STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
www.ct.gov/csc

October 20, 2005

Karina Fournier
Zoning Department
T-Mobile
100 Filley Street
Bloomfield, CT 06002

RE: **TS-T-MOBILE-078-050930** - Omnipoint Communications, Inc. (T-Mobile) request for an order to approve tower sharing at an existing telecommunications facility located at 230 Clover Mill Road, Mansfield, Connecticut.

Dear Ms. Fournier:

At a public meeting held October 19, 2005, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction. Please be advised that the validity of this action shall expire one year from the date of this letter.

The proposed shared use is to be implemented as specified in your letter dated September 30, 2005, including the placement of all necessary equipment and shelters within the tower compound.

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.
Chairman

PBK/laf

c: The Honorable Elizabeth Patterson, Mayor, Town of Mansfield
Gregory Padick, Town Planner, Town of Mansfield
TCP Communications, LLC
Christopher B. Fisher, Esq., Cuddy & Feder LLP
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels LLP
Kenneth C. Baldwin, Esq., Robinson & Cole LLP

G:\EM\T-MOBILE\Mansfield\dc101905.DOC

CSC
CONNECTICUT SITING COUNCIL

~ ORIGINAL ~

T-Mobile
Get more from life®

100 Filley Street, Bloomfield, CT 06002
860-692-7100 fax 860-692-7159
hkarina@adelphia.net

TS-T-MOBILE-078-050930

September 30, 2005

BY HAND

Pamela B. Katz, Chairman and
Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: **Tower Sharing Request by T-Mobile**
230 Clover Mill Road Mansfield, CT
Latitude: 41 46 33 / Longitude: 72 13 21

Dear Ms. Katz and Members of the Siting Council:

Pursuant to Connecticut General Statutes (C.G.S.) § 16-50aa, Omnipoint Communications, Inc. a.k.a. T-Mobile (formerly Voicestream Wireless Corp.) hereby requests an order from the Connecticut Siting Council ("Council") to approve the proposed shared use of an existing communications tower, located at 230 Clover Mill Road ("TCP Tower 1002 Mansfield"), in Mansfield, owned by TCP Communications LLC. T-Mobile and TCP Communications have agreed to the shared use of the TCP Tower 1002 Mansfield as detailed below.

TCP Tower 1002 Mansfield

The TCP Tower 1002 Mansfield consists of a one hundred eighty (180) foot high monopole ("Tower") owned and operated by TCP Communications LLC. T-Mobile proposes to locate antennas at a centerline mounting height of one hundred forty eight (148) feet. The equipment will be located within the existing compound at the base of the tower.

TCP Tower 1002 Mansfield

As shown on the enclosed plans prepared by Westcott and Mapes, Inc, including a site plan and tower elevation of the TCP Tower 1002 Mansfield, annexed hereto as Exhibit 1, T-Mobile proposes a shared use of the Facility by placing antennas on the tower and equipment needed to provide personal communications services ("PCS") within the existing site plan. T-Mobile will install nine (9) antennas at the one hundred forty eight (148) foot level of the Tower. Three (3) associated unmanned equipment cabinets will be located at the base of the tower.

Connecticut General Statutes § 16-50aa provides that, upon written request for shared use approval, an order approving such use shall be issued, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns." (C.G.S. § 16-50aa(c)(1).) Further, upon approval of such shared use, it is exclusive and no local zoning or land use approvals are required C.G.S. §16-50x. Shared use of the TCP Tower 1002 Mansfield satisfies the approval criteria set forth in C.G.S. § 16-50aa as follows:

A. Technical Feasibility The existing Tower and compound were designed to accommodate multiple carriers. A structural analysis of the Tower with the proposed T-Mobile installation has been performed and is attached as Exhibit 2. The structural analysis concludes that the tower can safely accommodate the proposed T-Mobile antennas. The proposed shared use of this Tower is technically feasible. Further there is sufficient room at the base of the facility, thus the site plan will not have to be altered.

B. Legal Feasibility Pursuant to C.G.S. § 16-50aa, the Council has been authorized to issue an order approving shared use of the existing TCP Tower 1002 Mansfield. (C.G.S. § 16-50aa (C)(1)). Under the authority vested in the Council by C.G.S. § 16-50aa, an order by the Council approving the shared use of a tower would permit the Applicant to obtain a building permit for the proposed installation.

C. Environmental Feasibility The proposed shared use would have a minimal environmental effect, for the following reasons:

1.) The proposed installation would have a de minimis visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing facility,

2.) The proposed installation by T-Mobile would not increase the height of the tower nor expand the site plan at the TCP Tower 1002 Mansfield and will be of minimal impact to the facility;

3.) The proposed installation would not increase the noise levels at the existing facility boundaries by six decibels or more;

4.) Operation of T-Mobile's antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. The "worst case" exposure calculated for the operation of this facility for all carriers would be approximately 15.86 % of the standard. See Radio Frequency Field Survey dated September 28, 2005, prepared by Marlon DePaz, annexed hereto as Exhibit 3;

5.) The proposed shared use of the TCP Tower 1002 Mansfield will not require any water or sanitary facilities, or generate any air emissions or discharges to water bodies. Further, the installation will not generate any traffic other than for periodic maintenance visits.

D. Economic Feasibility The Applicant and the tower owner have agreed to share use of the TCP Tower 1002 Mansfield on terms agreeable to both parties. The proposed tower sharing is therefore economically feasible.

E. Public Safety As stated above and evidenced in the Radio Frequency Field Survey annexed hereto as Exhibit 3, the operation of T-Mobile's antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. Further, the addition of T-Mobile's telecommunications service in the Mansfield area through shared use of the TCP Tower 1002 Mansfield is expected to enhance the safety and welfare of local residents and travelers through the area resulting in an improvement to public safety in this area.

Conclusion

As delineated above, the proposed shared use of the TCP Tower 1002 Mansfield satisfies the criteria set forth in C.G.S. § 16-50aa, and advances the General Assembly's and the Siting Council's goal of preventing the proliferation of tower in the State of Connecticut. T-Mobile therefore requests the Siting Council issue an order approving the proposed shared use of the TCP Tower 1002 Mansfield.

Respectfully submitted,

Karina Fournier
Zoning Dept.
T-Mobile
100 Filley St.
Bloomfield, CT 06002
(860) 692-7100

cc: Mayor, Elizabeth C. Paterson
Town Manager, Martin H. Berliner

Exhibit 1

TCP TOWER 1002 MANSFIELD

230 CLOVER MILL ROAD
MANSFIELD, CT 06268

SITE NUMBER: CTHA-211A

SITE TYPE: CO-LOCATE

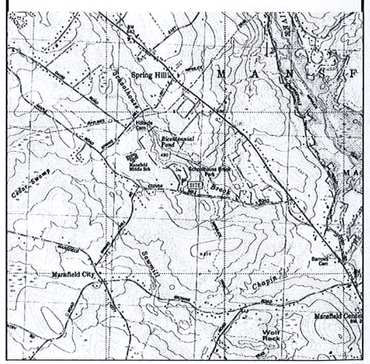
GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE LESSEE/LICENSEE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS / CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
15. THE CONTRACTOR SHALL NOTIFY THE LESSEE/LICENSEE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY:
DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233
CALL BEFORE YOU DIG (CT): 1-800-922-4455

VICINITY MAP

NO SCALE

TRUE NORTH



DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE LESSEE/LICENSEE REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
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S-1	STRUCT. NOTES, PLAN, SECTIONS & DETAILS	1
E-1	ELEC. & GROUNDING NOTES, RISERS & DETAILS	1

PROJECT SUMMARY

SITE NUMBER:	CTHA-211A
SITE NAME:	TCP TOWER 1002 MANSFIELD
SITE ADDRESS:	230 CLOVER MILL ROAD MANSFIELD, CT 06268
ASSESSOR'S PARCEL NO.:	MAP 23, BLOCK 60, LOT 7
CONSTRUCTION TYPE:	MONOPOLE
STRUCTURE OWNER:	TCP COMMUNICATIONS LLC 900 CUMMINGS CENTER, SUITE 305U BEVERLY, MA 01915
PROPERTY OWNER:	MANSFIELD MIDDLE SCHOOL TOWN OF MANSFIELD STORRS, CT 06268
APPLICANT:	OMNIPOINT COMMUNICATIONS, INC. 100 FILLEY STREET BLOOMFIELD, CT 06268

OMNIPOINT COMMUNICATIONS, INC.
A WHOLLY-OWNED SUBSIDIARY
OF T-MOBILE USA, INC.
100 FILLEY STREET
BLOOMFIELD, CT 06002
OFFICE: (860)-692-7100
FAX: (860)-692-7159

Westcott and Mapes, Inc.
Consulting Engineers and Architects since 1916
142 Temple Street
New Haven, CT 06510
TEL (203) 789-1260 • FAX (203) 789-8261

STATE OF CONNECTICUT
MICHAEL J. EGAN
No. 9422
LICENSED ARCHITECT

APPROVALS

LANDLORD _____
LEASING _____
R.F. _____
ZONING _____
CONSTRUCTION _____
A/E _____

PROJECT NO: 05062.17

DRAWN BY: RGG/MJE

CHECKED BY: CMM

SUBMITTALS

1	9/19/05	CONSTRUCTION FINAL
0	9/06/05	CONSTRUCTION

CTHA-211A
TCP TOWER 1002
MANSFIELD

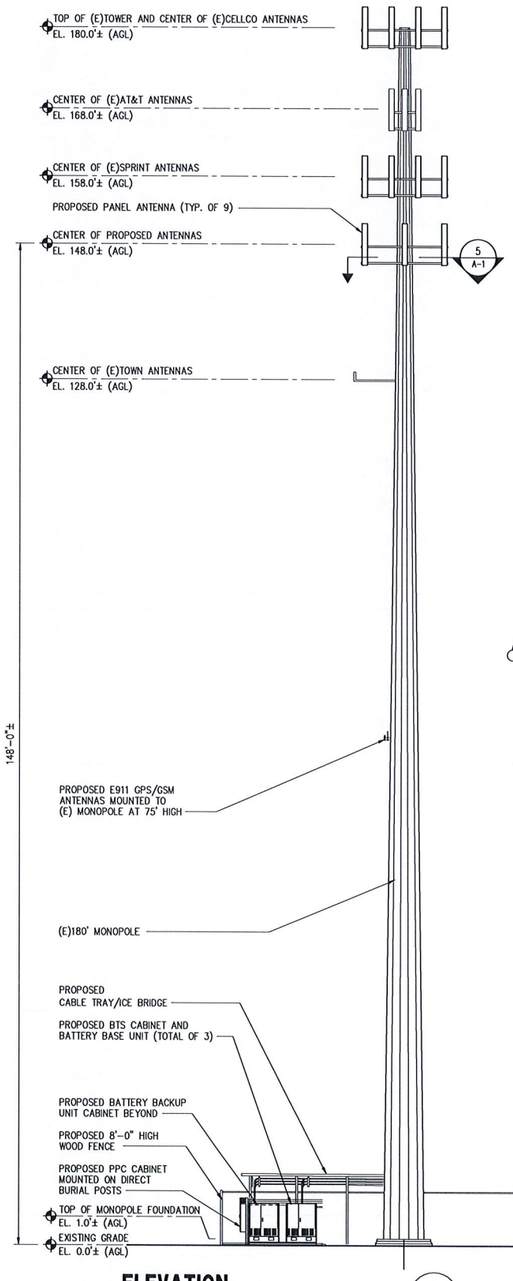
230 CLOVER MILL ROAD
MANSFIELD, CT 06268

