Robinson+Cole

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July 13, 2015

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

Re: **Petition No. 1121 – Cellco Partnership d/b/a Verizon Wireless Petition for Declaratory Ruling that No Certificate of Environmental Compatibility and Public Need is Required for the Proposed Replacement of and Modification to an Existing Telecommunications Facility at 353 Pumpkin Hill Road, Ashford, Connecticut**

Dear Ms. Bachman:

In accordance with the requirements of the Council's January 8, 2015 approval of the above-referenced Petition, enclosed please find the original and two (2) copies of the following information:

1. Design drawings for the proposed telecommunications facility at 353 Pumpkin Hill Road. Please note that the required wetland restoration and monitoring plan details are included on Plan Sheet C-1.2. Also note that the tower setback radius of 240 feet is noted on Plan Sheet C-1.1.

2. Tower and foundation design materials for the 240-foot self-supporting lattice tower stamped by William Heiden III, Professional Engineer licensed in the State of Connecticut.

Currently, Cellco anticipates that construction of the new tower at 353 Pumpkin Hill Road will commence on or about September 1, 2015. In accordance with the Council's approval, further notification will be provided upon completion of site improvements and the removal of the existing guyed lattice tower. Once finalized, we will also provide the Council

with information regarding the FAA's determination with respect to the type of lighting required on this facility prior to operation.

If you have any questions or need any additional information please contact me.

Sincerely,

Kenneth C. Baldwin

KCB/kmd
Enclosures
Copy to:
Anthony Befera
Brian Paul
Jim Smith

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

ASHFORD RELO., CT

353 PUMPKIN HILL ROAD

ASHFORD, CT 06278

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, 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 VERIZON WIRELESS 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 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.
19. 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.
20. 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.

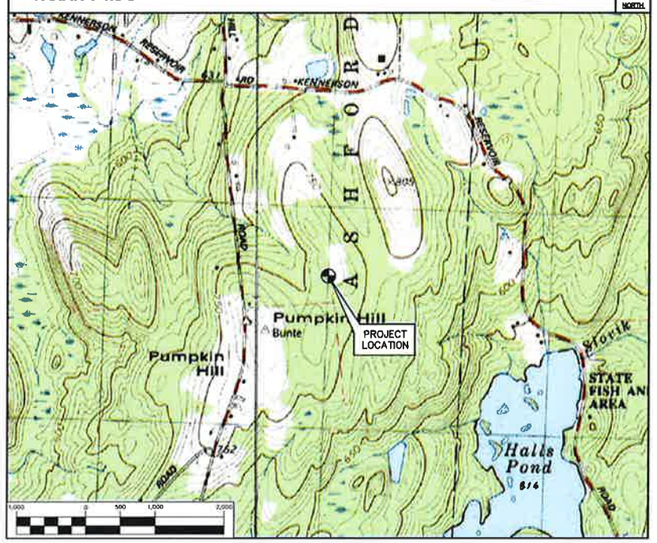
SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE, EAST HARTFORD, CT **TO:** 353 PUMPKIN HILL ROAD, ASHFORD, CT

1.	HEAD EAST ON E RIVER DR	253 FT.
2.	TURN LEFT ONTO THE CT-2 E RAMP TO NORWICH	0.2 MI.
3.	MERGE ONTO I-84 E	20.7 MI.
4.	TAKE EXIT 69 FOR CONNECTICUT 74 TOWARDS U.S. 44/WILLINGTON/PUTNAM	0.3 MI.
5.	TURN RIGHT ONTO CT-74 E	7.5 MI.
6.	TURN LEFT ONTO US-44 E	3.1 MI.
7.	TURN RIGHT ONTO PUMPKIN HILL DRIVE, DESTINATION WILL BE ON THE LEFT	1.7 MI.

VICINITY MAP

SCALE: 1" = 1000' NORTH



PROJECT SUMMARY

THE GENERAL SCOPE OF WORK CONSISTS OF THE FOLLOWING:

1. THE INSTALLATION OF A ±240' TALL SELF-SUPPORTING LATTICE TOWER TO REPLACE AN EXISTING ±300' TALL GUYED TOWER TO BE REMOVED.
2. A TOTAL OF TWELVE (12) VERIZON WIRELESS DIRECTIONAL PANEL ANTENNAS ARE TO BE MOUNTED AT A CENTERLINE ELEVATION OF 240'-0"± AGL ON THE 240'-0"± REPLACEMENT LATTICE TOWER.
3. EXISTING POWER AND TELCO UTILITIES AT THE SITE TO BE UPGRADED/CONSOLIDATED WITH A SINGLE MULTI-METER UTILITY BACKBOARD TO BE LOCATED ADJACENT TO THE EXISTING FENCED COMPOUND. EXISTING CARRIER UTILITIES TO BE BACKFED FROM THE MULTI-METER UTILITY BACKBOARD LOCATION.

PROJECT INFORMATION

SITE NAME:	ASHFORD RELO., CT
SITE ADDRESS:	353 PUMPKIN HILL ROAD ASHFORD, CT 06278
LESSEE/TENANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON:	BRIAN PAUL (CONSTRUCTION MANAGER) VERIZON WIRELESS (860) 305-8446
PROPOSED REPLACEMENT TOWER COORDINATES:	LATITUDE 41°-50'-52.136" LONGITUDE 72°-07'-17.777" GROUND ELEVATION: 760.8'± A.M.S.L. COORDINATES AND GROUND ELEVATION ARE BASED ON FAA 1-A SURVEY CERTIFICATION AS PREPARED FOR VERIZON WIRELESS, BY MARTINEZ COUCH AND ASSOCIATES DATED SEPTEMBER 05, 2014, REVISED MARCH 25, 2015.

SHEET INDEX

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N-1	SITE AND FOUNDATION SPECIFICATIONS	0
C-1.0	SITE LOCATION PLAN	0
C-1.1	PARTIAL SITE PLAN	0
C-1.2	WETLAND RESTORATION PLAN, DETAILS AND NOTES	0
C-2	COMPOUND PLAN, ELEVATION & ANTENNA MOUNTING CONFIG.	0
C-3	SITE CONSTRUCTION, S&E CONTROL NOTES & DETAILS	0
C-4	EQUIPMENT SHELTER PLANS AND DETAILS	0
C-5	SHELTER FOUNDATION PLAN, DETAILS, ELEVATIONS AND NOTES	0
M-1	MECH. NOTES, SYMBOLS, DETAILS & SCHEDULES	0
M-2	MECHANICAL PLAND & NOTES	0
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E-1	ELECTRICAL LEGEND AND NOTES	0
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E-3	RISER DIAGRAM AND NOTES	0
E-4	SCHEMATIC DIAGRAM AND NOTES	0
E-5	GROUNDING PLAN AND NOTES	0
E-6	ELECTRICAL PART PLANS AND NOTES	0
E-7	CABLETRAY DETAILS	0
E-8	DETAILS	0
E-9	DETAILS	0
E-10	DETAILS	0
E-11	DETAILS	0
E-12	SPECIFICATIONS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/09/15	HMR	DMD	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions
(203) 488-0580
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63-2 North Branford Road
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Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY

ASHFORD RELO., CT
353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

DATE: 05/11/15
SCALE: AS NOTED
JOB NO. 14124.000

TITLE SHEET

T-1

Sheet No. 1 of 24

SITE AND FOUNDATION 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:

   - BASIC WIND SPEED:
     WINDHAM COUNTY; V=85 MPH (FASTEST MILE) [SECTION 16 OF TIA/EIA-222-F-1996]

     WINDHAM COUNTY; V=110 MPH (3 SECOND GUST) [ANNEX B OF TIA-222-G]

     ASHFORD; V=100 MPH (FASTEST MILE)
     EQUIVALENT TO V=80 MPH (3 SECOND GUST) [APPENDIX K OF 2005 CT BUILDING CODE SUPPLEMENT]

     LOAD CASES USED:
     LOAD CASE 1: 110 MPH WIND SPEED W/ NO ICE PLUS GRAVITY LOAD (CLASS III STRUCTURE TYPE, EXPOSURE CATEGORY C) [ANNEX B OF TIA-222-G-2005]

     LOAD CASE 2: 50 MPH WIND SPEED W/ 1.00" RADIAL ICE PLUS GRAVITY LOAD (CLASS III STRUCTURE TYPE, EXPOSURE CATEGORY C) [ANNEX B OF TIA-222-G-2005]

     LOAD CASE 3: 80 MPH WIND SPEED W/ 0.50" RADIAL ICE PLUS GRAVITY LOAD [SECTION 16 OF TIA/EIA-222-F-1996]

   - SEISMIC LOAD (DOES NOT CONTROL): [SECTION 1614.5 OF 2005 CT STATE BUILDING CODE]

SPECIAL INSPECTIONS

1. SPECIAL INSPECTIONS ARE TO BE PROVIDED BY AN APPROVED AGENCY HIRED BY VERIZON WIRELESS. REFER TO THE STATEMENT OF SPECIAL INSPECTIONS PREPARED BY CENTEK ENGINEERING, INC. DATED 07.09.15.

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.
9. 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.
10. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.

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.

CONCRETE CONSTRUCTION:

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
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:
   SURFACES EXPOSED TO THE WEATHER 1–1/2 INCHES
   FORMED SURFACES EXPOSED TO EARTH 1–1/2 INCHES
   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. SHEAR KEYS (2" X 4"), SEPARATING CONCRETE POURS, SHALL BE PROVIDED IN ALL CONCRETE WALLS AND BETWEEN FOOTINGS AND WALLS.
13. AT ALL OPENINGS IN CONCRETE WALLS AND SUSPENDED SLABS, UNLESS OTHERWISE DETAILED, PROVIDE THE FOLLOWING ADDITIONAL REINFORCING:
    1 – #4 EACH FACE AT EACH SIDE OF OPENING. EXTEND 2'–0" BEYOND OPENING.
    1 – #4 x 4'–0" LONG EACH FACE DIAGONALLY AT EACH CORNER.
14. INSPECTION AND TESTING OF CONCRETE WORK SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY, PAID BY THE OWNER, AND APPROVED BY THE ARCHITECT. THE INSPECTOR SHALL OBSERVE CONDITION OF SOILS AND FORMWORK BEFORE FOOTINGS ARE PLACED, SIZE, SPACING AND LOCATION OF REINFORCEMENT, AND PLACEMENT OF CONCRETE.
15. THE TESTING COMPANY SHALL ALSO OBTAIN A MINIMUM OF THREE (3) COMPRESSIVE STRENGTH TEST SPECIMENS FOR EACH CONCRETE MIX DESIGN. ONE SPECIMEN TESTED AT 7 DAYS, ONE AT 28 DAYS, AND ONE HELD IN RESERVE FOR FUTURE TESTING, IF NEEDED.
16. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ARCHITECT WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

SLAB ON GRADE CONSTRUCTION:

1. PLACE AND COMPACT GRAVEL FILL IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL, BUT NOT LESS THAN ONE (1) PER LAYER, TO ENSURE COMPACTION TO 95% OF MAXIMUM DRY DENSITY.
2. SAW CUT CONTROL JOINTS 1/8" WIDE AND TO A DEPTH EQUAL TO 1/4 OF THE SLAB THICKNESS. CONSTRUCTION JOINTS AS REQUIRED SHALL BE KEYED AND LOCATED AT CONTROL JOINT INTERVALS. ALL CONTROL JOINTS SHALL BE FILLED WITH EUCO EPOXY #600 EPOXY JOINT FILLER AS MANUFACTURED BY EUCLID CHEMICAL CO. OR APPROVED EQUAL.
3. SAW CUT CONTROL JOINTS AT 20'–0" ON CENTER MAXIMUM WITHIN 12 HOURS OF CONCRETE PLACEMENT.
4. SLABS ON GRADE FINISHES: STEEL TROWEL FINISH AS DEFINED IN ACI 301. CURE SLAB WITH SONNEBORN KURE–N–SEAL WB OR APPROVED EQUAL, APPLIED AS RECOMMENDED BY MANUFACTURER.
5. CONSTRUCTION JOINT SPACING IN FOUNDATION WALLS SHALL NOT EXCEED 40 FEET NOR 20 FEET FROM ANY CORNER. JOINTS SHALL BE KEYED AND HORIZONTAL BARS SHALL EXTEND THRU JOINT AND BE 48 BAR DIAMETER SPLICED.
6. IN REINFORCED CONCRETE WALLS AND FOOTINGS, PROVIDE CORNER DOWELS OF THE SAME SIZE AND AT THE SAME SPACING AS HORIZONTAL REINFORCING. DOWELS SHALL HAVE A 48 BAR DIAMETER SPLICE WITH HORIZONTAL REINFORCING EACH DIRECTION.
7. WHERE FOOTINGS ARE IN CLOSE PROXIMITY TO SUBSURFACE PIPING, TOP OF FOOTING SHALL BE LOWERED TO PROVIDE A MINIMUM OF 8" BELOW INVERT ELEVATION OF PIPING.
8. CONCRETE PIERS (IF PROVIDED): PLACE CONCRETE PIERS AND WALLS TOGETHER, SET PIER STEEL AND EXTEND WALL STEEL THROUGH PIER VERTICAL BARS. PROVIDE DOWELS WITH STANDARD HOOK FROM FOOTINGS AT ALL PIERS. SIZE AND QUANTITY OF DOWELS TO MATCH VERTICAL PIER REINFORCING.
9. PROVIDE CORROSION RESISTANT ACCESSORIES IN ALL EXPOSED CONCRETE.
10. RUB ALL EXPOSED CONCRETE SURFACES SMOOTH AND FINISH WITH CEMENT GROUT.
11. PROVIDE AIR ENTRAINMENT IN ALL EXTERIOR CONCRETE AS WELL AS GARAGE AND PORCH SLABS THAT WILL BE EXPOSED TO DEICING SALTS..

STRUCTURAL LUMBER CONSTRUCTION:

1. STRUCTURAL LUMBER USED FOR JOISTS, RAFTERS AND COLUMNS SHALL BE NO. 2 GRADE DOUGLAS FIR AND SHALL HAVE NOT LESS THAN THE FOLLOWING ALLOWABLE UNIT STRESSES, BEFORE ADJUSTMENT FOR DURATION FACTORS, BASED ON 1997 NDS SPECIFICATION:

   EXTREME FIBER IN BENDING Fb 875 PSI
   HORIZONTAL SHEAR Fv 95 PSI
   TENSION PARALLEL TO GRAIN Ft = 575 PSI
   COMPRESSION PERPENDICULAR TO GRAIN Fc 625 PSI
   COMPRESSION PARALLEL TO GRAIN . Fc = 1,350 PSI
   MODULUS OF ELASTICITY E = 1,600,000 PSI

2. LIGHT FRAMING LUMBER USED FOR STUDS, PARTITIONS, AND MISCELLANEOUS FRAMING SHALL NOT BE LESS THAN STANDARD GRADE AND SHALL HAVE THE FOLLOWING MINIMUM ALLOWABLE UNIT STRESSES:

   EXTREME FIBER IN BENDING Fb 675 PSI
   TENSION PARALLEL TO GRAIN Ft = 450 PSI
   COMPRESSION PARALLEL TO GRAIN Fc 850 PSI
   MODULUS OF ELASTICITY E = 1,400,000 PSI

3. MOISTURE CONTENT OF ALL FRAMING LUMBER WHEN DELIVERED TO THE PROJECT SITE SHALL NOT EXCEED 19%.
4. EXCEPT WHERE STRICTER PROVISIONS ARE INDICATED, 2003 INTERNATIONAL RESIDENTIAL CODE SHALL GOVERN ALL WOOD CONSTRUCTION INCLUDING, BUT NOT LIMITED TO: MATERIALS, FASTENERS (TYPE, SIZE, SPACING, EMBEDMENT), SHOP AND FIELD FABRICATION, CONNECTIONS, AND INSTALLATION.
5. NOT USED
6. NAIL PENETRATION INTO WALL STUDS AND CORNER POSTS SHALL BE AT LEAST 1 3/4 INCHES.
7. PROVIDE AND INSTALL TIMBER POSTS (6x6 OR BUILT UP 2x6 MEMBERS) AT ALL EXTERIOR CORNERS AND ANCHOR TO FOUNDATION WALLS, AND BETWEEN EACH FRAMING LEVEL TO RESIST UPLIFT FORCES. PROVIDE AND INSTALL SIMPSON HDU5–SDS2.5 (HOLD DOWN) ANCHORS WITH SSTB24 ANCHOR RODS OR EQUIVALENT AT FOUNDATION WALLS. PROVIDE AND INSTALL HDU2–SDS2.5 ANCHORS WITH SSTB16 ANCHOR RODS AND POSTS EACH SIDE OF DOOR OPENINGS GREATER THAN 4'–0" IN EXTERIOR WALLS.
8. HORIZONTAL (SLOPED) DIAPHRAGMS: THE FLOOR AND ROOF ARE DESIGNED AS DIAPHRAGMS TO RESIST LATERAL LOADS. FLOOR SHEATHING SHALL BE 3/4 INCH THICK APA RATED STURDI–FLOOR TONGUE AND GROOVE PLYWOOD. FLOOR SHEATHING SHALL BE ATTACHED TO FLOOR JOISTS WITH CONSTRUCTION ADHESIVE AND 8D NAILS. ROOF SHEATHING SHALL BE 5/8 INCH THICK CDX PLYWOOD. ROOF SHEATHING SHALL BE ATTACHED TO RAFTERS WITH 8D NAILS.

   MAXIMUM NAIL SPACING OF FLOOR AND ROOF SHEATHING SHALL BE 6" o.c. ALONG ALL EDGES. ALL EDGES SHALL BE SUPPORTED WITH SOLID BLOCKING. FIELD NAILING SHALL BE 12" o.c. NAIL PENETRATION INTO SUPPORTING MEMBER SHALL BE AT LEAST 1–1 /2 INCHES.
9. ALL DOUBLE TOP PLATES, RIM JOISTS, AND HEADERS IN EXTERIOR WALLS ARE USED AS DIAPHRAGM CHORD MEMBERS. SPLICES IN DOUBLE TOP PLATES SHALL BE STAGGERED AND METAL STRAPS PROVIDED TO CONNECT RIM JOISTS WITH HEADER AND LINTEL BEAMS.
10. FRAMING ANCHORS AND RELATED CONNECTION HARDWARE SHALL BE FABRICATED BY SIMPSON STRONG–TIE COMPANY, INC., OR EQUAL. SUCH PRODUCTS SHALL BE PROPERLY INSTALLED WITH THE TYPE AND NUMBER OF FASTENERS SPECIFIED BY THE MANUFACTURER FOR THE INTENDED USE.

    JOIST AND BEAM HANGERS AND OTHER FRAMING ANCHORS SHALL BE SIZED FOR REACTIONS SHOWN ON THE DRAWINGS UNLESS A SPECIFIC HANGER OR FRAMING ANCHOR IS INDICATED. SUBMIT SHOP DRAWINGS INDICATING PROPOSED HANGER SIZE AND TYPE.

    CONNECTION HARDWARE AND FASTENERS SHALL BE GALVANIZED OR STAINLESS STEEL. FRAMING ANCHORS AND FASTENERS THAT ARE NOT EXPOSED TO THE WEATHER SHALL BE G90 GALVANIZED. FRAMING ANCHORS AND FASTENERS THAT ARE EXPOSED TO THE WEATHER SHALL BE STAINLESS STEEL.
11. ALL STRUCTURAL WOOD MEMBERS SHALL BE PROPERLY FIELD FABRICATED TO REQUIRED LENGTHS AND SPACING. PROVIDE SUITABLE CONNECTIONS, BEARING LENGTHS, STIFFENERS, BRIDGING, HEADERS, AND OTHER SPECIAL FRAMING AS INDICATED OR REQUIRED BY BUILDING CODE FOR COMPLETE INSTALLATION. ADDITIONAL JOISTS ARE REQUIRED AT FRAMED OPENINGS, AT CONCENTRATED LOADS, AND DIRECTLY BELOW PARTITIONS THAT ARE PARALLEL WITH JOISTS.
12. ALL FRAMING (ROOF, FLOORS, WALLS) SHALL BE PROPERLY ANCHORED TO EACH OTHER AND TO CONCRETE FOUNDATIONS AGAINST UPLIFT BY ADEQUATELY SPLICED AND NAILED ROOF AND WALL SHEATHING, BY METAL STRAPS, HURRICANE ANCHORS, OR SIMILAR CONNECTION HARDWARE.
13. PROVIDE HEAVY HEX NUTS AND WASHERS AT ALL ANCHOR BOLTS AND AT WOOD FRAME CONNECTIONS TO AVOID CRUSHING WOOD FIBERS.
14. PRESSURE TREATED LUMBER SHALL BE USED FOR FOUNDATION SILLS AND FOR ALL LUMBER EXPOSED TO THE WEATHER AND IN DIRECT CONTACT WITH CONCRETE OR MASONRY FOUNDATIONS.
15. PROVIDE SOLID BLOCKING BETWEEN ADJACENT FLOOR JOISTS AND ROOF RAFTERS, AT ALL SUPPORTS AND TOP FLANGE HANGERS, TO PREVENT MEMBER ROTATION. ALLOW SUFFICIENT CLEARANCE FOR CROSS VENTILATION AT ROOF.
16. PROVIDE SOLID BLOCKING AND/OR MINIMUM 1"x3" DIAGONAL BRIDGING AT 7 FEET ON CENTER MAXIMUM AT ALL WOOD FRAMING. IF SOLID BLOCKING IS USED, IT SHALL EXTEND THE FULL DEPTH OF THE MEMBER IT IS LATERALLY SUPPORTING, UNLESS OTHERWISE NOTD.
17. EXTERIOR WALLS AND INTERIOR LOAD–BEARING WALLS SHALL BE FRAMED WITH 2x6 STUDS SPACED AT 16 INCHES ON CENTER AND SHALL HAVE DOUBLE TOP PLATES. INTERIOR NON–LOAD–BEARING PARTITIONS SHALL BE FRAMED WITH 2x4 STUDS SPACED AT 16 INCHES ON CENTER. UNLESS OTHERWISE INDICATED, BEARING WALLS AND PARTITIONS THAT ARE PARALLEL WITH FLOOR JOISTS SHALL BE FULLY SUPPORTED BY DOUBLE JOISTS. INSTALL SOLID FULL–DEPTH BLOCKING BETWEEN JOISTS DIRECTLY BELOW BEARING WALLS AND PARTITIONS THAT ARE PERPENDICULAR WITH FLOOR JOISTS.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/09/15	HAR	DMD	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

Celtco Partnership
d.b.a. Verizon Wireless

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Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY

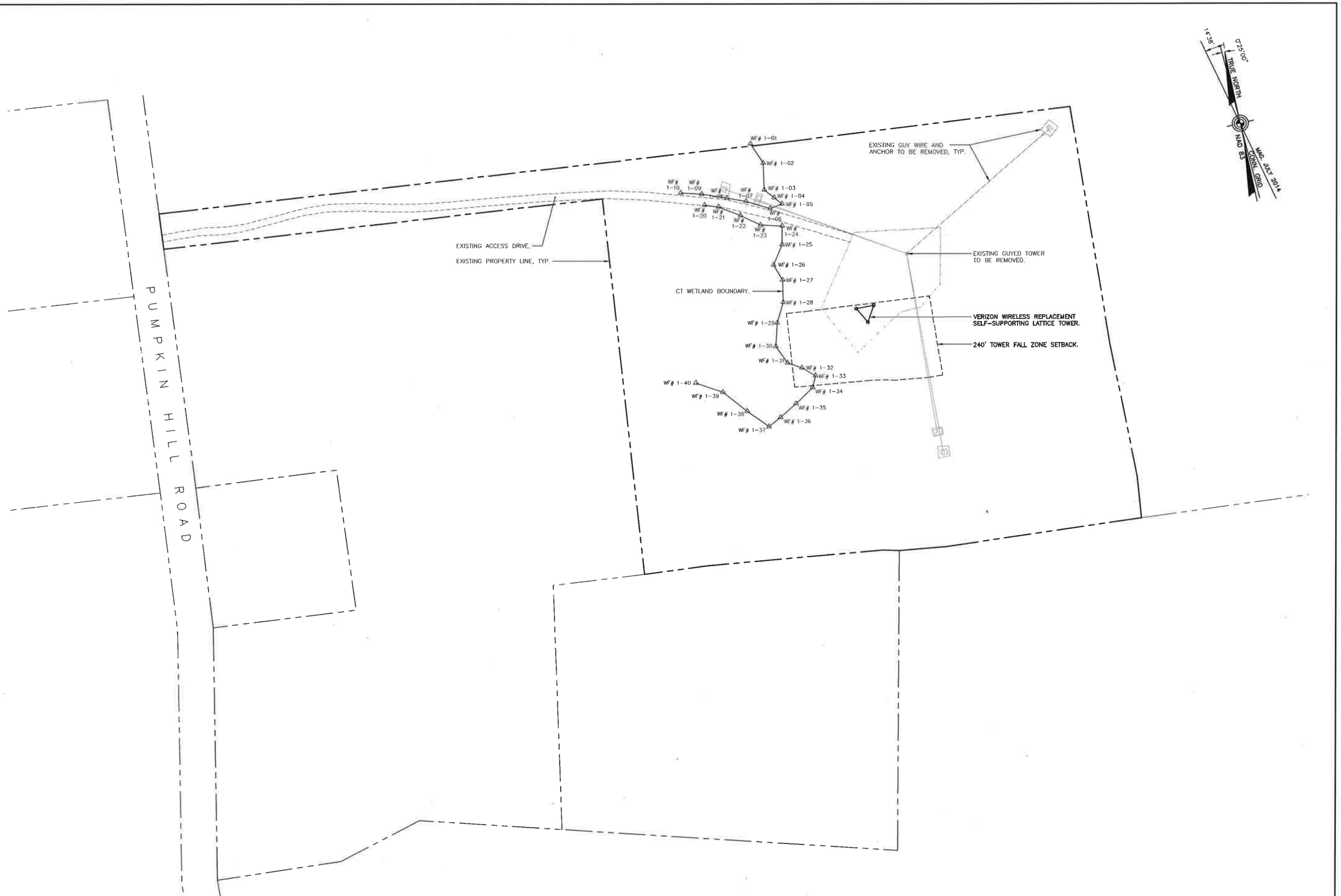
ASHFORD RELO., CT

353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

DATE: 05/11/15
SCALE: AS NOTED
JOB NO. 14124.000

SITE AND FOUNDATION SPECIFICATIONS

N–1



1 C-1.0 **SITE LOCATION PLAN**
SCALE: 1" = 60'

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/09/15	HAR	DMD	ISSUED FOR CONSTRUCTION

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SITE LOCATION PLAN

C-1.0

Sheet No. 3 of 24

EXISTING GUY ANCHOR FOUNDATION REINFORCEMENT BERMS, GUY ANCHOR WIRES AND BOLTS TO BE REMOVED, TYP. REFER TO WETLAND RESTORATION PLAN AND NOTES ON SHEET C-1.2 FOR ADDITIONAL INFORMATION.

EXISTING GRAVEL ACCESS DRIVE.

EXISTING POWER EASEMENT IN FAVOR OF CL&P VOL. 75 P. 942

EXISTING VERIZON WIRELESS EQUIPMENT BUILDING/ASSOCIATED FOUNDATION, PAD MOUNTED GENERATOR AND CHAINLINK FENCE ENCLOSURE TO BE REMOVED.

EXISTING 300' TALL GUYED LATTICE TOWER AND ASSOCIATED FOUNDATION TO BE REMOVED.

EXISTING ROLLING GATE.

EXISTING CHARTER OAK COMMUNICATIONS MASONRY EQUIPMENT BUILDING AND ASSOCIATED FOUNDATION TO BE REMOVED.

EXISTING COMPOUND UTILITY EQUIPMENT ON CONC. PADS, TYP.

VERIZON WIRELESS ±240' TALL SELF-SUPPORTING LATTICE TOWER AND FOUNDATION OUTLINE.

EXISTING TERRESTRIAL DISH CONC. PADS TO BE REMOVED AS REQUIRED FOR VERIZON WIRELESS TOWER AND FOUNDATION CONSTRUCTION, TYP.

EXISTING GUY WIRE TO BE REMOVED, TYP.

EXISTING 6' TALL CHAINLINK FENCE WITH BARBED WIRE.

COMPOST FILTER SOCK/STRAW WATTLE, TYP. (2 / C-1.2)

SILT FENCE, TYP. (1 / C-3)

CT WETLAND BOUNDARY.

TRUE NORTH

NAD 83

MAG. JULY 2014

CONN. GRID

1 / C-1.1 PARTIAL SITE PLAN
SCALE: 1"=20'

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

SYMBOLS LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING ACCESS DRIVE
- 650 CONTOUR LINE
- 650 GRADING LINE
- UTILITY POLE
- EXISTING DECIDUOUS TREE
- SILTATION FENCE
- COMPOST FILTER SOCK/STRAW WATTLE
- EXISTING FENCE LINE
- × SPOT ELEVATION (PROPOSED)

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/09/15	HMR	DMD	ISSUED FOR CONSTRUCTION

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PARTIAL SITE PLAN

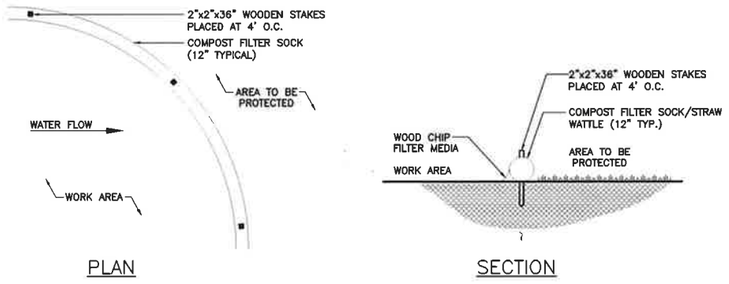
C-1.1

Sheet No. 4 of 24

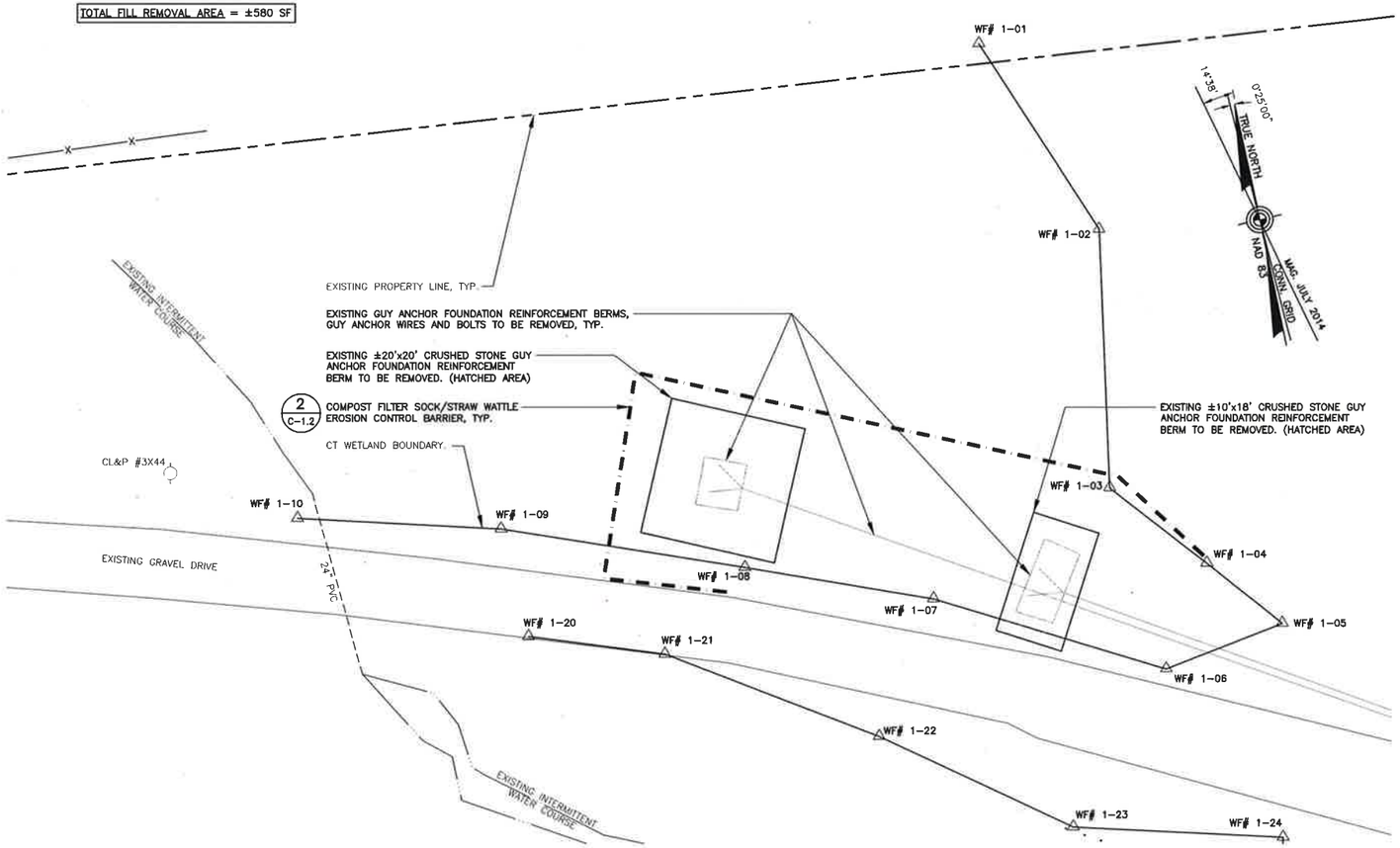
WETLAND RESTORATION PLANTING SCHEDULE				
QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING
TREES				
5	ACER RUBRUM	RED MAPLE	4–6'	10' O.C.
SHRUBS				
5	CORNUS AMOMUM	SILKY DOGWOOD	3–4'	5' O.C.
5	VIBURNUM DENTATUM	NORTHERN ARROWWOOD	3–4'	5' O.C.
5	SALIX DISCOLOR	PUSSYWILLOW	3–4'	5' O.C.
5	SAMBUCUS CANADENSIS	COMMON ELDERBERRY	3–4'	5' O.C.

NOTES:
1. WETLAND RESTORATION AREA WILL BE SOWN WITH A NATIVE NEW ENGLAND WETLAND SEED MIX (NEW ENGLAND WETLAND PLANTS, INC., OR EQUIVALENT). THIS SEED MIX PROVIDES A PERMANENT COVER OF GRASSES, FORBS AND WILDFLOWERS TO PROVIDE BOTH GOOD EROSION CONTROL AND WILDLIFE HABITAT VALUE.
2. PLANTINGS TO BE PLACED IN HATCHED AREAS SHOWN BELOW FOLLOWING REMOVAL OF EXISTING GUY ANCHOR FOUNDATION REINFORCEMENT BERMS, GUY ANCHOR WIRES AND BOLTS.

TOTAL FILL REMOVAL AREA = ±580 SF



2 / C-1.2 **TYP. COMPOST FILTER SOCK/ STRAW WATTLE DETAIL**
NOT TO SCALE



1 / C-1.2 **WETLAND RESTORATION PLAN**
SCALE: 1"=10'

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft

WETLAND RESTORATION AREA NOTES

THE WETLAND RESTORATION AREA WILL RESTORE 580± SQUARE FEET OF PREVIOUSLY FILLED WETLAND WITH REMOVAL OF TWO CRUSHED STONE GUY ANCHOR FOUNDATION REINFORCEMENT BERMS FROM BOTH THE INNER AND OUTER GUY ANCHORS FROM GUY ANCHOR BLOCK A. WETLAND RESTORATION WORK WILL BE PERFORMED DURING DEMOLITION OF THE EXISTING 300-FOOT GUYED LATTICE TOWER. THIS WETLAND AREA WILL BE RESTORED PER THE FOLLOWING:

1. AN APT WETLAND SCIENTIST WILL OBSERVE ALL PHASES OF THE WETLAND RESTORATION PROJECT INCLUDING REMOVAL OF FILL MATERIAL, EXPOSURE OF UNDERLYING NATIVE WETLAND TOPSOIL, GRADING AND PLANTING TO MONITOR AND OVERSEE IMPLEMENTATION OF THE WETLAND RESTORATION PLAN. THE CONTRACTOR WILL NOTIFY APT A MINIMUM OF SEVEN (7) BUSINESS DAYS PRIOR TO THE START OF WETLAND RESTORATION ACTIVITIES TO SCHEDULE A PRE-CONSTRUCTION MEETING ON SITE AND FOR ANY SUBSEQUENT PHASES OF THE WETLAND RESTORATION PLAN.
2. PRIOR TO ANY EARTHWORK, A STRAW WATTLE EROSION CONTROL BARRIER WILL BE INSTALLED ALONG THE NORTH, EAST AND WEST SIDES OF THE PROPOSED WETLAND RESTORATION AREA TO PROTECT NEARBY WETLANDS.
3. CONSTRUCTION OF THE WETLAND RESTORATION AREA WILL ONLY OCCUR FROM THE SOUTH SIDE (EXISTING GRAVEL ACCESS DRIVE) TO MINIMIZE DISTURBANCE TO ADJOINING WETLAND AREAS.
4. THE CONTRACTOR WILL USE SWAMP MATS/TIMBER MATS AS NECESSARY TO PROVIDE A STABLE WORK SURFACE DURING REMOVAL OF GRAVEL FILL MATERIAL THAT OVERLIES BURIED WETLAND TOPSOIL.
5. AS THE WETLAND RESTORATION AREA CONSISTS OF FILL MATERIAL OVERLYING ORIGINAL WETLAND SOILS, EXCAVATION WILL CONSIST OF REMOVAL OF FILL MATERIAL UNTIL THE UNDERLYING NATIVE WETLAND SOIL IS EXPOSED. MINOR MODIFICATIONS TO THIS GRADING PLAN MAY BE MADE IN THE FIELD BY THE WETLAND SCIENTIST IN RESPONSE TO ACTUAL SOIL CONDITIONS. THE SUPERVISING WETLAND SCIENTIST WILL INSPECT THE SUB-GRADE OF THE WETLAND RESTORATION AREA TO ENSURE THAT THE PROPER HYDROLOGY HAS BEEN ESTABLISHED.
6. IF ADDITIONAL WETLAND TOPSOIL IS NEEDED TO SUPPLEMENT THE UNDERLYING NATIVE WETLAND TOPSOIL, IT SHALL CONSIST OF PREPARED WEED-FREE TOPSOIL MADE UP OF A 1:1 MIXTURE (OR EQUAL VOLUMES) OF ORGANIC AND MINERAL MATERIALS THAT CONTAINS AT LEAST 12 PERCENT ORGANIC CARBON CONTENT BY WEIGHT. CLEAN COMPOSTED LEAF MOLD OR COMMERCIALLY AVAILABLE COMPOST FREE OF WEEDS OR INVASIVE SPECIES IS THE PREFERRED AMENDMENT TO ACHIEVE THIS STANDARD, THOUGH OTHER MATERIALS MAY BE USED IF APPROVED BY THE WETLAND SCIENTIST.
7. GUY ANCHOR RODS WILL BE REMOVED BY EXCAVATING A MINIMUM OF ONE (1) FOOT BELOW GROUND SURFACE AROUND THE ANCHOR ROD AND CUTTING OFF THE ROD. GUY ANCHOR FOUNDATIONS WILL REMAIN IN PLACE.
8. THESE SOILS WILL THEN BE GRADED TO ACHIEVE A SLIGHT HUMMOCK/HOLLOW MICROTOPOGRAPHY, SIMILAR TO THAT OF A NATURAL WETLAND SUBSTRATE. THE CONTRACTOR SHALL ENSURE THAT PROPER SOIL COMPACTION LEVELS (LOOSE TO FRIABLE) ARE MAINTAINED AND APPROPRIATE CORRECTION MEASURES (E.G. ROTOTILLING) MAY BE NECESSARY.
9. WETLAND RESTORATION AREA PLANTINGS SHALL TAKE PLACE ONCE THE ABOVE LISTED TASKS HAVE BEEN COMPLETED. THE WETLAND RESTORATION AREA WILL BE PLANTED WITH NATIVE TREES, SHRUBS AND HERBACEOUS SPECIES AS NOTED IN THE PLANTING SCHEDULE AND UNDER SOWN WITH A NATIVE NEW ENGLAND WETLAND SEED MIX (NEW ENGLAND WETLAND PLANTS, INC., OR EQUIVALENT) AFTER THE GRADING IS COMPLETED AT THE MANUFACTURER'S RECOMMENDED SEEDING RATE. SOIL CONDITIONING ACTIVITIES, INCLUDING RAKING, WILL BE COMBINED WITH THE SEED APPLICATION PROCESS.
10. THE SUPERVISING WETLAND SCIENTIST SHALL INSPECT THE PLANTING STOCK SPECIMENS FOR HEALTH, PEST, AND SUITABLE FOR USE WITHIN THE WETLAND RESTORATION AREA. UNSUITABLE SPECIMENS WILL BE REJECTED AND REPLACED WITH SUITABLE SPECIMENS. ANY PLANTING SUBSTITUTIONS MUST BE APPROVED BY THE WETLAND SCIENTIST. ALL WOODY PLANT STOCK SHALL BE CONTAINER-GROWN OR BURLAP BALLED. PLANTING WITHIN THE WETLAND RESTORATION AREA WILL CONFORM TO THESE PLANS OR WILL BE COMPLETED IN ACCORDANCE WITH DIRECTIONS PROVIDED IN THE FIELD BY THE SUPERVISING WETLAND SCIENTIST. ONLY PLANT MATERIALS NATIVE AND INDIGENOUS TO CONNECTICUT SHALL BE USED. INVASIVE PLANT SPECIES WILL NOT BE USED IN THE WETLAND RESTORATION AREA.
11. ALL PLANT MATERIALS INSTALLED SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN. ALL PLANT MATERIALS SHALL BE GUARANTEED BY THE CONTRACTOR FOR ONE YEAR FOLLOWING DATE OF PLANTING. NO CULTIVARS OF THE NATIVE PLANTS IDENTIFIED IN THE PLANTING SCHEDULE SHALL BE USED.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CAREFUL INSTALLATION, MAINTENANCE (INCLUDING WATERING), AND ESTABLISHMENT OF THE PLANT MATERIAL IN THE WETLAND RESTORATION AREA. A MAINTENANCE SCHEDULE FOR IRRIGATION AND PRUNING (AS NECESSARY) WILL BE ESTABLISHED BY THE CONTRACTOR.
13. ALL PLANTINGS TO BE SPACED GENERALLY AS NOTED ON THE PLANTING SCHEDULE WITH ASSISTANCE FROM THE WETLAND SCIENTIST TO SIMULATE NATURAL GROWTH PATTERNS.
14. AN ISOLATED PATCH OF COMMON REED (PHRAGMITES AUSTRALIS), AN AGGRESSIVE INVASIVE PLANT SPECIES, IS LOCATED ADJACENT TO THE WETLAND RESTORATION AREA. THIS AREA WILL BE TREATED AS FOLLOWS: IN LATE JUNE, COMMON REED WILL BE CUT TO THE GROUND; IN SEPTEMBER, COMMON REED WILL BE TREATED WITH GLYPHOSATE HERBICIDE RODEO®, OR APPROVED EQUIVALENT, USING AN HERBICIDE DIPPED GLOVE SWIPING TECHNIQUE TO AVOID IMPACT TO NATIVE PLANTS.
15. HERBICIDE APPLICATION WILL ADHERE TO THE FOLLOWING: ALL FEDERAL, STATE AND LOCAL REGULATIONS REGARDING HERBICIDE USE, APPLICATOR PERMIT AND POSTING REQUIREMENTS SHALL BE FOLLOWED; ALL HERBICIDE APPLICATION SHALL BE PERFORMED BY A STATE LICENSED INDIVIDUAL; CERTIFICATIONS, LICENSES AND PERMITS SHALL BE PROVIDED TO THE SUPERVISING WETLAND SCIENTIST PRIOR TO THE START OF WORK; ALL HERBICIDES SHALL BE MIXED WITH A DYE APPROVED BY U.S. EPA FOR USE AS AN HERBICIDE ADJUVANTS, SUCH AS TURFMARK® DYE OR EQUIVALENT; ONLY NONIONIC SURFACTANTS SHALL BE ADDED TO THE SPECIFIED HERBICIDE.
16. FALLEN LOGS, BRANCHES, STUMPS AND OTHER NATURAL DEBRIS, EXCLUDING INVASIVE PLANTS, WILL BE RELOCATED TO THE ENHANCEMENT AREA TO PROVIDE BENEFICIAL HABITAT FEATURES FOR WILDLIFE. THIS WILL INCLUDE DOWNED AND UNCOVERED MATERIAL THAT IS ACQUIRED DURING GRADING ACTIVITIES AND WILL BE DISTRIBUTED TO COVER NO MORE THAN 5 PERCENT OF THE WETLAND RESTORATION AREA'S SURFACE. THE NATURAL DEBRIS SHOULD BE OF VARYING SIZES AND IN VARYING DEGREES OF DECOMPOSITION.
17. THE EROSION CONTROL BARRIERS WILL BE DISASSEMBLED AND PROPERLY DISPOSED OF NO LATER THAN 30 DAYS FOLLOWING PERMANENT STABILIZATION OF EXPOSED SOILS BY THE PLANTED MATERIALS. SEDIMENT COLLECTED BY THESE DEVICES WILL BE REMOVED AND DISPOSED OF IN A MANNER THAT PREVENTS EROSION AND TRANSPORT TO A WATERWAY OR WETLAND. IF MINOR GRADING IS REQUIRED IN THIS ZONE TO PROVIDE SURFACE HYDROLOGIC CONNECTION BETWEEN THE AREAS, IT WILL BE DONE BY HAND AND STABILIZED WITH MULCH.

POST-CONSTRUCTION MONITORING REQUIREMENTS

1. IN ACCORDANCE WITH THE CONNECTICUT SITING COUNCIL'S PETITION NO. 1121 DECISION, ISSUED DECEMBER 29, 2014, THE WETLAND RESTORATION AREA SHALL BE MONITORED BY THE PROJECT WETLAND MONITOR DURING CONSTRUCTION AND FOR A PERIOD OF AT LEAST THREE AND UP TO FIVE GROWING SEASONS FOLLOWING CONSTRUCTION.
2. THE PROJECT WETLAND MONITOR WITH EXPERIENCE IN WETLAND RESTORATION WILL PERFORM POST CONSTRUCTION MONITORING OF THE WETLAND RESTORATION AREA. DEAN GUSTAFSON, SENIOR WETLAND SCIENTIST AT ALL-POINTS TECHNOLOGY CORPORATION, P.C. ('APT') WILL SERVE AS THE PROJECT WETLAND MONITOR FOR THIS PROJECT TO ENSURE COMPLIANCE WITH THE CONNECTICUT SITING COUNCIL'S DECISION FOR RESTORATION OF THE WETLAND AREA. MR. GUSTAFSON CAN BE REACHED BY PHONE AT (860) 663-1697 EXT. 201 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.
3. POST CONSTRUCTION INSPECTIONS OF THE WETLAND RESTORATION AREA WILL BE PERFORMED BY THE PROJECT WETLAND MONITOR TWICE EACH YEAR: LATE SPRING/EARLY SUMMER AND LATE SUMMER/EARLY FALL FOR A PERIOD OF AT LEAST THREE (3) YEARS AND UP TO FIVE (5) YEARS IF NECESSARY. THE WETLAND RESTORATION AREA WILL BE INSPECTED GENERALLY IN ACCORDANCE WITH THE CORPS' MITIGATION GUIDANCE TO ASSESS THE GENERAL HEALTH OF PLANTINGS, SOIL STABILIZATION AND PRESENCE OF INVASIVE PLANTS. INVASIVE PLANTS WILL INCLUDE SUCH SPECIES AS NOTED IN APPENDIX D OF THE CORPS' MITIGATION GUIDANCE WITH A PARTICULAR FOCUS ON COMMON REED (PHRAGMITES AUSTRALIS) WHICH CURRENTLY DOMINATES THE WETLAND RESTORATION AREA. SHOULD THE WETLAND RESTORATION AREA NOT SATISFY THE THREE SUCCESS STANDARDS IDENTIFIED BELOW AFTER THE THIRD YEAR, MONITORING SHALL CONTINUE TO A FOURTH, AND POSSIBLY A FIFTH, YEAR UNTIL SUCCESS STANDARDS HAVE BEEN ATTAINED.
4. MONITORING REPORTS GENERALLY FOLLOWING THE CORPS' MITIGATION GUIDANCE FORMAT WILL BE SUBMITTED BY THE PROJECT WETLAND MONITOR TO THE CONNECTICUT SITING COUNCIL NO LATER THAN DECEMBER 15 OF EACH YEAR. THE REPORTS WILL PROVIDE DETAILS ON THE THREE SUCCESS STANDARDS DESCRIBED BELOW. IF THERE ARE PROBLEMS THAT NEED TO BE ADDRESSED AND IF THE MEASURES TO CORRECT THEM REQUIRE PRIOR APPROVAL FROM THE CONNECTICUT SITING COUNCIL, VERIZON WIRELESS WILL CONTACT THE COUNCIL AS SOON AS THE NEED FOR CORRECTIVE ACTION IS DISCOVERED.
5. THE WETLAND RESTORATION AREA WILL BE ASSESSED USING THREE SUCCESS STANDARDS, DESCRIBED AS FOLLOWS:
   - 5.1. AT LEAST 80% OF THE AERIAL SURFACE OF THE WETLAND RESTORATION AREA SHALL BE ESTABLISHED WITH NATIVE HYDROPHYTES
   - 5.2. CONTROL OF NON-NATIVE SPECIES WITH LESS THAN 10% TOTAL AERIAL COVERAGE BY END OF MONITORING PERIOD
   - 5.3. ALL SLOPES AND SOILS WITHIN AND ADJACENT TO THE EXTENDED DETENTION SHALLOW WETLAND BASINS ARE PERMANENTLY STABILIZED WITH VEGETATION AND ANY EROSION CONTROL BARRIERS REMOVED NO LATER THAN THE END OF THE THIRD GROWING SEASON.
6. WETLAND RESTORATION AS SET FORTH HEREIN WILL NOT BE CONSIDERED FULFILLED UNTIL MITIGATION SUCCESS HAS BEEN DEMONSTRATED THROUGH ATTAINMENT OF THE THREE (3) SUCCESS STANDARDS AND WRITTEN VERIFICATION FROM THE CONNECTICUT SITING COUNCIL HAS BEEN RECEIVED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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ASHFORD RELO., CT

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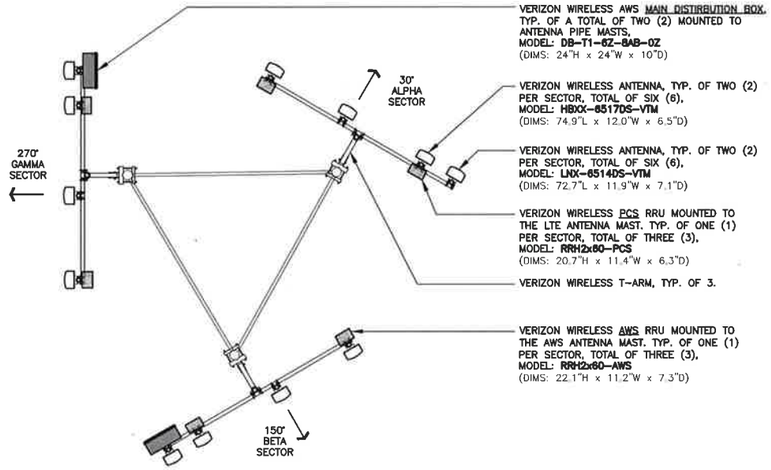
ASHFORD, CT 06278

DATE:	05/11/15
SCALE:	AS NOTED
JOB NO.	14124.000

WETLAND RESTORATION PLAN, DETAILS AND NOTES

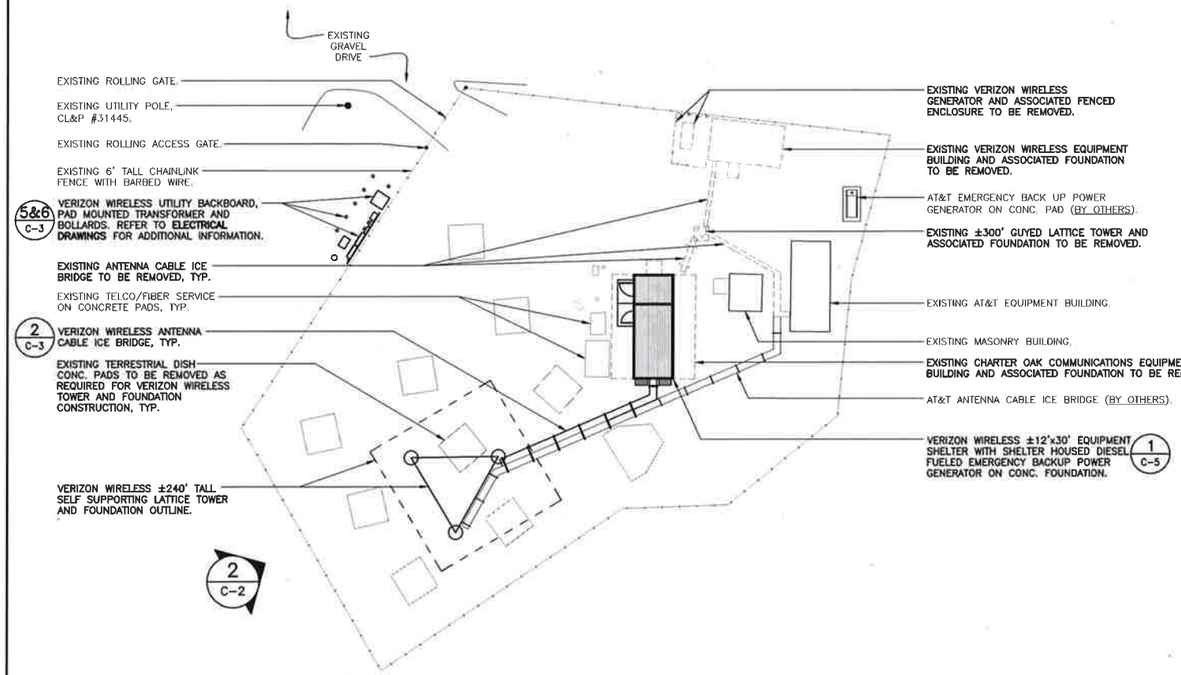
C-1.2

Sheet No. 5 of 24



3 C-2 **VERIZON WIRELESS ANTENNA MOUNTING CONFIGURATION**
SCALE: 1/4" = 1'-0"

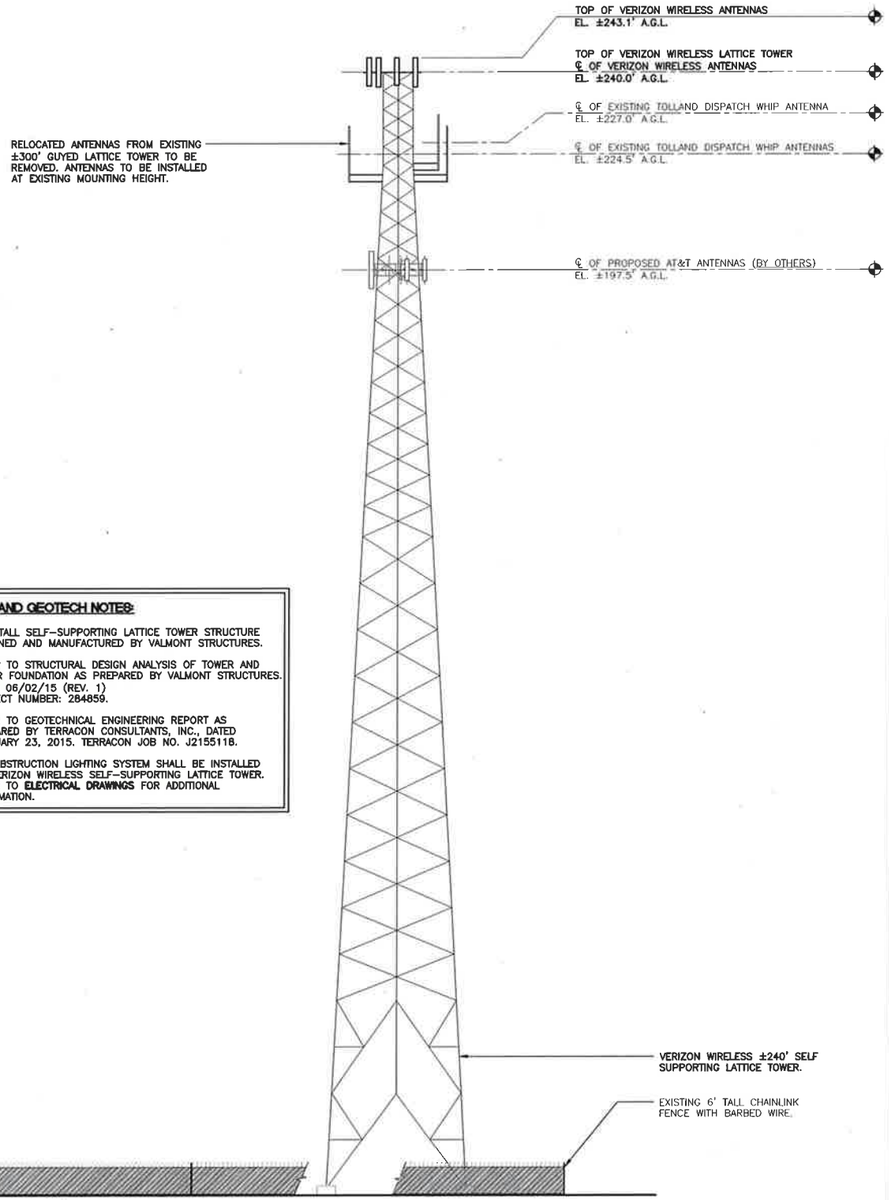
APPROXIMATE NORTH



1 C-2 **COMPOUND PLAN**
SCALE: 1" = 10'

APPROXIMATE NORTH

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



TOWER AND GEOTECH NOTES:

1. 240' TALL SELF-SUPPORTING LATTICE TOWER STRUCTURE DESIGNED AND MANUFACTURED BY VALMONT STRUCTURES.
2. REFER TO STRUCTURAL DESIGN ANALYSIS OF TOWER AND TOWER FOUNDATION AS PREPARED BY VALMONT STRUCTURES. DATED 06/02/15 (REV. 1) PROJECT NUMBER: 284859.
3. REFER TO GEOTECHNICAL ENGINEERING REPORT AS PREPARED BY TERRACON CONSULTANTS, INC., DATED FEBRUARY 23, 2015. TERRACON JOB NO. J2155118.
4. FAA OBSTRUCTION LIGHTING SYSTEM SHALL BE INSTALLED ON VERIZON WIRELESS SELF-SUPPORTING LATTICE TOWER. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.

2 C-2 **SOUTHWEST TOWER ELEVATION-PROPOSED**
SCALE: 1" = 15'

GRAPHIC SCALE
15 0 7.5 15 30 60
(IN FEET)
1 inch = 15 ft.

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0	07/09/15	HMR	DMD	ISSUED FOR CONSTRUCTION

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WIRELESS COMMUNICATIONS FACILITY

ASHFORD RELO., CT

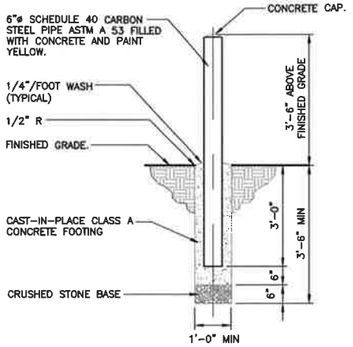
353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

DATE: 05/11/15
SCALE: AS NOTED
JOB NO. 14124.000

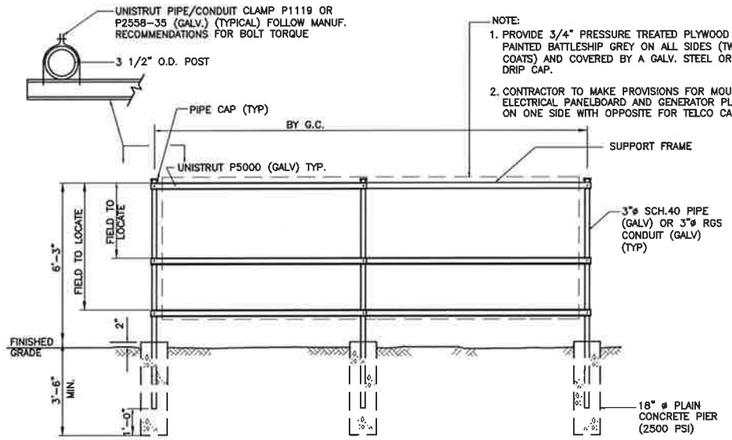
COMPOUND PLAN, ELEVATION AND ANTENNA MOUNTING CONFIGURATION

C-2

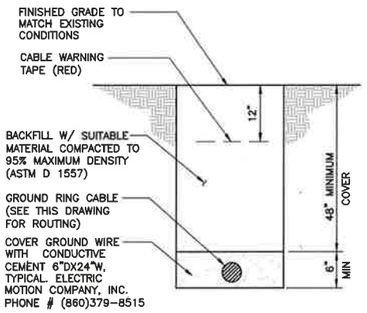
Sheet No. 6 of 24



6 C-3 **BOLLARD DETAIL**
NOT TO SCALE



5 C-3 **UTILITY SUPPORT FRAME (TYP)**
NOT TO SCALE



NOTES:
1. BACK FILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

4 C-3 **TYPICAL BURIAL GROUND CABLE DETAIL**
NOT TO SCALE

GENERAL CONSTRUCTION / PRE-CONSTRUCTION NOTES

1. PRIOR TO COMMENCEMNENT OF ANY CONSTRUCTION ACTIVITIES, A MANDITORY ON-SITE PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED WITH THE VERIZON WIRELESS CONSTRUCTION MANAGER, CONTRACTOR'S CONSTRUCTION MANAGER, THE PROJECT EROSION AND SEDIMENTATION CONTROL/ENVIRONMENTAL MONITOR AND THE ENGINEER OF RECORD.

GENERAL CONSTRUCTION SEQUENCE

THIS IS A GENERAL CONSTRUCTION SEQUENCE OUTLINE SOME ITEMS OF WHICH MAY NOT APPLY TO PARTICULAR SITES.

1. CUT AND STUMP AREAS OF PROPOSED CONSTRUCTION.
2. INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AS REQUIRED.
3. REMOVE AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE SEEDED TO PREVENT EROSION.
4. CONSTRUCT CLOSED DRAINAGE SYSTEM. PRECEPT CULVERT INLETS AND CATCH BASINS WITH SEDIMENTATION BARRIERS.
5. CONSTRUCT ROADWAYS AND PERFORM SITE GRADING, PLACING HAY BALES AND SILITATION FENCES AS REQUIRED TO CONTROL SOIL EROSION.
6. INSTALL UNDERGROUND UTILITIES.
7. BEGIN TEMPORARY AND PERMANENT SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED OR MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION. NO AREA SHALL BE LEFT UNSTABILIZED FOR A TIME PERIOD OF MORE THAN 30 DAYS.
8. DAILY, OR AS REQUIRED, CONSTRUCT, INSPECT, AND IF NECESSARY, RECONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND SEDIMENT TRAPS INCLUDING MULCHING AND SEEDING.
9. BEGIN EXCAVATION FOR AND CONSTRUCTION OF TOWERS AND PLATFORMS.
10. FINISH PAVING ALL ROADWAYS, DRIVES, AND PARKING AREAS.
11. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
12. NO FLOW SHALL BE DIVERTED TO ANY WETLANDS UNTIL A HEALTHY STAND OF GRASS HAS BEEN ESTABLISHED IN REGARDED AREAS.
13. AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

SOIL EROSION AND SEDIMENT CONTROL SEQUENCE

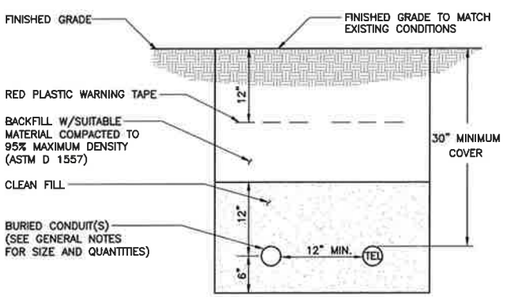
1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES, SUCH AS CONSTRUCTION ENTRANCE / ANTI TRACKING PAD, SILTATION FENCE, AND SILTATION FENCE / HAY BALE SHALL BE IN PLACE PRIOR TO ANY GRADING ACTIVITY. INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES. MEASURES SHALL BE LEFT IN PLACE AND MAINTAINED UNTIL CONSTRUCTION IS COMPLETED AND/OR AREA IS STABILIZED.
2. THE ENTRANCE TO THE PROJECT SITE IS TO BE PROTECTED BY STONE ANTI TRACKING PAD OF ASTM C-33, SIZE NO. 2 OR 3, OR D.O.T. 2" CRUSHED GRAVEL. THE STONE ANTI TRACKING PAD IS TO BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PERIOD.
3. LAND DISTURBANCE WILL BE KEPT TO A MINIMUM AND RESTABILIZATIONS WILL BE SCHEDULED AS SOON AS PRACTICAL.
4. ALL SOIL EROSION AND SEDIMENT CONTROL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL INCLUDING THE LATEST DATE FROM THE COUNCIL ON SOIL AND WATER CONSERVATION.
5. ANY ADDITIONAL EROSION/SEDIMENTATION CONTROL DEEMED NECESSARY BY TOWN STAFF DURING CONSTRUCTION, SHALL BE INSTALLED BY THE DEVELOPER. IN ADDITION, THE DEVELOPER SHALL BE RESPONSIBLE FOR THE REPAIR/REPLACEMENT/MAINTENANCE OF ALL EROSION CONTROL MEASURES UNTIL ALL DISTURBED AREAS ARE STABILIZED TO THE SATISFACTION OF THE TOWN STAFF.
6. IN ALL AREAS, REMOVAL OF TREES, BUSHES AND OTHER VEGETATION AS WELL AS DISTURBANCE OF THE SOIL IS TO BE KEPT TO AN ABSOLUTE MINIMUM WHILE ALLOWING PROPER DEVELOPMENT OF THE SITE. DURING CONSTRUCTION, EXPOSE AS SMALL AN AREA OF SOIL AS POSSIBLE FOR AS SHORT A TIME AS POSSIBLE.
7. SILTATION FENCE SHALL BE PLACED AS INDICATED BEFORE A CUT SLOPE HAS BEEN CREATED. SEDIMENT DEPOSITS SHOULD BE PERIODICALLY REMOVED FROM THE UPSTREAM SIDES OF SILTATION FENCE. THIS MATERIAL IS TO BE SPREAD AND STABILIZED IN AREAS NOT SUBJECT TO EROSION, OR TO BE USED IN AREAS WHICH ARE NOT TO BE PAVED OR BUILT ON. SILTATION FENCE IS TO BE REPLACED AS NECESSARY TO PROVIDE PROPER FILTERING ACTION. THE FENCE IS TO REMAIN IN PLACE AND BE MAINTAINED TO INSURE EFFICIENT SILTATION CONTROL UNTIL ALL AREAS ABOVE THE EROSION CHECKS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED.
8. SWALE DISCHARGE AREA WILL BE PROTECTED WITH RIP RAP SPLASH PAD/ ENERGY DISSIPATER.
9. ALL FILL AREAS SHALL BE COMPACTED SUFFICIENTLY FOR THEIR INTENDED PURPOSE AND AS REQUIRED TO REDUCE SLIPPING, EROSION OR EXCESS SATURATION.
10. THE SOIL SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBGRADE IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING.
11. AFTER CONSTRUCTION IS COMPLETE AND GROUND IS STABLE, REMOVE SILTS IN THE RIP RAP ENERGY DISSIPATERS. REMOVE OTHER EROSION AND SEDIMENT DEVICES.

CONSTRUCTION SPECIFICATIONS - SILT FENCE

1. THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.
2. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.
3. WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.
4. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MID-SECTION AND BOTTOM.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED.
6. FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG AND DRIVEN A MINIMUM OF 16 INCHES INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED TO PREVENT BUILD UP IN THE SILT FENCE DUE TO DEPOSITION OF SEDIMENT.

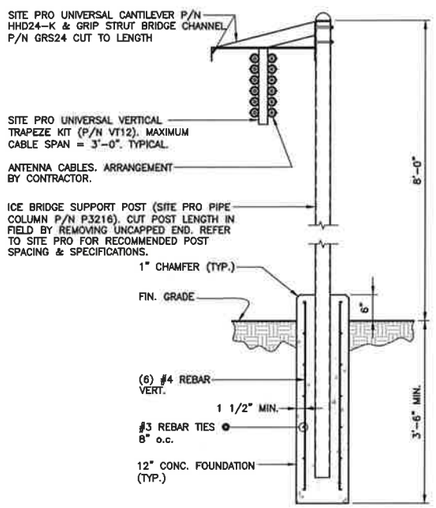
MAINTENANCE - SILT FENCE

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACHED APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

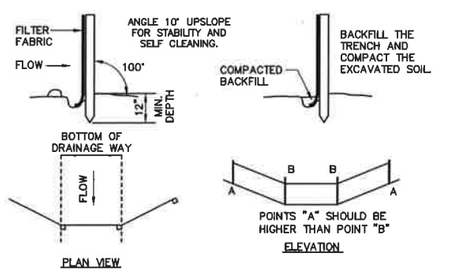


NOTES:
1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

3 C-3 **TYPICAL ELECTRICAL/TEL TRENCH DETAIL**
NOT TO SCALE



2 C-3 **ICE BRIDGE DETAIL**
NOT TO SCALE



SOURCE: U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, STORRS, CONNECTICUT

1 C-3 **PLACEMENT AND CONSTRUCTION OF SILTATION FENCE**
NOT TO SCALE

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SITE CONSTRUCTION, S&E CONTROL NOTES & DETAILS

C-3

Sheet No. 7 of 24

BUILDING FRAMING MATERIALS:

1. SILLS, BUCKS, BLOCKING, CURBING AT ROOF PENETRATIONS AND NAILERS FOR USE IN CONJUNCTION WITH WOOD CONSTRUCTION AND WHERE EXPOSED TO DAMPNESS: ANY SPECIES OF STRUCTURAL LUMBER, CONSTRUCTION GRADE, PRESSURE TREATED, MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION TT-W-571.
2. HEADERS, BEAMS, POSTS, AND OTHER STRUCTURAL SUPPORT MEMBERS: DOUGLAS FIR-LARCH NO. 2 GRADE OR BETTER (MIN Fb=1200 PSI).
3. STUDS, PLATES, AND OTHER LIGHT FRAMING IF USED: HEM-FIR NO. 2 GRADE OR BETTER (MIN. Fb= 1100 PSI).
4. BLOCKING, NAILERS, AND OTHER NON-STRUCTURAL USES: ANY SPECIES OF STRUCTURAL LUMBER, CONSTRUCTION GRADE OR BETTER.
5. SHEATHING PLYWOOD: C-C EXT-APA GROUP 1 WITH EXTERIOR GLUE, NO THINNER THAN 5/8".
6. BUILDING AIR INFILTRATION WRAP: 15 LB. ASPHALT-SATURATED FELT, ASTM D226, OR TYVEK.

INTERIOR FINISH SCHEDULE

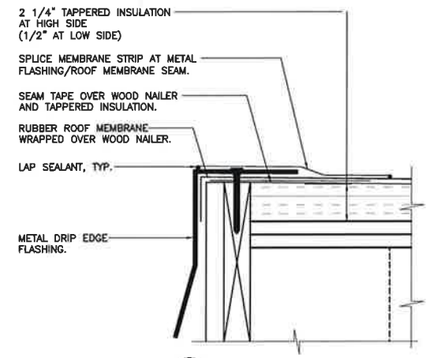
ROOM NAME	FLOORING	BASEBOARD	WALLS	CEILING
VERIZON EQUIPMENT ROOM	VCT OVER CONCRETE FLOOR SLAB SURFACE	4" VINYL BASE	1/8" FIBERGLASS REINF. PANEL OVER 1 LAYER 5/8" GWB OVER 1 LAYER 5/8" PLYWOOD (PLYWOOD TELCO BOARD TO BE PAINTED "GRAY")	1/8" FIBERGLASS REINF. PANEL OVER 1 LAYER 3/4" PLYWOOD
VERIZON WIRELESS GENERATOR ROOM	MARSEAL 400 FLOOR LINING SYSTEM AS MANUFACTURED BY MRC, INC. PREPARE FLOOR AND COAT IN STRICT ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. RETURN COATING A MINIMUM 8" ON ALL ADJOINING GENERATOR ROOM WALLS.	N/A	1/8" FIBERGLASS REINF. PANEL OVER 1 LAYER 5/8" GWB OVER 1 LAYER 5/8" PLYWOOD	1/8" FIBERGLASS REINF. PANEL OVER 1 LAYER 3/4" PLYWOOD

EXTERIOR FINISH SCHEDULE

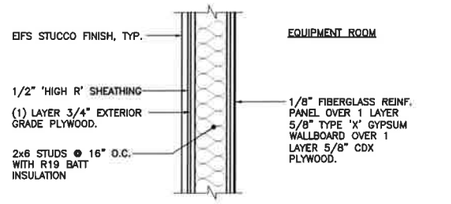
SIDING	TRIM	ROOFING
EIFS STUCCO FINISH COLOR: TO BE COORDINATED WITH CONSTRUCTION MANAGER AND BUILDING OWNER.	SOFFIT: ROYAL BUILDING PRODUCTS: ROYAL SOFFIT, TRADITIONAL SOFFIT, DOUBLE 4, 0.42 GAUGE EXTERIOR MOULDING AND TRIM: APEX ULTREX SIDING COMPONENTS. COORDINATE WITH SPECIFIED SIDING. COLOR: TO BE COORDINATED WITH CONSTRUCTION MANAGER AND BUILDING OWNER.	80 MIL. RUBBER ROOFING MEMBRANE. SEE DETAIL 2/C-4. COLOR: TO BE COORDINATED WITH CONSTRUCTION MANAGER AND BUILDING OWNER.

DOOR SCHEDULE

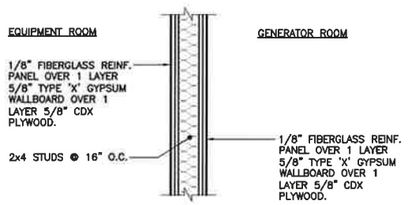
DOOR NO.	QTY.	DESCRIPTION	MANUF.	MODEL	HEIGHT	WIDTH	FINISH
001	1	FRAME	DE LA FONTAINE	SPLIT FRAME OPTION J7 (90 MIN. RATING)	7'-0"	3'-6"	PRIMED
	1	DOOR	DE LA FONTAINE	SERIES PA	7'-0"	3'-6"	PRIMED
	1.5	PAIR BUTT HINGES	HAGER	BB1199 4.5x4.5 NRP - STAINLESS STEEL	-	-	32D
	1	LOCKSET	PDQ	GT 115 PHL SFIC	-	-	26D
	1	CYLINDER	BEST ACCESS SYSTEMS	2 INTERCHANGEABLE	-	-	-
	1	DOOR CLOSER	HAGER	5200 MLT	-	-	686
	1	THRESHOLD	HAGER	412S	-	3'-6"	MIL
	1	AUTO DOOR BOTTOM	HAGER	747S	-	3'-6"	MIL
	1	WEATHERSTRIP SET	HAGER	870S	-	-	MIL
	1	LATCH PROTECTION	DON-JO	LP 211 SL	-	-	SILVER COATED
002	1	FRAME	DE LA FONTAINE	SPLIT FRAME OPTION J7 (90 MIN. RATING)	7'-0"	4'-0"	PRIMED
	1	DOOR	DE LA FONTAINE	SERIES PA	7'-0"	4'-0"	PRIMED
	1.5	PAIR BUTT HINGES	HAGER	BB1199 4.5x4.5 NRP - STAINLESS STEEL	-	-	32D
	1	LOCKSET	PDQ	GT 115 PHL SFIC	-	-	26D
	1	CYLINDER	BEST ACCESS SYSTEMS	2 INTERCHANGEABLE	-	-	-
	1	DOOR CLOSER	HAGER	5200 MLT	-	-	686
	1	THRESHOLD	HAGER	412S	-	4'-0"	MIL
	1	AUTO DOOR BOTTOM	HAGER	747S	-	4'-0"	MIL
	1	WEATHERSTRIP SET	HAGER	870S	-	-	MIL
	1	LATCH PROTECTION	DON-JO	LP 211 SL	-	-	SILVER COATED



2A / C-4 **SECTION**
SCALE: 3" = 1'-0"



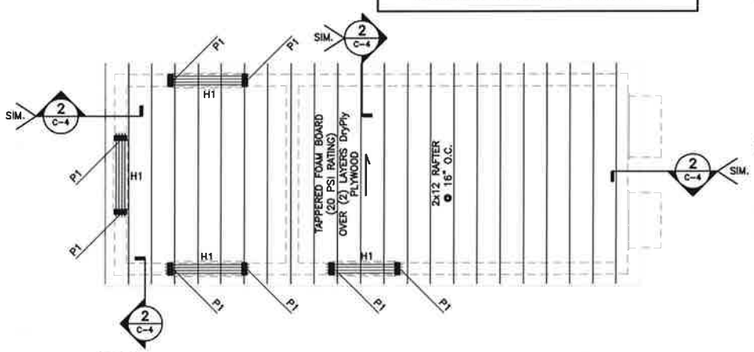
1 **EXTERIOR WALL TYPE**
SCALE: 1" = 1'-0"



2 **PARTITION WALL TYPE**
SCALE: 1" = 1'-0"

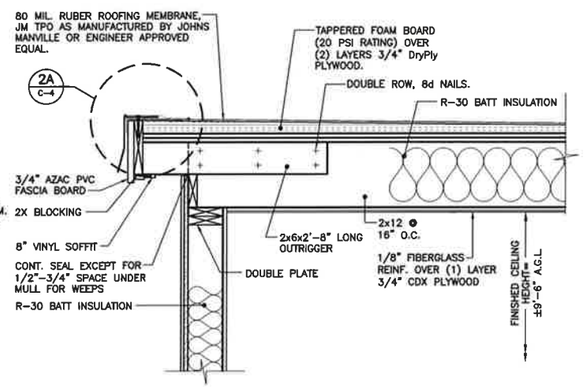
ROOF FRAMING PLAN NOTES:

1. H1 = (3) 2x8 D.F. #2 HEADER
2. P1 = (2) 2x6 D.F. #2 JACK STUDS
3. ⟶ INDICATES SLOPE OF TAPPERED FOAM BOARD.
4. REFER TO SHEET N-1 FOR STRUCTURAL LUMBER REQUIREMENTS AND ADDITIONAL INFORMATION.

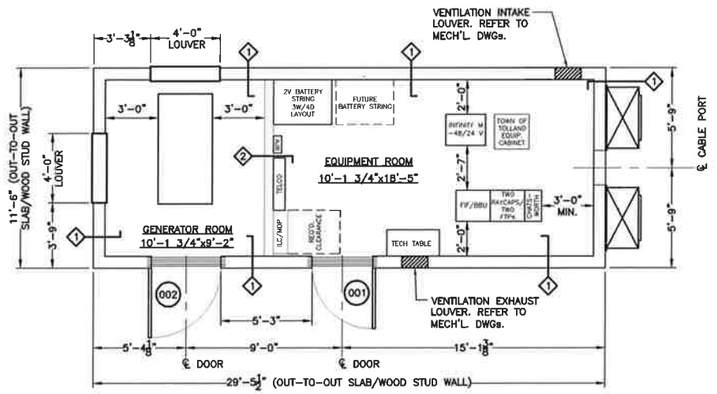


3 / C-4 **EQUIPMENT BUILDING ROOF FRAMING PLAN**
SCALE: 1/4" = 1'-0"

NORTH



2 / C-4 **SECTION**
SCALE: 1/2" = 1'-0"



1 / C-4 **EQUIPMENT BUILDING FLOOR PLAN**
SCALE: 1/4" = 1'-0"

NORTH

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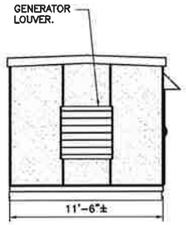
EQUIPMENT SHELTER PLANS AND DETAILS

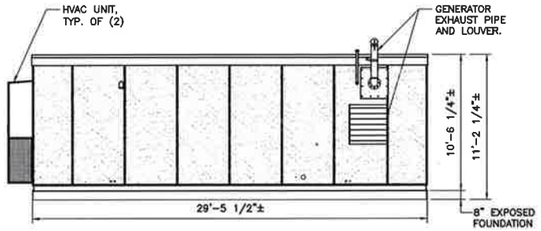
C-4

Sheet No. 8 of 24



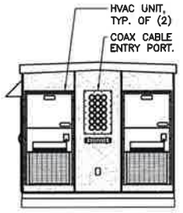
6 C-5 NORTHERN SHELTER ELEVATION

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



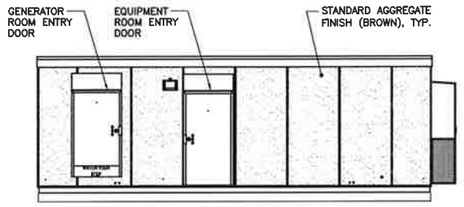
7 C-5 EASTERN SHELTER ELEVATION

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



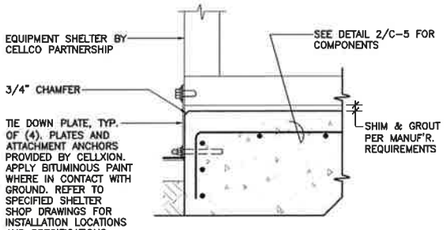
8 C-5 SOUTHERN SHELTER ELEVATION

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



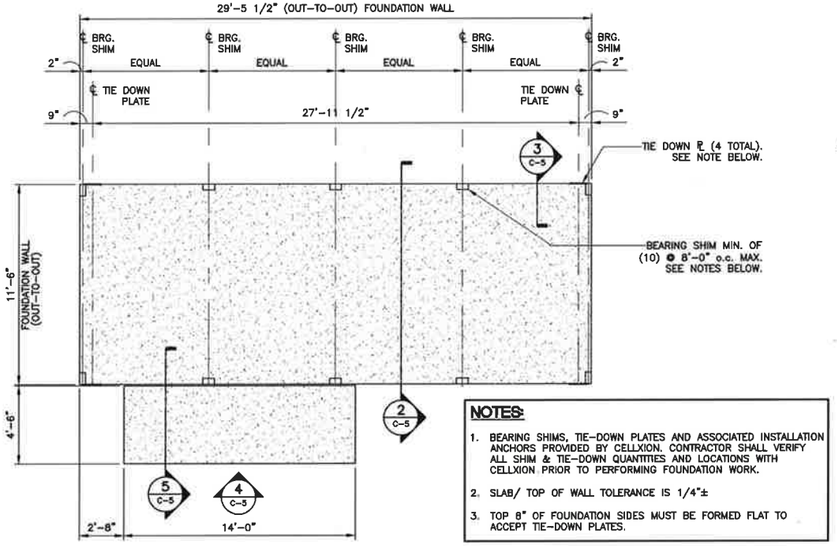
9 C-5 WESTERN SHELTER ELEVATION

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



3 C-5 BUILDING TIE DOWN

SCALE: 1"=1'-0"



1 C-5 FOUNDATION PLAN

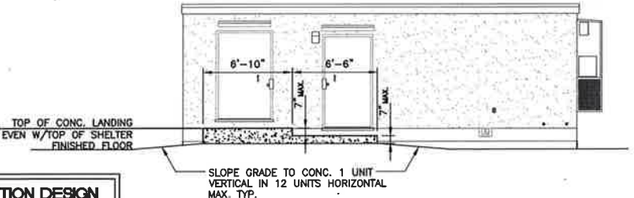
SCALE: 1/4"=1'-0"

APPROX. GRID NORTH

NOTES:

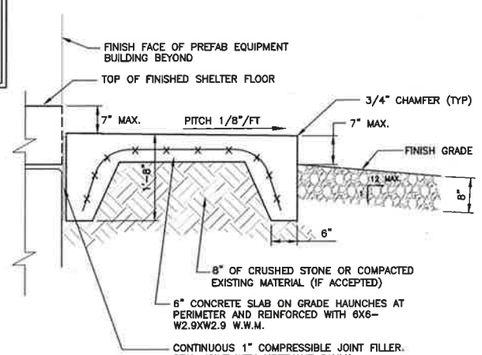
1. BEARING SHIMS, TIE-DOWN PLATES AND ASSOCIATED INSTALLATION ANCHORS PROVIDED BY CELLXION. CONTRACTOR SHALL VERIFY ALL SHIM & TIE-DOWN QUANTITIES AND LOCATIONS WITH CELLXION PRIOR TO PERFORMING FOUNDATION WORK.
2. SLAB/ TOP OF WALL TOLERANCE IS 1/4"±
3. TOP 8" OF FOUNDATION SIDES MUST BE FORMED FLAT TO ACCEPT TIE-DOWN PLATES.

SLAB ON GRADE FOUNDATION DESIGN CONFORMS TO THE REQUIREMENTS OF THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT STATE BUILDING CODE SUPPLEMENT SECTION 1805.2.1 'FROST PROTECTION' AND SEI/ASCE STANDARD 32-01 SECTION 7.1 'SLAB ON GRADE CONSTRUCTION'.



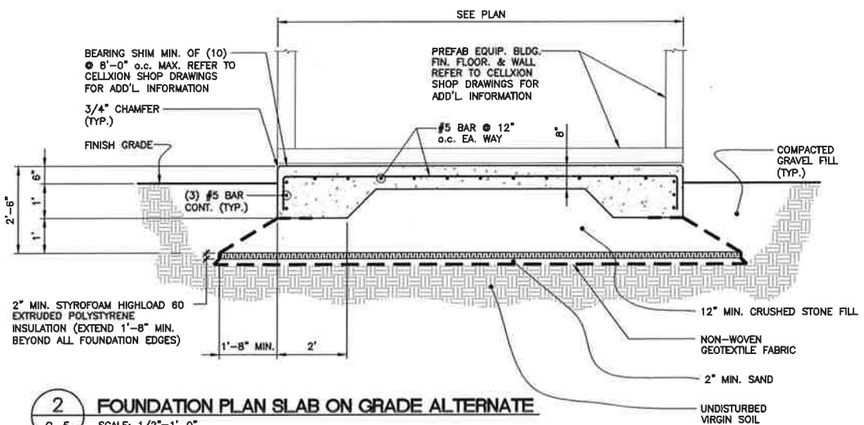
4 C-5 ENTRY STOOP DETAIL - ELEVATION

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



5 C-5 ENTRY STOOP DETAIL - SECTION

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



2 C-5 FOUNDATION PLAN SLAB ON GRADE ALTERNATE

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

FOUNDATION NOTES:

1. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
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.

COMPACTED GRAVEL FILL:

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. GRAVEL SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE M.02.02 OF THE CONNECTICUT D.O.T. STANDARD SPECIFICATIONS. ADMIXTURES AND SURFACE PROTECTIVE MATERIALS USED TO PREVENT THE GRAVEL FROM FREEZING MUST MEET THE APPROVAL OF THE ENGINEER. THE LARGEST STONE SIZE SHALL BE 3-1/2 INCHES.
3. SAMPLES OF THE MATERIAL TO BE USED SHALL BE DELIVERED TO THE JOB SITE 5 DAYS PRIOR TO ITS INTENDED USE SO IT MAY BE TESTED FOR APPROVAL.
4. AFTER ALL EXCAVATION HAS BEEN COMPLETED, GRAVEL SHALL BE DEPOSITED IN LAYERS NOT EXCEEDING EIGHT (8) INCHES IN DEPTH OVER THE AREAS. IN EXCEPTIONAL CASES, THE ENGINEER MAY PERMIT THE FIRST LAYER TO BE THICKER THAN EIGHT (8) INCHES. EACH LAYER SHALL BE LEVELED OFF BY SUITABLE EQUIPMENT. THE ENTIRE AREA OF EACH LAYER SHALL BE COMPACTED BY USE OF APPROVED VIBRATORY, PNEUMATIC-TIRED OR TREAD-TYPE COMPACTION EQUIPMENT. COMPACTION SHALL BE CONTINUED UNTIL THE DRY DENSITY OVER THE ENTIRE AREA OF EACH LAYER IS NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY ACHIEVED BY AASHTO T-99 METHOD C. THE MOISTURE CONTENT OF THE GRAVEL SHALL NOT VARY BY MORE THAN 3 %+ FROM ITS OPTIMUM MOISTURE CONTENT. NO SUBSEQUENT LAYER SHALL BE DEPOSITED UNTIL THE SPECIFIED COMPACTION IS ACHIEVED FOR THE PREVIOUS LAYER. IF NECESSARY TO OBTAIN THE REQUIRED COMPACTION, WATER SHALL BE ADDED AND GENTLE PUDDLING PERFORMED IF AUTHORIZED. COMPACTED GRAVEL FILL SHALL BE PREVENTED FROM FREEZING BY USE OF APPROVED ADMIXTURES OR BY USE OF APPROVED PROTECTIVE MATERIALS ON THE SURFACE, OR BOTH.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318.
2. ALL CONCRETE SHALL BE NORMAL WEIGHT, 6% AIR ENTRAINED WITH A MAXIMUM SLUMP OF 4", AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED BARS. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD UNLESS OTHERWISE INDICATED.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS OTHERWISE NOTED ON THE DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.

