CONNECT

EM-T-MOBILE-033-090515A

In re:
T-Mobile USA, Inc. Notice to Make an Exempt Modification to an Existing Facility, 207 West Street, Cromwell, Connecticut. : **EXEMPT MODIFICATION NO.** _____ : May 15, 2009

ORIGINAL

NOTICE OF EXEMPT MODIFICATION

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), T-Mobile USA, Inc. ("T-Mobile") hereby gives notice to the Connecticut Siting Council ("Council") and the Town of Cromwell of T-Mobile's intent to make an exempt modification to an existing monopole tower (the "Tower") located at 207 West Street in Cromwell, Connecticut. Specifically, T-Mobile plans to upgrade its wireless system in Connecticut by implementing its Universal Mobile Telecommunications System ("UMTS"). UMTS is a third-generation ("3G") technology that utilizes a code division multiple access ("CDMA") base to allow for fast and large data transfers. To accomplish this upgrade, T-Mobile must modify its antenna and equipment configurations at many of its existing sites.

Once the UMTS upgrade is complete, T-Mobile will operate on a more unified communication system, allowing international wireless telephones to function world-wide. Furthermore, UMTS will enhance GPS navigation capabilities and provide emergency responders with more advanced tracking capabilities. The proposed UMTS technology is compatible with the existing second-generation ("2G") Global System for Mobile Communication ("GSM") currently on the Tower and the proposed upgrade is expected to enhance the existing 2G system. In order to accomplish the upgrade at this site, T-Mobile plans to add UMTS technology, update GSM technology and install associated equipment at the base of the Tower.

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185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

Under the Council's regulations (Conn. Agencies Regs. § 16-50j-72(b)), T-Mobile's plans do not constitute a modification subject to the Council's review because T-Mobile will not change the height of the Tower, will not extend the boundaries of the compound, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

The Tower is a 54-foot monopole tower located at 207 West Street in Cromwell, Connecticut (41.6022, -72.68). The Tower is owned by Tahir Choudhry and T-Mobile is the only carrier located on the Tower. Currently, T-Mobile has 3 antennas and 3 Tower Mounted Amplifiers ("TMA") located on the Tower with a centerline of 51 feet. A site plan with Tower specifications is attached.

T-Mobile plans to utilize its 3 existing antennas for both GSM and UMTS technology. T-Mobile also plans to remove and replace its 3 existing TMA with 3 new GSM Twin TMA and add 3 UMTS Twin TMA to the Tower. The proposed TMA will have the same centerline as the existing antennas and TMA – 51 feet. To confirm the Tower can support these changes, T-Mobile commissioned Armor Tower to perform a structural analysis of the Tower (attached). According to the structural assessment, dated April 8, 2009, "...the pole is ... capable of supporting the proposed loading..." (Page 1, Structural Assessment).

In addition, T-Mobile plans to locate 6, 7/8 inch coax cables in the existing conduit to run inside of the Tower. T-Mobile proposes to install the UMTS equipment cabinet on its existing 14-foot by 16-foot (approximately) concrete pad. Hence, no increase in the size of the concrete pad is necessary.

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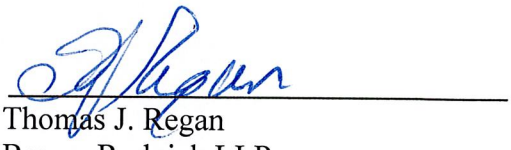
Therefore, excluding brief, minor, construction-related noise during the addition of the antennas and the installation of the equipment cabinet, T-Mobile's changes to the Tower will not increase noise levels at the site.

The proposed antennas and TMA will not adversely impact the health and safety of the surrounding community or the people working on the Tower. The total radio frequency exposure measured around the Tower will be well below the National Council on Radiation Protection and Measurements' ("NCRP") standard adopted by the Federal Communications Commission ("FCC"). A cumulative, worst case, power density analysis indicates that T-Mobile's antennas will emit only 56.84% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be well below the FCC mandated radio frequency exposure limits in all locations around the Tower, even with extremely conservative assumptions. The power density analysis is attached.

In conclusion, T-Mobile's proposed plan to utilize existing antennas for GSM and UMTS technology, remove and replace TMA and add TMA at this site does not constitute a modification subject to the Council's jurisdiction because T-Mobile will not increase the height of the Tower, will not extend the boundaries of the site, will not increase the noise levels at the site, and the total radio frequency electromagnetic radiation power density will stay within all applicable standards. *See* Conn. Agencies Regs. § 16-50j-72.

T-Mobile USA, Inc.

By: 

Thomas J. Regan
Brown Rudnick LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402
Email - tregan@brownrudnick.com
Phone - 860.509.6522
Fax - 860.509.6622

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Certificate of Service

This is to certify that on this 15th day of May, 2009, the foregoing Notice of Exempt Modification was sent, via first class mail, to the following:

Town of Cromwell
First Selectman's Office
First Selectman Jeremy Shingleton
41 West Street
Cromwell, CT 06416

By: _____
Thomas J. Regan

40259677 v1 - 025064/0016

BROWN RUDNICK LLP
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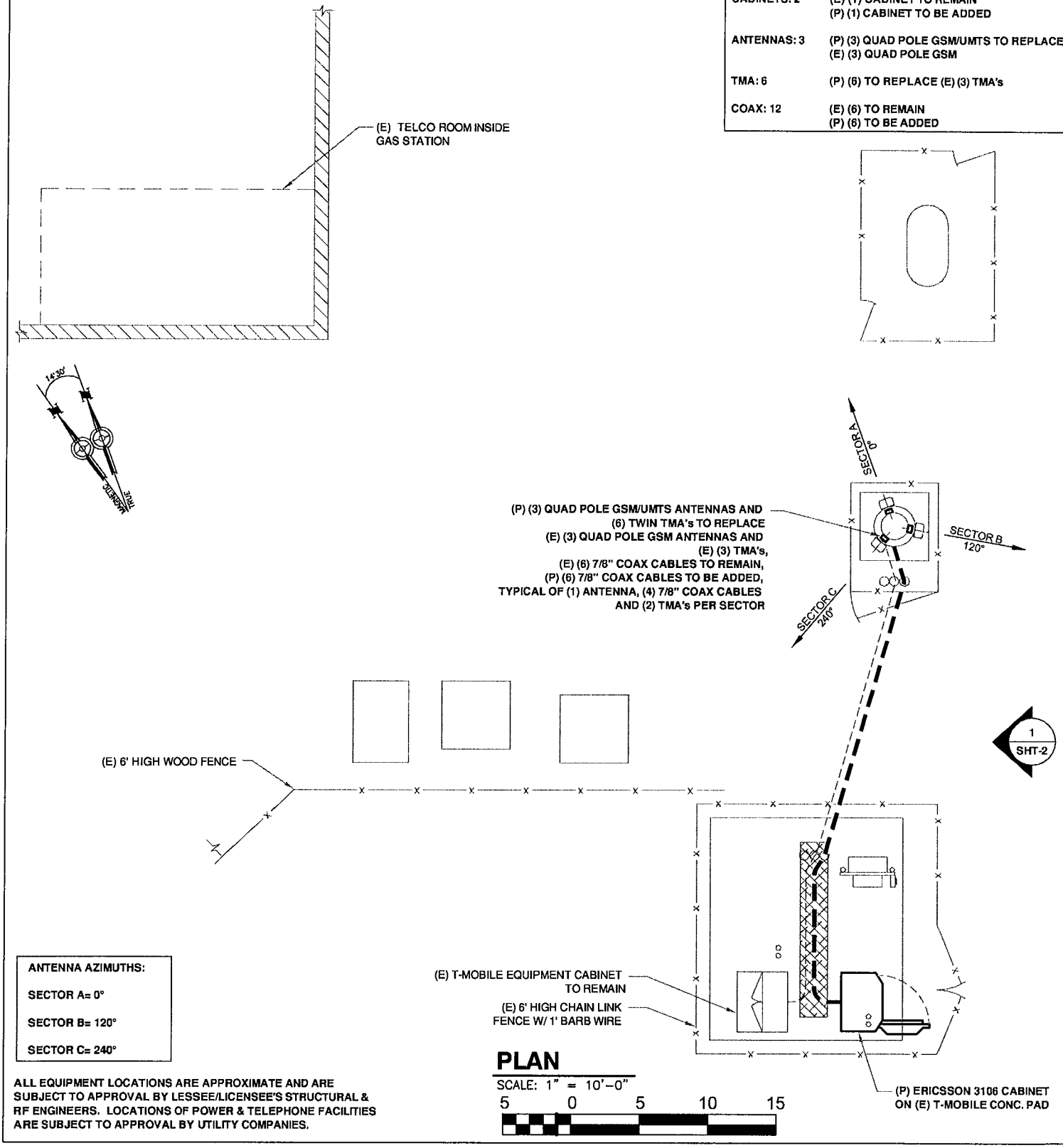
HARTFORD, CT 06103
(860) 509-6500

