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

VIA ELECTRONIC MAIL

January 8, 2015

Meredith Paynter
Site Acquisition Lead
SAI Communications
Meredith.Paynter@SAI-Comm.com

RE: **EM-AT&T-083-120827** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 90 Industrial Park Road, Middletown, Connecticut.

EM-CING-084-121031 – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 234 Melba Street, Milford, Connecticut.

EM- CING-007-121109 – New Cingular Wirless PCS, LLC notice of intent to modify an existing telecommunications facility located at 240 Kensington Road, Berlin, Connecticut.

Dear Ms. Paynter:

The Connecticut Siting Council (Council) is in receipt of your e-mail correspondence regarding the above mentioned exempt modifications, dated January 7, 2015. Please be advised that Council approval of these exempt modifications has expired. Specifically, with respect to each request, the Council rendered the following decisions:

EM-AT&T-083-120827 - decision date, September 14, 2012, including, but not limited to the following conditions:

- The tower reinforcements shown in the Modification Design Drawings shall be in implemented accordance with the recommendations made in the Structural Analysis Report prepared by GPD Group dated July 19, 2012 , and stamped by David Granger; and
- Prior to antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower and foundation will not exceed 100 percent of the post-construction structural rating.

EM-CING-084-121031 – decision date, December 14, 2012, including, but not limited to the following conditions:

- Prior to antenna installation, the tower modifications identified in the Structural Modification Analysis Report prepared by Tower Engineering Professionals dated September 12, 2012, and stamped by Andrew Haldane shall be implemented; and
- Not more than 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower does not exceed 100 percent of the post-construction structural rating.

EM- CING-007-121109 – decision date, November 30, 2012, including, but not limited to the following conditions:

- Prior to antenna installation, the tower modifications identified in the Structural Analysis Report prepared by GPD Group (GPD Project #: 201863.82) dated November 2, 2012, and stamped by David Granger shall be implemented; and
- Not more than 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower does not exceed 100 percent of the post-construction structural rating.

Copies of each of these decisions are attached for your convenience. The Council's decision letters state that the validity of these decisions will expire one year from the date of decision and that a request for an extension of time beyond the one year deadline shall be submitted to the Council not less than 60 days prior to the expiration. The Council has no record of any request for an extension of time for these exempt modifications. Therefore, any additional changes to these facilities will require explicit notice to the Council pursuant to Regulations of Connecticut State Agencies Section 16-50j-73 and a filing fee.

Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/cm

c: Rachel Rochette, Mayor, Town of Berlin
Denise McNair, Town Manager, Town of Berlin
Daniel T. Drew, Mayor, City of Middletown
Michael Wackers, AICP, Director of Planning, City of Middletown
Benjamin G. Blake, Mayor, City of Milford
David Sulkin, City Planner, City of Milford

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November 30, 2012

John Lawrence
New Cingular Wireless PCS, LLC
95 Ryan Drive, Suite #1
Raynham, MA 02767

RE: **EM-CING-007-121109** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 240 Kensington Road, Berlin, Connecticut.

Dear Mr. Lawrence:

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

- Prior to antenna installation, the tower modifications identified in the Structural Analysis Report prepared by GPD Group (GPD Project #: 2012863.82) dated November 2, 2012, and stamped by David Granger shall be implemented; and
- Not more than 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower does not exceed 100 percent of the post-construction structural rating.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not more than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 8, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency

emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Adam P. Salina, Mayor, Town of Berlin
Hellyn Riggins, Town Planner, Town of Berlin

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www.ct.gov/csc

November 13, 2012

The Honorable Adam P. Salina
Mayor
Town of Berlin
240 Kensington Road
Kensington, CT 06037

RE: **EM-CING-007-121109** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 240 Kensington Road, Berlin, Connecticut.

Dear Mayor Salina:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72. A copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by November 27, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/cm

c: Denise McNair, Town Manager, Town of Berlin
Hellyn Riggins, Town Planner, Town of Berlin

EM-CING-007-121109

at&t
Your world. Delivered.

500 Enterprise Drive
Rocky Hill, Connecticut 06067

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

November 8, 2012

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

Re: Notice of Exempt Modification – Existing Telecommunications Facility at 240 Kensington Road, Berlin

Dear Chairman Stein and Members of the Council:

New Cingular Wireless PCS, LLC ("AT&T") intends to modify the existing telecommunications antennas and associated equipment at an existing multicarrier telecommunications tower at 240 Kensington Road, Berlin, CT. AT&T operates under licenses issued by the Federal Communications Commission ("FCC") to provide cellular and PCS mobile telephone service in Hartford County, which includes the area to be served by AT&T's proposed installation.

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

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

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

Existing Facility

The Berlin facility is located at 240 Kensington Road, Berlin, CT

The facility is owned by T-Mobile.

The existing facility consists of a 190 foot monopole tower. AT&T currently operates wireless communications equipment at the facility and has six (6) antennas mounted at the tower centerline height of 149 feet.

Statutory Considerations

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

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

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

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

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

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

Respectfully yours,

John Lawrence
Real Estate Consultant

Enclosures:
Denise McNair, Town Manager

PROJECT INFORMATION

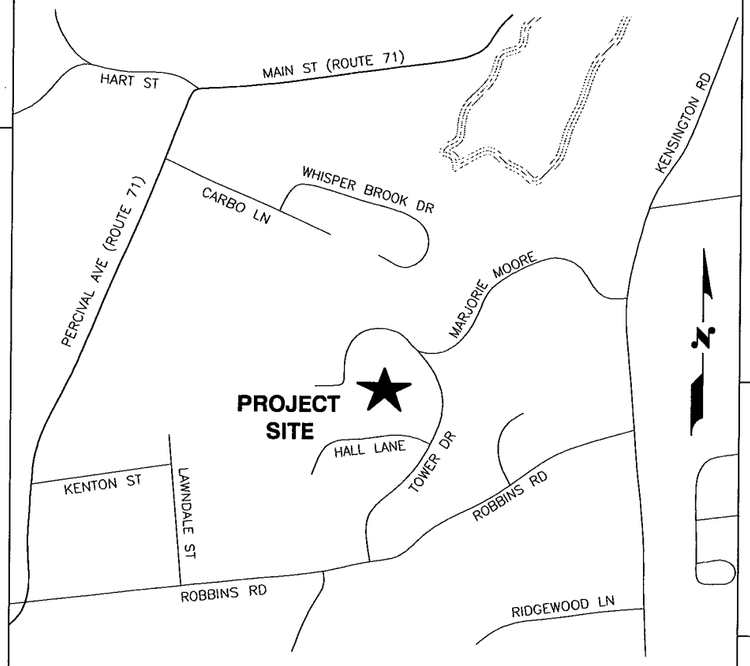
SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	240 KENSINGTON ROAD BERLIN, CT 06037
LATITUDE:	41.6262° N 41° 37' 34.3" N
LONGITUDE:	72.7756° W 72° 46' 32.1" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CT1019
SITE NAME: BERLIN POLICE DEPT

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:
START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.3 MI. TURN LEFT ONTO WEST ST. 0.3 0.4 MI. MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 1.7 MI. MERGE ONTO CT-9 N VIA EXIT 22N TOWARD NEW BRITAIN. 3.1 MI. TAKE EXIT 22 TOWARD US-5 S/CT-15 S/NEW HAVEN. 0.2 MI. TURN RIGHT ONTO FRONTAGE RD. 0.1 MI. TAKE THE 1ST RIGHT ONTO CT-372/WORTHINGTON RDG. 0.08 MI. TURN RIGHT ONTO MILL ST/CT-372. CONTINUE TO FOLLOW CT-372. 1.4 MI. TURN LEFT ONTO MAIN ST. 0.1 MI. TAKE THE 1ST LEFT ONTO KENSINGTON RD. 0.5 MI. 240 KENSINGTON RD IS ON THE RIGHT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

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

UNDERGROUND SERVICE ALERT

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

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

SITE NUMBER: CT1019
SITE NAME: BERLIN POLICE DEPT
240 KENSINGTON ROAD
BERLIN, CT 06037
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/18/12	ISSUED FOR CONSTRUCTION	RP	DC	DPH
0	03/08/12	ISSUED FOR REVIEW	RP	DC	DPH

SCALE: AS SHOWN DESIGNED BY: DC DRAWN BY: RP

DANIEL P. HAMM — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE)

JOB NUMBER	DRAWING NUMBER	REV
1019.01	T-1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – NEXLINK
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

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

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

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

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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

ABBREVIATIONS

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

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

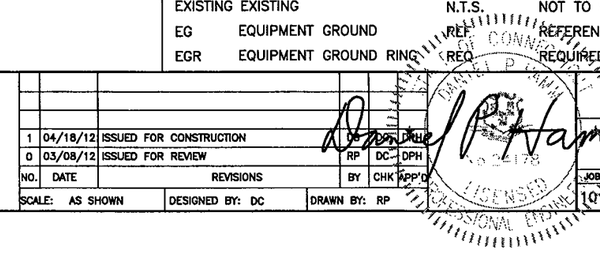
NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1019
SITE NAME: BERLIN POLICE DEPT
240 KENSINGTON ROAD
BERLIN, CT 06037
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK'D	APP'D
1	04/18/12	ISSUED FOR CONSTRUCTION	DC	DPH	
0	03/08/12	ISSUED FOR REVIEW	RP	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RP



AT&T

GENERAL NOTES (LTE)

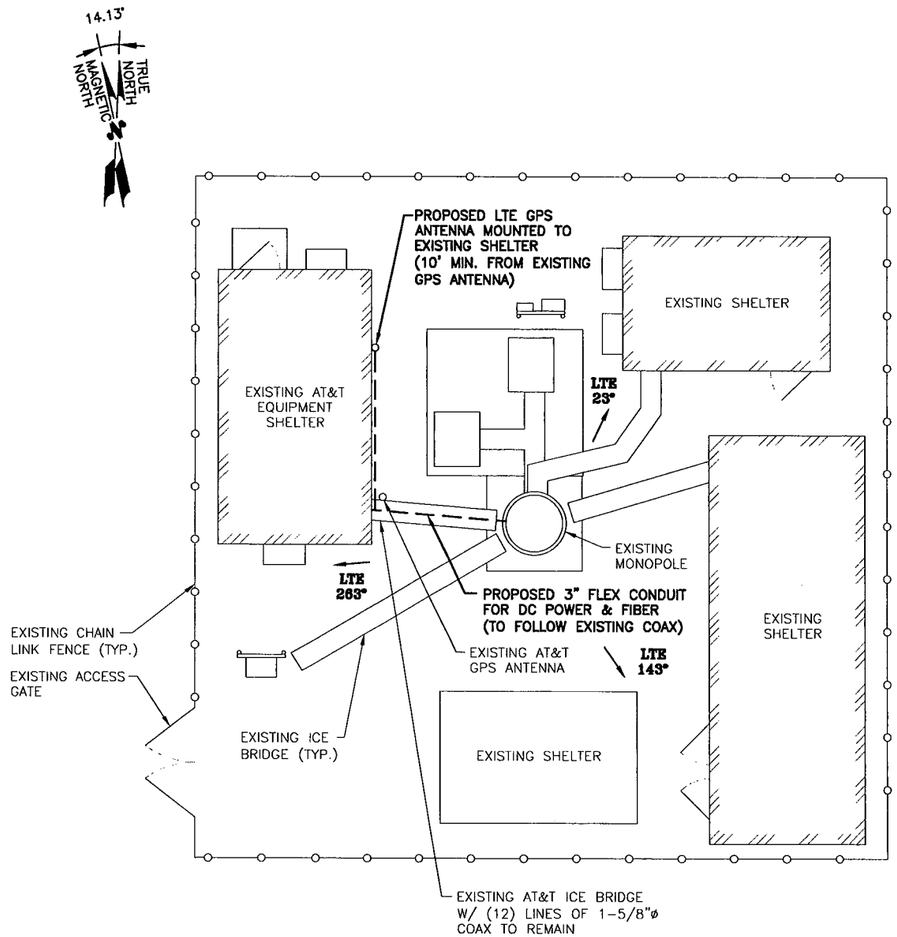
JOB NUMBER	DRAWING NUMBER	REV
1019.01	GN-1	1

NOTE:

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

NOTE:

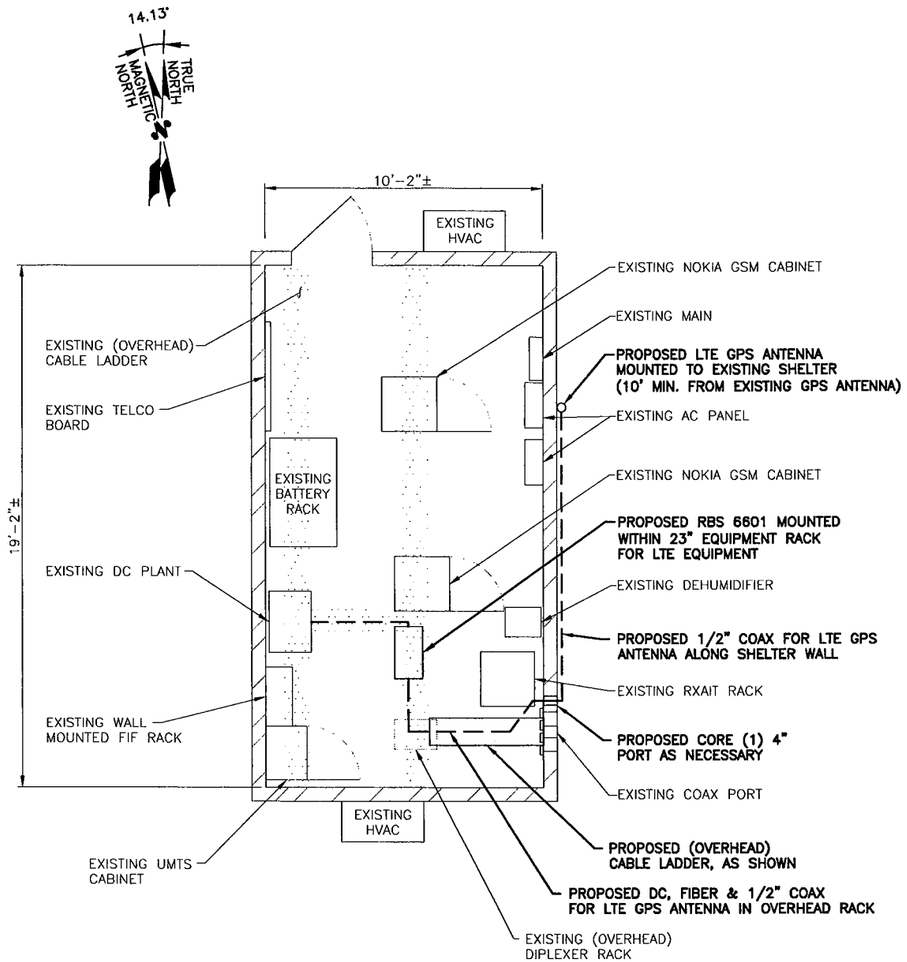
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



COMPOUND PLAN

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

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



EQUIPMENT PLAN

SCALE: 3/8"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"

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

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

SITE NUMBER: CT1019
SITE NAME: BERLIN POLICE DEPT
240 KENSINGTON ROAD
BERLIN, CT 06037
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK'D	APP'D
1	04/18/12	ISSUED FOR CONSTRUCTION	DC	DPH	
0	03/08/12	ISSUED FOR REVIEW	RP	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RP

STATE OF CONNECTICUT — DANIEL P. HAMM — 21178 — LICENSED PROFESSIONAL ENGINEER

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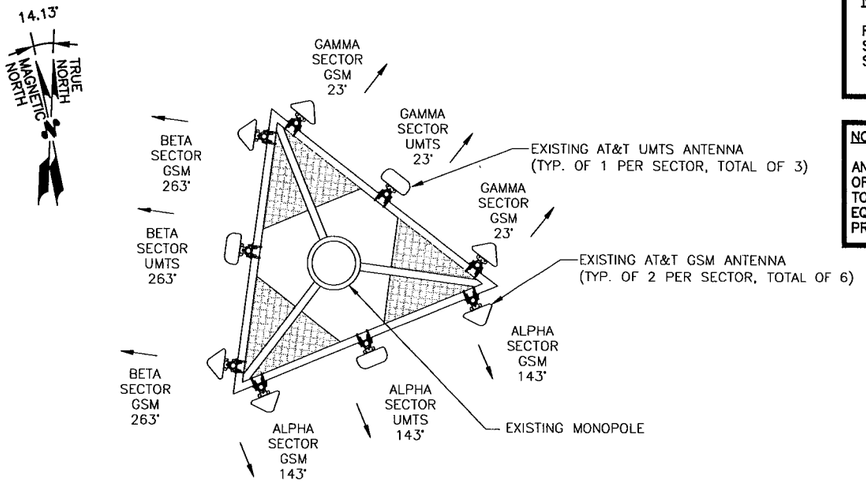
COMPOUND & EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1019.01	A-1	1



EXISTING UMTS/GSM ANTENNA PLAN

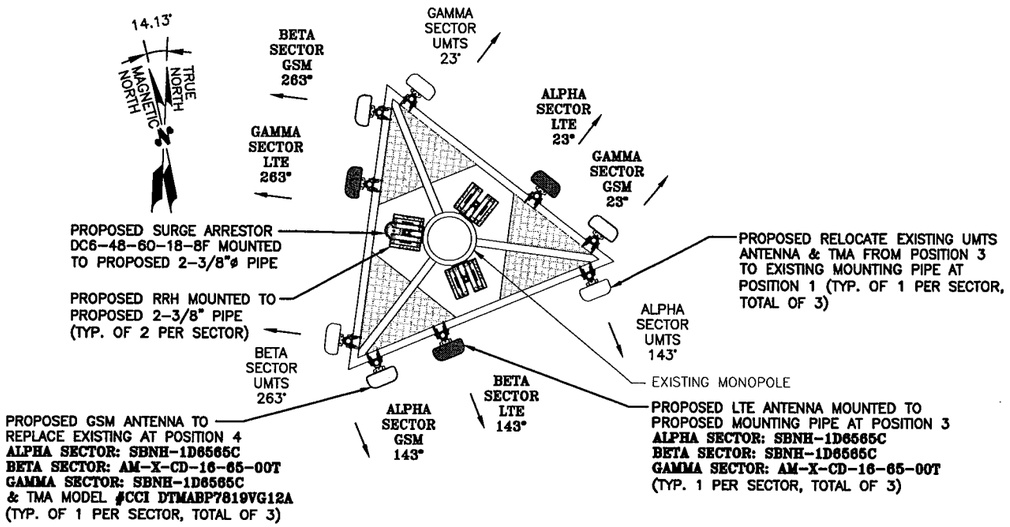
SCALE: N.T.S.

NOTE:

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

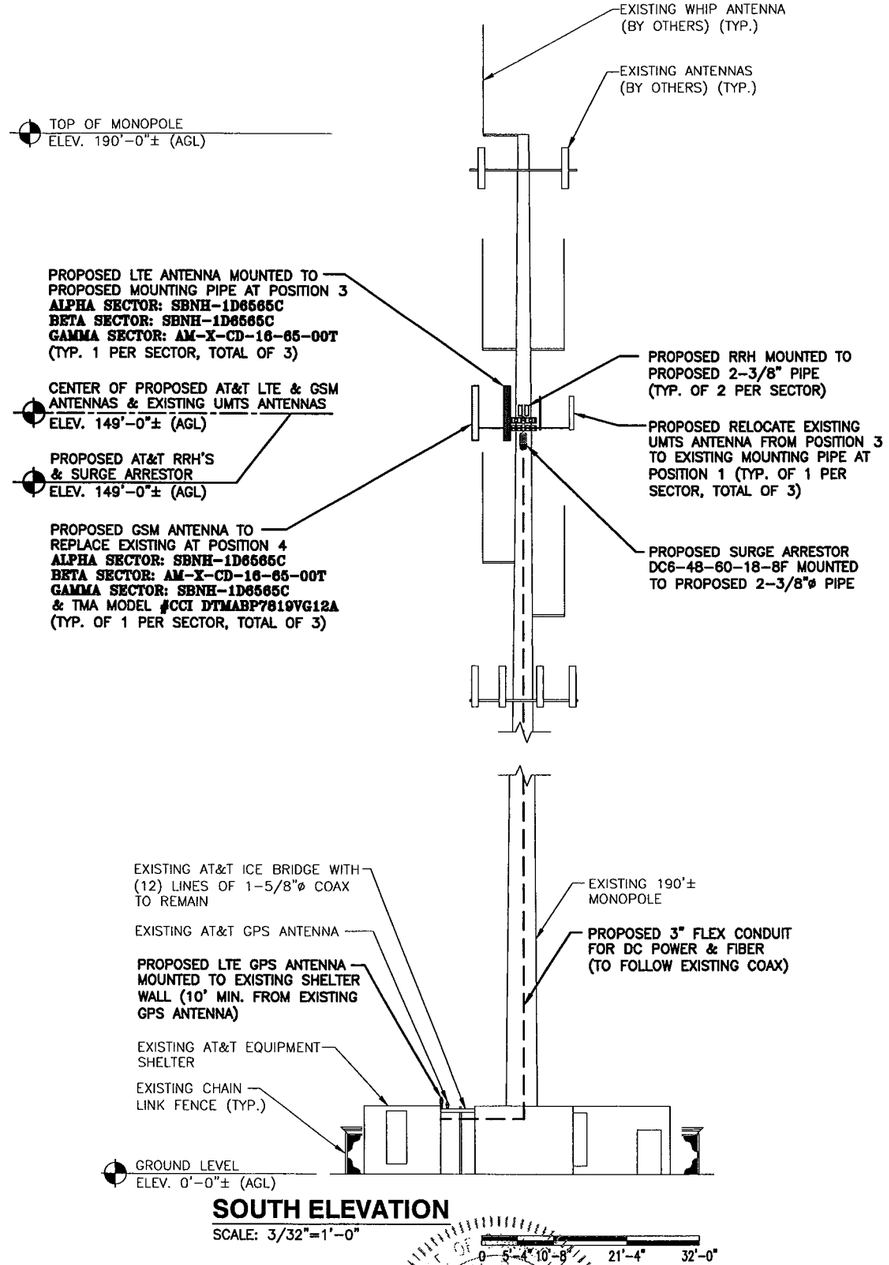
NOTE:

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



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



SOUTH ELEVATION

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

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

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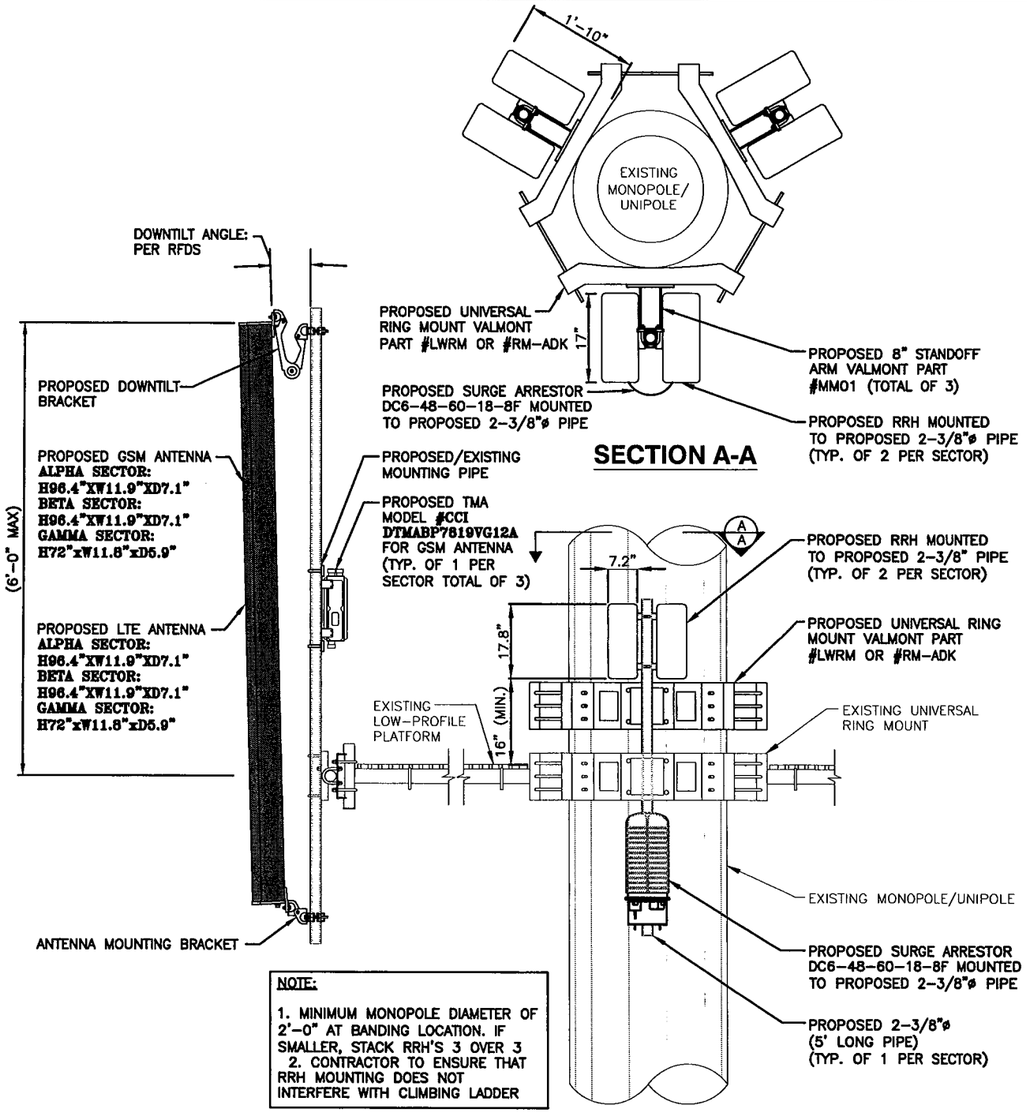
0	03/08/12	ISSUED FOR REVIEW	RP	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RP

AT&T

ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1019.01	A-2	1



SECTION A-A

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

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

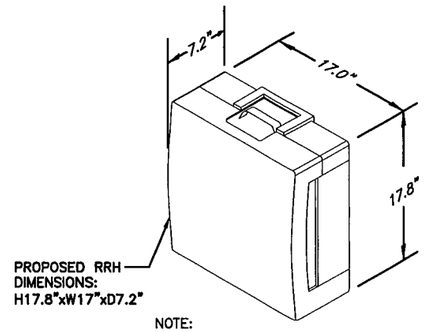
NOTES:
1. REFER TO RFDS & SECTOR SCHEMATICS FOR ANTENNA MODEL, TYPE & QUANTITY REQUIRED PER SECTOR

PROPOSED LTE & GSM ANTENNA, RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.

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

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

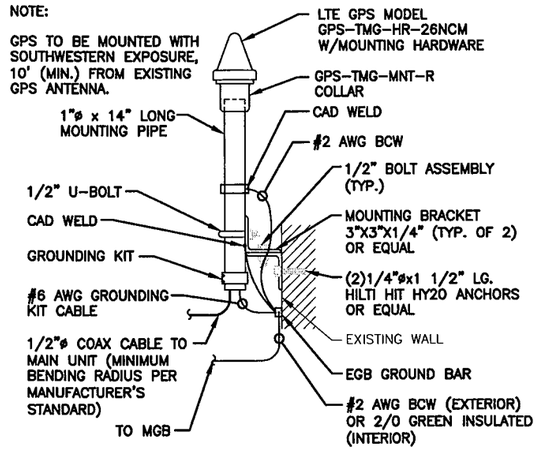


NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

RRH DETAIL

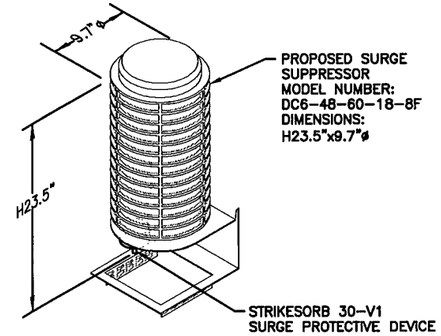
SCALE: N.T.S.

NOTE:
GPS TO BE MOUNTED WITH SOUTHWESTERN EXPOSURE, 10' (MIN.) FROM EXISTING GPS ANTENNA.



GPS MOUNTED TO SHELTER

SCALE: N.T.S.



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.

