

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

January 8, 2015

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

**Re: Notice of Exempt Modification
CTI Tower Assets 1, LLC/T-Mobile equipment upgrade
Site ID CT11031B
21 East Main Street, Clinton**

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, CTI Tower Assets 1, LLC owns the existing lattice telecommunications tower and related facility at 21 East Main Street Connecticut (latitude 41.27894874/longitude 72.5259641). T-Mobile intends to add three (3) antennas and related equipment at this existing telecommunications facility in Clinton ("Clinton Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the First Selectman William W. Fritz and the property owner, Storer Communications of Clinton.

The existing Clinton Facility consists of an approximately 67.5 foot tall lattice structure.¹ T-Mobile plans to add three (3) antennas on T-Arms at a centerline of 60 feet. T-Mobile will also install three (3) RRUs (remote radio units) on an existing stairwell wall, install six (6) diplexers, install six (6) TMAs (tower mounted amplifiers), and reuse existing coax cable all within the compound area. T-Mobile will also remove 3G RRUs and two (2) equipment cabinets. See the plans revised to December 12, 2014 attached hereto as Exhibit A. The existing Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analyses dated September 26, 2014 and November 21, 2014, tower modification plans dated September 26, 2014, and the accompanying professional engineer's

¹ The online CSC database does not include a Docket or Petition approval for this facility, it does however include a notice of intent captioned EM-T-MOBILE-027-110210 and EM-T-MOBILE-027-141006.

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letter dated December 19, 2014, all attached hereto as Exhibit B.²

The planned modifications to the Clinton Facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the height of the tower. T-Mobile's replacement antennas will be installed at the 60 foot level of the approximately 67.5 foot lattice tower. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

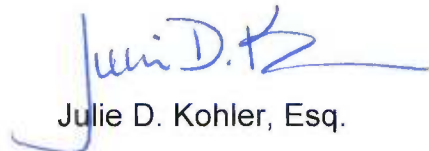
2. The installation of the T-Mobile equipment in the existing compound, as reflected on pages 2 and 3 of Exhibit B, will not require an extension of the site boundaries. T-Mobile's proposed equipment will be located entirely within the existing compound area.

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

4. The operation of the proposed antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated October 1, 2014 T-Mobile's operations would add 44.72% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 44.72% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

For the foregoing reasons, T-Mobile respectfully submits that the proposed antennas and equipment at the Clinton Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

Sincerely,



Julie D. Kohler, Esq.

² The Structural Analysis Reports and professional engineer's letter provides for tower modifications to the Clinton Facility as outlined on Sheet S-1 of the modification plans dated September 26, 2014. These tower modifications will be completed prior to T-Mobile's facility upgrade.

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cc: Town of Clinton, First Selectman William W. Fritz
Storer Communications of Clinton
CTI Tower Assets 1, LLC
Sheldon Freinkle, NSS

EXHIBIT A



OVERALL SITE PLAN
N.T.S.



CONFIGURATION

704BU

SUBMITTALS	
LE REV A	07.29.14
LE REV 0	12.12.14

ATLANTIS GROUP
1340 Centre Street
Suite 212
Newton, MA 02459
Office: 617-965-0789
Fax: 617-213-5056

LEASE EXHIBIT

SITE NUMBER:
CT11031B

SITE NAME:
CLINTON/I-95/X63/AT_1

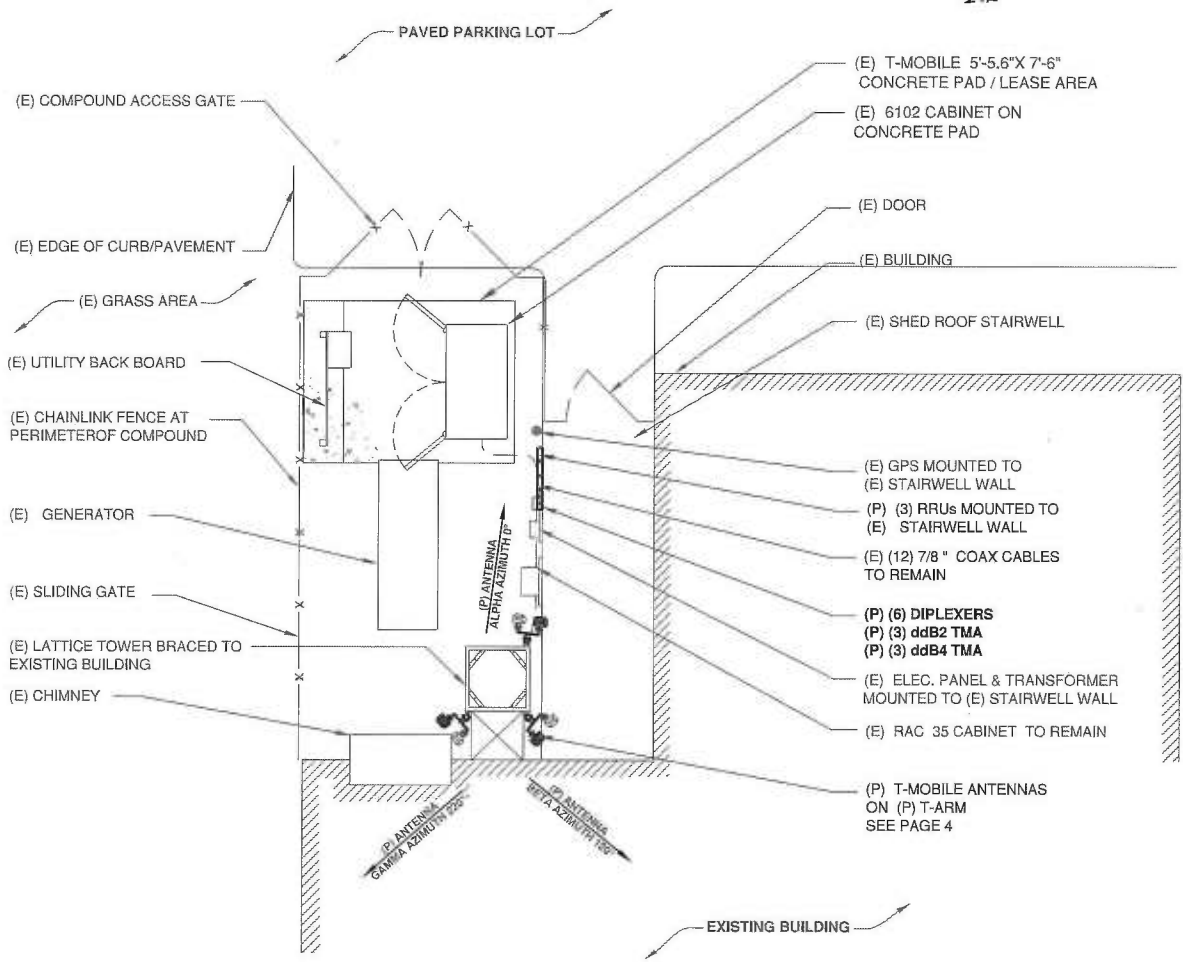
SITE ADDRESS:
21 EAST MAIN STREET
CLINTON, CT, 06413

