	9.028748E+12	.00003094	.00086054	27.81541014	2119.30222	60000.00000
2.793269E+08	8.849961E+12	.00003156	.00087420	27.69748735	2142.24804	60000.00000
2.793269E+08	8.678117E+12	.00003219	.00088788	27.58473444	2164.91574	60000.00000
2.793269E+08	8.512820E+12	.00003281	.00090158	27.47685957	2187.30413	60000.00000
2.793269E+08	8.353702E+12	.00003344	.00091530	27.37359381	2209.41205	60000.00000
2.793269E+08	8.200423E+12	.00003406	.00092865	27.26300955	2230.56158	60000.00000
2.793269E+08	8.052667E+12	.00003469	.00094192	27.15445089	2251.30085	60000.00000
2.793269E+08	7.910142E+12	.00003531	.00095521	27.05022955	2271.77601	60000.00000
2.793269E+08	7.772575E+12	.00003594	.00096852	26.95012808	2291.98634	60000.00000
2.793269E+08	7.639710E+12	.00003656	.00098185	26.85393476	2311.93053	60000.00000
2.793269E+08	7.511312E+12	.00003719	.00099519	26.76145506	2331.60745	60000.00000
2.793269E+08	7.267041E+12	.00003844	.00102110	26.56522608	2368.87515	60000.00000
2.793269E+08	7.038158E+12	.00003969	.00104701	26.38132238	2405.02896	60000.00000
2.793269E+08	6.823253E+12	.00004094	.00107298	26.21027899	2440.16734	60000.00000
2.793269E+08	6.621082E+12	.00004219	.00109864	26.04194212	2473.75031	60000.00000
2.793269E+08	6.430547E+12	.00004344	.00112392	25.87431479	2505.71766	60000.00000
2.793269E+08	6.250672E+12	.00004469	.00114925	25.71747637	2536.71412	60000.00000
2.793269E+08	6.080586E+12	.00004594	.00117600	25.59999990	2568.43440	60000.00000
2.793269E+08	5.919511E+12	.00004719	.00120800	25.59999990	2605.28559	60000.00000
2.793269E+08	5.766749E+12	.00004844	.00124000	25.59999990	2640.38640	60000.00000
2.793269E+08	5.621674E+12	.00004969	.00126646	25.48860312	2667.71534	60000.00000
2.793269E+08	5.483718E+12	.00005094	.00128989	25.32293558	2690.68927	60000.00000
2.793269E+08	5.352372E+12	.00005219	.00131335	25.16605711	2712.81564	60000.00000
2.793269E+08	5.227170E+12	.00005344	.00133592	24.99968290	2733.17408	60000.00000
2.793269E+08	5.107692E+12	.00005469	.00135854	24.84193754	2752.76187	60000.00000
2.793269E+08	4.993554E+12	.00005594	.00138122	24.69225740	2771.57302	60000.00000
2.793269E+08	4.884405E+12	.00005719	.00140396	24.55012178	2789.60108	60000.00000
2.793269E+08	4.779926E+12	.00005844	.00142602	24.40248156	2806.24475	60000.00000
2.793269E+08	4.679822E+12	.00005969	.00144794	24.25861788	2821.99497	60000.00000
2.793269E+08	4.583826E+12	.00006094	.00146991	24.12152052	2837.01235	60000.00000
2.793269E+08	4.491689E+12	.00006219	.00149193	23.99079752	2851.29143	60000.00000
2.793269E+08	4.403183E+12	.00006344	.00151317	23.85291052	2864.27868	60000.00000
2.793269E+08	4.318097E+12	.00006469	.00153440	23.72011614	2876.53644	60000.00000
2.793269E+08	4.236237E+12	.00006594	.00155567	23.59310675	2888.10406	60000.00000
2.793269E+08	4.157424E+12	.00006719	.00157616	23.45910215	2898.52016	60000.00000
2.796017E+08	4.085504E+12	.00006844	.00159636	23.32578707	2908.12479	60000.00000
2.798011E+08	4.015084E+12	.00006969	.00161600	23.18916750	2916.81740	60000.00000
2.799934E+08	3.947044E+12	.00007094	.00163568	23.05797815	2924.92433	60000.00000
2.801783E+08	3.881258E+12	.00007219	.00165540	22.93193579	2932.44106	60000.00000
2.803560E+08	3.817613E+12	.00007344	.00167517	22.81078863	2939.36337	60000.00000
2.805262E+08	3.755999E+12	.00007469	.00169498	22.69428778	2945.68658	60000.00000
2.806890E+08	3.696316E+12	.00007594	.00171484	22.58221292	2951.40633	60000.00000
2.808442E+08	3.638468E+12	.00007719	.00173474	22.47434950	2956.51793	60000.00000
2.816981E+08	3.591370E+12	.00007844	.00175700	22.40000010	2961.55123	60000.00000
2.842568E+08	3.567144E+12	.00007969	.00178500	22.40000010	2966.84054	60000.00000
2.867549E+08	3.542918E+12	.00008094	.00181300	22.40000010	2970.81514	60000.00000
2.891925E+08	3.518692E+12	.00008219	.00184100	22.40000010	2973.47502	60000.00000
2.915695E+08	3.494466E+12	.00008344	.00186900	22.40000010	2974.82017	60000.00000
2.938591E+08	3.469923E+12	.00008469	.00189700	22.40000010	2972.30250	60000.00000
2.938591E+08	3.419451E+12	.00008594	.00192100	22.35345125	2967.51563	60000.00000
2.938591E+08	3.370427E+12	.00008719	.00193855	22.23424673	2964.13243	60000.00000
2.938591E+08	3.276478E+12	.00008969	.00197377	22.00719595	2957.33891	60000.00000
2.938591E+08	3.187624E+12	.00009219	.00200916	21.79428720	2950.50874	60000.00000
2.938591E+08	3.103462E+12	.00009469	.00204472	21.59443331	2950.45358	60000.00000
2.938591E+08	3.023631E+12	.00009719	.00208046	21.40666151	2957.24031	60000.00000
2.938591E+08	2.947803E+12	.00009969	.00211638	21.23009634	2962.96983	60000.00000
2.938591E+08	2.875685E+12	.00010219	.00215247	21.06394815	2967.61783	60000.00000
2.938591E+08	2.807012E+12	.00010469	.00218875	20.90750742	2971.15922	60000.00000
2.938591E+08	2.741543E+12	.00010719	.00222523	20.76013613	2973.56806	60000.00000
2.938591E+08	2.679057E+12	.00010969	.00226189	20.62124777	2974.81733	60000.00000
2.938591E+08	2.619357E+12	.00011219	.00229896	20.49213552	2972.52847	60000.00000
2.938591E+08	2.562259E+12	.00011469	.00233641	20.37198400	2966.99077	60000.00000
2.938591E+08	2.507598E+12	.00011719	.00237397	20.25785494	2961.43022	60000.00000

2.938591E+08	2.455220E+12	.00011969	.00241163	20.14938211	2955.84653	60000.00000
2.938591E+08	2.404985E+12	.00012219	.00244940	20.04623652	2950.23922	60000.00000
2.938591E+08	2.356765E+12	.00012469	.00248728	19.94810629	2944.60806	60000.00000
2.938591E+08	2.310440E+12	.00012719	.00252527	19.85471392	2938.95254	60000.00000
2.938591E+08	2.265902E+12	.00012969	.00256338	19.76579332	2933.27243	60000.00000
2.938591E+08	2.223048E+12	.00013219	.00260160	19.68110991	2934.13180	60000.00000
2.938591E+08	2.181785E+12	.00013469	.00263993	19.60044050	2941.11610	60000.00000
2.938591E+08	2.142025E+12	.00013719	.00267839	19.52358198	2947.48550	60000.00000
2.938591E+08	2.103689E+12	.00013969	.00271697	19.45034266	2953.22767	60000.00000
2.938591E+08	2.066701E+12	.00014219	.00275567	19.38055086	2958.33015	60000.00000
2.938591E+08	2.030992E+12	.00014469	.00279450	19.31404066	2962.77982	60000.00000
2.938591E+08	1.996495E+12	.00014719	.00283346	19.25066614	2966.56342	60000.00000
2.938591E+08	1.963151E+12	.00014969	.00287400	19.20000029	2969.87440	60000.00000
2.938591E+08	1.930902E+12	.00015219	.00292200	19.20000029	2973.06561	60000.00000
2.938591E+08	1.899695E+12	.00015469	.00297000	19.20000029	2974.73206	60000.00000
2.938591E+08	1.869481E+12	.00015719	.00301800	19.20000029	2972.52008	60000.00000
2.938591E+08	1.840214E+12	.00015969	.00306600	19.20000029	2966.42762	60000.00000
2.938591E+08	1.811848E+12	.00016219	.00311400	19.20000029	2960.33517	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 293859.10247 in-kip

p-y Curve in Sand Computed Using Reese Criteria for Static Loading Conditions

Soil Layer Number	=	2	
Depth below pile head	=	144.000	in
Depth below ground surface	=	138.000	in
Equivalent Depth (see note)	=	137.128	in
Pile Diameter	=	96.000	in
Angle of Friction	=	35.000	deg.
Avg. Eff. Unit Weight	=	.06700	pci
k	=	90.000	pci
A (static)	=	1.8101	
B (static)	=	1.3087	
Pst	=	6758.142	lbs/in
Psd	=	47747.930	lbs/in
Ps	=	6758.142	lbs/in
Cbar	=	7657.3791	
n	=	3.2622	
m	=	1694.4458	
yk	=	.5024	in
pm	=	8844.072	lbs/in
ym	=	1.6000	in
pu	=	12232.964	lbs/in
yu	=	3.6000	in
p-multiplier	=	1.00000	
y-multiplier	=	1.00000	

This p-y curve is computed using the equivalent depth.

y, in	p, lbs/in	
0.0000	0.0000	
.1333333	1645.5374	*
.2666667	3291.0749	*
.4000000	4936.6123	*
.5333333	6315.2821	
.6666667	6762.3884	
.8000000	7151.0990	
.9333333	7497.1301	
1.0667	7810.3813	
1.2000	8097.5349	
1.3333	8363.3370	
1.4667	8611.2927	
1.6000	8844.0722	
2.6000	10538.5180	
3.6000	12232.9638	
99.6000	12232.9638	
195.6000	12232.9638	

* p value(s) computed using p = k * Eff x * y

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 56210.000 lbs
Specified moment at pile head = 67609476.000 in-lbs

Specified axial load at pile head = 53790.000 lbs

Non-zero moment for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment)condition.

**** WARNING - POSSIBLE SOLUTION ERROR 5501 ****

Force and moment imbalances may be too large.

The cause of the imbalance may be due to extreme changes in magnitude of nonlinear bending stiffness within three nodal points of the top of the pile which may affect the finite difference computation of shear force.

Please examine curves and printed output for deflection, moment, shear force, and number of iterations to determine if computed values are reasonable. If the shear force shows large changes, increase the number of nodal points (pile increments) and repeat the analysis.

Maximum moment imbalance for pile = -2.8170 in-lbs
Maximum lateral force imbalance for pile = .5741599 lbs

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 56210.	M= 6.76E+07	53790.0000	5.9357	6.9757E+07	-731605.

Computed Pile-head Stiffness Matrix Members K22, K23, K32, K33 for Superstructure

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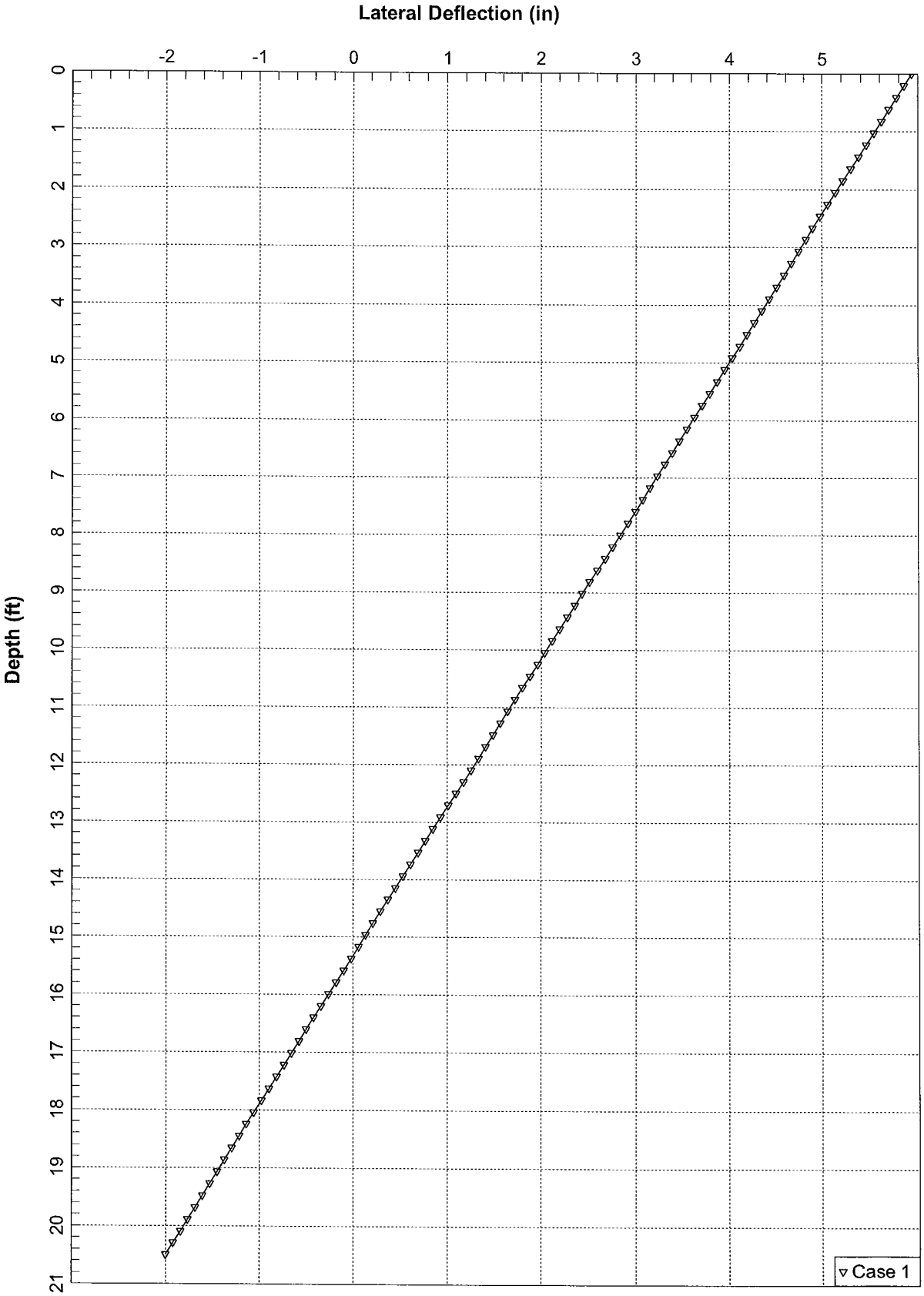
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
.00178066	5621.00008	942893.53034	3156691.	5.295185E+08
.00536033	16920.89606	2838392.	3156691.	5.295185E+08
.00849592	26818.98573	4498745.	3156691.	5.295185E+08
.01072065	33841.79212	5676785.	3156691.	5.295185E+08
.01244629	39289.10394	6590543.	3156691.	5.295185E+08
.01385624	43739.88179	7337138.	3156691.	5.295185E+08
.01504834	47502.96083	7968375.	3156691.	5.295185E+08
.01608098	50762.68817	8515177.	3156691.	5.295185E+08
.01699183	53637.97147	8997491.	3156691.	5.295185E+08
.01780662	56210.00002	9428935.	3156691.	5.295185E+08

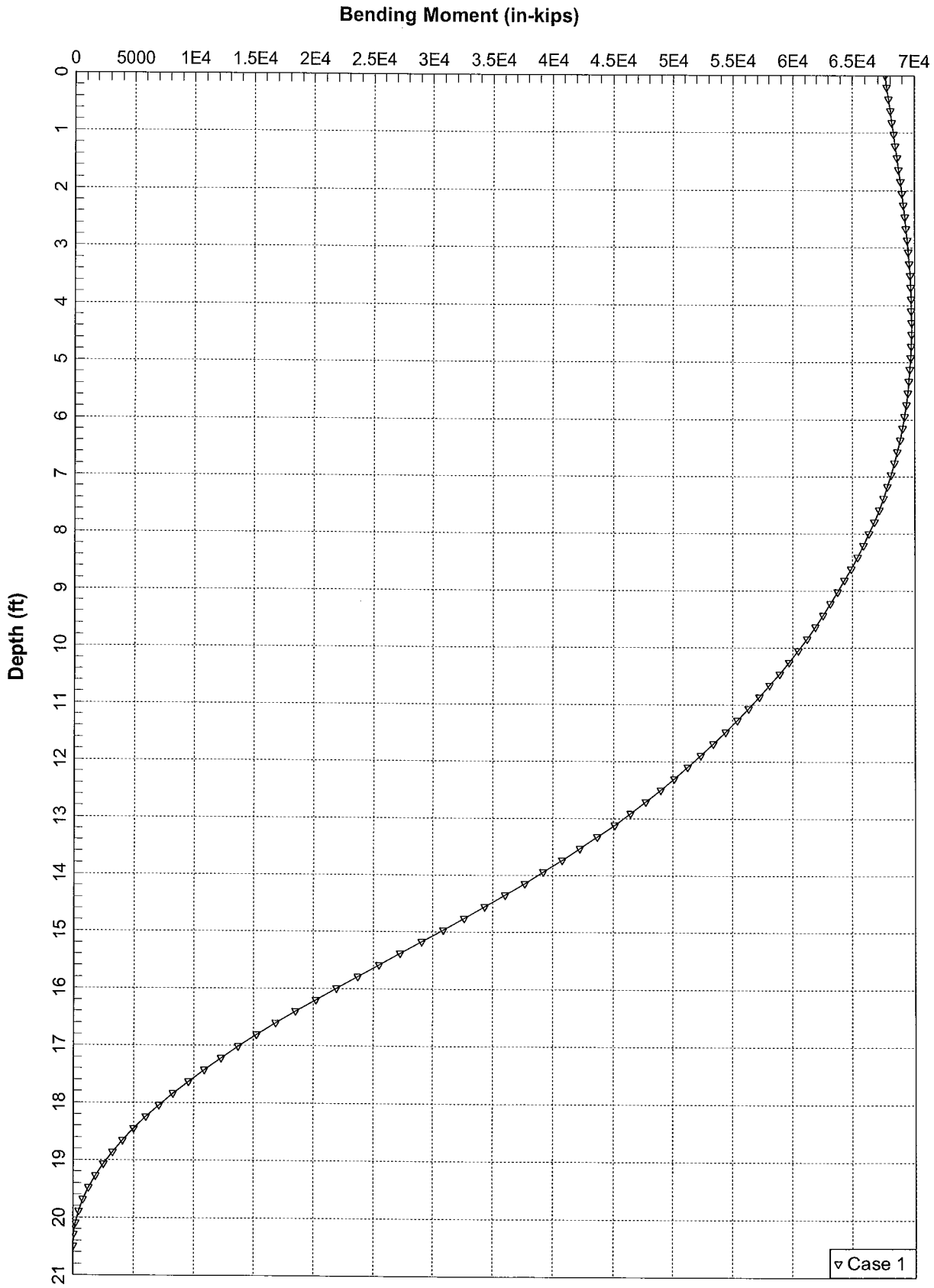
Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
.00006932	36708.35605	6760948.	5.295186E+08	9.752677E+10
.00020869	110503.16097	20352480.	5.295186E+08	9.752677E+10
.00033076	175143.36635	32257918.	5.295186E+08	9.752677E+10
.00041737	221006.32194	40704961.	5.295186E+08	9.752677E+10
.00048455	256580.39403	47256996.	5.295186E+08	9.752677E+10
.00053945	285646.52732	52610398.	5.295186E+08	9.752677E+10
.00058586	310221.59286	57136636.	5.295186E+08	9.752677E+10
.00062606	331509.48292	61057441.	5.295186E+08	9.752677E+10
.00066152	350286.73271	64515836.	5.295186E+08	9.752677E+10
.00069324	367083.55501	67609476.	5.295186E+08	9.752677E+10

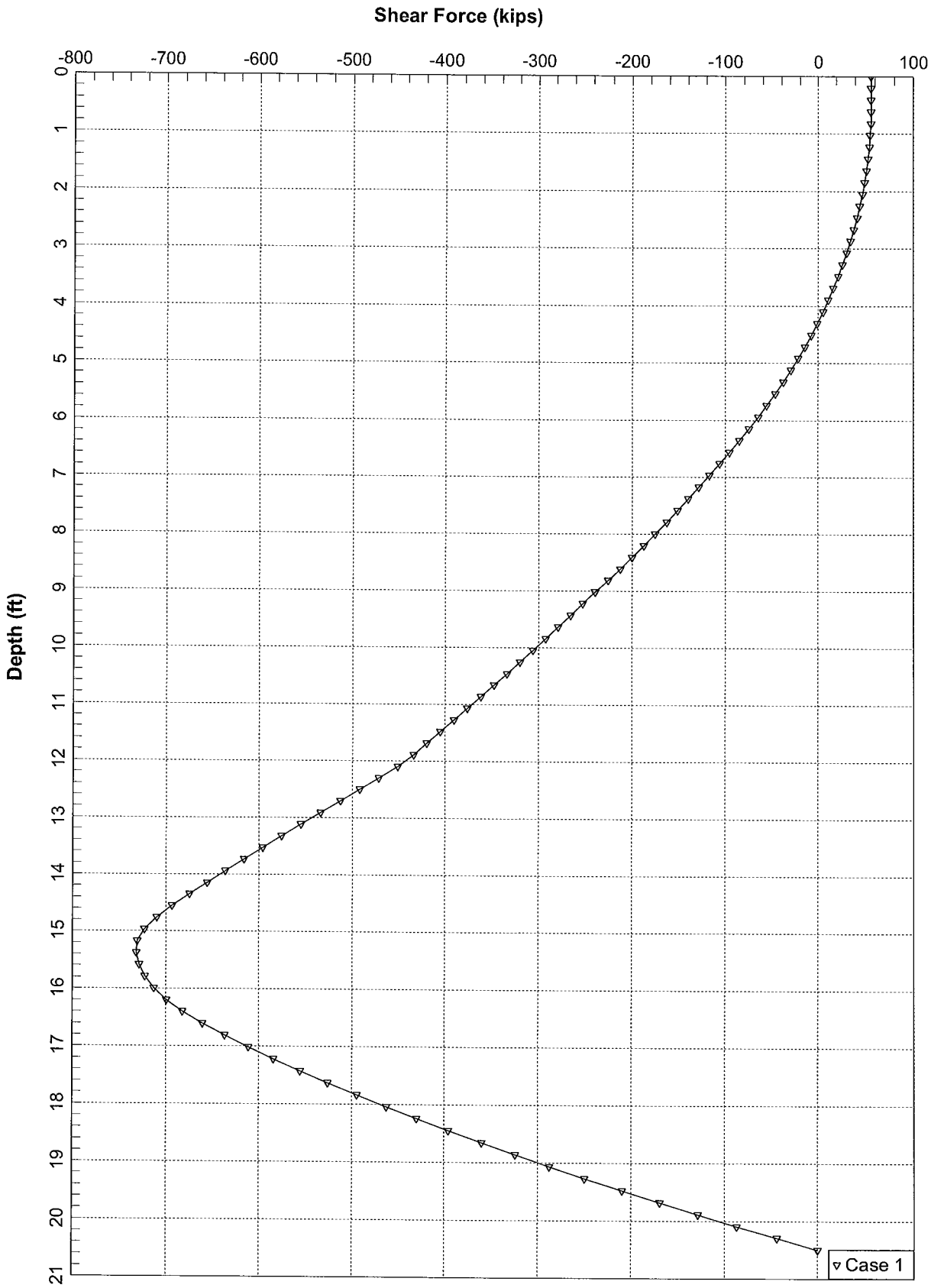
K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.