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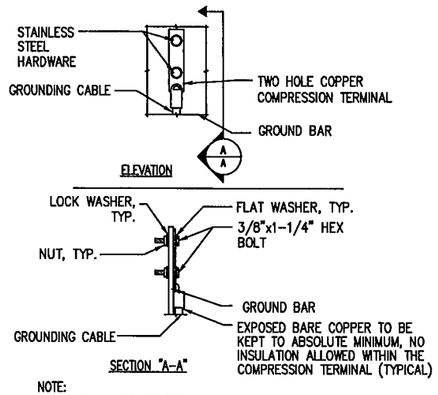
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RP

STATE OF CONNECTICUT · DANIEL P. HAMM · 20218 · LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS (LTE)

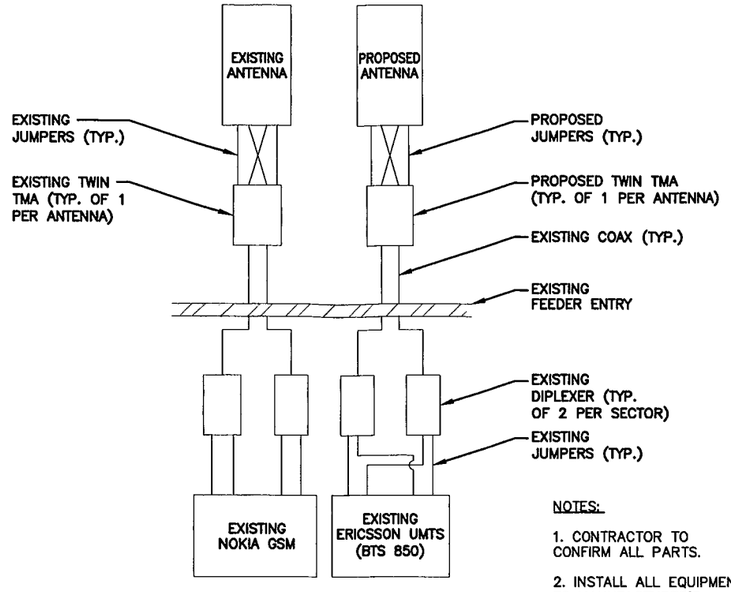
JOB NUMBER	DRAWING NUMBER	REV
1019.01	A-3	1



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

1 TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.

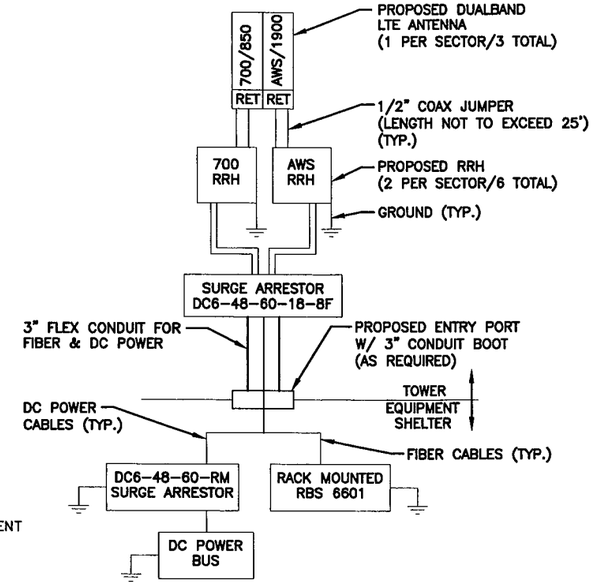


NOTES:

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

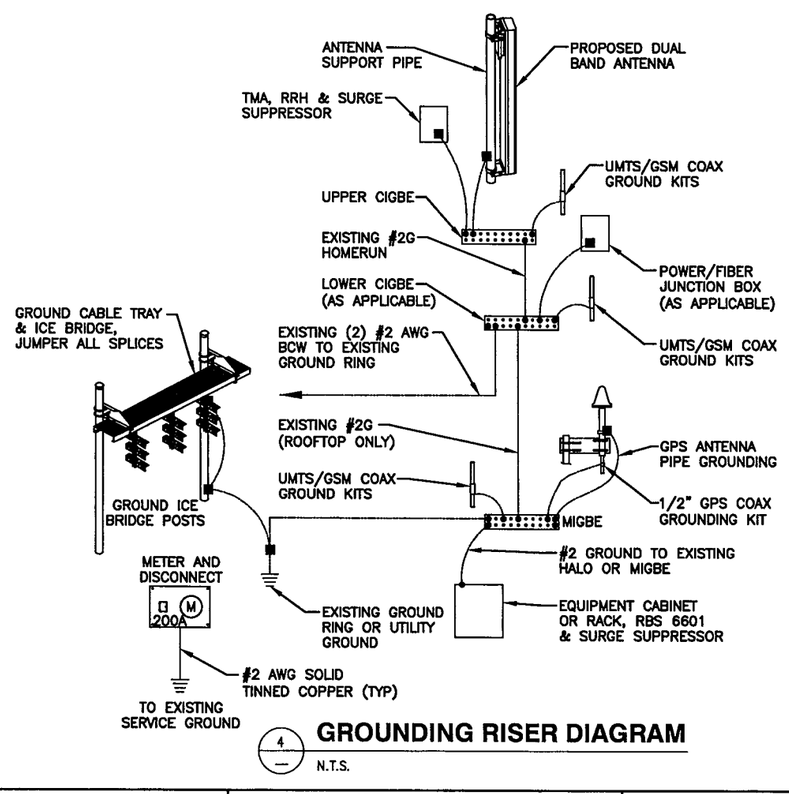
2 UMTS/GSM PLUMBING DIAGRAM

N.T.S.



3 LTE PLUMBING DIAGRAM

N.T.S.



4 GROUNDING RISER DIAGRAM

N.T.S.

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

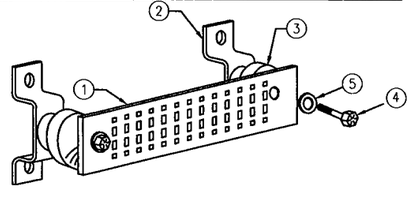
SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

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



5 GROUND BAR - DETAIL

N.T.S.

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RP

STATE OF CONNECTICUT · DANIEL P. HARMS · NO. 17... · LICENSED PROFESSIONAL ENGINEER

AT&T

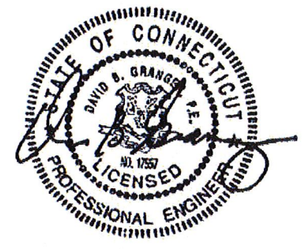
PLUMBING DIAGRAM & GROUNDING DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1019.01	G-1	1

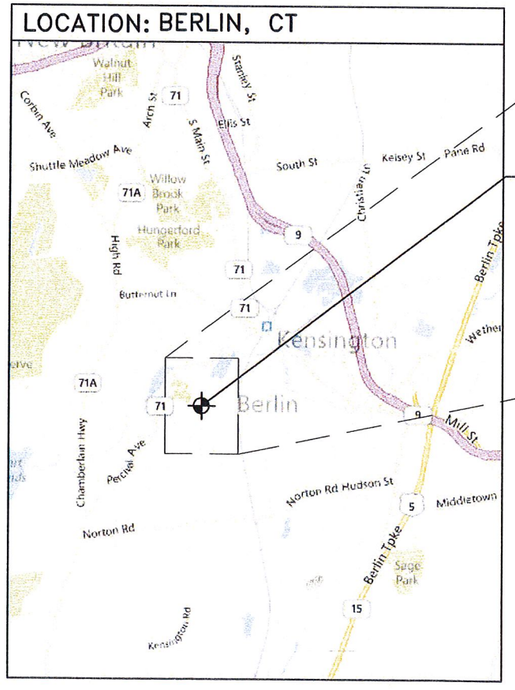
NEWINGTON_1

CT11004B

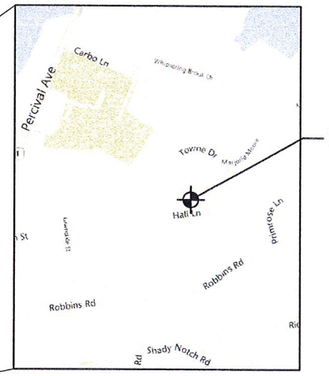
190' MODIFIED PIROD MONOPOLE



LOCATION: BERLIN, CT



SITE



SITE

AERIAL MAP

SITE

PROJECT SUMMARY

TOWER OWNER:	T–MOBILE TOWERS
TOWER TYPE:	MONOPOLE
GOVERNING CODE:	TIA/EIA–222–F & 2006 IBC
LATITUDE:	41° 37' 34.319" N
LONGITUDE:	72° 46' 32.159" W
OWNER CONTACT:	MR. AARON CHANDLER 4 SYLVAN WAY PARSIPPANY, NJ 07054 (508) 367–7138
ENGINEER CONTACT:	MR. CHRIS SCHEKS 400 NORTH 34TH STREET, SUITE 216 SEATTLE, WA 98103 (206) 204–7399

PROJECT OVERVIEW:
THE LISTED DRAWINGS REPRESENT MODIFICATIONS TO THE EXISTING TOWER BY REINFORCING THE EXISTING TOWER WITH FLAT PLATES, REMOVING EXISTING BRIDGE STIFFENERS, AND INSTALLING NEW BRIDGE STIFFENERS.

DRAWING INDEX

CO–LOCATOR:

at&t

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
520 SOUTH MAIN ST., SUITE 2531
AKRON, OHIO 44311
330.572.2100 330.572.2101

T-Mobile TOWERS

REV.	DATE	DESCRIPTION

Akron • Atlanta • Cleveland • Columbus • Indianapolis • Louisville • Marion • Phoenix • Seattle • Youngstown

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

TITLE SHEET

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO.
2012863.82

T-01

GENERAL NOTES

1. THE FOLLOWING DRAWINGS REPRESENT MODIFICATIONS TO THE EXISTING TOWER. THE MODIFICATIONS ARE BASED ON GPD GROUP STRUCTURAL REPORT (PROJECT #: 2012863.82, DATED OCTOBER 18, 2012). ALL MODIFICATIONS MUST BE INSTALLED TO BRING THE TOWER INTO CONFORMANCE WITH TIA/EIA-222-F & 2006 IBC.

2. THESE MODIFICATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF TIA/EIA-222-F, 2006 IBC, AWS, AND AISC. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.

3. ALL ORIGINAL TOWER INFORMATION WAS OBTAINED IN THE FORM OF ORIGINAL TOWER DRAWINGS BY PIROD (FILE #: A-115400 REV. C, DATED FEBRUARY 5, 2009) AND MODIFICATION DRAWINGS BY GPD GROUP (PROJECT #: 2008092.67, REV. 2, DATED FEBRUARY 20, 2008). CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE REFERENCED TOWER DOCUMENTS.

4. THIS DESIGN ASSUMES THE TOWER AND FOUNDATIONS HAVE BEEN WELL MAINTAINED, IN GOOD CONDITION, AND ARE WITHOUT DEFECT. BENT MEMBERS, CORRODED MEMBERS, LOOSE BOLTS, CRACKED WELDS AND OTHER MEMBER DEFECTS HAVE NOT BEEN CONSIDERED. THE TOWER IS ASSUMED TO BE PLUMB AND THE SITE IS ASSUMED TO BE LEVEL. THIS DESIGN IS BEING PROVIDED WITHOUT THE BENEFIT OF A CONDITION ASSESSMENT BY GPD GROUP. **CONTRACTOR SHALL COMMISSION A COMPLETE CONDITION ASSESSMENT PRIOR TO ORDERING ANY REINFORCING MATERIALS. CONTRACTOR SHALL SUPPLY CONDITION ASSESSMENT TO ENGINEER FOR REVIEW.** SEE CONTRACTOR NOTES.

5. MANUFACTURER TOLERANCES, FIELD ADJUSTMENTS, INCORRECT STACKING, AND TEMPERATURE CAN CAUSE DIMENSION DISCREPANCIES. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIALS. ALL FIELD MEASUREMENTS MUST BE REPORTED TO ENGINEER.

6. ALL NEW STEEL SHALL BE HOT DIPPED GALVANIZED FOR FULL WEATHER PROTECTION. IN ADDITION ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING STEEL. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.

7. ALL EXISTING PAINTED/GALVANIZED SURFACES DAMAGED DURING REHAB INCLUDING AREAS UNDER STIFFENER PLATES SHALL BE WIRE BRUSHED CLEAN, REPAIRED BY COLD GALVANIZING BRUSH APPLIED PAINT (ZRC OR EQUAL), AND REPAINTED TO MATCH THE EXISTING FINISH (IF APPLICABLE).

8. CAULKING SHALL BE PROVIDED AROUND PERIMETER OF ANY AND ALL MODIFICATION MEMBERS TO ENSURE COMPLETE SEAL BETWEEN EXISTING STRUCTURE AND REINFORCING MEMBERS. SEALANT IS TO BE EXTERIOR GRADE, PAINTABLE SILICONE CAULKING AS MANUFACTURED BY DOW AND ACCEPTABLE TO GPD.

9. LOADINGS:

WIND LOADS:	
FASTEST MILE WIND SPEED (PER: ANALYSIS CODE) (HARTFORD COUNTY, CT)	80 MPH
ICE LOADS:	
1/2" RADIAL BASE ICE	
FASTEST MILE WIND SPEED (CONCURRENT W/ ICE)	69 MPH

10. STRUCTURAL STEEL:

SPECIFICATIONS
LATEST EDITION OF AISC

MATERIAL

PLATES	ASTM A572 (GR 65)
BRIDGE STIFFENERS	ASTM A572 (GR 50)
ONE-SIDE BOLTS	AJAX 20MM (GR PC8.8) W/ HIGH STRENGTH SLEEVE (Fu=120 KSI)
HOT DIPPED GALVANIZING	ASTM A123
WELDS	E70XX
PAINT	NEW STEEL TO BE PAINTED TO MATCH EXISTING TOWER

11. ALL MATERIAL UTILIZED FOR THIS PROJECT MUST BE NEW AND FREE OF ANY DEFECTS. ANY MATERIAL SUBSTITUTIONS, INCLUDING BUT NOT LIMITED TO ALTERED SIZES AND/OR STRENGTHS, MUST BE APPROVED BY THE OWNER AND ENGINEER IN WRITING.

12. ALL SUBSTITUTES PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.

13. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.

14. UNLESS NOTED OTHERWISE, ALL NEW MEMBERS SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE ECCENTRICITIES INTO THE STRUCTURE.

15. THE ENGINEER (GPD GROUP) SHALL MAKE POST INSTALLATION OBSERVATION FOR TOWER. CONTRACTOR SHALL COORDINATE W/ENGINEER (GPD GROUP) WITHIN 72 HOURS AFTER 100% COMPLETION OF THE TOWER MODIFICATION INSTALLATION. INSTALLATION OF PROPOSED LOADING WITHOUT ENGINEER APPROVAL IS PROHIBITED. INSTALLATION OF THE PROPOSED LOADING IS BY OTHERS, AND IS BEYOND THE SCOPE OF THESE DRAWINGS.

CONTRACTOR NOTES

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER AND GPD GROUP THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW TOWER OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR TOWER OWNER AND GPD GROUP ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM LOWER TIER SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO TOWER OWNER AND GPD GROUP.

2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, GPD GROUP SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.

3. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE TOWER OWNER AND ENGINEER.

4. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.

5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THIS WORK.

6. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING; ANY PROBLEMS WITH ACCESS, INTERFERENCE, ETC. SHALL BE RESOLVED PRIOR TO MOBILIZATION. THE CONTRACTOR MUST VISIT THE SITE PRIOR TO ORDERING ANY MATERIAL AND MUST RESOLVE ALL ISSUES WITH THE OWNER PREVENTING A CONTINUOUS INSTALLATION. CONTRACTOR SHALL NOTE ALL ANTENNAS, MOUNTS, COAX, LIGHTING, CLIMBING SUPPORTS, STEP BOLTS, PORT HOLES, AND ANY OTHER TOWER APPURTENANCES IN THE REGION OF THE MODIFICATIONS. SEE GENERAL NOTES #4 AND #5 THIS SHEET.

7. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ALL COAX, T-BRACKETS, ANTENNA MOUNTS, AND ANY OTHER TOWER APPURTENANCE THAT MAY INTERFERE WITH THE TOWER MODIFICATIONS. ALL TOWER APPURTENANCES MUST BE REPLACED AND/OR RESTORED TO ITS ORIGINAL LOCATION. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.

8. SOME ATTACHMENTS MAY REQUIRE CUSTOM MODIFICATIONS TO PROPERLY FIT THE MODIFIED REGION OF THE STRUCTURE. THESE CUSTOMIZATIONS ARE DESIGNED BY OTHERS AND MUST BE APPROVED BY THE ENGINEER PRIOR TO REMOVING SUCH ATTACHMENTS. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.

9. CONTRACTOR SHALL ONLY WORK WITHIN THE LIMITS OF THE TOWER OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.

10. **WORK SHALL ONLY BE PERFORMED DURING CALM DRY DAYS (WINDS LESS THAN 10-MPH). CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY LOCAL TOWER SHORING, TEMPORARY GLOBAL TOWER SHORING, AND ALL SHORING OF SURROUNDING BUILDINGS, PADS, AND OTHER OUTDOOR SITE OBSTRUCTIONS. ALL SHORING, TEMPORARY BRACING, AND TEMPORARY SUPPORTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.**

11. CONTRACTOR SHALL VERIFY MONOPOLE IS SET PROPERLY AND HAS BEEN JACKED INTO ITS FINAL RESTING POSITION BEFORE FINAL CRITICAL FIELD MEASUREMENTS ARE VERIFIED AND BEFORE ORDERING MATERIAL. ANY OBJECTS/STEP BOLTS THAT PREVENT TOWER FROM SITTING PROPERLY SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY.

MODIFICATION PLATE NOTES

1. CONTRACTOR SHALL INSTALL PLATES AND BRIDGE STIFFENERS AT LOCATIONS PER PLAN VIEW.

2. USE AJAX BOLTS WITH CORRECT SLEEVE LENGTHS PER DETAILS. **BOLT THREADS SHALL NOT BE IN THE SHEAR PLANE.**

3. ALL HOLES DRILLED IN POLE SHALL BE SOLVENT CLEANED AND TOUCHED UP WITH ZRC ZINC RICH PAINT.

4. AJAX BOLTS TO BE TIGHTENED PER AISC "SNUG-TIGHT CONDITION".

5. CONTRACTOR SHALL VERIFY THAT TOWER IS PLUMB PRIOR TO THE INSTALLATION OF ANY TOWER MODIFICATIONS.

WELD NOTES

1. **CONTRACTOR IS RESPONSIBLE FOR COMMISSIONING A CERTIFIED WELD INSPECTOR (CWI) THROUGHOUT THE ENTIRETY OF THE PROJECT. A PASSING CWI REPORT SHALL BE PROVIDED TO THE ENGINEER UPON COMPLETION OF THE PROJECT.**

2. WELDING CERTIFICATES MUST BE PROVIDED TO CWI AND GPD GROUP PRIOR TO WELDING CONTRACTOR BEGINNING WORK ON SITE. CERTIFICATE WILL BE ASKED FOR AS PART OF INSPECTION PROCESS. ALL WELDING SHOULD BE PERFORMED BY AN AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES AND IN ACCORDANCE WITH ANSI/AWS D1.1 AND ANSI Z 49.1 OR LATEST EDITIONS.

3. OXY FUEL GAS WELDING OR BRAZING IS STRICTLY PROHIBITED. SPECIFICALLY, NO TORCH CUTTING IS PERMITTED ON SITE. ALL HOLES SHALL BE CUT WITH A GRINDER.

4. INSTALL 3000° (NFPA 701) FIRE BLANKET AROUND ALL COAX.

5. MORE SPLATTER AND SPARKS SHALL BE ANTICIPATED GIVEN THE PREVIOUSLY GALV. SURFACE.

6. COAX IS FLAMMABLE AND CAN CATCH FIRE IF PROPER PRECAUTIONS ARE NOT MADE TO SHIELD COAX FROM ALL WELDING PROCEDURES. ALL COAX SHALL BE SHIELDED AT AND BELOW EACH WELDING PROCEDURE AND ELEVATION. IN ADDITION, COAX SHALL BE PUSHED AWAY FROM TOWER FACE WHERE WELDING IS BEING PERFORMED.

7. CONTRACTOR SHALL EXERCISE CAUTION WHEN WELDING ON A GALVANIZED SURFACE. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC IT DOES NOT PROVIDE A STRUCTURAL WELD.

8. FUMES CREATED FROM WELDING ON A PREVIOUSLY GALV. SURFACE CAN BE HAZARDOUS.

9. PRIOR TO WELDING, ALL SURFACES SHALL BE PROPERLY GROUND TO REMOVE GALVANIZING.

10. ALL FIELD WELDS SHALL BE TOUCHED UP WITH A GALVANIZING PAINT REPAIR (ZRC OR APPROVED EQUIVALENT).

11. WATER SHALL BE ON SITE, OF ADEQUATE AMOUNT, AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. A MINIMUM OF 500 GAL. OF WATER SHALL BE PROVIDED. WATER SHALL BE CAPABLE OF REACHING HEIGHT WHERE WELDING IS BEING PERFORMED. IN ADDITION, A MINIMUM OF SIX (6) 10 LB. CLASS ABC MULTIPURPOSE FIRE EXTINGUISHERS FULLY CHARGED AND CAPABLE OF DISCHARGE WITHIN 30 SECONDS OF DETECTING A FIRE SHALL BE PROVIDED. FIRE EXTINGUISHERS SHALL BE STRATEGICALLY LOCATED AROUND COMPOUND AND IN THE AIR (I.E. ON THE MAN LIFT WHERE WELDING IS BEING PERFORMED).

12. CLEAN OUT ALL DEBRIS THROUGHOUT MONOPOLE AND MONOPOLE BASE PRIOR TO WELDING.

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T-Mobile TOWERS

REV.	DATE	DESCRIPTION

Akron • Atlanta • Cleveland • Columbus • Indianapolis • Louisville • Marion • Phoenix • Seattle • Youngstown

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

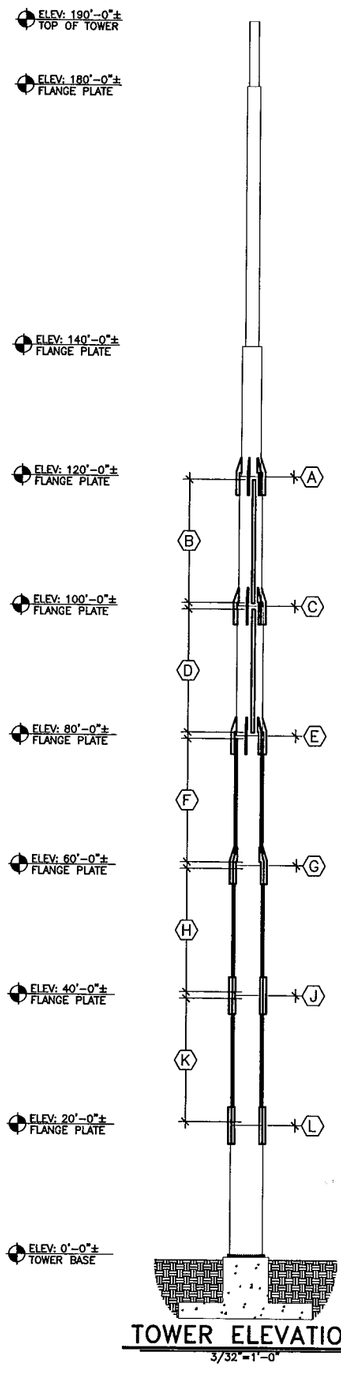
PROJECT NOTES

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

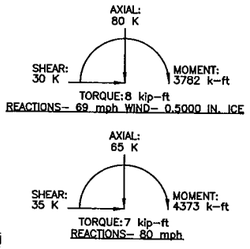
JOB NO.
2012863.82

N-01



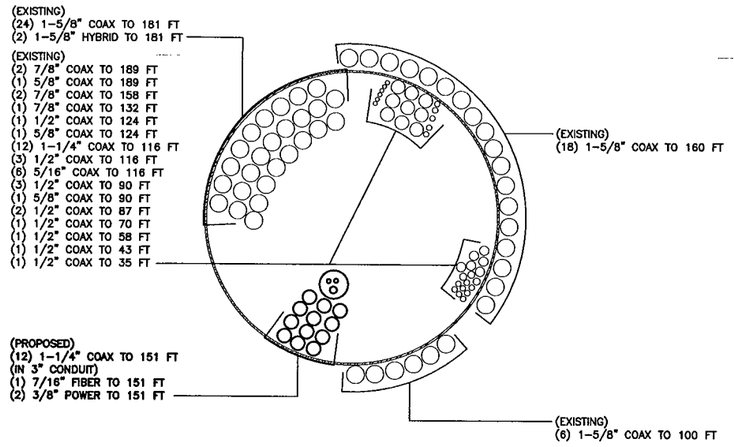
TOWER ELEVATION

3/32"=1'-0"



ANTENNA SCHEDULE

ELEVATION	STATUS	ANTENNA	MOUNT	COAX
189'-0"	EXISTING	(1) DB589	(1) 5' STANDOFF	(2) 7/8"
	EXISTING	(4) 4' OMNI		(1) 5/8"
	EXISTING	(1) 1'x1' PANEL		
181'-0"	EXISTING	(9) AIR21	(1) 16' LP PLATFORM	(24) 1-5/8"
	EXISTING	(3) AIR33		(2) 1-5/8" HYBRID
	EXISTING	(3) TWIN ETW190VS12UB TMAS		
	EXISTING	(1) HCS FIBER/DC BOXES (LARGE)		
	EXISTING	(1) 2' MW DISH		
160'-0"	EXISTING	(3) BXA-70063/6CF	(1) 13' LP PLATFORM	(18) 1-5/8"
	EXISTING	(4) LPA-80080/6CF		
	EXISTING	(2) LPA-80063/6CF		
	EXISTING	(2) BXA-171085/12BF		
	EXISTING	(1) BXA-171063/12BF		
	EXISTING	(2) GPS		
158'-0"	EXISTING	(1) DB205-A	(2) 5' STANDOFFS	(2) 7/8"
	EXISTING	(1) SRL224		
151'-0"	PROPOSED	(3) 7770	(1) 15' LP PLATFORM	(12) 1-1/4"
	PROPOSED	(4) SBNH-1D6565C		(2) 3/8" POWER
	PROPOSED	(2) AM-X-CD-1665-0T-RET		(1) 7/16" FIBER
	PROPOSED	(6) DTMABP7819VG12A TMAS		(1) 3" CONDUIT
	PROPOSED	(6) LGP 21901		
	PROPOSED	(6) CM1007-DBPXBC-003		
	PROPOSED	(6) RRUS-11	(1) COLLAR MOUNT	
	PROPOSED	(1) DC6-48-60-18-8F		
132'-0"	EXISTING	(1) SRL233	(1) 5' STANDOFF	(1) 7/8"
124'-0"	EXISTING	(1) DB205-A	(1) 5' STANDOFF	(1) 1/2"
	EXISTING	(1) LMU GSM RX		(1) 5/8"
116'-0"	EXISTING	(6) DB844G90VTA-SX	(1) 16' LP PLATFORM	(12) 1-1/4"
116'-0"	EXISTING	(3) 840-10054		(3) 1/2"
	EXISTING	(3) SAMSUNG BTS		(6) 5/16"
	EXISTING	(2) VHLP2.5		
	EXISTING	(2) HORIZON ODU		
100'-0"	EXISTING	(3) 742 213	FLUSH MOUNT	(6) 1-5/8"
90'-0"	EXISTING	(2) DB205-A	(2) 5' STANDOFFS	(3) 1/2"
	EXISTING	(1) 2' GRID DISH		(1) 5/8"
	EXISTING	(1) 1'x1'xPANEL		
87'-0"	EXISTING	(2) GPS	(2) 2' STANDOFFS	(2) 1/2"
70'-0"	EXISTING	(1) SRL233	(1) 5' STANDOFF	(1) 1/2"
58'-0"	EXISTING	(1) DB583	(1) 5' STANDOFF	(1) 1/2"
43'-0"	EXISTING	(1) FG4000	(1) 5' STANDOFF	(1) 1/2"
35'-0"	EXISTING	(1) MYA4505	(1) 5' STANDOFF	(1) 1/2"



NORTH

COAX LAYOUT

N.T.S.

