



February 14, 2013

ORIGINAL

VIA OVERNIGHT DELIVERY

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

RECEIVED  
FEB 19 2013  
CONNECTICUT  
SITING COUNCIL

RE: AT&T Mobility – Notice of Exempt Modification  
371 Terryville Avenue, Bristol, CT

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of AT&T Mobility (“AT&T”). AT&T is enhancing the capabilities of its wireless system in Connecticut by implementing LTE technology. In order to do so, AT&T will modify antenna and equipment configurations at a number of existing sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Mayor of the City of Bristol.

AT&T plans to modify the existing facility at 371 Terryville Avenue, Bristol, owned by AT&T Towers (coordinates 41°40’47.67”N, -72°57’45.29”W). Attached are drawings depicting the planned changes (including tower reinforcement drawings) and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration with the proposed tower reinforcements. Also included is a power density calculation reflecting the modification to AT&T’s operations at the site.

The changes to the 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. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. AT&T proposes to add three (3) new antennas, six (6) RRU's and one (1) surge arrester. Additionally, AT&T will install one (1) fiber cable and two (2) DC control cables within a 3" flex conduit which will follow existing coax.
2. The proposed changes will not extend the site boundaries. AT&T will install additional equipment on its existing concrete pad at grade. Thus, there will be no effect on the site compound.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.
4. The changes to the facility 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. As indicated in the attached power density calculations, AT&T's operations at the site will result in a power density of 1.32%; the combined site operations will result in a total power density of 31.84%.

Please feel free to call me with any questions or concerns regarding this matter.  
Thank you for your consideration.

Respectfully submitted,  
AT&T Mobility

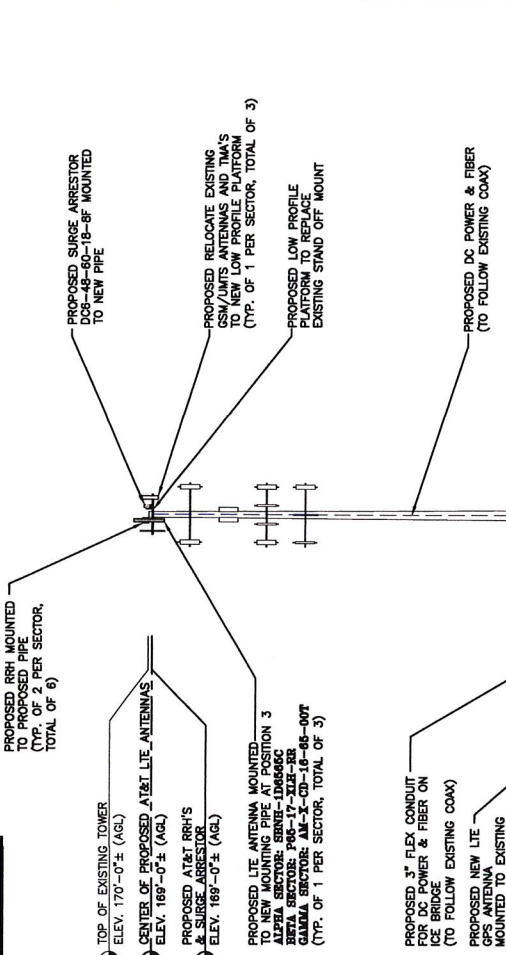
By:   
Eric Dahl, Consultant  
[edahl@comcast.net](mailto:edahl@comcast.net)  
860-227-1975

cc: Honorable Arthur J. Ward, Mayor, City of Bristol

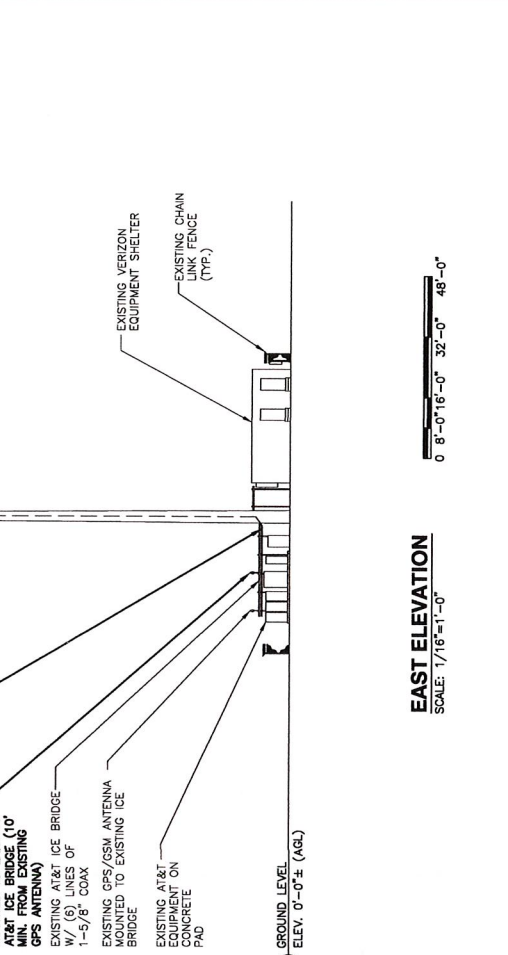
Attachments

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

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



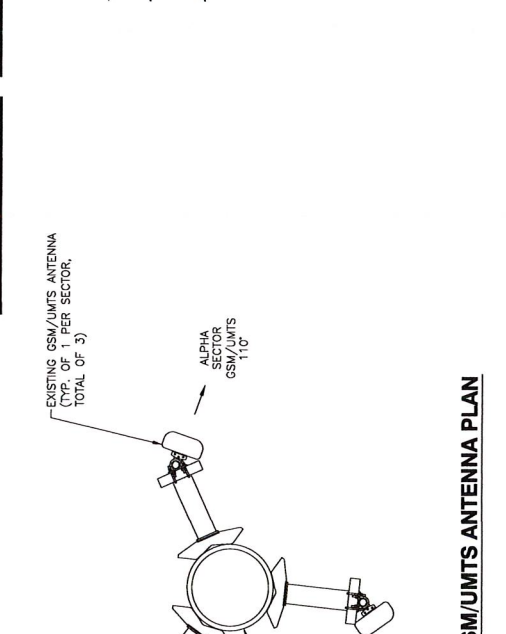
**EXISTING GSM/UMTS ANTENNA PLAN**  
SCALE: N.T.S.



**PROPOSED LTE ANTENNA PLAN**  
SCALE: N.T.S.

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

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



**EAST ELEVATION**  
SCALE: 1/16"=1'-0"

NO.	DATE	ISSUED FOR REVIEW	BY	DESIGNED BY	SCALE	AS SHOWN
0	07/23/12		RS	DC	DPH	
REVISIONS						
			RS	DC	DPH	
SCALE: AS SHOWN						
DESIGNED BY: DC						
DRAWN BY: RS						

JOB NUMBER	DRAWING NUMBER
5633.01	A-2

AT&T  
ANTENNA LAYOUT AND ELEVATION  
(LTE)



500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

**SITE NUMBER: CT5633**  
**SITE NAME: BRISTOL CENTER**  
OFF. TERRYVILLE AVE.  
BRISTOL, CT 06010  
HARTFORD COUNTY

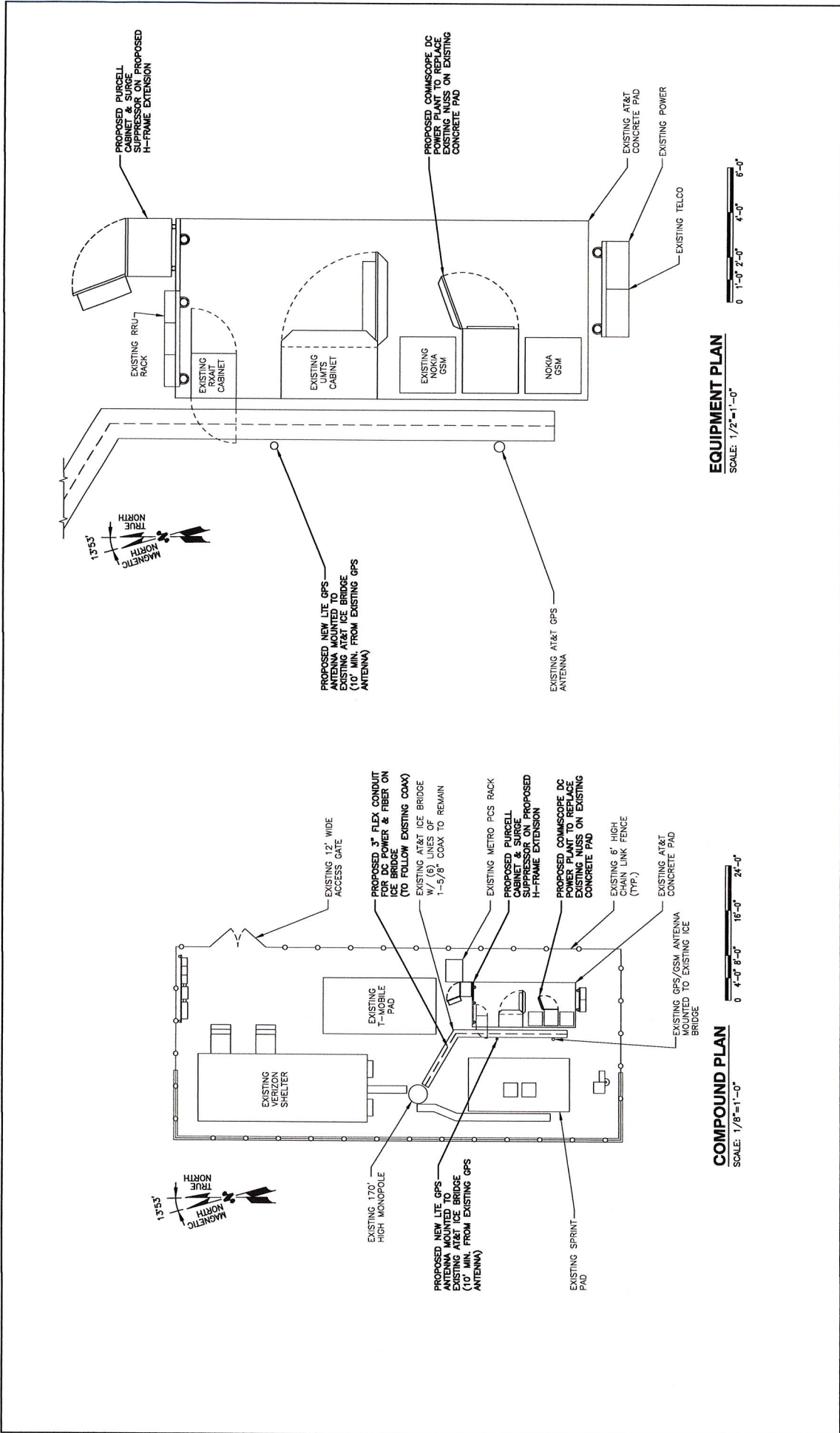


United Global Services Company  
800 MARSHALL PHELPS ROAD UNIT# 2A  
WINDSOR, CT 06095



1400 CROCODRIVER  
SUITE 2101  
N. WOODSIDE, MA 01863  
TEL: (781) 321-3553  
FAX: (781) 324-5886





 HUDSON Design Group 1400 WASHINGTON STREET SUITE 2.010 N. ANDOVER, MA 01855 TEL: (978) 552-5533 FAX: (978) 552-5588	 NEXLINK CABLE SERVICES a Unitek Global Services company 800 MARSHALL PHELPS ROAD UNIT# 2A WINDSOR, CT 06095	 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067	REVISIONS NO. DATE ISSUED FOR REVIEW BY CH/MP/PC		AT&T COMPOUND & EQUIPMENT PLAN (LITE)
			DESIGNED BY: DC DRAWN BY: RE	SCALE: AS SHOWN	



# BRISTOL CENTER

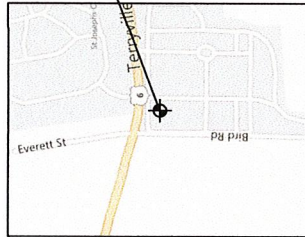
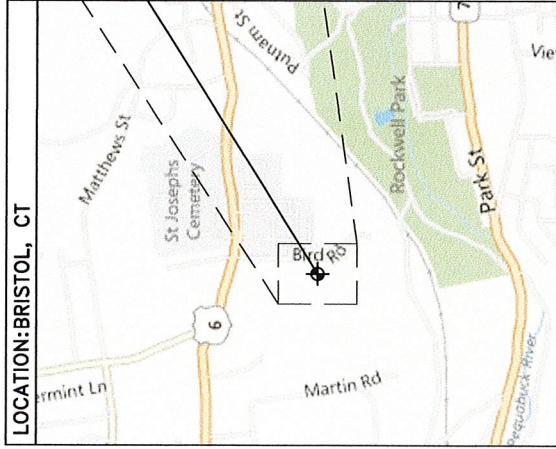
# USID #: 27074

# CLIENT #: CT5833

## 168.5' EEI MODIFIED MONOPOLE



*Gregory A. Smith*



PROJECT SUMMARY	
TOWER OWNER:	AT&T MOBILITY
TOWER TYPE:	MONOPOLE
GOVERNING CODE:	TU/TA-22-F, 2005 CTBC, 2003 IBC, AND ASCE 7-05
LATITUDE:	41° 40' 51.211" N
LONGITUDE:	72° 57' 56.516" W
OWNER CONTACT:	MS. STEPHANIE WINDGROTH 800 MARSHALL PHELPS ROAD WINDSOR, CT 06095 (401) 477-2838
ENGINEER CONTACT:	MR. KEVIN CLEMENTS 1117 PERIMETER CENTER WEST, SUITE W303 ATLANTA, GA 30338 (678) 781-5061

**PROJECT OVERVIEW:** REPRESENT MODIFICATIONS TO THE EXISTING TOWER BY INSTALLING NEW MODIFICATION PLATES TO THE TOWER AND REMOVING AND INSTALLING NEW STIFFENERS TO THE EXISTING BASE PLATE.

DRAWING INDEX	
T-01	TITLE SHEET
N-01	PROJECT NOTES
S-01	TOWER ELEVATION & MODIFICATION SCHEDULE
S-02	MODIFICATION SECTIONS & DETAILS
S-03	ADDITIONAL SECTIONS & DETAILS
S-04	ADDITIONAL SECTIONS & DETAILS
S-05	ADDITIONAL SECTIONS & DETAILS
S-06	ADDITIONAL SECTIONS & DETAILS
M-01	MODIFICATION INSPECTION CHECKLIST

**INTEGRATED BY:**

27074 - BRISTOL CENTER  
371 TERRYVILLE AVE  
BRISTOL, CT 06010

ISSUED FOR:	DATE:
PERMIT	06/09/13
CONSTRUCTION	-
RECORD	-
PROJECT MANAGER	DRUMMOND
DRAWN	JEP

JOB NO.  
2013801.01

T-01

REV	DATE	DESCRIPTION

TITLE SHEET



GENERAL NOTES

1. THE FOLLOWING DRAWINGS REPRESENT MODIFICATIONS TO THE EXISTING TOWER. THE MODIFICATIONS ARE IDENTIFIED BY A DASHED LINE AND A REFERENCE TO THE ORIGINAL DRAWING NUMBER AND DATE.

2. THESE MODIFICATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF THE NATIONAL BUILDING CODE AND ALL APPLICABLE LOCAL ORDINANCES AND REGULATIONS.

3. ALL ORIGINAL TOWER INFORMATION WAS OBTAINED FROM THE TOWER DESIGNER BY GPD GROUP, INC. ON 12/27/11. THE TOWER DESIGNER IS RESPONSIBLE FOR THE ACCURACY OF THE ORIGINAL DESIGN INFORMATION.

4. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS TO FACE SHALL BE SHOWN TO THE CENTERLINE OF THE MEMBER UNLESS OTHERWISE NOTED.

5. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS TO FACE SHALL BE SHOWN TO THE CENTERLINE OF THE MEMBER UNLESS OTHERWISE NOTED.

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8. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS TO FACE SHALL BE SHOWN TO THE CENTERLINE OF THE MEMBER UNLESS OTHERWISE NOTED.

CONTRACTOR NOTES

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER THE CONTRACTOR'S RESPONSIBILITY FOR THE ACCURACY OF THE ORIGINAL DESIGN INFORMATION.

2. THE CONTRACTOR SHALL VERIFY THE SITE PRIOR TO BEING RESPONSIBLE FOR THE ACCURACY OF THE ORIGINAL DESIGN INFORMATION.

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WELD NOTES

1. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL PERFORM A NONDESTRUCTIVE TEST ON THE EXISTING BASE JOINTS TO DETERMINE THE STRUCTURAL INTEGRITY. IN ACCORDANCE WITH AISC 3.08, THE CONTRACTOR SHALL PERFORM A NONDESTRUCTIVE TEST ON THE EXISTING BASE JOINTS TO DETERMINE THE STRUCTURAL INTEGRITY.

2. THE CONTRACTOR IS RESPONSIBLE FOR COMMENSURATE A EXTENDED WELD INSPECTION (EWI) THROUGHOUT CONSTRUCTION OF THE PROJECT. A WELDING INSPECTION REPORT SHALL BE PROVIDED TO THE ENGINEER UPON COMPLETION OF THE PROJECT.

3. WELDING OPERATIONS MUST BE PROVIDED TO THE OWNER AND GPD GROUP PRIOR TO WELDING. CONTRACTOR SHALL PROVIDE THE WELDING PROCEDURES TO THE OWNER AND GPD GROUP PRIOR TO WELDING.