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

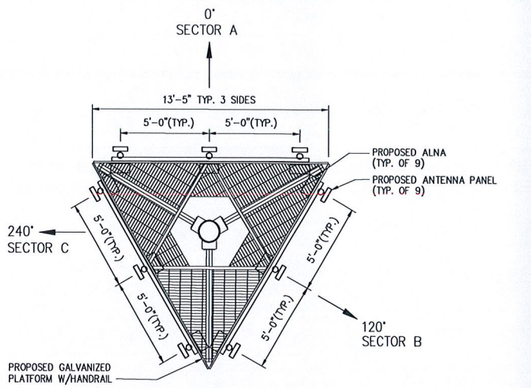


ELEVATION

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

3 / A-1

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



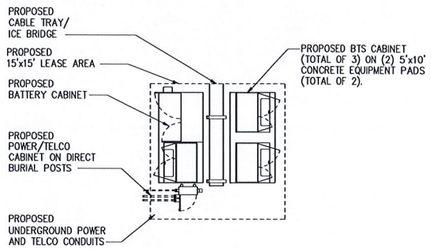
ANTENNA MOUNTING PLAN

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

5 / A-1

0 2 4 8 12

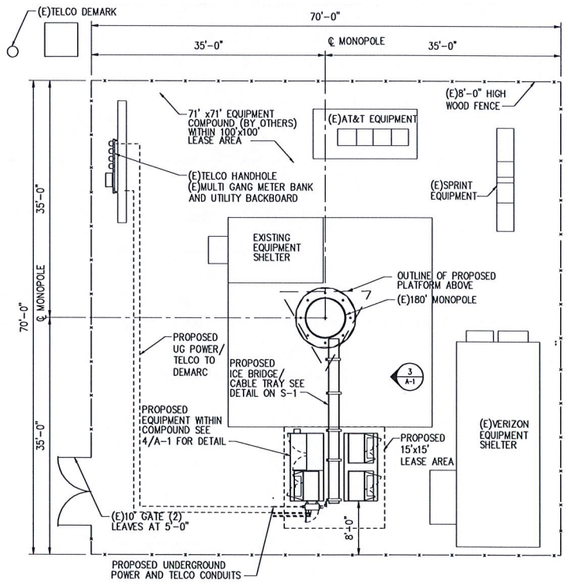
TRUE NORTH



EQUIPMENT PLAN

SCALE: 1/8"=1'-0"

4 / A-1



COMPOUND PLAN

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

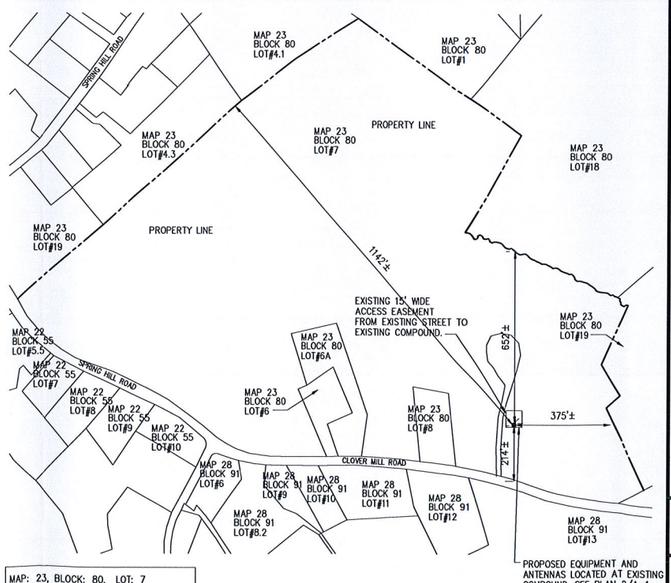
2 / A-1

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

TRUE NORTH

NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS SHOWN HEREIN.
2. ALL DIMENSIONS SHOWN THUS ± ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS WHICH EFFECT THE CONTRACTORS WORK. CONTRACTOR TO VERIFY ALL DIMENSIONS WITH OWNER PRIOR TO CONSTRUCTION.
3. NORTH ARROW SHOWN ON PLANS REFERS TO TRUE NORTH. PRIOR TO THE START OF CONSTRUCTION, ORDERING OR FABRICATION OF ANTENNA MOUNTS, CONTRACTOR SHALL CONSULT WITH PROJECT OWNER'S RF ENGINEER AND FIELD VERIFY ALL ANTENNA SECTOR LOCATIONS AND ANTENNA AZIMUTHS.
4. THE CONTRACTOR AND OR HIS SUB CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
5. ANTENNA INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS, TRANSMISSION LINES AND SUPPORT STRUCTURES.
6. COAXIAL CABLE CONNECTORS AND TRANSMITTER EQUIPMENT SHALL BE PROVIDED BY THE OWNER AND IS NOT INCLUDED IN THESE CONSTRUCTION DOCUMENTS. A SCHEDULE OF OWNER SUPPLIED MATERIALS IS ATTACHED TO THE BID DOCUMENTS (SEE ATTACHMENT K). ALL OTHER HARDWARE TO BE PROVIDED BY THE CONTRACTOR. CONNECTION HARDWARE SHALL BE STAINLESS STEEL.
7. ANTENNAS, SUPPORTS AND CABLE MOUNTS SHALL BE PAINTED TO MATCH EXISTING SURFACES TO WHICH IT IS ATTACHED. PAINT SHALL BE SHERWIN WILLIAMS, COROTHANE II. SURFACE PREPARATION AND APPLICATION SHALL BE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS AND LESSEE/LICENSEE GUIDELINES.
8. COORDINATION, LAYOUT, AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
9. EQUIPMENT WILL BE INDEPENDENTLY POWERED WITH SEPARATE METER.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.
12. ALL (E)ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW.
13. ALL (E)INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF UTILITY COMPANY ENGINEERING.
14. THE AREAS OF THE PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE EQUIPMENT, DRIVEWAY OR GRAVEL, SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED AND COVERED WITH MULCH.
15. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN SOIL EROSION AND SEDIMENTATION CONTROLS AT ALL TIMES DURING CONSTRUCTION.
16. PER FCC MANDATE, ENHANCED EMERGENCY (E911) SERVICE IS REQUIRED TO MEET NATIONWIDE STANDARDS FOR WIRELESS COMMUNICATIONS SYSTEMS. LESSEE/LICENSEE IMPLEMENTATION REQUIRES DEPLOYMENT OF EQUIPMENT AND ANTENNAS GENERALLY DEPICTED ON THIS PLAN, ATTACHED TO OR MOUNTED IN CLOSE PROXIMITY TO THE BTS RADIO CABINETS. LESSEE/LICENSEE RESERVES THE RIGHT TO MAKE REASONABLE MODIFICATIONS TO E911 EQUIPMENT AND LOCATION AS TECHNOLOGY EVOLVES TO MEET REQUIRED SPECIFICATIONS.



MAP: 23, BLOCK: 80, LOT: 7
LOT AREA: 86 ACRES
ZONING DISTRICT: RAR90

NOTES:

PLOT PLAN BASED ON TAX MAPS FROM THE TOWN OF MANSFIELD, CT.
SETBACKS ARE TAKEN FROM PROPOSED EQUIPMENT TO PROPERTY LINES.

PLOT PLAN

SCALE: 1"=300'-0"

1 / A-1

0 150 300 600 900

TRUE NORTH

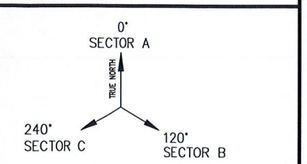
ABBREVIATIONS

ADJ	ADJUSTABLE	OC	ON CENTER
AGL	ABOVE GRADE LEVEL	OPP	OPPOSITE
APPROX	APPROXIMATE	SF	SQUARE FOOT
C	CONDUIT	SHT	SHEET
CONC	CONCRETE	SIM	SIMILAR
CONT	CONTINUOUS	STL	STEEL
CJ	CONSTRUCTION JOINT	TOC	TOP OF CONCRETE
DIA	DIAMETER	TOM	TOP OF MASONRY
DWG	DRAWING	TYP	TYPICAL
EGB	EQUIPMENT GROUND BAR	VIF	VERIFY IN FIELD
EA	EACH	UG	UNDERGROUND
ELEC	ELECTRICAL	UON	UNLESS OTHERWISE NOTED
EL	ELEVATION	WWF	WELDED WIRE FABRIC
EQ	EQUAL	W/	WITH
EQUIP	EQUIPMENT	BTS	BASE TRANSMISSION STATION
(E)	EXISTING	LNA	LOW NOISE AMPLIFIER
EXT	EXTERIOR	PCS	PERSONAL COMMUNICATIONS SERVICES
FCM	FIELD CONSTRUCTION MANAGER	A-1	ANTENNA MARK NO.
FF	FINISHED FLOOR	℄	PLATE
FG	FINISHED GRADE	&	AND
GA	GAUGE	@	AT
GALV	GALVANIZED		
GC	GENERAL CONTRACTOR		
LG	LONG		
MAX	MAXIMUM		
MECH	MECHANICAL		
MFR	MANUFACTURER		
MGB	MASTER GROUND BAR		
MIN	MINIMUM		
MTL	METAL		
NIC	NOT IN CONTRACT		
NTS	NOT TO SCALE		

SYMBOLS AND MATERIALS

	NEW ANTENNA		GROUT OR PLASTER
	EXISTING ANTENNAS		(E)BRICK
	ASPHALT		(E)MASONRY
	NEW ACCESS EASEMENT		CONCRETE
	CONCRETE		EARTH
	ELECTRIC BOX		GRAVEL
	LIGHT POLE		PLYWOOD
	FND. MONUMENT		SAND
	SPOT ELEVATION		WOOD CONT.
	SET POINT		WOOD BLOCKING
	REVISION		STEEL
	GRID REFERENCE		CENTER LINE
DET. # / SHT. #	DETAIL REFERENCE		PROPERTY LINE
			STEPPED FOOTING
D / SH	ELEVATION		MATCH LINE
			WORK POINT
D / SH	SECTIONS & DETAILS	G	GROUND WIRE
			COAXIAL CABLE

ANTENNA ORIENTATION KEY



OMNIPOINT COMMUNICATIONS, INC.
A WHOLLY-OWNED SUBSIDIARY
OF T-MOBILE USA, INC.
100 FILLEY STREET
BLOOMFIELD, CT 06002
OFFICE: (860)-692-7100
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142 Temple Street
New Haven, CT 06510
TEL (203) 789-1260 • FAX (203) 789-8261

STATE OF CONNECTICUT
MICHAEL J. EGAN
No. 8422
LICENSED ARCHITECT

APPROVALS

LANDLORD _____
LEASING _____
R.F. _____
ZONING _____
CONSTRUCTION _____
A/E _____

PROJECT NO: 05062.17

DRAWN BY: RGG

CHECKED BY: CMM

SUBMITTALS

1	9/19/05	CONSTRUCTION FINAL
0	9/06/05	CONSTRUCTION

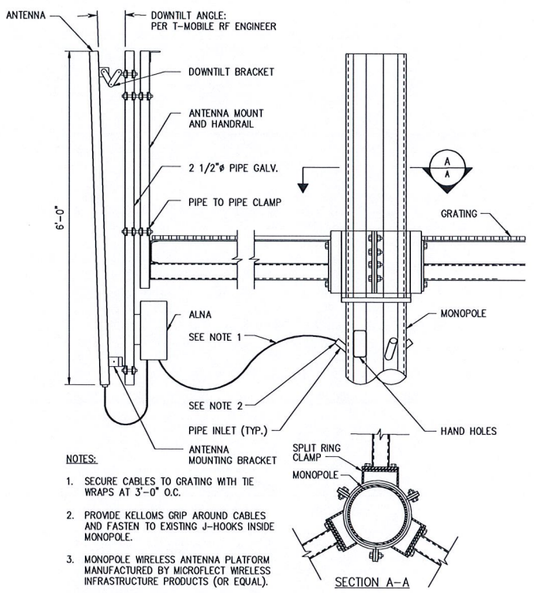
CTHA-211A
TCP TOWER 1002
MANSFIELD

230 CLOVER MILL ROAD
MANSFIELD, CT 06268

PLANS, ELEVATION,
DETAILS AND NOTES

SHEET NUMBER

A-1



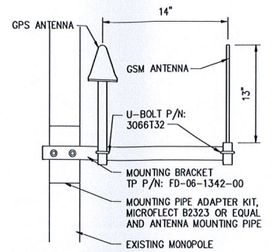
NOTES:

1. SECURE CABLES TO GRATING WITH TIE WRAPS AT 3'-0" O.C.
2. PROVIDE KELLOMS GRIP AROUND CABLES AND FASTEN TO EXISTING J-HOOKS INSIDE MONOPOLE.
3. MONOPOLE WIRELESS ANTENNA PLATFORM MANUFACTURED BY MICROFLECT WIRELESS INFRASTRUCTURE PRODUCTS (OR EQUAL).