MODIFICATION SCHEDULE

SYMBOL	ELEVATION	MEMBER TYPE	EXISTING MEMBER	NEW MEMBER	NOTES
A	120'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	REMOVE EXISTING BRIDGE STIFFENERS AS REQUIRED AND INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 6/S-04 & SECTION G/S-04.
B	100'-6"± TO 119'-6"±	FLAT PLATES	ROUND MONOPOLE	4"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 5/S-03, 6/S-04, AND 8/S-04 FOR MORE INFORMATION.
C	100'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	REMOVE EXISTING BRIDGE STIFFENERS AS REQUIRED AND INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 5/S-03 & SECTION G/S-04.
D	80'-6"± TO 99'-6"±	FLAT PLATES	ROUND MONOPOLE	4"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 4/S-03, 5/S-03, AND 8/S-04 FOR MORE INFORMATION.
E	80'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	REMOVE EXISTING BRIDGE STIFFENERS AS REQUIRED AND INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 4/S-03 & SECTION G/S-04.
F	60'-6"± TO 79'-6"±	FLAT PLATES	ROUND MONOPOLE	5-1/2"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 3/S-03, 4/S-03, AND 7/S-04 FOR MORE INFORMATION.
G	60'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 3/S-03 & SECTION G/S-04.
H	40'-6"± TO 59'-6"±	FLAT PLATES	ROUND MONOPOLE	5-1/2"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 2/S-02, 3/S-03, AND 7/S-04 FOR MORE INFORMATION.
J	40'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 2/S-02 & SECTION B/S-02.
K	20'-6"± TO 39'-6"±	FLAT PLATES	ROUND MONOPOLE	5-1/2"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 1/S-02, 2/S-02, AND 7/S-04 FOR MORE INFORMATION.
L	20'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 1/S-02 & SECTION B/S-02.

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T-Mobile TOWERS

REV	DATE	DESCRIPTION

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

TOWER ELEVATION & MODIFICATION SCHEDULE

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO. 2012863.82

S-01

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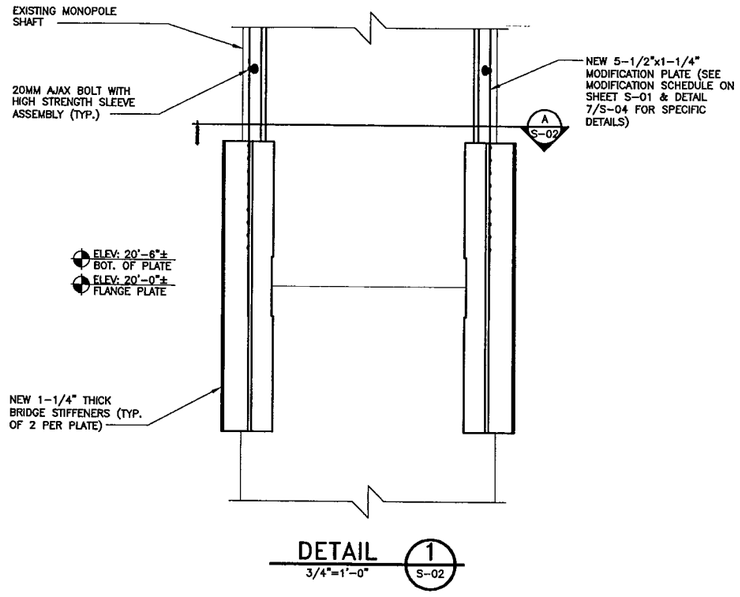
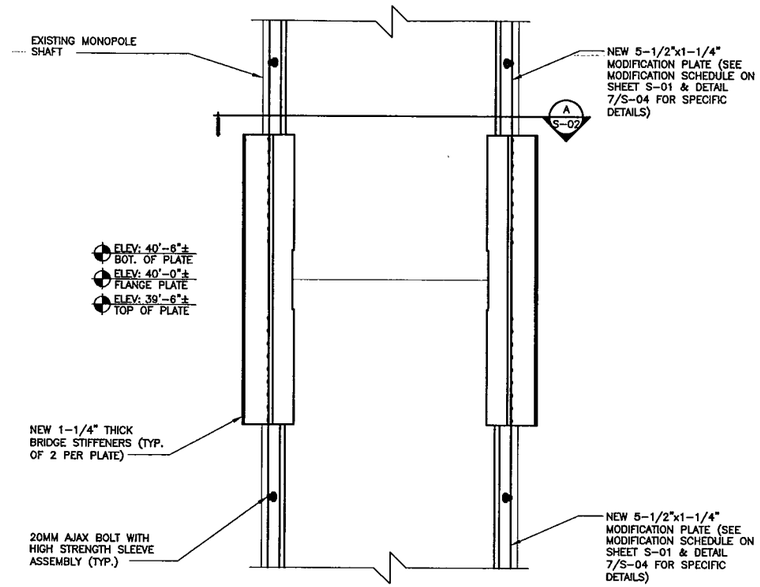
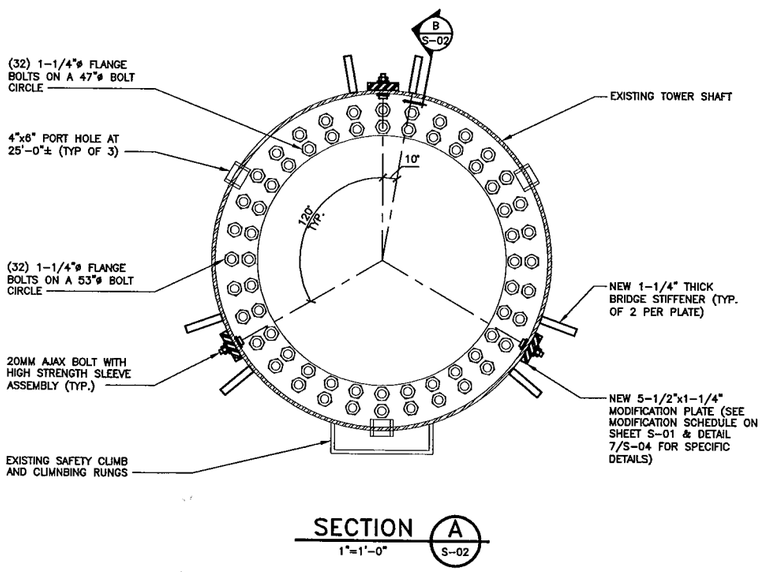


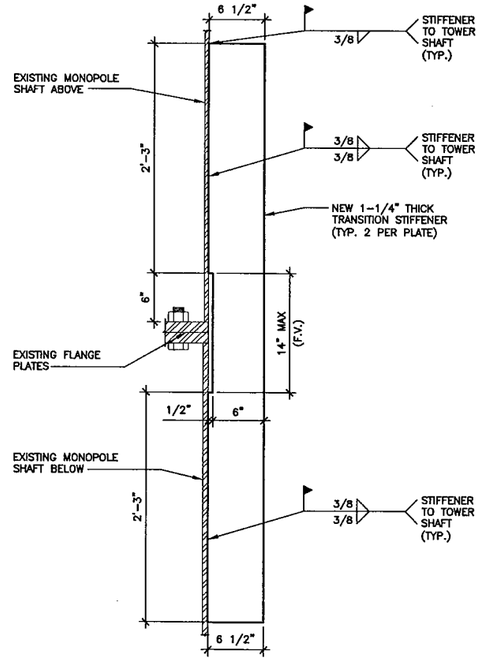
DETAIL 1 S-02
3/4"=1'-0"



DETAIL 2 S-02
3/4"=1'-0"



SECTION A S-02
1"=1'-0"



SECTION B S-02
1-1/2"=1'-0"

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MODIFICATION DETAILS & SECTIONS

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PERMIT	11/02/12
BID	-
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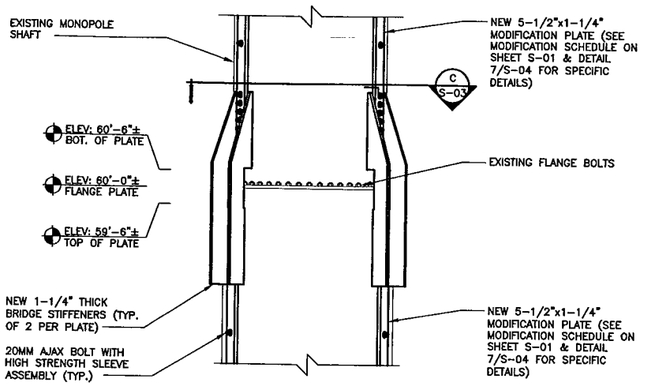
RECORD	-

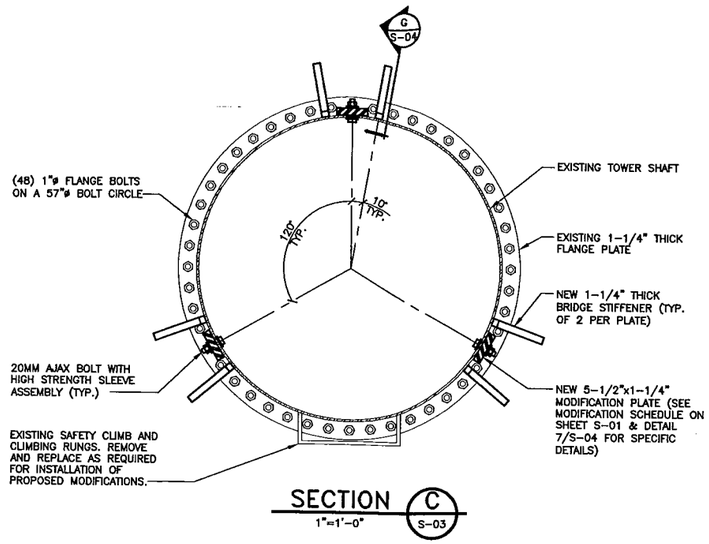
PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO. 2012863.82

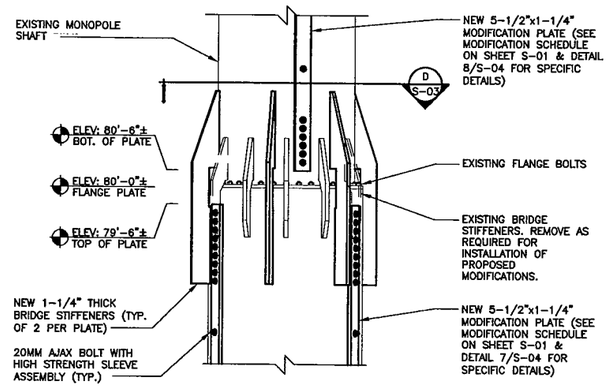
S-02



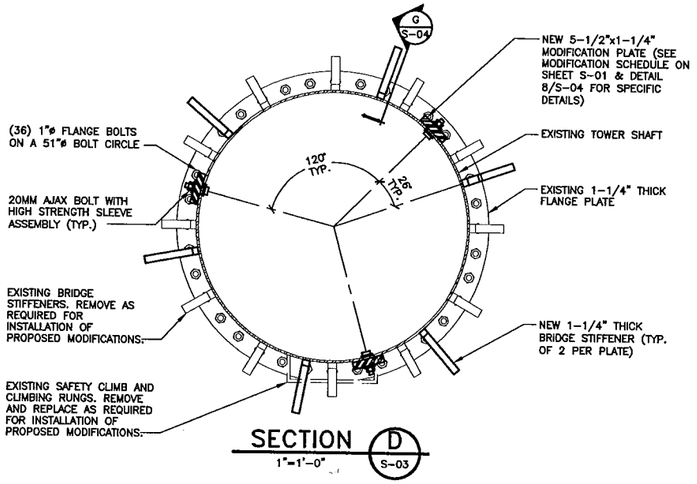
DETAIL 3 S-03
3/4"=1'-0"



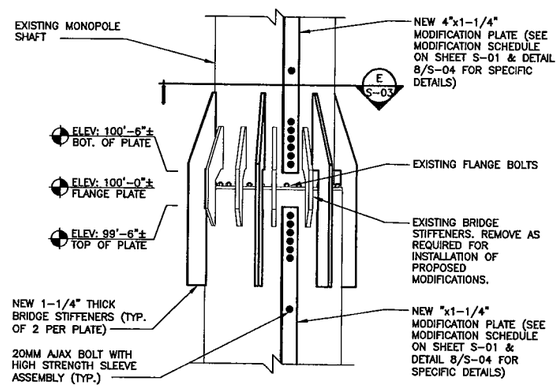
SECTION C S-03
1"=1'-0"



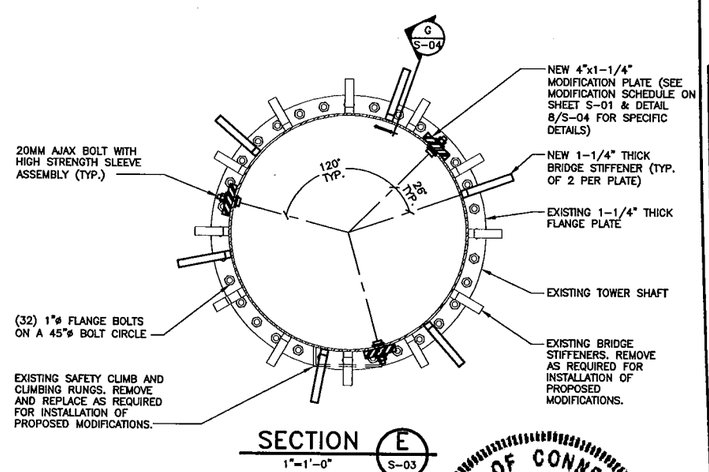
DETAIL 4 S-03
3/4"=1'-0"



SECTION D S-03
1"=1'-0"



DETAIL 5 S-03
3/4"=1'-0"



SECTION E S-03
1"=1'-0"

STATE OF CONNECTICUT
DAVID B. GRANGE P.E.
NO. 17557
LICENSED
PROFESSIONAL ENGINEER

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T-Mobile TOWERS

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ADDITIONAL DETAILS & SECTIONS

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO. 2012863.82

S-03

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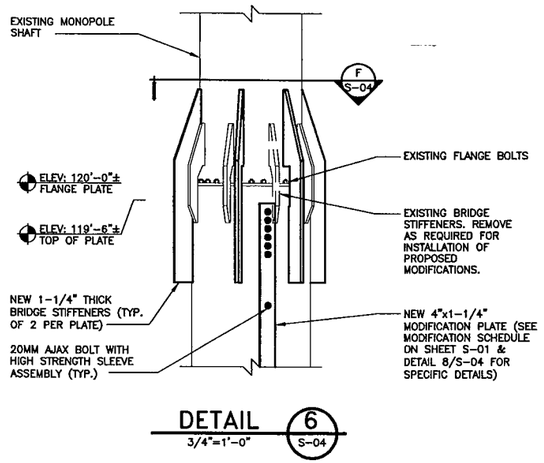
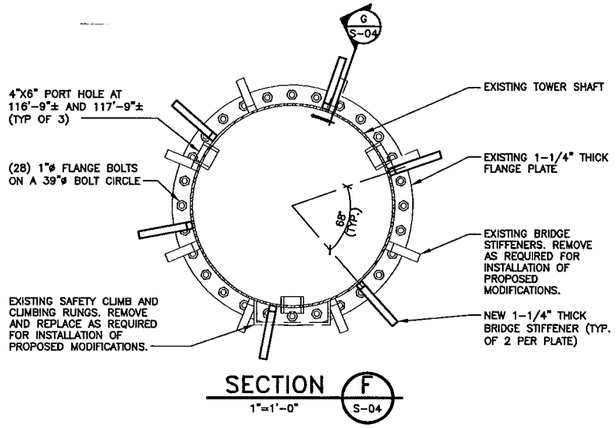
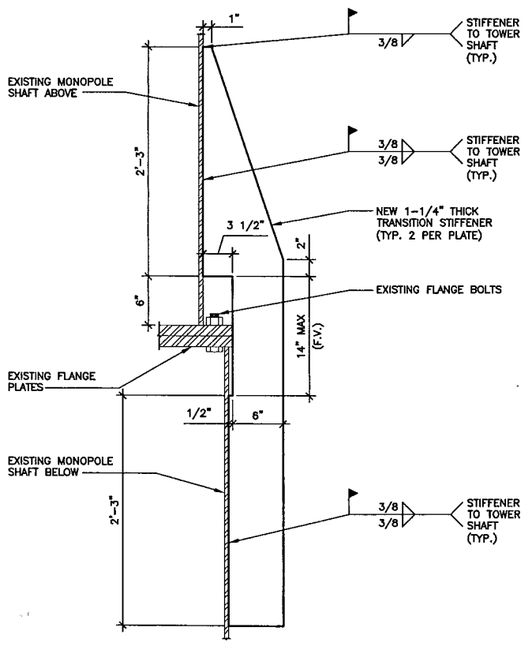


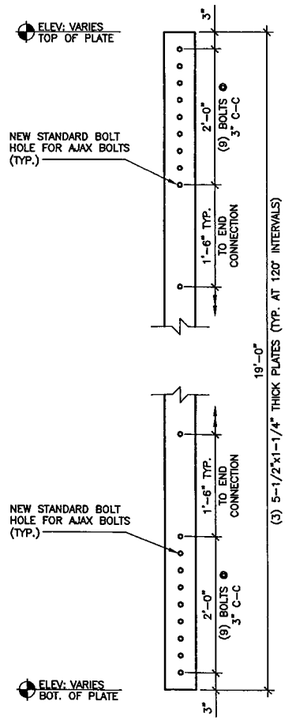
DETAIL 6 — 3/4"=1'-0" — S-04



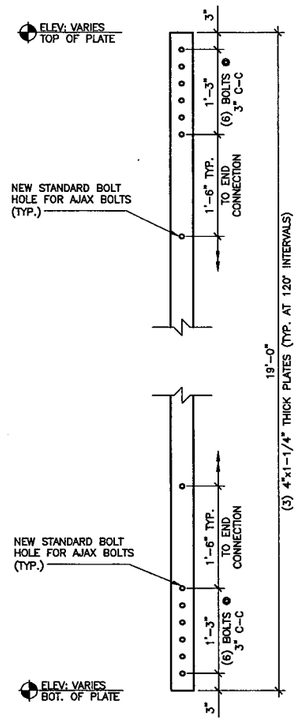
SECTION F — 1"=1'-0" — S-04



SECTION G — 1-1/2"=1'-0" — S-04



DETAIL 7 — 1-1/2"=1'-0" — S-04



DETAIL 8 — 1-1/2"=1'-0" — S-04

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ADDITIONAL DETAILS & SECTIONS

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CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO. 2012863.82

S-04

MODIFICATION INSPECTION CHECKLIST

BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
X	MODIFICATION INSPECTION CHECKLIST DRAWING
X	ENGINEER OF RECORD APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
–	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT
–	FABRICATOR NDE INSPECTION
–	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	

DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
X	CONSTRUCTION INSPECTIONS
–	FOUNDATION INSPECTIONS
–	CONCRETE COMP. STRENGTH AND SLUMP TESTS
–	POST INSTALLED ANCHOR ROD VERIFICATION
–	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
–	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
–	GUY WIRE TENSION REPORT
X	GC AS–BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	

AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
X	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWING(S)
–	POST INSTALLED ANCHOR ROD PULL–OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MODIFICATION INSPECTION REPORT
– DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MODIFICATION INSPECTION REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD.

2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MODIFICATION INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD AT ALL TIMES.

3. TO ENSURE THAT THE REQUIREMENTS OF THE MODIFICATION INSPECTION ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO OR PAYMENT IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. CONTACT LISTED ON THE TITLE SHEET SHALL BE CONTACTED IF SPECIFIC INSPECTOR CONTACT INFORMATION IS NOT KNOWN.

MODIFICATION INSPECTOR

1. THE MODIFICATION INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSPECTION TO:

- –REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST
- –WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON–SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- –DISCUSS ANY SITE SPECIFIC INSPECTIONS OR CONCERNS

2. THE MODIFICATION INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN–FIELD INSPECTIONS, AND SUBMITTING THE MODIFICATION INSPECTION REPORT.

GENERAL CONTRACTOR

1. THE GC IS REQUIRED TO CONTACT THE MODIFICATION INSPECTOR AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO:

- –REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST
- –WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON–SITE MODIFICATION INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- –BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.

RECOMMENDATIONS

1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MODIFICATION INSPECTION REPORT:

- –IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MODIFICATION INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION TO BE CONDUCTED.
- –THE GC AND MODIFICATION INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- –WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON–SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE–TENSIONING OPERATIONS.
- –IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MODIFICATION INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- –WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON–SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MODIFICATION INSPECTION. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MODIFICATION INSPECTION CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MODIFICATION INSPECTION

1. IF THE GC AND MODIFICATION INSPECTOR AGREE TO A DATE ON WHICH THE MODIFICATION INSPECTION WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE TOWER OWNER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON–SITE, ETC.). EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MODIFICATION INSPECTION ("FAILED MODIFICATION INSPECTION"), THE GC SHALL WORK WITH MODIFICATION INSPECTOR TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- –CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MODIFICATION INSPECTION.
- –OR, WITH TOWER OWNER'S APPROVAL, THE GC MAY WORK WITH THE ENGINEER OF RECORD TO RE–ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS–BUILT CONDITION.

VERIFICATION INSPECTIONS

1. TOWER OWNER RESERVES THE RIGHT TO CONDUCT A VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MODIFICATION INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

2. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MODIFICATION INSPECTION" OR "PASS AS NOTED MODIFICATION INSPECTION" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS ARE TO BE TAKEN AND INCLUDED IN THE MODIFICATION INSPECTION REPORT:

- –PRE–CONSTRUCTION GENERAL SITE CONDITION
- –PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- –POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION
- –ANY OTHER PHOTOS DEEMED RELEVANT TO SHOW COMPLETE DETAILS OF MODIFICATIONS

2. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
520 SOUTH MAIN ST., SUITE 2531
AKRON, OHIO 44311
330.572.2100 330.572.2101

T-Mobile TOWERS

REV	DATE	DESCRIPTION

Akron • Atlanta • Cleveland • Columbus • Indianapolis • Louisville • Marion • Phoenix • Seattle • Youngstown

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

MODIFICATION INSPECTION CHECKLIST

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO.
2012863.82

MI-01

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

at&t

CT1019

(Berlin - Omnipoint PD Tower)

240 Kensington Rd, Berlin, CT 06037

March 27, 2012

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List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the monopole tower located at 240 Kensington Rd in Berlin, CT. The coordinates of the tower are 41-37-34.30 N, 72-46-32.38 W.

AT&T is proposing the following modifications:

1) Replace six of nine existing dual-band (850/1900 MHz) panel antennas with six multi-band (700/850/1900/2100 MHz) antennas (two per sector);
2) Relocate three of nine existing dual-band (850/1900 MHz) panel antennas (one per sector) to an existing pipe mount;
3) Install three 700 MHz LTE Remote Radio Units (RRUs) (one per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

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

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

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

3. RF Exposure Prediction Methods

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

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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

4. Calculation Results

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

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular UMTS	149	880	1	500	0.0081	0.5867	1.38%
Cingular GSM	149	880	8	296	0.0384	0.5867	6.54%
Cingular GSM	149	1900	2	427	0.0138	1.0000	1.38%
Clearwire	118	2496	2	153	0.0079	1.0000	0.79%
Clearwire	122	11000	1	211	0.0051	1.0000	0.51%
Pocket	106	2130	3	631	0.0606	1.0000	6.06%
T-Mobile GSM	180	1945	8	117	0.0104	1.0000	1.04%
T-Mobile UMTS	180	2100	2	600	0.0133	1.0000	1.33%
Nextel	116	851	9	100	0.0240	0.5673	4.24%
Town of Berlin	194	850	N/A	N/A	0.0048	0.5667	0.84%
Town of Berlin	165	45	N/A	N/A	0.0013	0.2000	0.65%
Town of Berlin	165	159	N/A	N/A	0.0066	0.2000	3.30%
Town of Berlin	132	45	N/A	N/A	0.0021	0.2000	1.05%
Town of Berlin	136	154	N/A	N/A	0.0097	0.2000	4.85%
Town of Berlin	99	45	N/A	N/A	0.0073	0.2000	3.65%
Town of Berlin	75	155	N/A	N/A	0.0319	0.2000	15.95%
Town of Berlin	59	850	N/A	N/A	0.0516	0.5667	9.11%
Town of Berlin	45	450	N/A	N/A	0.0177	0.3000	5.90%
Town of Berlin	33	460	N/A	N/A	0.0330	0.3067	10.76%
Verizon	160	1970	3	410	0.0173	1.0000	1.73%
Verizon	160	875	9	348	0.0440	0.5833	7.54%
AT&T UMTS	149	880	2	565	0.0183	0.5867	0.31%
AT&T UMTS	149	1900	2	875	0.0283	1.0000	0.28%
AT&T LTE	149	734	1	1375	0.0223	0.4893	0.46%
AT&T GSM	149	880	1	538	0.0087	0.5867	0.15%
AT&T GSM	149	1900	4	934	0.0605	1.0000	0.61%
						Total	**81.10%**

Table 1: Carrier Information[1][2]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 1/10/2012.

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

5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **81.10% of the FCC limit**.