   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER.....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.

   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL.....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.
5. ALL EXPOSED EDGES OF CONCRETE TO RECEIVE A 3/4" CHAMFER IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. CONCRETE EQUIPMENT PAD TO RECEIVE A BRUSHED FINISH.
7. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT DURING DRILLING WITHOUT PRIOR REVIEW BY THE ENGINEER.

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SHELTER FOUND. PLAN, DETAILS, ELEVATIONS AND NOTES

C-5

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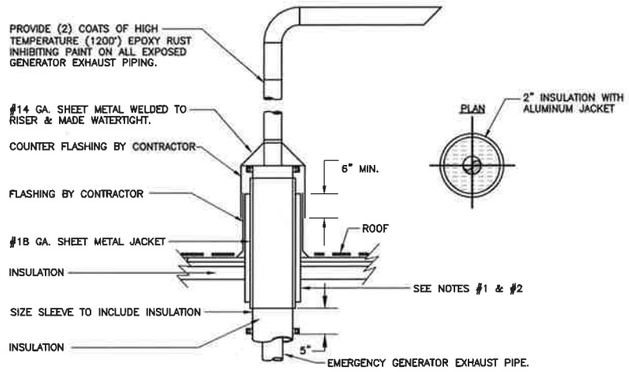
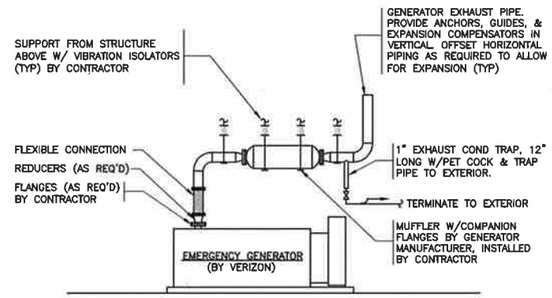
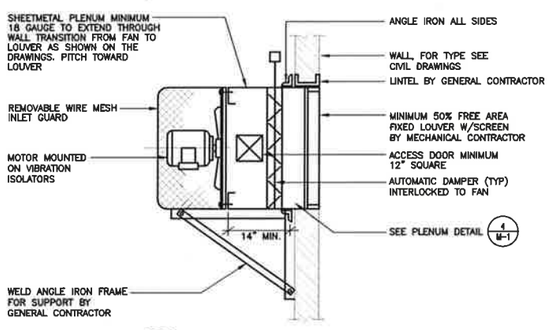


NOTES:
1. PACK ANNULAR OPENING IN SLEEVE W/FIRE RETARDANT ROPE.
2. RING PLATE WELDED TO SLEEVE AND FASTENED TO ROOF.
3. STACK SHALL BE LOCATED MIN. 30'-0" FROM ANY AIR INTAKE OR OPERABLE WINDOW

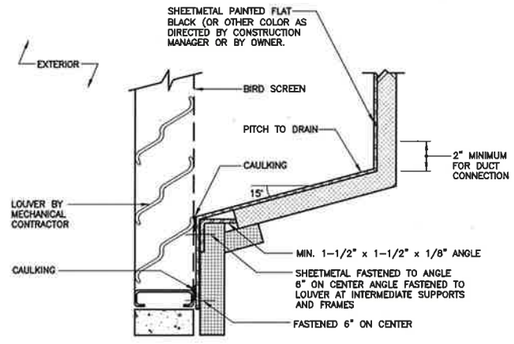
1 M-1 GENERATOR STACK DETAIL
N.T.S.



2 M-1 GENERATOR EXHAUST DETAIL
N.T.S.



3 M-1 PROPELLER FAN (EXHAUST)
N.T.S.



NOTES:
SUPPORT PLENUM FROM FLOOR OR STRUCTURE ABOVE W/GALVANIZED STEEL ANGLES AND CHANNELS.

4 M-1 PLENUM LOUVER CONNECTION
N.T.S.

HVAC DUCTWORK SYMBOLS

	DOUBLE LINE DUCTWORK
	FLEXIBLE DUCTWORK
	RECTANGULAR RETURN/EXHAUST DUCT RISER
	RECTANGULAR SUPPLY AIR GRILLE
	RECTANGULAR RETURN AIR GRILLE
T_R	REVERSE ACTING THERMOSTAT
T	THERMOSTAT
H	HYDROGEN DETECTOR
	EXHAUST FAN
	LOUVER
AD	MOTORIZED AUTOMATIC DAMPER
	LOCAL ALARM LIGHT

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	AHU	AIR HANDLING UNIT
BTU	BRITISH THERMAL UNIT	MBH	BTU PER HOUR (THOUSAND)
CFM	CUBIC FEET PER MINUTE	T	THERMOSTAT
EAT	ENTERING AIR TEMPERATURE	TYP	TYPICAL
EF-#	EXHAUST FAN	V	VOLTS
ESP	EXTERNAL STATIC PRESSURE	VEL	VELOCITY
FPM	FEET PER MINUTE	W	WATT
HP	HORSEPOWER	DB	DRY BULB
kW	KILOWATTS	WB	WET BULB
LAT	LEAVING AIR TEMPERATURE	CP	CONTROL PANEL
PH	PHASE	L-#	LOUVER
MIN.	MINIMUM	FC	FLEX CONNECTION
GA	GAUGE	WG	WATER COLUMN
COND	CONDENSATE	NOM	NOMINAL
REQ'D	REQUIRED	PD	PRESSURE DROP
N.T.S.	NOT TO SCALE	IN	INCH
HP	HORSEPOWER	SF	SQUARE FEET
		FT	FOOT

FAN SCHEDULE

SYMBOL	MAKE	MODEL NUMBER	CFM	ESP IN/WG	MOTOR DATA HP-VOLT-PH	DRIVE TYPE	REMARKS
EF-1	GREENHECK	SE1-12-432-E-1	383	.25	1/20-120-1	DIRECT	ALL

REMARKS:
1. PROVIDE SERVICE SWITCH.
2. PROVIDE MOTORIZED DAMPER.
3. POWER FED FROM INVERTOR CONNECTED TO EMERGENCY BATTERIES. COORDINATE WITH ELECTRICAL CONTRACTOR.
4. PROVIDE WALL MOUNT HOUSING, FAN GUARD, GRAVITY BACKDRAFT DAMPER.
5. COORDINATE SIZE WITH WALL OPENING.
6. COORDINATE LOCATION WITH OTHER TRADES

LOUVER SCHEDULE

SYMBOL	MAKE	MODEL NUMBER	CFM	VELOCITY FT/MIN	FREE AREA SF	NOM. WIDTH IN	NOM. HEIGHT IN	PD IN. WG	REMARKS
L-1,2	GREENHECK	ESD-603	383	472	.81	18	18	.04	ALL
L-3	GREENHECK	ESD-603	2460	378	7.8	48	48	.05	ALL
L-4	GREENHECK	ESD-603	2460	378	7.8	48	48	.05	ALL

REMARKS:
1. PROVIDE WITH BIRD SCREEN.
2. PROVIDE WITH EXTENDED SILL.
3. PROVIDE WITH BAKED ENAMEL FINISH. COLOR TO MATCH EXISTING BUILDING AND APPROVED BY OWNER.
4. COORDINATE ALL LOUVER SIZES IN FIELD PRIOR TO ORDERING OR INSTALLATION.

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MECH. NOTES SYMBOLS, DETAILS & SCHEDULES

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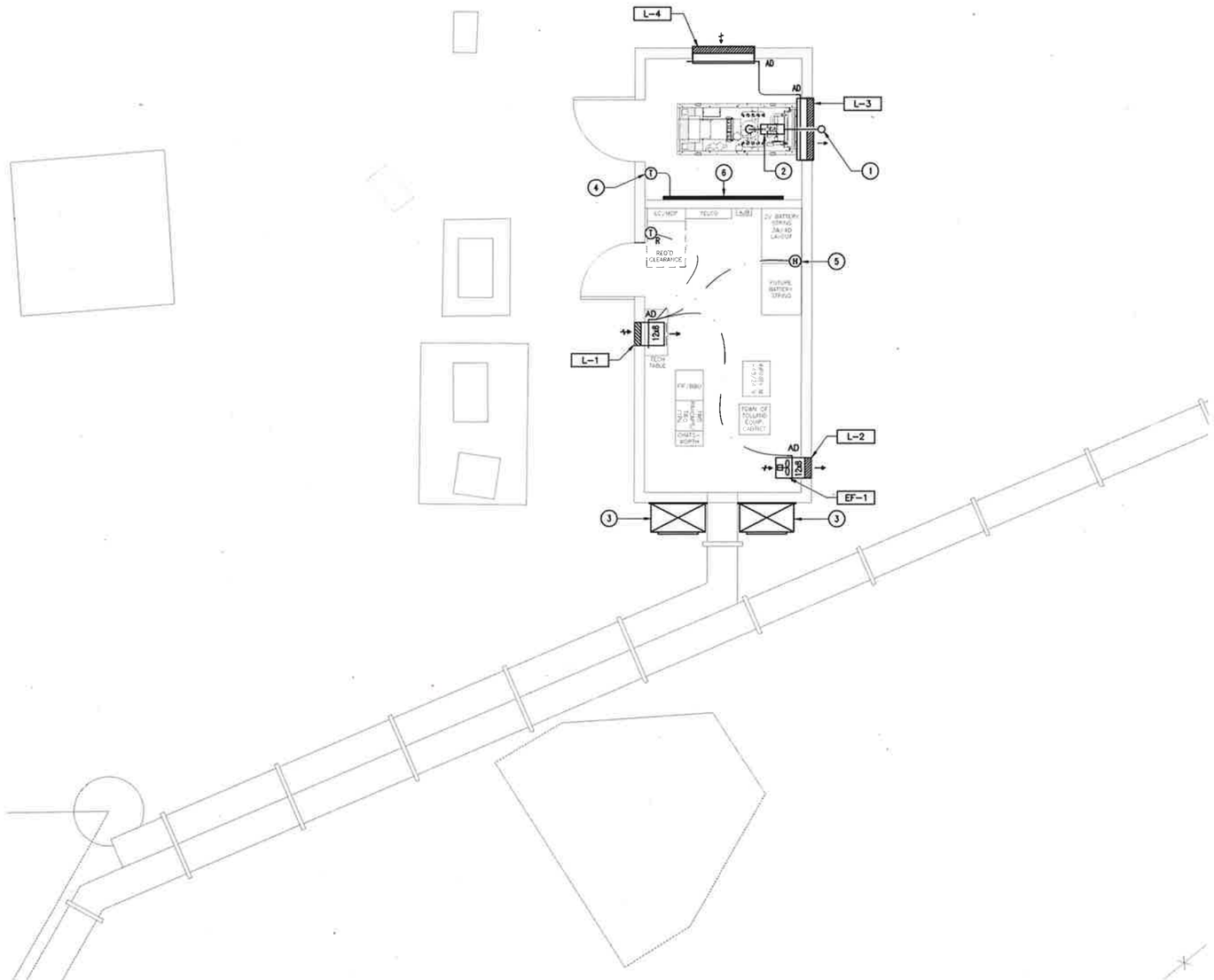
HVAC WORK NOTES

1. 2"ø SCHEDULE 40 EXHAUST PIPE THROUGH WALL AND UP. EXTEND EXHAUST PIPE 2'-0" VERTICALLY ABOVE STRUCTURE OR FIXED OBJECTS WITHIN 10'-0" HORIZONTAL OF PIPE. VERIFY IN FIELD.
2. EMERGENCY GENERATOR MUFFLER FURNISHED BY VERIZON AND INSTALLED BY CONTRACTOR. PROVIDE ALL REQUIRED HANGERS, VIBRATION ISOLATORS, RODS, SUPPLEMENTARY STEEL, ETC. TO HOUSE GENERATOR MUFFLER. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. REFER TO DETAILS 1/M-1 AND 2/M-1.
3. 5 TON WALL MOUNT AIR CONDITIONER EQUAL TO BARD MODEL W61A1. PROVIDE WITH 5KW HEAT, ECONOMIZER, LOW AMBIENT CONTROL, AND LEAD/LAG CONTROLLER WITH INTEGRAL THERMOSTAT.
4. REVERSE ACTING THERMOSTAT INTERLOCKED WITH EF-1.
5. PROVIDE HYDROGEN DETECTOR AND INTERLOCK WITH EF-1. INTERNAL RELAY SHALL ACTIVATE EXHAUST FAN WHEN HYDROGEN LEVEL IN SPACE REACHES 1% BY VOLUME (ADJUSTABLE).
6. HYDRONIC ELECTRIC HEATER EQUAL TO DAYTON 3UG29, 5118 BTUH, 240V/1PH, 1500 WATTS, 7.2 AMPS. PROVIDE WITH REMOTE THERMOSTAT.



1 / M-2 MECHANICAL - GENERATOR / EQUIPMENT ROOM PLAN
SCALE: 1/4"=1'-0"

APPROXIMATE NORTH

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

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MECHANICAL PLAN & NOTES

M-2

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MECHANICAL SPECIFICATIONS

SCOPE

THE WORK TO BE DONE UNDER THIS DIVISION OF THE SPECIFICATIONS INCLUDE THE FURNISHING OF ALL EQUIPMENT, SUPPLIES, LABOR, SUPERVISION AND ALL MATERIALS NOT SPECIFICALLY MENTIONED, READY FOR USE, PLUMBING, SPRINKLER, HEATING, VENTILATION, AIR CONDITIONING EQUIPMENT AND ASSOCIATED ITEMS AND ALL TEMPERATURE CONTROL OR EMS COMPONENTS. IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO CALL FOR FINISHED WORK, TESTED AND READY FOR OPERATION.

IT IS THE INTENT THAT ALL MECHANICAL WORK AND MATERIALS NECESSARY TO COMPLETE THE ENTIRE PROJECT IN ACCORDANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS, WHERE SPECIFICALLY MENTIONED HERE OR NOT, SHALL BE FURNISHED. ALL WORK AND MATERIALS NECESSARY TO FULFILL THIS INTENT SHALL BE SUPPLIED UNDER THE MECHANICAL SPECIFICATIONS WITHOUT ADDITIONAL COST TO THE OWNER.

CODES, RULES, PERMITS AND FEES

THIS CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS AND PAY ALL STATE AND LOCAL TAXES, FEES AND OTHER COSTS IN CONNECTION WITH HIS WORK; FILE ALL NECESSARY PLANS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL STATE AND LOCAL DEPARTMENTS HAVING JURISDICTION; OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HIS WORK AND DELIVERY OF SAME TO THE OWNER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.

THIS CONTRACTOR SHALL INCLUDE IN THE WORK, WITHOUT EXTRA COST TO THE OWNER, ANY LABOR, MATERIALS, SERVICES, APPARATUS, DRAWINGS (IN ADDITION TO CONTRACT DRAWINGS AND DOCUMENTS), IN ORDER TO COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES AND REGULATIONS WHETHER OR NOT SHOWN ON THE DRAWINGS AND/OR SPECIFIED.

THIS CONTRACTOR SHALL PERFORM AND FILE ALL TESTS IN ACCORDANCE WITH CURRENT REGULATIONS OF THE STATE AND LOCAL AUTHORITIES. HE SHALL FURNISH AND INSTALL SIGNS REQUIRED BY THE STATE AND LOCAL AUTHORITIES.

ALL MATERIALS FURNISHED AND ALL WORK INSTALLED SHALL COMPLY WITH THE RULES AND RECOMMENDATIONS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS, WITH ALL REQUIREMENTS OF LOCAL UTILITIES COMPANIES, WITH THE RECOMMENDATIONS OF THE FIRE INSURANCE RATING ORGANIZATION HAVING JURISDICTION.

REGULATIONS

ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH STATE BUILDING CODE, IBC 2003, STATE FIRE SAFETY CODE, A.D.A., U.L., NEMA, O.S.H.A., NATIONAL PLUMBING CODE AND NFPA, WITH ALL REQUIREMENTS OF ALL GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION. REQUIREMENTS OF THE ABOVE SHALL TAKE PRECEDENCE OVER PLANS AND SPECIFICATIONS.

GUARANTEE AND SERVICE

THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OF THE INSTALLATION. IN ADDITION, THE CONTRACTOR SHALL PROVIDE, FREE OF CHARGE, ONE YEAR'S MAINTENANCE GUARANTEE OF MAINTAINED SERVICE AND ADJUSTMENT OF ALL EQUIPMENT IN THIS CONTRACT.

DRAWINGS AND INTENT

DRAWINGS ARE INTENDED AS WORKING DRAWINGS FOR GENERAL LAYOUT OF THE VARIOUS ITEMS OF EQUIPMENT. HOWEVER, LAYOUT OF EQUIPMENT, ACCESSORIES, SPECIALTIES, AND PIPING SYSTEMS ARE DIAGRAMMATIC UNLESS SPECIFICALLY DIMENSIONED, AND DO NOT NECESSARILY INDICATE EVERY REQUIRED PIPE, VALVE, FITTINGS, TRAP, ELBOW, TRANSITION, OFFSETS, JUNCTION OR PULLBOX, OR SIMILAR ITEMS REQUIRED FOR A COMPLETE INSTALLATION.

WORK NOT INCLUDED

ALL ELECTRICAL WORK, CUTTING AND PATCHING, PIERS, LINTELS, ALL CONCRETE WORK AND ALL PAINTING.

THIS CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH THE SIZES AND LOCATIONS OF CHASES AND OPENINGS WHICH OCCUR IN WALLS, PARTITIONS, FLOORS, ETC., REQUIRED FOR THE INSTALLATION OF THE WORK CALLED FOR UNDER THIS CONTRACT, WILL BE DONE BY THE GENERAL CONTRACTOR, EXCEPT CUTTING REQUIRED FOR THE INSTALLATION OF HANGERS.

MEASUREMENTS

ALL MEASUREMENTS TAKEN AT THE BUILDING SHALL TAKE PRECEDENCE OVER SCALE DIMENSIONS. EVERY PART OF THE PLANS SHALL BE FITTED TO THE ACTUAL CONDITIONS AT THE BUILDING. IF IN CONFLICT WITH SCALE DIMENSIONS, CONTACT CONSTRUCTION MANAGER & ENGINEER FOR CLARIFICATION.

INTERRUPTION OF EXISTING SERVICES

PRIOR TO PERFORMING WORK REQUIRING INTERRUPTION OF EXISTING SERVICES, THE CONTRACTOR SHALL SECURE FROM THE OWNER, APPROVAL OF THE PROPOSED OPERATION. (72 HOURS IN ADVANCE WHENEVER POSSIBLE).

WORK SHALL BE ARRANGED FOR CONTINUOUS PERFORMANCE WHENEVER POSSIBLE. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR, INCLUDING OVERTIME, IF REQUIRED, TO ASSURE THAT EXISTING OPERATING SERVICES WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE NECESSARY CONNECTIONS.

PROTECTION OF FIXTURES, MATERIALS AND EQUIPMENT

CLOSE PIPE OPENINGS WITH CAPS OR PLUGS DURING INSTALLATION. TIGHTLY COVER AND PROTECT FIXTURES AND EQUIPMENT AGAINST DIRT, WATER AND CHEMICAL OR MECHANICAL INJURY. AT COMPLETION OF ALL WORK, FIXTURES, EXPOSED MATERIALS AND EQUIPMENT SHALL BE THOROUGHLY CLEANED.

DEMOLITION

CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, ETC., REQUIRED TO COMPLETE ALL DEMOLITION WORK NECESSARY FOR THE FULL COMPLETION OF THIS CONTRACT. PROTECT ALL PARTS AND EQUIPMENT THAT ARE TO REMAIN. ASSUME FULL RESPONSIBILITY FOR DAMAGE.

ALL ITEMS BEING REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS OTHERWISE INDICATED BY THE OWNER. EQUIPMENT AND DEVICES THE OWNER DOES NOT WISH TO RETAIN SHALL BECOME THE PROPERTY OF THIS CONTRACTOR AND REMOVED FROM THE SITE. ALL MATERIAL CHOSEN TO BE RETAINED BY THE OWNER SHALL BE DELIVERED BY THE CONTRACTOR TO SUCH POINT AS DESIGNATED BY THE OWNER.

EXAMINATION OF PREMISES – SPECIAL NOTE

NO CONSIDERATION OR ALLOWANCE WILL BE GRANTED FOR FAILURE TO VISIT SITE, OR FOR ANY ALLEGED MISUNDERSTANDING OF MATERIALS TO BE FURNISHED, OR WORK TO BE DONE; IT BEING THAT TENDER OF PROPOSAL INDICATED WITH IT AGREEMENT TO ITEMS AND CONDITIONS REFERRED TO HEREIN OR INDICATED ON AFOREMENTIONED DRAWINGS.

SCAFFOLDING, RIGGING AND HOISTING

UNLESS OTHERWISE SPECIFIED, CONTRACTOR SHALL FURNISH ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES OF ANY EQUIPMENT AND APPARATUS FURNISHED. REMOVE SAME FROM THE PREMISES WHEN NO LONGER REQUIRED.

HOUSEKEEPING

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING STOCK OF MATERIALS AND EQUIPMENT STORED ON PREMISES IN A NEAT AND ORDERLY MANNER AND, AT ALL TIMES, KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH CAUSED BY HIS EMPLOYEES AT WORK. HE SHALL REMOVE HIS RUBBISH AND SURPLUS MATERIALS FROM THE JOB SITE AND SHALL LEAVE THE PREMISES AND HIS WORK IN A CLEAN AND PERFECT CONDITION.

QUIET OPERATION

ALL WORK SHALL OPERATE UNDER ALL CONDITIONS OF LOAD WITHOUT ANY SOUND OR VIBRATION WHICH IS OBJECTIONABLE IN THE OPINION OF THE CONSTRUCTION MANAGER. IN CASE OF MOVING MACHINERY, SOUND OR VIBRATION NOTICEABLE OUTSIDE OF ROOM IN WHICH IT IS INSTALLED, OR ANNOYING INSIDE ITS OWN ROOM, WILL BE CONSIDERED OBJECTIONABLE BY THE CONSTRUCTION MANAGER AND SHALL BE REMEDIED IN APPROVED MANNER BY CONTRACTOR AT HIS EXPENSE.

SHOP DRAWINGS

PRIOR TO DELIVERY TO JOB SITE, BUT SUFFICIENTLY IN ADVANCE OF REQUIREMENTS NECESSARY TO ALLOW CONSTRUCTION MANAGER AMPLE TIME FOR REVIEW, CONTRACTOR SHALL SUBMIT FOR APPROVAL, SEVEN (7) COPIES EACH OF SHOP DRAWINGS OF ALL EQUIPMENT. ALSO, SHEET METAL FABRICATION DRAWINGS DRAWN TO A SCALE OF 1/4" TO THE FOOT OR LARGER.

ADJACENT TENANTS

WORK IN ADJACENT OCCUPIED TENANT SPACES SHALL NOT BE SCHEDULED DURING NORMAL WORK HOURS.

EQUIPMENT DEVIATION

THE PLANS AND/OR SPECIFICATIONS INDICATE THE NAME, MODEL NUMBER OR TYPE OF EQUIPMENT OR MATERIALS SPECIFIED. SHOULD THE BIDDER DESIRE TO USE EQUIPMENT OR MATERIALS OR A MAKE OTHER THAN THOSE SPECIFIED OR SHOWN, HE SHALL ATTACH A RIDER TO THE BID FORM LISTING THE DEDUCTIONS AND/OR ADDITIONS TO HIS BASE BID, TOGETHER WITH THE MANUFACTURER'S NAME AND MODEL NUMBERS OF THE EQUIPMENT OR MATERIALS HE PROPOSED TO FURNISH AS "SUBSTITUTES". IF NO SUBSTITUTE INFORMATION IS FURNISHED, IT WILL BE EXPRESSLY UNDERSTOOD THAT ALL EQUIPMENT AND MATERIALS NAMED WILL BE FURNISHED IN FULL ACCORDANCE WITH THE PLANS AND/OR SPECIFICATIONS.

CORE DRILLING/WATERPROOFING

ALL CORE DRILLING REQUIRED SHALL BE DONE BY GENERAL CONTRACTOR. ALL ROOF PENETRATIONS, FLASHING AND WATER PROOFING SHALL BE DONE BY GENERAL CONTRACTOR, WORK SHALL BE PERFORMED BY AN APPLICATOR CERTIFIED BY THE EXISTING ROOF SYSTEM MANUFACTURER.

RECORD DRAWINGS

CONTRACTOR SHALL KEEP ACCURATE RECORD OF ALL DEVIATIONS IN WORK AS ACTUALLY INSTALLED FROM WORK INDICATED PAYING PARTICULAR ATTENTION TO DIMENSIONING OUTSIDE UNDERGROUND UTILITY LINES, THEIR OFFSETS AND VALUES.

OWNER'S INSTRUCTIONS AND SYSTEM OPERATION

AT THE TIME OF THE JOB'S ACCEPTANCE BY OWNER, CONTRACTOR SHALL FURNISH ONE COMPLETE SET OF APPROVED CERTIFIED DRAWINGS TO THE OWNER. IN ADDITION, CONTRACTOR SHALL FURNISH MAINTENANCE AND OPERATING INSTRUCTIONS FOR ALL EQUIPMENT. THESE INSTRUCTIONS SHALL BE WRITTEN IN LAYMAN'S LANGUAGE AND SHALL BE INSERTED IN VINYL-COVERED THREE-RING LOOSE LEAF BINDER. THIS INFORMATION IN BINDER SHALL BE FIRST SENT TO AND APPROVED BY THE CONSTRUCTION MANAGER BEFORE TURNING OVER TO OWNER.

SEISMIC RESTRAINTS

SEISMIC RESTRAINTS DESIGNED AND CONSTRUCTED FOR LATERAL FORCES IN ANY DIRECTION SHALL BE PROVIDED FOR ALL MECHANICAL EQUIPMENT AND PIPING IN ACCORDANCE WITH THE STATE BUILDING CODE. SUBMIT SEISMIC RESTRAINT DESIGN AND CALCULATIONS STAMPED BY A CONNECTICUT LICENSED STRUCTURAL ENGINEER.

TESTS

THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, DURING THE PROGRESS OF THE WORK OR UPON ITS COMPLETION AS ORDERED, MAKE SUCH TESTS OF HIS WORK AS ARE HEREIN SPECIFIED OR AS ARE REQUIRED BY AND IN THE PRESENCE OF THE BUILDING INSPECTOR. IF SO DIRECTED, TESTS SHALL BE MADE OF SECTIONS FOR THE WORK SO AS NOT TO DELAY THE WORK OR OTHER TRADES.

THE CONTRACTOR SHALL PROVIDE ALL APPARATUS, TEMPORARY WORK OR ANY OTHER REQUIREMENTS NECESSARY FOR SUCH TESTS. HE SHALL TAKE ALL DUE PRECAUTIONS TO PREVENT DAMAGE TO THE BUILDING OR ITS CONTENTS THAT MAY BE INCURRED BY SUCH TESTS AS HE WILL BE REQUIRED TO REPAIR AND MAKE GOOD, AT HIS OWN EXPENSE, ANY DAMAGE CAUSED.

ANY DEFECTS OR DEFICIENCIES DISCOVERED AS A RESULT OF TESTS SHALL BE IMMEDIATELY REPAIRED AND TESTS SHALL BE REPEATED UNTIL THE TEST REQUIREMENTS ARE FULLY COMPLIED WITH.

TESTS SHALL BE PERFORMED IN THE PRESENCE OF AND TO THE SATISFACTION OF THE ENGINEER, AND LOCAL DEPARTMENT REPRESENTATIVES.

THE CONTRACTOR SHALL NOTIFY THE ARCHITECT TWO DAYS IN ADVANCE OF RUNNING TESTS TO ALLOW THEIR REPRESENTATIVE TO BE PRESENT TO WITNESS TESTS. NOTIFICATION TO BE IN WRITING.

HANGER AND SUPPORTING

HANGING AND SUPPORTING – PIPING SHALL NOT BE SUPPORTED BY OTHER PIPING, BUT SHALL BE SUPPORTED WITH COPPER PIPE HANGERS SUITABLE FOR THE SIZE OF PIPE AND PROPER STRENGTH AND QUALITY AT PROPER INTERVALS SO THAT PIPING CANNOT BE MOVED ACCIDENTALLY FROM THE INSTALLED POSITION. REFER TO DETAIL SHEET.

SEQUENCE OF OPERATION

PROVIDE ALL CONTROLS, LOW VOLTAGE CONTROL WIRING AND ACCESSORIES NECESSARY TO ACCOMPLISH THE SEQUENCE OF OPERATION AS INDICATED BELOW. POWER WIRING SHALL BE PROVIDED IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS. COORDINATE WITH ELECTRICAL CONTRACTOR.

EF-1 EXHAUST FAN

EXHAUST FAN SHALL BE ACTIVATED BY HYDROGEN DETECTOR AND REVERSE ACTING T-STAT.

INTERLOCK AUTOMATIC INTAKE AND EXHAUST DAMPERS WITH EXHAUST FAN MOTOR.

REVERSE ACTING THERMOSTAT SHALL ENERGIZE EXHAUST FAN AT A PRESET TEMPERATURE OF 78°F (ADJUSTABLE).

EXHAUST FAN SHALL BE INTERLOCKED WITH HYDROGEN DETECTOR. HYDROGEN DETECTOR RELAY SHALL ACTIVATE EXHAUST FAN WHEN HYDROGEN LEVEL REACHES 1% BY VOLUME.

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DATE: 05/11/15
SCALE: AS NOTED
JOB NO. 14124.000

MECHANICAL SPECIFICATIONS

M-3

LIGHT FIXTURE SCHEDULE

TYPE	MANUFACTURER CATALOG/MODEL No.	DESCRIPTION	LAMP	MOUNTING
A	DAY-BRITE #OWL-470L-840-UNIV	9" WIDE, SURFACE MOUNTED LED LIGHT FIXTURE WITH ACRYLIC PRISMATIC DIFFUSER, 4000K COLOR, UNIVERSAL VOLTAGE	73W LED	CEILING
B	LUMARK #LDWPFC4A120EDPE	EXTERIOR CUTOFF LED LUMINAIRE, DIE-CAST ALUMINUM HOUSING, BRONZE FINISH. IMPACT RESISTANT TEMPERED GLASS LENS, BUILT-IN PHOTO CONTROL	40W LED	WALL
E	SURE-LITES #CC3-NC-WH-SD	EMERGENCY LIGHT UNIT WITH 90 MINUTE NICKEL CADMIUM BATTERY & SELF-DIAGNOSTIC TESTING FEATURE	(2) 5.4W PAR36	WALL
E1	SURE-LITES #CC5-NC-WHSD WITH SURE-LITES #6T6DWWH REMOTE HEADS	EMERGENCY LIGHT UNIT WITH REMOTE WEATHERPROOF HEADS AND 90 MINUTE NICKEL CADMIUM BATTERY & SELF-DIAGNOSTIC TESTING FEATURE	(2) 5.4W PAR36 (2) 6 WATT HALOGEN	WALL

NOTES:
1. PROVIDE ALL THE NECESSARY ACCESSORIES AS REQUIRED TO MOUNT LIGHTING FIXTURES TO CEILING STRUCTURE AS REQUIRED.
2. EXTERIOR LIGHT SHALL BE CONNECTED TO 4HR TIMER SWITCH.

ELECTRICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
AIC	AMPERE INTERRUPTING CAPACITY
AWG	AMERICAN WIRE GAGE
C	CONDUIT
EGR	EXTERIOR GROUND RING
ETR	EXISTING TO REMAIN
G - GRD	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
IGR	INTERIOR GROUND RING MOUNTED 9'-0" ABOVE FINISHED FLOOR
KWH	KILO-WATT-HOUR
MCCB	MOLDED CASE CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
NC	NORMALLY CLOSED
OC	ON CENTER
SA	SURGE ARRESTOR
VM	VOLTAGE MONITOR
WP	WEATHERPROOF
ER	EXISTING TO REMAIN
RR	REMOVE AND RELOCATE
RE	RELOCATED EXISTING

VOLTAGE:	120/240	PHASE:	1	WIRE:	3	PANEL NO.		MDP	
MAIN BUS:	200	AMPS				TOTAL WATTS, L1		38,900	
MAIN BREAKER:	200	A FRAME	200	A TRIP		TOTAL WATTS, L2		38,240	LOC: EQUIPMENT ROOM
MOUNTING:	SURFACE					TOTAL WATTS		77,140	

NOTES:
A) PANEL SHALL BE GENERAC INTEGRATE LOAD CENTER. 200A, 120/240V, SINGLE-PHASE, DOUBLE TVSS.

B) BRANCH CIRCUIT BREAKER AND CONDUCTOR SIZE BASED ON SPECIFIC EQUIPMENT. CONFIRM ELECTRICAL REQUIREMENTS PRIOR TO INSTALLATION. COORDINATE WITH MECHANICAL CONTRACTOR AND USE HACR BREAKERS FOR HVAC

C) ALL BRANCH CIRCUITS SHALL BE ROUTED IN 4" X 4" WIREWAY TO THE FULLEST EXTENT POSSIBLE. CONNECTIONS FROM WIREWAY TO EQUIPMENT AND DEVICES SHALL BE IN GALVANIZED RIGID METAL CONDUIT INDICATED IN SCHEDULE BELOW.

D) INCREASE CONDUIT & CONDUCTOR SIZES AS REQUIRED TO MAINTAIN A MAXIMUM VOLTAGE DROP OF 2 % AND AS REQUIRED FOR AMBIENT TEMPERATURE CORRECTION, WHERE ROUTED ACROSS ROOFS.

DIRECTORY	WIRE & CONDUIT	WATTS LOAD L1	WATTS LOAD L2	CKT.	AMPS	L1 Y	L2 Y	AMPS	CKT.	WATTS LOAD L1	WATTS LOAD L2	WIRE & CONDUIT	DIRECTORY
HVAC-1	1 1/4" C, 3 #4, #6 GND	5,520		1	60/2P			60/2P	2	5,520		1 1/4" C, 3 #4, #6 GND	HVAC-2
			5,520	3					4		5,520		
SPARE				5	20			20	6				SPARE
SPARE				7	20			20	8				SPARE
SPARE				9	20			20	10	1,200		3/4" C, 2 #12, #12GND	RECEPTACLES
EXHAUST FAN	3/4" C, 2 #12, #12GND		400	11	20			20	12		600	3/4" C, 2 #12, #12GND	EXT REC, COND. PUMP
BATTERY CHARGER/RECEPT	3/4" C, 2 #12, #12GND	600		13	20			20	14	1,500		3/4" C, 2 #12, #12GND	BLOCK HEATER
LIGHTING	3/4" C, 2 #12, #12GND		1,000	15	20			30/2P	16		2,200	3/4" C, 2 #10, #10GND	RECTIFIER #6
RECTIFIER #1	3/4" C, 2 #10, #10GND	2,200		17	30/2P				18	2,200			
			2,200	19				30/2P	20		2,200	3/4" C, 2 #10, #10GND	RECTIFIER #7
RECTIFIER #2	3/4" C, 2 #10, #10GND	2,200		21	30/2P				22	2,200			
			2,200	23				30/2P	24		2,200	3/4" C, 2 #10, #10GND	RECTIFIER #8
RECTIFIER #3	3/4" C, 2 #10, #10GND	2,200		25	30/2P				26	2,200			
			2,200	27				30/2P	28		2,200	3/4" C, 2 #10, #10GND	RECTIFIER #9
RECTIFIER #4	3/4" C, 2 #10, #10GND	2,200		29	30/2P				30	2,200			
			2,200	31				30/2P	32		2,200	3/4" C, 2 #10, #10GND	RECTIFIER #10
RECTIFIER #5	3/4" C, 2 #10, #10GND	2,200		33	30/2P				34	2,200			
			2,200	35				30/2P	36		2,200	3/4" C, 2 #10, #10GND	RECTIFIER #11
SPARE				37	20				38	2,200			
SPARE				39	20			20	40		1,000	3/4" C, 2 #12, #12GND	FAA TOWER LIGHTS
SPARE				41	20			20	42	360		3/4" C, 2 #12, #12GND	RECEPT - TOWN EQUIP

WIRING SCHEMATIC FOR ALARM SENSORS

1	EQUIP ROOM DOOR ALARMS N.C. WHEN DOORS ARE CLOSED
2	
3	GEN ROOM DOOR ALARMS N.C. WHEN DOORS ARE CLOSED
4	
5	GENERATOR ROOM HEAT ALARM N.C. UNLESS HEAT DETECTED.
6	
7	SMOKE ALARM N.C. UNDER NO SMOKE CONDITION
8	
9	HIGH TEMP ALARM N.C. WHEN TEMP < 65°
10	
11	LOW TEMP ALARM N.C. WHEN TEMP > 50°
12	
13	TVSS PANEL ALARM N.C. UNDER NORMAL POWER CONDITION
14	
15	UTILITY POWER FAIL N.C.
16	
17	HVAC #1 & HVAC #2 FAIL WHEN HIGH OR LOW PRESSURE SWITCHES ACTIVATE THE LOCKOUT RELAY. THE ALARM CONTACTS WILL OPEN SENDING AN ALARM
18	
19	FUEL SPILL
20	
21	GENERATOR LOW FUEL ALARM N.O. UNLESS FUEL FALLS BELOW SETPOINT SENDING ALARM.
22	
23	BASIN LEAK ALARM
24	
25	GENERATOR OVERSPEED N.C. CONNECTED TO CONTACTS LOCATED IN GEN
26	
27	GENERATOR OVERCRANK N.C. CONNECTED TO CONTACTS LOCATED IN GEN
28	
29	GENERATOR HIGH ENG TEMP N.C. CONNECTED TO CONTACTS LOCATED IN GEN
30	
31	GENERATOR LOW OIL PRES N.C. CONNECTED TO CONTACTS LOCATED IN GEN
32	
33	GENERATOR LOW WATER TEMP N.C. CONNECTED TO CONTACTS LOCATED IN GEN
34	
35	GENERATOR AUX FAULT N.C.
36	
37	GENERATOR RUN N.C.
38	
39	GENERATOR POWER N.C.
40	
41	EMERG TRANSFER N.C.
42	
43	GEN AIR DAMPER N.C.
44	
45	GEN PRE-ALARM N.C.
46	
47	GEN PRE-ALARM LOW OIL PRESS N.C.
48	
49	GEN EMERG STOP N.C.
50	

NOTES:
1. TERMINAL STRIP SHALL BE SQUARE D #9080 GP6 WITH END BARRIERS AND MOUNTING RAIL. TERMINAL STRIP SHALL CONTAIN 20 TERMINAL BLOCKS.
2. CONDUCTOR SIZE FOR ALARM WIRING SHALL BE #14 THWN MINIMUM IN 3/4"C.
3. MOUNT TERMINAL STRIP INTO A 12"x12"x6" NEMA 1 HINGED DOOR ENCLOSURE MCKINSTRY #30-12128LP WITH BACK PANEL, "T" HANDLE, (6) - 1/2" 3/4" KO'S 4 SIDES, (2) 3/4" GROMMETS.
4. CONTRACTOR TO PROVIDE ALL CONDUIT, WIRING, ALARM SENSORS, AND TERMINATIONS.
5. COORDINATE WITH AND ASSIST WIRELESS CARRIER ENGINEER WITH TESTING OF ALARM CIRCUITS AT COMPLETION OF PROJECT.
6. ALARM CONTACTS SHALL CLOSE ON ALARM.
7. VERIFY WIRING WITH OWNER'S CONSTRUCTION MANAGER PRIOR TO INSTALLATION AND PROVIDE TERMINAL BLOCKS AND WIRING FOR ANY ADDITIONAL ALARMS REQUIRED TO MEET OWNERS STANDARDS.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	FLUORESCENT LIGHTING FIXTURE
E	EMERGENCY LIGHTING FIXTURE
	DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
MDP	HOMERUN. PANELBOARD AND CIRCUIT # AS INDICATED
	BRANCH CIRCUIT CONDUIT AND CONDUCTORS
	SWITCHED BRANCH CIRCUIT CONDUIT AND CONDUCTORS
MDP	MAIN DISTRIBUTION PANEL
AJB	ALARM JUNCTION BOX
	DUPLEX RECEPTACLE
	QUADRUPLEX RECEPTACLE
WP	DUPLEX RECEPTACLE WITH GFCI AND WEATHER PROOF COVER LISTED 'WHILE-IN-USE'
TH	HIGH TEMPERATURE SENSOR
TL	LOW TEMPERATURE SENSOR
T	THERMOSTAT (PROVIDED BY DIVISION 15, INSTALLED BY DIVISION 16)
H	HIGH HUMIDISTAT (PROVIDED BY DIVISION 15, INSTALLED BY DIVISION 16)
S	SMOKE DETECTOR WITH N.C. AUXILIARY CONTACTS FOR FACP INTERFACE
A	DOOR ALARM CONTACT
M	KWH SUBMETERING AS SPECIFIED
	TELEPHONE OUTLET, RJ-11/45 MODULAR JACK (MOUNTED 54" AFF)
	EXOTHERMIC WELD CONNECTION
	NON METALLIC 3" STANDOFF FASTENER
	EXOTHERMIC WELD 'T' OF THRU' CONDUCTOR AND TAP CONDUCTOR. 'CADWELD TYPE TA'
	EXOTHERMIC WELD TYPE "TA"
	NEW EXTERIOR GROUND RING
	GROUND BAR AT WAVE PORT
	5/8" DIAMETER x 10'-0" COPPER GROUND ROD
	5/8" DIAMETER x 10'-0" COPPER GROUND ROD WITH ACCESS
F	AUDIO/VISUAL ALARM
ST	12 HR TIMER SWITCH. (MOUNTED 54" AFF)
	EXIT SIGN WITH DUALHEAD EMERGENCY LIGHT
	EMERGENCY LIGHT REMOTE HEAD
	MOTION SENSOR CONTROLLED LIGHT
	GROUND WELL
H	HEAT DETECTOR WITH N.C. AUXILIARY CONTACTS FOR FACP INTERFACE
	HYDROGEN DETECTOR WITH N.C. AUXILIARY CONTACTS FOR FACP INTERFACE
G	INTERSECT 200A CAM-LOK GENERATOR CONNECTOR, WITH DEUTSCH CONNECTOR
	GROUND BAR
—T——T—	TELCO CONDUIT
—E——E—	ELECTRICAL CONDUIT
—G——G—	GROUND CONDUIT
—F——F—	FIRE ALARM CONDUIT

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ELECTRICAL LEGEND AND NOTES

E-1

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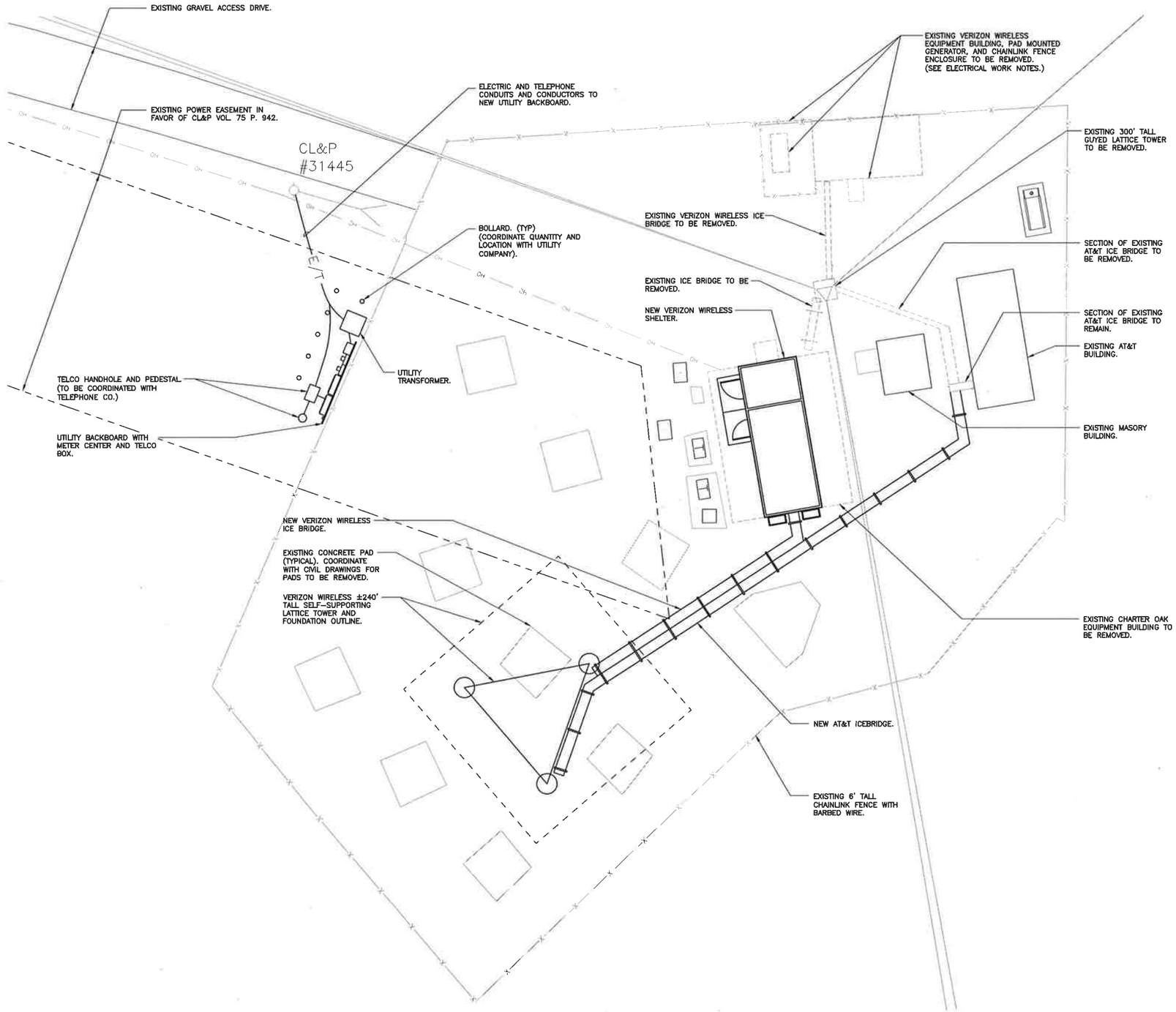

1 E-2 **SITE UTILITY PLAN**
SCALE: 1" = 10'

APPROXIMATE NORTH

GRAPHIC SCALE
10 8 5 10 20 40
(IN FEET)
1 inch = 10 ft.

GENERAL NOTES:

1. REFER TO CIVIL DRAWINGS FOR ACTUAL LOCATIONS OF STRUCTURES ON SITE.
2. COORDINATION, LAYOUT AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL/TELECOMMUNICATIONS SERVICES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY, AND OWNERS REQUIREMENTS AND SPECIFICATIONS.
4. PROVIDE CADWELD CONNECTION STYLES: THROUGH (CABLE TO CABLE) TYPE "TA"
   (CABLE TO SURFACE) TYPE "LA" OR "VS" (PIPE)
   (CABLE TO ROD) TYPE "GT" OR "NC"
   (CABLE TO CABLE) TYPE "SS"
5. ALL REFERENCES TO THE NEC WITHIN THESE PLANS SHALL ALSO INCLUDE THE MEC.
6. PRIOR TO REMOVAL OF TOWER, ICE BRIDGE, FENCE AND OTHER EQUIPMENT, DISCONNECT ALL ASSOCIATED GROUNDING CONNECTIONS.
7. EXISTING GROUND RING, RODS, AND OTHER ELEMENTS OF GROUNDING ELECTRODE SYSTEM SHALL REMAIN UNDISTURBED TO THE GREATEST EXTENT POSSIBLE UNLESS OTHERWISE NOTED. ANY DAMAGE SHALL BE RESTORED. ANY ELEMENTS IN CONFLICT WITH NEW CONSTRUCTION SHALL BE RELOCATED ACCORDING TO GROUNDING PLAN LAYOUT AND PROPERLY BONDED.
8. ANY EXISTING UNDERGROUND UTILITY CONDUITS LOCATED WITHIN PROXIMITY OF THE REPLACEMENT TOWER SHALL BE RELOCATED OUT OF THE NEW TOWER CONSTRUCTION AREA. COORDINATE RELOCATIONS AND OUTAGES WITH ALL AFFECTED PARTIES AND PROVIDE TEMPORARY POWER AS REQUIRED.

ELECTRICAL WORK NOTES:

1. INSTALL GROUNDING FOR VERIZON WIRELESS AS SHOWN IN THE PLANS AND DETAILS.
2. INSTALL GROUNDING FOR ANTENNA SYSTEM ELEMENTS BELONGING TO TENANTS RELOCATED FROM FORMER TOWER. COORDINATE WITH EACH TENANT AND INSTALL ALL GROUNDING ELEMENTS ACCORDING TO THE DETAILS AND SPECIFICATIONS PROVIDED BY EACH RESPECTIVE ENTITY. (FOR BIDDING PURPOSES ASSUME SAME REQUIREMENTS AS FOR VERIZON WIRELESS).
3. INSTALL ICE BRIDGE GROUNDING FOR ALL NEW ICE BRIDGE SECTIONS AS SHOWN IN THE PLANS AND DETAILS.
4. INSTALL ALL OTHER GROUNDING AS SHOWN IN THE PLANS AND DETAILS.
5. COORDINATE WITH CIVIL DRAWINGS FOR SEQUENCE OF CONSTRUCTION AND SCOPE OF WORK FOR ENTITIES OTHER THAN VERIZON WIRELESS.
6. RELOCATE TOWN RADIO EQUIPMENT AND ANTENNA SYSTEM FROM EXISTING VERIZON WIRELESS SHELTER PRIOR TO DECOMMISSIONING OR REMOVING TOWER. COORDINATE SCOPE OF WORK AND REQUIREMENTS WITH CONSTRUCTION MANAGER.
7. RELOCATE ALL EXISTING 120/240V, SINGLE PHASE UTILITY SERVICE METERS AND DISCONNECTS TO NEW METER CENTER. COORDINATE ALL WORK WITH UTILITY COMPANY AND EACH AFFECTED PARTY.

ELECTRICAL DEMOLITION NOTES:

1. REMOVE ALL CABLES, CONDUCTORS, LIGHTNING PROTECTION, SURGE PROTECTORS, GROUND BARS, AND OTHER ELECTRICAL DEVICES FROM EXISTING TOWER AND GUY WIRES.
2. DISCONNECTED GROUND LEADS CONNECTED TO GROUND RING SHALL BE CUT BACK BELOW GRADE TO A LOCATION JUST BEFORE THE BOND TO THE GROUND RING. THE GROUND RING AND ASSOCIATED EXOTHERMICALLY WELDED BONDS SHALL NOT BE DISTURBED.
3. ANY DAMAGE TO EXISTING GROUNDING SYSTEMS NOT SCHEDULED FOR REMOVAL, SHALL BE REPAIRED AND RESTORED TO ORIGINAL CONDITION.

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SITE UTILITY PLAN

E-2

Sheet No. 14 of 24

RISER NOTES

1. EXISTING UTILITY POLE TO BE USED. REFER TO SITE SURVEY AND UTILITY PLAN.
2. 3" CONDUIT FOR PRIMARY ELECTRIC CONDUCTORS. CONDUCTORS PROVIDED BY UTILITY COMPANY FROM UTILITY POLE TO TRANSFORMER. PROVIDE ALL COUPLINGS, ADAPTERS, SWEEPS, AND ASSOCIATED HARDWARE. MATERIAL SHALL BE PER UTILITY COMPANY SPECIFICATIONS.
3. TRANSFORMER PROVIDED BY UTILITY COMPANY. TRANSFORMER VAULT, HOUSING, AND GROUND GRID BY ELECTRICAL CONTRACTOR, PER UTILITY COMPANY SPECIFICATIONS.
4. PROVIDE TRANSFORMER GROUNDING PER NEC AND UTILITY COMPANY SPECIFICATIONS.
5. TWO SETS OF: (3) 600 KCMIL, (1) 1/0 AWG GROUND, 4"C.
6. TWO 4" CONDUITS WITH PULL ROPES FOR TELEPHONE COMPANY CONDUCTORS. CONDUCTORS PROVIDED BY TELEPHONE COMPANY FROM UTILITY POLE TO UTILITY BOARD. PROVIDE ALL COUPLINGS, ADAPTERS, SWEEPS, AND ASSOCIATED HARDWARE. MATERIAL SHALL BE PER TELEPHONE COMPANY SPECIFICATIONS.
7. PROVIDE CONDUIT WITH PULL ROPE BETWEEN HANDHOLE AND PEDESTAL. EXPECT TWO 4" CONDUITS, BUT FINAL SIZE AND QUANTITY PER TELEPHONE COMPANY.
8. TELEPHONE AND ELECTRIC SPLICE BOXES. MUST BE TRAFFIC RATED. QUANTITY AND LOCATION PER UTILITY COMPANY SPECIFICATIONS. EXPECT MAXIMUM OF ONE PER UTILITY. INSTALL ONLY IF REQUIRED BY UTILITY COMPANIES.
9. TELEPHONE COMPANY HANDHOLE. INSTALL PER TELEPHONE COMPANY SPECIFICATIONS.
10. TELEPHONE COMPANY PEDESTAL. INSTALL PER TELEPHONE COMPANY SPECIFICATIONS.
11. UTILITY BACKBOARD. REFER TO CIVIL DRAWINGS.
12. TWO 3'x4'x1' NEMA-3R TELEPHONE ENCLOSURES INSTALLED NEXT TO EACH OTHER ON UTILITY BACKBOARD. MAINTAIN APPROXIMATELY 1' SEPARATION BETWEEN AND INSTALL A SECTION OF 4" CONDUIT CONNECTING BOTH BOXES.
13. PROVIDE DOUBLE DUPLEX, GFI RECEPTACLE IN WEATHERPROOF ENCLOSURE INSIDE OF TELEPHONE ENCLOSURE. CONNECT TO DEDICATED 20A/1P CIRCUIT IN VERIZON WIRELESS ELECTRIC PANEL IN SHELTER.
14. PROVIDE GROUND BAR AS REQUIRED BY TELEPHONE COMPANY.
15. #2 AWG GROUNDING CONDUCTOR IN 3/4" PVC CONDUIT, UNLESS OTHERWISE SPECIFIED BY TELEPHONE COMPANY. BOND TO GROUNDING TRIAD.
16. 800A, 240/120V, 1P, 65 KAIC RATED, NEMA-3R, MAIN CIRCUIT BREAKER MODULE WITH 800A/2P MAIN CIRCUIT BREAKER. (SQUARE-D: EZM1800CBU OR APPROVED EQUIVALENT.) MUST BE UTILITY COMPANY APPROVED.
17. TWO 3-GANG MULTI-METER BRANCH DEVICES WITH 240V, 1P, 3W, 225A RATED METER SOCKETS. (SQUARE-D: EZML113225 OR APPROVED EQUIVALENT). MUST BE UTILITY COMPANY APPROVED.
18. UTILITY COMPANY APPROVED METER FOR VERIZON WIRELESS IN AVAILABLE SOCKET. PROVIDE LABEL STATING "VERIZON WIRELESS" ALSO PROVIDE LABEL INDICATING TYPE AND LOCATION OF GENERATOR PER NEC REQUIREMENTS.
19. 200A/2P MAIN CIRCUIT BREAKER IN AVAILABLE POSITION CORRESPONDING TO METER FOR VERIZON WIRELESS. PROVIDE LABELS INDICATING "VERIZON WIRELESS", AS WELL AS TYPE AND LOCATION OF ONSITE GENERATOR PER NEC.
20. 3/0 AWG GROUNDING ELECTRODE CONDUCTOR IN 3/4 PVC CONDUIT BONDED TO GROUNDING TRIAD LOCATED AT UTILITY BACKBOARD. GROUNDING TRIAD SHALL BE BONDED TO COMPOUND GROUND RING WITH #2 AWG SOLID TINNED BARE COPPER WIRE.
21. (3) # 3/0 AWG, (1) # 6 AWG GROUND, 2-1/2"C. FROM METER TO NORMAL POWER LUGS IN INTEGRATED LOAD CENTER IN EQUIPMENT ROOM.
22. (2) # 12 AWG, #12 AWG GROUND, 3/4"C. FROM DEDICATED 20A/1P CIRCUIT BREAKER IN VERIZON WIRELESS POWER PANEL TO RECEPTACLE IN TELCO BOXES.
23. EXPANSION COUPLING, TYPICAL.
24. (2) 4" PVC CONDUITS FOR TELEPHONE SERVICE. PROVIDE TELEPHONE CABLES AS REQUIRED BY TELEPHONE COMPANY AND OWNER. ONE CONDUIT SHALL REMAIN AS OWNERS SPARE, AND SHALL BE CAPPED AND LABELED AT BOTH ENDS. INSTALL PULL ROPE IN SPARE CONDUIT.
25. VERIZON WIRELESS EQUIPMENT SHELTER. AFTER COMPLETION OF INSTALLATION, REMOVE EXISTING VERIZON WIRELESS SHELTER AND GENERATOR AND RETURN TO VERIZON WIRELESS. COORDINATE DECOMMISSIONING WITH VERIZON CONSTRUCTION MANAGER.
26. EXTEND TO EMERGENCY LUGS FOR IN INTEGRATED LOAD CENTER/ATS IN EQUIPMENT ROOM.
27. INTEGRATED LOAD CENTER "MDP". REFER TO PANEL SCHEDULE FOR SPECIFICATIONS.
28. 1" CONDUIT AND CONDUCTORS FOR GENERATOR CONTROL WIRING.
29. (3) #3/0 AWG, (1) #6 AWG GROUND, 2" CONDUIT.
30. 150A, 240V, 2P CIRCUIT BREAKER ON GENERATOR OUTPUT.
31. GENERATOR BATTERY CHARGER. PROVIDE DEDICATED 20A, 120V CIRCUIT FROM PANEL MDP
32. GENERATOR BLOCK HEATER. PROVIDE DEDICATED 20A, 120V CIRCUIT FROM PANEL MDP
33. 30 KW, 120/240V, SINGLE PHASE, DIESEL FUELED GENERATOR
34. GENERATOR GROUND PER NEC.
35. REMOTE GENERATOR SHUT OFF SWITCH IN BREAK GLASS ENCLOSURE MOUNTED TO THE EXTERIOR OF THE SHELTER IN LOCATION APPROVED BY LOCAL FIRE MARSHAL. INSTALL ALL REQUIRED SIGNAGE.
36. 3/4" CONDUIT AND CONDUCTORS REQUIRED FOR PROPER OPERATION OF EMERGENCY GENERATOR SHUT OFF SWITCH.
37. NEW TOWER. (REFER TOP CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.)
38. PHOTOCELL FOR FAA LIGHTING SYSTEM CONTROL. SEE FAA LIGHTING NOTES THIS SHEET.
39. FAA LIGHTING SYSTEM CONTROLLER ENCLOSURE. PROVIDE DEDICATED 120V, 20A CIRCUIT FROM PANEL MDP. SEE FAA LIGHTING NOTES THIS SHEET.
40. DUAL RED & WHITE L-864/L-865 MEDIUM INTENSITY LED TOP MOUNTED AVIATION OBSTRUCTION FLASH HEAD. SEE FAA LIGHTING NOTES THIS SHEET.
41. L-81 LED MARKER LIGHT – TYPICAL OF THREE (ONE PER TOWER LEG). SEE FAA LIGHTING NOTES THIS SHEET.
42. CONDIUTS AND CONDUCTORS FOR RELOCATED SERVICES. ALL STANDALONE METERS SHALL BE RELOCATED TO NEW METER CENTER WITH NEW CONDUITS, CONDUCTORS, METERS, DISCONNECT BREAKERS, AND LABELS. ALL EXISTING STANDALONE SERVICE EQUIPMENT SHALL BE REMOVED PRIOR TO CUTOVER. COORDINATE ALL CUTOVER WORK WITH UTILITY COMPANY AND EACH AFFECTED PARTY. PROVIDE TEMPORARY POWER AS REQUIRED TO MINIMIZE DOWN TIME. COORDINATE OUTAGES WITH EACH AFFECTED PARTY. PRE-INSTALL AND ALL EQUIPMENT AND CONDUCTORS PRIOR TO DISCONNECTION OF EXISTING SERVICES.
43. PROVIDE DEDICATED 20A, 1P CIRCUIT AND DUPLEX RECEPTACLE FOR TOWN RADIO EQUIPMENT. PROVIDE LABEL INDICATING RECEPTACLE IS FOR TOWN USE ONLY. COORDINATE LOCATION AND QUANTITY OF DUPLEX RECEPTACLES WITH CONSTRUCTION MANAGER.

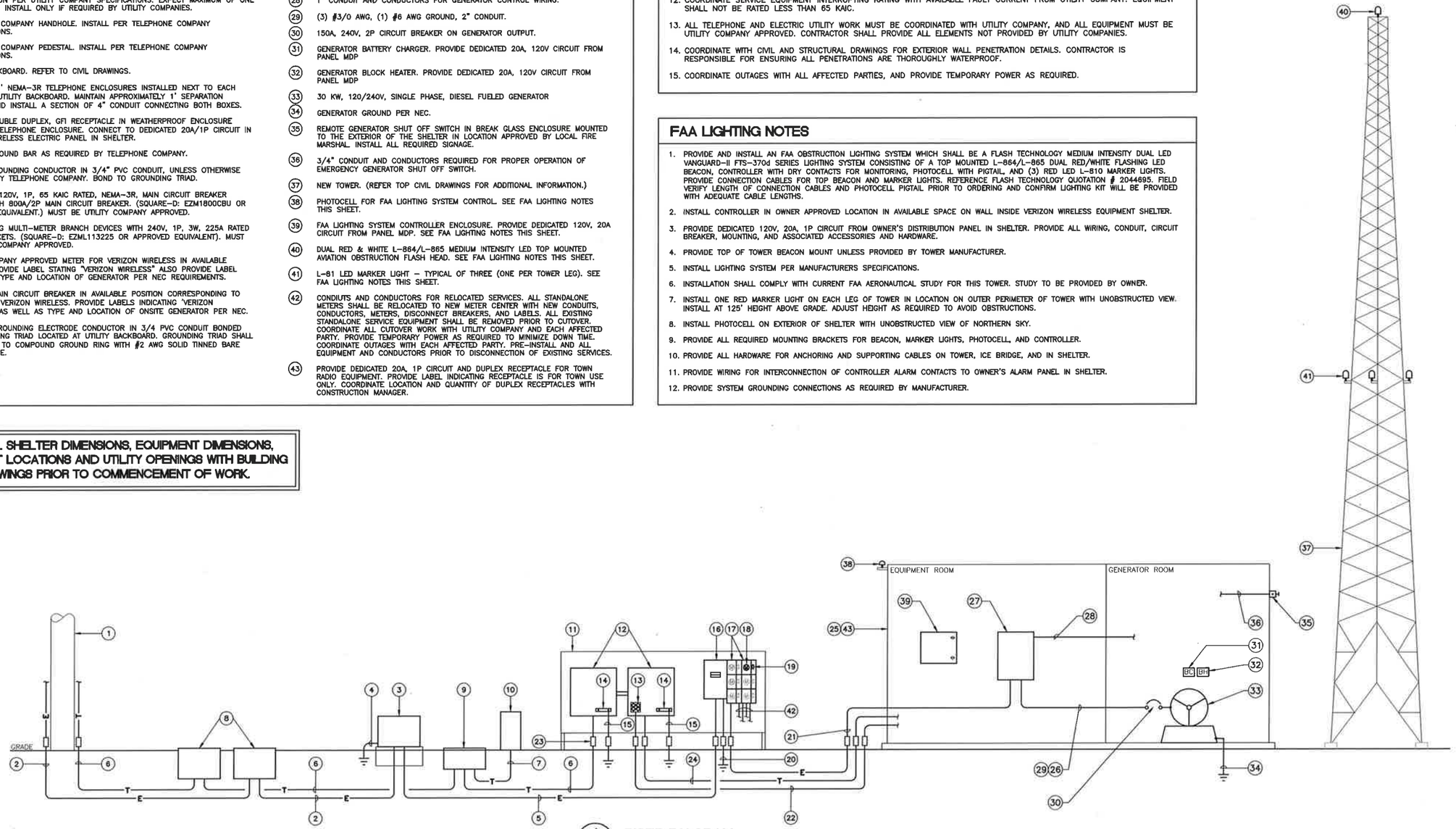
GENERAL NOTES

1. CONDUCTOR SIZES SHALL NOT BE REDUCED OR SUBSTITUTED WITHOUT ENGINEERS APPROVAL.
2. UNLESS OTHERWISE NOTED ALL CONDUCTORS AND CONDUCTOR TERMINATIONS SHALL BE RATED FOR MINIMUM 75 DEGREE C CONTINUOUS OPERATION.
3. COORDINATE WITH OWNER FOR ALL SHUTDOWNS.
4. COORDINATE ALL CONDUIT ROUTING IN THE FIELD WITH LANDLORD, CONSTRUCTION MANAGER, AND UTILITY COMPANIES.
5. RESTORE ALL DISTURBED AREAS TO PRE-CONSTRUCTION CONDITION.
6. ALL WORK SHALL BE IN ACCORDANCE WITH NEC REQUIREMENTS.
7. COORDINATE LOCATION AND MOUNTING REQUIREMENTS FOR ALL ELECTRICAL EQUIPMENT.
8. ALL CONDUITS SHALL HAVE EXPANSION COUPLINGS WHERE EXTENDING ABOVE GRADE.
9. ALL UTILITY SUPPLY CONDUITS, CONDUCTORS AND ASSOCIATED EQUIPMENT MUST BE LOCATED WITHIN THE LIMITS OF ASSOCIATED UTILITY EASEMENT. COORDINATE WITH OWNER FOR ALL EASEMENT DOCUMENTATION.
10. REFER TO SITE UTILITY PLAN.
11. TELEPHONE EQUIPMENT SHOWN APPROXIMATE. COORDINATE WITH TELEPHONE UTILITY COMPANY AND PROVIDE ALL SPECIFIED EQUIPMENT.
12. COORDINATE SERVICE EQUIPMENT INTERRUPTING RATING WITH AVAILABLE FAULT CURRENT FROM UTILITY COMPANY. EQUIPMENT SHALL NOT BE RATED LESS THAN 65 KAIC.
13. ALL TELEPHONE AND ELECTRIC UTILITY WORK MUST BE COORDINATED WITH UTILITY COMPANY, AND ALL EQUIPMENT MUST BE UTILITY COMPANY APPROVED. CONTRACTOR SHALL PROVIDE ALL ELEMENTS NOT PROVIDED BY UTILITY COMPANIES.
14. COORDINATE WITH CIVIL AND STRUCTURAL DRAWINGS FOR EXTERIOR WALL PENETRATION DETAILS. CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL PENETRATIONS ARE THOROUGHLY WATERPROOF.
15. COORDINATE OUTAGES WITH ALL AFFECTED PARTIES, AND PROVIDE TEMPORARY POWER AS REQUIRED.

FAA LIGHTING NOTES

1. PROVIDE AND INSTALL AN FAA OBSTRUCTION LIGHTING SYSTEM WHICH SHALL BE A FLASH TECHNOLOGY MEDIUM INTENSITY DUAL LED VANGUARD-II FTS-370d SERIES LIGHTING SYSTEM CONSISTING OF A TOP MOUNTED L-864/L-865 DUAL RED/WHITE FLASHING LED BEACON, CONTROLLER WITH DRY CONTACTS FOR MONITORING, PHOTOCELL WITH PIGTAIL, AND (3) RED LED L-810 MARKER LIGHTS. PROVIDE CONNECTION CABLES FOR TOP BEACON AND MARKER LIGHTS. REFERENCE FLASH TECHNOLOGY QUOTATION # 2044695. FIELD VERIFY LENGTH OF CONNECTION CABLES AND PHOTOCELL PIGTAIL PRIOR TO ORDERING AND CONFIRM LIGHTING KIT WILL BE PROVIDED WITH ADEQUATE CABLE LENGTHS.
2. INSTALL CONTROLLER IN OWNER APPROVED LOCATION IN AVAILABLE SPACE ON WALL INSIDE VERIZON WIRELESS EQUIPMENT SHELTER.
3. PROVIDE DEDICATED 120V, 20A, 1P CIRCUIT FROM OWNER'S DISTRIBUTION PANEL IN SHELTER. PROVIDE ALL WIRING, CONDUIT, CIRCUIT BREAKER, MOUNTING, AND ASSOCIATED ACCESSORIES AND HARDWARE.
4. PROVIDE TOP OF TOWER BEACON MOUNT UNLESS PROVIDED BY TOWER MANUFACTURER.
5. INSTALL LIGHTING SYSTEM PER MANUFACTURERS SPECIFICATIONS.
6. INSTALLATION SHALL COMPLY WITH CURRENT FAA AERONAUTICAL STUDY FOR THIS TOWER. STUDY TO BE PROVIDED BY OWNER.
7. INSTALL ONE RED MARKER LIGHT ON EACH LEG OF TOWER IN LOCATION ON OUTER PERIMETER OF TOWER WITH UNOBSTRUCTED VIEW. INSTALL AT 125' HEIGHT ABOVE GRADE. ADJUST HEIGHT AS REQUIRED TO AVOID OBSTRUCTIONS.
8. INSTALL PHOTOCELL ON EXTERIOR OF SHELTER WITH UNOBSTRUCTED VIEW OF NORTHERN SKY.
9. PROVIDE ALL REQUIRED MOUNTING BRACKETS FOR BEACON, MARKER LIGHTS, PHOTOCELL, AND CONTROLLER.
10. PROVIDE ALL HARDWARE FOR ANCHORING AND SUPPORTING CABLES ON TOWER, ICE BRIDGE, AND IN SHELTER.
11. PROVIDE WIRING FOR INTERCONNECTION OF CONTROLLER ALARM CONTACTS TO OWNER'S ALARM PANEL IN SHELTER.
12. PROVIDE SYSTEM GROUNDING CONNECTIONS AS REQUIRED BY MANUFACTURER.

VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.



1 E-3 **RISER DIAGRAM**
NOT TO SCALE

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RISER DIAGRAM AND NOTES

E-3

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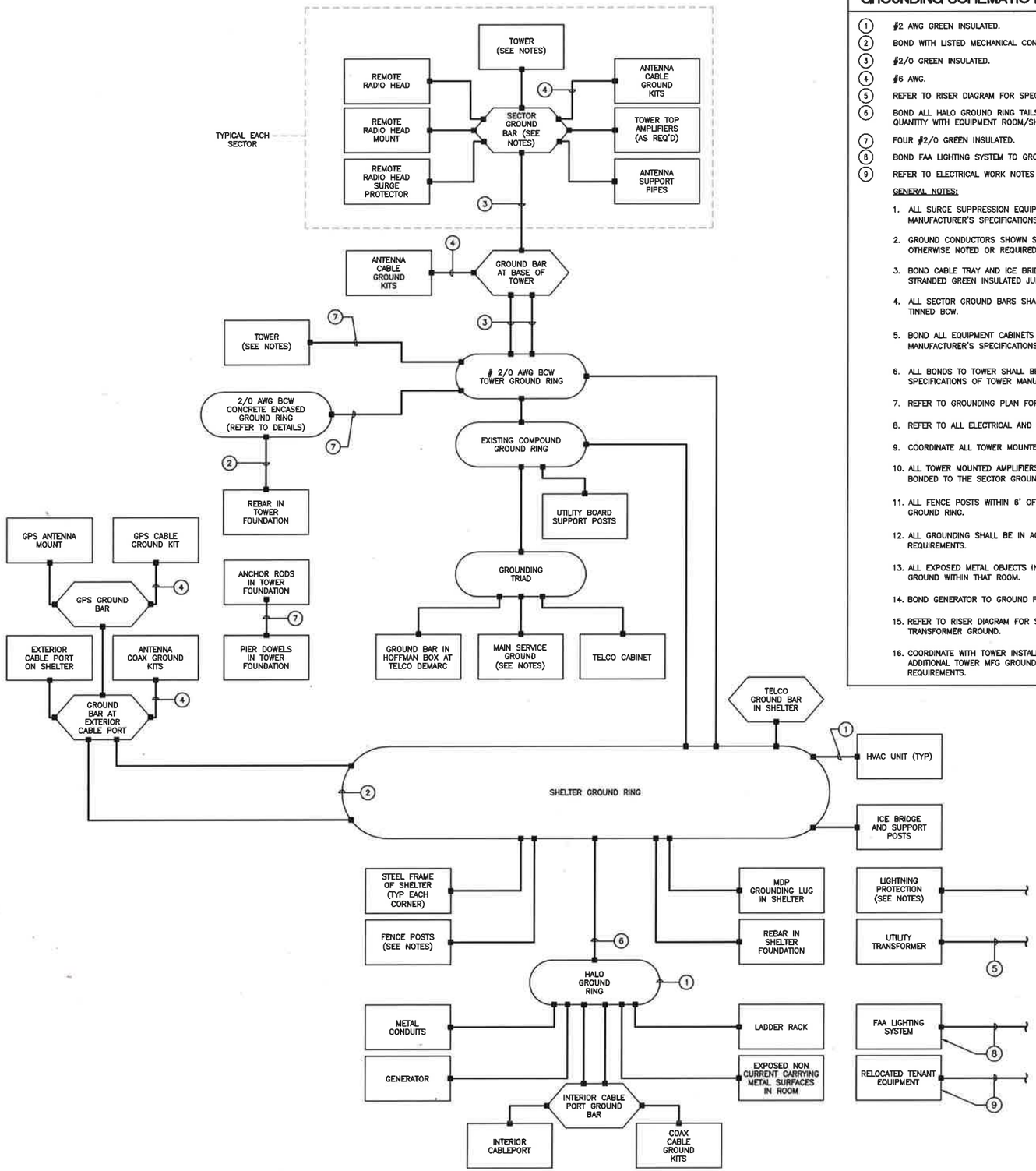

GROUNDING SCHEMATIC NOTES

1. #2 AWG GREEN INSULATED.
2. BOND WITH LISTED MECHANICAL CONNECTION.
3. #2/0 GREEN INSULATED.
4. #6 AWG.
5. REFER TO RISER DIAGRAM FOR SPECIFICATIONS.
6. BOND ALL HALO GROUND RING TAILS TO GROUND RING. COORDINATE LOCATION AND QUANTITY WITH EQUIPMENT ROOM/SHELTER DRAWINGS.
7. FOUR #2/0 GREEN INSULATED.
8. BOND FAA LIGHTING SYSTEM TO GROUND PER MFG SPECIFICATIONS.
9. REFER TO ELECTRICAL WORK NOTES ON SHEET E-2.

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. GROUND CONDUCTORS SHOWN SHALL BE #2 AWG SOLID TINNED BCW UNLESS OTHERWISE NOTED OR REQUIRED BY CODE.
3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
7. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
8. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
9. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
10. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
11. ALL FENCE POSTS WITHIN 6' OF EQUIPMENT SHELTER SHALL BE BONDED TO GROUND RING.
12. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
13. ALL EXPOSED METAL OBJECTS IN SHELTER SHALL BE BONDED TO THE HALO GROUND WITHIN THAT ROOM.
14. BOND GENERATOR TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS
15. REFER TO RISER DIAGRAM FOR SPECIFICATIONS OF SERVICE GROUND AND TRANSFORMER GROUND.
16. COORDINATE WITH TOWER INSTALLATION DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL TOWER MFG GROUNDING, BONDING AND LIGHTNING PROTECTION REQUIREMENTS.

CELLULAR GROUNDING NOTES

OBJECTIVE

PROVIDE A CELLULAR GROUNDING SYSTEM WITH MAXIMUM ALTERNATING CURRENT RESISTANCE OF 5 OHMS BETWEEN ANY POINT ON THE GROUNDING SYSTEM AND REFERENCE GROUND. PROVIDE EXTERIOR GROUNDING SCHEME WITH OWNER'S ENGINEER APPROVAL AS REQUIRED TO ACHIEVE DESIRED MAXIMUM AC RESISTANCE TO GROUND.

TESTING

CONTRACTOR TO PROVIDE AN INDEPENDENT TESTING CONTRACTOR TO DETERMINE THE GROUNDING SYSTEM RESISTANCE BY USE OF THE THREE POINT TEST AND AN AEMC MODEL 4500, OR APPROVED EQUAL. TEST TO BE PERFORMED PRIOR TO CONNECTION OF POWER SUPPLY TO THE CELL SITE AND CONNECTION OF THE GROUNDING SYSTEM TO THE WATER MAIN OR AC SUPPLY AS APPLICABLE.

CONDUCTOR USED FOR CELLULAR GROUNDING SYSTEM

EGR – #2 AWG ANNEALED SOLID TINNED BARE COPPER
IGR – #2 AWG ANNEALED STRANDED (7 STRAND) 'THW' GREEN COLORED INSULATION
INTER-BUS EXTENSION (FROM IGR TO EGR) – SEE DETAILS
EXTERNAL BOND CONNECTIONS TO EGR – #2 ANNEALED SOLID TINNED BARE COPPER
INTERIOR BOND CONNECTIONS TO IGR – #6 ANNEALED STRANDED (7 STRAND) 'THW' GREEN COLORED INSULATION

MINIMUM BENDING RADIUS

IGR #2 : 1'-0" NOMINAL AND 8" MINIMUM
EGR #2 : 2'-0" NOMINAL AND 8" MINIMUM
CELLULAR GROUNDING CONDUCTOR SHALL BE AS STRAIGHT AS POSSIBLE WITH MINIMUM 6" BENDING RADIUS.

FASTENER FOR CELLULAR GROUNDING CONDUCTOR

USE NON-METALLIC FASTENER AND STANDOFF 'CLIC' (AVAIL. FROM NEFCO 203-289-0285) TO SURFACE SUPPORT CONDUCTOR 3" AWAY FROM SURFACES.
SPACING OF FASTENERS: 2'-0" O.C. OUTSIDE BUILDING
3'-0" O.C. INSIDE BUILDING

GROUNDING ELECTRODE

GROUNDING ELECTRODE SHALL BE 5/8" DIA. x 10'-0" l. COPPER CLAD STEEL ROD. ADJUST LOCATION OF GROUNDING ELECTRODE IF SOIL CONDITION IS NOT CONDUCTIVE (GRAVEL, SANDY SOIL, ROCKS). SPACE GROUNDING ELECTRODES 20'-0" APART (SPACING MAY BE REDUCED WHERE REQUIRED TO ACCOMMODATE FIELD CONDITIONS BUT SHALL NOT BE LESS THAN 10'-0"). ELECTRODES SHALL BE DRIVEN ONLY WITH PROPER DRIVER SLEEVE TO PREVENT MUSHROOMING TOP OF ROD. WHEN ROCK BOTTOM IS ENCOUNTERED, THE ELECTRODE SHALL BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45° FROM THE VERTICAL AWAY FROM STRUCTURES. TOP OF GROUNDING ELECTRODE SHALL BE MIN. 3'-6" BELOW FINISH GRADE.

CONNECTIONS ABOVE GRADE (MECHANICAL)

COMPRESSION LUG CONNECTOR – 15 TON COMPRESSION, 2 HOLE, LONG BARREL, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V RATED. USE 1/4" ø BOLT, 3/4" SPACING LUGS TO BOND OBJECTS FROM THE IGR. (CONNECTOR SHALL BE BURNDY HYLUG SERIES OR EQUAL.)

EXOTHERMIC WELD LUG CONNECTOR – 2 HOLE, OFFSET, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V. USE 1/2"ø BOLT, 1-3/4" SPACING LUGS. CONNECTOR SHALL BE CADWELD CONNECTION STYLE (CABLE TO SURFACE) TYPE LA, LUG SIZE 1/8 x 1. EXOTHERMIC WELD TO LUG AS REQUIRED.

C-TAP COMPRESSION CONNECTOR – HIGH CONDUCTIVITY COPPER FOR MAIN TO BRANCH LINE TAPPING. (CONNECTOR SHALL BE BURNDY HYTAP SERIES OR EQUAL.)

MECHANICAL CONNECTIONS

USE MATCHING MANUFACTURER TOOL AND DIE FOR COMPRESSION CONNECTION.

APPLY ANTI-OXIDANT CONDUCTIVITY ENHANCER COMPOUND ON SURFACES THAT ARE COMPRESSED.

SURFACES INTENDED TO BE CONNECTED WITH MECHANICAL CONNECTORS SHALL BE BARE METAL TO BARE METAL. PRIME AND PAINT OVER BONDED AREA TO PREVENT CORROSION.

WHEN BONDING #2 TO #2

EXTERIOR OF BUILDING – USE EXOTHERMIC WELD CONNECTION
INTERIOR OF BUILDING – USE COMPRESSION CONNECTION ON STRANDED CONDUCTORS ONLY.
– USE EXOTHERMIC WELD CONNECTION ON SOLID CONDUCTOR.

WHEN BONDING #2 TO FENCE POST

USE EXOTHERMIC WELD 'CADWELD TYPE VS' CONNECTION TO FENCE POST STEEL SURFACE. TEST WELD FOR POSSIBLE BURN THRU. PATCH WELDED AREA WITH GALVANIZED COATING AS REQUIRED FOR PROPER WELDED PERMANENT BOND. REFER TO MANUFACTURER'S REQUIREMENTS FOR DETAILS

GROUNDING SYSTEM INTERCONNECTION

BOND THE EGR DOWN CONDUCTORS, AND/OR BURIED GROUND RING TO ANY METALLIC OBJECT OR EXISTING GROUNDING SYSTEM WITHIN 6'.

WHEN BONDING #2 TO TOWER GROUND PLATE

TOWER GROUND PLATE SHALL BE 6" x 8" x 1/4" COPPER AND BE MADE AVAILABLE TO TOWER CONTRACTOR TO BE INSTALLED DURING TOWER CONSTRUCTION. USE EXOTHERMIC WELD 'CADWELD TYPE HS' TO TOWER GROUND PLATE TEST WELD FOR POSSIBLE BURN THRU. COORDINATE THE SIZE OF THE MOUNTING HOLE WITH TOWER CONTRACTOR.

METALLIC CONDUITS

BOND ALL STEEL CONDUITS TO PANELS AT POINT OF CONTACT WITH APPROVED GROUNDING BUSHING.

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SCHEMATIC DIAGRAM AND NOTES

E-4

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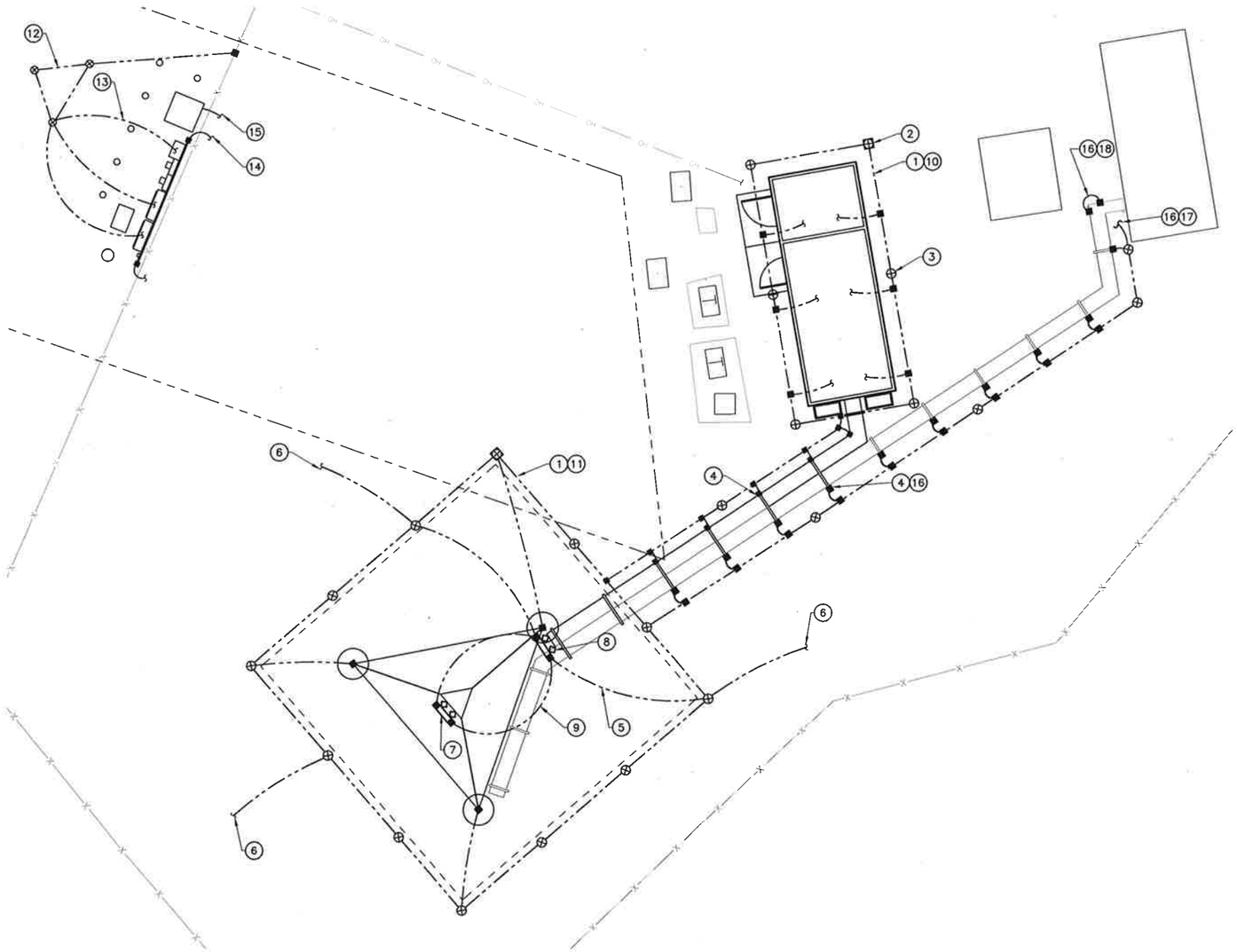
GROUNDING PLAN NOTES

1. PROVIDE COMPLETE GROUNDING SYSTEM TESTING (INCLUDING NEW AND EXISTING) PER SPECIFICATIONS.
2. GROUNDING ROD WITH ACCESS (TYP.) PER DETAILS.
3. GROUNDING ROD (TYP.) PER DETAILS.
4. ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING PER DETAILS.
5. BOND GROUND BAR TO NEW TOWER GROUND RING (TYP OF 2). CONTRACTOR TO VERIFY LOCATION IN FIELD.
6. BOND TO EXISTING COMPOUND GROUND RING.
7. UPPER TOWER MOUNTED GROUND BAR PER DETAILS.
8. LOWER TOWER MOUNTED GROUND BAR PER DETAILS.
9. BOND UPPER TOWER MOUNTED GROUND BAR TO LOWER TOWER MOUNTED GROUND BAR (2 GROUND LEADS) PER DETAILS.
10. #2 AWG SOLID TINNED BARE COPPER WIRE GROUND RING. TYPICAL, UNLESS OTHERWISE NOTED.
11. #2/0 TOWER GROUND RING. (COORDINATE WITH TOWER FOUNDATION)
12. GROUNDING TRIAD. BOND TO GROUND RING.
13. 4/0 AWG. MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR.
14. BOND NEW UTILITY BACKBOARD TO EXISTING GROUND RING.
15. PROVIDE TRANSFORMER GROUNDING PER UTILITY COMPANY SPECIFICATIONS.
16. SHOWN FOR REFERENCE ONLY. COORDINATE WITH ICE BRIDGE USER AND PROVIDE ANY ADDITIONAL GROUNDING TO MEET THEIR SPECIFICATIONS.
17. CONNECT NEW ICE BRIDGE GROUNDING TO EXISTING ICE BRIDGE GROUNDING.
18. BOND NEW ICE BRIDGE TO EXISTING.



1 / E-5 COMPOUND GROUNDING PLAN
SCALE: 1/8" = 1'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

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GROUNDING PLAN AND NOTES

E-5

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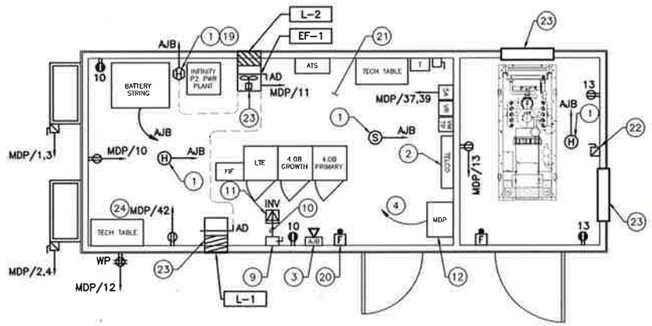
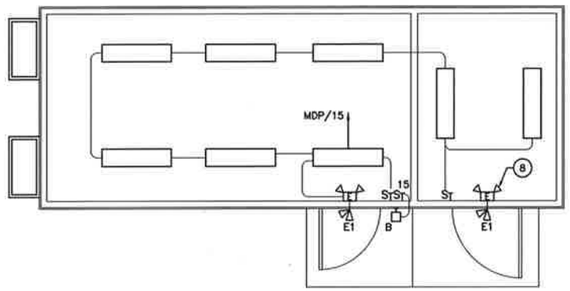


NOTE:
ROOM LAYOUT AND EQUIPMENT ARRANGEMENT ARE SHOWN TYPICAL. REFER TO CIVIL DRAWINGS FOR EXACT ROOM LAYOUT. ADJUST EQUIPMENT LOCATIONS AS REQUIRED FOR BEST FIT, CODE COMPLIANCE, AND TO AVOID OBSTRUCTIONS. FINAL EQUIPMENT LAYOUT MUST BE VERIFIED AND APPROVED BY WIRELESS CARRIER'S CONSTRUCTION MANAGER PRIOR TO INSTALLATION.

