

ORIGINAL

August 26, 2012



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

CONNECTICUT SITING COUNCIL

Re:

AT&T Mobility – Notice of Exempt Modification 90 Industrial Park Road, Middletown, CT 06457

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 attachment is being sent to the Mayor of Middletown.

AT&T plans to modify the existing facility at 90 Industrial Park Road owned by T-Mobile (coordinates 41° 35′ 8.124" N. -72°42′ 49.867′′ W). Attached are drawings depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also, included are 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)(c)

1. The height of the overall structure will be unaffected. Both AT&T's existing and proposed antennas will be located at an approximate center line of 175' AGL on the approximately 185' tower. The existing antennas will remain and be rotated to match new LTE azimuths (2/sector). AT&T will add three (3) new antennas and six (6) new RRU's. The existing and proposed equipment will be T-frame mounted. Additionally, AT&T will install one (1) surge arrestor at 175' AGL, and one (1) fiber cable and two (2) DC control cables. One (1) GPS LTE antenna will be mounted to existing shelter.

- 2. The proposed changes will not extend the site boundaries. AT&T will install one additional cabinet in the existing shelter. 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 1.07%; the combined site operations will result in a total power density of 5.84%.

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

Respectfully submitted,

AT&T Mobility

Theresa Ranciato-Viele

tviele@hotmail.com

(203) 606-5127

cc: Honorable Daniel T. Drew, Mayor, City of Middletown

Attachments



#### STRUCTURAL ANALYSIS REPORT



**SITE NUMBER:** 

CT11057C MIDDLETOWN 1

**SITE NAME:** 

**SITE ADDRESS:** 

90 INDUSTRIAL PARK RD.

**MIDDLETOWN, CT 06457** 

NEW ANTENNA INSTALLATION ON AN EXISTING 185' MONOPOLE

BY:



CARRIER SITE NUMBER: CT1044
CARRIER SITE NAME: DAINTY RUBBISH

July 19, 2012

GPD Project #: 2012715.25

#### **MONOPOLE**

#### STRUCTURAL ANALYSIS REPORT

CT11057C MIDDLETOWN 1 90 Industrial Park Rd. Middletown, CT 06457 GPD Project #: 2012715.25

New Antenna Installation Existing 185 ft Monopole

For: T-Mobile Towers Bellevue, Washington

Prepared By:

David B. Granger, P.E. Registered Professional Engineer

Connecticut #: 17557

July 19, 2012

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#### **APPENDICES**

- 1. TNXTOWER ANALYSIS PRINTOUT
- 2. MODIFIED MONOPOLE ANALYSIS
- 3. TOWER ELEVATION DRAWING AND FEEDLINE PLAN
- 4. ANCHOR ROD AND BASE PLATE ANALYSIS
- 5. FOUNDATION ANALYSIS
- 6. MODIFICATION DESIGN DRAWINGS

#### **EXECUTIVE SUMMARY**

The purpose of this analysis is to verify whether the design for the existing tower is structurally capable of carrying the new antenna and coax loads as specified by AT&T to T-Mobile Towers. This report was commissioned by Ms. MeganJo MacLeod of T-Mobile Towers.

The design for the existing structure meets the requirements of TIA/EIA-222-F and the 2005 Connecticut state building code for a fastest-mile wind speed of 85 mph with 1/2" radial ice (w/ 25% wind load reduction) for the proposed loading configuration. Refer to modification design drawing by GPD Group (Job #: 2012715.25, dated 7/19/12) in Appendix 6.

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

#### Section Results

Tower Members	% Capacity	Result
Pole	97.8%	Pass
Base Plate	91.1%	Pass
Anchor Rods	82.8%	Pass
Foundation	% Capacity	Result
Soil	98.7%	Pass
Overturning	51.9%	Pass
Tower Rating:	98.7%	

Note: BOLD type indicates members in their modified state.

#### **TOWER DESCRIPTION**

The existing tower is located in Middletown, CT. The 185' monopole was originally designed for Omnipoint by Fred A. Nudd Corporation of Ontario, New York. The original design load for the tower was for an 85 mph wind speed with 1/2" radial ice in accordance with ANSI/EIA/TIA-222-E. The tower was originally designed to hold the following:

#### Original Configuration

Antennas:	
Elev. 185'	(3) RR90-17 & (6) FB-1580-1-PTS Antennas on (3) Gate Booms w/ internal coax
Elev. 173'	(12) Dapa 58000 Antennas on (3) 12' T-Booms w/ internal coax
Elev. 161'	(12) Dapa 58000 Antennas on (3) 12' T-Booms w/ internal coax
Elev. 150'	(12) Dapa 58000 Antennas on (3) 12' T-Booms w/ internal coax

The existing monopole has nine major sections connected by full penetration welds and slip joints. It has 12 sides and is evenly tapered from 73.81" (flat-flat) at the base to 18" (flat-flat) at the top. The structure is galvanized and has no tower lighting.

#### **DOCUMENTS PROVIDED**

Description	Remarks	Source
Tower Drawings	Fred A. Nudd, File #: 98-5980, dated 5/1/98	T-Mobile
Foundation Drawings	Fred A. Nudd, File #: 98-5980, dated 5/1/98	T-Mobile
Geotechnical Report	Dr. Clarence Welti, 3/27/98	T-Mobile
Modification Drawings	All-Points, Project # CT107573, dated 4/28/05	T-Mobile
Previous Analysis	GPD, Project # 2012792.95, dated 4/11/12	GPD
Modification Drawings	GPD Project #: 2012715.25, dated 7/19/12	GPD

#### **TOWER MATERIALS**

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

Pole	42 KSI Yield Strength	
Base Plate	36 KSI Yield Strength	
Anchor Rods	70 KSI Yield Strength	

#### **TOWER LOADING**

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

Proposed, Existing, Reserved Configuration

Elevation	Carrier	Antennas
185'	T-Mobile	(9) Ericsson AIR 21 Antennas, (3) Ericssson AIR 33 Antennas,
		(3) Andrew ETW190VS12UB TMA's,
		(1) HCS Fiber/DC boxes (Large), & (1) 2' MW Dish,
		on (3) 12' T-Frames, w/ (25) 1-5/8" internal coax
		& (2) 1-5/8" internal hybrid coax
175'	AT&T	(6) Powerwave 7770 Antennas, (3) KMW AM-X-CD-16-65-00T
175		Antennas, (6) CCI DTMABP7819VG12A
		(6) Powerwave LGP13519 Diplexers, (6) Ericsson RRUS-11 radio
		heads, & (1) Raycap DC6-48-60-18-8F on (3) 12' T-Frames
		w/ (12) 1-1/4" internal coax, (1) 7/16" internal fiber cable,
		& (2) 3/8" DC Power internal cable
165'	Pocket	(3) Kathrein 742 213 Antennas, Flush Mounted,
		w/ (6) 1-5/8" internal coax

Note: - Bold indicates carrier's final configuration.

- See Appendix 2 for proposed and existing feedline plan.

The purpose of this independent structural analysis review is to determine if the design for the existing tower, with the proposed configuration, is in conformance to the latest TIA/EIA-222-F standard and the 2005 Connecticut building code requirements.

#### **ANALYSIS**

The purpose of this structural analysis review is to determine if the design for the existing tower, with the proposed loading, is in conformance to the latest TIA/EIA-222-F standard and the 2005 Connecticut building code requirements. TnxTower (Version v6.0.4.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the ANSI/TIA/EIA-222-F standard and all local building code requirements. Selected output from the analysis is included in Appendix 1.

The current requirements of TIA/EIA-222-F and the 2005 Connecticut building code are for a fastest-mile wind speed of 85 mph with 1/2" of radial ice. A 25% reduction in wind load is allowed when wind and ice are applied simultaneously. TIA/EIA-222-F requires towers within Middlesex County, Connecticut to be analyzed with a 85 mph fastest-mile wind speed.

#### **ANALYSIS FASTEST MILE WIND SPEED:**

85 MPH

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

#### CONCLUSIONS AND RECOMMENDATIONS

Based on the computer structural analysis results, the design for the existing 185' monopole meets the requirements of TIA/EIA-222-F and the 2005 Connecticut building code for a fastest-mile wind speed of 85 mph with 1/2" radial ice (w/ 25% wind load reduction) for the proposed loading configuration. Refer to modification design drawing by GPD Group (Job #: 2012715.25, dated 7/19/12) in Appendix 6.

The foundation reactions, with the proposed loading configuration, were found to be less than the capacity of the existing foundation design. Therefore the existing foundations are adequate, assuming they were properly constructed according to original design.

#### Summary of Findings

Pole	Satisfactory	
Base Plate	Satisfactory	
Anchor Rods	Satisfactory	
Foundation	Satisfactory	

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

#### DISCLAIMER OF WARRANTIES

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

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

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

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

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

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

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

#### CT11057C MIDDLETOWN 1

#### **APPENDICES**

1.	TnxTower	Analysis	Printout
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- 2. Modified Monopole Analysis
- 3. Tower Elevation Drawing and Feedline Plan
- 4. Anchor Rod and Base Plate Analysis
- 5. Foundation Analysis
- 6. Modification Design Drawings

#### **TNXTOWER ANALYSIS PRINTOUT**

GPD Group 520 South Main Street, Suite 2531 Akron, OH 44311 Phone: (216) 927-8648 FAX: (216) 518-5545

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	T-Mobile Towers	bsmith

#### **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 Middlesex County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 74 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

#### **Options**

Consider Moments - Legs Consider Moments - Horizontals

Consider Moments - Diagonals Use Moment Magnification

√ Use Code Stress Ratios

- Use Code Safety Factors Guys
  Escalate Ice
  Always Use Max Kz
  Use Special Wind Profile
- √ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section
- ✓ Secondary Horizontal Braces Leg
   Use Diamond Inner Bracing (4 Sided)

   Add IBC .6D+W Combination

- √ Distribute Leg Loads As Uniform
- Assume Legs Pinned

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

- Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules
- √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression
- √ All Leg Panels Have Same Allowable
- Offset Girt At Foundation

  √ Consider Feedline Torque
- Include Angle Block Shear Check Poles
- √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets

#### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or	Allow Shield	Component Type	Placement	Total Number		$C_A A_A$	Weigh
	Leg			ft			ft <sup>2</sup> /ft	plf
LDF7-50A (1-5/8	C	No	Inside Pole	185.00 - 8.00	25	No Ice	0.00	0.82
FOAM)						1/2" Ice	0.00	0.82
1-5/8" Hybrid Cable	C	No	Inside Pole	185.00 - 8.00	2	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
LDF6-50A (1-1/4	В	No	Inside Pole	175.00 - 8.00	12	No Ice	0.00	0.66
FOAM)						1/2" Ice	0.00	0.66
3/8" Power Cable	В	No	Inside Pole	175.00 - 8.00	2	No Ice	0.00	0.30
						1/2" Ice	0.00	0.30
7/16" Fiber Cable	В	No	Inside Pole	175.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF7-50A (1-5/8	A	No	Inside Pole	165.00 - 8.00	6	No Ice	0.00	0.82
FOAM)						1/2" Ice	0.00	0.82

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#### **Discrete Tower Loads**