4. ALL WELDS SHALL BE TOUGHENED TO MEET THE REQUIREMENTS OF THE DESIGN. THE CONTRACTOR SHALL PROVIDE THE WELDING PROCEDURES TO THE OWNER AND GPD GROUP PRIOR TO WELDING.

5. ALL WELDS SHALL BE TOUGHENED TO MEET THE REQUIREMENTS OF THE DESIGN. THE CONTRACTOR SHALL PROVIDE THE WELDING PROCEDURES TO THE OWNER AND GPD GROUP PRIOR TO WELDING.

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MODIFICATION PLATE NOTES

1. CONTRACTOR SHALL INSTALL PLATES AT LOCATIONS PER PLAN VIEW.

2. USE ANK BOLTS WITH CORRECT SLEEVE LENGTHS PER DETAILS. BOLT THREADS SHALL NOT BE IN THE PLATE.

3. ALL BOLTS DRILLED IN POLE SHALL BE SOLVED CLEANED AND TOUCHED UP WITH ZINC DICH RICH PAINT.

4. ANK BOLTS TO BE THREADED PER AISC "SHIM-TIGHT CONDITION".

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

PROJECT NOTES

27074 - BRISTOL CENTER  
371 TERRYVILLE AVE.  
BRISTOL, CT 06010

2013801.01  
JOB NO.

N-01

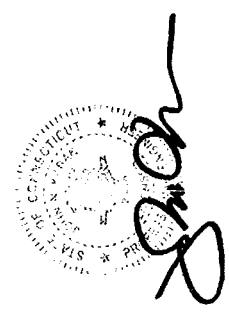
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REV	DATE	DESCRIPTION

**27074 - BRISTOL CENTER**  
 371 TERRYVILLE AVE.  
 BRISTOL, CT 06010

**TOWER ELEVATION & MODIFICATION SCHEDULE**

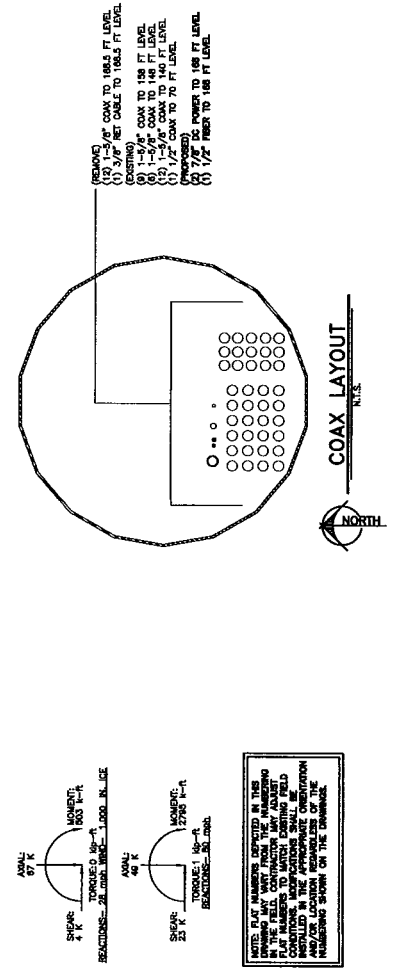
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DATE	DATE

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**2013801.01**

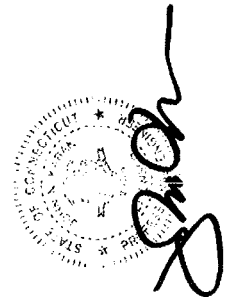
**S-01**

ANTENNA SCHEDULE		
ELEVATION	STATUS	ANTENNA MOUNT COAX
148'-0"	REMOVE (6) 800-10121 REMOVE (6) LP 21401 THMS REMOVE (6) SMO 10025	(5) PIPE MOUNTS (12) 1-5/8" (1) 3/8" SET
148'-0"	PROPOSED (1) SMM1-1000605 PROPOSED (1) SMM2-1000605 PROPOSED (1) AM-2-02-16-98-00T PROPOSED (6) RBR3001	(2) 7/8" DG TOWER (1) 1/2" FIBER
138'-0"	PROPOSED (1) DCH-48-48-18-8F EXISTING (5) DZBR30701E-M	(6) 1-5/8" (5) 12' T-ARMS
148'-0"	EXISTING (5) APV18-200175-C EXISTING (6) LP-8013 EXISTING (2) SBA 7000/767-4 EXISTING (2) SBA 7000/767-2F EXISTING (2) SBA 7003/647 EXISTING (1) SBA 171002/86F EXISTING (1) SBA 171002/0-3L	(5) PIPE MOUNTS (12) 1-5/8" (1) 13' LP PLATFORM
128'-0"	EXISTING (5) APV18-20014-C EXISTING (5) APV1800V-1800V-S-E-AU EXISTING (6) TWIN DUAL DUPLEX THMS	(12) 1-5/8"
70'-0"	EXISTING (1) EPS UNIT	(1) PIPE MOUNTS (1) 1/2"

MODIFICATION SCHEDULE					
SYMBOL	ELEVATION	MEMBER TYPE	EXISTING MEMBER	NEW MEMBER	NOTES
A	86'-0"± TO 115'-0"±	MODIFICATION PLATES	18 SMO MONPOLE	5"x1-1/4" THICK PLATE	INSTALL NEW FLAT PLATE REINFORCING TO THE TOWER SHAFT. SEE DETAILS 6/2-05, 6/2-06, & 1/2-08 FOR MORE INFORMATION.
B	72'-0"± TO 86'-0"±	MODIFICATION PLATES	18 SMO MONPOLE	5"x1-1/4" THICK PLATE	INSTALL NEW FLAT PLATE REINFORCING TO THE TOWER SHAFT. SEE DETAILS 4/2-04, 4/2-05, & 1/2-08 FOR MORE INFORMATION.
C	48'-0"± TO 72'-0"±	MODIFICATION PLATES	18 SMO MONPOLE	5"x1-1/4" THICK PLATE	INSTALL NEW FLAT PLATE REINFORCING TO THE TOWER SHAFT. SEE DETAILS 3/2-04, 3/2-05, & 1/2-08 FOR MORE INFORMATION.
D	28'-0"± TO 48'-0"±	MODIFICATION PLATES	18 SMO MONPOLE	5"x1-1/4" THICK PLATE	INSTALL NEW FLAT PLATE REINFORCING TO THE TOWER SHAFT. SEE DETAILS 2/2-04, 2/2-05, & 1/2-08 FOR MORE INFORMATION.
E	0'-0"± TO 28'-0"±	MODIFICATION PLATES	18 SMO MONPOLE	5"x1-1/4" THICK PLATE	INSTALL NEW FLAT PLATE REINFORCING TO THE TOWER SHAFT. SEE DETAILS 1/2-02, 1/2-03, & 1/2-08 FOR MORE INFORMATION.
F	0'-0"± TO 3'-0"±	TRANSITION STIFFENERS	-	1-1/4" THICK TRANSITION STIFFENERS	INSTALL NEW TRANSITION STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 1/2-02 AND SECTIONS 4/2-02 AND 6/2-03 FOR MORE INFORMATION.
G	0'-0"± TO 1'-0"±	BASE PLATE STIFFENERS	BASE PLATE STIFFENERS	-	REMOVE EXISTING BASE PLATE STIFFENERS FROM THE TOWER. ALL EXISTING MEMBERS REMOVED FROM TOWER SHALL BE DEPOSED OF BY CONTRACTOR OFF SITE.
H	0'-0"± TO 1'-0"±	BASE PLATE STIFFENERS	-	1/2" THICK BASE PLATE STIFFENERS	INSTALL NEW BASE PLATE STIFFENERS TO THE EXISTING TOWER. SEE DETAIL 1/2-02 AND SECTIONS 4/2-02 AND 6/2-03 FOR MORE INFORMATION.



**TOWER ELEVATION**  
 78'-0"





REV	DATE	DESCRIPTION

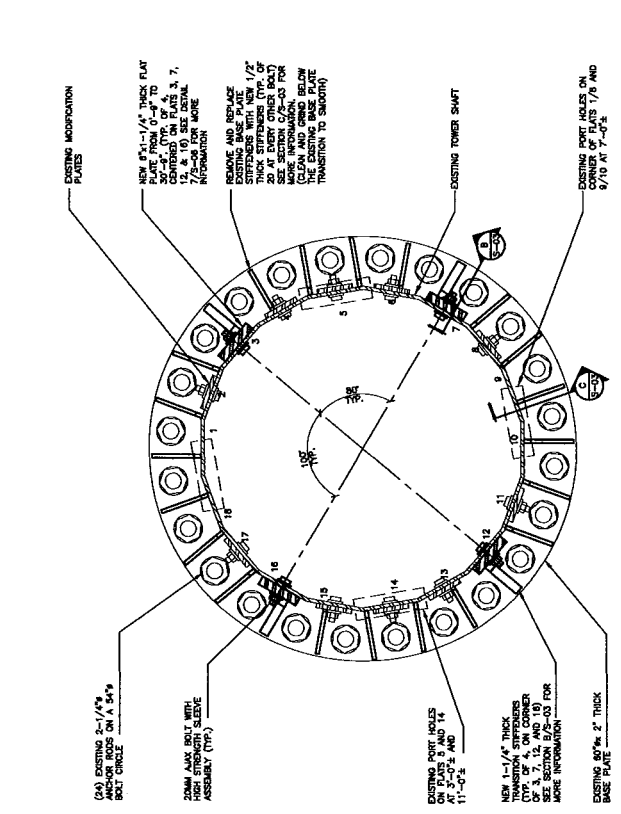
**27074 - BRISTOL CENTER**  
 371 TERRYVILLE AVE.  
 BRISTOL, CT 06010

**MODIFICATION SECTIONS & DETAILS**

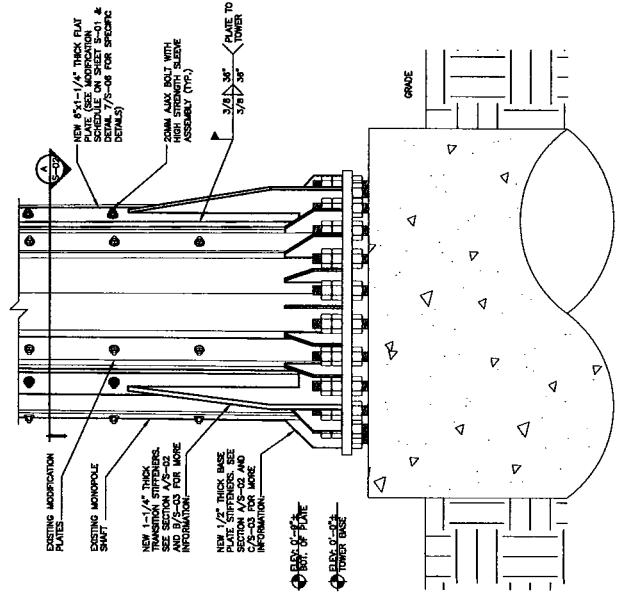
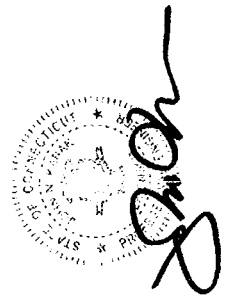
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PERMIT:	
NO.	
CONSTRUCTION RECORD:	
PROJECT NUMBER:	
DWG. NO.	
DWG. DATE	

JOB NO.  
**2013801.01**

**S-02**



**SECTION A**  
 1-1/2" x 1'-0"  
 S-02



**DETAIL 1**  
 1"-1'-0"  
 S-02

REV	DATE	DESCRIPTION

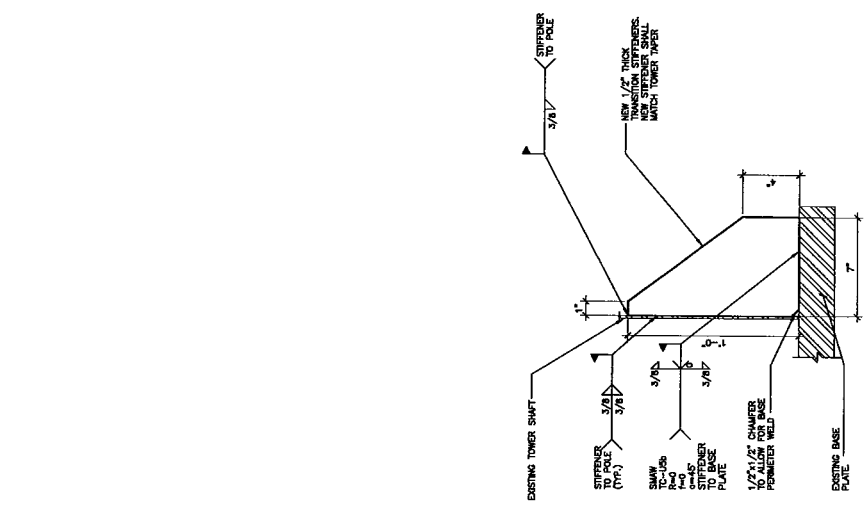
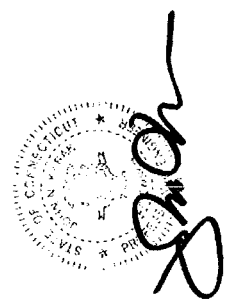
**27074 - BRISTOL CENTER**  
 371 TERRVILLE AVE  
 BRISTOL, CT 06010

**ADDITIONAL SECTIONS & DETAILS**

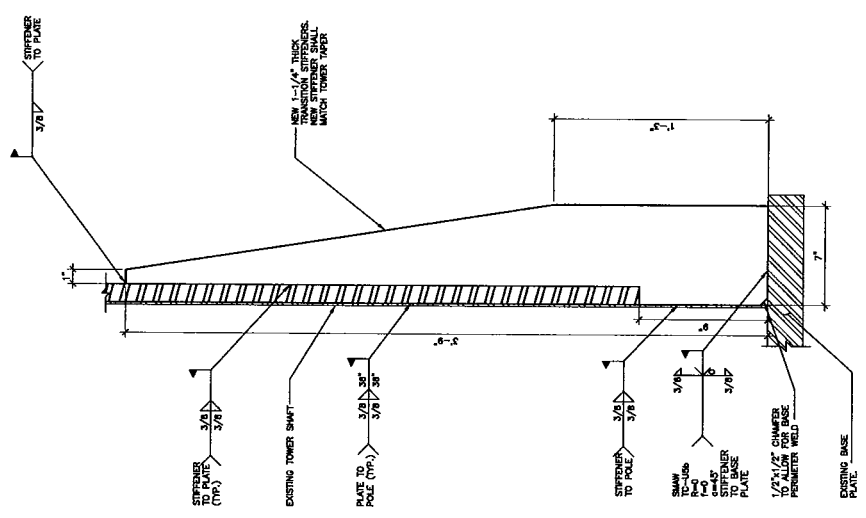
ISSUED FOR	CONTRACT
PERMIT	NO.
CONSTRUCTION	RECORD
PROJECT NUMBER	DRAWING
DWG	DATE

JOB NO.  
**2013801.01**

**S-03**



**SECTION B**  
 3'-11.0"



**SECTION C**  
 3'-11.0"

REV	DATE	DESCRIPTION

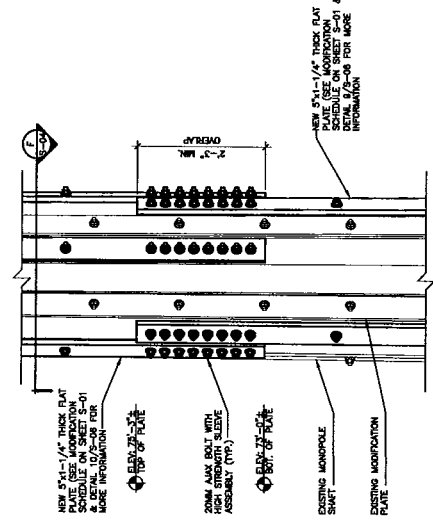
**27074 - BRISTOL CENTER**  
 371 TERRVILLE AVE  
 BRISTOL, CT 06010

**ADDITIONAL SECTIONS & DETAILS**

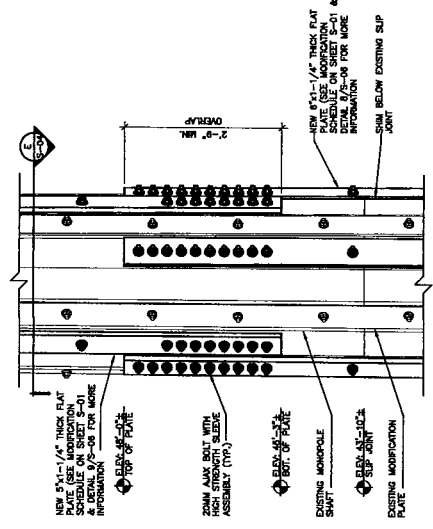
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CONSTRUCTION:	
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JOB NO.  
**2013801.01**

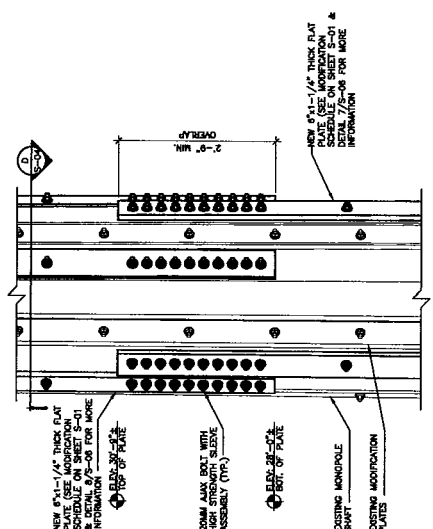
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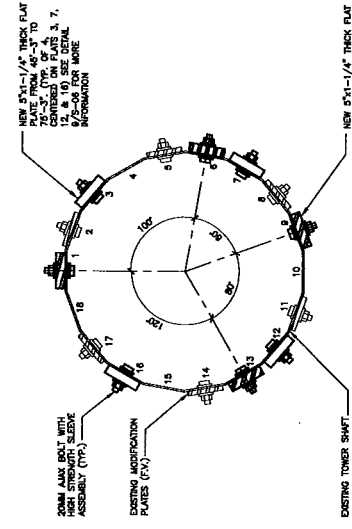
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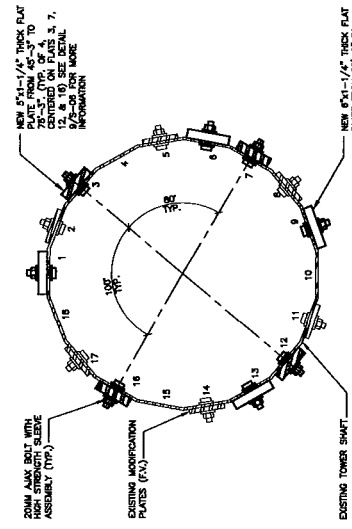
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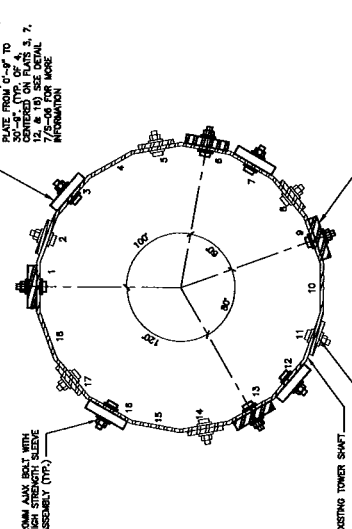
**DETAIL 3**  
 1/4\"/>



**SECTION F**  
 1-1/2\"/>



**SECTION E**  
 1-1/2\"/>



**SECTION D**  
 1-1/2\"/>

NOTE: REMOVE AND REPLACE EXISTING STEP PINS AS REQUIRED.