NORTHEAST SITE SOLUTIONS
54 MAIN STREET, UNIT 3
STURBRIDGE, MA 01566
(508) 434-5237
FOR
T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX: (860) 692-7159

DRAWN BY: FG

CHECKED BY: SM

PAGE 1 OF 4



SITE PLAN
N.T.S.

1
LE2

CONFIGURATION
704BU

SUBMITTALS	
LE REV A	07.29.14
LE REV 0	12.12.14


ATLANTIS GROUP
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LEASE EXHIBIT
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 OFFICE: (860) 692-7100
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TOP OF EXISTING LATTICE TOWER
67.5' ± ABOVE GRADE LEVEL

RAD CENTER OF (P) T-MOBILE ANTENNAS
60' ± ABOVE GRADE LEVEL

(P) COMMSCOPE QUAD POLE ANTENNA
ON (P) T-ARM
(TYP 1/SECTOR , 3 TOTAL)

(E) GSM/UMTS QUAD POLE
ON (P) T-ARM
(TYP 1/SECTOR , 3 TOTAL)

(E) LATTICE TOWER BRACED
TO (E) BUILDING

(E) (12) 7/8 " COAX CABLES

(E) RAC 35 CABINET TO REMAIN
(E) 3G RRUS ,PBCO2 AND 3518 TO BE REMOVED

(E) SHED ROOF STAIRWELL
(E) GPS

(E) ELEC. PANEL & TRANSFORMER
MOUNTED TO (E) STAIRWELL WALL

(P) (3) RRUs MOUNTED TO
(E) STAIRWELL WALL

(P) (6) DIPLEXERS
(P) (3) ddB2 TMA
(P) (3) ddB4 TMA

(E) 6102 CABINET ON
CONCRETE PAD

(E) CHAINLINK FENCE
GRADE

ELEVATION VIEW

N.T.S.

1
LE3

CONFIGURATION

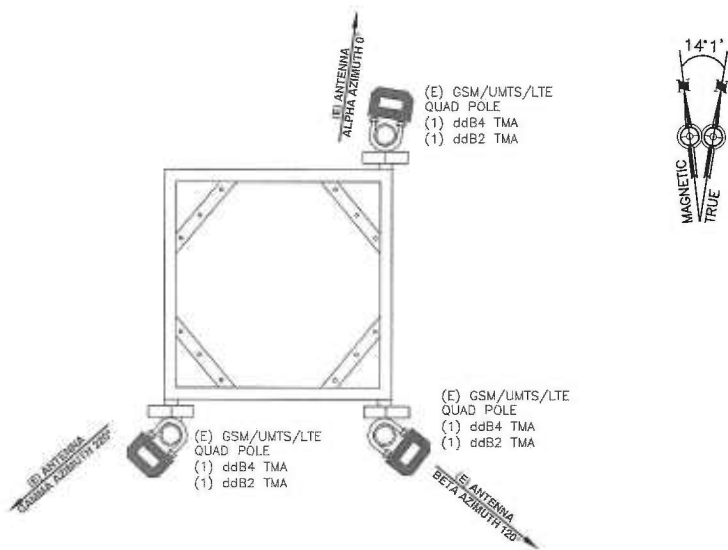
704BU

SUBMITTALS	
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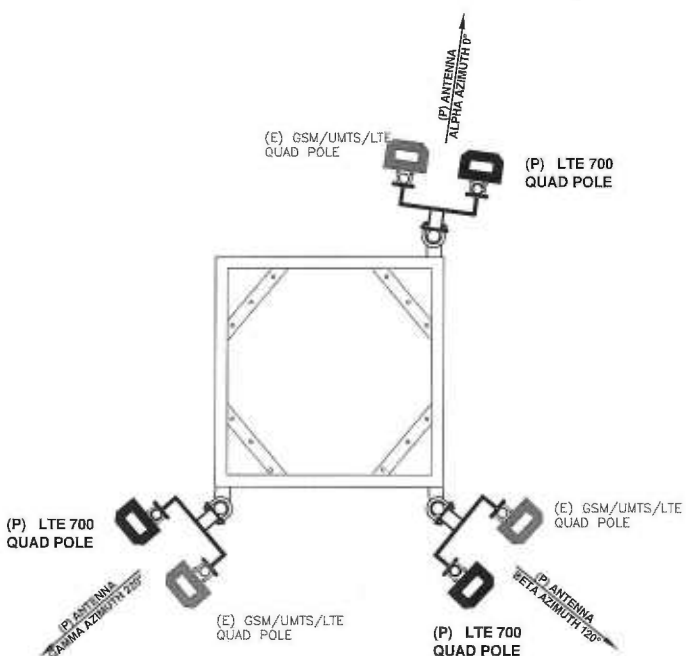
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DRAWN BY: FG CHECKED BY: SM

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PAGE 3 OF 4



EXISTING ANTENNA CONFIGURATION 1
LE4



PROPOSED ANTENNA CONFIGURATION 2
LE4

CONFIGURATION
704BU

SUBMITTALS	
LE REV A	07.29.14
LE REV 0	12.12.14

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EXHIBIT B



FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012

Structural Analysis for CTI Towers

67.5' Lattice Tower

CTI Towers Site Name: E Main St Clinton
CTI Towers Site ID: 11021
T-Mobile Site ID: CT11031B
T-Mobile Site Name: Clinton/ I-95/ X63/ At_1