GRAPHIC SCALE

(IN FEET)
1/4 inch = 1 ft.

1 E-6 POWER PLAN
SCALE: 1/4" = 1'-0"



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GRAPHIC SCALE

(IN FEET)
1/4 inch = 1 ft.

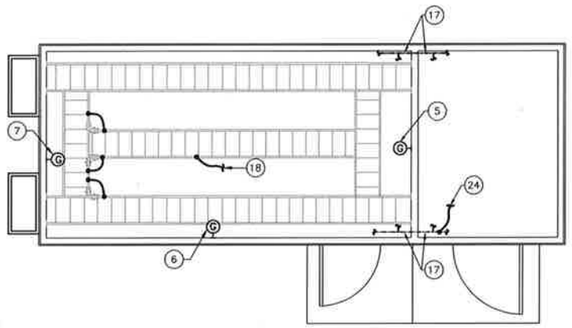
2 E-6 LIGHTING PLAN
SCALE: 1/4" = 1'-0"

ELECTRICAL WORK NOTES

1. ALL SMOKE, HEAT AND HYDROGEN DETECTORS SHALL BE OPERATE AT 48 VDC AND BE POWERED FROM THE 48 VDC POWER PLANT WITHIN THE EQUIPMENT ROOM. DO NOT MOUNT ABOVE CABLE TRAY.
2. TELEPHONE BACKBOARD AREA.
3. ALARM JUNCTION BOX.
4. PROVIDE CONDUCTORS FROM PANELBOARD MDP ROUTED THROUGH THE PERIMETER WIREWAY FOR RECTIFIER BRANCH CIRCUITS. PROVIDE 20' OF ADDITIONAL WIRING IN 1" FLEXIBLE METAL CONDUIT FOR FINAL TERMINATION BY OWNER.
5. TELCO GROUND BAR. (COORDINATE LOCATION WITH WIRELESS CARRIER'S CONSTRUCTION MANAGER.)
6. MAIN GROUND BAR. (COORDINATE LOCATION WITH WIRELESS CARRIER'S CONSTRUCTION MANAGER.)
7. GROUND BAR AT CABLE PORT. (COORDINATE LOCATION WITH WIRELESS CARRIER'S CONSTRUCTION MANAGER.)
8. CONNECT EMERGENCY LIGHT BRANCH CIRCUIT WIRING TO LINE SIDE OF LIGHTING CIRCUIT.
9. TO POWER BOARD (2) #8 AWG WHIP CABLE.
10. BATTERY DISCONNECT.
11. 2400 WATT INVERTER (24VDC/120VAC) MANUFACTURED BY TRIPP-LITE MODEL #PV2400FC OR APPROVED EQUAL (TELCO, CARDS AND EXHAUST FAN).
12. INTEGRATED LOAD CENTER "MDP". REFER TO PANEL SCHEDULE.
13. VERIFY ELECTRICAL REQUIREMENT WITH AHU MANUFACTURER AND MECHANICAL DRAWINGS.
14. 4" x 4", TYPE 1 CONTINUOUS SCREW COVER WIREWAY MOUNTED ALONG PERIMETER OF ROOM AGAINST CEILING.
15. SUPPORT BRACKET/SPACER (TYPICAL) (INSTALL AS REQUIRED).
16. (2) 3" CONDUITS CONNECTED TO PANELBOARD, MDP FROM WIREWAYS.
17. INSTALL HALO GROUND NEAR CEILING ALONG PERIMETER OF ROOM. INSTALL PER VERIZON WIRELESS SPECIFICATIONS AND THE DETAILS ON THESE PLANS.
18. BOND TO MAIN GROUND BAR.
19. HYDROGEN DETECTOR TO INTERFACE WITH EXHAUST FAN CONTROLS. REFER TO MECHANICAL PLANS.
20. AUDIO VISUAL FIRE ALARM DEVICE SHALL BE TIED DIRECTLY TO HOST BUILDING FIRE ALARM SYSTEM. THIS SHALL BE INDEPENDENT OF THE DEVICES ASSOCIATED WITH FM-200 SYSTEM.
21. PROVIDE 20A CIRCUIT AND WIRING REQUIRED FOR FM-200 SYSTEM. SEE FIRE PROTECTION DRAWING FOR MORE INFORMATION.
22. PRIOR TO START OF CONSTRUCTION ALL EXISTING ELECTRICAL EQUIPMENT DEVICES, CONDUIT, RACEWAY, LIGHTING CONTROLS, FIRE ALARM, J-BOXES, ETC. SHALL BE REMOVED AND RELOCATED OUTSIDE OF THE EQUIPMENT ROOM AREA. NEW LOCATIONS SHALL BE COORDINATED WITH BUILDING OWNER. ANY DEVICE REMOVED BUT NOT RELOCATED SHALL BE RETURNED TO BUILDING OWNER.
23. COORDINATE WITH MECHANICAL PLANS FOR CONTROL REQUIREMENTS OF EXHAUST FAN AND INTAKE LOUVER.
24. RECEPTACLE FOR TOWN EQUIPMENT COORDINATE LOCATION WITH CONSTRUCTION MANAGER. REFER TO RISER DIAGRAM FOR ADDITIONAL INFORMATION.

GENERAL NOTES:

1. REFER TO PANEL SCHEDULE FOR ADDITIONAL INFORMATION.
2. INSTALL ALL ALARM WIRING FOR PROPER OPERATION. COORDINATE ALL REQUIREMENTS WITH WIRELESS CARRIER'S CONSTRUCTION MANAGER.
3. COORDINATE ALL CONDUITS AND CEILING MOUNTED DEVICES WITH STRUCTURAL OBSTRUCTIONS.



NOTE:
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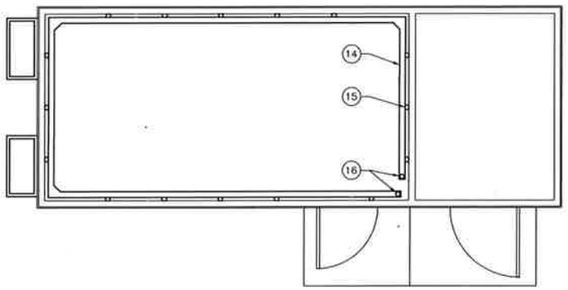
GRAPHIC SCALE

(IN FEET)
1/4 inch = 1 ft.

3 E-6 CABLE TRAY GROUNDING PLAN
SCALE: 1/4" = 1'-0"



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GRAPHIC SCALE

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4 E-6 WIREWAY LAYOUT PLAN
SCALE: 1/4" = 1'-0"

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ELECTRICAL PART PLANS AND NOTES

E-6

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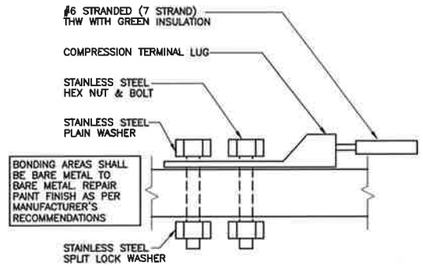

1 E-7 **LUG CONNECTION ON CABLE TRAY**
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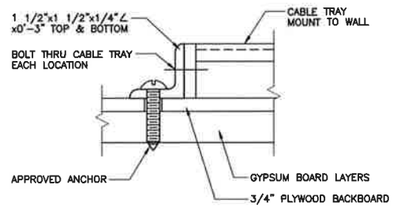
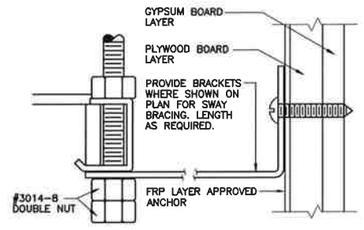
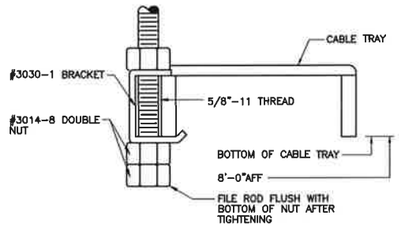


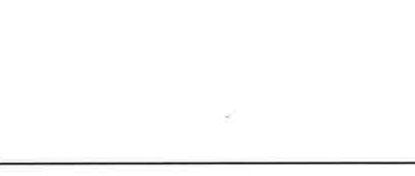
2 E-7 **WALL TRAY CONNECTION**
N.T.S.



3 E-7 **CABLE TRAY TO WALL SWAY BRACE**
N.T.S.



4 E-7 **SLOTTED TYPE CABLE TRAY HANGER BRACKET (ONE SIDE)**
N.T.S.

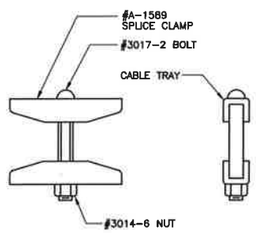


5 E-7 **SLOTTED TYPE CABLE TRAY HANGER BRACKET (BOTH SIDES)**
N.T.S.

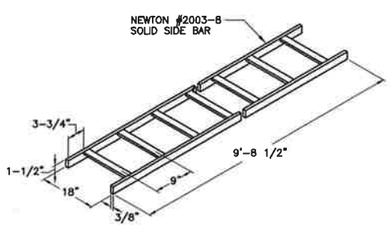
6 E-7 **STRUT HANGER BRACKET**
N.T.S.

7 E-7 **MAKING 90° TURN AND JUNCTIONING CABLE TRAY**
N.T.S.

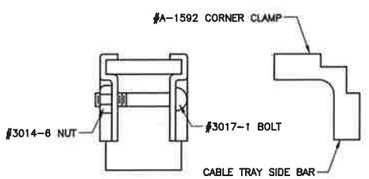
8 E-7 **CABLE TRAY JUNCTION**
N.T.S.



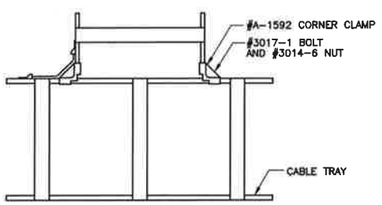
9 E-7 **JUNCTIONING OF SIDE BARS**
N.T.S.



10 E-7 **TYPICAL CABLE TRAY SECTION**
N.T.S.



11 E-7 **JUNCTIONING OF RIGHT ANGLE SIDE BARS**
N.T.S.



12 E-7 **CONNECTING TWO CABLE TRAYS BY "T"-JUNCTION**
N.T.S.

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CABLETRAY DETAILS

E-7

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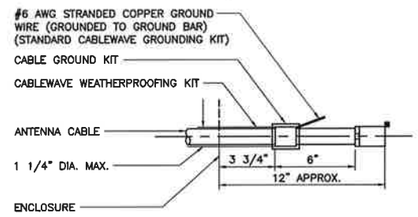
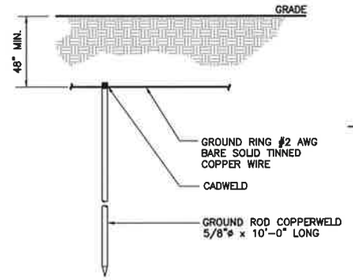


NOTE:

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

1 E-8 ANTENNA CABLE GROUNDING DETAIL

NOT TO SCALE

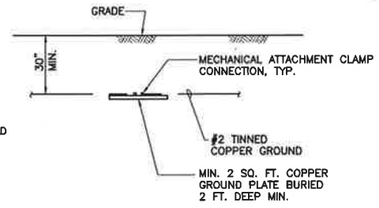


NOTE:

1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

2 E-8 GROUND ROD DETAIL

NOT TO SCALE

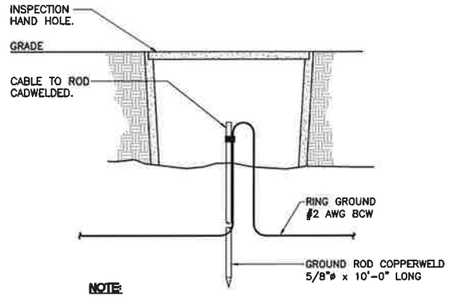


NOTE:

1. GROUND PLATE DETAIL TO BE USED ONLY IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

2A E-8 GROUND PLATE DETAIL

NOT TO SCALE

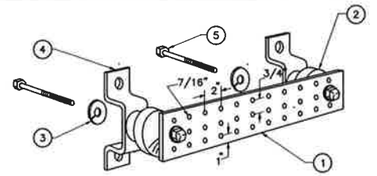


NOTE:

1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

3 E-8 GROUND ROD WITH ACCESS DETAIL

NOT TO SCALE

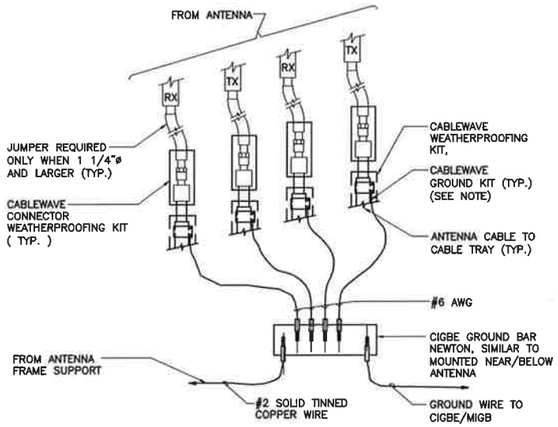


NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

4 E-8 GROUND BAR DETAIL

NOT TO SCALE

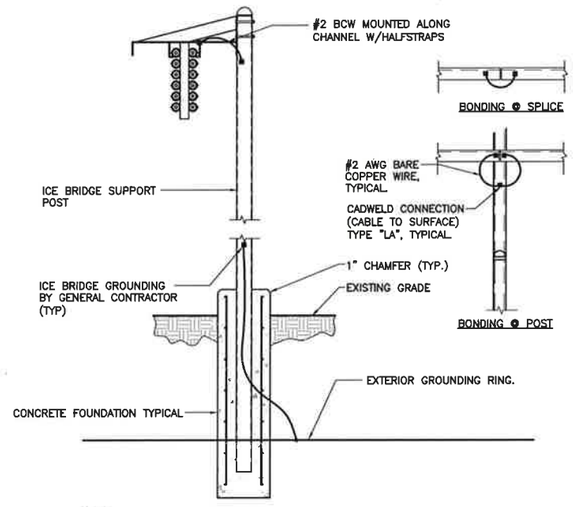


NOTE:

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

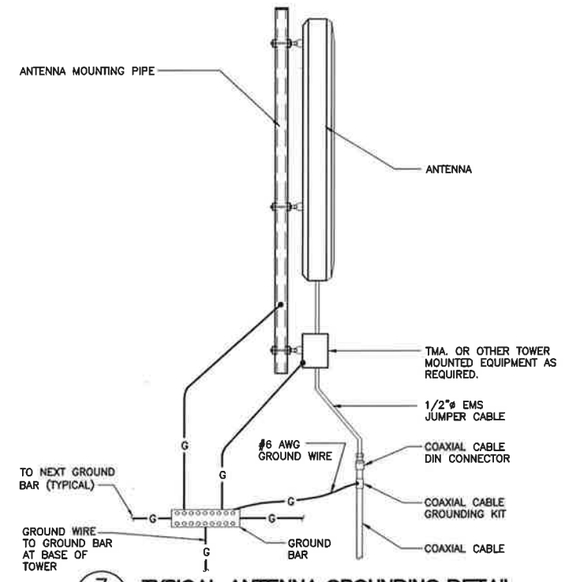
5 E-8 CONNECTION OF GROUND WIRES TO GROUND BAR

NOT TO SCALE



6 E-8 ICE BRIDGE BONDING DETAIL

NOT TO SCALE

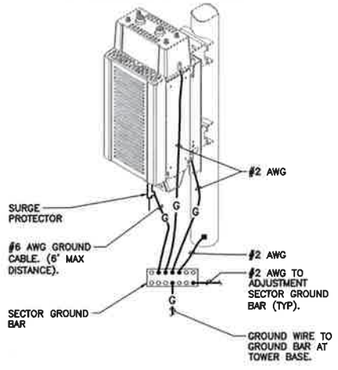


7 E-8 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

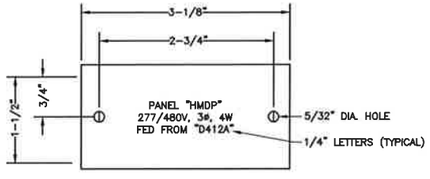
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



8 E-8 RRH POLE MOUNT GROUNDING

NOT TO SCALE



NOTES:

1. REFER TO SPECIFICATIONS FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
2. NAMEPLATE TO BE 1/16" WHITE PLASTIC WITH BLACK CENTER LAMINATION. FACE TO BE WHITE, ENGRAVED LETTERS TO BE BLACK.
3. SECURE NAMEPLATE TO SURFACES WITH (2) FLAT HEAD BRASS SCREWS.

9 E-8 DETAIL OF TYPICAL NAMEPLATE

NOT TO SCALE

WARNING

ARC FLASH & SHOCK HAZARD
APPROPRIATE PPE REQUIRED

MAXIMUM AVAILABLE FAULT CURRENT:

XX,XXX AMPS

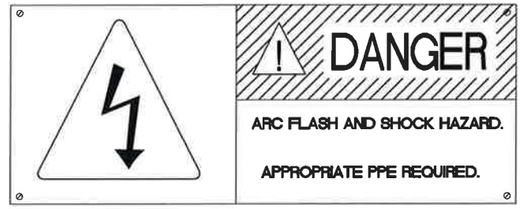
DATE: MM/DD/YYYY

NOTES:

1. REFER TO SPECIFICATIONS FOR FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
2. PROVIDE WARNING LABEL ON ALL SERVICE EQUIPMENT IN ACCORDANCE WITH 2011 NEC 110.24.

10 E-8 DETAIL OF TYPICAL FAULT CURRENT SIGN

NOT TO SCALE



NOTES:

1. REFER TO SPECIFICATIONS FOR FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
2. PROVIDE WARNING LABEL ON ALL SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS IN ACCORDANCE WITH 2005 NEC 110.16.

11 E-8 DETAIL OF TYPICAL FLASH PROTECTION WARNING SIGN

NOT TO SCALE

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DETAILS

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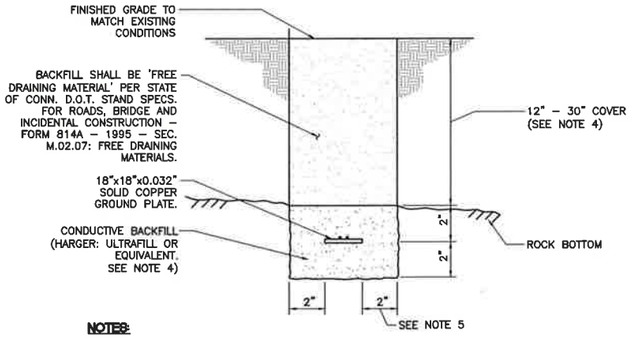
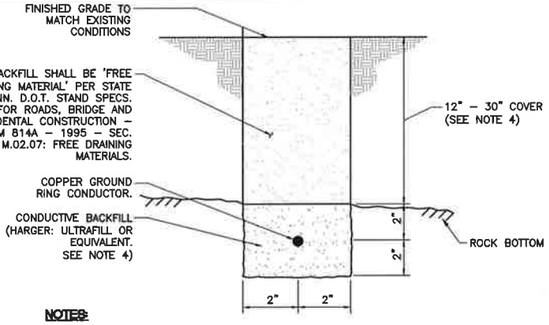


NOTES:

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'–0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.
5. PROVIDE MIN 2" CLEARANCE ON ALL SIDES OF GROUND PLATE.

6 E–9 GROUND PLATE TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)

NOT TO SCALE

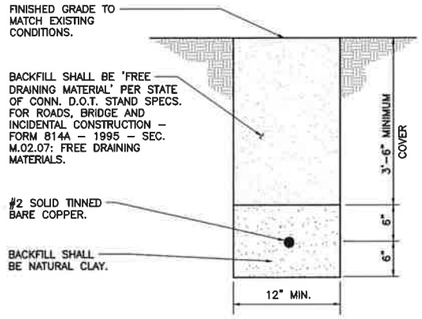


NOTES:

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'–0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.

2 E–9 EGR TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)

NOT TO SCALE

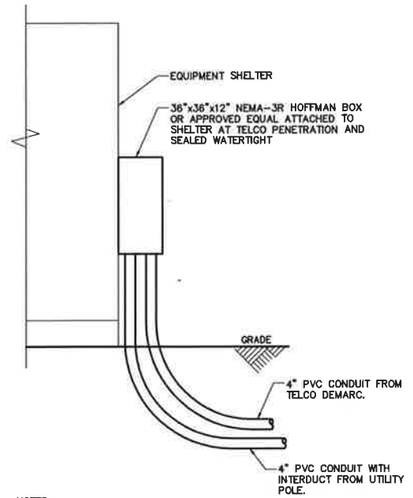


NOTES:

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'–0" LINEAR CLEARANCE BETWEEN NATURAL CLAY BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.

3 E–9 EGR TRENCH/BACKFILL DETAIL

NOT TO SCALE

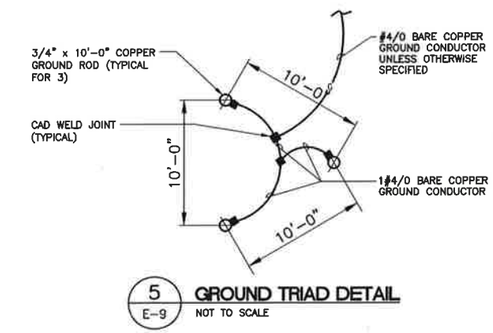


NOTES:

1. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF CONDUITS, PULL ROPES, AND SUPPORT ASSEMBLY.
2. COORDINATE EXACT LOCATION AND CONDUIT SIZE WITH TELEPHONE COMPANY.

8 E–9 HOFFMAN BOX DETAIL

NOT TO SCALE

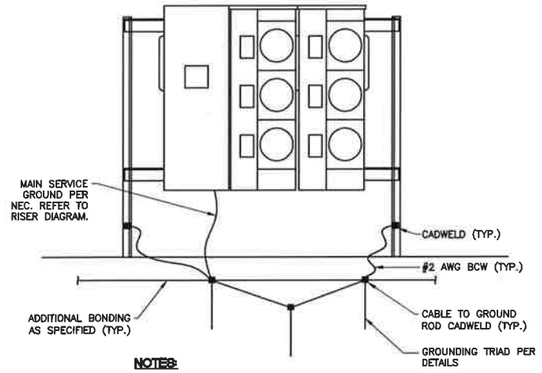


4 E–9 CABLEPORT GROUND BAR LUG CONNECTION

NOT TO SCALE

5 E–9 GROUND TRIAD DETAIL

NOT TO SCALE

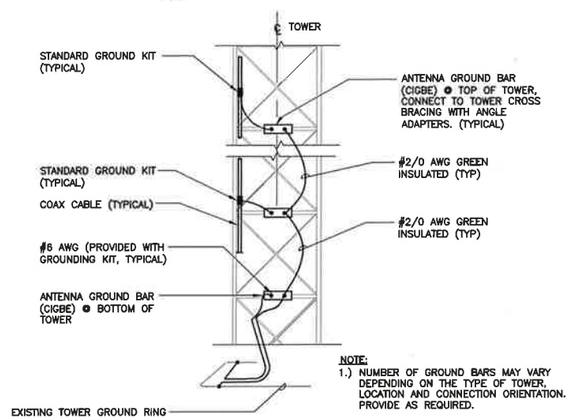


NOTES:

1. THE #2 AWG, BCW, FROM THE GROUND RING SHALL BE CADWELDED TO EACH POST, ABOVE GRADE.

2 E–6 UTILITY FRAME GROUNDING DETAIL

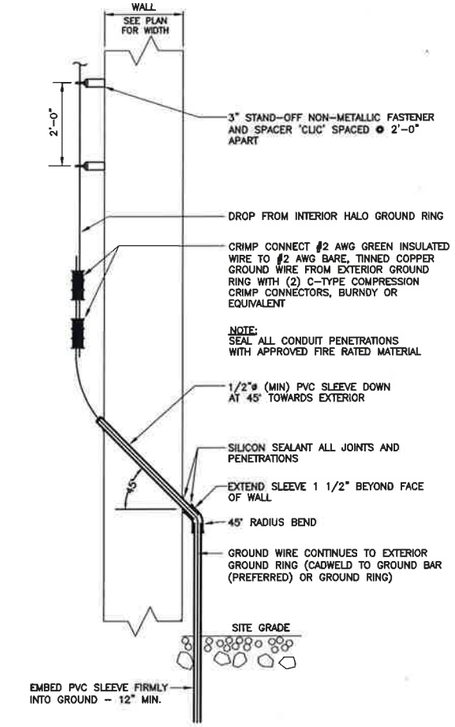
NOT TO SCALE



NOTE:
1.) NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

7 E–9 ANTENNA CABLE GROUNDING - LATTICE TOWER

NOT TO SCALE



9 E–12 CELLULAR GROUNDING CONDUCTOR SECURED ON WALL

N.T.S.

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DETAILS

E-9

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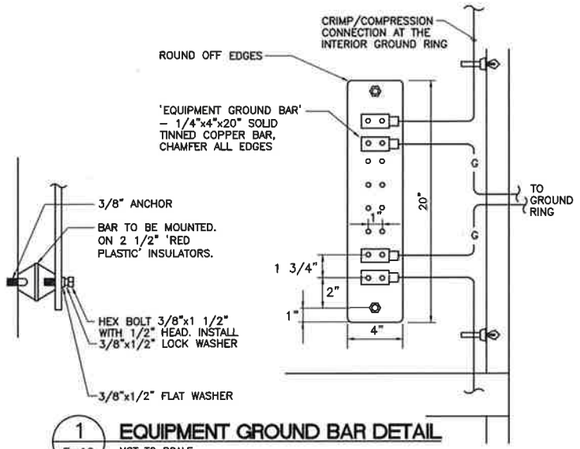
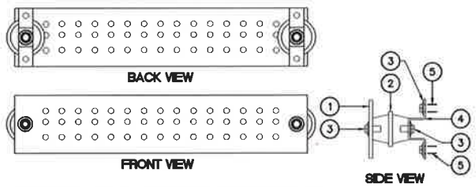


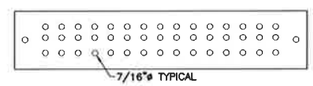
1 E-10 **EQUIPMENT GROUND BAR DETAIL**
NOT TO SCALE



TYPICAL GROUND BAR ASSEMBLY

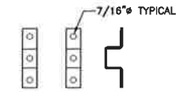
NOTES

1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'–8"Lx4"Wx1/4"D.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872–1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE – 3/8"ø EXPANSION BOLT FOR CONCRETE.



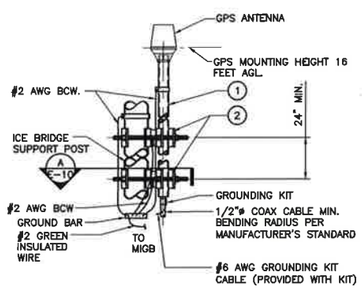
SIDE VIEW

TYPICAL GROUND BAR – DIMENSIONS



BRACKET FOR GROUND BAR-DIMENSIONS

3 E-10 **MASTER/EQUIPMENT GROUND BAR DETAILS**
NOT TO SCALE



GPS ANTENNA MOUNTING BRACKET

A E-10 **SECTION**
NOT TO SCALE

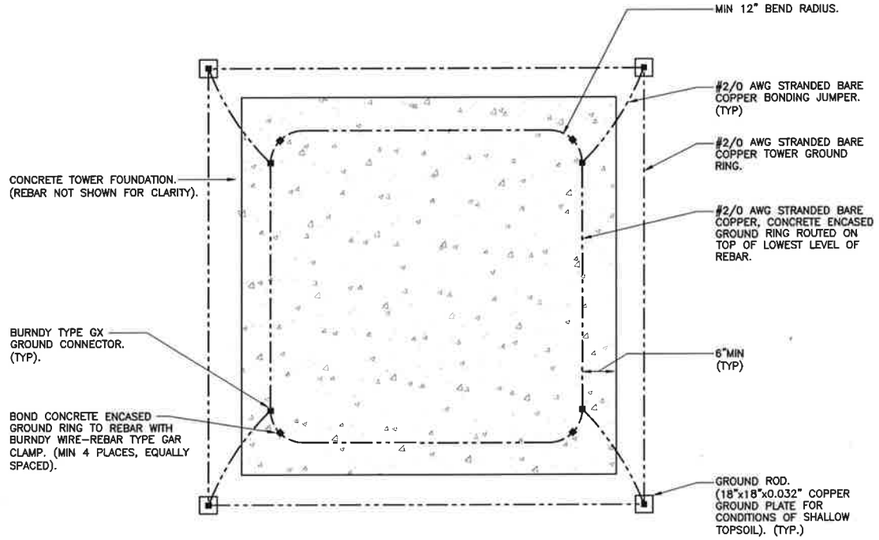
BILL OF MATERIALS

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

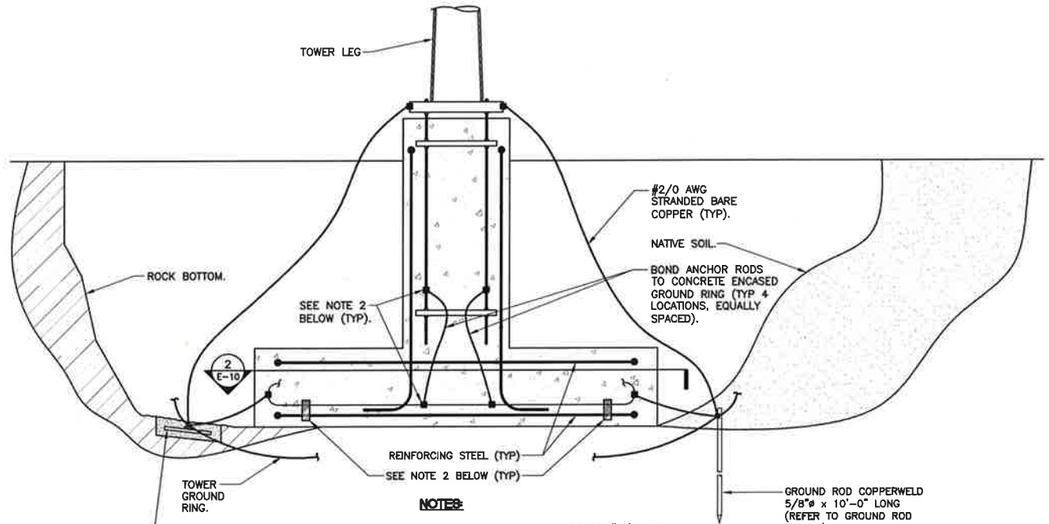
NOTES

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
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.

4 E-10 **GPS GROUNDING/MOUNTING BRACKET DETAIL**
NOT TO SCALE



2 E-10 **CONCRETE ENCASED GROUND RING PLAN VIEW**
NOT TO SCALE



NOTES:

1. ALL CONDUCTORS SHOWN ARE TO #2/0 AWG STRANDED BARE COPPER WIRE.
2. COPPER CONDUCTORS SHALL BE BONDED TO REINFORCING STEEL INSTALLED ON TOP OF LOWEST LAYER OF REBAR AND AT EACH CORNER USING BURNDY TYPE GAR WIRE–REBAR CLAMPS.
3. REFER TO ALL OTHER GROUNDING DETAILS FOR ADDITIONAL INFORMATION.
4. DESIGN IS BASED ON BARE STEEL REBAR FASTENED TOGETHER WITH THE USUAL STEEL TIE WIRES. CONTACT ENGINEER IF CONDITIONS VARY.

5 E-10 **TOWER FOUNDATION GROUNDING DETAIL**
NOT TO SCALE

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ASHFORD RELO., CT

353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

DATE:	05/11/15
SCALE:	AS NOTED
JOB NO.	14124.000

DETAILS

E-10

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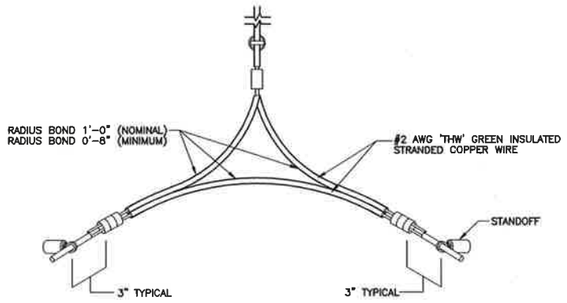
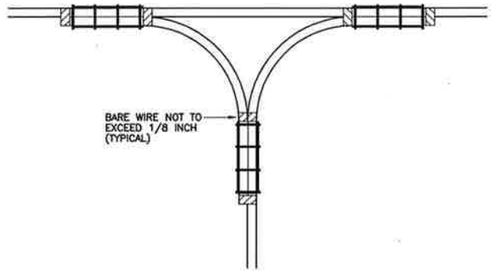
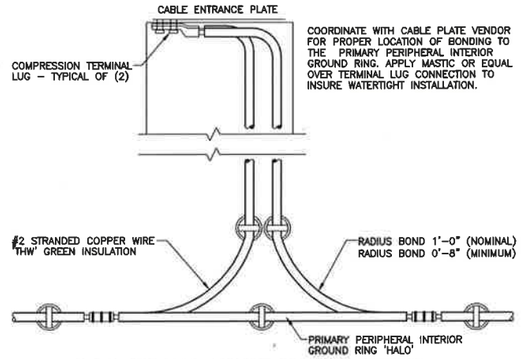


1 E-11 **ISOMETRIC VIEW OF VERTICAL NONDIRECTIONAL SPLICE FOR CORNER INSTALLATION**
N.T.S.

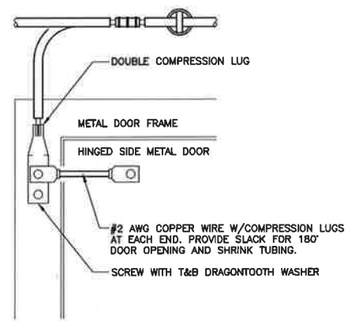


HORIZONTAL OMNI-DIRECTIONAL SPLICE FOR CONNECTING:
1. SUPPLEMENTARY BUS TO SUPPLEMENTAL BUS.
2. SUPPLEMENTARY BUS TO PRIMARY PERIPHERAL INTERIOR GROUND RING.

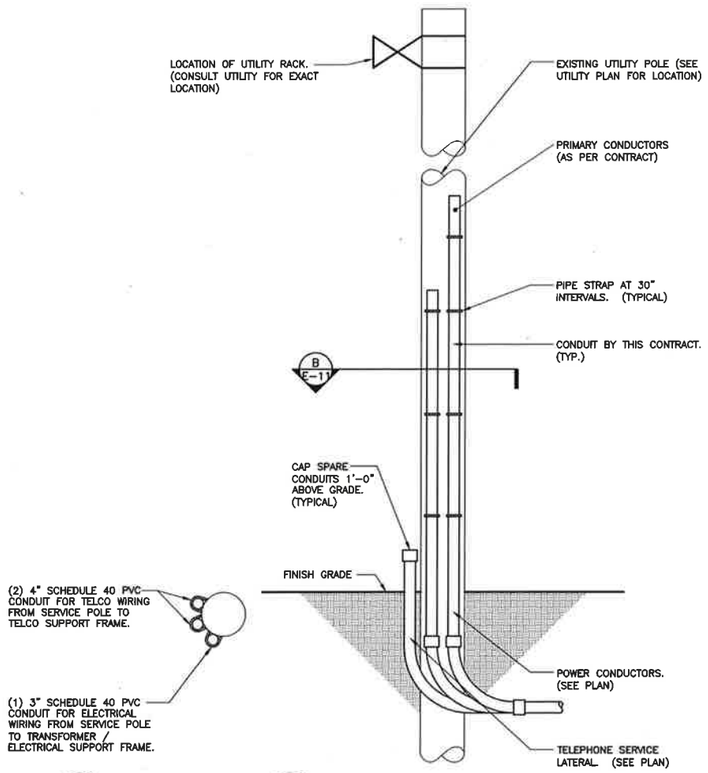
2 E-11 **HORIZONTAL NONDIRECTIONAL SPLICE**
N.T.S.



3 E-11 **BONDING CABLE ENTRANCE PLATE TO PRIMARY PERIPHERAL INTERIOR GROUND RING**
N.T.S.



4 E-11 **BONDING METAL DOOR FRAME AND DOOR TO INTERIOR GROUNDING RING**
N.T.S.



B E-11 **DETAIL**
NOT TO SCALE

5 E-11 **INCOMING SERVICE POLE RISER**
NOT TO SCALE

SERVICE RISER NOTES:

1. THE LOCATION SHOWN FOR THE CONNECTION TO UTILITIES, AND INCOMING POWER AND TELEPHONE SERVICES IS FOR CONCEPT ONLY. THE CONTRACTOR SHALL COORDINATE THE ACTUAL LOCATION WITH LOCAL TELEPHONE COMPANY, THE OWNER AND LOCAL ELECTRIC UTILITY COMPANY.
2. CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS WITH LOCAL UTILITY COMPANY AND LOCAL TELEPHONE COMPANY FOR A TIMELY INSTALLATION OF THE INCOMING POWER AND TELEPHONE SERVICE. CONTRACTOR WILL OBTAIN AN ELECTRIC SERVICE ORDER (ESO) FOR THE SITE FROM LOCAL UTILITY COMPANY AND LOCAL TELEPHONE COMPANY PRIOR TO CONSTRUCTION.
3. THE INCOMING ELECTRIC SERVICE WILL BE INSPECTED BY THE AUTHORITY HAVING JURISDICTION AND A CERTIFICATE OF SUCH INSPECTION SHALL BE FURNISHED TO THE OWNER AND A COPY FORWARDED TO LOCAL UTILITY COMPANY.
4. FOR INCOMING UNDERGROUND TELEPHONE SERVICE, THE CONTRACTOR SHALL INSTALL CONDUIT AND PULL WIRES BETWEEN THE RISER POLE AND THE TELCO SERVICE CABINET. THE CONTRACTOR SHALL PROVIDE PRE CAST PULL-BOXES INCLUSIVE OF THE PRE CAST COVERS OF THE TYPE AND AS REQUIRED BY LOCAL TELEPHONE COMPANY THE MAXIMUM DISTANCE BETWEEN PULL-BOXES CAN NOT EXCEED 750' (CONTRACTOR TO CONFIRM WITH LOCAL UTILITY). AT THE PROPOSED RISER POLE EXTEND THE TELEPHONE CONDUIT UP THE POLE APPROXIMATELY 8' AND SEAL.
5. THE CONTRACTOR SHALL COORDINATE THE METER REQUIREMENTS WITH LOCAL UTILITY COMPANY.
6. THE INCOMING ELECTRICAL SERVICE SHALL BE INSTALLED IN CONFORMANCE WITH LOCAL UTILITY COMPANY STANDARDS (LATEST EDITION).
7. THIS SITE MAY CONTAIN CRITICAL UNDERGROUND ELECTRIC AND TELEPHONE SERVICES IN THE VICINITY OF THE NEW UNDERGROUND SERVICE AND THE EQUIPMENT SUPPORTS. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DISRUPTION OF THESE EXISTING FACILITIES. THE CONTRACTOR SHALL ALSO CONTACT LOCAL UTILITY COMPANY AND LOCAL TELEPHONE COMPANY AND ALL THE APPROPRIATE AGENCIES PRIOR TO EXCAVATION AT THIS SITE.

REV.	DATE	DRAWN BY	CK'D BY	DESCRIPTION
0	07/09/15	TJB	CKD	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

Celico Partnership d.b.a. Verizon Wireless

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(203) 488-0580
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DETAILS

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ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL TRANSFORMER AND NEW 6-GANG MULTI METER CENTER, 800A, 240/120V, 1P, 3 WIRE ELECTRIC SERVICE WITH REVENUE METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT. (AS REQUIRED BY UTILITY CO.) SCOPE TO ALSO INCLUDE:

   a. RELOCATION OF ALL EXISTING ELECTRIC SERVICE METERS TO NEW METER CENTER, INCLUDING ALL CONDUITS, CONDUCTORS, DISCONNECTS, JUNCTION BOXES AND ACCESSORIES.

   b. REMOVAL OF ABANDONED SERVICE EQUIPMENT, CONDUIT, AND CONDUCTORS AFTER COMPLETION OF EACH RELOCATION.

   c. PROVIDE TEMPORARY POWER DURING CUTOVER AS REQUIRED.

   d. COORDINATE OUTAGES AND SERVICE RELOCATIONS WITH EACH AFFECTED PARTY.

2. NEW SITE TELEPHONE SERVICE AS SPECIFIED BY TELEPHONE COMPANY.

3. GENERATOR/TRANSFER SWITCH.

4. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, LIGHTING FIXTURES, ETC. AS INDICATED OR NOTED ON PLANS.

5. POWER AND TEMPERATURE CONTROL WIRING FOR HVAC EQUIPMENT.

   a. FURNISH AND INSTALL ALL POWER WIRING FOR ALL HEATING, VENTILATING, AIR CONDITIONING, MOTORS AND DEVICES, AND FIRE PROTECTION EQUIPMENT INDICATED ON THE PLANS OR CALLED FOR IN THIS SPECIFICATION, EITHER ELECTRICAL OR MECHANICAL INCLUDING ALL CONTROL WIRING. ALL MAGNETIC STARTERS SHALL BE FURNISHED UNDER DIVISION 15 AND HAVE INSTALLED THEREIN A PROPER OVERLOAD HEATER FOR EACH MOTOR.

   b. ALL WIRING, BOTH POWER AND CONTROL, FOR SUCH ITEMS AS UNIT HEATERS, EXHAUST FANS, ETC., NOT SPECIFICALLY CALLED FOR IN THE TEMPERATURE CONTROL SPECIFICATIONS, SHALL BE WIRED UNDER DIVISION 16.

   c. ALL CONTROLS WHICH ARE TO BE WIRED BY THIS CONTRACTOR SHALL BE DELIVERED TO HIM BY THE CONTRACTOR/VENDOR FURNISHING THEM.

6. CELLULAR SITE ALARMS, ASSOCIATED WIRING AND DEVICES.

7. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, INTERIOR GROUNDING RING, GROUND BARS, ETC.

8. FURNISH AND INSTALL 3/4" PLYWOOD BACKBOARD OF SIZE INDICATED ON DRAWINGS FOR MOUNTING OF POWER/SERVICE EQUIPMENT AND TELEPHONE/ALARM EQUIPMENT. BACKBOARDS SHALL BE PAINTED WITH TWO (2) COATS OF SEMI-GLOSS GRAY FIRE RETARDANT PAINT.

9. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.

10. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.

11. REMOVAL OF EXISTING GUYED TOWER AND ALL ASSOCIATED GROUNDING ELEMENTS, AS SPECIFIED IN THE PLANS.

B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:

1. TELEPHONE CABLES.

2. SHUTDOWN OF SERVICE (COORDINATE WITH OWNER).

C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

D. ELECTRICAL CONTRACTOR SHALL COORDINATE ELECTRICAL INSTALLATION WITH ELECTRIC UTILITY CO. PRIOR TO INSTALLATION.

E. CONTRACTOR SHALL COORDINATE WITH TELEPHONE UTILITY COMPANY FOR LOCATION OF TELEPHONE SERVICE AND TO DETERMINE ANY REQUIRED EQUIPMENT TO BE INSTALLED BY CONTRACTOR.

1.02. GENERAL REQUIREMENTS

A. 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.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LOCAL TELEPHONE COMPANY THAT MAY BE REQUIRED FOR THE INSTALLATION OF TELEPHONE SERVICE TO THE PROPOSED CELLULAR SITE.

F. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

G. 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.

H. 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.

I. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

J. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

K. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

L. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

M. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

N. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

O. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". ALL CONDUIT RUNS LOCATED WITHIN THE OWNER'S EQUIPMENT ROOM SHALL ORIGINATE FROM THE WIREWAY AND RUN VERTICALLY TO ITS DESTINATION. NO BENDS WILL BE ACCEPTED. CONDUITS SHALL BE PROPERLY FASTENED TO THE WALLS AND CEILINGS AS REQUIRED BY THE N.E.C.

CONDUIT MATERIAL SHALL BE AS FOLLOWS:

1. ELECTRIC METALLIC TUBING (EMT) - BRANCH CIRCUITS INSIDE WIRELESS ROOM

2. GALVANIZED RIGID CONDUIT (GRC) - FEEDERS AND CIRCUITS EXPOSED TO EXTERIOR & UNDERGROUND.

3. LIQUID TIGHT FLEXIBLE METAL CONDUIT - FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT (HVAC UNITS, MOTORS, ETC.) IN WET LOCATIONS.

4. FLEXIBLE METAL CONDUIT - FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT IN DRY LOCATIONS.

5. PVC CONDUIT - WHERE SHOWN ON GROUNDING DETAILS.

SECTION 16113

1.01. WIREWAYS

A. THE 4" X 4" WIREWAY LOCATED IN THE OWNER'S EQUIPMENT ROOM SHALL BE INSTALLED ALONG THE TOP OF THE INTERIOR WALL AND SHALL HAVE ONE VERTICAL DROP CONNECTED TO PANELBOARD. MANUFACTURER SHALL BE HOFFMAN ENGINEERING COMPANY OR APPROVED EQUAL.

SECTION 16114

1.01. CABLE TRAY

A. CABLE TRAY SHALL BE SOLID SIDE BAR, 18" WIDE (NEWTON INSTRUMENT COMPANY, INC.). TRAY SHALL BE INSTALLED AS SHOWN ON CONTRACT DOCUMENTS.

B. CROSSWISE RUNS SHALL BE COORDINATED WITH THE SPECIFIC EQUIPMENT THE TRAY SHALL SERVE.

C. ALL PROTRUDING CABLE TRAY SUPPORT RODS SHALL BE FILED SMOOTH WITH NO SHARP EDGES. ALL SUPPORT RODS SHALL BE CAD-PLATED FOR RUST RESISTANCE AND A MINIMUM 1/2" DIAMETER.

SECTION 16123

1.01. CONDUCTORS

A. 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:

LINE	120/208/240V COLOR	277/480V COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)

2. DUPLEX RECEPTACLE - P&S #2095 (GFCI) SPECIFICATION GRADE

3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE

4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

D. PROVIDE NAMEPLATE FOR PORTABLE ENGINE/GENERATOR CONNECTION SHOWING VOLTAGE KVA/KW RATING, # PHASE, AND # OF WIRES. PLATE TO BE PLASTIC ENGRAVED, RED WITH WHITE LETTERS.

E. ALL RECEPTACLES, SWITCHES, DISCONNECT SWITCHES, ETC. SHALL BE LABELED WITH THE CORRECT BRANCH CIRCUIT NUMBER SERVED BY MEANS OF PERMANENT PRESSED TYPE BLACK 1/4" TRANSFER LETTERING. (FOR EXAMPLE: "MDP-5", ETC.).

F. PROVIDE A NAMEPLATE AT THE SERVICE EQUIPMENT INDICATING THE TYPE AND LOCATION OF THE ON SITE GENERATOR.

SECTION 16450

1.01. GROUNDING

A. 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.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. REFER TO PANEL SCHEDULE "BRANCH CIRCUIT" DATA FOR EQUIPMENT GROUND CONDUCTOR SIZE FOR EACH BRANCH CIRCUIT.

4. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

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).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. INTERIOR GROUND RING
3. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
4. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S WIRELESS PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16500

1.01. LIGHTING FIXTURES

A. REFER TO LIGHT FIXTURE SCHEDULE FOR REQUIREMENTS.

SECTION 16620
(SUPPLIED BY OWNER, INSTALLED BY CONTRACTOR)

1.01. GENERATOR SET

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16700

1.01. BUILDING ALARMS (SIGNAL COMMUNICATIONS)

A. ALARM BOX SHALL BE 12" W x 12" H x 6" D NEMA 1 ENCLOSURE, MCKINSTRY #J30-1216LP WITH ACCESSORIES:

- "T" HANDLE LATCH KIT
- 14 GAUGE STEEL PANEL, PAINTED WHITE ENAMEL
- (6) 1/2"-3/4" K.OS ON EACH SIDE/TOP/BOTTOM WALLS
- (2) 3/4" RUBBER GROMMETS AS SLEEVES
- PROVIDE WIRING SCHEMATIC IN REMOVABLE PLASTIC COVER, TAPED TO BACK SIDE OF HINGED DOOR.

B. ALARM SENSORS' RELAY SHALL BE NORMALLY CLOSED. UPON ALARM CONDITION, THE RELAY SHALL REVERSE STATE TO OPEN. CONFIRM INSTALLATION AND LOCATION REQUIREMENTS FOR BUILDING'S ALARM SENSORS.

ALARM SENSORS SHALL BE:

1. FIRE ALARM CONTROL PANEL: FROM C CONTACT RELAY.

2. DOOR CONTACT SENSOR (SENTROL #1085T): SPDT MAGNETIC FORM C CONTACT - OPEN/CLOSE LOOP, MAX 1" GAP.

3. LOW TEMPERATURE SENSOR (HONEYWELL #T631C1103); SPDT AIR SWITCH CONTROLLER - COILED COPPER TUBE IN NEMA 1 ENCLOSURE. SET AT 50 DEGREES F., MOUNT LAMINATED, BACK-LIT NAMEPLATE WITH LEGIBLE DESCRIPTION "LOW TEMP 50 DEGREE F" BELOW SENSOR.

4. HIGH TEMPERATURE SENSOR (HONEYWELL #T631C1103): SPDT AIR SWITCH CONTROLLER - COILED COPPER TUBE IN NEMA 1 ENCLOSURE. SET AT 80 DEGREES F., MOUNT LAMINATED, BACK-LIT NAMEPLATE WITH LEGIBLE DESCRIPTION "HI TEMP 80 DEGREES F" BELOW SENSOR.

C. CONFIRM REQUIREMENTS FOR ALL BUILDING ALARM SENSORS INSTALLATION, AND LOCATION OF EACH SENSOR. ALARM WIRING SHALL BE ROUTED TO ALARM BOX AND SPADE CONNECTED TO RESPECTIVE TERMINAL BLOCK. EACH PAIR OF ALARM WIRING SHALL BE PERMANENTLY AND UNIQUELY TAGGED AT EACH TERMINAL STRIP LOCATION AND AT SPLICE/JUNCTION/BOXES/WIRING TROUGH.

D. REFER TO "WIRING SCHEMATIC FOR ALARM SENSORS" ON DRAWINGS.

SECTION 16960

1.01. 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: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: 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. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S 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.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CK'D BY	DESCRIPTION
0	07/09/15	TJB	CKD	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d.b.a. Verizon wireless

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

Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY

ASHFORD RELO., CT
353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

DATE: 05/11/15
SCALE: AS NOTED
JOB NO. 14124.000

SPECIFICATIONS

E-12

Unit Base Foundation

valmont STRUCTURES
Version = 4.0

Client: Verizon Wireless
File: A-284859
Location: Ashford, CT
Model: V-25.0 x 240'

Tower Reactions:

Shear: $S := 71 \cdot kips$
Moment: $M := 9309 \cdot ft \cdot kips$
Compression: $C := 476 \cdot kips$
Uplift: $U := 338 \cdot kips$
Weight: $W_t := 49 \cdot kips$

Height := 240 ft

- Soil parameters per soil report by := "Terracon, Dated 02/23/15, Project#J2155118"
- Concrete design conforms to the following:
  * *Building Code Requirements for Reinforced Concrete (ACI 318-02)*
  * *2003 International Building Code (IBC)*
  * *Structural Standards for Steel Antenna Towers TIA/EIA-222-F-1996*

STATE OF CONNECTICUT WILLIAM HEIDEN III No. 23038 LICENSED PROFESSIONAL ENGINEER
APR 0 1 2015

Soil Properties:

Soil strengths:
$B_c := 5.0 \cdot ksf$ (Allowable bearing capacity)
$\phi := 0 \cdot deg$ (Internal angle of friction)
$C := 0 \cdot ksf$ (Undrained shear strength)
$P_p := 0 \cdot kcf$ (Ultimate Passive Pressure)
Soil unit weight: $\gamma := .125 \cdot kcf$
Friction Coeff.: $\mu := 0.5$ *(Concrete/Soil)*

Foundation Dimensions:

Depth: $D := 6.5 \cdot ft$
Depth to neglect: $n := 5.5 \cdot ft$
Thickness: $T := 1.75 \cdot ft$
Pier diameter: $d := 3.5 \cdot ft$
Tower width: $W' := 25 \cdot ft$
Ext. above grade: $E := 0.5 \cdot ft$
Clear Cover: $cc := 3.0 \cdot in$

Soil Compaction Specifications:

Lift Thickness: $LT := 8 \cdot in$
Compaction Percent: $CP := 98\%$
Proctor Test:
Enter: 698 = ASTM D698
1557 = ASTM D1557
$ASTM := 698$

Material Properties:

Concrete Strength: $f'c := 4500$ psi
Concrete unit weight: $\delta\chi := 0.150 \cdot kcf$
Rebar yield strength: $f_y := 60000 \cdot psi$

Seismic zone (0,1,2,3 or 4): (UBC Fig. 23-2) $Z := 2$
Is tower centroid offset from foundation centroid? (no=0, yes=1) $os := 1$

Initial Width: $W := \left[\frac{2 \cdot M \cdot 1.5}{T \cdot (\delta\chi - \gamma) + D \cdot \gamma}\right]^{\frac{1}{3}}$ $W = 31.95\,ft$ Try: $W := 33.0 \cdot ft$

Concrete volume $:= \left(W^2 \cdot T\right) + 3 \cdot (D - T + E) \cdot \left(\frac{\pi}{4} \cdot d^2\right)$ $volume = 76.2 \cdot yd^3$

Concrete weight: $W_c := (volume) \cdot \delta\chi$ $W_c = 308.6 \cdot kips$

Soil weight (above footing): $W_s := \left[W^2 \cdot (D - T) - 3 \cdot (D - T + E) \cdot \left(\frac{\pi}{4} \cdot d^2\right)\right] \cdot \gamma$ $W_s = 627.7 \cdot kips$

Total weight: $P := W_c + W_s + W_t$ $P = 985.2 \cdot kips$

EIA/TIA-222 Load Factor [EIA - 3.1.13]

$LF := \text{if}\left[\text{Height} \le 700, 1.3, \text{if}\left[\text{Height} \ge 1200, 1.7, 1.3 + \left(\frac{\text{Height} - 700}{1200 - 700}\right)\cdot 0.4\right]\right]$ $LF = 1.3$

Passive Pressure:

Passive pressure coeff.: $K_p := \text{if}\left(P_p > 0\,\text{kcf}, 0, \tan\left(45\cdot\text{deg} + \frac{\phi}{2}\right)^2\right)$ $K_p = 1.00$

Passive pressure:

$P_{pn} := K_p\cdot\gamma\cdot n + 2\cdot c\cdot\sqrt{K_p}$ $P_{pn} = 0.687\cdot\text{ksf}$

$P_{pt} := K_p\cdot\gamma\cdot(D - T) + 2\cdot c\cdot\sqrt{K_p}$ $P_{pt} = 0.594\cdot\text{ksf}$

$P_{ptop} := \text{if}\left(n < D - T, P_{pt}, P_{pn}\right)$ $P_{ptop} = 0.687\cdot\text{ksf}$

$P_{pb} := K_p\cdot\gamma\cdot D + 2\cdot c\cdot\sqrt{K_p}$ $P_{pb} = 0.812\cdot\text{ksf}$

$P_p := \frac{P_{ptop} + P_{pb}}{2}$ $P_p = 0.75\cdot\text{ksf}$

Shear area:

$T_{pp} := \text{if}(n < D - T, T, D - n)$ $T_{pp} = 1\,\text{ft}$

$A_{pp} := W\cdot T_{pp}$ $A_{pp} = 33\,\text{ft}^2$

Shear Capacity: (factor of safety: $FS := 2.0$)

$S_{actual} := \frac{\left(P_p\cdot A_{pp}\right) + \mu\cdot P}{FS}$ $S_{actual} = 258.69\cdot\text{kips}$ $> S = 71.00\cdot\text{kips}$ ***CHECK*** = "OK"

Moment resisting at toe: (assume soil is perfectly rigid)

Weight of soil wedge (back face): $W_{sw} := \frac{D\cdot(D\cdot\tan(\phi))}{2}\cdot W\cdot\gamma$ $W_{sw} = 0\cdot\text{kips}$

Distance from leg to edge of concrete: $O := \text{if}\left(os = 0, \frac{W}{2} - \frac{1}{3}\cdot 0.866\cdot W', \frac{W - 0.866\cdot W'}{2}\right)$ $O = 5.675\,\text{ft}$

Additional offset of tower weight: $O_a := \frac{W}{2} - \left(\frac{1}{3}\cdot 0.866\cdot W' + O\right)$ $O_a = 3.608\,\text{ft}$

Resisting moment: $M_{rwt} := \left(W_c + W_s\right)\cdot\frac{W}{2} + W_t\cdot\left(\frac{W}{2} - O_a\right)$ $M_{rwt} = 16079.73\cdot\text{ft}\cdot\text{kips}$

$M_{rp} := \left(P_p\cdot A_{pp}\right)\cdot\frac{T_{pp}}{3}$ $M_{rp} = 8.25\cdot\text{ft}\cdot\text{kips}$

$M_{rsw} := W_{sw}\cdot\left(W + D\cdot\frac{\tan(\phi)}{3}\right)$ $M_{rsw} = 0\cdot\text{ft}\cdot\text{kips}$

Total resisting moment: $M_{rt} := M_{rwt} + M_{rp} + M_{rsw}$ $M_{rt} = 16087.98\cdot\text{ft}\cdot\text{kips}$

Overturning moment: $M_o := M + S\cdot(D + E)$ $M_o = 9806\cdot\text{ft}\cdot\text{kips}$

Factor of safety: ($FS_{required} := 1.50$) $FS := \frac{M_{rt}}{M_o}$ $FS = 1.64$ $> FS_{required} = 1.50$ ***CHECK*** = "OK"

Compression exerted by foundation:

Area of mat: $Area := W^2$ $Area = 1089\,ft^2$

Section modulus: $SM := \frac{W^3}{6}$ $SM = 5989.5\,ft^3$

Pressure exerted: $P_{pos} := \frac{P}{Area} + \frac{M_o}{SM}$ $P_{pos} = 2.54 \cdot ksf$ < $B_c = 5.00 \cdot ksf$

$P_{neg} := \frac{P}{Area} - \frac{M_o}{SM}$ $P_{neg} = -0.732 \cdot ksf$ < 0 ksf

Note = "The stress resultant is NOT within the kern. Bearing area has been adjusted below."

Load eccentricity: $e := \frac{M_o}{P}$ $e = 9.953\,ft$ $P_{adj} := \frac{2 \cdot P}{3 \cdot W \cdot \left(\frac{W}{2} - e\right)}$ $P_{adj} = 3.04 \cdot ksf$

Adjusted applied pressure: (assume symmetric condition controls) $q_a := if\left(P_{neg} \geq 0 \cdot ksf, P_{pos}, P_{adj}\right)$

$q_a = 3.04 \cdot ksf$ < $B_c = 5.00 \cdot ksf$ *CHECK* = "OK"

Column compression capacity: (ACI 10.15)

Compression reaction: $\phi := 0.65$ (ACI 9.3.2.2)

$P_c := \phi \cdot 0.85 \cdot f'c \cdot psi \cdot \left(\frac{d^2}{4} \cdot \pi\right)$ $P_c = 3444.56 \cdot kips$ > $LF \cdot C = 618.80 \cdot kips$ *CHECK* = "OK"

Concrete shear strength:

One way beam action at d from column face: (ACI 11.3.1.1)

Effective depth: $d_c := T - cc - 0.5 \cdot in$ $d_c = 17.5 \cdot in$

Factored load intensity: (ACI 9.2.1) $q_s := LF \cdot \frac{C}{W^2}$ $q_s = 0.568 \cdot ksf$

Required shear: ($\phi := 0.75$ - ACI 9.3.2.3) $V_n := \frac{q_s \cdot \left(0 - \frac{1}{2} \cdot d - d_c\right) \cdot W}{\phi}$ $V_n = 61.672 \cdot kips$

Available shear: (ACI 11.3.1.1) $V_c := 2.0 \cdot \sqrt{f'c} \cdot psi \cdot W \cdot d_c$ $V_c = 929.757 \cdot kips$

$V_c = 929.76 \cdot kips$ > $V_n = 61.67 \cdot kips$ *CHECK* = "OK"

Two way action at d/2 from column face: (ACI 11.12.2.1)

Perimeter: $P_o := \left(d + d_c\right) \cdot \pi$ $P_o = 15.577\,ft$

Required shear: ($\phi := 0.75$ - ACI 9.3.2.3) $V_n := q_s \cdot \frac{W^2 - \left(d + d_c\right)^2 \cdot \frac{\pi}{4}}{\phi}$ $V_n = 810.437 \cdot kips$

Available shear: (ACI 11.12.2.1) $V_c := 4.0 \cdot \sqrt{f'c} \cdot psi \cdot d_c \cdot P_o$ $V_c = 877.751 \cdot kips$

$V_c = 877.75 \cdot kips$ > $V_n = 810.44 \cdot kips$ *CHECK* = "OK"

Pier reinforcement:

Cross sectional area of pier: $A_c := d^2 \cdot \frac{\pi}{4}$ $A_c = 1385.442 \cdot in^2$

Minimum area of steel: (ACI 10.8.4 & 10.9.1)

$Percent(min) := if(Z > 2, 1.0 \cdot \%, 0.50 \cdot 1.0\%)$

$A_{stmin} := A_c \cdot (Percent(min))$ $A_{stmin} = 6.927 \cdot in^2$

Bending and tension requirements:

Bar Size: $s_c := 9$ Area: $A_{bc} := area_{s_c}$ $A_{bc} = 1.00 \cdot in^2$

Quantity: $m_c := 19$ Diameter: $d_{bc} := dia_{s_c}$ $d_{bc} = 1.128 \cdot in$

Total area of steel: $A_{st} := m_c \cdot A_{bc}$

$A_{st} = 19.00 \cdot in^2 > A_{stmin} = 6.93 \cdot in^2$ ***CHECK*** = "OK"

Treat the circular cage of reinforcement as an equivalent hollow circle (pipe). Set the outer diameter of the pipe to the diameter of the cage (d_o) and solve for the inner diameter (d_i) using the area of a pipe (A) equation.

Cage diameter: $d_o := d - 2 \cdot cc$ $d_o = 3.00 ft$

Given $A_{st} = \frac{\pi \cdot (d_o^2 - d_i^2)}{4}$ $d_i := Find(d_i)$ $d_i = 2.972 ft$

$A := \frac{\pi \cdot (d_o^2 - d_i^2)}{4}$ $A = 19 \cdot in^2 = A_{st} = 19 \cdot in^2$

Section Modulus: $SM := \pi \cdot \frac{d_o^4 - d_i^4}{32 \cdot d_o}$ $SM = 169.404 \cdot in^3$

Combined Stress: $\sigma := \frac{U}{A_{st}} + \frac{0.5 \cdot S \cdot (D - T + E)}{SM}$

$\sigma = 30.99 \cdot ksi < (f_y \cdot 0.60) = 36 \cdot ksi$ ***CHECK*** = "OK"

Bar separation: $B_s := \frac{d_o \cdot \pi}{m_c} - d_{bc}$ $B_s = 4.82 \cdot in$ ***CHECK*** = "OK"

Reinforcement Development length:

Tension: (ACI 12.2.3 & 12.2.4)

$\alpha := 1.0$ $\alpha = 1$

$\beta := 1.0$ $\beta = 1$

$\gamma := if(s_c > 6, 1.0, 0.8)$ $\gamma = 1$

$\lambda := 1.0$ $\lambda = 1$

$k := 0 \cdot in$ $k = 0 \cdot in$

$c := \min\left(\frac{B_s}{2} + d_{bc}, cc + \frac{d_{bc}}{2}\right)$ $c = 3.54 \cdot in$

$c' := \min\left(2.5, \frac{c + k}{d_{bc}}\right)$ $c' = 2.5$

$L_{dt} := \frac{3 \cdot f_y}{40 \cdot \sqrt{f'c} \cdot psi} \cdot \frac{\alpha \cdot \beta \cdot \gamma \cdot \lambda}{c'} \cdot d_{bc}$ $L_{dt} = 30.267 \cdot in$

Reinforcement Development length: - (continued)

Minimum development length: (ACI 12.2.1)

$L_{dt} := \text{if}\left(L_{dt} < 12\cdot in, 12\cdot in, L_{dt}\right)$ $L_{dt} = 30.267\cdot in$

Compression: (ACI 12.3.2)

$L_{db} := 0.02\cdot d_{bc}\cdot\frac{f_y}{\sqrt{f'c}\cdot psi}$ $L_{db} := L_{db}\cdot\frac{\sigma}{\left(f_y\cdot 0.60\right)}$ $L_{db} = 17.371\cdot in$

$L_{dmin} := 0.0003\cdot d_{bc}\cdot\frac{f_y}{psi}$ $L_{dmin} := L_{db}\cdot\frac{\sigma}{\left(f_y\cdot 0.60\right)}$ $L_{dmin} = 14.954\cdot in$

$L_{dc} := \max\left(8\cdot in, L_{dmin}, L_{db}\right)$ $L_{dc} = 17.371\cdot in$

Length available in pier: $L_{pier} := (D + E) - T - cc$

Tension: $L_{pier} = 60.00\cdot in > L_{dt} = 30.27\cdot in$ ***CHECK*** = "OK"

Compression: $L_{pier} = 60.00\cdot in > L_{dc} = 17.37\cdot in$ ***CHECK*** = "OK"

Length available in pad: $L_{pad} := T - cc$

Tension: $L_{pad} = 18.00\cdot in > L_{dt} = 30.27\cdot in$ ***CHECK*** = "HOOK REQUIRED"

Compression: $L_{pad} = 18.00\cdot in > L_{dc} = 17.37\cdot in$ ***CHECK*** = "OK"

Rebar Hook Design:

Basic development length: (ACI 12.5.2 & 12.5.3)

$\alpha := \text{if}\left[(cc \geq 2.5\cdot in)\cdot\left(s_c \leq 11\right), 0.7, 1\right]$ $\alpha = 0.7$

$\beta := 1.0$ $\beta = 1$

$\lambda := 1.0$ $\lambda = 1$

$L_{dh} := 0.02\cdot\alpha\cdot\beta\cdot\lambda\cdot\frac{f_y}{\sqrt{f'c}\cdot psi}\cdot d_{bc}$ $L_{dh} = 14.125\cdot in$

Minimum development length: (ACI 12.5.1)

$L_{dh} := \max\left(8\cdot d_{bc}, 6\cdot in, L_{dh}\right)$ $L_{dh} = 14.125\cdot in$

Length available in pad: $L_{pad} = 18.00\cdot in > L_{dh} = 14.12\cdot in$ ***CHECK*** = "OK"

Hook extension length: (ACI 7.1.2) $l_{hex} := 12\cdot d_{bc}$ $l_{hex} = 13.536\cdot in$

Length available in pad: $L_{havail} := \frac{W'}{2} - \frac{d}{2} - cc - \text{if}\left(s_c < 9, 3, 4\right)\cdot d_{bc}$

$L_{havail} = 121.49\cdot in > l_{hex} = 13.54\cdot in$ ***CHECK*** = "OK"

Pad reinforcement: Required Bending Capacity: ($\phi := 0.90$ - ACI 9.3.2.1)

MDSolids Geometry Input: (Case 1)

Total Beam Length: $B_{L1} := W$ $B_{L1} = 33\,ft$

Location of Left Support: $S_{L1} := 0$ $S_{L1} = 5.68\,ft$

Location of Right Support: $S_{R1} := W - 0$ $S_{R1} = 27.32\,ft$

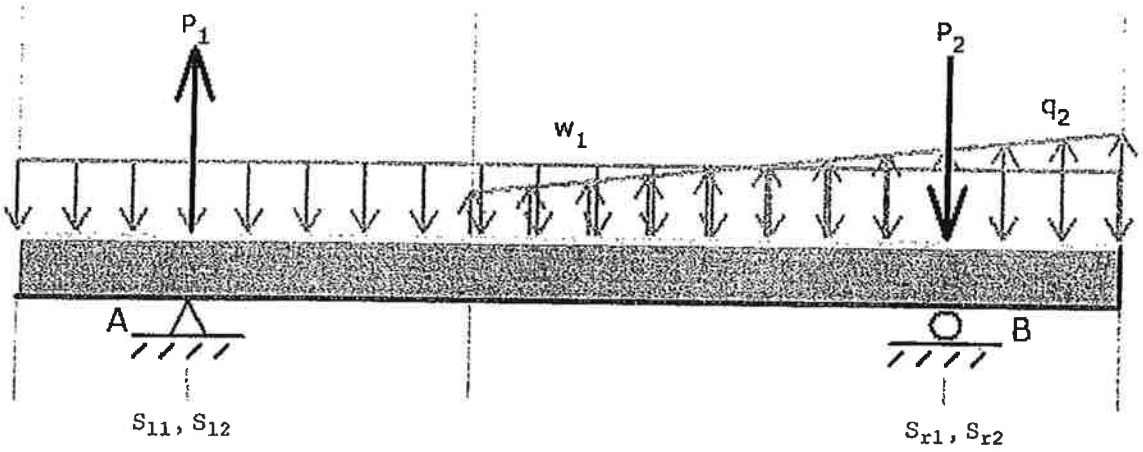
MDSolids Geometry Input: (Case 2)

Total Beam Length: $B_{L2} := W$ $B_{L2} = 33\,ft$

Location of Left Support: $S_{L2} := (W - W')\cdot 0.5$ $S_{L2} = 4\,ft$

Location of Right Support: $S_{R2} := S_{L2} + W'$ $S_{R2} = 29\,ft$

Pad Reinforcement: - (continued)



MDSolids Load Input (Case 1 & Case 2)

Uplift: $P_1 := U$ $P_1 = 338 \cdot kips$

Compression $P_2 := C$ $P_2 = 476 \cdot kips$

Weight of overburden: (Distributed) $w_1 := \frac{(W_c + W_s)}{W}$ $w_1 = 28.37 \cdot klf$

Applied over the beam starting at 0' and ending at $W = 33\,ft$

Distributed Soil Pressure: (Linearly Increasing) $q_{2L} := 0$ $q_{2R} := q_a \cdot W$ $q_{2R} = 100.32 \cdot klf$

This linearly increasing load is applied from $e = 9.95\,ft$ to $W = 33\,ft$

MDSolids Design Results: (Case 1)

Max. Moment: $M_{max1} := 1030 ft \cdot kips$

MDSolids Design Results: (Case 2)

Max. Moment: $M_{max2} := 530 ft \cdot kips$

Maximum Moment: $M_{max} := \max(M_{max1}, M_{max2})$ $M_{max} = 1030\,ft \cdot kips$

Maximum Moment w/ACI Strength Reduction Factor and EIA/TIA Load Increase Factor:

$M_n := \frac{LF}{\phi} \cdot M_{max}$ $M_n = 1487.778\,ft \cdot kips$

$\beta := if\left[f'c \le 4000, 0.85, if\left[f'c \ge 8000, 0.65, 0.85 - \left(\frac{f'c - 4000}{1000}\right) \cdot 0.05\right]\right]$ $\beta = 0.825$ *(ACI 10.2.7.3)*

Effective Beam Width: $W_e := W' \cdot 0.866 + d$ $W_e = 25.15\,ft$

Required Steel: $A_{st} := \frac{M_n}{0.9 \cdot f_y \cdot d_c}$ $A_{st} = 18.892 \cdot in^2$

$a := \frac{A_{st} \cdot f_y}{\beta \cdot f'c \cdot psi \cdot W_e}$ $a = 1.012 \cdot in$

$A_{st} := \frac{M_n}{f_y \cdot \left(d_c - \frac{a}{2}\right)}$ $A_{st} = 17.509 \cdot in^2$

$\rho := \frac{A_{st}}{W_e \cdot T}$ $\rho = 0.0028$

Pad Reinforcement: - (continued)

Temperature & shrinkage (ACI 7.12.2.1):

$$\rho_{sh} := \text{if}\left(f_y \geq 60000 \cdot psi, 0.0018, 0.0020\right) \qquad \rho_{sh} = 0.0018$$

$$A_{stw} := \text{if}\left(\rho \geq \frac{\rho_{sh}}{2}, A_{st}, \rho_{sh} \cdot W_e \cdot \frac{T}{2}\right) \qquad A_{st} = 17.509 \cdot in^2$$

Bars required in pad both ways: (width: $W = 33\,ft$)

Bar Size: $s_p := 8$

Area: $A_{bp} := area_{s_p}$ $\qquad A_{bp} = 0.79 \cdot in^2$

Diameter: $d_{bp} := dia_{s_p}$ $\qquad d_{bp} = 1.000 \cdot in$

Quantity: $m_{pad} := \frac{A_{st}}{A_{bp}} \cdot \left(\frac{W}{W_e}\right)$ $\qquad m_{pad} = 29.08$ $\qquad$ **Use:** $m_p := 49$

Bar separation: $B_s := \left(\frac{W - 2 \cdot cc - d_{bp}}{m_p - 1}\right) - d_{bp}$ $\qquad B_s = 7.10 \cdot in$ $\qquad$ *CHECK* = "OK"

Development length of Pad Reinforcement: (ACI 12.2.3 & 12.2.4)

$\alpha := \text{if}\left[T > 12 \cdot in + 2 \cdot \left(cc + d_{bp}\right), 1.3, 1.0\right]$ $\qquad \alpha = 1.3$

$\beta := 1.0$ $\qquad \beta = 1$

$\gamma := \text{if}\left(s_p > 6, 1.0, 0.8\right)$ $\qquad \gamma = 1$

$\lambda := 1.0$ $\qquad \lambda = 1$

$k := 0 \cdot in$ $\qquad k = 0 \cdot in$

$c := \min\left(\frac{B_s}{2} + d_{bp}, cc + \frac{d_{bp}}{2}\right)$ $\qquad c = 3.5 \cdot in$

$c' := \min\left(2.5, \frac{c + k}{d_{bp}}\right)$ $\qquad c' = 2.5$

$$L_d := \frac{3 \cdot f_y}{40 \cdot \sqrt{f'c} \cdot psi} \cdot \frac{\alpha \cdot \beta \cdot \gamma \cdot \lambda}{c'} \cdot d_{bp} \qquad L_d = 34.883 \cdot in$$

Minimum development length: (ACI 12.2.1)

$L_{dtw} := \text{if}\left(L_{dt} < 12 \cdot in, 12 \cdot in, L_d\right)$ $\qquad L_d = 34.883 \cdot in$

Length available in pad: $L_{pad} := \frac{W}{2} - \frac{W'}{2} - cc$

$L_{pad} = 45.0 \cdot in$ $\quad > \quad L_d = 34.9 \cdot in$ $\qquad$ *CHECK* = "OK"

Width required to ensure space for column hooks in pad: $w_{req} := \left(\frac{W'}{2} + \frac{d}{2} + \text{if}\left(s_c < 9, 16, 17\right) \cdot d_{bc}\right) \cdot 2$

$W = 33.0\,ft$ $\quad > \quad w_{req} = 31.7 \cdot ft$ $\qquad$ *CHECK* = "OK"

Determination of Tie size and spacing requirements for columns: (ACI 7.10.5)

Minimum tie bar size: $d_{tiemin} := if(s_c \le 10, 3, 4)$ $d_{tiemin} = 3$ **Use:** $d_{tie} := 4$

Factor based on seismic zone: (ACI 21.3.3.2) $z := if(Z < 2, 1, 0.5)$ $z = 0.5$

$s_{lim1} := 16 \cdot d_{bc} \cdot z$ $s_{lim1} = 9.024 \cdot in$

$s_{lim2} := 48 \cdot \frac{d_{tie}}{8} \cdot in \cdot z$ $s_{lim2} = 12 \cdot in$

$s_{lim3} := D \cdot z^2$ $s_{lim3} = 19.5 \cdot in$

$s_{lim4} := if(z > 0.5, 18.0, 12.0) \cdot in$ $s_{lim4} = 12 \cdot in$

Maximum tie spacing: $s_{tie} := \min(s_{lim1}, s_{lim2}, s_{lim3}, s_{lim4})$ $s_{tie} = 9.024 \cdot in$

Number of ties required: $n_t := \frac{D - T + E}{s_{tie}} + 2$ $n_t = 9.0$ **Use:** $n_{tie} := 10$

CHECK = "OK"

Foundation Design Summary

Soil Parameters: Soil parameters per soil report
by = "Terracon, Dated 02/23/15, Project#J2155118"

Allowable Soil Bearing Pressure: $B_c = 5.00 \cdot ksf$

Allowable Passive Pressure = $0.063 \cdot kcf$

Dimensions:

Base Width:	$W = 33.00\,ft$
Depth below grade:	$D = 6.50\,ft$
Extension above grade:	$E = 6 \cdot in$
Pier Diameter:	$d = 3.50\,ft$
Pad Thickness:	$T = 1.75\,ft$
Concrete Volume:	$volume = 76.2 \cdot yd^3$

Note = "CENTROID OF THE TOWER IS OFFSET FROM THE CENTROID OF THE FOUNDATION."
(ADDITIONAL ECCENTRIC LOAD WILL BE INDUCED IF THE TOWER IS OFFSET)

Reinforcement:

	Quantity	Size	
Pad:	$m_p = 49$	$s_p = 8$	equally spaced, both ways, top & bottom
Pier:	$m_c = 19$	$s_c = 9$	equally spaced on $d_o = 3\,ft$ cage
Ties:	$n_{tie} = 10$	$d_{tie} = 4$	per UBC spacing & standard overlap requirements

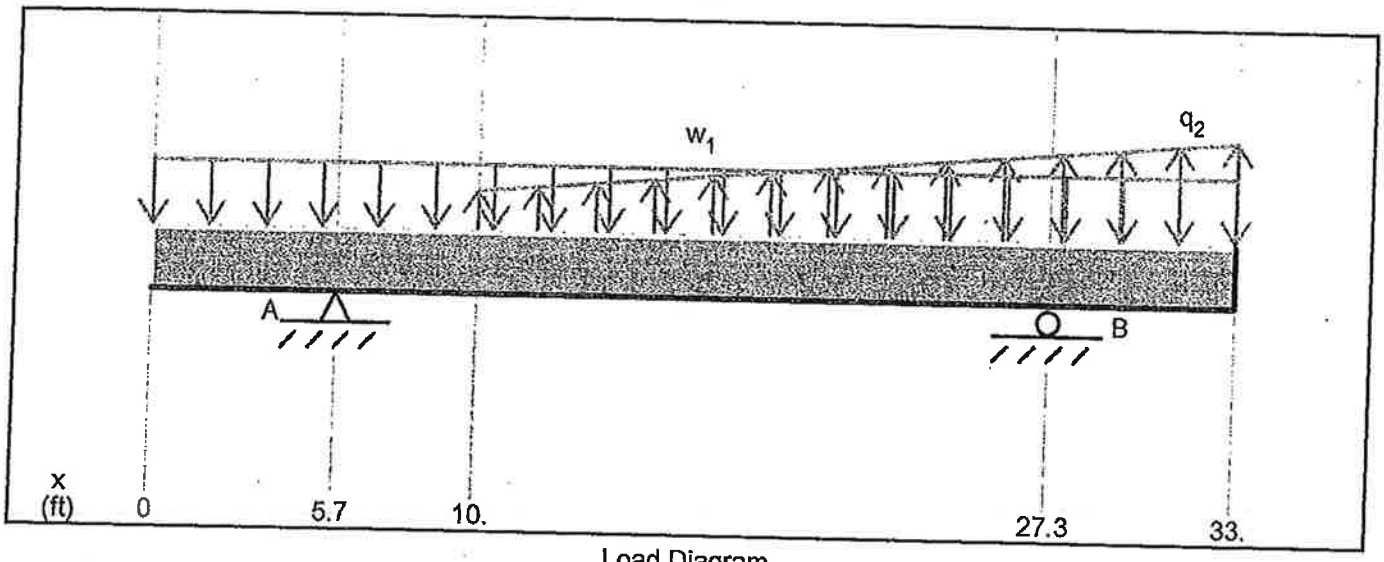
Use standees to support the top rebar above the bottom rebar in the mat.
Concrete clear cover: $cc = 3 \cdot in$

Material strengths:
Concrete strength: $f'c = 4500$ psi
Rebar yield strength: $f_y = 60 \cdot ksi$

Compaction Notes: ALL FILL SHOULD BE PLACED IN LOOSE LEVEL LIFTS OF NO MORE THAN $LT = 8 \cdot in$ THICK. FILL MATERIALS SHOULD BE CLEAN AND FREE OF ORGANIC AND FROZEN MATERIALS OR ANY OTHER DELETERIOUS MATERIALS. COMPACT FILL TO $CP = 98 \cdot \%$ OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM = "D698 STANDARD PROCTOR TEST."