Summary of Warning Messages


Lateral Deflection (in)
-2
-1
0
1
2
3
4
5
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Case 1


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
4.5E4
5E4
5.5E4
6E4
6.5E4
7E4
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Case 1


Shear Force (kips)
-800
-700
-600
-500
-400
-300
-200
-100
0
100
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Case 1

LPILE Plus for Windows, Version 5.0 (5.0.39)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This program is licensed to:

TJL
Centek Engineering Inc

Path to file locations: J:\Jobs\1102100.WI\CO-55 - CT5176 - 7 Stony Hill Road, Bethel,CT\Structural\Rev (1)\Calcs\L-Pile\
Name of input data file: Caisson Analysis - Manipulated Soil Diameter.lpd
Name of output file: Caisson Analysis - Manipulated Soil Diameter.lpo
Name of plot output file: Caisson Analysis - Manipulated Soil Diameter.lpp
Name of runtime file: Caisson Analysis - Manipulated Soil Diameter.lpr

Time and Date of Analysis

Date: January 30, 2012 Time: 17:24:16

Problem Title

11021.CO55 / CT5176 - Stony Hill / CL&P # 10254

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output summary table of values for pile-head deflection, maximum bending moment, and shear force only
- Analysis includes effects of soil movement on pile response
- Additional p-y curves computed at specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 250
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Only summary tables of pile-head deflection, maximum bending moment, and maximum shear force are to be printed in output file.

Pile Structural Properties and Geometry

Pile Length = 246.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = .00 deg.

Structural properties of pile defined using 6 points

Point	Depth X	Pile Diameter	Moment of Inertia	Pile Area	Modulus of Elasticity

	in	in	in**4	Sq.in	lbs/Sq.in
1	0.0000	96.00000000	4169220.	7238.2000	3300000.
2	54.0000	96.00000000	4169220.	7238.2000	3300000.
3	54.0000	192.00000	66707523.	28952.9000	3300000.
4	150.0000	192.00000	66707523.	28952.9000	3300000.
5	150.0000	96.00000000	4169220.	7238.2000	3300000.
6	246.0000	96.00000000	4169220.	7238.2000	3300000.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 6.000 in
Distance from top of pile to bottom of layer = 90.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 90.000 in
Distance from top of pile to bottom of layer = 144.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 144.000 in
Distance from top of pile to bottom of layer = 186.000 in
p-y subgrade modulus k for top of soil layer = 225.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 225.000 lbs/in**3

Layer 4 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 186.000 in
Distance from top of pile to bottom of layer = 246.000 in
p-y subgrade modulus k for top of soil layer = 125.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 125.000 lbs/in**3

(Depth of lowest layer extends .00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 8 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	.06700
2	90.00	.06700
3	90.00	.06700
4	144.00	.06700
5	144.00	.07500
6	186.00	.07500
7	186.00	.03900
8	246.00	.03900

Shear Strength of Soils

Shear strength parameters with depth defined using 8 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	.00000	30.00	------	------
2	90.000	.00000	30.00	------	------
3	90.000	.00000	30.00	------	------
4	144.000	.00000	30.00	------	------
5	144.000	.00000	40.00	------	------
6	186.000	.00000	40.00	------	------
7	186.000	.00000	40.00	------	------
8	246.000	.00000	40.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Lateral Soil Movements

Profile of soil movement with depth defined using 2 points

Point No.	Depth X in	Soil Movement in
1	.000	.000
2	.000	.000

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 56210.000 lbs
Bending moment at pile head = 67609476.000 in-lbs
Axial load at pile head = 53790.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Output of p-y Curves at Specified Depths

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p-y curves are generated and printed for verification at 1 depths.

Depth No.	Depth Below Pile Head in	Depth Below Ground Surface in
1	144.000	138.000

Depth of ground surface below top of pile = 6.00 in

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 3

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 96.0000 in

Material Properties:

Compressive Strength of Concrete = 3.500 kip/in**2
Yield Stress of Reinforcement = 60. kip/in**2
Modulus of Elasticity of Reinforcement = 29000. kip/in**2

Number of Reinforcing Bars	=	38	
Area of Single Bar	=	1.27000	in**2
Number of Rows of Reinforcing Bars	=	19	
Area of Steel	=	48.260	in**2
Area of Shaft	=	7238.229	in**2
Percentage of Steel Reinforcement	=	.667	percent
Cover Thickness (edge to bar center)	=	4.000	in

Unfactored Axial Squash Load Capacity = 24285.76 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.540	43.850
2	2.540	42.654
3	2.540	40.294
4	2.540	36.835
5	2.540	32.372
6	2.540	27.025
7	2.540	20.942
8	2.540	14.287
9	2.540	7.242
10	2.540	0.000
11	2.540	-7.242
12	2.540	-14.287
13	2.540	-20.942
14	2.540	-27.025
15	2.540	-32.372
16	2.540	-36.835
17	2.540	-40.294
18	2.540	-42.654
19	2.540	-43.850

Axial Thrust Force = 53790.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
9680885.	1.548942E+13	6.250000E-07	.00003219	51.50283194	106.82232	858.26496
19259171.	1.540734E+13	.00000125	.00006230	49.84267759	204.88393	1656.34933
28735289.	1.532549E+13	.00000188	.00009246	49.31153440	301.37440	2455.64308
38106361.	1.524254E+13	.00000250	.00012257	49.02919149	396.02165	3253.72092
38106361.	1.219404E+13	.00000313	.00007808	24.98612452	251.55446	6059.51313
38106361.	1.016170E+13	.00000375	.00009199	24.53060961	295.01982	7320.95300
38106361.	8.710025E+12	.00000438	.00010592	24.20921659	338.19122	8581.88858
38106361.	7.621272E+12	.00000500	.00012000	23.99999857	381.51753	9838.20927
38106361.	6.774464E+12	.00000563	.00013409	23.83766985	424.49195	11094.46530
38106361.	6.097018E+12	.00000625	.00014802	23.68379831	466.63866	12355.07289
38106361.	5.542743E+12	.00000688	.00016198	23.56067705	508.49330	13615.12748
38106361.	5.080848E+12	.00000750	.00017595	23.46063852	550.05482	14874.62472
38106361.	4.690014E+12	.00000813	.00018995	23.37837267	591.32214	16133.56067
38106361.	4.355013E+12	.00000875	.00020396	23.31009150	632.29426	17391.93015
38106361.	4.064679E+12	.00000938	.00021800	23.25300837	672.96993	18649.73035
38106361.	3.810636E+12	.00001000	.00023205	23.20504332	713.34819	19906.95557
38106361.	3.586481E+12	.00001063	.00024612	23.16459990	753.42787	21163.60192
38106361.	3.387232E+12	.00001125	.00026022	23.13043642	793.20777	22419.66551
38106361.	3.208957E+12	.00001188	.00027433	23.10157442	832.68675	23675.14184
38106361.	3.048509E+12	.00001250	.00028847	23.07723284	871.86371	24930.02576
38322426.	2.919804E+12	.00001313	.00030262	23.05677938	910.73753	26184.31214
40057154.	2.913248E+12	.00001375	.00031680	23.03969049	949.30681	27437.99835
41789841.	2.907119E+12	.00001438	.00033099	23.02554560	987.57064	28691.07674
43520459.	2.901364E+12	.00001500	.00034521	23.01398134	1025.52753	29943.54531
45249005.	2.895936E+12	.00001563	.00035945	23.00470304	1063.17645	31195.39726
46975462.	2.890798E+12	.00001625	.00037371	22.99745607	1100.51608	32446.62829
48699819.	2.885915E+12	.00001688	.00038799	22.99202585	1137.54521	33697.23294
50422059.	2.881261E+12	.00001750	.00040229	22.98822641	1174.26251	34947.20682
52142165.	2.876809E+12	.00001813	.00041662	22.98589754	1210.66662	36196.54547
53860130.	2.872540E+12	.00001875	.00043097	22.98490477	1246.75640	37445.24203
55575939.	2.868436E+12	.00001938	.00044534	22.98512793	1282.53051	38693.29138
57289574.	2.864479E+12	.00002000	.00045973	22.98646116	1317.98754	39940.68879
59001030.	2.860656E+12	.00002063	.00047414	22.98881578	1353.12633	41187.42695
60710278.	2.856954E+12	.00002125	.00048858	22.99210596	1387.94524	42433.50323
62417310.	2.853363E+12	.00002188	.00050304	22.99626303	1422.44304	43678.91030
64122114.	2.849872E+12	.00002250	.00051753	23.00122404	1456.61836	44923.64211
65824661.	2.846472E+12	.00002313	.00053204	23.00692892	1490.46958	46167.69522
67524961.	2.843156E+12	.00002375	.00054657	23.01333475	1523.99568	47411.05875
69222967.	2.839917E+12	.00002438	.00056112	23.02038717	1557.19469	48653.73301
72612098.	2.833643E+12	.00002563	.00059031	23.03629446	1622.60669	51136.97514
75991914.	2.827606E+12	.00002688	.00061959	23.05437040	1686.69343	53617.37379
79362298.	2.821771E+12	.00002813	.00064897	23.07439470	1749.44294	56094.87281
82723080.	2.816105E+12	.00002938	.00067845	23.09617281	1810.84206	58569.42605
85889787.	2.804564E+12	.00003063	.00070750	23.10188055	1869.75602	60000.00000
88306442.	2.770398E+12	.00003188	.00073442	23.04056597	1922.85173	60000.00000

90352109.	2.727611E+12	.00003313	.00076028	22.95181704	1972.54442	60000.00000
92096892.	2.679182E+12	.00003438	.00078523	22.84306097	2019.28206	60000.00000
93744636.	2.631428E+12	.00003563	.00080994	22.73506021	2064.44302	60000.00000
95113075.	2.579338E+12	.00003688	.00083372	22.60926962	2106.81015	60000.00000
96405952.	2.528681E+12	.00003813	.00085729	22.48637438	2147.80197	60000.00000
97830631.	2.484587E+12	.00003938	.00088200	22.40000010	2189.77996	60000.00000
98715620.	2.429923E+12	.00004063	.00090620	22.30635309	2229.79450	60000.00000
99691041.	2.380682E+12	.00004188	.00092826	22.16743612	2265.22825	60000.00000
1.006634E+08	2.334223E+12	.00004313	.00095037	22.03766012	2299.87496	60000.00000
1.015635E+08	2.288755E+12	.00004438	.00097219	21.90852785	2333.18736	60000.00000
1.022814E+08	2.241785E+12	.00004563	.00099316	21.76785707	2364.34878	60000.00000
1.029968E+08	2.197265E+12	.00004688	.00101417	21.63556623	2394.79658	60000.00000
1.037096E+08	2.155005E+12	.00004813	.00103522	21.51100588	2424.52620	60000.00000
1.044199E+08	2.114833E+12	.00004938	.00105631	21.39359808	2453.53346	60000.00000
1.051039E+08	2.076126E+12	.00005063	.00107731	21.28010988	2481.62390	60000.00000
1.056139E+08	2.035930E+12	.00005188	.00109734	21.15362692	2507.64614	60000.00000
1.061217E+08	1.997585E+12	.00005313	.00111742	21.03379297	2533.01195	60000.00000
1.066274E+08	1.960964E+12	.00005438	.00113753	20.92015886	2557.71787	60000.00000
1.071309E+08	1.925949E+12	.00005563	.00115768	20.81230688	2581.75973	60000.00000
1.076987E+08	1.893603E+12	.00005688	.00118300	20.79999876	2611.25720	60000.00000
1.082027E+08	1.861551E+12	.00005813	.00120277	20.69279623	2633.23974	60000.00000
1.086896E+08	1.830562E+12	.00005938	.00122243	20.58834028	2654.42000	60000.00000
1.090603E+08	1.798933E+12	.00006063	.00124124	20.47397947	2673.99120	60000.00000
1.093950E+08	1.768000E+12	.00006188	.00125980	20.36041403	2692.69806	60000.00000
1.097281E+08	1.738267E+12	.00006313	.00127840	20.25187254	2710.83851	60000.00000
1.100596E+08	1.709664E+12	.00006438	.00129703	20.14806318	2728.40919	60000.00000
1.103894E+08	1.682125E+12	.00006563	.00131570	20.04872274	2745.40714	60000.00000
1.107176E+08	1.655590E+12	.00006688	.00133440	19.95359945	2761.82878	60000.00000
1.110440E+08	1.630004E+12	.00006813	.00135313	19.86247015	2777.67120	60000.00000
1.113688E+08	1.605316E+12	.00006938	.00137190	19.77512312	2792.93107	60000.00000
1.116919E+08	1.581478E+12	.00007063	.00139070	19.69135523	2807.60469	60000.00000
1.120132E+08	1.558445E+12	.00007188	.00140954	19.61099195	2821.68916	60000.00000
1.123012E+08	1.535743E+12	.00007313	.00142810	19.52955008	2834.94836	60000.00000
1.125162E+08	1.512823E+12	.00007438	.00144598	19.44172812	2847.13018	60000.00000
1.129420E+08	1.469164E+12	.00007688	.00148183	19.27588034	2869.89169	60000.00000
1.139714E+08	1.435860E+12	.00007938	.00152400	19.20000029	2894.00567	60000.00000
1.139714E+08	1.392017E+12	.00008188	.00156163	19.07334280	2912.76984	60000.00000
1.142566E+08	1.354152E+12	.00008438	.00159634	18.91961432	2927.82357	60000.00000
1.146393E+08	1.319589E+12	.00008688	.00163118	18.77620554	2940.84273	60000.00000
1.150167E+08	1.286900E+12	.00008938	.00166615	18.64227247	2951.80340	60000.00000
1.153886E+08	1.255931E+12	.00009188	.00170126	18.51706553	2960.68113	60000.00000
1.156717E+08	1.225660E+12	.00009438	.00173520	18.38627386	2967.22857	60000.00000
1.158981E+08	1.196367E+12	.00009688	.00176847	18.25520754	2971.71431	60000.00000
1.161199E+08	1.168502E+12	.00009938	.00180186	18.13194036	2974.30475	60000.00000
1.163358E+08	1.141947E+12	.00010188	.00183537	18.01591730	2973.96235	60000.00000
1.165409E+08	1.116560E+12	.00010438	.00186901	17.90663481	2967.07931	60000.00000
1.167438E+08	1.092340E+12	.00010688	.00190276	17.80363798	2964.71602	60000.00000
1.169445E+08	1.069207E+12	.00010938	.00193665	17.70651484	2969.53721	60000.00000
1.171428E+08	1.047086E+12	.00011188	.00197067	17.61488485	2972.85778	60000.00000
1.171428E+08	1.024199E+12	.00011438	.00201300	17.59999895	2974.89078	60000.00000
1.176327E+08	1.006483E+12	.00011688	.00205510	17.58373976	2969.45219	60000.00000
1.178101E+08	9.868909E+11	.00011938	.00208816	17.49247885	2963.56317	60000.00000
1.179861E+08	9.680914E+11	.00012188	.00212133	17.40581274	2962.07963	60000.00000
1.181608E+08	9.500365E+11	.00012438	.00215461	17.32347822	2966.77049	60000.00000
1.183024E+08	9.324329E+11	.00012688	.00218711	17.23832560	2970.30446	60000.00000
1.183958E+08	9.151363E+11	.00012938	.00221840	17.14709044	2972.74118	60000.00000
1.184881E+08	8.984881E+11	.00013188	.00224979	17.06000662	2974.30094	60000.00000
1.185795E+08	8.824519E+11	.00013438	.00228126	16.97685385	2974.97238	60000.00000
1.186680E+08	8.669812E+11	.00013688	.00231296	16.89830732	2971.44176	60000.00000
1.187554E+08	8.520568E+11	.00013938	.00234475	16.82334852	2966.69870	60000.00000
1.188422E+08	8.376543E+11	.00014188	.00237662	16.75148535	2961.94163	60000.00000
1.189285E+08	8.237469E+11	.00014438	.00240855	16.68256617	2957.17026	60000.00000
1.190141E+08	8.103087E+11	.00014688	.00244054	16.61643934	2958.29638	60000.00000
1.190992E+08	7.973166E+11	.00014938	.00247260	16.55297613	2962.58293	60000.00000
1.191836E+08	7.847482E+11	.00015188	.00250473	16.49204493	2966.24746	60000.00000
1.192675E+08	7.725830E+11	.00015438	.00253693	16.43353128	2969.28306	60000.00000
1.193508E+08	7.608016E+11	.00015688	.00256919	16.37732363	2971.68251	60000.00000
1.194334E+08	7.493859E+11	.00015938	.00260153	16.32331896	2973.43852	60000.00000
1.195154E+08	7.383189E+11	.00016188	.00263394	16.27142000	2974.54362	60000.00000
1.195967E+08	7.275845E+11	.00016438	.00266641	16.22153521	2974.99021	60000.00000
1.196757E+08	7.171576E+11	.00016688	.00269911	16.17443419	2971.62608	60000.00000
1.197539E+08	7.070343E+11	.00016938	.00273188	16.12917280	2967.54198	60000.00000
1.198319E+08	6.972037E+11	.00017188	.00276469	16.08549070	2963.44805	60000.00000
1.199061E+08	6.876333E+11	.00017438	.00279780	16.04470396	2959.29179	60000.00000
1.202352E+08	6.703005E+11	.00017938	.00287000	16.00000048	2949.67337	60000.00000
1.209327E+08	6.559064E+11	.00018438	.00295000	16.00000048	2959.41401	60000.00000
1.216385E+08	6.423158E+11	.00018938	.00303000	16.00000048	2968.36516	60000.00000
1.216385E+08	6.257932E+11	.00019438	.00310615	15.98021364	2973.24794	60000.00000
1.216385E+08	6.100993E+11	.00019938	.00317088	15.90407896	2974.81687	60000.00000
1.216385E+08	5.951733E+11	.00020438	.00323633	15.83524561	2971.57830	60000.00000
1.216385E+08	5.809602E+11	.00020938	.00330222	15.77178240	2965.07490	60000.00000
1.216385E+08	5.674101E+11	.00021438	.00336825	15.71196985	2958.53931	60000.00000
1.216385E+08	5.544777E+11	.00021938	.00343444	15.65557337	2951.97081	60000.00000
1.216385E+08	5.421217E+11	.00022438	.00350078	15.60238123	2945.36857	60000.00000
1.216385E+08	5.303043E+11	.00022938	.00356729	15.55220175	2938.73172	60000.00000
1.216385E+08	5.189911E+11	.00023438	.00363395	15.50486326	2944.31092	60000.00000
1.216385E+08	5.081506E+11	.00023938	.00370079	15.46020555	2951.69322	60000.00000
1.216385E+08	4.977536E+11	.00024438	.00376779	15.41808271	2958.10580	60000.00000

1.216385E+08	4.877736E+11	.00024938	.00383498	15.37836599	2963.52670	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 121373.86716 in-kip

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Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 3

Pile Section No. 2

**** WARNING ****

An unreasonable input value for concrete cover thickness has been specified.
The input value is either smaller than 0.8 inches or larger than 8 inches.
You should check your input for correctness.