ANTENNA MOUNTING DETAIL

SCALE: 3/4"=1'-0"

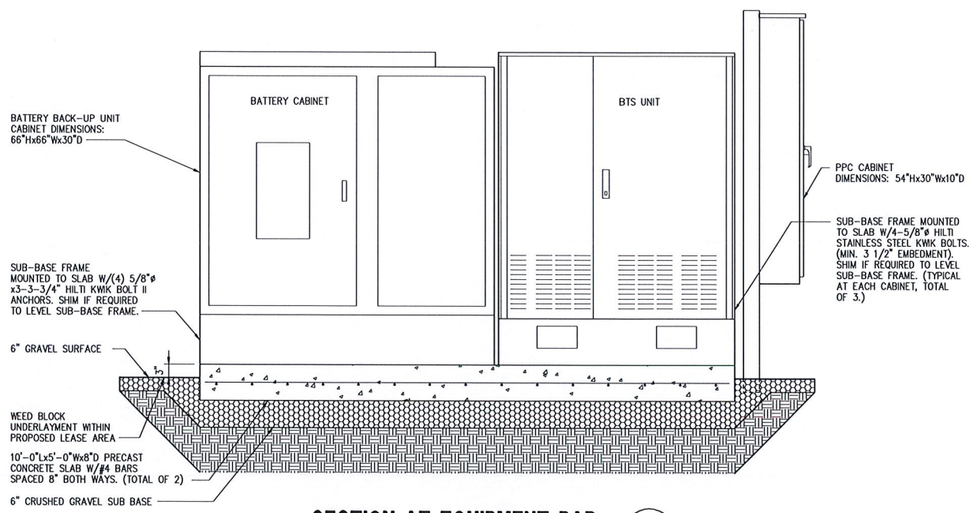
4 / S-1



GPS AND GSM ANTENNA MOUNTING DETAIL

SCALE: N.T.S.

5 / S-1

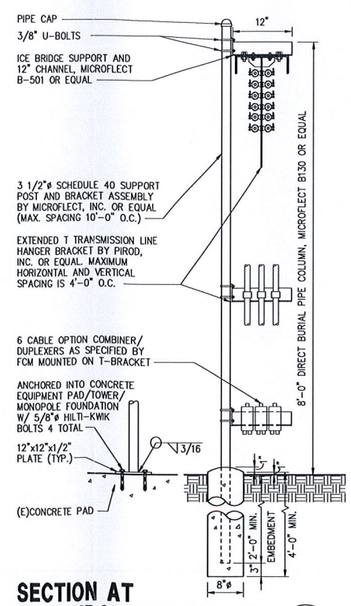


SECTION AT EQUIPMENT PAD

SCALE: 3/4"=1'-0"

3 / S-1

0 8" 1'-4" 2'-8" 4'-0"



SECTION AT ICE BRIDGE/CABLE TRAY

SCALE: 3/4"=1'-0"

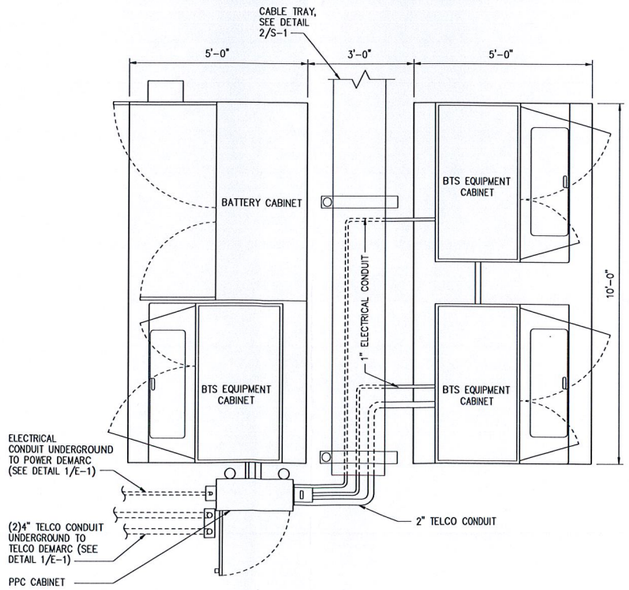
2 / S-1

0 8" 1'-4" 2'-8" 4'-0"

STRUCTURAL NOTES

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, ANSI/ASCE7, EIA/TIA-222-F STRUCTURAL STANDARDS FOR STEEL ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL WIDE-FLANGE SHAPES SHALL CONFORM TO ASTM 992A. ALL OTHER SHAPES AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 STRUCTURAL STEEL, UNLESS OTHERWISE NOTED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE A, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 5/8" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC- COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUTS SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP. WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF 1/2" DIAMETER STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-20 AND OR HY-150 SYSTEMS (AS SPECIFIED AN DWG.) OR ENGINEERS APPROVED EQUAL WITH 4-1/4" MIN. EMBEDMENT DEPTH.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT II OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE THREE AND ONE HALF (3 1/2) INCHES.
15. GRAVEL SUB BASE AND CONCRETE SHALL BE PLACED AGAINST UNDISTURBED SOIL.
16. CONCRETE FOR FENCE AND ICE BRIDGE SUPPORT SHALL BE 3000 PSI AIR ENTRAINED (4 %-6 %) NORMAL WEIGHT CONCRETE.
17. ALL CAST IN PLACE CONCRETE SHALL BE MIXED AND PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318 AND ACI 301.
18. THE FOLLOWING MINIMUM CONCRETE COVER OVER REINFORCING STEEL SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
    CONCRETE CAST AGAINST EARTH ... 3 INCHES.
    CONCRETE EXPOSED TO EARTH OR WATER
    #6 AND LARGER .....2 INCHES
    #5 AND SMALLER .....1 1/2 INCHES

    ALL EXPOSED EDGES SHALL BE PROVIDED WITH A 3/4"x3/4" CHAMFER UNLESS NOTED OTHERWISE.
19. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
20. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY.



PLAN AT EQUIPMENT PAD

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

1 / S-1

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STATE OF CONNECTICUT
MICHAEL J. EGAN
No. 18422
LICENSED ARCHITECT

APPROVALS

LANDLORD _____
LEASING _____
R.F. _____
ZONING _____
CONSTRUCTION _____
A/E _____

PROJECT NO: 05062.17

DRAWN BY: RGG

CHECKED BY: CMM

SUBMITTALS

1	9/19/05	CONSTRUCTION FINAL
0	9/06/05	CONSTRUCTION

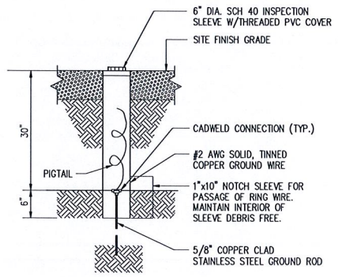
CTHA-211A
TCP TOWER 1002
MANSFIELD

230 CLOVER MILL ROAD
MANSFIELD, CT 06268

STRUCTURAL NOTES, PLAN SECTIONS AND DETAILS

SHEET NUMBER

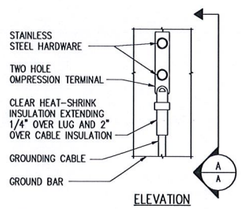
S-1



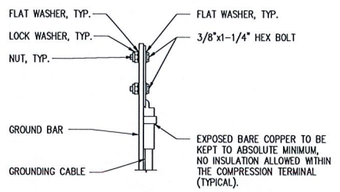
GROUND ROD TEST WELL DETAIL

8 / E-1

SCALE: N.T.S.



ELEVATION



SECTION A-A

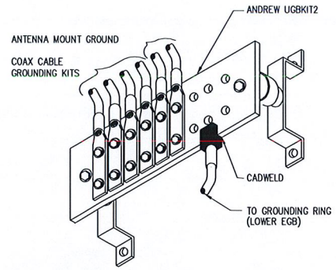
NOTES:

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

TYPICAL GROUND BAR CONNECTIONS DETAIL

7 / E-1

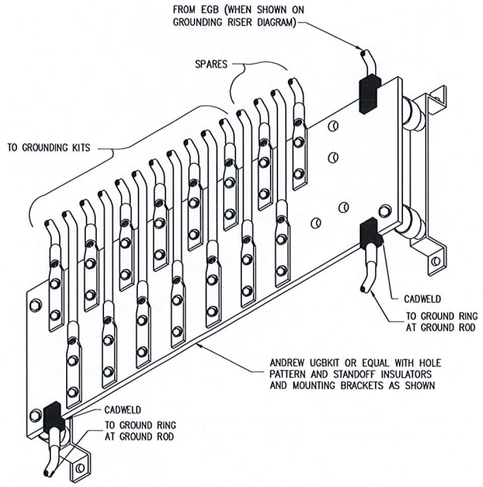
SCALE: N.T.S.



EQUIPMENT GROUND BAR (EGB)

6 / E-1

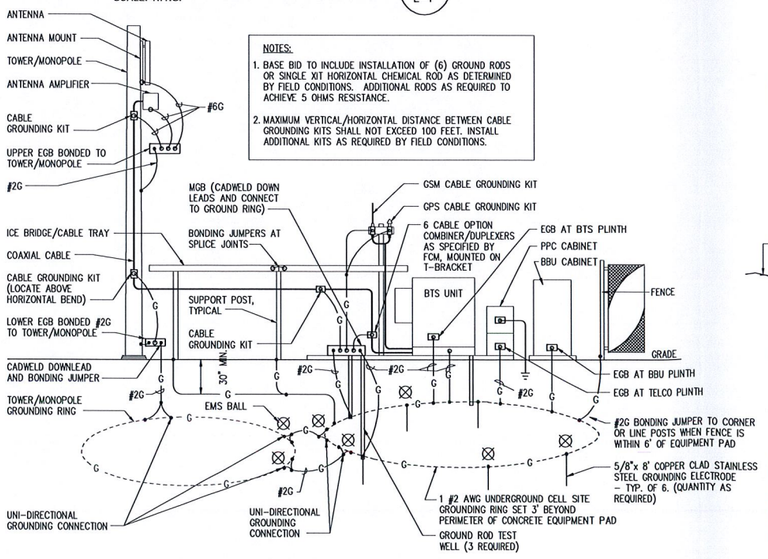
SCALE: N.T.S.



MASTER GROUND BAR (MGB)

5 / E-1

SCALE: N.T.S.



NOTES:

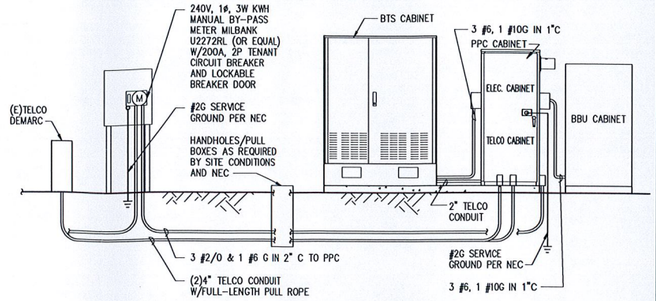
1. BASE BID TO INCLUDE INSTALLATION OF (6) GROUND RODS OR SINGLE 2IT HORIZONTAL CHEMICAL ROD AS DETERMINED BY FIELD CONDITIONS. ADDITIONAL RODS AS REQUIRED TO ACHIEVE 5 OHMS RESISTANCE.
2. MAXIMUM VERTICAL/HORIZONTAL DISTANCE BETWEEN CABLE GROUNDING KITS SHALL NOT EXCEED 100 FEET. INSTALL ADDITIONAL KITS AS REQUIRED BY FIELD CONDITIONS.

GROUNDING RISER DIAGRAM

4 / E-1

SCALE: N.T.S.

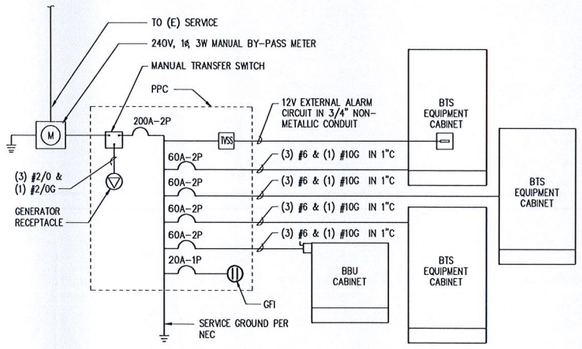
MAKE ALL CONNECTIONS AS PER UTILITY COMPANY'S REQUIREMENTS.



POWER RISER DIAGRAM

3 / E-1

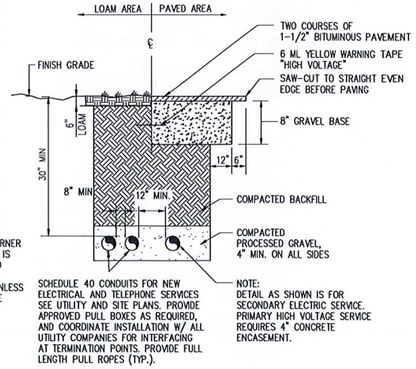
SCALE: N.T.S.