Additional Notes: None

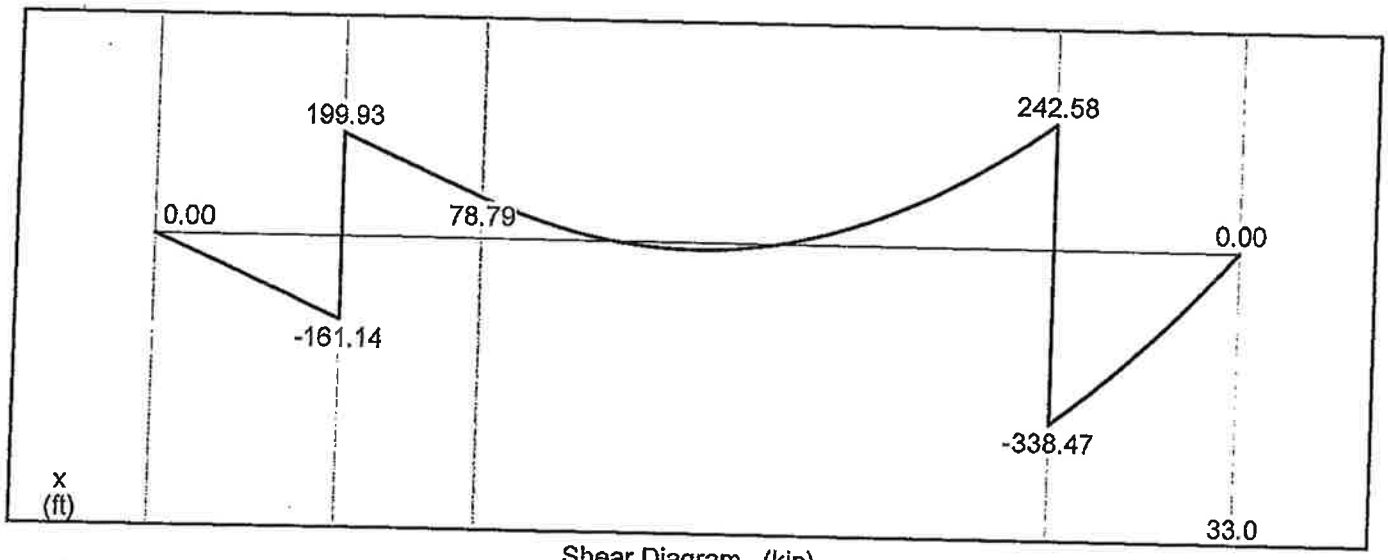
Case 1



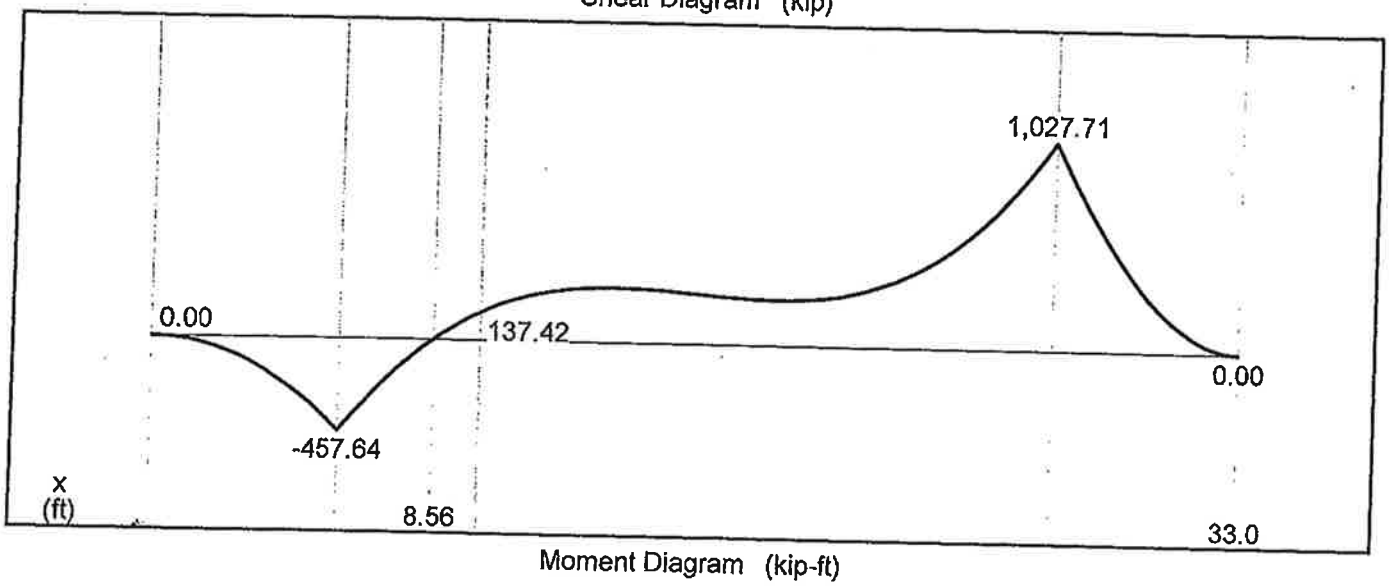
Load Diagram

w_1 = 28.37 kip/ft (down)
q_2 = 0.0 to 100.32 kip/ft (up)

A_y = 361.07 kip (up)
B_y = 581.05 kip (down)

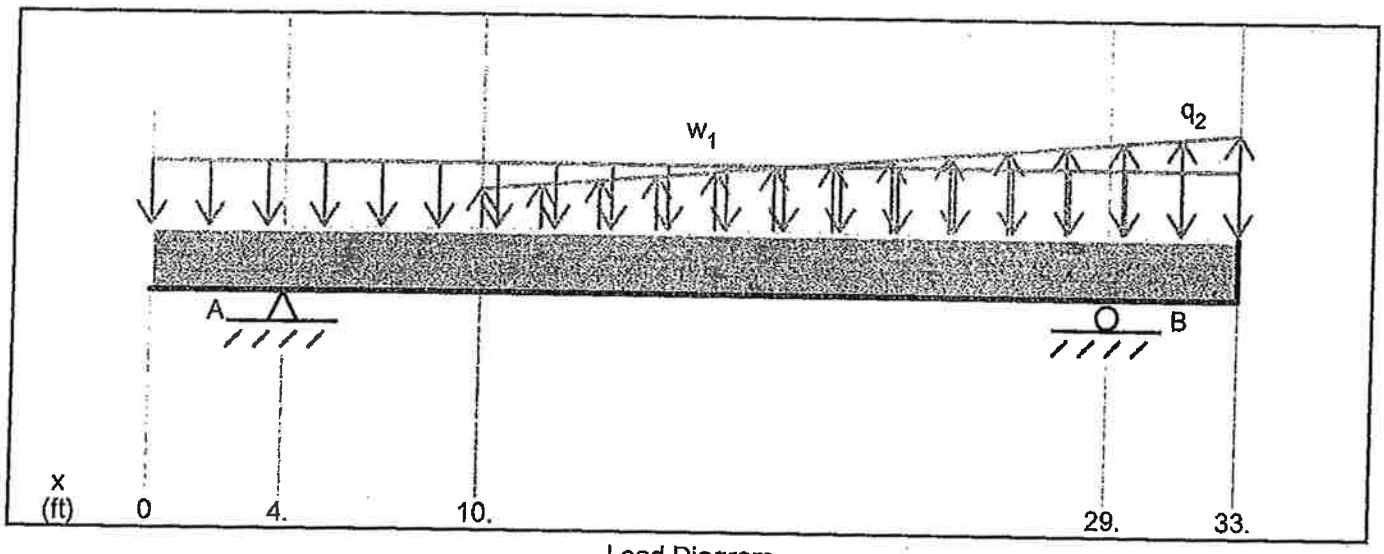


Shear Diagram (kip)



Moment Diagram (kip-ft)

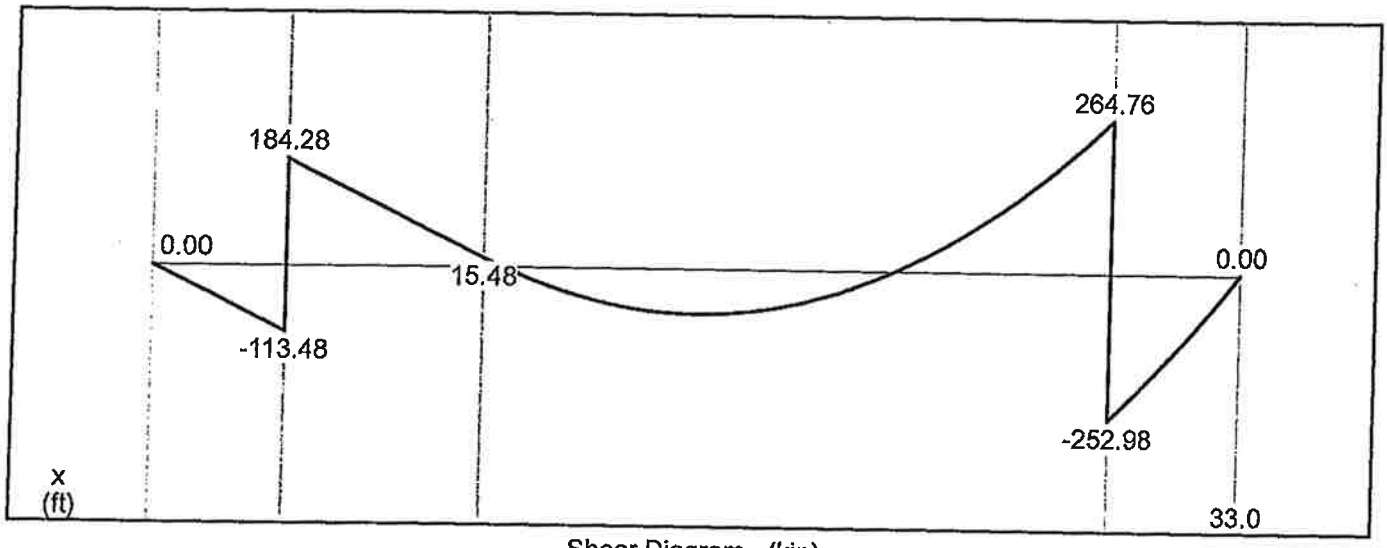
Case 2



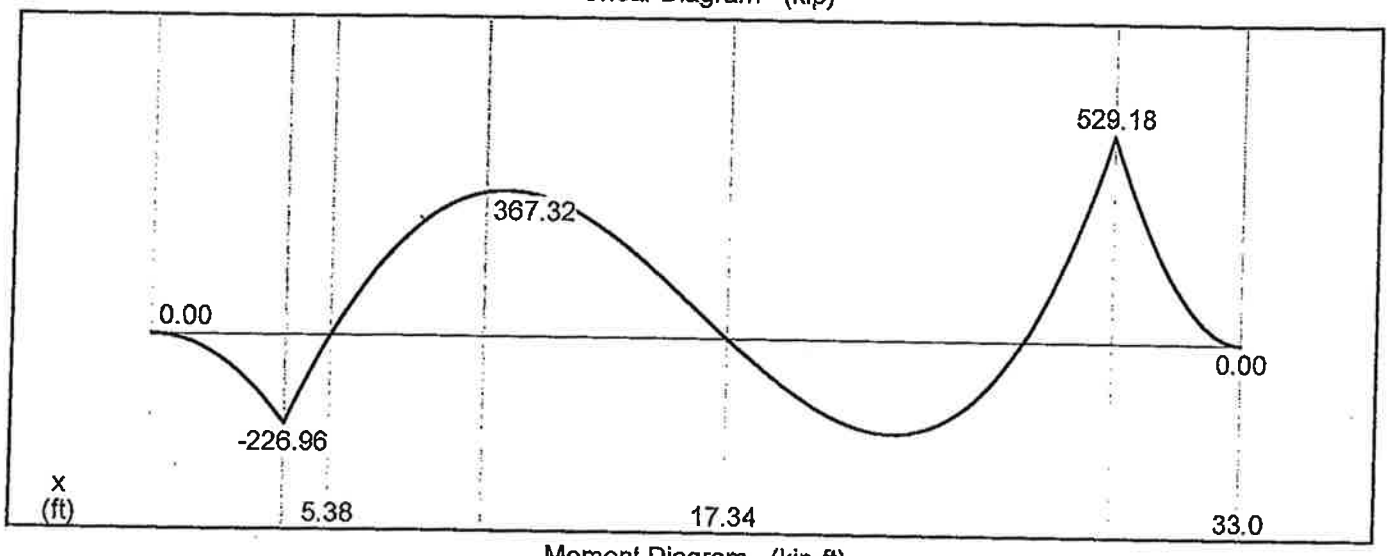
Load Diagram

w_1 = 28.37 kip/ft (down)
q_2 = 0.0 to 100.32 kip/ft (up)

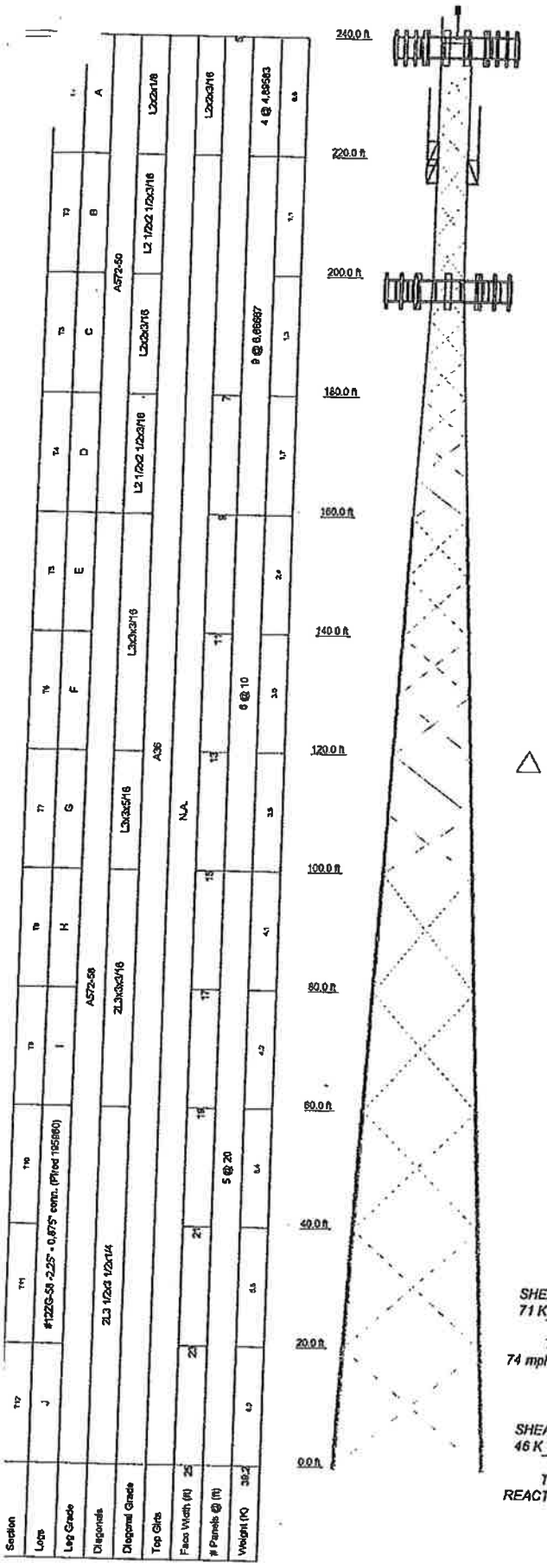
A_y = 297.76 kip (up)
B_y = 517.74 kip (down)



Shear Diagram (kip)



Moment Diagram (kip-ft)



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Beacon	240	24" Standoff	218
Beacon Extender (4) 603062	240	WHIP (2.68" X 12')	218
1/2" x 4' lightning rod	240	24" Standoff	218
(2) HBXX-6517DS-VTM	240	(2) 7770.00	198
(2) HBXX-6517DS-VTM	240	(2) 7770.00	198
(2) HBXX-6517DS-VTM	240	(2) 7770.00	198
(2) 2" x 84" Sch. 40	240	(2) 2" x 96" Sch. 40	198
(2) 2" x 84" Sch. 40	240	(2) 2" x 96" Sch. 40	198
(2) 2" x 84" Sch. 40	240	(2) 2" x 96" Sch. 40	198
(2) LNX-6514DS-VTM	240	AM-X-CD-17-65-00T-RET	198
(2) LNX-6514DS-VTM	240	AM-X-CD-17-65-00T-RET	198
(2) LNX-6514DS-VTM	240	AM-X-CD-17-65-00T-RET	198
(2) 2" x 84" Sch. 40	240	2" x 96" Sch. 40	198
(2) 2" x 84" Sch. 40	240	2" x 96" Sch. 40	198
(2) 2" x 84" Sch. 40	240	2" x 96" Sch. 40	198
Alcatel-Lucent RRH2X60-AWS	240	(2) Powerwave LGP21401X TMA-DD-1900	198
Alcatel-Lucent RRH2X60-AWS	240	(2) Powerwave LGP21401X TMA-DD-1900	198
Alcatel-Lucent RRH2X60-AWS	240	(2) Powerwave LGP21401X TMA-DD-1900	198
Alcatel-Lucent RRH2X60-PCS	240	(2) Powerwave LGP21903	198
Alcatel-Lucent RRH2X60-PCS	240	(2) Powerwave LGP21903	198
Alcatel-Lucent RRH2X60-PCS	240	(2) Powerwave LGP21903	198
DB-T1-6Z-8AB-0Z Assumed: (20.07" x 11.22" x 7.2")	240	(2) Powerwave 7020.00 Dual Band RET	198
DB-T1-6Z-8AB-0Z Assumed: (20.07" x 11.22" x 7.2")	240	(2) Powerwave 7020.00 Dual Band RET	198
12' V Frame	240	(2) Powerwave 7020.00 Dual Band RET	198
12' V Frame	240	(2) RRUS11 (20" X 17" X 7")	198
12' V Frame	240	(2) RRUS11 (20" X 17" X 7")	198
WHIP (2.68" X 12')	221	(2) RRUS11 (20" X 17" X 7")	198
24" Standoff	221	Polyphaser (12"x12"x8")	198
WHIP (2.68" X 12')	218	12' V Frame	198
		12' V Frame	198
		12' V Frame	198

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P- 2.50" - 0.75" conn.-20' -C-(Prod 226160)	F	#12ZG-58 - 1.75" - 1.00" conn.-TR1-(Prod 195213)
B	P- 4.00" - 0.75" conn.-20' -C-Trans-58-4B-(Prod 226184)	G	#12ZG-58 - 1.75" - 1.00" conn. (Prod 195217)
C	P- 5.00" - 0.75" conn.-Trans-20' -C-(Prod 226200)	H	#12ZG-58 -2.00" - 0.875" conn.-TR3-(Prod 195637)
D	P- 6.00" - 0.75" conn.-HSD-Trans-20' -C-(Prod 229377)	I	#12ZG-58 -2.00" - 0.875" conn. (Prod 195639)
E	#12ZG-58 - 1.50" - 1.00" conn. (Prod 194651)	J	#12ZG-58 - 2.50" - 0.875" conn.-TR4-(Prod 195902)

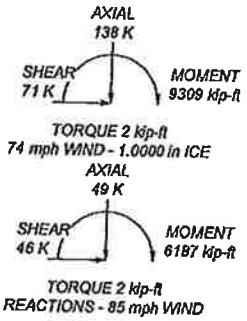
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A572-58	58 ksi	75 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 1.00 in Ice.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 99.2%

MAX. CORNER REACTIONS AT BASE:
DOWN: 476 K
UPLIFT: -338 K
SHEAR: 45 K

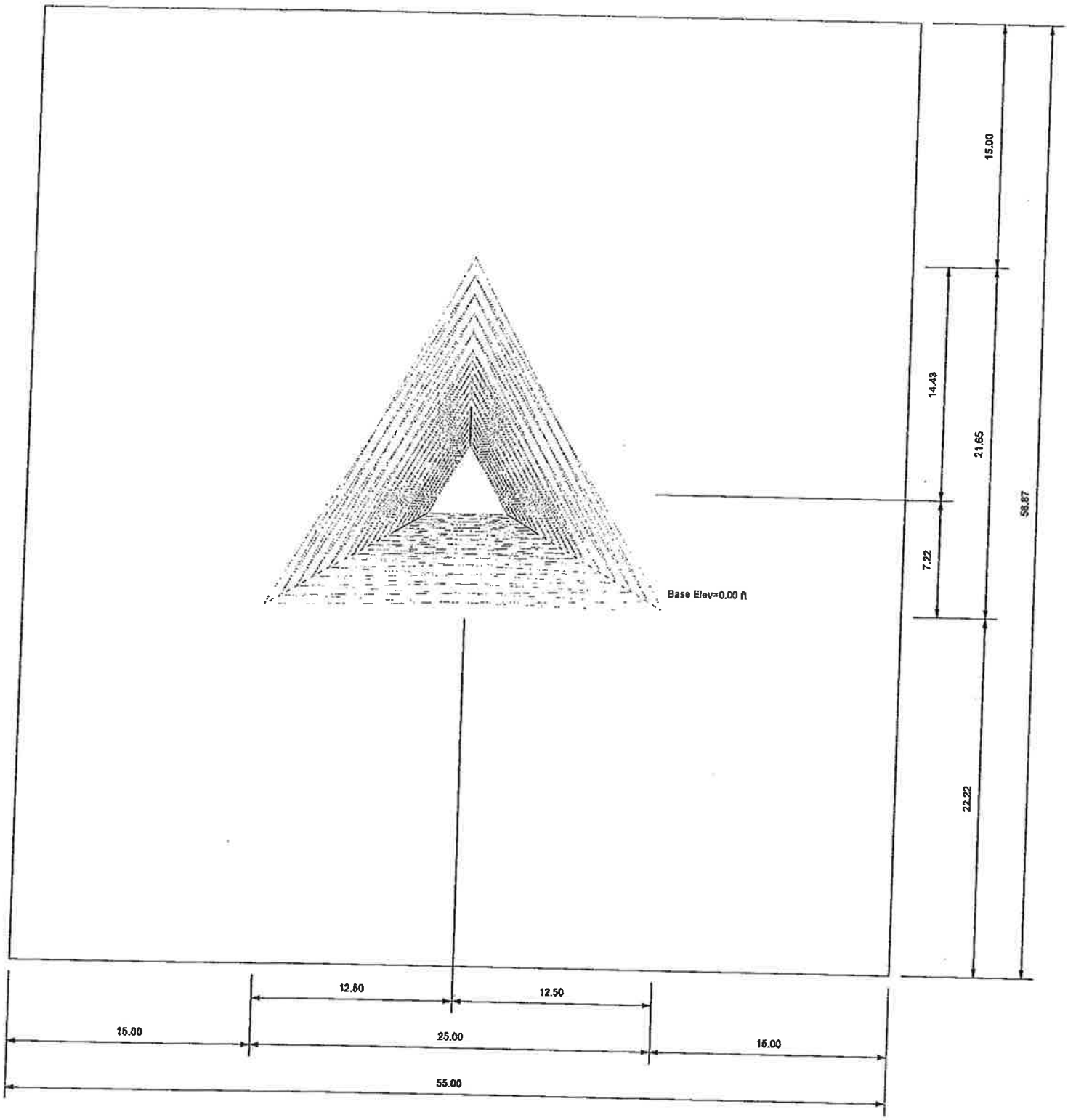


APR 0 1 2015

valmont STRUCTURES
Valmont Industries, Inc. - Specialty Structures Group
1545 Pidco Dr.
Plymouth, IN
Phone: (574) 936-4221
FAX: (574) 936-6458

Job: 284859			
Project: V-25 x 240' - Ashford, CT			
Client: Verizon Wireless	Drawn by: JAK	App'd:	
Code: TIA/EIA-222-F	Date: 03/30/15	Scale: NTS	
Path:		Dwg No. E-1	

Plot Plan
Total Area - 0.07 Acres



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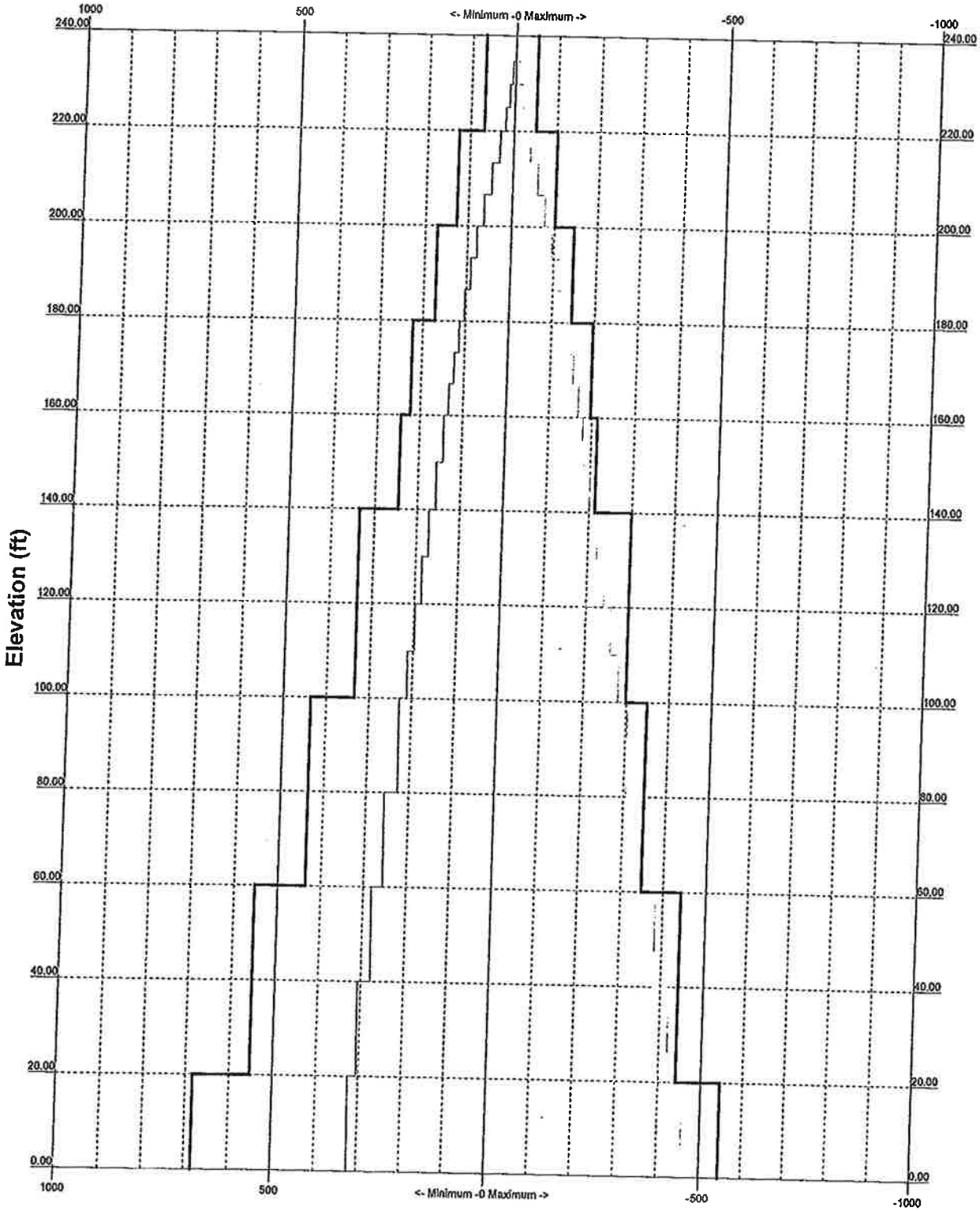
Project: V-25 x 240' - Ashford, CT		
Client: Verizon Wireless	Drawn by: JAK	App'd:
Code: TIA/EIA-222-F	Date: 03/30/15	Scale: NTS
Path:		Dwg No. E-2

TIA/EIA-222-F - 85 mph/74 mph 1.0000 in Ice

Leg Capacity ——— Leg Compression (K)



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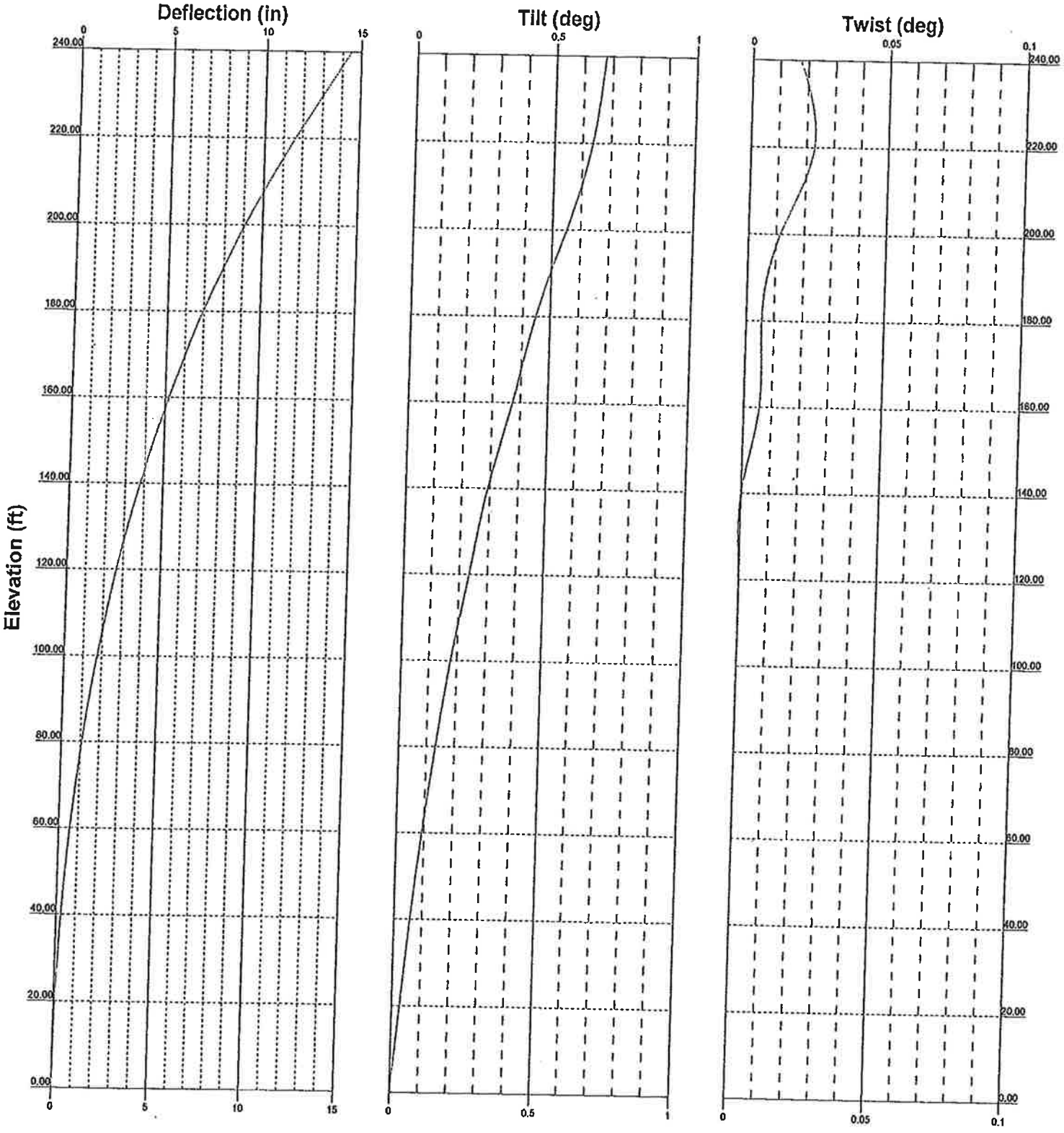
Project: V-25 x 240' - Ashford, CT			
Client: Verizon Wireless	Drawn by: JAK	App'd:	
Code: TIA/EIA-222-F	Date: 03/30/15	Scale: NTS	
Path:		Dwg No. E-3	

TIA/EIA-222-F - Service - 60 mph

Maximum Values



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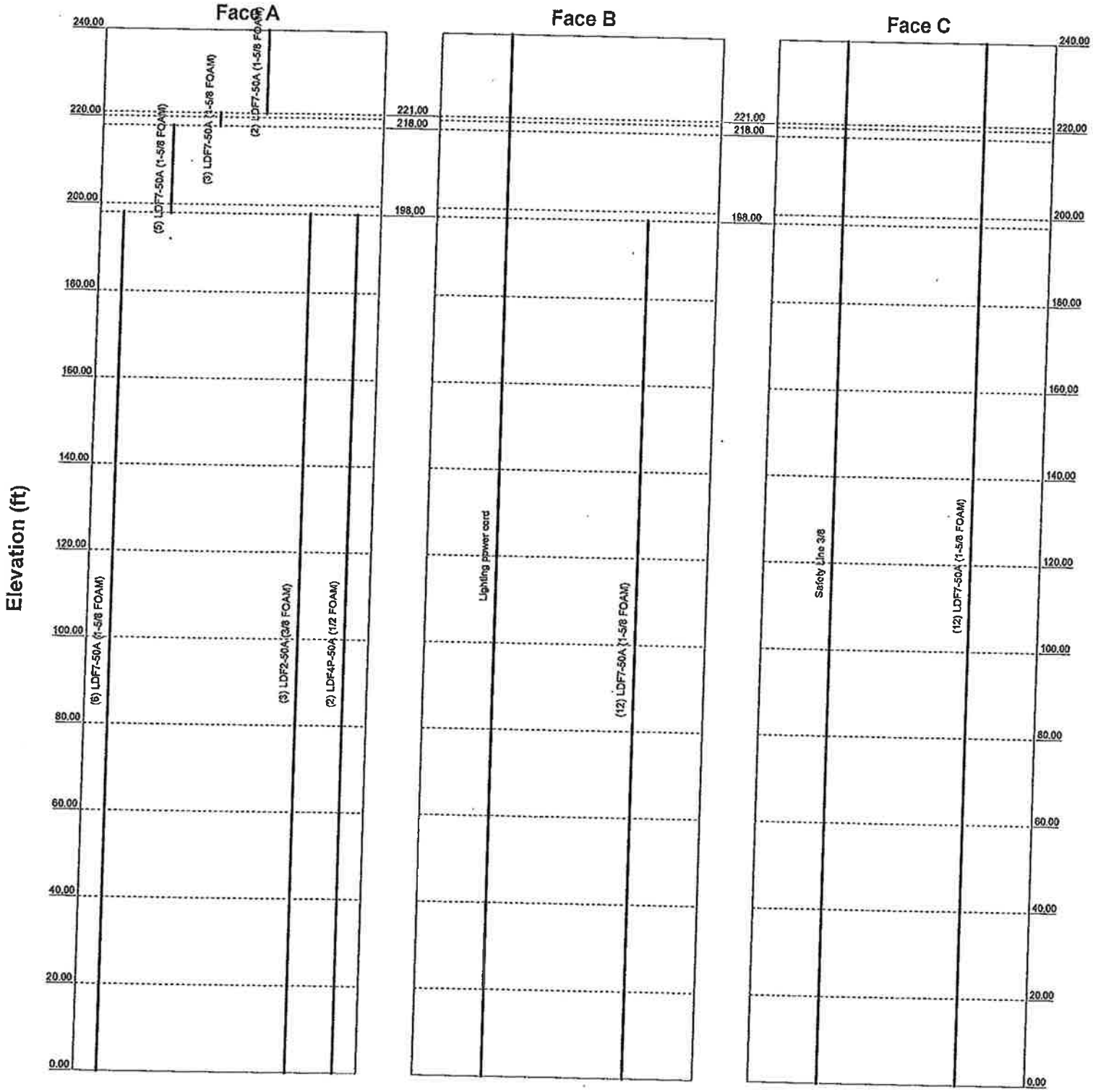
Job: 284859			
Project: V-25 x 240' - Ashford, CT			
Client: Verizon Wireless	Drawn by: JAK		App'd:
Code: TIA/EIA-222-F	Date: 03/30/15		Scale: NTS
Path:			Dwg No. E-5

Feedline Distribution Chart
0' - 240'

Round | Flat | App In Face | App Out Face | Truss Leg



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FAX: (574) 936-6458

Job: 284859			
Project: V-25 x 240' - Ashford, CT			
Client: Verizon Wireless	Drawn by: JAK	App'd:	
Code: TIA/EIA-222-F	Date: 03/30/15	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 240.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 25.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

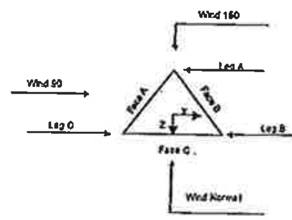
- Tower is located in Windham County, Connecticut.
- Basic wind speed of 85 mph.
- Nominal ice thickness of 1.0000 in.
- Ice density of 56 pcf.
- A wind speed of 74 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.333.
- Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
Add IBC .6D+W Combination

√ Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
√ Retension Guys To Initial Tension
Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
SR Members Have Cut Ends
√ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing

√ Treat Feedline Bundles As Cylinder
Use ASCE 10 X-Brace Ly Rules
√ Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
√ SR Leg Bolts Resist Compression
√ All Leg Panels Have Same Allowable
Offset Girt At Foundation
Consider Feedline Torque
√ Include Angle Block Shear Check
Poles
Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	240.00-220.00		V-Series Leg	5.00	1	20.00
T2	220.00-200.00		V-Series Leg	5.00	1	20.00
T3	200.00-180.00		V-Series Leg	5.00	1	20.00
T4	180.00-160.00		V-Series Leg	7.00	1	20.00
T5	160.00-140.00		PiRod 12BDFH Truss Leg	9.00	2	20.00
T6	140.00-120.00		PiRod 12BDFH Truss Leg	11.00	1	20.00
T7	120.00-100.00		PiRod 12BDFH Truss Leg	13.00	1	20.00
T8	100.00-80.00		PiRod 12BDH2 Truss Leg	15.00	1	20.00
T9	80.00-60.00		PiRod 12BDH2 Truss Leg	17.00	1	20.00
T10	60.00-40.00		PiRod 12BDH2 Truss Leg	19.00	1	20.00
T11	40.00-20.00		PiRod 12BDH2 Truss Leg	21.00	1	20.00
T12	20.00-0.00		PiRod 12BDH2 Truss Leg	23.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	240.00-220.00	4.90	X Brace	No	No	5.0000	0.0000
T2	220.00-200.00	6.67	X Brace	No	No	0.0000	0.0000
T3	200.00-180.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T4	180.00-160.00	6.67	X Brace	No	No	0.0000	0.0000
T5	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T6	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T7	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T8	100.00-80.00	20.00	X Brace	No	No	0.0000	0.0000
T9	80.00-60.00	20.00	X Brace	No	No	0.0000	0.0000
T10	60.00-40.00	20.00	X Brace	No	No	0.0000	0.0000
T11	40.00-20.00	20.00	X Brace	No	No	0.0000	0.0000
T12	20.00-0.00	20.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 240.00-220.00	Pipe	P- 2.50" - 0.75" conn.-20' -C-(Pirod 225160)	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T2 220.00-200.00	Pipe	P- 4.00"- 0.75" conn.-20' -C-Truss-6B-6B-(Pirod 225184)	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 200.00-180.00	Pipe	P- 5.00"- 0.75" conn.-Truss-20' -C-(Pirod 225200)	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 180.00-160.00	Pipe	P- 6.00"- 0.75" conn.-HBD-Truss-20' -C-(Pirod 225177)	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 160.00-140.00	Truss Leg	#12ZG-58 - 1.50" - 1.00" conn. (Pirod 194851)	A572-58 (58 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T6 140.00-120.00	Truss Leg	#12ZG-58 - 1.75" - 1.00" conn.-TR1-(Pirod 195213)	A572-58 (58 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 120.00-100.00	Truss Leg	#12ZG-58 - 1.75" - 1.00" conn. (Pirod 195217)	A572-58 (58 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 100.00-80.00	Truss Leg	#12ZG-58 -2.00" - 0.875" conn.-TR3-(Pirod 195037)	A572-58 (58 ksi)	Double Equal Angle	2L3x3x3/16	A36 (36 ksi)
T9 80.00-60.00	Truss Leg	#12ZG-58 -2.00" - 0.875" conn. (Pirod 195037)	A572-58 (58 ksi)	Double Equal Angle	2L3x3x3/16	A36 (36 ksi)
T10 60.00-40.00	Truss Leg	#12ZG-58 -2.25" - 0.875" conn. (Pirod 195950)	A572-58 (58 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)
T11 40.00-20.00	Truss Leg	#12ZG-58 -2.25" - 0.875" conn. (Pirod 195950)	A572-58 (58 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)
T12 20.00-0.00	Truss Leg	#12ZG-58 - 2.50" - 0.875" conn.-TR4-(Pirod 155562)	A572-58 (58 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 240.00-220.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 240.00-220.00	0.00	0.2500	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T2 220.00-200.00	0.00	0.2500	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T3 200.00-180.00	0.00	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T4 180.00-160.00	0.00	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T5 160.00-140.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T6 140.00-120.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T7 120.00-100.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T8 100.00-80.00	0.00	0.6250	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T9 80.00-60.00	0.00	0.6250	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T10 60.00-40.00	0.00	0.6250	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T11 40.00-20.00	0.00	0.6250	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T12 20.00-0.00	0.00	0.6250	A36 (36 ksi)	1	1	1.05	36.0000	36.0000

Tower Section Geometry *(cont'd)*

			K Factors[1]							
Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 240.00-220.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 220.00-200.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 200.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 180.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 140.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 120.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 100.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X / Y	K Brace Diags X / Y	Single Diags X / Y	Girts X / Y	Horiz. X / Y	Sec. Horiz. X / Y	Inner Brace X / Y
T10 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T12 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

Tower Section Geometry (cont'd)

	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
Tower Elevation ft	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T5 160.00-140.00	1	0.5	0.7	1	0.5	0.7
T6 140.00-120.00	1	0.5	0.7	1	0.5	0.7
T7 120.00-100.00	1	0.5	0.7	1	0.5	0.7
T8 100.00-80.00	1	0.5	0.7	1	0.5	0.7
T9 80.00-60.00	1	0.5	0.7	1	0.5	0.7
T10 60.00-40.00	1	0.5	0.7	1	0.5	0.7
T11 40.00-20.00	1	0.5	0.7	1	0.5	0.7
T12 20.00-0.00	1	0.5	0.7	1	0.5	0.7

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 240.00-220.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 220.00-200.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 200.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T4 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

	Connection Offsets							
	Diagonal				K-Bracing			
Tower Elevation ft	Vert. Top in	Horiz. Top in	Vert. Bot. in	Horiz. Bot. in	Vert. Top in	Horiz. Top in	Vert. Bot. in	Horiz. Bot. in
T1 240.00-220.00	5.0000	5.0000	5.0000	5.0000	0.0000	0.0000	0.0000	0.0000
T2 220.00-200.00	5.0000	5.0000	5.0000	5.0000	0.0000	0.0000	0.0000	0.0000
T3 200.00-180.00	5.0000	6.2500	5.0000	6.2500	0.0000	0.0000	0.0000	0.0000
T4 180.00-160.00	5.0000	6.2500	5.0000	6.2500	0.0000	0.0000	0.0000	0.0000
T5 160.00-140.00	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T6 140.00-120.00	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T7 120.00-100.00	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T8 100.00-80.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T9 80.00-60.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T10 60.00-40.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T11 40.00-20.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T12 20.00-0.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 240.00-220.00	Flange	0.7500 A325N	4	0.7500 A325N	1	0.7500 A325N	1	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T2 220.00-200.00	Flange	0.7500 A325N	6	0.7500 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T3 200.00-180.00	Flange	0.7500 A325N	8	0.7500 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T4 180.00-160.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T5 160.00-140.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T6 140.00-120.00	Flange	1.2500 A325N	6	1.0000 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T7 120.00-100.00	Flange	1.2500 A325N	6	1.0000 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T8 100.00-80.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T9 80.00-60.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T10 60.00-40.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T11 40.00-20.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T12 20.00-0.00	Flange	1.2500 F1554-105	12	0.8750 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	Yes	Ar (CaAa)	240.00 - 0.00	1	1	0.3750	0.3750		0.22
Lighting power cord	B	Yes	Ar (CaAa)	240.00 - 0.00	1	1	0.2000 0.0000	0.8300		0.15
LDF7-50A (1-5/8 FOAM)	C	Yes	Ar (CfAe)	240.00 - 0.00	12	12	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CfAe)	198.00 - 0.00	12	12	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	A	Yes	Ar (CfAe)	198.00 - 0.00	6	6	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	A	Yes	Ar (CfAe)	218.00 - 198.00	5	5	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	A	Yes	Ar (CfAe)	221.00 - 218.00	3	3	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	A	Yes	Ar (CfAe)	240.00 - 221.00	2	2	1.9800	1.9800		0.82
LDF2-50A (3/8 FOAM)	A	Yes	Ar (CfAe)	198.00 - 0.00	3	3	0.4400	0.4400		0.08
LDF4P-50A (1/2 FOAM)	A	Yes	Ar (CfAe)	198.00 - 0.00	2	2	0.6300	0.6300		0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	240.00-220.00	A	6.743	0.000	0.000	0.000	0.01
		B	0.000	0.000	1.740	0.000	0.00
		C	39.600	0.000	0.750	0.000	0.20
T2	220.00-200.00	A	15.840	0.000	0.000	0.000	0.01
		B	0.000	0.000	1.740	0.000	0.00
		C	39.600	0.000	0.750	0.000	0.20
T3	200.00-180.00	A	23.340	0.000	0.000	0.000	0.11
		B	33.640	0.000	1.740	0.000	0.18
		C	39.600	0.000	0.750	0.000	0.20
T4	180.00-160.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20
T5	160.00-140.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20
T6	140.00-120.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20
T7	120.00-100.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20
T8	100.00-80.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20
T9	80.00-60.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20
T10	60.00-40.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20
T11	40.00-20.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20
T12	20.00-0.00	A	24.100	0.000	0.000	0.000	0.11
		B	39.600	0.000	1.740	0.000	0.20
		C	39.600	0.000	0.750	0.000	0.20

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	240.00-220.00	A	1.000	6.633	8.950	0.000	0.000	0.21
		B		0.000	0.000	5.740	0.000	0.05
		C		6.633	72.600	4.750	0.000	1.39
T2	220.00-200.00	A	1.000	6.633	25.080	0.000	0.000	0.53
		B		0.000	0.000	5.740	0.000	0.05
		C		6.633	72.600	4.750	0.000	1.39
T3	200.00-180.00	A	1.000	14.231	36.810	0.000	0.000	0.78
		B		5.970	65.340	5.740	0.000	1.27
		C		6.633	72.600	4.750	0.000	1.39
T4	180.00-160.00	A	1.000	15.083	38.033	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	1.40
		C		6.633	72.600	4.750	0.000	1.39
T5	160.00-140.00	A	1.000	15.083	38.033	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	1.40
		C		6.633	72.600	4.750	0.000	1.39

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	Ax ft²	Ax Ice ft²	Ax Ice ft²	CaAa In Face ft²	CaAa Out Face ft²	Weight K
T6	140.00-120.00	A	1.000	15.083	38.033	0.000	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	0.000	1.40
		C		6.633	72.600	4.750	0.000	0.000	1.39
T7	120.00-100.00	A	1.000	15.083	38.033	0.000	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	0.000	1.40
		C		6.633	72.600	4.750	0.000	0.000	1.39
T8	100.00-80.00	A	1.000	15.083	38.033	0.000	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	0.000	1.40
		C		6.633	72.600	4.750	0.000	0.000	1.39
T9	80.00-60.00	A	1.000	15.083	38.033	0.000	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	0.000	1.40
		C		6.633	72.600	4.750	0.000	0.000	1.39
T10	60.00-40.00	A	1.000	15.083	38.033	0.000	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	0.000	1.40
		C		6.633	72.600	4.750	0.000	0.000	1.39
T11	40.00-20.00	A	1.000	15.083	38.033	0.000	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	0.000	1.40
		C		6.633	72.600	4.750	0.000	0.000	1.39
T12	20.00-0.00	A	1.000	15.083	38.033	0.000	0.000	0.000	0.80
		B		6.633	72.600	5.740	0.000	0.000	1.40
		C		6.633	72.600	4.750	0.000	0.000	1.39

Feed Line Shielding

Section	Elevation ft	Face	Ax ft²	Ax Ice ft²	Ax Ice ft²	Ax Ice ft²
T1	240.00-220.00	A	0.000	1.379	0.488	1.379
		B	0.000	0.485	0.147	0.485
		C	0.000	0.485	0.488	0.485
T2	220.00-200.00	A	0.000	2.645	1.459	3.353
		B	0.000	0.599	0.151	0.698
		C	0.000	0.933	4.190	3.656
T3	200.00-180.00	A	0.000	3.840	1.774	3.810
		B	0.000	5.710	2.737	5.318
		C	0.000	4.251	2.023	6.251
T4	180.00-160.00	A	0.000	3.463	1.965	4.332
		B	0.000	5.481	3.241	6.853
		C	0.000	5.427	3.285	6.784
T5	160.00-140.00	A	0.000	2.597	1.706	3.361
		B	0.000	3.956	2.907	5.949
		C	0.000	3.927	3.848	5.871
T6	140.00-120.00	A	0.000	2.307	1.570	3.450
		B	0.000	3.648	2.674	5.473
		C	0.000	3.613	2.628	5.419
T7	120.00-100.00	A	0.000	2.177	1.412	3.265
		B	0.000	3.443	2.524	5.168
		C	0.000	3.410	2.473	5.114
T8	100.00-80.00	A	0.000	1.917	0.964	2.125
		B	0.000	2.241	1.643	3.361
		C	0.000	2.219	1.609	3.328
T9	80.00-60.00	A	0.000	1.323	0.900	1.984
		B	0.000	2.093	1.534	3.139
		C	0.000	2.073	1.503	3.108
T10	60.00-40.00	A	0.000	1.252	0.994	2.190
		B	0.000	1.980	1.693	3.463
		C	0.000	1.960	1.659	3.431

Section	Elevation ft	Face	Ax ft²	Ax Ice ft²	Ax Ice ft²	Ax Ice ft²
T11	40.00-20.00	A	0.000	1.356	0.950	2.693
		B	0.000	1.892	1.618	3.311
		C	0.000	1.874	1.585	3.279
T12	20.00-0.00	A	0.000	1.352	0.915	2.616
		B	0.000	1.823	1.558	3.199
		C	0.000	1.803	1.527	3.168

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offset: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		Ca Ax Front ft²	Ca Ax Side ft²	Weight K
Beacon	A	From Leg	0.00	0.0000	240.00	No Ice	2.40	2.40	0.07
			0.00			1/2" Ice	2.67	2.67	0.10
			4.39			1" Ice	2.96	2.96	0.12
Beacon Extender (4) 855362	A	From Leg	0.00	0.0000	240.00	No Ice	1.11	1.11	0.03
			0.00			1/2" Ice	1.32	1.32	0.04
1/2" x 4' Eg bonding rod	C	From Leg	2.31	0.0000	240.00	1" Ice	1.54	1.53	0.05
			0.00			No Ice	0.20	0.20	0.01
			0.00			1/2" Ice	0.60	0.60	0.02
(2) HBXX-6517DS-VTM	C	From Leg	2.00	0.0000	240.00	1" Ice	0.89	0.89	0.02
			3.00			No Ice	4.32	4.19	0.04
			0.00			1/2" Ice	7.11	4.47	0.09
(2) HBXX-6517DS-VTM	B	From Leg	-1.25	0.0000	240.00	1" Ice	7.41	4.75	0.15
			3.00			No Ice	4.32	4.19	0.04
			0.00			1/2" Ice	7.11	4.47	0.09
(2) HBXX-6517DS-VTM	A	From Leg	-1.25	0.0000	240.00	1" Ice	7.41	4.75	0.15
			3.00			No Ice	0.18	1.33	0.03
			0.00			1/2" Ice	0.28	1.89	0.04
(2) 2" x 84" Sch. 40	C	From Leg	-1.25	0.0000	240.00	1" Ice	0.32	2.19	0.05
			3.00			No Ice	0.18	1.33	0.03
			0.00			1/2" Ice	0.28	1.89	0.04
(2) 2" x 84" Sch. 40	B	From Leg	-1.25	0.0000	240.00	1" Ice	0.32	2.19	0.05
			3.00			No Ice	0.18	1.33	0.03
			0.00			1/2" Ice	0.28	1.89	0.04
(2) 2" x 84" Sch. 40	A	From Leg	-1.25	0.0000	240.00	1" Ice	0.32	2.19	0.05
			3.00			No Ice	6.54	4.32	0.04
			0.00			1/2" Ice	6.82	4.60	0.09
(2) LNX-6514DS-VTM	C	From Leg	-1.25	0.0000	240.00	1" Ice	7.12	4.88	0.14
			3.00			No Ice	6.54	4.32	0.04
			0.00			1/2" Ice	6.82	4.60	0.09
(2) LNX-6514DS-VTM	B	From Leg	-1.25	0.0000	240.00	1" Ice	7.12	4.88	0.14
			3.00			No Ice	6.54	4.32	0.04
			0.00			1/2" Ice	6.82	4.60	0.09
(2) LNX-6514DS-VTM	A	From Leg	-1.25	0.0000	240.00	1" Ice	7.12	4.88	0.14
			3.00			No Ice	6.54	4.32	0.04
			0.00			1/2" Ice	6.82	4.60	0.09
(2) 2" x 84" Sch. 40	C	From Leg	-1.25	0.0000	240.00	1" Ice	7.12	4.88	0.14
			3.00			No Ice	0.22	1.33	0.03
			0.00			1/2" Ice	0.32	1.89	0.04
(2) 2" x 84" Sch. 40	B	From Leg	-1.25	0.0000	240.00	1" Ice	0.42	2.19	0.05
			3.00			No Ice	0.22	1.33	0.03
			0.00			1/2" Ice	0.32	1.89	0.04

Description	Face or Leg	Offset Type	Offset: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		Ca Ax Front ft²	Ca Ax Side ft²	Weight K
			-1.25			1" Ice	0.42	2.19	0.05
(2) 2" x 84" Sch. 40	A	From Leg	3.00	0.0000	240.00	No Ice	0.22	1.33	0.03
			0.00			1/2" Ice	0.32	1.89	0.04
Alcatel-Lucent RRHX60-AWS	C	From Leg	-1.25	0.0000	240.00	1" Ice	0.42	2.19	0.06
			3.00			No Ice	2.68	1.60	0.06
			0.00			1/2" Ice	2.85	1.75	0.08
Alcatel-Lucent RRHX60-AWS	B	From Leg	-1.25	0.0000	240.00	1" Ice	3.04	1.90	0.10
			3.00			No Ice	2.68	1.60	0.06
			0.00			1/2" Ice	2.85	1.75	0.08
Alcatel-Lucent RRHX60-AWS	A	From Leg	-1.25	0.0000	240.00	1" Ice	3.04	1.90	0.10
			3.00			No Ice	2.68	1.60	0.06
			0.00			1/2" Ice	2.85	1.75	0.08
Alcatel-Lucent RRH2X60-PCS	C	From Leg	-1.25	0.0000	240.00	1" Ice	3.04	1.90	0.10
			3.00			No Ice	2.68	1.60	0.06
			0.00			1/2" Ice	2.85	1.75	0.08
Alcatel-Lucent RRH2X60-PCS	B	From Leg	-1.25	0.0000	240.00	1" Ice	3.04	1.90	0.10
			3.00			No Ice	2.68	1.60	0.06
			0.00			1/2" Ice	2.85	1.75	0.08
Alcatel-Lucent RRH4X60-PCS	A	From Leg	-1.25	0.0000	240.00	1" Ice	3.04	1.90	0.10
			3.00			No Ice	2.68	1.60	0.06
			0.00			1/2" Ice	2.85	1.75	0.08
DB-T2-6Z-8AB-0Z Antenna: (20.0"W x 11.22"D x 7.2")	C	From Leg	-1.25	0.0000	240.00	1" Ice	3.04	1.90	0.10
			3.00			No Ice	1.88	1.22	0.04
			0.00			1/2" Ice	2.03	1.35	0.06
DB-T1-6Z-8AB-0Z Antenna: (20.0"W x 11.22"D x 7.2")	B	From Leg	-1.25	0.0000	240.00	1" Ice	2.20	1.49	0.07
			3.00			No Ice	1.88	1.22	0.04
			0.00			1/2" Ice	2.03	1.35	0.06
12' V Frame	C	From Leg	-1.25	0.0000	240.00	1" Ice	2.20	1.49	0.07
			3.00			No Ice	6.91	2.31	0.39
			0.00			1/2" Ice	9.73	4.62	0.59
12' V Frame	B	From Leg	-1.25	0.0000	240.00	1" Ice	12.49	6.66	0.82
			3.00			No Ice	6.91	2.31	0.39
			0.00			1/2" Ice	9.73	4.62	0.59
12' V Frame	A	From Leg	-1.25	0.0000	240.00	1" Ice	12.49	6.66	0.82
			3.00			No Ice	6.91	2.31	0.39
			0.00			1/2" Ice	9.73	4.62	0.59
WHIP (2.88" X 12')	C	From Leg	-1.25	0.0000	221.00	1" Ice	12.49	6.66	0.82
			2.00			No Ice	3.60	3.60	0.03
			0.00			1/2" Ice	4.83	4.89	0.06
24" Standoff	C	From Leg	6.09	0.0000	221.00	1" Ice	6.00	6.00	0.09
			1.00			No Ice	0.55	2.30	0.03
			0.00			1/2" Ice	0.79	2.75	0.04
WHIP (2.88" X 12')	C	From Leg	0.00	0.0000	218.00	1" Ice	0.99	3.18	0.07
			2.00			No Ice	3.60	3.60	0.03
			0.00			1/2" Ice	4.83	4.89	0.06
24" Standoff	C	From Leg	6.00	0.0000	218.00	1" Ice	6.00	6.00	0.09
			1.00			No Ice	0.55	2.30	0.03
			0.00			1/2" Ice	0.79	2.75	0.04
WHIP (2.88" X 12')	B	From Leg	0.00	0.0000	215.00	1" Ice	0.99	3.18	0.07
			2.00			No Ice	3.60	3.60	0.03
			0.00			1/2" Ice	4.83	4.89	0.06
24" Standoff	B	From Leg	6.00	0.0000	215.00	1" Ice	6.00	6.00	0.09
			1.00			No Ice	0.55	2.30	0.03
			0.00			1/2" Ice	0.79	2.75	0.04
(2) 7770.00	C	From Leg	0.00	0.0000	198.00	1" Ice	0.99	3.18	0.07
			3.00			No Ice	4.41	2.34	0.04
			0.00			1/2" Ice	4.64	2.55	0.07

Description	Face or Leg	Offset Type	Offset: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		Ca Ax Front ft²	Ca Ax Side ft²	Weight K
			0.00						
(2) 7770.00	B	From Leg	3.00	0.0000	198.00	1" Ice	4.81	2.77	0.10
			0.00			No Ice	4.41	2.34	0.04
			0.00			1/2" Ice	4.64	2.55	0.07
(2) 7770.00	A	From Leg	3.00	0.0000	198.00	1" Ice	4.88	2.77	0.10
			0.00			No Ice	4.41	2.34	0.04
			0.00			1/2" Ice	4.64	2.55	0.07
(2) 2" x 95" Sch. 40	C	From Leg	3.00	0.0000	198.00	1" Ice	4.88	2.77	0.10
			0.00			No Ice	0.81	1.52	0.03
			0.00			1/2" Ice	1.17	2.16	0.05
(2) 2" x 95" Sch. 40	B	From Leg	3.00	0.0000	198.00	1" Ice	1.52	2.64	0.06
			0.00			No Ice	0.81	1.52	0.03
			0.00			1/2" Ice	1.17	2.16	0.05
(2) 2" x 95" Sch. 40	A	From Leg	3.00	0.0000	198.00	1" Ice	1.52	2.64	0.06
			0.00			No Ice	0.81	1.52	0.03
			0.00			1/2" Ice	1.17	2.16	0.05
AM-X-CD-17-65-00T-RET	C	From Leg	3.00	0.0000	198.00	1" Ice	1.52	2.64	0.06
			3.00			No Ice	9.05	5.44	0.06
			0.00			1/2" Ice	9.42	5.76	0.12
AM-X-CD-17-65-00T-RET	B	From Leg	3.00	0.0000	198.00	1" Ice	9.81	6.10	0.19
			3.00			No Ice	9.05	5.44	0.06
			0.00			1/2" Ice	9.42	5.76	0.12
AM-X-CD-17-65-00T-RET	A	From Leg	3.00	0.0000	198.00	1" Ice	9.81	6.10	0.19
			3.00			No Ice	9.05	5.44	0.06
			0.00			1/2" Ice	9.42	5.76	0.12
2" x 95" Sch. 40	C	From Leg	3.00	0.0000	198.00	1" Ice	9.81	6.10	0.19
			0.00			No Ice	0.00	2.16	0.04
			0.00			1/2" Ice	0.00	2.16	0.04
2" x 95" Sch. 40	B	From Leg	3.00	0.0000	198.00	1" Ice	0.00	2.64	0.05
			0.00			No Ice	0.00	1.52	0.03
			0.00			1/2" Ice	0.00	2.16	0.04
2" x 95" Sch. 40	A	From Leg	3.00	0.0000	198.00	1" Ice	0.00	2.64	0.05
			0.00			No Ice	0.00	1.52	0.03
			0.00			1/2" Ice	0.00	2.16	0.04
(2) Powerwave LGP21403X TMA-DD-1900	C	From Leg	3.00	0.0000	198.00	1" Ice	0.00	2.64	0.05
			0.00			No Ice	0.85	0.29	0.02
			0.00			1/2" Ice	0.96	0.35	0.03
(2) Powerwave LGP21403X TMA-DD-1900	B	From Leg	3.00	0.0000	198.00	1" Ice	1.06	0.42	0.03
			0.00			No Ice	0.85	0.29	0.02
			0.00			1/2" Ice	0.96	0.35	0.03
(2) Powerwave LGP21403X TMA-DD-1900	A	From Leg	3.00	0.0000	198.00	1" Ice	1.06	0.42	0.03
			0.00			No Ice	0.85	0.29	0.02
			0.00			1/2" Ice	0.96	0.35	0.03
(2) Powerwave LGP21903	C	From Leg	3.00	0.0000	198.00	1" Ice	1.06	0.42	0.03
			0.00			No Ice	0.18	0.13	0.01
			0.00			1/2" Ice	0.23	0.17	0.01
(2) Powerwave LGP21903	B	From Leg	3.00	0.0000	198.00	1" Ice	0.28	0.21	0.01
			0.00			No Ice	0.18	0.13	0.01
			0.00			1/2" Ice	0.23	0.17	0.01
(2) Powerwave LGP21903	A	From Leg	3.00	0.0000	198.00	1" Ice	0.28	0.21	0.01
			0.00			No Ice	0.18	0.13	0.01
			0.00			1/2" Ice	0.23	0.17	0.01
(2) Powerwave 7020.00 Dualband RET	C	From Leg	3.00	0.0000	198.00	1" Ice	0.28	0.21	0.01
			0.00			No Ice	0.28	0.08	0.00
			0.00			1/2" Ice	0.33	0.11	0.01
(2) Powerwave 7020.00 Dualband RET	B	From Leg	3.00	0.0000	198.00	1" Ice	0.39	0.15	0.01
			0.00			No Ice	0.28	0.08	0.00
			0.00			1/2" Ice	0.33	0.11	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert (ft ft ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft²)	C_AA_A Side (ft²)	Weight (K)
			0.00			1" Ice	0.39	0.15	0.01
(2) Powerwave 7020.10 DualBand RET	A	From Leg	3.00	0.0000	198.00	No Ice	0.28	0.08	0.00
			0.00			1/2" Ice	0.33	0.11	0.01
			0.00			1" Ice	0.39	0.15	0.01
(2) RRUS11 (20" X 17" X 7")	C	From Leg	3.00	0.0000	198.00	No Ice	2.27	0.95	0.05
			0.00			1/2" Ice	2.41	1.05	0.07
			0.00			1" Ice	2.57	1.16	0.09
(2) RRUS11 (20" X 17" X 7")	B	From Leg	3.00	0.0000	198.00	No Ice	2.27	0.95	0.05
			0.00			1/2" Ice	2.41	1.05	0.07
			0.00			1" Ice	2.57	1.16	0.09
(2) RRUS11 (20" X 17" X 7")	A	From Leg	3.00	0.0000	198.00	No Ice	2.27	0.95	0.05
			0.00			1/2" Ice	2.41	1.05	0.07
			0.00			1" Ice	2.57	1.16	0.09
Polyphaser (12"x[illegible])	C	From Leg	3.00	0.0000	198.00	No Ice	1.20	0.60	0.03
			0.00			1/2" Ice	1.32	0.90	0.04
			0.00			1" Ice	1.45	1.01	0.06
12' V Frame	C	From Leg	3.00	0.0000	198.00	No Ice	6.91	2.31	0.30
			0.00			1/2" Ice	9.73	4.62	0.39
			0.00			1" Ice	12.49	6.66	0.52
12' V Frame	B	From Leg	3.00	0.0000	198.00	No Ice	6.91	2.31	0.30
			0.00			1/2" Ice	9.73	4.62	0.39
			0.00			1" Ice	12.49	6.66	0.52
12' V Frame	A	From Leg	3.00	0.0000	198.00	No Ice	6.91	2.31	0.30
			0.00			1/2" Ice	9.73	4.62	0.39
			0.00			1" Ice	12.49	6.66	0.52

Truss-Leg Properties

Section Designation	Area (in²)	Area Ice (in²)	Self Weight (K)	Ice Weight (K)	Equiv. Diameter (in)	Equiv. Diameter Ice (in)	Leg Area (in²)
#12ZG-58 - 1.50" - 1.00" conn. (Pirod 194551)	2010.3166	5334.6431	0.62	1.37	6.5932	18.1828	5.5014
#12ZG-58 - 1.75" - 1.00" conn.-TR1-(Pirod 195213)	2035.9552	5329.6431	0.79	1.43	7.0693	18.5057	7.2158
#12ZG-58 - 1.75" - 1.00" conn. (Pirod 195217)	2035.9652	5329.6431	0.79	1.43	7.0693	18.5057	7.2158
#12ZG-58 - 2.00" - 0.875" conn.-TR3-(Pirod 195637)	2339.7577	5449.2431	1.00	1.44	8.1242	18.9210	9.4248
#12ZG-58 - 2.00" - 0.875" conn. (Pirod 195639)	2339.7577	5449.2431	1.00	1.44	8.1242	18.9210	9.4248
#12ZG-58 - 2.25" - 0.875" conn. (Pirod	2475.7141	5521.2431	1.17	1.47	8.5962	19.1110	11.9282

Section Designation	Area (in²)	Area Ice (in²)	Self Weight (K)	Ice Weight (K)	Equiv. Diameter (in)	Equiv. Diameter Ice (in)	Leg Area (in²)
195960)							
#12ZG-58 - 2.25" - 0.875" conn. (Pirod 195963)	2475.7141	5533.2451	1.17	1.47	8.5962	19.1110	11.9282
#12ZG-58 - 2.50" - 0.875" conn.-TR4-(Pirod 195967)	2616.4335	5593.2431	1.37	1.49	9.6847	19.4210	14.7262

Tower Pressures - No Ice

$G_H = 1.102$

Section Elevation (ft)	z (ft)	K_Z	q_z (psf)	A_G (ft²)	Face	A_F (ft²)	A_R (ft²)	A_{leg} (ft²)	Leg %	C_AA_A In Face (ft²)	C_AA_A Out Face (ft²)
T1 240.00-220.00	230.00	1.741	32	104.792	A	7.855	16.348	9.313	39.58	0.000	0.000
					B	8.405	9.513		53.27	1.740	0.000
					C	4.454	49.133		17.85	0.750	0.000
T2 220.00-200.00	210.00	1.697	31	107.500	A	7.311	30.840	15.000	39.32	0.000	0.000
					B	8.810	15.000		63.00	1.740	0.000
					C	4.771	34.600		25.27	0.750	0.000
T3 200.00-180.00	190.00	1.649	30	129.283	A	5.915	41.914	18.574	38.83	0.000	0.000
					B	4.882	54.214		31.43	1.740	0.000
					C	4.647	58.174		29.57	0.750	0.000
T4 180.00-160.00	170.00	1.597	30	171.655	A	9.395	46.220	22.120	39.77	0.000	0.000
					B	8.013	61.720		31.72	1.740	0.000
					C	8.080	61.720		31.69	0.750	0.000
T5 160.00-140.00	150.00	1.541	29	222.528	A	10.607	47.406	23.306	40.17	0.000	0.000
					B	9.407	62.906		32.23	1.740	0.000
					C	9.465	62.906		32.20	0.750	0.000
T6 140.00-120.00	130.00	1.48	27	262.945	A	12.157	47.704	23.604	39.43	0.000	0.000
					B	11.033	63.204		31.79	1.740	0.000
					C	11.107	63.204		31.76	0.750	0.000
T7 120.00-100.00	110.00	1.411	26	302.945	A	12.791	47.704	23.604	38.38	0.000	0.000
					B	12.749	63.204		31.08	1.740	0.000
					C	12.799	63.204		31.05	0.750	0.000
T8 100.00-80.00	90.00	1.332	25	343.352	A	10.932	51.226	27.126	43.64	0.000	0.000
					B	10.253	66.726		35.24	1.740	0.000
					C	10.286	66.726		35.22	0.750	0.000
T9 80.00-60.00	70.00	1.24	23	383.352	A	11.613	51.226	27.126	43.17	0.000	0.000
					B	10.990	66.726		34.91	1.740	0.000
					C	11.011	66.726		34.89	0.750	0.000
T10 60.00-40.00	50.00	1.126	21	423.783	A	14.381	52.802	28.702	42.72	0.000	0.000
					B	13.682	68.302		35.01	1.740	0.000
					C	13.716	68.302		34.99	0.750	0.000
T11 40.00-20.00	30.00	1	18	463.780	A	15.248	52.802	28.702	42.18	0.000	0.000
					B	14.580	68.302		34.63	1.740	0.000
					C	14.612	68.302		34.62	0.750	0.000
T12 20.00-0.00	10.00	1	18	504.197	A	16.146	54.433	30.333	42.98	0.000	0.000
					B	15.502	69.933		35.50	1.740	0.000
					C	15.533	69.933		35.49	0.750	0.000

Tower Pressure - With Ice

$G_H = 1.102$

Section Elevation (ft)	z (ft)	K_Z	q_z (psf)	t_Z (in)	A_G (ft²)	Face	A_F (ft²)	A_R (ft²)	A_{leg} (ft²)	Leg %	C_AA_A In Face (ft²)	C_AA_A Out Face (ft²)
T1 240.00-220.00	230.00	1.741	24	1.0000	108.325	A	14.104	32.037	18.250	35.80	0.000	0.000
						B	8.066	24.315		50.18	5.740	0.000
						C	72.497	22.981		16.58	4.750	0.000
T2 220.00-200.00	210.00	1.697	24	1.0000	110.833	A	30.737	32.825	21.667	34.09	0.000	0.000
						B	8.462	28.437		58.72	3.740	0.000
						C	72.895	28.538		21.36	4.750	0.000
T3 200.00-180.00	190.00	1.649	23	1.0000	132.671	A	40.699	43.329	25.257	30.06	0.000	0.000
						B	67.292	33.173		25.14	5.740	0.000
						C	74.018	33.303		23.53	4.750	0.000
T4 180.00-160.00	170.00	1.597	22	1.0000	174.393	A	45.062	49.504	28.708	30.45	0.000	0.000
						B	73.109	39.039		24.79	5.740	0.000
						C	77.177	39.092		24.77	4.750	0.000
T5 160.00-140.00	150.00	1.541	21	1.0000	225.566	A	46.536	81.495	60.310	47.40	0.000	0.000
						B	78.954	71.187		40.33	5.740	0.000
						C	79.023	71.626		40.33	4.750	0.000
T6 140.00-120.00	130.00	1.48	21	1.0000	266.283	A	48.300	83.715	61.701	46.82	0.000	0.000
						B	83.154	72.925		39.02	5.740	0.000
						C	80.908	73.960		39.97	4.350	0.000
T7 120.00-100.00	110.00	1.411	20	1.0000	306.283	A	50.040	84.975	61.760	45.80	0.000	0.000
						B	82.707	75.163		39.14	5.740	0.000
						C	82.755	75.134		39.12	4.750	0.000
T8 100.00-80.00	90.00	1.332	18	1.0000	345.700	A	47.834	84.772	63.195	47.63	0.000	0.000
						B	81.133	75.495		40.33	5.740	0.000
						C	81.160	75.520		40.32	4.750	0.000
T9 80.00-60.00	70.00	1.24	17	1.0000	385.700	A	48.562	85.275	63.175	47.20	0.000	0.000
						B	81.935	75.051		39.98	5.740	0.000
						C	82.005	75.079		39.96	4.750	0.000
T10 60.00-40.00	50.00	1.125	15	1.0000	427.117	A	51.213	85.877	64.010	46.44	0.000	0.000
						B	84.510	77.429		39.32	5.740	0.000
						C	84.544	77.451		39.31	4.750	0.000
T11 40.00-20.00	30.00	1	14	1.0000	457.117	A	52.137	83.153	64.010	45.95	0.000	0.000
						B	85.456	78.007		39.15	5.740	0.000
						C	85.519	78.025		39.14	4.750	0.000
T12 20.00-0.00	10.00	1	14	1.0000	507.534	A	53.077	88.524	64.844	45.79	0.000	0.000
						B	86.471	79.404		39.09	5.740	0.000
						C	85.502	79.422		39.08	4.750	0.000

Tower Pressure - Service

$G_H = 1.102$

Section Elevation (ft)	z (ft)	K_Z	q_z (psf)	A_G (ft²)	Face	A_F (ft²)	A_R (ft²)	A_{leg} (ft²)	Leg %	C_AA_A In Face (ft²)	C_AA_A Out Face (ft²)
T1 240.00-220.00	230.00	1.741	16	104.792	A	7.855	16.348	9.313	39.58	0.000	0.000
					B	8.405	9.513		53.27	1.740	0.000
					C	4.454	49.133		17.85	0.750	0.000
T2 220.00-200.00	210.00	1.697	16	107.500	A	7.311	30.840	15.000	39.32	0.000	0.000
					B	8.810	15.000		63.00	1.740	0.000

Section Elevation (ft)	z (ft)	K_Z	q_z (psf)	A_G (ft²)	Face	A_F (ft²)	A_R (ft²)	A_{leg} (ft²)	Leg %	C_AA_A In Face (ft²)	C_AA_A Out Face (ft²)
					C	4.771	54.600		25.27	0.750	0.000
T3 200.00-180.00	190.00	1.649	15	129.283	A	5.915	41.914	18.574	38.83	0.000	0.000
					B	4.882	54.214		31.43	1.740	0.000
					C	4.647	58.174		29.57	0.750	0.000
T4 180.00-160.00	170.00	1.597	15	171.655	A	9.395	46.220	22.120	39.77	0.000	0.000
					B	8.013	61.720		31.72	1.740	0.000
					C	8.080	61.720		31.69	0.750	0.000
T5 160.00-140.00	150.00	1.541	14	222.528	A	10.607	47.406	23.306	40.17	0.000	0.000
					B	9.407	62.906		32.23	1.740	0.000
					C	9.465	62.906		32.20	0.750	0.000
T6 140.00-120.00	130.00	1.48	14	262.945	A	12.157	47.704	23.604	39.43	0.000	0.000
					B	11.033	63.204		31.79	1.740	0.000
					C	11.107	63.204		31.76	0.750	0.000
T7 120.00-100.00	110.00	1.411	13	302.945	A	12.791	47.704	23.604	38.38	0.000	0.000
					B	12.749	63.204		31.08	1.740	0.000
					C	12.799	63.204		31.06	0.750	0.000
T8 100.00-80.00	90.00	1.332	12	343.352	A	10.932	51.226	27.126	43.64	0.000	0.000
					B	10.253	66.726		35.24	1.740	0.000
					C	10.286	66.726		35.22	0.750	0.000
T9 80.00-60.00	70.00	1.24	11	383.352	A	11.613	51.226	27.126	43.17	0.000	0.000
					B	10.990	66.726		34.91	1.740	0.000
					C	11.011	66.726		34.89	0.750	0.000
T10 60.00-40.00	50.00	1.126	10	423.783	A	14.381	52.802	28.702	42.72	0.000	0.000
					B	13.682	68.302		35.01	1.740	0.000
					C	13.716	68.302		34.99	0.750	0.000
T11 40.00-20.00	30.00	1	9	463.783	A	15.248	52.802	28.702	42.18	0.000	0.000
					B	14.580	68.302		34.63	1.740	0.000
					C	14.612	68.302		34.62	0.750	0.000
T12 20.00-0.00	10.00	1	9	504.197	A	16.146	54.433	30.333	42.98	0.000	0.000
					B	15.502	69.933		35.50	1.740	0.000
					C	15.533	69.933		35.49	0.750	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation (ft)	Add Weight (K)	Self Weight (K)	Face	e	C_F	R_R	D_F	D_R	A_E (ft²)	F (K)	w (plf)	Ctrl. Face
T1 240.00-220.00	0.21	0.65	A	0.231	2.456	0.377	1	1	37.629	2.70	135.12	C
			B	0.272	2.693	0.585	1	1	14.012			
			C	0.512	1.835	0.734	1	1	39.013			
T2 220.00-200.00	0.28	1.10	A	0.355	2.16	0.634	1	1	26.871	2.92	145.63	C
			B	0.321	2.326	0.595	1	1	37.735			
			C	0.552	1.841	0.726	1	1	44.386			
T3 200.00-180.00	0.49	1.71	A	0.37	2.127	0.64	1	1	32.732	2.97	148.61	C
			B	0.457	1.952	0.677	1	1	41.557			
			C	0.485	1.919	0.69	1	1	44.811			
T4 180.00-150.00	0.51	1.73	A	0.325	2.231	0.624	1	1	38.233	3.32	165.77	C
			B	0.408	2.049	0.655	1	1	48.425			
			C	0.408	2.048	0.655	1	1	48.502			
T5 160.00-140.00	0.51	2.43	A	0.351	2.405	0.605	1	1	39.272	3.49	174.62	C
			B	0.325	2.232	0.624	1	1	48.651			
			C	0.325	2.231	0.624	1	1	48.715			
T6 140.00-120.00	0.51	3.01	A	0.228	2.506	0.556	1	1	40.609	3.59	179.37	C
			B	0.212	2.343	0.611	1	1	43.653			
			C	0.213	2.343	0.611	1	1	49.707			
T7	0.51	3.53	A	0.203	2.535	0.551	1	1	41.984	3.63	181.57	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	Cf	Ra	Df	Da	As ft²	F K	w plf	Col. Face
220.00-240.00			B	0.231	2.435	0.602	1	1	50.901			
			C	0.231	2.435	0.602	1	1	50.856			
T3	0.51	4.10	A	0.183	2.661	0.517	1	1	49.565	3.49	194.30	C
200.00-220.00			B	0.224	2.517	0.596	1	1	49.998			
			C	0.224	2.517	0.596	1	1	50.032			
T4	0.51	4.16	A	0.164	2.721	0.554	1	1	49.516	3.36	187.99	C
180.00-200.00			B	0.203	2.583	0.591	1	1	50.432			
			C	0.203	2.583	0.591	1	1	50.444			
T5	0.51	5.43	A	0.159	2.74	0.583	1	1	48.155	3.30	184.92	C
160.00-180.00			B	0.183	2.618	0.589	1	1	50.011			
			C	0.184	2.618	0.589	1	1	50.053			
T6	0.51	5.53	A	0.147	2.784	0.581	1	1	47.925	3.02	181.16	C
140.00-160.00			B	0.379	2.669	0.585	1	1	54.624			
			C	0.379	2.668	0.585	1	1	54.658			
T7	0.51	6.24	A	0.14	2.809	0.58	1	1	47.216	3.16	157.83	C
120.00-140.00			B	0.169	2.701	0.585	1	1	56.348			
			C	0.17	2.701	0.585	1	1	56.429			
Sum Weight:	5.60	39.18						OTM:	4187.37 kip-ft	38.94		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	Cf	Ra	Df	Da	As ft²	F K	w plf	Col. Face
T1	0.24	0.65	A	0.231	2.496	0.597	0.8	1	16.056	2.64	132.18	C
200.00-220.00			B	0.172	2.693	0.585	0.8	1	12.331			
			C	0.312	2.183	0.704	0.8	1	24.180			
T2	0.28	1.10	A	0.355	2.16	0.634	0.8	1	28.459	2.85	142.59	C
220.00-200.00			B	0.231	2.526	0.595	0.8	1	15.973			
			C	0.552	1.841	0.726	0.8	1	43.402			
T3	0.49	1.78	A	0.37	2.127	0.64	0.8	1	31.549	2.91	145.69	C
200.00-180.00			B	0.457	1.962	0.677	0.8	1	40.583			
			C	0.466	1.919	0.69	0.8	1	43.882			
T4	0.51	1.73	A	0.335	2.221	0.624	0.8	1	36.514	3.21	160.38	C
180.00-160.00			B	0.408	2.049	0.655	0.8	1	45.522			
			C	0.408	2.048	0.655	0.8	1	45.546			
T5	0.51	2.43	A	0.263	2.406	0.605	0.8	1	37.155	3.35	167.58	C
160.00-140.00			B	0.333	2.232	0.624	0.8	1	46.770			
			C	0.335	2.231	0.624	0.8	1	46.822			
T6	0.51	3.01	A	0.291	2.356	0.596	0.8	1	38.178	3.43	171.58	C
140.00-120.00			B	0.262	2.344	0.611	0.8	1	47.459			
			C	0.263	2.343	0.612	0.8	1	47.486			
T7	0.51	3.53	A	0.203	2.585	0.593	0.8	1	39.225	3.45	172.61	C
120.00-100.00			B	0.251	2.435	0.602	0.8	1	48.251			
			C	0.251	2.435	0.603	0.8	1	48.294			
T8	0.51	4.10	A	0.184	2.661	0.517	0.8	1	38.800	3.35	167.37	C
100.00-80.00			B	0.224	2.517	0.596	0.8	1	47.847			
			C	0.224	2.517	0.596	0.8	1	47.975			
T9	0.51	4.16	A	0.164	2.721	0.554	0.8	1	39.191	3.32	160.79	C
80.00-60.00			B	0.203	2.587	0.591	0.8	1	48.216			
			C	0.203	2.587	0.591	0.8	1	48.241			
T10	0.51	5.43	A	0.159	2.74	0.583	0.8	1	43.279	3.83	156.68	C
60.00-40.00			B	0.183	2.618	0.589	0.8	1	51.181			
			C	0.184	2.618	0.589	0.8	1	51.219			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	Cf	Ra	Df	Da	As ft²	F K	w plf	Col. Face
T11	0.51	5.53	A	0.147	2.784	0.581	0.8	1	42.875	3.56	142.22	C
40.00-20.00			B	0.379	2.669	0.585	0.8	1	51.708			
			C	0.379	2.668	0.586	0.8	1	51.755			
T12	0.51	6.24	A	0.14	2.809	0.58	0.8	1	44.419	2.99	149.28	C
20.00-0.00			B	0.169	2.701	0.585	0.8	1	53.227			
			C	0.17	2.701	0.585	0.8	1	53.319			
Sum Weight:	5.60	39.18						OTM:	4433.90 kip-ft	37.80		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	Cf	Ra	Df	Da	As ft²	F K	w plf	Col. Face
T1	0.24	0.65	A	0.231	2.496	0.597	0.85	1	16.449	2.66	132.98	C
200.00-220.00			B	0.172	2.693	0.585	0.85	1	12.751			
			C	0.312	2.183	0.704	0.85	1	24.403			
T2	0.28	1.10	A	0.355	2.16	0.634	0.85	1	28.774	2.87	143.55	C
220.00-200.00			B	0.231	2.526	0.595	0.85	1	16.434			
			C	0.552	1.841	0.726	0.85	1	43.671			
T3	0.49	1.78	A	0.37	2.127	0.64	0.85	1	31.845	2.93	146.64	C
200.00-180.00			B	0.457	1.962	0.677	0.85	1	40.829			
			C	0.466	1.919	0.69	0.85	1	44.114			
T4	0.51	1.73	A	0.335	2.221	0.624	0.85	1	36.825	3.23	161.79	C
180.00-160.00			B	0.408	2.049	0.655	0.85	1	47.223			
			C	0.408	2.048	0.655	0.85	1	47.250			
T5	0.51	2.43	A	0.263	2.406	0.605	0.85	1	37.681	3.39	169.64	C
160.00-140.00			B	0.333	2.232	0.624	0.85	1	47.240			
			C	0.335	2.231	0.624	0.85	1	47.295			
T6	0.51	3.01	A	0.291	2.356	0.596	0.85	1	38.785	3.47	173.48	C
140.00-120.00			B	0.262	2.344	0.611	0.85	1	47.972			
			C	0.263	2.343	0.611	0.85	1	48.041			
T7	0.51	3.53	A	0.203	2.585	0.593	0.85	1	39.915	3.50	174.83	C
120.00-100.00			B	0.251	2.435	0.602	0.85	1	48.818			
			C	0.251	2.435	0.602	0.85	1	48.864			
T8	0.51	4.10	A	0.184	2.661	0.517	0.85	1	39.347	3.38	169.65	C
100.00-80.00			B	0.224	2.517	0.596	0.85	1	48.460			
			C	0.224	2.517	0.596	0.85	1	48.589			
T9	0.51	4.16	A	0.164	2.721	0.554	0.85	1	39.772	3.25	162.59	C
80.00-60.00			B	0.203	2.587	0.591	0.85	1	48.763			
			C	0.203	2.587	0.591	0.85	1	48.792			
T10	0.51	5.43	A	0.159	2.74	0.583	0.85	1	43.908	3.17	158.74	C
60.00-40.00			B	0.183	2.618	0.589	0.85	1	51.865			
			C	0.184	2.618	0.589	0.85	1	51.905			
T11	0.51	5.53	A	0.147	2.784	0.581	0.85	1	43.537	2.90	145.20	C
40.00-20.00			B	0.379	2.669	0.585	0.85	1	52.437			
			C	0.379	2.668	0.586	0.85	1	52.485			
T12	0.51	6.24	A	0.14	2.809	0.58	0.85	1	45.094	3.03	151.42	C
20.00-0.00			B	0.169	2.703	0.585	0.85	1	54.063			
			C	0.17	2.701	0.585	0.85	1	54.090			
Sum Weight:	5.60	39.18						OTM:	4472.93 kip-ft	37.79		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	Cf	Ra	Df	Da	As ft²	F K	w plf	Col. Face
T1	1.65	1.65	A	0.408	2.048	0.655	1	1	33.794	3.09	254.56	C
240.00-220.00			B	0.299	2.397	0.616	1	1	23.039			
			C	0.545	1.903	0.969	1	1	54.973			
T2	1.97	3.20	A	0.574	1.823	0.733	1	1	54.954	5.39	298.42	C
220.00-200.00			B	0.333	2.212	0.627	1	1	26.279			
			C	0.915	1.945	0.999	1	1	101.349			
T3	3.44	2.40	A	0.634	1.787	0.775	1	1	74.253	5.03	252.46	C
200.00-180.00			B	0.718	1.791	0.863	1	1	95.909			
			C	0.829	1.823	0.904	1	1	104.124			
T4	3.60	3.17	A	0.542	1.851	0.72	1	1	83.934	4.96	247.91	C
180.00-160.00			B	0.655	1.798	0.795	1	1	106.193			
			C	0.667	1.778	0.797	1	1	108.321			
T5	3.60	7.46	A	0.567	1.828	0.734	1	1	106.403	5.53	297.37	C
160.00-140.00			B	0.667	1.778	0.797	1	1	131.949			
			C	0.667	1.778	0.797	1	1	134.100			
T6	3.60	8.38	A	0.496	1.906	0.695	1	1	106.313	5.82	290.86	C
140.00-120.00			B	0.581	1.817	0.742	1	1	135.729			
			C	0.582	1.817	0.743	1	1	135.824			
T7	3.60	9.02	A	0.44	1.959	0.659	1	1	106.819	5.71	285.64	C
120.00-100.00			B	0.511	1.841	0.705	1	1	131.792			
			C	0.512	1.84	0.706	1	1	131.817			
T8	3.60	9.70	A	0.452	1.971	0.674	1	1	102.445	5.51	275.61	C
100.00-80.00			B	0.452	1.97	0.674	1	1	132.027			
			C	0.452	1.97	0.674	1	1	132.081			
T9	3.60	9.82	A	0.346	2.181	0.631	1	1	102.301	5.31	265.65	C
80.00-60.00			B	0.409	2.047	0.655	1	1	131.305			
			C	0.409	2.047	0.655	1	1	131.353			
T10	3.60	11.43	A	0.323	2.207	0.623	1	1	105.197	5.05	252.65	C
60.00-40.00			B	0.379	2.107	0.643	1	1	134.335			
			C	0.379	2.106	0.643	1	1	134.385			
T11	3.60	11.61	A	0.298	2.301	0.613	1	1	105.767	4.84	241.33	C
40.00-20.00			B	0.35	2.171	0.633	1	1	134.894			
			C	0.35	2.171	0.633	1	1	134.951			
T12	3.60	12.47	A	0.279	2.313	0.61	1	1	107.651	4.79	239.66	C
20.00-0.00			B	0.327	2.227	0.634	1	1	136.957			
			C	0.327	2.227	0.635	1	1	136.992			
Sum Weight:	39.45	89.30						OTM:	7691.36 kip-ft	63.29		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	Cf	Ra	Df	Da	As ft²	F K	w plf	Col. Face
T1	1.65	1.65	A	0.408	2.048	0.655	0.8	1	30.973	4.33	217.72	C
240.00-220.00			B	0.299	2.397	0.616	0.8	1	21.426			
			C	0.805	1.903	0.969	0.8	1	53.434			
T2	1.97	3.20	A	0.574	1.823	0.733	0.8	1	48.897	4.65	232.63	C
220.00-200.00			B	0.333	2.212	0.627	0.8	1	24.565			
			C	0.915	1.945	0.999	0.8	1	85.775			

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	Cf	Ra	Df	Da	As ft²	F K	w plf	Col. Face
T1	1.65	1.65	A	0.408	2.048	0.655	0.85	1	31.879	4.54	326.93	C
240.00-220.00			B	0.299	2.397	0.616	0.85	1	21.829			
			C	0.545	1.903	0.969	0.85	1	54.058			
T2	1.97	3.20	A	0.574	1.823	0.733	0.85	1	53.344	4.84	363.82	C
220.00-200.00			B	0.333	2.212	0.627	0.85	1	25.009			
			C	0.915	1.945	0.999	0.85	1	90.419			
T3	3.44	2.40	A	0.634	1.787	0.775	0.85	1	68.153	4.54	339.95	C
200.00-180.00			B	0.718	1.791	0.863	0.85	1	88.816			
			C	0.829	1.823	0.904	0.85	1	93.033			
T4	3.60	3.17	A	0.542	1.851	0.72	0.85	1	77.845	4.46	332.78	C
180.00-160.00			B	0.666	1.778	0.795	0.85	1	96.436			
			C	0.667	1.778	0.797	0.85	1	96.745			
T5	3.60	7.46	A	0.567	1.828	0.734	0.85	1	99.415	5.43	372.54	C
160.00-140.00			B	0.667	1.778	0.797	0.85	1	124.165			
			C	0.667	1.778	0.797	0.85	1	124.245			
T6	3.60	8.38	A	0.496	1.906	0.695	0.85	1	99.268	5.32	353.83	C
140.00-120.00			B	0.581	1.817	0.742	0.85	1	127.691			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.312	2.317	0.743	0.85	1	123.668			
T7 120.00-100.00	3.60	9.02	A	0.44	1.589	0.669	0.85	1	99.313	5.23	251.48	C
			B	0.513	1.811	0.705	0.85	1	123.326			
			C	0.516	1.88	0.706	0.85	1	123.403			
T8 100.00-80.00	3.60	9.70	A	0.387	2.1	0.643	0.85	1	95.275	5.02	251.19	C
			B	0.452	1.971	0.674	0.85	1	119.857			
			C	0.452	1.97	0.674	0.85	1	119.956			
T9 80.00-60.00	3.60	9.02	A	0.346	2.131	0.631	0.85	1	95.056	4.84	241.79	C
			B	0.409	2.047	0.655	0.85	1	119.510			
			C	0.409	2.047	0.655	0.85	1	119.554			
T10 60.00-40.00	3.60	11.42	A	0.323	2.237	0.623	0.85	1	97.516	4.59	229.66	C
			B	0.379	2.107	0.643	0.85	1	121.659			
			C	0.379	2.106	0.643	0.85	1	121.704			
T11 40.00-20.00	3.60	11.61	A	0.258	2.301	0.615	0.85	1	97.946	4.21	210.54	C
			B	0.35	2.171	0.632	0.85	1	122.001			
			C	0.35	2.171	0.633	0.85	1	122.043			
T12 20.00-0.00	3.60	12.47	A	0.279	2.353	0.61	0.85	1	99.089	4.53	211.57	C
			B	0.327	2.227	0.674	0.85	1	122.085			
			C	0.327	2.227	0.635	0.85	1	121.127			
Sum Weight:	39.45	89.30						OTM	6953.33 kip-ft	57.31		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 240.00-220.00	0.24	0.65	A	0.331	2.706	0.597	1	1	12.629	1.35	67.35	C
			B	0.172	2.693	0.555	1	1	14.012			
			C	0.512	1.885	0.704	1	1	32.010			
T2 220.00-200.00	0.28	1.10	A	0.355	2.16	0.634	1	1	25.871	1.43	72.56	C
			B	0.221	2.526	0.595	1	1	17.735			
			C	0.552	1.841	0.726	1	1	44.356			
T3 200.00-180.00	0.49	1.28	A	0.37	2.127	0.64	1	1	32.732	1.48	74.08	C
			B	0.457	1.962	0.677	1	1	41.562			
			C	0.485	1.919	0.69	1	1	44.811			
T4 180.00-160.00	0.51	1.73	A	0.325	2.231	0.624	1	1	38.233	1.65	82.60	C
			B	0.408	2.049	0.655	1	1	48.425			
			C	0.408	2.048	0.655	1	1	48.502			
T5 160.00-140.00	0.51	2.43	A	0.261	2.406	0.605	1	1	39.272	1.74	87.01	C
			B	0.325	2.232	0.624	1	1	48.653			
			C	0.325	2.231	0.624	1	1	48.715			
T6 140.00-120.00	0.51	3.01	A	0.228	2.506	0.596	1	1	40.609	1.79	89.37	C
			B	0.282	2.344	0.611	1	1	49.650			
			C	0.283	2.343	0.611	1	1	49.707			
T7 120.00-100.00	0.51	3.53	A	0.203	2.586	0.591	1	1	41.984	1.81	90.47	C
			B	0.251	2.435	0.602	1	1	50.801			
			C	0.251	2.435	0.602	1	1	50.834			
T8 100.00-80.00	0.51	4.10	A	0.181	2.661	0.587	1	1	40.986	1.76	88.15	C
			B	0.224	2.517	0.596	1	1	49.998			
			C	0.224	2.517	0.596	1	1	50.032			
T9 80.00-60.00	0.51	4.16	A	0.164	2.721	0.584	1	1	41.514	1.67	83.70	C
			B	0.203	2.587	0.591	1	1	50.412			
			C	0.203	2.587	0.591	1	1	50.444			
T10	0.51	5.43	A	0.159	2.74	0.583	1	1	45.335	1.64	82.18	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
60.00-40.00			B	0.193	2.618	0.589	1	1	53.911			
			C	0.194	2.618	0.589	1	1	53.553			
T11 40.00-20.00	0.51	5.53	A	0.147	2.784	0.581	1	1	45.925	1.51	75.32	C
			B	0.179	2.659	0.586	1	1	54.634			
			C	0.179	2.661	0.586	1	1	54.658			
T12 20.00-0.00	0.51	6.24	A	0.14	2.839	0.58	1	1	47.316	1.57	78.64	C
			B	0.159	2.701	0.583	1	1	56.388			
			C	0.17	2.701	0.585	1	1	55.420			
Sum Weight:	5.60	39.18						OTM	2285.85 kip-ft	19.40		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 240.00-220.00	0.24	0.65	A	0.231	2.496	0.597	0.8	1	14.056	1.32	65.84	C
			B	0.172	2.693	0.555	0.8	1	12.351			
			C	0.512	1.885	0.704	0.8	1	38.180			
T2 220.00-200.00	0.28	1.10	A	0.355	2.16	0.634	0.8	1	25.408	1.42	71.05	C
			B	0.221	2.526	0.595	0.8	1	15.973			
			C	0.552	1.841	0.726	0.8	1	43.432			
T3 200.00-180.00	0.49	1.28	A	0.37	2.127	0.64	0.8	1	31.549	1.45	72.59	C
			B	0.457	1.962	0.677	0.8	1	40.515			
			C	0.486	1.919	0.69	0.8	1	43.872			
T4 180.00-160.00	0.51	1.73	A	0.325	2.231	0.624	0.8	1	36.354	1.60	79.91	C
			B	0.408	2.049	0.655	0.8	1	46.822			
			C	0.408	2.048	0.655	0.8	1	46.886			
T5 160.00-140.00	0.51	2.43	A	0.261	2.406	0.605	0.8	1	37.150	1.67	83.70	C
			B	0.325	2.232	0.624	0.8	1	45.770			
			C	0.325	2.231	0.624	0.8	1	45.822			
T6 140.00-120.00	0.51	3.01	A	0.228	2.506	0.596	0.8	1	38.378	1.71	85.46	C
			B	0.282	2.344	0.611	0.8	1	47.439			
			C	0.283	2.343	0.611	0.8	1	47.485			
T7 120.00-100.00	0.51	3.53	A	0.203	2.586	0.591	0.8	1	39.226	1.72	86.09	C
			B	0.251	2.435	0.602	0.8	1	48.251			
			C	0.251	2.435	0.602	0.8	1	48.294			
T8 100.00-80.00	0.51	4.10	A	0.181	2.661	0.587	0.8	1	38.800	1.67	83.35	C
			B	0.224	2.517	0.596	0.8	1	47.947			
			C	0.224	2.517	0.596	0.8	1	47.975			
T9 80.00-60.00	0.51	4.16	A	0.164	2.721	0.584	0.8	1	39.191	1.60	80.12	C
			B	0.203	2.587	0.591	0.8	1	48.216			
			C	0.203	2.587	0.591	0.8	1	48.241			
T10 60.00-40.00	0.51	5.43	A	0.159	2.74	0.583	0.8	1	42.279	1.56	78.07	C
			B	0.193	2.618	0.589	0.8	1	51.181			
			C	0.194	2.618	0.589	0.8	1	51.210			
T11 40.00-20.00	0.51	5.53	A	0.147	2.784	0.581	0.8	1	42.875	1.43	71.36	C
			B	0.179	2.659	0.585	0.8	1	51.708			
			C	0.179	2.661	0.585	0.8	1	51.735			
T12 20.00-0.00	0.51	6.24	A	0.14	2.839	0.58	0.8	1	44.411	1.49	74.38	C
			B	0.159	2.701	0.583	0.8	1	53.287			
			C	0.17	2.701	0.585	0.8	1	53.313			
Sum Weight:	5.60	39.18						OTM	2209.21 kip-ft	18.64		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1 240.00-220.00	0.24	0.65	A	0.231	2.456	0.597	0.85	1	16.449	1.32	66.21	C
			B	0.172	2.693	0.585	0.85	1	12.351			
			C	0.512	1.885	0.704	0.85	1	35.403			
T2 220.00-200.00	0.28	1.10	A	0.355	2.16	0.634	0.85	1	25.774	1.43	71.43	C
			B	0.221	2.526	0.595	0.85	1	16.414			
			C	0.552	1.841	0.726	0.85	1	43.671			
T3 200.00-180.00	0.49	1.28	A	0.37	2.127	0.64	0.85	1	31.345	1.46	72.96	C
			B	0.457	1.962	0.677	0.85	1	40.829			
			C	0.485	1.919	0.69	0.85	1	44.314			
T4 180.00-160.00	0.51	1.73	A	0.325	2.231	0.624	0.85	1	36.323	1.61	80.58	C
			B	0.408	2.049	0.655	0.85	1	47.223			
			C	0.408	2.048	0.655	0.85	1	47.290			
T5 160.00-140.00	0.51	2.43	A	0.261	2.406	0.605	0.85	1	37.681	1.69	84.53	C
			B	0.325	2.232	0.624	0.85	1	47.240			
			C	0.325	2.231	0.624	0.85	1	47.293			
T6 140.00-120.00	0.51	3.01	A	0.228	2.506	0.596	0.85	1	38.765	1.73	86.44	C
			B	0.282	2.344	0.611	0.85	1	47.992			
			C	0.283	2.343	0.611	0.85	1	48.041			
T7 120.00-100.00	0.51	3.53	A	0.203	2.585	0.591	0.85	1	39.916	1.74	87.12	C
			B	0.251	2.435	0.602	0.85	1	48.888			
			C	0.251	2.435	0.602	0.85	1	48.934			
T8 100.00-80.00	0.51	4.10	A	0.181	2.661	0.587	0.85	1	39.347	1.68	84.22	C
			B	0.224	2.517	0.596	0.85	1	48.450			
			C	0.224	2.517	0.596	0.85	1	48.489			
T9 80.00-60.00	0.51	4.16	A	0.164	2.721	0.584	0.85	1	39.772	1.62	81.01	C
			B	0.203	2.587	0.591	0.85	1	48.765			
			C	0.203	2.587	0.591	0.85	1	48.792			
T10 60.00-40.00	0.51	5.43	A	0.159	2.74	0.583	0.85	1	42.995	1.58	79.10	C
			B	0.193	2.618	0.589	0.85	1	51.863			
			C	0.194	2.618	0.589	0.85	1	51.895			
T11 40.00-20.00	0.51	5.53	A	0.147	2.785	0.581	0.85	1	43.637	1.45	72.35	C
			B	0.179	2.659	0.585	0.85	1	52.437			
			C	0.179	2.668	0.585	0.85	1	52.456			
T12 20.00-0.00	0.51	6.24	A	0.14	2.839	0.58	0.85	1	45.294	1.51	75.45	C
			B	0.169	2.701	0.583	0.85	1	54.063			
			C	0.17	2.701	0.583	0.85	1	54.090			
Sum Weight:	5.60	39.18						OTM	2228.42 kip-ft	18.83		

