PULLMAN & COMLEY, LLC
ATTORNEYS AT LAW

EM-POCKET-052-081010

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ORIGINAL

October 9, 2008

Via Federal Express

S. Derek Phelps, Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification
Town of Farmington Telecommunications Facility
319 New Britain Avenue, Farmington, Connecticut

Dear Mr. Phelps:

Youghiogheny Communications-Northeast, LLC, doing business as Pocket Communications ("Pocket"), intends to install antennas and appurtenant equipment at the existing 190-foot monopole facility owned by Town of Farmington and located at 319 New Britain Avenue, Farmington, Connecticut ("Facility"). Pocket Communications provides prepaid, flat rate wireless voice and data services to more than a quarter of a million subscribers. Pocket is licensed by the Federal Communications Commission (FCC) to provide PCS wireless telecommunications service in the State of Connecticut, which includes the area to be served by the proposed installation. This installation constitutes an exempt modification pursuant to the Public Utility Environmental Standards Act, Connecticut General Statutes Section 16-50g et. seq. (PUESA), and Section 16-50j-72(b)(2) of the Regulations of the Connecticut State Agencies adopted pursuant to PUESA. In accordance with R.C.S.A. Section 16-50j-73, a copy of this notice has been sent to Kathleen Eagen, Town Manager, Town of Farmington.

The existing Facility consists of a 190-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound. The coordinates for the Facility are **Lat: 41°-44'-59" and Long: 72°–52'-21".** The tower is located at the Farmington Police Station. The Facility is roughly 500 feet east of New Britain Avenue on the west side of the Farmington River. The Facility is roughly 700 feet west of Farmington Avenue (Route 4) in the Unionville area of northern Farmington (see Site Map, attached as Exhibit A). The tower currently supports AT&T antennas at the one hundred fifty foot (150') level centerline AGL (above ground level), T-Mobile antennas at the one hundred sixty foot level (160') AGL, and Sprint antennas at the one hundred seventy foot level (170') AGL. The Facility also supports numerous municipal and public safety whip style antennas at various heights, detailed in both the radio frequency report and the structural report (attached as Exhibits D and E, respectively). Pocket proposes to install three Kathrein 742-213 flush mount antennas on the tower at the one hundred forty foot

centerline (140') AGL, and a Nortel CDMA Micro BTS 3231 cabinet, mounted on an "H-Frame," contained within a six foot by six foot (6'-0" x 6'-0") lease area. A small GPS antenna will be mounted to an ice bridge will run from the lease area to the tower. Utilities will be run via a proposed underground conduit from an existing utility backboard, within the compound (See Design Drawings and Equipment Specifications, attached as Exhibits B and C respectively).

For the following reasons, the proposed modifications to the New Britain Avenue Facility meet the exempt modification criteria set forth in R.C.S.A. Section 16-50j-72(b)(2):

1. The proposed modification will not increase the height of the tower as Pocket's antennas will be installed at a center line height of approximately 140 feet.

2. The installation of Pocket's equipment and shelter will not require an extension of the site boundaries.

3. The proposed modifications will not increase the noise levels at the existing Facility by six decibels or more.

4. The operation of the additional antennas will not increase the total radio frequency (RF) power density, measured at the site boundary, to a level at or above the standard adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. The worst-case RF power density calculations for the proposed Pocket antennas would be 59.42% of the FCC standard (see general power density calculations table, attached as Exhibit D).

Also attached, Exhibit E, is a structural analysis confirming that the tower can support the existing and proposed antennas and associated equipment.

For the foregoing reasons, Pocket respectfully submits that the proposed antenna installation and equipment at the Farmington Facility constitutes an exempt modification under R.C.S.A. Section 16-50j-72(b)(2).

Respectfully Submitted,

Carrie L. Larson

cc: Kathleen Eagen, Town Manager, (Town is also underlying property owner)

Exhibit B

Design Drawings

Pocket Site HFCT1527A

319 New Britain Avenue

Farmington, Connecticut

PROJECT INFORMATION

TOWER OWNER:	FARMINGTON POLICE DEPARTMENT 319 FARMINGTON AVENUE UNIONVILLE, CONNECTICUT 06085
OWNER SITE ID#:	HFCT1527
APPLICANT:	YOUGHIOGHENY COMMUNICATIONS-NORTHEAST LLC 2219 NW LOOP 410 SAN ANTONIO, TX 78230
SITE ADDRESS:	319 NEW BRITAIN AVENUE, UNIONVILLE, CONNECTICUT 06085
COUNTY:	HARTFORD
LATITUDE:	41.7498°
LONGITUDE:	-72.8727°
STRUCTURE HEIGHT:	190' AGL
ZONING CLASSIFICATION:	N/A
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
POWER COMPANY	CL&P 1-860-947-2121
TELEPHONE COMPANY:	AT&T 1-888-727-8368
DESIGN FIRM:	URS CORPORATION AES 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067 PHONE: 860-529-8882

DRAWING INDEX

01	TITLE SHEET	0
02	SITE PLAN, DETAILS AND NOTES	0
03	TOWER ELEVATION, ANTENNA PLAN AND DETAILS	0
04	GROUNDING DETAILS	0
05	GROUNDING PLAN AND DETAILS	0
06	ELECTRICAL DETAILS	0

STRUCTURAL REVIEW

A TOWER ANALYSIS HAS NOT BEEN PERFORMED FOR THE PREPARATION OF THESE PLANS. AS OF THE ISSUANCE OF THESE DRAWINGS, THE EXISTING TOWER HAS NOT BEEN EVALUATED FOR REPLACEMENT/ADDITION OF ANTENNAS, COAX CABLES AND EQUIPMENT. NO WORK SHALL OCCUR ON THIS TOWER PRIOR TO THE ISSUANCE OF A PASSING STRUCTURAL TOWER ANALYSIS. A COPY OF THE TOWER ANALYSIS SHALL BE FORWARDED TO URS CORPORATION. ALL REINFORCEMENT (IF REQUIRED) SHALL BE PERFORMED PRIOR TO ANY WORK UNDER THIS CONTRACT BEING PERFORMED.

APPROVALS

_____ REAL ESTATE

_____ RF

_____ OPS/CONSTRUCTION

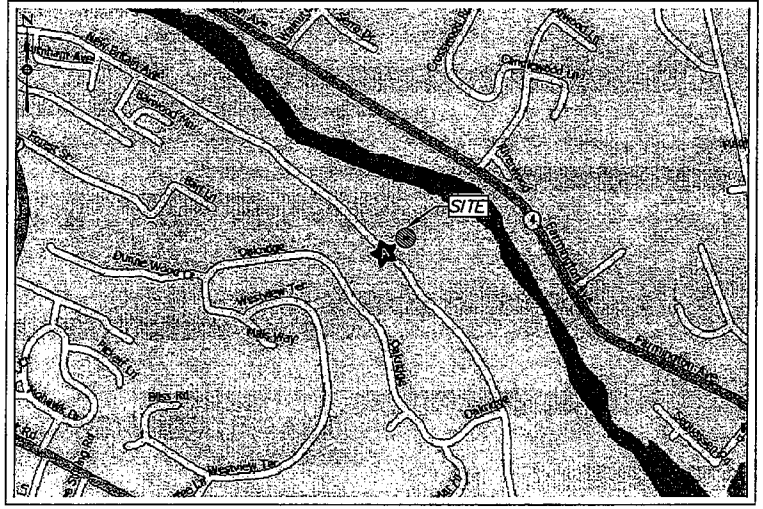
_____ LEGAL/COMPLIANCE

_____ NET DESIGN

pocket™
SMART WIRELESS

HFCT1527
FARMINGTON POLICE DEPT.
190' MONOPOLE

LOCATION MAP



DRIVING DIRECTIONS

FROM HARTFORD:
TAKE I-84 WEST TO EXIT #39, CT-4 WEST/FARMINTON AVENUE TOWARD FARMINGTON. TURN LEFT ONTO SOUTH MAIN STREET/CT-177. TURN LEFT ONTO NEW BRITAIN AVENUE.

APPLICABLE BUILDING CODES AND STANDARDS

CONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:
CONNECTICUT STATE BUILDING CODE
- 2003 INTERNATIONAL BUILDING CODE
- 2003 INTERNATIONAL PLUMBING CODE
- 2003 INTERNATIONAL MECHANICAL CODE
- 2003 INTERNATIONAL EXISTING BUILDING CODE
- 2005 CONNECTICUT SUPPLEMENT

ELECTRICAL CODE:
- 2005 NATIONAL ELECTRICAL CODE

CONNECTICUT STATE FIRE SAFETY CODE
- 2003 INTERNATIONAL FIRE CODE

CONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST APPROVED EDITION OF THE FOLLOWING STANDARDS.

AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARD FOR STRUCTURAL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:

TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM

IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1275 GENERAL INSTALLATION REQUIREMENTS

TELCORDIA GR-1503 COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

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

SITE NOTES

1. THIS SITE IS UNMANNED AND IS RESTRICTED TO OUTDOOR EQUIPMENT. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
2. POCKET COMMUNICATIONS CERTIFIES THAT THIS TELEPHONE EQUIPMENT FACILITY WILL BE SERVICED ONLY BY POCKET COMMUNICATIONS EMPLOYEES AND THE WORK ASSOCIATED WITH ANY EQUIPMENT CANNOT BE PERFORMED BY HANDICAPPED PERSONS. THIS FACILITY WILL BE FREQUENTED ONLY BY SERVICE PERSONNEL FOR REPAIR PURPOSED ONLY. THIS FACILITY IS EXEMPT FROM THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA) APPENDIX B, SECTION 4.11.(5)(B)
3. NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.
4. NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.
5. NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.
6. POCKET COMMUNICATIONS MAINTENANCE CREW (TYPICALLY ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.

NO.	DATE	REVISIONS	BY
0	08/29/08	ISSUED FOR CONSTRUCTION	JCF

pocket SMART WIRELESS

PROJECT NAME: HFCT1527, FARMINGTON POLICE DEPT.

SHEET: TITLE SHEET

URS

URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

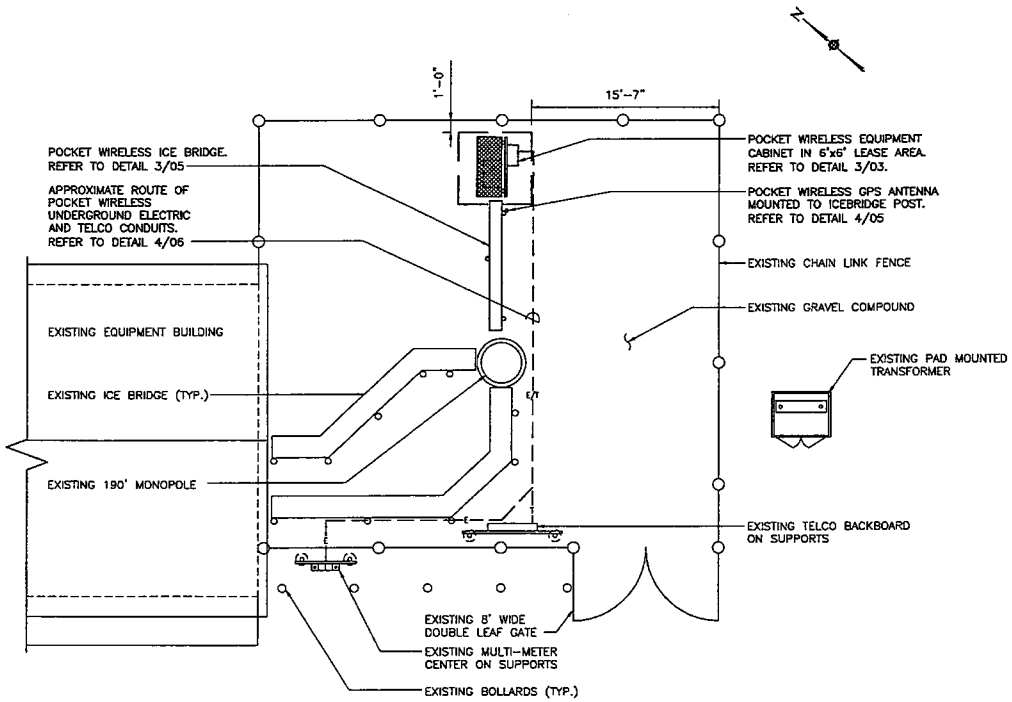
CHECKED BY: JCF
DRAWN BY: PD
DATE: 08/25/08
URS JOB NUMBER: PC1020/36923940
DRAWING NUMBER: 01

CONSTRUCTION NOTES

1. FIELD VERIFICATION: CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, POCKET COMMUNICATIONS ANTENNA MOUNT LOCATION AND ANTENNAS TO BE INSTALLED.
2. COORDINATION OF WORK: CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH POCKET COMMUNICATIONS.
3. GRAVEL SURFACE IN AREAS OF COMPOUND THAT ARE DISTURBED DURING CONSTRUCTION SHALL BE REPLACED TO ORIGINAL CONDITION BY CONTRACTOR.

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – POCKET COMMUNICATIONS
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND THE ENGINEER.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, AND GROUNDING CABLES AS SHOWN ON THE SITE PLAN
8. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
9. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
10. CONTRACTOR TO OBTAIN REQUIRED NOTICE TO PROCEED DOCUMENTS FROM THE TOWER OWNER BEFORE COMMENCING CONSTRUCTION.

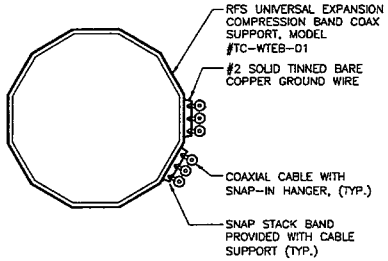


1/02 COMPOUND PLAN
SCALE: 1" = 10'-0"

NOTE:
REFER TO DRAWING 06 FOR ADDITIONAL UTILITY INFORMATION

SITE PLAN INFORMATION

THIS SITE PLAN DRAWING WAS COMPILED FROM DATA PROVIDED BY GRAPEVINE SOLUTIONS AND AVAILABLE EXISTING DRAWINGS OF THE SUBJECT AREA.