FINAL CONFIGURATION	
CABINETS: 2	(E) (1) CABINET TO REMAIN (P) (1) CABINET TO BE ADDED
ANTENNAS: 3	(P) (3) QUAD POLE GSM/UMTS TO REPLACE (E) (3) QUAD POLE GSM
TMA: 6	(P) (6) TO REPLACE (E) (3) TMA's
COAX: 12	(E) (6) TO REMAIN (P) (6) TO BE ADDED



ANTENNA AZIMUTHS:

SECTOR A= 0°

SECTOR B= 120°

SECTOR C= 240°

PLAN

SCALE: 1" = 10'-0"

5 0 5 10 15

ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

TRANSCEND WIRELESS, LLC
10 INDUSTRIAL AVE.
MAHWAH, NJ 07430
OFFICE: (201) 684-0055
FAX:(201) 684-0066

FOR

OMNIPOINT COMMUNICATIONS, INC. DBA T-MOBILE USA, INC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX:(860) 692-7159

ATLANTIS GROUP
15 Cypress St., Suite 300
Newton Centre, MA 02459
Office: 617-965-0789
Fax: 617-663-6032

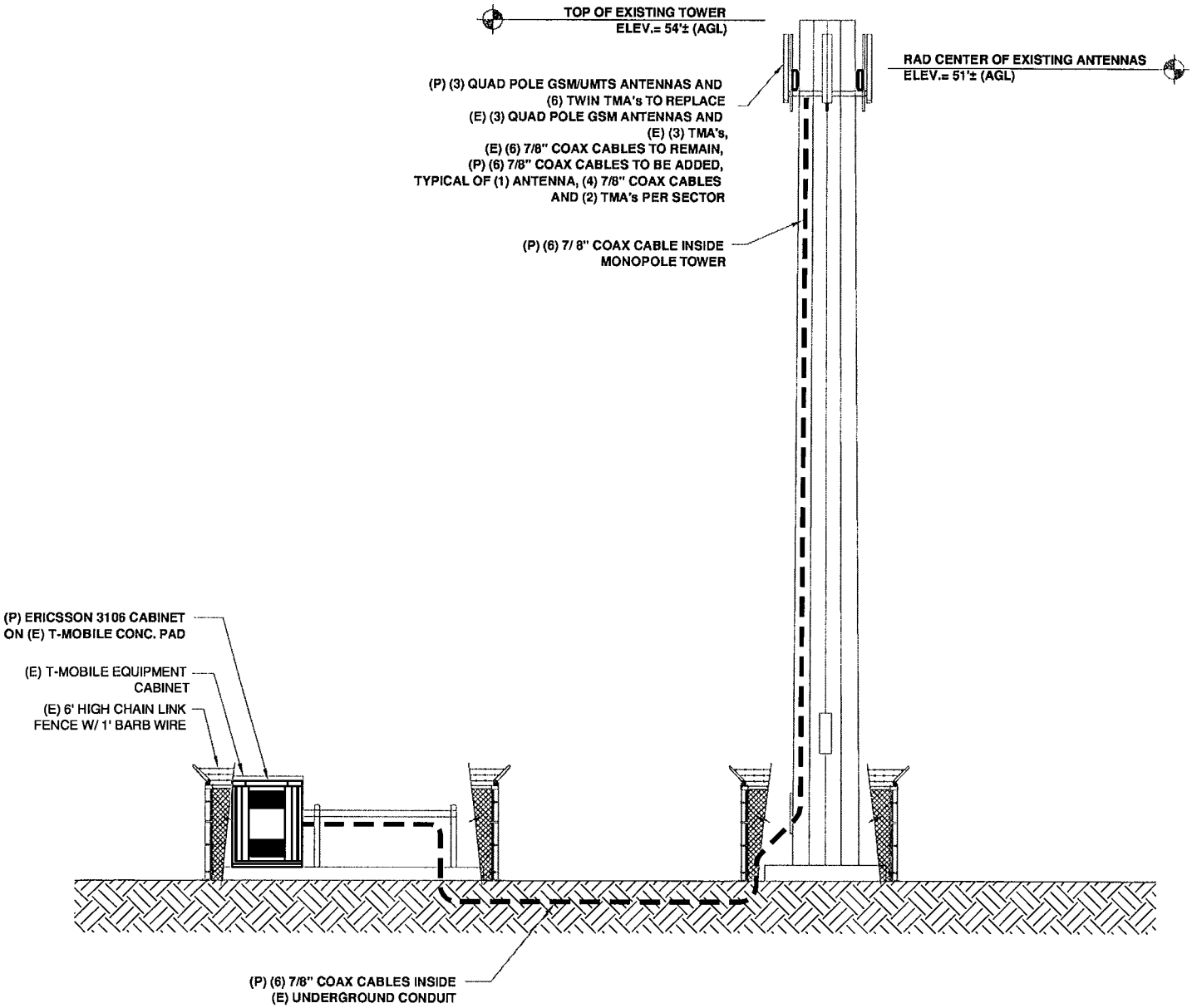
SITE NUMBER:	CTHA241C
SITE NAME:	HA241/EXXON-SIGN
ADDRESS:	207 WEST STREET CROMWELL, CT 6416
DRAWN BY	G.C.

REVISION	DATE
0: FINAL	03-17-09
A: REVIEW	02-09-09

APPROVALS

Site Owner	Date
Construction Manager	Date
RF Engineer	Date
Site Acquisition	Date

The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.



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ELEVATION

SCALE: 1" = 10'-0"

5 0 5 10 15

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ARMOR TOWER

April 8, 2009

Mr. Hans Fiedler
T-Mobile USA
35 Griffin Road South
Bloomfield, CT 06002

Re: CTHA241C – Exxon Sign site
207 West Street, Cromwell, CT 06416

Dear Mr. Fiedler:

Armor Tower has performed a structural assessment of the monopole communications installation at the above referenced address. This assessment is exclusively based on the T-Mobile RFDS dated 2-18-09, Atlantis Group lease exhibit drawings dated 3/17/09 and pictures provided by Atlantis Group.

T-Mobile proposes:
-Remove three existing ddTMAs. Replace with three Andrew twin PCS TMAs (12.1 lb. wt. each) and three Andrew twin AWS TMAs (11 lb. each) at 51' AGL.
-Reuse six existing 7/8" transmission lines.
-Install six new 7/8" transmission lines.

-Install one new RBS 3106 equipment cabinet (1925 lb. fully equipped) on the existing concrete slab.

The proposed loading will not increase the wind load, as the TMAs will be mounted behind the antennas and the transmission lines will be routed up the inside of the existing pole. The pole is therefore capable of supporting the proposed loading, assuming it was properly designed for the existing loading.

The existing ground-mounted equipment slab has capability to support the proposed equipment cabinet assuming normal soil allowable capacities of 1500 psf or greater (IBC Table 1804.2).

No conclusions, expressed or implied, shall indicate that Armor Tower has made an evaluation of the original design, materials, fabrication, or potential erection deficiencies. In addition, the conclusions expressed herein are based upon the information contained within the aforementioned documents. Any information contrary to that assumed for the purpose of preparing this assessment could alter the findings and conclusions as stated.

We appreciate the opportunity to provide our professional services to Atlantis Group and T-Mobile, and if we can be of further assistance, please do not hesitate to contact us.

Sincerely,
ARMOR TOWER, INC.