Mast Vectors - No Ice

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
T1	240.00-220.00	0	Wind Normal	2.70	0.00	-2.70	-621.56	0.00	0.00
		30	Wind 90	2.65	1.33	-2.30	-539.37	-305.63	0.00
		60	Wind 60	2.64	2.29	-1.32	-311.91	-526.39	0.00
		90	Wind 90	2.66	2.66	0.00	0.00	-611.25	0.00
		120	Wind Normal	2.70	2.34	1.35	310.78	-538.29	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
		150	Wind 90	2.66	1.33	2.30	529.37	-305.63	0.00
		180	Wind 60	2.64	0.00	2.64	607.82	0.00	0.00
		210	Wind 90	2.66	-1.33	2.30	529.37	305.63	0.00
		240	Wind Normal	2.70	-2.34	1.35	310.78	538.29	0.00
		270	Wind 90	2.66	-2.66	0.00	0.00	611.25	0.00
		300	Wind 60	2.64	-2.29	-1.32	-303.91	526.39	0.00
		330	Wind 90	2.66	-1.33	-2.30	-529.37	305.63	0.00
T2	220.00-200.00	0	Wind Normal	2.91	0.00	-2.91	-611.83	0.00	0.00
		30	Wind 90	2.87	1.43	-2.48	-571.40	-331.03	0.00
		60	Wind 60	2.85	2.47	-1.43	-299.43	-518.63	0.00
		90	Wind 90	2.87	2.87	0.00	0.00	-602.06	0.00
		120	Wind Normal	2.91	2.52	1.46	305.81	-529.68	0.00
		150	Wind 90	2.87	1.43	2.48	521.40	-331.03	0.00
		180	Wind 60	2.85	0.00	2.85	598.87	0.00	0.00
		210	Wind 90	2.87	-1.43	2.48	521.40	301.03	0.00
		240	Wind Normal	2.91	-2.52	1.46	305.81	529.68	0.00
		270	Wind 90	2.87	-2.87	0.00	0.00	602.06	0.00
		300	Wind 60	2.85	-2.47	-1.43	-299.43	518.63	0.00
		330	Wind 90	2.87	-1.43	-2.48	-521.40	301.03	0.00
T3	200.00-180.00	0	Wind Normal	2.97	0.00	-2.97	-554.99	0.00	0.00
		30	Wind 90	2.93	1.46	-2.54	-481.90	-278.23	0.00
		60	Wind 60	2.91	2.52	-1.46	-276.80	-479.44	0.00
		90	Wind 90	2.93	2.93	0.00	0.00	-556.45	0.00
		120	Wind Normal	2.97	2.58	1.49	282.50	-489.30	0.00
		150	Wind 90	2.93	1.46	2.54	481.90	-278.23	0.00
		180	Wind 60	2.91	0.00	2.91	553.61	0.00	0.00
		210	Wind 90	2.93	-1.46	2.54	481.90	278.23	0.00
		240	Wind Normal	2.97	-2.58	1.49	282.50	489.30	0.00
		270	Wind 90	2.93	-2.93	0.00	0.00	556.45	0.00
		300	Wind 60	2.91	-2.52	-1.46	-276.80	479.44	0.00
		330	Wind 90	2.93	-1.46	-2.54	-481.90	278.23	0.00
T4	180.00-160.00	0	Wind Normal	3.32	0.00	-3.32	-563.61	0.00	0.00
		30	Wind 90	3.23	1.62	-2.80	-476.20	-274.94	0.00
		60	Wind 60	3.21	2.78	-1.60	-272.65	-472.24	0.00
		90	Wind 90	3.23	3.23	0.00	0.00	-549.87	0.00
		120	Wind Normal	3.32	2.87	1.66	281.81	-488.10	0.00
		150	Wind 90	3.23	1.62	2.80	476.20	-274.94	0.00
		180	Wind 60	3.21	0.00	3.21	545.29	0.00	0.00
		210	Wind 90	3.23	-1.62	2.80	476.20	274.94	0.00
		240	Wind Normal	3.32	-2.87	1.66	281.81	488.10	0.00
		270	Wind 90	3.23	-3.23	0.00	0.00	549.87	0.00
		300	Wind 60	3.21	-2.78	-1.60	-272.65	472.24	0.00
		330	Wind 90	3.23	-1.62	-2.80	-476.20	274.94	0.00
T5	160.00-140.00	0	Wind Normal	3.49	0.00	-3.49	-523.85	0.00	0.00
		30	Wind 90	3.39	1.70	-2.94	-440.74	-254.46	0.00
		60	Wind 60	3.35	2.91	-1.68	-251.93	-435.43	0.00
		90	Wind 90	3.39	3.39	0.00	0.00	-508.93	0.00
		120	Wind Normal	3.49	3.02	1.75	261.93	-453.67	0.00
		150	Wind 90	3.39	1.70	2.94	440.74	-254.46	0.00
		180	Wind 60	3.35	0.00	3.35	503.95	0.00	0.00
		210	Wind 90	3.39	-1.70	2.94	440.74	254.46	0.00
		240	Wind Normal	3.49	-3.02	1.75	261.93	453.67	0.00
		270	Wind 90	3.39	-3.39	0.00	0.00	508.93	0.00
		300	Wind 60	3.35	-2.91	-1.68	-251.93	435.43	0.00
		330	Wind 90	3.39	-1.70	-2.94	-440.74	254.46	0.00
T6	140.00-120.00	0	Wind Normal	3.59	0.00	-3.59	-456.36	0.00	0.00
		30	Wind 90	3.47	1.73	-3.00	-390.63	-225.53	0.00
		60	Wind 60	3.43	2.97	-1.72	-222.93	-386.21	0.00
		90	Wind 90	3.47	3.47	0.00	0.00	-451.05	0.00
		120	Wind Normal	3.59	3.11	1.79	233.18	-403.83	0.00
		150	Wind 90	3.47	1.73	3.00	390.63	-225.53	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_i K	V_r K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
		180	Wind 60	3.43	0.00	3.43	445.64	0.00	0.00
		210	Wind 90	3.47	-1.73	3.00	390.83	225.53	0.00
		240	Wind Normal	3.59	-3.11	1.79	233.38	423.88	0.00
		270	Wind 90	3.47	-3.47	0.00	0.00	451.66	0.00
		300	Wind 60	3.43	-2.97	-1.72	-223.58	386.21	0.00
		330	Wind 90	3.47	-1.73	-3.00	-390.43	225.53	0.00
T7	120.00-100.00	0	Wind Normal	3.43	0.00	-3.43	-390.43	0.00	0.00
		30	Wind 90	3.50	1.73	-3.03	-393.33	-192.33	0.00
		60	Wind 60	3.43	2.99	-1.73	-389.87	-328.85	0.00
		90	Wind 90	3.50	3.50	0.00	0.00	-384.66	0.00
		120	Wind Normal	3.63	3.14	1.82	199.72	-345.93	0.00
		150	Wind 90	3.50	1.73	3.03	333.33	-192.33	0.00
		180	Wind 60	3.43	0.00	3.43	389.24	0.00	0.00
		210	Wind 90	3.50	-1.73	3.03	333.33	192.33	0.00
		240	Wind Normal	3.63	-3.14	1.82	199.72	345.93	0.00
		270	Wind 90	3.50	-3.50	0.00	0.00	384.66	0.00
		300	Wind 60	3.43	-2.99	-1.73	-189.87	328.85	0.00
		330	Wind 90	3.50	-1.73	-3.03	-333.33	192.33	0.00
T8	100.00-83.00	0	Wind Normal	3.43	0.00	-3.43	-333.33	0.00	0.00
		30	Wind 90	3.38	1.65	-2.53	-243.49	-112.13	0.00
		60	Wind 60	3.35	2.90	-1.67	-150.35	-260.75	0.00
		90	Wind 90	3.38	3.38	0.00	0.00	-304.26	0.00
		120	Wind Normal	3.49	3.03	1.74	196.87	-271.71	0.00
		150	Wind 90	3.38	1.65	2.93	283.49	-112.13	0.00
		180	Wind 60	3.35	0.00	3.35	301.69	0.00	0.00
		210	Wind 90	3.38	-1.65	2.93	283.49	192.13	0.00
		240	Wind Normal	3.49	-3.03	1.74	196.87	271.71	0.00
		270	Wind 90	3.38	-3.38	0.00	0.00	304.26	0.00
		300	Wind 60	3.31	-2.90	-1.67	-150.35	260.75	0.00
		330	Wind 90	3.38	-1.65	-2.93	-283.49	192.13	0.00
T9	83.00-60.00	0	Wind Normal	3.36	0.00	-3.36	-283.34	0.00	0.00
		30	Wind 90	3.25	1.63	-2.82	-197.13	-113.81	0.00
		60	Wind 60	3.22	2.78	-1.61	-112.53	-194.95	0.00
		90	Wind 90	3.25	3.25	0.00	0.00	-227.63	0.00
		120	Wind Normal	3.36	2.91	1.68	137.35	-203.67	0.00
		150	Wind 90	3.25	1.63	2.82	197.13	-113.81	0.00
		180	Wind 60	3.22	0.00	3.22	222.11	0.00	0.00
		210	Wind 90	3.25	-1.63	2.82	197.13	113.81	0.00
		240	Wind Normal	3.36	-2.91	1.68	137.39	203.67	0.00
		270	Wind 90	3.25	-3.25	0.00	0.00	227.63	0.00
		300	Wind 60	3.22	-2.78	-1.61	-112.53	194.95	0.00
		330	Wind 90	3.25	-1.63	-2.82	-197.13	113.81	0.00
T10	60.00-40.00	0	Wind Normal	3.33	0.00	-3.33	-164.92	0.00	0.00
		30	Wind 90	3.13	1.59	-2.73	-137.48	-79.37	0.00
		60	Wind 60	3.13	2.71	-1.57	-78.34	-135.69	0.00
		90	Wind 90	3.13	3.13	0.00	0.00	-158.74	0.00
		120	Wind Normal	3.33	2.85	1.65	83.46	-142.83	0.00
		150	Wind 90	3.13	1.59	2.73	137.48	-79.37	0.00
		180	Wind 60	3.13	0.00	3.13	136.68	0.00	0.00
		210	Wind 90	3.13	-1.59	2.73	137.48	79.37	0.00
		240	Wind Normal	3.33	-2.85	1.65	83.46	142.83	0.00
		270	Wind 90	3.13	-3.13	0.00	0.00	158.74	0.00
		300	Wind 60	3.13	-2.71	-1.57	-78.34	135.69	0.00
		330	Wind 90	3.13	-1.59	-2.73	-137.48	79.37	0.00
T11	40.00-20.00	0	Wind Normal	3.02	0.00	-3.02	-90.70	0.00	0.00
		30	Wind 90	2.90	1.41	-2.32	-75.45	-43.56	0.00
		60	Wind 60	2.85	2.48	-1.43	-42.97	-74.42	0.00
		90	Wind 90	2.90	2.90	0.00	0.00	-87.12	0.00
		120	Wind Normal	3.01	2.61	1.51	41.35	-71.55	0.00
		150	Wind 90	2.90	1.41	2.52	75.45	-43.56	0.00
		180	Wind 60	2.86	0.00	2.86	85.53	0.00	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_i K	V_r K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
		330	Wind 90	2.90	-1.45	2.52	75.45	-43.56	0.00
		240	Wind Normal	3.01	-2.42	1.51	45.35	78.35	0.00
		270	Wind 90	2.90	-2.90	0.00	0.00	87.12	0.00
		300	Wind 60	2.86	-2.48	-1.43	-42.97	74.42	0.00
		330	Wind 90	2.90	-1.45	-2.52	-75.45	43.56	0.00
T12	20.00-0.00	0	Wind Normal	3.16	0.00	-3.16	-31.57	0.00	0.00
		30	Wind 90	3.63	1.31	-2.63	-26.23	-15.14	0.00
		60	Wind 60	2.96	2.52	-1.49	-14.93	-25.85	0.00
		90	Wind 90	3.63	3.63	0.00	0.00	-30.29	0.00
		120	Wind Normal	3.16	2.73	1.58	15.78	-27.34	0.00
		150	Wind 90	3.63	1.31	2.42	26.23	-15.14	0.00
		180	Wind 60	2.99	0.00	2.99	29.85	0.00	0.00
		210	Wind 90	3.63	-1.31	2.42	26.23	15.14	0.00
		240	Wind Normal	3.16	-2.73	1.58	15.78	27.34	0.00
		270	Wind 90	3.63	-3.63	0.00	0.00	30.29	0.00
		300	Wind 60	2.99	-2.59	-1.49	-14.93	25.85	0.00
		330	Wind 90	3.63	-1.31	-2.63	-26.23	15.14	0.00

Mast Totals - No Ice

Wind Azimuth °	V_i K	V_r K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
0	0.00	-18.81	-3197.57	0.00	0.00
30	18.09	-32.72	-3197.14	-3225.18	0.00
60	32.59	-18.79	-2310.95	-3189.87	0.00
90	33.79	0.00	0.00	-1472.33	0.00
120	33.72	18.47	2291.27	-3912.95	0.00
150	18.88	32.72	3973.14	-2236.16	0.00
180	0.00	33.40	4033.90	0.00	0.00
210	-18.89	32.72	3973.14	2236.16	0.00
240	-33.72	19.47	2291.28	3972.95	0.00
270	-37.79	0.00	0.00	4472.33	0.00
300	-32.59	-18.79	-2310.95	3189.87	0.00
330	-18.89	-32.72	-3973.14	2236.16	0.00

Mast Vectors - With Ice

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_i K	V_r K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
T1	240.00-220.00	0	Wind Normal	3.09	0.00	-3.09	-1170.93	0.00	0.00
		30	Wind 90	4.54	2.27	-3.93	-904.03	-521.94	0.00
		60	Wind 60	4.33	3.77	-2.18	-509.78	-857.33	0.00
		90	Wind 90	4.54	4.54	0.00	0.00	-1043.88	0.00
		120	Wind Normal	5.09	4.41	2.55	785.48	-1014.61	0.00
		150	Wind 90	4.54	2.27	3.93	904.03	-521.94	0.00
		180	Wind 60	4.33	0.00	4.33	1051.52	0.00	0.00
		210	Wind 90	4.54	-2.27	3.93	904.03	521.94	0.00
		240	Wind Normal	5.09	-4.41	2.55	785.48	1014.61	0.00
		270	Wind 90	4.54	-4.54	0.00	0.00	1043.88	0.00
		300	Wind 60	4.33	-3.77	-2.18	-509.78	857.33	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_i K	V_r K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
		330	Wind 90	4.54	-2.27	-3.93	-904.03	521.94	0.00
T2	220.00-200.00	0	Wind Normal	5.33	0.00	-5.33	-1151.54	0.00	0.00
		30	Wind 90	4.84	2.42	-4.19	-879.56	-507.82	0.00
		60	Wind 60	4.65	4.03	-2.33	-498.50	-846.36	0.00
		90	Wind 90	4.84	4.84	0.00	0.00	-1015.63	0.00
		120	Wind Normal	5.39	4.67	2.69	565.77	-979.95	0.00
		150	Wind 90	4.84	2.42	4.19	879.56	-507.82	0.00
		180	Wind 60	4.65	4.03	4.65	974.99	0.00	0.00
		210	Wind 90	4.84	-2.42	4.19	879.56	507.82	0.00
		240	Wind Normal	5.39	-4.67	2.69	565.77	979.95	0.00
		270	Wind 90	4.84	-4.84	0.00	0.00	1015.63	0.00
		300	Wind 60	4.65	-4.03	-2.33	-482.50	846.36	0.00
		330	Wind 90	4.84	-2.42	-4.19	-879.56	507.82	0.00
T3	200.00-180.00	0	Wind Normal	5.03	0.00	-5.03	-939.35	0.00	0.00
		30	Wind 90	4.54	2.27	-3.93	-745.87	-431.31	0.00
		60	Wind 60	4.37	3.78	-2.18	-413.05	-718.89	0.00
		90	Wind 90	4.54	4.54	0.00	0.00	-862.41	0.00
		120	Wind Normal	5.03	4.37	2.52	479.63	-830.33	0.00
		150	Wind 90	4.54	2.27	3.93	745.87	-431.31	0.00
		180	Wind 60	4.37	3.78	4.37	830.33	0.00	0.00
		210	Wind 90	4.54	-2.27	3.93	745.81	431.31	0.00
		240	Wind Normal	5.03	-4.37	2.52	479.67	830.33	0.00
		270	Wind 90	4.54	-4.54	0.00	0.00	862.41	0.00
		300	Wind 60	4.37	-3.78	-2.18	-413.05	718.89	0.00
		330	Wind 90	4.54	-2.27	-3.93	-745.87	431.31	0.00
T4	180.00-160.00	0	Wind Normal	4.96	0.00	-4.96	-652.95	0.00	0.00
		30	Wind 90	4.46	2.23	-3.86	-655.98	-378.73	0.00
		60	Wind 60	4.29	3.71	-2.14	-364.49	-631.33	0.00
		90	Wind 90	4.46	4.46	0.00	0.00	-757.48	0.00
		120	Wind Normal	4.96	4.29	2.48	421.44	-729.96	0.00
		150	Wind 90	4.46	2.23	3.86	655.98	-378.73	0.00
		180	Wind 60	4.29	0.00	4.29	728.98	0.00	0.00
		210	Wind 90	4.46	-2.23	3.86	655.98	378.73	0.00
		240	Wind Normal	4.96	-4.29	2.48	421.44	729.96	0.00
		270	Wind 90	4.46	-4.46	0.00	0.00	757.48	0.00
		300	Wind 60	4.29	-3.71	-2.14	-364.49	631.33	0.00
		330	Wind 90	4.46	-2.23	-3.86	-655.98	378.73	0.00
T5	160.00-140.00	0	Wind Normal	5.05	0.00	-5.05	-892.38	0.00	0.00
		30	Wind 90	5.45	2.73	-4.72	-704.09	-428.81	0.00
		60	Wind 60	5.29	4.58	-2.64	-396.40	-686.59	0.00
		90	Wind 90	5.45	5.45	0.00	0.00	-857.63	0.00
		120	Wind Normal	5.95	5.15	2.97	445.05	-772.51	0.00
		150	Wind 90	5.45	2.73	4.72	704.09	-428.81	0.00
		180	Wind 60	5.29	0.00	5.29	793.81	0.00	0.00
		210	Wind 90	5.45	-2.73	4.72	704.09	408.81	0.00
		240	Wind Normal	5.95	-5.15	2.97	445.05	772.51	0.00
		270	Wind 90	5.45	-5.45	0.00	0.00	857.63	0.00
		300	Wind 60	5.29	-4.58	-2.64	-396.40	686.59	0.00
		330	Wind 90	5.45	-2.73	-4.72	-704.09	408.81	0.00
T6	140.00-120.00	0	Wind Normal	5.82	0.00	-5.82	-936.24	0.00	0.00
		30	Wind 90	5.32	2.65	-4.61	-598.79	-345.71	0.00
		60	Wind 60	5.15	4.46	-2.58	-334.91	-580.08	0.00
		90	Wind 90	5.32	5.32	0.00	0.00	-691.43	0.00
		120	Wind Normal	5.82	5.04	2.91	391.32	-654.95	0.00
		150	Wind 90	5.32	2.66	4.61	598.79	-345.71	0.00
		180	Wind 60	5.15	0.00	5.15	698.83	0.00	0.00
		210	Wind 90	5.32	-2.66	4.61	598.79	345.71	0.00
		240	Wind Normal	5.82	-5.04	2.91	391.32	654.95	0.00
		270	Wind 90	5.32	-5.32	0.00	0.00	691.43	0.00
		300	Wind 60	5.15	-4.46	-2.58	-334.91	580.08	0.00
		330	Wind 90	5.32	-2.65	-4.61	-598.79	345.71	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_i K	V_r K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
T7	120.00-100.00	0	Wind Normal	5.33	0.00	-5.33	-830.61	0.00	0.00
		30	Wind 90	5.23	2.61	-4.53	-598.18	-345.43	0.00
		60	Wind 60	5.06	4.38	-2.53	-274.40	-492.20	0.00
		90	Wind 90	5.23	5.23	0.00	0.00	-575.25	0.00
		120	Wind Normal	5.73	4.96	2.87	333.31	-545.13	0.00
		150	Wind 90	5.23	2.61	4.53	598.18	-345.43	0.00
		180	Wind 60	5.06	0.00	5.06	656.80	0.00	0.00
		210	Wind 90	5.23	-2.61	4.53	598.18	345.43	0.00
		240	Wind Normal	5.73	-4.96	2.87	333.31	545.13	0.00
		270	Wind 90	5.23	-5.23	0.00	0.00	575.25	0.00
		300	Wind 60	5.06	-4.38	-2.53	-274.40	492.20	0.00
		330	Wind 90	5.23	-2.61	-4.53	-598.18	345.43	0.00
T8	100.00-83.00	0	Wind Normal	5.31	0.00	-5.31	-596.09	0.00	0.00
		30	Wind 90	5.03	2.51	-4.35	-391.56	-226.07	0.00
		60	Wind 60	4.86	4.21	-2.43	-218.74	-378.87	0.00
		90	Wind 90	5.03	5.03	0.00	0.00	-452.14	0.00
		120	Wind Normal	5.51	4.77	2.76	248.05	-429.63	0.00
		150	Wind 90	5.03	2.51	4.35	391.56	-226.07	0.00
		180	Wind 60	4.86	4.21	4.86	437.48	0.00	0.00
		210	Wind 90	5.03	-2.51	4.35	391.56	226.07	0.00
		240	Wind Normal	5.51	-4.77	2.76	248.05	429.63	0.00
		270	Wind 90	5.03	-5.03	0.00	0.00	452.14	0.00
		300	Wind 60	4.86	-4.21	-2.43	-218.74	378.87	0.00
		330	Wind 90	5.03	-2.51	-4.35	-391.56	226.07	0.00
T9	83.00-60.00	0	Wind Normal	5.31	0.00	-5.31	-372.90	0.00	0.00
		30	Wind 90	4.84	2.42	-4.19	-293.18	-169.25	0.00
		60	Wind 60	4.68	4.05	-2.34	-163.69	-283.52	0.00
		90	Wind 90	4.84	4.84	0.00	0.00	-338.51	0.00
		120	Wind Normal	5.31	4.60	2.66	185.93	-322.03	0.00
		150	Wind 90	4.84	2.42	4.19	293.18	-169.25	0.00
		180	Wind 60	4.68	4.05	4.68	327.36	0.00	0.00
		210	Wind 90	4.84	-2.42	4.19	293.18	169.25	0.00
		240	Wind Normal	5.31	-4.60	2.66	185.93	322.04	0.00
		270	Wind 90	4.84	-4.84	0.00	0.00	338.51	0.00
		300	Wind 60	4.68	-4.05	-2.34	-163.69	283.52	0.00
		330	Wind 90	4.84	-2.42	-4.19	-293.18	169.25	0.00
T10	60.00-40.00	0	Wind Normal	5.03	0.00	-5.03	-252.63	0.00	0.00
		30	Wind 90	4.59	2.30	-3.97	-198.59	-114.63	0.00
		60	Wind 60	4.44	3.85	-2.22	-111.00	-192.25	0.00
		90	Wind 90	4.59	4.59	0.00	0.00	-229.68	0.00
		120	Wind Normal	5.03	4.36	2.52	126.32	-218.80	0.00
		150	Wind 90	4.59	2.30	3.97	198.59	-114.63	0.00
		180	Wind 60	4.44	3.85	4.44	221.99	0.00	0.00
		210	Wind 90	4.59	-2.30	3.97	198.59	114.63	0.00
		240	Wind Normal	5.03	-4.36	2.52	126.32	218.80	0.00
		270	Wind 90	4.59	-4.59	0.00	0.00	229.68	0.00
		300	Wind 60	4.44	-3.85	-2.22	-111.00	192.25	0.00
		330	Wind 90	4.59	-2.30	-3.97	-198.59	114.63	0.00
T11	40.00-20.00	0	Wind Normal	4.64	0.00	-4.64	-159.16	0.00	0.00
		30	Wind 90	4.21	2.11	-3.65	-109.40	-63.16	0.00
		60	Wind 60	4.07	3.53	-2.03	-61.03	-105.71	0.00
		90	Wind 90	4.21	4.21	0.00	0.00	-126.32	0.00
		120	Wind Normal	4.61	4.02	2.30	69.55	-120.46	0.00
		150	Wind 90	4.21	2.11	3.65	109.40	-63.16	0.00
		180	Wind 60	4.07	0.00	4.07	122.07	0.00	0.00
		210	Wind 90	4.21	-2.11	3.65	109.40	63.16	0.00
		240	Wind Normal	4.64	-4.02	2.33	69.55	120.46	0.00
		270	Wind 90	4.21	-4.21	0.00	0.00	126.32	0.00
		300	Wind 60	4.07	-3.52	-2.03	-61.03	105.71	0.00
		330	Wind 90	4.21	-2.11	-3.65	-109.40	63.16	0.00
T12	20.00-0.00	0	Wind Normal	4.79	0.00	-4.79	-47.93	0.00	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
		30	Wind 90	-4.31	2.18	-3.72	-37.89	-21.76	0.00
		60	Wind 60	-4.20	3.64	-2.10	-21.02	-36.41	0.00
		90	Wind 90	4.31	4.35	0.00	0.00	-43.51	0.00
		120	Wind Normal	4.79	4.15	2.40	23.97	-41.51	0.00
		150	Wind 90	4.31	2.18	3.72	37.88	-21.76	0.00
		180	Wind 60	4.20	0.00	4.20	42.04	0.00	0.00
		210	Wind 90	4.31	-2.18	3.72	37.88	21.76	0.00
		240	Wind Normal	4.79	-4.15	2.40	23.97	41.51	0.00
		270	Wind 90	4.31	-4.35	0.00	0.00	43.51	0.00
		300	Wind 60	4.20	-3.64	-2.10	-21.02	36.41	0.00
		330	Wind 90	4.31	-2.18	-3.72	-37.41	21.76	0.00

Mast Totals - With Ice

Wind Azimuth °	V_x K	V_z K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
0	0.00	-83.29	-7991.36	0.00	0.00
30	28.69	-49.70	-6032.19	-3474.91	0.00
60	43.99	-27.71	-3333.99	-5809.28	0.00
90	52.38	0.00	0.00	-6553.83	0.00
120	54.81	31.63	3649.69	-6560.91	0.00
150	28.69	49.70	6032.19	-3474.91	0.00
180	0.00	55.41	6707.98	0.00	0.00
210	-28.69	49.70	6032.19	3474.91	0.00
240	-54.81	31.63	3649.69	6560.91	0.00
270	-57.38	0.00	0.00	6553.83	0.00
300	-47.99	-27.71	-3333.99	5809.28	0.00
330	-28.69	-49.70	-6032.19	3474.91	0.00

Mast Vectors - Service

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
T1	240.00-220.00	0	Wind Normal	1.32	0.00	-1.33	-309.71	0.00	0.00
		30	Wind 90	1.32	0.66	-1.15	-268.77	-152.29	0.00
		60	Wind 60	1.32	1.14	-0.66	-151.43	-262.29	0.00
		90	Wind 90	1.33	1.33	0.00	0.00	-304.57	0.00
		120	Wind Normal	1.33	1.17	0.67	154.81	-268.31	0.00
		150	Wind 90	1.32	0.66	1.15	268.77	-152.29	0.00
		180	Wind 60	1.32	0.00	1.32	303.88	0.00	0.00
		210	Wind 90	1.32	-0.66	1.15	268.77	152.29	0.00
		240	Wind Normal	1.33	-1.17	0.67	154.81	268.31	0.00
		270	Wind 90	1.33	-1.33	0.00	0.00	304.57	0.00
		300	Wind 60	1.32	-1.14	-0.66	-151.43	262.29	0.00
		330	Wind 90	1.32	-0.66	-1.15	-268.77	152.29	0.00
T2	220.00-200.00	0	Wind Normal	1.45	0.00	-1.45	-304.75	0.00	0.00
		30	Wind 90	1.45	0.73	-1.26	-259.83	-149.99	0.00
		60	Wind 60	1.45	1.25	-0.73	-149.99	-259.83	0.00
		90	Wind 90	1.45	1.45	0.00	0.00	-299.99	0.00
		120	Wind Normal	1.45	1.26	0.73	149.99	-259.83	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
		150	Wind 90	1.45	0.73	1.26	259.83	-149.99	0.00
		180	Wind 60	1.45	0.00	1.45	299.99	0.00	0.00
		210	Wind 90	1.45	-0.73	1.26	259.83	149.99	0.00
		240	Wind Normal	1.45	-1.26	0.73	149.99	259.83	0.00
		270	Wind 90	1.45	-1.45	0.00	0.00	299.99	0.00
		300	Wind 60	1.45	-1.25	-0.73	-149.99	259.83	0.00
		330	Wind 90	1.45	-0.73	-1.26	-259.83	149.99	0.00
T3	200.00-180.00	0	Wind Normal	1.48	0.00	-1.48	-281.52	0.00	0.00
		30	Wind 90	1.48	0.74	-1.29	-243.12	-140.43	0.00
		60	Wind 60	1.48	1.28	-0.74	-137.92	-238.89	0.00
		90	Wind 90	1.48	1.48	0.00	0.00	-277.24	0.00
		120	Wind Normal	1.48	1.28	0.74	140.79	-243.82	0.00
		150	Wind 90	1.48	0.74	1.29	243.12	-140.43	0.00
		180	Wind 60	1.48	0.00	1.48	277.23	0.00	0.00
		210	Wind 90	1.48	-0.74	1.29	243.12	140.43	0.00
		240	Wind Normal	1.48	-1.28	0.74	140.79	243.82	0.00
		270	Wind 90	1.48	-1.48	0.00	0.00	277.24	0.00
		300	Wind 60	1.48	-1.28	-0.74	-137.92	238.89	0.00
		330	Wind 90	1.48	-0.74	-1.29	-243.12	140.43	0.00
T4	180.00-160.00	0	Wind Normal	1.65	0.00	-1.65	-283.83	0.00	0.00
		30	Wind 90	1.65	0.83	-1.46	-237.21	-136.99	0.00
		60	Wind 60	1.65	1.31	-0.83	-135.55	-233.30	0.00
		90	Wind 90	1.65	1.65	0.00	0.00	-277.09	0.00
		120	Wind Normal	1.65	1.43	0.83	140.42	-243.21	0.00
		150	Wind 90	1.65	0.83	1.46	237.21	-136.99	0.00
		180	Wind 60	1.65	0.00	1.65	276.70	0.00	0.00
		210	Wind 90	1.65	-0.83	1.46	237.21	136.99	0.00
		240	Wind Normal	1.65	-1.43	0.83	140.42	243.21	0.00
		270	Wind 90	1.65	-1.65	0.00	0.00	277.09	0.00
		300	Wind 60	1.65	-1.31	-0.80	-135.55	233.30	0.00
		330	Wind 90	1.65	-0.83	-1.46	-237.21	136.99	0.00
T5	160.00-140.00	0	Wind Normal	1.71	0.00	-1.71	-293.02	0.00	0.00
		30	Wind 90	1.69	0.85	-1.48	-239.61	-138.29	0.00
		60	Wind 60	1.67	1.35	-0.84	-135.55	-217.46	0.00
		90	Wind 90	1.69	1.69	0.00	0.00	-253.58	0.00
		120	Wind Normal	1.74	1.51	0.87	150.51	-226.05	0.00
		150	Wind 90	1.69	0.85	1.46	239.61	-138.29	0.00
		180	Wind 60	1.67	0.00	1.67	253.58	0.00	0.00
		210	Wind 90	1.69	-0.85	1.46	239.61	138.29	0.00
		240	Wind Normal	1.74	-1.51	0.87	150.51	226.05	0.00
		270	Wind 90	1.69	-1.69	0.00	0.00	253.58	0.00
		300	Wind 60	1.67	-1.35	-0.84	-135.55	217.46	0.00
		330	Wind 90	1.69	-0.85	-1.46	-239.61	138.29	0.00
T6	140.00-120.00	0	Wind Normal	1.79	0.00	-1.79	-252.33	0.00	0.00
		30	Wind 90	1.79	0.86	-1.55	-194.64	-112.37	0.00
		60	Wind 60	1.71	1.41	-0.83	-111.10	-192.44	0.00
		90	Wind 90	1.73	1.73	0.00	0.00	-224.73	0.00
		120	Wind Normal	1.79	1.55	0.89	116.19	-201.24	0.00
		150	Wind 90	1.73	0.86	1.50	194.64	-112.37	0.00
		180	Wind 60	1.71	0.00	1.71	222.21	0.00	0.00
		210	Wind 90	1.73	-0.86	1.50	194.64	112.37	0.00
		240	Wind Normal	1.79	-1.55	0.89	116.19	201.24	0.00
		270	Wind 90	1.73	-1.73	0.00	0.00	224.73	0.00
		300	Wind 60	1.71	-1.41	-0.83	-111.10	192.44	0.00
		330	Wind 90	1.73	-0.86	-1.50	-194.64	112.37	0.00
T7	120.00-100.00	0	Wind Normal	1.81	0.00	-1.81	-199.03	0.00	0.00
		30	Wind 90	1.76	0.87	-1.51	-145.99	-84.30	0.00
		60	Wind 60	1.72	1.43	-0.84	-84.65	-163.86	0.00
		90	Wind 90	1.74	1.74	0.00	0.00	-193.67	0.00
		120	Wind Normal	1.81	1.57	0.90	99.52	-172.37	0.00
		150	Wind 90	1.74	0.87	1.51	145.99	-84.30	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
		180	Wind 60	1.72	0.00	1.72	119.21	0.00	0.00
		210	Wind 90	1.74	-0.87	1.51	145.99	84.30	0.00
		240	Wind Normal	1.81	-1.57	0.90	99.52	172.37	0.00
		270	Wind 90	1.74	-1.74	0.00	0.00	193.67	0.00
		300	Wind 60	1.72	-1.49	-0.86	-84.61	153.86	0.00
		330	Wind 90	1.74	-0.87	-1.51	-145.99	84.30	0.00
T8	100.00-80.00	0	Wind Normal	1.71	0.00	-1.71	-156.33	0.00	0.00
		30	Wind 90	1.69	0.81	-1.48	-131.29	-75.83	0.00
		60	Wind 60	1.67	1.44	-0.83	-75.81	-129.53	0.00
		90	Wind 90	1.65	1.65	0.00	0.00	-151.60	0.00
		120	Wind Normal	1.74	1.50	0.87	78.16	-135.38	0.00
		150	Wind 90	1.69	0.81	1.46	131.29	-75.83	0.00
		180	Wind 60	1.67	0.00	1.67	150.81	0.00	0.00
		210	Wind 90	1.69	-0.84	1.46	131.29	75.80	0.00
		240	Wind Normal	1.74	-1.50	0.87	78.15	135.38	0.00
		270	Wind 90	1.69	-1.65	0.00	0.00	151.60	0.00
		300	Wind 60	1.67	-1.44	-0.83	-75.81	129.53	0.00
		330	Wind 90	1.69	-0.81	-1.46	-131.29	75.80	0.00
T9	80.00-60.00	0	Wind Normal	1.67	0.00	-1.67	-117.33	0.00	0.00
		30	Wind 90	1.62	0.81	-1.40	-98.22	-56.71	0.00
		60	Wind 60	1.60	1.39	-0.95	-56.81	-97.14	0.00
		90	Wind 90	1.62	1.62	0.00	0.00	-113.42	0.00
		120	Wind Normal	1.67	1.43	0.84	58.59	-101.48	0.00
		150	Wind 90	1.62	0.81	1.40	98.22	-56.71	0.00
		180	Wind 60	1.60	0.00	1.60	113.14	0.00	0.00
		210	Wind 90	1.62	-0.81	1.40	98.22	56.71	0.00
		240	Wind Normal	1.67	-1.43	0.84	58.59	101.48	0.00
		270	Wind 90	1.62	-1.62	0.00	0.00	113.42	0.00
		300	Wind 60	1.60	-1.39	-0.81	-55.01	97.14	0.00
		330	Wind 90	1.62	-0.81	-1.40	-98.22	56.71	0.00
T10	60.00-40.00	0	Wind Normal	1.61	0.00	-1.61	-92.18	0.00	0.00
		30	Wind 90	1.58	0.79	-1.37	-68.50	-39.55	0.00
		60	Wind 60	1.56	1.33	-0.78	-39.04	-67.61	0.00
		90	Wind 90	1.58	1.58	0.00	0.00	-79.10	0.00
		120	Wind Normal	1.64	1.42	0.82	41.09	-71.17	0.00
		150	Wind 90	1.58	0.79	1.37	68.50	-39.55	0.00
		180	Wind 60	1.56	0.00	1.56	78.07	0.00	0.00
		210	Wind 90	1.58	-0.79	1.37	68.50	39.55	0.00
		240	Wind Normal	1.64	-1.42	0.82	41.09	71.17	0.00
		270	Wind 90	1.58	-1.58	0.00	0.00	79.10	0.00
		300	Wind 60	1.56	-1.35	-0.78	-39.04	67.61	0.00
		330	Wind 90	1.58	-0.79	-1.37	-68.50	39.55	0.00
T11	40.00-20.00	0	Wind Normal	1.51	0.00	-1.51	-45.10	0.00	0.00
		30	Wind 90	1.45	0.72	-1.25	-37.57	-21.71	0.00
		60	Wind 60	1.43	1.24	-0.71	-21.41	-37.08	0.00
		90	Wind 90	1.45	1.45	0.00	0.00	-43.41	0.00
		120	Wind Normal	1.51	1.32	0.77	22.60	-39.14	0.00
		150	Wind 90	1.45	0.72	1.25	37.57	-21.71	0.00
		180	Wind 60	1.43	0.00	1.43	43.02	0.00	0.00
		210	Wind 90	1.45	-0.72	1.25	37.57	21.71	0.00
		240	Wind Normal	1.51	-1.30	0.75	22.61	39.14	0.00
		270	Wind 90	1.45	-1.45	0.00	0.00	43.41	0.00
		300	Wind 60	1.43	-1.24	-0.71	-21.41	37.08	0.00
		330	Wind 90	1.45	-0.72	-1.25	-37.57	21.71	0.00
T12	20.00-0.00	0	Wind Normal	1.57	0.00	-1.57	-15.73	0.00	0.00
		30	Wind 90	1.51	0.75	-1.31	-13.07	-7.54	0.00
		60	Wind 60	1.49	1.29	-0.74	-7.44	-12.88	0.00
		90	Wind 90	1.51	1.51	0.00	0.00	-15.09	0.00
		120	Wind Normal	1.57	1.36	0.79	7.86	-13.61	0.00
		150	Wind 90	1.51	0.75	1.31	13.07	-7.54	0.00
		180	Wind 60	1.49	0.00	1.49	14.88	0.00	0.00

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
		210	Wind 90	1.51	-0.75	1.31	13.07	7.54	0.00
		240	Wind Normal	1.57	-1.36	0.79	7.86	13.62	0.00
		270	Wind 90	1.51	-1.51	0.00	0.00	15.09	0.00
		300	Wind 60	1.49	-1.29	-0.74	-7.44	12.88	0.00
		330	Wind 90	1.51	-0.75	-1.31	-13.07	7.54	0.00

Mast Totals - Service

Wind Azimuth °	V_x K	V_z K	OM_x kip-ft	OM_z kip-ft	Torque kip-ft
0	0.00	-19.40	-2215.85	0.00	0.00
30	9.41	-16.31	-1929.87	-1114.21	0.00
60	16.34	-9.32	-1104.64	-1913.29	0.00
90	18.83	0.00	0.00	-2228.42	0.00
120	16.80	9.70	1142.93	-1979.60	0.00
150	9.41	16.31	1929.87	-1114.21	0.00
180	0.00	18.64	2206.28	0.00	0.00
210	-9.41	16.31	1929.87	1114.21	0.00
240	-16.80	9.70	1142.93	1979.60	0.00
270	-18.83	0.00	0.00	2228.42	0.00
300	-16.34	-9.32	-1104.64	1913.29	0.00
330	-9.41	-16.31	-1929.87	1114.21	0.00

Discrete Appurtenance Pressures - No Ice

Description	Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	Y ft	K_a	Φ	C_AA_A Front ft²	C_AA_A Side ft²
Beacon	0.0000	0.01	0.00	-2.39	244.39	1.777	33	2.40	2.40
Beacon Extender (4') 303983	0.0000	0.03	0.00	-2.39	240.21	1.767	33	1.11	1.11
1/2" x 4' Lightning rod	240.0000	0.01	-2.50	1.44	242.00	1.767	33	0.20	0.20
HBXX-6517DS-VTM	240.0000	0.09	-5.10	2.94	238.79	1.760	33	13.64	8.39
HBXX-6517DS-VTM	120.0000	0.09	5.10	2.94	238.79	1.760	33	13.64	8.39
HBXX-6517DS-VTM	0.0000	0.09	0.00	-5.89	238.79	1.760	33	13.64	8.39
2" x 8'6" Sch. 40	240.0000	0.01	-5.10	2.94	238.79	1.760	33	0.36	2.66
2" x 8'6" Sch. 40	120.0000	0.01	5.10	2.94	238.79	1.760	33	0.36	2.66
2" x 8'6" Sch. 40	0.0000	0.01	0.00	-5.89	238.79	1.760	33	0.36	2.66
LNX-6514DS-VTM	240.0000	0.03	-5.10	2.94	238.79	1.760	33	13.63	8.63
LNX-6514DS-VTM	120.0000	0.03	5.10	2.94	238.79	1.760	33	13.63	8.63
LNX-6514DS-VTM	0.0000	0.03	0.00	-5.89	238.79	1.760	33	13.63	8.63
2" x 8'6" Sch. 40	240.0000	0.01	-5.10	2.94	238.79	1.760	33	0.45	2.66
2" x 8'6" Sch. 40	120.0000	0.01	5.10	2.94	238.79	1.760	33	0.45	2.66
2" x 8'6" Sch. 40	0.0000	0.01	0.00	-5.89	238.79	1.760	33	0.45	2.66
Alcatel-Lucent RRH2X50-AWS	240.0000	0.06	-5.10	2.94	238.79	1.760	33	2.61	1.60
Alcatel-Lucent RRH2X50-AWS	120.0000	0.06	5.10	2.94	238.79	1.760	33	2.61	1.60
Alcatel-Lucent RRH2X50-AWS	0.0000	0.06	0.00	-5.89	238.79	1.760	33	2.61	1.60
Alcatel-Lucent	240.0000	0.06	-5.10	2.94	238.79	1.760	33	2.61	1.60

Description	Along Azimuth °	Weight K	Offset x ft	Offset y ft	z ft	K_z	q_z psf	Calc Front ft^2	Calc Side ft^2
RRH2X60-PCS									
Alcatel-Lucent RRH2X60-PCS	120.0000	0.06	5.10	2.94	238.75	1.760	33	2.48	1.60
Alcatel-Lucent RRH2X60-PCS	0.0000	0.06	0.00	-5.89	238.75	1.760	33	2.48	1.60
DB-T1-6Z-8AB-0Z Arsenal (20.07" x 11.22" x 7.2")	240.0000	0.04	-5.10	2.94	238.75	1.760	33	1.11	1.22
DB-T1-6Z-8AB-0Z Arsenal (20.07" x 11.22" x 7.2")	120.0000	0.04	5.10	2.94	238.75	1.760	33	1.11	1.22
12' V Frame	240.0000	0.30	-5.10	2.94	238.75	1.760	33	6.91	2.31
12' V Frame	120.0000	0.30	5.10	2.94	238.75	1.760	33	6.91	2.31
12' V Frame	0.0000	0.30	0.00	-5.89	238.75	1.760	33	6.91	2.31
WHIP (2.88" X 12')	240.0000	0.03	-4.23	2.44	227.00	1.735	32	3.60	3.60
24" Standoff	240.0000	0.03	-3.37	1.94	221.00	1.722	32	0.55	2.30
WHIP (2.88" X 12')	240.0000	0.03	-4.23	2.44	224.00	1.728	32	3.60	3.60
24" Standoff	240.0000	0.03	-3.37	1.94	218.00	1.715	32	0.55	2.30
WHIP (2.88" X 12')	120.0000	0.03	4.23	2.44	224.00	1.728	32	3.60	3.60
24" Standoff	120.0000	0.03	3.37	1.94	218.00	1.715	32	0.55	2.30
7770.00	240.0000	0.07	-5.20	3.00	198.00	1.669	31	8.81	4.65
7770.00	120.0000	0.07	5.20	3.00	198.00	1.669	31	8.81	4.65
7770.00	0.0000	0.07	0.00	-6.00	198.00	1.669	31	8.81	4.65
2" x 96" Sch. 40	240.0000	0.06	-5.20	3.00	198.00	1.669	31	1.82	3.04
2" x 96" Sch. 40	120.0000	0.06	5.20	3.00	198.00	1.669	31	1.82	3.04
2" x 96" Sch. 40	0.0000	0.06	0.00	-6.00	198.00	1.669	31	1.82	3.04
AM-X-CD-17-65-00T-RET	240.0000	0.06	-5.20	3.00	198.00	1.669	31	9.05	5.44
AM-X-CD-17-65-00T-RET	120.0000	0.06	5.20	3.00	198.00	1.669	31	9.05	5.44
AM-X-CD-17-65-00T-RET	0.0000	0.06	0.00	-6.00	198.00	1.669	31	9.05	5.44
2" x 96" Sch. 40	240.0000	0.03	-5.20	3.00	198.00	1.669	31	0.00	1.52
2" x 96" Sch. 40	120.0000	0.03	5.20	3.00	198.00	1.669	31	0.00	1.52
2" x 96" Sch. 40	0.0000	0.03	0.00	-6.00	198.00	1.669	31	0.00	1.52
Powerwave LGP2140X TMA-DD-1900	240.0000	0.04	-5.20	3.00	198.00	1.669	31	1.73	0.57
Powerwave LGP2140X TMA-DD-1900	120.0000	0.04	5.20	3.00	198.00	1.669	31	1.73	0.57
Powerwave LGP2140X TMA-DD-1900	0.0000	0.04	0.00	-6.00	198.00	1.669	31	1.73	0.57
Powerwave LGP21903	240.0000	0.01	-5.20	3.00	198.00	1.669	31	0.37	0.25
Powerwave LGP21903	120.0000	0.01	5.20	3.00	198.00	1.669	31	0.37	0.25
Powerwave LGP21903	0.0000	0.01	0.00	-6.00	198.00	1.669	31	0.37	0.25
Powerwave 7020.00 DualBand RET	240.0000	0.00	-5.20	3.00	198.00	1.669	31	0.55	0.11
Powerwave 7020.00 DualBand RET	120.0000	0.00	5.20	3.00	198.00	1.669	31	0.55	0.11
Powerwave 7020.00 DualBand RET	0.0000	0.00	0.00	-6.00	198.00	1.669	31	0.55	0.11
RRUS11 (20" X 17" X 7")	240.0000	0.20	-5.20	3.00	198.00	1.669	31	4.51	1.89
RRUS11 (20" X 17" X 7")	120.0000	0.10	5.20	3.00	198.00	1.669	31	4.51	1.89
RRUS11 (20" X 17" X 7")	0.0000	0.10	0.00	-6.00	198.00	1.669	31	4.51	1.89
Polyphaser (12"x17"x8")	240.0000	0.03	-5.20	3.00	198.00	1.669	31	1.20	0.85
12' V Frame	240.0000	0.30	-5.20	3.00	198.00	1.669	31	6.91	2.31
12' V Frame	120.0000	0.30	5.20	3.00	198.00	1.669	31	6.91	2.31
12' V Frame	0.0000	0.30	0.00	-6.00	198.00	1.669	31	6.91	2.31
	Sum Weight:	4.43							

Description	Along Azimuth °	Weight K	Offset x ft	Offset y ft	z ft	K_z	q_z psf	Calc Front ft^2	Calc Side ft^2
	Weight								

Discrete Appurtenance Vectors - No Ice

Beacon - Elevation [illegible] - From Leg A

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.09	0.00	0.00	-0.09	-21.39	0.00	0.00
30	0.08	0.04	0.04	-0.08	-18.33	-10.59	-0.13
60	0.04	0.08	0.08	-0.04	-10.60	-18.34	-0.22
90	0.00	0.09	0.09	0.00	-0.21	-21.18	-0.25
120	0.04	0.08	0.08	0.04	10.35	-18.31	-0.22
150	0.08	0.04	0.04	0.08	18.33	-10.59	-0.13
180	0.09	0.00	0.00	0.09	20.97	0.00	0.00
210	0.08	0.04	-0.04	0.08	18.13	10.59	0.13
240	0.04	0.08	-0.08	0.04	10.38	18.34	0.22
270	0.00	0.09	-0.09	0.00	-0.21	21.18	0.25
300	0.04	0.08	-0.08	-0.04	-10.83	18.34	0.22
330	0.08	0.04	-0.04	-0.08	-18.55	10.59	0.13

Beacon Extender [illegible] - Elevation [illegible] - From Leg A

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.04	0.00	0.00	-0.04	-9.77	0.00	0.00
30	0.03	0.02	0.02	-0.03	-8.47	-4.84	-0.06
60	0.02	0.03	0.03	-0.02	-4.93	-8.39	-0.10
90	0.00	0.04	0.04	0.00	-0.09	-9.68	-0.12
120	0.02	0.03	0.03	0.02	4.75	-8.39	-0.10
150	0.03	0.02	0.02	0.03	8.30	-4.84	-0.06
180	0.04	0.00	0.00	0.04	9.60	0.00	0.00
210	0.03	0.02	-0.02	0.03	8.30	4.84	0.06
240	0.02	0.03	-0.03	0.02	4.76	8.39	0.10
270	0.00	0.04	-0.04	0.00	-0.09	9.68	0.12
300	0.02	0.03	-0.03	-0.02	-4.93	8.39	0.10
330	0.03	0.02	-0.02	-0.03	-8.47	4.84	0.06

10" x 4' lightning rod - Elevation [illegible] - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.01	0.00	-0.01	-1.72	0.04	-0.02
30	0.01	0.00	0.00	-0.01	-1.49	-0.54	-0.01
60	0.01	0.00	0.01	-0.00	-0.83	-1.47	0.00
90	0.01	0.00	0.01	0.00	0.02	-1.71	0.01
120	0.00	0.01	0.01	0.00	0.89	-1.47	0.01
150	0.00	0.01	0.00	0.01	1.53	-0.84	0.02
180	0.00	0.01	0.00	0.01	1.76	0.04	0.02
210	0.01	0.00	-0.00	0.01	1.53	0.91	0.01
240	0.01	0.00	-0.01	0.00	0.89	1.54	0.00
270	0.01	0.00	-0.01	0.00	0.02	1.78	-0.01
300	0.00	0.01	-0.01	-0.00	-0.85	1.54	-0.01
330	0.00	0.01	-0.00	-0.01	-1.49	0.91	-0.02

[illegible] - Elevation [illegible] - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.24	0.26	0.08	-0.33	-82.85	-19.05	-1.53
30	0.42	0.15	0.29	-0.34	-81.46	-69.23	-0.89
60	0.49	0.00	0.42	-0.24	-58.18	-100.77	0.00
90	0.42	0.15	0.44	-0.08	-19.24	-105.17	0.89
120	0.24	0.26	0.34	0.10	24.92	-81.28	1.53
150	0.00	0.30	0.15	0.26	62.48	-35.49	1.77
180	0.24	0.26	-0.01	0.33	83.36	19.93	1.53
210	0.42	0.15	-0.29	0.34	81.97	70.13	0.89
240	0.49	0.00	-0.42	0.24	58.69	101.63	0.00
270	0.42	0.15	-0.44	0.08	19.75	106.03	-0.89
300	0.24	0.26	-0.31	-0.10	-24.42	82.15	-1.53
330	0.00	0.30	-0.15	-0.26	-61.97	35.35	-1.77

[illegible] - Elevation [illegible] - From Leg B

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.24	0.26	-0.08	-0.33	-82.85	19.05	1.53
30	0.00	0.30	0.15	-0.26	-61.97	-35.36	1.77
60	0.24	0.26	0.34	-0.10	-24.42	-82.15	1.53
90	0.42	0.15	0.44	0.08	19.75	-106.05	0.89
120	0.49	0.00	0.42	0.24	58.69	-101.63	0.00
150	0.42	0.15	0.29	0.34	81.97	-70.13	-0.89
180	0.24	0.26	0.01	0.33	83.36	-19.93	-1.53
210	0.00	0.30	-0.15	0.26	62.48	35.49	-1.77
240	0.24	0.26	-0.34	0.10	24.92	81.28	-1.53
270	0.42	0.15	-0.44	-0.08	-19.24	105.17	-0.89
300	0.49	0.00	-0.42	-0.24	-58.18	100.77	0.00
330	0.42	0.15	-0.29	-0.34	-81.46	69.23	0.89

[illegible] - Elevation [illegible] - From Leg A

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.49	0.00	0.00	-0.49	-117.37	0.00	0.00
30	0.42	0.15	0.15	-0.42	-101.71	-35.92	-0.89
60	0.24	0.26	0.28	-0.24	-58.94	-62.22	-1.53
90	0.00	0.30	0.30	0.00	-0.51	-71.85	-1.77
120	0.24	0.26	0.26	0.24	57.93	-62.22	-1.53
150	0.42	0.15	0.15	0.42	100.70	-35.92	-0.89
180	0.49	0.00	0.00	0.49	116.36	0.00	0.00
210	0.42	0.15	-0.15	0.42	100.70	35.92	0.89
240	0.24	0.26	-0.26	0.24	57.93	62.22	1.53
270	0.00	0.30	-0.30	0.00	-0.51	71.85	1.77
300	0.24	0.26	-0.26	-0.24	-58.94	62.22	1.53
330	0.42	0.15	-0.15	-0.42	-101.71	35.92	0.89

2" x 84" Sch. 40 - Elevation [illegible] - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.01	-0.04	-0.07	-17.71	8.79	-0.25

2" x 84" Sch. 40 - Elevation [illegible] - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
30	0.01	0.05	-0.01	-0.05	-11.05	3.64	-0.28
60	0.01	0.00	0.01	-0.01	-1.39	-2.41	0.00
90	0.01	0.05	0.03	0.04	8.69	-7.73	0.23
120	0.01	0.08	0.05	0.07	16.47	-10.94	0.45
150	0.00	0.10	0.05	0.08	19.88	-11.13	0.56
180	0.01	0.08	0.04	0.07	18.01	-8.27	0.45
210	0.01	0.05	0.01	0.05	11.35	-3.12	0.28
240	0.01	0.00	-0.01	0.01	1.69	2.93	0.00
270	0.01	0.05	-0.03	-0.04	-8.38	8.27	-0.28
300	0.01	0.08	-0.05	-0.07	-16.17	11.46	-0.45
330	0.00	0.10	-0.05	-0.08	-19.58	11.05	-0.56

2" x 84" Sch. 40 - Elevation [illegible] - From Leg B

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.08	0.04	-0.07	-17.71	-8.79	0.45
30	0.00	0.10	0.05	-0.08	-19.58	-11.65	0.56
60	0.01	0.08	0.05	-0.07	-16.17	-11.46	0.45
90	0.01	0.05	0.03	-0.04	-8.38	-8.27	0.28
120	0.01	0.00	0.01	0.01	1.69	-2.93	0.00
150	0.01	0.05	-0.01	0.05	11.35	3.12	-0.28
180	0.01	0.08	-0.04	0.07	18.01	8.27	-0.45
210	0.00	0.10	-0.05	0.08	19.88	11.13	-0.56
240	0.01	0.08	-0.05	0.07	16.47	10.94	-0.45
270	0.01	0.05	-0.03	0.04	8.69	7.73	-0.28
300	0.01	0.00	-0.01	-0.01	-1.39	2.41	0.00
330	0.01	0.05	0.01	-0.05	-11.05	-3.64	0.28

2" x 84" Sch. 40 - Elevation [illegible] - From Leg A

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.00	0.00	-0.01	-3.38	0.00	0.00
30	0.01	0.05	0.05	-0.01	-2.97	-11.39	-0.28
60	0.01	0.08	0.08	-0.01	-1.84	-19.73	-0.45
90	0.00	0.10	0.10	0.00	-0.30	-22.78	-0.56
120	0.01	0.08	0.08	0.01	1.26	-19.73	-0.45
150	0.01	0.05	0.05	0.01	2.37	-11.39	-0.28
180	0.01	0.00	0.00	0.01	2.78	0.00	0.00
210	0.01	0.05	-0.05	0.01	2.37	11.39	0.28
240	0.01	0.08	-0.08	0.01	1.26	19.73	0.45
270	0.00	0.10	-0.10	0.00	-0.30	22.78	0.56
300	0.01	0.08	-0.08	-0.01	-1.84	19.73	0.45
330	0.01	0.05	-0.05	-0.01	-2.97	11.39	0.28

[illegible] - Elevation [illegible] - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.23	0.27	0.07	-0.35	-83.33	-15.03	-1.58
30	0.41	0.16	0.27	-0.34	-83.34	-63.09	-0.91
60	0.47	0.00	0.41	-0.23	-35.77	-96.60	0.00
90	0.41	0.16	0.43	-0.07	-16.20	-102.12	0.91

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
120	0.23	0.27	0.24	0.12	77.78	-49.38	1.58
150	0.00	0.31	0.25	0.27	64.58	-56.64	1.82
180	0.23	0.27	-0.07	0.31	88.78	15.82	1.58
210	0.41	0.15	-0.27	0.24	83.83	65.86	0.91
240	0.47	0.00	-0.41	0.23	56.23	97.39	0.00
270	0.41	0.15	-0.43	0.07	15.65	102.92	-0.91
300	0.23	0.27	-0.34	-0.12	-29.33	85.97	-1.58
330	0.00	0.31	-0.16	-0.27	-63.93	37.43	-1.83

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.23	0.27	-0.07	-0.31	-12.33	15.65	1.58
30	0.00	0.31	0.25	-0.27	-63.93	-37.42	1.83
60	0.23	0.27	0.24	-0.12	-29.33	-85.97	1.58
90	0.41	0.15	0.43	0.07	15.65	-102.92	0.91
120	0.47	0.00	0.41	0.23	56.23	-97.39	0.00
150	0.41	0.15	0.27	0.24	83.80	-65.81	-0.91
180	0.23	0.27	0.07	0.31	88.78	-15.82	-1.58
210	0.00	0.31	-0.15	0.27	64.31	36.64	-1.83
240	0.23	0.27	-0.24	0.12	29.78	83.16	-1.58
270	0.41	0.15	-0.43	-0.07	-15.30	102.12	-0.91
300	0.47	0.00	-0.41	-0.23	-55.77	95.60	0.00
330	0.41	0.15	-0.27	-0.24	-83.24	65.09	0.91

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.47	0.00	0.00	-0.47	-112.45	0.00	0.00
30	0.41	0.15	0.15	-0.41	-97.45	-37.04	-0.91
60	0.23	0.27	0.27	-0.23	-55.46	-64.15	-1.58
90	0.00	0.31	0.31	0.00	-6.46	-74.07	-1.83
120	0.23	0.27	0.27	0.23	55.54	-64.15	-1.58
150	0.41	0.15	0.15	0.41	96.54	-37.04	-0.91
180	0.47	0.00	0.00	0.47	111.55	0.00	0.00
210	0.41	0.15	-0.15	0.41	96.54	37.04	0.91
240	0.23	0.27	-0.27	0.23	55.54	64.15	1.58
270	0.00	0.31	-0.31	0.00	-6.46	74.07	1.83
300	0.23	0.27	-0.27	-0.23	-55.46	64.15	1.58
330	0.41	0.15	-0.15	-0.41	-97.45	37.04	0.91

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.01	0.01	-0.01	-0.01	-17.89	8.47	-0.45
30	0.01	0.01	-0.01	-0.01	-11.37	3.01	-0.28
60	0.02	0.00	0.01	-0.01	-1.56	-2.66	0.00
90	0.01	0.01	0.01	0.01	8.56	-8.31	0.28
120	0.01	0.01	0.01	0.01	18.21	-11.36	0.45
150	0.00	0.02	0.01	0.01	19.88	-11.13	0.56
180	0.01	0.01	0.01	0.01	18.20	-7.55	0.45

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
210	0.01	0.01	0.01	0.01	11.67	-2.56	0.28
240	0.02	0.00	-0.01	0.01	2.07	3.58	0.00
270	0.01	0.01	-0.01	-0.01	-8.66	8.83	-0.28
300	0.01	0.01	-0.01	-0.01	-15.99	11.78	-0.45
330	0.00	0.01	-0.01	-0.01	-19.24	11.45	-0.56

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.01	0.01	0.01	-0.01	-17.89	-8.47	0.45
30	0.00	0.01	0.01	-0.01	-19.58	-11.65	0.56
60	0.01	0.01	0.01	-0.01	-15.99	-11.78	0.45
90	0.01	0.01	0.01	-0.01	-8.66	-8.83	0.28
120	0.01	0.01	0.01	-0.01	2.07	-3.58	0.00
150	0.01	0.01	0.01	-0.01	11.67	2.56	-0.28
180	0.01	0.01	0.01	-0.01	18.20	7.55	-0.45
210	0.00	0.01	0.01	-0.01	19.88	11.13	-0.56
240	0.01	0.01	0.01	-0.01	18.21	11.36	-0.45
270	0.01	0.01	0.01	-0.01	8.56	8.31	-0.28
300	0.01	0.01	0.01	-0.01	-1.79	3.05	0.00
330	0.01	0.01	0.01	-0.01	-11.37	-3.01	0.28

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.02	0.00	0.00	-0.02	-4.13	0.00	0.00
30	0.01	0.01	0.01	-0.01	-3.62	-1.39	-0.28
60	0.01	0.01	0.01	-0.01	-2.32	-10.73	-0.45
90	0.00	0.02	0.02	0.00	-0.30	-22.78	-0.56
120	0.01	0.01	0.01	0.01	1.61	-19.73	-0.45
150	0.01	0.01	0.01	0.01	3.02	-11.39	-0.28
180	0.02	0.00	0.00	0.02	3.53	0.00	0.00
210	0.01	0.01	0.01	0.01	3.02	11.39	0.28
240	0.01	0.01	0.01	0.01	1.61	19.73	0.45
270	0.00	0.02	0.02	0.00	-0.30	22.78	0.56
300	0.01	0.01	0.01	-0.01	-2.32	10.73	0.45
330	0.01	0.01	0.01	-0.01	-3.62	11.39	0.28

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.01	0.01	0.01	-0.01	-15.89	-3.73	-0.29
30	0.01	0.01	0.01	-0.01	-15.71	-13.33	-0.17
60	0.00	0.01	0.01	-0.01	-11.33	-19.83	0.00
90	0.01	0.01	0.01	-0.01	-3.85	-20.40	0.17
120	0.01	0.01	0.01	-0.01	4.72	-15.82	0.29
150	0.01	0.01	0.01	-0.01	12.05	-8.59	0.34
180	0.01	0.01	0.01	-0.01	15.21	-4.29	0.29
210	0.01	0.01	0.01	-0.01	14.07	1.44	0.17
240	0.01	0.01	0.01	-0.01	11.86	7.13	0.00
270	0.01	0.01	0.01	-0.01	4.11	20.94	-0.17

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
300	0.01	0.01	-0.01	-0.01	-4.39	16.11	-0.29
330	0.00	0.01	-0.01	-0.01	-11.73	7.13	-0.34

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.01	0.01	-0.01	-0.01	-15.89	3.73	0.29
30	0.00	0.01	-0.01	-0.01	-11.73	7.13	0.34
60	0.01	0.01	0.01	-0.01	-4.39	16.11	0.29
90	0.01	0.01	0.01	0.01	4.11	20.94	0.17
120	0.01	0.00	0.01	0.01	11.86	20.19	0.00
150	0.01	0.01	0.01	0.01	14.07	14.69	-0.17
180	0.01	0.01	0.01	0.01	15.21	4.29	-0.29
210	0.00	0.01	0.01	0.01	12.05	-8.59	-0.34
240	0.01	0.01	0.01	0.01	4.72	-15.82	-0.29
270	0.01	0.01	0.01	0.01	-3.85	-20.40	-0.17
300	0.00	0.01	0.01	0.01	-11.73	-19.83	0.00
330	0.01	0.01	0.01	0.01	-15.74	-13.33	0.17

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.10	0.00	0.00	-0.10	-33.31	0.00	0.00
30	0.01	0.01	0.01	-0.01	-20.23	-6.87	0.17
60	0.01	0.01	0.01	-0.01	-11.82	-11.90	0.29
90	0.00	0.01	0.01	0.00	-0.33	-13.74	0.34
120	0.01	0.01	0.01	0.01	11.17	-11.90	0.29
150	0.01	0.01	0.01	0.01	19.59	-6.87	0.17
180	0.02	0.00	0.00	0.02	22.67	0.00	0.00
210	0.01	0.01	0.01	0.01	19.59	6.87	-0.17
240	0.01	0.01	0.01	0.01	11.17	11.90	-0.29
270	0.00	0.01	0.01	0.00	-0.33	13.74	-0.34
300	0.01	0.01	0.01	0.01	-11.82	11.90	-0.29
330	0.01	0.01	0.01	0.01	-20.23	6.87	-0.17

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.01	0.01	0.01	-0.01	-15.89	-3.73	-0.29
30	0.01	0.01	0.01	-0.01	-15.71	-13.33	-0.17
60	0.01	0.01	0.01	-0.01	-11.33	-19.83	0.00
90	0.01	0.01	0.01	-0.01	-3.85	-20.40	0.17
120	0.01	0.01	0.01	-0.01	4.72	-15.82	0.29
150	0.01	0.01	0.01	-0.01	12.05	-8.59	0.34
180	0.01	0.01	0.01	-0.01	15.21	-4.29	0.29
210	0.01	0.01	0.01	-0.01	14.07	1.44	0.17
240	0.01	0.01	0.01	-0.01	11.86	7.13	0.00
270	0.01	0.01	0.01	-0.01	4.11	20.94	-0.17
300	0.01	0.01	0.01	-0.01	-4.39	16.11	-0.29
330	0.00	0.01	0.01	-0.01	-11.73	7.13	-0.34

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.03	0.03	-0.02	-0.07	-15.89	3.73	0.29
30	0.00	0.06	0.03	-0.03	-11.73	7.13	0.34
60	0.05	0.05	0.07	-0.05	-4.39	16.11	0.29
90	0.08	0.03	0.09	0.03	4.11	20.94	0.17
120	0.10	0.00	0.08	0.05	11.86	20.19	0.00
150	0.08	0.03	0.05	0.07	14.07	14.69	-0.17
180	0.05	0.05	0.03	0.07	15.21	4.29	-0.29
210	0.03	0.05	0.02	0.07	12.05	-8.59	-0.34
240	0.05	0.05	-0.03	0.05	4.72	-15.82	-0.29
270	0.08	0.03	-0.05	0.03	-3.85	-20.40	-0.17
300	0.10	0.00	-0.05	-0.03	-11.73	-19.83	0.00
330	0.08	0.03	-0.05	-0.07	-15.74	-13.33	0.17

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.03	0.03	-0.02	-0.07	-15.89	3.73	0.29
30	0.00	0.06	0.03	-0.03	-11.73	7.13	0.34
60	0.05	0.05	0.07	-0.05	-4.39	16.11	0.29
90	0.08	0.03	0.09	0.03	4.11	20.94	0.17
120	0.10	0.00	0.08	0.05	11.86	20.19	0.00
150	0.08	0.03	0.05	0.07	14.07	14.69	-0.17
180	0.05	0.05	0.03	0.07	15.21	4.29	-0.29
210	0.03	0.05	0.02	0.07	12.05	-8.59	-0.34
240	0.05	0.05	-0.03	0.05	4.72	-15.82	-0.29
270	0.08	0.03	-0.05	0.03	-3.85	-20.40	-0.17
300	0.10	0.00	-0.05	-0.03	-11.73	-19.83	0.00
330	0.08	0.03	-0.05	-0.07	-15.74	-13.33	0.17

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.10	0.00	0.00	-0.10	-33.31	0.00	0.00
30	0.01	0.01	0.01	-0.01	-20.23	-6.87	0.17
60	0.01	0.01	0.01	-0.01	-11.82	-11.90	0.29
90	0.00	0.01	0.01	0.00	-0.33	-13.74	0.34
120	0.01	0.01	0.01	0.01	11.17	-11.90	0.29
150	0.01	0.01	0.01	0.01	19.59	-6.87	0.17
180	0.02	0.00	0.00	0.02	22.67	0.00	0.00
210	0.01	0.01	0.01	0.01	19.59	6.87	-0.17
240	0.01	0.01	0.01	0.01	11.17	11.90	-0.29
270	0.00	0.01	0.01	0.00	-0.33	13.74	-0.34
300	0.01	0.01	0.01	0.01	-11.82	11.90	-0.29
330	0.01	0.01	0.01	0.01	-20.23	6.87	-0.17

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.03	0.03	0.03	-0.07	-15.89	-3.73	-0.29
30	0.01	0.03	0.06	-0.07	-15.71	-13.33	-0.17
60	0.01	0.00	0.05	-0.05	-11.33	-19.83	0.00
90	0.01	0.01	0.03	-0.02	-3.85	-20.40	0.17
120	0.01	0.01	0.03	0.02	4.72	-15.82	0.29
150	0.00	0.01	0.04	0.03	12.05	-8.59	0.34
180	0.01	0.01	0.03	0.03	15.21	-4.29	0.29
210	0.01	0.01	0.03	0.03	14.07	1.44	0.17
240	0.01	0.01	0.03	0.03	11.86	7.13	0.00
270	0.01	0.01	0.03	0.03	4.11	20.94	-0.17
300	0.01	0.01	0.03	0.03	-4.39	16.11	-0.29
330	0.00	0.01	0.03	0.03	-11.73	7.13	-0.34

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.03	0.04	0.01	-0.05	-11.73	-2.24	-0.33
30	0.06	0.02	0.04	-0.05	-10.56	-9.21	-0.33
60	0.07	0.00	0.06	-0.03	-7.93	-13.72	0.00
90	0.04	0.02	0.04	-0.01	-2.53	-14.46	0.33
120	0.01	0.04	0.01	0.02	3.92	-11.27	0.33
150	0.01	0.04	0.02	0.04	9.14	-5.01	0.25
180	0.03	0.04	-0.01	0.05	11.95	2.63	0.33
210	0.06	0.02	-0.04	0.05	11.39	9.45	0.33
240	0.07	0.00	-0.06	0.03	8.13	14.12	0.00
270	0.06	0.02	-0.06	0.01	2.56	14.86	-0.33
300	0.03	0.04	-0.05	-0.02	-3.61	11.48	-0.33
330	0.00	0.04	-0.01	-0.04	-8.91	3.42	-0.25

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODM_x kip-ft	ODM_z kip-ft	Torque kip-ft
0	0.03	0.04	-0.01	-0.05	-11.73	2.24	0.33
30	0.00	0.04	0.02	-0.04	-8.91	-5.42	0.25

2" x 96" Sch. 40 - Elevation 153 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.03	0.09	-0.02	-0.09	-17.91	4.44	-0.54
30	0.05	0.05	0.03	-0.07	-15.42	-3.77	-0.31
60	0.06	0.00	0.05	-0.03	-5.29	-9.16	0.00
90	0.05	0.05	0.07	0.02	4.31	-13.01	0.31
120	0.03	0.00	0.07	0.06	12.83	-13.29	0.54
150	0.00	0.10	0.03	0.09	17.90	-9.93	0.62
180	0.03	0.09	0.02	0.09	18.26	-3.83	0.54
210	0.05	0.05	-0.02	0.07	13.77	3.38	0.31
240	0.06	0.00	-0.05	0.03	5.64	9.77	0.00
270	0.05	0.05	-0.07	-0.02	-3.96	13.62	-0.31
300	0.03	0.09	-0.07	-0.06	-12.44	13.90	-0.54
330	0.00	0.10	-0.05	-0.09	-17.53	10.54	-0.62

2" x 96" Sch. 40 - Elevation 153 - From Leg B

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.03	0.09	0.02	-0.09	-17.91	-4.44	0.54
30	0.00	0.10	0.05	-0.09	-17.53	-10.54	0.62
60	0.03	0.09	0.07	-0.06	-12.44	-13.90	0.54
90	0.05	0.05	0.07	-0.02	-3.96	-13.62	0.31
120	0.06	0.00	0.05	0.03	5.64	-9.77	0.00
150	0.05	0.05	0.02	0.07	13.77	-3.38	-0.31
180	0.03	0.09	-0.02	0.09	18.26	3.83	-0.54
210	0.00	0.10	-0.03	0.09	17.90	9.93	-0.62
240	0.03	0.09	-0.07	0.05	12.83	13.29	-0.54
270	0.05	0.05	-0.07	0.02	4.31	13.01	-0.31
300	0.06	0.00	-0.05	-0.03	-5.29	9.16	0.00
330	0.05	0.05	-0.03	-0.07	-15.42	3.77	0.31

2" x 96" Sch. 40 - Elevation 153 - From Leg A

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.06	0.00	0.00	-0.06	-11.28	0.00	0.00
30	0.05	0.05	0.03	-0.05	-9.81	-10.23	-0.31
60	0.03	0.09	0.09	-0.03	-5.81	-17.73	-0.54
90	0.00	0.11	0.10	0.00	-0.35	-20.47	-0.62
120	0.03	0.09	0.09	0.01	5.11	-17.73	-0.54
150	0.05	0.05	0.05	0.03	9.11	-10.23	-0.31
180	0.06	0.00	0.00	0.06	10.35	0.00	0.00
210	0.05	0.05	-0.05	0.05	9.11	10.23	0.31
240	0.03	0.09	-0.09	0.03	5.11	17.73	0.54
270	0.00	0.11	-0.10	0.00	-0.35	20.47	0.62
300	0.03	0.09	-0.09	-0.03	-5.81	17.73	0.54
330	0.05	0.05	-0.05	-0.05	-9.81	10.23	0.31

APX-[illegible]-17-65-00T-RET - Elevation 153 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.13	0.11	0.03	-0.22	-42.52	-10.21	-0.95
30	0.27	0.09	0.18	-0.21	-42.06	-35.23	-0.56

APX-[illegible]-17-65-00T-RET - Elevation 153 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
60	0.31	0.00	0.27	-0.15	-30.29	-52.46	0.00
90	0.27	0.09	0.28	-0.05	-10.34	-54.54	0.56
120	0.15	0.15	0.21	0.06	12.42	-41.53	0.96
150	0.00	0.18	0.09	0.15	31.90	-18.00	1.11
180	0.15	0.15	-0.05	0.22	42.88	10.83	0.96
210	0.27	0.09	-0.18	0.21	42.42	36.85	0.55
240	0.31	0.00	-0.27	0.13	30.64	53.07	0.00
270	0.27	0.09	-0.28	0.05	10.70	55.16	-0.56
300	0.15	0.15	-0.21	-0.06	-12.06	42.55	-0.95
330	0.00	0.18	-0.09	-0.15	-31.54	18.67	-1.11

APX-[illegible]-17-65-00T-RET - Elevation 153 - From Leg B

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.15	0.16	-0.03	-0.22	-42.52	10.21	0.95
30	0.00	0.18	0.09	-0.18	-31.54	-18.67	1.11
60	0.15	0.15	0.21	-0.05	-12.06	-42.55	0.96
90	0.27	0.09	0.28	0.05	10.70	-55.16	0.55
120	0.31	0.00	0.27	0.15	30.64	-53.07	0.00
150	0.27	0.09	0.18	0.21	42.42	-36.85	-0.56
180	0.15	0.16	0.05	0.22	42.88	-10.83	-0.96
210	0.00	0.18	-0.09	0.18	31.90	18.00	-1.11
240	0.15	0.15	-0.21	0.06	12.42	41.93	-0.96
270	0.27	0.09	-0.28	-0.05	-10.34	54.54	-0.56
300	0.31	0.00	-0.27	-0.15	-30.29	52.41	0.00
330	0.27	0.09	-0.18	-0.21	-42.05	35.23	0.56

APX-[illegible]-17-65-00T-RET - Elevation 153 - From Leg A

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.31	0.00	0.00	-0.31	-51.28	0.00	0.00
30	0.27	0.09	0.09	-0.27	-53.12	-18.31	-0.56
60	0.15	0.16	0.16	-0.15	-30.82	-31.72	-0.96
90	0.00	0.18	0.18	0.00	-0.36	-35.61	-1.11
120	0.15	0.16	0.16	0.15	30.11	-31.72	-0.96
150	0.27	0.09	0.09	0.27	52.41	-18.31	-0.55
180	0.31	0.00	0.00	0.31	62.57	0.00	0.00
210	0.27	0.09	-0.09	0.27	52.41	18.31	0.55
240	0.15	0.15	-0.16	0.15	30.11	31.72	0.96
270	0.00	0.18	-0.18	0.00	-0.36	35.63	1.11
300	0.15	0.16	-0.16	-0.15	-30.82	31.72	0.96
330	0.27	0.09	-0.09	-0.27	-53.12	18.31	0.56

2" x 96" Sch. 40 - Elevation 153 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.00	0.04	-0.03	-0.04	-7.59	4.31	-0.27
30	0.00	0.03	-0.01	-0.03	-4.34	2.71	-0.15
60	0.00	0.00	0.00	0.00	0.09	0.13	0.00
90	0.00	0.03	0.01	0.02	4.52	-2.41	0.15
120	0.00	0.04	0.03	0.04	7.76	-4.28	0.27

2" x 96" Sch. 40 - Elevation 153 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
150	0.00	0.05	0.03	0.04	8.95	-4.97	0.31
180	0.00	0.04	0.03	0.04	7.75	-4.31	0.27
210	0.00	0.03	0.01	0.02	4.53	-2.41	0.16
240	0.00	0.00	0.00	0.00	0.09	0.15	0.00
270	0.00	0.03	-0.01	-0.02	-4.34	2.71	-0.15
300	0.00	0.04	-0.02	-0.04	-7.59	4.31	-0.27
330	0.00	0.05	-0.03	-0.04	-8.78	5.27	-0.31

2" x 96" Sch. 40 - Elevation 153 - From Leg B

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.00	0.04	0.02	-0.04	-7.59	-4.31	0.27
30	0.00	0.05	0.03	-0.04	-8.78	-5.27	0.31
60	0.00	0.04	0.02	-0.04	-7.59	-4.31	0.27
90	0.00	0.03	0.01	-0.02	-4.34	-2.71	0.15
120	0.00	0.00	0.00	0.00	0.09	-0.15	0.00
150	0.00	0.03	-0.01	0.02	4.52	2.41	-0.16
180	0.00	0.04	-0.03	0.04	7.75	4.31	-0.27
210	0.00	0.05	-0.03	0.04	8.95	4.97	-0.31
240	0.00	0.04	-0.03	0.04	7.76	4.28	-0.27
270	0.00	0.03	-0.01	0.02	4.52	2.41	-0.15
300	0.00	0.00	0.00	0.00	0.09	-0.15	0.00
330	0.00	0.03	0.01	-0.02	-4.34	-2.71	0.15

2" x 96" Sch. 40 - Elevation 153 - From Leg A

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.00	0.00	0.00	0.00	-0.18	0.00	0.00
30	0.00	0.03	0.03	0.00	-0.18	-5.12	-0.16
60	0.00	0.04	0.04	0.00	-0.18	-8.85	-0.27
90	0.00	0.05	0.05	0.00	-0.18	-10.23	-0.31
120	0.00	0.04	0.04	0.00	-0.18	-8.86	-0.27
150	0.00	0.03	0.03	0.00	-0.18	-5.12	-0.16
180	0.00	0.00	0.00	0.00	-0.18	0.00	0.00
210	0.00	0.03	-0.03	0.00	-0.18	5.12	0.15
240	0.00	0.04	-0.04	0.00	-0.18	8.86	0.27
270	0.00	0.05	-0.05	0.00	-0.18	10.23	0.31
300	0.00	0.04	-0.04	0.00	-0.18	8.86	0.27
330	0.00	0.03	-0.03	0.00	-0.18	5.12	0.15

Powerwave LGP21401 TMA-DD-1900 - Elevation 153 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.03	0.02	0.02	-0.03	-5.69	-7.17	-0.10
30	0.05	0.01	0.04	-0.03	-4.59	-7.56	-0.06
60	0.06	0.00	0.05	-0.03	-5.70	-9.88	0.00
90	0.05	0.01	0.05	-0.02	-3.23	-9.49	0.06
120	0.03	0.02	0.03	-0.00	0.10	-6.51	0.10
150	0.00	0.02	0.01	0.02	3.45	-1.73	0.12
180	0.03	0.02	-0.02	0.03	5.92	3.37	0.10
210	0.05	0.01	-0.04	0.03	6.82	7.56	0.06

Powerwave LGP21401 TMA-DD-1900 - Elevation 153 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
240	0.06	0.00	-0.05	0.03	5.93	10.27	0.00
270	0.05	0.01	-0.05	0.02	3.41	9.89	-0.06
300	0.03	0.02	-0.03	0.00	0.13	6.91	-0.10
330	0.00	0.02	-0.01	-0.02	-3.23	2.11	-0.12

Powerwave LGP21401 TMA-DD-1900 - Elevation 153 - From Leg B

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.03	0.02	-0.02	-0.03	-5.69	3.17	0.10
30	0.00	0.02	0.01	-0.02	-3.23	-2.11	0.12
60	0.03	0.02	0.03	0.00	0.13	-6.91	0.10
90	0.05	0.01	0.05	0.02	3.41	-9.89	0.06
120	0.06	0.00	0.05	0.03	5.93	-10.27	0.00
150	0.05	0.01	0.04	0.03	6.82	-7.56	-0.06
180	0.03	0.02	0.02	0.03	5.92	-3.37	-0.10
210	0.00	0.02	-0.01	0.02	3.45	1.73	-0.12
240	0.03	0.02	-0.03	-0.00	0.10	6.51	-0.10
270	0.05	0.01	-0.05	-0.02	-3.23	9.49	-0.06
300	0.06	0.00	-0.05	-0.03	-5.70	9.88	0.00
330	0.05	0.01	-0.04	-0.03	-6.59	7.56	0.06

Powerwave LGP21401 TMA-DD-1900 - Elevation 153 - From Leg A

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.06	0.00	0.00	-0.06	-11.86	0.00	0.00
30	0.05	0.01	0.01	-0.05	-10.33	-1.93	-0.06
60	0.03	0.02	0.02	-0.03	-6.05	-3.34	-0.10
90	0.00	0.02	0.02	0.00	-0.23	-3.86	-0.12
120	0.03	0.02	0.02	0.03	5.59	-3.34	-0.10
150	0.05	0.01	0.01	0.05	9.85	-1.93	-0.06
180	0.06	0.00	0.00	0.06	11.41	0.00	0.00
210	0.05	0.01	-0.01	0.05	9.85	1.93	0.06
240	0.03	0.02	-0.02	0.03	5.59	3.34	0.10
270	0.00	0.02	-0.02	0.00	-0.23	3.86	0.12
300	0.03	0.02	-0.02	-0.03	-6.05	3.34	0.10
330	0.05	0.01	-0.01	-0.05	-10.33	1.93	0.06