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 192.0000 in

Material Properties:

Compressive Strength of Concrete	=	3.500 kip/in**2
Yield Stress of Reinforcement	=	60. kip/in**2
Modulus of Elasticity of Reinforcement	=	29000. kip/in**2
Number of Reinforcing Bars	=	38
Area of Single Bar	=	1.27000 in**2
Number of Rows of Reinforcing Bars	=	19
Area of Steel	=	48.260 in**2
Area of Shaft	=	28952.918 in**2
Percentage of Steel Reinforcement	=	.167 percent
Cover Thickness (edge to bar center)	=	52.000 in

Unfactored Axial Squash Load Capacity = 88886.96 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.540	43.850
2	2.540	42.654
3	2.540	40.294
4	2.540	36.835
5	2.540	32.372
6	2.540	27.025
7	2.540	20.942
8	2.540	14.287
9	2.540	7.242
10	2.540	0.000
11	2.540	-7.242
12	2.540	-14.287
13	2.540	-20.942
14	2.540	-27.025
15	2.540	-32.372
16	2.540	-36.835
17	2.540	-40.294
18	2.540	-42.654
19	2.540	-43.850

Axial Thrust Force = 53790.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
71107381.	2.275436E+14	3.125000E-07	.00003066	98.11165094	101.71175	416.52490
1.413842E+08	2.262147E+14	6.250000E-07	.00006077	97.22823000	199.84066	817.03780
2.108318E+08	2.248873E+14	9.375000E-07	.00009088	96.93335867	296.26348	1217.53989
2.794504E+08	2.235603E+14	.00000125	.00012098	96.78562117	390.98025	1618.03103
2.794504E+08	1.788483E+14	.00000156	.00004961	31.75282717	158.11064	4898.14035
2.794504E+08	1.490402E+14	.00000188	.00005852	31.20862627	185.85485	5907.35935
2.794504E+08	1.277488E+14	.00000219	.00006743	30.82362127	213.48835	6916.34299
2.794504E+08	1.117802E+14	.00000250	.00007635	30.53813124	241.01089	7925.09002
2.794504E+08	9.936015E+13	.00000281	.00008527	30.31899977	268.42220	8933.59918
2.794504E+08	8.942413E+13	.00000313	.00009421	30.14633131	295.72200	9941.86939
2.794504E+08	8.129467E+13	.00000344	.00010315	30.00746584	322.91002	10949.89948
2.794504E+08	7.452011E+13	.00000375	.00011210	29.89396620	349.98601	11957.68798
2.794504E+08	6.878780E+13	.00000406	.00012106	29.79999018	376.94971	12965.23352

2.794504E+08	6.387438E+13	.00000438	.00013003	29.72136068	403.80079	13972.53530
2.794504E+08	5.961609E+13	.00000469	.00013901	29.65501928	430.53900	14979.59181
2.794504E+08	5.589008E+13	.00000500	.00014799	29.59867144	457.16408	15986.40171
2.794504E+08	5.260243E+13	.00000531	.00015699	29.55056334	483.67575	16992.96347
2.794504E+08	4.968007E+13	.00000563	.00016599	29.50932741	510.07370	17999.27616
2.794504E+08	4.706533E+13	.00000594	.00017500	29.47388792	536.35766	19005.33819
2.794504E+08	4.471207E+13	.00000625	.00018402	29.44338083	562.52733	20011.14856
2.794504E+08	4.258292E+13	.00000656	.00019305	29.41711092	588.58244	21016.70548
2.794504E+08	4.064733E+13	.00000688	.00020209	29.39450598	614.52269	22022.00784
2.794504E+08	3.888006E+13	.00000719	.00021113	29.37509394	640.34777	23027.05439
2.794504E+08	3.726006E+13	.00000750	.00022019	29.35848284	666.05739	24031.84358
2.794504E+08	3.576965E+13	.00000781	.00022925	29.34434366	691.65128	25036.37380
2.794504E+08	3.439390E+13	.00000813	.00023833	29.33239603	717.12911	26040.64392
2.794504E+08	3.312005E+13	.00000844	.00024741	29.32240248	742.49058	27044.65244
2.794504E+08	3.193719E+13	.00000875	.00025650	29.31415987	767.73540	28048.39780
2.794504E+08	3.083591E+13	.00000906	.00026560	29.30749369	792.86328	29051.87825
2.794504E+08	2.980804E+13	.00000938	.00027471	29.30224943	817.87386	30055.09293
2.794504E+08	2.884649E+13	.00000969	.00028383	29.29829550	842.76685	31058.04017
2.794504E+08	2.794504E+13	.00001000	.00029296	29.29551744	867.54196	32060.71807
2.794504E+08	2.709822E+13	.00001031	.00030209	29.29381227	892.19884	33063.12546
2.794504E+08	2.630122E+13	.00001063	.00031124	29.29308844	916.73712	34065.26139
2.794504E+08	2.554975E+13	.00001094	.00032040	29.29327154	941.15663	35067.12276
2.794504E+08	2.484004E+13	.00001125	.00032956	29.29428720	965.45691	36068.70920
2.794504E+08	2.416868E+13	.00001156	.00033874	29.29607248	989.63764	37070.01916
2.794504E+08	2.353267E+13	.00001188	.00034792	29.29857302	1013.69856	38071.05045
2.794504E+08	2.292927E+13	.00001219	.00035711	29.30173731	1037.63928	39071.80182
2.794504E+08	2.181076E+13	.00001281	.00037553	29.30988264	1085.15887	41072.45746
2.794504E+08	2.079631E+13	.00001344	.00039399	29.32019663	1132.19370	43071.97274
2.794504E+08	1.987203E+13	.00001406	.00041249	29.33242464	1178.74105	45070.33357
2.794504E+08	1.902641E+13	.00001469	.00043102	29.34635210	1224.79800	47067.52728
2.794504E+08	1.824982E+13	.00001531	.00044960	29.36180162	1270.36164	49063.54023
2.794504E+08	1.753414E+13	.00001594	.00046822	29.37863016	1315.42925	51058.35577
2.794504E+08	1.687248E+13	.00001656	.00048688	29.39671183	1359.99785	53051.95938
2.794504E+08	1.625893E+13	.00001719	.00050559	29.41593504	1404.06419	55044.33854
2.794504E+08	1.568844E+13	.00001781	.00052433	29.43621683	1447.62552	57035.47404
2.794504E+08	1.515663E+13	.00001844	.00054312	29.45747423	1490.67851	59025.35268
2.794504E+08	1.465969E+13	.00001906	.00056157	29.45945692	1532.30868	60000.00000
2.794504E+08	1.419431E+13	.00001969	.00057904	29.41159487	1571.06025	60000.00000
2.794504E+08	1.375756E+13	.00002031	.00059600	29.34157705	1608.10885	60000.00000
2.794504E+08	1.334689E+13	.00002094	.00061267	29.26162863	1643.98990	60000.00000
2.794504E+08	1.296002E+13	.00002156	.00062887	29.16511202	1678.36719	60000.00000
2.794504E+08	1.259495E+13	.00002219	.00064497	29.06923056	1712.05855	60000.00000
2.794504E+08	1.224988E+13	.00002281	.00066071	28.96275473	1744.51560	60000.00000
2.794504E+08	1.192322E+13	.00002344	.00067648	28.86300802	1776.60328	60000.00000
2.794504E+08	1.161352E+13	.00002406	.00069300	28.79999971	1809.88410	60000.00000
2.794504E+08	1.131951E+13	.00002469	.00071100	28.79999971	1845.79334	60000.00000
2.794504E+08	1.104002E+13	.00002531	.00072900	28.79999971	1881.14053	60000.00000
2.794504E+08	1.077399E+13	.00002594	.00074403	28.68558455	1909.89380	60000.00000
2.794504E+08	1.052049E+13	.00002656	.00075852	28.55588007	1937.16107	60000.00000
2.794504E+08	1.027864E+13	.00002719	.00077302	28.43296480	1964.11929	60000.00000
2.794504E+08	1.004766E+13	.00002781	.00078739	28.31050730	1990.44703	60000.00000
2.794504E+08	9.826828E+12	.00002844	.00080139	28.18063402	2015.72447	60000.00000
2.794504E+08	9.615498E+12	.00002906	.00081541	28.05704069	2040.71164	60000.00000
2.794504E+08	9.413067E+12	.00002969	.00082945	27.93933535	2065.40727	60000.00000
2.794504E+08	9.218983E+12	.00003031	.00084351	27.82716322	2089.81035	60000.00000
2.794504E+08	9.032741E+12	.00003094	.00085711	27.70440531	2113.02540	60000.00000
2.794504E+08	8.853875E+12	.00003156	.00087069	27.58621359	2135.91512	60000.00000
2.794504E+08	8.681955E+12	.00003219	.00088429	27.47318602	2158.52976	60000.00000
2.794504E+08	8.516584E+12	.00003281	.00089792	27.36503649	2180.86848	60000.00000
2.794504E+08	8.357396E+12	.00003344	.00091156	27.26149035	2202.92981	60000.00000
2.794504E+08	8.204049E+12	.00003406	.00092488	27.15245962	2224.14001	60000.00000
2.794504E+08	8.056228E+12	.00003469	.00093808	27.04365206	2244.83818	60000.00000
2.794504E+08	7.913640E+12	.00003531	.00095129	26.93918467	2265.27572	60000.00000
2.794504E+08	7.776012E+12	.00003594	.00096452	26.83882856	2285.45128	60000.00000
2.794504E+08	7.643088E+12	.00003656	.00097777	26.74238062	2305.36408	60000.00000
2.794504E+08	7.514633E+12	.00003719	.00099103	26.64964628	2325.01301	60000.00000
2.794504E+08	7.270255E+12	.00003844	.00101698	26.45790911	2362.52482	60000.00000
2.794504E+08	7.041270E+12	.00003969	.00104273	26.27355909	2398.64308	60000.00000
2.794504E+08	6.826270E+12	.00004094	.00106855	26.10206366	2433.75860	60000.00000
2.794504E+08	6.624010E+12	.00004219	.00109440	25.94140005	2467.81015	60000.00000
2.794504E+08	6.433391E+12	.00004344	.00111953	25.77338934	2499.77598	60000.00000
2.794504E+08	6.253436E+12	.00004469	.00114472	25.61615896	2530.78256	60000.00000
2.794504E+08	6.083274E+12	.00004594	.00117600	25.59999990	2568.43440	60000.00000
2.794504E+08	5.922128E+12	.00004719	.00120800	25.59999990	2605.28559	60000.00000
2.794504E+08	5.769299E+12	.00004844	.00123731	25.54450178	2637.31254	60000.00000
2.794504E+08	5.624159E+12	.00004969	.00126050	25.36848307	2661.15554	60000.00000
2.794504E+08	5.486143E+12	.00005094	.00128374	25.20226622	2684.18870	60000.00000
2.794504E+08	5.354739E+12	.00005219	.00130704	25.04516172	2706.40549	60000.00000
2.794504E+08	5.229481E+12	.00005344	.00133040	24.89630842	2727.78682	60000.00000
2.794504E+08	5.109950E+12	.00005469	.00135287	24.73813963	2747.45284	60000.00000
2.794504E+08	4.995762E+12	.00005594	.00137539	24.58803034	2766.35380	60000.00000
2.794504E+08	4.886565E+12	.00005719	.00139797	24.44545698	2784.48332	60000.00000
2.794504E+08	4.782039E+12	.00005844	.00142061	24.30995035	2801.83538	60000.00000
2.794504E+08	4.681892E+12	.00005969	.00144297	24.17543650	2818.14081	60000.00000
2.794504E+08	4.585853E+12	.00006094	.00146482	24.03803301	2833.25996	60000.00000
2.794504E+08	4.493675E+12	.00006219	.00148672	23.90699530	2847.64994	60000.00000
2.794504E+08	4.405130E+12	.00006344	.00150867	23.78195429	2861.30498	60000.00000
2.794504E+08	4.320006E+12	.00006469	.00153060	23.66149378	2874.17563	60000.00000

2.794504E+08	4.238111E+12	.00006594	.00155179	23.53429842	2885.83505	60000.00000
2.794504E+08	4.159262E+12	.00006719	.00157303	23.41256762	2896.80538	60000.00000
2.794504E+08	4.083294E+12	.00006844	.00159432	23.29601526	2907.08157	60000.00000
2.796628E+08	4.013098E+12	.00006969	.00161504	23.17548609	2916.36295	60000.00000
2.799792E+08	3.946843E+12	.00007094	.00163558	23.05658770	2924.88079	60000.00000
2.801783E+08	3.881258E+12	.00007219	.00165540	22.93193579	2932.44106	60000.00000
2.803560E+08	3.817613E+12	.00007344	.00167517	22.81078863	2939.36337	60000.00000
2.805262E+08	3.755999E+12	.00007469	.00169498	22.69428778	2945.68658	60000.00000
2.806890E+08	3.696316E+12	.00007594	.00171484	22.58221292	2951.40633	60000.00000
2.808442E+08	3.638468E+12	.00007719	.00173474	22.47434950	2956.51793	60000.00000
2.816981E+08	3.591370E+12	.00007844	.00175700	22.40000010	2961.55123	60000.00000
2.842568E+08	3.567144E+12	.00007969	.00178500	22.40000010	2966.84054	60000.00000
2.867549E+08	3.542918E+12	.00008094	.00181300	22.40000010	2970.81514	60000.00000
2.891925E+08	3.518692E+12	.00008219	.00184100	22.40000010	2973.47502	60000.00000
2.915695E+08	3.494466E+12	.00008344	.00186900	22.40000010	2974.82017	60000.00000
2.938591E+08	3.469923E+12	.00008469	.00189700	22.40000010	2972.30250	60000.00000
2.938591E+08	3.419451E+12	.00008594	.00192100	22.35345125	2967.51563	60000.00000
2.938591E+08	3.370427E+12	.00008719	.00193855	22.23424673	2964.13243	60000.00000
2.938591E+08	3.276478E+12	.00008969	.00197377	22.00719595	2957.33891	60000.00000
2.938591E+08	3.187624E+12	.00009219	.00200916	21.79428720	2950.50874	60000.00000
2.938591E+08	3.103462E+12	.00009469	.00204472	21.59443331	2950.45358	60000.00000
2.938591E+08	3.023631E+12	.00009719	.00208046	21.40666151	2957.24031	60000.00000
2.938591E+08	2.947803E+12	.00009969	.00211638	21.23009634	2962.96983	60000.00000
2.938591E+08	2.875685E+12	.00010219	.00215247	21.06394815	2967.61783	60000.00000
2.938591E+08	2.807012E+12	.00010469	.00218875	20.90750742	2971.15922	60000.00000
2.938591E+08	2.741543E+12	.00010719	.00222523	20.76013613	2973.56806	60000.00000
2.938591E+08	2.679057E+12	.00010969	.00226189	20.62124777	2974.81733	60000.00000
2.938591E+08	2.619357E+12	.00011219	.00229896	20.49213552	2972.52847	60000.00000
2.938591E+08	2.562259E+12	.00011469	.00233641	20.37198400	2966.99077	60000.00000
2.938591E+08	2.507598E+12	.00011719	.00237397	20.25785494	2961.43022	60000.00000
2.938591E+08	2.455220E+12	.00011969	.00241163	20.14938211	2955.84653	60000.00000
2.938591E+08	2.404985E+12	.00012219	.00244940	20.04623652	2950.23922	60000.00000
2.938591E+08	2.356765E+12	.00012469	.00248728	19.94810629	2944.60806	60000.00000
2.938591E+08	2.310440E+12	.00012719	.00252527	19.85471392	2938.95254	60000.00000
2.938591E+08	2.265902E+12	.00012969	.00256338	19.76579332	2933.27243	60000.00000
2.938591E+08	2.223048E+12	.00013219	.00260160	19.68110991	2934.13180	60000.00000
2.938591E+08	2.181785E+12	.00013469	.00263993	19.60044050	2941.11610	60000.00000
2.938591E+08	2.142025E+12	.00013719	.00267839	19.52358198	2947.48550	60000.00000
2.938591E+08	2.103689E+12	.00013969	.00271697	19.45034266	2953.22767	60000.00000
2.938591E+08	2.066701E+12	.00014219	.00275567	19.38055086	2958.33015	60000.00000
2.938591E+08	2.030992E+12	.00014469	.00279450	19.31404066	2962.77982	60000.00000
2.938591E+08	1.996495E+12	.00014719	.00283346	19.25066614	2966.56342	60000.00000
2.938591E+08	1.963151E+12	.00014969	.00287400	19.20000029	2969.87440	60000.00000
2.938591E+08	1.930902E+12	.00015219	.00292200	19.20000029	2973.06561	60000.00000
2.938591E+08	1.899695E+12	.00015469	.00297000	19.20000029	2974.73206	60000.00000
2.938591E+08	1.869481E+12	.00015719	.00301800	19.20000029	2972.52008	60000.00000
2.938591E+08	1.840214E+12	.00015969	.00306600	19.20000029	2966.42762	60000.00000
2.938591E+08	1.811848E+12	.00016219	.00311400	19.20000029	2960.33517	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 293859.10247 in-kip

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Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 3

Pile Section No. 3

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 96.0000 in

Material Properties:

Compressive Strength of Concrete	=	3.500 kip/in**2
Yield Stress of Reinforcement	=	60. kip/in**2
Modulus of Elasticity of Reinforcement	=	29000. kip/in**2
Number of Reinforcing Bars	=	38
Area of Single Bar	=	1.27000 in**2
Number of Rows of Reinforcing Bars	=	19
Area of Steel	=	48.260 in**2
Area of Shaft	=	7238.229 in**2
Percentage of Steel Reinforcement	=	.667 percent
Cover Thickness (edge to bar center)	=	4.000 in

Unfactored Axial Squash Load Capacity = 24285.76 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in

1	2.540	43.850
2	2.540	42.654
3	2.540	40.294
4	2.540	36.835
5	2.540	32.372
6	2.540	27.025
7	2.540	20.942
8	2.540	14.287
9	2.540	7.242
10	2.540	0.000
11	2.540	-7.242
12	2.540	-14.287
13	2.540	-20.942
14	2.540	-27.025
15	2.540	-32.372
16	2.540	-36.835
17	2.540	-40.294
18	2.540	-42.654
19	2.540	-43.850

Axial Thrust Force = 53790.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
9680885.	1.548942E+13	6.250000E-07	.00003219	51.50283194	106.82232	858.26496
19259171.	1.540734E+13	.00000125	.00006230	49.84267759	204.88393	1656.34933
28735289.	1.532549E+13	.00000188	.00009246	49.31153440	301.37440	2455.64308
38106361.	1.524254E+13	.00000250	.00012257	49.02919149	396.02165	3253.72092
38106361.	1.219404E+13	.00000313	.00007808	24.98612452	251.55446	6059.51313
38106361.	1.016170E+13	.00000375	.00009199	24.53060961	295.01982	7320.95300
38106361.	8.710025E+12	.00000438	.00010592	24.20921659	338.19122	8581.88858
38106361.	7.621272E+12	.00000500	.00012000	23.99999857	381.51753	9838.20927
38106361.	6.774464E+12	.00000563	.00013409	23.83766985	424.49195	11094.46530
38106361.	6.097018E+12	.00000625	.00014802	23.68379831	466.63866	12355.07289
38106361.	5.542743E+12	.00000688	.00016198	23.56067705	508.49330	13615.12748
38106361.	5.080848E+12	.00000750	.00017595	23.46063852	550.05482	14874.62472
38106361.	4.690014E+12	.00000813	.00018995	23.37837267	591.32214	16133.56067
38106361.	4.355013E+12	.00000875	.00020396	23.31009150	632.29426	17391.93015
38106361.	4.064679E+12	.00000938	.00021800	23.25300837	672.96993	18649.73035
38106361.	3.810636E+12	.00001000	.00023205	23.20504332	713.34819	19906.95557
38106361.	3.586481E+12	.00001063	.00024612	23.16459990	753.42787	21163.60192
38106361.	3.387232E+12	.00001125	.00026022	23.13043642	793.20777	22419.66551
38106361.	3.208957E+12	.00001188	.00027433	23.10157442	832.68675	23675.14184
38106361.	3.048509E+12	.00001250	.00028847	23.07723284	871.86371	24930.02576
38322426.	2.919804E+12	.00001313	.00030262	23.05677938	910.73753	26184.31214
40057154.	2.913248E+12	.00001375	.00031680	23.03969049	949.30681	27437.99835
41789841.	2.907119E+12	.00001438	.00033099	23.02554560	987.57064	28691.07674
43520459.	2.901364E+12	.00001500	.00034521	23.01398134	1025.52753	29943.54531
45249005.	2.895936E+12	.00001563	.00035945	23.00470304	1063.17645	31195.39726
46975462.	2.890798E+12	.00001625	.00037371	22.99745607	1100.51608	32446.62829
48699819.	2.885915E+12	.00001688	.00038799	22.99202585	1137.54521	33697.23294
50422059.	2.881261E+12	.00001750	.00040229	22.98822641	1174.26251	34947.20682
52142165.	2.876809E+12	.00001813	.00041662	22.98589754	1210.66662	36196.54547
53860130.	2.872540E+12	.00001875	.00043097	22.98490477	1246.75640	37445.24203
55575939.	2.868436E+12	.00001938	.00044534	22.98512793	1282.53051	38693.29138
57289574.	2.864479E+12	.00002000	.00045973	22.98646116	1317.98754	39940.68879
59001030.	2.860656E+12	.00002063	.00047414	22.98881578	1353.12633	41187.42695
60710278.	2.856954E+12	.00002125	.00048858	22.99210596	1387.94524	42433.50323
62417310.	2.853363E+12	.00002188	.00050304	22.99626303	1422.44304	43678.91030
64122114.	2.849872E+12	.00002250	.00051753	23.00122404	1456.61836	44923.64211
65824661.	2.846472E+12	.00002313	.00053204	23.00692892	1490.46958	46167.69522
67524961.	2.843156E+12	.00002375	.00054657	23.01333475	1523.99568	47411.05875
69222967.	2.839917E+12	.00002438	.00056112	23.02038717	1557.19469	48653.73301
72612098.	2.833643E+12	.00002563	.00059031	23.03629446	1622.60669	51136.97514
75991914.	2.827606E+12	.00002688	.00061959	23.05437040	1686.69343	53617.37379
79362298.	2.821771E+12	.00002813	.00064897	23.07439470	1749.44294	56094.87281
82723080.	2.816105E+12	.00002938	.00067845	23.09617281	1810.84206	58569.42605
85889787.	2.804564E+12	.00003063	.00070750	23.10188055	1869.75602	60000.00000
88306442.	2.770398E+12	.00003188	.00073442	23.04056597	1922.85173	60000.00000
90352109.	2.727611E+12	.00003313	.00076028	22.95181704	1972.54442	60000.00000
92096892.	2.679182E+12	.00003438	.00078523	22.84306097	2019.28206	60000.00000
93744636.	2.631428E+12	.00003563	.00080994	22.73506021	2064.44302	60000.00000
95113075.	2.579338E+12	.00003688	.00083372	22.60926962	2106.81015	60000.00000
96405952.	2.528681E+12	.00003813	.00085729	22.48637438	2147.80197	60000.00000
97830631.	2.484587E+12	.00003938	.00088200	22.40000010	2189.77996	60000.00000
98715620.	2.429923E+12	.00004063	.00090620	22.30635309	2229.79450	60000.00000
99691041.	2.380682E+12	.00004188	.00092826	22.16743612	2265.22825	60000.00000
1.006634E+08	2.334223E+12	.00004313	.00095037	22.03766012	2299.87496	60000.00000
1.015635E+08	2.288755E+12	.00004438	.00097219	21.90852785	2333.18736	60000.00000
1.022814E+08	2.241785E+12	.00004563	.00099316	21.76785707	2364.34878	60000.00000
1.029968E+08	2.197265E+12	.00004688	.00101417	21.63556623	2394.79658	60000.00000
1.037096E+08	2.155005E+12	.00004813	.00103522	21.51100588	2424.52620	60000.00000
1.044199E+08	2.114833E+12	.00004938	.00105631	21.39359808	2453.53346	60000.00000
1.051039E+08	2.076126E+12	.00005063	.00107731	21.28010988	2481.62390	60000.00000