2/02 COAX SUPPORT DETAIL
SCALE: 1/2" = 1'-0"

STATE OF CONNECTICUT
ANGELO C. ANTONUCCI
No. 16704
LICENSED ARCHITECT

NO.	DATE	REVISIONS	BY
0	09/09/08	ISSUED FOR CONSTRUCTION	JCF

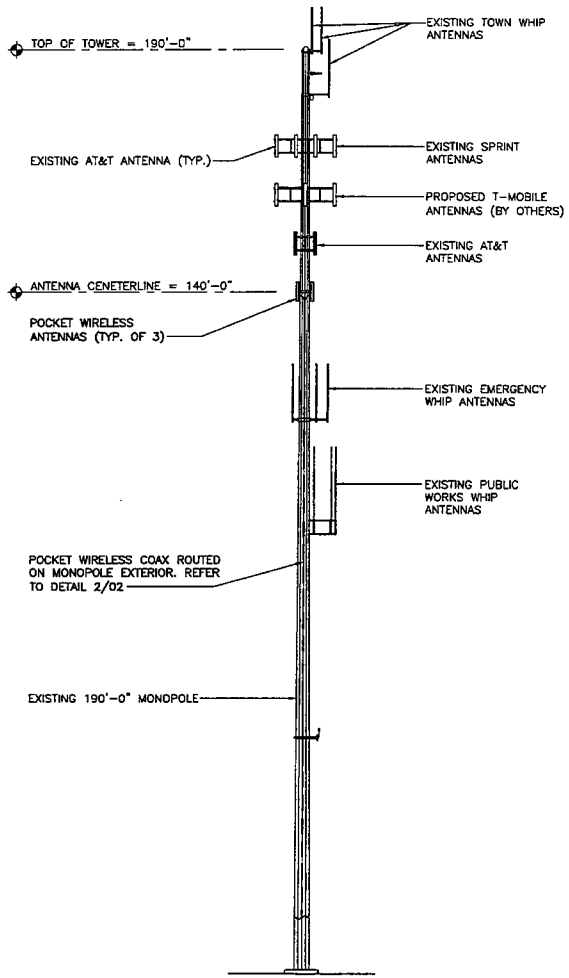
pocket SMART WIRELESS

PROJECT NAME: HFCT1827, FARMINGTON POLICE DEPT.
SHEET: SITE PLAN, DETAILS AND NOTES

URS
URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

CHECKED BY: JCF
DRAWN BY: PD
DATE: 08/25/08
URS JOB NUMBER: PC1020/36923940
DRAWING NUMBER: 02

A TOWER ANALYSIS HAS NOT BEEN PERFORMED FOR THE PREPARATION OF THESE PLANS. AS OF THE ISSUANCE OF THESE DRAWINGS, THE EXISTING TOWER HAS NOT BEEN EVALUATED FOR REPLACEMENT/ADDITION OF ANTENNAS, COAX CABLES AND EQUIPMENT. NO WORK SHALL OCCUR ON THIS TOWER PRIOR TO THE ISSUANCE OF A PASSING STRUCTURAL TOWER ANALYSIS. A COPY OF THE TOWER ANALYSIS SHALL BE FORWARDED TO URS CORPORATION. ALL REINFORCEMENT (IF REQUIRED) SHALL BE PERFORMED PRIOR TO ANY WORK UNDER THIS CONTRACT BEING PERFORMED.



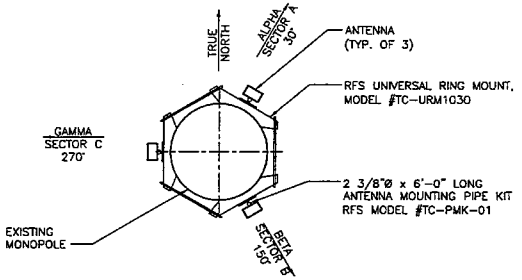
1 / 03 TOWER ELEVATION
SCALE: 1" = 25'-0"

ANTENNA KEY

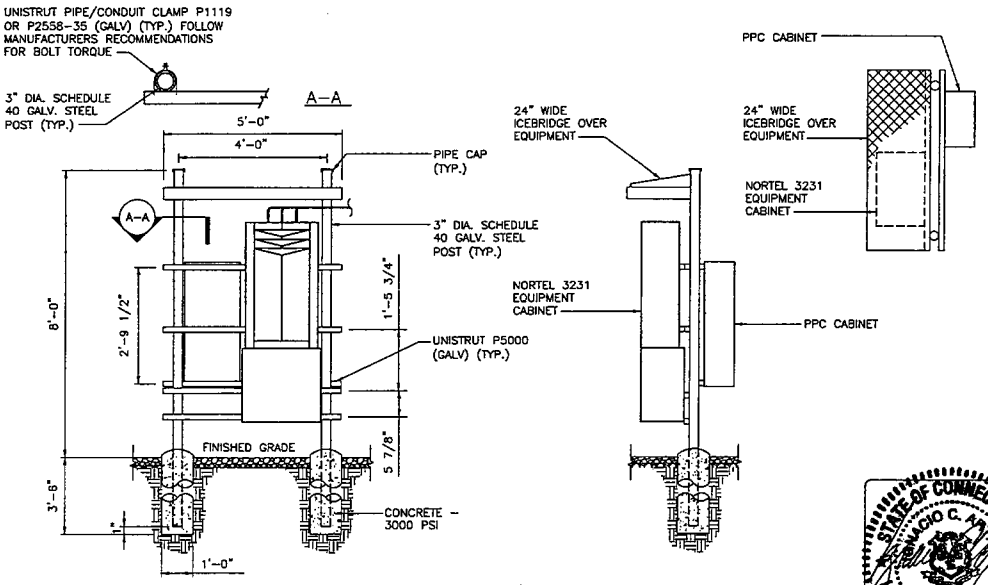
	# ANTENNAS PER SECTOR	ANTENNA NUMBER	COAX COLOR CODE	ANTENNA VENDOR	MODEL NUMBER	AZIMUTH	C/L HEIGHT	MECHANICAL DOWNTILT	COAX SIZE	NO. COAX PER ANTENNA	COAX MANUFACTURER
ALPHA	1	A-1	(1) RED BAND	KATHREIN	742 213	30°	140'-0"	0°	1 5/8"Ø	2	RFS
BETA	1	B-1	(1) BLUE BAND	KATHREIN	742 213	150°	140'-0"	0°	1 5/8"Ø	2	RFS
GAMMA	1	C-1	(1) BROWN BAND	KATHREIN	742 213	270°	140'-0"	0°	1 5/8"Ø	2	RFS

TOWER NOTES:
1. FOR DETAILED TOWER INFORMATION, REFER TO TOWER ERECTION DRAWINGS BY OTHERS. THE TOWER SHOWN ON THIS SHEET IS SHOWN FOR GENERAL CONFIGURATION PURPOSES ONLY.
2. ANTENNA CONFIGURATION IS SUBJECT TO CHANGE. VERIFY ANTENNA HEIGHT, DOWN-TILT, AND AZIMUTH WITH PROJECT MANAGER PRIOR TO CONSTRUCTION.

ANTENNA NOTES:
1. ALL COAX SHALL BE COLOR CODED AT THE ANTENNA AND AT THE EQUIPMENT CABINET.
2. (2) COLOR BANDS DENOTES TRANSMIT.
3. PRIOR TO ORDERING ANY ANTENNAS OR COAX, CONTRACTOR SHALL CONTACT POCKETS CONSTRUCTION MANAGER AND OBTAIN APPROVAL FOR MATERIALS LISTED. CONTRACTOR IS SOLELY RESPONSIBLE FOR THIS COORDINATION.



2 / 03 ANTENNA SECTOR PLAN
SCALE: N.T.S.



3 / 03 CABINET SUPPORT FRAME
SCALE: N.T.S.

STATE OF CONNECTICUT
IGNACIO C. ARIAS
No. 8704
LICENSED ARCHITECT

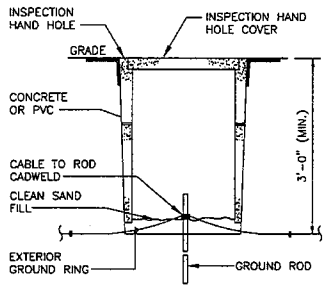
NO.	DATE	REVISIONS	BY
0	09/09/08	ISSUED FOR CONSTRUCTION	JCF

pocket. SMART WIRELESS

PROJECT NAME: HFCT1527, FARMINGTON POLICE DEPT.
SHEET: TOWER ELEVATION, ANTENNA PLAN AND DETAILS

URS
URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

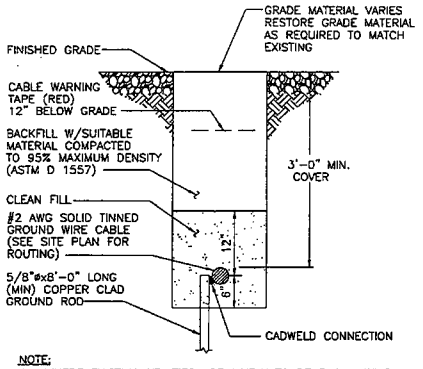
CHECKED BY: JCF
DRAWN BY: PD
DATE: 08/25/08
URS JOB NUMBER: PC1020/36923940
DRAWING NUMBER: 03



NOTE:
INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 8" IN WIDTH/DIAMETER

GROUND ROD WITH INSPECTION HANDHOLE

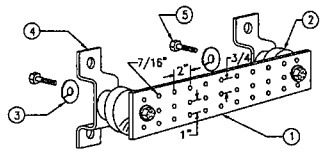
7 / 04 SCALE: N.T.S.



NOTE:
1. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
2. CADWELD GROUND ROD TO GROUND RING AFTER GROUND ROD HAS BEEN DRIVEN INTO PLACE

EGR DETAIL

6 / 04 SCALE: N.T.S.

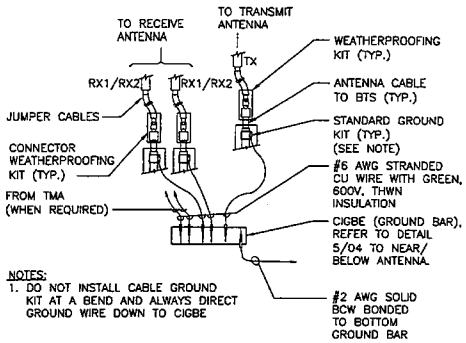


LEGEND

1- COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION. (ACTUAL GROUND BAR SIZE WILL VARY BASED ON NUMBER OF GROUND CONNECTIONS)
2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
3- 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8 OR EQUAL
4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056 OR EQUAL
5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1 OR EQUAL

MASTER/EQUIPMENT GROUND BAR DETAIL

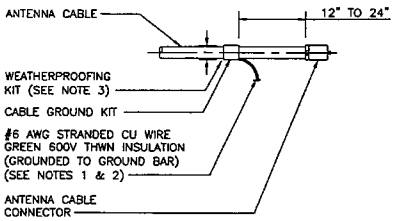
5 / 04 SCALE: N.T.S.



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

CONNECTION OF GROUND WIRE TO GROUND BAR

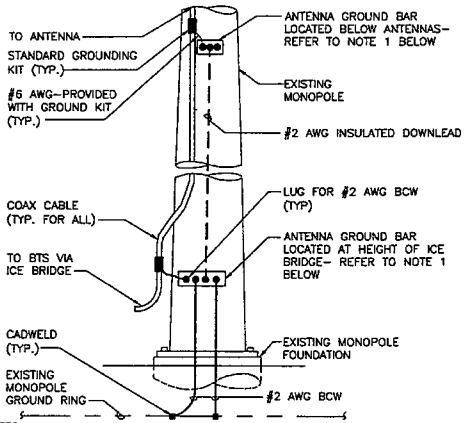
4 / 04 SCALE: N.T.S.



NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

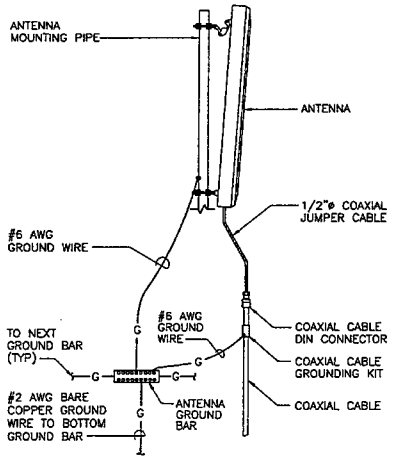
3 / 04 SCALE: N.T.S.



NOTES:
1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION & CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. NO WELDING OR DRILLING SHALL BE ALLOWED ON THE MONOPOLE.
3. DO NOT INSTALL ANTENNA GROUND KIT ON CABLE BEND (TYP.)

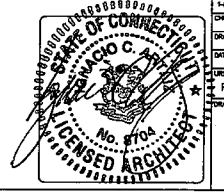
MONOPOLE - ANTENNA CABLE GROUNDING

2 / 04 SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL

1 / 04 SCALE: N.T.S.



NO.	DATE	REVISIONS	BY
0	09/09/08	ISSUED FOR CONSTRUCTION	JCF

pocket SMART WIRELESS

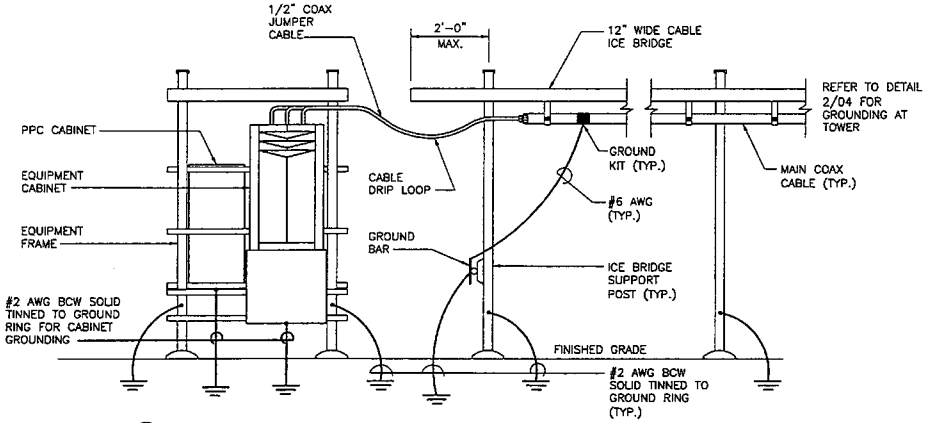
PROJECT NAME: HFCT1527, FARMINGTON POLICE DEPT.

SHEET: GROUNDING DETAILS

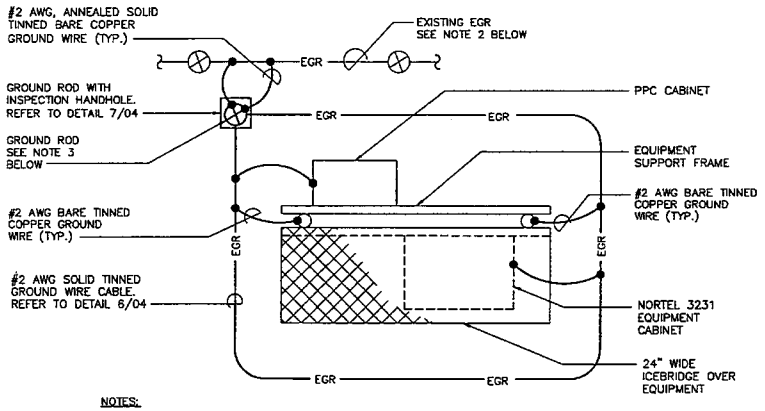
URS

URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

CHECKED BY: JCF
DRAWN BY: PD
DATE: 08/25/08
URS JOB NUMBER: PC1020/36923940
DRAWING NUMBER: 04



1/05 GROUNDING AT EQUIPMENT CABINET
SCALE: N.T.S.