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement		$C_AA_A$ Front	$C_AA_A$ Side	Weigh
	208		Vert						
			ft ft	٥	ft		ft²	ft²	K
Pirod 12' Universal T-Frame		Г Г	ft	0.0000	195.00	No Inc	0.55	10.00	0.26
Pirod 12 Universal 1-Frame	A	From Leg	2.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice	8.55 12.30	10.90 14.97	0.36 0.49
Pirod 12' Universal T-Frame	В	From Leg	2.00	0.0000	185.00	No Ice	8.55	10.90	0.36
			0.00			1/2" Ice	12.30	14.97	0.49
Pirod 12' Universal T-Frame	C	From Leg	2.00	0.0000	185.00	No Ice	8.55	10.90	0.36
			0.00			1/2" Ice	12.30	14.97	0.49
3) AIR21 Antenna w/ mount	Α	From Leg	0.00 4.00	0.0000	185.00	No Ice	6.73	5.62	0.11
pipe	А	Trom Leg	0.00	0.0000	103.00	1/2" Ice	7.24	6.42	0.17
• • •			0.00						
3) AIR21 Antenna w/ mount	В	From Leg	4.00	0.0000	185.00	No Ice	6.73	5.62	0.11
pipe			0.00			1/2" Ice	7.24	6.42	0.17
3) AIR21 Antenna w/ mount	C	From Leg	0.00 4.00	0.0000	185.00	No Ice	6.73	5.62	0.11
pipe	C	From Leg	0.00	0.0000	103.00	1/2" Ice	7.24	6.42	0.17
h.h.			0.00					,_	07
AIR33 Antenna w/ mount	Α	From Leg	4.00	0.0000	185.00	No Ice	6.65	5.60	0.10
pipe			0.00			1/2" Ice	7.17	6.43	0.16
AID 22 A-4	D	Frank I an	0.00	0.0000	105.00	No Inc	( (5	5.00	0.10
AIR33 Antenna w/ mount pipe	В	From Leg	4.00 0.00	0.0000	185.00	No Ice 1/2" Ice	6.65 7.17	5.60 6.43	0.16
pipe			0.00			1/2 100	7.17	0.43	0.10
AIR33 Antenna w/ mount	C	From Leg	4.00	0.0000	185.00	No Ice	6.65	5.60	0.10
pipe			0.00			1/2" Ice	7.17	6.43	0.16
			0.00						
ETW190VS12UB	Α	From Leg	4.00	0.0000	185.00	No Ice	0.66	0.35	0.01
			0.00			1/2" Ice	0.78	0.44	0.02
ETW190VS12UB	В	From Leg	4.00	0.0000	185.00	No Ice	0.66	0.35	0.01
211170101202		Trom Log	0.00	0.0000	100.00	1/2" Ice	0.78	0.44	0.02
			0.00						
ETW190VS12UB	C	From Leg	4.00	0.0000	185.00	No Ice	0.66	0.35	0.01
			0.00			1/2" Ice	0.78	0.44	0.02
HCS Fiber/DC Box (Large)	С	From Leg	0.00 4.00	0.0000	185.00	No Ice	3.22	1.16	0.02
Les Floei, De Box (Large)		110m Leg	0.00	0.0000	103.00	1/2" Ice	3.47	1.34	0.02
			0.00						
Pirod 12' Universal T-Frame	Α	From Leg	2.00	0.0000	175.00	No Ice	8.55	10.90	0.36
			0.00			1/2" Ice	12.30	14.97	0.49
Direct 12' Universal T Errors	D	From Lag	0.00	0.0000	175.00	No Ice	8.55	10.90	0.36
Pirod 12' Universal T-Frame	В	From Leg	2.00 0.00	0.0000	173.00	1/2" Ice	12.30	14.97	0.36
			0.00			1,2 100	12.50	1 1.71	0.17
Pirod 12' Universal T-Frame	C	From Leg	2.00	0.0000	175.00	No Ice	8.55	10.90	0.36
			0.00			1/2" Ice	12.30	14.97	0.49
(2) 7770 00		Day -	0.00	0.0000	175.00	NI. T	5.00	4.10	0.00
(2) 7770.00 w/Mount Pipe	A	From Leg	4.00 0.00	0.0000	175.00	No Ice 1/2" Ice	5.88 6.31	4.10 4.73	0.06 0.11
			0.00			1/2 100	0.51	7./3	0.11
(2) 7770.00 w/Mount Pipe	В	From Leg	4.00	0.0000	175.00	No Ice	5.88	4.10	0.06
		3	0.00			1/2" Ice	6.31	4.73	0.11
			0.00						

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Description	Face or	Offset Type	Offsets: Horz	Azimuth Adjustment	Placement		$C_A A_A$ Front	$C_AA_A$ Side	Weigh
	Leg		Lateral Vert						
			ft	0	ft		ft²	$ft^2$	K
			ft ft						
(2) 7770.00 w/Mount Pipe	С	From Leg	4.00	0.0000	175.00	No Ice	5.88	4.10	0.06
			0.00			1/2" Ice	6.31	4.73	0.11
AM-X-CD-16-65-00T w/	Α	From Leg	4.00	0.0000	175.00	No Ice	7.33	6.14	0.07
Mount Pipe			0.00			1/2" Ice	7.98	7.13	0.13
AM-X-CD-16-65-00T w/	В	From Leg	4.00	0.0000	175.00	No Ice	7.33	6.14	0.07
Mount Pipe			0.00			1/2" Ice	7.98	7.13	0.13
AM-X-CD-16-65-00T w/	C	From Leg	4.00	0.0000	175.00	No Ice	7.33	6.14	0.07
Mount Pipe			0.00			1/2" Ice	7.98	7.13	0.13
(2) DTMABP7819VG12A	Α	From Leg	4.00	0.0000	175.00	No Ice	1.17	0.44	0.02
			0.00			1/2" Ice	1.32	0.56	0.03
(2) DTMABP7819VG12A	В	From Leg	4.00	0.0000	175.00	No Ice	1.17	0.44	0.02
			0.00			1/2" Ice	1.32	0.56	0.03
(2) DTMABP7819VG12A	C	From Leg	4.00	0.0000	175.00	No Ice	1.17	0.44	0.02
			0.00			1/2" Ice	1.32	0.56	0.03
(2) LGP13519	A	From Leg	4.00	0.0000	175.00	No Ice	0.34	0.21	0.01
			0.00			1/2" Ice	0.42	0.28	0.01
(2) LGP13519	В	From Leg	4.00	0.0000	175.00	No Ice	0.34	0.21	0.01
			0.00			1/2" Ice	0.42	0.28	0.01
(2) LGP13519	C	From Leg	4.00	0.0000	175.00	No Ice	0.34	0.21	0.01
			0.00			1/2" Ice	0.42	0.28	0.01
(2) RRUS 11	Α	From Leg	4.00	0.0000	175.00	No Ice	2.94	1.25	0.06
			0.00			1/2" Ice	3.17	1.41	0.07
(2) RRUS 11	В	From Leg	4.00	0.0000	175.00	No Ice	2.94	1.25	0.06
			0.00			1/2" Ice	3.17	1.41	0.07
(2) RRUS 11	C	From Leg	4.00	0.0000	175.00	No Ice	2.94	1.25	0.06
			0.00			1/2" Ice	3.17	1.41	0.07
DC6-48-60-18-8F Surge	C	From Leg	4.00	0.0000	175.00	No Ice	1.47	1.47	0.03
Suppression Unit			0.00			1/2" Ice	1.67	1.67	0.05
742 213 w/ Mount Pipe	Α	From Leg	0.50	0.0000	165.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
742 213 w/ Mount Pipe	В	From Leg	0.50	0.0000	165.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
742 213 w/ Mount Pipe	C	From Leg	0.50	0.0000	165.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
Collar Mount	C	From Leg	0.00	0.0000	165.00	No Ice	2.14	2.14	0.19
			0.00			1/2" Ice	2.35	2.35	0.25

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					Dis	shes					
Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter		Aperture Area	Weight
				ft	0	0	ft	ft		ft²	K
2' MW	С	Paraboloid w/o	From	4.00	0.0000		185.00	2.00	No Ice	3.14	0.04
		Radome	Leg	0.00					1/2" Ice	3.41	0.07
				0.00							

	Critical Deflections and Radius of Curvature - Service Wind									
Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature				
ft		Comb.	in	0	0	fi				
185.00	2' MW	29	28.469	1.7089	0.0054	8518				
175.00	Pirod 12' Universal T-Frame	29	24.942	1.6490	0.0037	5885				
165.00	742 213 w/ Mount Pipe	29	21.610	1.5067	0.0025	4123				

#### Compression Checks

Section No.	Elevation	Size	L	$L_u$	Kl/r	$F_a$	A	Actual P	Allow. $P_a$	Ratio P
	ft		ft	ft		ksi	in <sup>2</sup>	K	K	$P_a$
LI	185 - 180 (1)	TP18x18x0.1875	5.00	0.00	0.0	25.200	10.7543	-2.22	271.01	0.008
L2	180 - 150.25 (2)	TP27.7059x18x0.25	29.75	0.00	0.0	25.200	22.1020	-7.08	556.97	0.013
L3	150.25 - 147.25 (3)	TP28.6847x27.7059x0.3894	3.00	0.00	0.0	21.960	35.4805	-7.54	779.14	0.010
L4	147.25 - 130 (4)	TP34.3125x28.6847x0.3902	17.25	0.00	0.0	25.200	40.5731	-9.55	1022.44	0.009
L5	130 - 118.75 (5)	TP37.4676x32.1813x0.37	16.25	0.00	0.0	25.091	44.1926	-13.07	1108.84	0.012
L6	118.75 - 115 (6)	TP38.6875x37.4676x0.3657	3.75	0.00	0.0	24.692	45.1260	-13.77	1114.24	0.012
L7	115 - 95 (7)	TP45.1875x38.6875x0.4155	20.00	0.00	0.0	25.200	57.2935	-16.88	1443.80	0.012
L8	95 - 91 (8)	TP45.8125x42.6125x0.4091	10.00	0.00	0.0	25.200	59.8087	-20.36	1507.18	0.014
L9	91 - 51 (9)	TP58.875x45.8125x0.375	40.00	0.00	0.0	25.004	67.8785	-28.72	1697.26	0.017
L10	51 - 40 (10)	TP61.6875x55.8391x0.4553	18.00	0.00	0.0	23.894	89.7689	-36.33	2144.91	0.017
L11	40 - 19 (11)	TP68.5x61.6875x0.4375	21.00	0.00	0.0	25.087	91.7700	-40.52	2302.21	0.013
L12	19 - 0 (12)	TP73.8125x64.7054x0.4375	28.00	0.00	0.0	23.546	103.3670	-53.61	2433.91	0.02

Pole Bending Design Data										
Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio  f <sub>by</sub> F <sub>by</sub>
L1	185 - 180 (1)	TP18x18x0.1875	30.71	7.888	25.200	0.313	0.00	0.000	25.200	0.000
L2	180 - 150.25 (2)	TP27.7059x18x0.25	402.76	32.616	25.200	1.294	0.00	0.000	25.200	0.000
L3	150.25 - 147.25 (3)	TP28.6847x27.7059x0.3894	449.52	22.106	21.960	1.007	0.00	0.000	21.960	0.000
L4	147.25 - 130 (4)	TP34.3125x28.6847x0.3902	652.11	24.532	25.200	0.974	0.00	0.000	25.200	0.000
L5	130 - 118.75 (5)	TP37.4676x32.1813x0.37	952.78	28.584	25.091	1.139	0.00	0.000	25.091	0.000
L6	118.75 - 115 (6)	TP38.6875x37.4676x0.3657	1027.53	29.213	24.692	1.183	0.00	0.000	24.692	0.000
L7	115 - 95 (7)	TP45.1875x38.6875x0.4155	1325.28	26.561	25.200	1.054	0.00	0.000	25.200	0.000
L8	95 - 91 (8)	TP45.8125x42.6125x0.4091	1557.53	28.184	25.200	1.118	0.00	0.000	25.200	0.000
L9	91 - 51 (9)	TP58.875x45.8125x0.375	2440.64	31.357	25.004	1.254	0.00	0.000	25.004	0.000
L10	51 - 40 (10)	TP61.6875x55.8391x0.4553	3001.32	26.789	23.894	1.121	0.00	0.000	23.894	0.000
LII	40 - 19 (11)	TP68.5x61.6875x0.4375	3405.11	27.925	25.087	1.113	0.00	0.000	25.087	0.000
L12	19 - 0 (12)	TP73.8125x64.7054x0.4375	4443.02	28.698	23.546	1.219	0.00	0.000	23.546	0.000

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#### Pole Shear Design Data

Section	Elevation	Size	Actua	Actual	Allow.	Ratio	Actual	Actual	Allow.	Ratio
No.			l	$f_{\rm v}$	$F_{v}$	$f_{\rm v}$	T	$f_{vt}$	$F_{vt}$	$f_{vt}$
	ft		V	ksi	ksi	$\overline{F_v}$	kip-ft	ksi	ksi	$F_{vt}$
			K			270.50				2000
L1	185 - 180 (1)	TP18x18x0.1875	6.29	0.585	16.800	0.071	0.00	0.000	16.800	0.000
L2	180 - 150.25 (2)	TP27.7059x18x0.25	15.41	0.697	16.800	0.084	0.00	0.000	16.800	0.000
L3	150.25 - 147.25 (3)	TP28.6847x27.7059x0.3894	15.77	0.445	14.640	0.062	0.00	0.000	14.640	0.000
L4	147.25 - 130 (4)	TP34.3125x28.6847x0.3902	17.34	0.427	16.800	0.052	0.00	0.000	16.800	0.000
L5	130 - 118.75 (5)	TP37.4676x32.1813x0.37	19.66	0.445	16.727	0.054	0.00	0.000	16.727	0.000
L6	118.75 - 115 (6)	TP38.6875x37.4676x0.3657	20.22	0.448	16.461	0.055	0.00	0.000	16.461	0.000
L7	115 - 95 (7)	TP45.1875x38.6875x0.4155	22.37	0.390	16.800	0.047	0.00	0.000	16.800	0.000
L8	95 - 91 (8)	TP45.8125x42.6125x0.4091	24.06	0.402	16.800	0.049	0.00	0.000	16.800	0.000
L9	91 - 51 (9)	TP58.875x45.8125x0.375	29.55	0.435	16.800	0.053	0.00	0.000	16.800	0.000
L10	51 - 40 (10)	TP61.6875x55.8391x0.4553	32.70	0.364	15.929	0.046	0.00	0.000	15.929	0.000
L11	40 - 19 (11)	TP68.5x61.6875x0.4375	34.63	0.377	16.800	0.046	0.00	0.000	16.800	0.000
L12	19 - 0 (12)	TP73.8125x64.7054x0.4375	39.54	0.383	16.800	0.046	0.00	0.000	16.800	0.000