FDH Project Number 146DCX1400

Analysis Results

Tower Components	93.4%	Sufficient
Foundation	N/A	N/A

Prepared By:

Joshua A Shaw, EI
Project Engineer I

Reviewed By:

Dennis D. Abel, PE
Director – Structural Engineering
CT PE License No. 23247

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com

September 26, 2014



09-26-2014

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut State Building Code

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EXECUTIVE SUMMARY

At the request of CTI Towers, FDH Engineering, Inc. performed a structural analysis of the monopole located in Clinton, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and the *2005 Connecticut State Building Code*. Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from:

- FDH Engineering, Inc. (Job No. 1424V21500) Self-Support Tower Mapping Report dated April 4, 2014
- Centek (Project No. 10116.CO6) Structural Analysis Report w/ Reinforcement Design dated January 10, 2011
- FDH Engineering, Inc. (Job No. 146DCX1400) Modification Drawings for a 67.5' Self-Support Tower dated September 26, 2014
- CTI Towers

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 Connecticut State Building Code* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Assumptions

1. The building is adequate to resist the loads transferred from the tower.
2. The anchor rods are embedded to a sufficient depth to develop the tensile strength of the rod.

Conclusions

With the existing and proposed antennas from T-Mobile in place at 60 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and the *2005 Connecticut State Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, since no foundation information was available at the time of the analysis, we cannot comment on the capacity of the foundation at this time. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and the *2005 Connecticut State Building Code* are met with the existing and proposed loading in place, we have the following recommendation:

1. The proposed feedlines should be installed as shown in the **Appendix**.
2. The modifications shown in the FDH Engineering, Inc. (Job No. 146DCX1400) Modification Drawings for a 67.5' Self-Support Tower dated September 26, 2014 must be installed as specified.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Feedlines	Carrier	Mount Elevation (ft)	Mount Type
60	(3) RFS APX16DWV-16DWVS (6) Ericsson KRY 112 71 TMAs (6) RFS ACU-A20-N RETs	(12) 7/8" (1) 1/4"	T-Mobile	60	(3) Pipe Mounts

Proposed Loading:

Antenna Elevation (ft)	Description	Feedlines	Carrier	Mount Elevation (ft)	Mount Type
60	(3) RFS APX16DWV-16DWVS (3) Commscope LNX-6515DS-VTM (6) Ericsson KRY 112 71 TMAs	(18) 7/8"	T-Mobile	60	(3) Standoff T-Arms (Assumed)

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Legs	36 ksi (Assumed)
Bracing	36 ksi (Assumed)
Anchor Bolts	36 ksi (Assumed)
Base Plate	36 ksi (Assumed)

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. *Note: Capacities up to 105% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
T1	67.5 - 47.5	Leg	L2 1/2x2 1/2x1/4	34.9	Pass
T2	47.5 - 35	Leg	L2 1/2x2 1/2x1/4	78.2	Pass
T3	35 - 32.5	Leg	L2 1/2x2 1/2x1/4	75.5	Pass
T4	32.5 - 30	Leg	L2 1/2x2 1/2x1/4	84.7	Pass
T5	30 - 27.5	Leg	L2 1/2x2 1/2x1/4	92.7	Pass
T6	27.5 - 25	Leg	(3) L2 1/2 x 2 1/2 x 1/4 (11201)	34.2	Pass
T7	25 - 22.5	Leg	L2 1/2x2 1/2x1/4	93.4	Pass
T8	22.5 - 20	Leg	L2 1/2x2 1/2x1/4	67.7	Pass
T9	20 - 17.5	Leg	L2 1/2x2 1/2x1/4	42.1	Pass
T10	17.5 - 15	Leg	L2 1/2x2 1/2x1/4	16.2	Pass
T11	15 - 12.5	Leg	L2 1/2x2 1/2x1/4	17.3	Pass
T12	12.5 - 10	Leg	L2 1/2x2 1/2x1/4	17.5	Pass
T13	10 - 7.5	Leg	L2 1/2x2 1/2x1/4	19.5	Pass
T14	7.5 - 5	Leg	L2 1/2x2 1/2x1/4	20.5	Pass
T15	5 - 2.5	Leg	L2 1/2x2 1/2x1/4	22.0	Pass
T16	2.5 - 0	Leg	L2 1/2x2 1/2x1/4	28.8	Pass
T1	67.5 - 47.5	Diagonal	L1 1/2x1 1/2x1/4	24.8	Pass
T2	47.5 - 35	Diagonal	L1 1/2x1 1/2x1/4	30.1	Pass
T3	35 - 32.5	Diagonal	L1 1/2x1 1/2x1/4	30.8	Pass
T4	32.5 - 30	Diagonal	L1 1/2x1 1/2x1/4	31.9	Pass
T5	30 - 27.5	Diagonal	L1 1/2x1 1/2x1/4	32.9	Pass
T6	27.5 - 25	Diagonal	L1 1/2x1 1/2x1/4	29.7	Pass
T7	25 - 22.5	Diagonal	L1 1/2x1 1/2x1/4	77.1	Pass
T8	22.5 - 20	Diagonal	L1 1/2x1 1/2x1/4	71.3	Pass
T9	20 - 17.5	Diagonal	L1 1/2x1 1/2x1/4	67.2	Pass
T10	17.5 - 15	Diagonal	L1 1/2x1 1/2x1/4	63.8	Pass