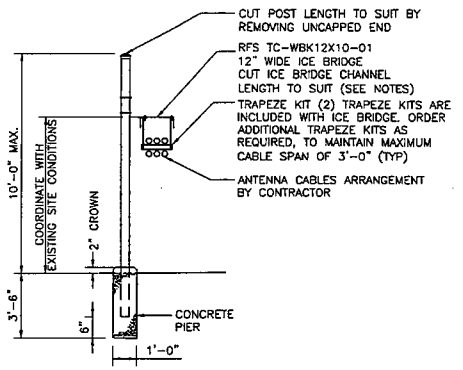


NOTES:

1. SEE SHEET 02 FOR EQUIPMENT ORIENTATION AND LOCATION.
2. EXISTING EGR. VERIFY LOCATION IN FIELD. CONTRACTOR SHALL HAND DIG AND LOCATE EXISTING EGR. IF ANY DAMAGE IS CAUSED TO EXISTING EGR, THE CONTRACTOR SHALL REPAIR THE DAMAGE AT HIS OWN COST TO THE SATISFACTION OF RESPECTIVE CELL ENGINEERS.
3. GROUNDING ELECTRODE SHALL BE 5/8" DIA. x 8'-0"L. COPPER CLAD STEEL ROD. ADJUST LOCATION OF GROUNDING ELECTRODE IF SOIL CONDITION IS NOT CONDUCTIVE (GRAVEL, SANDY SOIL, ROCKS). SPACING OF GROUNDING ELECTRODES SHALL NOT BE LESS THAN 8' O.C. 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. IF IT IS IMPRACTICAL TO DRIVE THE 8'-0" GROUND ROD, CONTRACTOR SHALL INSTALL THE GROUND ROD HORIZONTALLY IN A TRENCH AWAY FROM STRUCTURE, NOT LESS THEN 36" BELOW FINISHED GRADE. UNDER NO CIRCUMSTANCES SHALL THE GROUND ROD BE CUT OR MODIFIED TO ACCOMMODATE VERTICAL INSTALLATION INTO LEDGE. REFER TO THE NEC 2005, ARTICLE #250 FOR MORE INFORMATION ON GROUNDING.

2/05 EQUIPMENT GROUNDING PLAN
SCALE: N.T.S.

*INSTALL DRIP LOOP ON ANTENNA CABLES AT BOTTOM OF TOWER/MONOPOLE. BENDING RADIUS PER MANUFACTURER'S STANDARDS



MAXIMUM ALLOWABLE SPAN BETWEEN SUPPORTS ON A CONTINUOUS SINGLE SECTION OF BRIDGE CHANNEL SHALL BE 8 FEET FOR 10 FEET BRIDGE CHANNEL

FOR SPLICING BRIDGE CHANNEL SECTIONS, THE SPLICE SHOULD BE PROVIDED AT THE SUPPORT, IF POSSIBLE, OR AT A MAXIMUM OF 2 FEET FROM THE SUPPORT.

SUPPORT SHOULD BE PROVIDED AS CLOSE AS POSSIBLE TO THE ENDS OF ICE BRIDGES, WITH A MAXIMUM CANTILEVER DISTANCE OF 2 FEET FROM THE SUPPORT TO THE FREE END OF THE ICE BRIDGE.

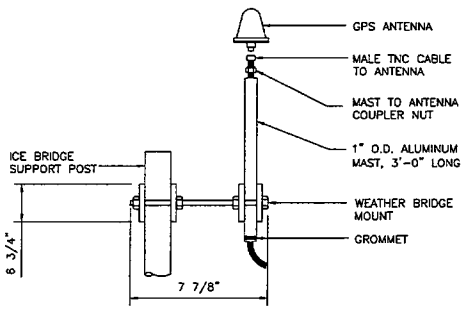
CUT BRIDGE CHANNEL SECTIONS SHALL HAVE RAW EDGES TREATED WITH A MATERIAL TO RESTORE THESE EDGES TO THE ORIGINAL CHANNEL, OR EQUIVALENT, FINISH.

ICE BRIDGES MAY BE CONSTRUCTED WITH COMPONENTS FROM MANUFACTURERS OTHER THAN VALMONT, PROVIDED THE MANUFACTURER'S INSTALLATION GUIDELINES ARE FOLLOWED.

DEVIATIONS FROM STANDARDS FOR COMPONENT INSTALLATIONS ARE PERMITTED WITH THE RESPECTIVE MANUFACTURER'S APPROVAL.

DEVIATIONS FROM ICE BRIDGE FOUNDATIONS REQUIRE ENGINEERING APPROVAL.

3/05 ICE BRIDGE DETAIL
SCALE: N.T.S.



4/05 GPS MOUNTING DETAIL
SCALE: N.T.S.

STATE OF CONNECTICUT
IGNACIO C. ARIAS
No. 8704
LICENSED ARCHITECT

NO.	DATE	REVISIONS	BY
0	01/09/08	ISSUED FOR CONSTRUCTION	JCF

pocket. SMART WIRELESS

PROJECT NUMBER: HFCT1527, FARMINGTON POLICE DEPT.

SHEET: GROUNDING PLAN AND DETAILS

URS
URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

CHECKED BY: JCF
DRAWN BY: PD
DATE: 08/25/08
URS JOB NUMBER: PC1020/36923940
DRAWING NUMBER: 05

PANEL SSC

LOAD DESCRIPTION	LOAD (kVA)	BRKR SIZE	CCT NO.	PHASE A	PHASE B	CCT NO.	BRKR SIZE	LOAD (kVA)	LOAD DESCRIPTION
BTS CABINET	2.5	30/2	1			2	30/2	2.2	BTS CABINET
	2.5		3			4		2.2	
LIGHTING	1.9	10/1	5			6	20/1	0.2	GFI OUTLET
SPACE	–	–	7			8	–	–	SPACE
SPACE	–	–	9			10	–	–	SPACE
SPACE	–	–	11			12	–	–	SPACE
SPACE	–	–	13			14	–	–	SPACE
SPACE	–	–	15			16	–	–	SPACE
SPACE	–	–	17			18	–	–	SPACE
SPACE	–	–	19			20	–	–	SPACE
SPACE	–	–	21			22	–	–	SPACE
SPACE	–	–	23			24	–	–	SPACE
LOAD SUB–TOTAL	6.9	LOAD TOTAL		11.5 kVA				4.6	LOAD SUB–TOTAL

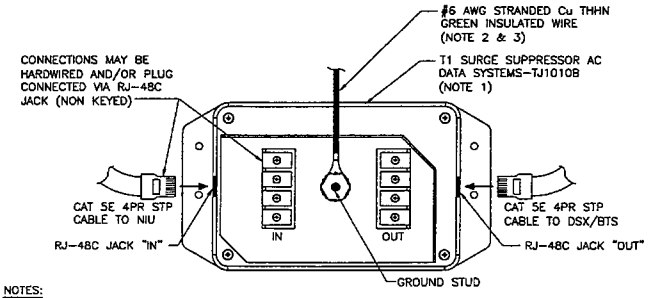
100A MCB, 120/208/240V, 1ø, 3 WIRE, 65,000 AIC

TOTAL CONNECTED LOAD	11.5 KW	
25% OF LARGEST CONT. LOAD	1.25 KW	
TOTAL LOADS	12.75 KW	
NOTE: ALL NON–OPTIONAL BREAKERS PROVIDED BY SSC MFR		

1 / 06 PANEL SCHEDULE
SCALE: N.T.S.

GENERAL ELECTRIC NOTES:

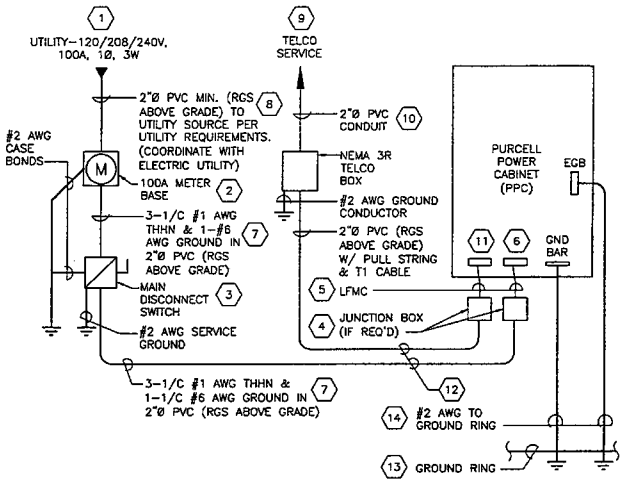
1. ALL ELECTRICAL AND GROUNDING WORK SHALL BE PERFORMED IN ACCORDANCE WITH PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONDUIT ROUTINGS ARE SCHEMATIC, CONTRACTOR SHALL VERIFY ROUTING AND LENGTHS PRIOR TO CONSTRUCTION.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
4. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
5. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES, AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.



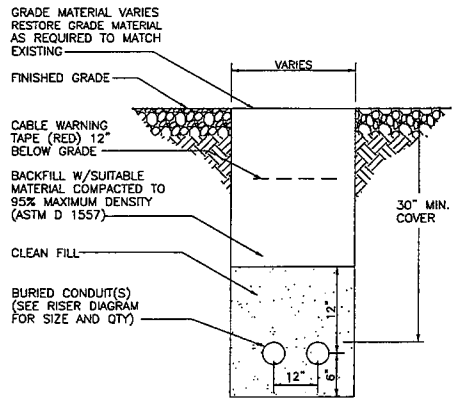
NOTES:

1. MOUNT T1–TVSS UNIT ON EQUIPMENT FRAME HOUSING THE DSX UNIT. USE APPROPRIATE STAINLESS STEEL BOLTS WITH FLAT WASHERS AND A LOCK WASHER ON THE NUT SIDE. THE TVSS MAY BE LOCATED ON THE TELCO BACKBOARD. REFER TO MANUFACTURER'S INSTRUCTIONS.
2. ATTACH RING TERMINAL FROM SUPPLIED GROUND CONDUCTOR TO TVSS GROUND STUD SECURELY FASTEN WITH SUPPLIED WASHER AND NUT. REFER TO MANUFACTURER'S INSTRUCTIONS. FOR PROPER PERFORMANCE, THE GROUND CONDUCTOR LENGTH SHOULD BE LIMITED WITH NO SHARP BENDS ON COILS.
3. WHEN TVSS IS MOUNTED ON EQUIPMENT FRAME, BOND THE GROUND CONDUCTOR TO THE EQUIPMENT FRAME GROUND. ENSURE PROPER GROUNDING SURFACES. WHEN TVSS IS MOUNTED ON THE TELCO BACK BOARD, BOND THE GROUND CONDUCTOR TO THE TELCO (BOARD) GROUND BAR OR NEAREST GROUND BAR.

3 / 06 TVSS DETAIL
SCALE: N.T.S.



2 / 06 POWER, TELCO, GROUND SINGLE LINE DIAGRAM FOR OUTDOOR CABINET
SCALE: N.T.S.



ELECTRICAL/TELEPHONE TRENCH DETAIL 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. THE TRENCH SHALL BE BACKFILLED IMMEDIATELY FOLLOWING PLACEMENT OF THE CONDUITS.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

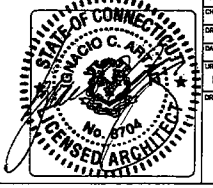
4 / 05 TYPICAL ELECTRICAL/ TELEPHONE TRENCH DETAIL
SCALE: N.T.S.

REFERENCE NOTES:

1. ELECTRICAL DEMARCATION POINT. ELECTRICAL CONTRACTOR TO COORDINATE WITH LOCAL UTILITY COMPANY FOR SERVICE TO METER.
2. CONTRACTOR TO SUPPLY AND INSTALL A 100A, 120/208/240V 1ø, 3W METER BASE. METER BASE TO BE NEMA 3R RATED AND ACCEPTABLE TO LOCAL UTILITY. PROVIDE WITH MECHANICALLY ATTACHED ENGRAVED IDENTIFICATION LABEL INDICATING "POCKET COMMUNICATIONS METER".
3. CONTRACTOR TO SUPPLY AND INSTALL NEMA 3R 100A FUSIBLE DISCONNECT SWITCH WITH LOCKABLE HANDLE. PROVIDE WITH TWO (2) 100A FUSES. AIC RATING TO COORDINATE WITH LOCAL UTILITY REQUIREMENTS. PROVIDE WITH MECHANICALLY ATTACHED ENGRAVED IDENTIFICATION LABEL INDICATING "POCKET COMMUNICATIONS SERVICE DISCONNECT".
4. WEATHER TIGHT NEMA 3R JUNCTION BOX (IF REQUIRED). SIZE TO NEC CODE FOR APPLICATION.
5. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT W/ WEATHER TIGHT FITTINGS AND SUPPORTS. SIZE AND CONTENTS TO MATCH ASSOCIATED USE (POWER OR TELCO) SEE NOTE #5 BELOW
6. UTILITY POWER ENTRY INTO CABINET. COORDINATE TERMINATION WITH CABINET MANUFACTURER.
7. CONTRACTOR SHALL SUPPLY AND INSTALL 2" GRC. AFG AND PVC 36" BFG C/W 3–#1 & 1–#6G AWG THHN FOR UTILITY SERVICE.
8. CONTRACTOR SHALL SUPPLY AND INSTALL 2" GRC. AFG AND PVC 36" BFG C/W 3–#1 & 1–#6G, AWG THHN FOR UTILITY SERVICE.
9. TELCO DEMARCATION POINT. ELECTRICAL CONTRACTOR TO COORDINATE WITH LOCAL TELCO FOR SERVICE TO TELCO BOX OR CABINET.
10. CONTRACTOR TO SUPPLY AND INSTALL (1) 2" GRC AFG AND PVC 36" BFG C/W PULL CORDS FOR TELCO SERVICE TO CABINET TERMINATION POINT.
11. TELCO SERVICE ENTRY INTO CABINET. COORDINATE TERMINATION WITH CABINET MANUFACTURER.
12. CONTRACTOR TO ARRANGE AND PAY FOR UNDERGROUND UTILITY LOCATION SURVEYS FOR ALL TRENCHING. REUSE NATIVE BACKFILL AND RE–INSTATE TO ORIGINAL CONDITION. INSTALL 6" WIDE METALLIC LINED RED PLASTIC MARK TAPE 8" ABOVE ALL BURIED CONDUIT.
13. PORTION OF EXTERIOR GROUND RING
14. (1) #2 SOLID BARE TINNED COPPER EQUIPMENT GROUND CONDUCTOR BONDED TO 5/8"x8' COPPER CLAD STEEL GROUNDING ELECTRODES. LOCATE GROUNDING ELECTRODE ADJACENT TO CABINET. BOND GROUNDING ELECTRODE SYSTEM TO CABINET GROUND RING.

NOTES:

1. CONTRACTOR SHALL PROVIDE 100 AMP, SINGLE PHASE, 120/208/240 VAC, 60 HZ ELECTRIC SERVICE FOR SITE
2. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY BEFORE THE START OF CONSTRUCTION. POWER AND TELCO CONDUIT SHALL BE PROVIDED AND INSTALLED PER UTILITY REQUIREMENTS.
3. FOR COMPLETE INTERNAL WIRING AND ARRANGEMENT REFER TO DRAWINGS PROVIDED BY AC OR TELCO PANEL MANUFACTURER.
4. ALL SERVICE EQUIPMENT AND INSTALLATIONS SHALL COMPLY WITH THE N.E.C. AND UTILITY COMPANY AND LOCAL CODE REQUIREMENTS.
5. CONTRACTOR SHALL INSTALL SUFFICIENT LENGTHS OF LFMC (NOT EXCEEDING 6'–0") INCLUDING ALL CONDUIT FITTINGS (NUTS, REDUCING BUSHINGS, ELBOWS, COUPLINGS, ETC.) NECESSARY FOR CONNECTION FROM IMC CONDUIT TO THE PURCELL POWER CABINET, (PPC).
6. CONTRACTOR SHALL PROVIDE ELECTRICAL SERVICE EQUIPMENT WITH FAULT CURRENT RATINGS GREATER THAN THE AVAILABLE FAULT CURRENT FROM THE POWER UTILITY.
7. CONTRACTOR SHALL VERIFY THAT THE MAIN BONDING JUMPER AND GROUNDING ELECTRODE CONDUCTOR IS INSTALLED PROPERLY IN MAIN DISCONNECT SWITCH.