#### Pole Interaction Design Data

Section No.	Elevation	Ratio P	Ratio $f_{bx}$	Ratio $f_{by}$	Ratio $f_v$	Ratio f <sub>vi</sub>	Comb. Stress Ratio	Allow. Stress	Criteria
	ft	$\overline{P_a}$	$\frac{f_{bx}}{F_{bx}}$	$\frac{f_{by}}{F_{by}}$	$\frac{f_v}{F_v}$	$\frac{f_{vt}}{F_{vt}}$	- biress raino	Ratio	
L1	185 - 180 (1)	0.008	0.313	0.000	0.071	0.000	0.322	1.333	H1-3+VT 🗸
L2	180 - 150.25 (2)	0.013	1.294	0.000	0.084	0.000	1.309	1.333	H1-3+VT 🗸
L3	150.25 - 147.25 (3)	0.010	1.007	0.000	0.062	0.000	1.017	1.333	H1-3+VT 🗸
L4	147.25 - 130 (4)	0.009	0.974	0.000	0.052	0.000	0.983	1.333	H1-3+VT 🗸
L5	130 - 118.75 (5)	0.012	1.139	0.000	0.054	0.000	1.152	1.333	H1-3+VT ✓
L6	118.75 - 115	0.012	1.183	0.000	0.055	0.000	1.196	1.333	H1-3+VT 🗸
L7	115 - 95 (7)	0.012	1.054	0.000	0.047	0.000	1.066	1.333	H1-3+VT 🗸
L8	95 - 91 (8)	0.014	1.118	0.000	0.049	0.000	1.133	1.333	H1-3+VT 🗸
L9	91 - 51 (9)	0.017	1.254	0.000	0.053	0.000	1.272	1.333	H1-3+VT 🗸
L10	51 - 40 (10)	0.017	1.121	0.000	0.046	0.000	1.139	1.333	H1-3+VT 🗸
LII	40 - 19 (11)	0.018	1.113	0.000	0.046	0.000	1.131	1.333	H1-3+VT
L12	19 - 0 (12)	0.022	1.219	0.000	0.046	0.000	1.241	1.333	H1-3+VT 🗸

#### **Section Capacity Table**

Section	Elevation	Component	Size	Critical	P	$SF*P_{allow}$	%	Pass
No.	ft	Type		Element	K	K	Capacity	Fail
L1	185 - 180	Pole	TP18x18x0.1875	1	-2.22	361.25	24.0	Pass
L2	180 - 150.25	Pole	TP27.7059x18x0.25	2	-7.08	742.44	97.8	Pass
L3	150.25 - 147.25	Pole & Rein.	TP28.6847x27.7059x0.3894	3	-7.54	1038.60	72.9	Pass
L4	147.25 - 130	Pole & Rein.	TP34.3125x28.6847x0.3902	4	-9.55	1362.91	73.9	Pass
L5	130 - 118.75	Pole & Rein.	TP37.4676x32.1813x0.37	5	-13.07	1478.08	86.5	Pass
L6	118.75 - 115	Pole & Rein.	TP38.6875x37.4676x0.3657	6	-13.77	1485.28	89.8	Pass
L7	115 - 95	Pole & Rein.	TP45.1875x38.6875x0.4155	7	-16.88	1924.59	80.0	Pass
L8	95 - 91	Pole & Rein.	TP45.8125x42.6125x0.4091	8	-20.36	2009.07	85.0	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF^*P_{allow} \ K$	% Capacity	Pass Fail
L9	91 - 51	Pole	TP58.875x45.8125x0.375	9	-28.72	2262.45	95.1	Pass
L10	51 - 40	Pole & Rein.	TP61.6875x55.8391x0.4553	10	-36.33	2859.16	85.3	Pass
L11	40 - 19	Pole	TP68.5x61.6875x0.4375	11	-40.52	3068.85	84.6	Pass
L12	19 - 0	Pole	TP73.8125x64.7054x0.4375	12	-53.61	3244.40	92.7	Pass
							Summary	
						Pole (L2)	97.8	Pass
						RATING =	97.8	Pass

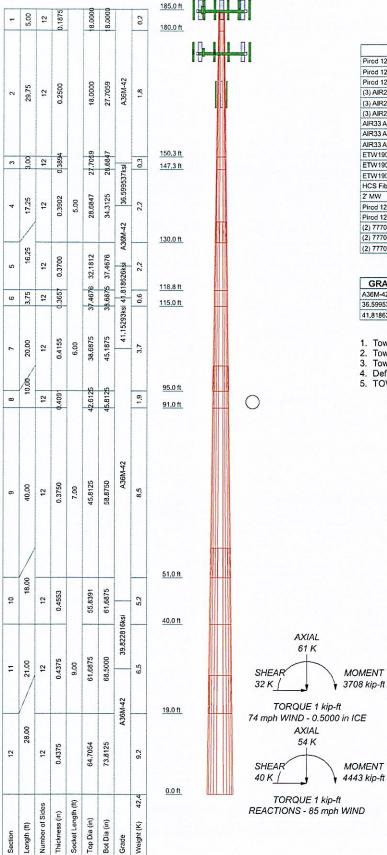
#### **MODIFIED MONOPOLE ANALYSIS**



Reinforced Pole Stress and Effective Thickness Check

2012		27	-	-		100			200	tit.		tir.	100		10		100				- 100	1
	S. Error in Decared Yiel	Mress		311.0%	3.976	0.1%	4.1%	.430	0.4%	.430	.650	0.4%	0.3%	0.53.	.400	92.0	0.9%	0.3%	0.000	0.2%	0.1%	
İ	Decaded Tield Stress D	land.		A TO SHAPE	42.0	200	9.7	42.5	0.7	100	No. of Line	100	0.74	7 0 7	2.0	47.0		6.6	62	41.0	5.0	
H	CONTRACTOR OF THE PARTY OF THE	4			80	West staff	TOTAL BASE									8		DOM NOT	Test from			
	To be the second	Meligite		100	201	000	400	16.0		150.031	1000000	64 G 52 F	0.09	60	100	1000	660	560	30	001	0.00	
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Ī	[]	Katho		0000	0.240	979.0	6.729	0.739	0.478	598.0	8.60	0.800	0.470	0,850	0.951	0 483	0.415	0.833	9880	0.410	6.627	87.6
ŀ	1		1	Ľ	-6	×	,	9		98		-	Н		i				-	Н	П	Г
L	-	learns in		*11	435	21.75	362	204%	10010	1163	8410	13410	26734	15733	27,174	28655	63335	4750	43690	111037	71017	
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L		Ingettia (sr.*)					1365	95/81	7007	746.7	2674	325	3545	38.43			6369	7418				
L	Terrator ordy or Terracon	Comp					TRC	180	180	180	180	160	180	180			180	391				
	Gap Between Pole and Back of	Rife (n)					0	0	0	0	0	0	0	0			0	0				
I	Position (F-flat.	Corners						,		,	,		,	,				,				
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#### DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Pirod 12' Universal T-Frame	185	AM-X-CD-16-65-00T w/ Mount Pipe	175
Pirod 12' Universal T-Frame	185	AM-X-CD-16-65-00T w/ Mount Pipe	175
Pirod 12' Universal T-Frame	185	AM-X-CD-16-65-00T w/ Mount Pipe	175
(3) AIR21 Antenna w/ mount pipe	185	(2) DTMABP7819VG12A	175
(3) AIR21 Antenna w/ mount pipe	185	(2) DTMABP7819VG12A	175
(3) AIR21 Antenna w/ mount pipe	185	(2) DTMABP7819VG12A	175
AIR33 Antenna w/ mount pipe	185	(2) LGP13519	175
AIR33 Antenna w/ mount pipe	185	(2) LGP13519	175
AIR33 Antenna w/ mount pipe	185	(2) LGP13519	175
ETW190VS12UB	185	(2) RRUS 11	175
ETW190VS12UB	185	(2) RRUS 11	175
ETW190VS12UB	185	(2) RRUS 11	175
HCS Fiber/DC Box (Large)	185	DC6-48-60-18-8F Surge Suppression	175
2' MW	185	Unit	
Pirod 12' Universal T-Frame	175	Pirod 12' Universal T-Frame	175
Pirod 12' Universal T-Frame	175	742 213 w/ Mount Pipe	165
(2) 7770.00 w/Mount Pipe	175	742 213 w/ Mount Pipe	165
(2) 7770.00 w/Mount Pipe	175	Collar Mount	165
(2) 7770.00 w/Mount Pipe	175	742 213 w/ Mount Pipe	165

#### MATERIAL STRENGTH

GRADE	Fv	Fu	GRADE	Fv	Fu
A36M-42	42 ksi	60 ksi	41.15293ksi	41 ksi	56 ksi
36.599537ksi	37 ksi	52 ksi	39.822816ksi	40 ksi	55 ksi
41.818626ksi	A2 kei	57 kei			

#### **TOWER DESIGN NOTES**

- Tower is located in Middlesex County, Connecticut.
   Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
   Tower is also designed for a 74 mph basic wind with 0.50 in ice.
- Deflections are based upon a 50 mph wind.
   TOWER RATING: 98.2%

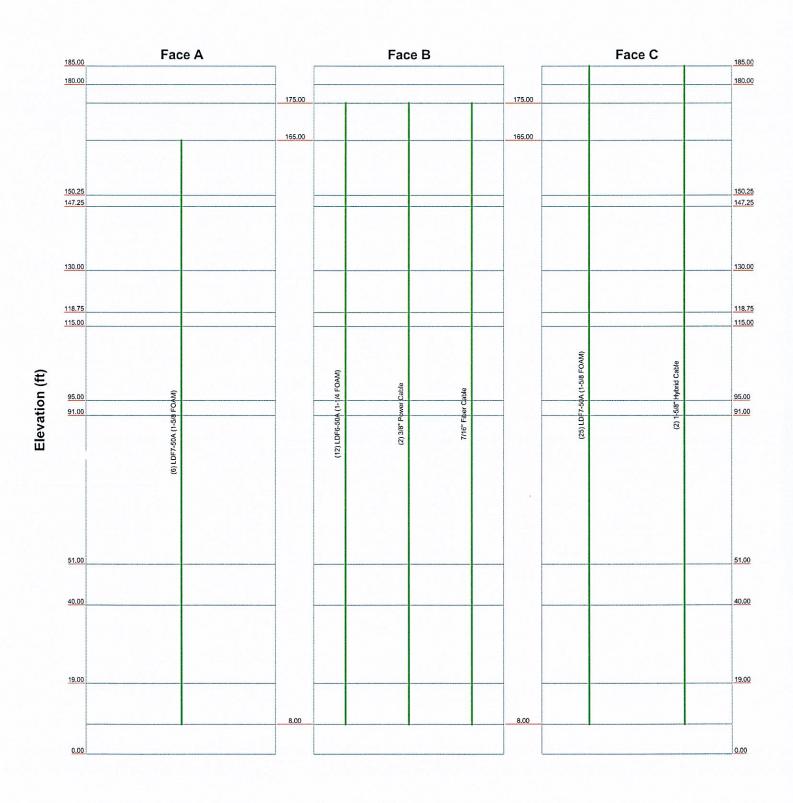


_	GPD Group	CT11057
Alla.	520 South Main Street, Suite 2531	Project: 2012715.
GPD GROUP	Akron, OH 44311	Client: T-Mobile
GPD Group	Phone: (216) 927-8648	Code: TIA/EIA-2
	FAX: (216) 518-5545	Path:

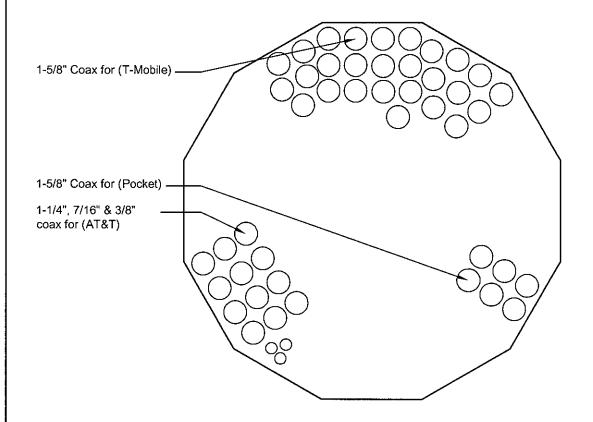
Job: CT11057C Middlet	own 1	
Project: 2012715.25		
Client: T-Mobile Towers	Drawn by: bsmith	App'd:
Code: TIA/EIA-222-F	Date: 07/19/12	Scale: NTS
Path:	Engagement of the Lorentz was alleged to the Control of the	Dwg No. E-1

#### Feedline Distribution Chart 0' - 185'

Round Flat App In Face App Out Face Truss Le









NOT TO SCALE





CT11057C - MIDDLETOWN 1

JOB NO.
2012715.25
DATE
7/19/2012
DRAWN BY
BPS

## ANCHOR ROD AND BASE PLATE ANALYSIS



Job 2012715.25 - CTII	057 <u>C</u>
Sheet No/	of
Calculated by	Date
Checked by	Date

Glan, Pyle, Schomer, Burns & Delivren, Inc	Checked by	Date
Anchor Ros Analysis		
Trux Reactions <u>Existing Roas</u> M: 4443.02K-A- A= 75.3982in <sup>2</sup> P: 53.62K	New Rods AN = 14.726212 IN = 11057.6046124 (12)14" & A193-B7 Ona 77.5" & BC	Total AT = 90.12441n2 IT = 54656.6275mg
MASON Decades and		
Modified Reactions		- 1
$M_{mod} = \frac{444302K-64(43549.0228144)}{54656.6275744} = 3544$	1.15 K-f+	
Pmod = 53,62K (753980in2) = 44.86K	es es en en en en en en en en en en en en en	
VMOD = 39,63K (75,3982m2) = 33,07K		
* Sec Anckor Rod & Base Plate Spi	readsheet for exposition	
	The second secon	
Modified Rods	4	
PU = 4443, 02K-8(1211) (12272117) + 53.62	$\frac{K(10272103)}{5.1244103} = 47.12K$	
Pallow=,33 (122721/2) (125Ksi) (4/3) = 67.50K		
% Capacity = 47-12×/67.50× = 69.8%	s ok	<u></u>
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#### Anchor Rod and Base Plate Stresses CT11057C MIDDLETOWN 1 2012715.25

- Welds Control

*Overturning Moment =	3544.15	k*ft
Axial Force =		k
Shear Force =		k

\*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of anchor rod forces used in the analysis below.