ONE LINE DIAGRAM

2 / E-1

SCALE: N.T.S.



SCHEDULE 40 CONDUITS FOR NEW ELECTRICAL AND TELEPHONE SERVICES SEE UTILITY AND SITE PLANS. PROVIDE APPROVED PULL BOXES AS REQUIRED, AND COORDINATE INSTALLATION W/ ALL UTILITY COMPANIES FOR INTERFACING AT TERMINATION POINTS. PROVIDE FULL LENGTH PULL ROPES (TYP.).

BURIED CONDUIT DETAIL

1 / E-1

SCALE: N.T.S.

ELECTRICAL LEGEND

	NEW PANEL BOARD, SURFACE MOUNTED
	EXISTING PANEL BOARD, SURFACE MOUNTED
T	DRY TYPE TRANSFORMER
M	METER
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH, MOUNTED 54" A.F.F.
F	FUSIBLE DISCONNECT SWITCH, MOUNTED 54"A.F.F.
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR WITH BUILT-IN FUSES, SURFACE MOUNTED
	DUPLEX OUTLET, SURFACE MOUNTED, 20 AMPS, 125 VOLTS, SINGLE PHASE
J	JUNCTION BOX, SURFACE MOUNTED 18" A.F.F.
	EXPOSED WIRING
	HOME RUNS, MINIMUM 2#10 + 1#10G IN 3/4" CONDUIT U.O.N.
A.F.F.	ABOVE FINISHED FLOOR
U.O.N.	UNLESS OTHERWISE NOTED
WP	WEATHERPROOF
GFI	GROUND FAULT INTERRUPTER
A	AMPERE
V	VOLT
KWH	KILOWATT - HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
G	GROUND
	GROUND
MGB	MASTER GROUND BAR ○MECHANICAL CONNECTION ●CADWELD CONNECTION
EGB	EQUIPMENT GROUND BAR ○MECHANICAL CONNECTION ●CADWELD CONNECTION
G	GROUND COPPER WIRE, SIZE AS NOTED
	EXPOSED WIRING
	COAXIAL CABLE
	5/8"x8' COPPER CLAD STAINLESS STEEL GROUND ROD
	●EXOTHERMIC (CADWELD) OR ○MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHNINSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
11. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
12. PPC SUPPLIED BY PROJECT OWNER.
13. GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE DONE IN ACCORDANCE WITH "T-MOBILE BTS SITE GROUNDING STANDARDS".
14. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
15. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
16. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
17. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
18. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
19. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
20. CONTRACTOR SHALL PROVIDE AND INSTALL OMNI DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXISTING TOWER/ MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.
21. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMNS MINIMUM RESISTANCE REQUIRED.
22. CONTRACTOR SHALL CONDUCT ANTENNA, COAX, AND LNA RETURN-LOSS AND DISTANCE-TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.

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STATE OF CONNECTICUT
MICHAEL J. EARLE
No. 8422
LICENSED ARCHITECT

APPROVALS

LANDLORD _____
LEASING _____
R.F. _____
ZONING _____
CONSTRUCTION _____
A/E _____

PROJECT NO: 05062.17

DRAWN BY: RGG/MJE

CHECKED BY: CMM

SUBMITTALS

1	9/19/05	CONSTRUCTION FINAL
0	9/06/05	CONSTRUCTION

CTHA-211A
TCP TOWER 1002
MANSFIELD

230 CLOVER MILL ROAD
MANSFIELD, CT 06268

ELECTRICAL AND GROUNDING NOTES, RISERS, AND DETAILS

SHEET NUMBER

E-1

Exhibit 2

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215

Structural Analysis Report

PJF Project No.: **31205-040**

Structure: Existing 178-ft Monopole

Owner: TCP Communications
Manufacturer: PennSummit Communications
Location: Mansfield, CT
Site Number: CTHA211A

Prepared For:

Omnipoint Communications, Inc.

50 Vision Boulevard
East Providence, RI 02914
Attn: Charmaine Simpson

APPROVED
T-Mobile Site No: CTHA211A
A & E Manager: D.O'Connor
Date: 9/23/05
Antenna Make: EMS Model No.: DX65, D90
Number Antennas: 9 Rad. Center (AGL).: 145 Feet
Coax Cables: Number: 24 ☐ 7/8" ☒ 1-5/8" ☐ 2-1/4"
☒ Tower and Foundation Acceptable: No Upgrades Required
☐ Tower Upgrades Required
☐ Foundation Upgrades Required
☐ Special Coax Placement or Bundling Required

September 28, 2005

STATE OF CONNECTICUT
KEVIN P. BAUMAN
NO. 17891
LICENSED
PROFESSIONAL ENGINEER

Analyzed by:
Kurt J. Swarts, P.E.
Project Manager
kswarts@pjfweb.com

Reviewed by:
Kevin P. Bauman
Department Manager

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215

Executive Summary

Design Standard:

Paul J. Ford and Company has analyzed the existing monopole in accordance with the Telecommunications Industry Association Standard TIA/EIA-222-F for the following *fastest mile* design wind velocities:

85 mph Basic Wind Velocity without ice
74 mph Basic Wind Velocity with 1/2" radial ice
50 mph (Operational) Basic Wind Velocity without ice

Results:

The monopole and foundation have sufficient capacity to support the antenna loading listed on page 4, while meeting the local minimum wind requirements.

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215

Project Description:

Paul J. Ford and Company has analyzed the existing monopole for T-Mobile in accordance with the Telecommunications Industry Association / Electronic Industry Association, TIA/EIA-222-F, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures." The TIA/EIA standard was developed by professional engineers experienced in the design of communication structures.

Pole History:

The monopole was manufactured by PennSummit Tubular, LLC in 2003 for TCP Communications per job #20031. Paul J. Ford and Company designed the pole and foundation for PennSummit, reference PJF #29203-0151. The monopole was originally designed in accordance with TIA/EIA-222-F for an 85 mph design wind for the following antenna loading:

Elevation	Description
180'	(1) 6' Whip, (2) 10' Whips, (3) 18' Whips (12) DB896H 14' Platform w/ Handrail
168'	(12) DB896H 14' Low Profile Platform
158'	(12) EMS RR65-19-00XP 14' Low Profile Platform
148'	(12) EMS RR65-19-00XP 14' Low Profile Platform
138'	(12) EMS RR65-19-00XP 14' Low Profile Platform
128'	(12) EMS RR65-19-00XP 14' Low Profile Platform
110'	(2) Celwave PD128, (2) Decibel DB264 (2) DB224, (2) DB212-2, (4) DB420 (3) 10' T-Arm Mounts

Structural Analysis:

Our analysis was completed according to the recommendations of the TIA/EIA-222-F 1996. This standard recommends a minimum design wind velocity of 85 mph (no ice) for Tolland County. If ice accumulation is considered, the TIA/EIA standard allows the design wind velocity reduced by 25% in conjunction with ½" radial ice. Our analysis was completed in compliance with the minimum wind requirements under the following load cases:

85 mph Basic Wind Velocity without ice
74 mph Basic Wind Velocity with 1/2" radial ice
50 mph (Operational) Basic Wind Velocity without ice

Existing & Proposed Antenna Loading:

Our analysis was completed using the following existing and proposed antenna loading:

Status	Elevation	Description	Coax	Owner
Existing	180'	(1) 6' Whip, (2) 10' Whips, (3) 18' Whips (12) DB848H80 14' Platform w/ Handrail	(6) 1 5/8" (12) 1 5/8"	Verizon / Town of Mansfiled
Existing	168'	(3) Allgon 7250.04	(6) 1 5/8"	AT&T
Proposed		(3) Allgon 7250.04 14' Low Profile Platform		
Existing	158'	(9) Decibel DB980F90E-M 14' Low Profile Platform	(9) 1 5/8"	Sprint PCS
Proposed	148'	(9) EMS DR65-19-00DPQ (12) Decibel PCS 1900 14' Low Profile Platform	(24) 1 5/8"	T-Mobile
Existing	110'	(2) Celwave PD128, (2) Decibel DB264 (2) DB224, (2) DB212-2, (4) DB420 (3) 10' T-Arm Mounts	(12) 1 5/8"	Town of Mansfield
Existing	60'	GPS on 3' Side Arm Mount		
Proposed	60'	NAIS VIC-100 GPS on 3' Side Arm Mount		T-Mobile

Coaxial cable for this analysis was assumed internally mounted and not exposed to the wind.

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215

Results:

When the new antenna configuration is considered, the monopole has sufficient capacity to safely support the new loading while maintaining the minimum wind rating:

Member	Elevation	Actual Stress	Allowable Stress	Percent Capacity	
Shaft #1	129'	33.0 ksi	52.0 ksi	63.5%	☑
Shaft #2	89'	34.6 ksi	52.0 ksi	66.5%	☑
Shaft #3	44'	41.7 ksi	52.0 ksi	80.1%	☑
Shaft #4	0'	38.6 ksi	51.2 ksi	75.4%	☑
Base Plate	0'	54.4 ksi	55.0 ksi	98.9%	☑
Anchor Bolts	0'	40.6 ksi	60.0 ksi	67.7%	☑

The existing foundation has sufficient capacity to support the new loading while maintaining the minimum required safety factors. ☑

Conclusion:

The existing monopole and foundation have sufficient capacity to support the new antenna loading while meeting the minimum wind requirements of this analysis.

If you have any questions concerning our analysis, or if we can be of further service to you, please feel free to contact us at (614) 221-6679.

Sincerely,

Paul J. Ford and Company

Kurt J Swarts

Kurt Swarts, P.E.
Project Manager

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1. Paul J. Ford and Company has not made a field inspection to verify the monopole dimensions or the antenna/coax loading. If the existing conditions are not as represented on these sketches, we should be contacted immediately to reevaluate any conclusions stated in this report.

2. No allowance was made for any damaged, missing, or rusted monopole parts. The analysis of this pole assumes that no physical deterioration has occurred in any of the structural components of the pole and that all the pole members have the same capacity as the day the pole was erected.

3. It is not possible to have all of the very detailed information to perform a thorough analysis of every structural sub-component of an existing monopole. The structural analysis provided by Paul J. Ford and Company verifies the adequacy of the main structural members of the monopole. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate, connection detail, etc.

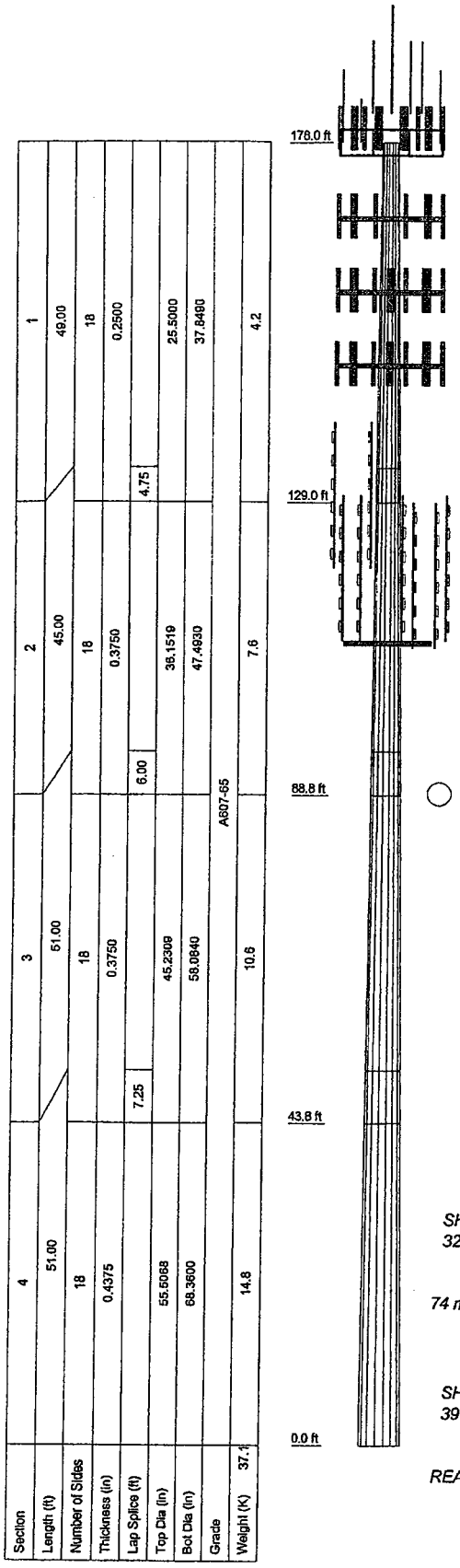
4. It is the owner's responsibility to determine the amount of ice accumulation, if any, that shall be used in the structural analysis.