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
T11	15 - 12.5	Diagonal	L1 1/2x1 1/2x1/4	39.3	Pass
T12	12.5 - 10	Diagonal	L1 1/2x1 1/2x1/4	41.0	Pass
T13	10 - 7.5	Diagonal	L1 1/2x1 1/2x1/4	42.1	Pass
T14	7.5 - 5	Diagonal	L1 1/2x1 1/2x1/4	43.0	Pass
T15	5 - 2.5	Diagonal	L1 1/2x1 1/2x1/4	44.4	Pass
T16	2.5 - 0	Diagonal	L1 1/2x1 1/2x1/4	45.6	Pass
T1	67.5 - 47.5	Horizontal	L1 1/2x1 1/2x1/4	4.4	Pass
T2	47.5 - 35	Horizontal	L1 1/2x1 1/2x1/4	2.9	Pass
T3	35 - 32.5	Horizontal	L1 1/2x1 1/2x1/4	3.2	Pass
T4	32.5 - 30	Horizontal	L1 1/2x1 1/2x1/4	3.5	Pass
T5	30 - 27.5	Horizontal	L1 1/2x1 1/2x1/4	3.9	Pass
T6	27.5 - 25	Horizontal	L1 1/2x1 1/2x1/4	4.3	Pass
T7	25 - 22.5	Horizontal	L1 1/2x1 1/2x1/4	66.3	Pass
T8	22.5 - 20	Horizontal	L1 1/2x1 1/2x1/4	33.8	Pass
T9	20 - 17.5	Horizontal	L1 1/2x1 1/2x1/4	19.7	Pass
T10	17.5 - 15	Horizontal	L1 1/2x1 1/2x1/4	11.8	Pass
T11	15 - 12.5	Horizontal	L1 1/2x1 1/2x1/4	43.6	Pass
T12	12.5 - 10	Horizontal	L1 1/2x1 1/2x1/4	0.7	Pass
T13	10 - 7.5	Horizontal	L1 1/2x1 1/2x1/4	0.8	Pass
T14	7.5 - 5	Horizontal	L1 1/2x1 1/2x1/4	0.9	Pass
T15	5 - 2.5	Horizontal	L1 1/2x1 1/2x1/4	43.6	Pass
T16	2.5 - 0	Horizontal	L1 1/2x1 1/2x1/4	1.5	Pass
T3	35 - 32.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	3.0 6.5 (b)	Pass
T4	32.5 - 30	Secondary Horizontal	L1 1/2x1 1/2x1/4	3.5	Pass
T5	30 - 27.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	3.9	Pass
T11	15 - 12.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	1.0	Pass
T12	12.5 - 10	Secondary Horizontal	L1 1/2x1 1/2x1/4	0.7 1.5 (b)	Pass
T13	10 - 7.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	0.8 1.7 (b)	Pass
T14	7.5 - 5	Secondary Horizontal	L1 1/2x1 1/2x1/4	1.9 3.9 (b)	Pass
T15	5 - 2.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	1.9 4.0 (b)	Pass
T16	2.5 - 0	Secondary Horizontal	L1 1/2x1 1/2x1/4	1.1 2.5 (b)	Pass
T1	67.5 - 47.5	Top Girt	L1 1/2x1 1/2x1/4	0.1	Pass
T16	2.5 - 0	Bottom Girt	L2 1/2x2 1/2x1/4	43.6	Pass
-	0	Anchor Rods	(4) 3/4"	71.1	Pass
-	0	Base Plate	(4) 3"x3/4" PL modified	94.3	Pass

*Capacities include 1/3 allowable increase for wind per TIA/EIA-222-F standards.

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis (TIA/EIA-222-F)
Axial	4 k
Shear	2 k
Moment	22 k-ft

GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of CTI Towers to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

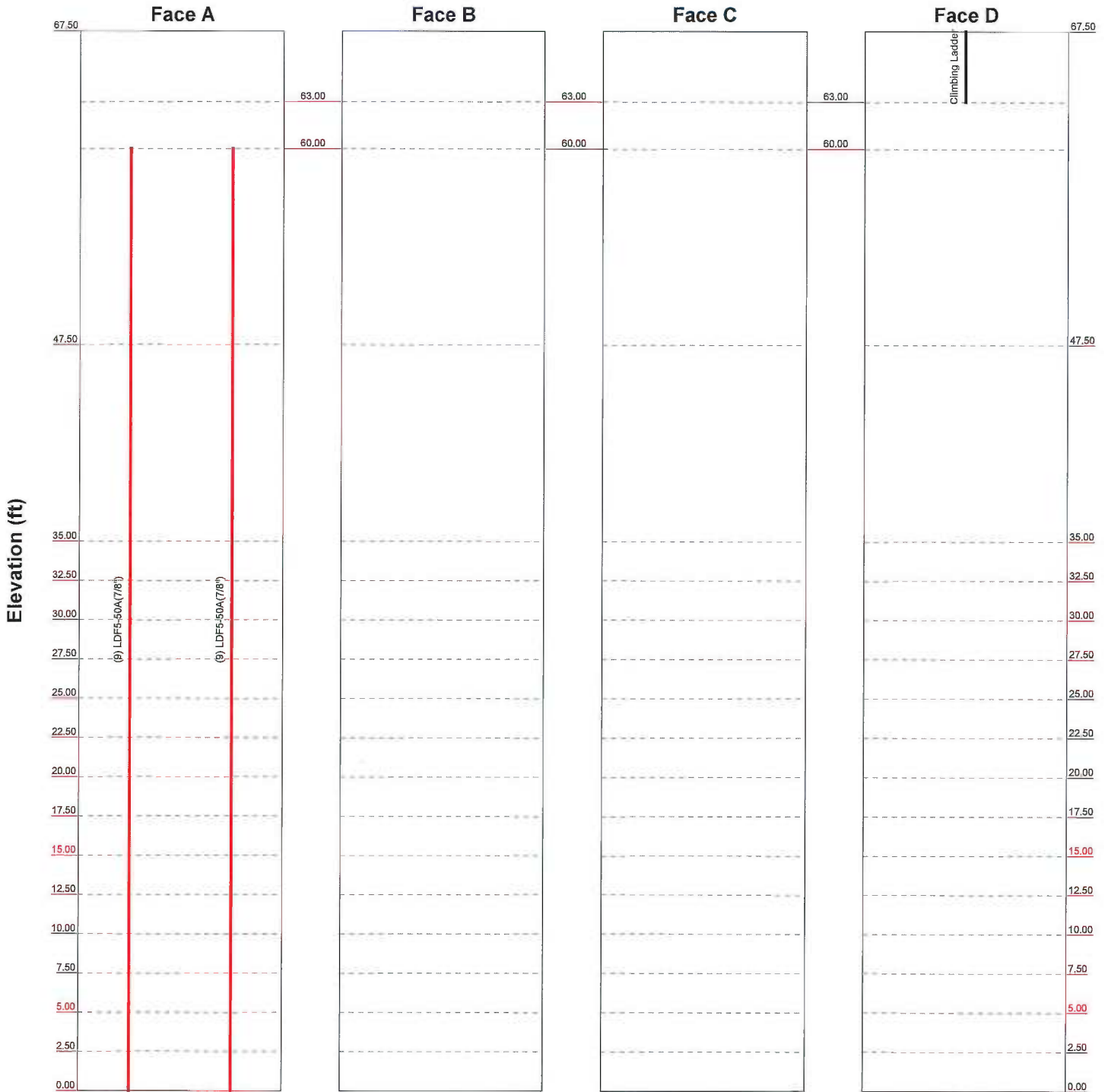
All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