Anchor Rods		
Number of Rods =	24	(F. 12)
Type =	Bolt	
Rod Ultimate Strength (Fu) =	90	ksi
ASIF =	1.333	
Rod Circle =	68	in
Rod Diameter =	2	in
Area =	3.14	in <sup>2</sup>
Max Tension on Rod =	102.33	kips
Max Compression on Rod =	106.06	kips
Allow. Rod Force =	124.41	kips
Anchor Rod Capacity =	82.3%	OK

Base Plat	е	6 327
Location =	Internal	1000
Plate Strength (F <sub>y</sub> ) =	36	ksi
Hole Diameter =	64	in
Plate Thickness =	2	in
b = L	7.65	
Le =	4.47	in
fb = [	32.80	ksi
Fb =	36	ksi
BP Capacity =	91.1%	OK

105.0%

Acceptable Stress Ratio =

Stiffeners		
Configuration =	Every Rod	
Thickness =	1.25	in
Width =	5	in
Notch =	1	in
Height =	18	in
Stiffener Strength (F <sub>y</sub> ) =	50	ksi
Weld Info. Known? =	Yes	
Vertical Weld Size =	0.375	in
Horiz. Weld Type =	Fillet	
Fillet Size =	0.75	in
Weld Strength =		ksi
Stiffener Vertical Force =	52.42	kips
Vert. Weld Capacity =	22.6%	kips
Horiz. Weld Capacity =	52.2%	kips
Stiffener Capacity =	30.0%	kips
Controlling Capacity =	52.2%	OK

Pole

Pole Diameter = 73.813 in

Number of Sides = 12

Thickness = 0.4375 in

Pole Yield Strength = 42 ksi

GPD Round Base Plate Stress (Rev F) - V1.07

#### **FOUNDATION ANALYSIS**





#### Mat Foundation Analysis CT11057C MIDDLETOWN 1 2012715.25

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

Tower Reactions		
Moment, M	4443.02	k-ft
Axial, P	53.62	k
Shear, V	39.53	k

Pad & Pier Geometry		
Pier Diameter, ø	7.5	ft
Pad Length, L	25	ft
Pad Width, W	25	ft
Pad Thickness, t	3	ft
Depth, D	10.5	ft
Height Above Grade, HG	0.25	ft

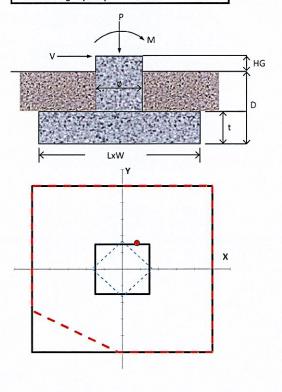
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	4	ksi
Clear Cover	3	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	#8	
Pad Quantity Per Layer	35	
Pier Rebar Size	#8	
Pier Quantity of Rebar	65	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	120	pcf
Angle of Friction, ø	29	•
Bearing Type	Net	
Ultimate Bearing	6	ksf
Water Table Depth	16	ft
Frost Depth	3.33	ft

GPD Mat Foundation Analysis - V1.01

Bearing Summary		Load Case	
Qxmax	2.96	ksf	1D+1W
Qymax	2.96	ksf	1D+1W
Qmax @ 60°	3.58	ksf	1D+1W
Q(all) Gross	3.63	ksf	
Controlling Capacity	98.7%	Pass	

Overturning Summary (Required FS=1.5)		Load Case	
FS(ot)x	2.89	≥1.5	1D+1W
FS(ot)y	2.89	≥1.5	1D+1W
Controlling Capacity	51.9%	Pass	

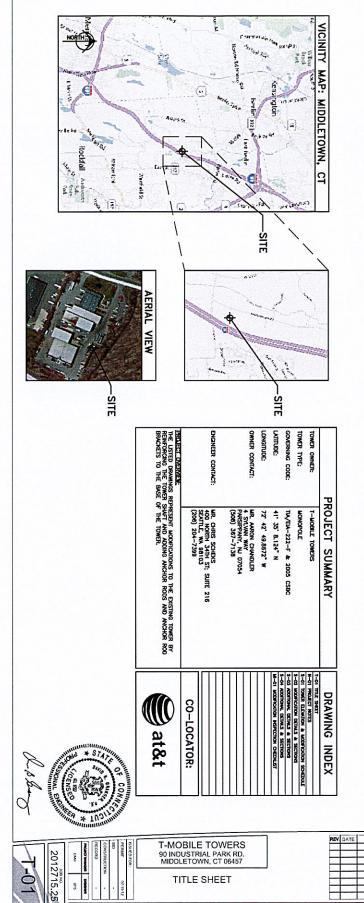


#### **MODIFICATION DESIGN DRAWINGS**

# MIDDLETOWN 1

## 185' MONOPOLE

DESCRIPTION



TITLE SHEET





## GENERAL NOTES

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CONC. ON ECHNIT, AND REPAYED SHAPPES CHANDED DERING FORM RELIGIOUS HARDS WHILE THE REPAYED BY COLD CHANDED BRISIS HAVED HAVE CONC. ON ECHNIT, AND REPAYED HAVE BY AND PAYED THE CONC. ON ECHNIT, AND REPAYED TO WAYDS HE EXCELLED HAVE CONC. ON ECHNIT, AND REPAYED TO WAYDS THE EXCELLED FRANCE OF PRIVILEGE. , Colland Shall be provide acund actements of any and all exceptions extends to charse Shalles Sal Bereal Desirio Structure, and Reprovides extende, selant is to be extended Shall provides belocke charges as immatrictured by dor and acceptable to ope. אנושאעה, אנו הפנט הפיטהומינה אינו במסימונים לם משאמנים, אם ומשאמה כאי באופו אנימאים מפגים האינות מינות המשאמנים לבני המסימונים לא משממנים הפנטה לם ממנושאים אופאעה, אנו הפנט הפיטהומינה באנו פל הפיטהום לם משאמנים, ALL HER STED. SHALL BE HAY DAYND DAWNAYDD FOR FULL WIGHER PROTECTER, BY ADDITION ALL 8 STED. SHALL BE PARTIDD TO METH DESTRIC STEDL COMPACTOR SHALL DESTRI METTON FORMESON PACTICAT STEDL BY ANY CHARL MEANE.

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(MEDILEEX COUNTY, COMMICTIONS)

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## CONTRACTOR NOTES

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A PROPE TO WELLING, ALL SURPACES SHALL BE PROPERLY ORGAND TO RELIGHE DALYWELTHIC. AL COAN EN TAMMENTE AND CAN CORTS FOR IF PROPER PROCESSIONS AND MOT MOT TO SHEED COAN PROCESSION AND MOTOR COST WILLIAM PROCESSION AND MOTOR COST WILLIAM AND MOTOR COST WILLIAM PROCESSION AND MOTOR COST WILLIAM PROCESSION AND PROCE , COMPACTOR SWIT CRECKS ONLY MED MEDING ON Y CATAMOED SHEKKE. IL LE MET MERINT IR CHUMBMUED MUS SHOULD MEDINE WEDING ON Y CATAMOED SHEKKE. IL LE MET

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### ANCHOR ROD NOTES

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IA, IT IS THE RESPONSEMENT OF THE CONTINUENCE TO PHISE CONSTRUCTION AT A POINT SHERE THE WHATCH ROOS ON BE CITED/RELY TISTED. CONSTRUCTION WAY CONTINUE AT IX TESTING IS COMPLETE. III. HALF OR A MINIMUM OF A (WHICHENDE IS ONEATER) HER ANCHOR ROOM SHALL BE TESTED. TY ANT LESUNG RANT BE IN YOCOMOMOE MILH YELY E489-40 (ME-YALAGAED 5001) is consume reduces shall be enhanced throughout the duration of the test. Modern long is considered shall be proof load.