NO.	DATE	REVISIONS	BY
0	09/09/08	ISSUED FOR CONSTRUCTION	JCF

pocket. SMART WIRELESS

PROJECT NAME: HFCT1527, FARMINGTON POLICE DEPT.

SHEET: ELECTRICAL DETAILS

URS

URS CORPORATION AES
500 ENTERPRISE DRIVE
ROCKY HILL, CT. 06067
1-(860)-529-8882

CHECKED BY: JCF
DRAWN BY: PD
DATE: 08/25/08
URS JOB NUMBER: PC1020/36923940
DRAWING NUMBER: 06

Exhibit C

Equipment Specifications

Pocket Site HFCT1527A

319 New Britain Avenue

Farmington, Connecticut

KATHREIN
SCALA DIVISION

742 213

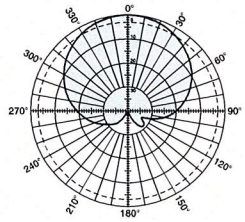
65° Panel Antenna

Kathrein's X-polarized adjustable electrical downtilt antennas offer the wireless carrier the ability to tailor polarization diversity sites for optimum performance. Using variable downtilt, only a few models need be procured to accommodate the needs of widely varying conditions. Remotely controlled downtilt is available as a retrofitable option.

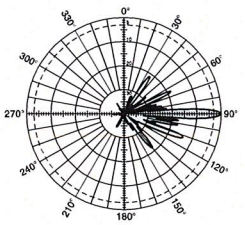
- 0-6° downtilt range.
- UV resistant pulltruded fiberglass radome.
- DC Grounded metallic parts for impulse suppression.
- No moving electrical connections.
- Wideband vector dipole technology.
- Optional remote downtilt Control.
- Will accomodate future 3G / UMTS applications.

General specifications:

Frequency range	1710–2170 MHz
VSWR	< 1.5:1
Impedance	50 ohms
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Front-to-back ratio (180°±30°)	>30 dB (co-polar) >25 dB (total power)
Maximum input power	300 watts per input (at 50°C)
Electrical downtilt continuously adjustable	0–6 degrees
Connector	2 x 7/16 DIN female
Isolation	>30 dB
Cross polar ratio Main direction 0° Sector ±60°	 25 dB (typical) >10 dB
Weight	22 lb (10 kg)
Dimensions	76.5 x 6.1 x 2.7 inches (1942 x 155 x 69 mm)
Equivalent flat plate area	4.62 ft² (0.429 m²)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	87.2 x 6.8 x 3.6 inches (2214 x 172 x 92 mm)
Shipping weight	24.3 lb (11 kg)
Mounting	Fixed and tilt mount options are available for 2 to 4.6 inch (50 to 115 mm) OD masts.
See reverse for order information.	



Horizontal pattern
±45°- polarization



Vertical pattern
±45°- polarization

Specifications:	**1710–1880 MHz**	**1850–1990 MHz**	**1920–2170 MHz**
Gain	19 dBi	19.2 dBi	19.5 dBi
+45° and -45° polarization horizontal beamwidth	67° (half-power)	65° (half-power)	63° (half-power)
+45° and -45° polarization vertical beamwidth	4.7° (half-power)	4.5° (half-power)	4.3° (half-power)
Vertical Pattern–sidelobe suppression for first side-lobe above main beam	0° 2° 4° 6° T 18 17 15 15 dB	0° 2° 4° 6° T 18 18 17 15 dB	0° 2° 4° 6° T 18 18 17 15 dB

RoHS
Lead-Free

10642-H
936.2074/h

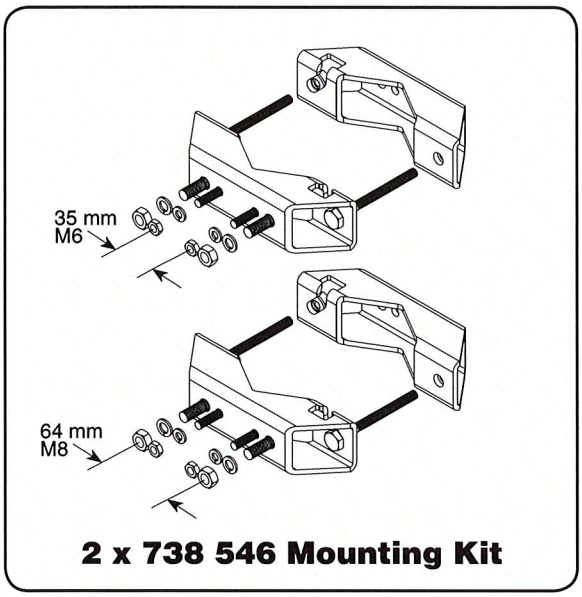
*Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

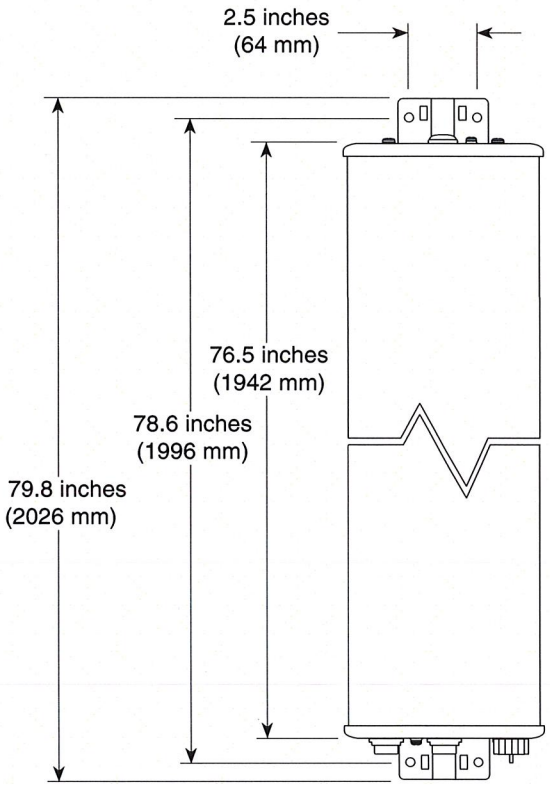
KATHREIN
SCALA DIVISION

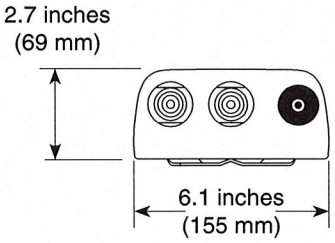
742 213

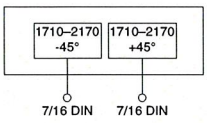
65° Panel Antenna



2 x 738 546 Mounting Kit







Mounting Options:

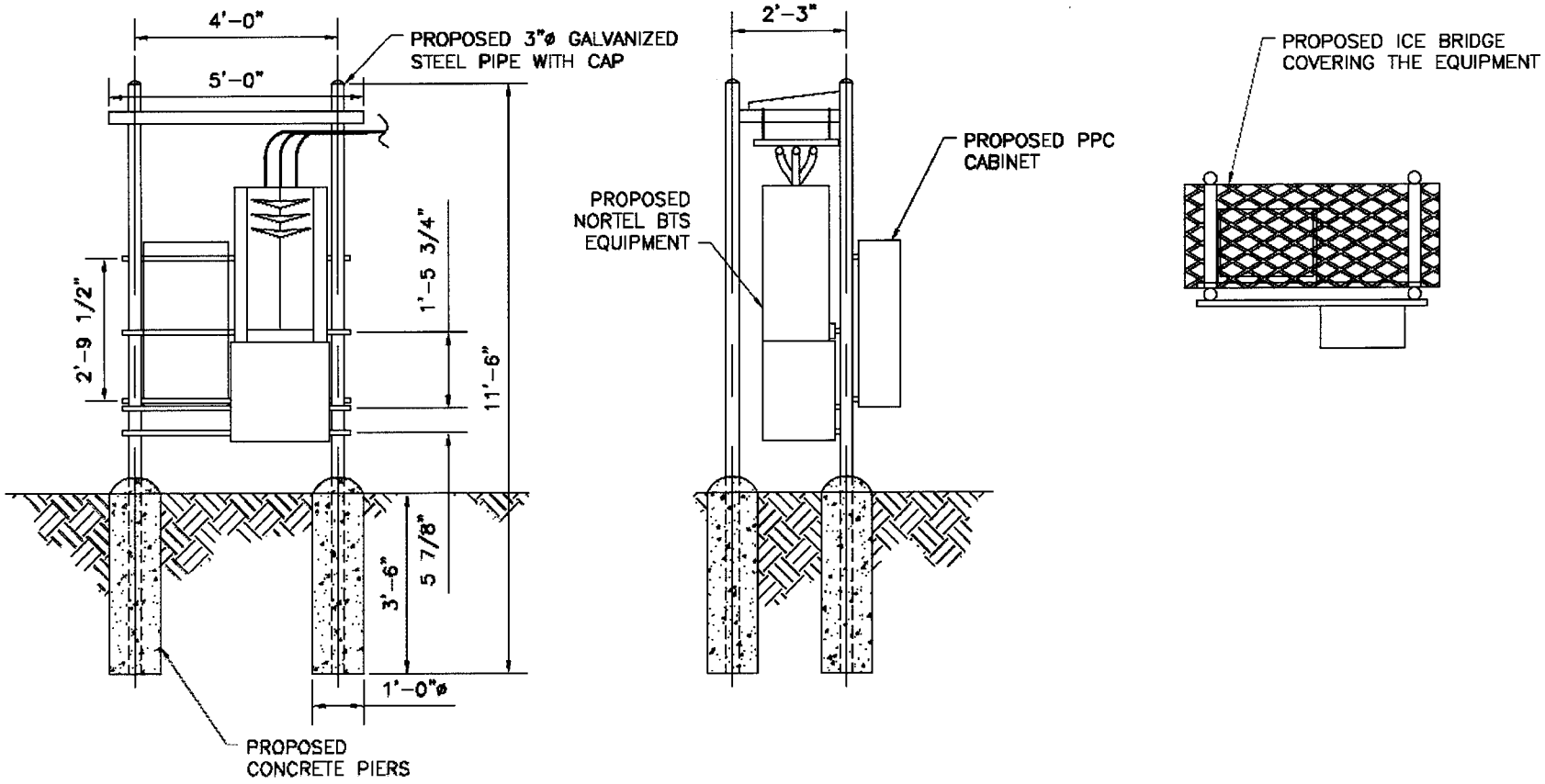
Model	Description
2 x 738 546	Mounting Kit for 2 to 4.6 inch (50 to 115 mm) OD mast.
737 978	Tilt Kit for use with the above mounting kit, 0–11 degrees downtilt angle. (requires 2 x 738 546 Mounting Kit)
742 263	Three-panel Sector Mounting Kit (120 deg. ea.) for 3.5 inch (89 mm) OD mast.

Order Information:

Model	Description
742 213	Antenna with 7/16 DIN connectors 0°–6° adjustable electrical downtilt

All specifications are subject to change without notice. The latest specifications are available at www.kathrein-scala.com.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com



Pocket/Youghiogheny Communications – Northeast, LLC

Rack Detail

>BUSINESS MADE **SIMPLE**

NORTEL

CDMA BTS 3231 AWS 1.7/2.1 GHz (Outdoor/Indoor)

CDMA BTS 3231

Industry's Highest Capacity AWS Micro BTS

The CDMA BTS 3231 is the latest extension to Nortel Networks BTS (Base Transceiver Station) portfolio providing the ideal solution for urban, sub-urban and rural deployments. The CDMA BTS 3231 is a 3-carrier, 3-sector outdoor/indoor BTS operating at the AWS band of 1.7/2.1 GHz supporting IS-95, 1XRTT and 1xEV-DO simultaneously. BTS 3231 provides flexible deployments solutions including floor, rack, and wall mount options. The power consumption of BTS3231 is industry leading consuming only 630W for 3C3S. The BTS 3231 is also very light at 240lbs making it easy to transport to hard to reach locations such as the top of a high rise building.

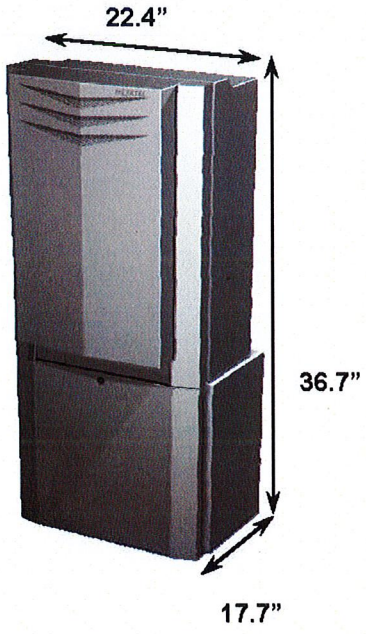


Exhibit D

Power Density Calculations

Pocket Site HFCT1527A

319 New Britain Avenue

Farmington, Connecticut

C Squared Systems, LLC
920 Candia Road
Manchester, NH 03109
Phone: (603) 657 9702
E-mail:
support@csquaredsystems.com

Calculated Radio Frequency Emissions

CT-1527

319 New Britain Avenue, Farmington, CT

Table of Contents

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed Pocket antennas to be installed on the existing tower at 319 New Britain Avenue, Farmington, CT.

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are much more conservative (higher) than the actual signal levels will be from the finished installation.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (mW/cm^2). The number of mW/cm^2 emitted is called the power density. The general population exposure limit for the cellular band is 0.567-0.593 mW/cm^2, and the general population exposure limit for the PCS/AWS band is 1.0 mW/cm^2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Higher exposure limits are permitted under the occupational / controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure (through training), and they must be able to exercise control over their exposure. General population / uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals."

The FCC describes exposure to radio frequency (RF) energy in terms of percentage of maximum permissible exposure (MPE) with 100% being the maximum allowed. Rather than the FCC presenting the user specification in terms of complex power density figures over a specified surface area, this MPE measure is particularly useful, and even more so when considering that power density limits actually vary by frequency because of the different absorptive properties of the human body at different frequencies.

MPE limits are specified as time-averaged exposure limits. This means that exposure can be averaged over 30 minutes for general population / uncontrolled exposure (or 6 minutes for occupational / controlled exposure). However, for the case of exposure of the general public, time averaging is usually not applied because of uncertainties over exact exposure conditions and difficulty in controlling time of exposure. Therefore, the typical conservative approach is to assume that any RF exposure to the general public will be continuous.

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

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit. As shown in these excerpts, each frequency band has different exposure limits, requiring power density to be reported as a percent of Maximum Permissible Exposure (MPE) when dealing with carriers transmitting in different frequency bands.

3. RF Exposure Prediction Methods

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

$$\text{Power Density} = \left(\frac{EIRP}{\pi \times R^2}\right) \times \text{Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna

V = Vertical Distance from bottom of antenna

Off Beam Loss is determined by the selected antenna patterns

4. Calculation Results

Table 1 below outlines the power density information for the site. All information for carriers other than Pocket was obtained from current CSC database.