Derek Hartzell
Armor Tower, Inc

ENGINEERED ENDEAVORS INCORPORATED
The Experienced Point of View

Customer: T-MOBILE
Description: 54' SIGN MONOPOLE
EEI Job Number: 14678

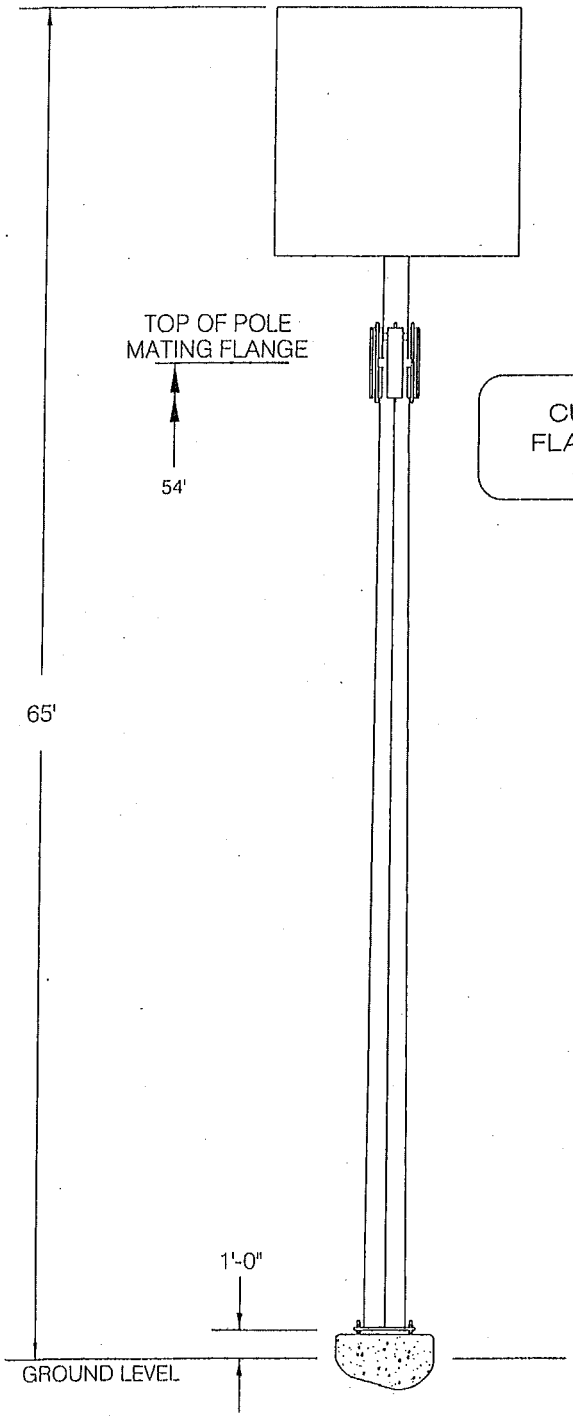
EMERSON™ Network Power

SITE INFORMATION

Location: MIDDLESEX COUNTY, CT
Site Name: CROMWELL EXXON
Site Number:CTHA-241-C

DESIGN INFORMATION

Designed By: R. BELKIN
Design Date: 12/14/2006
Status: REVISION 1



NOTE

CUSTOMER TO VERIFY FLANGE PLATE FOR SIGN ATTACHMENT

ANTENNA LOADING

(1) 108" x108" x 18" x 1000 lb SIGN MOUNTED ON TOP OF THE MONOPOLE AT 56' (BY OTHERS)

(3) APX16-16PVL PANEL ANTENNAS AND (6) TMAs MOUNTED ON LOW VISIBILITY MOUNT AT 54' ℄

DESIGN CRITERIA

DESIGNED IN ACCORDANCE WITH THE TIA 222-G FOR 110 MPH 3-SECOND GUST WIND SPEED

- STRUCTURE CLASSIFICATION - II
- EXPOSURE - C
- TOPOGRAPHIC CATEGORY - 1
- ICE LOADING- 0.75" @ 50 MPH WIND

STATE OF CONNECTICUT
MICHAEL R. MOREL
No 21220
LICENSED
PROFESSIONAL ENGINEER
12/18/06

ENGINEERED ENDEAVORS, INC.
7610 Jenther Drive • Mentor, Ohio 44060-4872
Phone: (440) 918-1101 • Phone: (888) 270-3855
Fax: (440) 918-1108 • www.engend.com

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT
Per the ANSI/TIA 222-G-2005

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ENDEAVORS
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The Experienced Point of View

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Mentor, Ohio 44060
*Tel (440) 918-1101 * Fax (440) 918-1108*

EMERSON.
Network Power

CUSTOMER: T-MOBILE
SITE LOCATION: MIDDLESEX COUNTY, CT
SITE NAME: CROMWELL EXXON
SITE NUMBER: CTHA-241-C

CURRENT DATE: 12/14/06
STRUCTURE: 54' MONOPOLE
JOB NUMBER: 14678
STATUS: RELEASE

Load Combinations

6 $1.0D + 1.0W_o$ — SERVICE DEAD LOAD FACTOR = 1.0; SERVICE WIND LOAD FACTOR = 1.0

1 $1.2D + 1.6W_o$ — WIND DEAD LOAD FACTOR = 1.0; WIND w/o ICE FACTOR = 1.6

3 $1.2D + 1.0D_i + 1.0W_i$ — WIND DEAD LOAD w/ICE FACTOR = 1.0; WIND w/ ICE FACTOR = 1.0; DEAD LOAD FACTOR FOR ICE = 1.0

MAXIMUM DEFLECTION (in) = 33
MAXIMUM ROTATION @ TOP (°) = 3.00

WEIGHT OF ICE (pcf) = 56
TEMPERATURE FACTOR = N/A to non-guy structures

General Information

STRUCTURE HEIGHT (ft) = 55.00
NUMBER OF MONOPOLE SIDES = 18
DESIGN WIND SPEED (mph) = 110
WIND SPEED w/ ICE (mph) = 50
RADIAL ICE (in) = 0.75
OPERATIONAL WIND SPEED (mph) = 60

DIRECTIONALITY DESIGN, Kd = 0.95
DIRECTIONALITY SERVICE, Kd = 0.85
DESIGN GUST RESPONSE FACTOR, Gh = 1.10
SERVICE GUST RESPONSE FACTOR, Gh = 1.10
FORCE COEFFICIENT w/o ICE, Cf = 0.65
FORCE COEFFICIENT w/ ICE, Cf = 1.20
ACROSS POINTS FACTOR = 1.015

STRUCTURE CLASSIFICATION II (Importance Factor)

	DESIGN	SERVICE (Section 2.8.3)
Wind Load w/o Ice	1.00	1.00
Wind Load w/ Ice	1.00	
Ice Thickness	1.00	
Earthquake	1.00	

EXPOSURE CATEGORY - C
Zg = 900
α = 9.5
Ke = 1.0
Kzmin = 0.85
TOPOGRAPHIC CATEGORY- 1
Kt = N/A
f = N/A

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT
Per the ANSI/TIA 222-G-2005

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EMERSON.
Network Power

CUSTOMER: T-MOBILE
SITE LOCATION: MIDDLESEX COUNTY, CT
SITE NAME: CROMWELL EXXON
SITE NUMBER: CTHA-241-C

CURRENT DATE: 12/14/06
STRUCTURE: 54' MONOPOLE
JOB NUMBER: 14678
STATUS: RELEASE

Antenna Loading

	DESCRIPTION	QTY	HEIGHT (ft)	Kz	CASE 1 EPA (ft^2)	CASE 1 WEIGHT (lbs)	CASE 2 EPA (ft^2)	CASE 2 WEIGHT (lbs)	CASE 3 EPA_i (ft^2)	CASE 3 $WEIGHT_i$ (lbs)
1	SIGN	1	60	1.137	97.20	1000.00	97.20	1000.00	60.90	2500.00
2	APX16PV-16PVL-E	3	53	1.107	4.49	52.70	4.49	52.70	5.57	187.10
3	TMA	6	53	1.107	0.55	13.20	0.55	13.20	0.94	33.65
4	LOW VISIBILITY MOUNT	1	53	1.107	18.00	750.00	18.00	750.00	26.00	1500.00
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COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT
Per the ANSI/TIA 222-G-2005

ENGINEERED ENDEAVORS INCORPORATED
The Experienced Point of View

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Mentor, Ohio 44060
*Tel (440) 918-1101 * Fax (440) 918-1108*

EMERSON. Network Power

CUSTOMER: T-MOBILE
SITE LOCATION: MIDDLESEX COUNTY, CT
SITE NAME: CROMWELL EXXON
SITE NUMBER: CTHA-241-C

CURRENT DATE: 12/14/06
STRUCTURE: 54' MONOPOLE
JOB NUMBER: 14678
STATUS: RELEASE

Loading Case 1 - Serviceability

The loading developed in Case 1 shall be used for the evaluation of serviceability for the twist and sway limits. The design of a monopole must also take into account the factored loading cases.