1.056139E+08	2.035930E+12	.00005188	.00109734	21.15362692	2507.64614	60000.00000
1.061217E+08	1.997585E+12	.00005313	.00111742	21.03379297	2533.01195	60000.00000
1.066274E+08	1.960964E+12	.00005438	.00113753	20.92015886	2557.71787	60000.00000
1.071309E+08	1.925949E+12	.00005563	.00115768	20.81230688	2581.75973	60000.00000
1.076987E+08	1.893603E+12	.00005688	.00118300	20.79999876	2611.25720	60000.00000
1.082027E+08	1.861551E+12	.00005813	.00120277	20.69279623	2633.23974	60000.00000
1.086896E+08	1.830562E+12	.00005938	.00122243	20.58834028	2654.42000	60000.00000
1.090603E+08	1.798933E+12	.00006063	.00124124	20.47397947	2673.99120	60000.00000
1.093950E+08	1.768000E+12	.00006188	.00125980	20.36041403	2692.69806	60000.00000
1.097281E+08	1.738267E+12	.00006313	.00127840	20.25187254	2710.83851	60000.00000
1.100596E+08	1.709664E+12	.00006438	.00129703	20.14806318	2728.40919	60000.00000
1.103894E+08	1.682125E+12	.00006563	.00131570	20.04872274	2745.40714	60000.00000
1.107176E+08	1.655590E+12	.00006688	.00133440	19.95359945	2761.82878	60000.00000
1.110440E+08	1.630004E+12	.00006813	.00135313	19.86247015	2777.67120	60000.00000
1.113688E+08	1.605316E+12	.00006938	.00137190	19.77512312	2792.93107	60000.00000
1.116919E+08	1.581478E+12	.00007063	.00139070	19.69135523	2807.60469	60000.00000
1.120132E+08	1.558445E+12	.00007188	.00140954	19.61099195	2821.68916	60000.00000
1.123012E+08	1.535743E+12	.00007313	.00142810	19.52955008	2834.94836	60000.00000
1.125162E+08	1.512823E+12	.00007438	.00144598	19.44172812	2847.13018	60000.00000
1.129420E+08	1.469164E+12	.00007688	.00148183	19.27588034	2869.89169	60000.00000
1.139714E+08	1.435860E+12	.00007938	.00152400	19.20000029	2894.00567	60000.00000
1.139714E+08	1.392017E+12	.00008188	.00156163	19.07334280	2912.76984	60000.00000
1.142566E+08	1.354152E+12	.00008438	.00159634	18.91961432	2927.82357	60000.00000
1.146393E+08	1.319589E+12	.00008688	.00163118	18.77620554	2940.84273	60000.00000
1.150167E+08	1.286900E+12	.00008938	.00166615	18.64227247	2951.80340	60000.00000
1.153886E+08	1.255931E+12	.00009188	.00170126	18.51706553	2960.68113	60000.00000
1.156717E+08	1.225660E+12	.00009438	.00173520	18.38627386	2967.22857	60000.00000
1.158981E+08	1.196367E+12	.00009688	.00176847	18.25520754	2971.71431	60000.00000
1.161199E+08	1.168502E+12	.00009938	.00180186	18.13194036	2974.30475	60000.00000
1.163358E+08	1.141947E+12	.00010188	.00183537	18.01591730	2973.96235	60000.00000
1.165409E+08	1.116560E+12	.00010438	.00186901	17.90663481	2967.07931	60000.00000
1.167438E+08	1.092340E+12	.00010688	.00190276	17.80363798	2964.71602	60000.00000
1.169445E+08	1.069207E+12	.00010938	.00193665	17.70651484	2969.53721	60000.00000
1.171428E+08	1.047086E+12	.00011188	.00197067	17.61488485	2972.85778	60000.00000
1.171428E+08	1.024199E+12	.00011438	.00201300	17.59999895	2974.89078	60000.00000
1.176327E+08	1.006483E+12	.00011688	.00205510	17.58373976	2969.45219	60000.00000
1.178101E+08	9.868909E+11	.00011938	.00208816	17.49247885	2963.56317	60000.00000
1.179861E+08	9.680914E+11	.00012188	.00212133	17.40581274	2962.07963	60000.00000
1.181608E+08	9.500365E+11	.00012438	.00215461	17.32347822	2966.77049	60000.00000
1.183024E+08	9.324329E+11	.00012688	.00218711	17.23832560	2970.30446	60000.00000
1.183958E+08	9.151363E+11	.00012938	.00221840	17.14709044	2972.74118	60000.00000
1.184881E+08	8.984881E+11	.00013188	.00224979	17.06000662	2974.30094	60000.00000
1.185795E+08	8.824519E+11	.00013438	.00228126	16.97685385	2974.97238	60000.00000
1.186680E+08	8.669812E+11	.00013688	.00231296	16.89830732	2971.44176	60000.00000
1.187554E+08	8.520568E+11	.00013938	.00234475	16.82334852	2966.69870	60000.00000
1.188422E+08	8.376543E+11	.00014188	.00237662	16.75148535	2961.94163	60000.00000
1.189285E+08	8.237469E+11	.00014438	.00240855	16.68256617	2957.17026	60000.00000
1.190141E+08	8.103087E+11	.00014688	.00244054	16.61643934	2958.29638	60000.00000
1.190992E+08	7.973166E+11	.00014938	.00247260	16.55297613	2962.58293	60000.00000
1.191836E+08	7.847482E+11	.00015188	.00250473	16.49204493	2966.24746	60000.00000
1.192675E+08	7.725830E+11	.00015438	.00253693	16.43353128	2969.28306	60000.00000
1.193508E+08	7.608016E+11	.00015688	.00256919	16.37732363	2971.68251	60000.00000
1.194334E+08	7.493859E+11	.00015938	.00260153	16.32331896	2973.43852	60000.00000
1.195154E+08	7.383189E+11	.00016188	.00263394	16.27142000	2974.54362	60000.00000
1.195967E+08	7.275845E+11	.00016438	.00266641	16.22153521	2974.99021	60000.00000
1.196757E+08	7.171576E+11	.00016688	.00269911	16.17443419	2971.62608	60000.00000
1.197539E+08	7.070343E+11	.00016938	.00273188	16.12917280	2967.54198	60000.00000
1.198319E+08	6.972037E+11	.00017188	.00276469	16.08549070	2963.44805	60000.00000
1.199061E+08	6.876333E+11	.00017438	.00279780	16.04470396	2959.29179	60000.00000
1.202352E+08	6.703005E+11	.00017938	.00287000	16.00000048	2949.67337	60000.00000
1.209327E+08	6.559064E+11	.00018438	.00295000	16.00000048	2959.41401	60000.00000
1.216385E+08	6.423158E+11	.00018938	.00303000	16.00000048	2968.36516	60000.00000
1.216385E+08	6.257932E+11	.00019438	.00310615	15.98021364	2973.24794	60000.00000
1.216385E+08	6.100993E+11	.00019938	.00317088	15.90407896	2974.81687	60000.00000
1.216385E+08	5.951733E+11	.00020438	.00323633	15.83524561	2971.57830	60000.00000
1.216385E+08	5.809602E+11	.00020938	.00330222	15.77178240	2965.07490	60000.00000
1.216385E+08	5.674101E+11	.00021438	.00336825	15.71196985	2958.53931	60000.00000
1.216385E+08	5.544777E+11	.00021938	.00343444	15.65557337	2951.97081	60000.00000
1.216385E+08	5.421217E+11	.00022438	.00350078	15.60238123	2945.36857	60000.00000
1.216385E+08	5.303043E+11	.00022938	.00356729	15.55220175	2938.73172	60000.00000
1.216385E+08	5.189911E+11	.00023438	.00363395	15.50486326	2944.31092	60000.00000
1.216385E+08	5.081506E+11	.00023938	.00370079	15.46020555	2951.69322	60000.00000
1.216385E+08	4.977536E+11	.00024438	.00376779	15.41808271	2958.10580	60000.00000
1.216385E+08	4.877736E+11	.00024938	.00383498	15.37836599	2963.52670	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 121373.86716 in-kip

p-y Curve in Sand Computed Using Reese Criteria for Static Loading Conditions

Soil Layer Number	=	2
Depth below pile head	=	144.000 in
Depth below ground surface	=	138.000 in
Equivalent Depth (see note)	=	126.611 in
Pile Diameter	=	192.000 in
Angle of Friction	=	35.000 deg.

Avg. Eff. Unit Weight	=	.06700 pci
k	=	90.000 pci
A (static)	=	2.3620
B (static)	=	1.7375
Pst	=	8759.266 lbs/in
Psd	=	95495.860 lbs/in
Ps	=	8759.266 lbs/in
Cbar	=	10893.1577
n	=	3.4779
m	=	1367.5203
yk	=	.9387 in
pm	=	15219.480 lbs/in
ym	=	3.2000 in
pu	=	20689.561 lbs/in
yu	=	7.2000 in
p-multiplier	=	1.00000
y-multiplier	=	1.00000

This p-y curve is computed using the equivalent depth.

y, in	p, lbs/in	
0.0000	0.0000	
.2666667	3038.6648	*
.5333333	6077.3295	*
.8000000	9115.9943	*
1.0667	11097.1869	
1.3333	11832.5266	
1.6000	12469.3700	
1.8667	13034.4814	
2.1333	13544.6632	
2.4000	14011.2254	
2.6667	14442.1814	
2.9333	14843.4364	
3.2000	15219.4802	
5.2000	17954.5207	
7.2000	20689.5612	
199.2000	20689.5612	
391.2000	20689.5612	

* p value(s) computed using p = k * Eff x * y

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 56210.000 lbs
Specified moment at pile head = 67609476.000 in-lbs
Specified axial load at pile head = 53790.000 lbs

Non-zero moment for this load case indicates the pile-head may rotate under
the applied pile-head loading, but is not a free-head (zero moment)condition.

Output Verification:

Computed forces and moments are within specified convergence limits.

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 56210.	M= 6.76E+07	53790.0000	3.0920	6.9842E+07	-678118.

Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

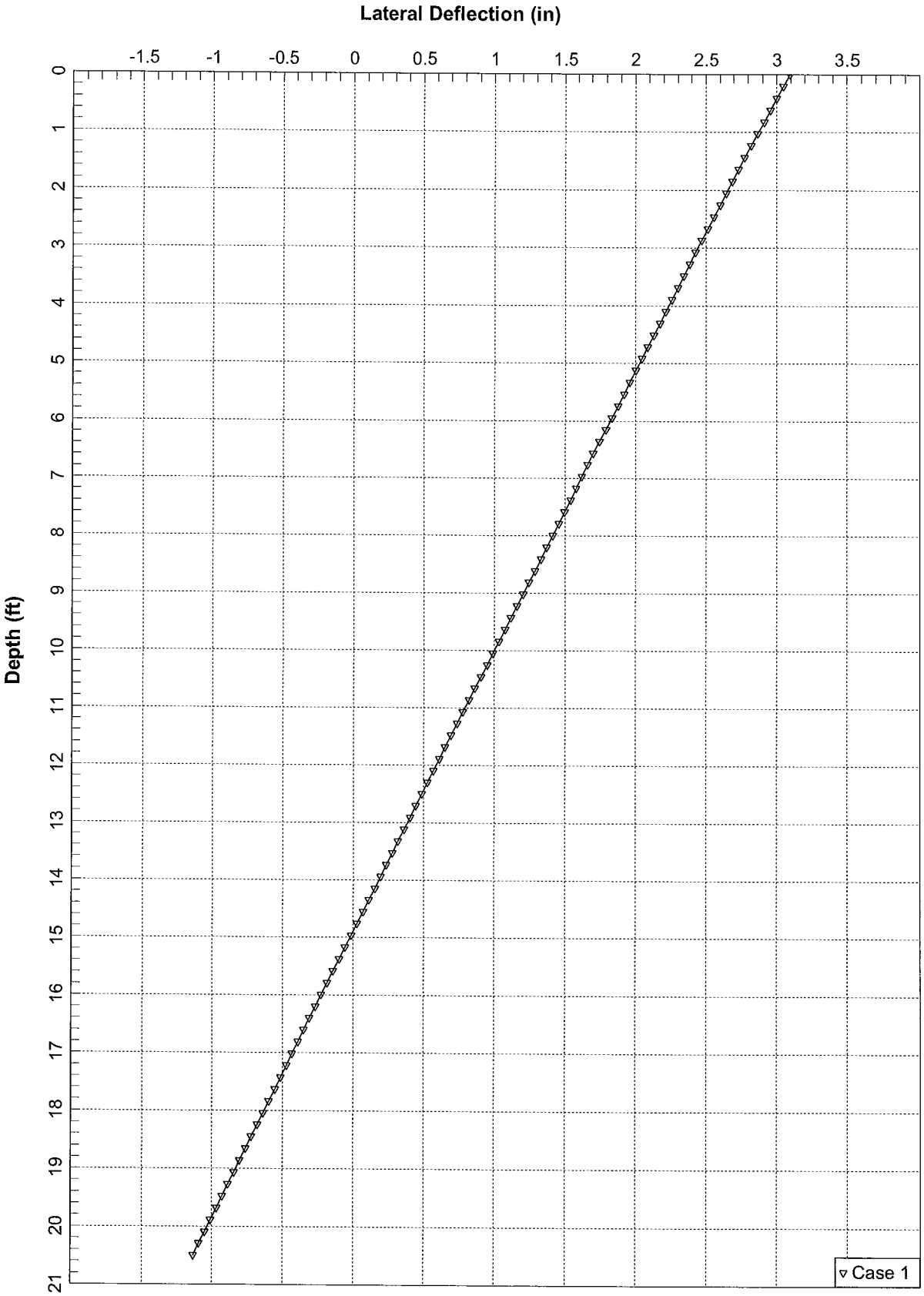
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
.00213981	5621.00008	936123.90822	2626863.	4.374789E+08
.00644148	16920.89606	2818014.	2626863.	4.374789E+08
.01020951	26818.98573	4466446.	2626863.	4.374789E+08
.01288297	33841.79211	5636027.	2626863.	4.374789E+08
.01495666	39289.10394	6543225.	2626863.	4.374789E+08
.01665100	43739.88179	7284460.	2626863.	4.374789E+08
.01808353	47502.96083	7911165.	2626863.	4.374789E+08
.01932445	50762.68817	8454041.	2626863.	4.374789E+08
.02041902	53637.97146	8932892.	2626863.	4.374789E+08
.02139815	56210.00000	9361239.	2626863.	4.374789E+08

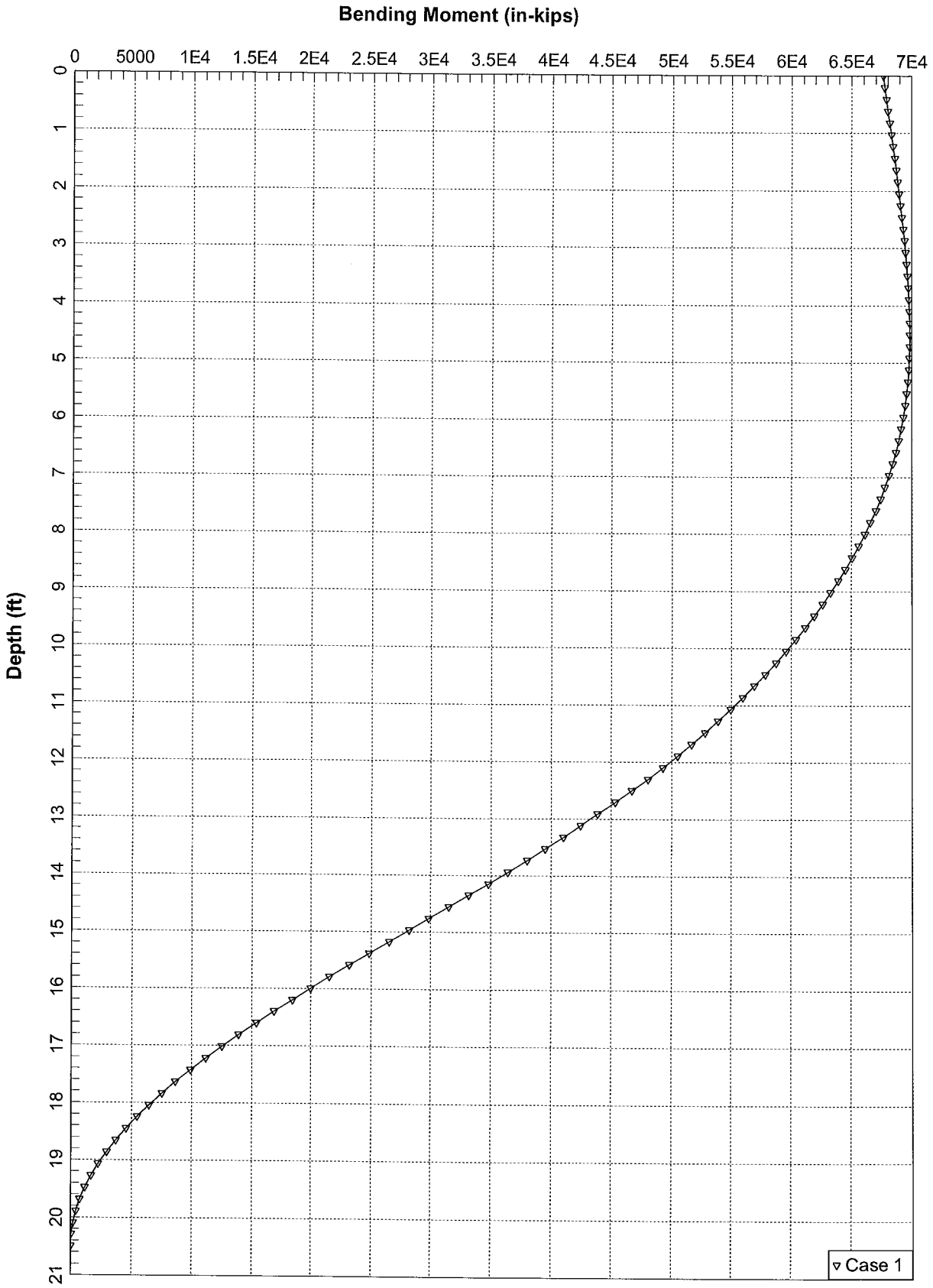
Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
.00008299	36306.43708	6760948.	4.374789E+08	8.146688E+10
.00025008	109295.03670	20352480.	4.370426E+08	8.138431E+10
.00039684	173231.86305	32257918.	4.365284E+08	8.128699E+10
.00050558	218602.20437	40704961.	4.323826E+08	8.051207E+10
.00089471	255051.36852	47256996.	2.850674E+08	5.281850E+10
.00115529	285797.57798	52610398.	2.473812E+08	4.553861E+10
.00132478	311512.05870	57136636.	2.351419E+08	4.312905E+10
.00142777	333082.13000	61057441.	2.332877E+08	4.276408E+10
.00151088	351965.89420	64515836.	2.329548E+08	4.270093E+10
.00158530	368858.54974	67609476.	2.326740E+08	4.264769E+10

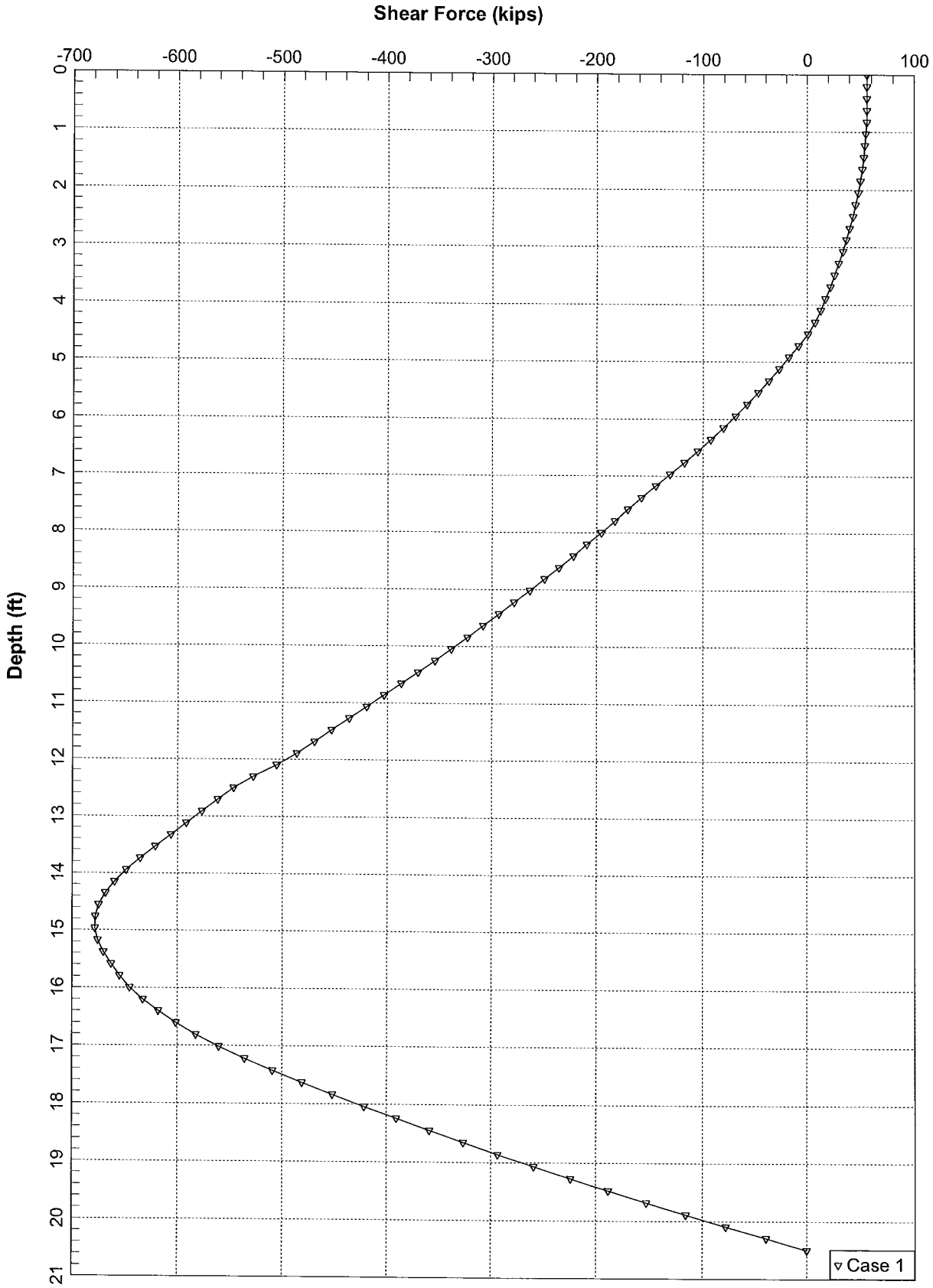
K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.