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## MODIFICATION PLATE NOTES

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T-MOBILE TOWERS 90 INDUSTRIAL PARK RD. MIDDLETOWN, CT 06457

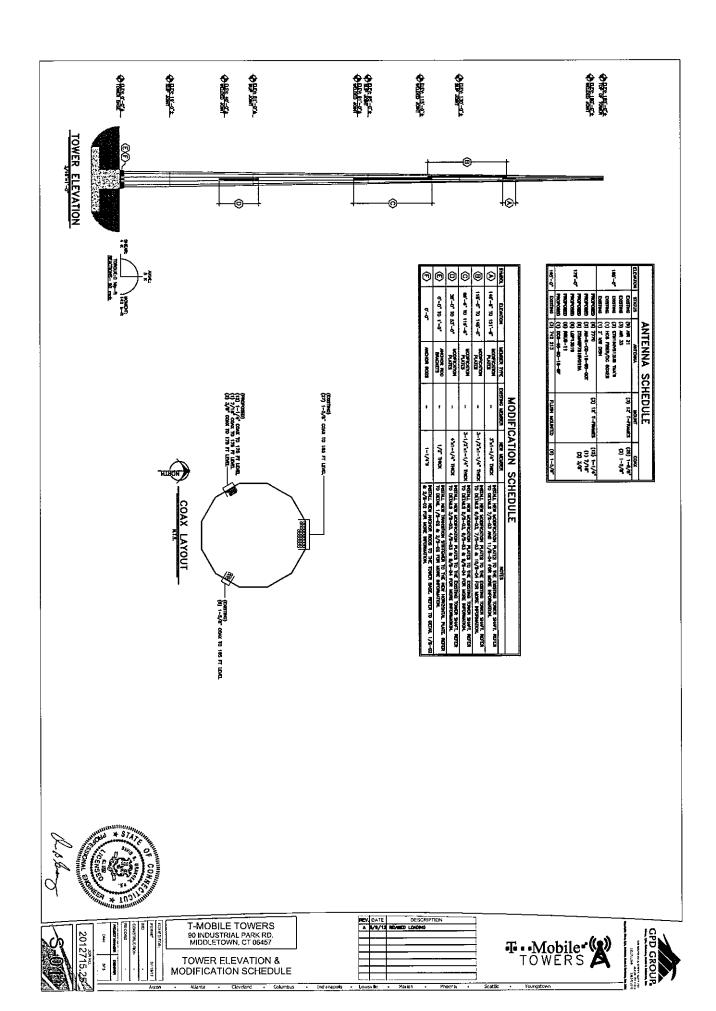
REV. DATE	DESCRIPTION

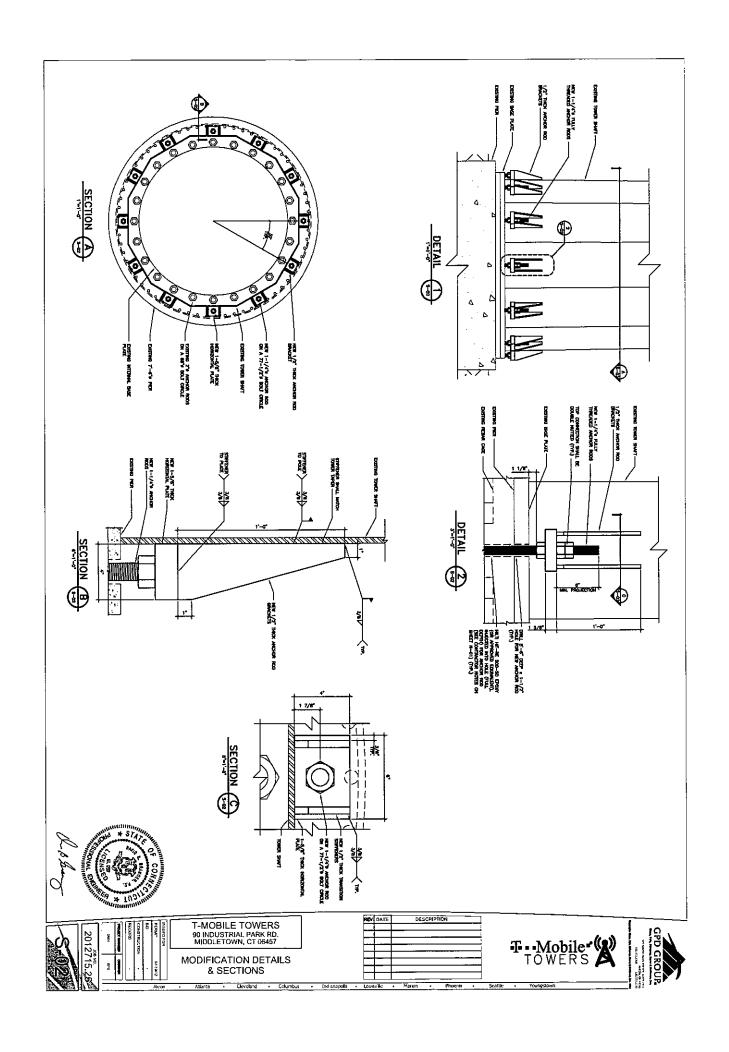
T Mobile TOWERS

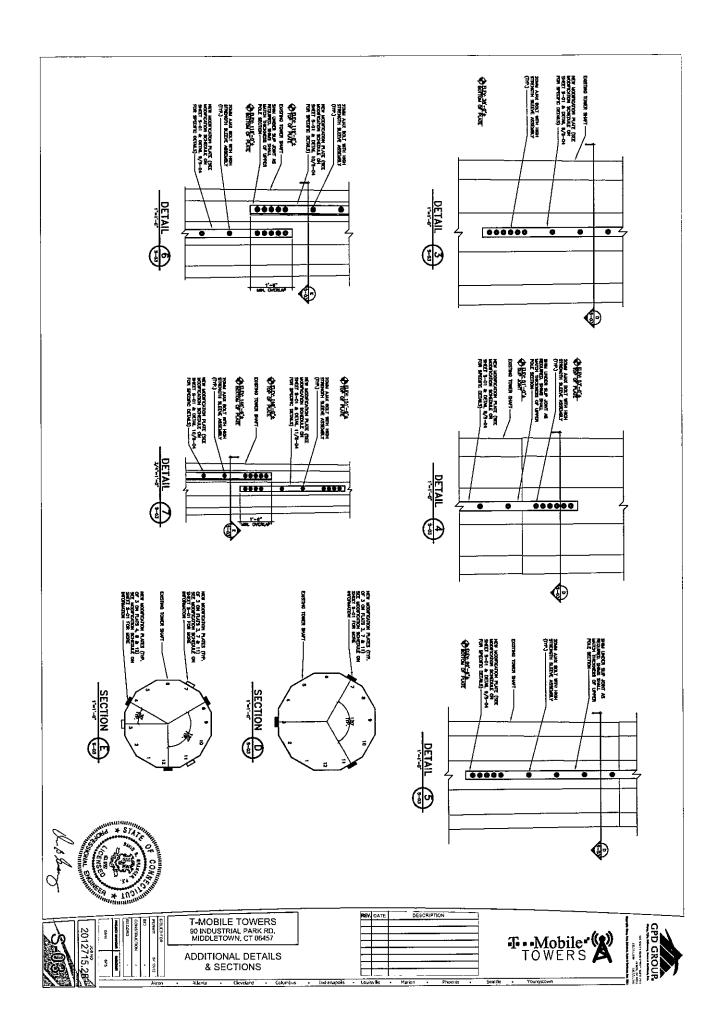


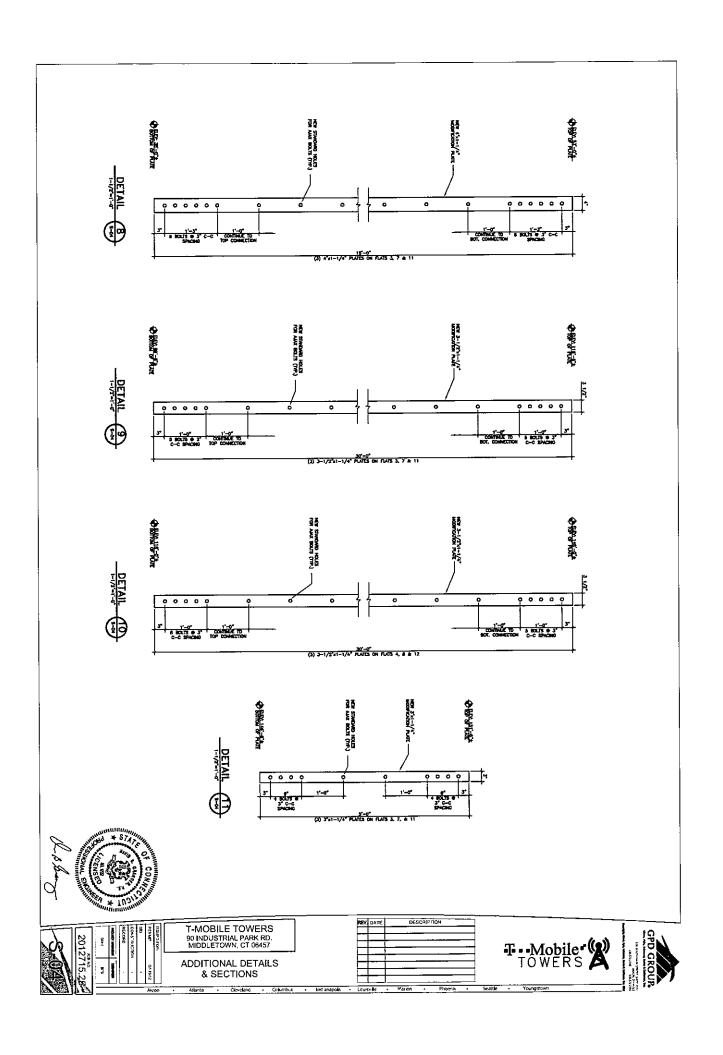
2012715.25 2

PROJECT NOTES









	BEFORE CONSTRUCTION	MODIFICATION	MODIFICATION INSPECTION CHECKLIST  DURING CONSTRUCTION	Α	AFTER CONSTRUCTION
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	регонт пъм	CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REGULIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM	CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REGUNED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
×	MODIFICATION INSPECTION CHECKLIST DRAWING	×	CONSTRUCTION INSPECTIONS	×	MODIFICATION INSPECTION REDLANE OR RECORD DRAWING(S)
×	ENGINEER OF RECORD APPROVED SHOP DRAWINGS	_	FOLHDATION INSPECTIONS	×	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
×	FABRICATION INSPECTION		CONCRETE COUP. STREAGH AND STUDY TESTS	×	PHOTOGRAPHS
×	FABRICATOR CERTIFIED WELD INSPECTION	X	POST INSTALLED ANCHOR ROO VERFICATION	ADDITIONAL TESTING AND INSPECTIONS:	mors:
×	MATERIAL TEST REPORT	×	BASE PLATE GROUT VERIFICATION		
×	FABRICATOR NDE INSPECTION	×	CONTRACTOR'S CERTIFIED WELD INSPECTION		
×	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)	•	EARTHWORK: LIFT AND DEHSITY (REPORT REQUIRED)		MANOR CONN.
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		NOTE: X DENOTES A DOCUMENT	NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MODIFICATION INSPECTION REPORT		THE COUNTY OF THE PARTY OF THE

denotes a document that is not required for the modification inspection report

# MODIFICATION INSPECTION NOTES:

GENERAL

THE MODERATION INSPECTION IS A VISUAL INSPECTION OF TOMER MODERATIONS AND A
THE MODERATION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS
CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, MARRY THE MODERATION
ORMANICS, AS DESCRIBED BY THE DIMERERY OF RECORD.

2. THE MODEFCHION MESPECTION IS TO COMPRIA MEDITALIZATION CONFIDERATION AND MESONAL MEDITALIZATION AND MESONAL PROPERTY AND IS MOTI, REACHEN OF THE MODIFICATION DESCRIPT, MAD DOES THE MODEFCHION DESCRIPT, MEDITALIZATION DESCRIPT, MEDITALIZATION DESCRIPT, MEDITALIZATION DESCRIPT, MEDITALIZATION DESCRIPT, MEDITALIZATION DESCRIPT, MEDITALIZATION OF ALL TRANSP.

A TO DESIRE THAT THE REQUERIENTS OF THE MODERATION ASSECTION ARE NET, IT IS VIVIA, THAT THE GREEK A COMMINIOUS (CO) AND THE MODERATION ASSECTION EXAMPLE COMMINICATION AND COMMINIOUS AND AND COMMINIOUS ASSECTION ASSECTION TO THE CONTROL OF THE COMMINIOUS AND ASSECTION ASSECTION ASSECTION ASSECTION ON THE COMMINIOUS SENTENCES ASSECTION CONTROL REPORTANTION IS NOT MODIFIED.

# MODIFICATION INSPECTOR IS REQUIRED TO CARRICT THE OC AS SOON AS RECEIVING A PO OR PARASET FOR THE MODIFICATION RESPECTION TO:

-reary the requirements of the Modification Instection Checklest -more with the GC to Cradup a Schedice to Combuct Che-site inspections, Including Education Associations or Concerns -discuss any site stream instructions or Concerns

2. THE MODIFICATION INSPECTIOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR ((CC)) INSPECTION AND ITSET REPORTS, REPORTING THE DOCUMENTS FOR ADJEBBAS; TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FELD INSPECTIONS, AND SUBMITING THE MODIFICATION INSPECTION REPORT.

# GENERAL CONTRACTOR

1\_THE GC IS REQUIRED TO CONTACT THE MODIFICATION INSPECTIOR AS SOON AS RECEIVING A POWNER FOR THE MODIFICATION INSTALLATION OR TURRINELY PROJECT TO:

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2. The OC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE RECURREMENTS OF THE MODIFICATION INSPECTION CHECKLET.

I THE POLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE ETFICIENCY AND ETFECTIVENESS OF DELINERBYO A MODERICATION INSPECTION REPORT:

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MODIFICATION INSPECTION

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CORRECTION OF FAILING MODIFICATION INSPECTION

I, IF THE MODIFICATION INSTALLATION WOLLD FAIL THE MODIFICATION RESECTION TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

-COORDIT MANS ISSUES TO COMPAY WITH THE SPECIFICATIONS CONTINUED IN THE OPICIALL CONTROL OCCUMENTS AND CONSIDERING A SUPPLIBITING MOSPICATION RESPECTION.

-CR. WITH TOWARD CHARSETS APPROVAL. THE COL MAY WORK WITH THE ENGINEERS OF RECORD TO RE-MALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BALLT COUNTROL.

# VERIFICATION INSPECTIONS

2. VERHOLATION INSPECTION MAY BE CONDUCTED BY AN INDEPONDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLICID. AS MARKED BY THE DATE OF AN ACCEPTED POSSIBLE MODIFICATION, INSPECTION: REPORT FOR THE OFFICIAL RESPECTION: REPORT FOR THE OFFICIAL PROJECT. ), tower owner reserves the right to conduct a vereication inspection to veries according made completeness of previously completen moderation inspection(s) tower moderation projects. 요볶

REQUIRED PHOTOS

IL RETRESS THE CO. AND THE M. INSPECTION THE FOLLOWING PHOTOGRAPHS ARE TO BE TAKEN FOR DATABLES OF THE MODIFICATION MERCETION REPORT.

-PRE-CANSTRUCTION GENERAL SITE CONDITION
-PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/EXECTION AND INSPECTION

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--POST CONSTRUCTION FEDITIONS
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---ANY OTHER PRIOTICS DEEMED RELEASED TO SHOW COMPLETE DETAILS OF MODIFICATIONS

 $\mathbf{z}_{i}$  photos of elevated modifications taken from the ground shall be considered injuguante.

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DESCRIPTION

T - Mobile TOWERS



T-MOBILE TOWERS 90 INDUSTRIAL PARK RD. MIDDLETOWN, CT 06457

MODIFICATION INSPECTION CHECKLIST





63-3 North Branford Road Branford, CT 06405

P: 203-488-0712 F: 203-481-1135

# **JOB WORK SHEET**

Date:		Client:			Site ID:		Site Addre	ess:	<del>_</del> ,	
At Shop:		Departed S	hop:		Arrived @	Site:		Departed	Site:	
Total Hours	:	Including L	unch		Lunch Tak	en:				
Foreman:					Crew:					
Site Type:	Mono	Flag	SS	Guyed	Roof	Steeple	Water	Other:		
Sweep Tech	on Site:				Total Hour	rs on Site:				
Tail Gat	e Safety N	Meeting:	Yes	No	All PPE	& Safety Eq	uipment li	nspected	Yes	No
Work Perfo	med:						<u> </u>			
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C Squared Systems, LLC 65 Dartmouth Drive, Unit A3 Auburn, NH 03032 (603) 644-2800 support@csquaredsystems.com

# Calculated Radio Frequency Emissions



CT1044

(Cromwell East, a.k.a. Dainty Rubbish)

90 Industrial Park Road, Middletown, CT 06457

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3. RF Exposure Prediction Methods	2
4. Calculation Results	3
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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 90 Industrial Park Road in Middletown, CT. The coordinates of the tower are 41-35-08.3 N, 72-42-50.2 W.

AT&T is proposing the following modifications:

1) Install three 700 MHz LTE antennas (one per sector).