Carrier	Number of Trans.	Effective Radiated Power (ERP) Per Transmitter (Watts)	Antenna Height (Feet)	Operating Frequency (MHz)	Total ERP (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Sprint	11	250	170	1,950	2,750	0.0342	1.0000	3.42%
Town	2	300	194.83	810	600	0.0057	0.5402	1.05%
Town	2	300	187	810	600	0.0062	0.5402	1.14%
Emergency	4	500	120	933	2,000	0.0499	0.6221	8.03%
Public Works	4	500	100.4	153	2,000	0.0713	0.2000	35.67%
AT&T GSM	4	570	150	1,900	2,280	0.0364	1.0000	3.64%
AT&T UMTS	1	500	150	880	500	0.0080	0.5867	1.36%
T-Mobile	8	145	160	1,945	1,160	0.0163	1.0000	1.63%
Pocket	3	631	140	2130-2133.75	1,893	0.0347	1.0000	3.47%
							Total	59.42%

Table 1: Proposed Carrier Information

5. Conclusion

The above analysis verifies that emissions from the proposed site will be well below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at the base of the tower is 59.42% of the FCC limit.

Please note that as indicated in the introduction, obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished installation.

6. Statement of Certification

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

September 15, 2008
Date

Daniel l. Goulet
C Squared Systems, LLC

Attachment A: References

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

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

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

Attachment B: FCC Limits For Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure

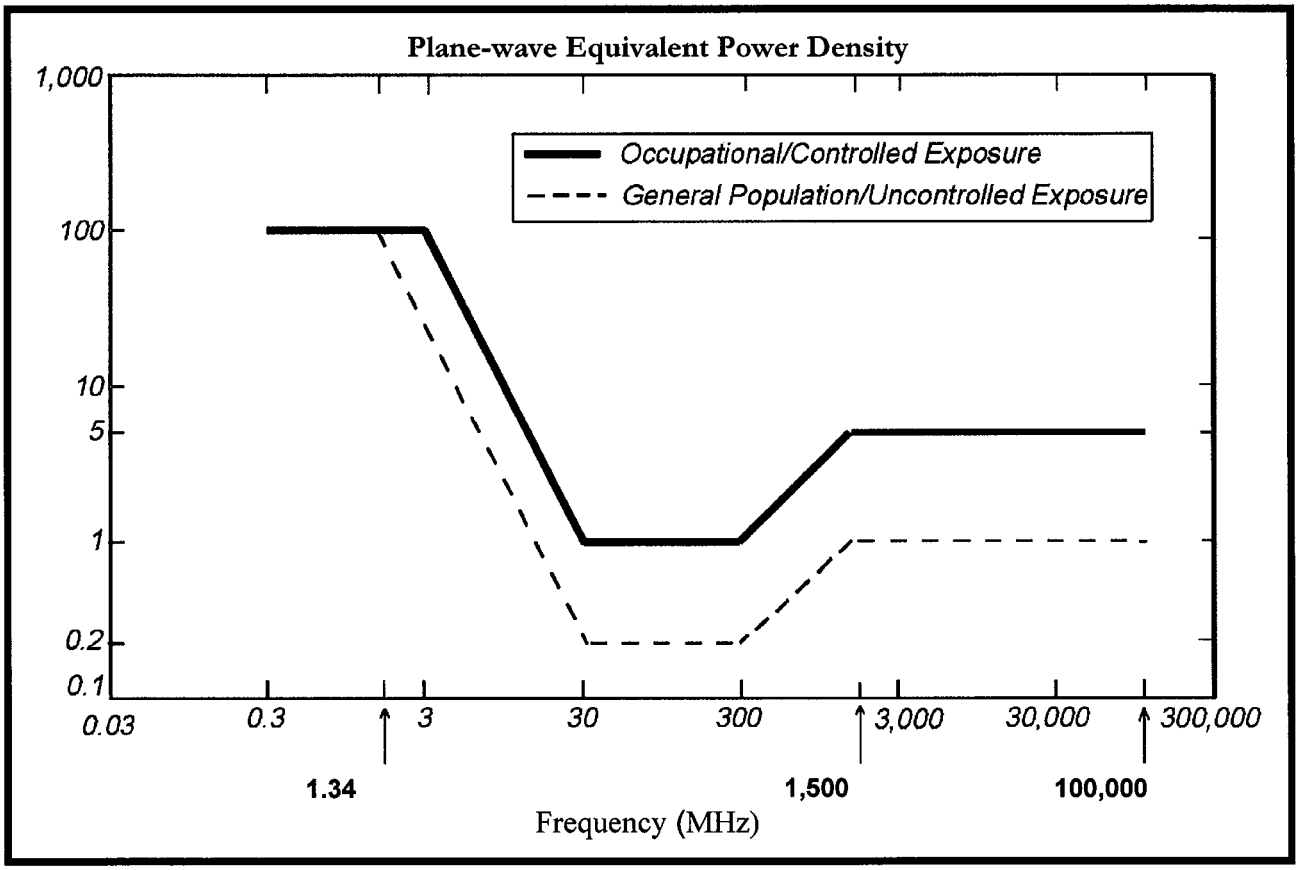
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure

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

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

NOTE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.



• FCC Limits for Maximum Permissible Exposure (MPE)

Exhibit E

Structural Analysis

Pocket Site HFCT1527A

319 New Britain Avenue

Farmington, Connecticut

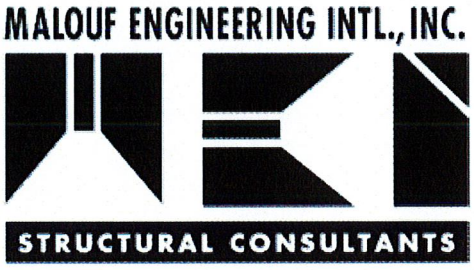
Structural Analysis Report

Farmington Police Department #HFCT1527A

Owner: Farmington Police Department
Farmington, Connecticut

October 8, 2008

MEI PROJECT ID: CT00937M-08V1



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MALOUF ENGINEERING INTL., INC.

STRUCTURAL CONSULTANTS

October 8, 2008

Mr. Bobby Carter
Force 3 Communications
Columbia, SC

RIGOROUS STRUCTURAL ANALYSIS

Structure/Make/Model:	190 ft Monopole		PiRod / 18-Sided	
Client/Site Name/#:	**Force 3 Comm. / Pocket Comm.**		**Farmington Police Dept.**	**#HFCT1527A**
Owner/Site Name/#:	Farmington Police Department			
MEI Project ID:	**CT00937M-08V1**			
Location:	319-321 New Britain Ave. Farmington, CT 06085		Hartford County FCC #1226793	
	LAT	41-44-59.3 N	LON	72-52-21.7 W

EXECUTIVE SUMMARY:

Malouf Engineering Int'l (MEI), as requested, has performed a rigorous structural analysis of the above mentioned structure to assess the impact of the changed condition as noted in Table 1.

Based on the stress analysis performed, the existing structure **is in conformance** with the ANSI/TIA **222-F** Standard for the loading considered under the criteria listed and referenced in the report sections - tower rated at 76.3%.

The installation of the proposed changed condition *of the Pocket Communications (3) Kathrein 742 213 Panel Antennas onto (3) Close Contact Mounts at Elev. 140 ft c.l. fed with (6) 1-5/8" Dia. Tx-Lines (external tightly strapped to shaft)* ***is structurally acceptable.***

MEI appreciates the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects please contact us.

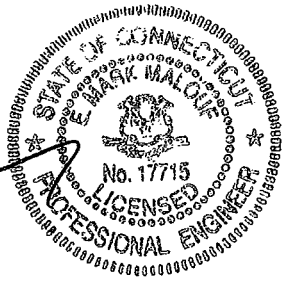
Respectfully submitted,

MALOUF ENGINEERING INT'L, INC.

Analysis performed by:

Luan Nguyen, PE
Project Engineer

Reviewed & Approved by:



E. Mark Malouf, PE
Connecticut #17715
972-783-2578 ext. 106
mmalouf@maloufengineering.com

TABLE OF CONTENTS

1. INTRODUCTION & SCOPE

A rigorous structural analysis was performed by Malouf Engineering Int'l (MEI), as requested and authorized by Bobby Carter, of Force 3 Communications, on behalf of Pocket Communications, to determine the acceptance of the proposed changed conditions in conformance with the ANSI/TIA-222-F Standard, "*Structural Standards for Steel Antenna Towers and Antenna Supporting Structures*".

The scope of this independent analysis is to determine the overall stability and the adequacy of structural members, foundations, and member connections, as available and stated. This analysis considers the structure to have been properly installed and maintained with no structural defects. Installation procedures and related loading are not with the scope of this analysis and should be performed and evaluated by a competent person of the erection contractor.

The different report sections detail the applicable information used in this evaluation, relating to the tower data, the appurtenances configuration and the wind and ice loading considered.

2. SOURCE OF DATA

The following information has been used in this evaluation as source data that accurately represent the existing structure and the related appurtenances:

	Source	Information	Reference
STRUCTURE			
Tower	MEI Records	Previous Structural Analysis	MEI ID: CT00937M-08V0 Dated 09/24/08
Foundation	MEI Records	Previous Structural Analysis	MEI ID: CT00937M-08V0 Dated 09/24/08
Material Grade	Available from supplied documents noted above – refer to Appendix.		
CURRENT APPURTENANCES			
	MEI Records	Previous Structural Analysis	MEI ID: CT00937M-08V0 Dated 09/24/08
CHANGED CONDITION			
	Bobby Carter / Force 3 Comm.	E-mail Instructions	E-mail Dated 10/06/08

Background Information:

Based on available information, the following is known regarding this structure:

DESIGNER / FABRICATOR	PiRod / 18-Sided
DESIGN CRITERIA	TIA/EIA 222- F–85/74 Mph + 0"/0.5" Ice
PRIOR STRUCTURAL MODIFICATIONS	None Known

3. ANALYSIS CRITERIA

The structural analysis performed used the following criteria:

CODE / STANDARD	ANSI/TIA-222-F-96 Standard	
LOADING CASES	*Full Wind*:	80 Mph (fastest-mile) - with No Radial Ice
	Iced Case:	69 Mph (fastest-mile) + 1/2" Radial Ice
	Service:	50 Mph

Appurtenances Configuration

The following appurtenances configuration has been considered:

Table 1: Proposed Changed Condition Appurtenances

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
140	Pocket	3	Kathrein 742 213 Panels	(3) Close Contact Mounts	6	1-5/8"- (E)

Table 2: Current and Reserved/Future Appurtenances

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
190		1	Lightning Rod on Extension	(3) 5' Sidearm Mounts	3	7/8"-(I)
		2	10'x3" Omni Whip Antenna			
		1	4' Parareflector Grid Dish			
185		1	12'x3" Omni Whip Antenna	(2) 5' Sidearm Mounts	2	7/8"-(I)
		1	4' Parareflector Grid Dish			
180		1	8'x3" Omni Whip Antenna	(1) 5' Sidearm Mounts	1	7/8"-(I)
				(1) Empty 5' Sidearm Mount		
170	Sprint	6	5' Panel Antennas	L.P. Platform w/o Rails	6	1-5/8"-(I)
160	*T-Mobile*	*6*	*APXV18-209014-C Panels [Reserved]*	*(1) LP Valmont Platform w/o Rails (P/n 852207)*	*9*	*1-5/8" -(I)*
150	AT&T	3	Allgon LGP 7770 Panels	(3) 3' Sidearm Mounts	6	1-5/8"-(I)
		6	LGP 21401 TMA's			
113		3	10'x3" Omni Whip Antenna	(3) 5' Sidearm Mounts	3	1/2"-(I)
90		3	18'x3" Omni Whip Antenna	(3) 5' Sidearm Mounts	3	1/2"-(I)

Notes:

1. *Please note appurtenances not listed above are to be removed/not present as per data supplied.*
2. (I) = internal; (E) = External; (FZ) = Within Face Zone & (OFZ) = Outside Face Zone.
3. The above antennas, mounts, and lines represent MEI's understanding of the appurtenances configuration. If different than above, the analysis is invalid. Please refer to Appendix 2 for EPA wind areas used in the calculations. Please contact MEI if any discrepancies are found.

4. ANALYSIS PROCEDURE

The subject structure is analyzed for feasibility of the installation of the proposed changed condition previously noted. The data records furnished were reviewed and a computer stress analysis was performed in accordance with the TIA-222 Standard provisions and with the agreed scope of work terms and the results of this analysis are reported.

Analysis Program

The computer program used to model the structure is a rigorous Finite Element Analysis program, RISATower (ver. 5.3.1.0), a commercially available program developed by C-Concepts, WI and now maintained by RISA Technologies. The latticed structures members are modeled using beam/truss and cable members and the pole members using tubular beam elements. The structural parameters and geometry of the members are included in the model. The dead and temperature loads and the wind loads are internally calculated by the program for the different wind directions and then applied as external loads on the structure.

Assumptions

This engineering study is based on the theoretical capacity of the members and is not a condition assessment of the structure. This analysis is based on information supplied, and therefore, its results are based on and as accurate as that supplied data. MEI has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural stress analysis:

- This existing tower is assumed, for the purpose of this analysis, to have been properly maintained and to be in good condition with no structural defects and with no deterioration to its member capacities ('as-new' condition).
- The tower member sizes and configuration are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated.
- The appurtenances configuration is as supplied and/or as stated in the report. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type & industry practice.
- Mounts/Platforms are considered adequate to support the loading. No actual analysis of the platform/mount itself is performed, with the analysis being limited to analyzing the structure.
- The soil parameters are as per data supplied or as assumed and stated in the calculations. Refer to the Appendix. If no data is available, the foundation system is assumed to support the structure with its new reactions.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report. All guy cable assemblies, as applicable, are assumed to develop the rated breaking strength of the wire.
- All prior structural modifications, if any, are assumed to be as per data supplied/available, and to have been properly installed and to be fully effective.

If any of the above assumptions are not valid or have been made in error, this analysis results may be invalided, MEI should be contacted to review any contradictory information to determine its effect.

5. ANALYSIS RESULTS

The results of the structural stress analysis based on data available and with the previous listed criteria, indicated the following:

Table 3: Stress Analysis Results

Member Type	Maximum Stress Ratio	Controlling Elev. (ft) / Component	Pass/Fail	Comment
POLE SHAFT	73.3%	31.25 - 0	**Pass**	
BASE PLATE	59.4%	Plate Stress	**Pass**	
ANCHOR RODS	**76.3%**	**Bolt Tensions**	**Pass**	
FOUNDATION	70.8%	Overturning Moment	**Pass**	

Notes:
1. The Maximum Stress Ratio is the percentage that the maximum load in the member is relative to the allowable load as determined by Code requirements.
2. Refer to the Appendix 2 for more details on the member loads.
3. A maximum stress ratio between 100% and 105% may be considered as *Acceptable* according to industry standard practice.

6. FINDINGS & RECOMMENDATIONS

- Based on the rigorous stress analysis results, the subject structure **is rated at 76.3%** of its support capacity (controlling component: Anchor Bolt Controls) with the proposed changed condition considered. Please refer to Table 3 and to Appendix 2 for more details of the analysis results.
- Based on the stress analysis performed, the existing structure **is in conformance** with the ANSI/TIA **222-F** Standard for the loading considered under the criteria listed and referenced in the report sections.
- ***The installation of the proposed changed condition*** *of the Pocket Communications (3) Kathrein 742 213 Panel Antennas onto (3) Close Contact Mounts at Elev. 140 ft c.l. fed with (6) 1-5/8" Dia. Tx-Lines (external tightly strapped to shaft)* ***is structurally acceptable***.
- This pole has additional support capacity for the appurtenances and loading criteria considered. However, no changes to the configuration considered should be made without performing a new proper evaluation.

Rigging and temporary supports required for the erection/modification shall be determined, documented, furnished and installed by the erector/contractor accounting for the loads imposed on the structure due to the proposed construction method.