Feed Line Distribution Chart

0' - 67'6"

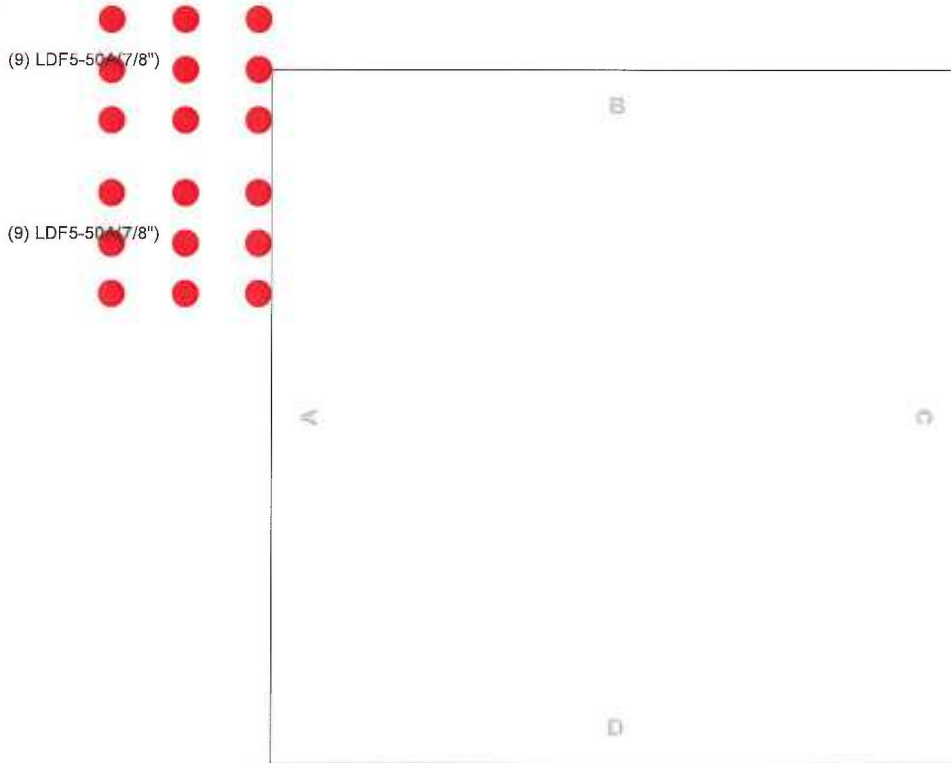
— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Leg




 Tower Analysis	FDH Engineering, Inc.		Job: E Main St Clinton, CT (11201)		
	6521 Meridien Dr. Raleigh, NC		Project: 146DCX1400		
	Phone: (919) 755-1012		Client: CT! Towers	Drawn by: Joshua A Shaw	App'd:
	FAX: (919) 755-1031		Code: TIA/EIA-222-F	Date: 09/26/14	Scale: NTS
			Path:		Dwg No. E-7

Feed Line Plan

— Round
 — Flat
 — App In Face
 — App Out Face



 Tower Analysis	FDH Engineering, Inc.		Job: E Main St Clinton, CT (11201)		
	6521 Meridien Dr. Raleigh, NC		Project: 146DCX1400		
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	FAX: (919) 755-1031		Code: TIA/EIA-222-F	Date: 09/26/14	Scale: NTS
		Path:	Dwg No. E-7		



FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012

Structural Analysis for CTI Towers

67.5' Lattice Tower

CTI Towers Site Name: E Main St Clinton
CTI Towers Site ID: 11021
T-Mobile Site ID: CT11031B
T-Mobile Site Name: Clinton/ I-95/ X63/ At_1

FDH Project Number 146HAZ1400

Analysis Results

Tower Components	98.1%	Sufficient
Foundation	N/A	N/A

Prepared By:

Jarel Duncan

Jarel Duncan, EI
Project Engineer I

Reviewed By:

Bradley R. Newman

Bradley R. Newman, PE
Senior Project Engineer
CT PE License No. 29630

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com



November 21, 2014

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut State Building Code

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The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 Connecticut State Building Code* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Assumptions

1. The building is adequate to resist the loads transferred from the tower.
2. The anchor rods are embedded to a sufficient depth to develop the tensile strength of the rod.

Conclusions

With the existing and proposed antennas from T-Mobile in place at 60 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and the *2005 Connecticut State Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, since no foundation information was available at the time of the analysis, we cannot comment on the capacity of the foundation at this time. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and the *2005 Connecticut State Building Code* are met with the existing and proposed loading in place, we have the following recommendation:

1. The proposed feedlines should be installed as shown in the **Appendix**.
2. The existing TMAs and proposed diplexers should be installed directly behind the existing/proposed panel antennas.
3. The modifications shown in the FDH Engineering, Inc. (Job No. 146DCX1400) Modification Drawings for a 67.5' Self-Support Tower dated September 26, 2014 must be installed correctly in order for this analysis to be valid.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Feedlines	Carrier	Mount Elevation (ft)	Mount Type
60	(3) RFS APX16DWV-16DWVS (6) Ericsson KRY 112 71 (6) RFS ACU-A20-N	(12) 7/8" (1) 1/4"	T-Mobile	60	(3) Pipe Mounts

Proposed Carrier – Final Loading:

Antenna Elevation (ft)	Description	Feedlines	Carrier	Mount Elevation (ft)	Mount Type
60	(3) RFS APX16DWV-16DWVS (3) Commscope LNX-6515DS-VTM (6) Ericsson KRY 112 71 (6) Andrew ECC1920-VPUB (3) Andrew Smart Bias T	(12) 7/8"	T-Mobile	60	(3) Standoff T-Arms (assumed CaAa = 3.75 ft ² ea.)