5. The monopole has been analyzed according to the minimum basic design wind velocity recommended by the Electronics Industry Association Standard ANSI/EIA-222-F. If the owner or local or state agencies require a higher design wind velocity, Paul J. Ford and Company should be made aware of this requirement.

6. The enclosed sketches are a schematic representation of the monopole we have analyzed. If any material is fabricated from these sketches, the fabricator shall be responsible for field verifying the existing conditions and for proper fit and clearance in the field.

7. Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

8. Installation of new hand hole ports and/or cable access ports will not reduce the structural capacity of the monopole shaft, if the hand hole frames and/or cable access ports are properly designed and installed in accordance to proper procedures. Paul J. Ford and Company recommends that new hand holes and/or cable access port hole frames be purchased from the original pole manufacturer. The new hand hole and/or cable access frames shall be installed per the original manufacturer's installation procedures. Paul J. Ford and Company will design and provide installation procedures for new hand holes and/or cable access ports if required, as an additional scope of services.



Section	1	2	3	4
Length (ft)	49.00	45.00	61.00	51.00
Number of Sides	18	18	18	18
Thickness (in)	0.2500	0.3750	0.3750	0.4375
Lap Splice (ft)	4.75	6.00	7.25	
Top Dia (in)	25.5000	36.1519	45.2309	55.5068
Bot Dia (in)	37.8480	47.4930	58.0840	68.3600
Grade	A607-65			
Weight (K)	4.2	7.6	10.6	14.8

AXIAL
66 K
SHEAR
32 K
MOMENT
4294 kip-ft
TORQUE 1 kip-ft
74 mph WIND - 0.5000 in ICE

AXIAL
55 K
SHEAR
39 K
MOMENT
5013 kip-ft
TORQUE 2 kip-ft
REACTIONS - 85 mph WIND

APPURTENANCES

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2" x 23'	189.5	(4) PCS 1900	148
18 ft x 3" dia whip	187	(3) DR65-19-00DPQ	148
18 ft x 3" dia whip	187	(4) PCS 1900	148
18 ft x 3" dia whip	187	(3) DR65-19-00DPQ	148
10 ft x 2.5" dia whip	183	(4) PCS 1900	148
10 ft x 2.5" dia whip	183	PennSummit 14' Low Profile Platform	148
6 ft x 1.5" dia whip	181		
(4) DB848H80E-XY	180	DB212-2-A	130
(4) DB848H80E-XY	180	DB212-2-A	130
(4) DB848H80E-XY	180	DB264-A	120
PennSummit 14' Platform w/ Handrail	178	DB264-A	120
		DB224	120
(2) 7250.04	168	DB224	120
(2) 7250.04	168	DB420 (16-dipole)	119
(2) 7250.04	168	DB420 (16-dipole)	119
PennSummit 14' Low Profile Platform	168	DB420 (16-dipole)	119
		DB420 (16-dipole)	119
(3) DB980F90E-M	158	PD128	114
(3) DB980F90E-M	158	PD128	114
(3) DB980F90E-M	158	Valmont T-Arm (3)	110
PennSummit 14' Low Profile Platform	158	GPS	60
		NAIS VIC-100	60
(3) DR65-19-00DPQ	148	(2) 3' Side Arm Mount	60

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

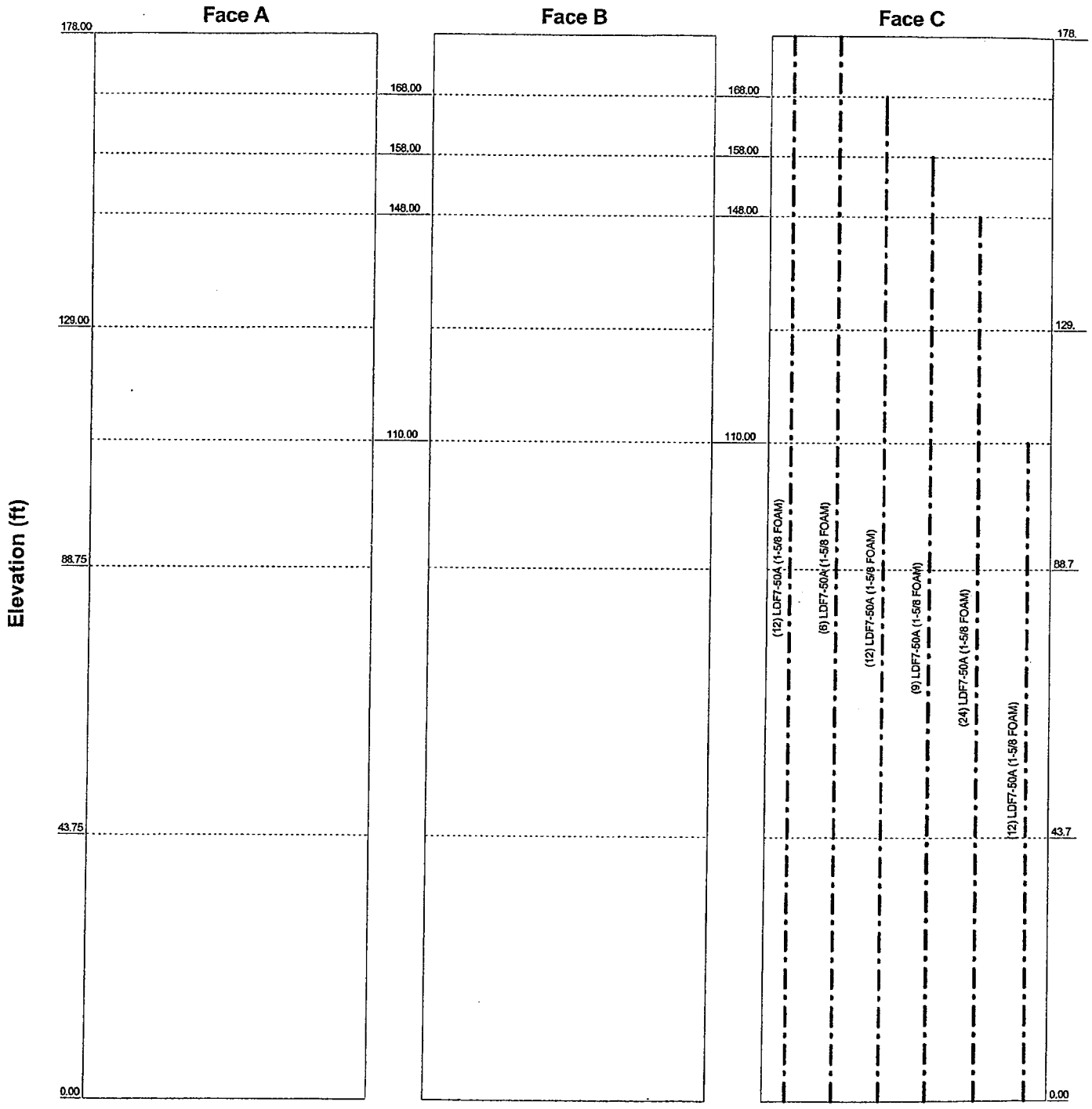
1. Tower is located in Tolland County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 80.1%

Paul J. Ford and Company
250 East Broad Street, Suite 1500
Columbus, OH
Phone: (614) 221-6679
FAX: (614) 448-4105

Job: CTHA211A: Mansfield, CT			
Project: 31205-0039			
Client: T-Mobile	Drawn by: kswarts	App'd:	
Code: TIA/EIA-222-F	Date: 09/28/05	Scale:	
Path: G:\TOWER\312_T-Mobile (VoiceStream)\2005\31205-039\31205-039.er		Dwg N	

Feedline Distribution Chart
0' - 178'

Round ___ Flat ___ App In Face ___ . ___ App Out Face ___ .. ___ Truss Leg



Paul J. Ford and Company
250 East Broad Street, Suite 1500
Columbus, OH
Phone: (614) 221-6679
FAX: (614) 448-4105

Job: *CTHA211A: Mansfield, CT*			
Project: *31205-0039*			
Client: T-Mobile	Drawn by: kswarts		App'd:
Code: TIA/EIA-222-F	Date: 09/28/05		Scale:
Path: GATOWER\312 T-Mobile (VoiceStream)\2005\31205-039\31205-039.ef			Dwg N

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 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 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Pole Options
√ Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	178.00-129.00	49.00	4.75	18	25.5000	37.8490	0.2500	1.0000	A607-65 (65 ksi)
L2	129.00-88.75	45.00	6.00	18	36.1519	47.4930	0.3750	1.5000	A607-65 (65 ksi)
L3	88.75-43.75	51.00	7.25	18	45.2309	58.0840	0.3750	1.5000	A607-65 (65 ksi)
L4	43.75-0.00	51.00		18	55.5068	68.3600	0.4375	1.7500	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	25.8934	20.0359	1613.8699	8.9637	12.9540	124.5847	3229.8634	10.0198	4.0480	16.192
	38.4329	29.8348	5328.6018	13.3476	19.2273	277.1374	10664.2150	14.9202	6.2214	24.886
L2	37.9252	42.5835	6886.2672	12.7008	18.3652	374.9635	13781.5955	21.2958	5.7027	15.207
	48.2257	56.0822	15730.2702	16.7269	24.1264	651.9929	31481.2388	28.0464	7.6988	20.53
L3	47.4641	53.3897	13571.6618	15.9238	22.9773	590.6559	27161.1816	26.6999	7.3006	19.468
	58.9800	68.6881	28900.5619	20.4867	29.5067	979.4585	57839.1519	34.3506	9.5628	25.501
L4	58.2185	76.4707	29298.9444	19.5496	28.1975	1039.0628	58636.4411	38.2426	8.9992	20.57
	69.4146	94.3189	54974.7695	24.1125	34.7269	1583.0610	110021.876 3	47.1684	11.2614	25.74

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 178.00-129.00				1	1	1		
L2 129.00-88.75				1	1	1		
L3 88.75-43.75				1	1	1		
L4 43.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	178.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	178.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	168.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	158.00 - 0.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	148.00 - 0.00	24	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	110.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	178.00-129.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.69
L2	129.00-88.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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
		C	0.000	0.000	0.000	0.000	2.29
L3	88.75-43.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	2.77
L4	43.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	2.69

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	178.00-129.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.69
L2	129.00-88.75	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	2.29
L3	88.75-43.75	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	2.77
L4	43.75-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	2.69

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 2" x 23'	A	None		0.0000	189.50	No Ice	4.60	4.60	0.10
						1/2" Ice	6.92	6.92	0.14
6 ft x 1.5" dia whip	A	From Face	5.00	0.0000	181.00	No Ice	0.90	0.90	0.01
			2.50			1/2" Ice	1.52	1.52	0.02
			0.00						
10 ft x 2.5" dia whip	A	From Face	5.00	0.0000	183.00	No Ice	2.50	2.50	0.03
			-2.50			1/2" Ice	3.53	3.53	0.04
			0.00						
10 ft x 2.5" dia whip	B	From Face	5.00	0.0000	183.00	No Ice	2.50	2.50	0.03
			2.50			1/2" Ice	3.53	3.53	0.04
			0.00						
18 ft x 3" dia whip	B	From Face	5.00	0.0000	187.00	No Ice	5.40	5.40	0.05
			-2.50			1/2" Ice	7.23	7.23	0.09
			0.00						
18 ft x 3" dia whip	C	From Face	5.00	0.0000	187.00	No Ice	5.40	5.40	0.05
			2.50			1/2" Ice	7.23	7.23	0.09
			0.00						
18 ft x 3" dia whip	C	From Face	5.00	0.0000	187.00	No Ice	5.40	5.40	0.05
			-2.50			1/2" Ice	7.23	7.23	0.09

ERITower	Job: CTHA211A: Mansfield, CT	Page: 4 of 16
Paul J. Ford and Company 250 East Broad Street, Suite 1500 Columbus, OH Phone: (614) 221-6679 FAX: (614) 448-4105	Project: 31205-0039	Date: 07:52:20 09/28/05
	Client: T-Mobile	Designed by: kswarts