7. REPORT DISCLAIMER

The engineering services rendered by **M**alouf **E**ngineering **I**nternational, Inc. *('MEI') in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. MEI does not analyze the fabrication, including welding and connection capacities, except as included in this Report.*

The analysis performed and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

1. Proper alignment and plumbness.
2. Correct guy tensions, as applicable.
3. Correct bolt tightness or slip jacking of sleeved connections.
4. No significant deterioration or damage to any structural component.

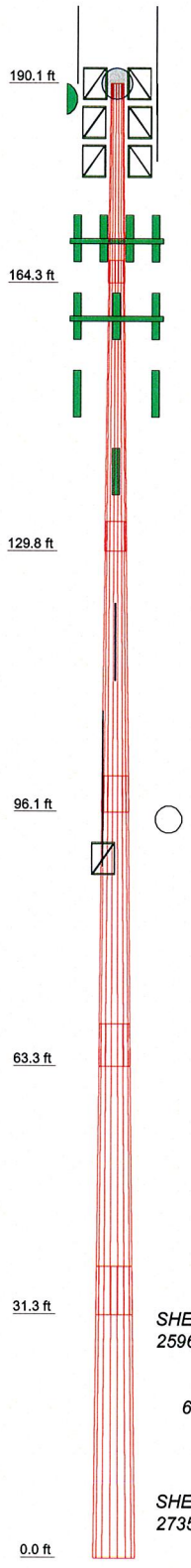
Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-art" engineering and analysis procedures and formulae. MALOUF ENGINEERING INTERNATIONAL, INC. Assumes no obligation to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will MALOUF ENGINEERING INTERNATIONAL, INC. Have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of MALOUF ENGINEERING INTERNATIONAL, INC., if any, pursuant to this Report shall be limited to the total funds actually received by MALOUF ENGINEERING INTERNATIONAL, INC. For preparation of this Report.

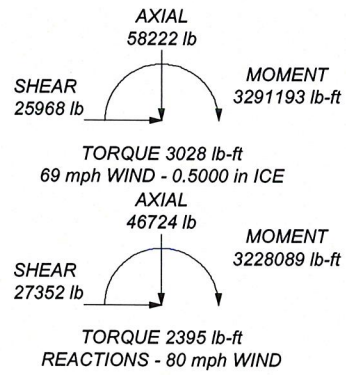
Customer has requested MALOUF ENGINEERING INTERNATIONAL, INC. To prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested MALOUF ENGINEERING INTERNATIONAL, INC. to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of MALOUF ENGINEERING INTERNATIONAL, INC., Customer has informed MALOUF ENGINEERING INTERNATIONAL, INC. that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by MALOUF ENGINEERING INTERNATIONAL, INC. and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice. MALOUF ENGINEERING INTERNATIONAL, INC. shall have the right to rely upon the accuracy of the information supplied by the customer and shall not be held responsible for the Customer's misrepresentation or omission of relevant fact whether intentional or otherwise.

Customer hereby agrees and acknowledges that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than MALOUF ENGINEERING INTERNATIONAL, INC. in connection with the implementation of services including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor and that Customer and rigger, erector, or subcontractor will provide MALOUF ENGINEERING INTERNATIONAL, INC. with a Certificate of Insurance naming MALOUF ENGINEERING INTERNATIONAL, INC. as additional insured.

APPENDIX 1 - TOWER DRAWING

Section	Length (ft)	Number of Sides	Thickness (in)	Lap Splice (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	25.75	18	0.2500	2.92	19.5625	25.4469	A572-65	1547.3
2	37.50	18	0.3125	3.83	24.2804	33.3498		3607.5
3	37.50	18	0.3750	4.67	31.7978	41.0432		5474.6
4	37.50	18	0.3750	5.50	39.1426	48.5462		6602.2
5	37.50	18	0.3750	6.25	46.4170	55.8588		7709.9
6	37.50	18	0.3750		53.5352	63.0000		8792.8
								33734.4





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod on Ext. (E)	205	LP PLATFORM w/o Rails (E)	170
10'x3" Omni Whip Ant. (E)	190	(9) APXV18-209014-C Panels (T-Mobile / R)	160
5' Sidearm Mount (E)	190		
10'x3" Omni Whip Ant. (E)	190	LP PLATFORM w/o Rails (T-Mobile / R)	160
5' Sidearm Mount (E)	190		
5' Sidearm Mount (E)	190	(3) 3' Sidearm Mount (E)	150
4' Parareflector Grid Dish (E)	190	(3) Allgon 7770 Panel Antennas (E)	150
12'x3" Omni Whip Ant. (E)	185	(6) LGP 21401 TMA's (E)	150
5' Sidearm Mount (E)	185	(3) Kathrein 742 213 Panels (Pocket / P)	140
5' Sidearm Mount (E)	185		
4' Parareflector Grid Dish (E)	185	(3) Close Contact Mounts (Pocket / P)	140
Empty 5' Sidearm Mount w/ Pipe Mounts (E)	180	(3) 5' Sidearm Mount (E)	113
		(3) 10'x3" Omni Whip Ant. (E)	113
8'x3" Omni Whip Ant. (E)	180	(3) 18'x3" Omni Whip Ant. (E)	90
5' Sidearm Mount (E)	180	(3) 5' Sidearm Mount (E)	90
(6) 5' Panel Antennas (E)	170		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 76.3%

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FAX: (972) 783-2583

Job: **190 FT MNP, FARMINGTON POLICE DEPARTMENT SITE #HFCT1527A**			
Project: **CT00937M-08V1**			
Client: FORCE 3 COMM. / POCKET COMM.	Drawn by: LNguyen	App'd:	
Code: TIA/EIA-222-F	Date: 10/07/08	Scale: NTS	
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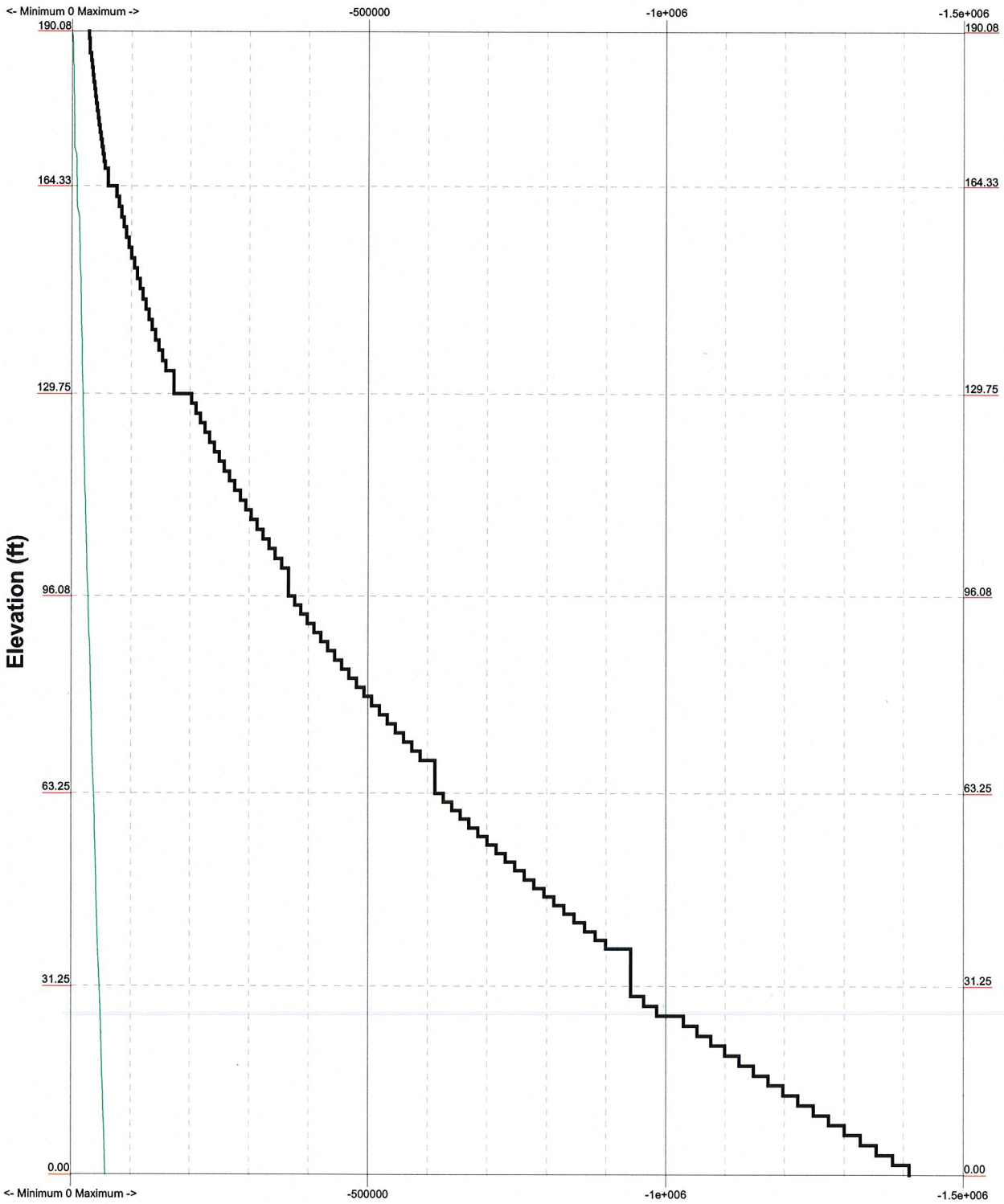
APPENDIX 2 - ANALYSIS PRINTOUT & GRAPHICS

TIA/EIA-222-F - 80 mph/69 mph 0.5000 in Ice

Leg Capacity ——— **Leg Compression (lb)**



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Client: FORCE 3 COMM. / POCKET COMM.	Drawn by: LNguyen	App'd:	
Code: TIA/EIA-222-F	Date: 10/07/08	Scale: NTS	
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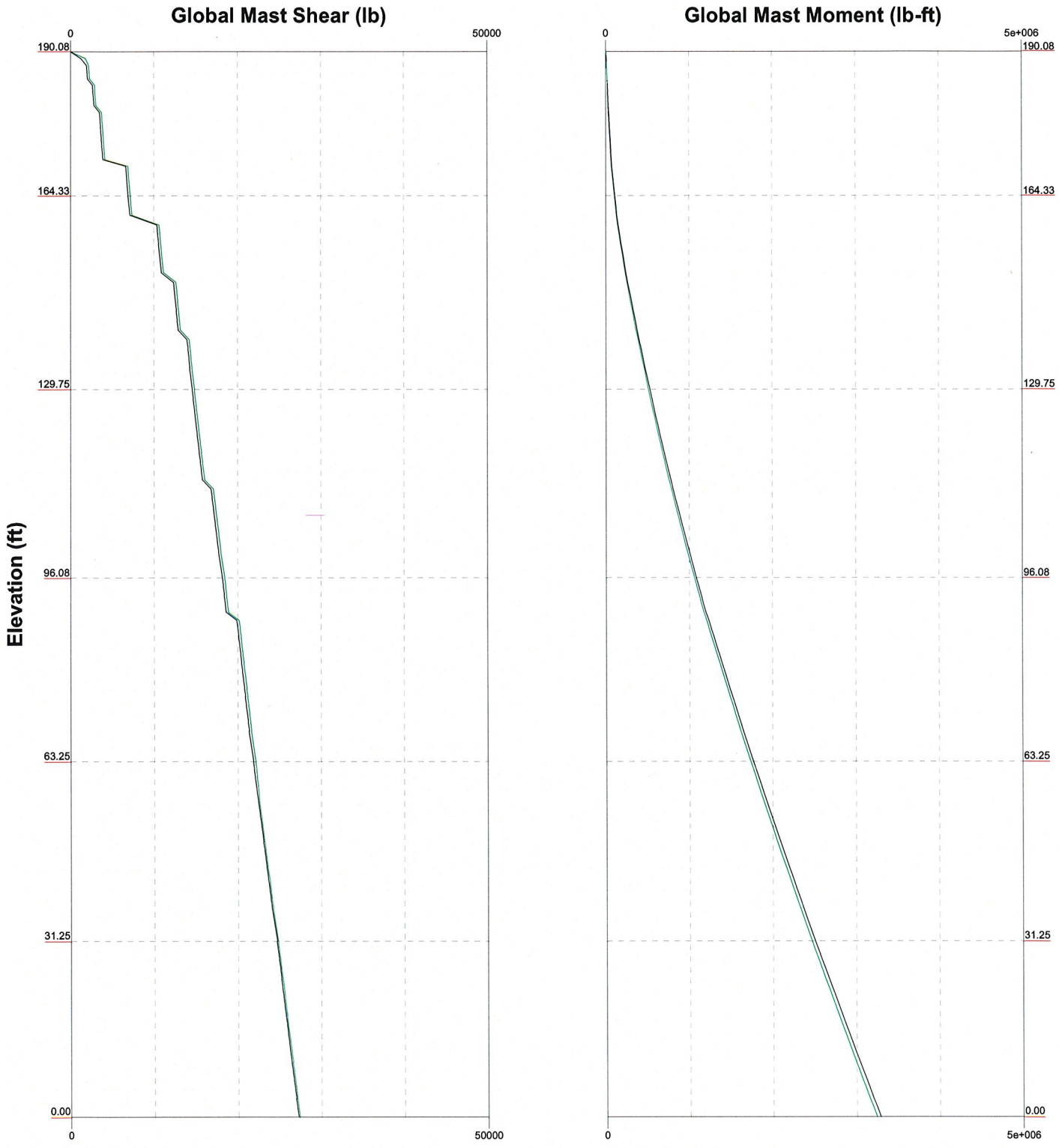
TIA/EIA-222-F - 80 mph/69 mph 0.5000 in Ice