WIND VELOCITY (mph) = 60

Load Combination
1.0D + 1.0Wo

Antenna Loads

	HEIGHT (ft)	APPURTENANCE FORCES GRAVITY (kips)	WIND (kips)
1	60	1.000	0.952
2	53	0.158	0.129
3	53	0.079	0.031
4	53	0.750	0.172
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Monopole Pressures

HEIGHT (ft)	EXPOSURE COEFFICIENT Kz	WIND PRESSURE ON POLE (psf)
10	0.850	4.83
30	0.982	5.59
50	1.094	6.22
70	1.174	6.68
90	1.238	7.04
110	1.291	7.34
130	1.337	7.61
150	1.378	7.84
170	1.415	8.05
190	1.449	8.24
210	1.480	8.42
230	1.508	8.58
250	1.535	8.73
270	1.560	8.87
290	1.584	9.01

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT
Per the ANSI/TIA 222-G-2005

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*Tel (440) 918-1101 * Fax (440) 918-1108*

EMERSON.
Network Power

CUSTOMER: T-MOBILE
SITE LOCATION: MIDDLESEX COUNTY, CT
SITE NAME: CROMWELL EXXON
SITE NUMBER: CTHA-241-C

CURRENT DATE: 12/14/06
STRUCTURE: 54' MONOPOLE
JOB NUMBER: 14678
STATUS: RELEASE

Loading Case 2 - Design

WIND VELOCITY (mph) = 110.00

Load Combination
1.2D + 1.6Wo

Antenna Loads

	HEIGHT (ft)	APPURTENANCE FORCES GRAVITY (kips)	WIND (kips)
1	60	1.000	5.722
2	53	0.158	0.773
3	53	0.079	0.189
4	53	0.750	1.032
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Monopole Pressures

HEIGHT (ft)	EXPOSURE COEFFICIENT Kz	WIND PRESSURE ON POLE (psf)
10	0.850	29.06
30	0.982	33.58
50	1.094	37.39
70	1.174	40.13
90	1.238	42.31
110	1.291	44.14
130	1.337	45.72
150	1.378	47.12
170	1.415	48.38
190	1.449	49.52
210	1.480	50.58
230	1.508	51.56
250	1.535	52.47
270	1.560	53.33
290	1.584	54.13

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT
Per the ANSI/TIA 222-G-2005

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EMERSON.
Network Power

CUSTOMER: T-MOBILE
SITE LOCATION: MIDDLESEX COUNTY, CT
SITE NAME: CROMWELL EXXON
SITE NUMBER: CTHA-241-C

CURRENT DATE: 12/14/06
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JOB NUMBER: 14678
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Loading Case 3 - Design

WIND VELOCITY (mph) = 50.00
RADIAL ICE (in) = 0.75

Load Combination
1.2D + 1.0Di + 1.0Wi

Antenna Loads

	HEIGHT (ft)	APPURTENANCE FORCES GRAVITY (kips)	WIND (kips)
1	60	2.500	0.463
2	53	0.561	0.124
3	53	0.202	0.042
4	53	1.500	0.193
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Monopole Pressures

HEIGHT (ft)	EXPOSURE COEFFICIENT Kz	tiz ICE THICK (in)	WIND PRESSURE ON POLE (psf)
10	0.850	1.331	6.93
30	0.982	1.486	8.00
50	1.094	1.564	8.91
70	1.174	1.617	9.57
90	1.238	1.658	10.09
110	1.291	1.692	10.52
130	1.337	1.720	10.90
150	1.378	1.745	11.23
170	1.415	1.767	11.53
190	1.449	1.787	11.81
210	1.480	1.805	12.06
230	1.508	1.821	12.29
250	1.535	1.837	12.51
270	1.560	1.851	12.71
290	1.584	1.864	12.91

Engineered Endeavors Inc.

7810 Jenther Drive
Mentor, Ohio 44060
Tel (440) 918-1101 Fax (440) 918-1108

Communications Structure Nonlinear Analysis and Design Program

12/14/2006 1:39:20 PM
Revision 2.0 10/01/05
R.BELKIN Engineer

Customer T-MOBILE
Job Name 14678
Structure 54' MONOPOLE
Location MIDDLESEX COUNTY, CT
Site CROMWELL EXXON

OD BOT	OD TOP	NUM SIDES	THICK INCH	TAPER IN/FT	LENGTH FT	JOINT INCH	JOINT TYPE	YIELD KSI	WEIGHT LBS	JOINT HEIGHT
30.00	18.00	18	.1875	.226	53.00	.00	BASEPL	65.00	2525.	.00
			TOTAL TUBE WEIGHT			2525.		POUNDS		
			POLE SHAFT LENGTH			53.00		FEET		

AISC constants are used for stress reductions.
Tube sections hsve 18 sides
Internal bend radius = 4. X T
Tube diameters are measured flat to flat.
Resistance moment modified by Points Factor to account for stress at knuckles
Tube diameters are increased by 1.02 for wind across points.
AISC Tube Shape Coefficient of 1. is applied.

RESISTANCE TABLE

ELEV Ft	DIAM In.	THICK In.	EFF FY Ksi	PhiPn Kips	PhiMn Ft-Kips	PhiVn Kips	PhiTn Ft-Kips	DEFLECT IN	TILT DEG
53.00	18.00	.1875	65.00	580.	221.	307.	451.		
47.50	19.25	.1875	65.00	620.	253.	328.	516.		
42.00	20.49	.1875	65.00	661.	287.	350.	586.		
36.00	21.85	.1875	65.00	705.	327.	373.	668.		
30.00	23.21	.1875	65.00	749.	370.	397.	755.		
24.00	24.57	.1875	65.00	793.	415.	420.	847.		
18.00	25.92	.1875	65.00	838.	463.	443.	944.		
12.00	27.28	.1875	65.00	882.	513.	467.	1047.		
6.00	28.64	.1875	64.52	919.	562.	487.	1146.		
.00	30.00	.1875	63.18	943.	604.	499.	1233.		

LOAD CASE 1

SERVICE LOADING
DEAD LOAD FACTOR 1. RADIAL ICE . IN.

WIND VELOCITY 60. MPH BOTTOM 4.8 PSF TOP 6.7 PSF
MAX BASE ROTATION 0.0 DEG

LOAD CASE 1 SERVICE LOADING
1.00 DEAD LOAD + 1.00 WIND - DESIGN

ELEV Ft	DIAM In.	THICK In.	EFF FY Ksi	RATIO	Pu Kips	Mu Ft-Kips	Vu Kips	Tu Ft-Kips	Displ Inches	Tilt Deg
53.00	18.00	.1875	65.00	.034	2.09	7.	1.33	.0	3.70	.60
47.50	19.25	.1875	65.00	.059	2.30	14.	1.39	.0	3.02	.57
42.00	20.49	.1875	65.00	.079	2.54	22.	1.45	.0	2.39	.52
36.00	21.85	.1875	65.00	.097	2.80	30.	1.52	.0	1.77	.46
30.00	23.21	.1875	65.00	.111	3.08	39.	1.59	.0	1.24	.39
24.00	24.57	.1875	65.00	.122	3.37	49.	1.65	.0	.79	.31
18.00	25.92	.1875	65.00	.132	3.68	59.	1.72	.0	.45	.24
12.00	27.28	.1875	65.00	.139	4.01	69.	1.79	.0	.20	.16
6.00	28.64	.1875	64.52	.147	4.36	80.	1.85	.0	.05	.08
.00	30.00	.1875	63.18	.155	4.53	91.	1.89	.0	.00	.00

Max Deflection Percentage .6% Max Tilt .6 Degrees

REACTION COMPONENTS (KIPS AND FT-KIPS)

TRANSVERSE SHEAR	VERTICAL FORCE	WIND SHEAR	MOMENT ABOUT TRANSVERSE	MOMENT ABOUT VERTICAL	MOMENT ABOUT WIND AXIS
.000	-4.532	1..883	91.047	.000	.000

LOAD CASE 2

BASIC LOADING
DEAD LOAD FACTOR 1. RADIAL ICE . IN.

WIND VELOCITY 110. MPH BOTTOM 29.1 PSF TOP 40.1 PSF
MAX BASE ROTATION 0.0 DEG

LOAD CASE 2 BASIC LOADING
1.20 DEAD LOAD + 1.00 WIND - DESIGN

ELEV Ft	DIAM In.	THICK In.	EFF FY Ksi	RATIO	Pu Kips	Mu Ft-Kips	Vu Kips	Tu Ft-Kips	Displ Inches	Tilt Deg
53.00	18.00	.1875	65.00	.185	2.00	40.	8.02	.0	22.16	3.63
47.50	19.25	.1875	65.00	.336	2.22	84.	8.37	.0	18.10	3.43
42.00	20.49	.1875	65.00	.457	2.49	130.	8.74	.0	14.32	3.14
36.00	21.85	.1875	65.00	.562	2.79	182.	9.14	.0	10.62	2.75
30.00	23.21	.1875	65.00	.646	3.13	237.	9.54	.0	7.42	2.33
24.00	24.57	.1875	65.00	.714	3.77	294.	9.94	.0	4.77	1.88
18.00	25.92	.1875	65.00	.770	4.08	354.	10.35	.0	2.69	1.42
12.00	27.28	.1875	65.00	.816	4.41	416.	10.75	.0	1.20	.94
6.00	28.64	.1875	64.52	.861	4.75	481.	11.13	.0	.30	.47
.00	30.00	.1875	63.18	.912	4.93	547.	11.34	.0	.00	.00

Max Deflection Percentage 3.5% Max Tilt 3.63 Degrees

REACTION COMPONENTS (KIPS AND FT-KIPS)