Powerwave LGP21901 - Elevation 153 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.01	0.01	0.00	-0.01	-1.86	-0.28	-0.04
30	0.01	0.00	0.01	-0.01	-1.78	-1.33	-0.03
60	0.01	0.00	0.01	-0.01	-1.21	-2.09	0.00
90	0.01	0.00	0.01	-0.00	-0.31	-2.23	0.03
120	0.01	0.01	0.01	0.00	0.65	-1.73	0.04
150	0.00	0.01	0.00	0.01	1.51	-0.79	0.05
180	0.01	0.01	-0.00	0.01	1.93	0.41	0.04
210	0.01	0.00	-0.01	0.01	1.83	1.50	0.03
240	0.01	0.00	-0.01	0.01	1.28	2.23	0.00
270	0.01	0.00	-0.01	0.00	0.38	2.35	-0.03
300	0.01	0.01	-0.01	-0.00	-0.61	1.87	-0.04

Powerwave LGP21903 - Elevation 158 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
330	0.00	0.01	-0.00	-0.01	-1.43	0.51	-0.03

Powerwave LGP21903 - Elevation 158 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.01	0.01	-0.00	-0.01	-1.85	0.21	0.04
30	0.00	0.01	0.00	-0.01	-1.43	-0.91	0.05
60	0.01	0.01	0.01	-0.00	-0.51	-1.87	0.04
90	0.01	0.00	0.01	0.00	0.31	-2.33	0.03
120	0.01	0.00	0.01	0.01	1.21	-2.22	0.00
150	0.01	0.00	0.01	0.01	1.85	-1.53	-0.03
180	0.01	0.01	0.00	0.01	1.93	-0.41	-0.04
210	0.00	0.01	-0.00	0.01	1.51	0.79	-0.05
240	0.01	0.01	-0.01	0.00	0.69	1.73	-0.04
270	0.01	0.00	-0.01	-0.00	-0.31	2.23	-0.03
300	0.01	0.00	-0.01	-0.01	-1.21	2.09	0.00
330	0.01	0.00	-0.01	-0.01	-1.78	1.38	0.03

Powerwave LGP21903 - Elevation 158 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.01	0.00	0.00	-0.01	-2.58	0.00	0.00
30	0.01	0.00	0.00	-0.01	-2.21	-0.85	-0.03
60	0.01	0.01	0.01	-0.01	-1.32	-1.47	-0.04
90	0.00	0.01	0.01	0.00	-0.01	-1.70	-0.05
120	0.01	0.01	0.01	0.01	1.17	-1.47	-0.04
150	0.01	0.00	0.00	0.01	2.05	-0.85	-0.03
180	0.01	0.00	0.00	0.01	2.42	0.00	0.00
210	0.01	0.00	-0.00	0.01	2.03	0.85	0.03
240	0.01	0.01	-0.01	0.01	1.17	1.47	0.04
270	0.00	0.01	-0.01	0.00	-0.01	1.70	0.05
300	0.01	0.01	-0.01	-0.01	-1.32	1.47	0.04
330	0.01	0.00	-0.00	-0.01	-2.23	0.85	0.03

Powerwave 7020.00 DualBand RET - Elevation 158 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.01	0.00	0.01	-0.01	-1.73	-1.12	-0.03
30	0.02	0.00	0.01	-0.01	-2.06	-2.43	-0.02
60	0.02	0.00	0.02	-0.01	-1.81	-3.19	0.00
90	0.02	0.00	0.02	-0.01	-1.12	-3.03	0.02
120	0.01	0.00	0.01	-0.00	-0.10	-2.05	0.03
150	0.00	0.01	0.00	0.00	0.95	-0.52	0.03
180	0.01	0.00	-0.01	0.01	1.75	1.16	0.03
210	0.02	0.00	-0.01	0.01	2.08	2.53	0.02
240	0.02	0.00	-0.02	0.01	1.87	3.23	0.00
270	0.02	0.00	-0.02	0.01	1.15	3.07	-0.02
300	0.01	0.00	-0.01	0.00	0.13	2.09	-0.03
330	0.00	0.01	-0.00	-0.00	-0.92	0.56	-0.03

Powerwave 7020.00 DualBand RET - Elevation 158 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.01	0.00	-0.01	-0.01	-1.72	1.12	0.03
30	0.00	0.01	0.00	-0.00	-0.92	-0.56	0.03
60	0.01	0.00	0.01	0.00	0.13	-2.09	0.03
90	0.02	0.00	0.02	0.01	1.15	-3.07	0.03
120	0.02	0.00	0.02	0.01	1.87	-3.23	0.00
150	0.02	0.00	0.01	0.01	2.08	-2.53	-0.02
180	0.01	0.00	0.01	0.01	1.75	-1.15	-0.03
210	0.00	0.01	-0.00	0.00	0.95	0.52	-0.03
240	0.01	0.00	-0.01	-0.00	-0.10	2.05	-0.03
270	0.02	0.00	-0.02	-0.01	-1.12	3.03	-0.02
300	0.02	0.00	-0.02	-0.01	-1.84	3.19	0.00
330	0.02	0.00	-0.01	-0.01	-2.06	2.49	0.02

Powerwave 7020.00 DualBand RET - Elevation 158 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.02	0.00	0.00	-0.02	-3.73	0.00	0.00
30	0.02	0.00	0.01	-0.02	-3.24	-0.54	-0.02
60	0.01	0.00	0.01	-0.01	-1.88	-0.93	-0.03
90	0.00	0.01	0.01	0.00	-0.03	-1.08	-0.03
120	0.01	0.01	0.00	0.01	1.83	-0.93	-0.03
150	0.02	0.01	0.00	0.02	3.18	-0.54	-0.02
180	0.02	0.00	0.00	0.02	3.65	0.00	0.00
210	0.02	0.00	-0.00	0.02	3.18	0.54	0.02
240	0.01	0.00	-0.00	0.01	1.83	0.93	0.03
270	0.00	0.01	-0.01	0.00	-0.03	1.08	0.03
300	0.01	0.00	-0.00	-0.01	-1.88	0.93	0.03
330	0.02	0.00	-0.00	-0.02	-3.24	0.54	0.02

RRUS11 (20" X 17" X 7") - Elevation 158 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.05	0.05	0.04	-0.09	-16.88	-7.18	-0.33
30	0.13	0.03	0.10	-0.09	-18.43	-19.10	-0.35
60	0.15	0.00	0.13	-0.08	-14.96	-25.91	0.00
90	0.13	0.03	0.13	-0.04	-7.45	-25.56	0.15
120	0.08	0.06	0.09	0.01	2.22	-18.21	0.33
150	0.00	0.06	0.03	0.05	11.33	-5.85	0.39
180	0.05	0.06	-0.04	0.09	17.48	8.22	0.33
210	0.13	0.03	-0.10	0.09	19.03	20.23	0.15
240	0.15	0.00	-0.13	0.08	15.56	26.95	0.00
270	0.13	0.03	-0.13	0.04	8.00	25.61	-0.19
300	0.08	0.06	-0.09	-0.01	-1.62	19.21	-0.33
330	0.00	0.06	-0.03	-0.06	-10.73	6.89	-0.39

RRUS11 (20" X 17" X 7") - Elevation 158 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.05	0.06	-0.04	-0.09	-16.88	7.18	0.33
30	0.00	0.06	0.03	-0.06	-10.73	-6.89	0.39

RRUS11 (20" X 17" X 7") - Elevation 158 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
60	0.08	0.06	0.09	-0.01	-1.62	-19.23	0.33
90	0.13	0.03	0.13	0.04	8.00	-25.60	0.19
120	0.15	0.00	0.13	0.08	15.56	-26.95	0.00
150	0.13	0.03	0.10	0.09	19.03	-20.23	-0.19
180	0.08	0.06	0.04	0.09	17.48	-8.22	-0.33
210	0.00	0.06	-0.03	0.06	11.33	5.85	-0.39
240	0.08	0.06	-0.09	0.01	2.22	18.21	-0.33
270	0.13	0.03	-0.13	-0.04	-7.40	25.56	-0.19
300	0.15	0.00	-0.13	-0.08	-14.96	25.91	0.00
330	0.13	0.03	-0.10	-0.09	-18.43	19.19	0.15

RRUS11 (20" X 17" X 7") - Elevation 158 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.15	0.00	0.00	-0.15	-31.13	0.00	0.00
30	0.13	0.03	0.03	-0.13	-27.03	-6.37	-0.19
60	0.08	0.06	0.05	-0.08	-15.86	-11.03	-0.33
90	0.00	0.06	0.06	0.00	-0.60	-12.73	-0.39
120	0.08	0.06	0.05	0.08	14.65	-11.03	-0.33
150	0.13	0.03	0.03	0.13	25.83	-6.37	-0.19
180	0.15	0.00	0.00	0.15	29.92	0.00	0.00
210	0.13	0.03	-0.03	0.13	25.83	6.37	0.15
240	0.08	0.06	-0.05	0.08	14.65	11.03	0.33
270	0.00	0.06	-0.06	0.00	-0.60	12.73	0.39
300	0.08	0.06	-0.06	-0.08	-15.85	11.03	0.33
330	0.13	0.03	-0.03	-0.13	-27.03	6.37	0.19

Polyphaser (12"X12"X7") - Elevation 158 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.02	0.02	0.01	-0.03	-5.97	-3.01	-0.13
30	0.04	0.01	0.03	-0.03	-5.74	-4.55	-0.08
60	0.04	0.00	0.04	-0.02	-3.55	-6.84	0.00
90	0.04	0.01	0.04	-0.01	-1.08	-7.25	0.08
120	0.02	0.02	0.03	0.01	2.11	-5.61	0.14
150	0.00	0.03	0.01	0.02	4.73	-2.54	0.16
180	0.02	0.02	-0.01	0.03	6.15	1.33	0.14
210	0.04	0.01	-0.02	0.03	5.92	4.87	0.08
240	0.04	0.00	-0.04	0.03	4.33	7.15	0.00
270	0.04	0.01	-0.04	0.01	1.26	7.58	-0.08
300	0.02	0.02	-0.03	-0.01	-1.93	5.99	-0.13
330	0.00	0.03	-0.01	-0.02	-4.53	2.95	-0.16

12' V Frame - Elevation 158 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.12	0.07	0.07	-0.12	-22.43	-11.88	-0.41
30	0.20	0.04	0.15	-0.14	-25.01	-29.49	-0.24
60	0.21	0.00	0.20	-0.12	-22.39	-38.78	0.00
90	0.20	0.01	0.20	-0.07	-12.53	-37.27	0.24
120	0.12	0.07	0.14	0.00	0.53	-25.37	0.41

12' V Frame - Elevation 158 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
150	0.00	0.03	0.04	0.07	14.37	-6.23	0.47
180	0.12	0.07	-0.07	0.12	24.20	14.95	0.41
210	0.20	0.04	-0.15	0.14	22.79	32.56	0.24
240	0.24	0.00	-0.20	0.12	24.15	41.95	0.00
270	0.20	0.04	-0.20	0.07	14.30	40.34	-0.24
300	0.12	0.07	-0.14	-0.00	0.85	28.44	-0.41
330	0.00	0.08	-0.04	-0.07	-12.60	9.32	-0.47

12' V Frame - Elevation 158 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.12	0.07	-0.07	-0.12	-22.43	11.88	0.41
30	0.00	0.08	0.04	-0.07	-12.60	-9.32	0.47
60	0.12	0.07	0.14	-0.00	0.85	-28.44	0.41
90	0.20	0.04	0.20	0.07	14.30	-40.34	0.24
120	0.24	0.00	0.20	0.12	24.15	-41.85	0.00
150	0.20	0.04	0.15	0.14	22.79	-32.56	-0.24
180	0.12	0.07	0.07	0.12	24.20	-14.95	-0.41
210	0.00	0.08	-0.04	0.07	14.37	6.23	-0.47
240	0.12	0.07	-0.14	0.00	0.53	25.37	-0.41
270	0.20	0.04	-0.20	-0.07	-12.53	37.27	-0.24
300	0.24	0.00	-0.20	-0.12	-22.39	38.78	0.00
330	0.21	0.04	-0.15	-0.14	-25.01	29.49	0.24

12' V Frame - Elevation 158 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.24	0.00	0.00	-0.24	-48.33	0.00	0.00
30	0.20	0.04	0.04	-0.20	-42.09	-7.79	-0.24
60	0.12	0.07	0.07	-0.12	-25.05	-13.48	-0.41
90	0.00	0.08	0.08	0.00	-1.77	-15.57	-0.47
120	0.12	0.07	0.07	0.12	21.50	-13.48	-0.41
150	0.20	0.04	0.04	0.20	38.54	-7.79	-0.24
180	0.24	0.00	0.00	0.24	44.78	0.00	0.00
210	0.20	0.04	-0.04	0.20	38.54	7.79	0.24
240	0.12	0.07	-0.07	0.12	21.50	13.48	0.41
270	0.00	0.08	-0.08	0.00	-1.77	15.57	0.47
300	0.12	0.07	-0.07	-0.12	-25.05	13.48	0.41
330	0.20	0.04	-0.04	-0.20	-42.09	7.79	0.24

Discrete Appurtenance Totals - No Ice

Wind Azimuth °	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	-0.02	-7.21	-1599.89	5.14	-0.97
30	3.56	-6.23	-1383.33	-789.08	-0.13
60	6.18	-3.59	-795.64	-1371.35	0.71
90	7.13	0.02	5.35	-1586.73	1.31
120	6.20	3.62	804.69	-1376.47	1.41

Wind Azimuth °	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
150	3.33	6.23	1318.72	-797.26	1.53
180	0.03	7.21	1600.36	-4.31	0.97
210	-3.58	6.23	1314.00	789.91	0.35
240	-6.18	3.59	796.31	1372.51	-0.71
270	-7.15	-0.02	-4.28	1577.28	-1.31
300	-6.20	-3.62	-803.83	1377.33	-1.49
330	-3.57	-6.23	-1382.83	793.09	-1.51

Discrete Appurtenance Pressures - With Ice - $G_H = 1.102$

Description	Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	r ft	K_a	q_z psf	Calc Front ft^2	Calc Side ft^2	A_R in
Beacon	0.0000	0.12	0.00	-2.19	244.19	1.772	23	2.96	2.96	1.0000
Beacon Extender (4') 930563	0.0000	0.03	0.00	-2.69	242.21	1.767	23	1.54	1.53	1.0000
1/2" x 4' Lightning rod	240.0000	0.01	-2.50	1.41	243.00	1.767	23	0.83	0.83	1.0000
HBXX-6517DS-VTM	240.0000	0.50	-5.10	2.94	238.75	1.760	24	14.83	9.51	1.0000
HBXX-6517DS-VTM	120.0000	0.50	5.10	2.94	238.75	1.760	24	14.83	9.51	1.0000
HBXX-6517DS-VTM	0.0000	0.50	0.00	-5.89	238.75	1.760	24	14.83	9.51	1.0000
3" x 14' Sch. 40	240.0000	0.11	-5.10	2.94	238.75	1.760	24	0.64	4.37	1.0000
3" x 14' Sch. 40	120.0000	0.11	5.10	2.94	238.75	1.760	24	0.64	4.37	1.0000
3" x 14' Sch. 40	0.0000	0.11	0.00	-5.89	238.75	1.760	24	0.64	4.37	1.0000
LNX-6514DS-VTM	240.0000	0.29	-5.10	2.94	238.75	1.760	24	14.23	9.76	1.0000
LNX-6514DS-VTM	120.0000	0.29	5.10	2.94	238.75	1.760	24	14.23	9.76	1.0000
LNX-6514DS-VTM	0.0000	0.29	0.00	-5.89	238.75	1.760	24	14.23	9.76	1.0000
3" x 14' Sch. 40	240.0000	0.11	-5.10	2.94	238.75	1.760	24	0.64	4.37	1.0000
3" x 14' Sch. 40	120.0000	0.11	5.10	2.94	238.75	1.760	24	0.64	4.37	1.0000
3" x 14' Sch. 40	0.0000	0.11	0.00	-5.89	238.75	1.760	24	0.64	4.37	1.0000
Alcatel-Lucent RRH2X60-AWS	240.0000	0.33	-5.10	2.94	238.75	1.760	24	3.04	1.90	1.0000
Alcatel-Lucent RRH2X60-AWS	120.0000	0.33	5.10	2.94	238.75	1.760	24	3.04	1.90	1.0000
Alcatel-Lucent RRH2X60-AWS	0.0000	0.33	0.00	-5.89	238.75	1.760	24	3.04	1.90	1.0000
Alcatel-Lucent RRH2X60-PCS	240.0000	0.33	-5.10	2.94	238.75	1.760	24	3.04	1.90	1.0000
Alcatel-Lucent RRH2X60-PCS	120.0000	0.33	5.10	2.94	238.75	1.760	24	3.04	1.90	1.0000
Alcatel-Lucent RRH2X60-PCS	0.0000	0.33	0.00	-5.89	238.75	1.760	24	3.04	1.90	1.0000
DB-T1-6Z-8AB-0Z Azimuth: (20.0° x 11.33" x 7.2")	240.0000	0.67	-5.10	2.94	238.75	1.760	24	2.30	1.49	1.0000
DB-T1-6Z-8AB-0Z Azimuth: (20.0° x 11.33" x 7.2")	120.0000	0.67	5.10	2.94	238.75	1.760	24	2.30	1.49	1.0000
12' V Frame	240.0000	0.53	-5.10	2.94	238.75	1.760	24	12.49	6.66	1.0000
12' V Frame	120.0000	0.53	5.10	2.94	238.75	1.760	24	12.49	6.66	1.0000
12' V Frame	0.0000	0.53	0.00	-5.89	238.75	1.760	24	12.49	6.66	1.0000
WHP (2.38" X 12')	240.0000	0.09	-4.23	2.44	223.00	1.723	24	6.00	6.00	1.0000
24" Standoff	240.0000	0.07	-3.33	1.94	218.00	1.713	24	0.99	3.18	1.0000
WHP (2.38" X 12')	120.0000	0.09	4.23	2.44	224.00	1.725	24	6.00	6.00	1.0000
24" Standoff	120.0000	0.07	3.33	1.94	218.00	1.713	24	0.99	3.18	1.0000
7770.00	240.0000	0.21	-5.20	3.00	198.00	1.669	23	9.75	5.53	1.0000

Description	Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	r ft	K_a	q_z psf	Calc Front ft^2	Calc Side ft^2	A_R in
7770.00	120.0000	0.21	5.20	3.00	198.00	1.669	23	9.75	5.53	1.0000
7770.00	0.0000	0.21	0.00	-6.00	198.00	1.669	23	9.75	5.53	1.0000
2" x 96" Sch. 40	240.0000	0.13	-5.20	3.00	198.00	1.669	23	3.04	5.28	1.0000
2" x 96" Sch. 40	120.0000	0.13	5.20	3.00	198.00	1.669	23	3.04	5.28	1.0000
2" x 96" Sch. 40	0.0000	0.13	0.00	-6.00	198.00	1.669	23	3.04	5.28	1.0000
AM-X-CD-17-65-00T-R ET	240.0000	0.19	-5.20	3.00	198.00	1.669	23	9.81	6.10	1.0000
AM-X-CD-17-65-00T-R ET	120.0000	0.19	5.20	3.00	198.00	1.669	23	9.81	6.10	1.0000
AM-X-CD-17-65-00T-R ET	0.0000	0.19	0.00	-6.00	198.00	1.669	23	9.81	6.10	1.0000
2" x 96" Sch. 40	240.0000	0.06	-5.20	3.00	198.00	1.669	23	0.00	2.64	1.0000
2" x 96" Sch. 40	120.0000	0.06	5.20	3.00	198.00	1.669	23	0.00	2.64	1.0000
2" x 96" Sch. 40	0.0000	0.06	0.00	-6.00	198.00	1.669	23	0.00	2.64	1.0000
Powerwave LGP21403X TMA-DD-1900	240.0000	0.07	-5.20	3.00	198.00	1.669	23	2.12	0.84	1.0000
Powerwave LGP21403X TMA-DD-1900	120.0000	0.07	5.20	3.00	198.00	1.669	23	2.12	0.84	1.0000
Powerwave LGP21403X TMA-DD-1900	0.0000	0.07	0.00	-6.00	198.00	1.669	23	2.12	0.84	1.0000
Powerwave LGP21903	240.0000	0.03	-5.20	3.00	198.00	1.669	23	0.57	0.43	1.0000
Powerwave LGP21903	120.0000	0.03	5.20	3.00	198.00	1.669	23	0.57	0.43	1.0000
Powerwave LGP21903	0.0000	0.03	0.00	-6.00	198.00	1.669	23	0.57	0.43	1.0000
Powerwave 7020.00 DualBand RET	240.0000	0.02	-5.20	3.00	198.00	1.669	23	0.79	0.31	1.0000
Powerwave 7020.00 DualBand RET	120.0000	0.02	5.20	3.00	198.00	1.669	23	0.79	0.31	1.0000
Powerwave 7020.00 DualBand RET	0.0000	0.02	0.00	-6.00	198.00	1.669	23	0.79	0.31	1.0000
RRUS11 (26" X 17" X 7")	240.0000	0.35	-5.20	3.00	198.00	1.669	23	5.14	2.33	1.0000
RRUS11 (26" X 17" X 7")	120.0000	0.35	5.20	3.00	198.00	1.669	23	5.14	2.33	1.0000
RRUS11 (26" X 17" X 7")	0.0000	0.35	0.00	-6.00	198.00	1.669	23	5.14	2.33	1.0000
Polyphaser (12"x12"x4")	240.0000	0.06	-5.20	3.00	198.00	1.669	23	1.43	1.01	1.0000
12' V Frame	240.0000	0.53	-5.20	3.00	198.00	1.669	23	12.49	6.66	1.0000
12' V Frame	120.0000	0.53	5.20	3.00	198.00	1.669	23	12.49	6.66	1.0000
12' V Frame	0.0000	0.53	0.00	-6.00	198.00	1.669	23	12.49	6.66	1.0000
	Sum Weight:	9.61								

Discrete Appurtenance Vectors - With Ice

Beacon - Elevation 244.19 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
0	0.03	0.00	0.00	-0.04	-19.95	0.00	0.60
30	0.07	0.04	0.04	-0.07	-17.28	-9.80	-0.32
60	0.04	0.07	0.07	-0.04	-10.33	-16.97	-0.20
90	0.00	0.03	0.04	0.00	-0.35	-19.59	-0.23
120	0.07	0.04	0.03	0.04	9.44	-16.97	-0.25
150	0.03	0.00	0.00	0.03	16.61	-9.80	-0.12
180	0.03	0.00	0.00	0.03	19.24	0.00	0.00
210	0.07	0.04	-0.04	0.03	16.61	9.80	0.32
240	0.04	0.07	-0.07	0.04	9.44	16.97	0.20
270	0.00	0.04	-0.04	0.00	-0.36	19.59	0.23

Beacon - Elevation 244.19 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
330	0.04	0.03	-0.07	-0.04	-19.15	10.97	0.20
330	0.03	0.04	-0.04	-0.03	-17.33	9.80	0.12

Beacon Extender (4') 930563 - Elevation 242.21 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
0	0.04	0.00	0.00	-0.04	-10.23	0.00	0.00
30	0.04	0.02	0.02	-0.04	-8.85	-5.01	-0.06
60	0.03	0.04	0.04	-0.03	-5.19	-8.67	-0.13
90	0.00	0.04	0.04	0.00	-0.17	-10.01	-0.12
120	0.02	0.04	0.04	0.02	4.89	-8.67	-0.13
150	0.04	0.02	0.02	0.04	8.58	-5.01	-0.06
180	0.04	0.00	0.00	0.04	9.93	0.00	0.00
210	0.04	0.02	-0.02	0.04	8.58	5.01	0.06
240	0.02	0.04	-0.04	0.02	4.89	8.67	0.13
270	0.00	0.04	-0.04	0.00	-0.17	10.01	0.12
300	0.03	0.04	-0.04	-0.02	-5.19	8.67	0.13
330	0.04	0.02	-0.02	-0.04	-8.85	5.01	0.06

1/2" x 4' Lightning rod - Elevation 243.00 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
0	0.01	0.02	0.00	-0.02	-5.82	0.03	-0.04
30	0.02	0.01	0.01	-0.02	-5.03	-2.85	-0.03
60	0.02	0.01	0.02	-0.01	-2.97	-5.00	0.00
90	0.02	0.01	0.02	0.00	0.03	-5.78	0.03
120	0.01	0.02	0.02	0.01	2.95	-5.00	0.05
150	0.00	0.02	0.01	0.01	5.03	-2.85	0.03
180	0.01	0.02	0.02	0.01	5.82	0.03	0.04
210	0.01	0.01	0.01	0.02	5.03	2.97	0.01
240	0.02	0.00	0.02	0.01	2.95	5.11	0.00
270	0.02	0.01	0.02	0.00	0.03	5.89	-0.03
300	0.01	0.02	0.02	-0.01	-2.89	5.11	-0.06
330	0.00	0.02	0.01	-0.02	-5.02	2.97	-0.07

LNX-6514DS-VTM - Elevation 238.75 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
0	0.20	0.22	0.06	-0.20	-48.76	-33.29	-1.33
30	0.33	0.13	0.24	-0.21	-65.93	-54.66	-0.73
60	0.40	0.06	0.33	-0.20	-46.75	-83.98	0.00
90	0.33	0.13	0.36	-0.06	-13.92	-81.20	0.71
120	0.20	0.22	0.31	0.09	22.97	-64.10	1.36
150	0.06	0.26	0.13	0.22	53.77	-29.04	1.91
180	0.20	0.22	0.06	0.20	70.49	16.29	1.36
210	0.33	0.13	-0.21	0.21	63.56	53.66	0.75
240	0.40	0.06	-0.33	0.20	41.49	83.99	0.00
270	0.33	0.13	-0.36	0.06	13.84	83.21	-0.75
300	0.20	0.22	-0.31	0.09	-21.13	64.10	-1.36
330	0.06	0.26	-0.13	0.22	-53.03	32.05	-1.91

HBXX-6517DS-VTM - Elevation 238.75 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
0	0.20	0.22	-0.06	-0.20	-48.76	33.29	1.33
30	0.60	0.26	0.13	-0.22	-52.03	-32.05	1.91
60	0.20	0.22	0.28	-0.09	-21.13	-69.10	1.33
90	0.33	0.13	0.36	0.06	13.66	-81.21	0.71
120	0.40	0.06	0.33	0.20	42.49	-83.99	0.00
150	0.33	0.13	0.24	0.21	65.56	-53.66	-0.73
180	0.20	0.22	0.06	0.20	70.49	-16.29	-1.36
210	0.06	0.26	-0.13	0.22	53.77	29.04	-1.91
240	0.20	0.22	-0.28	0.09	22.83	66.19	-1.36
270	0.33	0.13	-0.36	-0.06	-13.93	83.20	-0.73
300	0.40	0.06	-0.33	-0.20	-46.73	83.98	0.00
330	0.33	0.13	-0.24	-0.21	-65.93	54.66	0.73

RRUS 11 (26" X 17" X 7") - Elevation 238.75 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
0	0.40	0.03	0.00	-0.40	-66.98	0.00	0.00
30	0.31	0.13	0.13	-0.33	-84.22	-50.54	-0.73
60	0.20	0.22	0.22	-0.20	-63.34	-92.90	-1.36
90	0.00	0.26	0.26	0.00	-1.74	-91.68	-2.51
120	0.20	0.22	0.22	0.20	61.88	-52.90	-1.36
150	0.33	0.13	0.13	0.33	83.71	-30.54	-0.73
180	0.40	0.03	0.00	0.40	91.50	0.00	0.00
210	0.33	0.13	-0.13	0.33	83.74	30.54	0.73
240	0.20	0.22	-0.22	0.20	61.88	52.90	1.36
270	0.00	0.26	-0.26	0.00	-1.74	91.68	2.51
300	0.20	0.22	-0.22	-0.20	-63.34	92.90	1.36
330	0.33	0.13	-0.13	-0.33	-84.22	50.54	0.73

3" x 14' Sch. 40 - Elevation 238.75 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
0	0.01	0.10	-0.04	-0.09	-21.27	10.51	-0.60
30	0.01	0.06	-0.02	-0.06	-13.43	4.50	-0.33
60	0.02	0.00	0.01	-0.01	-1.72	-3.09	0.00
90	0.01	0.06	0.04	0.04	10.71	-9.54	0.33
120	0.01	0.10	0.06	0.08	23.33	-13.38	0.60
150	0.02	0.10	0.06	0.10	24.66	-13.49	0.83
180	0.01	0.10	0.04	0.09	22.42	-9.32	0.66
210	0.01	0.06	0.02	0.06	14.27	-3.34	0.33
240	0.02	0.00	-0.01	0.01	2.36	4.12	0.00
270	0.01	0.06	-0.04	-0.01	-10.06	10.67	-0.35
300	0.01	0.10	-0.06	-0.03	-19.92	14.51	-0.66
330	0.00	0.10	-0.06	-0.10	-24.01	14.61	-0.69

2" x 96" Sch. 40 - Elevation 238.75 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	ODL_x lb-ft	ODL_z lb-ft	Torque lb-ft
0	0.01	0.10	-0.04	-0.09	-21.27	-10.51	0.60
30	0.09	0.06	0.04	-0.10	-24.01	-14.61	0.69

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.01	0.10	0.09	-0.03	-19.72	-14.51	0.60
30	0.01	0.06	0.04	-0.04	-10.06	-10.07	0.33
60	0.02	0.00	0.01	0.01	2.31	-4.13	0.00
90	0.01	0.06	-0.02	0.05	14.27	3.24	-0.35
120	0.01	0.10	-0.04	0.09	22.42	9.83	-0.60
150	0.00	0.12	-0.06	0.10	24.66	13.49	-0.65
180	-0.01	0.10	-0.05	0.01	20.31	13.31	-0.60
210	0.01	0.06	-0.01	0.04	10.31	9.34	-0.35
240	0.01	0.00	-0.01	-0.01	-1.75	3.00	0.00
270	0.01	0.06	0.02	-0.06	-13.43	-4.90	0.31

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.01	0.05	0.00	-0.02	-4.75	0.80	0.00
30	0.01	0.06	0.06	-0.01	-4.21	-14.05	-0.35
60	0.01	0.10	0.10	-0.01	-2.90	-24.33	-0.60
90	0.00	0.12	0.12	0.00	-0.65	-28.10	-0.65
120	0.01	0.10	0.10	0.01	1.41	-24.33	-0.60
150	0.01	0.06	0.04	0.01	2.91	-14.05	-0.35
180	0.01	0.00	0.00	0.02	3.45	0.00	0.00
210	0.01	0.06	-0.05	0.01	2.91	14.05	0.35
240	0.01	0.10	-0.10	0.01	1.41	24.33	0.60
270	0.00	0.12	-0.12	0.00	-0.65	28.10	0.65
300	0.01	0.10	-0.10	-0.01	-2.70	24.33	0.60
330	0.01	0.06	-0.06	-0.01	-4.21	14.05	0.35

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.10	0.23	0.03	-0.29	-49.05	-10.97	-1.34
30	0.23	0.13	0.22	-0.23	-51.99	-51.43	-0.77
60	0.38	0.00	0.33	-0.19	-58.87	-77.72	0.00
90	0.33	0.13	0.33	-0.03	-71.59	-82.79	0.77
120	0.19	0.23	0.23	0.10	35.02	-65.29	1.34
150	0.00	0.25	0.13	0.32	38.16	-29.99	1.53
180	0.23	0.13	-0.03	0.29	20.74	13.39	1.34
210	0.33	0.13	-0.23	0.28	67.59	54.33	0.77
240	0.38	0.00	-0.33	0.19	46.56	83.61	0.00
270	0.33	0.13	-0.33	0.05	13.28	83.71	-0.77
300	0.19	0.23	-0.23	-0.10	-33.24	68.21	-1.34
330	0.00	0.25	-0.13	-0.23	-51.47	32.83	-1.53

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.10	0.23	-0.05	-0.29	-49.05	10.97	1.34
30	0.00	0.25	0.13	-0.23	-51.47	-32.83	1.53
60	0.19	0.23	0.23	-0.10	-33.24	-68.21	1.34
90	0.33	0.13	0.33	0.03	13.28	-83.71	0.77
120	0.38	0.00	0.33	0.19	46.56	-83.61	0.00

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
150	0.33	0.13	0.22	0.28	67.59	-54.33	-0.77
180	0.38	0.23	0.05	0.29	70.74	-13.39	-1.34
210	0.00	0.25	-0.13	0.23	55.15	29.99	-1.53
240	0.19	0.23	-0.28	0.10	35.02	65.29	-1.34
270	0.33	0.13	-0.35	-0.03	-11.59	82.79	-0.77
300	0.38	0.00	-0.33	-0.19	-34.87	77.72	0.00
330	0.33	0.13	-0.22	-0.28	-65.96	51.43	0.77

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.38	0.00	0.00	-0.33	-93.33	0.00	0.00
30	0.33	0.13	0.13	-0.33	-60.83	-31.36	-0.77
60	0.19	0.23	0.23	-0.19	-57.40	-54.31	-1.34
90	0.00	0.26	0.26	0.00	-1.69	-63.72	-1.55
120	0.19	0.23	0.23	0.19	44.03	-54.31	-1.34
150	0.38	0.13	0.33	0.33	72.49	-31.36	-0.77
180	0.38	0.00	0.00	0.33	89.74	0.00	0.00
210	0.33	0.13	-0.33	0.33	72.49	31.36	0.77
240	0.19	0.23	-0.23	0.19	44.03	54.31	1.34
270	0.00	0.26	-0.26	0.00	-1.69	63.72	1.55
300	0.19	0.23	-0.23	-0.19	-57.40	54.31	1.34
330	0.33	0.13	-0.13	-0.33	-93.87	31.36	0.77

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.01	0.10	-0.04	-0.09	-22.05	10.39	-0.60
30	0.02	0.06	-0.01	-0.05	-14.11	3.54	-0.31
60	0.02	0.00	0.02	-0.01	-2.37	-4.31	0.00
90	0.01	0.06	0.03	0.04	10.16	-10.50	0.33
120	0.01	0.10	0.06	0.08	20.03	-13.54	0.60
150	0.00	0.12	0.05	0.10	24.66	-13.49	0.65
180	0.01	0.10	0.04	0.09	22.74	-9.37	0.60
210	0.02	0.06	0.01	0.06	14.82	-2.42	0.33
240	0.01	0.00	-0.01	0.01	3.62	5.33	0.00
270	0.02	0.04	-0.01	-0.04	-8.51	12.43	-0.31
300	0.01	0.10	-0.05	-0.08	-19.40	15.06	-0.60
330	0.00	0.11	-0.06	-0.10	-24.01	14.61	-0.65

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.01	0.12	0.04	-0.09	-22.09	-10.33	0.65
30	0.00	0.12	0.06	-0.10	-24.01	-14.61	0.65
60	0.01	0.10	0.05	-0.08	-19.40	-15.06	0.60
90	0.02	0.06	0.03	-0.04	-8.51	-12.43	0.31
120	0.02	0.00	0.02	0.01	3.62	-5.33	0.00
150	0.01	0.06	-0.01	0.06	14.82	2.42	-0.31
180	0.01	0.10	-0.04	0.09	22.74	9.37	-0.60
210	0.00	0.12	-0.06	0.10	24.66	13.49	-0.65

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
240	0.01	0.10	-0.06	0.08	20.03	13.54	-0.60
270	0.02	0.06	-0.05	0.04	10.16	10.50	-0.33
300	0.02	0.00	-0.02	-0.01	-2.37	4.31	0.00
330	0.01	0.06	0.01	-0.05	-14.11	-3.54	0.33

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.01	0.00	0.00	-0.01	-4.84	0.00	0.00
30	0.02	0.06	0.05	-0.03	-5.32	-14.05	-0.33
60	0.01	0.10	0.10	-0.01	-3.34	-24.33	-0.60
90	0.00	0.12	0.12	0.00	-0.65	-28.10	-0.65
120	0.01	0.10	0.10	0.01	2.03	-24.33	-0.60
150	0.02	0.06	0.05	0.02	4.03	-14.05	-0.33
180	0.02	0.00	0.00	0.02	4.76	0.00	0.00
210	0.02	0.06	-0.05	0.02	4.03	14.05	0.33
240	0.01	0.10	-0.10	0.01	2.03	24.33	0.60
270	0.00	0.12	-0.12	0.00	-0.65	28.10	0.65
300	0.01	0.10	-0.10	-0.01	-3.34	24.33	0.60
330	0.01	0.06	-0.06	-0.02	-5.32	14.05	0.33

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.04	0.04	0.01	-0.06	-13.73	-2.62	-0.26
30	0.07	0.03	0.03	-0.06	-13.44	-14.05	-0.33
60	0.08	0.00	0.07	-0.04	-9.45	-16.37	0.00
90	0.07	0.03	0.07	-0.01	-2.93	-12.16	0.33
120	0.04	0.04	0.06	0.02	4.60	-13.22	0.26
150	0.00	0.03	0.03	0.04	10.90	-5.59	0.30
180	0.04	0.01	-0.01	0.06	14.33	3.65	0.26
210	0.07	0.03	-0.03	0.06	14.03	12.10	0.33
240	0.08	0.00	-0.07	0.04	10.06	17.42	0.00
270	0.07	0.03	-0.07	0.01	3.46	18.22	-0.33
300	0.04	0.04	-0.06	-0.02	-3.99	14.27	-0.26
330	0.00	0.03	-0.03	-0.04	-10.29	6.64	-0.30

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.04	0.04	-0.01	-0.06	-13.73	2.62	0.26
30	0.00	0.03	0.03	-0.04	-10.29	-6.64	0.30
60	0.04	0.04	0.06	-0.02	-3.99	-14.27	0.26
90	0.07	0.03	0.07	0.01	3.46	-18.22	0.33
120	0.08	0.00	0.07	0.04	10.06	-17.42	0.00
150	0.07	0.03	0.03	0.06	14.03	-12.10	-0.33
180	0.04	0.04	0.01	0.06	14.33	-3.65	-0.26
210	0.00	0.03	-0.03	0.04	10.90	5.59	-0.30
240	0.04	0.04	-0.06	0.02	4.60	13.22	-0.26
270	0.07	0.03	-0.07	-0.01	-2.93	12.16	-0.33
300	0.04	0.04	-0.06	-0.03	-8.45	16.37	0.00

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
330	0.07	0.03	-0.05	-0.05	-13.44	13.05	0.33

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.08	0.00	0.00	-0.08	-20.12	0.00	0.00
30	0.07	0.03	0.03	-0.07	-17.50	-6.13	-0.33
60	0.04	0.04	0.04	-0.04	-10.36	-10.59	-0.26
90	0.00	0.05	0.05	0.00	-0.61	-12.23	-0.30
120	0.04	0.04	0.04	0.04	9.15	-10.59	-0.26
150	0.07	0.03	0.03	0.07	16.29	-6.13	-0.33
180	0.08	0.00	0.00	0.08	18.96	0.00	0.00
210	0.07	0.03	-0.03	0.07	16.29	6.13	0.33
240	0.04	0.04	-0.04	0.04	9.15	10.59	0.26
270	0.00	0.05	-0.05	0.00	-0.61	12.23	0.30
300	0.04	0.04	-0.04	-0.04	-10.35	10.59	0.26
330	0.07	0.03	-0.03	-0.07	-17.50	6.13	0.33

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.04	0.04	0.01	-0.06	-13.73	-2.62	-0.26
30	0.07	0.03	0.03	-0.06	-13.44	-14.05	-0.33
60	0.08	0.00	0.07	-0.04	-9.45	-16.37	0.00
90	0.07	0.03	0.07	-0.01	-2.93	-12.16	0.33
120	0.04	0.04	0.06	0.02	4.60	-13.22	0.26
150	0.00	0.03	0.03	0.04	10.90	-5.59	0.30
180	0.04	0.04	-0.01	0.06	14.33	3.65	0.26
210	0.07	0.03	-0.03	0.06	14.03	12.10	0.33
240	0.08	0.00	-0.07	0.04	10.06	17.42	0.00
270	0.07	0.03	-0.07	0.01	3.46	18.22	-0.33
300	0.04	0.04	-0.06	-0.02	-3.99	14.27	-0.26
330	0.00	0.03	-0.03	-0.04	-10.29	6.64	-0.30

Wind Azimuth	F_a	F_t	V_a	V_t	OM_t	OM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.04	0.04	-0.01	-0.06	-13.73	2.62	0.26
30	0.00	0.03	0.03	-0.04	-10.29	-6.64	0.30
60	0.04	0.04	0.06	-0.02	-3.99	-14.27	0.26
90	0.07	0.03	0.07	0.01	3.46	-18.22	0.33
120	0.08	0.00	0.07	0.04	10.06	-17.42	0.00
150	0.07	0.03	0.03	0.06	14.03	-12.10	-0.33
180	0.04	0.04	0.01	0.06	14.33	-3.65	-0.26
210	0.00	0.03	-0.03	0.04	10.90	5.59	-0.30
240	0.04	0.04	-0.06	0.02	4.60	13.22	-0.26
270	0.07	0.03	-0.07	-0.01	-2.93	12.16	-0.33
300	0.08	0.00	-0.07	-0.04	-9.45	16.37	0.00
330	0.07	0.03	-0.03	-0.05	-13.44	13.05	0.33

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
350	0.00	0.14	-0.07	-0.12	-33.53	13.04	-0.83

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.22	0.12	-0.03	-0.12	-33.64	8.15	0.31
30	0.00	0.14	0.07	-0.12	-33.57	-15.04	0.83
60	0.12	0.13	0.17	-0.04	-8.02	-34.49	0.73
90	0.22	0.07	0.22	0.05	9.84	-44.58	0.42
120	0.25	0.00	0.22	0.12	25.24	-43.71	0.00
150	0.22	0.07	0.13	0.17	34.03	-31.02	-0.42
180	0.13	0.12	0.05	0.17	33.88	-10.20	-0.73
210	0.00	0.14	-0.07	0.12	24.81	13.90	-0.83
240	0.12	0.13	-0.17	0.04	9.26	33.51	-0.73
270	0.22	0.07	-0.22	-0.05	-8.61	42.84	-0.42
300	0.25	0.00	-0.22	-0.12	-24.00	41.57	0.00
330	0.22	0.07	-0.13	-0.17	-32.86	28.98	0.42

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.33	0.00	0.00	-0.25	-50.48	0.00	0.00
30	0.22	0.07	0.07	-0.22	-43.88	-13.97	-0.42
60	0.12	0.12	0.12	-0.12	-25.86	-24.19	-0.73
90	0.00	0.14	0.14	0.00	-1.24	-27.93	-0.83
120	0.12	0.12	0.12	0.12	23.38	-24.19	-0.73
150	0.22	0.07	0.07	0.22	41.41	-13.97	-0.42
180	0.33	0.00	0.00	0.25	48.00	0.00	0.00
210	0.22	0.07	-0.07	0.22	41.41	13.97	0.42
240	0.12	0.12	-0.12	0.12	23.38	24.19	0.73
270	0.00	0.14	-0.14	0.00	-1.24	27.93	0.83
300	0.12	0.12	-0.12	-0.12	-25.86	24.19	0.73
330	0.22	0.07	-0.07	-0.22	-43.88	13.97	0.42

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.04	0.13	0.02	-0.12	-23.47	-3.35	0.70
30	0.00	0.13	0.07	-0.12	-22.73	-13.99	0.81
60	0.04	0.12	0.09	-0.07	-15.82	-18.83	0.70
90	0.02	0.07	0.09	-0.02	-4.51	-18.83	0.40
120	0.01	0.00	0.07	0.04	8.65	-13.94	0.00
150	0.02	0.07	0.02	0.09	18.57	-5.49	-0.40
180	0.04	0.12	-0.02	0.12	24.22	4.25	-0.70
210	0.06	0.13	-0.07	0.12	23.48	12.69	-0.81
240	0.04	0.12	-0.09	0.08	16.53	17.54	-0.70
270	0.02	0.07	-0.09	0.02	5.29	17.52	-0.40
300	0.01	0.00	-0.07	-0.04	-7.29	12.63	0.00
330	0.02	0.07	-0.02	-0.09	-17.92	-4.18	0.40

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.01	0.00	0.00	-0.01	-16.09	0.00	0.00
30	0.01	0.01	0.01	-0.01	-14.04	-13.34	-0.40
60	0.04	0.12	0.12	-0.04	-8.42	-23.10	-0.70
90	0.02	0.13	0.13	0.00	-0.71	-26.63	-0.81
120	0.04	0.12	0.12	0.04	6.93	-23.10	-0.70
150	0.01	0.01	0.01	0.01	13.33	-13.34	-0.40
180	0.01	0.00	0.00	0.01	14.58	0.00	0.00
210	0.01	0.01	-0.01	0.01	13.33	13.34	0.40
240	0.04	0.12	-0.12	0.04	6.93	23.10	0.70
270	0.02	0.13	-0.13	0.00	-0.71	26.63	0.81
300	0.01	0.01	-0.01	-0.04	-8.42	23.10	0.70
330	0.01	0.01	-0.01	-0.01	-14.04	13.34	0.40

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.13	0.13	0.04	-0.18	-34.93	-7.13	-0.81
30	0.22	0.08	0.15	-0.18	-34.23	-28.49	-0.47
60	0.21	0.00	0.22	-0.13	-24.21	-43.94	0.05
90	0.21	0.05	0.23	-0.04	-7.55	-49.89	0.47
120	0.13	0.13	0.18	0.05	11.27	-33.82	0.81
150	0.00	0.18	0.08	0.13	27.23	-14.43	0.93
180	0.13	0.18	-0.04	0.18	34.65	9.09	0.81
210	0.22	0.08	-0.15	0.18	35.33	30.43	0.47
240	0.25	0.00	-0.22	0.13	25.33	43.81	0.05
270	0.22	0.05	-0.23	0.04	8.48	45.83	-0.47
300	0.13	0.13	-0.18	-0.05	-10.13	35.75	-0.81
330	0.05	0.16	-0.08	-0.13	-26.11	16.37	-0.93

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.13	0.13	-0.04	-0.18	-34.93	7.13	0.81
30	0.00	0.16	0.08	-0.13	-26.11	-16.37	0.93

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
60	0.13	0.13	0.18	-0.05	-10.15	-35.96	0.81
90	0.22	0.08	0.23	0.04	8.65	-45.83	0.47
120	0.25	0.00	0.22	0.13	25.35	-49.88	0.00
150	0.22	0.08	0.15	0.18	35.33	-30.43	-0.47
180	0.13	0.13	0.04	0.18	34.65	-9.09	-0.81
210	0.00	0.18	-0.08	0.13	27.23	14.43	-0.93
240	0.13	0.13	-0.18	0.08	11.27	33.82	-0.81
270	0.22	0.08	-0.23	-0.04	-7.56	43.89	-0.47
300	0.25	0.00	-0.22	-0.13	-24.21	43.94	0.00
330	0.22	0.08	-0.15	-0.18	-34.23	28.49	0.47

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.25	0.00	0.00	-0.25	-50.64	0.00	0.00
30	0.22	0.08	0.08	-0.22	-44.03	-15.80	-0.47
60	0.13	0.13	0.13	-0.13	-25.89	-25.67	-0.81
90	0.00	0.16	0.16	0.00	-1.13	-30.80	-0.93
120	0.13	0.13	0.13	0.13	23.65	-25.67	-0.81
150	0.22	0.08	0.08	0.22	41.79	-15.80	-0.47
180	0.25	0.00	0.00	0.25	48.42	0.00	0.00
210	0.22	0.08	-0.08	0.22	41.79	15.80	0.47
240	0.13	0.13	-0.13	0.13	23.65	25.67	0.81
270	0.00	0.16	-0.16	0.00	-1.13	30.80	0.93
300	0.13	0.13	-0.13	-0.13	-25.89	25.67	0.81
330	0.22	0.08	-0.08	-0.22	-44.03	15.80	0.47

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.09	0.06	-0.03	-0.03	-9.82	6.10	-0.33
30	0.06	0.03	-0.02	-0.03	-5.59	3.66	-0.20
60	0.00	0.00	0.00	0.00	0.19	0.33	0.00
90	0.00	0.03	0.02	0.03	3.96	-3.03	0.20
120	0.00	0.06	0.03	0.03	10.19	-5.45	0.33
150	0.00	0.07	0.03	0.06	11.74	-5.34	0.40
180	0.00	0.06	0.03	0.03	10.19	-5.45	0.33
210	0.00	0.03	0.02	0.03	3.96	-3.03	0.20
240	0.00	0.00	0.00	0.00	0.19	0.33	0.00
270	0.00	0.03	-0.02	-0.03	-5.59	3.66	-0.20
300	0.00	0.06	-0.03	-0.03	-9.82	6.10	-0.33
330	0.00	0.07	-0.03	-0.06	-11.34	7.00	-0.40

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.00	0.06	0.03	-0.03	-9.82	-6.10	0.33
30	0.00	0.07	0.03	-0.06	-11.34	-7.00	0.40
60	0.00	0.06	0.03	-0.03	-9.82	-6.10	0.33
90	0.00	0.03	0.03	-0.03	-5.59	-3.66	0.20
120	0.00	0.00	0.00	0.00	0.19	-0.33	0.00

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
150	0.00	0.03	-0.02	0.03	5.96	3.61	-0.20
180	0.00	0.06	-0.03	0.03	10.19	5.45	-0.33
210	0.00	0.07	-0.03	0.06	11.74	6.34	-0.40
240	0.00	0.06	-0.03	0.03	10.19	5.45	-0.33
270	0.00	0.03	-0.02	0.03	5.96	3.61	-0.20
300	0.00	0.00	0.00	0.00	0.19	-0.33	0.00
330	0.00	0.03	0.02	-0.03	-5.59	-3.66	0.20

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.00	0.00	0.00	0.00	-0.31	0.00	0.00
30	0.00	0.03	0.03	0.00	-0.38	-6.67	-0.20
60	0.00	0.06	0.06	0.00	-0.38	-11.55	-0.33
90	0.00	0.07	0.07	0.00	-0.31	-13.34	-0.40
120	0.00	0.06	0.06	0.00	-0.38	-11.55	-0.33
150	0.00	0.03	0.03	0.00	-0.38	-6.67	-0.20
180	0.00	0.00	0.00	0.00	-0.38	0.00	0.00
210	0.00	0.03	-0.03	0.00	-0.38	6.67	0.20
240	0.00	0.06	-0.06	0.00	-0.38	11.55	0.33
270	0.00	0.07	-0.07	0.00	-0.38	13.34	0.40
300	0.00	0.06	-0.06	0.00	-0.38	11.55	0.33
330	0.00	0.03	-0.03	0.00	-0.38	6.67	0.20

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.03	0.02	0.01	-0.03	-3.67	-2.44	-0.13
30	0.03	0.01	0.02	-0.03	-4.31	-4.61	-0.06
60	0.05	0.00	0.05	-0.03	-5.15	-4.93	0.00
90	0.05	0.01	0.05	-0.01	-2.59	-6.75	0.06
120	0.03	0.02	0.03	0.00	0.72	-6.13	0.13
150	0.00	0.03	0.01	0.02	3.90	-1.77	0.13
180	0.03	0.03	-0.01	0.03	6.01	3.35	0.13
210	0.03	0.01	-0.05	0.03	6.65	7.52	0.06
240	0.05	0.00	-0.05	0.03	7.53	9.64	0.00
270	0.05	0.01	-0.05	0.01	3.80	9.46	-0.06
300	0.03	0.03	-0.03	-0.00	-0.31	6.84	-0.13
330	0.00	0.03	-0.01	-0.02	-3.28	2.49	-0.13

Wind Azimuth °	F_a K	F_t K	V_t K	V_r K	OTM_t kip-ft	OTM_r kip-ft	Torque kip-ft
0	0.03	0.02	-0.01	-0.03	-3.67	2.44	0.13
30	0.00	0.03	0.01	-0.03	-3.48	-3.49	0.13
60	0.03	0.03	0.03	-0.00	-0.31	-6.84	0.13
90	0.05	0.01	0.05	0.01	3.80	-9.46	0.06
120	0.03	0.00	0.05	0.03	5.37	-9.64	0.00
150	0.03	0.01	0.04	0.03	6.65	-7.52	-0.06
180	0.03	0.02	0.01	0.03	6.01	-3.35	-0.13
210	0.00	0.03	-0.01	0.03	3.90	1.77	-0.13

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Powerwave LGP21401 TMA DD-1900 - Elevation 158 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
240	0.03	0.02	-0.03	0.00	0.72	6.13	-0.11
270	0.05	0.01	-0.05	-0.01	-2.59	3.73	-0.06
300	0.03	0.00	-0.03	-0.03	-5.15	8.93	0.00
330	0.05	0.01	-0.04	-0.03	-6.21	6.83	0.06

Powerwave LGP21401 TMA DD-1900 - Elevation 158 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.03	0.01	0.00	-0.05	-11.13	0.00	0.00
30	0.03	0.01	0.01	-0.05	-9.70	-2.13	-0.06
60	0.03	0.02	0.02	-0.03	-5.77	-3.69	-0.11
90	0.00	0.02	0.02	0.00	-0.41	-4.25	-0.13
120	0.03	0.02	0.02	0.03	4.95	-3.63	-0.11
150	0.05	0.01	0.01	0.05	8.87	-2.13	-0.06
180	0.05	0.00	0.00	0.05	10.31	0.00	0.00
210	0.05	0.01	-0.01	0.05	8.87	2.13	0.05
240	0.03	0.02	-0.02	0.03	4.95	3.69	0.11
270	0.00	0.02	-0.02	0.00	-0.41	4.26	0.13
300	0.03	0.02	-0.02	-0.03	-5.77	3.69	0.11
330	0.05	0.01	-0.01	-0.05	-9.70	2.13	0.06

Powerwave LGP21901 - Elevation 158 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.01	0.00	-0.01	-2.27	-0.19	-0.06
30	0.01	0.01	0.01	-0.01	-2.11	-1.49	-0.03
60	0.01	0.00	0.01	-0.01	-1.36	-2.36	0.00
90	0.01	0.01	0.01	-0.00	-0.24	-2.57	0.03
120	0.01	0.01	0.01	0.00	0.97	-2.06	0.06
150	0.00	0.01	0.01	0.01	1.94	-0.96	0.07
180	0.01	0.01	-0.00	0.01	2.40	0.42	0.06
210	0.01	0.01	-0.01	0.01	2.21	1.73	0.03
240	0.01	0.00	-0.01	0.01	1.50	2.60	0.00
270	0.01	0.01	-0.01	0.00	0.37	2.81	-0.03
300	0.01	0.01	-0.01	-0.00	-0.84	2.29	-0.06
330	0.00	0.01	-0.01	-0.01	-1.80	1.22	-0.07

Powerwave LGP21901 - Elevation 158 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.01	-0.00	-0.01	-2.27	0.19	0.06
30	0.00	0.01	0.01	-0.01	-1.80	-1.20	0.07
60	0.01	0.01	0.01	-0.00	-0.84	-2.29	0.06
90	0.01	0.01	0.01	0.00	0.37	-2.81	0.03
120	0.01	0.00	0.01	0.01	1.50	-2.60	0.00
150	0.01	0.01	0.01	0.01	2.21	-1.73	-0.03
180	0.01	0.01	0.00	0.01	2.40	-0.42	-0.06
210	0.00	0.01	-0.01	0.01	1.94	0.96	-0.07
240	0.01	0.01	-0.01	0.00	0.97	2.06	-0.06
270	0.01	0.01	-0.01	-0.00	-0.24	2.57	-0.03
300	0.01	0.00	-0.01	-0.01	-1.36	2.36	0.00

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Powerwave LGP21901 - Elevation 158 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
330	0.01	0.01	-0.01	-0.01	-2.11	1.49	0.03

Powerwave LGP21901 - Elevation 158 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.00	0.00	-0.01	-3.00	0.00	0.00
30	0.01	0.01	0.01	-0.01	-2.63	-1.08	-0.03
60	0.01	0.01	0.01	-0.01	-1.57	-1.87	-0.06
90	0.00	0.01	0.01	0.00	-0.14	-2.16	-0.07
120	0.01	0.01	0.01	0.01	1.30	-1.87	-0.06
150	0.01	0.01	0.01	0.01	2.34	-1.08	-0.03
180	0.01	0.00	0.00	0.01	2.73	0.00	0.00
210	0.01	0.01	-0.01	0.01	2.34	1.08	0.03
240	0.01	0.01	-0.01	0.01	1.30	1.87	0.05
270	0.00	0.01	-0.01	0.00	-0.14	2.16	0.07
300	0.01	0.01	-0.01	-0.01	-1.57	1.87	0.05
330	0.01	0.01	-0.01	-0.01	-2.63	1.08	0.03

Powerwave 7020.00 DualBand FST - Elevation 158 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.01	0.01	-0.01	-2.10	-0.97	-0.04
30	0.02	0.00	0.01	-0.01	-2.34	-2.51	-0.02
60	0.02	0.00	0.02	-0.01	-1.94	-3.35	0.00
90	0.02	0.00	0.02	-0.01	-1.00	-3.28	0.02
120	0.01	0.01	0.01	0.00	0.21	-2.30	0.04
150	0.00	0.01	0.00	0.01	1.39	-0.61	0.05
180	0.01	0.01	-0.01	0.01	2.21	1.15	0.04
210	0.02	0.00	-0.01	0.01	2.44	2.69	0.02
240	0.02	0.00	-0.02	0.01	2.04	3.54	0.00
270	0.02	0.00	-0.02	0.01	1.11	3.45	-0.02
300	0.01	0.01	-0.01	-0.00	-0.11	2.48	-0.04
330	0.00	0.01	-0.00	-0.01	-1.28	0.86	-0.05

Powerwave 7020.00 DualBand FST - Elevation 158 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.01	-0.01	-0.01	-2.10	0.97	0.04
30	0.00	0.01	0.00	-0.01	-1.28	-0.86	0.05
60	0.01	0.01	0.01	-0.00	-0.11	-2.48	0.04
90	0.01	0.00	0.02	0.01	1.11	-3.45	0.02
120	0.02	0.00	0.02	0.01	2.04	-3.54	0.00
150	0.02	0.00	0.01	0.01	2.44	-2.69	-0.02
180	0.01	0.01	0.01	0.01	2.21	-1.15	-0.04
210	0.00	0.01	-0.00	0.01	1.39	0.61	-0.05
240	0.01	0.01	-0.01	0.00	0.21	2.30	-0.04
270	0.02	0.00	-0.02	-0.01	-1.00	3.28	-0.02
300	0.02	0.00	-0.02	-0.01	-1.94	3.35	0.00
330	0.02	0.00	-0.01	-0.01	-2.34	2.51	0.02

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Powerwave 7020.00 DualBand FST - Elevation 158 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.00	0.00	-0.02	-4.09	0.00	0.00
30	0.02	0.00	0.00	-0.02	-3.55	-0.77	-0.02
60	0.01	0.01	0.01	-0.01	-2.10	-1.34	-0.04
90	0.00	0.01	0.01	0.00	-0.10	-1.54	-0.05
120	0.01	0.01	0.01	0.01	1.89	-1.34	-0.04
150	0.02	0.00	0.00	0.02	3.34	-0.77	-0.02
180	0.02	0.00	0.00	0.02	3.81	0.00	0.00
210	0.02	0.00	-0.00	0.02	3.34	0.77	0.02
240	0.01	0.01	-0.01	0.01	1.89	1.34	0.04
270	0.00	0.01	-0.01	0.00	-0.10	1.54	0.05
300	0.01	0.01	-0.01	-0.01	-2.10	1.34	0.04
330	0.02	0.00	-0.00	-0.02	-3.55	0.77	0.02

RRUS11 (29" X 11" X 7") - Elevation 158 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.07	0.05	0.03	-0.08	-14.71	-5.20	-0.31
30	0.11	0.03	0.08	-0.08	-15.72	-15.57	-0.18
60	0.13	0.00	0.11	-0.07	-12.42	-21.51	0.00
90	0.11	0.03	0.11	-0.03	-5.61	-21.42	0.18
120	0.07	0.05	0.08	0.01	2.85	-15.34	0.31
150	0.00	0.06	0.03	0.05	10.79	-4.81	0.35
180	0.07	0.05	-0.03	0.08	15.83	7.14	0.31
210	0.11	0.03	-0.08	0.08	16.87	17.51	0.18
240	0.13	0.00	-0.11	0.07	13.54	23.45	0.00
270	0.11	0.03	-0.11	0.03	6.73	23.36	-0.18
300	0.07	0.05	-0.08	-0.01	-1.73	17.28	-0.31
330	0.00	0.06	-0.03	-0.05	-9.51	6.82	-0.35

RRUS11 (29" X 11" X 7") - Elevation 158 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.07	0.05	-0.03	-0.08	-14.71	5.20	0.31
30	0.00	0.06	0.03	-0.05	-9.51	-6.82	0.35
60	0.07	0.05	0.08	-0.01	-1.73	-17.28	0.31
90	0.11	0.03	0.11	0.03	6.73	-23.36	0.18
120	0.13	0.00	0.11	0.07	13.54	-23.45	0.00
150	0.11	0.03	0.08	0.08	16.87	-17.51	-0.18
180	0.07	0.05	0.03	0.08	15.83	-7.14	-0.31
210	0.00	0.06	-0.03	0.05	10.79	4.81	-0.35
240	0.07	0.05	-0.08	0.01	2.85	15.34	-0.31
270	0.11	0.03	-0.11	-0.03	-5.61	21.42	-0.18
300	0.13	0.00	-0.11	-0.07	-12.42	21.51	0.00
330	0.11	0.03	-0.08	-0.08	-15.72	15.57	0.18

RRUS11 (29" X 11" X 7") - Elevation 158 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.13	0.00	0.00	-0.13	-27.01	0.00	0.00
30	0.11	0.03	0.03	-0.11	-23.60	-5.83	-0.18

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RRUS11 (29" X 11" X 7") - Elevation 158 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
60	0.07	0.05	0.05	-0.07	-14.10	-10.14	-0.31
90	0.00	0.06	0.06	0.00	-1.12	-11.70	-0.35
120	0.07	0.05	0.05	0.07	11.86	-10.14	-0.31
150	0.11	0.03	0.03	0.11	21.36	-5.85	-0.18
180	0.13	0.00	0.00	0.13	24.83	0.00	0.00
210	0.11	0.03	-0.03	0.11	21.36	5.85	0.18
240	0.07	0.05	-0.05	0.07	11.86	10.14	0.31
270	0.00	0.06	-0.06	0.00	-1.12	11.70	0.35
300	0.07	0.05	-0.05	-0.07	-14.10	10.14	0.31
330	0.11	0.03	-0.03	-0.11	-23.60	5.85	0.18

Polyphaser (11"x12"x8") - Elevation 158 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.01	0.00	-0.03	-5.51	-0.87	-0.13
30	0.03	0.01	0.02	-0.03	-5.23	-3.94	-0.08
60	0.04	0.00	0.03	-0.02	-3.50	-6.07	0.00
90	0.03	0.01	0.03	-0.00	-0.79	-6.50	0.08
120	0.02	0.03	0.03	0.01	2.17	-5.11	0.13
150	0.00	0.03	0.01	0.02	4.60	-2.27	0.15
180	0.02	0.02	-0.00	0.03	5.84	1.25	0.13
210	0.03	0.01	-0.02	0.03	5.59	4.51	0.08
240	0.04	0.00	-0.03	0.02	3.83	6.64	0.00
270	0.03	0.01	-0.03	0.00	1.13	7.07	-0.08
300	0.02	0.02	-0.03	-0.01	-1.84	5.68	-0.13
330	0.00	0.03	-0.01	-0.02	-4.27	2.83	-0.15

12' V Frame - Elevation 158 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.15	0.15	0.06	-0.21	-39.44	-10.05	-0.88
30	0.28	0.08	0.20	-0.21	-45.32	-36.20	-0.51
60	0.32	0.00	0.28	-0.15	-29.58	-51.93	0.00
90	0.28	0.08	0.28	-0.06	-11.19	-55.02	0.51
120	0.35	0.15	0.21	0.03	11.03	-39.18	0.88
150	0.00	0.17	0.08	0.15	30.59	-14.11	1.02
180	0.15	0.15	-0.06	0.21	42.56	15.40	0.88
210	0.28	0.08	-0.20	0.21	45.45	41.83	0.51
240	0.32	0.00	-0.28	0.16	33.11	57.34	0.00
270	0.28	0.08	-0.28	0.06	14.32	58.43	-0.51
300	0.35	0.15	-0.21	-0.03	-2.89	44.59	-0.88
330	0.00	0.17	-0.08	-0.15	-27.57	19.52	-1.02

12' V Frame - Elevation 158 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.35	0.15	-0.06	-0.21	-39.44	10.05	0.88
30	0.00	0.17	0.08	-0.15	-27.57	-19.52	1.02
60	0.15	0.15	0.21	-0.05	-7.89	-44.59	0.88
90	0.28	0.08	0.28	0.06	14.32	-58.43	0.51
120	0.32	0.00	0.28	0.16	33.11	-57.34	0.00

12' V Frame - Elevation 198 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
150	0.28	0.08	0.27	0.21	43.65	-11.41	-0.51
180	0.18	0.15	0.05	0.21	42.56	-15.46	-0.88
210	0.00	0.17	-0.08	0.15	30.69	24.11	-1.02
240	0.15	0.15	-0.21	0.05	11.02	39.11	-0.88
270	0.28	0.08	-0.28	-0.06	-11.19	53.02	-0.51
300	0.32	0.00	-0.28	-0.15	-29.58	51.93	0.00
330	0.28	0.08	-0.30	-0.21	-40.33	36.20	0.51

12' V Frame - Elevation 198 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.32	0.00	0.00	-0.32	-66.21	0.00	0.00
30	0.28	0.08	0.08	-0.28	-57.76	-16.83	-0.51
60	0.16	0.15	0.15	-0.16	-34.67	-29.13	-0.88
90	0.00	0.17	0.17	0.00	-3.13	-33.63	-1.02
120	0.15	0.15	0.15	0.16	28.42	-29.13	-0.88
150	0.28	0.08	0.08	0.28	51.51	-16.82	-0.51
180	0.32	0.00	0.00	0.32	59.56	0.00	0.00
210	0.28	0.08	-0.08	0.28	51.51	16.82	0.51
240	0.16	0.15	-0.15	0.15	28.42	29.13	0.88
270	0.00	0.17	-0.17	0.00	-3.13	33.63	1.02
300	0.16	0.15	-0.15	-0.16	-34.67	29.13	0.88
330	0.28	0.08	-0.08	-0.28	-57.76	16.82	0.51

Discrete Appurtenance Totals - With Ice

Wind Azimuth °	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	-0.02	-7.31	-1617.15	5.49	-1.13
30	3.61	-6.33	-1398.08	-777.65	-0.17
60	6.26	-3.64	-804.06	-1355.81	0.85
90	7.23	0.02	5.71	-1604.18	1.65
120	6.28	3.67	814.29	-1391.39	2.00
150	3.64	6.34	1404.95	-805.54	1.82
180	0.03	7.31	1619.50	-3.60	1.13
210	-3.61	6.32	1400.41	799.55	0.17
240	-6.26	3.64	806.40	1388.79	-0.85
270	-7.23	-0.02	-3.38	1606.05	-1.65
300	-6.28	-3.61	-811.92	1393.28	-2.00
330	-3.64	-6.34	-1402.62	807.43	-1.82

Discrete Appurtenance Pressures - Service $G_H = 1.100$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	Calc Front ft²	Calc Side ft²
Beacon	0.0000	0.07	0.00	-2.87	244.39	1.772	16	2.40	2.40
Beacon Extender (4')	0.0000	0.03	0.00	-2.89	242.21	1.767	16	1.11	1.11

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	Calc Front ft²	Calc Side ft²
833062									
1/2" x 4' Lightning rod	240.0000	0.01	-2.50	1.44	242.00	1.767	16	0.20	0.20
HBXX-6517DS-VTM	240.0000	0.09	-5.10	2.94	238.75	1.760	16	13.64	8.35
HBXX-6517DS-VTM	120.0000	0.09	5.10	2.94	238.75	1.760	16	13.64	8.35
HBXX-6517DS-VTM	0.0000	0.09	0.00	-5.89	238.75	1.760	16	13.64	8.35
2" x 84" Sch. 40	240.0000	0.03	-5.10	2.94	238.75	1.760	16	0.34	2.66
2" x 84" Sch. 40	120.0000	0.03	5.10	2.94	238.75	1.760	16	0.34	2.66
2" x 84" Sch. 40	0.0000	0.03	0.00	-5.89	238.75	1.760	16	0.34	2.66
LNX-6514DS-VTM	240.0000	0.08	-5.10	2.94	238.75	1.760	16	13.08	8.63
LNX-6514DS-VTM	120.0000	0.08	5.10	2.94	238.75	1.760	16	13.08	8.65
LNX-6514DS-VTM	0.0000	0.08	0.00	-5.89	238.75	1.760	16	13.08	8.65
2" x 84" Sch. 40	240.0000	0.03	-5.10	2.94	238.75	1.760	16	0.43	2.66
2" x 84" Sch. 40	120.0000	0.03	5.10	2.94	238.75	1.760	16	0.43	2.66
2" x 84" Sch. 40	0.0000	0.03	0.00	-5.89	238.75	1.760	16	0.43	2.66
Alcatel-Lucent RRH2X60-AWS	240.0000	0.06	-5.10	2.94	238.75	1.760	16	2.65	1.60
Alcatel-Lucent RRH2X60-AWS	120.0000	0.06	5.10	2.94	238.75	1.760	16	2.65	1.60
Alcatel-Lucent RRH2X50-AWS	0.0000	0.06	0.00	-5.89	238.75	1.760	16	2.65	1.60
Alcatel-Lucent RRH2X60-PCS	240.0000	0.06	-5.10	2.94	238.75	1.760	16	2.65	1.60
Alcatel-Lucent RRH2X60-PCS	120.0000	0.06	5.10	2.94	238.75	1.760	16	2.65	1.60
Alcatel-Lucent RRH2X60-PCS	0.0000	0.06	0.00	-5.89	238.75	1.760	16	2.65	1.60
DB-T1-6Z-8AB-0Z Assembly (20.07" x 11.22" x 7.2")	240.0000	0.04	-5.10	2.94	238.75	1.760	16	1.88	1.22
DB-T1-6Z-8AB-0Z Assembly (20.07" x 11.22" x 7.2")	120.0000	0.04	5.10	2.94	238.75	1.760	16	1.88	1.22
12' V Frame	240.0000	0.30	-5.10	2.94	238.75	1.760	16	6.91	2.31
12' V Frame	120.0000	0.30	5.10	2.94	238.75	1.760	16	6.91	2.31
12' V Frame	0.0000	0.30	0.00	-5.89	238.75	1.760	16	6.91	2.31
WHIP (2.88" X 12')	240.0000	0.03	-4.23	2.44	227.00	1.733	16	3.60	3.60
24" Standoff	240.0000	0.03	-3.37	1.94	221.00	1.722	16	0.55	2.30
WHIP (2.88" X 12')	240.0000	0.03	-4.23	2.44	224.00	1.728	16	3.60	3.60
24" Standoff	240.0000	0.03	-3.37	1.94	218.00	1.715	16	0.55	2.30
WHIP (2.88" X 12')	120.0000	0.03	4.23	2.44	224.00	1.728	16	3.60	3.60
24" Standoff	120.0000	0.03	3.37	1.94	218.00	1.715	16	0.55	2.30
7770.00	240.0000	0.07	-5.20	3.00	198.00	1.669	15	8.81	4.69
7770.00	120.0000	0.07	5.20	3.00	198.00	1.669	15	8.81	4.69
7770.00	0.0000	0.07	0.00	-6.00	198.00	1.669	15	8.81	4.69
2" x 96" Sch. 40	240.0000	0.06	-5.20	3.00	198.00	1.669	15	1.62	3.04
2" x 96" Sch. 40	120.0000	0.06	5.20	3.00	198.00	1.669	15	1.62	3.04
2" x 96" Sch. 40	0.0000	0.06	0.00	-6.00	198.00	1.669	15	1.62	3.04
AM-X-CD-17-65-00T-RET	240.0000	0.06	-5.20	3.00	198.00	1.669	15	9.65	5.44
AM-X-CD-17-65-00T-RET	120.0000	0.06	5.20	3.00	198.00	1.669	15	9.65	5.44
AM-X-CD-17-65-00T-RET	0.0000	0.06	0.00	-6.00	198.00	1.669	15	9.65	5.44
2" x 96" Sch. 40	240.0000	0.03	-5.20	3.00	198.00	1.669	15	0.00	1.52
2" x 96" Sch. 40	120.0000	0.03	5.20	3.00	198.00	1.669	15	0.00	1.52
2" x 96" Sch. 40	0.0000	0.03	0.00	-6.00	198.00	1.669	15	0.00	1.52
Powerwave LGP2140X TMA-DD-1900	240.0000	0.04	-5.20	3.00	198.00	1.669	15	1.73	0.57
Powerwave LGP2140X TMA-DD-1900	120.0000	0.04	5.20	3.00	198.00	1.669	15	1.73	0.57
Powerwave LGP2140X	0.0000	0.04	0.00	-6.00	198.00	1.669	15	1.73	0.57

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	Calc Front ft²	Calc Side ft²
TMA-DD-1900									
Powerwave LGP21903	240.0000	0.01	-5.20	3.00	198.00	1.669	15	0.37	0.23
Powerwave LGP21903	120.0000	0.01	5.20	3.00	198.00	1.669	15	0.37	0.23
Powerwave LGP21903	0.0000	0.01	0.00	-6.00	198.00	1.669	15	0.37	0.23
Powerwave 7020.00 DualBand RET	240.0000	0.00	-5.20	3.00	198.00	1.669	15	0.55	0.16
Powerwave 7020.00 DualBand RET	120.0000	0.00	5.20	3.00	198.00	1.669	15	0.55	0.16
Powerwave 7020.00 DualBand RET	0.0000	0.00	0.00	-6.00	198.00	1.669	15	0.55	0.16
RRUS11 (20" X 17" X 7")	240.0000	0.10	-5.20	3.00	198.00	1.669	15	4.53	1.89
RRUS11 (20" X 17" X 7")	120.0000	0.10	5.20	3.00	198.00	1.669	15	4.53	1.89
RRUS11 (20" X 17" X 7")	0.0000	0.10	0.00	-6.00	198.00	1.669	15	4.53	1.89
Polyphaser (12"x12"x5")	240.0000	0.03	-5.20	3.00	198.00	1.669	15	1.20	0.82
12' V Frame	240.0000	0.30	-5.20	3.00	198.00	1.669	15	6.91	2.31
12' V Frame	120.0000	0.30	5.20	3.00	198.00	1.669	15	6.91	2.31
12' V Frame	0.0000	0.30	0.00	-6.00	198.00	1.669	15	6.91	2.31
	Sum Weight:	4.42							

Discrete Appurtenance Vectors - Service

Beacon - Elevation 244.39 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.04	0.00	0.00	-0.04	-10.77	0.00	0.00
30	0.04	0.02	0.02	-0.04	-9.33	-5.28	-0.06
60	0.02	0.04	0.04	-0.02	-5.39	-9.14	-0.11
90	0.00	0.04	0.04	0.00	-0.21	-10.55	-0.12
120	0.02	0.04	0.04	0.02	5.07	-9.14	-0.11
150	0.04	0.02	0.02	0.04	8.93	-5.28	-0.06
180	0.04	0.00	0.00	0.04	10.34	0.00	0.00
210	0.04	0.02	-0.02	0.04	8.93	5.28	0.06
240	0.02	0.04	-0.04	0.02	5.07	9.14	0.11
270	0.00	0.04	-0.04	0.00	-0.21	10.55	0.12
300	0.02	0.04	-0.04	-0.02	-5.49	9.14	0.11
330	0.04	0.02	-0.02	-0.04	-9.33	5.28	0.06

Beacon Extender (4') 833062 - Elevation 242.21 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.00	0.00	-0.02	-4.91	0.00	0.00
30	0.02	0.01	0.01	-0.02	-4.27	-2.41	-0.03
60	0.01	0.02	0.02	-0.01	-2.52	-4.18	-0.05
90	0.00	0.02	0.02	0.00	-0.09	-4.83	-0.06
120	0.01	0.02	0.02	0.01	2.33	-4.18	-0.05
150	0.02	0.01	0.01	0.02	4.09	-2.41	-0.03
180	0.02	0.00	0.00	0.02	4.74	0.00	0.00
210	0.02	0.01	-0.01	0.02	4.09	2.41	0.03
240	0.01	0.02	-0.02	0.01	2.33	4.18	0.05
270	0.00	0.02	-0.02	0.00	-0.09	4.83	0.06

Beacon Extender (4') 833062 - Elevation 242.21 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
300	0.01	0.02	-0.02	-0.01	-2.50	4.18	0.05
330	0.02	0.01	-0.01	-0.02	-4.27	2.41	0.03

1/2" x 4' Lightning rod - Elevation 242 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.00	0.00	-0.00	-0.83	0.04	-0.01
30	0.00	0.00	0.00	-0.00	-0.73	-0.40	-0.01
60	0.00	0.00	0.00	-0.00	-0.41	-0.72	0.00
90	0.00	0.00	0.00	0.00	0.02	-0.83	0.01
120	0.00	0.00	0.00	0.00	0.45	-0.72	0.01
150	0.00	0.00	0.00	0.00	0.77	-0.40	0.01
180	0.00	0.00	0.00	0.00	0.89	0.04	0.01
210	0.00	0.00	-0.00	0.00	0.77	0.47	0.01
240	0.00	0.00	-0.00	0.00	0.45	0.79	0.00
270	0.00	0.00	-0.00	0.00	0.02	0.90	-0.01
300	0.00	0.00	-0.00	-0.00	-0.41	0.79	-0.01
330	0.00	0.00	-0.00	-0.00	-0.73	0.47	-0.01

HBXX-6517DS-VTM - Elevation 238.75 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.32	0.13	0.04	-0.31	-41.15	-9.27	-0.76
30	0.21	0.07	0.15	-0.17	-49.46	-34.29	-0.44
60	0.24	0.00	0.21	-0.12	-28.85	-42.99	0.00
90	0.21	0.07	0.22	-0.04	-9.45	-52.18	0.44
120	0.12	0.13	0.17	0.03	12.55	-40.28	0.76
150	0.00	0.13	0.03	0.13	31.26	-17.40	0.88
180	0.12	0.13	-0.04	0.17	41.66	10.15	0.76
210	0.21	0.07	-0.13	0.17	40.97	35.16	0.44
240	0.24	0.00	-0.21	0.17	29.37	50.87	0.00
270	0.21	0.07	-0.22	0.04	9.97	53.06	-0.44
300	0.12	0.13	-0.17	-0.05	-12.04	41.15	-0.76
330	0.00	0.13	-0.07	-0.13	-30.73	18.34	-0.88

HBXX-6517DS-VTM - Elevation 238.75 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.12	0.13	-0.04	-0.17	-41.15	9.27	0.76
30	0.00	0.13	0.07	-0.13	-50.73	-18.34	0.88
60	0.12	0.13	0.17	-0.03	-12.04	-41.15	0.76
90	0.21	0.07	0.22	0.04	9.97	-53.06	0.44
120	0.24	0.00	0.21	0.12	29.37	-50.87	0.00
150	0.21	0.07	0.13	0.17	40.97	-35.16	-0.44
180	0.12	0.13	0.04	0.17	41.66	-10.15	-0.76
210	0.00	0.13	-0.07	0.13	31.26	17.40	-0.88
240	0.12	0.13	-0.17	0.03	12.55	40.28	-0.76
270	0.21	0.07	-0.22	-0.04	-9.45	52.18	-0.44
300	0.24	0.00	-0.21	-0.12	-28.85	42.99	0.00
330	0.21	0.07	-0.15	-0.17	-43.46	34.29	0.44

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.24	0.00	0.00	-0.24	-58.74	0.00	0.00
30	0.21	0.07	0.07	-0.21	-50.94	-17.90	-0.44
60	0.13	0.13	0.13	-0.12	-29.42	-31.00	-0.76
90	0.00	0.15	0.15	0.00	-0.31	-35.80	-0.88
120	0.12	0.13	0.13	0.12	28.61	-31.00	-0.76
150	0.21	0.07	0.07	0.21	49.92	-17.90	-0.44
180	0.24	0.00	0.00	0.24	57.72	0.00	0.00
210	0.21	0.07	-0.07	0.21	49.92	17.90	0.44
240	0.13	0.13	-0.13	0.13	28.61	31.00	0.76
270	0.00	0.15	-0.15	0.00	-0.31	35.80	0.88
300	0.12	0.13	-0.13	-0.12	-29.42	31.00	0.76
330	0.21	0.07	-0.07	-0.21	-50.94	17.90	0.44

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.00	0.04	-0.02	-0.04	-8.73	4.31	-0.21
30	0.01	0.02	-0.01	-0.02	-5.43	1.55	-0.14
60	0.01	0.00	0.01	-0.00	-0.62	-1.07	0.00
90	0.01	0.01	0.02	0.02	4.40	-3.71	0.14
120	0.00	0.04	0.03	0.03	8.28	-5.33	0.21
150	0.00	0.05	0.03	0.04	9.59	-5.41	0.21
180	0.00	0.04	0.02	0.04	9.03	-3.99	0.24
210	0.01	0.02	0.01	0.02	3.73	-1.41	0.14
240	0.01	0.00	-0.01	0.00	0.92	1.55	0.06
270	0.01	0.01	-0.02	-0.02	-4.10	4.31	-0.14
300	0.00	0.04	-0.02	-0.03	-7.91	5.81	-0.24
330	0.00	0.05	-0.03	-0.04	-9.68	5.91	-0.21

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.00	0.04	0.02	-0.04	-8.73	-4.31	0.24
30	0.00	0.05	0.07	-0.04	-9.68	-5.91	0.24
60	0.00	0.04	0.03	-0.03	-7.91	-5.81	0.24
90	0.01	0.03	0.02	-0.02	-4.10	-4.23	0.14
120	0.01	0.00	0.01	0.00	0.92	-1.39	0.00
150	0.01	0.03	-0.01	0.02	3.73	1.41	-0.14
180	0.00	0.04	-0.03	0.04	9.03	3.99	-0.24
210	0.00	0.05	-0.02	0.04	9.59	5.41	-0.24
240	0.00	0.04	-0.02	0.03	8.28	5.33	-0.24
270	0.01	0.01	-0.02	0.02	4.40	3.73	-0.14
300	0.01	0.00	-0.01	-0.00	-0.62	1.07	0.00
330	0.01	0.03	0.01	-0.02	-5.43	-1.55	0.14

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.01	0.00	0.00	-0.01	-1.84	0.00	0.00
30	0.01	0.02	0.02	-0.01	-1.63	-3.61	-0.14

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
60	0.00	0.01	0.01	-0.00	-1.07	-9.83	-0.24
90	0.00	0.00	0.01	0.00	-0.30	-11.35	-0.28
120	0.00	0.01	0.00	0.00	0.47	-9.83	-0.24
150	0.01	0.01	0.01	0.01	1.83	-5.65	-0.14
180	0.01	0.00	0.00	0.01	1.83	0.00	0.00
210	0.01	0.01	-0.01	0.01	1.83	5.65	0.14
240	0.00	0.01	0.01	0.00	0.47	9.83	0.24
270	0.00	0.01	-0.01	0.00	-0.30	11.35	0.28
300	0.00	0.01	-0.01	-0.00	-1.07	9.83	0.24
330	0.01	0.01	-0.01	-0.01	-1.07	5.65	0.14

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.23	0.13	0.03	-0.17	-41.41	-7.79	-0.79
30	0.20	0.04	0.14	-0.17	-39.52	-23.23	-0.48
60	0.23	0.00	0.25	-0.13	-27.63	-47.53	0.00
90	0.20	0.03	0.21	-0.03	-7.55	-50.89	0.46
120	0.12	0.13	0.13	0.06	13.56	-39.75	0.79
150	0.00	0.13	0.03	0.13	32.19	-18.06	0.91
180	0.12	0.13	-0.03	0.17	41.85	7.53	0.79
210	0.20	0.03	-0.14	0.17	40.39	33.02	0.45
240	0.23	0.00	-0.25	0.12	28.13	48.73	0.00
270	0.20	0.01	-0.21	0.03	8.41	51.41	-0.48
300	0.12	0.13	-0.17	-0.06	-11.50	45.54	-0.79
330	0.00	0.15	-0.01	-0.13	-31.74	33.85	-0.91

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.12	0.13	-0.03	-0.17	-41.41	7.79	0.79
30	0.00	0.13	0.03	-0.13	-31.74	-18.85	0.91
60	0.12	0.13	0.12	-0.06	-13.50	-40.54	0.79
90	0.20	0.03	0.21	0.03	8.41	-51.48	0.46
120	0.23	0.00	0.25	0.12	28.13	-48.73	0.00
150	0.20	0.03	0.14	0.17	40.38	-33.02	-0.45
180	0.12	0.13	0.03	0.17	41.85	-8.31	-0.79
210	0.00	0.15	-0.03	0.13	32.19	18.06	-0.91
240	0.12	0.13	-0.13	0.06	13.56	39.75	-0.79
270	0.20	0.03	-0.21	-0.03	-7.55	50.89	-0.46
300	0.23	0.00	-0.25	-0.13	-27.63	47.53	0.00
330	0.20	0.03	-0.14	-0.17	-39.52	23.23	0.48

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.23	0.00	0.00	-0.23	-56.35	0.00	0.00
30	0.20	0.08	0.08	-0.20	-48.39	-18.45	-0.46
60	0.12	0.13	0.13	-0.12	-28.36	-31.96	-0.79
90	0.00	0.13	0.13	0.00	-0.46	-34.51	-0.91
120	0.12	0.13	0.13	0.12	27.43	-31.96	-0.79

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
150	0.20	0.04	0.03	0.20	47.87	-18.45	-0.46
180	0.23	0.00	0.00	0.23	53.35	0.00	0.00
210	0.20	0.08	-0.08	0.20	47.87	18.45	0.46
240	0.12	0.13	-0.13	0.12	27.43	31.96	0.79
270	0.00	0.13	-0.13	0.00	-0.46	34.51	0.91
300	0.12	0.13	-0.13	-0.12	-28.36	31.96	0.79
330	0.20	0.08	-0.08	-0.20	-48.39	18.45	0.46

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.00	0.04	-0.02	-0.04	-8.84	4.33	-0.21
30	0.01	0.02	-0.01	-0.02	-5.39	1.67	-0.14
60	0.01	0.00	0.01	-0.00	-0.58	-1.39	0.00
90	0.01	0.02	0.02	0.02	4.24	-3.61	0.14
120	0.00	0.04	0.03	0.03	8.19	-5.38	0.21
150	0.00	0.05	0.03	0.04	9.58	-5.41	0.21
180	0.00	0.04	0.03	0.04	9.14	-3.83	0.24
210	0.01	0.02	0.01	0.02	3.89	-1.15	0.14
240	0.01	0.00	-0.01	0.00	1.11	1.91	0.06
270	0.01	0.01	-0.02	-0.02	-3.91	4.33	-0.14
300	0.00	0.04	-0.02	-0.03	-7.89	6.00	-0.24
330	0.00	0.05	-0.03	-0.04	-9.68	5.91	-0.21

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.00	0.04	0.02	-0.04	-8.84	-4.33	0.24
30	0.00	0.05	0.02	-0.03	-9.68	-5.94	0.28
60	0.00	0.04	0.03	-0.03	-7.89	-6.00	0.24
90	0.01	0.03	0.03	-0.02	-3.91	-4.53	0.14
120	0.01	0.00	0.01	0.00	1.11	-1.91	0.00
150	0.01	0.03	-0.01	0.02	3.89	1.15	-0.14
180	0.00	0.04	-0.02	0.04	9.14	3.83	-0.24
210	0.00	0.05	-0.03	0.04	9.58	5.41	-0.24
240	0.00	0.04	-0.02	0.03	8.19	5.38	-0.24
270	0.01	0.01	-0.02	0.02	4.24	3.61	-0.14
300	0.01	0.00	-0.01	-0.00	-0.58	1.39	0.00
330	0.01	0.03	0.01	-0.02	-5.39	-1.67	0.14

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.01	0.00	0.00	-0.01	-2.31	0.00	0.00
30	0.01	0.02	0.02	-0.01	-1.95	-5.65	-0.14
60	0.00	0.04	0.04	-0.00	-1.26	-9.83	-0.24
90	0.00	0.05	0.05	0.00	-0.30	-11.35	-0.28
120	0.00	0.04	0.04	0.00	0.65	-9.83	-0.24
150	0.01	0.03	0.03	0.01	1.61	-5.65	-0.14
180	0.01	0.00	0.00	0.01	1.33	0.00	0.00
210	0.01	0.03	-0.02	0.01	1.33	5.65	0.14

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
210	0.00	0.03	-0.04	0.00	0.65	9.83	0.24
270	0.00	0.03	-0.03	0.00	-0.30	11.35	0.28
300	0.00	0.04	-0.04	-0.00	-1.26	9.83	0.24
330	0.01	0.03	-0.03	-0.01	-1.95	5.65	0.14