*[Signature]*

NOTE: REMOVE AND REPLACE EXISTING STEP PINS AS REQUIRED.

NOTE: REMOVE AND REPLACE EXISTING STEP PINS AS REQUIRED.



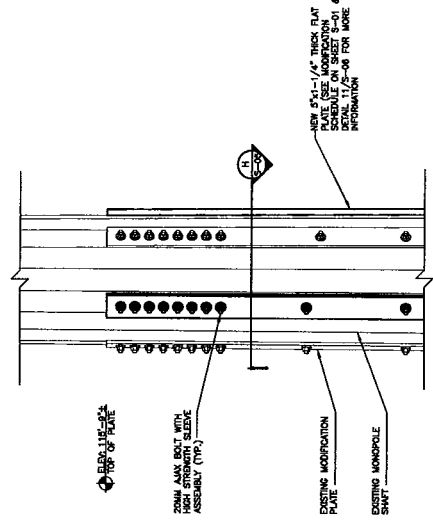
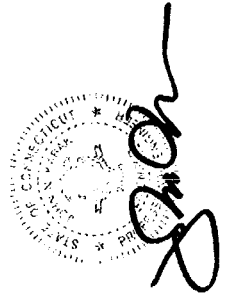
REV	DATE	DESCRIPTION

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 371 TERRAVILLE AVE.  
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**ADDITIONAL SECTIONS & DETAILS**

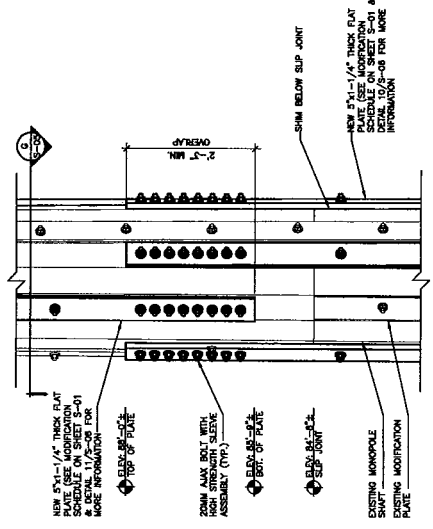
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BY:	
DATE:	
PROJECT NUMBER:	
DWG. NO.:	
DATE:	

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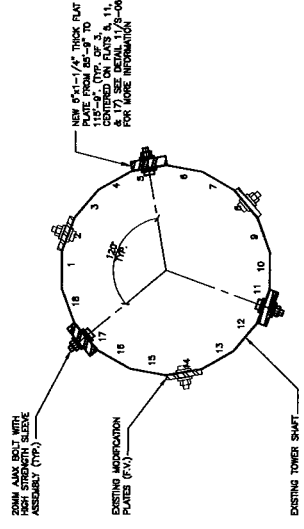
**S-05**



**DETAIL 5**  
 1-1/2" x 0"

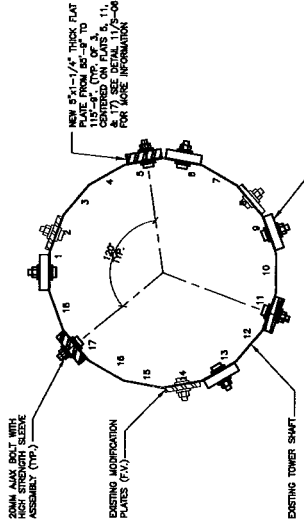


**DETAIL 6**  
 1-1/2" x 0"



**SECTION H**  
 1-1/2" x 1'-0"

NOTE: REMOVE AND REPLACE EXISTING STEP PINS AS REQUIRED.



**SECTION G**  
 1-1/2" x 1'-0"

NOTE: REMOVE AND REPLACE EXISTING STEP PINS AS REQUIRED.



REV	DATE	DESCRIPTION

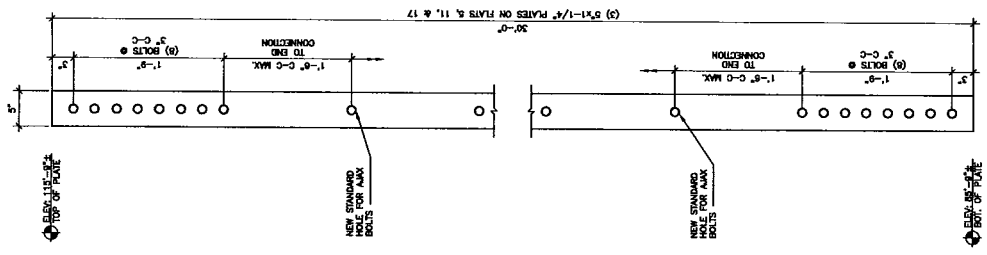
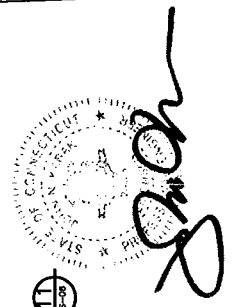
27074 - BRISTOL CENTER  
 371 TERRYVILLE AVE.  
 BRISTOL, CT 06010

ADDITIONAL SECTIONS  
 & DETAILS

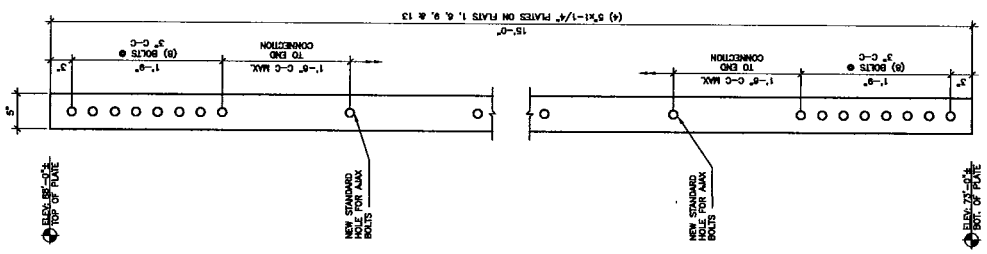
ISSUED FOR	CONTRACT
PERMIT	NO.
CONSTRUCTION	RECORD
PROJECT NUMBER	DATE
DRAWN	DATE

JOB NO.  
2013801.01

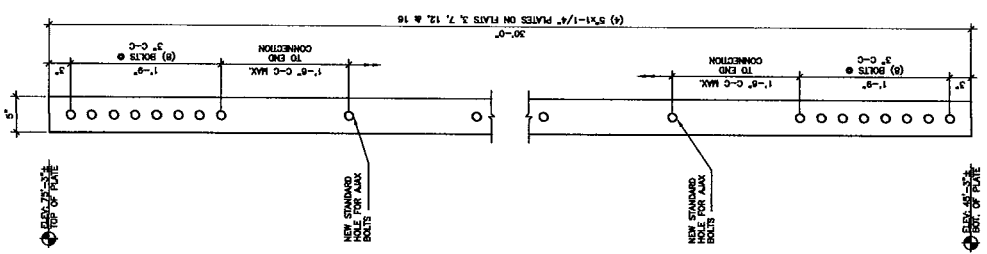
S-05



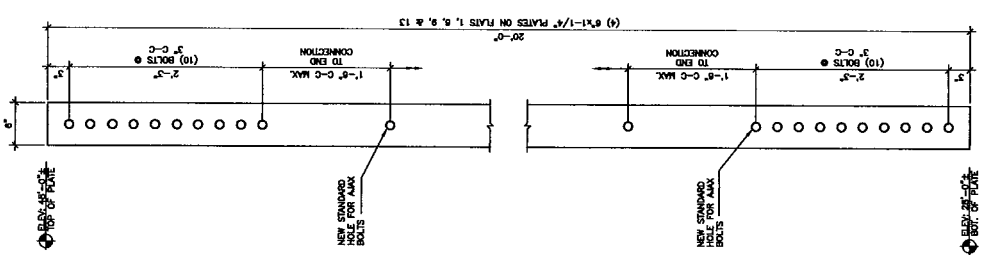
DETAIL 11  
1-1/2"x1'-0"



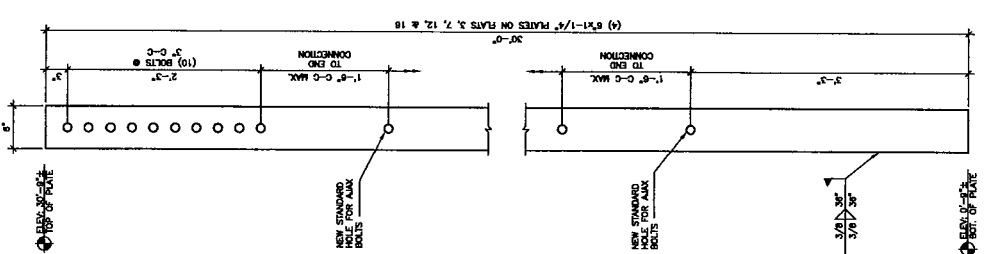
DETAIL 10  
1-1/2"x1'-0"



DETAIL 9  
1-1/2"x1'-0"



DETAIL 8  
1-1/2"x1'-0"



DETAIL 7  
1-1/2"x1'-0"

PLATE TO TOWER  
 3/8" 30"  
 3/8" 30"

REV	DATE	DESCRIPTION

**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
X	FABRICATOR CERTIFIED WELD INSPECTION		POST INSTALLED ANCHOR ROD VERIFICATION		ADDITIONAL TESTING AND INSPECTIONS:
X	MATERIAL TEST REPORT		BASE PLATE GROUT VERIFICATION		
X	FABRICATOR NDE INSPECTION		CONTRACTOR'S CERTIFIED WELD INSPECTION		
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)		EARTHWORK: LIFT AND DENSITY		
X	PACKING SLIPS		ON SITE COLD GALVANIZING VERIFICATION		
			GLY WIRE TENSION REPORT		
			GC AS-BUILT DOCUMENTS		

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:**

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 INSPECTION CONSTITUTE A GUARANTEE OF THE ACCURACY 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 BEIN COMMUNICATING AND COORDINATING AS SOON AS A PO OR PAYMENT IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROMPT IN REACHING OUT TO THE OTHER PARTY. CONTACT LISTED ON THE TOWER 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**

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 8 BUSINESS DAYS NOTICE TO THE FOUNDATION ENGINEERS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MODIFICATION INSPECTION REPORT.
- FOR THE MODIFICATION INSPECTION TO BE CONDUCTED WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION TO BE CONDUCTED CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- THE GC AND MODIFICATION INSPECTOR COORDINATE ALL TOWERING OPERATIONS SIMULTANEOUSLY FOR ANY GLY WIRE TENSIONING OR RE-TENSIONING OPERATIONS. IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MODIFICATION INSPECTIONS TO OCCUR AT THE SAME TIME.
- 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 WITH THE 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, LOSSES OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME PERIOD EXCEPT AS SPECIFICALLY STATED IN THE MODIFICATION INSPECTION REPORT. 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 OR CORRECTED) THE GC SHALL RE-ANALYZE THE MODIFICATION INSPECTION TO COORDINATE A REMEDIATION PLAN IN ONE OF THE WAYS:
  - CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE 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 INSPECTION REPORT. VERIFICATION INSPECTIONS SHALL BE CONDUCTED IN ACCORDANCE WITH THE ORIGINAL PROJECT.

**REQUIRED PHOTOS**

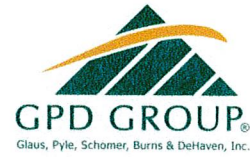
1. REMEMBER THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS ARE TO BE TAKEN AND INCLUDED IN THE MODIFICATION INSPECTION REPORT:
  - PRE-CONSTRUCTION GENERAL SITE CONDITION
  - INSPECTIONS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - PHOTOS OF ALL MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - 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.







Pinnacle Wireless  
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Windsor, CT 06095  
(401) 477-2938



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[kclements@gpdgroup.com](mailto:kclements@gpdgroup.com)

**GPD# 2013801.01**  
February 8, 2013

### STRUCTURAL ANALYSIS REPORT WITH MODIFICATION DESIGN

**AT&T DESIGNATION:** Site USID: 27074  
Site FA: 10070954  
Site Name: BRISTOL CENTER  
AT&T Project: 1 in Line MOD LTE 082912

**ANALYSIS CRITERIA:** Codes: TIA/EIA-222-F, 2005 CTBC, 2003 IBC & ASCE 7-05  
80-mph with 0" ice  
28-mph with 1" ice

**SITE DATA:** 371 Terryville Ave, Bristol, CT 06010, Hartford County  
Latitude 41° 40' 51.211" N, Longitude 72° 57' 56.516" W  
Market: New England  
168.5' EEI Monopole

Ms. Stephanie Wenderoth,

GPD is pleased to submit this Structural Analysis Report with Modification Design to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

#### Analysis Results

Tower Stress Level with Proposed Equipment: 90.8% Pass  
Foundation Ratio with Proposed Equipment: 99.0% Pass

Note: In order for this analysis results to be valid for the proposed, existing, and reserved loading in Appendix A the modifications referenced in the design drawings by GPD (Project #: 2013801.01, dated 2/8/2013) must be installed.

We at GPD appreciate the opportunity of providing our continuing professional services to you and Pinnacle Wireless. If you have any questions or need further assistance on this or any other projects please do not hesitate to call.

Respectfully submitted,

John N. Kabak, P.E.  
Connecticut #: 28336

## SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing modified structure is capable of carrying the proposed loading configuration as specified by AT&T Mobility to Pinnacle Wireless. This report was commissioned by Ms. Stephanie Wenderoth of Pinnacle Wireless.

**The proposed coax shall be run internal to the monopole with the existing coax in order for the analysis to be valid.**

Modifications by Black & Veatch (Project #: 166951, dated 5/4/2012) which included installing reinforcement plates and installing base plate stiffeners were found to be ineffective and were not considered in the analysis. However, the installed anchor rods were considered to be effective.

The proposed modifications by GPD (Project #: 2013801.01, dated 2/8/13), consist of adding modification plates from 0' – 115.3' and removing and replacing the existing stiffeners at the base, and have been considered in this analysis. See Appendix G for the modification drawings.

### TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	90.8%	Pass
Anchor Rods	52.0%	Pass
Base Plate	80.4%	Pass
Foundation	99.0%	Pass

## ANALYSIS METHOD

tnxTower (Version 6.0.4.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and is being completed without the benefit of a detailed site visit.

### DOCUMENTS PROVIDED

Document	Remarks	Source
Equipment Modification Form	AT&T Internal Loading Document, uploaded 8/29/2012	Siterra
RF Data Sheet	Not Provided	N/A
Tower Design	EI Project #: 12027, dated 12/2/2003	Siterra
Foundation Design	EI Project #: 12027, dated 12/2/2003	Siterra
Geotechnical Report	VN Engineers Project #: 23-124G, dated 11/11/2003	Siterra
Previous Structural Analysis	B&V Project #: 166951, dated 5/4/2012	Siterra
Previous Structural Analysis	GPD Project #: 2012801.80, dated 12/4/2012	Siterra
Modification Drawings	GPD Project #: 2013801.01, dated 2/8/2013	GPD
Modification Drawings	B&V Project #: 166951, dated 5/4/2012	Siterra

## ASSUMPTIONS

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

1. The tower shaft sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. Modifications by Black & Veatch (Project #: 166951, dated 5/4/2012) which included installing reinforcement plates and installing base plate stiffeners were found to be ineffective and were not considered in the analysis. However, the installed anchor rods were considered to be effective.
10. Loading interpreted from photos is accurate to  $\pm 5'$  AGL, antenna size accurate to  $\pm 3.3$  sf, and coax equal to the number of existing antennas without reserve.
11. All existing loading was obtained from the previous structural analysis by B&V (Project #: 166951, dated 5/4/2012), site photos, and the provided Equipment Modification Form and is assumed to be accurate.
12. The proposed coax shall be run internal to the monopole with the existing coax in order for the analysis to be valid.
13. The existing AT&T loading and elevation found in the equipment modification form was found to differ from the existing AT&T loading and elevation found in site photos. Existing AT&T loading has been modeled based on the equipment modification form per correspondence with Stephanie Wenderoth and the loading elevation has been modeled based on site photos.
14. The proposed DC Power/Fiber feedline sizes have been assumed based on previous experience with AT&T LTE projects.
15. The proposed modifications by GPD (Project #: 2013801.01, dated 2/8/13), consist of adding modification plates from 0' – 115.3' and removing and replacing the existing stiffeners at the base, and have been considered in this analysis. See Appendix G for the modification drawings.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

## 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 in excess of the specified code recommended amount, 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.