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert (ft / ft / ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
			0.00						
(4) DB848H80E-XY	A	From Face	4.00	0.0000	180.00	No Ice	7.19	8.36	0.03
			0.00			1/2" Ice	7.78	8.95	0.08
			0.00						
(4) DB848H80E-XY	B	From Face	4.00	0.0000	180.00	No Ice	7.19	8.36	0.03
			0.00			1/2" Ice	7.78	8.95	0.08
			0.00						
(4) DB848H80E-XY	C	From Face	4.00	0.0000	180.00	No Ice	7.19	8.36	0.03
			0.00			1/2" Ice	7.78	8.95	0.08
			0.00						
PennSummit 14' Platform w/ Handrail	B	None		0.0000	178.00	No Ice	40.00	40.00	2.10
						1/2" Ice	45.00	45.00	3.20
(2) 7250.04	A	From Face	4.00	0.0000	168.00	No Ice	2.68	1.93	0.01
			0.00			1/2" Ice	3.00	2.25	0.03
			0.00						
(2) 7250.04	B	From Face	4.00	0.0000	168.00	No Ice	2.68	1.93	0.01
			0.00			1/2" Ice	3.00	2.25	0.03
			0.00						
(2) 7250.04	C	From Face	4.00	0.0000	168.00	No Ice	2.68	1.93	0.01
			0.00			1/2" Ice	3.00	2.25	0.03
			0.00						
PennSummit 14' Low Profile Platform	B	None		0.0000	168.00	No Ice	35.00	35.00	1.30
						1/2" Ice	40.00	40.00	2.10
(3) DB980F90E-M	A	From Face	4.00	0.0000	158.00	No Ice	3.90	2.29	0.01
			0.00			1/2" Ice	4.28	2.65	0.03
			0.00						
(3) DB980F90E-M	B	From Face	4.00	0.0000	158.00	No Ice	3.90	2.29	0.01
			0.00			1/2" Ice	4.28	2.65	0.03
			0.00						
(3) DB980F90E-M	C	From Face	4.00	0.0000	158.00	No Ice	3.90	2.29	0.01
			0.00			1/2" Ice	4.28	2.65	0.03
			0.00						
PennSummit 14' Low Profile Platform	B	None		0.0000	158.00	No Ice	35.00	35.00	1.30
						1/2" Ice	40.00	40.00	2.10
(3) DR65-19-00DPQ	A	From Face	4.00	0.0000	148.00	No Ice	8.40	3.53	0.03
			0.00			1/2" Ice	8.95	3.97	0.07
			0.00						
(4) PCS 1900	A	None		0.0000	148.00	No Ice	0.63	0.61	0.02
						1/2" Ice	0.74	0.73	0.02
(3) DR65-19-00DPQ	B	From Face	4.00	0.0000	148.00	No Ice	8.40	3.53	0.03
			0.00			1/2" Ice	8.95	3.97	0.07
			0.00						
(4) PCS 1900	B	None		0.0000	148.00	No Ice	0.63	0.61	0.02
						1/2" Ice	0.74	0.73	0.02
(3) DR65-19-00DPQ	C	From Face	4.00	0.0000	148.00	No Ice	8.40	3.53	0.03
			0.00			1/2" Ice	8.95	3.97	0.07
			0.00						
(4) PCS 1900	C	None		0.0000	148.00	No Ice	0.63	0.61	0.02
						1/2" Ice	0.74	0.73	0.02
PennSummit 14' Low Profile Platform	B	None		0.0000	148.00	No Ice	35.00	35.00	1.30
						1/2" Ice	40.00	40.00	2.10
DB212-2-A	A	From Face	4.00	0.0000	130.00	No Ice	4.40	4.40	0.03
			5.00			1/2" Ice	8.42	8.42	0.07
			0.00						
DB264-A	A	From Face	4.00	0.0000	120.00	No Ice	3.16	3.16	0.04
			2.50			1/2" Ice	5.69	5.69	0.05
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB264-A	A	From Face	4.00	0.0000	120.00	No Ice	3.16	3.16	0.04
			-2.50			1/2" Ice	5.69	5.69	0.05
			0.00						
DB212-2-A	A	From Face	4.00	0.0000	130.00	No Ice	4.40	4.40	0.03
			-5.00			1/2" Ice	8.42	8.42	0.07
			0.00						
DB224	B	From Face	4.00	0.0000	120.00	No Ice	3.15	3.15	0.03
			6.00			1/2" Ice	5.67	5.67	0.04
			0.00						
DB420 (16-dipole)	B	From Face	4.00	0.0000	119.00	No Ice	5.99	5.99	0.03
			3.00			1/2" Ice	7.83	7.83	0.08
			0.00						
DB420 (16-dipole)	B	From Face	4.00	0.0000	119.00	No Ice	5.99	5.99	0.03
			-3.00			1/2" Ice	7.83	7.83	0.08
			0.00						
DB224	B	From Face	4.00	0.0000	120.00	No Ice	3.15	3.15	0.03
			-6.00			1/2" Ice	5.67	5.67	0.04
			0.00						
PD128	C	From Face	4.00	0.0000	114.00	No Ice	0.14	0.14	0.00
			5.00			1/2" Ice	0.62	0.62	0.02
			0.00						
DB420 (16-dipole)	C	From Face	4.00	0.0000	119.00	No Ice	5.99	5.99	0.03
			2.50			1/2" Ice	7.83	7.83	0.08
			0.00						
DB420 (16-dipole)	C	From Face	4.00	0.0000	119.00	No Ice	5.99	5.99	0.03
			-2.50			1/2" Ice	7.83	7.83	0.08
			0.00						
PD128	C	From Face	4.00	0.0000	114.00	No Ice	0.14	0.14	0.00
			-5.00			1/2" Ice	0.62	0.62	0.02
			0.00						
Valmont T-Arm (3)	B	None		0.0000	110.00	No Ice	21.00	21.00	1.01
						1/2" Ice	29.00	29.00	1.24
GPS	A	From Face	3.00	0.0000	60.00	No Ice	0.20	0.20	0.02
			0.00			1/2" Ice	0.27	0.27	0.02
			0.00						
NAIS VIC-100	C	From Face	3.00	0.0000	60.00	No Ice	0.20	0.20	0.02
			0.00			1/2" Ice	0.27	0.27	0.02
			0.00						
(2) 3' Side Arm Mount	A	None		0.0000	60.00	No Ice	0.76	0.76	0.03
						1/2" Ice	0.96	0.96	0.04

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 178.00-	152.18	1.548	29	129.338	A	0.000	129.338	129.338	100.00	0.000	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
129.00					B	0.000	129.338		100.00		
					C	0.000	129.338		100.00		
L2 129.00-88.75	108.34	1.404	26	142.287	A	0.000	142.287	142.287	100.00	0.000	0.000
					B	0.000	142.287		100.00		
					C	0.000	142.287		100.00		
L3 88.75-43.75	65.99	1.219	22	196.551	A	0.000	196.551	196.551	100.00	0.000	0.000
					B	0.000	196.551		100.00		
					C	0.000	196.551		100.00		
L4 43.75-0.00	21.24	1	18	229.130	A	0.000	229.130	229.130	100.00	0.000	0.000
					B	0.000	229.130		100.00		
					C	0.000	229.130		100.00		

Tower Pressure - With Ice

$G_H = 1.690$

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
L1 178.00-129.00	152.18	1.548	21	0.5000	133.421	A	0.000	133.421	133.421	100.00	0.000	0.000
						B	0.000	133.421		100.00		
						C	0.000	133.421		100.00		
L2 129.00-88.75	108.34	1.404	19	0.5000	145.641	A	0.000	145.641	145.641	100.00	0.000	0.000
						B	0.000	145.641		100.00		
						C	0.000	145.641		100.00		
L3 88.75-43.75	65.99	1.219	17	0.5000	200.301	A	0.000	200.301	200.301	100.00	0.000	0.000
						B	0.000	200.301		100.00		
						C	0.000	200.301		100.00		
L4 43.75-0.00	21.24	1	14	0.5000	232.776	A	0.000	232.776	232.776	100.00	0.000	0.000
						B	0.000	232.776		100.00		
						C	0.000	232.776		100.00		

Tower Pressure - Service

$G_H = 1.690$

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
L1 178.00-129.00	152.18	1.548	10	129.338	A	0.000	129.338	129.338	100.00	0.000	0.000
					B	0.000	129.338		100.00		
					C	0.000	129.338		100.00		
L2 129.00-88.75	108.34	1.404	9	142.287	A	0.000	142.287	142.287	100.00	0.000	0.000
					B	0.000	142.287		100.00		
					C	0.000	142.287		100.00		
L3 88.75-43.75	65.99	1.219	8	196.551	A	0.000	196.551	196.551	100.00	0.000	0.000
					B	0.000	196.551		100.00		
					C	0.000	196.551		100.00		
L4 43.75-0.00	21.24	1	6	229.130	A	0.000	229.130	229.130	100.00	0.000	0.000
					B	0.000	229.130		100.00		

Section Elevation ft	z ft	K_Z	q_t 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	0.000	229.130		100.00		

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
L1 178.00-129.00	1.69	4.16	A	1	0.65	1	1	1	129.338	4.06	82.90	C
			B	1	0.65	1	1	1	129.338			
			C	1	0.65	1	1	1	129.338			
L2 129.00-88.75	2.29	7.55	A	1	0.65	1	1	1	142.287	4.05	100.72	C
			B	1	0.65	1	1	1	142.287			
			C	1	0.65	1	1	1	142.287			
L3 88.75-43.75	2.77	10.59	A	1	0.65	1	1	1	196.551	4.84	107.59	C
			B	1	0.65	1	1	1	196.551			
			C	1	0.65	1	1	1	196.551			
L4 43.75-0.00	2.69	14.82	A	1	0.65	1	1	1	229.130	4.66	106.41	C
			B	1	0.65	1	1	1	229.130			
			C	1	0.65	1	1	1	229.130			
Sum Weight:	9.44	37.12						OTM	1475.76 kip-ft	17.61		

Tower Forces - No Ice - 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
L1 178.00-129.00	1.69	4.16	A	1	0.65	1	1	1	129.338	4.06	82.90	C
			B	1	0.65	1	1	1	129.338			
			C	1	0.65	1	1	1	129.338			
L2 129.00-88.75	2.29	7.55	A	1	0.65	1	1	1	142.287	4.05	100.72	C
			B	1	0.65	1	1	1	142.287			
			C	1	0.65	1	1	1	142.287			
L3 88.75-43.75	2.77	10.59	A	1	0.65	1	1	1	196.551	4.84	107.59	C
			B	1	0.65	1	1	1	196.551			
			C	1	0.65	1	1	1	196.551			
L4 43.75-0.00	2.69	14.82	A	1	0.65	1	1	1	229.130	4.66	106.41	C
			B	1	0.65	1	1	1	229.130			
			C	1	0.65	1	1	1	229.130			
Sum Weight:	9.44	37.12						OTM	1475.76 kip-ft	17.61		

Tower Forces - No Ice - 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
L1 178.00-129.00	1.69	4.16	A	1	0.65	1	1	1	129.338	4.06	82.90	C
			B	1	0.65	1	1	1	129.338			
			C	1	0.65	1	1	1	129.338			
L2 129.00-88.75	2.29	7.55	A	1	0.65	1	1	1	142.287	4.05	100.72	C
			B	1	0.65	1	1	1	142.287			
			C	1	0.65	1	1	1	142.287			
L3 88.75-43.75	2.77	10.59	A	1	0.65	1	1	1	196.551	4.84	107.59	C
			B	1	0.65	1	1	1	196.551			
			C	1	0.65	1	1	1	196.551			
L4 43.75-0.00	2.69	14.82	A	1	0.65	1	1	1	229.130	4.66	106.41	C
			B	1	0.65	1	1	1	229.130			
			C	1	0.65	1	1	1	229.130			
Sum Weight:	9.44	37.12						OTM	1475.76 kip-ft	17.61		