TRANSVERSE SHEAR	VERTICAL FORCE	WIND SHEAR	MOMENT ABOUT TRANSVERSE	MOMENT ABOUT VERTICAL	MOMENT ABOUT WIND AXIS
.000	-4.929	11.320	547.306	.000	.000

Design Summary Table

Elevation	Stress Ratio	Axial	Bending	Loading	
53.	.19	2.	40.1	2	BASIC LOADING
47.5	.34	2.	84.1	2	BASIC LOADING
42.	.46	2.22	130.1	2	BASIC LOADING
36.	.56	2.49	182.4	2	BASIC LOADING
30.	.65	2.79	237.2	2	BASIC LOADING
24.	.71	3.13	294.4	2	BASIC LOADING
18.	.77	3.77	354.	2	BASIC LOADING
12.	.82	4.08	416.1	2	BASIC LOADING
6.	.86	4.41	480.5	2	BASIC LOADING
0.	.91	4.93	547.3	2	BASIC LOADING

BASE PLATE AT ELEVATION	.00	FEET
TUBE DIAMETER	30.00	INCHES
DESIGN MOMENT	547.31	KIP FT

DESIGN MOMENT IS .00 DEGREES FROM THE WIND DIRECTION

APPLIED AXIAL FORCE	4.9	KIPS
APPLIED SHEAR	11.34	KIPS

BOLT DATA

BOLT TYPE	A615GR75	
BOLTS ARE EVENLY SPACED		
DIAMETER	2.25	INCHES
EFFECTIVE AREA	3.25	SQ IN
BOLT YIELD	75.	KSI
TOTAL LENGTH	6.	FEET
BOTTOM TEMPLATE MUST BE BOLTED ON		
End plates are required.		
MINIMUM EMBEDMENT	6.1	FEET
NUMBER OF BOLTS	6	
BOLT CIRCLE DIAMETER	37.	INCHES
APPLIED AXIAL STRESS	36.7	KSI
MAX BOLT FORCE	119.2	KIPS
MAX BOLT SHEAR	1.9	KIPS
BOLT PHI	.8	
TENSION RESISTANCE	182.8	KIPS
SHEAR RESISTANCE	89.5	KIPS
RATIO	.673	
BOLT PHI	.750	
BOLT WEIGHT	507.6	POUNDS

PLATE DATA

DIAMETER OF PLATE	43.	INCHES
Bend Width Reduction Factor	.75	
MATERIAL	A572MOD60	
PLATE YIELD	60.	KSI
PROVIDED THICKNESS	1.75	INCHES
REQUIRED THICKNESS	1.416	INCHES
BOLT HOLE DIAMETER	2.625	INCHES
CENTER HOLE SIZE	20.	INCHES
NET WEIGHT	547.5	POUNDS
RAW STOCK WEIGHT	958.8	POUNDS
SURFACE AREA	15.36	SQ FT
MAX APPLIED STRESS	35.36	KSI
APPLIED MOMENT	17.38	KIP-FT
RESIST MOMENT	26.53	KIP-FT
RATIO	.65	
PLATE PHI	.9	
PLATE YIELD	60.	KSI
CONCRETE STRENGTH	3000.	PSI

Base Plate - use 43. inch ROUND x 1.750 inch A572MOD60 with (6) 2.25 diameter x 6. foot caged A615GR75 bolts on a 37. inch bolt circle. End plates are required.

Engineered Endeavors Inc. 14678

FLANGE DESIGN

FLANGE AT ELEVATION 53.00 FEET

TUBE DIAMETER	18.00	INCHES
DESIGN MOMENT	25.0	KIP FT
DESIGN MOMENT IS	0.	DEGREES FROM THE WIND DIRECTION
BOLTS ARE ON THE KNUCKLES OF THE TUBE		
APPLIED AXIAL FORCE	2.5	KIPS
APPLIED SHEAR	5.00	KIPS

BOLT DATA

BOLT TYPE	A325	
BOLTS ARE EVENLY SPACED		
DIAMETER	1.000	INCHES
EFFECTIVE AREA	0.785	SQ IN
TOTAL LENGTH	4.75	INCHES
NUMBER OF BOLTS	24	
BOLT CIRCLE DIAMETER	25.75	INCHES
ALLOWABLE STRESS	44.0	KSI
APPLIED AXIAL STRESS	2.6	KSI
MAX BOLT FORCE	2.0	KIPS

PLATE DATA

DIAMETER OF PLATE	28.50	INCHES
MATERIAL	A572 MOD60	
PROVIDED THICKNESS	1.000	INCHES
REQUIRED THICKNESS	0.387	INCHES
BOLT HOLE DIAMETER	1.250	INCHES
CENTER HOLE SIZE	16.00	INCHES
NET WEIGHT	115.3	POUNDS
RAW STOCK WEIGHT	229.9	POUNDS
SURFACE AREA	5.66	SQ FT
ALLOWABLE STRESS	59.99	KSI
MAX APPLIED STRESS	9.00	KSI

Flange - use 28.50 inch ROUND x 1.000 inch A572 MOD60
with (24) 1.000 diameter x 4.00 inch A325 bolts
on 25.75 in bolt circle.

ENGINEERED ENDEAVORS INCORPORATED
The Experienced Point of View

7610 Jenther Drive * Mentor, OH 44060-4872
Ph: (440) 918-1101 * Ph: (888) 270-3855
Fx: (440) 918-1108 * www.engend.com

DESIGN CALCULATIONS FOR A SPREAD FOOTER FOUNDATION

T-MOBILE
54 ft SIGN POLE

CROMWELL EXXON
CTHA-241-C
Middlesex County, Ct

EEI Project Number 14678
December 14, 2006

FOUNDATION DESIGN CALCULATIONS
FOR
SPREAD FOOTING FOUNDATION

ENGINEERED ENDEAVORS INC.
*7610 Jentner Drive * Mentor, Ohio 44060*
*Tel:(216)918-1101 * Fax:(216)918-1108*

14-Dec-06
03:03 PM

CUSTOMER	T-MOBILE
STRUCTURE	54' SIGN POLE
EEI PROJECT	14678
LOCATION	MIDDLESEX COUNTY, CT
SITE NAME	CROMWELL EXXON/CTHA-241-C

(per ANSI/TIA-222-G-2005)

SERVICE LOADS AT BASE OF THE MONOPOLE

	Design Loading	φ=0.75
Moment, kip-ft	574.3	765.7
Shear, kips	11.34	15.1
Axial Load, kips	4.9	6.5

Anchor Bolts	Quantity	6.0
	Length, ft	6.0
	Circle Dia., in	37.0
	Projection, in	12.0
Foundation Parameters		
Pedestal Min. Width, in		55.00
Pedestal Projection, in		12.0
Found. Min Height, ft		5.5

	Height, ft	Width, ft
Footing	3.00	17.00
Pedestal	3.00	5.00

Soil Unit Wt., pcf	120.00
Concrete Unit Wt., pcf	150.00
Slope of backfill, degrees	0.00

Foundation Weight, kips	141.30
Concrete, cub.yd.	34.89
Soil Weight, kips	63.36
Total Vertical Load, kips	211.19
Kern of Eccentricity, ft	2.83
Actual Eccentricity, ft	4.06
Overturning Moment, kip-ft	856.47
Resisting Moment, kip-ft	1795.14
Allowable Gross Soil Pressure, ksf	0.0
Allowable Net Soil Pressure, ksf	4.0
Gross Soil Pressure, (Service Load), ksf	

H=	2.00
B=	17.00

MUST BE LESS THAN ALLOWABLE NET SOIL PRESSURE

	(gross)	(net)
max q=	1.86	1.16
min q=	0.00	

Safety Factor Sf= 2.10 SHOULD BE >2

ULTIMATE STRENGTH DESIGN OF FOOTING

CONCRETE, psi	3000
STEEL, KSI	60

SHEAR IN FOOTING

1. CASE I -DEAD LOAD, TWO-WAY SHEAR

Ultimate Vertical Load, kips		337.91	
Ultimate Pressure, ksf		1.17	
Ultimate shear V, kips		272.14	
Design shear Vn, kips		2011.24	O.K.

2. CASE II - WIND LOAD, ONE-WAY SHEAR

Ultimate Moment, kip-ft		1370.35	
Ultimate Vertical Load, kips		190.07	
Eccentricity, ft		7.21	
Ultimate Pressure, ksf	qult=	5.78	
Dist. from edge to critical sect., ft		3.50	
Pressure distance ft	c=	3.87	
Pressure @ critical section, ksf		0.55	
Ultimate Shear, kips		188.32	
Design Shear, kips		569.85	O.K.