Summary of Warning Messages


Lateral Deflection (in)
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3
3.5
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Case 1


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
4.5E4
5E4
5.5E4
6E4
6.5E4
7E4
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Case 1


Shear Force (kips)
-700
-600
-500
-400
-300
-200
-100
0
100
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Case 1

LPILE Plus for Windows, Version 5.0 (5.0.39)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This program is licensed to:

TJL
Centek Engineering Inc

Path to file locations: J:\Jobs\1102100.WI\CO-55 - CT5176 - 7 Stony Hill Road, Bethel,CT\Structural\Rev (1)\Calcs\L-Pile\Improved Soil Condition\
Name of input data file: Caisson Analysis - Improved Soil Condition.lpd
Name of output file: Caisson Analysis - Improved Soil Condition.lpo
Name of plot output file: Caisson Analysis - Improved Soil Condition.lpp
Name of runtime file: Caisson Analysis - Improved Soil Condition.lpr

Time and Date of Analysis

Date: January 30, 2012 Time: 17:43:35

Problem Title

11021.CO55 / CT5176 - Stony Hill / CL&P # 10254

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output summary table of values for pile-head deflection, maximum bending moment, and shear force only
- Analysis includes effects of soil movement on pile response
- Additional p-y curves computed at specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 250
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Only summary tables of pile-head deflection, maximum bending moment, and maximum shear force are to be printed in output file.

Pile Structural Properties and Geometry

Pile Length = 246.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = .00 deg.

Structural properties of pile defined using 2 points

Point	Depth X	Pile Diameter	Moment of Inertia	Pile Area	Modulus of Elasticity

	in	in	in**4	Sq.in	lbs/Sq.in
1	0.0000	96.00000000	4169220.	7238.2000	3300000.
2	246.0000	96.00000000	4169220.	7238.2000	3300000.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 6.000 in
Distance from top of pile to bottom of layer = 54.000 in
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 54.000 in
Distance from top of pile to bottom of layer = 150.000 in
p-y subgrade modulus k for top of soil layer = 300.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 300.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 150.000 in
Distance from top of pile to bottom of layer = 186.000 in
p-y subgrade modulus k for top of soil layer = 225.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 225.000 lbs/in**3

Layer 4 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 186.000 in
Distance from top of pile to bottom of layer = 246.000 in
p-y subgrade modulus k for top of soil layer = 125.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 125.000 lbs/in**3

(Depth of lowest layer extends .00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 8 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	.06700
2	54.00	.06700
3	54.00	.07500
4	150.00	.07500
5	150.00	.07500
6	186.00	.07500
7	186.00	.03900
8	246.00	.03900

Shear Strength of Soils

Shear strength parameters with depth defined using 8 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	.00000	30.00	------	------
2	54.000	.00000	30.00	------	------
3	54.000	.00000	40.00	------	------
4	150.000	.00000	40.00	------	------
5	150.000	.00000	40.00	------	------
6	186.000	.00000	40.00	------	------
7	186.000	.00000	40.00	------	------
8	246.000	.00000	40.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.

(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Lateral Soil Movements

Profile of soil movement with depth defined using 2 points

Point No.	Depth X in	Soil Movement in
1	.000	.000
2	.000	.000

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 56210.000 lbs
Bending moment at pile head = 67609476.000 in-lbs
Axial load at pile head = 53790.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Output of p-y Curves at Specified Depths

p-y curves are generated and printed for verification at 1 depths.

Depth No.	Depth Below Pile Head in	Depth Below Ground Surface in
1	144.000	138.000

Depth of ground surface below top of pile = 6.00 in

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Number of sections = 1

Pile Section No. 1

**** WARNING ****

An unreasonable input value for concrete cover thickness has been specified.
The input value is either smaller than 0.8 inches or larger than 8 inches.
You should check your input for correctness.

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 192.0000 in

Material Properties:

Compressive Strength of Concrete = 3.500 kip/in**2

Yield Stress of Reinforcement = 60. kip/in**2
Modulus of Elasticity of Reinforcement = 29000. kip/in**2
Number of Reinforcing Bars = 38
Area of Single Bar = 1.27000 in**2
Number of Rows of Reinforcing Bars = 19
Area of Steel = 48.260 in**2
Area of Shaft = 28952.918 in**2
Percentage of Steel Reinforcement = .167 percent
Cover Thickness (edge to bar center) = 53.635 in

Unfactored Axial Squash Load Capacity = 88886.96 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.540	42.220
2	2.540	41.069
3	2.540	38.797
4	2.540	35.467
5	2.540	31.169
6	2.540	26.021
7	2.540	20.164
8	2.540	13.756
9	2.540	6.973
10	2.540	0.000
11	2.540	-6.973
12	2.540	-13.756
13	2.540	-20.164
14	2.540	-26.021
15	2.540	-31.169
16	2.540	-35.467
17	2.540	-38.797
18	2.540	-41.069
19	2.540	-42.220

Axial Thrust Force = 53790.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
71076502.	2.274448E+14	3.125000E-07	.00003066	98.11165094	101.71175	401.75832
1.413224E+08	2.261158E+14	6.250000E-07	.00006077	97.22823000	199.84066	787.50464
2.107392E+08	2.247885E+14	9.375000E-07	.00009088	96.93335867	296.26348	1173.24015
2.793269E+08	2.234615E+14	.00000125	.00012098	96.78562117	390.98025	1558.96472
2.793269E+08	1.787692E+14	.00000156	.00004961	31.75282717	158.11064	4824.30746
2.793269E+08	1.489743E+14	.00000188	.00005852	31.20862627	185.85485	5818.75987
2.793269E+08	1.276923E+14	.00000219	.00006743	30.82362127	213.48835	6812.97694
2.793269E+08	1.117308E+14	.00000250	.00007635	30.53813124	241.01089	7806.95738
2.793269E+08	9.931623E+13	.00000281	.00008527	30.31899977	268.42220	8800.69997
2.793269E+08	8.938461E+13	.00000313	.00009421	30.14633131	295.72200	9794.20360
2.793269E+08	8.125874E+13	.00000344	.00010315	30.00746584	322.91002	10787.46711
2.793269E+08	7.448717E+13	.00000375	.00011210	29.89396620	349.98601	11780.48902
2.793269E+08	6.875739E+13	.00000406	.00012106	29.79999018	376.94971	12773.26799
2.793269E+08	6.384615E+13	.00000438	.00013003	29.72136068	403.80079	13765.80319
2.793269E+08	5.958974E+13	.00000469	.00013901	29.65501928	430.53900	14758.09313
2.793269E+08	5.586538E+13	.00000500	.00014799	29.59867144	457.16408	15750.13644
2.793269E+08	5.257918E+13	.00000531	.00015699	29.55056334	483.67575	16741.93162
2.793269E+08	4.965812E+13	.00000563	.00016599	29.50932741	510.07370	17733.47774
2.793269E+08	4.704453E+13	.00000594	.00017500	29.47388792	536.35766	18724.77318
2.793269E+08	4.469230E+13	.00000625	.00018402	29.44338083	562.52733	19715.81697
2.793269E+08	4.256410E+13	.00000656	.00019305	29.41711092	588.58244	20706.60731
2.793269E+08	4.062937E+13	.00000688	.00020209	29.39450598	614.52269	21697.14309
2.793269E+08	3.886287E+13	.00000719	.00021113	29.37509394	640.34777	22687.42307
2.793269E+08	3.724359E+13	.00000750	.00022019	29.35848284	666.05739	23677.44568
2.793269E+08	3.575384E+13	.00000781	.00022925	29.34434366	691.65128	24667.20932
2.793269E+08	3.437870E+13	.00000813	.00023833	29.33239603	717.12911	25656.71285
2.793269E+08	3.310541E+13	.00000844	.00024741	29.32240248	742.49058	26645.95480
2.793269E+08	3.192307E+13	.00000875	.00025650	29.31415987	767.73540	27634.93358
2.793269E+08	3.082228E+13	.00000906	.00026560	29.30749369	792.86328	28623.64745
2.793269E+08	2.979487E+13	.00000938	.00027471	29.30224943	817.87386	29612.09555
2.793269E+08	2.883374E+13	.00000969	.00028383	29.29829550	842.76685	30600.27621
2.793269E+08	2.793269E+13	.00001000	.00029296	29.29551744	867.54196	31588.18753
2.793269E+08	2.708625E+13	.00001031	.00030209	29.29381227	892.19884	32575.82835
2.793269E+08	2.628959E+13	.00001063	.00031124	29.29308844	916.73712	33563.19769
2.793269E+08	2.553846E+13	.00001094	.00032040	29.29327154	941.15663	34550.29249
2.793269E+08	2.482906E+13	.00001125	.00032956	29.29428720	965.45691	35537.11234
2.793269E+08	2.415800E+13	.00001156	.00033874	29.29607248	989.63764	36523.65573
2.793269E+08	2.352227E+13	.00001188	.00034792	29.29857302	1013.69856	37509.92043
2.793269E+08	2.291913E+13	.00001219	.00035711	29.30173731	1037.63928	38495.90522
2.793269E+08	2.180112E+13	.00001281	.00037553	29.30988264	1085.15887	40467.02771
2.793269E+08	2.078712E+13	.00001344	.00039399	29.32019663	1132.19370	42437.00983
2.793269E+08	1.986325E+13	.00001406	.00041249	29.33242464	1178.74105	44405.83750
2.793269E+08	1.901800E+13	.00001469	.00043102	29.34635210	1224.79800	46373.49806

2.793269E+08	1.824176E+13	.00001531	.00044960	29.36180162	1270.36164	48339.97784
2.793269E+08	1.752639E+13	.00001594	.00046822	29.37863016	1315.42925	50305.26022
2.793269E+08	1.686502E+13	.00001656	.00048688	29.39671183	1359.99785	52269.33068
2.793269E+08	1.625175E+13	.00001719	.00050559	29.41593504	1404.06419	54232.17668
2.793269E+08	1.568151E+13	.00001781	.00052433	29.43621683	1447.62552	56193.77902
2.793269E+08	1.514993E+13	.00001844	.00054312	29.45747423	1490.67851	58154.12450
2.793269E+08	1.465321E+13	.00001906	.00056192	29.47798491	1533.14523	60000.00000
2.793269E+08	1.418803E+13	.00001969	.00057981	29.45052767	1572.85085	60000.00000
2.793269E+08	1.375148E+13	.00002031	.00059703	29.39241171	1610.48876	60000.00000
2.793269E+08	1.334099E+13	.00002094	.00061378	29.31509829	1646.53599	60000.00000
2.793269E+08	1.295429E+13	.00002156	.00063021	29.22691011	1681.35801	60000.00000
2.793269E+08	1.258938E+13	.00002219	.00064648	29.13723135	1715.40038	60000.00000
2.793269E+08	1.224447E+13	.00002281	.00066234	29.03409433	1748.07343	60000.00000
2.793269E+08	1.191795E+13	.00002344	.00067815	28.93454790	1780.22063	60000.00000
2.793269E+08	1.160839E+13	.00002406	.00069371	28.82951689	1811.39563	60000.00000
2.793269E+08	1.131451E+13	.00002469	.00071100	28.79999971	1845.79334	60000.00000
2.793269E+08	1.103514E+13	.00002531	.00072900	28.79999971	1881.14053	60000.00000
2.793269E+08	1.076923E+13	.00002594	.00074671	28.78893042	1915.34283	60000.00000
2.793269E+08	1.051584E+13	.00002656	.00076127	28.65952635	1942.68524	60000.00000
2.793269E+08	1.027409E+13	.00002719	.00077585	28.53691149	1969.71540	60000.00000
2.793269E+08	1.004321E+13	.00002781	.00079040	28.41885138	1996.33509	60000.00000
2.793269E+08	9.822484E+12	.00002844	.00080448	28.28926420	2021.68241	60000.00000
2.793269E+08	9.611248E+12	.00002906	.00081857	28.16595984	2046.73633	60000.00000
2.793269E+08	9.408906E+12	.00002969	.00083269	28.04854631	2071.49553	60000.00000
2.793269E+08	9.214908E+12	.00003031	.00084683	27.93666887	2095.95898	60000.00000
2.793269E+08	9.028748E+12	.00003094	.00086054	27.81541014	2119.30222	60000.00000
2.793269E+08	8.849961E+12	.00003156	.00087420	27.69748735	2142.24804	60000.00000
2.793269E+08	8.678117E+12	.00003219	.00088788	27.58473444	2164.91574	60000.00000
2.793269E+08	8.512820E+12	.00003281	.00090158	27.47685957	2187.30413	60000.00000
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2.793269E+08	8.200423E+12	.00003406	.00092865	27.26300955	2230.56158	60000.00000
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2.793269E+08	7.910142E+12	.00003531	.00095521	27.05022955	2271.77601	60000.00000
2.793269E+08	7.772575E+12	.00003594	.00096852	26.95012808	2291.98634	60000.00000
2.793269E+08	7.639710E+12	.00003656	.00098185	26.85393476	2311.93053	60000.00000
2.793269E+08	7.511312E+12	.00003719	.00099519	26.76145506	2331.60745	60000.00000
2.793269E+08	7.267041E+12	.00003844	.00102110	26.56522608	2368.87515	60000.00000
2.793269E+08	7.038158E+12	.00003969	.00104701	26.38132238	2405.02896	60000.00000
2.793269E+08	6.823253E+12	.00004094	.00107298	26.21027899	2440.16734	60000.00000
2.793269E+08	6.621082E+12	.00004219	.00109864	26.04194212	2473.75031	60000.00000
2.793269E+08	6.430547E+12	.00004344	.00112392	25.87431479	2505.71766	60000.00000
2.793269E+08	6.250672E+12	.00004469	.00114925	25.71747637	2536.71412	60000.00000
2.793269E+08	6.080586E+12	.00004594	.00117600	25.59999990	2568.43440	60000.00000
2.793269E+08	5.919511E+12	.00004719	.00120800	25.59999990	2605.28559	60000.00000
2.793269E+08	5.766749E+12	.00004844	.00124000	25.59999990	2640.38640	60000.00000
2.793269E+08	5.621674E+12	.00004969	.00126646	25.48860312	2667.71534	60000.00000
2.793269E+08	5.483718E+12	.00005094	.00128989	25.32293558	2690.68927	60000.00000
2.793269E+08	5.352372E+12	.00005219	.00131335	25.16605711	2712.81564	60000.00000
2.793269E+08	5.227170E+12	.00005344	.00133592	24.99968290	2733.17408	60000.00000
2.793269E+08	5.107692E+12	.00005469	.00135854	24.84193754	2752.76187	60000.00000
2.793269E+08	4.993554E+12	.00005594	.00138122	24.69225740	2771.57302	60000.00000
2.793269E+08	4.884405E+12	.00005719	.00140396	24.55012178	2789.60108	60000.00000
2.793269E+08	4.779926E+12	.00005844	.00142602	24.40248156	2806.24475	60000.00000
2.793269E+08	4.679822E+12	.00005969	.00144794	24.25861788	2821.99497	60000.00000
2.793269E+08	4.583826E+12	.00006094	.00146991	24.12152052	2837.01235	60000.00000
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2.793269E+08	4.318097E+12	.00006469	.00153440	23.72011614	2876.53644	60000.00000
2.793269E+08	4.236237E+12	.00006594	.00155567	23.59310675	2888.10406	60000.00000
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2.796017E+08	4.085504E+12	.00006844	.00159636	23.32578707	2908.12479	60000.00000
2.798011E+08	4.015084E+12	.00006969	.00161600	23.18916750	2916.81740	60000.00000
2.799934E+08	3.947044E+12	.00007094	.00163568	23.05797815	2924.92433	60000.00000
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2.803560E+08	3.817613E+12	.00007344	.00167517	22.81078863	2939.36337	60000.00000
2.805262E+08	3.755999E+12	.00007469	.00169498	22.69428778	2945.68658	60000.00000
2.806890E+08	3.696316E+12	.00007594	.00171484	22.58221292	2951.40633	60000.00000
2.808442E+08	3.638468E+12	.00007719	.00173474	22.47434950	2956.51793	60000.00000
2.816981E+08	3.591370E+12	.00007844	.00175700	22.40000010	2961.55123	60000.00000
2.842568E+08	3.567144E+12	.00007969	.00178500	22.40000010	2966.84054	60000.00000
2.867549E+08	3.542918E+12	.00008094	.00181300	22.40000010	2970.81514	60000.00000
2.891925E+08	3.518692E+12	.00008219	.00184100	22.40000010	2973.47502	60000.00000
2.915695E+08	3.494466E+12	.00008344	.00186900	22.40000010	2974.82017	60000.00000
2.938591E+08	3.469923E+12	.00008469	.00189700	22.40000010	2972.30250	60000.00000
2.938591E+08	3.419451E+12	.00008594	.00192100	22.35345125	2967.51563	60000.00000
2.938591E+08	3.370427E+12	.00008719	.00193855	22.23424673	2964.13243	60000.00000
2.938591E+08	3.276478E+12	.00008969	.00197377	22.00719595	2957.33891	60000.00000
2.938591E+08	3.187624E+12	.00009219	.00200916	21.79428720	2950.50874	60000.00000
2.938591E+08	3.103462E+12	.00009469	.00204472	21.59443331	2950.45358	60000.00000
2.938591E+08	3.023631E+12	.00009719	.00208046	21.40666151	2957.24031	60000.00000
2.938591E+08	2.947803E+12	.00009969	.00211638	21.23009634	2962.96983	60000.00000
2.938591E+08	2.875685E+12	.00010219	.00215247	21.06394815	2967.61783	60000.00000
2.938591E+08	2.807012E+12	.00010469	.00218875	20.90750742	2971.15922	60000.00000
2.938591E+08	2.741543E+12	.00010719	.00222523	20.76013613	2973.56806	60000.00000
2.938591E+08	2.679057E+12	.00010969	.00226189	20.62124777	2974.81733	60000.00000
2.938591E+08	2.619357E+12	.00011219	.00229896	20.49213552	2972.52847	60000.00000
2.938591E+08	2.562259E+12	.00011469	.00233641	20.37198400	2966.99077	60000.00000
2.938591E+08	2.507598E+12	.00011719	.00237397	20.25785494	2961.43022	60000.00000

2.938591E+08	2.455220E+12	.00011969	.00241163	20.14938211	2955.84653	60000.00000
2.938591E+08	2.404985E+12	.00012219	.00244940	20.04623652	2950.23922	60000.00000
2.938591E+08	2.356765E+12	.00012469	.00248728	19.94810629	2944.60806	60000.00000
2.938591E+08	2.310440E+12	.00012719	.00252527	19.85471392	2938.95254	60000.00000
2.938591E+08	2.265902E+12	.00012969	.00256338	19.76579332	2933.27243	60000.00000
2.938591E+08	2.223048E+12	.00013219	.00260160	19.68110991	2934.13180	60000.00000
2.938591E+08	2.181785E+12	.00013469	.00263993	19.60044050	2941.11610	60000.00000
2.938591E+08	2.142025E+12	.00013719	.00267839	19.52358198	2947.48550	60000.00000
2.938591E+08	2.103689E+12	.00013969	.00271697	19.45034266	2953.22767	60000.00000
2.938591E+08	2.066701E+12	.00014219	.00275567	19.38055086	2958.33015	60000.00000
2.938591E+08	2.030992E+12	.00014469	.00279450	19.31404066	2962.77982	60000.00000
2.938591E+08	1.996495E+12	.00014719	.00283346	19.25066614	2966.56342	60000.00000
2.938591E+08	1.963151E+12	.00014969	.00287400	19.20000029	2969.87440	60000.00000
2.938591E+08	1.930902E+12	.00015219	.00292200	19.20000029	2973.06561	60000.00000
2.938591E+08	1.899695E+12	.00015469	.00297000	19.20000029	2974.73206	60000.00000
2.938591E+08	1.869481E+12	.00015719	.00301800	19.20000029	2972.52008	60000.00000
2.938591E+08	1.840214E+12	.00015969	.00306600	19.20000029	2966.42762	60000.00000
2.938591E+08	1.811848E+12	.00016219	.00311400	19.20000029	2960.33517	60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 293859.10247 in-kip

p-y Curve in Sand Computed Using Reese Criteria for Static Loading Conditions

Soil Layer Number	=	2
Depth below pile head	=	144.000 in
Depth below ground surface	=	138.000 in
Equivalent Depth (see note)	=	119.426 in
Pile Diameter	=	96.000 in
Angle of Friction	=	40.000 deg.
Avg. Eff. Unit Weight	=	.07222 pci
k	=	300.000 pci
A (static)	=	1.9392
B (static)	=	1.4082
Pst	=	8390.430 lbs/in
Psd	=	99642.284 lbs/in
Ps	=	8390.430 lbs/in
Cbar	=	10253.8767
n	=	3.3153
m	=	2227.4757
yk	=	.1667 in
pm	=	11815.633 lbs/in
ym	=	1.6000 in
pu	=	16270.585 lbs/in
yu	=	3.6000 in
p-multiplier	=	1.00000
y-multiplier	=	1.00000

This p-y curve is computed using the equivalent depth.

y, in	p, lbs/in	
0.0000	0.0000	
.1333333	4777.0500	*
.2666667	6882.4406	
.4000000	7777.8050	
.5333333	8482.8629	
.6666667	9073.4721	
.8000000	9586.4327	
.9333333	10042.6945	
1.0667	10455.4426	
1.2000	10833.5703	
1.3333	11183.3903	
1.4667	11509.5621	
1.6000	11815.6332	
2.6000	14043.1089	
3.6000	16270.5845	
99.6000	16270.5845	
195.6000	16270.5845	

* p value(s) computed using p = k * Eff x * y

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 56210.000 lbs
Specified moment at pile head = 67609476.000 in-lbs

Specified axial load at pile head = 53790.000 lbs

Non-zero moment for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment)condition.