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

6. Statement of Certification

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

Daniel L. Goulet
C Squared Systems, LLC

March 27, 2012
Date

Attachment A: References

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

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

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

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

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

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

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

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

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

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

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

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

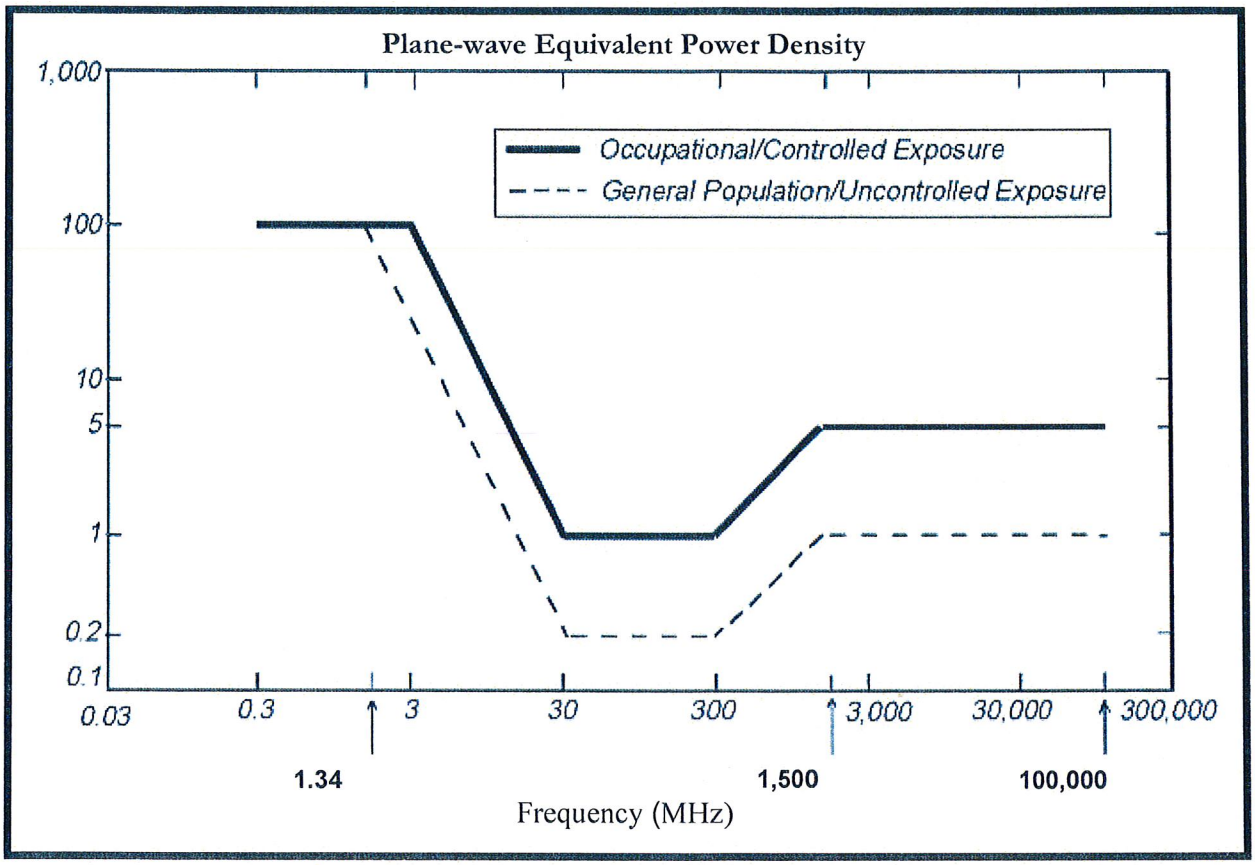
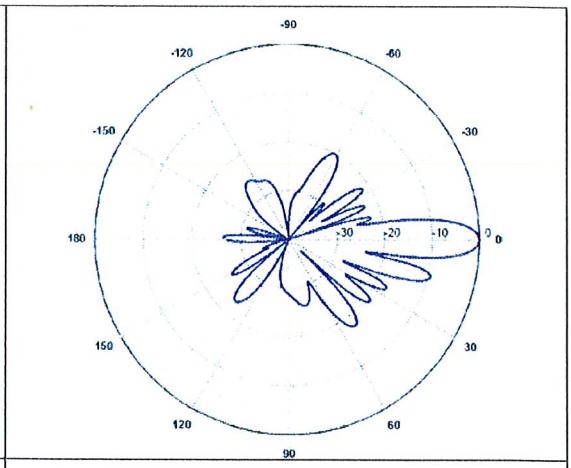


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

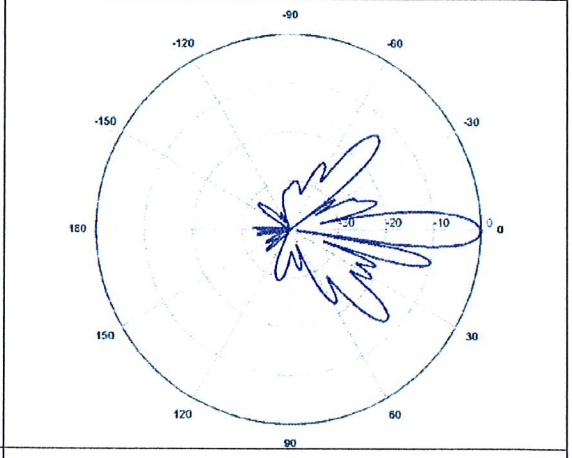
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.9" x 7.1"



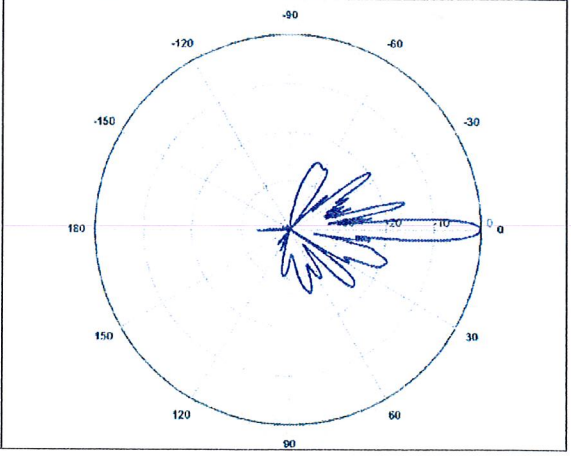
850 MHz GSM

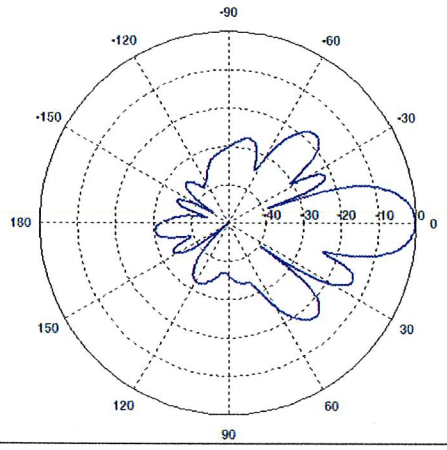
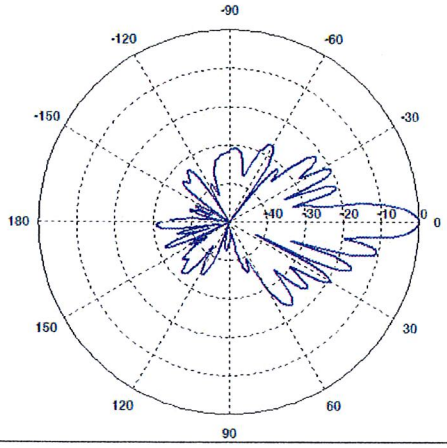
Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	806-896 MHz
Gain:	14.3 dBd
Vertical Beamwidth:	7.8°
Horizontal Beamwidth:	67°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.9" x 7.1"



1900 MHz GSM

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	1850-1990 MHz
Gain:	15.9 dBd
Vertical Beamwidth:	5.1°
Horizontal Beamwidth:	57°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.9" x 7.1"



850 MHz UMTS Manufacturer: Powerwave Model #: 7770.00 Frequency Band: 824-896 MHz Gain: 11.4 dBd Vertical Beamwidth: 15° Horizontal Beamwidth: 85° Polarization: Dual Linear ±45° Size L x W x D: 55.0" x 11.0" x 5.0"	
1900 MHz UMTS Manufacturer: Powerwave Model #: 7770.00 Frequency Band: 1850-1990 MHz Gain: 13.4 dBd Vertical Beamwidth: 7° Horizontal Beamwidth: 90° Polarization: Dual Linear ±45° Size L x W x D: 55.0" x 11.0" x 5.0"	

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

STRUCTURAL ANALYSIS REPORT

T-Mobile TOWERS

SITE NUMBER: CT11004B
SITE NAME: NEWINGTON_1

SITE ADDRESS: 240 KENSINGTON ROAD
BERLIN, CT 06037

NEW ANTENNA INSTALLATION
ON A MODIFIED
190' MONOPOLE

BY:

at&t
Your world. Delivered.

CARRIER SITE NAME: BERLIN – OMNIPOINT PD TOWER
CARRIER SITE NUMBER: CT1019

November 2, 2012

GPD Project #: 2012863.82

MODIFIED MONOPOLE

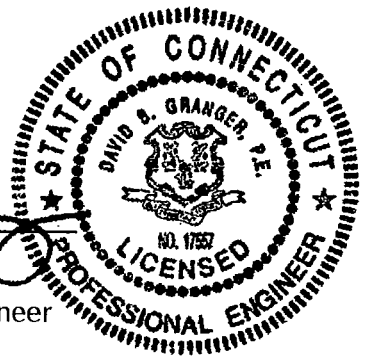
STRUCTURAL ANALYSIS REPORT

CT11004B NEWINGTON_1
240 Kensington Road
Berlin, CT 06037
GPD Project #: 2012863.82

New Antenna Installation
Modified 190 ft Monopole

For:
T-Mobile Towers
Bellevue, Washington

Prepared By:



David B. Granger, P.E.
Registered Professional Engineer
Connecticut #: 17557

November 2, 2012

Glaus, Pyle, Schomer, Burns and DeHaven, Inc. dba GPD Group **ENGINEERS ● ARCHITECTS ● PLANNERS**
520 South Main Street • Suite 2531 • Akron • Ohio • 44311-1010 • Tel: 330-572-2100 • Fax: 330-572-2101

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APPENDICES

EXECUTIVE SUMMARY

The purpose of this analysis is to verify whether the design for the modified tower is structurally capable of carrying the new antenna and coax loads as specified by Verizon to T-Mobile Towers. This report was commissioned by Ms. Peggy Anderson of T-Mobile Towers.

The design for the existing structure meets the requirements of TIA/EIA-222-F for a fastest-mile wind speed of 80 mph with 1/2" of radial ice (w/ 25% wind load reduction) for the proposed antenna configuration, once the modifications by GPD (Project #: 2012863.82, dated 11/2/2012) have been installed.

The foundation reactions, with the proposed loading, were found to be less than the capacity of the existing foundation design. Therefore the existing foundation is adequate, assuming it was properly constructed according to original design.

Section Results

Monopole	% Capacity	Result
180′ – 190′	4.7%	Pass
Flange Bolts @ 180′	3.0%	Pass
Flange Plates @ 180′	5.1%	Pass
140′ – 180′	87.1%	Pass
Bridge Stiffeners @ 140′	27.2%	Pass
Flange Bolts @ 140′	55.8%	Pass
Flange Plates @ 140′	55.8%	Pass
120′ – 140′	83.4%	Pass
Bridge Stiffeners @ 120′	35.5%	Pass
Flange Bolts @ 120′	18.5%	Pass
Flange Plates @ 120′	21.9%	Pass
100′ – 120′	75.6%	Pass
Bridge Stiffeners @ 100′	47.8%	Pass
Flange Bolts @ 100′	25.5%	Pass
Flange Plates @ 100′	30.3%	Pass
80′ – 100′	87.9%	Pass
Bridge Stiffeners @ 80′	56.5%	Pass
Flange Bolts @ 80′	31.9%	Pass
Flange Plates @ 80′	37.9%	Pass
60′ – 80′	90.1%	Pass
Bridge Stiffeners @ 60′	61.0%	Pass
Flange Bolts @ 60′	33.4%	Pass
Flange Plates @ 60′	43.5%	Pass
40′ – 60′	96.7%	Pass
Bridge Stiffeners @ 40′	62.4%	Pass
Flange Bolts @ 40′	32.1%	Pass
Flange Plates @ 40′	52.4%	Pass
20′ – 40′	88.7%	Pass
Bridge Stiffeners @ 20′	80.7%	Pass
Flange Bolts @ 20′	39.2%	Pass
Flange Plates @ 20′	64.6%	Pass
0′ – 20′	98.9%	Pass
Anchor Rods	87.4%	Pass
Base Plate	94.1%	Pass

Foundation	% Capacity	Result
Bearing	77.9%	Pass
Overturning	92.4%	Pass

Tower Rating: 98.9%

TOWER DESCRIPTION

The modified 190' monopole is located in Berlin, Connecticut. It was originally designed for Omnipoint by PiROD, Inc. of Plymouth, Indiana. The original design load for the tower was for an 80 mph basic wind speed with 1/2" radial ice (w/ 25% wind load reduction) in accordance with TIA/EIA-222-F. The tower was originally designed to hold the following:

Original Configuration

Antennas:	
Elev. 190'	(1) DB809 Antenna on a clamp-on side arm w/ (1) 1-5/8" internal coax
Elev. 178'	(12) RR90-17-00DP Antennas on a LP platform w/ (12) 1-5/8" internal coax
Elev. 155'	(2) DB205 Antennas on a clamp-on side arm w/ (2) 1-5/8" internal coax
Elev. 140'	(2) DB205 Antennas on a clamp-on side arm w/ (2) 1-5/8" internal coax
Elev. 128'	(12) RR90-17-00DP Antennas on a LP platform w/ (12) 1-5/8" internal coax
Elev. 118'	(12) RR90-17-00DP Antennas on a LP platform w/ (12) 1-5/8" internal coax
Elev. 25'	(1) DB516 & (1) DB809M on a clamp-on side arm w/ (2) 1-5/8" coax
Elev. 20'	(1) DB205 Antenna on a clamp-on side arm w/ (1) 1-5/8" internal coax

The existing monopole has nine major sections connected by bolted flange joints. The sections have a constant diameter with a 60" diameter at the base stepping down to 18" diameter at the top. The structure is galvanized and has no tower lighting.

All previous modifications designed by GPD Group (Project #: 2008092.67 Rev. 2, dated February 20, 2008) have been considered in this analysis. Modifications include installation of bridge stiffeners at 80', 100', 120' and 140'.

DOCUMENTS PROVIDED

Description	**Remarks**	**Source**
Tower Drawings	PiROD, Inc. #: A-115400 Rev. C, dated 2/5/2009	T-Mobile
Foundation Drawings	PiROD, Inc. #: A-115400 Rev. C, dated 2/5/2009	T-Mobile
Geotechnical Report	French & Parrello #: 98A209ERI, dated 11/13/1998	T-Mobile
Modification Design	GPD Project #: 2008092.67 Rev. 2, dated 2/20/2008	T-Mobile
Modification Design	GPD Project #: 2012863.82, dated 11/2/2012	GPD
Previous Analysis	GPD Project #: 2012863.82, dated 10/18/2012	GPD

TOWER MATERIALS

Data on steel strength was available from the information provided. The following table details the steel strength used in the analysis.

Monopole	ASTM A53 Gr. B (42 KSI Yield Strength)
Flange Plates	ASTM A36 (36 KSI Yield Strength)
Flange Bolts	ASTM A325
Anchor Rods	ASTM A687 (105 KSI Yield Strength)
Base Plate	ASTM A36 (36 KSI Yield Strength)

TOWER LOADING

The following data shows the major loading that the tower supports. Existing, reserved, and proposed antenna information was provided by T-Mobile Towers.

Existing & Reserved Configuration

Elevation	Carrier	Antennas
189′	Berlin	(1) DB589 Antenna, (1) 4′ Omni Antenna & (1) 1′x1′ Panel Antenna on (1) 5′ Standoff, w/ (2) 7/8″ coax & (1) 5/8″ internal coax
181′	T-Mobile	(9) Ericsson AIR21 Antennas, (3) Ericsson AIR33 Antennas, (3) Andrew Twin ETW190VS12UB TMAs, (1) HCS Fiber/DC Boxes (Large) & (1) 2′ MW Dish on a 16′ LP Platform, w/ (24) 1-5/8″ internal coax & (2) 1-5/8″ internal hybrid cable
160′	Verizon	(3) Antel BXA-70063/6CF Antennas, (4) Antel LPA-80080/6CF Antennas, (2) Antel LPA-80063/6CF Antennas, (2) Antel BXA-171085/12BF Antennas, (1) Antel BXA-171063/12BF Antennas & (2) GPS Antennas on a 13′ LP Platform, w/ (18) 1-5/8″ external coax
158′	Berlin	(1) DB205-A Antenna & (1) SRL224 Antenna on (2) 5′ Standoffs, w/ (2) 7/8″ internal coax
151′	AT&T	(3) Powerwave 7770 Antennas, (2) Andrew SBNH-1D6565C Antenna, (1) KMW AM-X-CD-1665-0T-RET Antenna, (6) CSS DUO 1417-8686 Antennas, (6) Cleargain ADC 850/1900 TMAs, (3) Powerwave LGP 13519 Diplexers on a 15′ LP Platform & (6) Ericsson RRUS-11 Units & (1) Raycap DC6-48-60-18-8F Surge Arrestor on a Collar Mount, w/ (12) 1-1/4″ internal coax, (2) 3/8″ DC power cables & (1) 7/16″ fiber cable inside (1) 3″ internal flex conduit
132′	Berlin	(1) SRL233 Antenna on (1) 5′ Standoff, w/ (1) 7/8″ internal coax
124′	Berlin	(1) DB205-A Antenna, (1) LMU GSM RX Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax & (1) 5/8″ internal coax
116′	Sprint	(6) Decibel DB844G90VTA-SX Antennas on a 16′ LP Platform, w/ (12) 1-1/4″ internal coax
116′	Clearwire	(3) Kathrein 840-10054 Antennas, (3) Samsung BTS Units, (2) Andrew VHLP2.5 Dishes & (2) Dragonwave Horizon ODUs on the same platform as above, w/ (3) 1/2″ internal coax & (6) 5/16″ internal coax
100′	Pocket	(3) Kathrein 742 213 Antennas on a flush mount, w/ (6) 1-5/8″ external coax
90′	Berlin	(2) DB205-A Antennas, (1) 2′ Grid Dish & (1) 1′x1′ Panel Antenna on (2) 5′ Standoffs, w/ (3) 1/2″ internal coax & (1) 5/8″ internal coax
87′	Berlin	(2) GPS Units on (2) 2′ Standoffs, w/ (2) 1/2″ internal coax
70′	Berlin	(1) SRL233 Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax
58′	Berlin	(1) DB583 Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax
43′	Berlin	(1) FG4000 Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax
35′	Berlin	(1) MYA4505 Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax

Proposed Configuration

Elevation	Carrier	Antennas
189′	Berlin	(1) DB589 Antenna, (1) 4′ Omni Antenna & (1) 1′x1′ Panel Antenna on (1) 5′ Standoff, w/ (2) 7/8″ coax & (1) 5/8″ internal coax
181′	T-Mobile	(9) Ericsson AIR21 Antennas, (3) Ericsson AIR33 Antennas, (3) Andrew Twin ETW190VS12UB TMAs, (1) HCS Fiber/DC Boxes (Large) & (1) 2′ MW Dish on a 16′ LP Platform, w/ (24) 1-5/8″ internal coax & (2) 1-5/8″ internal hybrid cable
160′	Verizon	(3) Antel BXA-70063/6CF Antennas, (4) Antel LPA-80080/6CF Antennas, (2) Antel LPA-80063/6CF Antennas, (2) Antel BXA-171085/12BF Antennas, (1) Antel BXA-171063/12BF Antennas & (2) GPS Antennas on a 13′ LP Platform, w/ (18) 1-5/8″ external coax
158′	Berlin	(1) DB205-A Antenna & (1) SRL224 Antenna on (2) 5′ Standoffs, w/ (2) 7/8″ internal coax
151′	**AT&T**	**(3) Powerwave 7770 Antennas, (4) Andrew SBNH-1D6565C Antennas, (2) KMW AM-X-CD-1665-0T-RET Antennas, (6) CCI DTMABP7819VG12A TMAs, (6) Powerwave LGP 21901 Diplexers, (6) Powerwave CM1007-DBPXBC-003 Diplexers on a 15′ LP Platform & (6) Ericsson RRUS-11 Units & (1) Raycap DC6-48-60-18-8F Surge Arrestor on a Collar Mount, w/ (12) 1-1/4″ internal coax, (2) 3/8″ DC power cables & (1) 7/16″ fiber cable inside (1) 3″ internal flex conduit**
132′	Berlin	(1) SRL233 Antenna on (1) 5′ Standoff, w/ (1) 7/8″ internal coax
124′	Berlin	(1) DB205-A Antenna, (1) LMU GSM RX Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax & (1) 5/8″ internal coax
116′	Sprint	(6) Decibel DB844G90VTA-SX Antennas on a 16′ LP Platform, w/ (12) 1-1/4″ internal coax
116′	Clearwire	(3) Kathrein 840-10054 Antennas, (3) Samsung BTS Units, (2) Andrew VHLP2.5 Dishes & (2) Dragonwave Horizon ODUs on the same platform as above, w/ (3) 1/2″ internal coax & (6) 5/16″ internal coax
100′	Pocket	(3) Kathrein 742 213 Antennas on a flush mount, w/ (6) 1-5/8″ external coax
90′	Berlin	(2) DB205-A Antennas, (1) 2′ Grid Dish & (1) 1′x1′ Panel Antenna on (2) 5′ Standoffs, w/ (3) 1/2″ internal coax & (1) 5/8″ internal coax
87′	Berlin	(2) GPS Units on (2) 2′ Standoffs, w/ (2) 1/2″ internal coax
70′	Berlin	(1) SRL233 Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax
58′	Berlin	(1) DB583 Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax
43′	Berlin	(1) FG4000 Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax
35′	Berlin	(1) MYA4505 Antenna on (1) 5′ Standoff, w/ (1) 1/2″ internal coax

Notes: - **BOLD** type indicates proposed carrier's final configuration.
- The proposed coax shall be placed internal to the pole.
- The external coax to 160′ shall be stacked in (1) row to the 120′ elevation. From 120′ to 160′ it shall be stacked in (2) rows.
- See Appendix 2 for coax layout.

The purpose of this independent structural analysis review is to determine if the design for the modified tower, with the proposed configuration, is in conformance to the latest TIA/EIA-222-F standard requirements.

ANALYSIS

The purpose of this structural analysis review is to determine if the design for the modified tower, with the proposed loading, is in conformance to the latest TIA/EIA-222-F standard requirements. TnxTower (Version v6.0.4.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/TIA/EIA-222-F standard and all local building code requirements. Selected output from the analysis is included in Appendix 1.

The current requirements of TIA/EIA-222-F are for a fastest-mile wind speed of 80 mph with 1/2" of radial ice. A 25% reduction in wind load is allowed when wind and ice are applied simultaneously. TIA/EIA-222-F requires towers within Hartford County, Connecticut be analyzed with an 80 mph fastest-mile wind speed.

ANALYSIS FASTEST-MILE WIND SPEED:	80 MPH

The tower and foundations are assumed, for the purpose of this analysis, to have been properly fabricated, constructed, maintained, and to be in good condition with no structural defects. This is not a condition assessment of the tower and has been provided without the benefit of detailed tower photos, a detailed tower mapping, or a GPD Group site visit. This analysis assumes all antennas and coax have been installed in a neat and orderly fashion. Proposed antennas are assumed to be installed on standard sized mounts at 120° azimuths. The existing/proposed mounts are assumed to have been verified by the carrier to support the existing/proposed loading for the required various load cases.

CONCLUSIONS AND RECOMMENDATIONS

Based on the computer structural analysis results, the design for the existing structure meets the requirements of TIA/EIA-222-F for a fastest-mile wind speed of 80 mph with 1/2" of radial ice (w/ 25% wind load reduction) for the proposed antenna configuration, once the modifications by GPD (Project #: 2012863.82, dated 11/2/2012) have been installed.

The foundation reactions, with the proposed loading, were found to be less than the capacity of the existing foundation design. Therefore the existing foundation is adequate, assuming it was properly constructed according to original design.

Summary of Findings

Monopole	Satisfactory
Flange Bolts	Satisfactory
Flange Plates	Satisfactory
Anchor Rods	Satisfactory
Base Plate	Satisfactory
Foundation	Satisfactory

Therefore, based on our analysis results, the design for the existing structure is structurally satisfactory for the proposed loading configuration.

DISCLAIMER OF WARRANTIES

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

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

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

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

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDICES

1. TnxTower Analysis Printout

2. Tower Elevation Drawing and Feedline Plan

3. Flange Bolts and Plates Analysis

4. Anchor Rod and Base Plate Analysis

5. Modification Calculations

6. Foundation Analysis

7. Modification Drawings

TNXTOWER ANALYSIS PRINTOUT

tnxTower	Job	Page
	CT11004B NEWINGTON_1	1 of 11
GPD Group 520 South Main Street Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Project 2012863.82	Date 11:28:03 11/02/12
	Client T-Mobile Towers	Designed by jfields

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.

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Component Type*	*Placement* *ft*	*Total Number*		C_AA_A *ft²/ft*	*Weight* *plf*
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	189.00 - 6.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF4.5-50 (5/8 FOAM)	A	No	Inside Pole	189.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	181.00 - 6.00	24	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
1-5/8" Hybrid Cable	C	No	Inside Pole	181.00 - 6.00	2	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	160.00 - 120.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	160.00 - 120.00	16	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	120.00 - 6.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	120.00 - 6.00	17	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	158.00 - 6.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF6-50A (1-1/4 FOAM)	B	No	Inside Pole	151.00 - 6.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
3" Flex Conduit	B	No	Inside Pole	151.00 - 6.00	1	No Ice	0.00	0.48
						1/2" Ice	0.00	0.48
3/8" DC Power Cable	B	No	Inside Pole	151.00 - 6.00	2	No Ice	0.00	0.10
						1/2" Ice	0.00	0.10
7/16" Fiber Cable	B	No	Inside Pole	151.00 - 6.00	1	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	132.00 - 6.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	124.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF4.5-50 (5/8 FOAM)	A	No	Inside Pole	124.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	116.00 - 6.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
FSJ4-50B(1/2")	A	No	Inside Pole	116.00 - 6.00	3	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
9207 (5/16")	A	No	Inside Pole	116.00 - 6.00	6	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	100.00 - 6.00	1	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	100.00 - 6.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
LDF6-50A(1/2")	A	No	Inside Pole	90.00 - 6.00	3	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
LDF4.5-50(5/8")	A	No	Inside Pole	90.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF4P-50A (1/2 FOAM)	C	No	Inside Pole	87.00 - 6.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	70.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	58.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	43.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	35.00 - 6.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
1-1/4" Mod Plate	A	No	CaAa (Out Of Face)	100.00 - 20.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	1.30
1-1/4" Mod Plate	B	No	CaAa (Out Of Face)	100.00 - 20.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	1.30
1-1/4" Mod Plate	C	No	CaAa (Out Of Face)	100.00 - 20.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	1.30

Discrete Tower Loads

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
PiROD 16'6" LP Platform	C	None		0.0000	181.00	No Ice	21.50	21.50	1847.00
						1/2" Ice	24.90	24.90	2077.00
(3) AIR21 Antenna	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice	6.42	4.28	83.00
						1/2" Ice	6.86	4.69	124.22
(3) AIR21 Antenna	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice	6.42	4.28	83.00
						1/2" Ice	6.86	4.69	124.22
(3) AIR21 Antenna	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice	6.42	4.28	83.00
						1/2" Ice	6.86	4.69	124.22
AIR33 Antenna	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice	6.42	4.28	83.00
						1/2" Ice	6.86	4.69	124.22
AIR33 Antenna	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice	6.42	4.28	83.00
						1/2" Ice	6.86	4.69	124.22
AIR33 Antenna	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice	6.42	4.28	83.00
						1/2" Ice	6.86	4.69	124.22
ETW190VS12UB	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice	0.66	0.35	11.00
						1/2" Ice	0.78	0.44	15.83

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 lb
ETW190VS12UB	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice 1/2" Ice	0.66 0.78	0.35 0.44	11.00 15.83
ETW190VS12UB	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice 1/2" Ice	0.66 0.78	0.35 0.44	11.00 15.83
HCS Fiber/DC Box (Large)	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	181.00	No Ice 1/2" Ice	3.22 3.47	1.16 1.34	19.00 38.06
PiROD 13' Low Profile Platform (Monopole)	C	None		0.0000	160.00	No Ice 1/2" Ice	15.70 20.10	15.70 20.10	1300.00 1765.00
BXA-70063/6CF	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	7.74 8.28	3.76 4.20	17.00 57.65
BXA-70063/6CF	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	7.74 8.28	3.76 4.20	17.00 57.65
BXA-70063/6CF	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	7.74 8.28	3.76 4.20	17.00 57.65
(2) LPA-80080/6CF	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	4.33 4.76	9.09 9.64	21.00 69.24
LPA-80080/6CF	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	4.33 4.76	9.09 9.64	21.00 69.24
LPA-80080/6CF	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	4.33 4.76	9.09 9.64	21.00 69.24
BXA-171063/12BF-EDIN-X	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	4.73 5.18	3.57 4.01	15.00 42.20
BXA-171085-12BF	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	4.73 5.18	3.57 4.01	15.00 42.20
BXA-171085-12BF	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	4.73 5.18	3.57 4.01	15.00 42.20
(2) LPA-80063/6CF	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	10.31 10.87	9.01 9.55	27.00 100.95
GPS	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	0.17 0.24	0.17 0.24	0.87 3.85
GPS	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	0.17 0.24	0.17 0.24	0.87 3.85
PiROD 15' Low Profile Platform (Monopole)	C	None		0.0000	151.00	No Ice 1/2" Ice	17.30 22.10	17.30 22.10	1500.00 2030.00
7770.00	A	From Centroid-Leg	3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	39.00 71.63
7770.00	B	From Centroid-Leg	3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	39.00 71.63
7770.00	C	From Centroid-Leg	3.76 1.37	20.0000	151.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	39.00 71.63

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / g ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) SBNH-1D6565C	C	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	11.45 12.06	7.70 8.29	60.80 126.67
(2) SBNH-1D6565C	B	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	11.45 12.06	7.70 8.29	60.80 126.67
(2) AM-X-CD-16-65-00T-RET	A	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	6.62 7.05	4.13 4.54	33.00 74.48
(2) DTMABP7819VG12A	A	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	1.17 1.32	0.44 0.56	19.00 26.12
(2) DTMABP7819VG12A	B	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	1.17 1.32	0.44 0.56	19.00 26.12
(2) DTMABP7819VG12A	C	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	1.17 1.32	0.44 0.56	19.00 26.12
(2) 850/1900 dual band TMA	A	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	2.15 2.35	0.48 0.60	30.00 41.26
(2) 850/1900 dual band TMA	B	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	2.15 2.35	0.48 0.60	30.00 41.26
(2) 850/1900 dual band TMA	C	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	2.15 2.35	0.48 0.60	30.00 41.26
(2) LGP21901	A	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
(2) LGP21901	B	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
(2) LGP21901	C	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	5.50 7.92
(2) CM1007-DBPXBC-003	A	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	0.28 0.37	0.16 0.21	6.50 9.99
(2) CM1007-DBPXBC-003	B	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	0.28 0.37	0.16 0.21	6.50 9.99
(2) CM1007-DBPXBC-003	C	From Centroid-Le g	0.00 3.76 1.37 0.00	20.0000	151.00	No Ice 1/2" Ice	0.28 0.37	0.16 0.21	6.50 9.99
Valmont Light Duty Tri-Bracket (1)	C	None		0.0000	151.00	No Ice 1/2" Ice	1.76 2.08	1.76 2.08	54.00 70.00
(2) RRUS 11	A	From Leg	0.50 0.00 1.00	0.0000	151.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	55.00 74.32
(2) RRUS 11	B	From Leg	0.50 0.00 1.00	0.0000	151.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	55.00 74.32
(2) RRUS 11	C	From Leg	0.50 0.00 1.00	0.0000	151.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	55.00 74.32