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Legs	36 ksi (Assumed)
Bracing	36 ksi (Assumed)
Anchor Bolts	36 ksi (Assumed)
Base Plate	36 ksi (Assumed)

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. *Note: Capacities up to 105% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
T1	67.5 - 47.5	Leg	L2 1/2x2 1/2x1/4	35.9	Pass
T2	47.5 - 35	Leg	L2 1/2x2 1/2x1/4	81.7	Pass
T3	35 - 32.5	Leg	L2 1/2x2 1/2x1/4	78.8	Pass
T4	32.5 - 30	Leg	L2 1/2x2 1/2x1/4	88.5	Pass
T5	30 - 27.5	Leg	L2 1/2x2 1/2x1/4	96.6	Pass
T6	27.5 - 25	Leg	(3) L2 1/2 x 2 1/2 x 1/4 (11201)	98.0	Pass
T7	25 - 22.5	Leg	L2 1/2x2 1/2x1/4	98.1	Pass
T8	22.5 - 20	Leg	L2 1/2x2 1/2x1/4	70.6	Pass
T9	20 - 17.5	Leg	L2 1/2x2 1/2x1/4	43.2	Pass
T10	17.5 - 15	Leg	L2 1/2x2 1/2x1/4	15.4	Pass
T11	15 - 12.5	Leg	L2 1/2x2 1/2x1/4	17.0	Pass
T12	12.5 - 10	Leg	L2 1/2x2 1/2x1/4	16.6	Pass
T13	10 - 7.5	Leg	L2 1/2x2 1/2x1/4	18.1	Pass
T14	7.5 - 5	Leg	L2 1/2x2 1/2x1/4	18.9	Pass
T15	5 - 2.5	Leg	L2 1/2x2 1/2x1/4	21.3	Pass
T16	2.5 - 0	Leg	L2 1/2x2 1/2x1/4	27.2	Pass
T1	67.5 - 47.5	Diagonal	L1 1/2x1 1/2x1/4	25.4	Pass
T2	47.5 - 35	Diagonal	L1 1/2x1 1/2x1/4	30.4	Pass
T3	35 - 32.5	Diagonal	L1 1/2x1 1/2x1/4	31.3	Pass
T4	32.5 - 30	Diagonal	L1 1/2x1 1/2x1/4	32.3	Pass
T5	30 - 27.5	Diagonal	L1 1/2x1 1/2x1/4	33.5	Pass
T6	27.5 - 25	Diagonal	L1 1/2x1 1/2x1/4	30.3	Pass
T7	25 - 22.5	Diagonal	L1 1/2x1 1/2x1/4	73.9	Pass
T8	22.5 - 20	Diagonal	L1 1/2x1 1/2x1/4	66.3	Pass
T9	20 - 17.5	Diagonal	L1 1/2x1 1/2x1/4	65.6	Pass
T10	17.5 - 15	Diagonal	L1 1/2x1 1/2x1/4	65.1	Pass

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
T11	15 - 12.5	Diagonal	L1 1/2x1 1/2x1/4	36.5	Pass
T12	12.5 - 10	Diagonal	L1 1/2x1 1/2x1/4	38.7	Pass
T13	10 - 7.5	Diagonal	L1 1/2x1 1/2x1/4	39.2	Pass
T14	7.5 - 5	Diagonal	L1 1/2x1 1/2x1/4	40.6	Pass
T15	5 - 2.5	Diagonal	L1 1/2x1 1/2x1/4	41.5	Pass
T16	2.5 - 0	Diagonal	L1 1/2x1 1/2x1/4	43.0	Pass
T1	67.5 - 47.5	Horizontal	L1 1/2x1 1/2x1/4	4.6	Pass
T2	47.5 - 35	Horizontal	L1 1/2x1 1/2x1/4	3.0	Pass
T3	35 - 32.5	Horizontal	L1 1/2x1 1/2x1/4	3.3	Pass
T4	32.5 - 30	Horizontal	L1 1/2x1 1/2x1/4	3.7	Pass
T5	30 - 27.5	Horizontal	L1 1/2x1 1/2x1/4	4.0	Pass
T6	27.5 - 25	Horizontal	L1 1/2x1 1/2x1/4	4.5	Pass
T7	25 - 22.5	Horizontal	L1 1/2x1 1/2x1/4	68.5	Pass
T8	22.5 - 20	Horizontal	L1 1/2x1 1/2x1/4	34.5	Pass
T9	20 - 17.5	Horizontal	L1 1/2x1 1/2x1/4	20.2	Pass
T10	17.5 - 15	Horizontal	L1 1/2x1 1/2x1/4	11.7	Pass
T11	15 - 12.5	Horizontal	L1 1/2x1 1/2x1/4	43.6	Pass
T12	12.5 - 10	Horizontal	L1 1/2x1 1/2x1/4	0.7	Pass
T13	10 - 7.5	Horizontal	L1 1/2x1 1/2x1/4	0.8	Pass
T14	7.5 - 5	Horizontal	L1 1/2x1 1/2x1/4	0.9	Pass
T15	5 - 2.5	Horizontal	L1 1/2x1 1/2x1/4	43.6	Pass
T16	2.5 - 0	Horizontal	L1 1/2x1 1/2x1/4	1.5	Pass
T3	35 - 32.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	3.1 6.8 (b)	Pass
T4	32.5 - 30	Secondary Horizontal	L1 1/2x1 1/2x1/4	3.7	Pass
T5	30 - 27.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	4.0	Pass
T11	15 - 12.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	1.0	Pass
T12	12.5 - 10	Secondary Horizontal	L1 1/2x1 1/2x1/4	0.7 1.4 (b)	Pass
T13	10 - 7.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	0.7 1.6 (b)	Pass
T14	7.5 - 5	Secondary Horizontal	L1 1/2x1 1/2x1/4	1.9 3.9 (b)	Pass
T15	5 - 2.5	Secondary Horizontal	L1 1/2x1 1/2x1/4	1.9 4.0 (b)	Pass
T16	2.5 - 0	Secondary Horizontal	L1 1/2x1 1/2x1/4	1.1 2.3 (b)	Pass
T1	67.5 - 47.5	Top Girt	L1 1/2x1 1/2x1/4	0.1	Pass
T16	2.5 - 0	Bottom Girt	L2 1/2x2 1/2x1/4	43.6	Pass
-	0	Anchor Rods	(4) 3/4"	67.8	Pass
-	0	Base Plate	(4) 3"x3/4" PL modified	90.0	Pass

*Capacities include 1/3 allowable increase for wind per TIA/EIA-222-F standards.