**** WARNING - POSSIBLE SOLUTION ERROR 5501 ****

Force and moment imbalances may be too large.

The cause of the imbalance may be due to extreme changes in magnitude of nonlinear bending stiffness within three nodal points of the top of the pile which may affect the finite difference computation of shear force.

Please examine curves and printed output for deflection, moment, shear force, and number of iterations to determine if computed values are reasonable. If the shear force shows large changes, increase the number of nodal points (pile increments) and repeat the analysis.

Maximum moment imbalance for pile = -7.4153 in-lbs
Maximum lateral force imbalance for pile = 1.5139 lbs

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 56210.	M= 6.76E+07	53790.0000	2.5474	6.9896E+07	-699893.

Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

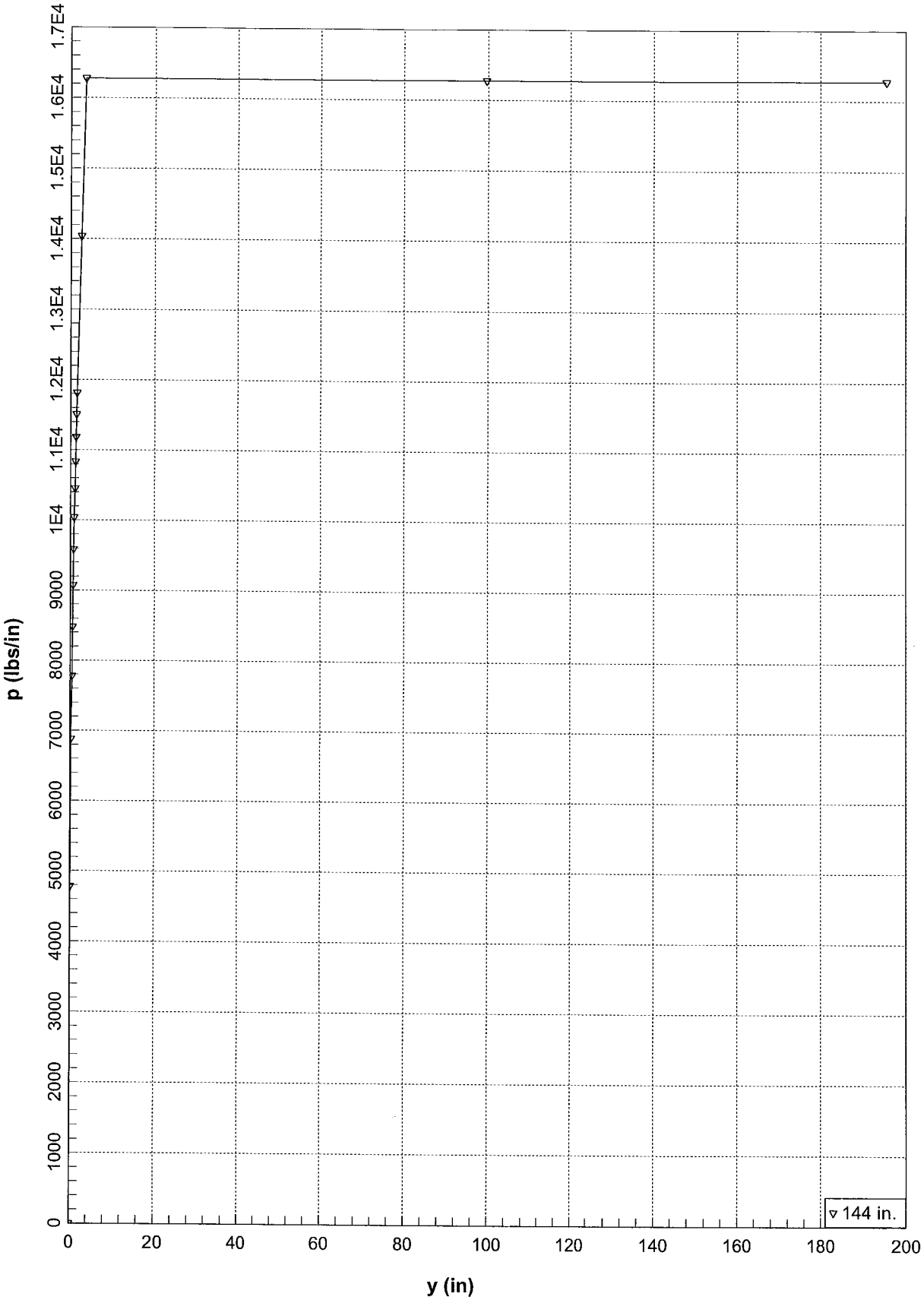
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
.00117689	5621.00008	863166.85024	4776133.	7.334281E+08
.00354280	16920.89606	2598391.	4776133.	7.334281E+08
.00561521	26818.98573	4118353.	4776133.	7.334281E+08
.00708561	33841.79211	5196782.	4776133.	7.334281E+08
.00822613	39289.10394	6033277.	4776133.	7.334281E+08
.00915801	43739.88180	6716744.	4776133.	7.334281E+08
.00994590	47502.96083	7294606.	4776133.	7.334281E+08
.01062841	50762.68816	7795173.	4776133.	7.334281E+08
.01123042	53637.97146	8236705.	4776133.	7.334281E+08
.01176894	56209.99999	8631668.	4776133.	7.334281E+08

Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
.00005367	39362.07010	6760948.	7.334281E+08	1.259758E+11
.00016156	118491.63615	20352480.	7.334281E+08	1.259758E+11
.00025606	187804.79994	32257918.	7.334281E+08	1.259758E+11
.00032312	236983.27229	40704961.	7.334281E+08	1.259758E+11
.00037513	275129.05898	47256996.	7.334281E+08	1.259758E+11
.00041762	306296.43609	52610398.	7.334281E+08	1.259758E+11
.00045355	332648.07796	57136636.	7.334281E+08	1.259758E+11
.00048468	355474.90844	61057441.	7.334281E+08	1.259758E+11
.00051213	375609.59988	64515836.	7.334281E+08	1.259758E+11
.00053669	393620.69512	67609476.	7.334281E+08	1.259758E+11

K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.

Summary of Warning Messages


p (lbs/in)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
1E4
1.1E4
1.2E4
1.3E4
1.4E4
1.5E4
1.6E4
1.7E4
0
20
40
60
80
100
120
140
160
180
200
y (in)
144 in.

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CT5176	DATE:	4/13/2011 11:04	RF DESIGN ENG:	Radu Alecsandru	RF PERF ENG:	TBD
ISSUE:	Final	Approved? (Y/N)	Y	RF DESIGN PHONE:	(860) 965-6685	RF PERF PHONE:	TBD
REVISION:	V04	RF MANAGER:	Walter C. Saddig Jr.	RF DESIGN EMAIL:	ra9161@att.com	RF PERF EMAIL:	TBD
INITIATIVE / PROJECT:	LTE Addition					TRIDENT:	TBD
						GSM FREQUENCY:	1900
						UMTS FREQUENCY:	Dual Band
						LTE FREQUENCY:	700
						I-PLAN JOB # 1:	NER-RCTB-10-05692
						I-PLAN JOB # 2:	
						I-PLAN JOB # 3:	
						I-PLAN JOB # 4:	

Section 2 - LOCATION INFORMATION

USID:	60443	FA LOCATION CODE:	10071269	LOCATION NAME:	AWE - STONY HILL	ORACLE PRJT # 1:	2051003238
REGION:	North East	MARKET CLUSTER:	New England	MARKET:	CT	ORACLE PRJT # 2:	
ADDRESS:	7 STONY HILL ROAD	CITY:	BETHEL	STATE:	CT	ORACLE PRJT # 3:	
ZIP CODE:	06801	COUNTY:	FAIRFIELD	MSA/RSA:	42	ORACLE PRJT # 4:	
LATITUDE (D-M-S):	41° 24' 56.85"	LONGITUDE (D-M-S):	-73° 24' 6.12"	LAT (DEC. DEG.):	41.415792	SEARCH RING NAME:	N/A
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	TBD					SEARCH RING ID:	N/A
						BTA:	321
						LONG (DEC. DEG.):	-73.401699
						BORDER CELL WITH	TBD
						AM STUDY REQ'D (Y/N):	TBD
						FREQ COORD:	TBD

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED:	TBD	CGSA LOSS:	TBD	PCS REDUCED - UPS ZIP:	TBD
CGSA - MINOR FILING NEEDED:	TBD	CGSA EXT AGMT NEEDED:	TBD	PCS POPS REDUCED:	TBD
CGSA - MAJOR FILING NEEDED:	TBD	CGSA SCORECARD UPDATED:	TBD		

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	TBD	GROUND ELEVATION (ft):	410'	STRUCTURE TYPE:	Flagpole On Roof	MKT LOCATION 850 MHZ CALL SIGN(S):	TBD
ADDITIONAL REGULATORY?:	TBD	HEIGHT OVERALL (ft):	TBD	FCC ASR NUMBER:	TBD	MKT LOCATION 1900 MHZ CALL SIGN(S):	TBD
SUB-LEASE RIGHTS?:	TBD	STRUCTURE HEIGHT (ft):	TBD			MKT LOCATION 700 MHZ CALL SIGN(S):	
LIGHTING TYPE:	TBD					MKT LOCATION AWS MHZ CALL SIGN(S):	

Section 5 - E-911 INFORMATION

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRK:	DATE LIVE PH1:	DATE LIVE PH2:
ALPHA			TBD	TBD	TBD	TBD	TBD	TBD
BETA			TBD	TBD	TBD	TBD	TBD	TBD
GAMMA			TBD	TBD	TBD	TBD	TBD	TBD
DELTA								
EPSILON								
PSI								

Section 6 - RBS GENERAL INFORMATION

4-DIGIT SITE ID:	4176	COW OR TOY?:	NO	CELLULAR NETWORK:	GOLD	DISASTER PRIORITY:	TBD
CELL SITE TYPE:	SECTORIZED	SITE TYPE:	MACRO	OPS DISTRICT:	CT-South	OPS ZONE:	NE_CT_S FRFD_NE_CS
BTS LOCATION ID:	TBD	ORIGINATING CO:	ATT	RF DISTRICT:	Bridgeport	RF ZONE:	BBP06

Section 7 - RBS SPECIFIC INFORMATION

	GSM RBSs	UMTS 1ST CARRIER RBSs	UMTS 2ND CARRIER RBSs	UMTS 3RD CARRIER RBSs	UMTS 4TH CARRIER RBSs	LTE RBSs
MSC	MBP01	TBD	TBD	TBD		
BSC/RNC	BRPTCTBSC06	BRPTCT04CR0R03	BRPTCT04CR0R03	BRPTCT04CR0R03		
LAC	05015	5995	5995	5995		
RAC	TBD	255	255	255		
EQUIPMENT VENDOR	NOKIA	ERICSSON	ERICSSON	ERICSSON		ERICSSON
EQUIPMENT TYPE	TBD	RBS3206	RBS3206	RBS3206		RBS6601
LOCATION	TBD	TBD	TBD	TBD		
CABINET LOCATION						

Section 8 - RBS INDIVIDUAL INFORMATION

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS
CELL ID/BCF	N/A	321P5176	CTV5176	N/A	N/A	CTV5176	N/A	CTV4176			CTL05176_7A_1	
CTS COMMON ID	N/A	321P5176	CTV5176	N/A	N/A	CTU5176	N/A	CTV4176				

Section 9 - SOFT SECTOR ID

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS
ALPHA (OR OMNI)	N/A	321P51761	CTV51761	N/A	N/A	CTU51767	N/A	CTU41767				
BETA	N/A	321P51762	CTV51762	N/A	N/A	CTU51768	N/A	CTU41768				
GAMMA	N/A	321P51763	CTV51763	N/A	N/A	CTU51769	N/A	CTU41769				
DELTA												
EPSILON												
PSI												

Section 10 - CID/SAC

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS
ALPHA (OR OMNI)	N/A	51761	51761	N/A	N/A	51767	N/A	41767				
BETA	N/A	51762	51762	N/A	N/A	51768	N/A	41768				
GAMMA	N/A	51763	51763	N/A	N/A	51769	N/A	41769				
DELTA												
EPSILON												
PSI												

Section 11 - CURRENT RADIO COUNTS (Existing)

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS
ALPHA (OR OMNI)	N/A	3	3	3	3	3	3	3				
BETA	N/A	2	3	3	3	3	3	3				
GAMMA	N/A	5	3	3	3	3	3	3				
DELTA												
EPSILON												
PSI												

Section 12 - CURRENT BASE BAND CONFIGURATION (Existing)

	GSM 1st Cabinet	GSM 2nd Cabinet	UMTS 1st Cabinet	UMTS 2nd Cabinet	LTE 1st Cabinet	LTE 2nd Cabinet
# T1s	2	4	0	4		
LINK PROFILE	TBD	TBD	TBD	TBD		
RF Combining						
Fiber or Ethernet?	TBD	TBD	TBD	TBD		
Tx Board Model						
Tx Board QTY						
RAX/ECU Board Model						
RAX/ECU Board QTY						
BBU Board Model						
BBU Board QTY						
RRU - Type(Qty-Model)						
Fiber Jumper						
DC Cable						
DC/Fiber Dem. Box						
Bundled Fiber Cable						
Bundled DC Cable						

Section 13 - NEW/PROPOSED RADIO COUNTS

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS
ALPHA (OR OMNI)												
BETA												
GAMMA												
DELTA												
EPSILON												
PSI												

Section 14 - NEW/PROPOSED BASE BAND CONFIGURATION

	GSM 1st Cabinet	GSM 2nd Cabinet	UMTS 1st Cabinet	UMTS 2nd Cabinet	LTE 1st Cabinet	LTE 2nd Cabinet
# T1s						
LINK PROFILE						
RF Combining						
Fiber or Ethernet?						
Tx Board Model						
Tx Board QTY						
RAX/ECU Board Model						
RAX/ECU Board QTY						
BBU Board Model						
BBU Board QTY						
RRU - Type(Qty-Model)						
Fiber Jumper						
DC Cable						
DC/Fiber Dem. Box						
Bundled Fiber Cable						
Bundled DC Cable						

Section 15A - CURRENT SECTOR/CELL INFORMATION - ALPHA (OR OMNI)

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?	-Rx / TxRx-Rx	-TxRx / Rx-TxRx								
TECHNOLOGY	-UMTS / GSM-UMTS	-UMTS / GSM-UMTS								
RRH LOCATION (Top/Bottom/None)	N/A	N/A								
FEEDERS TYPE	1 5/8" - Andrew	1 5/8" - Andrew								
Feeder Length (feet)	170 '	170 '								
ANTENNA ATOLL										
ANTENNA MAKE - MODEL	7770									
ANTENNA VENDOR	Powerwave									
ANTENNA SIZE (H x W x D)	55.0 x 11.0 x 5.0									
ANTENNA WEIGHT	35									
ANTENNA GAIN	13.5 dBi	16.5 dBi								
AZIMUTH	30 °									
RADIATION CENTER (feet)	145 '									
ANTENNA TIP HEIGHT	147 '									
ELECTRICAL TILT (700/850/1900/AWS)	0 °	0 °								
MECHANICAL DOWNTILT	0 °									
FEEDER AMOUNT	2									
Antenna RET Motor (QTY/MODEL)	1 / Powerwave 7020 (DB)									
Antenna RET Splitter (QTY/MODEL)	N/A									
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)	N/A									
Antenna RET Surge Arrestor (QTY/MODEL)	N/A									
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site	1 / Powerwave / 7070									
DC BLOCK (QTY/MODEL)	N/A									
TMA/LNA (TYPE/MODEL)	2 / LGP 21401 (DB - 850 Bypass)									
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser 1000860									
PDU FOR TMAS (QTY/MODEL) usually per site	LGP 12104 (1900 AND 850 Bypass TMA)									
SURGE ARRESTOR (QTY/MODEL)	N/A									
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave LGP 21901									
HYBRID COMBINER (QTY/MODEL)	N/A									
DUPLEXER (QTY/MODEL)	N/A									
FILTER (QTY/MODEL)	N/A									
RXAIT KIT MODULE?	1900 CCI RXAIT									
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)	N/A	N/A								
SCPA/MCPA MODULE?	1900 CCI SCPA									
Additional Component1	Polyphaser									
Additional Component2	N/A									
Additional Component3	Home Run to BTS									
MAGNETIC DECLINATION	-14 °									
HATCHPLATE POWER (Watts)	TBD	TBD								
ERP (Watts)	TBD	TBD								
Local Market Note1										
Local Market Note2										
Local Market Note3										

Section 15B - CURRENT SECTOR/CELL INFORMATION - BETA

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?	-Rx / TxRx-Rx	-TxRx / Rx-TxRx								
TECHNOLOGY	-UMTS / GSM-UMTS	-UMTS / GSM-UMTS								
RRH LOCATION (Top/Bottom/None)	N/A	N/A								
FEEDERS TYPE	1 5/8" - Andrew	1 5/8" - Andrew								
Feeder Length (feet)	170 '	170 '								
ANTENNA ATOLL										
ANTENNA MAKE - MODEL	7770									
ANTENNA VENDOR	Powerwave									
ANTENNA SIZE (H x W x D)	55.0 x 11.0 x 5.0									
ANTENNA WEIGHT	35									
ANTENNA GAIN	13.5 dBi	16.5 dBi								
AZIMUTH	150 °									
RADIATION CENTER (feet)	145 '									
ANTENNA TIP HEIGHT	147 '									
ELECTRICAL TILT (700/850/1900/AWS)	0 °	0 °								
MECHANICAL DOWNTILT	0 °									
FEEDER AMOUNT	2									
Antenna RET Motor (QTY/MODEL)	1 / Powerwave 7020 (DB)									
Antenna RET Splitter (QTY/MODEL)	N/A									
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)	N/A									
Antenna RET Surge Arrestor (QTY/MODEL)	N/A									
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site	1 / Powerwave / 7070									
DC BLOCK (QTY/MODEL)	N/A									
TMA/LNA (TYPE/MODEL)	2 / LGP 21401 (DB - 850 Bypass)									
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser 1000860									
PDU FOR TMAS (QTY/MODEL) usually per site	LGP 12104 (1900 AND 850 Bypass TMA)									
SURGE ARRESTOR (QTY/MODEL)	N/A									
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave LGP 21901									
HYBRID COMBINER (QTY/MODEL)	N/A									
DUPLEXER (QTY/MODEL)	N/A									
FILTER (QTY/MODEL)	N/A									
RXAIT KIT MODULE?	1900 CCI RXAIT									
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)	N/A	N/A								
SCPA/MCPA MODULE?	1900 CCI SCPA									
Additional Component1	Polyphaser									
Additional Component2	N/A									
Additional Component3	Home Run to BTS									
MAGNETIC DECLINATION	-14 °									
HATCHPLATE POWER (Watts)	TBD	TBD								
ERP (Watts)	TBD	TBD								
Local Market Note1										
Local Market Note2										
Local Market Note3										

Section 15C - CURRENT SECTOR/CELL INFORMATION - GAMMA

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?	-Rx / TxRx-Rx	-TxRx / Rx-TxRx								
TECHNOLOGY	-UMTS / GSM-UMTS	-UMTS / GSM-UMTS								
RRH LOCATION (Top/Bottom/None)	N/A	N/A								
FEEDERS TYPE	1 5/8" - Andrew	1 5/8" - Andrew								
Feeder Length (feet)	170 '	170 '								
ANTENNA ATOLL										
ANTENNA MAKE - MODEL	7770									
ANTENNA VENDOR	Powerwave									
ANTENNA SIZE (H x W x D)	55.0 x 11.0 x 5.0									
ANTENNA WEIGHT	35									
ANTENNA GAIN	13.5 dBi	16.5 dBi								
AZIMUTH	270 °									
RADIATION CENTER (feet)	145 '									
ANTENNA TIP HEIGHT	147 '									
ELECTRICAL TILT (700/850/1900/AWS)	0 °	0 °								
MECHANICAL DOWNTILT	0 °									
FEEDER AMOUNT	2									
Antenna RET Motor (QTY/MODEL)	1 / Powerwave 7020 (DB)									
Antenna RET Splitter (QTY/MODEL)	N/A									
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)	N/A									
Antenna RET Surge Arrestor (QTY/MODEL)	N/A									
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site	1 / Powerwave / 7070									
DC BLOCK (QTY/MODEL)	N/A									
TMA/LNA (TYPE/MODEL)	2 / LGP 21401 (DB - 850 Bypass)									
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser 1000860									
PDU FOR TMAS (QTY/MODEL) usually per site	LGP 12104 (1900 AND 850 Bypass TMA)									
SURGE ARRESTOR (QTY/MODEL)	N/A									
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave LGP 21901									
HYBRID COMBINER (QTY/MODEL)	N/A									
DUPLEXER (QTY/MODEL)	N/A									
FILTER (QTY/MODEL)	N/A									
RXAIT KIT MODULE?	1900 CCI RXAIT									
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)	N/A	N/A								
SCPA/MCPA MODULE?	1900 CCI SCPA									
Additional Component1	Polyphaser									
Additional Component2	N/A									
Additional Component3	Home Run to BTS									
MAGNETIC DECLINATION	-14 °									
HATCHPLATE POWER (Watts)	TBD	TBD								
ERP (Watts)	TBD	TBD								
Local Market Note1										
Local Market Note2										
Local Market Note3										

Section 15D - CURRENT SECTOR/CELL INFORMATION - DELTA

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?										
TECHNOLOGY										
RRH LOCATION (Top/Bottom/None)										
FEEDERS TYPE										
Feeder Length (feet)										
ANTENNA ATOLL										
ANTENNA MAKE - MODEL										
ANTENNA VENDOR										
ANTENNA SIZE (H x W x D)										
ANTENNA WEIGHT										
ANTENNA GAIN										
AZIMUTH										
RADIATION CENTER (feet)										
ANTENNA TIP HEIGHT										
ELECTRICAL TILT (700/850/1900/AWS)										
MECHANICAL DOWNTILT										
FEEDER AMOUNT										
Antenna RET Motor (QTY/MODEL)										
Antenna RET Splitter (QTY/MODEL)										
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)										
Antenna RET Surge Arrestor (QTY/MODEL)										
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site										
DC BLOCK (QTY/MODEL)										
TMA/LNA (TYPE/MODEL)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)										
PDU FOR TMAS (QTY/MODEL) usually per site										
SURGE ARRESTOR (QTY/MODEL)										
DIPLEXER (QTY/MODEL)										
HYBRID COMBINER (QTY/MODEL)										
DUPLEXER (QTY/MODEL)										
FILTER (QTY/MODEL)										
RXAIT KIT MODULE?										
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)										
SCPA/MCPA MODULE?										
Additional Component1										
Additional Component2										
Additional Component3										
MAGNETIC DECLINATION										
HATCHPLATE POWER (Watts)										
ERP (Watts)										
Local Market Note1										
Local Market Note2										
Local Market Note3										