## APPENDIX A

### Tower Analysis Summary Form

# Tower Analysis Summary Form

General Info	
Site Name	BRISTOL CENTER
Site Number	27074
FA Number	10070954
Date of Analysis	2/8/2013
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	
Tower Height (top of steel AGL)	168.5'	
Tower Manufacturer	EEL	
Tower Model	n/a	
Foundation Design	EEL Inc. Project #: 12027	12/2/2003
Geotech Report	EEL Inc. Project #: 12027	12/2/2003
Tower Mapping	VN Engineers Project #: 23-741G	11/11/2003
Previous Structural Analysis	n/a	
Modification Drawings	B&V Project #: 166951	5/4/2012
	B&V Project #: 166951	5/4/2012

Design Parameters	
Design Code Used	TIA/EIA-222-E, 2005 CTBC, 2003 IBC & ASCE 7-05
Location of Tower (County, State)	Hartford, CT
Basic Wind Speed (mph)	90 (fastest mile)
Ice Thickness (in)	1
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)	
Existing/Reserved + Proposed Condition	
Tower (%)	90.8%
Tower Base (%)	52.0%
Foundation (%)	99.0%
Foundation Adequate?	Yes

Included installing reinforcement plates and installing base plate stiffeners were found to be ineffective and were not considered in the analysis. However, the installed anchor rods were considered to be effective.

Steel Yield Strength (ksi)	
Pole	65
Base Plate	60
Anchor Rods	75

The proposed modifications by GPD (Project #: 2013801.01, dated 2/8/13), consist of adding modification plates from 0' - 115.3' and removing and replacing the existing stiffeners at the base, and have been considered in this analysis. See Appendix G for the modification drawings.

Existing / Reserved Loading										
Antenna					Mount					
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type
AT&T Mobility	168.5	169	6	Panel	Kathrein	800-10121	30/150/270	3		Pipe Mounts behind antennas on same mount
AT&T Mobility	168.5	169	6	TMA	Powerwave	LGP 21401				
AT&T Mobility	168.5	169	6	RET	Kathrein	860 10025				
Sprint	158	158	9	Panel	Decibel	DB980F9074E-M	60/160/280	3	Unknown	12' T-Arms
Pocket Communications	148	148	3	Panel	RFS	APXY18-206517S-C	25/130/250	3	Unknown	Pipe Mounts
Verizon	140	140	6	Panel	Anel	LPD-6513	60/180/300	1	Unknown	13' LP Platform on same mount
Verizon	140	140	2	Panel	Anel	BXA 70980/GCF-4	60/300		Unknown	13' LP Platform on same mount
Verizon	140	140	2	Panel	Anel	BXA 171085-02BF	60/300		Unknown	13' LP Platform on same mount
Verizon	140	140	1	Panel	Anel	BXA 70983/GCF	180		Unknown	13' LP Platform on same mount
Verizon	140	140	1	Panel	Anel	BXA 177069/9BF	180		Unknown	13' LP Platform on same mount
Verizon	140	140	6	Diplexer	RFS	PD9R60042C-3L			Unknown	behind antennas
T-Mobile	128	130	3	Panel	RFS	APXY18-209014-C	30/120/240	1	Unknown	13' LP Platform on same mount
T-Mobile	128	130	3	Panel	RFS	APX16DW1-16DWV-S-E-ACU	30/120/240		Unknown	13' LP Platform on same mount
T-Mobile	128	130	6	TMA	Andrew	Twin Dual Duplex			Unknown	on same mount
Sprint	70	70	1	GPS	Unknown	GPS Unit		1	Unknown	Pipe Mounts

Note: The existing mount at 168.5 shall be removed and was not considered in the analysis. The remaining loading shall be relocated to the proposed mount.

Proposed Loading										
Antenna					Mount					
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type
AT&T Mobility	168	169	1	Panel	Andrew	SEBH-1D656C	30	1	Unknown	12.5' LP Platform on same mount
AT&T Mobility	168	169	1	Panel	Powerwave	PE5-17-XLH-RR	150		Unknown	12.5' LP Platform on same mount
AT&T Mobility	168	169	1	Panel	KIMW	AM-X-CD-16-65-00T	270		Unknown	12.5' LP Platform on same mount
AT&T Mobility	168	169	6	RRH	RBS6601	RBS6601			Unknown	on same mount
AT&T Mobility	168	167	1	DC Unit	Raycap	DC6-48-50-18-3F			Unknown	on same mount

Note: The proposed loading shall be installed in addition to the remaining existing loading.

Future Loading										
Antenna					Mount					
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type
AT&T Mobility	168	169	1	Panel	Andrew	SEBH-1D656C	30	1	Unknown	12.5' LP Platform on same mount
AT&T Mobility	168	169	1	Panel	Powerwave	PE5-17-XLH-RR	150		Unknown	12.5' LP Platform on same mount
AT&T Mobility	168	169	1	Panel	KIMW	AM-X-CD-16-65-00T	270		Unknown	12.5' LP Platform on same mount
AT&T Mobility	168	169	6	RRH	RBS6601	RBS6601			Unknown	on same mount
AT&T Mobility	168	167	1	DC Unit	Raycap	DC6-48-50-18-3F			Unknown	on same mount

Note: The proposed loading shall be installed in addition to the remaining existing loading.



## APPENDIX B

tnxTower Output File



<b>tnxTower</b>  <b>GPD</b> 520 South Main St, Suite 2531 Akron, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.2101	<b>Job</b> 27074 BRISTOL CENTER	<b>Page</b> 1 of 8
	<b>Project</b> 2013801.01	<b>Date</b> 17:04:40 02/08/13
	<b>Client</b> Pinnacle Wireless	<b>Designed by</b> 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 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 28 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 <sub>A</sub> A <sub>A</sub>		Weight plf
						ft <sup>2</sup> /ft	plf	
Safety Line 3/8	C	No	CaAa (Out Of Face)	168.50 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
Climbing Pegs	C	No	CaAa (Out Of Face)	168.50 - 8.00	1	No Ice	0.01	0.31
						1/2" Ice	0.12	0.71
						1" Ice	0.22	1.71
						2" Ice	0.41	5.56
						4" Ice	0.82	20.59
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	168.50 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
RET Cable	C	No	Inside Pole	168.50 - 8.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
7/8" DC Power Cable	C	No	Inside Pole	168.50 - 8.00	2	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
						2" Ice	0.00	0.60
						4" Ice	0.00	0.60
1/2" Fiber Cable	C	No	Inside Pole	168.50 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	158.00 - 8.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>AA</sub>		Weight plf
						ft <sup>2</sup> /ft		
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	148.00 - 8.00	6	4" Ice	0.00	0.82
						No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	140.00 - 8.00	12	4" Ice	0.00	0.82
						No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	128.00 - 8.00	12	4" Ice	0.00	0.82
						No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	70.00 - 8.00	1	4" Ice	0.00	0.82
						No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
1-1/4" Mod Plate	A	No	CaAa (Out Of Face)	115.75 - 0.75	1	4" Ice	0.00	0.15
						No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
						2" Ice	0.65	0.00
1-1/4" Mod Plate	B	No	CaAa (Out Of Face)	115.75 - 0.75	2	4" Ice	1.10	0.00
						No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
1-1/4" Mod Plate	C	No	CaAa (Out Of Face)	115.75 - 0.75	1	4" Ice	0.00	0.00
						No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
						2" Ice	0.65	0.00
5"x5/8" Mod Plate (Rev F)	A	No	CaAa (Out Of Face)	84.67 - 0.00	2	4" Ice	1.10	0.00
						No Ice	0.00	10.63
						1/2" Ice	0.00	11.70
						1" Ice	0.00	13.11
						2" Ice	0.00	16.96
5"x5/8" Mod Plate (Rev F)	B	No	CaAa (Out Of Face)	84.67 - 0.00	2	4" Ice	0.00	28.83
						No Ice	0.00	10.63
						1/2" Ice	0.00	11.70
						1" Ice	0.00	13.11
						2" Ice	0.00	16.96
5"x5/8" Mod Plate (Rev F)	C	No	CaAa (Out Of Face)	84.67 - 0.00	2	4" Ice	0.00	28.83
						No Ice	0.00	10.63
						1/2" Ice	0.00	11.70
						1" Ice	0.00	13.11
						2" Ice	0.00	16.96
5"x5/8" Mod Plate (Rev F)	A	No	CaAa (Out Of Face)	120.00 - 84.67	1	4" Ice	0.00	28.83
						No Ice	0.00	10.63
						1/2" Ice	0.00	11.70
						1" Ice	0.00	13.11
						2" Ice	0.00	16.96
5"x5/8" Mod Plate (Rev F)	B	No	CaAa (Out Of Face)	120.00 - 84.67	1	4" Ice	0.00	28.83
						No Ice	0.00	10.63
						1/2" Ice	0.00	11.70
						1" Ice	0.00	13.11
						2" Ice	0.00	16.96
						4" Ice	0.00	28.83
						No Ice	0.00	10.63
						1/2" Ice	0.00	11.70

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
5"x5/8" Mod Plate (Rev F)	C	No	CaAa (Out Of Face)	120.00 - 84.67	1	No Ice	0.00	10.63
						1/2" Ice	0.00	11.70
						1" Ice	0.00	13.11
						2" Ice	0.00	16.96
						4" Ice	0.00	28.83

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight lb
MTS 12.5' LP Platform	C	None		0.0000	168.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
(2) 800 10121 w/ Mount Pipe	A	From Centroid-Le g	3.46 2.00 1.00	30.0000	168.00	No Ice	5.46	4.33	62.58
						1/2" Ice	5.88	4.95	105.72
						1" Ice	6.31	5.59	157.65
						2" Ice	7.21	6.96	282.19
						4" Ice	9.09	10.14	639.73
(2) 800 10121 w/ Mount Pipe	B	From Centroid-Le g	3.46 2.00 1.00	30.0000	168.00	No Ice	5.46	4.33	62.58
						1/2" Ice	5.88	4.95	105.72
						1" Ice	6.31	5.59	157.65
						2" Ice	7.21	6.96	282.19
						4" Ice	9.09	10.14	639.73
(2) 800 10121 w/ Mount Pipe	C	From Centroid-Le g	3.46 2.00 1.00	30.0000	168.00	No Ice	5.46	4.33	62.58
						1/2" Ice	5.88	4.95	105.72
						1" Ice	6.31	5.59	157.65
						2" Ice	7.21	6.96	282.19
						4" Ice	9.09	10.14	639.73
(2) LGP21401	A	From Centroid-Le g	3.46 2.00 1.00	30.0000	168.00	No Ice	0.00	0.23	14.10
						1/2" Ice	0.00	0.31	21.26
						1" Ice	0.00	0.40	30.32
						2" Ice	0.00	0.61	54.89
						4" Ice	0.00	1.12	135.29
(2) LGP21401	B	From Centroid-Le g	3.46 2.00 1.00	30.0000	168.00	No Ice	0.00	0.23	14.10
						1/2" Ice	0.00	0.31	21.26
						1" Ice	0.00	0.40	30.32
						2" Ice	0.00	0.61	54.89
						4" Ice	0.00	1.12	135.29
(2) LGP21401	C	From Centroid-Le g	3.46 2.00 1.00	30.0000	168.00	No Ice	0.00	0.23	14.10
						1/2" Ice	0.00	0.31	21.26
						1" Ice	0.00	0.40	30.32
						2" Ice	0.00	0.61	54.89
						4" Ice	0.00	1.12	135.29
(2) 860 10025	A	From Centroid-Le g	3.46 2.00 1.00	30.0000	168.00	No Ice	0.18	0.15	1.20
						1/2" Ice	0.25	0.21	2.85
						1" Ice	0.33	0.29	5.48
						2" Ice	0.51	0.47	14.45
						4" Ice	0.98	0.93	52.66
(2) 860 10025	B	From Centroid-Le g	3.46 2.00 1.00	30.0000	168.00	No Ice	0.18	0.15	1.20
						1/2" Ice	0.25	0.21	2.85
						1" Ice	0.33	0.29	5.48
						2" Ice	0.51	0.47	14.45



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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
(2) 860 10025	C	From Centroid-Le g	3.46	30.0000	168.00	4" Ice	0.98	0.93	52.66
			2.00			No Ice	0.18	0.15	1.20
			1.00			1/2" Ice	0.25	0.21	2.85
						1" Ice	0.33	0.29	5.48
						2" Ice	0.51	0.47	14.45
SBNH-1D6565C w/ Mount Pipe	A	From Centroid-Le g	3.46	30.0000	168.00	4" Ice	0.98	0.93	52.66
			2.00			No Ice	11.45	9.12	82.70
			1.00			1/2" Ice	12.06	10.21	162.03
						1" Ice	12.69	11.18	254.15
						2" Ice	14.03	13.17	469.01
P65-17-XLH-RR w/ Mount Pipe	B	From Centroid-Le g	3.46	30.0000	168.00	4" Ice	17.05	17.35	1051.99
			2.00			No Ice	11.47	8.70	99.20
			1.00			1/2" Ice	12.08	10.11	179.13
						1" Ice	12.71	11.38	273.32
						2" Ice	14.07	13.58	493.70
AM-X-CD-16-65-00T w/ 2"x78" Mount Pipe	C	From Centroid-Le g	3.46	30.0000	168.00	4" Ice	17.08	18.18	1100.38
			2.00			No Ice	7.09	5.68	56.73
			1.00			1/2" Ice	7.71	6.69	112.77
						1" Ice	8.28	7.51	179.35
						2" Ice	9.45	9.18	335.57
(2) RBS 6601	A	From Centroid-Le g	3.46	30.0000	168.00	4" Ice	11.92	12.75	772.87
			2.00			No Ice	0.55	0.40	22.00
			1.00			1/2" Ice	0.70	0.52	34.88
						1" Ice	0.86	0.64	50.27
						2" Ice	1.19	0.91	89.38
(2) RBS 6601	B	From Centroid-Le g	3.46	30.0000	168.00	4" Ice	1.97	1.55	206.33
			2.00			No Ice	0.55	0.40	22.00
			1.00			1/2" Ice	0.70	0.52	34.88
						1" Ice	0.86	0.64	50.27
						2" Ice	1.19	0.91	89.38
(2) RBS 6601	C	From Centroid-Le g	3.46	30.0000	168.00	4" Ice	1.97	1.55	206.33
			2.00			No Ice	0.55	0.40	22.00
			1.00			1/2" Ice	0.70	0.52	34.88
						1" Ice	0.86	0.64	50.27
						2" Ice	1.19	0.91	89.38
DC6-48-60-18-8F Surge Suppression Unit	A	From Centroid-Le g	3.46	30.0000	168.00	4" Ice	1.97	1.55	206.33
			2.00			No Ice	1.47	1.47	32.80
			-1.00			1/2" Ice	1.67	1.67	50.52
						1" Ice	1.88	1.88	70.72
						2" Ice	2.33	2.33	119.24
12' T-Arm - Round (GPD)	A	From Face	1.88	-20.0000	158.00	4" Ice	3.38	3.38	252.92
			-0.68			No Ice	4.70	2.33	333.00
			0.00			1/2" Ice	5.33	2.96	400.00
						1" Ice	6.00	3.60	467.00
						2" Ice	6.67	4.87	533.00
12' T-Arm - Round (GPD)	B	From Face	2.00	0.0000	158.00	4" Ice	8.33	7.41	600.00
			0.00			No Ice	4.70	2.33	333.00
			0.00			1/2" Ice	5.33	2.96	400.00
						1" Ice	6.00	3.60	467.00
						2" Ice	6.67	4.87	533.00
12' T-Arm - Round (GPD)	C	From Face	1.88	-20.0000	158.00	4" Ice	8.33	7.41	600.00
			-0.68			No Ice	4.70	2.33	333.00
			0.00			1/2" Ice	5.33	2.96	400.00
						1" Ice	6.00	3.60	467.00
						2" Ice	6.67	4.87	533.00
(3) DB980F90T4E-M	A	From Face	3.76	-20.0000	158.00	4" Ice	8.33	7.41	600.00
						No Ice	4.37	3.95	34.05