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.02	0.02	0.01	-0.03	-7.84	1.72	-0.13
30	0.04	0.01	0.03	-0.03	-7.76	-5.60	-0.08
60	0.01	0.00	0.04	-0.02	-5.57	-9.64	0.00
90	0.04	0.01	0.04	-0.01	-1.83	-10.03	0.08
120	0.03	0.01	0.04	0.01	2.43	-7.64	0.13
150	0.00	0.03	0.01	0.02	6.59	-3.14	0.17
180	0.02	0.02	0.01	0.03	8.16	2.28	0.15
210	0.04	0.01	0.03	0.03	8.09	7.16	0.08
240	0.03	0.00	0.04	0.02	5.89	10.20	0.00
270	0.04	0.01	0.04	0.01	2.16	10.58	-0.08
300	0.02	0.02	0.03	-0.01	-2.11	8.20	-0.13
330	0.00	0.03	0.01	-0.02	-5.77	3.78	-0.17

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.02	0.02	-0.01	-0.03	-7.84	1.72	0.13
30	0.00	0.03	0.01	-0.03	-5.77	-3.78	0.17
60	0.02	0.02	0.03	-0.01	-2.11	-8.20	0.13
90	0.04	0.01	0.04	0.01	2.16	-10.58	0.08
120	0.03	0.00	0.04	0.02	5.89	-10.20	0.00
150	0.04	0.01	0.03	0.03	8.09	-7.16	-0.08
180	0.02	0.02	0.01	0.03	8.16	-2.28	-0.15
210	0.00	0.03	-0.01	0.02	6.59	3.14	-0.17
240	0.02	0.02	-0.03	0.01	2.43	7.64	-0.13
270	0.04	0.01	-0.04	-0.01	-1.83	10.03	-0.08
300	0.03	0.00	-0.04	-0.02	-5.57	9.64	0.00
330	0.04	0.01	-0.03	-0.03	-7.76	5.60	0.08

Wind Azimuth	F_a	F_s	V_a	V_s	ODM_a	ODM_t	Torque
°	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.05	0.00	0.00	-0.05	-11.78	0.00	0.00
30	0.04	0.01	0.01	-0.04	-10.24	-3.42	-0.08
60	0.01	0.02	0.02	-0.02	-4.05	-5.93	-0.13
90	0.00	0.03	0.03	0.00	-0.32	-6.84	-0.17
120	0.02	0.02	0.02	0.02	3.40	-5.93	-0.13
150	0.04	0.01	0.01	0.04	9.60	-3.42	-0.08
180	0.05	0.00	0.00	0.05	11.33	0.00	0.00
210	0.04	0.01	-0.01	0.04	9.60	3.42	0.08
240	0.02	0.02	-0.02	0.02	3.40	5.93	0.13
270	0.00	0.03	-0.03	0.00	-0.32	6.84	0.17
300	0.02	0.02	-0.03	-0.02	-4.05	5.93	0.13

[illegible] - Elevation 238.73 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
330	0.04	0.01	-0.01	-0.04	-10.24	3.42	0.08

[illegible] - Elevation 238.73 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.02	0.01	-0.03	-7.84	-1.72	-0.13
30	0.04	0.01	0.03	-0.03	-7.26	-4.60	-0.03
60	0.05	0.00	0.04	-0.02	-5.57	-9.64	0.00
90	0.04	0.01	0.04	-0.01	-1.83	-10.02	0.08
120	0.03	0.02	0.03	0.01	2.43	-7.64	0.13
150	0.00	0.03	0.01	0.02	6.09	-3.14	0.17
180	0.02	0.02	-0.01	0.03	8.15	2.28	0.13
210	0.04	0.03	-0.03	0.03	8.09	2.18	0.08
240	0.05	0.00	-0.04	0.02	5.87	10.20	0.00
270	0.04	0.01	-0.04	0.03	2.16	10.53	-0.08
300	0.03	0.03	-0.03	-0.01	-2.13	8.20	-0.13
330	0.00	0.03	-0.03	-0.03	-5.77	3.76	-0.17

[illegible] - Elevation 238.73 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.02	-0.01	-0.03	-7.84	1.72	0.13
30	0.00	0.03	0.01	-0.02	-5.77	-3.72	0.17
60	0.02	0.03	0.03	-0.01	-2.13	-8.20	0.13
90	0.04	0.01	0.04	0.01	2.16	-10.53	0.08
120	0.05	0.00	0.04	0.02	5.89	-10.20	0.00
150	0.04	0.01	0.03	0.03	8.09	-7.16	-0.08
180	0.02	0.02	0.01	0.03	8.16	-2.28	-0.13
210	0.00	0.03	-0.01	0.02	6.09	3.14	-0.17
240	0.02	0.02	-0.03	0.01	2.43	7.64	-0.13
270	0.04	0.01	-0.04	-0.01	-1.83	10.02	-0.08
300	0.05	0.00	-0.04	-0.02	-5.57	9.64	0.00
330	0.04	0.01	-0.03	-0.03	-7.75	6.60	0.03

[illegible] - Elevation 238.73 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.05	0.00	0.00	-0.05	-11.78	0.00	0.00
30	0.04	0.01	0.01	-0.04	-10.24	-3.42	-0.08
60	0.02	0.02	0.03	-0.02	-5.03	-5.93	-0.13
90	0.00	0.03	0.03	0.00	-0.32	-6.81	-0.17
120	0.02	0.03	0.03	0.02	5.40	-5.93	-0.15
150	0.01	0.01	0.03	0.04	9.60	-3.42	-0.08
180	0.05	0.00	0.00	0.05	11.33	0.00	0.00
210	0.04	0.01	-0.01	0.04	9.60	3.42	0.08
240	0.02	0.02	-0.03	0.02	5.40	5.93	0.15
270	0.00	0.03	-0.03	0.00	-0.32	6.81	0.17
300	0.02	0.02	-0.03	-0.02	-5.03	5.93	0.15
330	0.04	0.01	-0.01	-0.04	-10.24	3.42	0.08

[illegible] Antenna - [illegible] - Elevation 238.73 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.02	0.01	-0.02	-5.71	-1.01	-0.11
30	0.03	0.01	0.02	-0.02	-5.61	-4.50	-0.06
60	0.03	0.00	0.03	-0.02	-3.89	-6.73	0.00
90	0.03	0.01	0.03	-0.01	-1.10	-7.10	0.06
120	0.02	0.02	0.02	0.01	2.01	-5.51	0.11
150	0.00	0.02	0.01	0.02	4.62	-2.39	0.13
180	0.02	0.02	-0.01	0.02	6.02	1.42	0.11
210	0.03	0.01	-0.02	0.02	5.83	4.91	0.06
240	0.03	0.00	-0.03	0.02	4.12	7.14	0.00
270	0.03	0.01	-0.03	0.01	1.34	7.51	-0.06
300	0.02	0.03	-0.02	-0.01	-1.78	5.92	-0.11
330	0.00	0.03	-0.01	-0.02	-4.33	2.80	-0.13

[illegible] Antenna - [illegible] - Elevation 238.73 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.02	-0.01	-0.02	-5.78	1.01	0.11
30	0.00	0.02	0.01	-0.02	-4.38	-2.83	0.13
60	0.02	0.03	0.02	-0.01	-1.78	-5.92	0.11
90	0.03	0.01	0.03	0.01	1.34	-7.51	0.06
120	0.03	0.00	0.03	0.02	4.12	-7.14	0.00
150	0.03	0.01	0.02	0.02	5.83	-4.91	-0.06
180	0.02	0.02	0.01	0.02	6.02	-1.42	-0.11
210	0.00	0.02	-0.01	0.02	4.62	2.39	-0.13
240	0.02	0.02	-0.02	0.01	2.01	5.51	-0.11
270	0.03	0.01	-0.03	-0.01	-1.10	7.10	-0.06
300	0.03	0.00	-0.03	-0.02	-3.89	6.73	0.00
330	0.03	0.01	-0.02	-0.02	-5.60	4.50	0.06

12' V Frame - Elevation 238.73 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.06	0.04	0.04	-0.05	-13.91	-7.00	-0.21
30	0.11	0.02	0.08	-0.07	-16.18	-18.16	-0.12
60	0.12	0.00	0.11	-0.06	-13.88	-24.05	0.00
90	0.11	0.02	0.10	-0.04	-7.63	-23.09	0.12
120	0.06	0.04	0.07	0.00	0.89	-15.54	0.21
150	0.00	0.04	0.07	0.04	9.42	-3.43	0.24
180	0.06	0.04	-0.04	0.05	15.63	10.01	0.21
210	0.11	0.02	-0.08	0.07	17.92	21.17	0.12
240	0.12	0.00	-0.11	0.06	15.62	27.66	0.00
270	0.11	0.02	-0.10	0.04	9.37	26.10	-0.12
300	0.06	0.04	-0.07	-0.00	0.84	18.55	-0.21
330	0.00	0.04	-0.02	-0.04	-7.68	6.41	-0.24

12' V Frame - Elevation 238.73 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.06	0.04	-0.04	-0.05	-13.91	7.00	0.21
30	0.00	0.04	0.02	-0.04	-7.68	-6.44	0.24

12' V Frame - Elevation 238.73 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
60	0.06	0.04	0.07	-0.00	0.84	-18.56	0.21
90	0.11	0.02	0.10	0.04	9.37	-26.10	0.12
120	0.12	0.00	0.11	0.06	15.62	-27.66	0.00
150	0.11	0.02	0.08	0.07	17.92	-21.17	-0.12
180	0.06	0.04	0.04	0.05	15.65	-10.01	-0.21
210	0.00	0.04	-0.02	0.04	9.42	3.43	-0.24
240	0.06	0.04	-0.07	0.00	0.89	15.54	-0.21
270	0.11	0.02	-0.10	-0.04	-7.63	23.09	-0.12
300	0.12	0.00	-0.11	-0.06	-13.88	24.05	0.00
330	0.11	0.02	-0.08	-0.07	-16.18	18.16	0.12

12' V Frame - Elevation 238.73 - From Leg A

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.12	0.00	0.00	-0.12	-31.25	0.00	0.00
30	0.11	0.02	0.02	-0.11	-27.29	-4.93	-0.12
60	0.06	0.04	0.04	-0.06	-16.49	-8.55	-0.21
90	0.00	0.04	0.04	0.00	-1.74	-9.87	-0.24
120	0.06	0.04	0.04	0.06	13.01	-8.55	-0.21
150	0.11	0.02	0.02	0.11	23.81	-4.93	-0.12
180	0.12	0.00	0.00	0.12	27.77	0.00	0.00
210	0.11	0.02	-0.02	0.11	23.81	4.93	0.12
240	0.06	0.04	-0.04	0.06	13.01	8.55	0.21
270	0.00	0.04	-0.04	0.00	-1.74	9.87	0.24
300	0.06	0.04	-0.04	-0.06	-16.49	8.55	0.21
330	0.11	0.02	-0.02	-0.11	-27.29	4.93	0.12

KNP [illegible] - Elevation 227 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.03	0.05	0.00	-0.06	-14.32	0.13	-0.27
30	0.05	0.03	0.03	-0.05	-12.40	-7.07	-0.15
60	0.06	0.00	0.05	-0.03	-7.13	-12.34	0.00
90	0.05	0.03	0.06	0.00	0.07	-14.27	0.15
120	0.03	0.05	0.05	0.03	7.27	-12.34	0.27
150	0.00	0.06	0.03	0.05	12.54	-7.07	0.31
180	0.03	0.05	0.00	0.06	14.47	0.13	0.27
210	0.05	0.03	-0.03	0.05	12.54	7.33	0.15
240	0.06	0.00	-0.05	0.03	7.27	12.60	0.00
270	0.05	0.03	-0.06	0.00	0.07	14.53	-0.15
300	0.03	0.05	-0.05	-0.03	-7.13	12.60	-0.27
330	0.00	0.06	-0.03	-0.05	-12.40	7.33	-0.31

24" Standoff - Elevation 227 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.03	-0.01	-0.03	-7.13	3.03	-0.11
30	0.01	0.02	-0.03	-0.02	-4.70	0.74	-0.08
60	0.01	0.00	0.01	-0.00	-1.00	-1.13	0.00
90	0.01	0.02	0.03	0.01	2.99	-3.70	0.08
120	0.00	0.03	0.03	0.03	6.15	-4.65	0.14

24" Standoff - Elevation 227 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
150	0.00	0.04	0.02	0.03	7.75	-4.34	0.16
180	0.00	0.03	0.01	0.03	7.26	-2.88	0.14
210	0.01	0.02	0.00	0.03	4.81	-0.54	0.08
240	0.01	0.00	-0.01	0.00	1.11	1.97	0.00
270	0.01	0.02	-0.03	-0.01	-2.88	3.90	-0.08
300	0.03	0.03	-0.02	-0.03	-6.08	4.83	-0.14
330	0.00	0.04	-0.03	-0.03	-7.63	4.54	-0.15

KNP [illegible] - Elevation 226 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.03	0.05	0.00	-0.05	-14.08	0.13	-0.27
30	0.05	0.03	0.03	-0.03	-12.11	-6.95	-0.15
60	0.06	0.00	0.05	-0.03	-7.00	-12.13	0.00
90	0.05	0.03	0.06	0.00	0.07	-14.03	0.15
120	0.03	0.05	0.05	0.03	7.13	-12.13	0.27
150	0.00	0.06	0.03	0.05	12.33	-6.95	0.31
180	0.03	0.05	0.00	0.06	14.23	0.13	0.27
210	0.05	0.03	-0.03	0.05	12.33	7.20	0.15
240	0.06	0.00	-0.05	0.03	7.13	12.33	0.00
270	0.05	0.03	-0.06	0.00	0.07	14.28	-0.15
300	0.03	0.05	-0.05	-0.03	-7.00	12.28	-0.27
330	0.00	0.06	-0.03	-0.05	-12.11	7.20	-0.31

24" Standoff - Elevation 218 - From Leg C

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.03	-0.01	-0.03	-7.01	2.51	-0.13
30	0.01	0.02	-0.00	-0.02	-4.62	0.77	-0.08
60	0.01	0.00	0.01	-0.00	-0.99	-1.70	0.00
90	0.01	0.02	0.02	0.01	2.94	-3.54	0.08
120	0.00	0.03	0.02	0.03	6.01	-4.53	0.13
150	0.00	0.04	0.02	0.03	7.61	-4.27	0.16
180	0.00	0.03	0.01	0.03	7.12	-2.78	0.13
210	0.01	0.02	0.00	0.02	4.73	-0.53	0.08
240	0.01	0.00	-0.01	0.00	1.09	1.89	0.00
270	0.01	0.02	-0.03	-0.01	-2.83	3.83	-0.08
300	0.00	0.03	-0.02	-0.03	-5.97	4.77	-0.13
330	0.00	0.04	-0.03	-0.03	-7.50	4.45	-0.15

KNP [illegible] - Elevation 226 - From Leg B

Wind Azimuth °	F_x K	F_z K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.03	0.05	0.00	-0.06	-14.08	-0.13	0.27
30	0.00	0.06	0.03	-0.05	-12.11	-7.20	0.31
60	0.03	0.05	0.05	-0.03	-7.00	-12.28	0.27
90	0.05	0.03	0.06	0.00	0.07	-14.28	0.15
120	0.06	0.00	0.05	0.03	7.13	-12.33	0.00
150	0.05	0.03	0.03	0.05	12.33	-7.20	-0.15
180	0.03	0.05	0.00	0.06	14.23	-0.13	-0.27
210	0.00	0.06	-0.03	0.05	12.33	6.95	-0.31

Polyphaser(12"x12"x3") - Elevation [illegible] - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
60	0.02	0.00	0.02	-0.02	-1.92	-3.33	0.00
90	0.02	0.01	0.02	-0.02	-0.49	-3.51	0.04
120	0.01	0.01	0.01	0.01	1.10	-2.75	0.07
150	0.00	0.01	0.01	0.01	2.41	-1.16	0.08
180	0.01	0.01	-0.00	0.02	3.11	0.74	0.07
210	0.02	0.01	-0.01	0.01	3.00	2.50	0.04
240	0.02	0.00	-0.02	0.01	2.10	3.64	0.00
270	0.02	0.01	-0.02	0.00	0.47	3.85	-0.04
300	0.01	0.01	-0.01	-0.01	-0.92	3.06	-0.07
330	0.00	0.01	-0.01	-0.01	-2.23	1.53	-0.08

12' V Frame - Elevation [illegible] - From Leg C

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.06	0.01	0.03	-0.06	-10.73	-5.13	-0.20
30	0.10	0.02	0.05	-0.07	-12.53	-13.92	-0.12
60	0.12	0.00	0.10	-0.06	-10.71	-18.55	0.00
90	0.10	0.03	0.10	-0.03	-5.80	-17.80	0.12
120	0.06	0.03	0.07	0.00	0.91	-11.87	0.20
150	0.00	0.04	0.02	0.03	7.61	-2.34	0.24
180	0.06	0.03	-0.03	0.06	12.50	8.22	0.20
210	0.10	0.02	-0.08	0.07	14.29	16.99	0.13
240	0.12	0.06	-0.10	0.06	12.49	21.62	0.00
270	0.10	0.03	-0.10	0.03	7.57	20.87	-0.12
300	0.06	0.03	-0.07	-0.00	0.87	14.94	-0.20
330	0.00	0.04	-0.02	-0.03	-5.83	5.42	-0.24

12' V Frame - Elevation [illegible] - From Leg B

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.06	0.03	-0.03	-0.06	-10.73	5.13	0.20
30	0.00	0.04	0.03	-0.03	-5.83	-5.42	0.24
60	0.06	0.03	0.07	-0.00	0.87	-14.94	0.20
90	0.10	0.03	0.10	0.03	7.57	-20.87	0.12
120	0.12	0.00	0.10	0.06	12.49	-21.62	0.00
150	0.10	0.02	0.08	0.07	14.29	-16.99	-0.12
180	0.06	0.03	0.03	0.06	12.50	-8.22	-0.20
210	0.00	0.04	-0.02	0.03	7.61	2.34	-0.24
240	0.06	0.03	-0.07	0.00	0.91	11.87	-0.20
270	0.10	0.03	-0.10	-0.03	-5.80	17.80	-0.12
300	0.12	0.00	-0.10	-0.06	-10.71	18.55	0.00
330	0.10	0.03	-0.08	-0.07	-12.53	13.92	0.12

12' V Frame - Elevation [illegible] - From Leg A

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
0	0.12	0.00	0.00	-0.12	-24.97	0.00	0.00
30	0.10	0.03	0.03	-0.10	-21.86	-3.88	-0.11
60	0.06	0.03	0.03	-0.06	-13.37	-6.72	-0.20
90	0.00	0.04	0.04	0.00	-1.77	-7.75	-0.24
120	0.06	0.03	0.03	0.06	9.82	-6.72	-0.20

12' V Frame - Elevation [illegible] - From Leg A

Wind Azimuth °	F_a K	F_s K	V_a K	V_s K	OTM_a kip-ft	OTM_s kip-ft	Torque kip-ft
150	0.10	0.02	0.02	0.10	18.37	-3.88	-0.11
180	0.12	0.00	0.00	0.12	21.42	0.00	0.00
210	0.10	0.02	-0.02	0.10	18.32	3.88	0.12
240	0.06	0.03	-0.03	0.06	9.82	6.72	0.20
270	0.00	0.04	-0.04	0.00	-1.77	7.75	0.24
300	0.06	0.03	-0.03	-0.06	-13.37	6.72	0.20
330	0.10	0.02	-0.02	-0.10	-21.86	3.88	0.12

Discrete Appurtenance Totals - Service

Wind Azimuth °	F_x K	F_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	-0.01	-3.59	-796.96	2.77	-0.41
30	1.77	-3.11	-688.95	-392.97	-0.07
60	3.08	-1.79	-396.22	-683.29	0.36
90	3.56	0.01	2.79	-795.42	0.69
120	3.00	1.80	401.17	-685.65	0.84
150	1.79	3.12	692.18	-397.24	0.76
180	0.01	3.50	797.83	-1.94	0.43
210	-1.77	3.11	689.82	393.83	0.07
240	-3.08	1.79	392.10	684.12	-0.36
270	-3.56	-0.01	-1.93	791.25	-0.69
300	-3.09	-1.80	-400.35	686.41	-0.84
330	-1.79	-3.12	-691.30	397.87	-0.76

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	26.91					
Bracing Weight	12.27					
Total Member Self-Weight	39.18			0.44	0.41	
Total Weight	49.29			0.44	0.41	
Wind 0 deg - No Ice		-0.02	-45.15	-6187.45	5.14	-0.97
Wind 30 deg - No Ice		22.43	-38.96	-5356.27	-3025.24	-0.15
Wind 60 deg - No Ice		38.57	-22.29	-3312.59	-5231.42	0.71
Wind 90 deg - No Ice		44.53	0.02	3.16	-6039.07	1.38
Wind 120 deg - No Ice		39.91	23.09	3098.47	-5349.42	1.68
Wind 150 deg - No Ice		22.49	38.58	5751.86	-3033.41	1.53
Wind 180 deg - No Ice		0.02	44.61	6034.66	-4.31	0.97
Wind 210 deg - No Ice		-22.43	38.56	5359.14	3025.07	0.15
Wind 240 deg - No Ice		-38.90	23.09	3090.29	5345.33	-0.71
Wind 270 deg - No Ice		-44.50	-0.02	-4.21	6059.99	-1.33
Wind 300 deg - No Ice		-38.50	-22.32	-3020.74	5217.17	-1.68
Wind 330 deg - No Ice		-22.49	-38.98	-3250.99	3034.24	-1.53
Member Ice	50.12					
Total Weight Ice	118.41			1.17	0.94	
Wind 0 deg - Ice		-0.02	-70.60	-6308.52	5.49	-1.15

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 30 deg - Ice		32.33	-56.01	-7420.27	-4274.39	-0.17
Wind 60 deg - Ice		54.35	-31.34	-4138.05	-7196.33	0.81
Wind 90 deg - Ice		64.63	0.02	5.71	-8557.99	1.61
Wind 120 deg - Ice		61.10	35.32	4659.94	-8052.35	2.00
Wind 150 deg - Ice		32.33	56.03	7422.14	-4282.45	1.82
Wind 180 deg - Ice		0.02	62.72	8327.48	-3.60	1.11
Wind 210 deg - Ice		-32.30	55.61	7422.60	4276.18	0.17
Wind 240 deg - Ice		-61.08	35.21	4652.08	8049.65	-0.83
Wind 270 deg - Ice		-64.63	-0.02	-3.33	8559.87	-1.61
Wind 300 deg - Ice		-54.27	-31.37	-4185.92	7202.56	-2.00
Wind 330 deg - Ice		-32.33	-56.03	-7424.81	4251.34	-1.83
Total Weight	49.29			0.44	0.41	
Wind 0 deg - Service		-0.01	-22.90	-3082.80	2.77	-0.38
Wind 30 deg - Service		11.19	-19.41	-2618.83	-1507.18	-0.07
Wind 60 deg - Service		19.22	-11.11	-1500.86	-2596.59	0.36
Wind 90 deg - Service		22.39	0.01	2.79	-3018.84	0.69
Wind 120 deg - Service		19.89	11.51	1544.09	-2665.21	0.84
Wind 150 deg - Service		11.20	19.42	2522.04	-1511.25	0.76
Wind 180 deg - Service		0.01	22.23	3007.11	-1.94	0.48
Wind 210 deg - Service		-11.19	19.41	2619.69	1508.01	0.07
Wind 240 deg - Service		-19.83	11.49	1540.02	2663.72	-0.35
Wind 270 deg - Service		-22.39	-0.01	-1.92	3019.47	-0.69
Wind 300 deg - Service		-19.23	-11.12	-1504.94	2599.77	-0.84
Wind 330 deg - Service		-11.29	-19.43	-2621.17	1512.08	-0.76

Load Combinations

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

Comb. No.	Description
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	240 - 220	Leg	Max Tension	25	19.64	0.34	0.11
			Max. Compression	23	-25.63	0.34	-0.18
			Max. Mx	11	0.67	0.55	0.01
			Max. My	8	0.85	0.00	-0.56
			Max. Vy	9	1.33	-0.55	0.00
			Max. Vx	2	-1.31	0.00	0.54
		Diagonal	Max Tension	22	3.70	0.00	0.00
			Max. Compression	16	-3.53	0.00	0.00
			Max. Mx	15	3.39	0.03	0.00
			Max. My	24	3.63	0.01	0.00
			Max. Vy	15	-0.02	0.03	0.00
			Max. Vx	24	-0.00	-0.00	0.00
		Top Girt	Max Tension	19	0.92	0.00	0.00
			Max. Compression	12	-0.85	0.00	0.00
			Max. Mx	14	0.09	-0.02	0.00
			Max. Vy	14	0.02	0.00	0.00
T2	220 - 200	Leg	Max Tension	31	61.46	-0.01	0.54
			Max. Compression	23	-76.59	2.01	-1.23
			Max. Mx	19	-76.51	-2.02	-1.11
			Max. My	15	-76.32	-0.02	2.31
			Max. Vy	19	0.64	-2.02	-1.11
			Max. Vx	15	-0.74	-0.03	2.31
		Diagonal	Max Tension	24	7.21	0.07	-0.02
			Max. Compression	19	-7.84	0.00	0.00
			Max. Mx	23	5.85	0.13	-0.02
			Max. My	20	-6.84	-0.03	-0.03
			Max. Vy	23	-0.05	0.13	-0.02
			Max. Vx	20	0.01	0.10	-0.03
T3	200 - 180	Leg	Max Tension	21	102.59	-0.20	0.01
			Max. Compression	23	-125.82	1.92	0.02
			Max. Mx	15	-53.93	2.67	0.03
			Max. My	20	-6.16	-0.03	-2.04
			Max. Vy	15	-0.93	2.67	0.03
			Max. Vx	20	0.84	-0.03	-2.04
		Diagonal	Max Tension	18	5.48	0.00	0.00
			Max. Compression	19	-5.67	0.00	0.00
			Max. Mx	23	5.09	0.06	-0.00
			Max. My	24	-5.00	-0.03	0.01
			Max. Vy	23	-0.03	0.06	-0.00
			Max. Vx	24	-0.00	0.00	0.00
T4	180 - 160	Leg	Max Tension	31	134.38	-1.02	0.00
			Max. Compression	15	-157.37	2.73	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	13	-167.57	2.73	0.00
			Max. My	20	-10.08	-0.09	-2.91
			Max. Vy	21	0.48	-2.64	-0.01
			Max. Vx	20	0.66	-0.09	-2.98
		Diagonal	Max Tension	19	5.92	0.00	0.00
			Max. Compression	19	-5.69	0.00	0.00
			Max. Mx	15	4.56	0.08	0.01
			Max. My	24	-4.71	-0.02	0.01
			Max. Vy	15	-0.03	0.00	0.01
			Max. Vx	24	-0.00	0.00	0.00
T5	160 - 140	Leg	Max Tension	21	191.08	-2.31	0.03
			Max. Compression	15	-200.84	9.89	0.02
			Max. Mx	15	-200.84	9.80	0.02
			Max. My	20	-11.27	-0.23	-8.94
			Max. Vy	13	-1.46	9.72	0.03
			Max. Vx	20	1.22	-0.23	-8.94
		Diagonal	Max Tension	18	6.85	0.00	0.00
			Max. Compression	18	-6.86	0.00	0.00
			Max. Mx	19	6.36	0.13	-0.01
			Max. My	24	-5.87	-0.06	0.02
			Max. Vy	19	-0.65	0.13	-0.01
			Max. Vx	24	-0.00	0.00	0.00
T6	140 - 120	Leg	Max Tension	21	189.40	-2.78	0.02
			Max. Compression	15	-239.04	8.93	0.02
			Max. Mx	15	-221.03	9.32	0.01
			Max. My	20	-17.41	-0.35	-8.78
			Max. Vy	15	-1.19	9.32	0.01
			Max. Vx	26	-0.98	-0.36	1.77
		Diagonal	Max Tension	18	7.00	0.00	0.00
			Max. Compression	18	-7.03	0.00	0.00
			Max. Mx	15	6.45	0.13	-0.01
			Max. My	20	6.55	0.13	-0.01
			Max. Vy	15	-0.64	0.12	0.01
			Max. Vx	20	0.00	0.00	0.00
T7	120 - 100	Leg	Max Tension	21	212.84	-2.75	0.02
			Max. Compression	15	-280.03	11.76	0.01
			Max. Mx	15	-280.03	11.76	0.01
			Max. My	20	-21.71	0.51	-8.05
			Max. Vy	15	-1.20	11.76	0.01
			Max. Vx	20	1.03	0.53	-8.05
		Diagonal	Max Tension	19	7.97	0.00	0.00
			Max. Compression	19	-8.42	0.00	0.00
			Max. Mx	15	6.63	0.19	-0.01
			Max. My	24	-7.17	0.08	0.02
			Max. Vy	15	-0.06	0.19	-0.01
			Max. Vx	24	-0.00	0.00	0.00
T8	100 - 80	Leg	Max Tension	21	229.70	-6.71	0.03
			Max. Compression	15	-305.14	15.05	0.02
			Max. Mx	21	227.36	-16.38	-0.03
			Max. My	20	-23.19	-1.65	-12.48
			Max. Vy	17	2.67	-15.49	-0.02
			Max. Vx	26	-4.32	-1.65	12.48
		Diagonal	Max Tension	18	11.34	0.00	0.00
			Max. Compression	19	-12.78	0.00	0.00
			Max. Mx	21	10.33	-0.29	0.01
			Max. My	24	-11.24	-0.06	-0.07
			Max. Vy	21	-0.09	-0.29	0.01
			Max. Vx	24	0.01	0.00	0.00
T9	80 - 60	Leg	Max Tension	21	251.19	0.96	0.03
			Max. Compression	15	-346.22	19.68	0.03
			Max. Mx	15	-346.22	19.68	0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	24	-20.09	2.61	9.82
			Max. Vy	15	-3.07	19.65	0.03
			Max. Vx	26	-0.17	2.62	9.82
		Diagonal	Max Tension	18	13.49	0.00	0.00
			Max. Compression	18	-12.27	0.00	0.00
			Max. Mx	15	10.93	-0.33	0.06
			Max. My	20	11.18	-0.31	0.06
			Max. Vy	21	-0.10	-0.33	0.06
			Max. Vx	20	-0.01	0.00	0.00
T10	60 - 40	Leg	Max Tension	21	210.37	0.37	0.02
			Max. Compression	15	-304.10	12.91	0.03
			Max. Mx	23	278.02	-18.13	-0.02
			Max. My	20	-25.37	-3.52	-6.39
			Max. Vy	17	1.73	-18.10	-0.01
			Max. Vx	26	-0.99	-3.51	6.39
		Diagonal	Max Tension	18	12.74	0.00	0.00
			Max. Compression	19	-12.16	0.00	0.00
			Max. Mx	15	11.13	-0.50	0.07
			Max. My	20	12.41	-0.45	0.07
			Max. Vy	21	-0.14	-0.47	0.07
			Max. Vx	20	-0.01	0.00	0.00
T11	40 - 20	Leg	Max Tension	21	307.22	-3.76	0.03
			Max. Compression	15	-421.00	17.71	0.01
			Max. Mx	15	-421.00	17.71	0.01
			Max. My	20	-30.31	3.91	-15.50
			Max. Vy	15	-1.72	17.71	0.01
			Max. Vx	26	-1.35	3.91	15.50
		Diagonal	Max Tension	18	11.38	0.00	0.00
			Max. Compression	18	-15.43	0.00	0.00
			Max. Mx	21	8.46	-0.61	-0.04
			Max. My	24	-12.89	-0.27	-0.09
			Max. Vy	21	-0.16	-0.61	-0.04
			Max. Vx	24	0.02	0.00	0.00
T12	20 - 0	Leg	Max Tension	21	335.51	0.99	0.03
			Max. Compression	15	-458.61	7.45	0.01
			Max. Mx	15	-458.61	7.45	0.01
			Max. My	20	-40.39	1.95	-10.27
			Max. Vy	17	1.18	-6.90	-0.01
			Max. Vx	24	-1.19	1.95	-10.27
		Diagonal	Max Tension	18	14.58	0.00	0.00
			Max. Compression	19	-18.43	0.00	0.00
			Max. Mx	15	12.18	-0.56	0.13
			Max. My	20	14.28	-0.50	0.13
			Max. Vy	20	-0.16	-0.54	0.13
			Max. Vx	20	-0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	23	475.56	38.93	-22.45
	Max. H_x	23	475.56	38.93	-22.45
	Max. H_z	17	-337.73	-32.16	18.54
	Min. Vert	17	-337.73	-32.16	18.54
	Min. H_x	17	-337.73	-32.16	18.54
	Min. H_z	23	475.56	38.93	-22.45

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg B	Max. Vert	19	475.85	-31.96	-22.44
	Max. H_x	25	-338.19	32.19	18.53
	Max. H_z	25	-338.19	32.19	18.53
	Min. Vert	25	-338.19	32.19	18.53
	Min. H_x	19	475.85	-31.96	-22.44
	Min. H_z	19	475.85	-31.96	-22.44
Leg A	Max. Vert	15	476.08	-0.03	44.98
	Max. H_x	24	46.29	3.21	1.52
	Max. H_z	15	476.08	-0.03	44.98
	Min. Vert	21	-338.49	0.03	-37.17
	Min. H_x	18	48.83	-3.22	1.49
	Min. H_z	21	-338.49	0.03	-37.17

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear, S_x K	Shear, S_z K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	49.20	-0.00	0.00	0.44	0.41	0.00
Dead+Wind 0 deg - No Ice	49.20	-0.02	-46.15	-4187.47	5.14	-0.97
Dead+Wind 30 deg - No Ice	49.20	22.45	-34.96	-3156.21	-3035.24	-0.15
Dead+Wind 60 deg - No Ice	49.20	38.57	-22.29	-3012.59	-5211.63	0.31
Dead+Wind 90 deg - No Ice	49.20	44.93	0.02	9.16	-6059.08	1.38
Dead+Wind 120 deg - No Ice	49.20	38.92	23.09	3078.41	-5193.43	1.63
Dead+Wind 150 deg - No Ice	49.20	22.49	38.98	5291.87	-3033.42	1.33
Dead+Wind 180 deg - No Ice	49.20	0.02	44.61	6034.87	-4.31	0.97
Dead+Wind 210 deg - No Ice	49.20	-22.45	38.96	5257.15	5026.07	0.13
Dead+Wind 240 deg - No Ice	49.20	-38.89	23.06	3099.20	5145.54	-0.71
Dead+Wind 270 deg - No Ice	49.20	-44.93	-0.02	-4.24	6059.81	-1.31
Dead+Wind 300 deg - No Ice	49.20	-38.59	-22.32	-3026.77	5137.18	-1.45
Dead+Wind 330 deg - No Ice	49.20	-22.49	-38.98	-5281.00	3034.25	-1.53
Dead+Ice+Temp	124.41	-0.00	0.00	1.17	0.91	0.00
Dead+Wind 0 deg+Ice+Temp	124.41	-0.02	-79.60	-8305.34	5.49	-1.15
Dead+Wind 30 deg+Ice+Temp	124.41	32.30	-54.01	-7470.28	-7274.69	-0.17
Dead+Wind 60 deg+Ice+Temp	124.41	54.25	-31.34	-6153.66	-7196.14	0.35
Dead+Wind 90 deg+Ice+Temp	124.41	64.65	0.02	5.71	-8538.00	1.65
Dead+Wind 120 deg+Ice+Temp	124.41	54.10	33.32	4659.95	-8592.32	2.00
Dead+Wind 150 deg+Ice+Temp	124.41	32.33	56.08	7422.16	-4262.46	1.82
Dead+Wind 180 deg+Ice+Temp	124.41	0.02	63.72	8527.49	-3.60	1.15
Dead+Wind 210 deg+Ice+Temp	124.41	-32.30	56.01	7422.61	4276.48	0.37
Dead+Wind 240 deg+Ice+Temp	124.41	-54.68	33.29	4652.09	7249.66	-0.35
Dead+Wind 270 deg+Ice+Temp	124.41	-64.63	-0.02	-3.38	8559.89	-1.45
Dead+Wind 300 deg+Ice+Temp	124.41	-54.27	-31.31	-6165.93	7292.57	-2.00
Dead+Wind 330 deg+Ice+Temp	124.41	-32.33	-56.02	-7424.92	4284.35	-1.82
Dead+Wind 0 deg - Service	49.20	-0.01	-22.99	-2092.51	2.77	-0.48
Dead+Wind 30 deg - Service	49.20	11.19	-19.41	-2418.83	-1507.18	-0.07
Dead+Wind 60 deg - Service	49.20	19.22	-11.11	-1500.87	-3596.59	0.26
Dead+Wind 90 deg - Service	49.20	22.39	0.01	2.79	-3518.85	0.69
Dead+Wind 120 deg - Service	49.20	19.39	11.51	1544.10	-2665.25	0.81
Dead+Wind 150 deg - Service	49.20	11.20	19.43	2622.05	-1511.25	0.76
Dead+Wind 180 deg - Service	49.20	0.01	22.23	3007.12	-1.91	0.48
Dead+Wind 210 deg - Service	49.20	-11.19	19.41	2619.79	1504.81	0.07
Dead+Wind 240 deg - Service	49.20	-19.21	11.49	1640.02	2603.73	-0.36
Dead+Wind 270 deg - Service	49.20	-22.39	-0.01	-1.92	3039.61	-0.69
Dead+Wind 300 deg - Service	49.20	-19.23	-11.12	-1504.94	2599.77	-0.84
Dead+Wind 330 deg - Service	49.20	-11.20	-19.42	-2621.18	1512.68	-0.76

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-49.20	0.00	0.00	49.20	-0.00	0.000%
2	-0.02	-49.20	-46.15	0.02	49.20	46.15	0.000%
3	22.45	-49.20	-34.96	-22.45	49.20	34.96	0.000%
4	38.57	-49.20	-22.29	-38.57	49.20	22.29	0.000%
5	44.93	-49.20	0.02	-44.93	49.20	-0.02	0.000%
6	38.92	-49.20	23.09	-38.92	49.20	-23.09	0.000%
7	22.49	-49.20	38.98	-22.49	49.20	-38.98	0.000%
8	0.01	-49.20	44.61	-0.02	49.20	-44.61	0.000%
9	-22.45	-49.20	38.96	22.45	49.20	-38.96	0.000%
10	-38.90	-49.20	23.06	38.90	49.20	-23.06	0.000%
11	-44.93	-49.20	-0.02	44.93	49.20	0.02	0.000%
12	-38.59	-49.20	-22.32	38.59	49.20	22.32	0.000%
13	-22.49	-49.20	-38.98	22.49	49.20	38.98	0.000%
14	0.00	-138.41	0.00	0.00	138.41	-0.00	0.000%
15	-0.02	-138.41	-79.60	0.03	138.41	79.60	0.000%
16	32.30	-138.41	-54.01	-32.30	138.41	54.01	0.000%
17	54.25	-138.41	-31.34	-54.25	138.41	31.34	0.000%
18	64.63	-138.41	0.02	-64.63	138.41	-0.02	0.000%
19	54.10	-138.41	33.32	-54.10	138.41	-33.32	0.000%
20	32.33	-138.41	56.08	-32.33	138.41	-56.08	0.000%
21	0.02	-138.41	63.72	-0.03	138.41	-63.72	0.000%
22	-32.30	-138.41	56.01	32.30	138.41	-56.01	0.000%
23	-54.68	-138.41	33.29	54.68	138.41	-33.29	0.000%
24	-64.63	-138.41	-0.02	64.63	138.41	0.02	0.000%
25	-54.27	-138.41	-31.31	54.27	138.41	31.31	0.000%
26	-32.33	-138.41	-56.02	32.33	138.41	56.02	0.000%
27	-0.01	-49.20	-22.99	0.01	49.20	22.99	0.000%
28	11.19	-49.20	-19.41	-11.19	49.20	19.41	0.000%
29	19.22	-49.20	-11.11	-19.22	49.20	11.11	0.000%
30	22.39	-49.20	0.01	-22.39	49.20	-0.01	0.000%
31	19.39	-49.20	11.51	-19.39	49.20	-11.51	0.000%
32	11.20	-49.20	19.43	-11.20	49.20	-19.43	0.000%
33	0.01	-49.20	22.23	-0.01	49.20	-22.23	0.000%
34	-11.19	-49.20	19.41	11.19	49.20	-19.41	0.000%
35	-19.21	-49.20	11.49	19.21	49.20	-11.49	0.000%
36	-22.39	-49.20	-0.01	22.39	49.20	0.01	0.000%
37	-19.23	-49.20	-11.12	19.23	49.20	11.12	0.000%
38	-11.20	-49.20	-19.42	11.20	49.20	19.42	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	240 - 220	14.466	27	0.6779	0.0250
T2	220 - 200	13.435	27	0.6378	0.0205
T3	200 - 180	9.681	27	0.5184	0.0130
T4	180 - 160	6.597	27	0.4004	0.0063
T5	160 - 140	3.909	27	0.2715	0.0033
T6	140 - 120	2.391	27	0.2017	0.0022
T7	120 - 100	1.660	27	0.1541	0.0013

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T8	100 - 80	1.733	27	0.1359	0.0009
T9	80 - 60	1.084	27	0.1341	0.0006
T10	60 - 40	0.591	27	0.0920	0.0003
T11	40 - 20	0.269	27	0.0559	0.0002
T12	20 - 0	0.068	27	0.0253	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
240.00	Beacon	27	14.468	0.6779	0.0200	42132
221.00	WHIP (2.88" X 12')	27	11.772	0.6409	0.0208	16538
218.00	WHIP (2.88" X 12')	27	11.363	0.6320	0.0202	14855
195.00	(2) 7770.00	27	8.853	0.5381	0.0171	10532

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	240 - 220	42.006	15	1.9050	0.0491
T2	220 - 200	34.048	15	1.8108	0.0496
T3	200 - 180	26.961	15	1.5781	0.0310
T4	180 - 160	20.604	15	1.3065	0.0151
T5	160 - 140	15.495	15	1.0880	0.0087
T6	140 - 120	11.325	15	0.8507	0.0054
T7	120 - 100	7.875	15	0.6948	0.0032
T8	100 - 80	5.339	15	0.5275	0.0022
T9	80 - 60	3.270	15	0.4011	0.0014
T10	60 - 40	1.745	15	0.2760	0.0007
T11	40 - 20	0.718	15	0.1772	0.0004
T12	20 - 0	0.172	15	0.0779	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
240.00	Beacon	15	42.006	1.9050	0.0491	27517
221.00	WHIP (2.88" X 12')	15	34.435	1.8186	0.0500	7290
218.00	WHIP (2.88" X 12')	15	33.375	1.7937	0.0485	6368
195.00	(2) 7770.00	15	26.093	1.5502	0.0290	3882

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load/Allowable	Allowable Ratio	Criteria
T1	240	Leg	A325N	0.7500	4	4.51	19.44	0.233 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	3.70	4.44	0.833 ✓	1.333	Member Block Shear
		Top Girt	A325N	0.7500	1	0.92	5.03	0.184 ✓	1.333	Member Block Shear
T2	220	Leg	A325N	0.7500	6	10.58	19.44	0.544 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	7.21	8.02	0.900 ✓	1.333	Member Block Shear
T3	200	Leg	A325N	0.7500	8	12.82	19.44	0.660 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	5.48	6.66	0.823 ✓	1.333	Member Block Shear
T4	180	Leg	A325N	1.0000	6	22.39	34.56	0.648 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	5.32	8.02	0.663 ✓	1.333	Member Block Shear
T5	160	Leg	A325N	1.0000	6	26.33	34.56	0.762 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	6.85	7.77	0.881 ✓	1.333	Member Block Shear
T6	140	Leg	A325N	1.2500	6	30.90	53.99	0.572 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	7.00	7.77	0.901 ✓	1.333	Member Block Shear
T7	120	Leg	A325N	1.2500	6	35.47	53.99	0.657 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	7.97	12.95	0.615 ✓	1.333	Member Block Shear
T8	100	Leg	A325N	1.0000	12	19.14	34.56	0.554 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	11.24	16.31	0.689 ✓	1.333	Member Block Shear
T9	80	Leg	A325N	1.0000	12	21.52	34.56	0.623 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	11.49	16.31	0.704 ✓	1.333	Member Block Shear
T10	60	Leg	A325N	1.0000	12	23.38	34.56	0.677 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	2	12.74	25.26	0.505 ✓	1.333	Bolt Shear
T11	40	Leg	A325N	1.0000	12	25.63	34.56	0.742 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	13.43	25.26	0.532 ✓	1.333	Bolt Shear
T12	20	Leg	F1554-105	1.2500	12	27.13	50.62	0.536 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	14.51	25.26	0.577 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in²	Actual P K	Allow. P_a K	Ratio P/P_a
T1	240 - 220	P-2.50" - 0.75" conn.-20' -C (Pirod 225160)	20.00	4.90	62.0 K=1.00	22.371	1.7040	-26.63	38.12	0.699 ✓
T2	220 - 200	P-4.00" - 0.75" conn.-20' -C-Truss 4B-4B (Pirod 225184)	20.00	4.67	53.8 K=1.00	21.877	3.1741	-76.59	75.79	1.011 ✓
T3	200 - 180	P-5.00" - 0.75" conn.-Truss-20' -C (Pirod 226200)	20.03	6.68	42.7 K=1.00	25.451	4.2999	-124.62	109.44	1.139 ✓
T4	180 - 160	P-6.00" - 0.75" conn.-HDD-Truss-20' -C (Pirod 229377)	20.03	6.61	35.7 K=1.00	26.422	5.5813	-167.57	147.47	1.136 ✓
T5	160 - 140	#12ZG-58 - 1.50" - 1.00" conn. (Pirod 194531)	20.03	10.02	35.7 K=1.00	30.223	5.3014	-200.84	160.22	1.254 ✓
T6	140 - 120	#12ZG-58 - 1.75" - 1.00" conn.-TR1 (Pirod 195213)	20.03	10.02	30.6 K=1.00	31.059	7.2151	-239.94	224.19	1.070 ✓
T7	120 - 100	#12ZG-58 - 1.75" - 1.00" conn. (Pirod 195217)	20.03	10.02	30.6 K=1.00	31.069	7.2151	-280.03	224.19	1.249 ✓
T8	100 - 80	#12ZG-58 - 2.00" - 0.875" conn.-TR3 (Pirod 195637)	20.03	20.03	41.8 K=1.00	27.775	9.4248	-305.14	261.77	1.166 ✓
T9	80 - 60	#12ZG-58 - 2.00" - 0.875" conn. (Pirod 195659)	20.03	20.03	41.8 K=1.00	27.775	9.4248	-346.22	261.77	1.323 ✓
T10	60 - 40	#12ZG-58 - 2.25" - 0.875" conn. (Pirod 195963)	20.03	20.03	48.8 K=1.00	27.740	11.9282	-384.10	331.45	1.159 ✓
T11	40 - 20	#12ZG-58 - 2.25" - 0.875" conn. (Pirod 195950)	20.03	20.03	48.8 K=1.00	27.788	11.9282	-421.00	331.46	1.270 ✓
T12	20 - 0	#12ZG-58 - 2.50" - 0.875" conn.-TR4 (Pirod 195957)	20.03	20.03	48.7 K=1.00	22.303	14.7262	-458.63	409.43	1.120 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in²	Actual V K	Allow. V_a K	Stress Ratio
T5	160 - 140	0.5	1.42	95.3	13.575	0.1963	1.46	3.08	0.475 ✓
T6	140 - 120	0.5	1.40	94.4	13.679	0.1963	1.19	3.11	0.384 ✓
T7	120 - 100	0.5	1.40	94.4	13.679	0.1963	1.30	3.11	0.417 ✓
T8	100 - 80	0.5	1.39	93.2	13.816	0.1963	1.57	3.15	0.510 ✓
T9	80 - 60	0.5	1.39	93.2	13.816	0.1963	2.07	3.15	0.658 ✓
T10	60 - 40	0.5	1.38	92.4	13.917	0.1963	1.75	3.17	0.551 ✓
T11	40 - 20	0.5	1.38	92.4	13.917	0.1963	1.72	3.17	0.542 ✓
T12	20 - 0	0.5	1.36	91.6	14.015	0.1963	1.34	3.19	0.421 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in²	Actual P K	Allow. P_a K	Ratio P/P_a
T1	240 - 220	L2x2x1/8	5.82	2.72	91.6 K=1.13	13.717	0.4844	-3.53	6.64	0.531 ✓
T2	220 - 200	L2 1/2x2 1/2x3/16	7.17	3.43	91.8 K=1.11	13.994	0.9020	-7.84	12.62	0.621 ✓
T3	200 - 180	L2x2x3/16	8.13	4.07	123.9 K=1.00	9.317	0.7150	-5.21	6.93	0.754 ✓
T4	180 - 160	L2 1/2x2 1/2x3/16	9.08	4.54	112.6 K=1.02	11.320	0.9020	-5.69	10.21	0.558 ✓
T5	160 - 140	L3x3x3/16	12.65	6.33	129.5 K=1.00	8.901	1.0900	-6.86	9.70	0.707 ✓
T6	140 - 120	L3x3x3/16	14.18	7.14	143.8 K=1.00	7.225	1.0900	-7.03	7.88	0.893 ✓
T7	120 - 100	L3x3x5/16	14.87	7.52	153.2 K=1.00	6.362	1.7800	-8.42	11.32	0.743 ✓
T8	100 - 80	2L3x3x3/16	21.79	12.45	159.1 K=1.00	5.898	2.1800	-12.73	12.86	0.990 ✓
T9	80 - 60	2L3x3x3/16	23.03	13.02	166.4 K=1.00	5.393	2.1800	-12.27	11.76	1.044 ✓
T10	60 - 40	2L3 1/2x3 1/2x1/4	26.36	13.63	150.1 K=1.00	6.629	3.3750	-12.16	22.37	0.544 ✓
T11	40 - 20	2L3 1/2x3 1/2x1/4	22.77	14.33	157.5 K=1.00	6.017	3.3750	-13.43	20.31	0.661 ✓
T12	20 - 0	2L3 1/2x3 1/2x1/4	29.25	15.08	161.4 K=1.00	5.457	3.3750	-13.43	18.42	0.729 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in²	Actual P K	Allow. P_a K	Ratio P/P_a
T1	240 - 220	L2x2x3/16	5.00	4.47	135.1 K=1.00	8.051	0.7150	-0.83	5.76	0.144 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in²	Actual P K	Allow. P_a K	Ratio P/P_a
T1	240 - 220	P-2.50" - 0.75" conn.-20' -C (Pirod 225160)	20.00	4.90	62.0	33.000	1.7040	19.64	51.12	0.384 ✓

tnxTower	Job: 284859	Page: 105 of 107
1545 Pidco Dr.	Project: V-25 x 240' - Ashford, CT	Date: 15:15:37 03/30/15
Plymouth, IN *Phone: (574) 936-4221* *FAX: (574) 936-6458*	Client: Verizon Wireless	Designed by: JAK

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in²	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	220 - 200	P- 4.00" - 0.33" conn.-20' -C-Truss-4B-4B-(Pirod 225184)	20.00	6.67	53.0	30.000	3.3741	61.45	91.23	0.658 ✓
T3	200 - 180	P- 5.00" - 0.75" conn.-Truss-20' -C-(Pirod 226200)	20.03	6.68	42.7	30.000	4.2999	102.59	129.00	0.795 ✓
T4	180 - 160	P- 6.00" - 0.75" conn.-HBD-Truss-20' -C-(Pirod 225377)	20.03	6.68	35.7	30.000	5.5813	134.31	167.44	0.802 ✓
T5	160 - 140	#12ZG-58 - 1.50" - 1.00" conn. (Pirod 194651)	20.03	10.02	33.7	34.800	5.3014	151.68	184.49	0.857 ✓
T6	140 - 120	#12ZG-58 - 1.75" - 1.00" conn.-TR1-(Pirod 195213)	20.03	10.02	30.6	34.800	7.2158	185.40	251.12	0.738 ✓
T7	120 - 100	#12ZG-58 - 1.75" - 1.00" conn. (Pirod 195217)	20.03	10.02	30.6	34.800	7.2158	212.84	251.11	0.848 ✓
T8	100 - 80	#12ZG-58 - 2.00" - 0.875" conn.-TR3-(Pirod 195637)	20.03	20.03	48.8	34.800	9.4248	229.71	327.98	0.700 ✓
T9	80 - 60	#12ZG-58 - 2.00" - 0.875" conn. (Pirod 195639)	20.03	20.03	48.8	34.800	9.4248	258.10	327.58	0.787 ✓
T10	60 - 40	#12ZG-58 - 2.25" - 0.875" conn. (Pirod 195950)	20.03	20.03	48.0	34.800	11.9282	280.57	415.10	0.676 ✓
T11	40 - 20	#12ZG-58 - 2.25" - 0.875" conn. (Pirod 195950)	20.03	20.03	48.8	34.800	11.9282	307.52	415.10	0.741 ✓
T12	20 - 0	#12ZG-58 - 2.50" - 0.875" conn.-TR4-(Pirod 195952)	20.05	20.03	45.7	34.800	14.7262	325.55	512.47	0.635 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in²	Actual V K	Allow. V_a K	Stress Ratio
T5	160 - 140	0.5	1.42	95.2	13.573	0.1963	1.45	3.08	0.475 ✓
T6	140 - 120	0.5	1.40	94.4	13.679	0.1963	1.19	3.11	0.384 ✓
T7	120 - 100	0.5	1.40	94.4	13.679	0.1963	1.30	3.11	0.417 ✓
T8	100 - 80	0.5	1.39	93.2	13.816	0.1963	1.67	3.15	0.530 ✓
T9	80 - 60	0.5	1.39	93.2	13.816	0.1963	2.07	3.15	0.658 ✓
T10	60 - 40	0.5	1.38	92.4	13.917	0.1963	1.75	3.17	0.551 ✓
T11	40 - 20	0.5	1.38	92.4	13.917	0.1963	1.72	3.17	0.542 ✓
T12	20 - 0	0.5	1.36	91.6	14.015	0.1963	1.34	3.19	0.421 ✓

tnxTower	Job: 284859	Page: 106 of 107
1545 Pidco Dr.	Project: V-25 x 240' - Ashford, CT	Date: 15:15:37 03/30/15
Plymouth, IN *Phone: (574) 936-4221* *FAX: (574) 936-6458*	Client: Verizon Wireless	Designed by: JAK

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in²	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	240 - 220	L2x2x1/8	5.12	2.72	55.8	29.000	0.2813	3.70	8.16	0.453 ✓
T2	220 - 200	L2 1/2x2 1/2x3/16	7.17	3.40	55.3	29.000	0.5535	7.21	16.05	0.449 ✓
T3	200 - 180	L2x2x3/16	7.66	3.85	78.6	29.000	0.4132	5.48	11.98	0.458 ✓
T4	180 - 160	L2 1/2x2 1/2x3/16	9.60	4.80	76.9	29.000	0.5535	5.32	15.05	0.351 ✓
T5	160 - 140	L3x3x3/16	12.61	6.43	84.7	29.000	0.6593	6.85	19.12	0.351 ✓
T6	140 - 120	L3x3x3/16	14.10	7.14	93.7	29.000	0.6593	7.00	19.12	0.356 ✓
T7	120 - 100	L3x3x5/16	15.67	7.91	105.5	29.000	1.0713	7.97	31.07	0.256 ✓
T8	100 - 80	2L3x3x3/16	23.79	12.45	161.5	29.000	1.3537	10.24	39.26	0.255 ✓
T9	80 - 60	2L3x3x3/16	25.03	13.02	168.8	29.000	1.3537	11.49	39.26	0.293 ✓
T10	60 - 40	2L3 1/2x3 1/2x1/4	26.36	13.45	152.1	29.000	2.1563	12.74	62.53	0.204 ✓
T11	40 - 20	2L3 1/2x3 1/2x1/4	27.77	14.33	159.6	29.000	2.1563	11.23	62.51	0.180 ✓
T12	20 - 0	2L3 1/2x3 1/2x1/4	29.25	15.04	167.5	29.000	2.1563	14.58	62.53	0.233 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in²	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	240 - 220	L2x2x3/16	5.00	4.47	92.6	29.000	0.4132	0.92	11.58	0.077 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T1	240 - 220	Leg	P- 2.50" - 0.75" conn.-20' -C (Pirod 226160)	1	-25.43	50.82	52.4	Pass
T2	220 - 200	Leg	P- 4.00" - 0.75" conn.-20' -C-Truss-4B-4B-(Pirod 225184)	31	-76.59	101.02	75.8	Pass
T3	200 - 180	Leg	P- 5.00" - 0.75" conn.-Truss-20' -C-(Pirod 226200)	52	-126.12	145.18	86.9	Pass
T4	180 - 160	Leg	P- 6.00" - 0.75" conn.-HBD-Truss-20' -C-(Pirod 225377)	75	-167.57	196.58	85.2	Pass
T5	160 - 140	Leg	#12ZG-58 - 1.50" - 1.00" conn. (Pirod 194651)	95	-200.84	218.57	94.0	Pass
T6	140 - 120	Leg	#12ZG-58 - 1.75" - 1.00" conn.-TR1-(Pirod 195213)	111	-239.94	298.84	80.3	Pass
T7	120 - 100	Leg	#12ZG-58 - 1.75" - 1.00" conn. (Pirod 195217)	126	-280.02	298.84	93.7	Pass
T8	100 - 80	Leg	#12ZG-58 - 2.00" - 0.875" conn.-TR3-(Pirod 195637)	141	-305.14	348.94	87.4	Pass
T9	80 - 60	Leg	#12ZG-58 - 2.00" - 0.875" conn. (Pirod 195639)	150	-346.22	348.94	99.2	Pass
T10	60 - 40	Leg	#12ZG-58 - 2.25" - 0.875" conn. (Pirod 195950)	159	-384.10	441.84	85.9	Pass
T11	40 - 20	Leg	#12ZG-58 - 2.25" - 0.875" conn. (Pirod 195950)	168	-421.00	441.84	95.3	Pass
T12	20 - 0	Leg	#12ZG-58 - 2.50" - 0.875" conn.-TR4-(Pirod 195952)	177	-458.62	545.79	84.0	Pass
T1	240 - 220	Diagonal	L2x2x1/8	11	-3.53	8.88	39.9 62.5 (b)	Pass
T2	220 - 200	Diagonal	L2 1/2x2 1/2x3/16	35	-7.84	16.83	46.6 67.5 (b)	Pass
T3	200 - 180	Diagonal	L2x2x3/16	56	-5.28	9.24	56.6 61.1 (b)	Pass
T4	180 - 160	Diagonal	L2 1/2x2 1/2x3/16	81	-5.69	13.61	41.8 49.8 (b)	Pass
T5	160 - 140	Diagonal	L3x3x3/16	98	-6.68	12.97	51.0 66.1 (b)	Pass
T6	140 - 120	Diagonal	L3x3x3/16	113	-7.03	10.30	62.0 67.8 (b)	Pass
T7	120 - 100	Diagonal	L3x3x5/16	134	-8.42	15.09	55.1	Pass
T8	100 - 80	Diagonal	2L3x3x3/16	143	-12.71	17.14	74.3	Pass
T9	80 - 60	Diagonal	2L3x3x3/16	152	-12.27	15.67	78.3	Pass
T10	60 - 40	Diagonal	2L3 1/2x3 1/2x1/4	161	-12.15	29.82	40.8	Pass
T11	40 - 20	Diagonal	2L3 1/2x3 1/2x1/4	170	-13.43	27.07	49.6	Pass
T12	20 - 0	Diagonal	2L3 1/2x3 1/2x1/4	179	-13.40	24.53	54.7	Pass
T1	240 - 220	Top Girt	L2x2x3/16	6	-0.15	7.58	11.3 13.8 (b)	Pass
							Summary	
						Leg (T9)	99.2	Pass
						Diagonal (T9)	78.3	Pass
						Top Girt (T1)	13.8	Pass
						Bolt Checks	67.6	Pass
						RATING =	99.2	Pass

ms13

UNIT BASE FOUNDATION SUMMARY

Verizon
Ashford, CT

V- 25.0 240
A- 284859

V 2.1

Foundation Dimensions		
Pad width, W:	33.0	ft
Depth, D:	6.5	ft
Ext. above grade, E:	0.5	ft
Pier diameter, d_i:	3.5	ft
Pad thickness, T:	1.75	ft
Depth neglected, N:	6.5	ft
Volume, V_o:	76.20	cy

Reinforcement Design		
pad, m_p:	49	bars *
size, s_p:	8	
vertical, m_c:	19	verticals
size, s_c:	9	3" cage
ties, m_t:	10	ties
size, s_t:	4	w/ hooks

* Rebar to be equally spaced, both ways, top & bottom

* Use standees to support top rebar above bottom rebar in mat

Soil Information Per:
Terracon, Dated 02/23/15, Project#J2155118

Soil Parameters		
Soil unit weight, γ:	125	pcf
Ultimate Bearing, B_c:	10.000	ksf
Cohesion, C_o:	0.000	ksf
Friction angle, ϕ:	0.0	degrees
Ult. Passive P., P_p:	0.125	pcf
Base sliding, μ:	0.20	
Seismic Zone:	2	
Water at:	none	ft

Anchor Steel Selection		
Part Number, P/N:	103183	Da = 1.25" Length = 60"

Material Properties		
Steel tensile str, F_y:	60000	psi
Conc. Comp. str, F'_c:	4500	psi
Conc. Density, δ:	150	pcf
Clear cover, cc:	3.00	in

Backfill Compaction		
Lift thickness:	8	in
Compaction:	95	%
Modified Proctor:	ASTM	D1557

Tower design conforms to the following:

* *1997 Uniform Building Code (UBC)*
* *2000 & 2003 International Building Code (IBC)*
* *ANSI TIA-222-G*
* *Building Code Requirements for Reinforced Concrete (ACI 318-05)*

Note: The centroid of the tower is offset from the centroid of the foundation

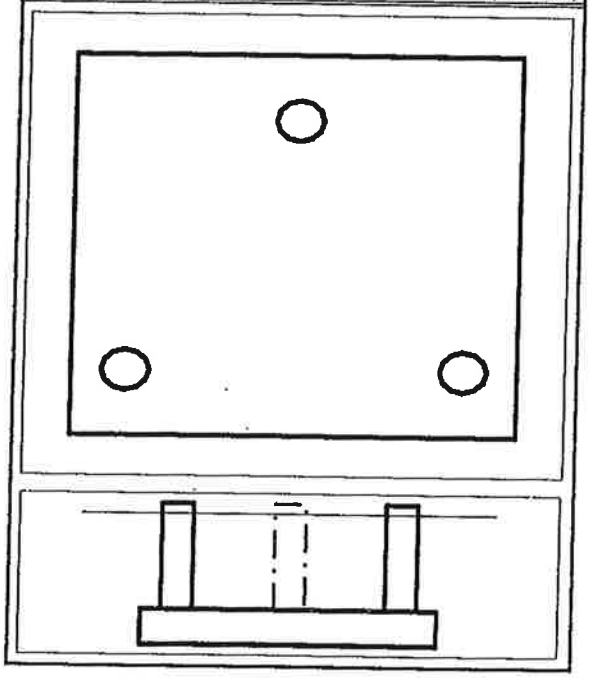
Foundation Loading

Load Case 1:

Load Case 2	stress ratio: 100.0%		mark up: 0.0%
Shear (total), S:	84.00 kips	x 1 =	84.00 kips
Moment, M:	11251.00 ft-kips	x 1 =	11251.00 ft-kips
Compression/Leg, C:	530.00 kips	x 1 =	530.00 kips
Uplift/Leg, U:	473.00 kips	x 1 =	473.00 kips
Tower Weight, W_t:	59.00 kips	=	59.00 kips

Views of Foundation

(not to scale)



APR 0 1 2015

Additional Notes:

* No foundation modifications listed.
* See attached "Foundation Notes" for further information.

FOUNDATION NOTES

1. THE ON-SITE GEOTECHNICAL ENGINEER SHALL CONFIRM THAT THE INSITU SOIL STRENGTHS MEET OR EXCEED THOSE PARAMETERS GIVEN IN THE SOIL REPORT.
2. GRADE THE SITE TO DRAIN AWAY FROM FOUNDATION.
3. A SUMP PUMP OR OTHER DEWATERING SYSTEM MAY BE REQUIRED TO LOWER THE WATER TABLE TO FACILITATE THE INSTALLATION OF THE FOUNDATION.
4. ANY SOFT OR UNSTABLE SUBGRADE SOILS DETECTED DURING THE EXCAVATION SHOULD BE REMOVED AND REPLACED WITH COMPACTED FILL AS PER THE SPECIFICATIONS PROVIDED IN THE GEOTECHNICAL REPORT REFERENCED ABOVE (SEE SECTION 4.3.1.2).

UNIT BASE FOUNDATION (Load Case 2)

Verizon
Ashford, CT

V- 25.0 240 V 2.1
A- 284859

Reactions	stress ratio	100.0%	mark up:	0.0%
Shear, S:	84.00 kips	x 1 =	84.00 kips	
Moment, M:	11251.00 ft-kips	x 1 =	11251.00 ft-kips	
Compression / leg, C:	530.00 kips	x 1 =	530.00 kips	
Uplift / leg, U:	473.00 kips	x 1 =	473.00 kips	
Tower weight, W_t:	59.00 kips	=	59.00 kips	

Soil per: Terracon, Dated 02/23/15, Project#J2155118

Ultimate bearing: 10.000 ksf
Ultimate Pp: 0.125 kcf

Load Case 2 = 0.9*D + 1.0*Dg + 1.6*Wo

Physical Parameters:

Concrete volume:	$V = T * W^2 + 3 * (di^2 / 4 * \pi) * (D + E - T)$	$V =$	76.2	cy
Concrete weight:	$W_c = V * \delta$	$W_c =$	308.6	kips
Soil weight:	$W_s = (D - T) * (W^2 - 3 * (di^2 / 4 * \pi)) * \gamma$	$W_s =$	628.5	kips
Total weight:	$P = Wc + Ws + Wt$	$P =$	997.05	kips

Passive Pressure:

Pp coefficient:	$K_p = TAN(45 + \varphi / 2)^2$	$K_p =$	1.000	
	$P_{pn} = Kp * \gamma * N + 2 * Co * \sqrt{(Kp)}$	$P_{pn} =$	0.813	ksf
	$P_{pt} = Kp * \gamma * (D - T) + 2 * Co * \sqrt{(Kp)}$	$P_{pt} =$	0.594	ksf
	$P_{pb} = Kp * \gamma * D + 2 * Co * \sqrt{(Kp)}$	$P_{pb} =$	0.813	ksf
	$P_{ptop} = IF(N < (D - T), Ppt, Ppn)$	$P_{ptop} =$	0.8	ksf
	$Pp' = (Pptop + Ppb) / 2$	$Pp' =$	0.813	ksf
Shear area:	$T_{pp} = 0$	$T_{pp} =$	0.0	ft
	$A_{pp} = Tpp * W$	$A_{pp} =$	0.00	ft^2
Shear Capacity: $\varphi r = 0.75$	$S_{actual} = (Pp' * App + \mu * P) * \varphi r$	$S_{actual} =$	149.557	kips

Check	$S_{actual} =$	149.56 kips	>=	S =	84.00 kips	OK

Overturning Moment Resistance at Toe:

Wt of soil wedge:	$W_{sw} = D * (D * TAN(\varphi)) / 2 * W * \gamma$	$W_{sw} =$	0.0	kips
Dist. from leg to edge:	$O = (W - 0.866 * w') / 2$	$O =$	5.675	ft
Additional offset of Wt:	$O_a = (2 / 3 * 0.866 * w' + O) - W / 2$	$O_a =$	3.608	ft
Resisting moments:	$M_{rwt} = P * W / 2 - Wt * Oa$	$M_{rwt} =$	16238.41	ft-kips
	$M_{rp} = Pp' * App * (D - N) / 3$	$M_{rp} =$	0.00	ft-kips
	$M_{rsw} = Wsw * (W + D * TAN(\varphi) / 3)$	$M_{rsw} =$	0.00	ft-kips
Total resisting: $\varphi r = 0.75$	$M_{rt} = (Mrwt + Mrp + Mrsw) * \varphi r$	$M_{rt} =$	12178.81	ft-kips
Total overturning:	$M_o = M + S * (D + E)$	$M_o =$	11839.00	ft-kips

Check	$M_{rt} =$	12178.81 ft-kips	>=	$M_o =$	11839.00 ft-kips	OK

Bearing Resistance due to Pressure Distribution:

Area of mat:	$area = W^2$	area =	1089.0	ft^2
Section modulus:	$SM = W^3 / 6$	SM =	5989.5	ft^3
Factored total weight:	$P' = Wt + 0.9 * (Wc + Ws)$	P' =	903.2	kip
Pressure exerted:	$P_{pos} = P' / area + Mo / SM$	$P_{pos} =$	2.806	ksf
	$P_{neg} = P' / area - Mo / SM$	$P_{neg} =$	-1.147	ksf

Note: The stress resultant is NOT within the kern. Bearing area has been adjusted below.

Load eccentricity:	$e_o = Mo / P'$	$e_o =$	13.11	ft			
	$P_{adj} = 2 * P' / (3 * W * (W / 2 - ec))$	$P_{adj} =$	5.4	ksf			
Adj. applied pressure:	$q_a = IF(Pneg >= 0, Ppos, Padj)$	$q_a =$	5.378	ksf			
$\varphi r = 0.75$	Check	$q_a =$	5.378	ksf	<=	$B_c * \varphi r =$	7.500 ksf OK

Concrete Shear Strength:

One way beam action at d_1 from lower

Effective depth:	$d_c = T - cc - db\_p / 2$	$d_c =$	17.500	in
Factored intensity:	$q_s = C / area$	$q_s =$	0.487	ksf
Required shear: $\varphi s = 0.75$ (ACI 9.3.2.3)	$V_{n1} = qs * (O - di / 2 - dc) * W / \varphi s$	$V_{n1} =$	52.82	kips
Available shear: (ACI 12.2.4)	$V_{c1} = 2 * \sqrt{(F'c)} * W * dc$	$V_{c1} =$	929.76	kips

Check	$V_{c1} =$	929.76 kips	>=	$V_{n1} =$	52.82 kips	OK

Two way beam action at d_i / 2 from tower

Perimeter:	$Po = (di + dc) * \pi$			$P_o =$	15.58	ft
Required shear: $\varphi s = 0.75$ *[ACI 9.3.2.3]*	$V_{n2} = qs / \varphi s * (area - (di + dc)^2 * \pi / 4)$			$V_{n2} =$	694.14	kips
Available shear: *[ACI 12.2.2]*	$V_{c2} = 4 * \sqrt{(F'c)} * Po * dc$			$V_{c2} =$	877.75	kips
	Check	$V_{c2} =$ 877.75 kips	>=	$V_{n2} =$ 694.14	kips	OK

Column Compression Capacity:

Compression reaction: $\varphi c = 0.65$ *[ACI 9.3.2.2]*	$P_o = \varphi c * 0.8 * F'c * (di^2 / 4 * \pi)$			$P_o =$	3241.9	kips
	Check	$P_c =$ 3241.94 kips	>=	C = 530.00	kips	OK

Pier Reinforcement:

Cross-sectional area:	$A_g = di^2 * \pi / 4$			$A_g =$	1385.44	in^2
Min. area of steel (pier): *[ACI 10.9.1] & [ACI 10.8.4]*	$A_{st\_c} = Ag * 0.005$			$A_{st\_c} =$	6.93	in^2
Cage circle:	$d_o = di - 2 * cc$			$d_o =$	36.00	in
Rebar:	$s\_c = 9$	$d_{b\_c} =$ 1.128 in				
	$m\_c = 19$	$A_{b\_c} =$ 1 in^2				
	$A_{s\_c} = Ab\_c * m\_c$			$A_{s\_c} =$	19.00	in^2
	Check	$A_{s\_c} =$ 19.00 in^2	>=	$A_{st\_c} =$ 6.93	in^2	OK
Actual moment:	$M_{max} = (D - T + E) * S / 2$			$M_{max} =$	220.50	ft-kips
Pier moment capacity:	M_{allow} *per Maxmomnt.xls (see attached)*			$M_{allow} =$	406.65	ft-kips
	Check	$M_{allow} =$ 406.65 ft-kips	>=	$M_{max} =$ 220.50	ft-kips	OK
Bar separation:	$B_{s\_c} = (do * \pi) / m\_c - db\_c$			$B_{s\_c} =$	4.82	in
	Check	10.87 >= $B_{s\_c} =$ 4.82 in		>= 4.5"		OK

Vertical Rebar Development Length:

Reinforcement location: *[ACI 12.2.4]*	ψ_{t_c} = if the space under the rebar > 12 in, use 1.3, else use 1.0	$\psi_{t\_c} =$	1.3
Epoxy coating: *[ACI 12.2.4]*	ψ_{e_c} = if epoxy-coated bars are not used, use 1.0; but if epoxy-coated bars are used, then if Bs < 6 * db or cc < 3 * db, use 1.5, else 1.2	$\psi_{e\_c} =$	1.0
Max term: *[ACI 12.2.4]*	$\psi_t\psi_{e\_c}$ = the product of ψt & ψe, need not be taken larger than 1.7	$\psi_t\psi_{e\_c} =$	1.3
Reinforcement size: *[ACI 12.2.4]*	ψ_{s_c} = if the bar size is 6 or less, then use 0.8, else use 1.0	$\psi_{s\_c} =$	1
Light weight concrete: *[ACI 12.2.4]*	λ_c = if lightweight concrete is used, 1.3, else use 1.0	$\lambda\_c =$	1.0
Spacing/cover: *[ACI 12.2.4]*	c_c the smaller of: half the bar spacing or the concrete edge distace	$c\_c =$	3.54 in
Transverse bars: *[ACI 12.2.3]*	$k_{tr\_c} = 0$ in (per simplification)	$k_{tr\_c} =$	0 in
Max term: *[ACI 12.2.3]*	$c\_c' = MIN(2.5, (c\_c + ktr\_c) / db\_c)$	$c\_c' =$	2.500
Excess reinforcement: *[ACI 12.2.5]*	$R_c = Mmax / Mallow$	$R\_c =$	0.54
Development (tensile): *[ACI 12.2.2]*	$L_{dt}'\_c = (3 / 40) * (Fy / \sqrt{(F'c)}) * (\psi t\psi e\_c * \psi s\_c * \lambda\_c * R\_c / c\_c') * db\_c$	$L_{dt}'\_c =$	21.34 in
Minimum length: *[ACI 12.2.1]*	$L_{d\_min} = 12$ inches	$L_{d\_min} =$	12.0 in
Development length:	$L_{dt\_c} = MAX(Ld\_min, Ldt'\_c)$	$L_{dt\_c} =$	21.34 in
Development (comp.): *[ACI 12.3.2]*	$L_{dc}'\_c = 0.02 * db\_c * Fy * R\_c / \sqrt{(F'c)}$	$L_{dc}'\_c =$	10.94 in
	$L_{dc}''\_c = 0.0003 * db\_c * Fy * R\_c$	$L_{dc}''\_c =$	11.01 in
Development length:	$L_{dc\_c} = MAX(8, Ldc'\_c, Ldc''\_c)$	$L_{dc\_c} =$	11.01 in
Length available in pier:	$L_{vc} = D - T + E - cc$	$L_{vc} =$	60.0 in
	Check $L_{vc} =$ 60.0 in >=	$L_{dt\_c} =$ 21.3	in OK
	Check $L_{vc} =$ 60.0 in >=	$L_{dc\_c} =$ 11.0	in OK
Length available in pad:	$L_{vp} = T - cc$	$L_{vp} =$	18.0 in
	Check $L_{vp} =$ 18.0 in >=	$L_{dt\_c} =$ 21.3	in HOOKS
	Check $L_{vp} =$ 18.0 in >=	$L_{dc\_c} =$ 11.0	in OK

Vertical Rebar Hook Ending:

Bar size & clear cover: [ACI 12.5.3]	α_h if the bar size <= 11 and side cc >= 2.5", use 0.7, else use 1.0				ψ_{t_h} =	0.7	
Epoxy coating: [ACI 12.5.2]	β_h if epoxy-coated bars are used, use 1.2, else use 1.0				ψ_{e_h} =	1.0	
Light weight concrete: [ACI 12.5.2]	λ_h if lightwieght concrete is used, 1.3, else use 1.0				$\lambda_{\_h}$ =	1.0	
Development (hook): [ACI 12.5.2]	$L_{dh}' = 0.02 * \psi t\_h * \psi e\_h * \lambda\_h * Fy / \sqrt{(F'c)} * db\_c$				L_{dh}' =	14.1	in
Minimum length: [ACI 12.5.1]	L_{dh_min} the larger of: 8 * db or 6 in				L_{dh_min} =	9.0	in
Development length:	L_{dh} = MAX(Ldh_min, Ldh')				L_{dh} =	14.1	in
	Check	L_{hp} = 18.0	in	>=	L_{dh} =	14.1	in OK
Hook tail length:	L_{h_tail} 12 * db beyond the bend radius				L_{h_tail} =	19.2	in
Length available in pad:	L_{h_pad} = (W - w' - di) / 2				L_{h_pad} =	27	in
	Check	L_{h_pad} = 27.0	in	>=	L_{dh_tail} =	19.2	in OK

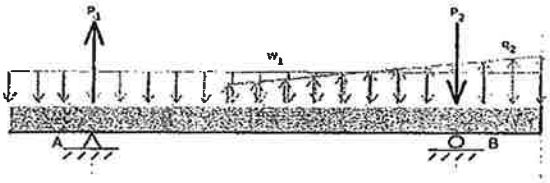
Pier Ties:

Minimum size: [ACI 7.10.5.1]	s_t_{min} =IF(s_c <= 10, 3, 4)				s_t_{min} =	3	
z factor:	z = 0.5 if the seismic zone is less than 2, else 1.0				z =	1	
Tie parameters:	s_t = 4	d_{b_t} =	0.5	in			
	m_t = 10	A_{b_t} =	0.2	in^2			
Allowable tie spacing:							
per vertical rebar [ACI 7.10.5.2] & [ACI 21.3.3.2]	$B_{s\_t\_max1}$ = 8 / z * db_c				$B_{s\_t\_max1}$ =	9.024	in
per tie size [ACI 7.10.5.2] & [ACI 21.3.3.2]	$B_{s\_t\_max2}$ = 24 / z * db_t				$B_{s\_t\_max2}$ =	12	in
per pier diameter [ACI 7.10.5.2] & [ACI 21.3.3.2]	$B_{s\_t\_max3}$ = di / (4 * z²)				$B_{s\_t\_max3}$ =	10.5	in
per seismic zone [ACI 7.10.5.2] & [ACI 21.3.3.2]	$B_{s\_t\_max4}$ = 12" in active seismic zones, else 18"				$B_{s\_t\_max4}$ =	12	in
	$B_{s\_t\_max}$ = MIN(Bs_t_max1, Bs_t_max2, Bs_t_max3, Bs_t_max4)				$B_{s\_t\_max}$ =	9.024	in
	m_t_{min} = (D - T + E) / Bs_t_max + 2				m_t_{min} =	9.0	
	Check	m_t = 10.0		>=	m_t_{min} =	9.0	OK

Anchor Steel:

A/S parameters:	P_{as} = 103183			L_{as} =	60	in	
	d_{as} = 1.25 in			E_{as} =	51.50	in	
Development available:	L_{das} *per Anchor Bolts (see attached)*					L_{das} =	41.50 in
Required development:	L_{das_min} *per Anchor Bolts (see attached)*					L_{das_min} =	21.34 in
	Check	L_{das} = 41.50	in	>=	L_{das_min} =	21.34	in OK
To bottom rebar grid:	E_{as_max} =D + E - cc - 2 * db_p					E_{as_max} =	79 in
	Check	E_{as} = 51.50	in	<=	E_{as_max} =	79.00	in OK
To top rebar grid:	rebar @ = D + E - T + cc					rebar @	66.00 in
	Check 66 + 6 in	>=	E_{as} = 51.50	in or	<=	66	in OK
Min. cage dia:	d_{o_min} *per ancsteel.xls (see attached)*					d_{o_min} =	33.89 in
	Check	d_o = 36.00	in	>=	d_{o_min} =	33.89	in OK

Pad Reactions:



MDSolids Geometry Input (Option 1)				
Total Beam Length:	B_{L2_1} =W	B_{L2_1}=	33	ft
Location of Left Support:	S_{L2_1} =0	S_{L2_1}=	5.675	ft
Location of Right Support:	S_{R2_1} =W-O	S_{R2_1}=	27.33	ft
MDSolids Geometry Input (Option 2)				
Total Beam Length:	B_{L2_2} =W	B_{L2_2}=	33.0	ft
Location of Left Support:	S_{L2_2} =(W - w1) / 2	S_{L2_2}=	4.00	ft
Location of Right Support:	S_{R2_2} =S_{L1_2} + w1	S_{R2_2}=	29.00	ft
MDSolids Load Input (Option 1 & Option 2)				
Uplift:	P_{2_1} =U	P_{2_1}=	473.0	kips
Compression:	P_{2_2} =C	P_{2_2}=	530.00	kips
Weight of Overburden: (Distributed)	w_{2_1} =0.9 * (W_c + W_s) / W	w_{2_1}=	25.58	klf
	Applied over the beam starting at 0' and ending at W=33ft.			
Distributed Soil Pressure: (Linearly Increasing)	q_{2_2L} =0	q_{2_2L}=	0.00	klf
	q_{2_2R} =q_a * W	q_{2_2R}=	177.48	klf
		This linearly increasing load is applied from e=13.11ft to W=33ft		
MDSolids Design Result				
Option 1:	M_{max2_1} =M_{max2_1} (Max. Moment calculated from MDsolids for Option 1)	M_{max2_1}=	2175.00	ft*kips
Option 2:	M_{max2_2} =M_{max2_2} (Max. Moment calculated from MDsolids for Option 2)	M_{max2_2}=	1121.00	ft*kips
Max moment:	M_{maxp} =Max(Mmax2_1,Mmax2_2)	M_{maxp}=	2175.00	ft*kips
Required moment: φt = 0.9 *[ACI 9.3.2.1]*	M_n = Mmaxp / φt	M_n =	2416.67	ft*kips

Pad Reinforcement:

β = IF(F'c <= 4000, 0.85, IF(F'c >= 8000, 0.65, 0.85 - (F'c - 4000) * 0.05)) → β = 0.825

Effective width: $W_e = w' * 0.866 + di$ → W_e = 25.150 ft

$A_{st\_p}' = Mn / (0.9 * Fy * dc)$ → A_{st_p}' = 30.688 in²

$a_p = Ast\_p' * Fy / (\beta * F'c * We)$ → a_p = 1.64 in

Required steel: $A_{st\_p\_st} = Mn / (Fy * (dc - ap / 2)) * (W / We)$ → $A_{st\_p\_st}$ = 38.025 in²

Shrinkage: ρ_{sh} = IF(Fy >= 60000, 0.0018, 0.002) → ρ_{sh} = 0.0018

$A_{st\_p\_sh} = psh * W * T / 2$ → $A_{st\_p\_sh}$ = 7.484 in²

$A_{st\_p} = MAX(Ast\_p\_st, Ast\_p\_sh)$ → A_{st_p} = 38.025 in²

Rebar: s_p = 8 *Equally spaced, top and* d_{b_p} = 1 in

m_p = 49 *bottom, both directions.* A_{b_p} = 0.79 in²

$A_{s\_p} = Ab\_p * m\_p$ → A_{s_p} = 38.71 in²

Check	A_{s_p} =	38.71	in²	>=	A_{st_p} =	38.03	in²	OK

Bar separation: $B_{s\_p} = (W - 2 * cc - db\_p) / (m\_p - 1) - db\_p$ → B_{s_p} = 7.10 in

Check	11	>=	B_{s_p} =	7.10	in	>=	4.5"	OK

Pad Development Length:

Reinforcement location: *[ACI 12.2.4]* ψ_{t_p} = if the space under the rebar > 12 in, use 1.3, else use 1.0 → ψ_{t_p} = 1.3

Epoxy coating: *[ACI 12.2.4]* ψ_{e_p} = if epoxy-coated bars are not used, use 1.0; but if epoxy-coated bars are used, then if Bs < 6 * db or cc < 3 * db, use 1.5, else 1.2 → ψ_{e_p} = 1.0

Max term: *[ACI 12.2.4]* $\psi_t\psi_{e\_p}$ = the product of ψt & ψe, need not be taken larger than 1.7 → $\psi_t\psi_{e\_p}$ = 1.3

Reinforcement size: *[ACI 12.2.4]* ψ_{s_p} = if the bar size is 6 or less, then use 0.8, else use 1.0 → ψ_{s_p} = 1

Light weight concrete: *[ACI 12.2.4]* λ_p = if lightweight concrete is used, 1.3, else use 1.0 → λ_p = 1.0

Spacing/cover: *[ACI 12.2.4]* c_p = the smaller of: half the bar spacing or the concrete edge distace → c_p = 3.50 in

Transverse bars: *[ACI 12.2.3]* k_{tr_p} = 0 in (per simplification) → k_{tr_p} = 0 in

Max term: *[ACI 12.2.3]* $c_p' = MIN(2.5, (c\_p + ktr\_p) / db\_p)$ → c_p' = 2.500

Excess reinforcement: *[ACI 12.2.5]* $R_p = Asl\_p / As\_p$ → R_p = 0.98

Development (tensile): *[ACI 12.2.2]* $L_d = (3 / 40) * (Fy / \sqrt{(F'c)}) * \psi t\psi e\_p * \psi s\_p * \lambda\_p * R\_p * db\_p / c\_p'$ → L_{dp}' = 34.3 in

Minimum length: *[ACI 12.2.1]* L_{d_min} = 12 inches → L_{d_min} = 12.0 in

Development length: $L_{dp} = MAX(Ld\_min, Ldp')$ → L_{dp} = 34.3 in

Length available in pad: $L_{pad} = (W / 2 - w' / 2) - cc$ → L_{pad} = 45.0 in

Check	L_{pad} =	45.00	in	>=	L_{dp} =	34.27	in	OK

THIS SPREADSHEET IS SET UP FOR A MAXIMUM OF 56 BARS.
MAXIMUM FACTORED MOMENT OF A CIRCULAR SECTION

Loading (negative for compression)		
Axial load =	473.00	kips

Foundation		
Concrete		
Pier diameter =	3.50	ft
Pier area =	1385.4	in^2
Reinforcement		
Clear cover =	3.00	in
Cage diameter =	2.91	ft
Bar size =	9	
Bar diameter =	1.128	in
Bar area =	0.999	in^2
Number of bars =	19	

Material Strengths			
Concrete compressive strength =	4500	psi	
Reinforcement yield strength =	60000	psi	
Modulus of elasticity =	29000	ksi	
Reinforcement yield strain =	0.00207		(per ACI 10.3.5 - OK)
Limiting compressive strain =	0.003		

Seismic	
Seismic Zone =	2
Are hooks required?	yes

Minimum Area of Steel

Required area of steel =	6.93	in^2	
Actual area of steel =	18.99	in^2	OK
Bar spacing =	4.82	in	

Axial Loading

Load factor =	1.00	
Reduction factor =	0.65575	(per ACI 9.3.1 & 2)
Factored axial load =	721.31	kips

Neutral Axis

Distance from extreme edge to neutral axis =	4.32	in	
Equivalent compression zone factor =	0.825		(per ACI 10.2.7.3)
Distance from extreme edge to Equivalent compression zone factor =	3.56	in	
Distance from centroid to neutral axis =	16.68	in	

Compression Zone

Area of steel in compression zone =	0.00	in^2	
Angle from centroid of pier to intersection of equivalent compression zone and edge of pier =	33.85	deg	
Area of concrete in compression =	56.54	in^2	
Force in concrete = 0.85 * f'c * Acc =	216.28	kips	(per ACI 10.3.6.2)
Total reinforcement forces =	-937.59	kips	
Factored axial load =	721.31	kips	
Force in concrete =	-216.28	kips	
Sum of the forces in concrete =	0.00	kips	OK

Maximum Moment

First moment of the concrete area in compression about the centoid =			1067.25	in^3
Distance between centroid of concrete in compression and centroid of pier =			18.87	in
Moment of concrete in compression =	4082.25	in-kips		
Total reinforcement moment =	3359.43	in-kips		
Nominal moment strength of column =	7441.67	in-kips		
Factored moment strength of column =	4879.86	in-kips	406.65	ft-kips

Maximum allowable moment of the pier =	406.65	ft-kips

Individual Bars

Bar #	Angle from first bar (deg)	Distance to centroid (in)	Distance to neutral axis (in)	Distance to equivalent comp. zone (in)	Strain	Area of steel in compression (in^2)	Axial force (kips)	Moment (in-kips)
1	0.00	0.00	-16.68	-17.44	-0.0116	0.00	-59.96	0.00
2	18.95	5.66	-11.02	-11.78	-0.00766	0.00	-59.96	-339.46
3	37.89	10.71	-5.98	-6.73	-0.00415	0.00	-59.96	-642.13
4	56.84	14.60	-2.09	-2.84	-0.00145	0.00	-42.07	-614.05
5	75.79	16.90	0.22	-0.54	0.00015	0.00	4.39	74.13
6	94.74	17.38	0.69	-0.06	0.00048	0.00	13.94	242.15
7	113.68	15.97	-0.72	-1.47	-0.0005	0.00	-14.45	-230.78
8	132.63	12.83	-3.86	-4.61	-0.00268	0.00	-59.96	-769.17
9	151.58	8.30	-8.39	-9.14	-0.00583	0.00	-59.96	-497.58
10	170.53	2.87	-13.81	-14.57	-0.0096	0.00	-59.96	-172.08
11	189.47	-2.87	-19.55	-20.31	-0.01359	0.00	-59.96	172.08
12	208.42	-8.30	-24.98	-25.74	-0.01737	0.00	-59.96	497.58
13	227.37	-12.83	-29.51	-30.27	-0.02052	0.00	-59.96	769.17
14	246.32	-15.97	-32.65	-33.41	-0.0227	0.00	-59.96	957.40
15	265.26	-17.38	-34.06	-34.82	-0.02368	0.00	-59.96	1041.89
16	284.21	-16.90	-33.59	-34.34	-0.02335	0.00	-59.96	1013.47
17	303.16	-14.60	-31.28	-32.04	-0.02175	0.00	-59.96	875.22
18	322.11	-10.71	-27.39	-28.15	-0.01904	0.00	-59.96	642.13
19	341.05	-5.66	-22.35	-23.10	-0.01554	0.00	-59.96	339.46

DEVELOPMENT LENGTH CHECK OF PIER REINFORCEMENT

Foundation:	Pier diameter =	3.5	ft	Cover between side of pier and cage =	3.00	in.
	Cage diameter =	3	ft	Cover between top of pier and cage =	3.00	in.
	Rebar size =	8		Compressive strength of concrete =	4500	psi
	Number of bars =	49		Rebar yield strength =	60000	psi
	Clear spacing =	7.10	in.			
	Are there hooks?	n				
	Check Compression?	n				
Anchor Steel:	Part number:	103183		Actual Bending Moment =	220.50	ft-kips
	Embedment length =	51.5	in.	Allowable Bending Moment =	406.65	ft-kips
	Bolt Diameter =	1.25"		Excess Reinforcement Ratio =	0.542	
Anchor Plate:	Part number:	212009				
	Plate width =	22	in.			