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 lb
DC6-48-60-18-8F Surge Suppression Unit	C	From Leg	0.50 0.00 1.00	0.0000	151.00	No Ice 1/2" Ice	1.47 1.67	1.47 1.67	32.80 50.52
PiROD 16'6" LP Platform	C	None		0.0000	116.00	No Ice 1/2" Ice	21.50 24.90	21.50 24.90	1847.00 2077.00
(2) 844G90VTA-SX w/Mount Pipe	A	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	3.77 4.42	5.40 6.49	37.05 79.02
(2) 844G90VTA-SX w/Mount Pipe	B	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	3.77 4.42	5.40 6.49	37.05 79.02
(2) 844G90VTA-SX w/Mount Pipe	C	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	3.77 4.42	5.40 6.49	37.05 79.02
840 10054 w/ mount pipe	A	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	6.21 6.61	3.38 3.93	49.60 91.65
840 10054 w/ mount pipe	B	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	6.21 6.61	3.38 3.93	49.60 91.65
840 10054 w/ mount pipe	C	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	6.21 6.61	3.38 3.93	49.60 91.65
Samsung BTS	A	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	1.82 2.00	0.83 0.97	33.00 44.91
Samsung BTS	B	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	1.82 2.00	0.83 0.97	33.00 44.91
Samsung BTS	C	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	1.82 2.00	0.83 0.97	33.00 44.91
Horizon ODU	B	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	0.87 1.00	0.43 0.53	11.50 18.08
Horizon ODU	C	From Centroid-Leg	3.46 2.00 0.00	30.0000	116.00	No Ice 1/2" Ice	0.87 1.00	0.43 0.53	11.50 18.08
Valmont Light Duty Tri-Bracket (1)	C	None		0.0000	100.00	No Ice 1/2" Ice	1.76 2.08	1.76 2.08	54.00 70.00
742 213 w/ Mount Pipe	A	From Leg	0.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	5.37 5.95	4.62 6.00	48.92 90.56
742 213 w/ Mount Pipe	B	From Leg	0.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	5.37 5.95	4.62 6.00	48.92 90.56
742 213 w/ Mount Pipe	C	From Leg	0.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	5.37 5.95	4.62 6.00	48.92 90.56
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00 0.00 0.00	0.0000	189.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00
DB589	B	From Leg	4.00 0.00 4.25	0.0000	189.00	No Ice 1/2" Ice	2.13 3.00	2.13 3.00	11.50 27.39
4' Omni / Whip	B	From Leg	4.00 0.00	0.0000	189.00	No Ice 1/2" Ice	0.60 0.92	0.60 0.92	15.00 20.05

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
			2.00						
1'x1' Panel	B	From Leg	4.00	0.0000	189.00	No Ice	1.40	1.40	20.00
			0.00			1/2" Ice	1.56	1.56	35.20
			0.00						
4' x 2.5" Mount Pipe	C	From Leg	0.50	0.0000	189.00	No Ice	1.51	1.51	20.00
			0.00			1/2" Ice	1.80	1.80	29.73
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	158.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
DB205-A	B	From Leg	4.00	0.0000	158.00	No Ice	1.20	1.20	38.00
			0.00			1/2" Ice	2.16	2.16	49.40
			4.00						
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00	0.0000	158.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
SRL224	C	From Leg	4.00	0.0000	158.00	No Ice	5.22	5.22	35.00
			0.00			1/2" Ice	7.02	7.02	72.00
			10.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	132.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
SRL233	B	From Leg	4.00	0.0000	132.00	No Ice	1.26	1.26	2.00
			0.00			1/2" Ice	2.27	2.27	13.00
			6.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	124.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
DB205-A	B	From Leg	4.00	0.0000	124.00	No Ice	1.20	1.20	38.00
			0.00			1/2" Ice	2.16	2.16	49.40
			4.00						
1'x1' Panel	B	From Leg	4.00	0.0000	124.00	No Ice	1.40	1.40	20.00
			0.00			1/2" Ice	1.56	1.56	35.20
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	90.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00	0.0000	90.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
DB205-A	B	From Leg	4.00	0.0000	90.00	No Ice	1.20	1.20	38.00
			0.00			1/2" Ice	2.16	2.16	49.40
			4.00						
DB205-A	C	From Leg	4.00	0.0000	90.00	No Ice	1.20	1.20	38.00
			0.00			1/2" Ice	2.16	2.16	49.40
			4.00						
1'x1' Panel	B	From Leg	4.00	0.0000	90.00	No Ice	1.40	1.40	20.00
			0.00			1/2" Ice	1.56	1.56	35.20
			0.00						
2' Standoff	B	From Leg	1.00	0.0000	87.00	No Ice	1.36	1.36	20.00
			0.00			1/2" Ice	2.45	2.45	40.00
			0.00						
2' Standoff	C	From Leg	1.00	0.0000	87.00	No Ice	1.36	1.36	20.00
			0.00			1/2" Ice	2.45	2.45	40.00
			0.00						
Generic GPS	B	From Leg	2.00	0.0000	87.00	No Ice	0.21	0.21	15.00
			0.00			1/2" Ice	0.32	0.32	17.52

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						
Generic GPS	C	From Leg	2.00	0.0000	87.00	No Ice	0.21	0.21	15.00
			0.00			1/2" Ice	0.32	0.32	17.52
			0.00						
Pirod 4' Side Mount Standoff (1)	B	From Leg	2.00	0.0000	70.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
SRL233	B	From Leg	4.00	0.0000	70.00	No Ice	1.26	1.26	2.00
			0.00			1/2" Ice	2.27	2.27	13.00
			6.00						
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00	0.0000	58.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
DB583	C	From Leg	4.00	0.0000	58.00	No Ice	0.54	0.54	6.25
			0.00			1/2" Ice	0.71	0.71	11.60
			1.38						
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00	0.0000	43.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
5' Omni	C	From Leg	4.00	0.0000	43.00	No Ice	1.00	1.00	15.00
			0.00			1/2" Ice	1.39	1.39	22.86
			1.05						
Pirod 4' Side Mount Standoff (1)	C	From Leg	2.00	0.0000	35.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00						
MYA4505	C	From Leg	4.00	0.0000	35.00	No Ice	0.23	0.23	2.00
			0.00			1/2" Ice	0.41	0.41	2.60
			0.00						

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
2' Dish	C	Paraboloid w/Shroud (HP)	From Centroid -Leg	4.00	0.0000		181.00	2.00	No Ice	3.14	70.00
				0.00					1/2" Ice	3.41	280.00
				0.00							
VHLP2.5	B	Paraboloid w/Shroud (HP)	From Centroid -Leg	3.46	0.0000		116.00	2.92	No Ice	6.68	50.00
				2.00					1/2" Ice	7.07	60.00
				0.00							
VHLP2.5	C	Paraboloid w/Shroud (HP)	From Centroid -Leg	3.46	0.0000		116.00	2.92	No Ice	6.68	50.00
				2.00					1/2" Ice	7.07	60.00
				0.00							
2' Dish	C	Grid	From Leg	4.00	0.0000		90.00	2.00	No Ice	3.14	70.00
				0.00					1/2" Ice	3.41	280.00
				0.00							

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 180	31.476	30	1.5348	0.0111
L2	180 - 140	28.265	30	1.5299	0.0100
L3	140 - 120	16.408	30	1.1492	0.0049
L4	120 - 100	11.976	30	0.9459	0.0034
L5	100 - 80	8.326	30	0.7848	0.0025
L6	80 - 60	5.367	30	0.6185	0.0018
L7	60 - 40	3.080	30	0.4664	0.0012
L8	40 - 20	1.421	30	0.3200	0.0008
L9	20 - 0	0.376	30	0.1743	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.00	Pirod 4' Side Mount Standoff (1)	30	31.155	1.5353	0.0111	214558
181.00	2' Dish	30	28.586	1.5321	0.0102	91673
160.00	PiROD 13' Low Profile Platform (Monopole)	30	21.982	1.3851	0.0079	6783
158.00	Pirod 4' Side Mount Standoff (1)	30	21.382	1.3631	0.0076	6199
151.00	PiROD 15' Low Profile Platform (Monopole)	30	19.346	1.2813	0.0065	4763
132.00	Pirod 4' Side Mount Standoff (1)	30	14.511	1.0611	0.0043	4424
124.00	Pirod 4' Side Mount Standoff (1)	30	12.787	0.9820	0.0037	6033
116.00	VHLP2.5	30	11.192	0.9119	0.0033	7252
100.00	Valmont Light Duty Tri-Bracket (1)	30	8.326	0.7848	0.0026	6835
90.00	2' Dish	30	6.760	0.7016	0.0022	6967
87.00	2' Standoff	30	6.324	0.6764	0.0021	7020
70.00	Pirod 4' Side Mount Standoff (1)	30	4.141	0.5408	0.0015	7327
58.00	Pirod 4' Side Mount Standoff (1)	30	2.887	0.4516	0.0012	7639
43.00	Pirod 4' Side Mount Standoff (1)	30	1.633	0.3415	0.0009	8587
35.00	Pirod 4' Side Mount Standoff (1)	30	1.096	0.2846	0.0007	7681

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 180	80.373	5	3.9177	0.0296
L2	180 - 140	72.181	5	3.9064	0.0265
L3	140 - 120	41.915	5	2.9353	0.0130
L4	120 - 100	30.601	5	2.4163	0.0091
L5	100 - 80	21.277	5	2.0051	0.0067
L6	80 - 60	13.716	5	1.5806	0.0049
L7	60 - 40	7.872	5	1.1921	0.0034
L8	40 - 20	3.632	5	0.8179	0.0021
L9	20 - 0	0.960	5	0.4455	0.0011

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.00	Pirod 4' Side Mount Standoff (1)	5	79.553	3.9191	0.0297	90119
181.00	2' Dish	5	72.999	3.9119	0.0273	39133
160.00	PiROD 13' Low Profile Platform (Monopole)	5	56.147	3.5376	0.0202	2679
158.00	Pirod 4' Side Mount Standoff (1)	5	54.614	3.4816	0.0194	2447
151.00	PiROD 15' Low Profile Platform (Monopole)	5	49.417	3.2727	0.0169	1877
132.00	Pirod 4' Side Mount Standoff (1)	5	37.072	2.7102	0.0117	1740
124.00	Pirod 4' Side Mount Standoff (1)	5	32.672	2.5085	0.0103	2372
116.00	VHLP2.5	5	28.598	2.3295	0.0091	2851
100.00	Valmont Light Duty Tri-Bracket (1)	5	21.277	2.0051	0.0072	2683
90.00	2' Dish	5	17.277	1.7928	0.0062	2733
87.00	2' Standoff	5	16.163	1.7283	0.0059	2753
70.00	Pirod 4' Side Mount Standoff (1)	5	10.585	1.3821	0.0043	2871
58.00	Pirod 4' Side Mount Standoff (1)	5	7.378	1.1543	0.0035	2992
43.00	Pirod 4' Side Mount Standoff (1)	5	4.173	0.8728	0.0025	3362
35.00	Pirod 4' Side Mount Standoff (1)	5	2.801	0.7275	0.0020	3006

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 - 180 (1)	P18x3/8	10.00	0.00	0.0	25.200	20.7640	-4734.51	523252.00	0.009
L2	180 - 140 (2)	P24x3/8	40.00	0.00	0.0	25.200	27.8325	-12419.30	701380.00	0.018
L3	140 - 120 (3)	P36x3/8	20.00	0.00	0.0	23.696	41.9697	-16451.80	994507.00	0.017
L4	120 - 100 (4)	P42x0.504 MOD	20.00	0.00	0.0	24.744	65.7032	-24409.80	1625760.00	0.015
L5	100 - 80 (5)	P48x0.486 MOD	20.00	0.00	0.0	23.503	72.5450	-31219.70	1705010.00	0.018
L6	80 - 60 (6)	P54x0.509 MOD	20.00	0.00	0.0	23.040	85.5359	-38504.80	1970740.00	0.020
L7	60 - 40 (7)	P60x0.495 MOD	20.00	0.00	0.0	22.262	92.5355	-46361.30	2059980.00	0.023
L8	40 - 20 (8)	P60x0.621 MOD	20.00	0.00	0.0	23.652	115.8440	-55771.00	2739910.00	0.020
L9	20 - 0 (9)	P60x5/8	20.00	0.00	0.0	23.696	116.5830	-64863.70	2762520.00	0.023

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 - 180 (1)	P18x3/8	10808.75	1.447	27.720	0.052	0.00	0.000	27.720	0.000
L2	180 - 140 (2)	P24x3/8	425167.50	31.522	27.720	1.137	0.00	0.000	27.720	0.000
L3	140 - 120 (3)	P36x3/8	797418.33	25.866	23.696	1.092	0.00	0.000	23.696	0.000
L4	120 - 100 (4)	P42x0.504 MOD	1263883.33	22.518	24.744	0.910	0.00	0.000	24.744	0.000
L5	100 - 80 (5)	P48x0.486 MOD	1800225.00	25.323	23.503	1.077	0.00	0.000	23.503	0.000
L6	80 - 60 (6)	P54x0.509 MOD	2384441.67	25.251	23.040	1.096	0.00	0.000	23.040	0.000

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 $\frac{f_{by}}{F_{by}}$
L7	60 - 40 (7)	P60x0.495 MOD	3011150.00	26.465	22.262	1.189	0.00	0.000	22.262	0.000
L8	40 - 20 (8)	P60x0.621 MOD	3677158.33	25.925	23.652	1.096	0.00	0.000	23.652	0.000
L9	20 - 0 (9)	P60x5/8	4373466.67	30.643	23.696	1.293	0.00	0.000	23.696	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	190 - 180 (1)	P18x3/8	4411.44	0.425	16.800	0.025	1413.14	0.095	16.800	0.006
L2	180 - 140 (2)	P24x3/8	17485.30	1.256	16.800	0.075	3209.93	0.119	16.800	0.007
L3	140 - 120 (3)	P36x3/8	19683.10	0.938	16.800	0.056	4083.36	0.066	11.901	0.006
L4	120 - 100 (4)	P42x0.504 MOD	24888.20	0.758	16.800	0.045	4419.25	0.039	14.715	0.003
L5	100 - 80 (5)	P48x0.486 MOD	28077.80	0.774	16.800	0.046	5661.68	0.040	11.405	0.003
L6	80 - 60 (6)	P54x0.509 MOD	30246.40	0.707	16.800	0.042	6046.68	0.032	10.758	0.003
L7	60 - 40 (7)	P60x0.495 MOD	32408.70	0.700	16.800	0.042	6634.74	0.029	9.600	0.003
L8	40 - 20 (8)	P60x0.621 MOD	34115.80	0.589	16.800	0.035	6870.96	0.024	12.746	0.002
L9	20 - 0 (9)	P60x5/8	35471.90	0.609	16.800	0.036	6899.75	0.024	12.848	0.002

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	190 - 180 (1)	0.009	0.052	0.000	0.025	0.006	0.062 ✓	1.333	H1-3+VT ✓
L2	180 - 140 (2)	0.018	1.137	0.000	0.075	0.007	1.162 ✓	1.333	H1-3+VT ✓
L3	140 - 120 (3)	0.017	1.092	0.000	0.056	0.006	1.112 ✓	1.333	H1-3+VT ✓
L4	120 - 100 (4)	0.015	0.910	0.000	0.045	0.003	0.927 ✓	1.333	H1-3+VT ✓
L5	100 - 80 (5)	0.018	1.077	0.000	0.046	0.003	1.098 ✓	1.333	H1-3+VT ✓
L6	80 - 60 (6)	0.020	1.096	0.000	0.042	0.003	1.118 ✓	1.333	H1-3+VT ✓
L7	60 - 40 (7)	0.023	1.189	0.000	0.042	0.003	1.213 ✓	1.333	H1-3+VT ✓
L8	40 - 20 (8)	0.020	1.096	0.000	0.035	0.002	1.118 ✓	1.333	H1-3+VT ✓

tnxTower	Job	Page
	CT11004B NEWINGTON_1	11 of 11
GPD Group 520 South Main Street Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	**Project** 2012863.82	**Date** 11:28:03 11/02/12
	Client T-Mobile Towers	**Designed by** jfields

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
L9	20 - 0 (9)	0.023	1.293	0.000	0.036	0.002	1.318 ✓	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	190 - 180	Pole	P18x3/8	1	-4734.51	697494.89	4.7	Pass
L2	180 - 140	Pole	P24x3/8	2	-12419.30	934939.50	87.1	Pass
L3	140 - 120	Pole	P36x3/8	3	-16451.80	1325677.78	83.4	Pass
L4	120 - 100	Pole	P42x0.504 MOD	4	*	*	75.6*	Pass
L5	100 - 80	Pole	P48x0.486 MOD	5	*	*	87.9*	Pass
L6	80 - 60	Pole	P54x0.509 MOD	6	*	*	90.1*	Pass
L7	60 - 40	Pole	P60x0.495 MOD	7	*	*	96.7*	Pass
L8	40 - 20	Pole	P60x0.621 MOD	8	*	*	88.7*	Pass
L9	20 - 0	Pole	P60x5/8	9	-64863.70	3682439.01	98.9	Pass
							Summary	
						Pole (L9)	98.9	Pass
						RATING =	**98.9**	**Pass**

*See Appendix 5 for modification calculations.

TOWER ELEVATION DRAWING AND FEEDLINE PLAN

Section	Size	Length (ft)	Grade	Weight (lb)
1	P18x3/8	10.00	A53-B-42	706.6
2	P24x3/8	40.00		3788.3
3	P36x3/8	20.00		2856.3
4	P42x0.504 MOD	20.00		4471.5
5	P48x0.486 MOD	20.00		4937.1
6	P54x0.509 MOD	20.00		5821.2
7	P60x0.495 MOD	20.00		6297.6
8	P60x0.621 MOD	20.00		7883.9
9	P60x5/8	20.00		7934.1
				44696.6

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Pirod 4' Side Mount Standoff (1)	189	7770.00	151
DB589	189	7770.00	151
4' Omni / Whip	189	(2) SBNH-1D6565C	151
1'x1' Panel	189	(2) AM-X-CD-16-65-00T-RET	151
4' x 2.5" Mount Pipe	189	(2) DTMABP7819VG12A	151
AIR33 Antenna	181	(2) DTMABP7819VG12A	151
AIR33 Antenna	181	(2) DTMABP7819VG12A	151
ETW190VS12UB	181	(2) SBNH-1D6565C	151
ETW190VS12UB	181	Pirod 4' Side Mount Standoff (1)	132
ETW190VS12UB	181	SRL233	132
HCS Fiber/DC Box (Large)	181	Pirod 4' Side Mount Standoff (1)	124
PiROD 16'6" LP Platform	181	DB205-A	124
(3) AIR21 Antenna	181	1'x1' Panel	124
(3) AIR21 Antenna	181	PiROD 16'6" LP Platform	116
(3) AIR21 Antenna	181	(2) 844G90VTA-SX w/Mount Pipe	116
AIR33 Antenna	181	(2) 844G90VTA-SX w/Mount Pipe	116
2' Dish	181	(2) 844G90VTA-SX w/Mount Pipe	116
LPA-80080/6CF	160	840 10054 w/ mount pipe	116
BXA-171063/12BF-EDIN-X	160	840 10054 w/ mount pipe	116
BXA-171085-12BF	160	840 10054 w/ mount pipe	116
BXA-171085-12BF	160	Samsung BTS	116
(2) LPA-80063/6CF	160	Samsung BTS	116
GPS	160	Horizon ODU	116
GPS	160	Horizon ODU	116
PiROD 13' Low Profile Platform (Monopole)	160	Samsung BTS	116
BXA-70063/6CF	160	VHLP2.5	116
BXA-70063/6CF	160	VHLP2.5	116
BXA-70063/6CF	160	742 213 w/ Mount Pipe	100
(2) LPA-80080/6CF	160	742 213 w/ Mount Pipe	100
LPA-80080/6CF	160	Valmont Light Duty Tri-Bracket (1)	100
Pirod 4' Side Mount Standoff (1)	158	742 213 w/ Mount Pipe	100
DB205-A	158	DB205-A	90
Pirod 4' Side Mount Standoff (1)	158	1'x1' Panel	90
SRL224	158	Pirod 4' Side Mount Standoff (1)	90
(2) 850/1900 dual band TMA	151	Pirod 4' Side Mount Standoff (1)	90
(2) 850/1900 dual band TMA	151	DB205-A	90
(2) 850/1900 dual band TMA	151	2' Dish	90
(2) LGP21901	151	2' Standoff	87
(2) LGP21901	151	2' Standoff	87
(2) LGP21901	151	Generic GPS	87
(2) CM1007-DBPXBC-003	151	Generic GPS	87
(2) CM1007-DBPXBC-003	151	Pirod 4' Side Mount Standoff (1)	70
(2) CM1007-DBPXBC-003	151	SRL233	70
Valmont Light Duty Tri-Bracket (1)	151	Pirod 4' Side Mount Standoff (1)	58
(2) RRUS 11	151	DB583	58
(2) RRUS 11	151	Pirod 4' Side Mount Standoff (1)	43
(2) RRUS 11	151	5' Omni	43
DC6-48-60-18-8F Surge Suppression Unit	151	Pirod 4' Side Mount Standoff (1)	35
PiROD 15' Low Profile Platform (Monopole)	151	MYA4505	35
7770.00	151		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. [illegible]

GPD Group
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Phone: (330) 572-2100
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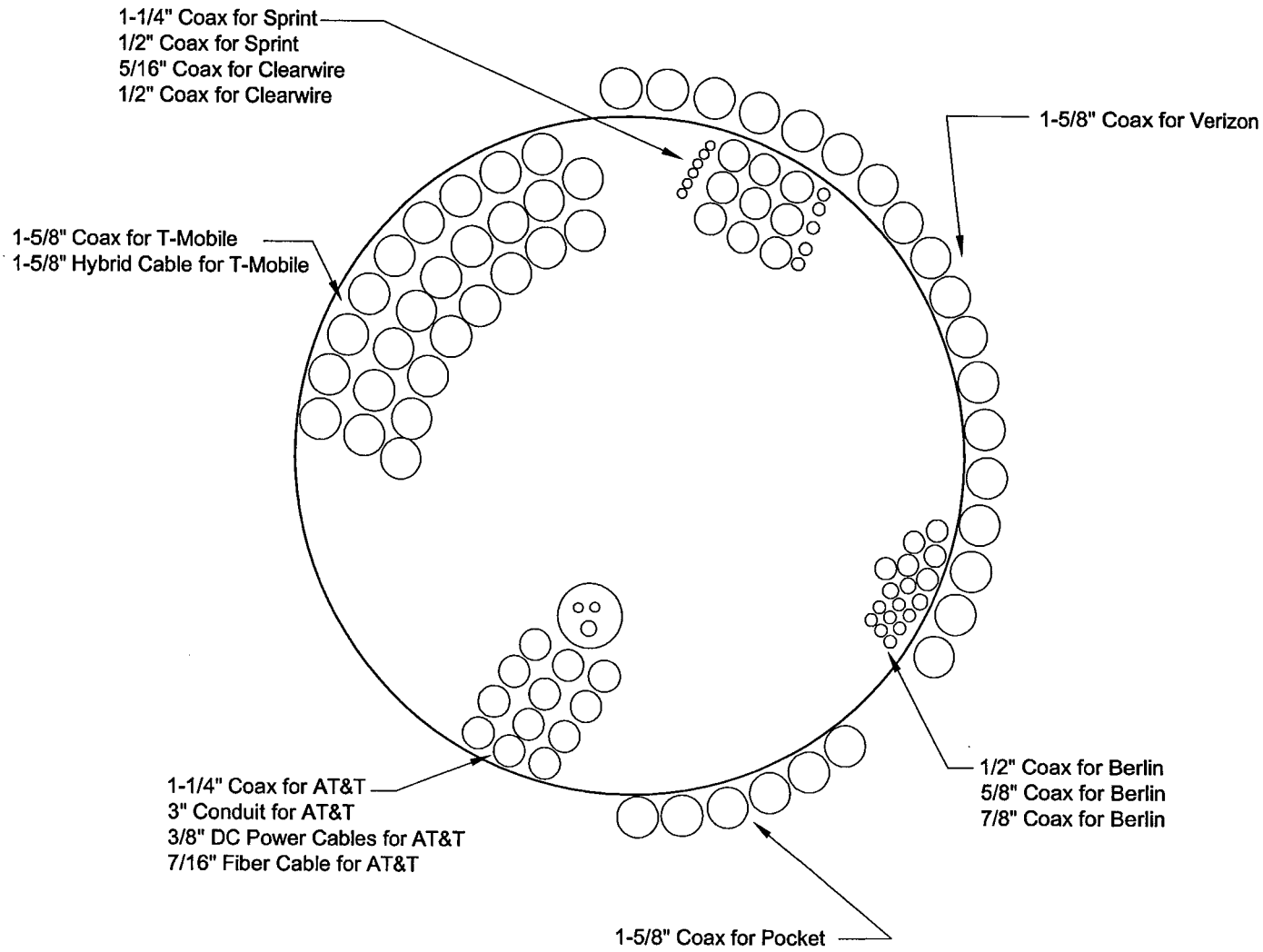
Consulting Engineers

Job: CT11004B NEWINGTON_1		
Project: 2012863.82		
Client: T-Mobile Towers	Drawn by: jfields	App'd:
Code: TIA/EIA-222-F	Date: 11/02/12	Scale: NTS
Path: C:\Users\jfields\Desktop\Drop\TNX\2012863.82\CT11004B.eri		Dwg No. E-1



FEEDLINE PLAN

NOT TO SCALE

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
520 South Main Street, Suite 2531
Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

CT11004B NEWINGTON_1

JOB NO.
2012863.82
DATE
11/2/2012
DRAWN BY
JDF

FLANGE BOLTS AND PLATES ANALYSIS

GPD GROUP

Existing Flange Connection @ 180'
CT11004B NEWINGTON_1
2012863.82

O.T. Moment =	10.81	k*ft
Axial =	4.73	kips
Shear =	4.41	kips

Acceptable Stress Ratio =	100.0%

Flange Bolts		
# Bolts =	16	
Bolt Type =	A325	
F_t =	44	ksi
ASIF =	1.333	
Bolt Circle =	21	in
Bolt Diameter =	1	in
Tension & Shear (ASD, Section J3.5)		
F_v =	21	ksi
Nominal Area =	0.79	in^2
f_v =	0.35	ksi
Applied Shear =	0.28	kips
Allowable Shear =	21.99	kips
Ft^2 - 4.39(fv^2))^1/2 =	43.99	ksi
Allowable Bolt Stress =	58.65847	ksi
B =	46.07	kips
Prying Action Check		
Tall =	42.01	kips
$t_{req'd}$ =	0.19	in
Max Comp. on Bolt =	1.84	kips
Max Tension on Bolt =	1.25	kips
Shear Capacity =	1.3%	
Tensile Capacity =	3.0%	
Bolt Capacity =	**3.0% OK**	

Pole Information		
Shaft Diam. (Upper) =	18	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	24	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Upper Flange Plate		
Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Outer Diameter =	24.375	in
wcalc =	10.82	in
wmax =	20.54	in
w =	10.82	in
S =	2.82	in^3
f_b =	1.83	ksi
F_b =	36	ksi
UP Capacity =	**5.1% OK**	

Lower Flange Plate		
Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	18	in
Pole Inner Diameter =	23.25	in
e =	1.13	in
w =	4.57	in
S =	1.19	in^3
f_b =	1.74	ksi
F_b =	36	ksi
LP Capacity =	**4.8% OK**	

UpperStiffeners	
Configuration =	None

Lower Stiffeners	
Configuration =	None

GPD GROUP

Existing Flange Connection @ 140'

CT11004B NEWINGTON_1

2012863.82

*O.T. Moment =	115.6906	k*ft
Axial =	4.27	kips
Shear =	17.49	kips

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Acceptable Stress Ratio	
=	105.0%