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
w/Mount Pipe			-1.36 0.00			1/2" Ice 4.96 1" Ice 5.47 2" Ice 6.52 4" Ice 8.98	5.04 5.85 7.49 10.98	70.69 117.91 234.84 592.97
(3) DB980F90T4E-M w/Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	158.00	No Ice 4.37 1/2" Ice 4.96 1" Ice 5.47 2" Ice 6.52 4" Ice 8.98	3.95 5.04 5.85 7.49 10.98	34.05 70.69 117.91 234.84 592.97
(3) DB980F90T4E-M w/Mount Pipe	C	From Face	3.76 -1.36 0.00	-20.0000	158.00	No Ice 4.37 1/2" Ice 4.96 1" Ice 5.47 2" Ice 6.52 4" Ice 8.98	3.95 5.04 5.85 7.49 10.98	34.05 70.69 117.91 234.84 592.97
APXV18-206517S-C w/ 6' Mount Pipe	A	From Leg	0.91 0.42 0.00	25.0000	148.00	No Ice 5.17 1/2" Ice 5.62 1" Ice 6.08 2" Ice 7.02 4" Ice 9.12	4.46 5.39 6.20 7.87 11.40	48.30 88.36 139.05 264.53 642.74
APXV18-206517S-C w/ 6' Mount Pipe	B	From Leg	0.98 0.17 0.00	10.0000	148.00	No Ice 5.17 1/2" Ice 5.62 1" Ice 6.08 2" Ice 7.02 4" Ice 9.12	4.46 5.39 6.20 7.87 11.40	48.30 88.36 139.05 264.53 642.74
APXV18-206517S-C w/ 6' Mount Pipe	C	From Leg	0.98 0.17 0.00	10.0000	148.00	No Ice 5.17 1/2" Ice 5.62 1" Ice 6.08 2" Ice 7.02 4" Ice 9.12	4.46 5.39 6.20 7.87 11.40	48.30 88.36 139.05 264.53 642.74
MTS 12.5' LP Platform	A	None		0.0000	140.00	No Ice 14.66 1/2" Ice 18.87 1" Ice 23.08 2" Ice 31.50 4" Ice 48.34	14.66 18.87 23.08 31.50 48.34	1250.00 1481.33 1712.66 2175.32 3100.64
(2) LPD-6513 w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	140.00	No Ice 7.14 1/2" Ice 7.86 1" Ice 8.46 2" Ice 9.69 4" Ice 12.31	6.81 7.92 8.75 10.44 14.03	53.55 115.23 187.68 355.69 818.38
(2) LPD-6513 w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	140.00	No Ice 7.14 1/2" Ice 7.86 1" Ice 8.46 2" Ice 9.69 4" Ice 12.31	6.81 7.92 8.75 10.44 14.03	53.55 115.23 187.68 355.69 818.38
(2) LPD-6513 w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	140.00	No Ice 7.14 1/2" Ice 7.86 1" Ice 8.46 2" Ice 9.69 4" Ice 12.31	6.81 7.92 8.75 10.44 14.03	53.55 115.23 187.68 355.69 818.38
BXA-70080/6CFx4 w/ Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	140.00	No Ice 6.01 1/2" Ice 6.58 1" Ice 7.10 2" Ice 8.20 4" Ice 10.75	6.21 7.38 8.26 10.05 13.89	43.55 95.42 158.86 311.23 752.23
BXA-70080/6CFx4 w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	140.00	No Ice 6.01 1/2" Ice 6.58 1" Ice 7.10	6.21 7.38 8.26	43.55 95.42 158.86

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
							ft <sup>2</sup>	ft <sup>2</sup>	lb
BXA-70063/4CF w/ mount pipe	C	From Face	4.00	0.0000	140.00	2" Ice	8.20	10.05	311.23
						4" Ice	10.75	13.89	752.23
						No Ice	5.65	3.87	31.80
						1/2" Ice	6.20	4.67	74.05
						1" Ice	6.72	5.34	125.75
BXA-171085-12BF w/Mount Pipe	A	From Face	4.00	0.0000	140.00	2" Ice	7.80	6.79	249.67
						4" Ice	10.08	10.00	610.49
						No Ice	4.74	5.30	49.74
						1/2" Ice	5.19	6.10	93.74
						1" Ice	5.64	6.91	146.98
BXA-171085-12BF w/Mount Pipe	B	From Face	4.00	0.0000	140.00	2" Ice	6.58	8.59	279.63
						4" Ice	8.58	12.14	668.98
						No Ice	4.74	5.30	49.74
						1/2" Ice	5.19	6.10	93.74
						1" Ice	5.64	6.91	146.98
BXA-171063/8BF w/Mount Pipe	C	From Face	4.00	0.0000	140.00	2" Ice	6.58	8.59	279.63
						4" Ice	8.58	12.14	668.98
						No Ice	3.44	3.81	45.24
						1/2" Ice	3.87	4.48	80.29
						1" Ice	4.34	5.15	123.02
(2) FD9R6004/2C-3L	A	From Face	4.00	0.0000	140.00	2" Ice	5.35	6.56	230.03
						4" Ice	7.50	9.72	549.48
						No Ice	0.00	0.08	3.10
						1/2" Ice	0.00	0.14	5.40
						1" Ice	0.00	0.20	8.79
(2) FD9R6004/2C-3L	B	From Face	4.00	0.0000	140.00	2" Ice	0.00	0.34	19.61
						4" Ice	0.00	0.74	62.87
						No Ice	0.00	0.08	3.10
						1/2" Ice	0.00	0.14	5.40
						1" Ice	0.00	0.20	8.79
(2) FD9R6004/2C-3L	C	From Face	4.00	0.0000	140.00	2" Ice	0.00	0.34	19.61
						4" Ice	0.00	0.74	62.87
						No Ice	0.00	0.08	3.10
						1/2" Ice	0.00	0.14	5.40
						1" Ice	0.00	0.20	8.79
MTS 12.5' LP Platform	A	None		0.0000	128.00	2" Ice	0.00	0.34	19.61
						4" Ice	0.00	0.74	62.87
						No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
APXV18-209014-C w/ Mount Pipe	A	From Leg	4.00	30.0000	128.00	2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
						No Ice	3.62	3.21	36.95
						1/2" Ice	4.00	3.84	67.79
						1" Ice	4.40	4.49	107.24
APXV18-209014-C w/ Mount Pipe	B	From Leg	4.00	0.0000	128.00	2" Ice	5.30	5.82	205.70
						4" Ice	7.23	8.76	508.07
						No Ice	3.62	3.21	36.95
						1/2" Ice	4.00	3.84	67.79
						1" Ice	4.40	4.49	107.24
APXV18-209014-C w/ Mount Pipe	C	From Leg	4.00	0.0000	128.00	2" Ice	5.30	5.82	205.70
						4" Ice	7.23	8.76	508.07
						No Ice	3.62	3.21	36.95
						1/2" Ice	4.00	3.84	67.79
						1" Ice	4.40	4.49	107.24



<b>tnxTower</b>  <b>GPD</b> 520 South Main St, Suite 2531 Akron, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.2101	<b>Job</b>	27074 BRISTOL CENTER	<b>Page</b>	7 of 8
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	<b>Client</b>	Pinnacle Wireless	<b>Designed by</b>	jfields

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
APX16DWV-16DWV-S-E-A CU w/ Mount Pipe	A	From Leg	4.00	30.0000	128.00	No Ice	6.84	3.19	57.85
			0.00	1/2" Ice		7.31	3.82	100.44	
			2.00	1" Ice		7.78	4.46	152.07	
				2" Ice		8.77	5.80	276.09	
APX16DWV-16DWV-S-E-A CU w/ Mount Pipe	B	From Leg	4.00	0.0000	128.00	No Ice	6.84	3.19	57.85
			0.00	1/2" Ice		7.31	3.82	100.44	
			2.00	1" Ice		7.78	4.46	152.07	
				2" Ice		8.77	5.80	276.09	
APX16DWV-16DWV-S-E-A CU w/ Mount Pipe	C	From Leg	4.00	0.0000	128.00	No Ice	6.84	3.19	57.85
			0.00	1/2" Ice		7.31	3.82	100.44	
			2.00	1" Ice		7.78	4.46	152.07	
				2" Ice		8.77	5.80	276.09	
(2) Onebase Twin Dual Duplex TMA	A	From Leg	4.00	30.0000	128.00	No Ice	0.00	0.31	11.00
			0.00	1/2" Ice		0.00	0.39	15.83	
			2.00	1" Ice		0.00	0.49	22.16	
				2" Ice		0.00	0.70	40.11	
(2) Onebase Twin Dual Duplex TMA	B	From Leg	4.00	0.0000	128.00	No Ice	0.00	0.31	11.00
			0.00	1/2" Ice		0.00	0.39	15.83	
			2.00	1" Ice		0.00	0.49	22.16	
				2" Ice		0.00	0.70	40.11	
(2) Onebase Twin Dual Duplex TMA	C	From Leg	4.00	0.0000	128.00	No Ice	0.00	0.31	11.00
			0.00	1/2" Ice		0.00	0.39	15.83	
			2.00	1" Ice		0.00	0.49	22.16	
				2" Ice		0.00	0.70	40.11	
GPS	A	From Leg	1.00	0.0000	70.00	No Ice	0.17	0.17	0.87
			0.00	1/2" Ice		0.24	0.24	3.85	
			0.00	1" Ice		0.32	0.32	7.85	
				2" Ice		0.51	0.51	19.56	
					4" Ice	1.02	1.02	62.07	

### Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
168.00	MTS 12.5' LP Platform	29	48.853	2.7276	0.0093	17721
158.00	12' T-Arm - Round (GPD)	29	43.197	2.6391	0.0074	8438
148.00	APXV18-206517S-C w/ 6' Mount Pipe	29	37.683	2.5300	0.0057	4321
140.00	MTS 12.5' LP Platform	29	33.464	2.4152	0.0045	3107
128.00	MTS 12.5' LP Platform	29	27.615	2.1758	0.0031	2561
70.00	GPS	29	8.016	1.1216	0.0008	3062

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	<b>Project</b> 2013801.01	<b>Date</b> 17:04:40 02/08/13
	<b>Client</b> Pinnacle Wireless	<b>Designed by</b> jfields

**Section Capacity Table**

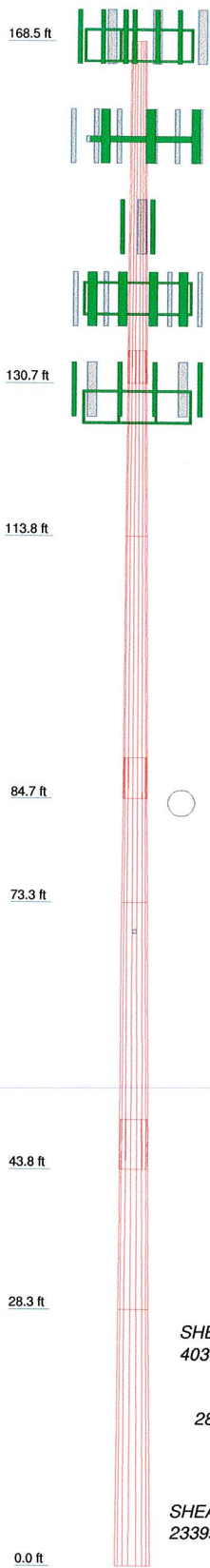
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail
L1	168.5 - 130.67	Pole	TP25.31x19x0.1875	1	-6432.39	758319.67	64.0	Pass
L2	130.67 - 113.75	Pole	TP27.7112x24.3228x0.25	2	-10643.10	1132819.34	84.8	Pass
L3	113.75 - 84.71	Pole	TP32.49x27.7112x0.459	3	-16201.80	*	*	Pass
L4	84.71 - 73.25	Pole	TP33.8639x30.8183x0.553	4	-21652.00	*	*	Pass
L5	73.25 - 43.79	Pole	TP38.69x33.8639x0.503	5	-29153.80	*	*	Pass
L6	43.79 - 28.25	Pole	TP40.6156x36.7961x0.612	6	-38033.80	*	*	Pass
L7	28.25 - 0	Pole	TP45.25x40.6156x0.569	7	-48508.30	*	*	Pass
<b>Summary</b>								
Pole (L2)							*	Pass
<b>RATING =</b>							*	<b>Pass</b>

\*See Appendix E for the modification calculations.

## APPENDIX C

### Tower Elevation Drawing

Section	1	2	3	4	5	6	7	
Length (ft)	37.83	20.59	29.04	16.04	29.46	20.96	26.25	28785.9
Number of Slides	18	18	18	18	18	18	18	
Thickness (in)	0.1875	0.2500	0.4590	0.5530	0.5030	0.6120	0.5690	
Socket Length (ft)	3.67		4.58		5.42			
Top Dia (in)	19.0000	24.3228	27.7112	30.8183	33.8639	36.7961	40.6156	
Bot Dia (in)	25.3100	27.7112	32.4900	33.8639	38.6900	40.6156	45.2500	
Grade				A572-65				
Weight (lb)	1662.9	1432.5	4267.3	3045.3	5725.5	5277.6	7354.8	



**DESIGNED APPURTENANCE LOADING**

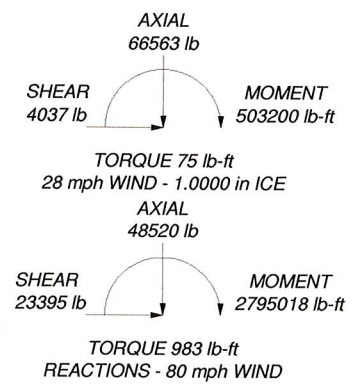
TYPE	ELEVATION	TYPE	ELEVATION
MTS 12.5' LP Platform	168	MTS 12.5' LP Platform	140
(2) 800 10121 w/ Mount Pipe	168	(2) LPD-6513 w/ Mount Pipe	140
(2) 800 10121 w/ Mount Pipe	168	(2) LPD-6513 w/ Mount Pipe	140
(2) 800 10121 w/ Mount Pipe	168	(2) LPD-6513 w/ Mount Pipe	140
(2) LGP21401	168	BXA-70080/6CFx4 w/ Mount Pipe	140
(2) LGP21401	168	BXA-70063/4CF w/ mount pipe	140
(2) 860 10025	168	BXA-171085-12BF w/Mount Pipe	140
(2) 860 10025	168	BXA-171085-12BF w/Mount Pipe	140
(2) 860 10025	168	BXA-171063/8BF w/Mount Pipe	140
SBNH-1D6565C w/ Mount Pipe	168	(2) FD9R6004/2C-3L	140
P65-17-XLH-RR w/ Mount Pipe	168	(2) FD9R6004/2C-3L	140
AM-X-CD-16-65-00T w/ 2"x78" Mount Pipe	168	(2) FD9R6004/2C-3L	140
(2) RBS 6601	168	MTS 12.5' LP Platform	128
(2) RBS 6601	168	APXV18-209014-C w/ Mount Pipe	128
(2) RBS 6601	168	APXV18-209014-C w/ Mount Pipe	128
(2) RBS 6601	168	APXV18-209014-C w/ Mount Pipe	128
DC6-48-60-18-8F Surge Suppression Unit	168	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	128
12' T-Arm - Round (GPD)	158	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	128
12' T-Arm - Round (GPD)	158	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	128
12' T-Arm - Round (GPD)	158	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	128
(3) DB980F90T4E-M w/Mount Pipe	158	(2) Onebase Twin Dual Duplex TMA	128
(3) DB980F90T4E-M w/Mount Pipe	158	(2) Onebase Twin Dual Duplex TMA	128
(3) DB980F90T4E-M w/Mount Pipe	158	(2) Onebase Twin Dual Duplex TMA	128
APXV18-206517S-C w/ 6' Mount Pipe	148	(2) Onebase Twin Dual Duplex TMA	128
APXV18-206517S-C w/ 6' Mount Pipe	148	GPS	70
APXV18-206517S-C w/ 6' Mount Pipe	148		

**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.



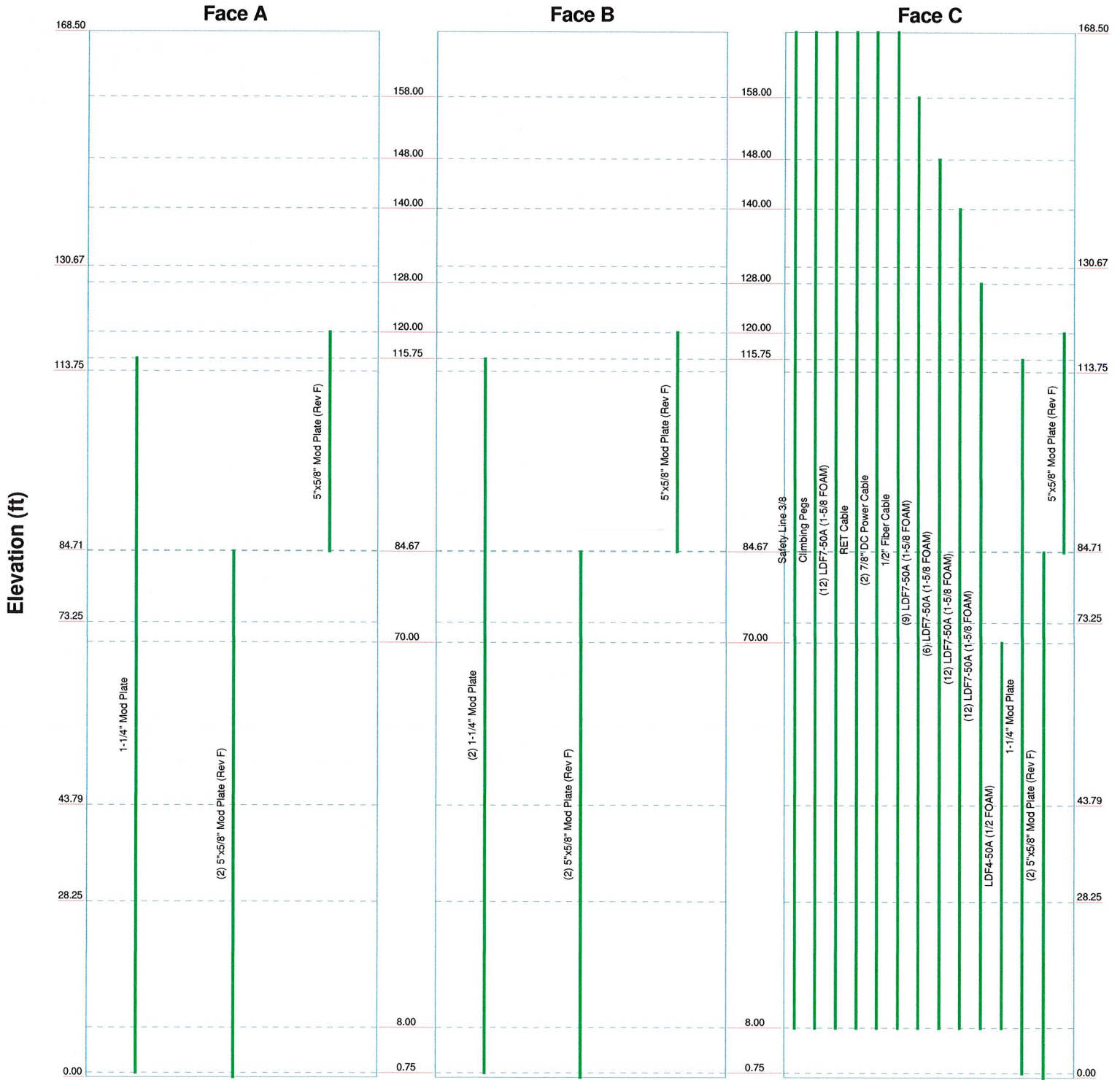
 <b>GPD</b> 520 South Main St, Suite 2531 Akron, Ohio 44311 Consulting Engineers Phone: 330.572.2100 FAX: 330.572.2101	<b>Job: 27074 BRISTOL CENTER</b> Project: 2013801.01	
	Client: Pinnacle Wireless Code: TIA/EIA-222-F Path:	Drawn by: jfields Date: 02/08/13 Scale: NTS Dwg No. E-1
	App'd:	
	C:\Users\jfields\Desktop\Draw\TNS\2013\2013801.01\27074 Bristol Center.dwg	