FLEXURE STRENGTH DESIGN

Ultimate Moment, kip-ft		Case I	357.79		
		Case II	895.16	q1=	0.00
Coefficient of Resistance		Rn=	65.0		
Reinforcement Ratio		r=	0.00110		
Min. Reinforcement Ratio		r min	0.00180		
Min. Steel Area, sq.in.		A1	11.02		
Type of Bars		#	8		
		Ab,in^2=	0.79		
BOTTOM	Min. Number of Bars		13.94		
	Actual Number of Bars		16.00		
	Actual Steel Area, sq.in.		12.64		
	Steel Ratio Actual	ra=	0.00207		
	Revised Coef. of Resist	Rn=	123.91		
	Design Moment, kip-ft		1706.30		
	Horizontal Spacing, in	shor=	13.20		
TOP	Min. Steel Area, sq.in		11.02		
	Min. Number of Bars		13.94		
	Actual Number of Bars		16.00		
	Top Steel Area, sq.in		12.64		
	Horizontal Spacing, in	shor=	13.20		

PEDESTAL DESIGN

Pedestal Width, in		60	Ultim. Moment		1297.8
Concrete, ksi		3			
Reinforcement, ksi		60			
Actual Rebars , # 8	Q-ty	20	Area, sq.in		0.79
Design Rebars	Q-ty	12	Area, sq.in		1.32
Minimum reinforcement ratio		0.0033	Rebar space, in		8.01
Actual reinforcement ratio		0.0044			
Concrete cover , in		4			
Rebar layout radius, in		25.50			

Bending about the major axis

No.	Angle, deg	Coord., in	Edge Dist., in	No.	Angle, deg	Coord., in	Edge Dist., in
1	0	25.50	4.50	7	180	-25.50	55.50
2	30	22.08	7.92	8	210	-22.08	52.08
3	60	12.75	17.25	9	240	-12.75	42.75
4	90	0.00	30.00	10	270	0.00	30.00
5	120	-12.75	42.75	11	300	12.75	17.25
6	150	-22.08	52.08	12	330	22.08	7.92

Location of neutral axis c=, in 5.89
Compression zone, a= 5.01

	No.	e	Force *kips*
	1	0.0007	23.68

eu= 0.003

Concrete, kips 765.99

Total compression 789.67

Tension zone

ey= 0.00207

No.	e	Force *kips*
2	0.0010	39.41
3	0.0058	79.00
4	0.0123	79.00
5	0.0188	79.00
6	0.0235	79.00
7	0.0253	79.00
8	0.0235	79.00
9	0.0188	79.00
10	0.0123	79.00
11	0.0058	79.00
12	0.0010	39.41

Total tension, kips 789.82

Moment due to compression

Rebars	Force *kips*	Mom. Arm. *in*	Moment *k-ft*
1	23.68	25.50	50.31
2	0.00	22.08	0.00
12	0.00	22.08	0.00
Concrete	765.99	27.50	1755.20

Total in compression 1805.51

Moment due to tension

Rebars	Force *kips*	Mom. Arm. *in*	Moment *k-ft*
2	39.41	22.08	-72.52
3	79.00	12.75	-83.94
4	79.00	0.00	0.00
5	79.00	-12.75	83.94
6	79.00	-22.08	145.38
7	79.00	-25.50	167.88
8	79.00	-22.08	145.38
9	79.00	-12.75	83.94
10	79.00	0.00	0.00
11	79.00	12.75	-83.94
12	39.41	22.08	-72.52

Total in tension 313.59

Design moment about the major axis, kip-ft 1907.19 O.K.

Bending about the diagonal

No.	Angle, deg phi	Coord., in c1	Edge Dist., in di
1	0	25.50	16.93
2	30	22.08	20.34
3	60	12.75	29.68
4	90	0.00	42.43
5	120	-12.75	55.18
6	150	-22.08	64.51
7	180	-25.50	67.93
8	210	-22.08	64.51
9	240	-12.75	55.18
10	270	0.00	42.43
11	300	12.75	29.68
12	330	22.08	20.34

Location of neutral axis c=, in 19.221
Compression zone, a= 3.00

	No.	e	Force kips
	1	0.000358138	10.32
eu= 0.003	2		
	12		
Concrete, kips			680.66
Total compression			690.98

Tension zone	No.	e	Force kips
	2	0.0002	6.69
	3	0.0016	62.31
ey= 0.00207	4	0.0036	79.00
	5	0.0056	79.00
	6	0.0071	79.00
	7	0.0076	79.00
	8	0.0071	79.00
	9	0.0056	79.00
	10	0.0036	79.00
	11	0.0016	62.31
	12	0.0002	6.69
Total tension, kips			690.99

Moment due to compression

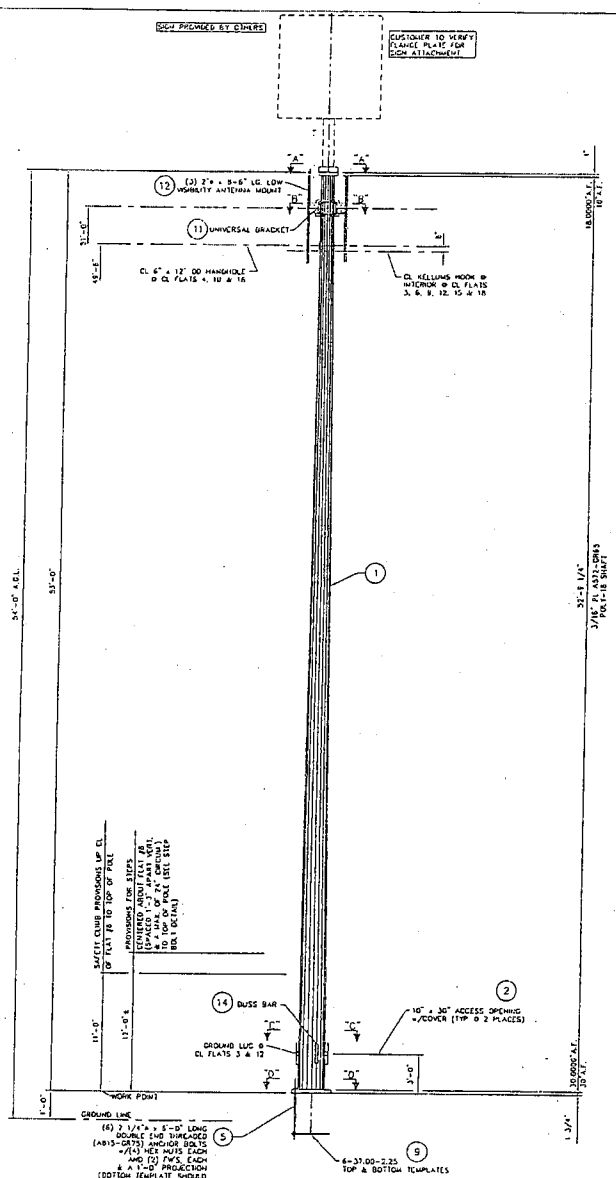
Rebars	Force kips	Mom. Arm. in	Moment k-ft
1	10.32	25.50	21.92
2	0.00	22.08	0.00
12	0.00	22.08	0.00
Concrete	680.66	41.43	2349.77
Total in compressior			2371.70

Moment due to tension

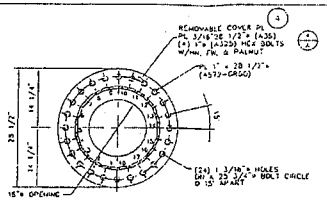
Rebars	Force kips	Mom. Arm. in	Moment k-ft
3	62.31	12.75	-66.20
4	79.00	12.75	-83.94
5	79.00	0.00	0.00
6	79.00	-12.75	83.94
7	79.00	-25.50	167.88
8	79.00	-22.08	145.38
9	79.00	-12.75	83.94
10	79.00	0.00	0.00
11	62.31	12.75	-66.20
Total in tension			264.79

Design Moment, kip-ft 2372.84

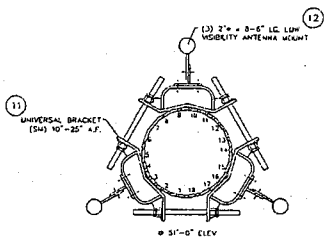
Pedestal Design Moment, kip-ft 1907.19 O.K.