Flange Bolts		
# Bolts =	24	
Bolt Type =	A325	
F_t =	44	ksi
ASIF =	1.333	
Bolt Circle =	33	in
Bolt Diameter =	1	in
Tension & Shear (ASD, Section J3.5)		
F_v =	21	ksi
Nominal Area =	0.79	in^2
f_v =	0.93	ksi
Applied Shear =	0.73	kips
Allowable Shear =	21.99	kips
Ft^2 - 4.39(fv^2))^1/2 =	43.96	ksi
Allowable Bolt Stress =	58.60937	ksi
B =	46.03	kips
Prying Action Check		
Tall =	12.24	kips
$t_{req'd}$ =	0.93	in
Max Comp. on Bolt =	7.19	kips
Max Tension on Bolt =	6.83	kips
Shear Capacity =	3.3%	
Tensile Capacity =	55.8%	
Bolt Capacity =	**55.8% OK**	

Pole Information		
Shaft Diam. (Upper) =	24	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	36	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Upper Flange Plate		
Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Outer Diameter =	36.375	in
wcalc =	22.65	in
wmax =	32.59	in
w =	22.65	in
S =	5.90	in^3
f_b =	19.97	ksi
F_b =	36	ksi
UP Capacity =	**55.8% OK**	

Required plate thickness controls over plate stress ratio

UpperStiffeners	
Configuration =	None

Lower Flange Plate		
Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	24	in
Pole Inner Diameter =	35.25	in
e =	1.13	in
w =	4.61	in
S =	1.20	in^3
f_b =	6.73	ksi
F_b =	36	ksi
LP Capacity =	**18.7% OK**	

Lower Stiffeners	
Configuration =	None

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Job #: 2012863.82
Sheet No 1 Of 1

Calculated By: JDF Date: 11/2/2012
Checked By: AW Date: 11/2/2012

BOLT AND BRIDGE STIFFENER CALCULATIONS @ 140'

Tower Type = Monopole
Acceptable Sress Ratio = 105.0%
Code = TIA/EIA-222-F
ASIF = 1.333

Moment from RISA (M) = 425.17 kip-ft
Axial from RISA (P) = 12.42 kip

Inner Bolt Diameter = 1 in
Inner Bolt Area (A_{inner}) = 0.79 in^2
Inner Bolt MOI ($I_{o.inner}$) = 0.05 in^4
Number Inner Bolts (N_{inner}) = 24

Inner Bolt Circle (BC_{inner}) = 33 in
Total Area ($A_{tot.in}$) = 18.85 in^2
Percent Total Area (η_{in}) = 34.4%

Axial, Inner Bolts ($P*\eta_{in}$) = 4.27 kips

Bridge Stiffener Width = 3.00 in
Bridge Stiffener Thickness = 1.50 in
Bridge Stiffener Unbraced Length = 6.00 in
Bridge Stiffener Area (A_{pl}) = 4.50 in^2
Bridge Stiffener Average MOI (I_o) = 2.11 in^4
Number Bridge Stiffeners (N_{pl}) 8

Bridge Stiffener Circle (BC_{pl}) = 39 in
Total Area ($A_{tot.pl}$) = 36.00 in^2
Percent Total Area (η_{pl}) = 65.6%

Axial, Bridge Stiffeners ($P*\eta_{pl}$) = 8.15 kips

I_{inner} =	2567.07 $in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{outer} =	0.00 $in.^4$	$(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$
I_{pl} =	6861.38 $in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	9428.45 $in.^4$	$(I_{inner} + I_{outer} + I_{pl})$

$P_{u.t.inner}$ =	6.83 kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.outer}$ =	0.00 kips	$(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{out}/N_{outer})$
$P_{u.t.pl}$ =	46.47 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	48.50 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
ASIF*Pnt.bolt / Ω =	12.24 kips	
Bolt Rating =	55.8% OK	

Number Bridge Stiffeners (N_{pl}) 8
f_y = 50 ksi
f_u = 65 ksi
Plate Width = 3.00 in
Plate Thickness = 1.50 in
Plate Unbraced Length = 6.00 in
Plate Area (A_{pl}) = 4.50 in^2
Upper Pole Diameter = 24.00 in
Flange Plate Diameter = 36.00 in
Flange Plate to Bridge Stiffener Gap = 0.00 in
Bridge Stiffener Circle (BC_{pl}) = 39.00 in
Bridge Stiffener MOI (I_o) = 3.38 in^4
I_{pl} = 6861.38 $in.^4$ $(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
Axial Capacity Required = 48.50 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
Load Eccentricity, e = 7.50 in (from weld to center of stiffener area)
Moment Capacity Required = 0.00 kip-in
E = 29000 ksi
K = 0.80
r_{min} = 0.43
KL/r_{min} = 11.085
F_e = 2329.25 ksi
F_{cr} = 49.55 ksi
Pnc / Ω = 133.53 kips
Pnt / Ω = 134.73 kips
S = 2.25 in^3
Z = 3.38 in^3
$L_b d/t^2$ = 8.00
M_{nLTB} = n/a
M_p = 168.75 kip-in
Mn/ Ω = 101.05 kip-in
Stiffener Rating = 27.2% OK

Bridge Stiffener Welds: Analysis
Bridge Stiffener Height = 15.00 in
a value (from AISC Table 8-4) = 0.500
C value (from AISC Table 8-4) = 2.29
Fillet Size = 0.3125 in
Weld Rating = 42.4% OK

GPD GROUP

Existing Flange Connection @ 120'
CT11004B NEWINGTON_1
2012863.82

*O.T. Moment =	187.8142	k*ft
Axial =	5.4	kips
Shear =	19.68	kips

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Acceptable Stress Ratio	
=	105.0%

Flange Bolts		
# Bolts =	28	
Bolt Type =	A325	
F_t =	44	ksi
ASIF =	1.333	
Bolt Circle =	39	in
Bolt Diameter =	1	in
Tension & Shear (ASD, Section J3.5)		
F_v =	21	ksi
Nominal Area =	0.79	in^2
f_v =	0.89	ksi
Applied Shear =	0.70	kips
Allowable Shear =	21.99	kips
Ft^2 - 4.39(fv^2))^1/2 =	43.96	ksi
Allowable Bolt Stress =	58.61337	ksi
B =	46.03	kips
Prying Action Check		
Tall =	43.47	kips
$t_{req'd}$ =	0.44	in
Max Comp. on Bolt =	8.45	kips
Max Tension on Bolt =	8.06	kips
Shear Capacity =	3.2%	
Tensile Capacity =	18.5%	
Bolt Capacity =	**18.5% OK**	

Pole Information		
Shaft Diam. (Upper) =	36	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	42	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Upper Flange Plate		
Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Outer Diameter =	42.375	in
wcalc =	15.00	in
wmax =	25.38	in
w =	15.00	in
S =	3.91	in^3
f_b =	7.58	ksi
F_b =	36	ksi
UP Capacity =	**21.0% OK**	

Lower Flange Plate		
Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	36	in
Pole Inner Diameter =	41.25	in
e =	1.13	in
w =	4.63	in
S =	1.21	in^3
f_b =	7.88	ksi
F_b =	36	ksi
LP Capacity =	**21.9% OK**	

UpperStiffeners	
Configuration =	None

Lower Stiffeners	
Configuration =	None

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Job #: 2012863.82
Sheet No 1 Of 1

Calculated By: JDF Date: 11/2/2012
Checked By: AW Date: 11/2/2012

BOLT AND BRIDGE STIFFENER CALCULATIONS @ 120'

Tower Type = Monopole
Acceptable Sress Ratio = 105.0%
Code = TIA/EIA-222-F
ASIF = 1.333

Moment from RISA (M) = 797.42 kip-ft
Axial from RISA (P) = 16.45 kip

Inner Bolt Diameter = 1 in
Inner Bolt Area (A_{inner}) = 0.79 in^2
Inner Bolt MOI ($I_{o.inner}$) = 0.05 in^4
Number Inner Bolts (N_{inner}) = 28

Inner Bolt Circle (BC_{inner}) = 39 in
Total Area ($A_{tot.in}$) = 21.99 in^2
Percent Total Area (η_{in}) = 32.8%

Axial, Inner Bolts ($P*\eta_{in}$) = 5.40 kips

Bridge Stiffener Width = 6.00 in
Bridge Stiffener Thickness = 1.25 in
Bridge Stiffener Unbraced Length = 12.00 in
Bridge Stiffener Area (A_{pl}) = 7.50 in^2
Bridge Stiffener Average MOI (I_o) = 11.74 in^4
Number Bridge Stiffeners (N_{pl}) 6

Bridge Stiffener Circle (BC_{pl}) = 49 in
Total Area ($A_{tot.pl}$) = 45.00 in^2
Percent Total Area (η_{pl}) = 67.2%

Axial, Bridge Stiffeners ($P*\eta_{pl}$) = 11.05 kips

I_{inner} = 4182.44 $in.^4$ ($N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner}$)
I_{outer} = 0.00 $in.^4$ ($N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer}$)
I_{pl} = 13576.05 $in.^4$ ($N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl}$)
I_{tot} = 17758.50 $in.^4$ ($I_{inner} + I_{outer} + I_{pl}$)

$P_{u.t.inner}$ = 8.06 kips $(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner}$
$P_{u.t.outer}$ = 0.00 kips $(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{our}/N_{outer}$
$P_{u.t.pl}$ = 97.17 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl}$
$P_{u.c.pl}$ = 100.85 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl}$
ASIF*Pnt.bolt / Ω = 43.47 kips
Bolt Rating = 18.5% OK

Number Bridge Stiffeners (N_{pl}) 6
f_y = 50 ksi
f_u = 65 ksi
Plate Width = 6.00 in
Plate Thickness = 1.25 in
Plate Unbraced Length = 12.00 in
Plate Area (A_{pl}) = 7.50 in^2
Upper Pole Diameter = 36.00 in
Flange Plate Diameter = 42.00 in
Flange Plate to Bridge Stiffener Gap = 0.50 in
Bridge Stiffener Circle (BC_{pl}) = 49.00 in
Bridge Stiffener MOI (I_o) = 22.50 in^4
I_{pl} = 13576.05 $in.^4$ ($N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl}$)
Axial Capacity Required = 100.85 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl}$
Load Eccentricity, e = 6.50 in (from weld to center of stiffener area)
Moment Capacity Required = 0.00 kip-in
E = 29000 ksi
K = 0.80
r_{min} = 0.36
KL/r_{min} = 26.604
F_e = 404.38 ksi
F_{cr} = 47.48 ksi
Pnc / Ω = 213.23 kips
Pnt / Ω = 224.55 kips
S = 7.50 in^3
Z = 11.25 in^3
$L_b d/t^2$ = 46.08
M_{nLTB} = n/a
M_p = 562.50 kip-in
Mn/ Ω = 336.83 kip-in
Stiffener Rating = 35.5% OK

Bridge Stiffener Welds Analysis
Bridge Stiffener Height = 27.00 in
a value (from AISC Table 8-4) = 0.241
C value (from AISC Table 8-4) = 3.35
Fillet Size = 0.3750 in
Weld Rating = 27.9% OK

GPD GROUP

Existing Flange Connection @ 100'
CT11004B NEWINGTON_1
2012863.82

*O.T. Moment =	343.0878	k*ft
Axial =	8.75	kips
Shear =	24.89	kips

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Acceptable Stress Ratio =	105.0%

Flange Bolts		
# Bolts =	32	
Bolt Type =	A325	
F_t =	44	ksi
ASIF =	1.333	
Bolt Circle =	45	in
Bolt Diameter =	1	in
Tension & Shear (ASD, Section J3.5)		
F_v =	21	ksi
Nominal Area =	0.79	in^2
f_v =	0.99	ksi
Applied Shear =	0.78	kips
Allowable Shear =	21.99	kips
Ft^2 - 4.39(fv^2))^1/2 =	43.95	ksi
Allowable Bolt Stress =	58.60139	ksi
B =	46.03	kips
Prying Action Check		
Tall =	43.71	kips
$t_{req'd}$ =	0.51	in
Max Comp. on Bolt =	11.71	kips
Max Tension on Bolt =	11.16	kips
Shear Capacity =	3.5%	
Tensile Capacity =	25.5%	
Bolt Capacity =	**25.5% OK**	

Pole Information		
Shaft Diam. (Upper) =	42	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	48	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Upper Flange Plate		
Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Outer Diameter =	48.375	in
wcalc =	16.16	in
wmax =	25.56	in
w =	16.16	in
S =	4.21	in^3
f_b =	10.54	ksi
F_b =	36	ksi
UP Capacity =	**29.3% OK**	

Lower Flange Plate		
Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	42	in
Pole Inner Diameter =	47.25	in
e =	1.13	in
w =	4.64	in
S =	1.21	in^3
f_b =	10.90	ksi
F_b =	36	ksi
LP Capacity =	**30.3% OK**	

UpperStiffeners	
Configuration =	None

Lower Stiffeners	
Configuration =	None

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Job #: 2012863.82
Sheet No 1 Of 1

Calculated By: JDF Date: 11/2/2012
Checked By: AW Date: 11/2/2012

BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 100'

Tower Type = Monopole
Acceptable Sress Ratio = 105.0%
Code = TIA/EIA-222-F
ASIF = 1.333

Moment from RISA (M) = 1263.88 kip-ft
Axial from RISA (P) = 24.41 kip

Inner Bolt Diameter = 1 in
Inner Bolt Area (A_{inner}) = 0.79 in^2
Inner Bolt MOI ($I_{o.inner}$) = 0.05 in^4
Number Inner Bolts (N_{inner}) = 32

Inner Bolt Circle (BC_{inner}) = 45 in
Total Area ($A_{tot.in}$) = 25.13 in^2
Percent Total Area (η_{in}) = 35.8%

Axial, Inner Bolts ($P*\eta_{in}$) = 8.75 kips

Bridge Stiffener Width = 6.00 in
Bridge Stiffener Thickness = 1.25 in
Bridge Stiffener Unbraced Length = 12.00 in
Bridge Stiffener Area (A_{pl}) = 7.50 in^2
Bridge Stiffener Average MOI (I_o) = 11.74 in^4
Number Bridge Stiffeners (N_{pl}) 6

Bridge Stiffener Circle (BC_{pl}) = 55 in
Total Area ($A_{tot.pl}$) = 45.00 in^2
Percent Total Area (η_{pl}) = 64.2%

Axial, Bridge Stiffeners ($P*\eta_{pl}$) = 15.66 kips

I_{inner} =	6363.30 $in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{outer} =	0.00 $in.^4$	$(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$
I_{pl} =	17086.05 $in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	23449.35 $in.^4$	$(I_{inner} + I_{outer} + I_{pl})$

$P_{u.t.inner}$ =	11.16 kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.outer}$ =	0.00 kips	$(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{out}/N_{outer})$
$P_{u.t.pl}$ =	130.79 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	136.01 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
ASIF*Pnt.bolt / Ω =	43.71 kips	
Bolt Rating =	25.5% OK	

Number Bridge Stiffeners (N_{pl}) 6
f_y = 50 ksi
f_u = 65 ksi
Plate Width = 6.00 in
Plate Thickness = 1.25 in
Plate Unbraced Length = 12.00 in
Plate Area (A_{pl}) = 7.50 in^2
Upper Pole Diameter = 42.00 in
Flange Plate Diameter = 48.00 in
Flange Plate to Bridge Stiffener Gap = 0.50 in
Bridge Stiffener Circle (BC_{pl}) = 55.00 in
Bridge Stiffener MOI (I_o) = 22.50 in^4
I_{pl} = 17086.05 $in.^4$ $(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
Axial Capacity Required = 136.01 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
Load Eccentricity, e = 6.50 in (from weld to center of stiffener area)
Moment Capacity Required = 0.00 kip-in
E = 29000 ksi
K = 0.80
r_{min} = 0.36
KL/r_{min} = 26.604
F_e = 404.38 ksi
F_{cr} = 47.48 ksi
Pnc / Ω = 213.23 kips
Pnt / Ω = 224.55 kips
S = 7.50 in^3
Z = 11.25 in^3
L_bd/t^2 = 46.08
M_{nLTB} = n/a
M_p = 562.50 kip-in
Mn/ Ω = 336.83 kip-in
Stiffener Rating = 47.8% OK

Bridge Stiffener Welds Analysis
Bridge Stiffener Height = 27.00 in
a value (from AISC Table 8-4) = 0.241
C value (from AISC Table 8-4) = 3.35
Fillet Size = 0.3750 in
Weld Rating = 37.6% OK

GPD GROUP

Existing Flange Connection @ 80'
CT11004B NEWINGTON_1
2012863.82

*O.T. Moment =	547.9941	k*ft
Axial =	12.05	kips
Shear =	28.08	kips

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Acceptable Stress Ratio	
=	100.0%

Flange Bolts		
# Bolts =	36	
Bolt Type =	A325	
F_t =	44	ksi
ASIF =	1.333	
Bolt Circle =	51	in
Bolt Diameter =	1	in
Tension & Shear (ASD, Section J3.5)		
F_v =	21	ksi
Nominal Area =	0.79	in^2
f_v =	0.99	ksi
Applied Shear =	0.78	kips
Allowable Shear =	21.99	kips
Ft^2 - 4.39(fv^2))^1/2 =	43.95	ksi
Allowable Bolt Stress =	58.60103	ksi
B =	46.03	kips
Prying Action Check		
Tall =	43.91	kips
$t_{req'd}$ =	0.56	in
Max Comp. on Bolt =	14.66	kips
Max Tension on Bolt =	13.99	kips
Shear Capacity =	3.5%	
Tensile Capacity =	31.9%	
Bolt Capacity =	**31.9% OK**	

Pole Information		
Shaft Diam. (Upper) =	48	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	54	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Upper Flange Plate		
Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Outer Diameter =	54.375	in
wcalc =	17.23	in
wmax =	25.70	in
w =	17.23	in
S =	4.49	in^3
f_b =	13.12	ksi
F_b =	36	ksi
UP Capacity =	**36.4% OK**	

UpperStiffeners	
Configuration =	None

Lower Flange Plate		
Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	48	in
Pole Inner Diameter =	53.25	in
e =	1.13	in
w =	4.65	in
S =	1.21	in^3
f_b =	13.63	ksi
F_b =	36	ksi
LP Capacity =	**37.9% OK**	

Lower Stiffeners	
Configuration =	None

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Job #: 2012863.82
Sheet No 1 Of 1

Calculated By: JDF Date: 11/2/2012
Checked By: AW Date: 11/2/2012

BOLT AND BRIDGE STIFFENER CALCULATIONS @ 80'

Tower Type = Monopole
Acceptable Sress Ratio = 105.0%
Code = TIA/EIA-222-F
ASIF = 1.333

Moment from RISA (M) = 1800.23 kip-ft
Axial from RISA (P) = 31.22 kip

Inner Bolt Diameter = 1 in
Inner Bolt Area (A_{inner}) = 0.79 in^2
Inner Bolt MOI ($I_{o.inner}$) = 0.05 in^4
Number Inner Bolts (N_{inner}) = 36

Inner Bolt Circle (BC_{inner}) = 51 in
Total Area ($A_{tot.in}$) = 28.27 in^2
Percent Total Area (η_{in}) = 38.6%

Axial, Inner Bolts ($P*\eta_{in}$) = 12.05 kips

Bridge Stiffener Width = 6.00 in
Bridge Stiffener Thickness = 1.25 in
Bridge Stiffener Unbraced Length = 6.00 in
Bridge Stiffener Area (A_{pl}) = 7.50 in^2
Bridge Stiffener Average MOI (I_o) = 11.74 in^4
Number Bridge Stiffeners (N_{pl}) 6

Bridge Stiffener Circle (BC_{pl}) = 61 in
Total Area ($A_{tot.pl}$) = 45.00 in^2
Percent Total Area (η_{pl}) = 61.4%

Axial, Bridge Stiffeners ($P*\eta_{pl}$) = 19.17 kips

I_{inner} =	9194.46 $in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o\,inner})$
I_{outer} =	0.00 $in.^4$	$(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$
I_{pl} =	21001.05 $in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	30195.51 $in.^4$	$(I_{inner} + I_{outer} + I_{pl})$

$P_{u.t.inner}$ =	13.99 kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.outer}$ =	0.00 kips	$(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{out}/N_{outer})$
$P_{u.t.pl}$ =	160.46 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	166.85 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
ASIF*Pnt.bolt / Ω =	43.91 kips	
Bolt Rating =	31.9% OK	

Number Bridge Stiffeners (N_{pl}) 6
f_y = 50 ksi
f_u = 65 ksi
Plate Width = 6.00 in
Plate Thickness = 1.25 in
Plate Unbraced Length = 6.00 in
Plate Area (A_{pl}) = 7.50 in^2
Upper Pole Diameter = 48.00 in
Flange Plate Diameter = 54.00 in
Flange Plate to Bridge Stiffener Gap = 0.50 in
Bridge Stiffener Circle (BC_{pl}) = 61.00 in
Bridge Stiffener MOI (I_o) = 22.50 in^4
I_{pl} = 21001.05 $in.^4$ $(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
Axial Capacity Required = 166.85 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
Load Eccentricity, e = 6.50 in (from weld to center of stiffener area)
Moment Capacity Required = 0.00 kip-in
E = 29000 ksi
K = 0.80
r_{min} = 0.36
KL/r_{min} = 13.302
F_e = 1617.54 ksi
F_{cr} = 49.36 ksi
Pnc / Ω = 221.66 kips
Pnt / Ω = 224.55 kips
S = 7.50 in^3
Z = 11.25 in^3
$L_b d/t^2$ = 23.04
M_{nLTB} = n/a
M_p = 562.50 kip-in
Mn/ Ω = 336.83 kip-in
Stiffener Rating = 56.5% OK

Bridge Stiffener Welds: Analysis
Bridge Stiffener Height = 27.00 in
a value (from AISC Table 8-4) = 0.241
C value (from AISC Table 8-4) = 3.35
Fillet Size = 0.3750 in
Weld Rating = 46.1% OK

GPD GROUP

Existing Flange Connection @ 60'
CT11004B NEWINGTON_1
2012863.82

*O.T. Moment =	898.672	k*ft
Axial =	17.55	kips
Shear =	30.25	kips

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Acceptable Stress Ratio =	100.0%

Flange Bolts

# Bolts =	48	
Bolt Type =	A325	
F_t =	44	ksi
ASIF =	1.333	
Bolt Circle =	57	in
Bolt Diameter =	1	in
Tension & Shear (ASD, Section J3.5)		
F_v =	21	ksi
Nominal Area =	0.79	in^2
f_v =	0.80	ksi
Applied Shear =	0.63	kips
Allowable Shear =	21.99	kips
Ft^2 - 4.39(fv^2))^1/2 =	43.97	ksi
Allowable Bolt Stress =	58.62382	ksi
B =	46.04	kips
Prying Action Check		
N/A for stiffened flange		
Max Comp. on Bolt =	16.13	kips
Max Tension on Bolt =	15.40	kips
Shear Capacity =	2.9%	
Tensile Capacity =	33.4%	
Bolt Capacity =	**33.4% OK**	

Pole Information

Shaft Diam. (Upper) =	54	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	60	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Upper Flange Plate

Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Outer Diameter =	60.375	in
b =	3.11	in
Le =	3.00	in
f_b =	13.11	ksi
F_b =	36	ksi
UP Capacity =	**36.4% OK**	

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	54	in
b =	3.11	in
Le =	2.00	in
f_b =	15.66	ksi
F_b =	36	ksi
LP Capacity =	**43.5% OK**	

UpperStiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	3	in
Notch =	0.5	in
Height =	5	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	9.22	kips
Vert. Weld Capacity =	*Not Verified*	kips
Horiz. Weld Capacity =	*Not Verified*	kips
Stiffener Capacity =	36.1%	kips
Controlling Capacity =	**36.1%**	**OK**

Lower Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	2	in
Notch =	0.5	in
Height =	3.5	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	5.96	kips
Vert. Weld Capacity =	*Not Verified*	kips
Horiz. Weld Capacity =	*Not Verified*	kips
Stiffener Capacity =	33.0%	kips
Controlling Capacity =	**33.0%**	**OK**

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Job #: 2012863.82
Sheet No 1 Of 1

Calculated By: JDF Date: 11/2/2012
Checked By: AW Date: 11/2/2012

BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 60'

Tower Type = Monopole
Acceptable Sress Ratio = 105.0%
Code = TIA/EIA-222-F
ASIF = 1.333

Moment from RISA (M) = 2384.44 kip-ft
Axial from RISA (P) = 38.50 kip

Inner Bolt Diameter = 1 in
Inner Bolt Area (A_{inner}) = 0.79 in^2
Inner Bolt MOI ($I_{o.inner}$) = 0.05 in^4
Number Inner Bolts (N_{inner}) = 48

Inner Bolt Circle (BC_{inner}) = 57 in
Total Area ($A_{tot.in}$) = 37.70 in^2
Percent Total Area (η_{in}) = 45.6%

Axial, Inner Bolts ($P*\eta_{in}$) = 17.55 kips

Bridge Stiffener Width = 6.00 in
Bridge Stiffener Thickness = 1.25 in
Bridge Stiffener Unbraced Length = 6.00 in
Bridge Stiffener Area (A_{pl}) = 7.50 in^2
Bridge Stiffener Average MOI (I_o) = 11.74 in^4
Number Bridge Stiffeners (N_{pl}) 6

Bridge Stiffener Circle (BC_{pl}) = 67 in
Total Area ($A_{tot.pl}$) = 45.00 in^2
Percent Total Area (η_{pl}) = 54.4%

Axial, Bridge Stiffeners ($P*\eta_{pl}$) = 20.95 kips

I_{inner} =	15312.91 $in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{outer} =	0.00 $in.^4$	$(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$
I_{pl} =	25321.05 $in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	40633.96 $in.^4$	$(I_{inner} + I_{outer} + I_{pl})$

$P_{u.t.inner}$ =	15.40 kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.outer}$ =	0.00 kips	$(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{our}/N_{outer})$
$P_{u.t.pl}$ =	173.43 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	180.41 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
ASIF*Pnt.bolt / Ω =	46.04 kips	
Bolt Rating =	33.4% OK	

Number Bridge Stiffeners (N_{pl}) 6
f_y = 50 ksi
f_u = 65 ksi
Plate Width = 6.00 in
Plate Thickness = 1.25 in
Plate Unbraced Length = 6.00 in
Plate Area (A_{pl}) = 7.50 in^2
Upper Pole Diameter = 54.00 in
Flange Plate Diameter = 60.00 in
Flange Plate to Bridge Stiffener Gap = 0.50 in
Bridge Stiffener Circle (BC_{pl}) = 67.00 in
Bridge Stiffener MOI (I_o) = 22.50 in^4
I_{pl} = 25321.05 $in.^4$ $(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
Axial Capacity Required = 180.41 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
Load Eccentricity, e = 6.50 in (from weld to center of stiffener area)
Moment Capacity Required = 0.00 kip-in
E = 29000 ksi
K = 0.80
r_{min} = 0.36
KL/r_{min} = 13.302
F_e = 1617.54 ksi
F_{cr} = 49.36 ksi
Pnc / Ω = 221.66 kips
Pnt / Ω = 224.55 kips
S = 7.50 in^3
Z = 11.25 in^3
L_bd/t^2 = 23.04
M_{nLTB} = n/a
M_p = 562.50 kip-in
Mn/ Ω = 336.83 kip-in
Stiffener Rating = 61.0% OK

Bridge Stiffener Welds Analysis
Bridge Stiffener Height = 27.00 in
a value (from AISC Table 8-4) = 0.241
C value (from AISC Table 8-4) = 3.35
Fillet Size = 0.3750 in
Weld Rating = 49.9% OK

GPD GROUP

Existing Flange Connection @ 40'
CT11004B NEWINGTON_1
2012863.82

*O.T. Moment =	1480.236	k*ft
Axial =	29.47	kips
Shear =	32.41	kips

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Acceptable Stress Ratio =	100.0%

Flange Bolts

# Bolts =	32	
Bolt Type =	A325	
F_t =	44	ksi
ASIF =	1.333	
Bolt Circle =	50	in
Bolt Diameter =	1.713321	in

Tension & Shear (ASD, Section J3.5)

F_v =	21	ksi
Nominal Area =	2.31	in^2
f_v =	0.44	ksi
Applied Shear =	1.01	kips
Allowable Shear =	64.55	kips
Ft^2 - 4.39(fv^2))^1/2 =	43.99	ksi
Allowable Bolt Stress =	58.65383	ksi
B =	135.23	kips