# Feedline Distribution Chart

## 0' - 168'6"

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



 <b>GPD</b> 520 South Main St, Suite 2531 Akron, Ohio 44311 Phone: 330.572.2100 FAX: 330.572.2101 Consulting Engineers	<b>Job: 27074 BRISTOL CENTER</b>		
	Project: <b>2013801.01</b>		
	Client: Pinnacle Wireless	Drawn by: jfields	App'd:
	Code: TIA/EIA-222-F	Date: 02/08/13	Scale: NTS
	Path:		Dwg No. E-7

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## APPENDIX D

### Base Plate & Anchor Rod Analysis





**Anchor Rod and Base Plate Stresses**  
**27074 BRISTOL CENTER**  
**2013801.01**

Overturning Moment =	2795.02	k*ft
Axial Force =	48.52	k
Shear Force =	23.40	k

Acceptable Stress Ratio	=	100.0%
-------------------------	---	--------

Anchor Rods		
Number of Rods =	24	
Type =	Upset Rod	
Rod Yield Strength (F <sub>y</sub> ) =	75	ksi
ASIF =	1.333	
Rod Circle =	54	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in <sup>2</sup>
Max Tension on Rod =	101.41	kips
Max Compression on Rod =	105.45	kips
Allow. Rod Force =	195.00	kips
<b>Anchor Rod Capacity =</b>	<b>52.0%</b>	<b>OK</b>

Base Plate		
Location =	External	
Plate Strength (F <sub>y</sub> ) =	60	ksi
Outside Diameter =	60	in
Plate Thickness =	2	in
b =	6.57	in
Le =	7.00	in
fb =	26.16	ksi
Fb =	60	ksi
<b>BP Capacity =</b>	<b>43.6%</b>	<b>OK</b>

Stiffeners		
Configuration =	Every Rod	
Thickness =	0.5	in
Width =	7	in
Notch =	0.5	in
Height =	12	in
Stiffener Strength (F <sub>y</sub> ) =	65	ksi
Weld Info. Known? =	Yes	
Vertical Weld Size =	0.375	in
Horiz. Weld Type =	Both	
Groove Angle =	45	deg
Groove Size =	0.25	in
Fillet Size =	0.375	in
Weld Strength =	70	ksi
Stiffener Vertical Force =	71.59	kips
Vert. Weld Capacity =	56.4%	kips
Horiz. Weld Capacity =	23.8%	kips
Stiffener Capacity =	80.4%	kips
<b>Controlling Capacity =</b>	<b>80.4%</b>	<b>OK</b>

Pole		
Pole Diameter =	45.25	in
Number of Sides =	18	
Thickness =	0.375	in
Pole Yield Strength =	65	ksi

## APPENDIX E

### Pole Reinforcement Calculations

**Reinforced Monopole Analysis**  
**27074 BRISTOL CENTER**  
**2013801.01**



Code =	TIA/EIA-222-F
AISF =	1.333
Max Stress Ratio =	1.05
# of Sides =	18

Shape	Quantity	Section	Geometry				Reactions				Output		Capacities		Pass/Fail
			Elevation (ft)	Pole Flat-Flat (ft)	Wall L (in)	Fy (ksi)	K	Conn. Spacing (in)	Moment (k-ft)	Axial (k)	Shear (k)	Torsion (k-ft)	Equivalent (in)	Pole Reinforcement	
Plate 5x1.25	3	L3	84.71	32.49	0.25	65	0.8	18	938.33	16.2	17.51	0.18	0.459	78.4%	Pass
Plate 5x1.25	4	L4	73	33.9033	0.3125	65	0.8	18	1230.86	21.65	18.92	0.21	0.553	78.8%	Pass
Plate 5x1.25	4	L5	43.79	38.69	0.3125	65	0.8	18	1705.93	29.15	20.62	0.25	0.503	90.8%	Pass
Plate 6x1.25	4	L6	28	40.6567	0.375	65	0.8	18	2153.67	38.03	22.01	0.29	0.612	81.3%	Pass
Plate 6x1.25	4	L7	0	45.25	0.375	65	0.8	18	2795.02	48.52	23.4	0.98	0.569	90.7%	Pass

## **APPENDIX F**

### Foundation Analysis



**Caisson Analysis**  
**27074 BRISTOL CENTER**  
**2013801.01**

General Info	
Code	TIA/EIA-222-F
Concrete Code	ACI 318-05
Seismic Design Category	B
Max Stress Ratio	1.00
Reinforcing Known?	Yes
Modified?	No

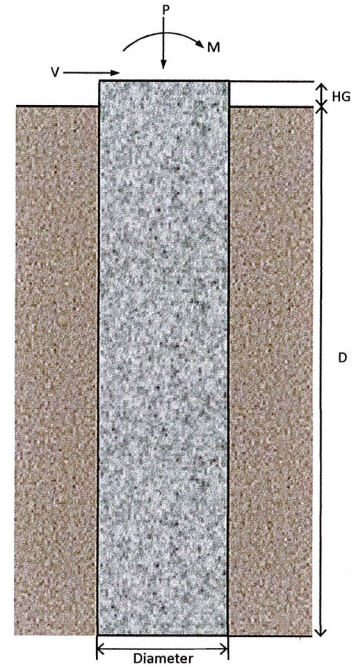
General Soil	
Ground Water	99.00 ft
Soil Depth to Neglect	3.00 ft

Reactions	
Moment, M	2795.02 k-ft
Axial, P	48.52 k
Shear, V	23.40 k

Pier Information	
Pier Diameter	6.5 ft
Pier Length Below Grade	26 ft
Distance Above Grade	1 ft
Vertical Bar Size	# 11
Vertical Bar Quantity	16
Tie Size	# 5 ft
fc'	4 ksi
fy	60 ksi
Clear Cover =	4 in

Soil Summary (Req. FS=2.0)		
Mu =	2795.02	k-ft
Mr =	9671.35	k-ft
FS =	3.46	
Capacity =	57.8%	Pass

Reinforcing Summary		
φMn =	3839.09	k-ft
Mu =	3802.30	k-ft
Min ρ =	0.00333	
Provided ρ =	0.00522	OK
Capacity =	99.0%	Pass



Soil Info								
Layer	Soil Type	Thickness	γ, pcf	Cu, psf	φ	Kp	Top of Layer	Bot. of Layer
Layer 1	Clay	3	110	0	0	0.00	0.00	3.00
Layer 2	Sand	25	120	0	30	3.00	3.00	28.00
Layer 3	Clay					0.00	28.00	28.00
Layer 4	Clay					0.00	28.00	28.00
Layer 5	Clay					0.00	28.00	28.00
Layer 6	Sand					1.00	28.00	28.00
Layer 7	Sand					1.00	28.00	28.00
Layer 8	Clay					0.00	28.00	28.00
Layer 9	Sand					1.00	28.00	28.00
Layer 10	Clay					0.00	28.00	28.00

## APPENDIX G

### Modification Drawings







REV	DATE	DESCRIPTION

**PROJECT NOTES**  
 2704 - BRISTOL CENTER  
 371 TERRAVILLE AVE  
 BRISTOL, CT 06010

DESIGNED BY	CPD GROUP
PERMIT NO.	
CONSTRUCTION	
RECORDED	
PROJECT NUMBER	
DRAWN	
CHECKED	

DATE: 2013801.01

N-01

**WELD NOTES**

1. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE A MEASUREMENT TEST ON THE EXISTING BASE PERMITTED WELD TO INSURE ITS STRUCTURAL INTEGRITY IN ACCORDANCE WITH THE TOWER OWNER'S REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TESTING AND REPORTING. THE TOWER OWNER AND THE ENGINEER SHALL BE CONTACTED IMMEDIATELY UPON A FAILING PERFORMANCE BEING OBSERVED.
2. THE CONTRACTOR SHALL PROVIDE A CERTIFIED WELD INSPECTOR (CWI) THROUGHOUT THE COMPLETION OF THE PROJECT. A PHOTO LOG REPORT SHALL BE PROVIDED TO THE TOWER OWNER.
3. WELDING OPERATIONS MUST BE PROVIDED TO ONE AND CPD GROUP PRIOR TO WELDING CONTRACTOR WELDING SHALL BE PERFORMED BY AN ALL QUALIFIED WELDER. THE CONTRACTOR SHALL PROVIDE ALL SURFACES AND IN ACCORDANCE WITH AWS/AISC D1.1 AND AWS 7.401 OR LATEST EDITIONS.
4. COY DIEL GAS WELDING OR BRANDING IS STRICTLY PROHIBITED. SPECIFICALLY, NO TORCH CUTTING IS PERMITTED ON SITE. ALL HOLES SHALL BE CUT WITH A DRILLER.
5. INSTALL 3000 (NPA 701) FIRE BLANKET AROUND ALL COAK.
6. MORE SPATTER AND SPARKS SHALL BE ANTICIPATED GIVEN THE PREVIOUSLY DRY SURFACE.
7. COAK IS FLAMMABLE AND CAN CATCH FIRE IF PROPER PRECAUTIONS ARE NOT MADE TO SHIELD COAK FROM ALL WELDING PROCEDURES. ALL COAK SHALL BE SHIELDED AT AND BELOW EACH WELDING LOCATION IS BEING PERFORMED. IN ADDITION, COAK SHALL BE PUSHED AWAY FROM TOWER FACE WHERE WELDING IS COMPLETED.
8. 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.
9. FUMES CREATED FROM WELDING ON A PREVIOUSLY DRY SURFACE CAN BE HAZARDOUS.
10. PRIOR TO WELDING, ALL SURFACES SHALL BE PROPERLY GROUND TO REMOVE GALVANIZING.
11. ALL WELD WELDS SHALL BE TOUCHED UP WITH A GALVANIZING PAINT NEAR END OR APPROVED EQUIVALENT.
12. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT, AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. A MINIMUM OF 200 GALS OF WATER SHALL BE PROVIDED. WATER SHALL BE USED TO CLEAN AND MULTIPURPOSE THE EXHAUSTERS FULLY COVERED AND LAID OUT (OR STORED) WITHIN 30 SECONDS OF DETECTING A FIRE SHALL BE PROVIDED. FIRE EXTINGUISHERS SHALL BE BEING PERFORMED.
13. CLEAN OUT ALL DEBRIS THROUGHOUT MONOPOLE AND MONOPOLE BASE PRIOR TO WELDING.



**CONTRACTOR NOTES**

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER AND CPD GROUP THAT THEY HAVE OBTAINED, UNDERSTOOD AND WILL FOLLOW TOWER OWNER STANDARDS, LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROVIDE MODIFICATIONS DESCRIBED IN DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO REVIEW THE DOCUMENTATION FOR CLARITY UNDER THE TOWER OWNER'S STANDARDS AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN IT TO TOWER OWNER AND CPD GROUP.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MONOPOLES, THE CONTRACTOR SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DISCOVERY.
3. ALL WORK SHALL BE COMPLETED WITHIN THE TIME FRAME SPECIFIED ON THE DRAWINGS. THIS SHALL BE A GUARANTEE BY THE CONTRACTOR TO THE TOWER OWNER AND ENGINEER. THE WELLS PROVIDING THE NECESSARY CONNECTIONS TO THE TOWER OWNER AND ENGINEER.
4. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THIS WORK.
5. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BEGINNING ANY WORKS WITH ACCESS, INTERFERENCE ETC. SHALL BE RESOLVED PRIOR TO MOBILIZATION. THE CONTRACTOR MUST VISIT THE SITE PRIOR TO MOBILIZATION. CONTRACTOR SHALL NOTE ALL AVIATION, MARINE, COAK, MARINE, CLEARING SUPPORTS SIZE, LOCATION, NOTES #4 AND #6, THIS SHEET.
6. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ALL COAK, T-RINGS, ANTENNA MOUNTS AND ANY OTHER TOWER APPURTENANCE THAT MAY INTERFERE WITH THE TOWER MONOPOLES. ALL TOWER APPURTENANCE MUST BE CORRELATED WITH THE TOWER OWNER'S DRAWINGS.
7. SOME STRUCTURES MAY REQUIRE CUSTOM MODIFICATIONS TO PROPERLY FIT THE WORKED REGION OF THE STRUCTURE. THESE CUSTOMIZATIONS ARE DESIGNED BY OTHERS AND MUST BE APPROVED BY THE TOWER OWNER IN WRITING. SUCH ATTACHMENTS, ANY CARRIER DOWNLINE MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
8. CONTRACTOR SHALL ONLY WORK WITHIN THE LIMITS OF THE TOWER OWNER'S PROPERTY OR LEASE. ANY AND APPROVED EXCESSIVE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN BOUNDARIES. THESE CUSTOMIZATIONS WILL BE MADE BY A LICENSED TRADESMAN. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, AND TEMPORARY WORKING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9. WORK SHALL ONLY BE PERFORMED DURING DRY DAYS (WINDS LESS THAN 10-MPH). STOPPING WORK IMMEDIATELY IN THE EVENT OF ANY WEATHER CONDITIONS THAT PRESENT A SAFETY HAZARD TO THE WORKERS. ALL WORK SHALL BE STOPPED IMMEDIATELY IN THE EVENT OF ANY WEATHER CONDITIONS THAT PRESENT A SAFETY HAZARD TO THE WORKERS. ALL WORK SHALL BE STOPPED IMMEDIATELY IN THE EVENT OF ANY WEATHER CONDITIONS THAT PRESENT A SAFETY HAZARD TO THE WORKERS.
10. CONTRACTOR SHALL VERIFY MONOPOLE SET POINTS AND BE RESPONSIBLE FOR MONITORING AND ITS FINAL POSITION. MONOPOLES SHALL BE POSITIONED TO REMAIN PERMANENTLY OPEN AND CLEAR OF ALL MATERIAL. ANY OBJECTS/STEP BOLTS THAT PRESENT TOWER FROM SITTING PROPERLY SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY.

**MODIFICATION PLATE NOTES**

1. CONTRACTOR SHALL INSTALL PLATES AT LOCATIONS PER PLAN VIEW.
2. USE SAME BOLTS WITH CORRECT SLEEVE LENGTHS PER DETAILS. BOLT THREADS SHALL NOT BE IN THE BREAK PAINT.
3. ALL HOLES DRILLED IN POLE SHALL BE SOLVENT CLEANED AND TOUCHED UP WITH ZINC RICH PAINT.
4. MAX BOLTS TO BE TORQUED PER AISC "SHAG-TIGHT CONDITION".
5. CONTRACTOR SHALL VERIFY THAT TOWER IS PLUMB PRIOR TO THE INSTALLATION OF ANY TOWER MODIFICATIONS.