Section 15E - CURRENT SECTOR/CELL INFORMATION - EPSILON

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?										
TECHNOLOGY										
RRH LOCATION (Top/Bottom/None)										
FEEDERS TYPE										
Feeder Length (feet)										
ANTENNA ATOLL										
ANTENNA MAKE - MODEL										
ANTENNA VENDOR										
ANTENNA SIZE (H x W x D)										
ANTENNA WEIGHT										
ANTENNA GAIN										
AZIMUTH										
RADIATION CENTER (feet)										
ANTENNA TIP HEIGHT										
ELECTRICAL TILT (700/850/1900/AWS)										
MECHANICAL DOWNTILT										
FEEDER AMOUNT										
Antenna RET Motor (QTY/MODEL)										
Antenna RET Splitter (QTY/MODEL)										
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)										
Antenna RET Surge Arrestor (QTY/MODEL)										
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site										
DC BLOCK (QTY/MODEL)										
TMA/LNA (TYPE/MODEL)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)										
PDU FOR TMAS (QTY/MODEL) usually per site										
SURGE ARRESTOR (QTY/MODEL)										
DIPLEXER (QTY/MODEL)										
HYBRID COMBINER (QTY/MODEL)										
DUPLEXER (QTY/MODEL)										
FILTER (QTY/MODEL)										
RXAIT KIT MODULE?										
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)										
SCPA/MCPA MODULE?										
Additional Component1										
Additional Component2										
Additional Component3										
MAGNETIC DECLINATION										
HATCHPLATE POWER (Watts)										
ERP (Watts)										
Local Market Note1										
Local Market Note2										
Local Market Note3										

Section 15F - CURRENT SECTOR/CELL INFORMATION - ZETA

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?										
TECHNOLOGY										
RRH LOCATION (Top/Bottom/None)										
FEEDERS TYPE										
Feeder Length (feet)										
ANTENNA ATOLL										
ANTENNA MAKE - MODEL										
ANTENNA VENDOR										
ANTENNA SIZE (H x W x D)										
ANTENNA WEIGHT										
ANTENNA GAIN										
AZIMUTH										
RADIATION CENTER (feet)										
ANTENNA TIP HEIGHT										
ELECTRICAL TILT (700/850/1900/AWS)										
MECHANICAL DOWNTILT										
FEEDER AMOUNT										
Antenna RET Motor (QTY/MODEL)										
Antenna RET Splitter (QTY/MODEL)										
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)										
Antenna RET Surge Arrestor (QTY/MODEL)										
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site										
DC BLOCK (QTY/MODEL)										
TMA/LNA (TYPE/MODEL)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)										
PDU FOR TMAS (QTY/MODEL) usually per site										
SURGE ARRESTOR (QTY/MODEL)										
DIPLEXER (QTY/MODEL)										
HYBRID COMBINER (QTY/MODEL)										
DUPLEXER (QTY/MODEL)										
FILTER (QTY/MODEL)										
RXAIT KIT MODULE?										
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)										
SCPA/MCPA MODULE?										
Additional Component1										
Additional Component2										
Additional Component3										
MAGNETIC DECLINATION										
HATCHPLATE POWER (Watts)										
ERP (Watts)										
Local Market Note1										
Local Market Note2										
Local Market Note3										

Section 16A - NEW/PROPOSED SECTOR/CELL INFORMATION - ALPHA (OR OMNI)

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?	-Rx / TxRx-TxRx	-TxRx / Rx-TxRx	TBD	N/A						
TECHNOLOGY	-UMTS / GSM-UMTS	-UMTS / GSM-UMTS	LTE / 700							
RRH LOCATION (Top/Bottom/None)	N/A	N/A	BOTTOM							
FEEDERS TYPE	1 5/8" - Andrew	1 5/8" - Andrew	1 5/8" - Andrew	1 5/8" - Andrew						
Feeder Length (feet)	170 '	170 '	170 '	170 '						
ANTENNA ATOLL										
ANTENNA MAKE - MODEL	7770		P65-16-XLH-RR							
ANTENNA VENDOR	Powerwave		Powerwave							
ANTENNA SIZE (H x W x D)	55.0 x 11.0 x 5.0		72.0 x 12.0 x 6.0							
ANTENNA WEIGHT	35		64							
ANTENNA GAIN	13.5 dBi	16.5 dBi	14.0 dBi							
AZIMUTH	30 °		30 °							
RADIATION CENTER (feet)	145 '		145 '							
ANTENNA TIP HEIGHT	147 '		148 '							
ELECTRICAL TILT (700/850/1900/AWS)	0 °	0 °	2 °							
MECHANICAL DOWNTILT	0 °		0 °							
FEEDER AMOUNT	2		2							
Antenna RET Motor (QTY/MODEL)	1 / Powerwave 7020 (DB)		N/A / Powerwave / Built-in RET Equipment							
Antenna RET Splitter (QTY/MODEL)	N/A		N/A							
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)	N/A		N/A							
Antenna RET Surge Arrestor (QTY/MODEL)	N/A		N/A							
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site	1 / Powerwave / 7070		N/A							
DC BLOCK (QTY/MODEL)	N/A		N/A							
TMA/LNA (TYPE/MODEL)	2 / LGP 21401 (DB - 850 Bypass)		1 / Powerwave / TTAW-07BP111-001							
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser 1000860		Powerwave AISG Diplexer (Built In)							
PDU FOR TMAS (QTY/MODEL) usually per site	LGP 12104 (1900 AND 850 Bypass TMA)		N/A							
SURGE ARRESTOR (QTY/MODEL)	N/A		2 / APTDC-BDFDM-DBW Broadband							
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave LGP 21901		0 + 2 / Powerwave / CM1007-DBPXBC-003							
HYBRID COMBINER (QTY/MODEL)	N/A		N/A							
DUPLEXER (QTY/MODEL)	N/A		N/A							
FILTER (QTY/MODEL)	N/A		N/A							
RXAIT KIT MODULE?	1900 CCI RXAIT		N/A	N/A						
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)	N/A	N/A	N/A	N/A						
SCPA/MCPA MODULE?	1900 CCI SCPA		N/A	N/A						
Additional Component1	Polyphaser		N/A							
Additional Component2	N/A		N/A							
Additional Component3	Home Run to BTS		N/A							
MAGNETIC DECLINATION	-14 °		-14 °							
HATCHPLATE POWER (Watts)	TBD	TBD	TBD	TBD						
ERP (Watts)	TBD	TBD	TBD	TBD						
Local Market Note1			RET via RRH							
Local Market Note2										
Local Market Note3										

Section 16B - NEW/PROPOSED SECTOR/CELL INFORMATION - BETA

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?	-Rx / TxRx-TxRx	-TxRx / Rx-TxRx	TBD	N/A						
TECHNOLOGY	-UMTS / GSM-UMTS	-UMTS / GSM-UMTS	LTE / 700							
RRH LOCATION (Top/Bottom/None)	N/A	N/A	BOTTOM							
FEEDERS TYPE	1 5/8" - Andrew	1 5/8" - Andrew	1 5/8" - Andrew	1 5/8" - Andrew						
Feeder Length (feet)	170 '	170 '	170 '	170 '						
ANTENNA ATOLL										
ANTENNA MAKE - MODEL	7770		P65-16-XLH-RR							
ANTENNA VENDOR	Powerwave		Powerwave							
ANTENNA SIZE (H x W x D)	55.0 x 11.0 x 5.0		72.0 x 12.0 x 6.0							
ANTENNA WEIGHT	35		64							
ANTENNA GAIN	13.5 dBi	16.5 dBi	14.0 dBi							
AZIMUTH	150 °		150 °							
RADIATION CENTER (feet)	145 '		145 '							
ANTENNA TIP HEIGHT	147 '		148 '							
ELECTRICAL TILT (700/850/1900/AWS)	0 °	0 °	6 °							
MECHANICAL DOWNTILT	0 °		0 °							
FEEDER AMOUNT	2		2							
Antenna RET Motor (QTY/MODEL)	1 / Powerwave 7020 (DB)		N/A / Powerwave / Built-in RET Equipment							
Antenna RET Splitter (QTY/MODEL)	N/A		N/A							
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)	N/A		N/A							
Antenna RET Surge Arrestor (QTY/MODEL)	N/A		N/A							
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site	1 / Powerwave / 7070		N/A							
DC BLOCK (QTY/MODEL)	N/A		N/A							
TMA/LNA (TYPE/MODEL)	2 / LGP 21401 (DB - 850 Bypass)		1 / Powerwave / TTAW-07BP111-001							
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser 1000860		Powerwave AISG Diplexer (Built In)							
PDU FOR TMAS (QTY/MODEL) usually per site	LGP 12104 (1900 AND 850 Bypass TMA)		N/A							
SURGE ARRESTOR (QTY/MODEL)	N/A		2 / APTDC-BDFDM-DBW Broadband							
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave LGP 21901		0 + 2 / Powerwave / CM1007-DBPXBC-003							
HYBRID COMBINER (QTY/MODEL)	N/A		N/A							
DUPLEXER (QTY/MODEL)	N/A		N/A							
FILTER (QTY/MODEL)	N/A		N/A							
RXAIT KIT MODULE?	1900 CCI RXAIT		N/A	N/A						
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)	N/A	N/A	N/A	N/A						
SCPA/MCPA MODULE?	1900 CCI SCPA		N/A	N/A						
Additional Component1	Polyphaser		N/A							
Additional Component2	N/A		N/A							
Additional Component3	Home Run to BTS		N/A							
MAGNETIC DECLINATION	-14 °		-14 °							
HATCHPLATE POWER (Watts)	TBD	TBD	TBD	TBD						
ERP (Watts)	TBD	TBD	TBD	TBD						
Local Market Note1			RET via RRH							
Local Market Note2										
Local Market Note3										

Section 16C - NEW/PROPOSED SECTOR/CELL INFORMATION - GAMMA

ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?	-Rx / TxRx-TxRx	-TxRx / Rx-TxRx	TBD	N/A						
TECHNOLOGY	-UMTS / GSM-UMTS	-UMTS / GSM-UMTS	LTE / 700							
RRH LOCATION (Top/Bottom/None)	N/A	N/A	BOTTOM							
FEEDERS TYPE	1 5/8" - Andrew	1 5/8" - Andrew	1 5/8" - Andrew	1 5/8" - Andrew						
Feeder Length (feet)	170 '	170 '	170 '	170 '						
ANTENNA ATOLL										
ANTENNA MAKE - MODEL	7770		P65-16-XLH-RR							
ANTENNA VENDOR	Powerwave		Powerwave							
ANTENNA SIZE (H x W x D)	55.0 x 11.0 x 5.0		72.0 x 12.0 x 6.0							
ANTENNA WEIGHT	35		64							
ANTENNA GAIN	13.5 dBi	16.5 dBi	14.0 dBi							
AZIMUTH	270 °		270 °							
RADIATION CENTER (feet)	145 '		145 '							
ANTENNA TIP HEIGHT	147 '		148 '							
ELECTRICAL TILT (700/850/1900/AWS)	0 °	0 °	8 °							
MECHANICAL DOWNTILT	0 °		0 °							
FEEDER AMOUNT	2		2							
Antenna RET Motor (QTY/MODEL)	1 / Powerwave 7020 (DB)		N/A / Powerwave / Built-in RET Equipment							
Antenna RET Splitter (QTY/MODEL)	N/A		N/A							
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)	N/A		N/A							
Antenna RET Surge Arrestor (QTY/MODEL)	N/A		N/A							
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site	1 / Powerwave / 7070		N/A							
DC BLOCK (QTY/MODEL)	N/A		N/A							
TMA/LNA (TYPE/MODEL)	2 / LGP 21401 (DB - 850 Bypass)		1 / Powerwave / TTAW-07BP111-001							
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser 1000860		Powerwave AISG Diplexer (Built In)							
PDU FOR TMAS (QTY/MODEL) usually per site	LGP 12104 (1900 AND 850 Bypass TMA)		N/A							
SURGE ARRESTOR (QTY/MODEL)	N/A		2 / APTDC-BDFDM-DBW Broadband							
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave LGP 21901		0 + 2 / Powerwave / CM1007-DBPXBC-003							
HYBRID COMBINER (QTY/MODEL)	N/A		N/A							
DUPLEXER (QTY/MODEL)	N/A		N/A							
FILTER (QTY/MODEL)	N/A		N/A							
RXAIT KIT MODULE?	1900 CCI RXAIT		N/A	N/A						
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)	N/A	N/A	N/A	N/A						
SCPA/MCPA MODULE?	1900 CCI SCPA		N/A	N/A						
Additional Component1	Polyphaser		N/A							
Additional Component2	N/A		N/A							
Additional Component3	Home Run to BTS		N/A							
MAGNETIC DECLINATION	-14 °		-14 °							
HATCHPLATE POWER (Watts)	TBD	TBD	TBD	TBD						
ERP (Watts)	TBD	TBD	TBD	TBD						
Local Market Note1			RET via RRH							
Local Market Note2										
Local Market Note3										

Section 16D - NEW/PROPOSED SECTOR/CELL INFORMATION - DELTA										
ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?										
TECHNOLOGY										
RRH LOCATION (Top/Bottom/None)										
FEEDERS TYPE										
Feeder Length (feet)										
ANTENNA ATOLL										
ANTENNA MAKE - MODEL										
ANTENNA VENDOR										
ANTENNA SIZE (H x W x D)										
ANTENNA WEIGHT										
ANTENNA GAIN										
AZIMUTH										
RADIATION CENTER (feet)										
ANTENNA TIP HEIGHT										
ELECTRICAL TILT (700/850/1900/AWS)										
MECHANICAL DOWNTILT										
FEEDER AMOUNT										
Antenna RET Motor (QTY/MODEL)										
Antenna RET Splitter (QTY/MODEL)										
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)										
Antenna RET Surge Arrestor (QTY/MODEL)										
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site										
DC BLOCK (QTY/MODEL)										
TMA/LNA (TYPE/MODEL)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)										
PDU FOR TMAS (QTY/MODEL) usually per site										
SURGE ARRESTOR (QTY/MODEL)										
DIPLEXER (QTY/MODEL)										
HYBRID COMBINER (QTY/MODEL)										
DUPLEXER (QTY/MODEL)										
FILTER (QTY/MODEL)										
RXAIT KIT MODULE?										
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)										
SCPA/MCPA MODULE?										
Additional Component1										
Additional Component2										
Additional Component3										
MAGNETIC DECLINATION										
HATCHPLATE POWER (Watts)										
ERP (Watts)										
Local Market Note1										
Local Market Note2										
Local Market Note3										

Section 16E - NEW/PROPOSED SECTOR/CELL INFORMATION - EPSILON										
ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?										
TECHNOLOGY										
RRH LOCATION (Top/Bottom/None)										
FEEDERS TYPE										
Feeder Length (feet)										
ANTENNA ATOLL										
ANTENNA MAKE - MODEL										
ANTENNA VENDOR										
ANTENNA SIZE (H x W x D)										
ANTENNA WEIGHT										
ANTENNA GAIN										
AZIMUTH										
RADIATION CENTER (feet)										
ANTENNA TIP HEIGHT										
ELECTRICAL TILT (700/850/1900/AWS)										
MECHANICAL DOWNTILT										
FEEDER AMOUNT										
Antenna RET Motor (QTY/MODEL)										
Antenna RET Splitter (QTY/MODEL)										
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)										
Antenna RET Surge Arrestor (QTY/MODEL)										
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site										
DC BLOCK (QTY/MODEL)										
TMA/LNA (TYPE/MODEL)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)										
PDU FOR TMAS (QTY/MODEL) usually per site										
SURGE ARRESTOR (QTY/MODEL)										
DIPLEXER (QTY/MODEL)										
HYBRID COMBINER (QTY/MODEL)										
DUPLEXER (QTY/MODEL)										
FILTER (QTY/MODEL)										
RXAIT KIT MODULE?										
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)										
SCPA/MCPA MODULE?										
Additional Component1										
Additional Component2										
Additional Component3										
MAGNETIC DECLINATION										
HATCHPLATE POWER (Watts)										
ERP (Watts)										
Local Market Note1										
Local Market Note2										
Local Market Note3										

Section 16F - NEW/PROPOSED SECTOR/CELL INFORMATION - ZETA										
ANTENNA CONFIG (FROM BACK):	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	
TX/RX?										
TECHNOLOGY										
RRH LOCATION (Top/Bottom/None)										
FEEDERS TYPE										
Feeder Length (feet)										
ANTENNA ATOLL										
ANTENNA MAKE - MODEL										
ANTENNA VENDOR										
ANTENNA SIZE (H x W x D)										
ANTENNA WEIGHT										
ANTENNA GAIN										
AZIMUTH										
RADIATION CENTER (feet)										
ANTENNA TIP HEIGHT										
ELECTRICAL TILT (700/850/1900/AWS)										
MECHANICAL DOWNTILT										
FEEDER AMOUNT										
Antenna RET Motor (QTY/MODEL)										
Antenna RET Splitter (QTY/MODEL)										
Antenna RET Earth (Grounding) Clamp (QTY/MODEL)										
Antenna RET Surge Arrestor (QTY/MODEL)										
Antenna RET CONTROL UNIT (QTY/MODEL) usually per site										
DC BLOCK (QTY/MODEL)										
TMA/LNA (TYPE/MODEL)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)										
PDU FOR TMAS (QTY/MODEL) usually per site										
SURGE ARRESTOR (QTY/MODEL)										
DIPLEXER (QTY/MODEL)										
HYBRID COMBINER (QTY/MODEL)										
DUPLEXER (QTY/MODEL)										
FILTER (QTY/MODEL)										
RXAIT KIT MODULE?										
TRIPLEXER or NARROW BAND LLC (QTY/MODEL)										
SCPA/MCPA MODULE?										
Additional Component1										
Additional Component2										
Additional Component3										
MAGNETIC DECLINATION										
HATCHPLATE POWER (Watts)										
ERP (Watts)										
Local Market Note1										
Local Market Note2										
Local Market Note3										

P65-16-XLH-RR Dual Broadband Antennas

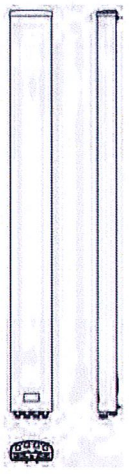
POLARIZATION: Dual linear ±45°
FREQUENCY (MHz): 698-894, 1710-2170
HORIZONTAL BEAM WIDTH (°): 65, 65
GAIN (dBi/dBd): 15.5/13.4 17.5/15.4
TILT: 1-12, 0-8
LENGTH: 72"

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)	698-894		1710-2170		
Frequency band (MHz)	698-806	806-894	1710-1880	1850-1990	1900-2170
Gain (dBi/dBd)	14.8/12.7	15.5/13.4	16.9/14.8	17.2/15.1	17.5/15.4
Polarization	Dual Linear +/- 45		Dual Linear +/- 45		
Nominal Impedance (Ω)	50		50		
VSWR	< 1.5:1		< 1.5:1		
Horizontal beam width, -3 dB (°)	66	65	60	63	63
Vertical beam width, -3 dB (°)	14.7	12.5	6.8	6.4	5.7
Electrical down tilt (°)	1 to 12		0 to 8		
Side lobe suppression, vertical 1st upper (dB)	> 16 >16	>16 >16	> 16		
Isolation between inputs (dB)	> 30	> 30	> 30	> 30	
Inter band Isolation (dB)	> 40		> 40		
Tracking, horizontal plane ±60° (dB)	< 2		< 2	< 2	< 2
First null fill (dB)			>-20	>-20	>-20
Vertical beam squint (°)	< 0.8	< 0.8	< 0.5	< 0.5	< 0.5
Front to back ratio (dB) 180°±30° copolar	>24	>24	> 30	>30	>28
Front to back ratio (dB) 180°±30° total power					
Cross polar discrimination (XPD) 0° (dB)	> 15	> 15	> 15	> 15	> 15
Cross polar discrimination (XPD) ±60° (dB)	> 10	> 10	> 10	> 10	> 10
Far field coupling					
IM3, 2xTx@43dBm (dBc)	<-153		<-153		
IM7, 2xTx@43dBm (dBc)					
Power handling, average per input (W)	500		250		
Power handling, average total (W)	1000		500		

MECHANICAL SPECIFICATIONS*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 6" (1829 x 305 x 152)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	29 (64)
Weight, without brackets, kg (lbs)	24 (53)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40C to +60C
Radome material	PVC, IP55
Packet size, HxWxD, mm (ft)	87" x 16" x 10" (2225 x 400 x 225)
Radome colour	Light Grey
Shipping weight, kg (lbs)	34 (75)
RET	iRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00



*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visit http://www.powerwave.com/rpa/.