Prying Action Check

N/A for stiffened flange

Max Comp. on Bolt =	45.30	kips
Max Tension on Bolt =	43.46	kips
Shear Capacity =	1.6%	
Tensile Capacity =	32.1%	
Bolt Capacity =	**32.1%**	**OK**

Pole Information

Shaft Diam. (Upper) =	60	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	60	in
Thickness (Lower)=	0.5	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Upper Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	44	in
b =	4.28	in
Le =	7.00	in
f_b =	18.45	ksi
F_b =	36	ksi
UP Capacity =	**51.3%**	**OK**

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	44	in
b =	4.28	in
Le =	7.00	in
f_b =	18.74	ksi
F_b =	36	ksi
LP Capacity =	**52.1%**	**OK**

UpperStiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	25.51	kips
Vert. Weld Capacity =	*Not Verified*	kips
Horiz. Weld Capacity =	*Not Verified*	kips
Stiffener Capacity =	52.4%	kips
Controlling Capacity =	**52.4%**	**OK**

Lower Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	22.48	kips
Vert. Weld Capacity =	*Not Verified*	kips
Horiz. Weld Capacity =	*Not Verified*	kips
Stiffener Capacity =	46.2%	kips
Controlling Capacity =	**46.2%**	**OK**

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Job #: 2012863.82
Sheet No 1 Of 1

Calculated By: JDF Date: 11/2/2012
Checked By: AW Date: 11/2/2012

BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 40'

Tower Type = Monopole
Acceptable Sress Ratio = 105.0%
Code = TIA/EIA-222-F
ASIF = 1.333

Moment from RISA (M) = 3011.15 kip-ft
Axial from RISA (P) = 46.36 kip

Inner Bolt Diameter = 1.25 in
Inner Bolt Area (A_{inner}) = 1.23 in^2
Inner Bolt MOI ($I_{o.inner}$) = 0.12 in^4
Number Inner Bolts (N_{inner}) = 32

Inner Bolt Circle (BC_{inner}) = 47 in
Total Area ($A_{tot.in}$) = 39.27 in^2
Percent Total Area (η_{in}) = 31.8%

Axial, Inner Bolts ($P*\eta_{in}$) = 14.74 kips

Outer Bolt Diameter = 1.25 in
Outer Bolt Area (A_{outer}) = 1.23 in^2
Outer Bolt MOI ($I_{o.outer}$) = 0.12 in^4
Number Outer Bolts (N_{outer}) = 32

Outer Bolt Circle (BC_{outer}) = 53 in
Total Area ($A_{tot.out}$) = 39.27 in^2
Percent Total Area (η_{out}) = 31.8%

Axial, Outer Bolts ($P*\eta_{out}$) = 14.74 kips

Bridge Stiffener Width = 6.00 in
Bridge Stiffener Thickness = 1.25 in
Bridge Stiffener Unbraced Length = 6.00 in
Bridge Stiffener Area (A_{pl}) = 7.50 in^2
Bridge Stiffener Average MOI (I_b) = 11.74 in^4
Number Bridge Stiffeners (N_{pl}) = 6

Bridge Stiffener Circle (BC_{pl}) = 67 in
Total Area ($A_{tot.pl}$) = 45.00 in^2
Percent Total Area (η_{pl}) = 36.4%

Axial, Bridge Stiffeners ($P*\eta_{pl}$) = 16.89 kips

I_{inner} = 10847.24 $in.^4$ $(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{outer} = 13792.48 $in.^4$ $(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$
I_{pl} = 25321.05 $in.^4$ $(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} = 49960.77 $in.^4$ $(I_{inner} + I_{outer} + I_{pl})$

$P_{u.t.inner}$ = 20.40 kips $(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.outer}$ = 23.06 kips $(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{out}/N_{outer})$
$P_{u.t.pl}$ = 178.90 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ = 184.53 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
ASIF*Pnt.bolt / Ω = 71.94 kips
Bolt Rating = 32.1% OK

Number Bridge Stiffeners (N_{pl}) 6
f_y = 50 ksi
f_u = 65 ksi
Plate Width = 6.00 in
Plate Thickness = 1.25 in
Plate Unbraced Length = 6.00 in
Plate Area (A_{pl}) = 7.50 in^2
Upper Pole Diameter = 60.00 in
Flange Plate Diameter = 60.00 in
Flange Plate to Bridge Stiffener Gap = 0.50 in
Bridge Stiffener Circle (BC_{pl}) = 67.00 in
Bridge Stiffener MOI (I_b) = 22.50 in^4
I_{pl} = 25321.05 $in.^4$ $(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
Axial Capacity Required = 184.53 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
Load Eccentricity, e = 3.50 in (from weld to center of stiffener area)
Moment Capacity Required = 0.00 kip-in
E = 29000 ksi
K = 0.80
r_{min} = 0.36
KL/r_{min} = 13.302
F_e = 1617.54 ksi
F_{cr} = 49.36 ksi
Pnc / Ω = 221.66 kips
Pnt / Ω = 224.55 kips
S = 7.50 in^3
Z = 11.25 in^3
L_bd/t^2 = 23.04
M_{nLTB} = n/a
M_p = 562.50 kip-in
Mn/ Ω = 336.83 kip-in
Stiffener Rating = 62.4% OK

Bridge Stiffener Welds Analysis
Bridge Stiffener Height = 27.00 in
a value (from AISC Table 8-4) = 0.130
C value (from AISC Table 8-4) = 3.67
Fillet Size = 0.3750 in
Weld Rating = 46.6% OK

GPD GROUP

Existing Flange Connection @ 20'

CT11004B NEWINGTON_1

2012863.82

*O.T. Moment =	1807.666	k*ft
Axial =	35.46	kips
Shear =	34.12	kips

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Acceptable Stress Ratio =	100.0%

Flange Bolts

# Bolts =	32	
Bolt Type =	A325	
F_t =	44	ksi
ASIF =	1.333	
Bolt Circle =	50	in
Bolt Diameter =	1.71399	in

Tension & Shear (ASD, Section J3.5)

F_v =	21	ksi
Nominal Area =	2.31	in²
f_v =	0.46	ksi
Applied Shear =	1.07	kips
Allowable Shear =	64.60	kips
Ft^2 - 4.39(fv^2))^1/2 =	43.99	ksi
Allowable Bolt Stress =	58.65246	ksi
B =	135.33	kips

Prying Action Check

N/A for stiffened flange

Max Comp. on Bolt =	55.31	kips
Max Tension on Bolt =	53.09	kips
Shear Capacity =	1.7%	
Tensile Capacity =	39.2%	
Bolt Capacity =	**39.2%**	**OK**

Pole Information

Shaft Diam. (Upper) =	60	in
Thickness (Upper)=	0.5	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	60	in
Thickness (Lower)=	0.625	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Upper Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	44	in
b =	4.28	in
Le =	7.00	in
f_b =	22.88	ksi
F_b =	36	ksi
UP Capacity =	**63.6%**	**OK**

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	44	in
b =	4.28	in
Le =	7.00	in
f_b =	23.25	ksi
F_b =	36	ksi
LP Capacity =	**64.6%**	**OK**

UpperStiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	27.44	kips
Vert. Weld Capacity =	*Not Verified*	kips
Horiz. Weld Capacity =	*Not Verified*	kips
Stiffener Capacity =	56.3%	kips
Controlling Capacity =	**56.3%**	**OK**

Lower Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	24.54	kips
Vert. Weld Capacity =	*Not Verified*	kips
Horiz. Weld Capacity =	*Not Verified*	kips
Stiffener Capacity =	50.4%	kips
Controlling Capacity =	**50.4%**	**OK**

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GPD GROUP
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Job #: 2012863.82
Sheet No 1 Of 1

Calculated By: JDF Date: 11/2/2012
Checked By: AW Date: 11/2/2012

BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 20'

Tower Type = Monopole
Acceptable Sress Ratio = 105.0%
Code = TIA/EIA-222-F
ASIF = 1.333

Moment from RISA (M) = 3677.16 kip-ft
Axial from RISA (P) = 55.77 kip

Inner Bolt Diameter = 1.25 in
Inner Bolt Area (A_{inner}) = 1.23 in^2
Inner Bolt MOI ($I_{o.inner}$) = 0.12 in^4
Number Inner Bolts (N_{inner}) = 32

Inner Bolt Circle (BC_{inner}) = 47 in
Total Area ($A_{tot.in}$) = 39.27 in^2
Percent Total Area (η_{in}) = 31.8%

Axial, Inner Bolts ($P*\eta_{in}$) = 17.73 kips

Outer Bolt Diameter = 1.25 in
Outer Bolt Area (A_{outer}) = 1.23 in^2
Outer Bolt MOI ($I_{o.outer}$) = 0.12 in^4
Number Outer Bolts (N_{outer}) = 32

Outer Bolt Circle (BC_{outer}) = 53 in
Total Area ($A_{tot.out}$) = 39.27 in^2
Percent Total Area (η_{out}) = 31.8%

Axial, Outer Bolts ($P*\eta_{out}$) = 17.73 kips

Bridge Stiffener Width = 6.00 in
Bridge Stiffener Thickness = 1.25 in
Bridge Stiffener Unbraced Length = 14.00 in
Bridge Stiffener Area (A_{pl}) = 7.50 in^2
Bridge Stiffener Average MOI (I_o) = 11.74 in^4
Number Bridge Stiffeners (N_{pl}) 6

Bridge Stiffener Circle (BC_{pl}) = 67 in
Total Area ($A_{tot.pl}$) = 45.00 in^2
Percent Total Area (η_{pl}) = 36.4%

Axial, Bridge Stiffeners ($P*\eta_{pl}$) = 20.31 kips

I_{inner} =	10847.24 $in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{outer} =	13792.48 $in.^4$	$(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$
I_{pl} =	25321.05 $in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	49960.77 $in.^4$	$(I_{inner} + I_{outer} + I_{pl})$

$P_{u.t.inner}$ =	24.92 kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.outer}$ =	28.17 kips	$(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{out}/N_{outer})$
$P_{u.t.pl}$ =	218.52 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	225.29 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
ASIF*Pnt.bolt / Ω =	71.93 kips	
Bolt Rating =	39.2% OK	

Number Bridge Stiffeners (N_{pl}) 6
f_y = 50 ksi
f_u = 65 ksi
Plate Width = 6.00 in
Plate Thickness = 1.25 in
Plate Unbraced Length = 14.00 in
Plate Area (A_{pl}) = 7.50 in^2
Upper Pole Diameter = 60.00 in
Flange Plate Diameter = 60.00 in
Flange Plate to Bridge Stiffener Gap = 0.50 in
Bridge Stiffener Circle (BC_{pl}) = 67.00 in
Bridge Stiffener MOI (I_o) = 22.50 in^4
I_{pl} = 25321.05 $in.^4$ $(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
Axial Capacity Required = 225.29 kips $(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
Load Eccentricity, e = 3.50 in (from weld to center of stiffener area)
Moment Capacity Required = 0.00 kip-in
E = 29000 ksi
K = 0.80
r_{min} = 0.36
KL/r_{min} = 31.038
F_e = 297.10 ksi
F_{cr} = 46.60 ksi
Pnc / Ω = 209.28 kips
Pnt / Ω = 224.55 kips
S = 7.50 in^3
Z = 11.25 in^3
L_bd/t^2 = 53.76
M_{nLTB} = 560.48
M_p = 562.50 kip-in
Mn/ Ω = 335.61 kip-in
Stiffener Rating = 80.7% OK

Bridge Stiffener Welds: Analysis
Bridge Stiffener Height = 27.00 in
a value (from AISC Table 8-4) = 0.130
C value (from AISC Table 8-4) = 3.67
Fillet Size = 0.3750 in
Weld Rating = 56.8% OK

ANCHOR ROD AND BASE PLATE ANALYSIS

GPD GROUP

Anchor Rod and Base Plate Stresses
CT11004B NEWINGTON_1
2012863.82

Overturning Moment =	4373.47	k*ft
Axial Force =	64.87	k
Shear Force =	35.46	k

Acceptable Stress Ratio =	105.0%

Anchor Rods		
Number of Rods =	52	
Type =	Bolt	
Rod Ultimate Strength (Fu) =	125	ksi
ASIF =	1.333	
Rod Circle =	67	in
Rod Diameter =	1.25	in
Area =	1.23	in^2
Max Tension on Rod =	59.00	kips
Max Compression on Rod =	61.49	kips
Allow. Rod Force =	67.50	kips
Anchor Rod Capacity =	**87.4%**	**OK**

Base Plate		
Location =	External	
Plate Strength (F_y) =	36	ksi
Outside Diameter =	70	in
Plate Thickness =	1.25	in
b =	3.42	in
Le =	4.50	in
fb =	33.88	ksi
Fb =	36	ksi
BP Capacity =	**94.1%**	**OK**

Stiffeners		
Configuration =	Every Rod	
Thickness =	0.625	in
Width =	4.5	in
Notch =	0.5	in
Height =	8	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	36.17	kips
Vert. Weld Capacity =	*Not Verified*	kips
Horiz. Weld Capacity =	*Not Verified*	kips
Stiffener Capacity =	87.6%	kips
Controlling Capacity =	**87.6%**	**OK**

Pole		
Pole Diameter =	60	in
Number of Sides =	Round	
Thickness =	0.625	in
Pole Yield Strength =	42	ksi

GPD GROUP

Reinforced Monopole Analysis
CT11004B NEWINGTON_1
2012863.82

Code =	TIA/EIA-222-F
AISF=	1.333
Max Stress Ratio=	1.05
# of Sides =	Round

Geometry									Reactions				Output	Capacities		
Shape	Quantity	Section	Elevation (ft)	Pole Flat-Flat (in)	Wall t (in)	Fy (ksi)	K	Conn.Spacing (in)	Moment (k-ft)	Axial (k)	Shear (k)	Torsion (k-ft)	Equivalent t (in)	Pole	Reinforcment	Pass/Fail
Plate 4x1.25	3	L4	100	42	0.375	42	0.8	18	1263.88	24.41	24.89	4.42	0.504	75.6%	63.1%	Pass
Plate 4x1.25	3	L5	80	48	0.375	42	0.8	18	1800.23	31.22	28.08	5.66	0.486	87.9%	70.7%	Pass
Plate 5.5x1.25	3	L6	60	54	0.375	42	0.8	18	2384.44	38.5	30.25	6.05	0.509	90.1%	62.5%	Pass
Plate 5.5x1.25	3	L7	40	60	0.375	42	0.8	18	3011.15	46.36	32.41	6.63	0.495	96.7%	65.5%	Pass
Plate 5.5x1.25	3	L8	20	60	0.5	42	0.8	18	3677.16	55.77	34.12	6.87	0.621	88.7%	64.1%	Pass

GPD GROUP

Mat Foundation Analysis
CT11004B NEWINGTON_1
2012863.82

General Info	
Code	TIA/EIA-222-F (ASD)
Bearing On	Rock
Foundation Type	Mono Pad
Pier Type	Round
Reinforcing Known	Yes
Max Capacity	1.05

Tower Reactions		
Moment, M	4373.47	k-ft
Axial, P	64.87	k
Shear, V	35.46	k

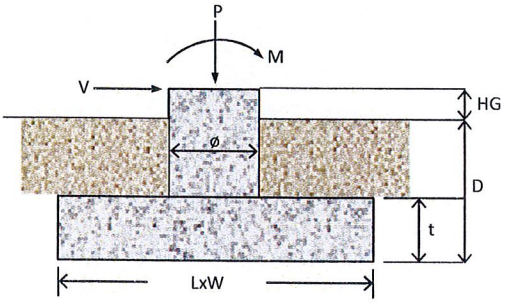
Pad & Pier Geometry		
Pier Diameter, ø	7	ft
Pad Length, L	20.5	ft
Pad Width, W	20.5	ft
Pad Thickness, t	2.5	ft
Depth, D	9	ft
Height Above Grade, HG	0.5	ft

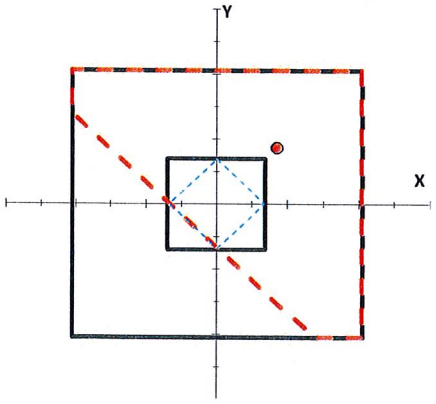
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	4	ksi
Clear Cover	3	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 11	
Pad Quantity Per Layer	30	
Pier Rebar Size	# 9	
Pier Quantity of Rebar	34	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	130	pcf
Angle of Friction, ø	36	°
Bearing Type	Gross	
Ultimate Bearing	16	ksf
Water Table Depth	Below	ft
Frost Depth	3.33	ft

Bearing Summary			Load Case
Qxmax	4.84	ksf	1D+1W
Qymax	4.84	ksf	1D+1W
Qmax @ 45°	6.24	ksf	1D+1W
$Q_{(all)\ Gross}$	8.00	ksf	
Controlling Capacity	**77.9%**	**Pass**	

Overturning Summary (Required FS=1.5)			Load Case
FS(ot)x	1.62	≥1.5	1D+1W
FS(ot)y	1.62	≥1.5	1D+1W
Controlling Capacity	**92.4%**	**Pass**	





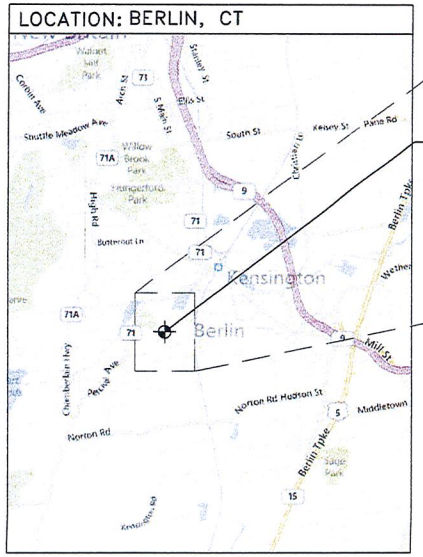
NEWINGTON_1

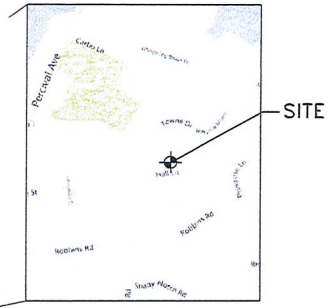
CT11004B

190' MODIFIED PIROD MONOPOLE

STATE OF CONNECTICUT
DAVID B. GRANGE P.E.
NO. 17557
LICENSED
PROFESSIONAL ENGINEER

LOCATION: BERLIN, CT





AERIAL MAP

PROJECT SUMMARY	
TOWER OWNER:	T-MOBILE TOWERS
TOWER TYPE:	MONOPOLE
GOVERNING CODE:	TIA/EIA-222-F & 2006 IBC
LATITUDE:	41° 37' 34.319" N
LONGITUDE:	72° 46' 32.159" W
OWNER CONTACT:	MR. AARON CHANDLER 4 SYLVAN WAY PARSIPPANY, NJ 07054 (508) 367-7138
ENGINEER CONTACT:	MR. CHRIS SCHEKS 400 NORTH 34TH STREET, SUITE 216 SEATTLE, WA 98103 (206) 204-7399

PROJECT OVERVIEW:
THE LISTED DRAWINGS REPRESENT MODIFICATIONS TO THE EXISTING TOWER BY REINFORCING THE EXISTING TOWER WITH FLAT PLATES, REMOVING EXISTING BRIDGE STIFFENERS, AND INSTALLING NEW BRIDGE STIFFENERS.

DRAWING INDEX
T-01 TITLE SHEET
N-01 PROJECT NOTES
S-01 TOWER ELEVATION & MODIFICATION SCHEDULE
S-02 MODIFICATION DETAILS & SECTIONS
S-03 ADDITIONAL DETAILS & SECTIONS
S-04 ADDITIONAL DETAILS & SECTIONS
MI-01 MODIFICATION INSPECTION CHECKLIST

CO-LOCATOR:

at&t

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
520 SOUTH MAIN ST., SUITE 2531
AKRON, OHIO 44311
330.572.2100

T-Mobile TOWERS

REV	DATE	DESCRIPTION

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

TITLE SHEET

ISSUED FOR	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO
2012863.82

T-01

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GENERAL NOTES

1. THE FOLLOWING DRAWINGS REPRESENT MODIFICATIONS TO THE EXISTING TOWER. THE MODIFICATIONS ARE BASED ON GPD GROUP STRUCTURAL REPORT (PROJECT #: 2012863.82, DATED OCTOBER 18, 2012). ALL MODIFICATIONS MUST BE INSTALLED TO BRING THE TOWER INTO CONFORMANCE WITH TIA/EIA-222-F & 2006 IBC.

2. THESE MODIFICATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF TIA/EIA-222-F, 2006 IBC, AWS, AND AISC. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.

3. ALL ORIGINAL TOWER INFORMATION WAS OBTAINED IN THE FORM OF ORIGINAL TOWER DRAWINGS BY PIROD (FILE #: A-115400 REV. C, DATED FEBRUARY 5, 2009) AND MODIFICATION DRAWINGS BY GPD GROUP (PROJECT #: 2008092.67, REV. 2, DATED FEBRUARY 20, 2008). CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE REFERENCED TOWER DOCUMENTS.

4. THIS DESIGN ASSUMES THE TOWER AND FOUNDATIONS HAVE BEEN WELL MAINTAINED, IN GOOD CONDITION, AND ARE WITHOUT DEFECT. BENT MEMBERS, CORRODED MEMBERS, LOOSE BOLTS, CRACKED WELDS AND OTHER MEMBER DEFECTS HAVE NOT BEEN CONSIDERED. THE TOWER IS ASSUMED TO BE PLUMB AND THE SITE IS ASSUMED TO BE LEVEL. THIS DESIGN IS BEING PROVIDED WITHOUT THE BENEFIT OF A CONDITION ASSESSMENT BY GPD GROUP. CONTRACTOR SHALL COMMISSION A COMPLETE CONDITION ASSESSMENT PRIOR TO ORDERING ANY REINFORCING MATERIALS. CONTRACTOR SHALL SUPPLY CONDITION ASSESSMENT TO ENGINEER FOR REVIEW. SEE CONTRACTOR NOTES.

5. MANUFACTURER TOLERANCES, FIELD ADJUSTMENTS, INCORRECT STACKING, AND TEMPERATURE CAN CAUSE DIMENSION DISCREPANCIES. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIALS. ALL FIELD MEASUREMENTS MUST BE REPORTED TO ENGINEER.

6. ALL NEW STEEL SHALL BE HOT DIPPED GALVANIZED FOR FULL WEATHER PROTECTION. IN ADDITION ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING STEEL. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.

7. ALL EXISTING PAINTED/GALVANIZED SURFACES DAMAGED DURING REHAB INCLUDING AREAS UNDER STIFFENER PLATES SHALL BE WIRE BRUSHED CLEAN, REPAIRED BY COLD GALVANIZING BRUSH APPLIED PAINT (ZRC OR EQUAL), AND REPAINTED TO MATCH THE EXISTING FINISH (IF APPLICABLE).

8. CAULKING SHALL BE PROVIDED AROUND PERIMETER OF ANY AND ALL MODIFICATION MEMBERS TO ENSURE COMPLETE SEAL BETWEEN EXISTING STRUCTURE AND REINFORCING MEMBERS. SEALANT IS TO BE EXTERIOR GRADE, PAINTABLE SILICONE CAULKING AS MANUFACTURED BY DOW AND ACCEPTABLE TO GPD.

9. LOADINGS:

WIND LOADS:	
FASTEST MILE WIND SPEED (PER: ANALYSIS CODE) (HARTFORD COUNTY, CT)	80 MPH
ICE LOADS:	
1/2" RADIAL BASE ICE	
FASTEST MILE WIND SPEED (CONCURRENT W/ ICE)	69 MPH

10. STRUCTURAL STEEL:

SPECIFICATIONS
LATEST EDITION OF AISC

MATERIAL

PLATES	ASTM A572 (GR 65)
BRIDGE STIFFENERS	ASTM A572 (GR 50)
ONE-SIDE BOLTS	AJAX 20MM (GR PC8.8) W/ HIGH STRENGTH SLEEVE (Fu=120 KSI)
HOT DIPPED GALVANIZING	ASTM A123
WELDS	E70XX
PAINT	NEW STEEL TO BE PAINTED TO MATCH EXISTING TOWER

11. ALL MATERIAL UTILIZED FOR THIS PROJECT MUST BE NEW AND FREE OF ANY DEFECTS. ANY MATERIAL SUBSTITUTIONS, INCLUDING BUT NOT LIMITED TO ALTERED SIZES AND/OR STRENGTHS, MUST BE APPROVED BY THE OWNER AND ENGINEER IN WRITING.

12. ALL SUBSTITUTES PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.

13. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.

14. UNLESS NOTED OTHERWISE, ALL NEW MEMBERS SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE ECCENTRICITIES INTO THE STRUCTURE.

15. THE ENGINEER (GPD GROUP) SHALL MAKE POST INSTALLATION OBSERVATION FOR TOWER. CONTRACTOR SHALL COORDINATE W/ENGINEER (GPD GROUP) WITHIN 72 HOURS AFTER 100% COMPLETION OF THE TOWER MODIFICATION INSTALLATION. INSTALLATION OF PROPOSED LOADING WITHOUT ENGINEER APPROVAL IS PROHIBITED. INSTALLATION OF THE PROPOSED LOADING IS BY OTHERS, AND IS BEYOND THE SCOPE OF THESE DRAWINGS.

CONTRACTOR NOTES

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER AND GPD GROUP THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW TOWER OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR TOWER OWNER AND GPD GROUP ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM LOWER TIER SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO TOWER OWNER AND GPD GROUP.

2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, GPD GROUP SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.

3. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE TOWER OWNER AND ENGINEER.

4. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.

5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THIS WORK.

6. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING; ANY PROBLEMS WITH ACCESS, INTERFERENCE, ETC. SHALL BE RESOLVED PRIOR TO MOBILIZATION. THE CONTRACTOR MUST VISIT THE SITE PRIOR TO ORDERING ANY MATERIAL AND MUST RESOLVE ALL ISSUES WITH THE OWNER PREVENTING A CONTINUOUS INSTALLATION. CONTRACTOR SHALL NOTE ALL ANTENNAS, MOUNTS, COAX, LIGHTING, CLIMBING SUPPORTS, STEP BOLTS, PORT HOLES, AND ANY OTHER TOWER APPURTENANCES IN THE REGION OF THE MODIFICATIONS. SEE GENERAL NOTES #4 AND #5 THIS SHEET.

7. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ALL COAX, T-BRACKETS, ANTENNA MOUNTS, AND ANY OTHER TOWER APPURTENANCE THAT MAY INTERFERE WITH THE TOWER MODIFICATIONS. ALL TOWER APPURTENANCES MUST BE REPLACED AND/OR RESTORED TO ITS ORIGINAL LOCATION. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.

8. SOME ATTACHMENTS MAY REQUIRE CUSTOM MODIFICATIONS TO PROPERLY FIT THE MODIFIED REGION OF THE STRUCTURE. THESE CUSTOMIZATIONS ARE DESIGNED BY OTHERS AND MUST BE APPROVED BY THE ENGINEER PRIOR TO REMOVING SUCH ATTACHMENTS. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.

9. CONTRACTOR SHALL ONLY WORK WITHIN THE LIMITS OF THE TOWER OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.

10. WORK SHALL ONLY BE PERFORMED DURING CALM DRY DAYS (WINDS LESS THAN 10-MPH). CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY LOCAL TOWER SHORING, TEMPORARY GLOBAL TOWER SHORING, AND ALL SHORING OF SURROUNDING BUILDINGS, PADS, AND OTHER OUTDOOR SITE OBSTRUCTIONS. ALL SHORING, TEMPORARY BRACING, AND TEMPORARY SUPPORTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.

11. CONTRACTOR SHALL VERIFY MONOPOLE IS SET PROPERLY AND HAS BEEN JACKED INTO ITS FINAL RESTING POSITION BEFORE FINAL CRITICAL FIELD MEASUREMENTS ARE VERIFIED AND BEFORE ORDERING MATERIAL. ANY OBJECTS/STEP BOLTS THAT PREVENT TOWER FROM SITTING PROPERLY SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY.