**GENERAL NOTES**

1. THE FOLLOWING DRAWINGS REPRESENT MODIFICATIONS TO THE EXISTING TOWER. THE MODIFICATIONS ARE BASED ON CPD GROUP STRUCTURAL REPORT (PROJECT # 2012601.00, DATED DECEMBER 4, 2012). ALL MODIFICATIONS SHALL BE IN ACCORDANCE WITH 1745M-222-7, 2005 CTBC, 2003 IBC, AND ASCE 7-02.
2. THESE MODIFICATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF 1745M-222-7, 2005 CTBC, 2003 IBC, ASCE 7-02, AWS, AND AISC. MATERIALS AND SERVICES PROVIDED SHALL CONFORM TO THE ABOVE MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.
3. ALL ORIGINAL TOWER INFORMATION WAS OBTAINED IN THE FORM OF TOWER DESIGN BY ECI PROJECT # 12027, DATED DECEMBER 2, 2003) AND MODIFICATION DRAWINGS BY BAY (PROJECT # 16901), DATED MAY 4, 2012). 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 NO SIGNIFICANT DEFECTS HAVE BEEN OBSERVED. THE TOWER IS ASSUMED TO BE PLUMB AND THE FOUNDATION IS ASSUMED TO BE SOUND. CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESULTS OF A CONDITION ASSESSMENT BY A QUALIFIED ENGINEER. CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE REFERENCED TOWER DOCUMENTS.
5. ALL FIELD REVISIONS, CORRECTIONS, AND MODIFICATIONS SHALL BE INDICATED BY CHANGES TO THE ORIGINAL DRAWINGS. ALL FIELD REVISIONS MUST BE REPORTED TO ENGINEER.
6. ALL NEW STEEL SHALL BE HOT DIPPED GALVANIZED FOR FULL WEATHER PROTECTION. IN ADDITION ALL STEEL SHALL BE PROTECTED WITH AN EPOXY PRIMER. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.
7. ALL EXISTING PAINTED/GALVANIZED SURFACES DAMAGED DURING BUILDING, INCLUDING AREAS UNDER STRENGTHENERS SHALL BE WIRE BRUSHED CLEAN, REPAIRED BY COOL GALVANIZING BRUSH APPLIED PAINT (COC OR EQUAL), AND REPAINTED TO MATCH THE EXISTING FINISH (IF APPLICABLE).
8. GALVANIZING SHALL BE PROVIDED AROUND PERIMETER OF ANY AND ALL MODIFICATION MEMBERS TO ENHANCE CORROSION RESISTANCE. GALVANIZING SHALL BE MANUFACTURED BY DOW AND ACCEPTABLE TO CPD.
9. LOADINGS:  
 WIND LOADS: FASTEST WIND SPEED (PER 1745M-222-7, CTBC, 2003 IBC, AND ASCE 7-02) 80 MPH (HARTFORD COUNTY, CONNECTICUT)  
 ICE LOADS: NONE PER FASTEST WIND SPEED (CONCURRENT W/ IBC)  
 10. STRUCTURAL STEEL:  
 SPECIFICATIONS: LATEST EDITION OF AISC  
 MATERIAL:  
 PLATES: A572 GR 60  
 BEAMS: A572 GR 60  
 ONE SIDE BOLTS: A572 GR 60 (OR POLAR) W/ HIGH STRENGTH SLEEVE (P=120 KSI)  
 WELDS: E70T1  
 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 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. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE.  
 13. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.  
 14. UNLESS NOTED OTHERWISE, ALL NEW MATERIAL SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE DISCONTINUITIES INTO THE STRUCTURE.  
 15. THE ENGINEER (CPD GROUP) SHALL MAKE POST INSTALLATION OBSERVATION FOR TOWER. CONTRACTOR SHALL COORDINATE WITH ENGINEER (CPD GROUP) WITHIN 72 HOURS AFTER COMPLETION OF THE TOWER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE.  
 THESE DRAWINGS.



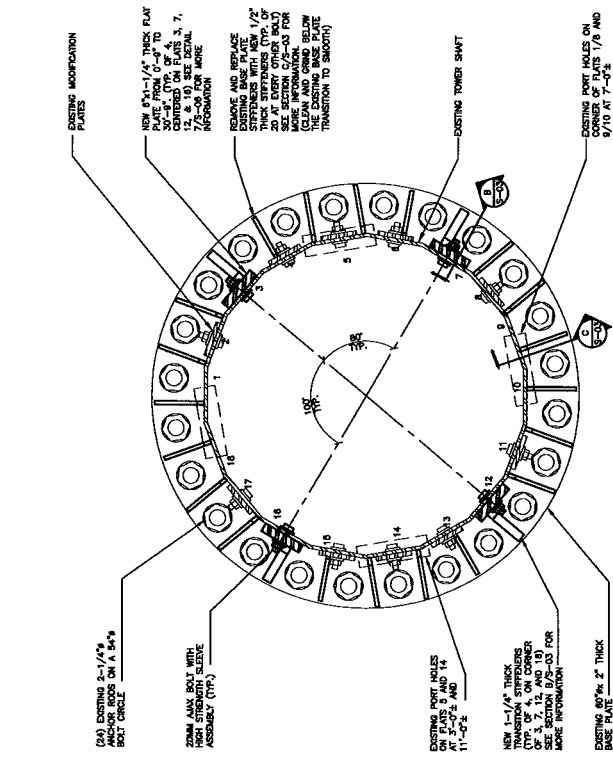
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**27074 - BRISTOL CENTER**  
 371 TERRVILLE AVE  
 BRISTOL, CT 06010  
**MODIFICATION SECTIONS & DETAILS**

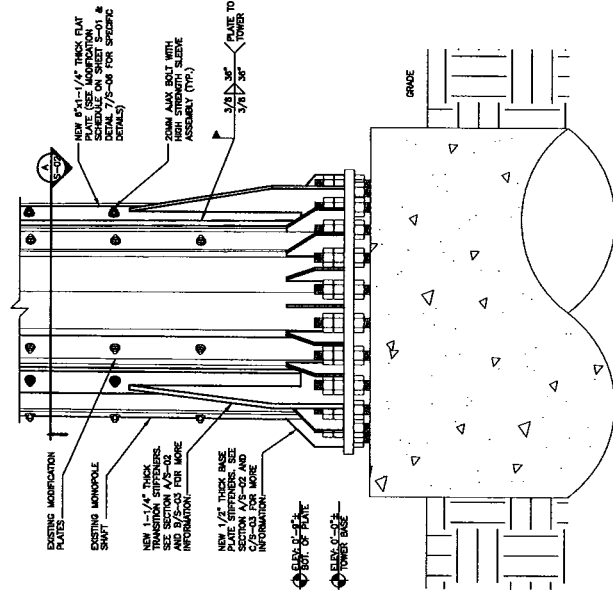
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JOB NO.  
**2013801.01**

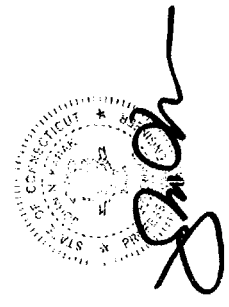
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**SECTION A**  
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**DETAIL 1**  
 1" = 1'-0"



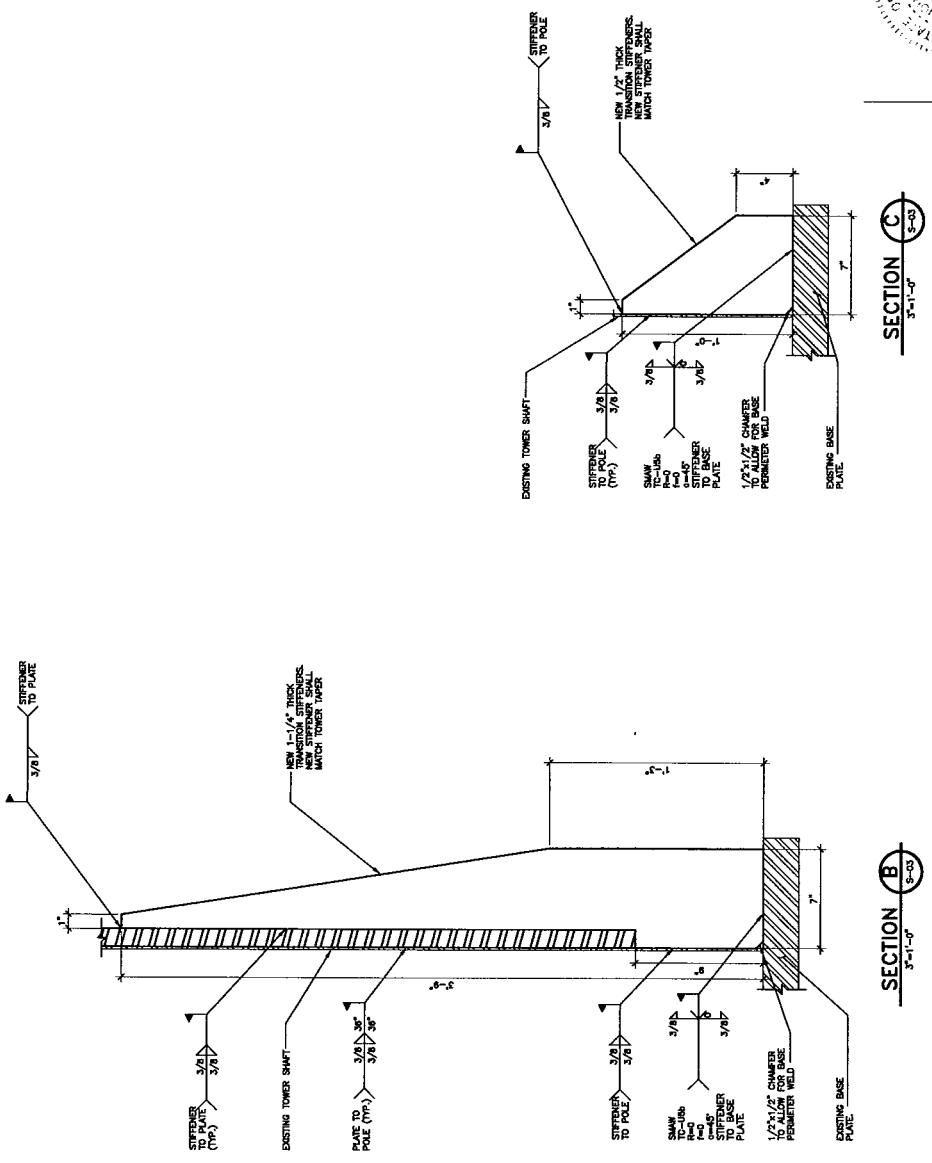
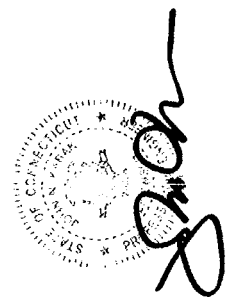
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 BRISTOL, CT 06010

PROJECT NO.	2013801.01
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CONSTRUCTION	
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**2013801.01**

**S-03**



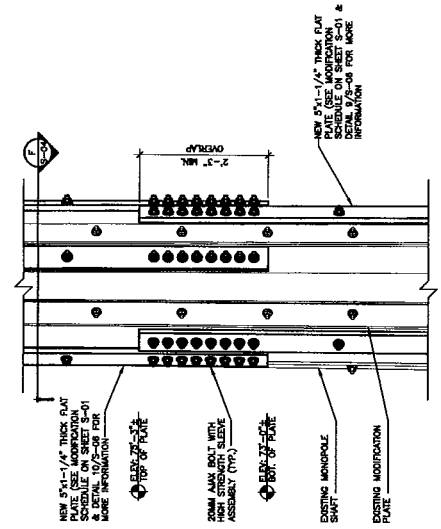
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**2704 - BRISTOL CENTER**  
 371 TERRAVILLE AVE  
 BRISTOL, CT 06010

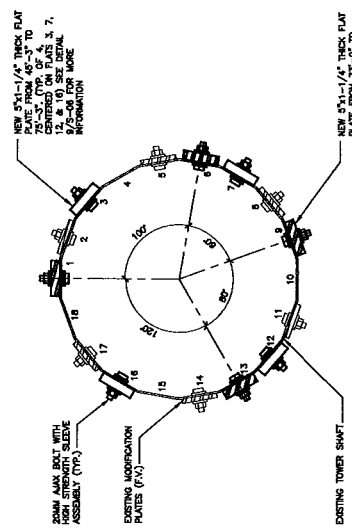
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JOB NO  
**2013801.01**

**S-04**



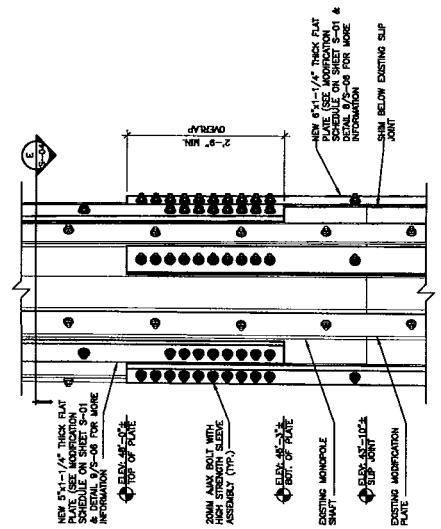
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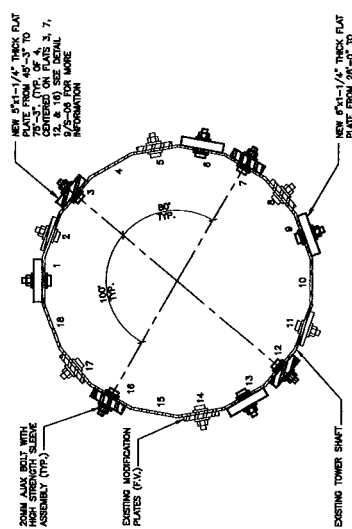
**SECTION F**  
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 3-04

NOTES: REWORK AND PERMITS EXISTING STEP PILES AS REQUIRED.

*Robert J. G. Smith*

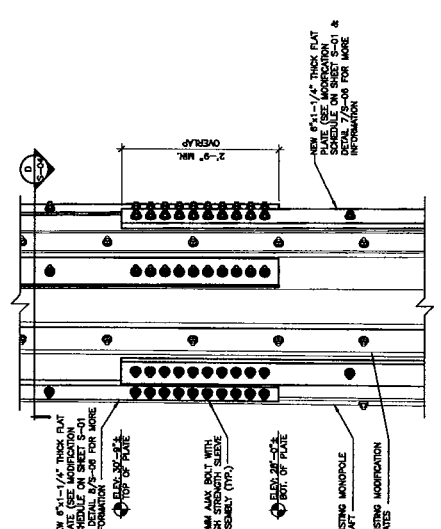


**DETAIL 3**  
 1"-1'-0"  
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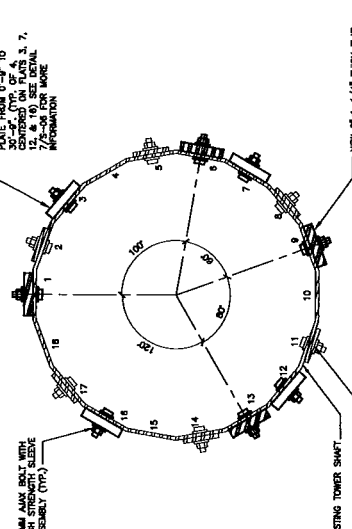


**SECTION E**  
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 3-04

NOTES: REWORK AND PERMITS EXISTING STEP PILES AS REQUIRED.



**DETAIL 2**  
 1"-1'-0"  
 3-04

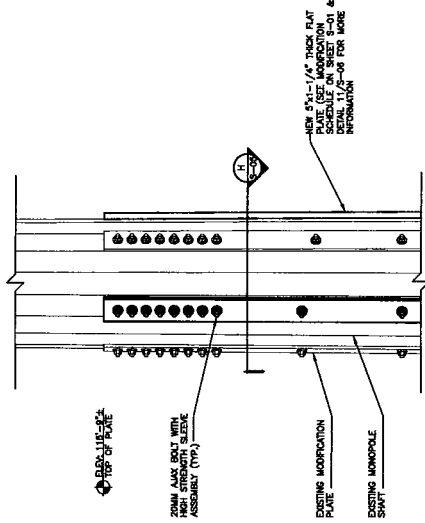


**SECTION D**  
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 3-04

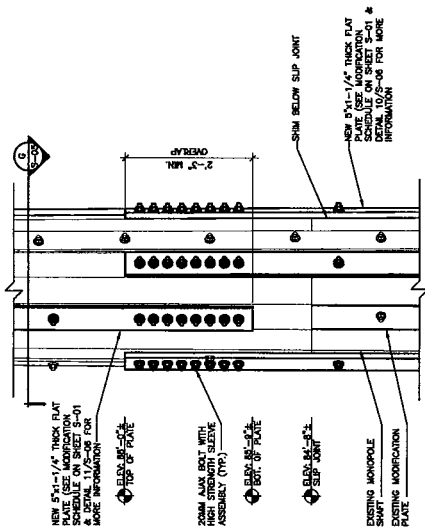
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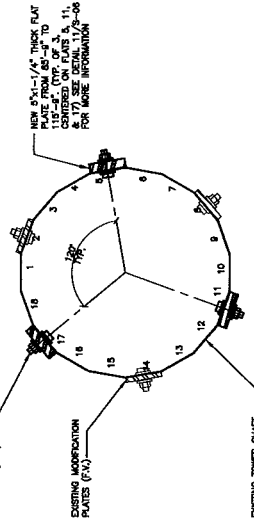
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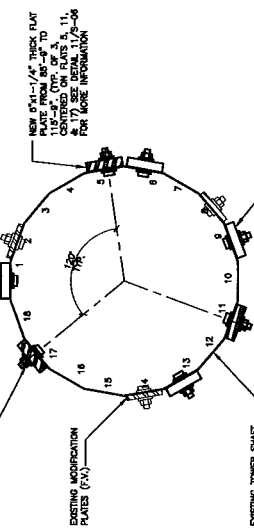
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 1-1/2"=1'-0"



DETAIL 6  
 1-1/2"=1'-0"



SECTION H  
 1-1/2"=1'-0"



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

NOTE: REMOVE AND REFACE EXISTING STEPS AS REQUIRED.