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis (TIA/EIA-222-F)
Axial	4 k
Shear	2 k
Moment	21 k-ft

GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of CTI Towers to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

Section	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs					L2 1/2x2 1/2x1/4											L2 1/2x2 1/2x1/4
Leg Grade																
Diagonals																
Diagonal Grade																
Top Chits																
Bottom Chits																
Horizontal																
Sec. Horizontals																
Face Width (ft)																
# Panels @ (ft)																
Weight (K)	3.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

67.5 ft
47.5 ft
35.0 ft
32.5 ft
30.0 ft
27.5 ft
25.0 ft
22.5 ft
20.0 ft
17.5 ft
15.0 ft
12.5 ft
10.0 ft
7.5 ft
5.0 ft
2.5 ft
0.0 ft

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
4x4.5" Pipe Mount	65	LNX-6515DS-VTM w/ Mount Pipe	60
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	60	LNX-6515DS-VTM w/ Mount Pipe	60
		(2) ECC1920-VPUB	60
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	60	(2) ECC1920-VPUB	60
		(2) ECC1920-VPUB	60
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	60	Smart Bias T	60
		Smart Bias T	60
(2) KRY 112 71	60	Smart Bias T	60
(2) KRY 112 71	60	(3) 5" Pipe Mounts	60
(2) KRY 112 71	60	(3) Standoff T-Arms	60
LNX-6515DS-VTM w/ Mount Pipe	60		

SYMBOL LIST

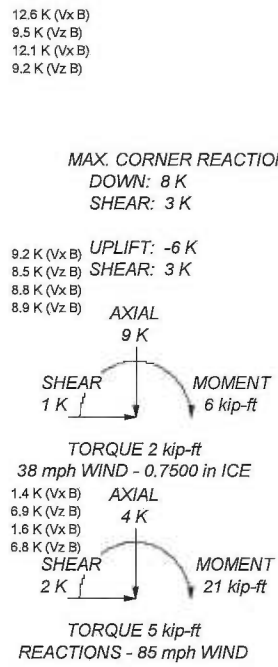
MARK	SIZE	MARK	SIZE
A	(3) L2 1/2 x 2 1/2 x 1/4 (11201)	B	L2 1/2x2 1/2x1/4

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

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 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
- Deflections are based upon a 50 mph wind.
- TOWER RATING: 98.1%