Tower Forces - With 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
L1 178.00-129.00	1.69	5.13	A	1	0.65	1	1	1	133.421	3.14	64.14	C
			B	1	0.65	1	1	1	133.421			
			C	1	0.65	1	1	1	133.421			
L2 129.00-88.75	2.29	8.62	A	1	0.65	1	1	1	145.641	3.11	77.32	C
			B	1	0.65	1	1	1	145.641			
			C	1	0.65	1	1	1	145.641			
L3 88.75-43.75	2.77	12.06	A	1	0.65	1	1	1	200.301	3.70	82.23	C
			B	1	0.65	1	1	1	200.301			
			C	1	0.65	1	1	1	200.301			
L4 43.75-0.00	2.69	16.53	A	1	0.65	1	1	1	232.776	3.55	81.08	C
			B	1	0.65	1	1	1	232.776			
			C	1	0.65	1	1	1	232.776			
Sum Weight:	9.44	42.34						OTM	1134.98 kip-ft	13.50		

Tower Forces - With Ice - 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
L1 178.00-129.00	1.69	5.13	A	1	0.65	1	1	1	133.421	3.14	64.14	C
			B	1	0.65	1	1	1	133.421			
			C	1	0.65	1	1	1	133.421			
L2 129.00-88.75	2.29	8.62	A	1	0.65	1	1	1	145.641	3.11	77.32	C
			B	1	0.65	1	1	1	145.641			
			C	1	0.65	1	1	1	145.641			
L3 88.75-43.75	2.77	12.06	A	1	0.65	1	1	1	200.301	3.70	82.23	C
			B	1	0.65	1	1	1	200.301			
			C	1	0.65	1	1	1	200.301			

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
L4 43.75-0.00	2.69	16.53	A	1	0.65	1	1	1	232.776	3.55	81.08	C
			B	1	0.65	1	1	1	232.776			
			C	1	0.65	1	1	1	232.776			
Sum Weight:	9.44	42.34						OTM	1134.98 kip-ft	13.50		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
L1 178.00-129.00	1.69	5.13	A	1	0.65	1	1	1	133.421	3.14	64.14	C
			B	1	0.65	1	1	1	133.421			
			C	1	0.65	1	1	1	133.421			
L2 129.00-88.75	2.29	8.62	A	1	0.65	1	1	1	145.641	3.11	77.32	C
			B	1	0.65	1	1	1	145.641			
			C	1	0.65	1	1	1	145.641			
L3 88.75-43.75	2.77	12.06	A	1	0.65	1	1	1	200.301	3.70	82.23	C
			B	1	0.65	1	1	1	200.301			
			C	1	0.65	1	1	1	200.301			
L4 43.75-0.00	2.69	16.53	A	1	0.65	1	1	1	232.776	3.55	81.08	C
			B	1	0.65	1	1	1	232.776			
			C	1	0.65	1	1	1	232.776			
Sum Weight:	9.44	42.34						OTM	1134.98 kip-ft	13.50		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
L1 178.00-129.00	1.69	4.16	A	1	0.65	1	1	1	129.338	1.41	28.69	C
			B	1	0.65	1	1	1	129.338			
			C	1	0.65	1	1	1	129.338			
L2 129.00-88.75	2.29	7.55	A	1	0.65	1	1	1	142.287	1.40	34.85	C
			B	1	0.65	1	1	1	142.287			
			C	1	0.65	1	1	1	142.287			
L3 88.75-43.75	2.77	10.59	A	1	0.65	1	1	1	196.551	1.68	37.23	C
			B	1	0.65	1	1	1	196.551			
			C	1	0.65	1	1	1	196.551			
L4 43.75-0.00	2.69	14.82	A	1	0.65	1	1	1	229.130	1.61	36.82	C
			B	1	0.65	1	1	1	229.130			
			C	1	0.65	1	1	1	229.130			
Sum Weight:	9.44	37.12						OTM	510.64 kip-ft	6.09		

ERITower	Job	Page
	CTHA211A: Mansfield, CT	10 of 16
Paul J. Ford and Company 250 East Broad Street, Suite 1500 Columbus, OH Phone: (614) 221-6679 FAX: (614) 448-4105	**Project** 31205-0039	**Date** 07:52:20 09/28/05
	Client T-Mobile	**Designed by** kswarts

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
L1 178.00-129.00	1.69	4.16	A	1	0.65	1	1	1	129.338	1.41	28.69	C
			B	1	0.65	1	1	1	129.338			
			C	1	0.65	1	1	1	129.338			
L2 129.00-88.75	2.29	7.55	A	1	0.65	1	1	1	142.287	1.40	34.85	C
			B	1	0.65	1	1	1	142.287			
			C	1	0.65	1	1	1	142.287			
L3 88.75-43.75	2.77	10.59	A	1	0.65	1	1	1	196.551	1.68	37.23	C
			B	1	0.65	1	1	1	196.551			
			C	1	0.65	1	1	1	196.551			
L4 43.75-0.00	2.69	14.82	A	1	0.65	1	1	1	229.130	1.61	36.82	C
			B	1	0.65	1	1	1	229.130			
			C	1	0.65	1	1	1	229.130			
Sum Weight:	9.44	37.12						OTM	510.64 kip-ft	6.09		

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
L1 178.00-129.00	1.69	4.16	A	1	0.65	1	1	1	129.338	1.41	28.69	C
			B	1	0.65	1	1	1	129.338			
			C	1	0.65	1	1	1	129.338			
L2 129.00-88.75	2.29	7.55	A	1	0.65	1	1	1	142.287	1.40	34.85	C
			B	1	0.65	1	1	1	142.287			
			C	1	0.65	1	1	1	142.287			
L3 88.75-43.75	2.77	10.59	A	1	0.65	1	1	1	196.551	1.68	37.23	C
			B	1	0.65	1	1	1	196.551			
			C	1	0.65	1	1	1	196.551			
L4 43.75-0.00	2.69	14.82	A	1	0.65	1	1	1	229.130	1.61	36.82	C
			B	1	0.65	1	1	1	229.130			
			C	1	0.65	1	1	1	229.130			
Sum Weight:	9.44	37.12						OTM	510.64 kip-ft	6.09		

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	37.12					
Bracing Weight	0.00					
Total Member Self-Weight	37.12			-0.04	-0.03	
Total Weight	55.34			-0.04	-0.03	
Wind 0 deg - No Ice		0.00	-38.93	-4878.21	-0.03	1.57
Wind 90 deg - No Ice		38.93	0.00	-0.04	-4878.20	0.34

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 180 deg - No Ice		0.00	38.93	4878.13	-0.03	-1.57
Member Ice	5.22					
Total Weight Ice	66.13			0.27	-0.25	
Wind 0 deg - Ice		0.00	-32.49	-4134.14	-0.25	0.62
Wind 90 deg - Ice		32.49	0.00	0.27	-4134.66	-0.65
Wind 180 deg - Ice		0.00	32.49	4134.68	-0.25	-0.62
Total Weight	55.34			-0.04	-0.03	
Wind 0 deg - Service		0.00	-13.47	-1687.99	-0.03	0.54
Wind 90 deg - Service		13.47	0.00	-0.04	-1687.98	0.12
Wind 180 deg - Service		0.00	13.47	1687.91	-0.03	-0.54

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 90 deg - No Ice
4	Dead+Wind 180 deg - No Ice
5	Dead+Ice+Temp
6	Dead+Wind 0 deg+Ice+Temp
7	Dead+Wind 90 deg+Ice+Temp
8	Dead+Wind 180 deg+Ice+Temp
9	Dead+Wind 0 deg - Service
10	Dead+Wind 90 deg - Service
11	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	178 - 129	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-18.41	-0.31	-0.48
			Max. Mx	3	-10.98	-705.18	-0.15
			Max. My	4	-10.98	-0.13	-705.26
			Max. Vy	3	22.69	-705.18	-0.15
			Max. Vx	2	-22.69	-0.13	704.77
			Max. Torque	8			-2.10
L2	129 - 88.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-30.32	-0.33	-0.22
			Max. Mx	3	-21.46	-1739.27	0.10
			Max. My	2	-21.46	-0.11	1739.23
			Max. Vy	3	29.80	-1739.27	0.10
			Max. Vx	2	-29.80	-0.11	1739.23
			Max. Torque	7			2.36
L3	88.75 - 43.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-44.53	-0.25	-0.27
			Max. Mx	3	-34.90	-3143.04	0.04
			Max. My	2	-34.90	-0.03	3143.05
			Max. Vy	3	34.31	-3143.04	0.04
			Max. Vx	2	-34.31	-0.03	3143.05
			Max. Torque	4			1.61

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	43.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-66.13	-0.25	-0.27
			Max. Mx	3	-55.32	-5013.03	0.04
			Max. My	2	-55.32	-0.03	5013.04
			Max. Vy	3	38.95	-5013.03	0.04
			Max. Vx	2	-38.95	-0.03	5013.04
			Max. Torque	4			1.57

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	5	66.13	-0.00	-0.00
	Max. H_x	1	55.34	0.00	0.00
	Max. H_z	2	55.34	-0.00	38.93
	Max. M_x	2	5013.04	-0.00	38.93
	Max. M_z	3	5013.03	-38.93	-0.00
	Max. Torsion	4	1.57	-0.00	-38.93
	Min. Vert	3	55.34	-38.93	-0.00
	Min. H_x	3	55.34	-38.93	-0.00
	Min. H_z	4	55.34	-0.00	-38.93
	Min. M_x	4	-5012.95	-0.00	-38.93
	Min. M_z	4	0.03	-0.00	-38.93
	Min. Torsion	2	-1.57	-0.00	38.93

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	55.34	0.00	0.00	-0.04	-0.03	0.00
Dead+Wind 0 deg - No Ice	55.34	0.00	-38.93	-5013.04	-0.03	1.57
Dead+Wind 90 deg - No Ice	55.34	38.93	0.00	-0.04	-5013.03	0.35
Dead+Wind 180 deg - No Ice	55.34	0.00	38.93	5012.95	-0.03	-1.57
Dead+Ice+Temp	66.13	0.00	0.00	0.27	-0.25	0.00
Dead+Wind 0 deg+Ice+Temp	66.13	0.00	-32.49	-4293.29	-0.26	0.64
Dead+Wind 90 deg+Ice+Temp	66.13	32.49	0.00	0.29	-4293.84	-0.61
Dead+Wind 180 deg+Ice+Temp	66.13	0.00	32.49	4293.87	-0.26	-0.64
Dead+Wind 0 deg - Service	55.34	0.00	-13.47	-1736.25	-0.04	0.55
Dead+Wind 90 deg - Service	55.34	13.47	0.00	-0.04	-1736.25	0.12
Dead+Wind 180 deg - Service	55.34	0.00	13.47	1736.16	-0.04	-0.55

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-55.34	0.00	0.00	55.34	0.00	0.000%
2	0.00	-55.34	-38.93	-0.00	55.34	38.93	0.005%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
3	38.93	-55.34	0.00	-38.93	55.34	-0.00	0.005%
4	0.00	-55.34	38.93	-0.00	55.34	-38.93	0.005%
5	0.00	-66.13	0.00	-0.00	66.13	-0.00	0.000%
6	0.00	-66.13	-32.49	0.00	66.13	32.49	0.000%
7	32.49	-66.13	0.00	-32.49	66.13	0.00	0.000%
8	0.00	-66.13	32.49	0.00	66.13	-32.49	0.000%
9	0.00	-55.34	-13.47	0.00	55.34	13.47	0.002%
10	13.47	-55.34	0.00	-13.47	55.34	0.00	0.002%
11	0.00	-55.34	13.47	0.00	55.34	-13.47	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00006259	0.00012709
3	Yes	12	0.00006259	0.00010568
4	Yes	12	0.00006259	0.00012710
5	Yes	6	0.00000001	0.00000001
6	Yes	14	0.00000001	0.00011094
7	Yes	14	0.00000001	0.00011098
8	Yes	14	0.00000001	0.00011098
9	Yes	12	0.00000001	0.00004880
10	Yes	12	0.00000001	0.00004742
11	Yes	12	0.00000001	0.00004880

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	178 - 129	34.023	10	1.7683	0.0033
L2	133.75 - 88.75	18.957	10	1.3876	0.0010
L3	94.75 - 43.75	9.230	10	0.9643	0.0007
L4	51 - 0	2.565	9	0.4630	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.50	Lightning Rod 2" x 23'	10	34.023	1.7683	0.0033	38242
187.00	18 ft x 3" dia whip	10	34.023	1.7683	0.0033	38242
183.00	10 ft x 2.5" dia whip	10	34.023	1.7683	0.0033	38242
181.00	6 ft x 1.5" dia whip	10	34.023	1.7683	0.0033	38242
180.00	(4) DB848H80E-XY	10	34.023	1.7683	0.0033	38242
178.00	PennSummit 14' Platform w/ Handrail	10	34.023	1.7683	0.0033	38242