Steven A. Gagnier  
 Professional Engineer  
 State of Connecticut  
 No. 9815



REV	DATE	DESCRIPTION

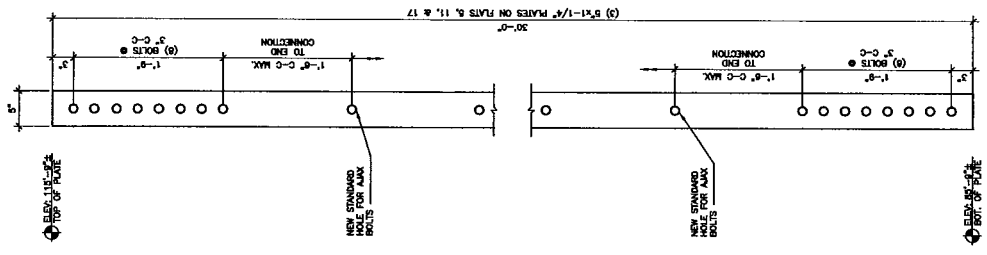
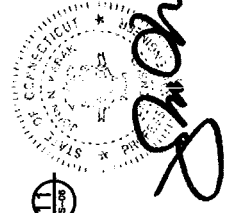
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 371 TERRYVILLE AVE.  
 BRISTOL, CT 06010

ADDITIONAL SECTIONS  
 & DETAILS

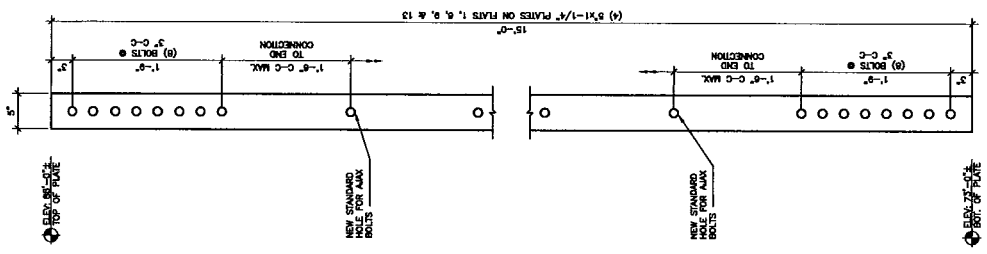
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PROJECT NUMBER:	DESIGN
DATE:	REV

JOB NO.  
2013801.01

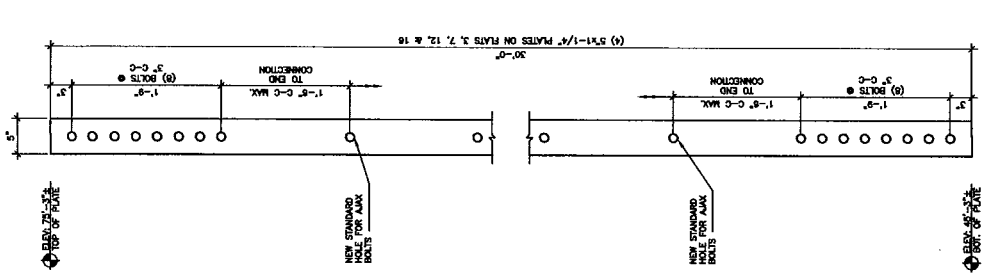
S-05



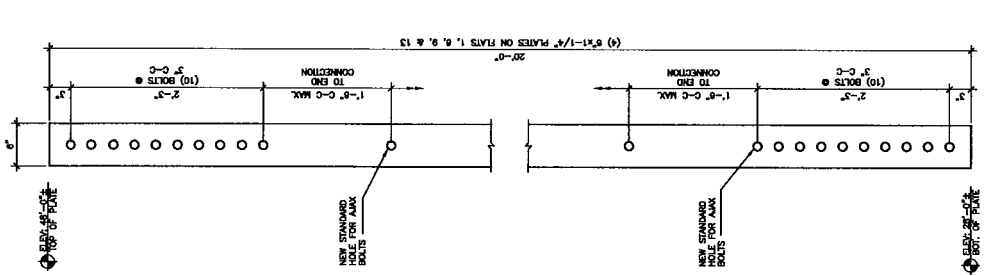
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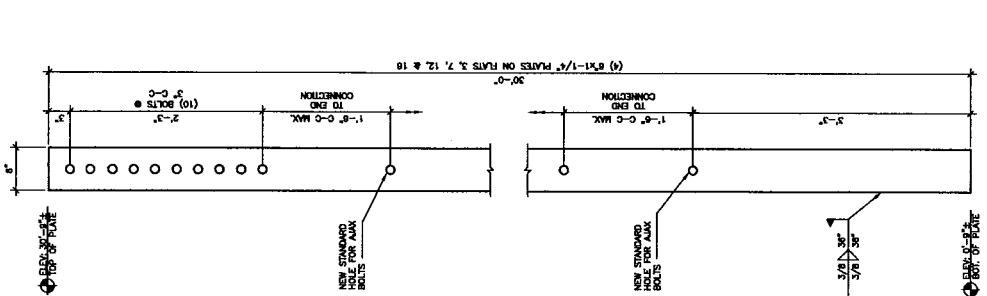
DETAIL 10  
1-1/2\"/>



DETAIL 9  
1-1/2\"/>



DETAIL 8  
1-1/2\"/>



DETAIL 7  
1-1/2\"/>

PLATE TO TOWER  
 3/4\"/>



# MODIFICATION INSPECTION CHECKLIST

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

- 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.
- THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES IT GUARANTEE THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD AT ALL TIMES.
- 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 MODIFICATION SHEET SHALL BE CONTACTED IF SPECIFIC INSPECTOR CONTACT INFORMATION IS NOT KNOWN.

### MODIFICATION INSPECTOR

- 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
  - INCLUDING FOUNDATION INSPECTIONS
  - DISCUSS ANY SITE SPECIFIC INSPECTIONS OR CONCERNS
- 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

- THE GC IS REQUIRED TO CONTACT THE MODIFICATION INSPECTOR AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSTALLATION OR TURKEY PROJECT TO:
  - 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
- THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.

### RECOMMENDATIONS

- 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 FOR THE MODIFICATION INSPECTION TO BE CONDUCTED TO WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION.
  - THE GC AND MODIFICATION INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
  - WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTORS ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR SEE-TENSIONING OPERATIONS.
  - IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MODIFICATION INSPECTIONS TO OCCUR AT THE SAME TIME.
  - 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 TOWER DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

### CANCELLATION OR DELAYS IN SCHEDULED MODIFICATION INSPECTION

- 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 INCLUDE WEATHER, FORCE MAJEURE, AND OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

### CORRECTION OF FAILING MODIFICATION INSPECTION

- IF THE MODIFICATION INSTALLATION WOULD FAIL THE MODIFICATION INSPECTION (FAILED BY THE GC OR THE MI INSPECTOR), THE GC SHALL:
  - COORDINATE A REVISION PLAN IN ONE OF THE WAYS:
    - CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE 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

- 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.
- 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 INSPECTOR" REPORT FOR THE ORIGINAL PROJECT.

### REQUIRED PHOTOS

- 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 RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - PHOTOGRAPHS OF ALL MODIFICATION PHOTOGRAPHS
  - FINAL INFILTED CONDITION
  - ANY OTHER PHOTOS DEEMED RELEVANT TO SHOW COMPLETE DETAILS OF MODIFICATIONS
- PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

REV	DATE	DESCRIPTION



G. Smith

**27074 - BRISTOL CENTER**  
 371 TERRAVILLE AVE  
 BRISTOL, CT 06010

### MODIFICATION INSPECTION CHECKLIST

ISSUED FOR:	
PERMIT:	
NO:	
CONSTRUCTION:	
RECORD:	
PROJECT MANAGER:	
DATE:	
JOB NO.:	

2013801.01

MI-01



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

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Calculated Radio Frequency Emissions



at&t

CT5833

(Milford-Bristol Center)

371 Terryville Avenue, Bristol, CT 06010

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February 11, 2013

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## 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 371 Terryville Avenue in Bristol, CT. The coordinates of the tower are 41° 40' 47.67" N, 72° 57' 45.29" W.

AT&T is proposing the following modifications:

- 1) Install three multi-band (700/850/1900/2100 MHz) antennas for their LTE network (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 ( $\text{mW}/\text{cm}^2$ ). 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:

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

Where:

EIRP = Effective Isotropic Radiated Power

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

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 patterns 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 <sup>2</sup> )	Limit	%MPE
Cingular GSM	169	1900	4	490	0.0247	1.0000	2.47%
Cingular UMTS	169	880	1	500	0.0063	0.5867	1.07%
Sprint	166	1962.5	11	239	0.0343	1.0000	3.43%
MetroPCS CDMA	156	2135	3	727	0.0322	1.0000	3.22%
MetroPCS LTE	156	2130	1	1200	0.0177	1.0000	1.77%
Verizon PCS	140	1970	11	250	0.0504	1.0000	5.04%
Verizon Cellular	140	869	9	257	0.0424	0.5793	7.32%
Verizon AWS	140	2145	1	680	0.0125	1.0000	1.25%
Verizon LTE	140	698	1	841	0.0154	0.4653	3.32%
T-Mobile GSM	130	1945	8	126	0.0214	1.0000	2.14%
T-Mobile UMTS	130	2100	2	711	0.0303	1.0000	3.03%
AT&T UMTS	169	880	2	565	0.0014	0.5867	0.24%
AT&T UMTS	169	1900	2	1077	0.0027	1.0000	0.27%
AT&T LTE	169	734	1	1615	0.0020	0.4893	0.42%
AT&T GSM	169	880	1	283	0.0004	0.5867	0.06%
AT&T GSM	169	1900	4	646	0.0033	1.0000	0.33%
<b>Total</b>							<b>31.84%</b>

**Table 1: Carrier Information<sup>1 2 3</sup>**

<sup>1</sup> 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 1/14/2013. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

<sup>2</sup> 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.

<sup>3</sup> Antenna height listed for AT&T is in reference to the GPD Group Structural Analysis dated February 8, 2013.

## 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 well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **31.84% 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

February 11, 2013

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<sup>4</sup>**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	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<sup>5</sup>**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	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)**

<sup>4</sup> 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.

<sup>5</sup> 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.

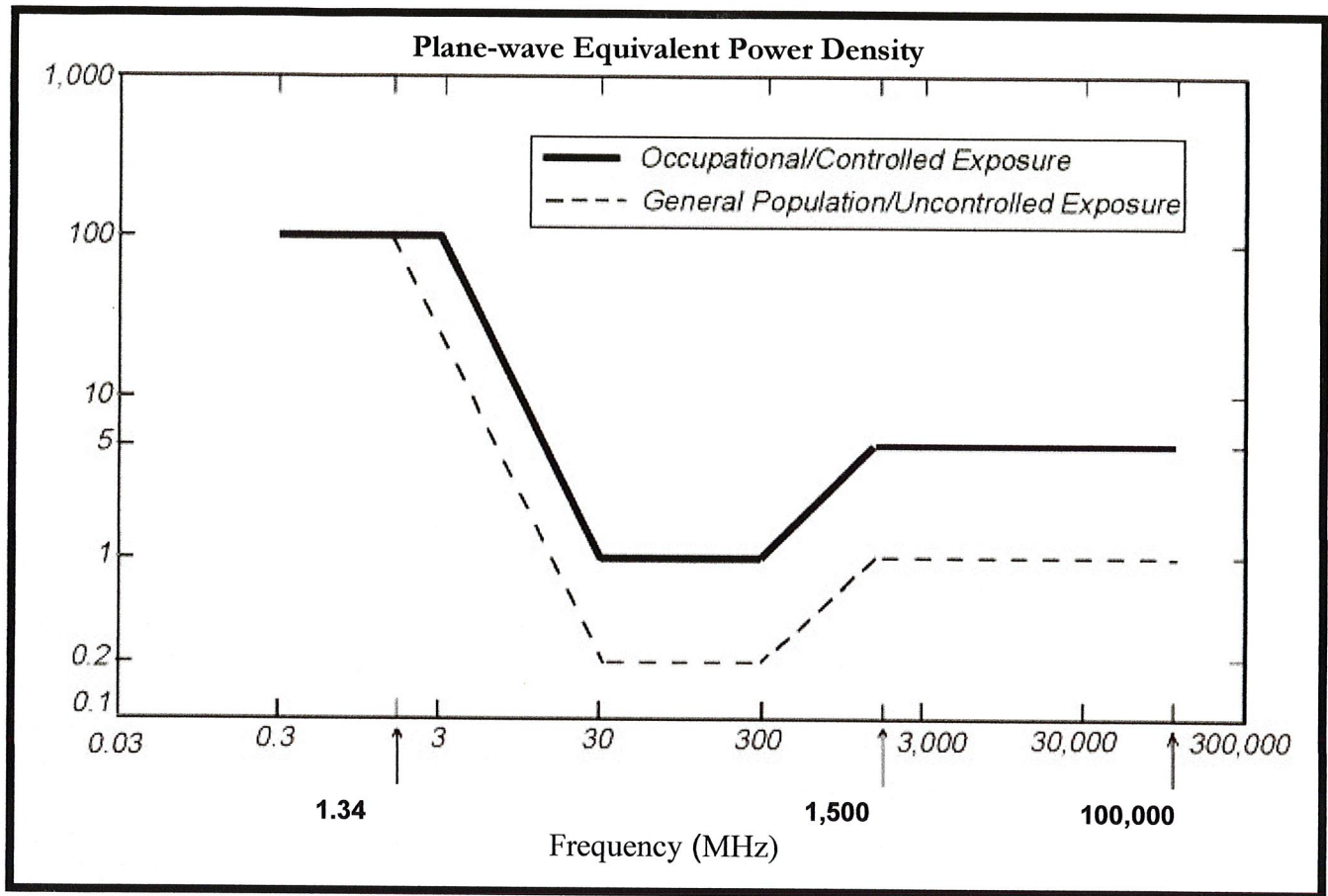
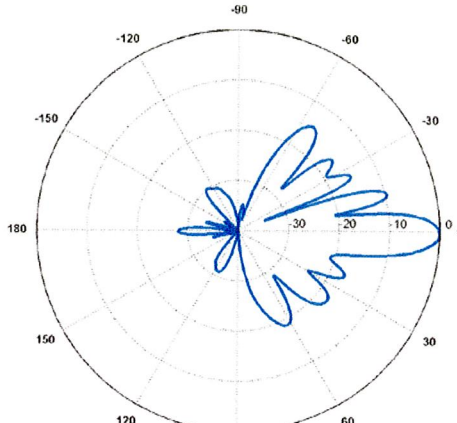
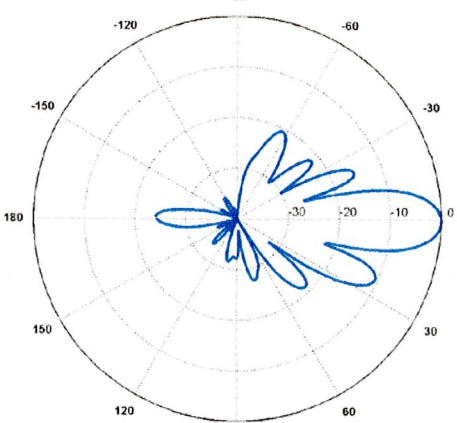
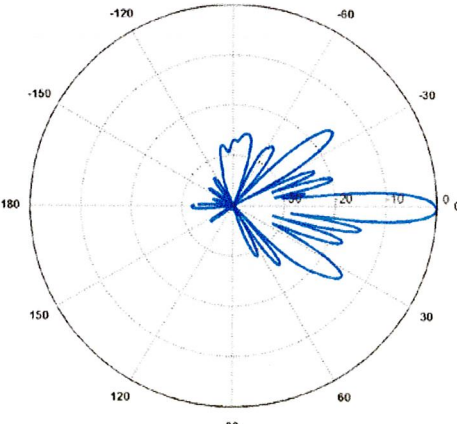


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

<p><b>700 MHz</b></p> <p>Manufacturer: Powerwave            Model #: P65-17-XLH-RR            Frequency Band: 698-806 MHz            Gain: 14.3 dBd            Vertical Beamwidth: 8.4°            Horizontal Beamwidth: 70°            Polarization: Dual Linear <math>\pm 45^\circ</math>            Size L x W x D: 96.0" x 12.0" x 6.0"</p>	 <p>A polar plot showing the radiation pattern for a 700 MHz antenna. The plot is circular with concentric dashed lines representing gain levels and radial lines representing angles from 0 to 180 degrees. The main beam is directed towards 0 degrees, with a peak gain of approximately 14.3 dBd. The beamwidth is narrow, consistent with the 8.4 degree vertical beamwidth specification.</p>
<p><b>850 MHz</b></p> <p>Manufacturer: Kathrein-Scala            Model #: 800 10121            Frequency Band: 824-896 MHz            Gain: 11.5 dBd            Vertical Beamwidth: 14.5°            Horizontal Beamwidth: 86°            Polarization: <math>\pm 45^\circ</math>            Size L x W x D: 54.5" x 10.3" x 5.9"</p>	 <p>A polar plot showing the radiation pattern for an 850 MHz antenna. The plot is circular with concentric dashed lines representing gain levels and radial lines representing angles from 0 to 180 degrees. The main beam is directed towards 0 degrees, with a peak gain of approximately 11.5 dBd. The beamwidth is wider than the 700 MHz model, consistent with the 14.5 degree vertical beamwidth specification.</p>
<p><b>1900 MHz</b></p> <p>Manufacturer: Kathrein-Scala            Model #: 800 10121            Frequency Band: 1850-1990 MHz            Gain: 14.3 dBd            Vertical Beamwidth: 6.6°            Horizontal Beamwidth: 85°            Polarization: <math>\pm 45^\circ</math>            Size L x W x D: 54.5" x 10.3" x 5.9"</p>	 <p>A polar plot showing the radiation pattern for a 1900 MHz antenna. The plot is circular with concentric dashed lines representing gain levels and radial lines representing angles from 0 to 180 degrees. The main beam is directed towards 0 degrees, with a peak gain of approximately 14.3 dBd. The beamwidth is very narrow, consistent with the 6.6 degree vertical beamwidth specification.</p>