ERECTION VIEW
SCALE ——— NONE



VIEW "A-A"
NOTE: COVER PL REMOVED FOR CLARITY



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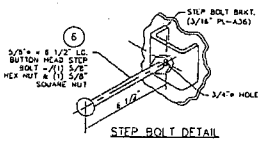
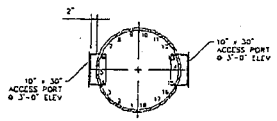


STEP BOLT DETAIL



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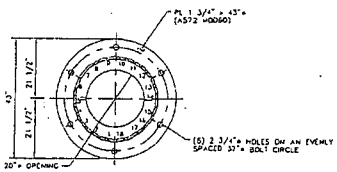

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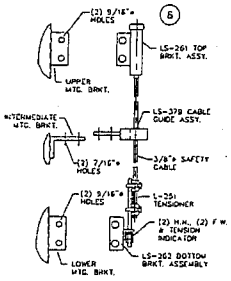

SAFETY CLIMB ATTACHMENT DETAILS
(LOCATED ALONG CL OF FLAT #8)

MATERIAL REQ'D. PER ASSEMBLY

GALV. WT.	QTY.	ITEM	MK. NO.	DESCRIPTION
--	1	(1)	---	SHAFT ASSY. (SINGLE) 53.00' LG.
31.41	2	(2)	K11497	10" x 30" ACCESS PORT COVER PL
		(3)		HARDWARE AS FOLLOWS:
6.87	3	(3) (A)	K11097	6" x 12" HANDHOLE COVER PL
--	1	(4)	---	REMOVABLE COVER PLATE
	4	(4) (A)		1"ø x 3/4" LG. (A325-T) HEX BOLT w/(1) H.N., (1) F.W. & (1) PALNUT
101.45	6	(5)	2.25-ABI5GOE-4	(2) 2 1/4"ø x 6'-0" LG. (ABI5-GR75) ANCHOR BOLTS w/(4) HEX NUTS (A194-GR2H) & (3) F.W.S. EACH
1.08	--	(6)	S10006	3/8"ø x 8 1/2" LG. BUTTON HEAD STEP BOLT w/(1) HEX & (1) SQUARE NUT EACH
	1	(7)		STRUCTURE ASSEMBLY AND ERECTION PROCEDURES
	1	(8)	DBI-50	50'-0" SAFETY CLIMB KIT
	1	(8) (A)	L2010	SAFETY CLIMB HARNESS
71.35	2	(9)	6-37.00-2.25	SETTING TEMPLATE
0.40	6	(10)	GS13220	3/8"ø KELLUMS HOOK ASSY.
146.40	1	(11)	K10874	LIGHT DUTY UNIVERSAL BRACKET (RANGE 10° - 25°)
52.48	3	(12)	K11041	8'-6" LOW VISIBILITY ANTENNA MOUNTS
28.60	1	(13)	K10333	7' LIGHTNING ROD
7.50	1	(14)	K10062	BUSS BAR KIT

TOTAL GALV. STR. & ACCES. WT. ___#___
TOTAL ANCHOR BOLT & TEMPLATE WT. 751.37#

GENERAL NOTES

1) MONOPOLE IS DESIGNED IN ACCORDANCE WITH TIA-222-G FOR 110 MPH 3-SECOND GUST WIND SPEED.
   - STRUCTURE CLASSIFICATION - II
   - EXPOSURE - C
   - TOPOGRAPHIC CATEGORY - 1
   - ICE LOADING - 0.75" @ 50 MPH WIND
2) ALL WELDS SHALL BE IN ACCORDANCE WITH AWS D1.1, (LATEST EDITION). LONGITUDINAL SEAM WELDS WITHIN SLIP-JOINT AREA IN FEMALE SECTION SHALL BE 100% PENETRATION.
3) MONOPOLE SHALL BE HOT DIP GALVANIZED PER ASTM A123
4) CONTRACTOR SHALL THOROUGHLY REVIEW EEI'S ASSEMBLY & ERECTION PROCEDURE PRIOR TO INITIATING THE ERECTION OF THE MONOPOLE.
5) THE ORIENTATION OF THE MONOPOLE SHALL BE VERIFIED PRIOR TO ERECTION OF THE POLE.
6) GAP BETWEEN TOP OF THE FOUNDATION AND BOTTOM OF THE BASE PLATE MAY BE FILLED WITH A NON-SHRINK GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF f'c=2000 psi. WATER DRAINAGE MUST BE PROVIDED UNDERNEATH THE BASE PLATE TO ENSURE THAT MOISTURE DOES NOT COLLECT INSIDE THE MONOPOLE.
7) ALL BOLTED CONNECTIONS WITH A325 HIGH-STRENGTH BOLTS SHALL BE ASSEMBLED IN ACCORDANCE WITH SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS. BOLTS SHALL BE DRIFTED TO SNUG-TIGHT CONDITIONS AS RECOMMENDED BY THE FLANGE SPECIFICATIONS IN FLANGE-TYPE JOINTS AND SHOULD BE SHIMMED IF NECESSARY. THE SHIMS WILL BE SUPPLIED BY EEI.
8) ANCHOR BOLTS SHALL BE TIGHTENED AFTER THE STRUCTURE IS PLUMB. BOTH TOP & BOTTOM NUT SHALL BE TIGHTEN TO 500 ft-lbs MOMENT FOR DETAIL ANCHOR BOLT INSTALLATION REFER TO EEI ASSEMBLY AND ERECTION PROCEDURE
9) POLE TAPER = 0.2214in/ft.

NOTE: ALL ELEVATIONS SHOWN FROM BOTTOM OF BASE PLATE UNLESS OTHERWISE NOTED.

ASSEMBLY MARKING PROCEDURE
EACH INDIVIDUAL ASSEMBLY SHALL HAVE A METAL TAG WELDED TO IT WHICH WILL BE ENGRAVED WITH THE ASSEMBLY MARK NO. AS SHOWN IN THE MATERIAL BLOCK. (MINIMUM OF 5/8" HIGH LETTERS)

STATE OF CONNECTICUT
MICHAEL R. MAY
No 21220
LICENSED
PROFESSIONAL ENGINEER
12/13/16

REV	DESCRIPTION	DATE	BY
0	COMPLETED APPROVAL DWG	12/14/16	J A M

ENGINEERED ENDEAVORS INCORPORATED
The Experienced Point of View
7610 Jennifer Drive * Mentor, OH 44060-4672
Ph: (440) 918-1101 * Ph: (888) 270-3655
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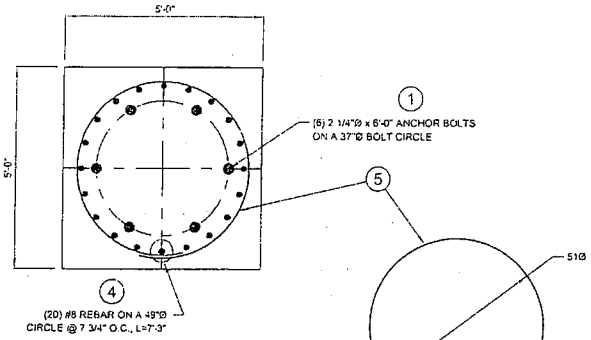
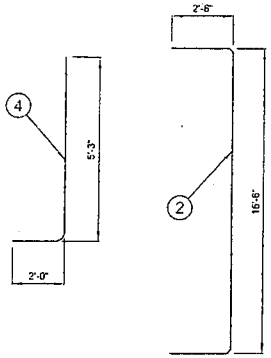
54'-0" SIGN MONOPOLE
T-MOBILE
CROMWELL EXXON
CTHA-241-C
MIDDLESEX COUNTY, CT

SCALE	PROJECT NO.
NONE	14678
SHEET 1 of 1	DRAWING NO. GS56651



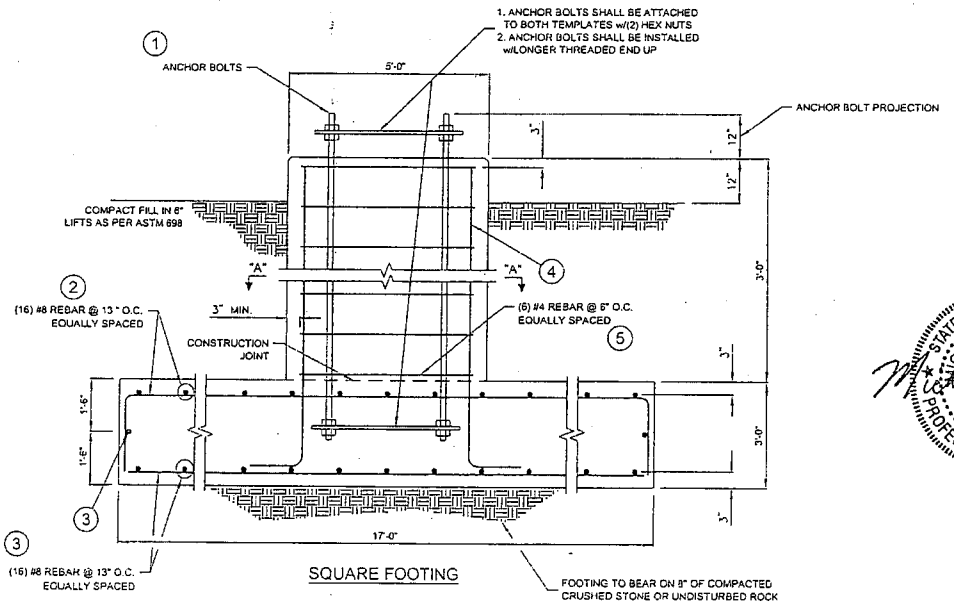
SECTION "A-A"