### 2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm²). 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.

CT1044 1 June 26, 2012



### 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:

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

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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



### 4. Calculation Results

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

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	Transmitter	Power Density (mw/cm²)	Limit	%МРЕ
Cingular UMTS	175	880	1	500	0.0059	0.5867	1.00%
Cingular GSM	175	880	4	296	0.0139	0.5867	2.37%
Cingular GSM	175	1930	2	427	0.0100	1.0000	1.00%
Pocket	165	2130	3	631	0.0250	1.0000	2.50%
T-Mobile GSM	185	1945	8	113	0.0095	1.0000	0.95%
T-Mobile UMTS	185	2100	2	639	0.0134	1.0000	1.34%
AT&T UMTS	175	880	2	565	0.0013	0.5867	0.23%
AT&T UMTS	175	1900	2	875	0.0021	1.0000	0.21%
AT&T LTE	175	734	1	1313	0.0015	0.4893	0.32%
AT&T GSM	175	880	1	283	0.0003	0.5867	0.06%
AT&T GSM	175	1900	4	525	0.0025	1.0000	0.25%
						Total	5.84%

Table 1: Carrier Information 1 2 3

<sup>&</sup>lt;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 3/29/2012. 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>&</sup>lt;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>&</sup>lt;sup>3</sup> Antenna height listed for AT&T is in reference to the GPD Group Structural Analysis Report dated 4/19/2012.



### 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 5.84% 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

June 26, 2012

Date



### **Attachment A: References**

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

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

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



### 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 ^2$ , $ H ^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	$(900/f^2)*$	6
30-300	61.4	0.163	1.0	6
300-1500	=	=	f/300	6
500-100,000		-	5	6

### (B) Limits for General Population/Uncontrolled Exposure<sup>5</sup>

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

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

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

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<sup>&</sup>lt;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>&</sup>lt;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.



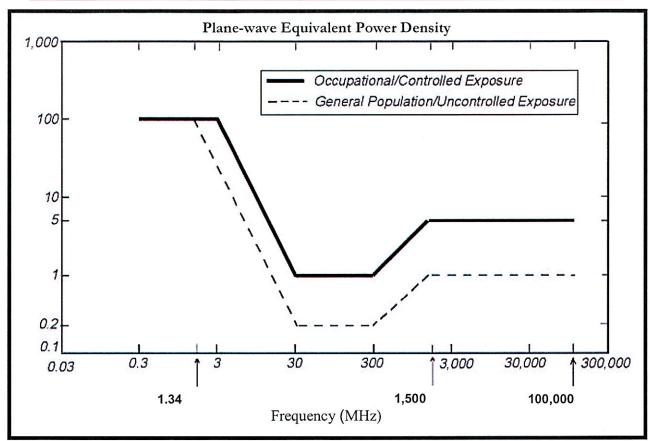


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)



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

### 700 MHz

Manufacturer: KMW

Model #: AM-X-CD-16-65-00T-RET

Frequency Band: 698-806 MHz

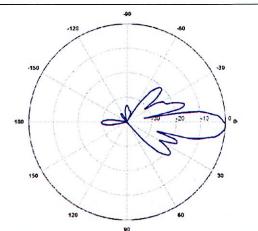
Gain: 13.4 dBd

Vertical Beamwidth: 12.3°

Horizontal Beamwidth: 65°

Polarization: Dual Slant  $\pm 45^{\circ}$ 

Size L x W x D: 72.0" x 11.8" x 5.9"



### 850 MHz

Manufacturer: Powerwave

Model #: 7770

Frequency Band: 824-896 MHz

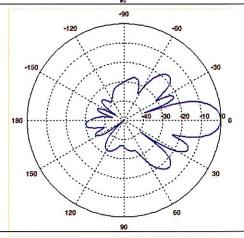
Gain: 11.5 dBd

Vertical Beamwidth: 15°

Horizontal Beamwidth: 85°

Polarization: Dual Linear ±45°

Size L x W x D: 55.4" x 11.0" x 5.0"



### 1900 MHz

Manufacturer: Powerwave

Model #: 7770

Frequency Band: 1850-1990 MHz

Gain: 13.4 dBd

Vertical Beamwidth: 7°

Horizontal Beamwidth: 90°

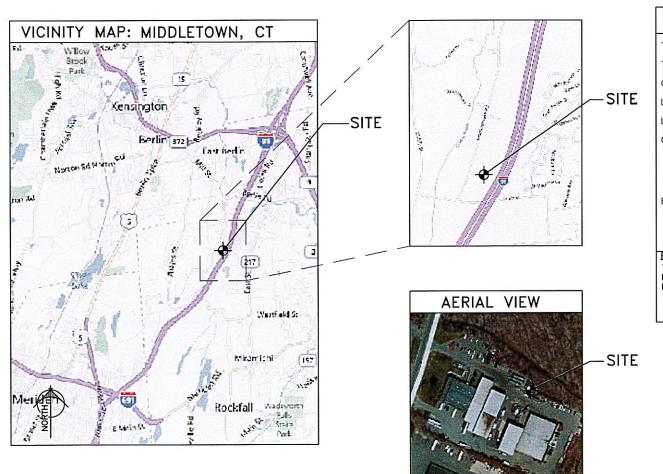
Polarization: Dual Linear ±45°

Size L x W x D: 55.4" x 11.0" x 5.0"

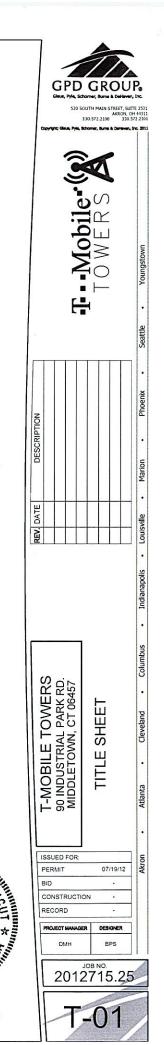
180 30 20 10 0

# MIDDLETOWN 1 CT11057C

# 185' MONOPOLE



	PROJECT SUMMARY	DRAWING INDEX
TOWER OWNER:	T-MOBILE TOWERS	T-01 TITLE SHEET N-01 PROJECT NOTES
TOWER TYPE:	MONOPOLE	S-01 TOWER ELEVATION & MODIFICATION SCHEDULE
		S-02 MODIFICATION DETAILS & SECTIONS
GOVERNING CODE:	TIA/EIA-222-F & 2005 CSBC	S-03 ADDITIONAL DETAILS & SECTIONS
LATITUDE:	41' 35' 8.124" N	S-04 ADDITIONAL DETAILS & SECTIONS MI-01 MODIFICATION INSPECTION CHECKLIST
LONGITUDE:	72' 42' 49.8672" W	
OWNER CONTACT:	MR. AARON CHANDLER 4 SYLVAN WAY PARSIPPANY, NJ 07054 (508) 367-7138	
ENGINEER CONTACT:	MR. CHRIS SCHEKS 400 NORTH 34TH ST; SUITE 216 SEATTLE, WA 98103	
	(206) 204–7399	CO-LOCATOR:
	REPRESENT MODIFICATIONS TO THE EXISTING TOWER BY R SHAFT AND ADDING ANCHOR RODS AND ANCHOR ROD OF THE TOWER.	at&t



DD 1144110 111DE14

### **GENERAL NOTES**

1. THE FOLLOWING DRAWINGS REPRESENT MODIFICATIONS TO THE EXISTING TOWER. THE MODIFICATIONS ARE BASED ON GPD GROUP STRUCTURAL REPORT (PROJECT #: 2012792.95, DATED APRIL 11, 2012). ALL MODIFICATIONS MUST BE INSTALLED TO BRING THE TOWER INTO CONFORMANCE WITH TIA/EIA-222-F AND 2006 CSCP.

2. THESE MODIFICATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF TIA/FIA-222-F, 2005 CSBC, AWS, AND AISC. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.

3. ALL ORIGINAL TOWER INFORMATION WAS OBTAINED IN THE FORM OF THE ORIGINAL TOWER DRAWINGS BY FRED A. NUDD (FILE #: 98-580, DATED MAY 1, 1998). CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE REFERENCED TOWER DOCUMENTS.

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

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

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

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

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

### 9. LOADINGS:

WIND LOADS:
FASTEST MILE WIND SPEED (PER: TIA/EIA-222-F & 2005 CSBC)

(MIDDLESEX COUNTY, CONNECTICUT)

ICE LOADS:
1/2" RADIAL BASE ICE
FASTEST MILE WIND SPEED (CONCURRENT W/ ICE)

74 MPH

10. STRUCTURAL STEEL:

SPECIFICATIONS
LATEST EDITION OF AISC

MATERIALS

 MODIFICATION PLATES
 ASTM A572 (GR 65)

 HORIZONTAL PLATE
 ASTM A572 (GR 50)

 STIFFENERS
 ASTM A572 (GR 50)

 ANCHOR RODS
 A193-B7

NOTES 20MM AJAX W/ HIGH STRENGTH SLEEVE (FU = 120KSI)
NUTS LOCKING STRUCTURAL GRADE

WELDS E70XX
EP0XY HILTI HIT-RE 500-SD (ICC∯: ERS-2322)

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

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

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

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

15. THE ENGINEER (GPD GROUP) SHALL MAKE POST INSTALLATION OBSERVATION FOR FOUNDATION. CONTRACTOR SHALL COORDINATE THE ON-SITE INSTALLATION OBSERVATION W/ ENGINEER (GPD GROUP) AT LEAST 5 BUSINESS DAYS PRIOR TO THE CONCRETE POUR FOR EACH FOUNDATION MODIFICATION. INSTALLATION OF PROPOSED LOADING WITHOUT ENGINEER APPROVAL IS PROHIBITED. INSTALLATION OF THE PROPOSED LOADING IS BY OTHERS, AND IS BEYOND THE SCOPE OF THESE DRAWINGS.

### CONTRACTOR NOTES

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

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

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

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

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

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

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

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

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

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

### WELD NOTES

- 1. CONTRACTOR IS RESPONSIBLE FOR COMMISSIONING A CERTIFIED WELD INSPECTOR (CM) THROUGHOUT THE ENTIRETY OF THE PROJECT. A PASSING CMI REPORT SHALL BE PROVIDED 10 THE ENGINEER UPON COMPLETION OF THE PROJECT.
- 2. WELDING CERTIFICATES MUST BE PROVIDED TO CWI AND GPD GROUP PRIOR TO WELDING CONTRACTOR BEGINNING WORK ON SITE. CERTIFICATE WILL BE ASKED FOR AS PART OF INSPECTION PROCESS. ALL WELDING SHOULD BE PERFORMED BY AN AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES AND IN ACCORDANCE WITH ANSI/AWS D1.1 AND ANSI Z 49.1 OR LATEST EDITIONS.

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

- 4. INSTALL 3000" (NFPA 701) FIRE BLANKET AROUND ALL COAX.
- 5. MORE SPLATTER AND SPARKS SHALL BE ANTICIPATED GIVEN THE PREVIOUSLY GALV. SURFACE.

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

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

- 8. FUMES CREATED FROM WELDING ON A PREVIOUSLY GALV. SURFACE CAN BE HAZARDOUS.
- 9. PRIOR TO WELDING, ALL SURFACES SHALL BE PROPERLY GROUND TO REMOVE CALVANIZING.

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

11. WATER SHALL BE ON SITE, OF ADEQUATE AMOUNT, AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. A MINIMUM OF 500 CAL. OF WATER SHALL BE PROVIDED. WATER SHALL BE CAPABLE OF REACHING HEIGHT WHERE WELDING IS BEING PERFORMED. IN ADDITION, A MINIMUM OF 5XX (6) TO LIB. CLASS ABC MULTIPURPOSE FIRE EXTINGUISHERS FULLY CHARGED AND CAPABLE OF DISCHARGE WITHIN 30 SECONDS OF DETECTING A FIRE SHALL BE PROVIDED. FIRE EXTINGUISHERS SHALL BE STRATEGICALLY LOCATED AROUND COMPOUND AND IN THE AIR (I.E. ON THE MAN LIFT WHERE WELDING IS BEING PERFORMED).