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.00	(2) 7250.04	10	30.424	1.6860	0.0025	19121
158.00	(3) DB980F90E-M	10	26.887	1.6026	0.0019	9560
148.00	(3) DR65-19-00DPQ	10	23.477	1.5168	0.0014	6372
130.00	DB212-2-A	9	17.853	1.3520	0.0009	4418
120.00	DB264-A	9	15.095	1.2525	0.0008	4700
119.00	DB420 (16-dipole)	9	14.834	1.2421	0.0008	4730
114.00	PD128	9	13.564	1.1892	0.0007	4888
110.00	Valmont T-Arm (3)	9	12.592	1.1454	0.0007	5021
60.00	GPS	10	3.546	0.5368	0.0003	4592

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	178 - 129	98.093	3	5.0983	0.0096
L2	133.75 - 88.75	54.685	3	4.0031	0.0028
L3	94.75 - 43.75	26.635	3	2.7827	0.0019
L4	51 - 0	7.406	2	1.3366	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.50	Lightning Rod 2" x 23'	3	98.093	5.0983	0.0096	13446
187.00	18 ft x 3" dia whip	3	98.093	5.0983	0.0096	13446
183.00	10 ft x 2.5" dia whip	3	98.093	5.0983	0.0096	13446
181.00	6 ft x 1.5" dia whip	3	98.093	5.0983	0.0096	13446
180.00	(4) DB848H80E-XY	3	98.093	5.0983	0.0096	13446
178.00	PennSummit 14' Platform w/ Handrail	3	98.093	5.0983	0.0096	13446
168.00	(2) 7250.04	3	87.724	4.8646	0.0072	6722
158.00	(3) DB980F90E-M	3	77.536	4.6265	0.0053	3359
148.00	(3) DR65-19-00DPQ	3	67.709	4.3795	0.0041	2237
130.00	DB212-2-A	2	51.504	3.8980	0.0026	1548
120.00	DB264-A	2	43.551	3.6044	0.0022	1643
119.00	DB420 (16-dipole)	2	42.797	3.5740	0.0022	1653
114.00	PD128	2	39.135	3.4192	0.0021	1707
110.00	Valmont T-Arm (3)	2	36.333	3.2922	0.0021	1752
60.00	GPS	3	10.235	1.5935	0.0009	1594

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	178 - 129 (1)	TP37.849x25.5x0.25	49.00	0.00	0.0	39.000	28.8849	-10.98	1126.51	0.010
L2	129 - 88.75 (2)	TP47.493x36.1519x0.375	45.00	0.00	0.0	39.000	54.2824	-21.46	2117.01	0.010
L3	88.75 - 43.75 (3)	TP58.084x45.2309x0.375	51.00	0.00	0.0	39.000	66.5134	-34.90	2594.02	0.013
L4	43.75 - 0 (4)	TP68.36x55.5068x0.4375	51.00	0.00	0.0	38.420	94.3189	-55.32	3623.76	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	178 - 129 (1)	TP37.849x25.5x0.25	705.26	32.586	39.000	0.836	0.00	0.000	39.000	0.000
L2	129 - 88.75 (2)	TP47.493x36.1519x0.375	1739.23	34.178	39.000	0.876	0.00	0.000	39.000	0.000
L3	88.75 - 43.75 (3)	TP58.084x45.2309x0.375	3143.04	41.075	39.000	1.053	0.00	0.000	39.000	0.000
L4	43.75 - 0 (4)	TP68.36x55.5068x0.4375	5013.03	38.000	38.420	0.989	0.00	0.000	38.420	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	178 - 129 (1)	TP37.849x25.5x0.25	22.69	0.786	26.000	0.060	0.93	0.021	26.000	0.001
L2	129 - 88.75 (2)	TP47.493x36.1519x0.375	29.80	0.549	26.000	0.042	1.61	0.015	26.000	0.001
L3	88.75 - 43.75 (3)	TP58.084x45.2309x0.375	34.31	0.516	26.000	0.040	1.57	0.010	26.000	0.000
L4	43.75 - 0 (4)	TP68.36x55.5068x0.4375	38.95	0.413	26.000	0.032	1.57	0.006	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	178 - 129 (1)	0.010	0.836	0.000	0.060	0.001	0.846 ✔	1.333	H1-3+VT ✔
L2	129 - 88.75 (2)	0.010	0.876	0.000	0.042	0.001	0.887 ✔	1.333	H1-3+VT ✔
L3	88.75 - 43.75 (3)	0.013	1.053	0.000	0.040	0.000	1.067 ✔	1.333	H1-3+VT ✔
L4	43.75 - 0 (4)	0.015	0.989	0.000	0.032	0.000	1.005 ✔	1.333	H1-3+VT ✔

Section Capacity Table

ERITower	Job	Page
	CTHA211A: Mansfield, CT	16 of 16
Paul J. Ford and Company 250 East Broad Street, Suite 1500 Columbus, OH Phone: (614) 221-6679 FAX: (614) 448-4105	**Project** 31205-0039	**Date** 07:52:20 09/28/05
	Client T-Mobile	**Designed by** kswarts

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	178 - 129	Pole	TP37.849x25.5x0.25	1	-10.98	1501.64	63.5	Pass
L2	129 - 88.75	Pole	TP47.493x36.1519x0.375	2	-21.46	2821.97	66.5	Pass
L3	88.75 - 43.75	Pole	TP58.084x45.2309x0.375	3	-34.90	3457.83	80.1	Pass
L4	43.75 - 0	Pole	TP68.36x55.5068x0.4375	4	-55.32	4830.47	75.4	Pass
							Summary	
						Pole (L3)	80.1	Pass
						RATING =	**80.1**	**Pass**

Program Version 3.0.0.16 - 7/1/2004 File:G:/TOWER/312_T-Mobile (VoiceStream)/2005/31205-039/31205-039.eri

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 500 • Columbus, Ohio 43215
Ph: (614) 221-6679 • Fax1: (614) 221-2540 • Fax2: (614) 221-0166

MONOPOLE BASE PLATE ANALYSIS

TITLE: 178-Ft Pole
SITE: CTHA211A: Mansfield, CT
OWNER: T-Mobile
COMM. NO: 31205-039
DATE: 28-Sep-05

Number of Sides	18	Stress Increase	1.33
Shaft Dia, DF	68.360 in.	Base Plate Shape	SQUARE
PT-to-PT, DP	69.415 in.		
Min Bolt Circle	72.36 in.	Actual Bolt Circle	76.00 in.

Base Reactions

Moment	5013.0 ft-kips
Axial Load	55.0 kips
Base Elevation	0.0 ft

Bolt Details

Number of Bolts	24
Bolt Diameter	2 1/4 inches
Bolt Type	A615 #18J
Mom. Of Inertia	17328.00 inches^4
Bolt Tension, T	131.92 kips
Allowable Tension	195.00 kips
Bolt Compression, C	134.21 kips
Actual / Allowable Ratio	67.7% ☑

Base Plate Details

Plate Moment, MPL	3076.16 inch-kips
Bend Plane, W	37.71 inches
Plate Thickness, t	3.00 inches
Plate Width	75.00 inches
Plate Steel Spec.	ASTM A572 GRADE 55
Plate Steel Grade	55.00 ksi
Actual Stress	54.39 ksi
Allowable Stress	55.00 ksi
Actual / Allowable Ratio	98.9% ☑

Base Plate Analysis Summary

Plate Thickness	3.00 in.	Bolt Circle	76.00 in.
Plate Length	75.00 in.	Bolt Diameter	2.25 in.
Number of Bolts	24	Bolt Type	A615 #18J

MAT FOOTING FOR TOWERS PROGRAM BY PAUL J. FORD and COMPANY

JOB NO. 31205-039 DATE 09-28-2005 PAGE 1

CTHA211A: Mansfield_CT

INPUT: MAT FOOTING FOR TOWERS

TOWER LOADS: TOWER WEIGHT = 53.00 kips (including ice,antenna etc)
OVERTURNING MOMENT = 5009.00 ft-k at base of tower
TOTAL HORIZONTAL = 39.00 kips total for entire tower

DESIGN SAFETY FACTOR AGAINST OVERTURNING = 1.50

CONCRETE: CONCRETE STRENGTH = 3000 psi at 28 days
REINFORCING STEEL STRENGTH = 60000 psi (ASTM A615)

SOIL: WATER TABLE BELOW BOTTOM OF FOOTING
SOIL WT = 100 pcf (dry)
ALLOWABLE SOIL BEARING =10000 psf

FOOTING SIZE: WIDTH = 30.5 ft LENGTH = 30.5 ft
THICKNESS = 4.50 ft DEPTH = 4.00 ft below grade
CONCRETE WEIGHT = 150 pcf

OUTPUT: MAT FOOTING FOR TOWERS

VOLUME OF CONCRETE = 4186 ft^3 (155.04 cubic yards)

WEIGHT OF TOWER ====> 53.00 kips
WEIGHT OF CONCRETE => 627.92 kips (4186 x 0.150)

TOTAL WEIGHT = 680.92 kips

OVERTURNING MOMENT =5009.00 ft-k + (39.00 k x 4.50 ft) = 5185 ft-kips
RESISTING MOMENT = 680.92 k x 30.50 ft/2 = 10384 ft-kips

SAFETY FACTOR = Mresist / O.T.M. =10384 / 5185 = 2.00 > 1.50 O.K.

GROSS SOIL BEARING = 1949 psf (includes soil overburden)
NET SOIL BEARING = 1549 psf <10000 psf O.K.

BENDING MOMENT IN FOOTING = 3748 ft-kips
FOOTING REINFORCING = 0.72 in^2/ft = 50 no. 6 bars @ 7.38 in. o.c.
(.18 % = 1.17 in^2/ft) half top and half bottom

BENDING S

Exhibit 3

T-Mobile USA Inc.
100 Filley St, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

Technical Memo

To: Karina Fournier
From: Marlon Depaz - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CTHA211A
Date: September 28, 2005

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile PCS antenna installation on a Monopole at 230 Clover Mill Road, Mansfield , CT, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location.

2. Discussion:

The following assumptions were used in the calculations:

1) The emissions from T-Mobile transmitters are in the 1935-1945 MHz frequency band.
2) The antenna array consists of three sectors, with 2 antennas per sector.
3) The model number for each antenna is EMS-RR90-17-02DPL2.
4) The antenna center line height is 148 ft.
5) The maximum transmit power from any sector is 2214.73 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
8) The average ground level of the studied area does not change significantly with respect to the transmitting location

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile PCS antenna installation on a Monopole at 230 Clover Mill Road, Mansfield , CT, CT, is 0.0241 mW/cm^2. This value represents 2.41% of the Maximum Permissible Emission (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for T-Mobile will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area.
The combined Power Density from other carriers is 13.45%. The combined Power Density for the site is 15.86% of the M.P.E. standard.

New England Market
Connecticut
Worst Case Power Density

T-Mobile

Site:	**CTHA211A**
Site Address:	**230 Clover Mill Road**
Town:	**Mansfield , CT**
Tower Height:	**180 ft.**
Tower Style:	**Monopole**
Base Station TX output	20 W
Number of channels	8
Antenna Model	EMS-RR90-17-02DPL2
Cable Size	1 5/8 in.
Cable Length	180 ft.
Antenna Height	148.0 ft.
Ground Reflection	1.6
Frequency	1935.0 MHz
Jumper & Connector loss	4.50 dB
Antenna Gain	18.0 dBi
Cable Loss per foot	0.0116 dB
Total Cable Loss	2.0880 dB
Total Attenuation	6.5880 dB
Total EIRP per Channel	54.42 dBm
(In Watts)	276.84 W
Total EIRP per Sector	63.45 dBm
(In Watts)	2214.73 W
nsg	11.4120
Power Density (S) =	**0.024097 mW/cm^2**
T-Mobile Worst Case % MPE =	**2.4097%**

Equation Used :

$$S = \frac{(1000)(grf)^2 (Power) * 10^{(nsg/10)}}{4\pi (R)^2}$$

Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997

Co-Location Total

Carrier	% of Standard
Verizon	6.3100 %
Cingular	
Sprint PCS	3.2900 %
AT&T Wireless	3.8500 %
Nextel	
Total Excluding T-Mobile	**13.4500 %**
T-Mobile	2.4097
Total % MPE for Site	**15.8597%**