Vx Vz

Maximum Values

Mx Mz



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Client: FORCE 3 COMM. / POCKET COMM.	Drawn by: LNguyen	App'd:	
Code: TIA/EIA-222-F	Date: 10/07/08	Scale: NTS	
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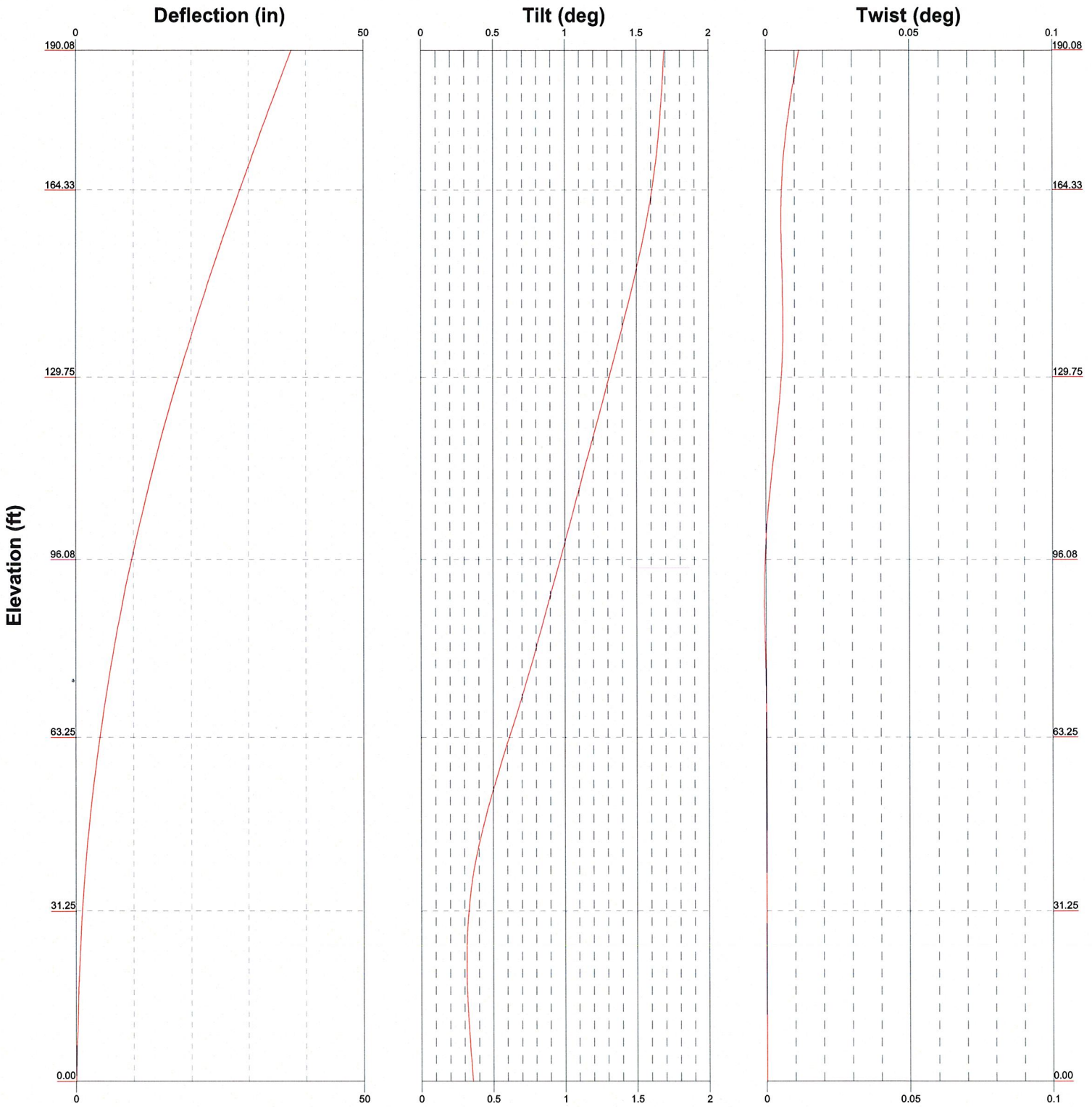
TIA/EIA-222-F - Service - 50 mph

Maximum Values



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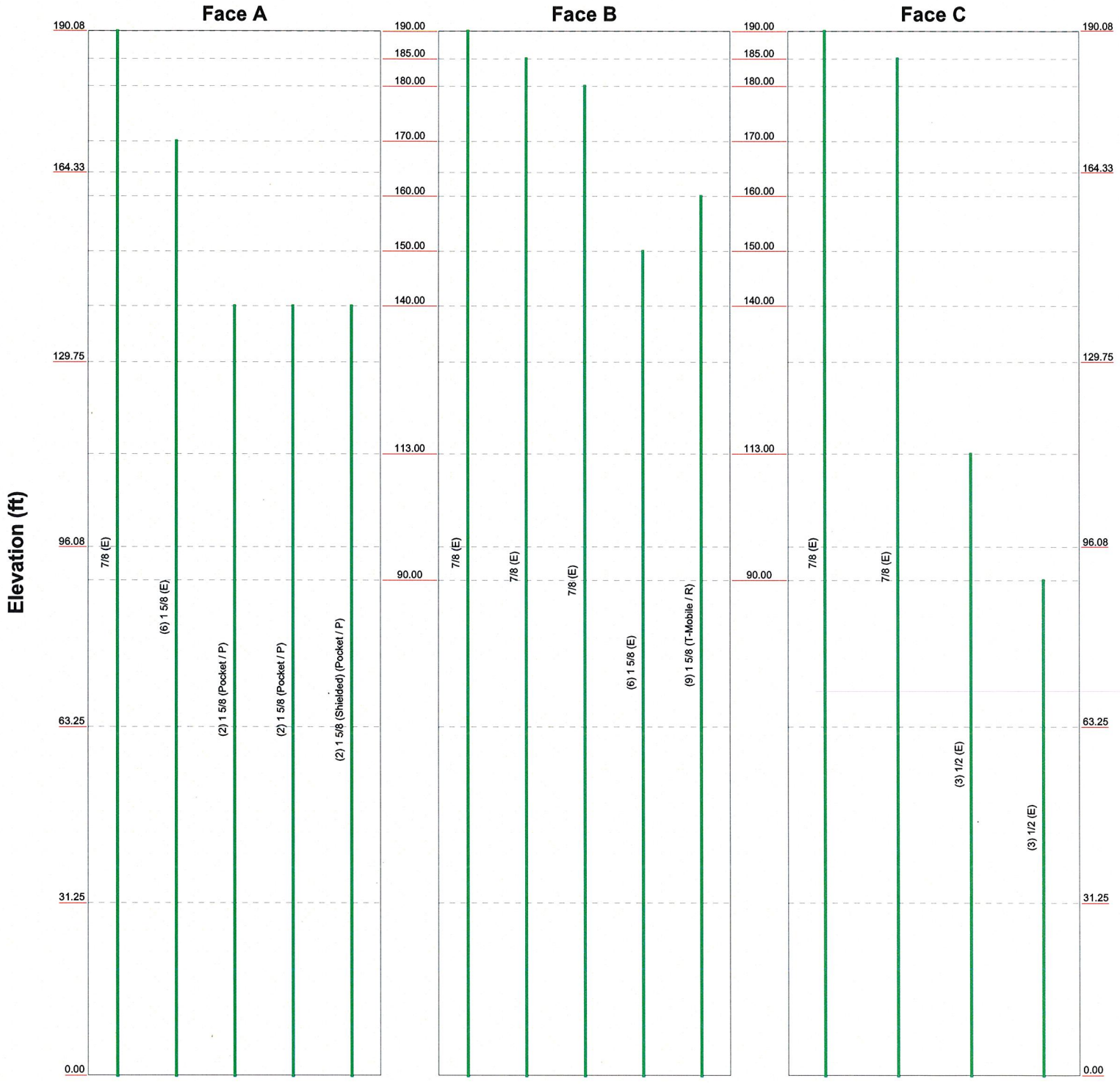
Client: FORCE 3 COMM. / POCKET COMM.	Drawn by: LNguyen	App'd:	
Code: TIA/EIA-222-F	Date: 10/07/08	Scale: NTS	
Path: C:\MEIProjects\08 DATA\MNP\CT00937M-08V1\CT00937M-08V1.eri		Dwg No. E-5	

Feedline Distribution Chart
0' - 190'31/32"

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



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Phone: (972) 783-2578
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Job: ***190 FT MNP, FARMINGTON POLICE DEPARTMENT SITE #HFCT1527A***			
Project: ***CT00937M-08V1***			
Client: FORCE 3 COMM. / POCKET COMM.	Drawn by: LNguyen	App'd:	
Code: TIA/EIA-222-F	Date: 10/07/08	Scale: NTS	
Path: C:\MEIProjects\08 DATA\MNP\CT00937M-08V1\CT00937M-08V1.eri		Dwg No. E-7	

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 Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 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	Poles
√ 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	190.08-164.33	25.75	2.92	18	19.5625	25.4469	0.2500	1.0000	A572-65 (65 ksi)
L2	164.33-129.75	37.50	3.83	18	24.2804	33.3498	0.3125	1.2500	A572-65 (65 ksi)
L3	129.75-96.08	37.50	4.67	18	31.7978	41.0432	0.3750	1.5000	A572-65 (65 ksi)
L4	96.08-63.25	37.50	5.50	18	39.1426	48.5462	0.3750	1.5000	A572-65 (65 ksi)
L5	63.25-31.25	37.50	6.25	18	46.4170	55.8588	0.3750	1.5000	A572-65 (65 ksi)
L6	31.25-0.00	37.50		18	53.5352	63.0000	0.3750	1.5000	A572-65 (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

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	19.8643	15.3245	722.1042	6.8559	9.9377	72.6627	1445.1586	7.6637	3.0030	12.012
	25.8395	19.9937	1603.7096	8.9449	12.9270	124.0587	3209.5293	9.9988	4.0387	16.155
L2	25.3712	23.7731	1725.3730	8.5086	12.3344	139.8827	3453.0162	11.8888	3.7233	11.915
	33.8643	32.7689	4518.6430	11.7282	16.9417	266.7172	9043.2318	16.3875	5.3196	17.023
L3	33.2479	37.4010	4665.6228	11.1551	16.1533	288.8345	9337.3847	18.7040	4.9364	13.164
	41.6764	48.4053	10114.4086	14.4372	20.8499	485.1048	20242.1259	24.2073	6.5636	17.503
L4	40.9348	46.1431	8761.5635	13.7625	19.8844	440.6243	17534.6558	23.0759	6.2291	16.611
	49.2951	57.3358	16808.8513	17.1008	24.6615	681.5835	33639.8202	28.6733	7.8841	21.024
L5	48.5392	54.8015	14677.0319	16.3449	23.5798	622.4399	29373.3762	27.4060	7.5094	20.025
	56.7205	66.0396	25684.6844	19.6967	28.3763	905.1466	51403.1653	33.0261	9.1711	24.456
L6	55.9628	63.2739	22590.9581	18.8719	27.1959	830.6762	45211.6420	31.6430	8.7622	23.366
	63.9719	74.5394	36933.3632	22.2319	32.0040	1154.0233	73915.3243	37.2768	10.4280	27.808

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 190.08-164.33				1	1	1		
L2 164.33-129.75				1	1	1		
L3 129.75-96.08				1	1	1		
L4 96.08-63.25				1	1	1		
L5 63.25-31.25				1	1	1		
L6 31.25-0.00				1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	F1554-105
Anchor bolt size	1.2500 in
Number of bolts	44
Embedment length	51.5000 in
f'_c	4 ksi
Grout space	2.0000 in
Base plate grade	A572-50
Base plate thickness	1.5000 in
Bolt circle diameter	68.0000 in
Outer diameter	74.0000 in
Inner diameter	62.0000 in
Base plate type	Stiffened Plate
Bolts per stiffener	1
Stiffener thickness	0.5000 in
Stiffener height	10.0000 in

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
7/8	B	No	Inside Pole	190.00 - 0.00	1	No Ice	0.00	0.54
(E)						1/2" Ice	0.00	0.54
7/8	C	No	Inside Pole	190.00 - 0.00	1	No Ice	0.00	0.54
(E)						1/2" Ice	0.00	0.54

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8	A	No	Inside Pole	190.00 - 0.00	1	No Ice	0.00	0.54
(E)						1/2" Ice	0.00	0.54
7/8	C	No	Inside Pole	185.00 - 0.00	1	No Ice	0.00	0.54
(E)						1/2" Ice	0.00	0.54
7/8	B	No	Inside Pole	185.00 - 0.00	1	No Ice	0.00	0.54
(E)						1/2" Ice	0.00	0.54
7/8	B	No	Inside Pole	180.00 - 0.00	1	No Ice	0.00	0.54
(E)						1/2" Ice	0.00	0.54
1 5/8	A	No	Inside Pole	170.00 - 0.00	6	No Ice	0.00	1.04
(E)						1/2" Ice	0.00	1.04
1 5/8	B	No	Inside Pole	150.00 - 0.00	6	No Ice	0.00	1.04
(E)						1/2" Ice	0.00	1.04
1/2	C	No	Inside Pole	113.00 - 0.00	3	No Ice	0.00	0.25
(E)						1/2" Ice	0.00	0.25
1/2	C	No	Inside Pole	90.00 - 0.00	3	No Ice	0.00	0.25
(E)						1/2" Ice	0.00	0.25
1 5/8	A	No	Inside Pole	140.00 - 0.00	2	No Ice	0.00	1.04
(Pocket / P)						1/2" Ice	0.00	1.04
1 5/8	A	No	CaAa (Out Of Face)	140.00 - 0.00	2	No Ice	0.20	1.04
(Pocket / P)						1/2" Ice	0.30	2.55
1 5/8 (Shielded)	A	No	CaAa (Out Of Face)	140.00 - 0.00	2	No Ice	0.00	1.04
(Pocket / P)						1/2" Ice	0.00	2.55
1 5/8	B	No	Inside Pole	160.00 - 0.00	9	No Ice	0.00	1.04
(T-Mobile / R)						1/2" Ice	0.00	1.04

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 lb
Lightning Rod on Ext.	A	None		0.0000	205.00	No Ice	2.00	2.00	50.00
(E)						1/2" Ice	3.00	3.00	75.00
10'x3" Omni Whip Ant.	B	From Leg	5.00	0.0000	190.00	No Ice	3.00	3.00	33.00
(E)			0.00			1/2" Ice	5.00	5.00	83.00
			5.00						
5' Sidearm Mount	B	From Leg	2.50	0.0000	190.00	No Ice	3.00	3.00	150.00
(E)			0.00			1/2" Ice	4.50	4.50	225.00
			0.00						
10'x3" Omni Whip Ant.	C	From Leg	5.00	0.0000	190.00	No Ice	3.00	3.00	33.00
(E)			0.00			1/2" Ice	5.00	5.00	83.00
			5.00						
5' Sidearm Mount	C	From Leg	2.50	0.0000	190.00	No Ice	3.00	3.00	150.00
(E)			0.00			1/2" Ice	4.50	4.50	225.00
			0.00						
5' Sidearm Mount	A	From Leg	2.50	0.0000	190.00	No Ice	3.00	3.00	150.00
(E)			0.00			1/2" Ice	4.50	4.50	225.00
			0.00						
5' Sidearm Mount	C	From Leg	2.50	0.0000	185.00	No Ice	3.00	3.00	150.00
(E)			0.00			1/2" Ice	4.50	4.50	225.00
			0.00						
12'x3" Omni Whip Ant.	B	From Leg	5.00	0.0000	185.00	No Ice	3.60	3.60	40.00
(E)			0.00			1/2" Ice	6.10	6.10	100.00
			6.00						
5' Sidearm Mount	B	From Leg	2.50	0.0000	185.00	No Ice	3.00	3.00	150.00
(E)			0.00			1/2" Ice	4.50	4.50	225.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
8'x3" Omni Whip Ant.	B	From Leg	5.00	0.0000	180.00	No Ice	3.00	3.00	33.00
(E)			0.00			1/2" Ice	5.00	5.00	83.00
			5.00						
5' Sidearm Mount	B	From Leg	2.50	0.0000	180.00	No Ice	3.00	3.00	150.00
(E)			0.00			1/2" Ice	4.50	4.50	225.00
			0.00						
Empty 5' Sidearm Mount w/ Pipe Mounts	C	From Leg	2.50	0.0000	180.00	No Ice	5.00	5.00	200.00
			0.00			1/2" Ice	7.50	7.50	300.00
(E)			0.00						
(6) 5' Panel Antennas	A	None		0.0000	170.00	No Ice	24.14	24.14	214.00
(E)						1/2" Ice	35.24	35.24	661.00
LP PLATFORM w/o Rails	A	None		0.0000	170.00	No Ice	25.00	25.00	1800.00
(E)						1/2" Ice	38.00	38.00	2700.00
(3) Allgon 7770 Panel Antennas	B	None		0.0000	150.00	No Ice	15.81	15.81	182.00
						1/2" Ice	21.26	21.26	479.00
(E)									
(6) LGP 21401 TMA's	B	None		0.0000	150.00	No Ice	4.31	4.31	114.00
(E)						1/2" Ice	6.51	6.51	209.00
(3) 3' Sidearm Mount	B	None		0.0000	150.00	No Ice	8.00	8.00	300.00
(E)						1/2" Ice	12.00	12.00	450.00
(3) 10'x3" Omni Whip Ant.	A	From Leg	0.00	0.0000	113.00	No Ice	9.00	9.00	99.00
(E)			0.00			1/2" Ice	15.08	15.08	240.00
			5.00						
(3) 5' Sidearm Mount	A	From Leg	0.00	0.0000	113.00	No Ice	9.00	9.00	450.00
(E)			0.00			1/2" Ice	14.00	14.00	675.00
			0.00						
(3) 18'x3" Omni Whip Ant.	C	From Leg	0.00	0.0000	90.00	No Ice	16.20	16.20	135.00
(E)			0.00			1/2" Ice	27.25	27.25	401.00
			9.00						
(3) 5' Sidearm Mount	C	From Leg	0.00	0.0000	90.00	No Ice	9.00	9.00	450.00
(E)			0.00			1/2" Ice	14.00	14.00	675.00
			0.00						
(3) Kathrein 742 213 Panels (Pocket / P)	A	None		0.0000	140.00	No Ice	14.63	14.63	143.00
						1/2" Ice	21.03	21.03	398.00
(3) Close Contact Mounts (Pocket / P)	A	None		0.0000	140.00	No Ice	6.00	6.00	90.00
						1/2" Ice	9.00	9.00	135.00
(9) APXV18-209014-C Panels (T-Mobile / R)	B	None		0.0000	160.00	No Ice	34.42	34.42	399.00
						1/2" Ice	50.25	50.25	1052.00
LP PLATFORM w/o Rails (T-Mobile / R)	B	None		0.0000	160.00	No Ice	25.00	25.00	1800.00
						1/2" Ice	38.00	38.00	2700.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
4' Parareflector Grid Dish	A	Grid	From Leg	5.00	0.0000		190.00	4.00	No Ice	12.60	200.00
				0.00					1/2" Ice	13.20	400.00
(E)				0.00							
4' Parareflector Grid Dish	C	Grid	From Leg	5.00	0.0000		185.00	4.00	No Ice	12.60	200.00
				0.00					1/2" Ice	13.20	400.00