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

### ANCHOR ROD NOTES

- 1. CONTRACTOR SHALL INSTALL ANCHOR RODS PER MANUFACTURER'S INSTALLATION PROCEDURES AND GUIDELINES.
- 2. CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE INSTALLATION PROCEDURES AND RECOMMENDATIONS FOR THE SPECIFIED EPOXY ADHESINE RESIN (OR APPROVED EQUIVALENT). EPOXY SHALL BE ALLOWED TO PROPERLY CURE PER MANUFACTURER'S SPECIFICATIONS PRIOR TO IMPLEMENTING ANCHOR ROD PULL TEST.
- 3. CONTRACTOR INSTALLING EPOXY ADHESIVE AND ANCHOR RODS SHALL BE TRAINED BY THE MANUFACTURER OR MANUFACTURER'S REPRESENTATIVE. THIS INCLUDES PROPER DRILLING, HOLE CLEANING, AND INSTALLATION METHODS FOR THE EPOXY ADHESIVE. ALL TRAINING SHALL BE COMPLETED PRIOR TO BEGINNING OF CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN THE APPROPRIATE TRAINING. ALL TRAINING COSTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- 4. CONTRACTOR SHALL INSTALL RODS AND BRACKETS AT LOCATIONS INDICATED ON DRAWINGS.
- 5. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (EUCO NS GROUT BY EUCLID, OR APPROVED EQUIVALENT) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. PVC DRAINAGE PIPES SHALL BE PROVIDED FROM THE INSIDE THE POLE SHAFT OUT THROUGH THE GROUT SPACE UNDER THE BASE PLATE IN ORDER TO ALLOW MOISTURE TO ADEQUATELY DRAIN FROM THE INTERIOR OF THE POLE SHAFT. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE (EXCEPT FOR DRAIN PIPES) UNDER ENTIRE SUFFACE OF BASE PLATE AND BASE PLATE EXTENSIONS UNDER ANCHOR BRACKETS, FROM OUTSIDE EDGE TO INSIDE EDGE.
- 5. CONTRACTOR SHALL VERIFY THAT TOWER IS PLUMB PRIOR TO THE INSTALLATION OF ANY TOWER MODIFICATIONS.
- ${\it Z}_{\rm c}$  contractor shall provide top and bottom heavy hex nuts for proposed anchor rods. Top connection shall be double nutred.
- 8. CARE SHALL BE TAKEN DURING INSTALLATION OF ANCHOR RODS SO THAT EXISTING REINFORCING STEEL AND OR ANCHOR BOLTS ARE NOT DAMAGED. CONTACT ENGINEER IMMEDIATELY IF REINFORCING ENCOUNTERED. CONTRACTOR SHALL NONDESTRUCTIVELY DETERMINE LOCATION AND SIZE OF EXISTING REINFORCING STEEL PRIOR TO INSTALLATION OF ANCHOR RODS. EXISTING REINFORCEMENT INDICATED ON DRAWINGS IS ILLUSTRATIVE. ACTUAL QUANTITY AND LOCATION OF REINFORCEMENT MIGHT DIFFER FROM THAT INDICATED ON THE DRAWINGS. ANCHOR TEMPLATES MAY BE ENCOUNTERED DURING DRILLING PROCESS, AND MAY BE DRILLED THROUGH.
- 9. EACH ANCHOR ROD TO BE TESTED SHALL BE PROOF LOADED TO A MAXIMUM OF 43 KIPS. PULL TESTING RESULTS SHALL BE SUPPLIED TO THE TOWER OWNER AND THE ENGINEER OF RECORD (GPD GROUP) FOR REFERENCE IN THE POST INSTALLATION OBSERVATION REPORT.
- 10. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PAUSE CONSTRUCTION AT A POINT WHERE THE ANCHOR RODS CAN BE EFFECTIVELY TESTED. CONSTRUCTION MAY CONTINUE AFTER TESTING IS COMPLETE.
- 11. HALF OR A MINIMUM OF 4 (WHICHEVER IS GREATER) NEW ANCHOR RODS SHALL BE TESTED.
- 12. COMPLETE RECORDS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE TEST. MAXIMUM LOAD INCREMENT SHALL BE 15% OF THE PROOF LOAD.
- 13. PULL TESTING SHALL BE IN ACCORDANCE WITH ASTM E488-96 (RE-APPROVED 2003).

14. IF A DISPLACEMENT GREATER THAN 0.01 INCHES, MEASURED FROM THE BASE LINE, REMAINS AFTER THE FIRST TEST CYCLE, FURTHER TESTS SHALL BE PERFORMED UP TO A MAXIMUM OF 3 TEST CYCLES TO DETERMINE IF ANCHOR ROD MOVEMENT CONTINUES TO ACCUMULATE. TOTAL RESIDUAL MOVEMENT SHALL NOT EXCEPT 0.05 INCHES, INCREMENTAL, RESIDUAL MOVEMENT STRECKPRED FROM EACH TEST CYCLE MUST BE DECREASING IN VALUE AND STABILIZE TO A VALUE NO MORE THAN 0.01 INCHES, ANCHORS NOT MEETING THE TOTAL RESIDUAL MOVEMENT AND/OR THE INCREMENTAL RESIDUAL MOVEMENT LIMITATIONS SHALL BE CONSIDERED TO HAVE FAILED THE TEST.

15. INSTALLATION OF GROUT AND/OR BOTTOM NUT FLUSH TO BASE PLATE IS PROHIBITED PRIOR TO COMPLETION OF ANCHOR ROD PULL TEST.

16. NEW ANCHOR RODS TO BE HOT DIPPED GALVANIZED TO A MINIMUM OF  $3^{\circ}$  BELOW THE CONCRETE SURFACE.

### MODIFICATION PLATE NOTES

- 1 CONTRACTOR SHALL INSTALL STIFFENERS, AND BRACKETS AT LOCATIONS PER PLAN VIEW.
- 2. USE AJAX BOLTS WITH CORRECT SLEEVE LENGTHS PER DETAILS. BOLT THREADS SHALL NOT BE IN THE SHEAR PLANE.
- 3. ALL HOLES DRILLED IN POLE SOLVENT CLEANED AND TOUCHED UP WITH ZRC ZINC RICH PAINT.
- 4. SLIP JOINTS TO BE JACKED TOGETHER USING 6 TON COME-A-LONGS PRIOR TO MOUNTING CHANNELS.
- 5. SHIM PLATES ARE TO BE USED BELOW SUP JOINT AS REQUIRED.
- 6. SPLICE PLATE SHIMS ARE TO BE USED IN LOWER HALF OF SPLICE CONNECTION TO KEEP PLATES FLUSH WITH POLE.
- 7. SPLICE BOLTS AND AJAX BOLTS TO BE TIGHTENED PER AISC "SNUG-TIGHT CONDITION".
- 8. ADDITIONAL CARE MUST BE USED AT SPLICE CONNECTIONS TO INSURE ALIGNMENT OF SPLICE PLATES.
- ${f g}_{\rm c}$  bent shim plates are to be installed under plates in the upper section of the splice connection and positioned close to the center of the build bout in splice.
- 11. FINAL SHOP DRAWINGS MUST BE SENT TO DESIGN ENGINEER FOR FINAL APPROVAL PRIOR TO FABRICATION.
- 12. CONTRACTOR SHALL VERIFY THAT TOWER IS PLUMB PRIOR TO THE INSTALLATION OF ANY TOWER MODIFICATIONS.



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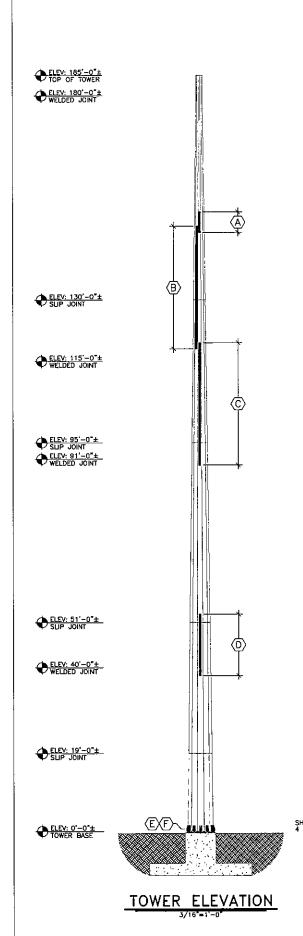
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T-MOBILE TOWERS 90 INDUSTRIAL PARK RD. MIDDLETOWN, CT 06457 PROJECT NOTES

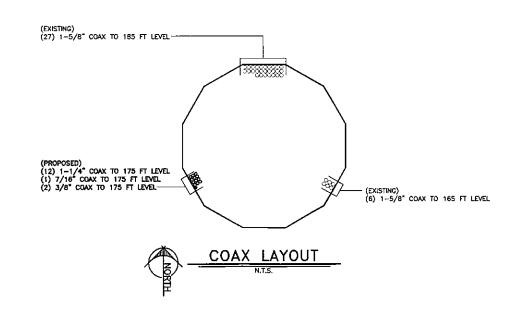
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TORQUE:0 kip-ft REACTIONS- 90 mph

		ANTENNA SCI	HEDULE	,
ELEVATION	STATUS	ANTENNA	MOUNT	COAX
	EXISTING	(9) AIR 21	(3) 12' T-FRAMES	(25) 1-5/8"
	EXISTING	(3) AIR 33		(2) 1-5/8"
185'-0"	EXISTING	(3) ETW190VS12UB TMA'S		
103 -0	EXISTING	(1) HCS FIBER/DC BOXES		
	EXISTING	(1) 2' MW DISH		
	PROPOSED	(6) 7770	(3) 12' T-FRAMES	(12) 1-1/4"
	PROPOSED	(3) AM-X-CD-16-65-00T		(1) 7/16°
	PROPOSED	(6) DTMABP7819VG12A		(2) 3/8"
175'0"	PROPOSED	(6) LGP13519		
	PROPOSED	(6) RRUS-11		
	PROPOSED	(1) DC6-48-60-18-8F		
165'-0"	EXISTING	(3) 742 213	FLUSH MOUNTED	(6) 1-5/8"

	MODIFICATION SCHEDULE										
SYMBOL	ELEVATION	MEMBER TYPE	EXISTING MEMBER	NEW MEMBER	NOTES						
(A)	146'-6" TO 151'-6"	MODIFICATION PLATES	-	3"x1-1/4" THICK	INSTALL NEW MODIFICATION PLATES TO THE EXISTING TOWER SHAFT. REFER TO DETAILS 7/S-03 AND 11/S-04 FOR MORE INFORMATION.						
B	118'-0" TO 148'-0"	MODIFICATION PLATES		3-1/2"x1-1/4" THICK	INSTALL NEW MODIFICATION PLATES TO THE EXISTING TOWER SHAFT. REFER TO DETAILS 6/S-03, 7/S-03 & 10/S-04 FOR MORE INFORMATION.						
©	89'-6" TO 119'-6"	MODIFICATION PLATES	-	3-1/2"x1-1/4" THICK	INSTALL NEW MODIFICATION PLATES TO THE EXISTING TOWER SHAFT. REFER TO DETAILS 5/S-03, 6/S-03 & 9/S-04 FOR MORE INFORMATION.						
0	38'-0" TO 53'-0"	MODIFICATION PLATES	-	4"x1-1/4" THICK	INSTALL NEW MODIFICATION PLATES TO THE EXISTING TOWER SHAFT. REFER TO DETAILS 3/S-03, 4/S-03 & 8/S-04 FOR MORE INFORMATION.						
E	0'-0" TO 1'-0"	ANCHOR ROD BRACKETS	-	1/2° THICK	INSTALL NEW TRANSITION STIFFENER TO THE NEW HORIZONTAL PLATE, REFER TO DETAIL 1/S-02 & 2/S-02 FOR MORE INFORMATION.						
Ē	oo <u>.</u>	ANCHOR RODS	-	1-1/4"#	INSTALL NEW ANCHOR RODS TO THE TOWER BASE. REFER TO DETAIL 1/S-02 & 2/S-02 FOR MORE INFORMATION.						