7770.00A DBB90 Broadband Cross Polarized

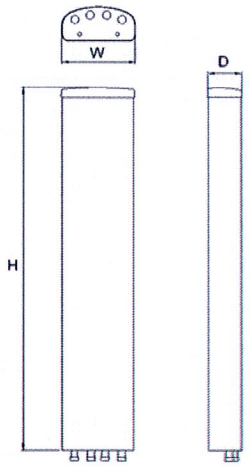
POLARIZATION: XX-Pol
FREQUENCY (MHz): 824-896, 1710-2170
HORIZONTAL BEAM WIDTH (°): 90
GAIN (dBi/dBd): 13.5/11.4, 15.5/13.4
TILT: MET
LENGTH: 1.4m (4'7")

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)	824-896	1710-2170		
Frequency band (MHz)	824-896	1710-1880	1850-1990	1900-2170
Gain (dBi/dBd)	13.5/11.4	15.5/13.4	15.5/13.4	15.5/13.4
Polarization	Dual linear ±45°	Dual linear ±45°		
Nominal Impedance (Ω)	50	50		
VSWR	<1.5:1	<1.5:1		
Horizontal beam width, -3 dB (°)	85	90	90	90
Vertical beam width, -3 dB (°)	15	7	7	7
Electrical down tilt (°)	0 to 10	0 to 8		
Side lobe suppression, vertical 1st upper (dB)	>18	>18	>18	>18
Isolation between inputs (dB)	>30	>30	>30	>25
Inter band Isolation (dB)	>36	>36		
Tracking, horizontal plane ±60° (dB)	<2	<2	<2	<2
First null fill (dB)	-	-	-	-
Vertical beam squint (°)	<1.0	<0.5	<0.5	<0.5
Front to back ratio (dB) 180°±30° copolar	>25	>25	>25	>25
Front to back ratio (dB) 180°±30° total power	>22	>21	>21	>21
Cross polar discrimination (XPD) 0° (dB)	-	-	-	-
Cross polar discrimination (XPD) ±60° (dB)	>10	>10	>10	>10
Far field coupling	-	-	-	-
IM3, 2xTx@43dBm (dBc)	<-153	<-153		
IM7, 2xTx@43dBm (dBc)	-	<-160		
Power handling, average per input (W)	500	250		
Power handling, average total (W)	800	500		

MECHANICAL SPECIFICATIONS*

Connector	4 x 7/16 DIN Female
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	1408x280x125mm
Mounting	Pre-mounted heavy duty brackets
Weight, with brackets, kg (lbs)	17.6 (39)
Weight, without brackets, kg (lbs)	12.1 (27)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	415
Maximum operational wind speed, m/s (mph)	42 (93)
Survival wind speed, m/s (mph)	55 (123)
Lightning protection	DC grounded
Operating Temperature	-40°C to +60°C
Radome material	GRP
Package size, HxWxD, mm (ft)	1550x355x255 (61"x1'2"x10")
Radome colour	Light Grey
Shipping weight, kg (lbs)	21.5 (47.4)
RET	8220.10, 8220.40, 8210.10, 8210.40
Brackets	7256.00, 7454.00



*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visithttp://www.powerwave.com/rpa/.

Updated: 2010-12-02

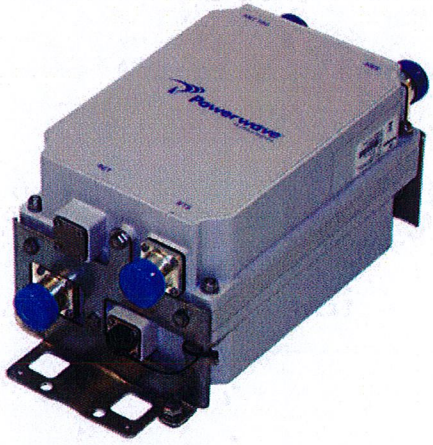
TTAW-07BP111-001 | TMA Twin Dual Band AWS with 700 Bypass 13 dB AISG

ELECTRICAL SPECIFICATIONS	
UL Frequency Range (MHz)	1710-1770 with 698-746 bypass
UL Rejection	>80 dB TX rejection, >25 dB rejection at 1700 and 1800 MHz
UL Gain(dB)	13
UL Return Loss	>18 dB
UL Noise Figure	<1.6 dB
UL Output 3rd Order Intercept Point(dBm)	>+23 (Input IP3 >+11)
UL Bypass Loss(dB)	<1.9
UL Max Input Power (dBm)	+14 dBm
DL Frequency Range (MHz)	2110-2170 with 698-746 bypass
DL Return Loss	>18 dB
DL Insertion Loss (dB)	<0.4
Intermodulation	<-155 dBc (2x43 dBm TX)
Input Voltage (V)	8.0-30V (AISG Mode 10-30V; Current Alarm Mode 8-17)
Alarm Functionality	AISG compatible or in case of no AISG command received, current alarm mode 170-190 mA
Power Consumption	<1.5 W
Power Handling, RMS	700: 500 W; AWS 300W
AISG Compatibility	AISG 1.1 fully upgreadable to AISG 2.0 (AISG version only depended on loaded SW version) TTAW-07BP112-001 has AISG 2.0 loaded from factory

MECHANICAL SPECIFICATIONS	
Dimension HxWxD mm(ft)	250x169x139 (9.9"x6.7"x5.4")
Weight(lbs)	<18 (<8 kg)
Colors	Off white (NCS 1502-R)
RF Connectors	Female 7/16 DIN, long neck
Mounting Kit	Mounting kit for pole and wall is included

ENVIRONMENTAL SPECIFICATIONS	
Temperature Range	-40 to +65°C
Operational	ETS 300 019-1-4
Transportation	ETS 300 019-1-2
Storage	ETS 300 019-1-1
Lightning Protection	IEC 61312-1: 2 kA 8/20 µs, 3 kA 10/350 µs
Housing	Aluminium
MTBF	>1 million hours
Ingress Protection	IP67 minimum

APPROVAL AND TESTS	
Safety	UL 60950; UL 1950, TUV
EMC	FCC part 15

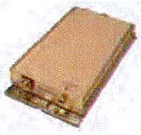


*All specifications subject to change without notice. Contact your Powerwave representative for complete performance data.

Updated: 2010-12-02

Tower Mounted Amplifier

1900/850 MHz



Technical Specifications

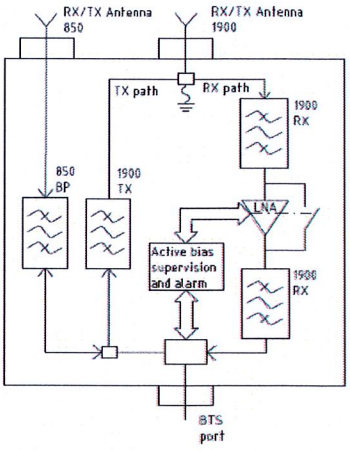
Product Number	LGP214nn	
850 MHz	Bypass (MHz)	824-894
	Return loss* (dB)	> 20
	Insertion loss* (dB)	< 0.3
1900 MHz		
Up-link	Frequency range, full band (60 MHz)	1850-1910
	Nominal gain (dB)	12
	Return loss* (dB)	> 20
	Noise figure* (dB)	< 1.7
	Output 3rd order Intercept Point* (dBm)	> +23
Down-link	Frequency range, full band (60 MHz)	1930-1990
	Insertion loss* (dB)	< 0.6
	Return loss* (dB)	> 20
Intermodulation	2 Tx@x43 dBm (dBc)	<-158
Alarm Functionality	Two levels,individually supervised LNAs	
Power Consumption	@12 VDC	1.2 W

* Typical

All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

Mechanical Specifications

Size,W x H x D (without mounting plate)	235 x 366 x 66 mm (9.2 x 14.4 x 2.6 in)
Weight	6.4 kg (14.1 lbs)
Color	Off white (NCS 1502-R)
Housing	Aluminum
RF-connectors	DIN 7/16 female.
Mounting kit	Mounting kit for pole and wall is included
Temperature range	-40 °C to +65 °C (-40 °F to +149 °F)
MTBF	>1 million hours
Safety	UL 60 950
Ingress protection, IP 65	EN 60 529
Environmental	ETS 300 019
EMC	FCC Part 15



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Powerwave technologies

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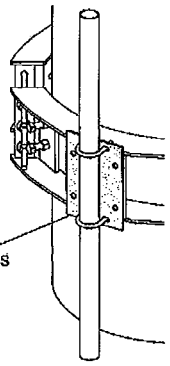
Monopole Pipe Mounts

Tri-Sector Adapter Kit for Single Antenna per Sector

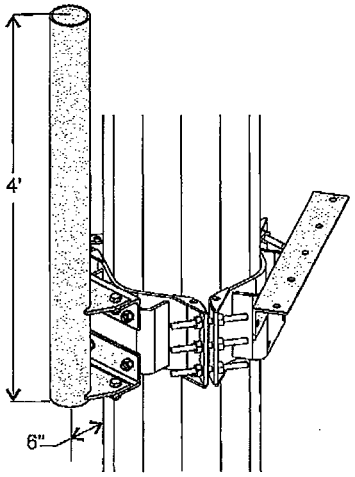
The Tri-Sector Adapter Kit provides adapter plates (3 per kit) for supporting a single wireless antenna per each sector, positioned adjacent to the pole. The plates bolt directly to the tri-bracket with included 5/8" diameter hardware. Tri-bracket and 2-3/8" antenna mounting pipes ordered separately.



Description	P/N
Tri-Sector Adapter Kit	B1865

Pipe Mount for Polygon or Round Poles

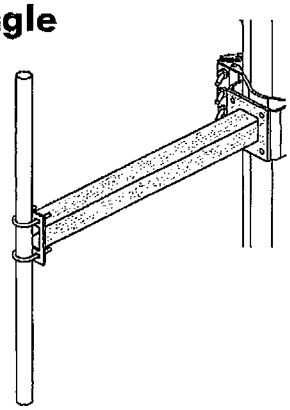
The B2102 Pipe Mount, for round or polygon poles has a 4-1/2" O. D. x 4' mounting pipe. The mounting pipe is cantilevered upward 3' for the attachment of a dish antenna up to 6' diameter. To use the included side strut bracket the antenna may need to be installed inverted to position the antenna side strut closer to the side strut bracket. The mount bolts to the separately ordered tri-bracket with included 5/8" diameter hardware.



Description	P/N
Pipe Mount, 4-1/2" x 48"	B2102

Standoff Arm for Single Antenna

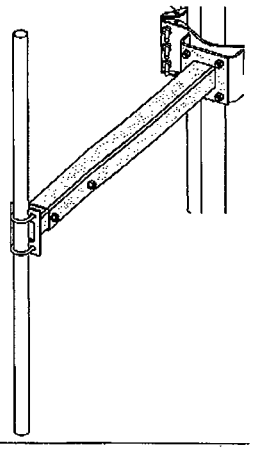
This Standoff Arm provides support for a single wireless sector antenna from the tri-bracket. The Standoff Arm bolts to the separately ordered tri-bracket with included 5/8" diameter hardware. The wireless panel antenna mounts on a separately ordered 2-3/8" O. D. antenna mounting pipe.



Description	P/N
1' 6" Standoff Arm for single antenna	B2434
2' Standoff Arm for single antenna	B2758
3' Standoff Arm for single antenna	B2759
4' Standoff Arm for single antenna	B1826

5' - 8' Adjustable Standoff Arm

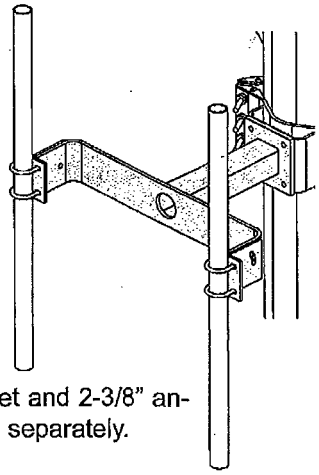
The Adjustable Standoff Arm allows for the field adjustment as required for the site. The adjustable arm telescopes in 1' increments from 5' to 8'. When the Mount is fully extended, it will support an applied load of 400 lbs. Hardware included for mounting to tri-bracket and antenna pipe. Tri-bracket and 2-3/8" antenna mounting pipe ordered separately.



Description	P/N
5' - 8' Standoff Arm	B2065

Dual Standoff Mount

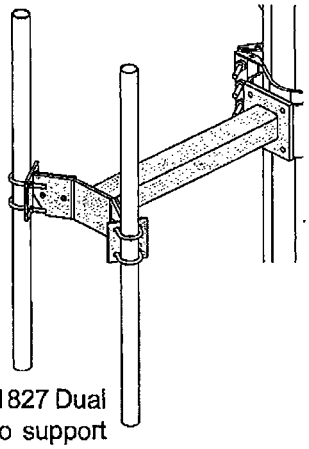
The Dual Standoff Mount provides support for two antennas that face the same azimuth and are positioned 2' 3-9/16" from the tri-bracket. The two antennas, separated by 3', can be down-tilted from 0° to 30°. The mount bolts to a separately ordered tri-bracket with included 5/8" diameter hardware. Tri-bracket and 2-3/8" antenna mounting pipes ordered separately.



Description	P/N
Dual Standoff for two antennas	B1827

Standoff Arm for Two Antennas

The Standoff Arm provides support for two antennas that face adjacent sectors, 120° apart. The two antennas, separated by 1' 8-1/2", can be tilted from 0° to 30°. Galvanized. Tri-bracket and 2-3/8" antenna pipes ordered separately.
When three or four antennas are required for a sector, the B1826 Standoff Mount or the B1827 Dual Standoff Mount can be used to support the additional antennas.

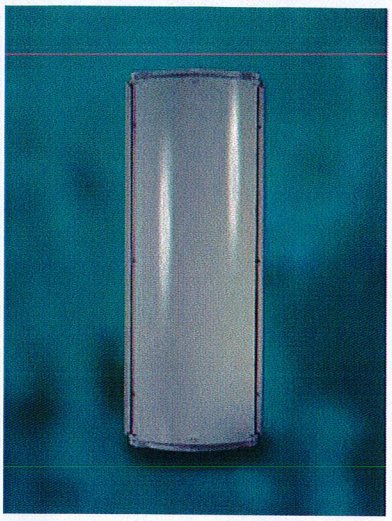


Standoff From Tri-Bracket	Sector Antenna Separation*	P/N
3' 3-5/16"	6'	B1868
5' 7-1/16"	10'	B1970

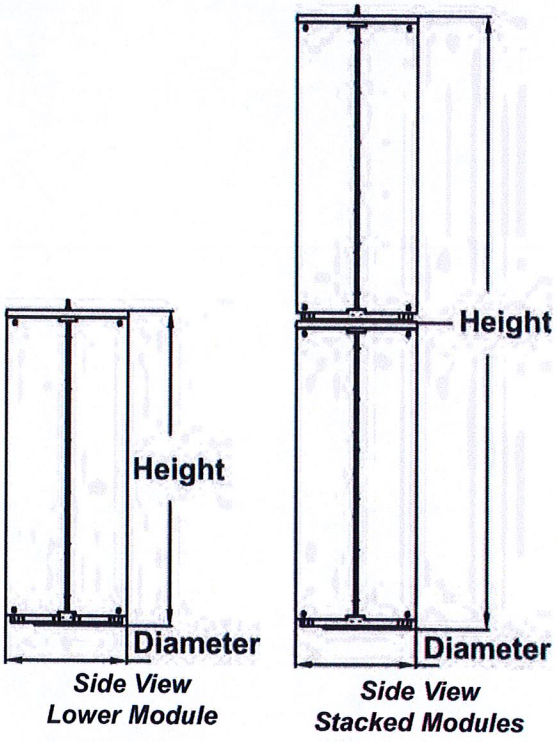
*The "Sector Antenna Separation" is for two antennas on each sector, where multiple Straight Arm Sector Mounts are installed.

30" AcCELLerator™

EMS Wireless



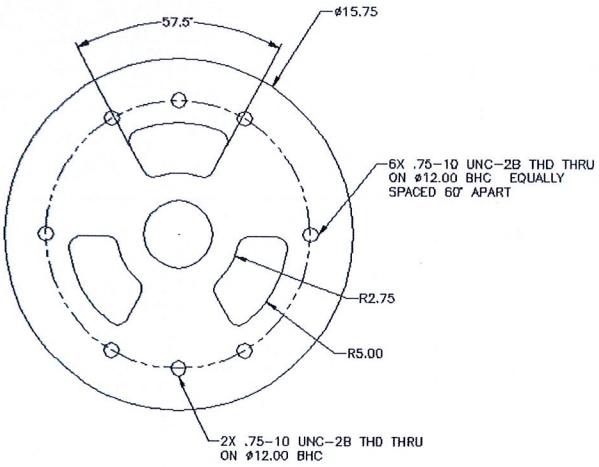
PCS 30" AcCELLerator™



Side View Lower Module

Side View Stacked Modules

Mounting Interface



Mechanical Specifications		Single	Stacked
Dimensions:	*Height*	76 inches (193 cm)	152 inches (386 cm)
	Diameter	30 inches (76.2 cm)	
Rated Wind Velocity		100 mph (161 kph)	
Side Wind Load @ 100 mph		317 lbs (1408 N)	634 lbs (2816 N)
Weight		265 lbs (120 kg)	530 lbs (240 kg)
Mounting Interface		6 ea. 3/4-10 Bolts on 12 inch Bolt Circle	

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P65-15-XLH-RR | Dual Broadband Antennas

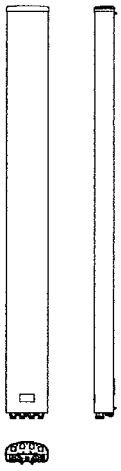
POLARIZATION: Dual linear ±45°
FREQUENCY (MHz): 698-894, 1710-2170
HORIZONTAL BEAM WIDTH (°): 65, 65
GAIN (dBi/dBd): 14.7/12.6, 17.0/14.9
TILT: 0-13, 0-9
LENGTH: 51"

ELECTRICAL SPECIFICATIONS*

Frequency range (MHz)	698-894		1710-2170		
Frequency band (MHz)	698-806	806-894	1710-1880	1850-1990	1900-2170
Gain (dBi/dBd)	14/11.9	14.7/12.6	16.4/14.3	16.7/14.6	17.0/14,9
Polarization	Dual Linear +/- 45			Dual Linear +/- 45	
Nominal Impedance (Ω)	50			50	
VSWR	< 1.5:1			< 1.5:1	
Horizontal beam width, -3 dB (°)	73	63	65	61	60
Vertical beam width, -3 dB (°)	17			7.5	
Electrical down tilt (°)	0-13			0-9	
Side lobe suppression, vertical 1st upper (dB)	> 14			>20	
Isolation between inputs (dB)	>30			> 30	
Inter band Isolation (dB)	> 40			> 40	
Tracking, horizontal plane ±60° (dB)	< 2			< 2	
Vertical beam squint (°)	<1.25			< 0.5	
Front to back ratio (dB) 180°±30° copolar	> 25			> 28	
Front to back ratio (dB) 180°±30° total power	> 25			> 25	
Cross polar discrimination (XPD) 0° (dB)	> 15			> 15	
Cross polar discrimination (XPD) ±60° (dB)	> 10			> 10	
IM3, 2xTx@43dBm (dBc)	<-153			<-153	
Power handling, average per input (W)	500			300	
Power handling, average total (W)	1000			600	

MECHANICAL SPECIFICATIONS*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, in (mm)	51"x12"x6" (1290x312.5x147.5)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, lbs (kg)	41 (19)
Weight, without brackets, lbs (kg)	30 (14)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.0 (N)	404 / 75 / 511
Maximum operational wind speed, mph (m/s)	100 (45)
Survival wind speed, mph (m/s)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40°C to +60°C
Radome material	PVC, IP55
Package size, HxWxD, in (mm)	60" x 16" x 10" (1524 x 400 x 255)
Radome colour	Light Grey
Shipping weight, lbs (kg)	52 (24)
RET	iRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00A



*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

ANTENNA PATTERNS*

For detailed patterns visit http://www.powerwave.com/rpa/.

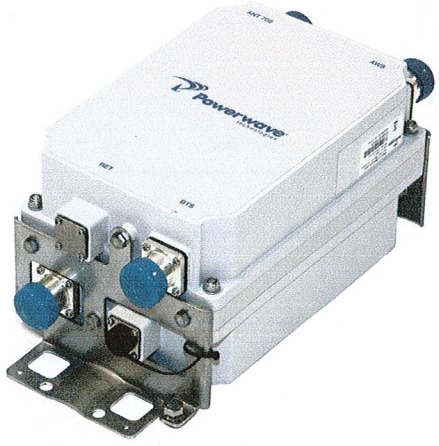
TTAW-07BP111-001 | TMA Twin Dual Band AWS with 700 Bypass 13 dB AISG

ELECTRICAL SPECIFICATIONS	
UL Frequency Range (MHz)	1710-1770 with 698-746 bypass
UL Rejection	>80 dB TX rejection, >25 dB rejection at 1700 and 1800 MHz
UL Gain(dB)	13
UL Return Loss	>18 dB
UL Noise Figure	<1.6 dB
UL Output 3rd Order Intercept Point(dBm)	>+23 (Input IP3 >+11)
UL Bypass Loss(dB)	<1.9
UL Max Input Power (dBm)	+14 dBm
DL Frequency Range (MHz)	2110-2170 with 698-746 bypass
DL Return Loss	>18 dB
DL Insertion Loss (dB)	<0.4
Intermodulation	<-155 dBc (2x43 dBm TX)
Input Voltage (V)	8.0-30V (AISG Mode 10-30V; Current Alarm Mode 8-17)
Alarm Functionality	AISG compatible or in case of no AISG command received, current alarm mode 170-190 mA
Power Consumption	<1.5 W
Power Handling, RMS	700: 500 W; AWS 300W
AISG Compatibility	AISG 1.1 fully upgreadable to AISG 2.0 (AISG version only depended on loaded SW version) TTAW-07BP112-001 has AISG 2.0 loaded from factory

MECHANICAL SPECIFICATIONS	
Dimension HxWxD mm(ft)	250x169x139 (9.9"x6.7"x5.4")
Weight(lbs)	<18 (<8 kg)
Colors	Off white (NCS 1502-R)
RF Connectors	Female 7/16 DIN, long neck
Mounting Kit	Mounting kit for pole and wall is included

ENVIRONMENTAL SPECIFICATIONS	
Temperature Range	-40 to +65°C
Operational	ETS 300 019-1-4
Transportation	ETS 300 019-1-2
Storage	ETS 300 019-1-1
Lightning Protection	IEC 61312-1: 2 kA 8/20 µs, 3 kA 10/350 µs
Housing	Aluminium
MTBF	>1 million hours
Ingress Protection	IP67 minimum

APPROVAL AND TESTS	
Safety	UL 60950; UL 1950, TUV
EMC	FCC part 15



*All specifications subject to change without notice. Contact your Powerwave representative for complete performance data.

Updated: 2010-12-02

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 463-5511
Fax: (860) 513-7190

Douglas L. Culp
Real Estate Consultant

February 6, 2012

Honorable Matt Knickerbocker
First Selectman Bethel
Bethel Town Hall
1 School Street
Bethel, CT 06801

Re: Telecommunications Facility – 7 Stoney Hill Road Bethel, CT

Dear First Selectman Knickerbocker:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification 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 accompanying letter to the Siting Council fully describes Cingular's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures; please call me at (860) 463-5511 or Ms. Linda Roberts, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Douglas L. Culp
Real Estate Consultant

Enclosure