FOUNDATION LOADING	
MOMENT	547.3 kip-ft
SHEAR	11.3 kips
AXIAL	4.9 kips



MATERIAL LIST		
ITEM	QTY.	DESCRIPTION
1	6	2 1/4"Ø x 6'-0" (A615-GR.75) ANCHOR BOLTS
2	32	#8 REBAR x 21'-6" (ASTM A615-GR.60)
3	36	#8 REBAR x 16'-6" (ASTM A615-GR.60)
4	20	#8 REBAR x 7'-3" (ASTM A615-GR.60)
5	6	#4 REBAR x 15'-3" (ASTM A615-GR.60)

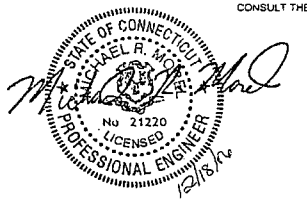
VOL. CONCRETE @ 4000 psi (TYPE II CEMENT)	34.9 yd^3
STEEL (ASTM A615-GR.60)	4376.3 lbs



SQUARE FOOTING

GENERAL NOTES:

1. FOUNDATION DESIGN IS BASE ON THE FOLLOWING: EEI JOB# 14678, DRAWING# GS56551
   SOIL REPORT BY EBI CONSULTING, REPORT NO. 61065025 - 10/10/2006
2. FOUNDATION EMBEDMENT IS SHOWN FROM THE GROUND LEVEL AT THE TIME OF SOIL INVESTIGATION AS DEPICTED IN THE SOIL REPORT. SHOULD THE ACTUAL SOIL CONDITIONS DIFFER FROM THOSE IN THE REPORT, THE GEOTECHNICAL ENGINEER AND FOUNDATION DESIGNER SHOULD BE NOTIFIED IN ORDER TO RE-EVALUATE THE FOUNDATION DESIGN.
3. SOIL REPORT SHOULD BE CONSULTED PRIOR TO CONSTRUCTION. STEEL CASING OR SLURRY METHOD MAY BE REQUIRED TO PREVENT SOIL FROM CAVING DURING CONSTRUCTION. THE CASING SHOULD BE REMOVED AFTER COMPLETION OF CONCRETING OR, IF LEFT IN THE GROUND, ALL VOIDS AROUND THE CASING SHALL BE FILLED WITH PRESSURIZED GROUT. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
4. FOUNDATION EXCAVATION SHALL BE INSPECTED PRIOR TO PLACEMENT OF REINFORCEMENT AND ANCHOR BOLTS.
5. SPECIAL INSPECTION OF REINFORCEMENT, ANCHOR BOLT INSTALLATION, AND CONCRETE IS REQUIRED PER 2005 IBC. FOUNDATION REINFORCEMENT AND ANCHOR BOLTS SHALL BE INSPECTED PRIOR TO PLACEMENT.
6. REINFORCING STEEL SHALL COMFORM TO ASTM A615-97, Fy=60 ksi. REINFORCEMENT SHALL BE ASSEMBLED USING STEEL WIRE. WELDING IS NOT PERMITTED. MINIMUM SPLICE LENGTH: FOR No. 6 BARS AND SMALLER - 44 x Øbar; FOR No. 7 BARS AND LARGER - 55 x Øbar. HORIZONTAL TIES SHALL BE STAGGERED WITH NO MORE THAN 50% OF SPLICES IN ONE PLACE.
7. CONCRETE MIX DESIGN AND CONSTRUCTION PROCEDURE SHALL BE IN COMPLIANCE WITH ACI 318-02, ACI 336.3R-93, AND ALL APPLICABLE STATE AND LOCAL CODES.
   a. MINIMUM COMPRESSIVE STRENGTH - 4000 psi AT 28 DAYS. USE TYPE II CEMENT UNLESS STATED OTHERWISE.
   b. CONCRETE MIX SHOULD HAVE A SLUMP OF 7" (±1") FOR DRILLED PIER AND 3" (±1") FOR MAT FOUNDATIONS.
   c. FOR DRILLED PIERS ONLY THE CONCRETE OVER THE ENTIRE LENGTH OF ANCHOR BOLTS SHALL BE VIBRATED. FOR MAT FOUNDATIONS ALL CONCRETE SHALL BE VIBRATED.
8. ANCHOR BOLT ORIENTATION REQUIRED PRIOR TO CONCRETE PLACEMENT. THE CONTRACTOR SHOULD CONSULT THE SITE PLAN AND MONOPOLE DRAWING FOR PROPER ACCESS PORT ORIENTATION.



REV	DESCRIPTION	DATE	DWN	CHK
0	COMPLETED DRAWING	12/14/2006	R.B.	

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T-MOBILE
54'-0" MONOPOLE
CROMWELL EXXON
CTHA-241-C
MIDDLESEX COUNTY, CT

SCALE: N.T.S.	PROJECT NO.	14678
SHEET 1 of 1	DRAWING NO.	14678S-54.0

T-Mobile

T-Mobile USA Inc.
35 Griffin Rd South, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

Technical Memo

To: Transcend
From: Farid Marbouh - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CTHA241C
Date: May 5, 2009

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile antenna installation on a Monopole at 207 West Street, Cromwell, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location.

2. Discussion:

The following assumptions were used in the calculations:

1) The emissions from T-Mobile transmitters are in the (1935-1944.8), (2140-2145), (2110-2120)MHz frequency Band.
2) The antenna array consists of three sectors, with 1 antenna per sector.
3) The model number for GSM antenna is APX16DWV-16DWV.
3) The model number for UMTS antenna is APX16DWV-16DWV.
4) GSM antenna center line height is 51 ft.
4) UMTS antenna center line height is 51 ft.
5) The maximum transmit power from any GSM sector is 2436.24 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 2809.89 Watts Effective Radiated Power (EiRP) assuming 2 channels per sector.
6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
8) The average ground level of the studied area does not change significantly with respect to the transmitting location.

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

3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile antenna installation on a Monopole at 207 West Street, Cromwell, CT, is 0.56837 mW/cm^2. This value represents 56.837% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for T-Mobile will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area.

Connecticut Market

T-Mobile

Worst Case Power Density

Site:	**CTHA241C**
Site Address:	**207 West Street**
Town:	**Cromwell**
Tower Height:	**40 ft.**
Tower Style:	**Monopole**

GSM Data		**UMTS Data**	
Base Station TX output	20 W	**Base Station TX output**	40 W
Number of channels	8	**Number of channels**	2
Antenna Model	APX16DWV-16DWV	**Antenna Model**	APX16DWV-16DWV
Cable Size	7/8 in.	**Cable Size**	7/8 in.
Cable Length	90 ft.	**Cable Length**	90 ft.
Antenna Height	51.0 ft.	**Antenna Height**	51.0 ft.
Ground Reflection	1.6	**Ground Reflection**	1.6
Frequency	1945.0 MHz	**Frequency**	2.1 GHz
Jumper & Connector loss	4.50 dB	**Jumper & Connector loss**	1.50 dB
Antenna Gain	18.0 dBi	**Antenna Gain**	18.0 dBi
Cable Loss per foot	0.0186 dB	**Cable Loss per foot**	0.0116 dB
Total Cable Loss	1.6740 dB	**Total Cable Loss**	1.0440 dB
Total Attenuation	6.1740 dB	**Total Attenuation**	2.5440 dB
Total EIRP per Channel	54.84 dBm	**Total EIRP per Channel**	61.48 dBm
(In Watts)	304.53 W	**(In Watts)**	1404.95 W
Total EIRP per Sector	63.87 dBm	**Total EIRP per Sector**	64.49 dBm
(In Watts)	2436.24 W	**(In Watts)**	2809.89 W
nsg	11.8260	**nsg**	15.4560
Power Density (S) =	**0.263946 mW/cm^2**	**Power Density (S) =**	**0.304429 mW/cm^2**

T-Mobile Worst Case % MPE = 56.8375%

Equation Used :

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

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

Co-Location Total

Carrier	**% of Standard**
Verizon	
Cingular	
Sprint	
AT&T Wireless	
Nextel	
MetroPCS	
Other Antenna Systems	
Total Excluding T-Mobile	**0.0000 %**
T-Mobile	56.8375
Total % MPE for Site	**56.8375%**