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LOADING

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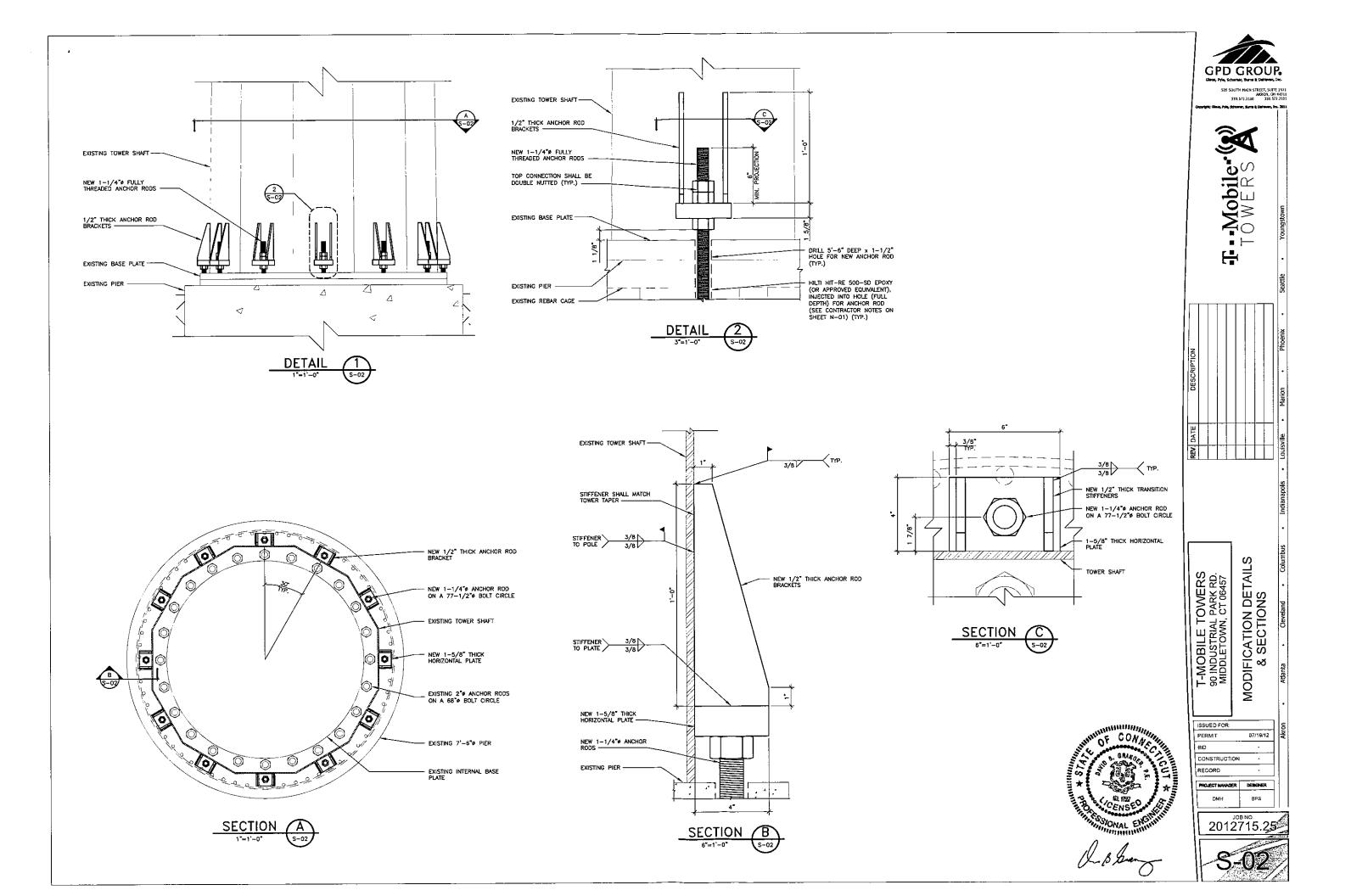
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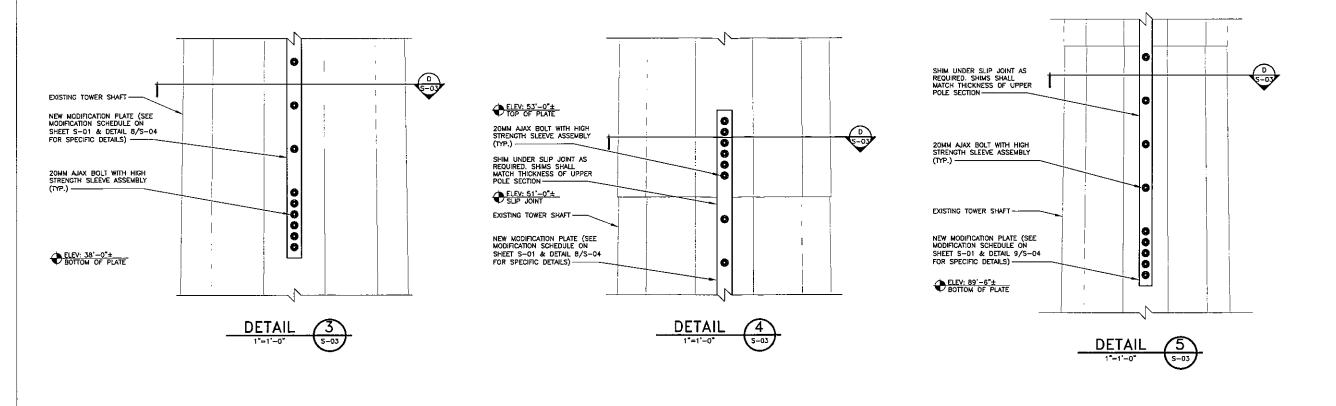
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90 INDUSTRIAL PARK RD.
MIDDLETOWN, CT 06457
TOWER ELEVATION &
MODIFICATION SCHEDULE

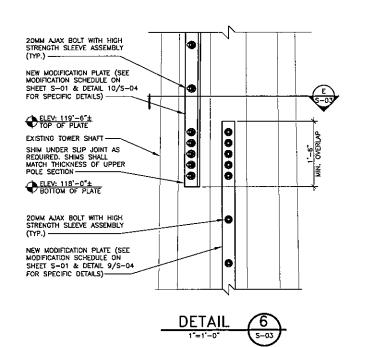
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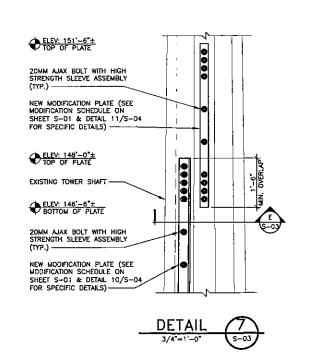
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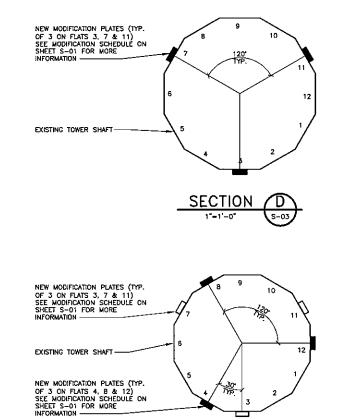












SECTION





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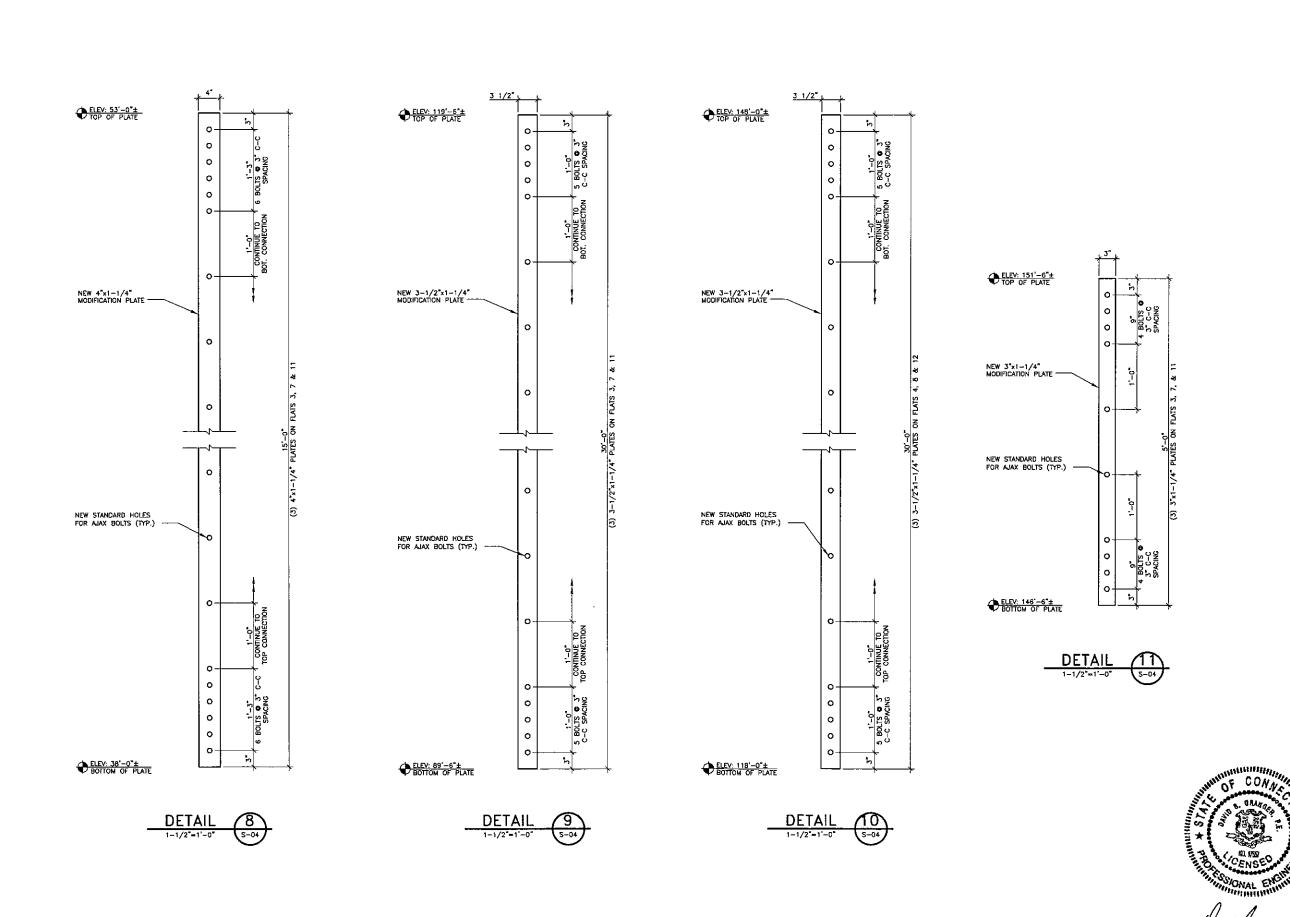
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REV. DATE DESCRIPTION

T-MOBILE TOWERS 90 INDUSTRIAL PARK RD. MIDDLETOWN, CT 06457 ADDITIONAL DETAILS & SECTIONS

ISSUED FOR:
PERMIT 07/19/12
BID
CONSTRUCTION
RECORD
PROJECT MANAGER DESIGNER

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BEFORE CONSTRUCTION			OURING CONSTRUCTION	A	AFTER
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)	
X	MODIFICATION INSPECTION CHECKLIST DRAWING	X	CONSTRUCTION INSPECTIONS	X	MODIFIC
X	ENGINEER OF RECORD APPROVED SHOP DRAWINGS	_	FOUNDATION INSPECTIONS	X	POST IN
X	FABRICATION INSPECTION	_	CONCRETE COMP. STRENGTH AND SLUMP TESTS	X	РНОТОС
X	FABRICATOR CERTIFIED WELD INSPECTION	X	POST INSTALLED ANCHOR ROD VERIFICATION	ADDITIONAL TESTING AND INSPE	CTIONS:
X	MATERIAL TEST REPORT	X	BASE PLATE GROUT VERIFICATION		
Χ	FABRICATOR NDE INSPECTION	X	CONTRACTOR'S CERTIFIED WELD INSPECTION		
X	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)		EARTHWORK: LIFT AND DENSITY (REPORT REQUIRED)		, HI
X	PACKING SLIPS	X	ON SITE COLD GALVANIZING VERIFICATION		THE WASHINGTON
ADDITIONAL TESTING AND INSPECTIONS:		_	GUY WIRE TENSION REPORT		S 7
		X	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.

- THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MODIFICATION INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF
- 3. TO ENSURE THAT THE REQUIREMENTS OF THE MODIFICATION INSPECTION ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO OR PAYMENT IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. CONTACT LISTED ON THE TITLE SHEET SHALL BE CONTACTED IF SPECIFIC INSPECTOR CONTACT INFORMATION IS NOT

### MODIFICATION INSPECTOR

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

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

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

### GENERAL CONTRACTOR

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

- -REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST -WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MODIFICATION INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS -BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS
- 2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.

### RECOMMENDATIONS

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

- -IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MODIFICATION INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION TO BE CONDUCTED.
- -THE GC AND MODIFICATION INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE
- -WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
  -IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MODIFICATION INSPECTION(S) TO
- COMMENCE WITH ONE SITE VISIT.

  WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MODIFICATION INSPECTION. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MODIFICATION INSPECTION CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

### CANCELLATION OR DELAYS IN SCHEDULED MODIFICATION INSPECTION

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

### CORRECTION OF FAILING MODIFICATION INSPECTION

CONN

AFTER CONSTRUCTION

**PHOTOGRAPHS** 

REPORT ITEM

MODIFICATION INSPECTOR REDLINE OR RECORD DRAWING(S)

POST INSTALLED ANCHOR ROD PULL-OUT TESTING

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

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

### **VERIFICATION INSPECTIONS**

- 1. TOWER OWNER RESERVES THE RIGHT TO CONDUCT A VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MODIFICATION INSPECTION(S) ON TOWER MODIFICATION PROJECTS.
- 2. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MODIFICATION INSPECTION" OR "PASS AS NOTED MODIFICATION INSPECTION" REPORT FOR THE

### **REQUIRED PHOTOS**

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

-PRE-CONSTRUCTION GENERAL SITE CONDITION

-- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION

PHOTOS OF ALL CRITICAL DETAILS FOUNDATION MODIFICATIONS WELD PREPARATION BOLT INSTALLATION AND TORQUE FINAL INSTALLED CONDITION SURFACE COATING REPAIR ~POST CONSTRUCTION PHOTOGRAPHS FINAL INFIELD CONDITION

-ANY OTHER PHOTOS DEEMED RELEVANT TO SHOW COMPLETE DETAILS OF MODIFICATIONS

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



520 SOUTH MAIN STREET, SUITE 2531 AKRON, OH 44311 330.572.2100 330.572.2101

**obil** VER

REV. DATE
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OWERS PARK RD. CT 06457 BIL T-MOPUMED IN MIDDE

AODIFICATION INSPECTION CHECKLIST

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ISSUED FOR:	
PERMIT	07/19/12
BID	
CONSTRUCTION	
RECORD	
PROJECT MANAGER	DESIGNER
DMH	BPS