MODIFICATION PLATE NOTES

1. CONTRACTOR SHALL INSTALL PLATES AND BRIDGE STIFFENERS AT LOCATIONS PER PLAN VIEW.

2. USE AJAX BOLTS WITH CORRECT SLEEVE LENGTHS PER DETAILS. BOLT THREADS SHALL NOT BE IN THE SHEAR PLANE.

3. ALL HOLES DRILLED IN POLE SHALL BE SOLVENT CLEANED AND TOUCHED UP WITH ZRC ZINC RICH PAINT.

4. AJAX BOLTS TO BE TIGHTENED PER AISC "SNUG-TIGHT CONDITION".

5. CONTRACTOR SHALL VERIFY THAT TOWER IS PLUMB PRIOR TO THE INSTALLATION OF ANY TOWER MODIFICATIONS.

WELD NOTES

1. CONTRACTOR IS RESPONSIBLE FOR COMMISSIONING A CERTIFIED WELD INSPECTOR (CWI) THROUGHOUT THE ENTIRETY OF THE PROJECT. A PASSING CWI REPORT SHALL BE PROVIDED TO THE ENGINEER UPON COMPLETION OF THE PROJECT.

2. WELDING CERTIFICATES MUST BE PROVIDED TO CWI AND GPD GROUP PRIOR TO WELDING CONTRACTOR BEGINNING WORK ON SITE. CERTIFICATE WILL BE ASKED FOR AS PART OF INSPECTION PROCESS. ALL WELDING SHOULD BE PERFORMED BY AN AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES AND IN ACCORDANCE WITH ANSI/AWS D1.1 AND ANSI Z 49.1 OR LATEST EDITIONS.

3. OXY FUEL GAS WELDING OR BRAZING IS STRICTLY PROHIBITED. SPECIFICALLY, NO TORCH CUTTING IS PERMITTED ON SITE. ALL HOLES SHALL BE CUT WITH A GRINDER.

4. INSTALL 3000° (NFPA 701) FIRE BLANKET AROUND ALL COAX.

5. MORE SPLATTER AND SPARKS SHALL BE ANTICIPATED GIVEN THE PREVIOUSLY GALV. SURFACE.

6. COAX IS FLAMMABLE AND CAN CATCH FIRE IF PROPER PRECAUTIONS ARE NOT MADE TO SHIELD COAX FROM ALL WELDING PROCEDURES. ALL COAX SHALL BE SHIELDED AT AND BELOW EACH WELDING PROCEDURE AND ELEVATION. IN ADDITION, COAX SHALL BE PUSHED AWAY FROM TOWER FACE WHERE WELDING IS BEING PERFORMED.

7. CONTRACTOR SHALL EXERCISE CAUTION WHEN WELDING ON A GALVANIZED SURFACE. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC IT DOES NOT PROVIDE A STRUCTURAL WELD.

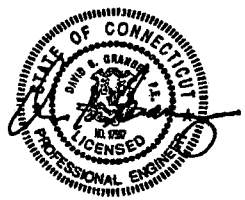
8. FUMES CREATED FROM WELDING ON A PREVIOUSLY GALV. SURFACE CAN BE HAZARDOUS.

9. PRIOR TO WELDING, ALL SURFACES SHALL BE PROPERLY GROUND TO REMOVE GALVANIZING.

10. ALL FIELD WELDS SHALL BE TOUCHED UP WITH A GALVANIZING PAINT REPAIR (ZRC OR APPROVED EQUIVALENT).

11. WATER SHALL BE ON SITE, OF ADEQUATE AMOUNT, AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. A MINIMUM OF 500 GAL. OF WATER SHALL BE PROVIDED. WATER SHALL BE CAPABLE OF REACHING HEIGHT WHERE WELDING IS BEING PERFORMED. IN ADDITION, A MINIMUM OF SIX (6) 10 LB. CLASS ABC MULTIPURPOSE FIRE EXTINGUISHERS FULLY CHARGED AND CAPABLE OF DISCHARGE WITHIN 30 SECONDS OF DETECTING A FIRE SHALL BE PROVIDED. FIRE EXTINGUISHERS SHALL BE STRATEGICALLY LOCATED AROUND COMPOUND AND IN THE AIR (I.E. ON THE MAN LIFT WHERE WELDING IS BEING PERFORMED).

12. CLEAN OUT ALL DEBRIS THROUGHOUT MONOPOLE AND MONOPOLE BASE PRIOR TO WELDING.



GPD GROUP
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AKRON, OHIO 44311
330.572.2000 330.572.2101

T-Mobile TOWERS

REV.	DATE	DESCRIPTION

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

PROJECT NOTES

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO. 2012863.82

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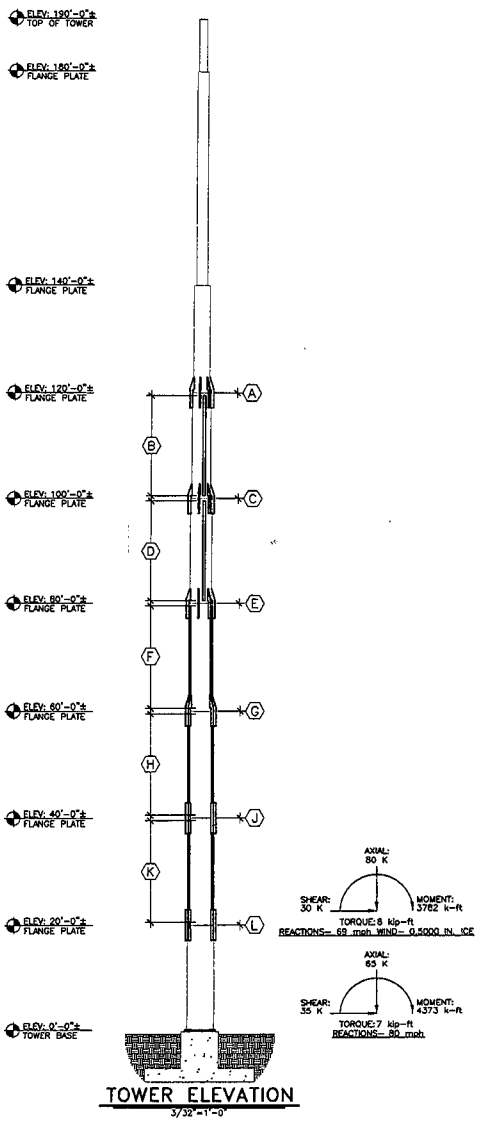
ANTENNA SCHEDULE

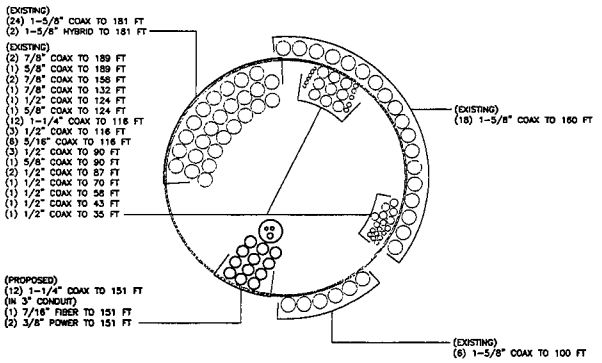
ELEVATION	STATUS	ANTENNA	MOUNT	COAX
189'-0"	EXISTING	(1) DB589	(1) 5' STANDOFF	(2) 7/8"
	EXISTING	(4) 4' OMNI		(1) 5/8"
	EXISTING	(1) 1'x1' PANEL		
181'-0"	EXISTING	(9) AIR21	(1) 16' LP PLATFORM	(24) 1-5/8"
	EXISTING	(3) AIR33		(2) 1-5/8" HYBRID
	EXISTING	(3) TWIN ETW190VS12UB TMAS		
	EXISTING	(1) HCS FIBER/DC BOXES (LARGE)		
	EXISTING	(1) 2' MW DISH		
160'-0"	EXISTING	(3) BXA-70063/6CF	(1) 13' LP PLATFORM	(18) 1-5/8"
	EXISTING	(4) LPA-80080/6CF		
	EXISTING	(2) LPA-80063/6CF		
	EXISTING	(2) BXA-171085/12BF		
	EXISTING	(1) BXA-171063/12BF		
	EXISTING	(2) GPS		
158'-0"	EXISTING	(1) DB205-A	(2) 5' STANDOFFS	(2) 7/8"
	EXISTING	(1) SRL224		
151'-0"	PROPOSED	(3) 7770	(1) 15' LP PLATFORM	(12) 1-1/4"
	PROPOSED	(4) SBNH-1D6565C		(2) 3/8" POWER
	PROPOSED	(2) AM-X-CD-1665-0T-RET		(1) 7/16" FIBER
	PROPOSED	(6) DTMABP7819VG12A TMAS		(1) 3" CONDUIT
	PROPOSED	(6) LGP 21901		
	PROPOSED	(6) CM1007-D8PXBC-003		
	PROPOSED	(6) RRUS-11	(1) COLLAR MOUNT	
	PROPOSED	(1) DC6-48-60-18-8F		
132'-0"	EXISTING	(1) SRL233	(1) 5' STANDOFF	(1) 7/8"
124'-0"	EXISTING	(1) DB205-A	(1) 5' STANDOFF	(1) 1/2"
	EXISTING	(1) LMU GSM RX		(1) 5/8"
116'-0"	EXISTING	(6) DB844G90VTA-SX	(1) 16' LP PLATFORM	(12) 1-1/4"
116'-0"	EXISTING	(3) 840-10054		(3) 1/2"
	EXISTING	(3) SAMSUNG BTS		(6) 5/16"
	EXISTING	(2) VHLP2.5		
	EXISTING	(2) HORIZON ODU		
100'-0"	EXISTING	(3) 742 213	FLUSH MOUNT	(6) 1-5/8"
90'-0"	EXISTING	(2) DB205-A	(2) 5' STANDOFFS	(3) 1/2"
	EXISTING	(1) 2' GRID DISH		(1) 5/8"
	EXISTING	(1) 1'x1'xPANEL		
87'-0"	EXISTING	(2) GPS	(2) 2' STANDOFFS	(2) 1/2"
70'-0"	EXISTING	(1) SRL233	(1) 5' STANDOFF	(1) 1/2"
58'-0"	EXISTING	(1) DB583	(1) 5' STANDOFF	(1) 1/2"
43'-0"	EXISTING	(1) FG4000	(1) 5' STANDOFF	(1) 1/2"
35'-0"	EXISTING	(1) MYA4505	(1) 5' STANDOFF	(1) 1/2"

MODIFICATION SCHEDULE

SYMBOL	ELEVATION	MEMBER TYPE	EXISTING MEMBER	NEW MEMBER	NOTES
(A)	120'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	REMOVE EXISTING BRIDGE STIFFENERS AS REQUIRED AND INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 6/S-04 & SECTION G/S-04.
(B)	100'-6"± TO 119'-6"±	FLAT PLATES	ROUND MONOPOLE	4"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 5/S-03, 6/S-04, AND 8/S-04 FOR MORE INFORMATION.
(C)	100'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	REMOVE EXISTING BRIDGE STIFFENERS AS REQUIRED AND INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 5/S-03 & SECTION G/S-04.
(D)	80'-6"± TO 99'-6"±	FLAT PLATES	ROUND MONOPOLE	4"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 4/S-03, 5/S-03, AND 8/S-04 FOR MORE INFORMATION.
(E)	80'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	REMOVE EXISTING BRIDGE STIFFENERS AS REQUIRED AND INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 4/S-03 & SECTION G/S-04.
(F)	60'-6"± TO 79'-6"±	FLAT PLATES	ROUND MONOPOLE	5-1/2"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 3/S-03, 4/S-03, AND 7/S-04 FOR MORE INFORMATION.
(G)	60'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 3/S-03 & SECTION G/S-04.
(H)	40'-6"± TO 59'-6"±	FLAT PLATES	ROUND MONOPOLE	5-1/2"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 2/S-02, 3/S-03, AND 7/S-04 FOR MORE INFORMATION.
(J)	40'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 2/S-02 & SECTION B/S-02.
(K)	20'-6"± TO 39'-6"±	FLAT PLATES	ROUND MONOPOLE	5-1/2"x1-1/4" THICK PLATES	INSTALL NEW (3) MODIFICATION PLATES TO THE EXISTING MONOPOLE SHAFT. SEE DETAILS 1/S-02, 2/S-02, AND 7/S-04 FOR MORE INFORMATION.
(L)	20'-0"±	BRIDGE STIFFENERS	ROUND MONOPOLE	1-1/4" THICK BRIDGE STIFFENERS	INSTALL NEW BRIDGE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 1/S-02 & SECTION B/S-02.



TOWER ELEVATION
3/32"=1'-0"



COAX LAYOUT
N.T.S.

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T-Mobile TOWERS

REV	DATE	DESCRIPTION

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

TOWER ELEVATION & MODIFICATION SCHEDULE

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO.
2012863.82

S-0

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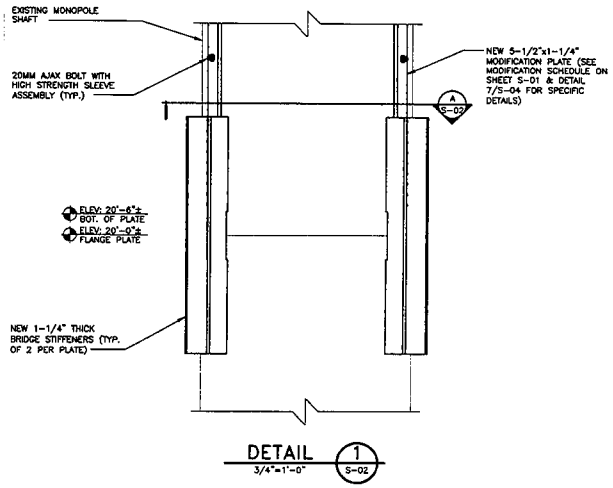
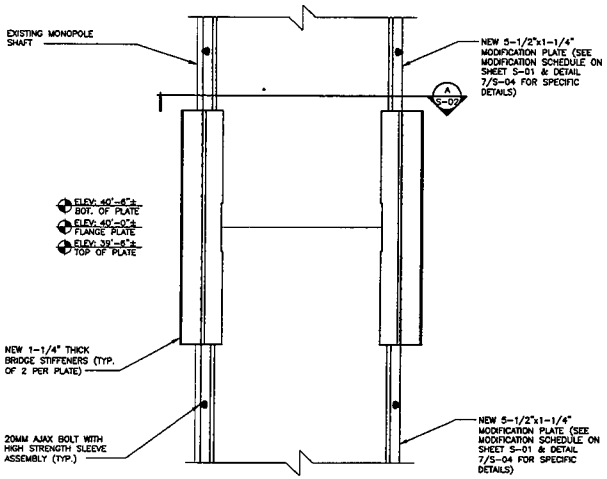
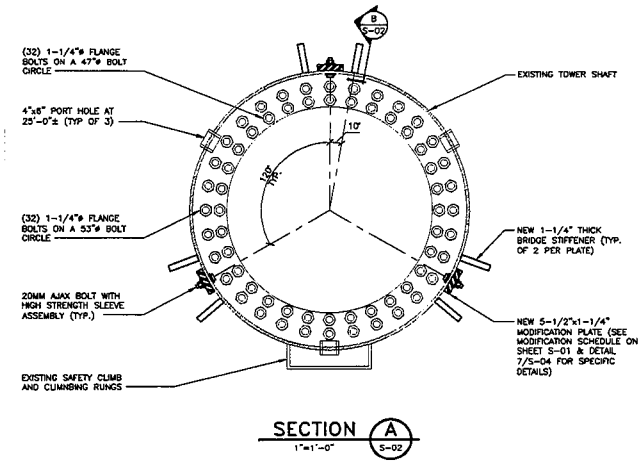
STATE OF CONNECTICUT
DAVID M. GRANGE
NO. 19317
LICENSED
PROFESSIONAL ENGINEER



DETAIL 1 S-02
3/4"=1'-0"



DETAIL 2 S-02
3/4"=1'-0"



SECTION A S-02
1"=1'-0"

SECTION B S-02
1-1/2"=1'-0"

GPD GROUP

T-Mobile TOWERS

REV	DATE	DESCRIPTION

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T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

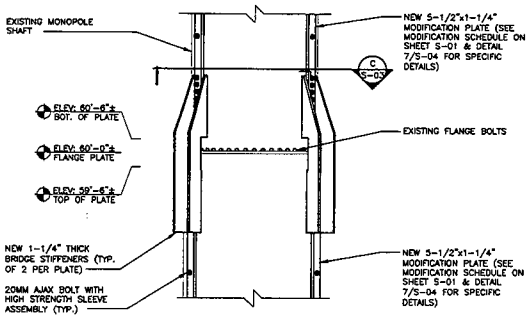
MODIFICATION DETAILS & SECTIONS

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

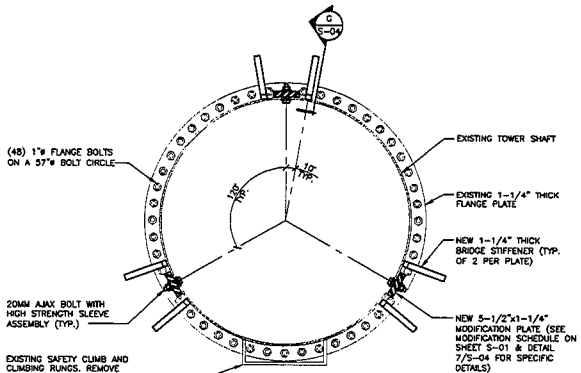
PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO.
2012863.82

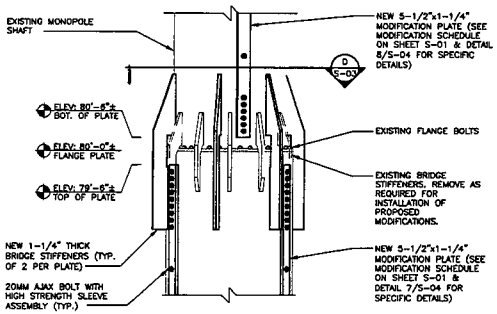
S-02



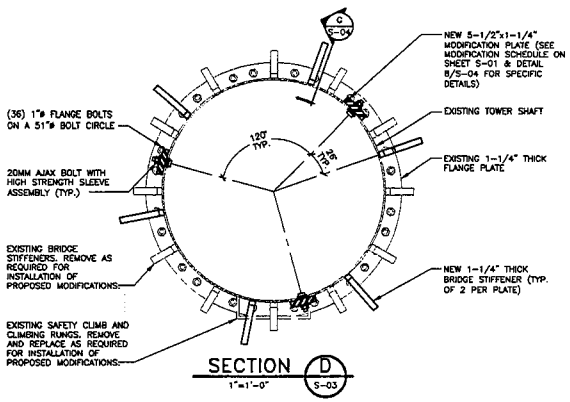
DETAIL 3 — 3/4"=1'-0" — S-03



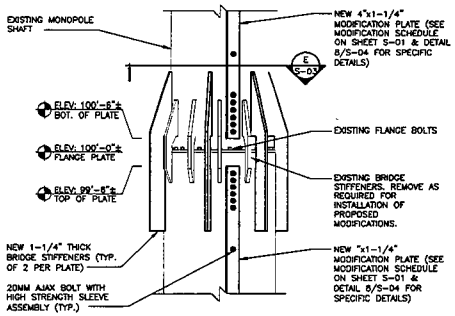
SECTION C — 1"=1'-0" — S-03



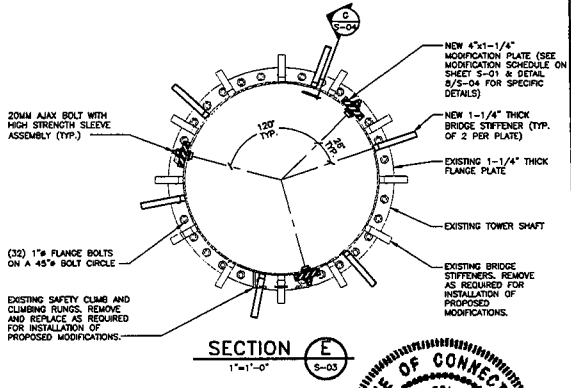
DETAIL 4 — 3/4"=1'-0" — S-03



SECTION D — 1"=1'-0" — S-03



DETAIL 5 — 3/4"=1'-0" — S-03



SECTION E — 1"=1'-0" — S-03

STATE OF CONNECTICUT
DAVID A. GRANGE
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T-Mobile TOWERS

REV	DATE	DESCRIPTION

Akron • Atlanta • Cleveland • Columbus • Indianapolis • Louisville • Marion • Phoenix • Seattle • Youngstown

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

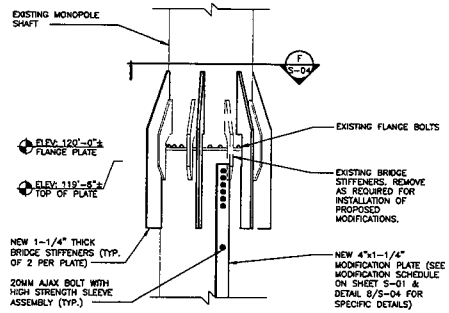
ADDITIONAL DETAILS & SECTIONS

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

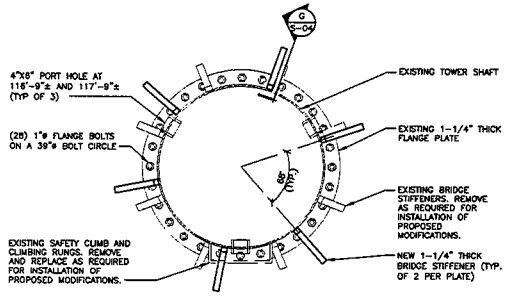
PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO. 2012863.82

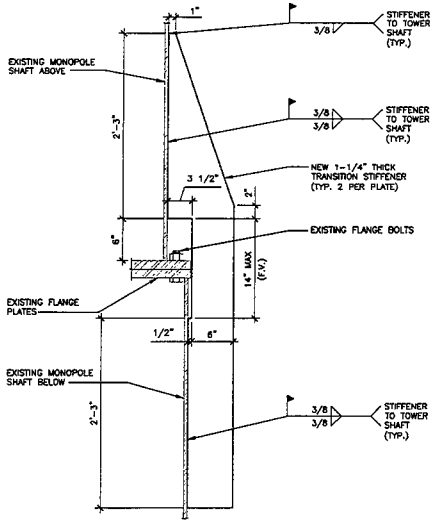
S-05



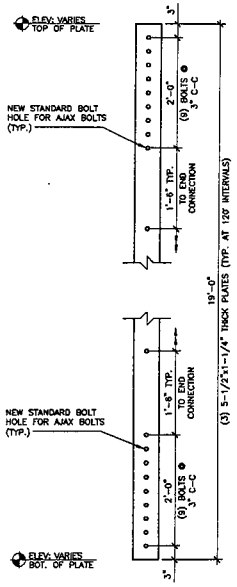
DETAIL 6
3/4"=1'-0" S-04



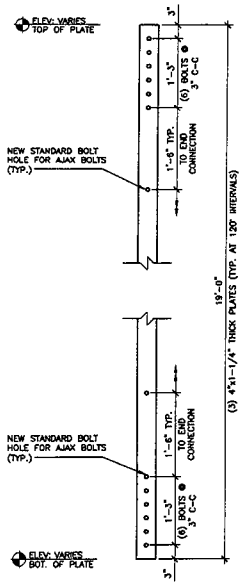
SECTION F
1"=1'-0" S-04



SECTION G
1-1/2"=1'-0" S-04



DETAIL 7
1-1/2"=1'-0" S-04



DETAIL 8
1-1/2"=1'-0" S-04

GPD GROUP
Glace, Pyle, Schomer, Burns & Deibaum, Inc.
520 SOUTH MAIN ST., SUITE 2531
AKRON, OHIO 44311
330.572.2100 330.572.2101

T-Mobile TOWERS

REV	DATE	DESCRIPTION

Akron • Atlanta • Cleveland • Columbus • Indianapolis • Louisville • Marion • Phoenix • Seattle • Youngstown

T-MOBILE TOWERS
240 KENSINGTON ROAD
BERLIN, CT 06037

ADDITIONAL DETAILS & SECTIONS

ISSUED FOR:	
PERMIT	11/02/12
BID	-
CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO. 2012863.82

S-04

MODIFICATION INSPECTION CHECKLIST

BEFORE CONSTRUCTION		DURING CONSTRUCTION		AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM	CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM	CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
X	MODIFICATION INSPECTION CHECKLIST DRAWING	X	CONSTRUCTION INSPECTIONS	X	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWING(S)
X	ENGINEER OF RECORD APPROVED SHOP DRAWINGS	–	FOUNDATION INSPECTIONS	–	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	FABRICATION INSPECTION	–	CONCRETE COMP. STRENGTH AND SLUMP TESTS	X	PHOTOGRAPHS
–	FABRICATOR CERTIFIED WELD INSPECTION	–	POST INSTALLED ANCHOR ROD VERIFICATION	ADDITIONAL TESTING AND INSPECTIONS:	
X	MATERIAL TEST REPORT	–	BASE PLATE GROUT VERIFICATION		
–	FABRICATOR NDE INSPECTION	X	CONTRACTOR'S CERTIFIED WELD INSPECTION		
–	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)	–	EARTHWORK: LIFT AND DENSITY		
X	PACKING SLIPS	X	ON SITE COLD GALVANIZING VERIFICATION		
ADDITIONAL TESTING AND INSPECTIONS:		–	GUY WIRE TENSION REPORT		
		X	GC AS-BUILT DOCUMENTS		
		ADDITIONAL TESTING AND INSPECTIONS:			

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MODIFICATION INSPECTION REPORT
– DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MODIFICATION INSPECTION REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD.

2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MODIFICATION INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD AT ALL TIMES.

3. **TO ENSURE THAT THE REQUIREMENTS OF THE MODIFICATION INSPECTION ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO OR PAYMENT IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. CONTACT LISTED ON THE TITLE SHEET SHALL BE CONTACTED IF SPECIFIC INSPECTOR CONTACT INFORMATION IS NOT KNOWN.**

MODIFICATION INSPECTOR

1. THE MODIFICATION INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSPECTION TO:

- –REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST
- –WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- –DISCUSS ANY SITE SPECIFIC INSPECTIONS OR CONCERNS

2. THE MODIFICATION INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MODIFICATION INSPECTION REPORT.

GENERAL CONTRACTOR

1. THE GC IS REQUIRED TO CONTACT THE MODIFICATION INSPECTOR AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO:

- –REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST
- –WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MODIFICATION INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- –BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.

RECOMMENDATIONS

1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MODIFICATION INSPECTION REPORT:

- –IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MODIFICATION INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION TO BE CONDUCTED.
- –THE GC AND MODIFICATION INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- –WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- –IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MODIFICATION INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- –WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MODIFICATION INSPECTION. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MODIFICATION INSPECTION CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MODIFICATION INSPECTION

1. IF THE GC AND MODIFICATION INSPECTOR AGREE TO A DATE ON WHICH THE MODIFICATION INSPECTION WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE TOWER OWNER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MODIFICATION INSPECTION ("FAILED MODIFICATION INSPECTION"), THE GC SHALL WORK WITH MODIFICATION INSPECTOR TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- –CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MODIFICATION INSPECTION.
- –OR, WITH TOWER OWNER'S APPROVAL, THE GC MAY WORK WITH THE ENGINEER OF RECORD TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

VERIFICATION INSPECTIONS

1. TOWER OWNER RESERVES THE RIGHT TO CONDUCT A VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MODIFICATION INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

2. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MODIFICATION INSPECTION" OR "PASS AS NOTED MODIFICATION INSPECTION" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS ARE TO BE TAKEN AND INCLUDED IN THE MODIFICATION INSPECTION REPORT:

- –PRE-CONSTRUCTION GENERAL SITE CONDITION
- –PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- –POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION
- –ANY OTHER PHOTOS DEEMED RELEVANT TO SHOW COMPLETE DETAILS OF MODIFICATIONS

2. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

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520 SOUTH MAIN ST., SUITE 2131
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BERLIN, CT 06037

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CONSTRUCTION	-
RECORD	-

PROJECT MANAGER	DESIGNER
DMH	JDF

JOB NO. 2012863.82

MI-01

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

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

Novemenber 8,2012

Denise McNair, Town Manager
Berlin Town Hall
240 Kensington Road
Berlin, CT 06037

Re: Notice of Exempt Modification – Existing Telecommunications Facility at 240 Kensington Road, Berlin CT

Dear Denise,

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

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

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

Sincerely,

John Lawrence
Real Estate Consultant

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