Required development length (compression) =	999.00	in.	
Required development length (tension) =	39.35	in.	
Required development length (tension) =	21.34	in.	(reduced)
Available development length =	41.500	in.	

OK

The length available in the pier for the development of the vertical reinforcement exceeds the required length (ACI 318-02, section 12.2).

CHECK EMBEDMENT PLATE CLEARANCE IN THE PIER

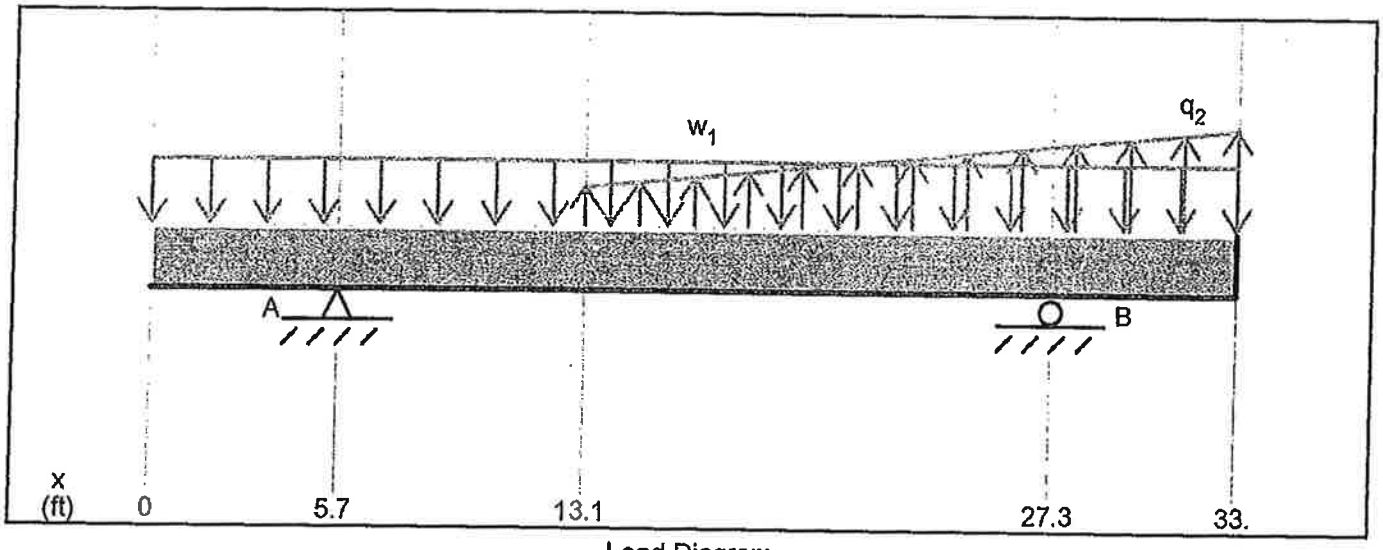
Foundation:	Pier diameter =	3.5	ft	Cover between side of pier and cage =	3.00	in.
	Cage diameter =	3	ft	Minimum cover between A/S and cage =	3.00	in.
Anchor Steel:	Part number:	103183		Angle of anchor steel in foundation =	3.3	degrees
	Embedment length =	51.5	in.			
Anchor Plate:	Part number:	212009				
	Largest plate width =	22.00	in.			
	Bolt Diameter =	1.25	in.			

Minimum cage diameter =	33.89	in.
Actual cage diameter =	36	in.

OK

The available space exceeds the minimum cage diameter required for anchor steel installed in the pier at an angle.

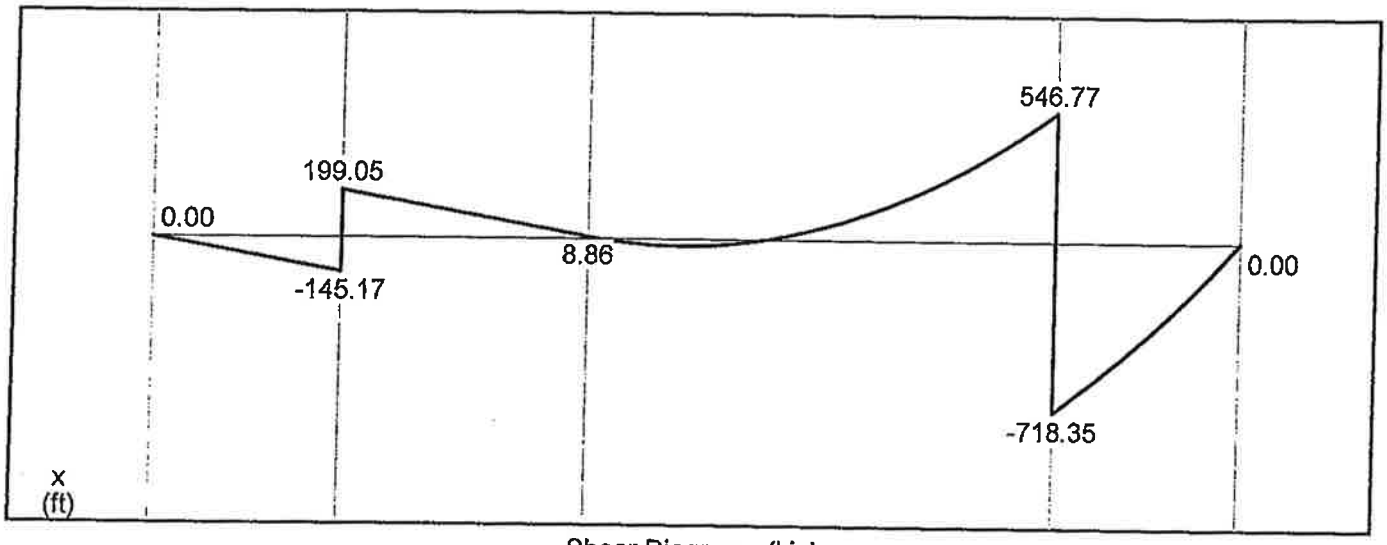
LC2- OPTION 1



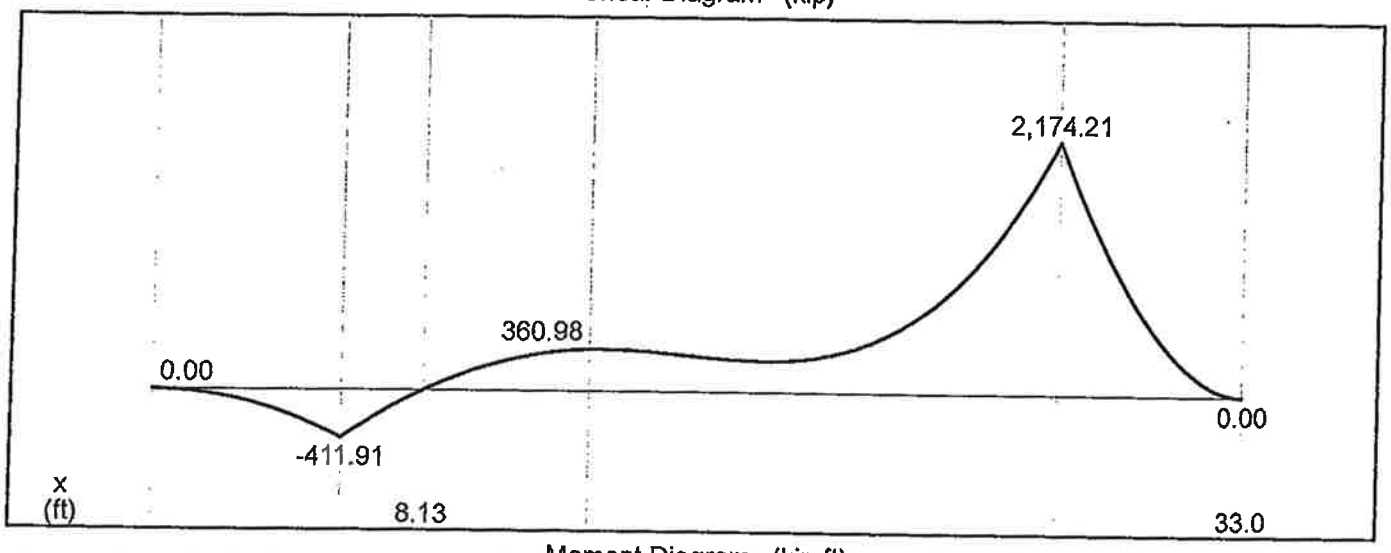
Load Diagram

w_1 = 25.58 kip/ft (down)
q_2 = 0.0 to 177.48 kip/ft (up)

A_y = 344.21 kip (up)
B_y = 1,265.11 kip (down)

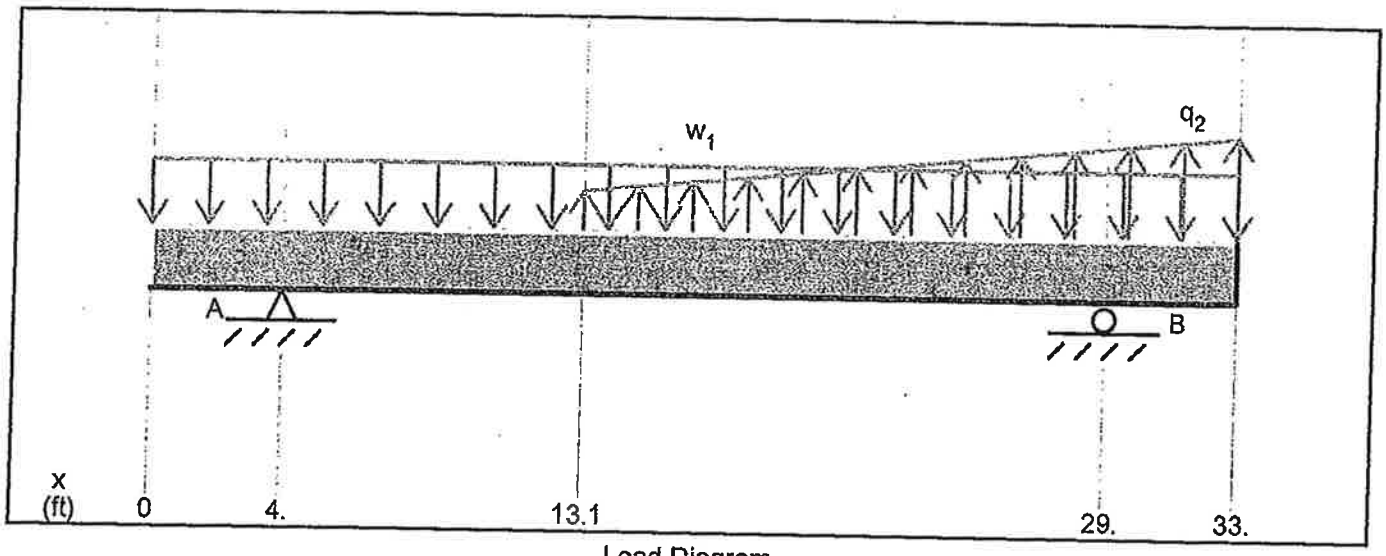


Shear Diagram (kip)



Moment Diagram (kip-ft)

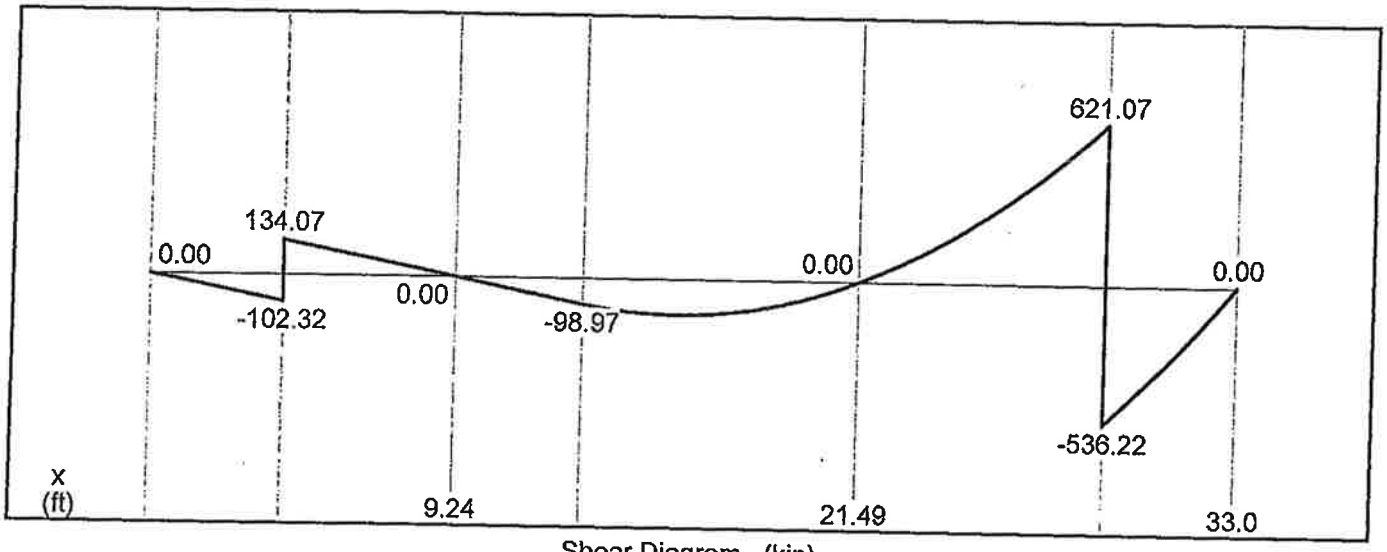
LC2- OPTION 2



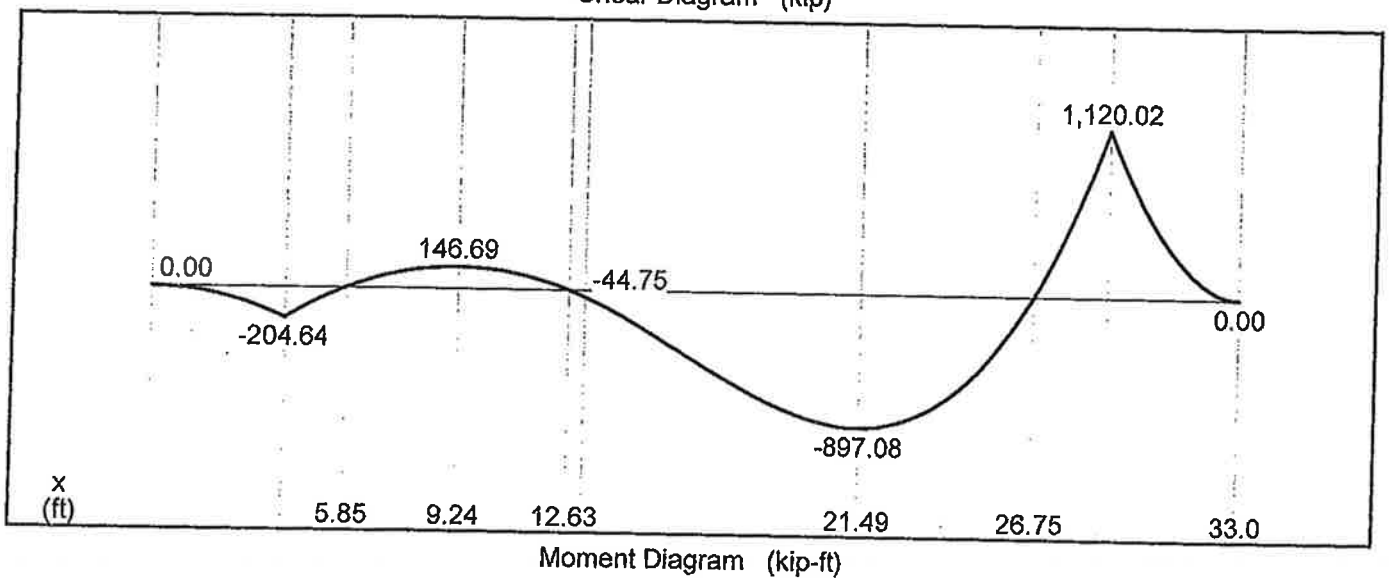
Load Diagram

w_1 = 25.58 kip/ft (down)
q_2 = 0.0 to 177.48 kip/ft (up)

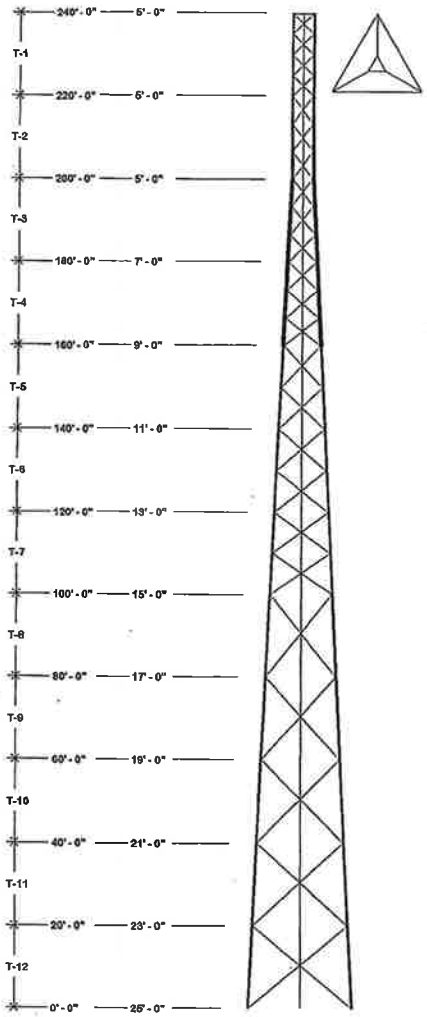
A_y = 236.39 kip (up)
B_y = 1,157.29 kip (down)



Shear Diagram (kip)



Moment Diagram (kip-ft)



SEE PAGE 2 FOR APPURTENANCES

APPLICABLE CODES & STANDARDS
Building Code: 2009 International Building Code
Design Standard: TIA-222-G

TOWER DESIGN CRITERIA
Basic Wind Speed: 110mph (no ice)
50 mph (1.0" ICE)
50mph (deflection only)
Structure Class: III
Exposure: C -
Topographic Category: 1
Crest Height: 0

MATERIAL STRENGTHS
Solid Rod A36 (rod dia. <3/4")
A572 Gr.50 (3/4" thru 1" dia.)
A572 Gr.58 (>1" dia.)
Pipe A500 Gr.B (antenna pipes)
A500 Gr.B/C (lower legs min. Fy 50 ksi)
Angle A36 Gr.36
Plate A572 Gr.50
Bolts A-325/A-449 (leg & angle)
Anchor Bolt F1554 GRADE 105 OR A687

AXIAL
265.0 K
SHEAR 20.0 K
MOMENT 2754.0 kip-ft

MAX. CORNER REACTIONS AT BASE:
DOWN: 529.8 K
UPLIFT: 473.0 K
SHEAR: 52.0 K
TORQUE 3.0 kip-ft
REACTIONS 50 mph WIND

AXIAL
59.0 K
SHEAR 84.0 K
MOMENT 11251.0 kip-ft

MAX. CORNER REACTIONS AT BASE:
DOWN: 529.8 K
UPLIFT: 473.0 K
SHEAR: 52.0 K
TORQUE 15.0 kip-ft
REACTIONS 110 mph WIND

TOWER COLUMN

SECTION	ELEVATION	FACE WIDTH	PANELS	LEG SIZE	LEG STYLE	LEG BOLT QTY & DIA	DIAGONAL BRACING SIZE	HORIZONAL BRACING SIZE	BRACING BOLT QTY & DIA	SECTION WEIGHT
T1	220' - 240'	5.0'	4	2.50"	V	4 x 3/4"	1/8" x 2" x 2"	3/16" x 2" x 2"	3/4" x 1	944.41
T2	200' - 220'	5.0'	3	4.00"	V	6 x 3/4"	3/16" x 2-1/2" x 2-1/2"		3/4" x 1	1376.35
T3	180' - 200'	7.0'	3	5.00"	V	8 x 3/4"	3/16" x 2" x 2"		3/4" x 1	1611.68
T4	160' - 180'	9.0'	3	6.00"	V	6 x 1"	3/16" x 2-1/2" x 2-1/2"		3/4" x 1	2289.39
T5	140' - 160'	11.0'	2	1.50"	12BDFH	6 x 1"	3/16" x 3" x 3"		1" x 1	2466.15
T6	120' - 140'	13.0'	2	1.75"	12BDFH	6 x 1 1/4"	3/16" x 3" x 3"		1" x 1	2977.89
T7	100' - 120'	15.0'	2	1.75"	12BDFH	6 x 1 1/4"	5/16" x 3" x 3"		1" x 1	3544.53
T8	80' - 100'	17.0'	1	2.00"	12BDH2	12 x 1"	3/16" x 3" x 3"		7/8" x 1	3986.40
T9	60' - 80'	19.0'	1	2.00"	12BDH2	12 x 1"	3/16" x 3" x 3"		7/8" x 1	4106.91
T10	40' - 60'	21.0'	1	2.25"	12BDH2	12 x 1"	1/4" x 3-1/2" x 3-1/2"		7/8" x 1	5382.51
T11	20' - 40'	23.0'	1	2.25"	12BDH2	12 x 1"	1/4" x 3-1/2" x 3-1/2"		7/8" x 1	5485.59
T12	0' - 20'	25.0'	1	2.50"	12BDH2	12 x 1 1/4"	1/4" x 3-1/2" x 3-1/2"		7/8" x 1	6239.52

STATE OF CONNECTICUT
WILLIAM HEIDEMANN
No. 23038
LICENSED PROFESSIONAL ENGINEER

APR 0 1 2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
	REVISION HISTORY			

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
Tower View Page 1

STRUCTURE APPROVAL 3/30/2015
FOUNDATION APPROVAL 3/30/2015

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859
DWG. NO. 259147T
PAGE 1 OF 14

Page 1

DESIGNED APPURTENANCE LOADING	
TYPE	ELEVATION
(1) 1/2" X 4' LIGHTNINGROD	240'
(3) 12' V FRAME	240'
(12) 2" X 84" SCH. 40	240'
(3) ALCATEL-LUCENT RRH2X80-AWS	240'
(3) ALCATEL-LUCENT RRH2X50-PCS	240'
(1) BEACON	240'
(1) BEACON EXTENDER (4') 803062	240'
(2) DB-T1-6Z-8AB-0Z ASSUMED: (20.07" X 11.22" X	240'
(6) HBXX-6517DS-VTM	240'
(6) LNX-6514DS-VTM	240'
(1) 24" STANDOFF	221'
(1) WHIP (2.88" X 12')	221'
(2) 24" STANDOFF	218'
(2) WHIP (2.88" X 12')	218'
(3) 12' V FRAME	198'
(9) 2" X 96" SCH. 40	198'
(6) 7770.00	198'
(6) AM-X-CD-17-65-00T-RET	198'
(1) POLYPHASER (12"X12"X6")	198'
(6) POWERWAVE 7020.00 DUALBAND RET	198'
(6) POWERWAVE LGP21401X TMA-DD-1900	198'
(6) POWERWAVE LGP21903	198'
(6) RRUS11 (20" X 17" X 7")	198'

STATE OF CONNECTICUT
WILLIAM HEIDEN III
No. 23038
LICENSED PROFESSIONAL ENGINEER

APR 0 1 2015

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
Tower View Page 2

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

PAGE 2 OF 14

DWG. NO. 259147T

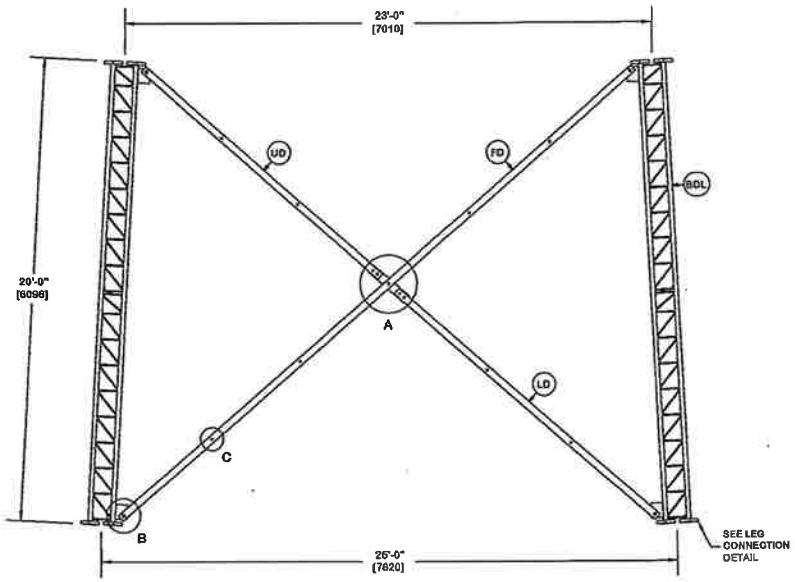
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE

REVISION HISTORY

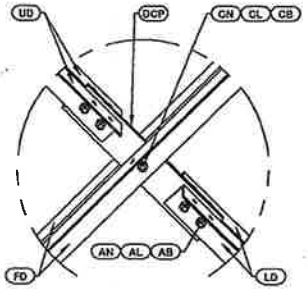
STRUCTURE APPROVAL 3/30/2015

FOUNDATION APPROVAL 3/30/2015

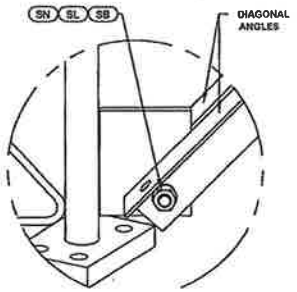
ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION



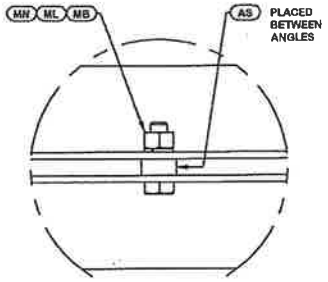
PARTS LIST					
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
BDL	3	195862	#12 LEG SECT - 2-1/2" TO 2" TRANS LEG - 1/2" BRACE	1335.4	4006.1
UD	5	215312	ANGLE U-25 UP 13'-8"	83.3	499.5
LD	6	215316	ANGLE U-25 LOW 14'-11 7/32"	90.9	545.5
FD	6	215377	ANGLE U-25 LONG 20'-6 23/32"	180.0	1080.1
ML	24	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.6
MN	24	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	2.9
AS	24	104291	SPACER 1/2" THICK 13/16" HOLE	0.5	12.0
MB	24	161895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	8.2
AB/CB	15	161895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	3.9
AL / CL	15	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.3
AN / CN	15	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.8
DCP	3	211833	MID BRACE CONNECTION PLATE FOR #12 B/D LEG ANGLES	20.6	61.8
SL	12	312193	7/8" GALVANIZED LOCKWASHER	0.1	0.8
SN	12	312215	7/8"-9 HOT DIPPED GALVANIZED NUT	0.3	3.6
SB	12	172275	7/8"-9 X 2-1/2" A-325 BOLT WITH 1-1/2" THREAD	1.2	14.8
			Total Wt	6239.6 lb [2832.5 kg]	



DETAIL A
ANGLE INTERSECTION CONNECTION



DETAIL B
END SIDE PLATE ANGLE CONNECTION



DETAIL C
STITCH BOLT CONNECTION

SEE FOUNDATION DRAWING
DETAILS FOR BASE
CONNECTION

BASE CONNECTION

STATE OF CONNECTICUT
WILLIAM HEIDEN LIC.
No. 23038
LICENSED
PROFESSIONAL ENGINEER

APR 0 1 2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
REVISION HISTORY				

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION U-25.0 (0' - 20' ELEVATION)

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

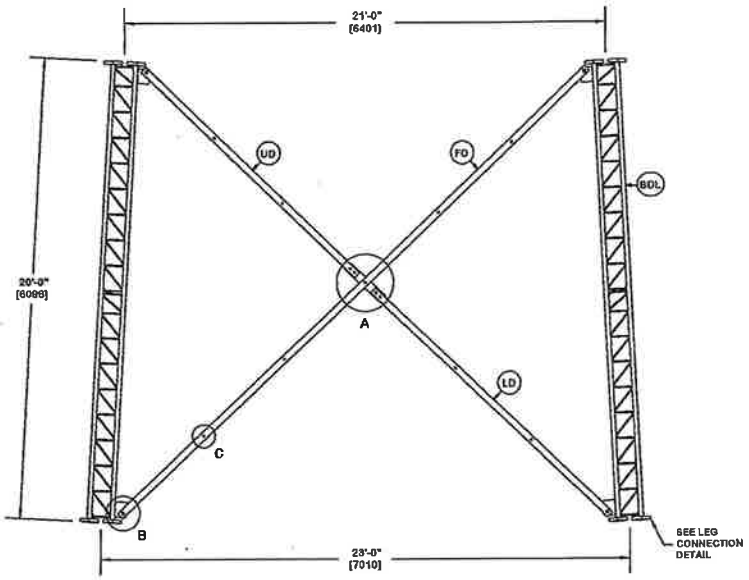
PAGE 3 OF 14

DWG. NO. 259147T

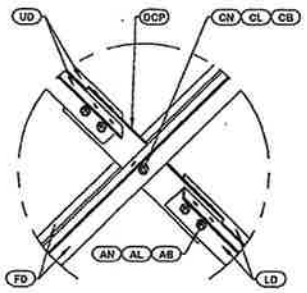
STRUCTURE APPROVAL 3/30/2015

FOUNDATION APPROVAL 3/30/2015

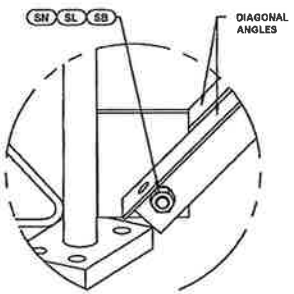
ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION



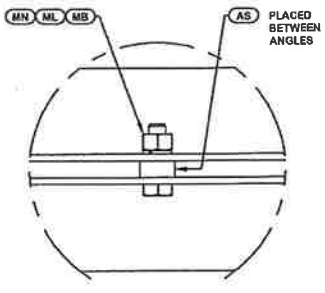
PARTS LIST					
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
BDL	3	195960	#12 LEG SECTION - 2-1/4" LEG - 1/2" BRACE - 7/8" B	1160.5	3301.6
UD	6	215304	ANGLE U-23 UP 12'-10 25/32"	78.9	471.4
LD	6	215308	ANGLE U-23 LOW 14'-2 11/16"	86.6	519.6
FD	6	215373	ANGLE U-23 LONG 28'-0 15/16"	171.0	1026.1
ML	24	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.5
MN	24	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	2.9
AS	24	104251	SPACER 1/2" THICK 13/16" HOLE	0.5	12.0
MB	24	181895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	8.2
AB/CB	15	181895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	3.9
AL / CL	15	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.3
AN / CN	15	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.8
DCP	3	211833	MID BRACE CONNECTION PLATE FOR #12 B/D LEG ANGLES	20.6	61.8
SL	12	312193	7/8" GALVANIZED LOCKWASHER	0.1	0.6
SN	12	312215	7/8"-9 HOT DIPPED GALVANIZED NUT	0.3	3.6
SB	12	172275	7/8"-9 X 2-1/2" A-325 BOLT WITH 1-1/2" THREAD	1.2	14.8
LCB	36	172281	1"-8 X 5" A-325 BOLT WITH 1-3/4" THREAD	0.8	30.2
LCF	72	312222	1" GALVANIZED FLAT WASHER (F436)	0.1	10.1
LCL	36	312223	1" GALVANIZED LOCKWASHER	0.1	2.9
LCN	36	312504	1"-8 HOT DIPPED GALVANIZED NUT	0.4	15.5
			Total Wt	5455.8 lb [2400.6 kg]	



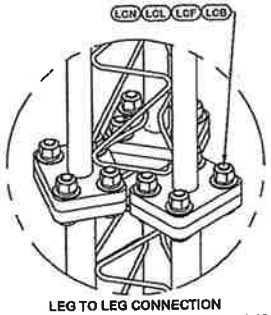
DETAIL A
ANGLE INTERSECTION CONNECTION



DETAIL B
END SIDE PLATE ANGLE CONNECTION



DETAIL C
STITCH BOLT CONNECTION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

STATE OF CONNECTICUT
WILLIAM HEIDEN III
No. 23038
LICENSED
PROFESSIONAL ENGINEER

APR 0 1 2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
REVISION HISTORY				

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

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PROPRIETARY NOTE.
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DESCRIPTION
SECTION U-23.0 (20' - 40' ELEVATION)

STRUCTURE APPROVAL 3/30/2015

FOUNDATION APPROVAL 3/30/2015

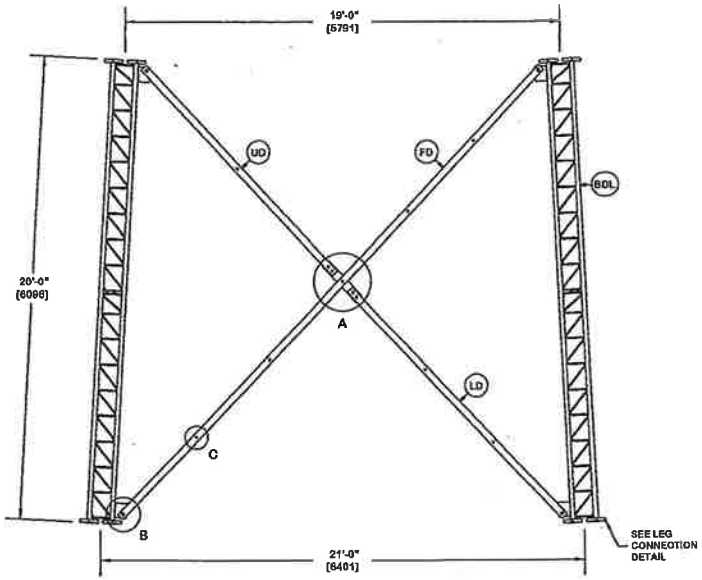
valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

DWG. NO. 259147T

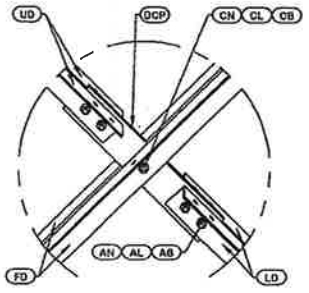
PAGE 4 OF 14

ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

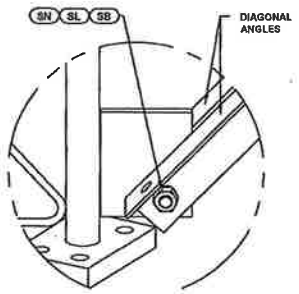


PARTS LIST

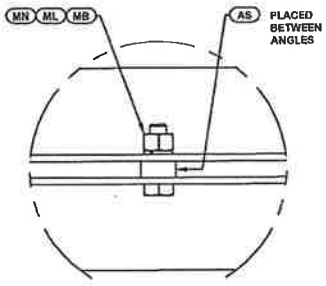
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
BDL	3	195960	#12 LEG SECTION - 2-1/4" LEG - 1/2" BRACE - 7/8" B	1100.5	3301.6
UD	6	215298	ANGLE U-21 UP 12-1 7/8"	74.1	444.3
LD	6	216300	ANGLE U-21 LOW 13'-6 5/8"	82.5	495.1
FD	6	215369	ANGLE U-21 LONG 26'-8"	162.4	974.5
ML	24	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.5
MN	24	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	2.9
AS	24	104291	SPACER 1/2" THICK 13/16" HOLE	0.5	12.0
MB	24	161895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	6.2
AB/CB	15	161895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	3.8
AL / CL	15	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.3
AN / CN	15	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.8
DCP	3	211833	MID BRACE CONNECTION PLATE FOR #12 B/D LEG ANGLES	20.6	61.8
SL	12	312193	7/8" GALVANIZED LOCKWASHER	0.1	0.6
SN	12	312215	7/8"-9 HOT DIPPED GALVANIZED NUT	0.3	3.6
SB	12	172276	7/8"-9 X 2-1/2" A-325 BOLT WITH 1-1/2" THREAD	1.2	14.8
LCB	36	172261	1"-8 X 5" A-325 BOLT WITH 1-3/4" THREAD	0.8	30.2
LCF	72	312222	1" GALVANIZED FLAT WASHER (F436)	0.1	10.1
LCL	36	312223	1" GALVANIZED LOCKWASHER	0.1	2.9
LCN	36	312504	1"-8 HOT DIPPED GALVANIZED NUT	0.4	15.5
			Total Wt	5382.8 lb [2443.7 kg]	



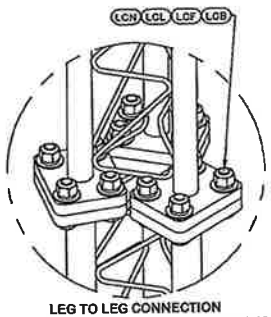
DETAIL A
ANGLE INTERSECTION CONNECTION



DETAIL B
END SIDE PLATE ANGLE CONNECTION



DETAIL C
STITCH BOLT CONNECTION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

APR 0 1 2015

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION U-21.0 (40' - 60' ELEVATION)

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2161 Salem, OR

ENG. FILE NO. 284859

PAGE 5 OF 14

DWG. NO. 259147T

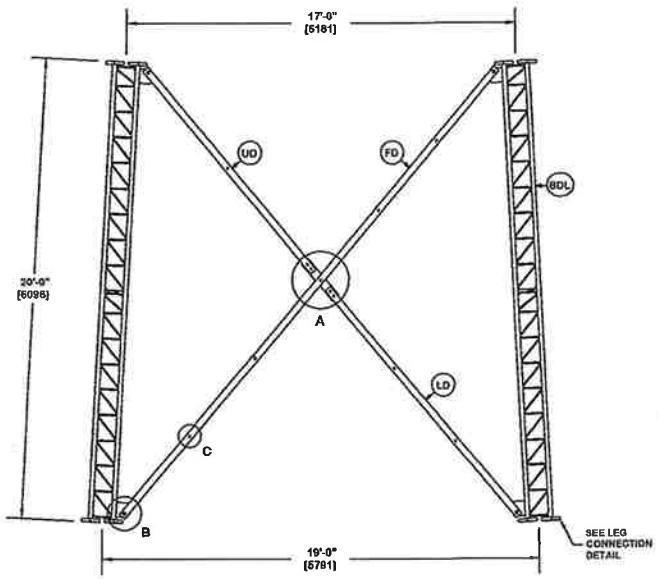
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE

REVISION HISTORY

STRUCTURE APPROVAL 3/30/2015

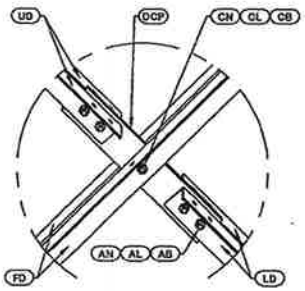
FOUNDATION APPROVAL 3/30/2015

ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

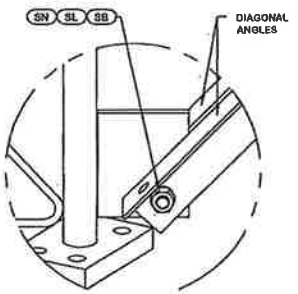


PARTS LIST

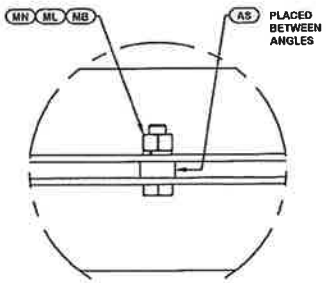
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
BDL	3	195639	#12 LEG SECTION - 2" LEG - 1/2" BRACE - 7/8" BOLT	926.9	2780.8
UD	6	215288	ANGLE U-19 UP 11'-5 11/32"	44.6	267.4
LD	6	215292	ANGLE U-19 LOW 12'-11 7/32"	50.4	302.2
FD	6	215364	ANGLE U-19 LONG 25'-4 1/32"	98.7	592.3
ML	21	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.4
MN	21	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	2.5
AS	21	104291	SPACER 1/2" THICK 13/16" HOLE	0.5	10.5
MB	21	161896	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	5.5
AB/CB	15	161895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	3.6
AL / CL	15	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.3
AN / CN	15	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.8
DCP	3	211833	MID BRACE CONNECTION PLATE FOR #12 B/D LEG ANGLES	20.6	61.8
SL	12	312198	7/8" GALVANIZED LOCKWASHER	0.1	0.6
SN	12	312215	7/8"-9 HOT DIPPED GALVANIZED NUT	0.3	3.6
SB	12	172275	7/8"-9 X 2-1/2" A-325 BOLT WITH 1-1/2" THREAD	1.2	14.8
LCB	36	172261	1"-8 X 6" A-325 BOLT WITH 1-3/4" THREAD	0.8	30.2
LCF	72	312222	1" GALVANIZED FLAT WASHER (F436)	0.1	10.1
LCL	36	312223	1" GALVANIZED LOCKWASHER	0.1	2.9
LCN	36	312594	1"-8 HOT DIPPED GALVANIZED NUT	0.4	15.5
			Total Wt	4107.1 lb [1864.7 kg]	



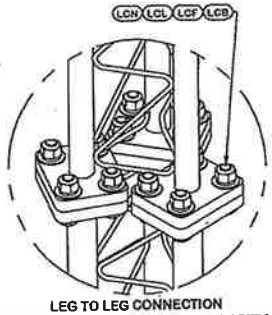
DETAIL A
ANGLE INTERSECTION CONNECTION



DETAIL B
END SIDE PLATE ANGLE CONNECTION



DETAIL C
STITCH BOLT CONNECTION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

STATE OF CONNECTICUT
WILLIAM HEIDEN III
No. 23038
LICENSED
PROFESSIONAL ENGINEER

APR 0 1 2015

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION U-19.0 (60' - 80' ELEVATION)

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

PAGE 6 OF 14

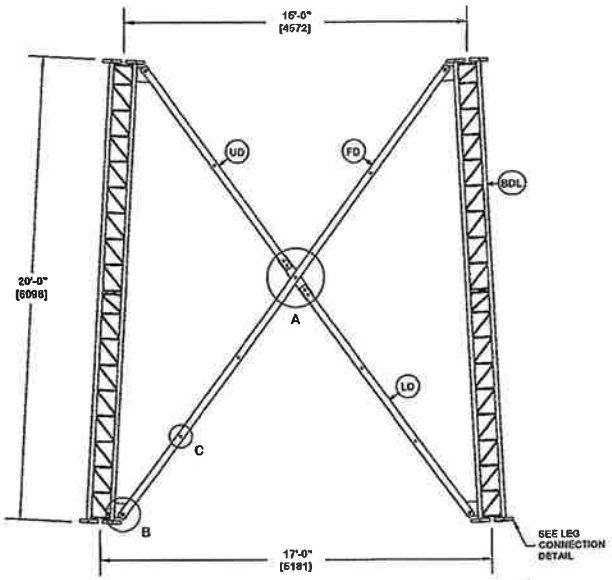
DWG. NO. 259147T

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
	REVISION HISTORY			

STRUCTURE APPROVAL 3/30/2015

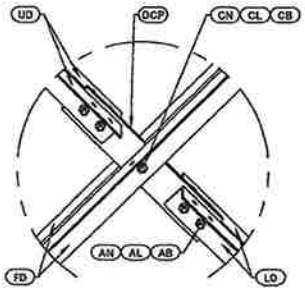
FOUNDATION APPROVAL 3/30/2015

ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

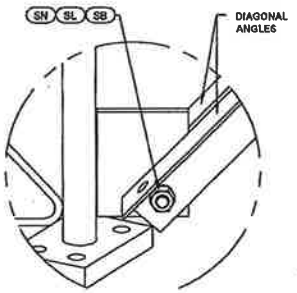


PARTS LIST

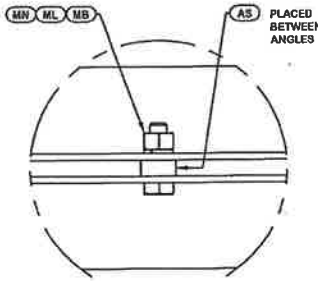
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
BDL	3	195837	#12 LEG SECT - 2" TO 1-3/4" TRANS LEG - 1/2" BRACE	906.9	2720.6
UD	8	215280	ANGLE U-17 UP 10'-9 5/32"	41.9	251.5
LD	8	215284	ANGLE U-17 LOW 12'-4 9/16"	48.2	289.4
FD	6	215361	ANGLE U-17 LONG 24'-1 3/16"	93.9	563.3
ML	18	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.4
MN	18	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	2.2
AS	18	104291	SPACER 1/2" THICK 13/16" HOLE	0.5	9.0
MB	18	161895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	4.7
AB/CB	15	161895	5/8"-11 X 2 1/4" A-325 BOLT 1 1/4" THREAD	0.3	3.9
AL / CL	15	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.3
AN / CN	15	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.8
DCP	3	211833	MID BRACE CONNECTION PLATE FOR #12 B/D LEG ANGLES	20.6	61.8
SL	12	312193	7/8" GALVANIZED LOCKWASHER	0.1	0.8
SN	12	312215	7/8"-9 HOT DIPPED GALVANIZED NUT	0.3	3.6
SB	12	172276	7/8"-9 X 2-1/2" A-325 BOLT WITH 1-1/2" THREAD	1.2	14.8
LCB	36	172261	1"-8 X 5" A-325 BOLT WITH 1-3/4" THREAD	0.8	30.2
LCF	72	312222	1" GALVANIZED FLAT WASHER (F436)	0.1	10.1
LCL	36	312223	1" GALVANIZED LOCKWASHER	0.1	2.8
LCN	36	312504	1"-8 HOT DIPPED GALVANIZED NUT	0.4	15.6
			Total Wt	3986.6 lb [1810.0 kg]	



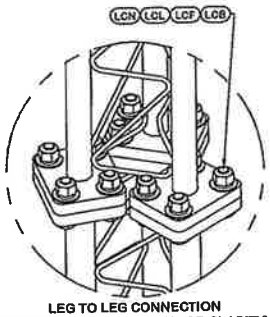
DETAIL A
ANGLE INTERSECTION CONNECTION



DETAIL B
END SIDE PLATE ANGLE CONNECTION



DETAIL C
STITCH BOLT CONNECTION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

APR 0 1 2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
	REVISION HISTORY			

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION U-17.0 (80' - 100' ELEVATION)

STRUCTURE APPROVAL 3/30/2015

FOUNDATION APPROVAL 3/30/2015

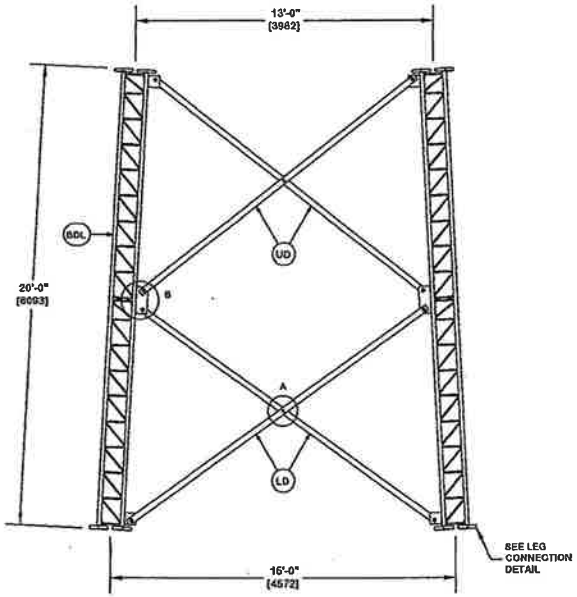
valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

DWG. NO. 259147T

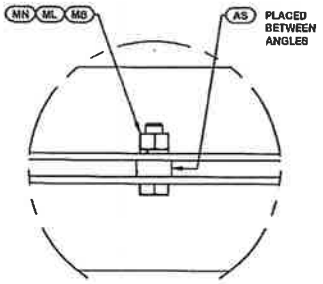
PAGE 7 OF 14

ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

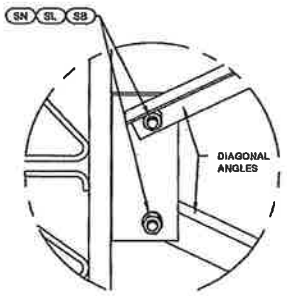


PARTS LIST

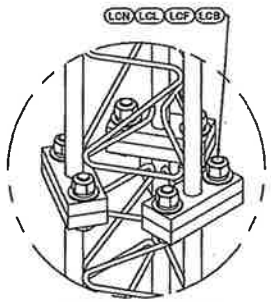
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
BDL	3	195217	#12 LEG SECTION - 1-3/4" LEG - 1/2" BRACE - 1" BOL	746.7	2240.1
LD	6	105583	DIAG BRACE 5/16"X 3"X 3" 15'- 11-31/32" LONG (A	102.5	614.8
AS	6	104291	SPACER 1/2" THICK 13/16" HOLE	0.5	3.0
MN	6	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	1.1
ML	6	312153	3/4" GALVANIZED LOCKWASHER	0.0	0.2
MB	6	160427	3/4"-10 X 3" A-325T BOLT WITH FULL THREAD	0.5	2.8
SL	24	312223	1" GALVANIZED LOCKWASHER	0.1	1.9
SN	24	312504	1"-8 HOT DIPPED GALVANIZED NUT	0.4	10.3
SB	24	172265	1"-8 X 2-1/4" A-325 BOLT WITH 1-3/4" THREAD	0.8	20.2
UD	6	105580	DIAG BRACE 5/16"X 3"X 3" 15'- 2-3/8" LONG (A-36	97.3	584.0
LCB	18	222022	1-1/4"-7 X 5-1/2" A-325 BOLT WITH 2" THREAD	2.5	45.6
LCF	36	312282	1-1/4" GALVANIZED FLAT WASHER (F436)	0.1	4.7
LCL	18	312283	1-1/4" GALVANIZED LOCKWASHER	0.2	2.7
LCN	18	312507	1-1/4"-7 HOT DIPPED GALVANIZED NUT	0.7	13.1
			Total Wt	3544.4 lb [1609.2 kg]	



DETAIL A
ANGLE INTERSECTION CONNECTION



DETAIL B
MID SIDE PLATE ANGLE CONNECTION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

APR 0 1 2015

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION U-15.0 (100' - 120' ELEVATION)

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

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DWG. NO. 259147T

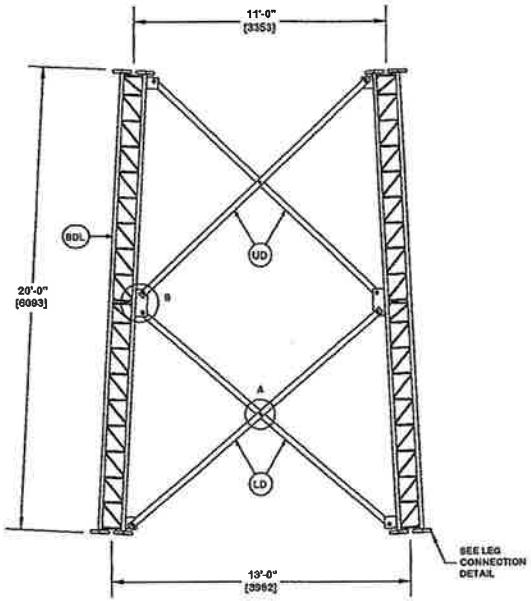
STRUCTURE APPROVAL 3/30/2015

FOUNDATION APPROVAL 3/30/2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE

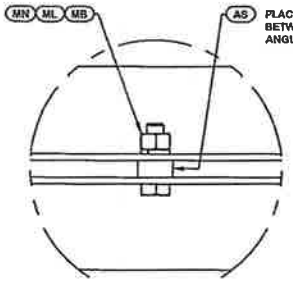
REVISION HISTORY

ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

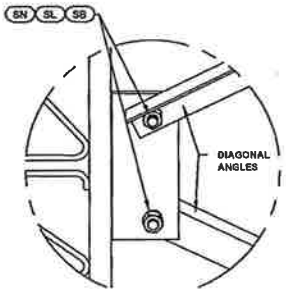


PARTS LIST

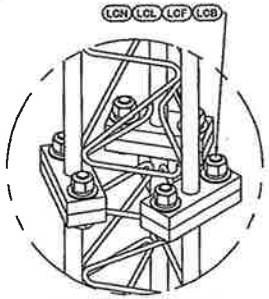
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
BDL	3	195213	#12 LEG SECT - 1-3/4" TO 1-1/2" TRANS LEG - 1/2" B	738.9	2219.7
LD	6	165576	DIAG BRACE 3/16" X 3" X 3" 14'- 5-3/32" LONG (A-3	55.6	333.8
AS	6	164291	SPACER 1/2" THICK 13/16" HOLE	0.5	3.0
MN	6	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	1.1
ML	6	312153	3/4" GALVANIZED LOCKWASHER	0.0	0.2
MB	6	160427	3/4"-10 X 3" A-325T BOLT WITH FULL THREAD	0.5	2.8
SL	24	312223	1" GALVANIZED LOCKWASHER	0.1	1.9
SN	24	312504	1"-8 HOT DIPPED GALVANIZED NUT	0.4	10.3
SB	24	172285	1"-8 X 2-1/4" A-325 BOLT WITH 1-3/4" THREAD	0.8	20.2
UD	6	165574	DIAG BRACE 3/16" X 3" X 3" 13'- 8-5/32" LONG (A-3	53.1	318.8
LCB	18	222022	1-1/4"-7 X 5-1/2" A-325 BOLT WITH 2" THREAD	2.5	45.6
LCF	36	312282	1-1/4" GALVANIZED FLAT WASHER (F436)	0.1	4.7
LCL	18	312283	1-1/4" GALVANIZED LOCKWASHER	0.2	2.7
LCN	18	312507	1-1/4"-7 HOT DIPPED GALVANIZED NUT	0.7	13.1
			Total Wt.	2977.8 lb [1351.9 kg]	



DETAIL A
ANGLE INTERSECTION CONNECTION



DETAIL B
MID SIDE PLATE ANGLE CONNECTION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

APR 0 1 2015

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION U-13.0 (120' - 140' ELEVATION)

valmont STRUCTURES
1-877-467-4783 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

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DWG. NO. 259147T

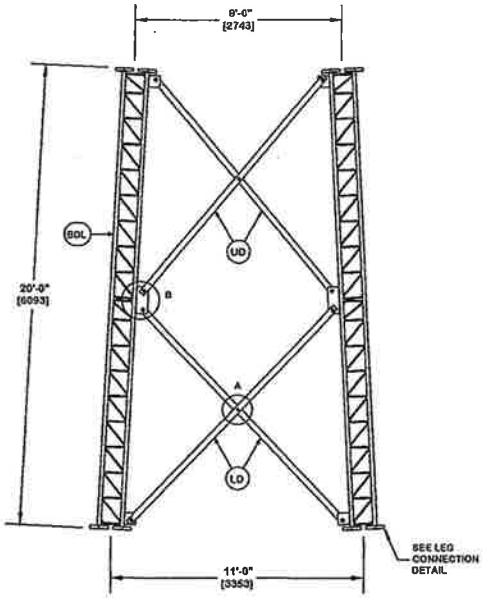
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE

REVISION HISTORY

STRUCTURE APPROVAL 3/30/2015

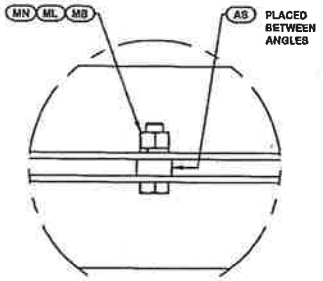
FOUNDATION APPROVAL 3/30/2015

ORIENT ANGLES WITH STAMPED END TOWARD TOP OF SECTION

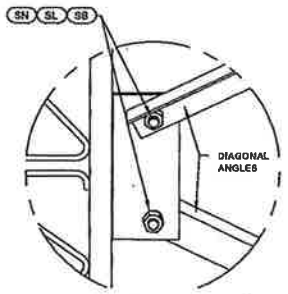


PARTS LIST

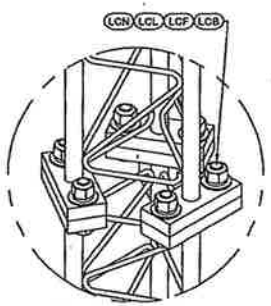
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
BDL	3	194851	#12 LEG SEOTION - 1-1/2" LEG - 1/2" BRACE - 1" BOL	602.8	1808.5
LD	6	105571	ANGLE U-12 UP 12'-11 21/32"	50.3	302.0
AS	6	104291	SPACER 1/2" THICK 13/16" HOLE	0.5	3.0
MN	6	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	1.1
ML	6	312153	3/4" GALVANIZED LOCKWASHER	0.0	0.2
MB	6	160427	3/4"-10 X 3" A-325T BOLT WITH FULL THREAD	0.5	2.8
SL	24	312223	1" GALVANIZED LOCKWASHER	0.1	1.6
SN	24	312504	1"-8 HOT DIPPED GALVANIZED NUT	0.4	10.3
SB	24	172295	1"-8 X 2-1/4" A-325 BOLT WITH 1-3/4" THREAD	0.8	20.2
UD	6	105568	ANGLE U-10 LOW 12'-3 5/8"	47.8	286.7
LCB	16	172261	1"-8 X 5" A-325 BOLT WITH 1-3/4" THREAD	0.8	16.1
LCF	36	312222	1" GALVANIZED FLAT WASHER (F436)	0.1	5.0
LCL	16	312223	1" GALVANIZED LOCKWASHER	0.1	1.4
LCN	16	312504	1"-8 HOT DIPPED GALVANIZED NUT	0.4	7.7
			Total Wt	2485.9 lb [1119.5 kg]	



DETAIL A
ANGLE INTERSECTION CONNECTION



DETAIL B
MID SIDE PLATE ANGLE CONNECTION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

APR 0 1 2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
	REVISION HISTORY			

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION U-11.0 (140' - 160' ELEVATION)

STRUCTURE APPROVAL 3/30/2015

FOUNDATION APPROVAL 3/30/2015

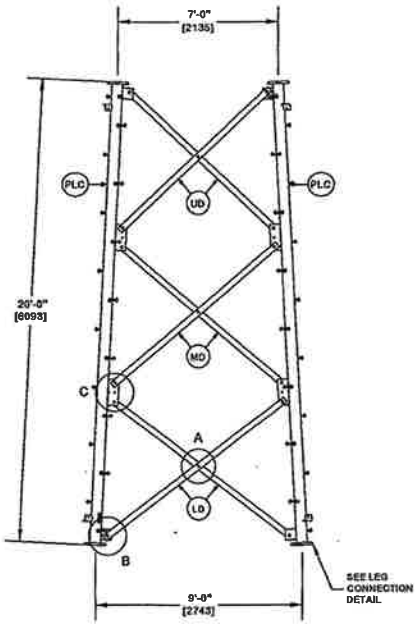
valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

DWG. NO. 259147T

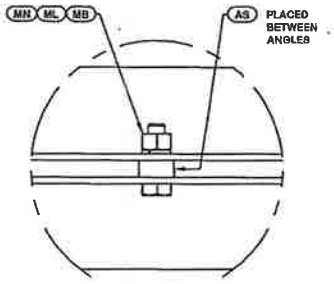
PAGE 10 OF 14

ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

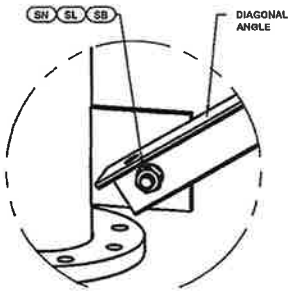


PARTS LIST

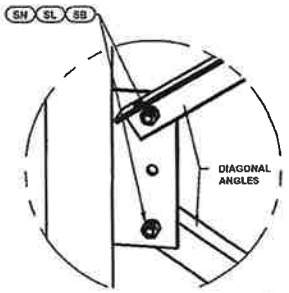
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
PLC	3	229377	PIPE LEG SECTION 20'-0" (CLIMBING) 6" SCH. 40 V-SE	537.9	1613.8
STP	48	226189	STEP BOLT ASSY 5/8"-11 X 7" W/ LOCK WASHER HEAVY	1.1	52.8
LD	6	231345	ANGLE V-9 LOW 119 5/32" (W45 CLIPPED)	31.5	188.8
MB	9	227580	5/8"-11 X 2-1/4" A325T HOT DIPPED GALV. BOLT (FULL	0.6	5.8
AS	8	124638	MID-DIAGONAL SPACER 11/16" HOLE 3/8" THICK	0.5	4.1
MN	9	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.1
ML	9	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.2
SL	36	312153	3/4" GALVANIZED LOCKWASHER	0.0	1.1
SN	36	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	6.8
SB	36	172280	3/4"-10 X 2" A-325 BOLT WITH 1-3/8" THREAD	0.7	24.1
MD	6	225034	ANGLE V-9 MID 112 29/32"	30.3	182.0
UD	6	225035	ANGLE V-9 UPPER 106 29/32"	28.7	172.3
LCB	18	222016	1"-8 X 4-3/4" A-325 BOLT WITH 1-3/4" THREAD	1.4	24.8
LCF	18	312222	1" GALVANIZED FLAT WASHER (F436)	0.1	2.5
LCL	18	312223	1" GALVANIZED LOCKWASHER	0.1	1.4
LCN	18	312504	1"-8 HOT DIPPED GALVANIZED NUT	0.4	7.7
			Total Wt	2289.3 lb [1039.4 kg]	



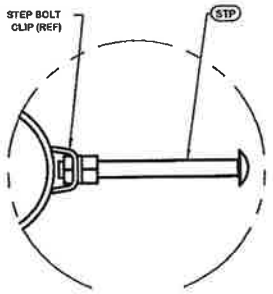
DETAIL A
ANGLE INTERSECTION CONNECTION



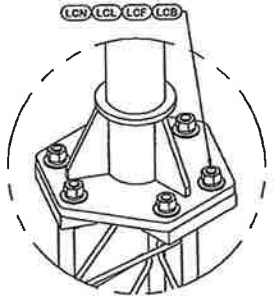
DETAIL B
END SIDE PLATE ANGLE CONNECTION



DETAIL C
MID SIDE PLATE ANGLE CONNECTION



STEP BOLT INSTALLATION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

APR 0 1 2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE

REVISION HISTORY

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION V-9.0 (160' - 180' ELEVATION)

STRUCTURE APPROVAL 3/30/2015

FOUNDATION APPROVAL 3/30/2015

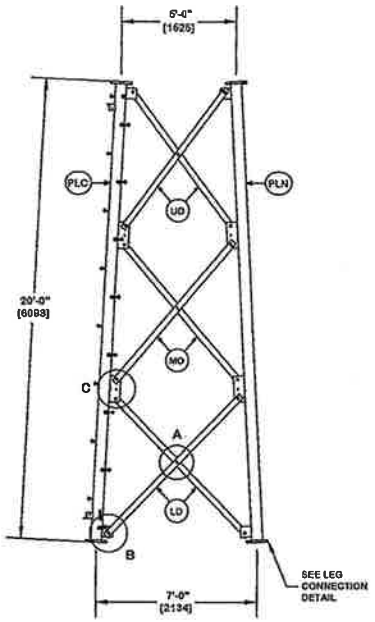
valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

DWG. NO. 259147T

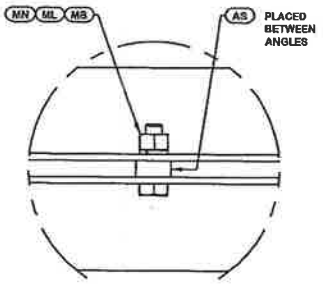
PAGE 11 OF 14

ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

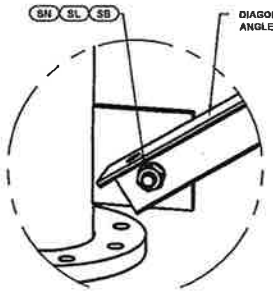


PARTS LIST

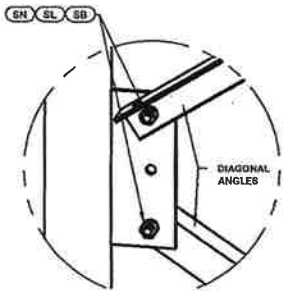
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
PLC	1	226200	PIPE LEG SECTION 20'-0" (CLIMBING) 5" SCH. 40 V-SE	386.6	386.6
PLN	2	226201	PIPE LEG SECTION 20'-0" (NON-CLIMBING) 5" SCH. 40	386.3	772.6
STP	16	228189	STEP BOLT ASSY 5/8"-11 X 7" W/ LOCK WASHER HEAVY	1.1	17.6
LO	6	231342	ANGLE V-7 LOW 101 3/16" (W/45 CLIPPED)	21.6	129.6
MB	9	227580	5/8"-11 X 2-1/4" A325T HOT DIPPED GALV. BOLT (FULL	0.6	5.8
AS	9	124838	MID-DIAGONAL SPACER 11/16" HOLE 3/8" THICK	0.5	4.1
MN	9	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.1
ML	9	312123	5/8" GALVANIZED LOCKWASHER (63-22230)	0.0	0.2
SL	36	312153	3/4" GALVANIZED LOOKWASHER	0.0	1.1
SN	36	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	6.8
SB	36	172260	3/4"-10 X 2" A-325 BOLT WITH 1-3/8" THREAD	0.7	24.1
MD	6	226189	ANGLE V-7 MID 95 13/16"	20.5	122.6
UD	6	226190	ANGLE V-7 UP 90 27/32"	19.4	116.3
LCB	24	227666	3/4"-10 X 3-1/2" A-325T BOLT WITH FULL THREAD	0.5	13.0
LCF	24	312152	3/4" GALVANIZED FLAT WASHER (F436)	0.1	1.8
LCL	24	312153	3/4" GALVANIZED LOCKWASHER	0.0	0.7
LCN	24	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	4.8
			Total Wt	1611.8 lb [731.8 kg]	



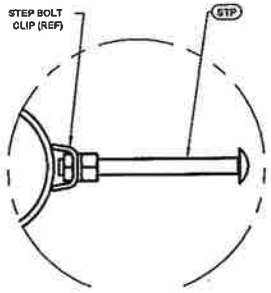
DETAIL A
ANGLE INTERSECTION CONNECTION



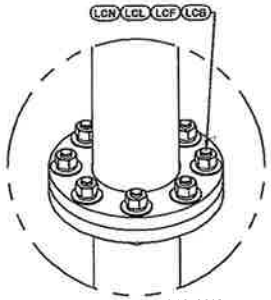
DETAIL B
END SIDE PLATE ANGLE CONNECTION



DETAIL C
MID SIDE PLATE ANGLE CONNECTION



STEP BOLT INSTALLATION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

APR 0 1 2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
	REVISION HISTORY			

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION V-7.0 (180' - 200' ELEVATION)

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

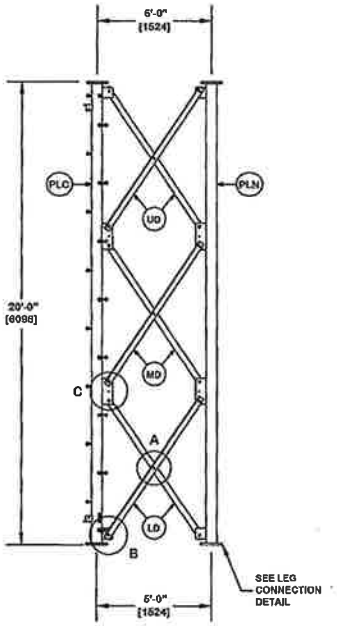
STRUCTURE APPROVAL	FOUNDATION APPROVAL
3/30/2015	3/30/2015

ENG. FILE NO. 284859

DWG. NO. 259147T

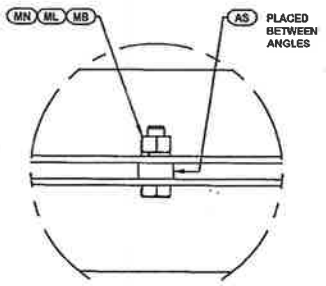
PAGE 12 OF 14

ORIENT ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

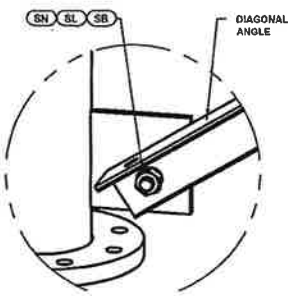


PARTS LIST

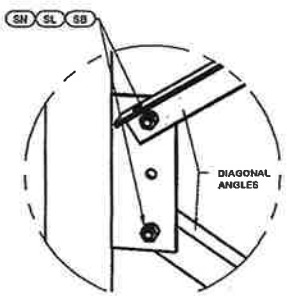
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
PLC	1	226184	PIPE LEG SECTION 20'-0" (CLIMBING) 4" SCH. 40 V-SE	302.1	302.1
PLN	2	226185	PIPE LEG SECTION 20'-0" (NON-CLIMBING) 4" SCH. 40	284.7	569.3
STP	16	228189	STEP BOLT ASSY 5/8"-11 X 7" W/ LOCK WASHER HEAVY	1.1	17.6
FD	18	217946	V-5 DIAG #9 17/32" 2 1/2" X 2 1/2" X 3/16"	24.1	432.9
ML	9	312123	5/8" GALVANIZED LOCKWASHER (63-22230)	0.0	0.2
AS	9	116467	SPACER 1/4" THICK 11/16" DIA HOLE	0.3	2.3
MB	9	227580	5/8"-11 X 2-1/4" A325T HOT DIPPED GALV. BOLT (FULL	0.6	5.8
MN	9	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.1
SL	36	312153	3/4" GALVANIZED LOCKWASHER	0.0	1.1
SN	36	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	8.6
SB	36	172250	3/4"-10 X 2" A-325 BOLT WITH 1-3/8" THREAD	0.7	24.1
LCB	18	227668	3/4"-10 X 3-1/2" A-325T BOLT WITH FULL THREAD	0.5	9.7
LCF	18	312152	3/4" GALVANIZED FLAT WASHER (F436)	0.1	1.4
LCL	18	312153	3/4" GALVANIZED LOCKWASHER	0.0	0.5
LCN	18	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	3.4
			Total Wt	1378.3 lb [625.6 kg]	



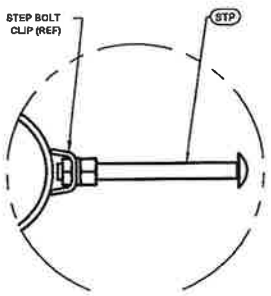
DETAIL A
ANGLE INTERSECTION CONNECTION



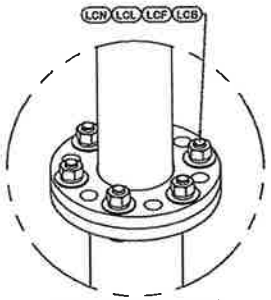
DETAIL B
END SIDE PLATE ANGLE CONNECTION



DETAIL C
MID SIDE PLATE ANGLE CONNECTION



STEP BOLT INSTALLATION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

APR 0 1 2015

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
REVISION HISTORY				

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

DESCRIPTION
SECTION V-5.0 (200' - 220' ELEVATION)

STRUCTURE APPROVAL 3/30/2015

FOUNDATION APPROVAL 3/30/2015

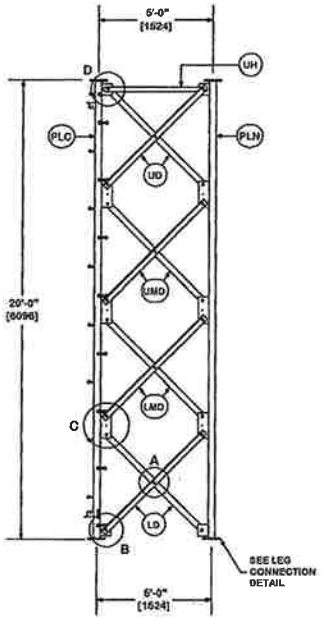
valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

DWG. NO. 259147T

PAGE 13 OF 14

INSTALL ANGLES WITH STAMPED
END TOWARD TOP OF SECTION

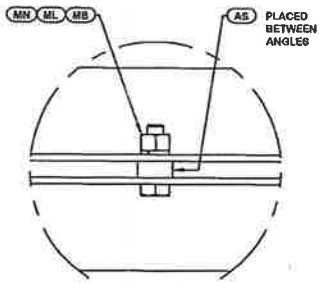


PARTS LIST

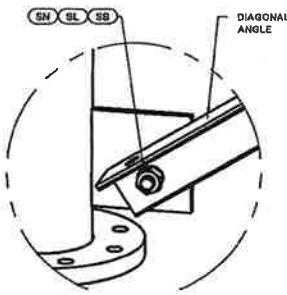
ITEM	QTY	PART NO.	PART DESCRIPTION	UNIT WT.	NET WT.
PLC	1	226160	PIPE LEG SECTION 20'-0" (CLIMBING) 2 1/2" SCH. 40	194.4	194.4
PLN	2	226161	PIPE LEG SECTION 20'-0" (NON-CLIMBING) 2 1/2" SCH.	189.2	378.3
STP	16	226189	STEP BOLT ASSY 5/8"-11 X 7" W/ LOCK WASHER HEAVY	1.1	17.6
FD	24	227077	ANGLE V-5 STR 74 7/32" - 2" X 2" X 1/8" ANGLE (A36	10.7	257.0
ML	12	312123	5/8" GALVANIZED LOCKWASHER (53-22230)	0.0	0.2
AS	12	116467	SPACER 1/4" THICK 11/16" DIA HOLE	0.3	3.0
MB	12	227580	5/8"-11 X 2-1/4" A325T HOT DIPPED GALV. BOLT (FULL	0.6	7.7
MN	12	312501	5/8"-11 HOT DIPPED GALVANIZED NUT	0.1	1.4
SL	48	312153	3/4" GALVANIZED LOCKWASHER	0.0	1.4
SN	48	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	9.1
SB	48	172260	3/4"-10 X 2" A-325 BOLT WITH 1-3/8" THREAD	0.7	32.2
UH	3	227584	UPPER HORIZONTAL BRACE ANGLE FOR V-SERIES TOWER (2	10.8	31.9
LCB	12	227668	3/4"-10 X 3-1/2" A-325T BOLT WITH FULL THREAD	0.5	6.5
LCF	12	312152	3/4" GALVANIZED FLAT WASHER (F436)	0.1	1.0
LCL	12	312153	3/4" GALVANIZED LOCKWASHER	0.0	0.4
LCN	12	312502	3/4"-10 HOT DIPPED GALVANIZED NUT	0.2	2.3
			Total Wt	944.4 lb [428.8 kg]	

STATE OF CONNECTICUT
WILLIAM HEIDENTIT
No. 23038
LICENSED
PROFESSIONAL ENGINEER

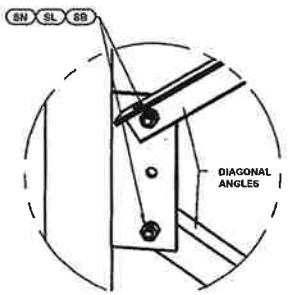
APR 0 1 2015



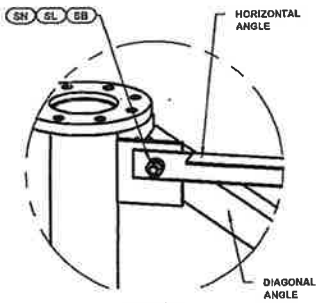
DETAIL A
ANGLE INTERSECTION CONNECTION



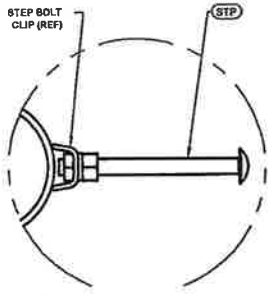
DETAIL B
END SIDE PLATE ANGLE CONNECTION



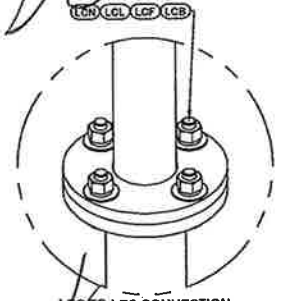
DETAIL C
MID SIDE PLATE ANGLE CONNECTION



DETAIL D
UPPER HORIZONTAL ANGLE CONNECTION



STEP BOLT INSTALLATION



LEG TO LEG CONNECTION
(SIDE PLATES NOT SHOWN FOR CLARITY)

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
REVISION HISTORY				

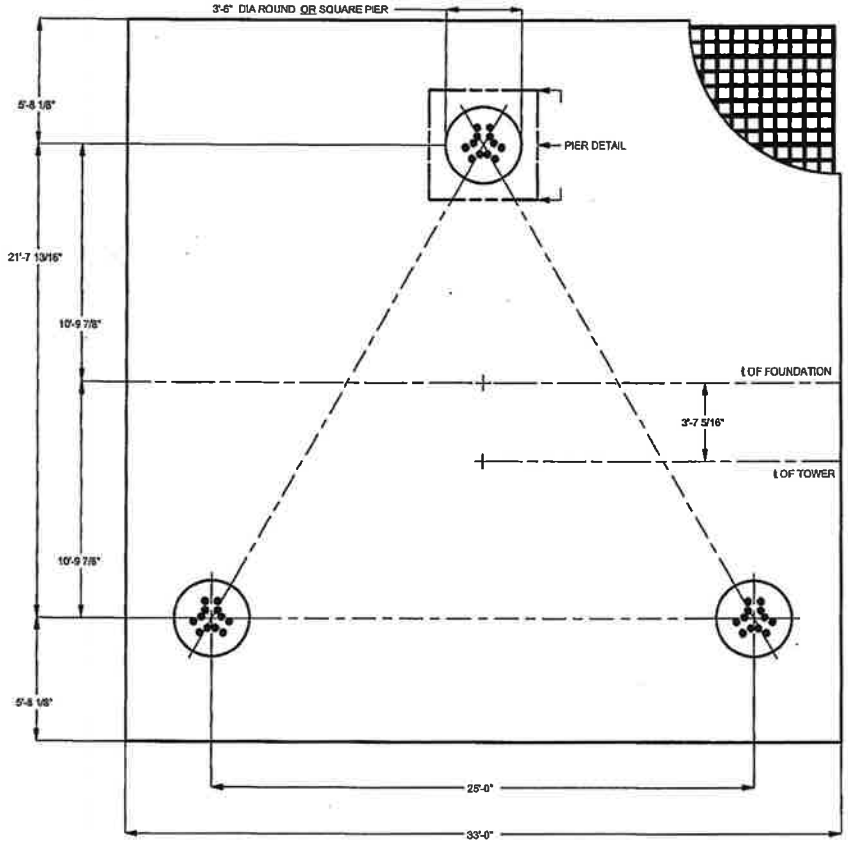
SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

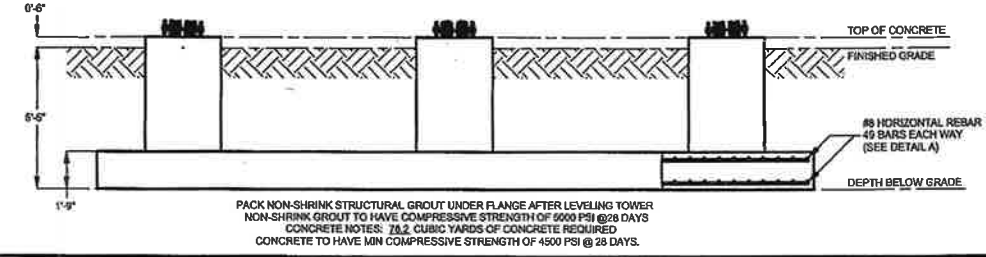
DESCRIPTION
SECTION V-5.0 (220' - 240' ELEVATION)

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

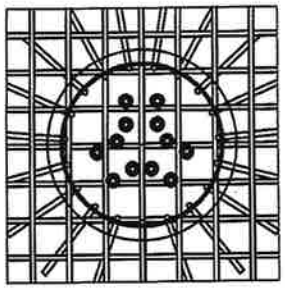
STRUCTURE APPROVAL	FOUNDATION APPROVAL
3/30/2015	3/30/2015

ENG. FILE NO. 284859
DWG. NO. 259147T
PAGE 14 OF 14





PACK NON-SHRINK STRUCTURAL GROUT UNDER FLANGE AFTER LEVELING TOWER
NON-SHRINK GROUT TO HAVE COMPRESSIVE STRENGTH OF 5000 PSI @28 DAYS
CONCRETE NOTES: 74.2 CUBIC YARDS OF CONCRETE REQUIRED
CONCRETE TO HAVE MIN COMPRESSIVE STRENGTH OF 4500 PSI @ 28 DAYS.



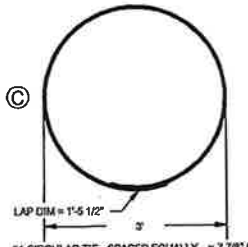
PIER DETAIL (TOP VIEW)

REBAR/ANCHOR STEEL TABLE				
ITEM	QTY	PART DESCRIPTION	UNIT WT.	NET WT.
1	36	1 1/4" DIA. x 60" LONG ANCHOR BOLT - 103183	20.91	752.70
2	3	EMBEDMENT PLATE - 217971	35.17	105.50
A	196	HORIZONTAL REBAR (#8 REBAR)	86.88	17047.81
B	57	VERTICAL REBAR (#9 REBAR)	26.07	1485.98
C	30	CIRCULAR TIE (#4 REBAR)	7.18	215.31
D	100	STANDEE (#5 REBAR)	5.93	592.90
			APPROX TOTAL WT #	20290.19

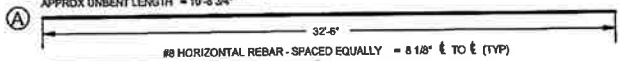
REBAR NOTES: ALL REINFORCING BARS MUST CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS.

FOUNDATION NOTES:

1. SOIL AS PER REPORT BY TERRACON, DATED 02/23/15, PROJECT#J2155118
2. CONCRETE TO BE 4500 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 (2008) BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR NOT PERMITTED.
3. A COLD JOINT IS PERMISSIBLE UPON CONSULTATION WITH PIROD. ALL COLD JOINTS SHALL BE COATED WITH BONDING AGENTS PRIOR TO SECOND POUR.
4. ALL FILL SHOULD BE PLACED IN LOOSE LEVEL LIFTS OF NO MORE THAN 8" THICK. FILL MATERIALS SHOULD BE CLEAN AND FREE OF ORGANIC AND FROZEN MATERIALS OR ANY OTHER DELETERIOUS MATERIALS. COMPACT FILL TO 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557.
5. BENDING, STRAIGHTENING OR REALIGNING (HOT OR COLD) OF THE ANCHOR BOLTS BY ANY METHOD IS PROHIBITED.
6. CROWN TOP OF FOUNDATION FOR PROPER DRAINAGE.
7. THE ON-SITE GEOTECHNICAL ENGINEER SHALL CONFIRM THAT THE INSITU SOIL STRENGTHS MEET OR EXCEED THOSE PARAMETERS GIVEN IN THE SOIL REPORT.
8. GRADE THE SITE TO DRAIN AWAY FROM FOUNDATION.
9. A SUMP PUMP OR OTHER DEWATERING SYSTEM MAY BE REQUIRED TO LOWER THE WATER TABLE TO FACILITATE THE INSTALLATION OF THE FOUNDATION.
10. ANY SOFT OR UNSTABLE SUBGRADE SOILS DETECTED DURING THE EXCAVATION SHOULD BE REMOVED AND REPLACED WITH COMPACTED FILL AS PER THE SPECIFICATIONS PROVIDED IN THE GEOTECHNICAL REPORT REFERENCED ABOVE (SEE SECTION 4.3.1.2).



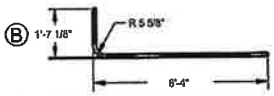
#4 CIRCULAR TIE - SPACED EQUALLY = 7 7/8" (TYP)
APPROX UNBENT LENGTH = 10'-6 3/4"



#8 HORIZONTAL REBAR - SPACED EQUALLY = 8 1/8" ℄ TO ℄ (TYP)

ATTENTION CONTRACTOR INSTALLING ANCHOR BOLTS!
1 1/4" DIA. ANCHOR BOLTS REQUIRED.
VERIFY THE PART NUMBER AND SIZES FOR ALL COMPONENTS ON THIS PAGE. IF THERE ARE ANY DISCREPANCIES, PLEASE NOTIFY VALMONT/PIROD, LLC PRIOR TO INSTALLATION.

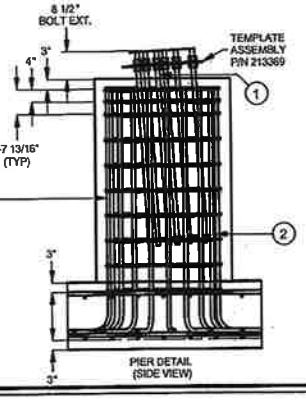
TEMPLATE INSTALLATION NOTES:
1. TEMPLATE PLACEMENT MUST BE +/- 3".
2. TEMPLATE ASSEMBLY MUST BE LEVEL +/- 1°.
3. BASE LEG REFERENCE ANGLE 3.31°.
4. INSTALLED TEMPLATE CLEARANCE: 2" MIN - 4" MAX



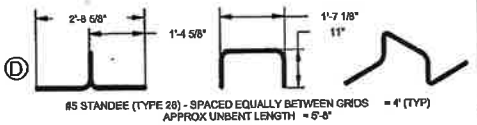
#9 VERTICAL REBAR - TO BE SPACED EQUALLY AROUND PIER AND INSIDE CIRCULAR TIES
APPROX UNBENT LENGTH = 7'-7 7/8"

CIRCULAR TIE NOTES:
PLACE CIRCULAR TIES SO LAPS ON ADJACENT TIES ARE 180 DEGREES APART. PLACE ONE TIE AT TOP OF REBAR GRID AND ONE TIE AT TOP OF PIER, EQUALLY SPACE TIES ALONG THE PIER, WITH ONE BAR PLACED 4" DOWN FROM THE TOP TIE. 10 TIES PER PIER (SEE DETAIL C)

#9 VERTICAL REBAR
18 PIECES PER PIER
EQUALLY SPACED, TO BE
PLACED INSIDE TIES
(SEE DETAIL B)



PIER DETAIL
(SIDE VIEW)



#5 STANDEE (TYPE 2B) - SPACED EQUALLY BETWEEN GRIDS = 4" (TYP)
APPROX UNBENT LENGTH = 5'-8"

STATE OF CONNECTICUT
WILLIAM HEIDENTHAL III
No. 23038
LICENSED PROFESSIONAL ENGINEER

APR 0 1 2015

SITE
ASHFORD, CT
VERIZON WIRELESS
U 25 X 240'

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DESCRIPTION
UNIT BASE
SELF SUPPORTING
TOWER FOUNDATION #1

valmont STRUCTURES
1-877-467-4763 Plymouth, IN
1-800-547-2151 Salem, OR

ENG. FILE NO. 284859

PAGE 1 OF 1

DWG. NO. 259147-F

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STRUCTURE APPROVAL		FOUNDATION APPROVAL	
MS	3/30/2015	MS	3/30/2015