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft²	Weight lb
(E)				3.00						

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
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 Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	14	58222.40	-0.85	0.56
	Max. H_x	11	46724.38	27193.29	-6.56
	Max. H_z	2	46724.29	-35.75	27305.57
	Max. M_x	15	3276601.52	-588.73	25915.91
	Max. M_z	18	3236357.01	-25728.33	367.77

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. Torsion	24	3028.08	25518.50	-16.53
	Min. Vert	2	46724.29	-35.75	27305.57
	Min. H_x	5	46724.38	-27193.38	46.91
	Min. H_z	8	46724.29	52.38	-27278.89
	Min. M_x	21	-3287337.30	75.38	-25955.54
	Min. M_z	24	-3200765.54	25518.50	-16.53
	Min. Torsion	20	-2598.72	-12545.74	-22467.61

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190.083 - 164.333	37.422	34	1.6911	0.0133
L2	167.25 - 129.75	29.450	34	1.6229	0.0077
L3	133.583 - 96.083	18.829	34	1.3468	0.0032
L4	100.75 - 63.25	10.641	34	1.0134	0.0017
L5	68.75 - 31.25	4.916	34	0.6736	0.0009
L6	37.5 - 0	1.477	34	0.3556	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
205.00	Lightning Rod on Ext.	34	37.422	1.6911	0.0133	47896
190.00	4' Parareflector Grid Dish	34	37.392	1.6910	0.0133	47896
188.00	4' Parareflector Grid Dish	34	36.685	1.6870	0.0127	47896
185.00	5' Sidearm Mount	34	35.626	1.6809	0.0120	47111
180.00	8'x3" Omni Whip Ant.	34	33.866	1.6694	0.0107	23750
170.00	(6) 5' Panel Antennas	34	30.390	1.6358	0.0083	11942
160.00	(9) APXV18-209014-C Panels	34	27.014	1.5797	0.0064	8824
150.00	(3) Allgon 7770 Panel Antennas	34	23.774	1.5020	0.0049	7240
140.00	(3) Kathrein 742 213 Panels	34	20.700	1.4100	0.0038	6137
113.00	(3) 10'x3" Omni Whip Ant.	34	13.421	1.1385	0.0021	5495
90.00	(3) 18'x3" Omni Whip Ant.	34	8.473	0.9036	0.0014	5562

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual / Allowable Ratio Bolt Tension lb	Actual / Allowable Ratio Bolt Compression lb	Actual / Allowable Ratio Plate Stress ksi	Actual / Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
1.5000	44	1.2500	51476.87 50621.37 1.02	54122.91 84031.47 0.64	29.609 37.500 0.79	8.148 37.500 0.22	Bolt T	1.02 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	190.083 - 164.333 (1)	TP25.4469x19.5625x0.25	25.75	190.08	261.9	2.177	19.4649	-7476.85	42365.90	0.176
L2	164.333 - 129.75 (2)	TP33.3498x24.2804x0.3125	37.50	190.08	200.1	3.729	31.8494	-17287.60	118781.00	0.146
L3	129.75 - 96.083 (3)	TP41.0432x31.7978x0.375	37.50	190.08	162.6	5.649	47.0358	-25335.70	265685.00	0.095
L4	96.083 - 63.25 (4)	TP48.5462x39.1426x0.375	37.50	190.08	137.3	7.920	55.6942	-34978.40	441073.00	0.079
L5	63.25 - 31.25 (5)	TP55.8588x46.417x0.375	37.50	190.08	119.2	10.512	64.1666	-44834.70	674540.00	0.066
L6	31.25 - 0 (6)	TP63x53.5352x0.375	37.50	190.08	102.6	14.186	74.5394	-58212.90	1057400.00	0.055

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	190.083 - 164.333 (1)	TP25.4469x19.5625x0.25	90383.33	-9.227	39.000	0.237	0.00	0.000	39.000	0.000
L2	164.333 - 129.75 (2)	TP33.3498x24.2804x0.3125	471247.50	-22.450	39.000	0.576	0.00	0.000	39.000	0.000
L3	129.75 - 96.083 (3)	TP41.0432x31.7978x0.375	1000525.00	-26.219	39.000	0.672	0.00	0.000	39.000	0.000
L4	96.083 - 63.25 (4)	TP48.5462x39.1426x0.375	1648858.33	-30.773	39.000	0.789	0.00	0.000	39.000	0.000
L5	63.25 - 31.25 (5)	TP55.8588x46.417x0.375	2358358.33	-33.124	39.000	0.849	0.00	0.000	39.000	0.000
L6	31.25 - 0 (6)	TP63x53.5352x0.375	3291191.67	-34.223	37.105	0.922	0.00	0.000	37.105	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	190.083 - 164.333 (1)	TP25.4469x19.5625x0.25	0.176	0.237	0.000	0.413 ✔	1.333	H1-3 ✔
L2	164.333 - 129.75 (2)	TP33.3498x24.2804x0.3125	0.146	0.576	0.000	0.721 ✔	1.333	H1-3 ✔
L3	129.75 - 96.083 (3)	TP41.0432x31.7978x0.375	0.095	0.672	0.000	0.768 ✔	1.333	H1-3 ✔
L4	96.083 - 63.25 (4)	TP48.5462x39.1426x0.375	0.079	0.789	0.000	0.868 ✔	1.333	H1-3 ✔
L5	63.25 - 31.25 (5)	TP55.8588x46.417x0.375	0.066	0.849	0.000	0.916 ✔	1.333	H1-3 ✔
L6	31.25 - 0 (6)	TP63x53.5352x0.375	0.055	0.922	0.000	0.977 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	190.083 - 164.333	Pole	TP25.4469x19.5625x0.25	1	-7476.85	56473.74	31.0	Pass
L2	164.333 - 129.75	Pole	TP33.3498x24.2804x0.3125	2	-17287.60	158335.07	54.1	Pass
L3	129.75 - 96.083	Pole	TP41.0432x31.7978x0.375	3	-25335.70	354158.09	57.6	Pass
L4	96.083 - 63.25	Pole	TP48.5462x39.1426x0.375	4	-34978.40	587950.28	65.1	Pass
L5	63.25 - 31.25	Pole	TP55.8588x46.417x0.375	5	-44834.70	899161.78	68.7	Pass
L6	31.25 - 0	Pole	TP63x53.5352x0.375	6	-58212.90	1409514.14	73.3	Pass
							Summary	
						Pole (L6)	73.3	Pass
						Base Plate	76.3	Pass
						RATING =	**76.3**	**Pass**

FOUNDATION DESIGN PRINTOUT

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Version: FDN2-D72/AP
**********************************************************
*               FOUNDATION ANALYSIS PROGRAM              *
*                 Spread Footing Analysis                *
*         (c) 1999, Malouf Engineering Intl., Inc.       *
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------------------------------------------------------------------------------
MEI JOB NUMBER = CT00937M-08V1
DESCRIPTION    = 190' MONOPOLE BASE FOUNDATION
SITE NAME      = FARMINGTON POLICE DEPT SITE #HFCT1527A
CLIENT NAME    = FORCE 3 COMM / POCKET COMMUNICATIONS
CHECK CODE     = TIA/EIA-222-REV. F
TIME/DATE/FILE = 15:30:40 / 10-07-2008 / 080937v1.mnp
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 INPUT DATA
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*LOADS*                                        | ORIGINAL DESIGN
COMPRESSION FORCE (1 PEDESTAL) =    58.222 KIPS |    46.610 KIPS
UPLIFT FORCE (1 PEDESTAL)      =      .000 KIPS |      .000 KIPS
SHEAR FORCE (1 PEDESTAL)       =    25.968 KIPS |    36.700 KIPS
MOMENT                         =  3291.193 KIP-FT | 4673.600 KIP-FT
ECCENTRICTY OF AXIAL LOADS     =      .000 FT

*FOOTING DIMENSIONS AND PROPERTIES*
DEPTH OF FOOTING               =     7.500 FT
FOOTING DIMENSIONS (L X B)     =    29.000 x 29.000 FT
THICKNESS OF FOOTING           =     2.500 FT (FOOTING HAS NO TOE)
NUMBER OF PEDESTALS / TYPE     =         1 / CIRCULAR
PEDESTAL DIAMETER              =     7.500 FT
EXTENSION ABOVE GRADE          =      .500 FT
CONCRETE DENSITY               =      .088 KCF
GROUNDWATER LEVEL BELOW BOTTOM OF FOUNDATION

*FACTOR OF SAFETY VALUES*
F.O.S. BEARING PRESSURE        =     2.000
F.O.S. CONCRETE WEIGHT         =     1.250 / 1.500
F.O.S. SOIL WEIGHT             =     2.000 / 1.500
F.O.S. UPLIFT                  =     2.000

*SOIL PROPERTIES*
ULTIMATE BEARING CAPACITY      =     8.000 KSF
SOIL DENSITY                   =      .055 KCF
INTERNAL ANGLE OF FRICTION     =    32.000 DEG
SOIL COHESION (FOR UPLIFT)     =      .000 KSF (PAD PERIMETER)
PASSIVE PRESSURE               =      .179 KCF (Kp= 3.25)
DEPTH NEGLECTED FOR PASSIVE PR.=     3.500 FT
BASE SOIL/CONCRETE FRICTION    =      .450

*** COMMENTS ***
FOUNDATION SPECS AS PER PIROD DWG. NO. 157375-B ENG. FILE: A-118703
DATED 10/26/01. SOIL PARAMETERS AS PER FDN CALCS BY PIROD.
NO GEOTECHNICAL REPORT PROVIDED.

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 RESULTS
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**COMPARISON WITH ORIGINAL DESIGN LOADS**
ORIGINAL COMPRESSION      =     46.6 KIPS <      58.2 KIPS (OK)     R= 1.249
ORIGINAL SHEAR            =     36.7 KIPS >      26.0 KIPS (OK)     R= 0.708
ORIGINAL MOMENT           =   4673.6 K-FT >    3291.2 K-FT (OK)     R= 0.704

VOL./WT. OF SOIL ABOVE    =   3984.1 FT3 /  219.126 KIPS
VOL./WT. OF SOIL WEDGE    =    226.5 FT3 /   12.458 KIPS  (FOR OVERTURNING)
                          =    957.2 FT3 /   52.644 KIPS  (FOR UPLIFT)
VOL./WT. OF PEDESTAL(S)   =    243.0 FT3 /   21.285 KIPS
VOL./WT. OF FOOTING       =   2102.5 FT3 /  184.179 KIPS

TOTAL RESISTING MOMENT    =   7411.3 KIP-FT
TOTAL OVERTURNING MOMENT  =   3498.9 KIP-FT
F.O.S. OVERTURNING        =  2.118 >  1.500 (OK)    R=  .708

SOIL PRESSURES (KSF)      =    1.531 GROSS /  .427 IN-SITU /  .000 PMIN
FRICTION RESISTANCE(ALLW) =     .000 KIPS (SKF=  .000KSF)
TOTAL DOWNLOAD CAPACITY   =    4.000 KSF  >     1.104 KSF  (OK)     R=  .276
SOIL SHEAR CAPACITY       =   35.69 (PASSIVE) +  87.84 (FRICTION)
                          =   123.5 KIPS >      26.0 KIPS (OK)     R=  .210
UPLIFT CAPACITY           =   300.3 KIPS >        .0 KIPS (OK)     R=  .000
PUNCHING CHECK (WIDE BEAM)=   107.5 PSI  >      49.0 PSI  (OK)     R=  .456
             (2-WAY)      =   215.0 PSI  >       2.2 PSI  (OK)     R=  .010

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REINFORCEMENT CHECK (CIRCULAR PEDESTAL) L=  5.50' DIA= 90.0"  FC= 4000 PSI
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FACTORED MOMENT LOAD      =  4960.25 KIP-FT
FACTORED COMPRESSION LOAD =   100.92 KIPS (ECC=707.78")
REINFD. COMPR. CAPACITY =   136.96 KIPS (COMPR. & MOMENT: TENSION CONTROLS)

REQUIRED STEEL AREA       =  29.98 IN2 (COMPR. AND MOMENT)
REQUIRED STEEL AREA       =  31.81 IN2 (ACI MIN.= 0.005A)

TOTAL BAR AREA PROVIDED   =  39.97 IN2 (40 x NO. 9 BARS) /FY= 60.KSI,C= 3.0"
THE TOTAL BAR AREA PROVIDED IS SUFFICIENT.
VERT. BAR CLEAR SPACING   =   5.47 IN

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REINFORCEMENT CHECK (FOOTING) W= 29.00' THK=30.00"  FC= 4000 PSI
==============================================================================

FACTORED MOMENT LOAD      =  3688.51 KIP-FT (UPLIFT)
FACTORED MOMENT LOAD      =  5054.02 KIP-FT (DOWNLOAD)

REQUIRED STEEL AREA       =  38.85 IN2 (DUE TO MAXIMUM MOMENT)
REQUIRED STEEL AREA       =  18.79 IN2 (ACI MIN. = 0.0018Bd)

TOTAL BAR AREA PROVIDED   =  36.98 IN2 ( 37 x NO. 9 BARS) /FY= 60.KSI,C= 3.0"
THE TOTAL BAR AREA PROVIDED IS INSUFFICIENT, BUT WITHIN 5% OF REQUIRED.
BAR SPACING C/C (3" COVER)=   9.50 IN
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