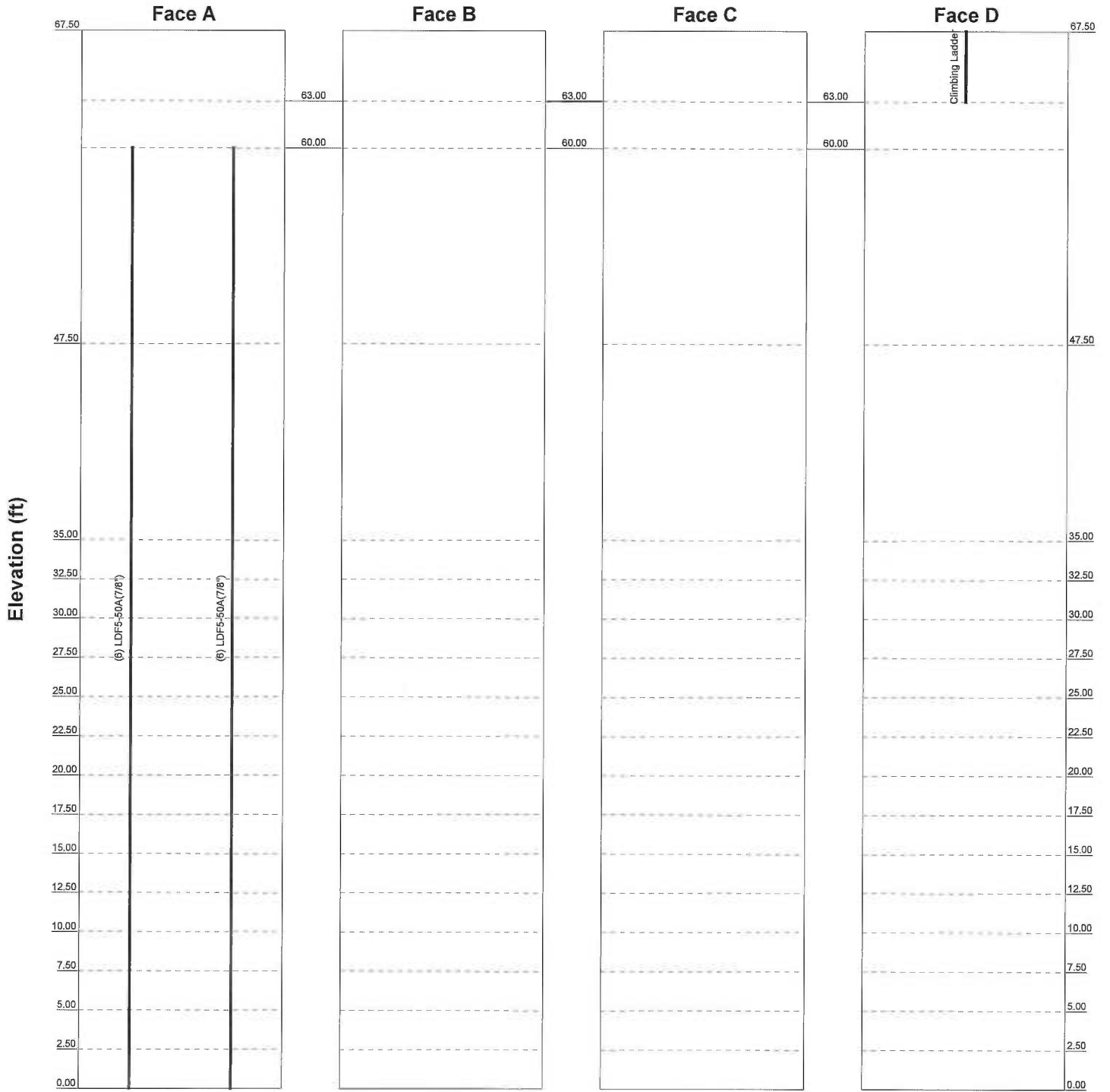


<p>FDH Tower Analysis</p>	FDH Engineering, Inc.		Job: E Main St Clinton, CT (11201)		
	6521 Meridien Drive		Project: 146HAZ1400		
	Raleigh, NC 27616		Client: CTI Towers	Drawn by: Jarel Duncan	App'd:
	Phone: (919) 755-1012		Code: TIA/EIA-222-F	Date: 11/21/14	Scale: NTS
	FAX: (919) 755-1031		Path:	Dwg No. E-1	

Feed Line Distribution Chart

0' - 67'6"

Round
Flat
App In Face
App Out Face
Truss Leg



 Tower Analysis	FDH Engineering, Inc.		Job: E Main St Clinton, CT (11201)		
	6521 Meridien Drive		Project: 146HAZ1400		
	Raleigh, NC 27616		Client: CTI Towers	Drawn by: Jarel Duncan	App'd:
	Phone: (919) 755-1012		Code: TIA/EIA-222-F	Date: 11/21/14	Scale: NTS
	FAX: (919) 755-1031		Path:	Dwg No. E-7	

MODIFICATION INSPECTION NOTES:

GENERAL

1. THE POST CONSTRUCTION INSPECTION (MI) 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 (EOR).
2. THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF. NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.
3. ALL MI'S SHALL BE CONDUCTED BY A MI INSPECTOR THAT IS APPROVED TO PERFORM ELEVATED WORK FOR FDH ENGINEERING, INC.
4. TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR FDH POINT OF CONTACT (POC).
5. REFER TO CCR-01 : CONTRACTOR CLOUSEOUT REQUIREMENTS FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
 - REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
 - WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
2. THE MI 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 MI REPORT TO FDH.

CORRECTION OF FAILING MI'S

1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH FDH 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 MI.
 - OR, WITH FDH'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

REQUIRED PHOTOS

1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
 - PRE-CONSTRUCTION GENERAL SITE CONDITION AND INSPECTION
 - PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION
 - RAW MATERIALS
 - PHOTOS OF ALL CRITICAL DETAILS
 - FOUNDATION MODIFICATIONS
 - WELD PREPARATION
 - BOLT INSTALLATION AND TORQUE
 - FINAL INSTALLED CONDITION
 - SURFACE COATING REPAIR
 - POST CONSTRUCTION PHOTOGRAPHS
 - FINAL INFIELD CONDITION
2. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

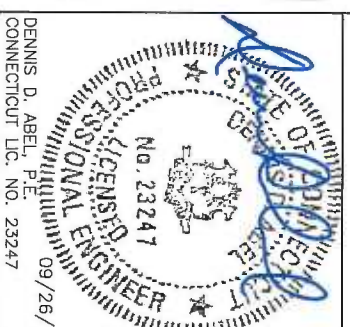
MI CHECKLIST		REPORT ITEM
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED		
PRE-CONSTRUCTION		
X	MI CHECKLIST DRAWING	
N/A	EOR APPROVED SHOP DRAWINGS	
N/A	FABRICATION INSPECTION	
N/A	FABRICATOR CERTIFIED WELD INSPECTION	
X	MATERIAL TEST REPORT (MTR)	
N/A	FABRICATOR NDE INSPECTION	
N/A	NDE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

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT
 N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

PREPARED BY:



PREPARED FOR:



DRAWN BY: LWL
 CHECKED BY: JAS
 ENG APPVD: DDA
 PROJECT NO: 14DDCX1400

SUBMITTALS		
DATE	DESCRIPTION	REV
09/28/14	CONSTRUCTION	0

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. REPRODUCTION OR CAUSING TO BE REPRODUCED THE WHOLE OR ANY PART OF THESE DRAWINGS WITHOUT THE PERMISSION OF FDH ENGINEERING, INC. IS PROHIBITED.

SITE NAME:
E MAIN STREET
 SITE NUMBER:
11201
 SITE ADDRESS:
21 E MAIN STREET
CLINTON, CT 06413

SHEET TITLE
 MODIFICATION
 INSPECTION NOTES

SHEET NUMBER

N-1

GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND ORDINANCES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL PERMITS NECESSARY TO COMPLETE THE PROJECT AND ABIDE BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO FDH ENGINEERING FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
3. INCORRECTLY FABRICATED, DAMAGED, OTHERWISE MISFITTING, OR NON-COMFORMING MATERIALS AND CONDITIONS SHALL BE REPORTED TO FDH ENGINEERING PRIOR TO ANY REMEDIAL OR CORRECTIVE ACTION. ALL ACTIONS SHALL REQUIRE FDH ENGINEERING APPROVAL.
4. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AFTER THE COMPLETION OF THE PROJECT.
5. CONTRACTOR SHALL PROMPTLY REMOVE ANY & ALL DEBRIS FROM SITE AND RESTORE AS BEST AS POSSIBLE TO PRECONSTRUCTION CONDITION.

CONTRACTOR QUALIFICATION NOTES:

1. ALL REPAIRS SHALL BE PERFORMED BY A TOWER CONTRACTOR WITH A MINIMUM 5 YEARS EXPERIENCE IN TOWER ERECTION AND RETROFIT AND WITH WORKING KNOWLEDGE OF THE TIA/EIA 222-F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES."
2. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS. SHOULD THE CONTRACTOR REQUIRE DIRECT CONSULTATION, FDH ENGINEERING, INC. IS WILLING TO OFFER SERVICES BASED UPON AN AGREED FEE FOR THE WORK REQUIRED.
3. ALL SUBMITTAL INFORMATION MUST BE SENT TO FDH ENGINEERING, INC. 6521 MERIDEN DRIVE, RALEIGH NC, 27616. TEL. (919) 755-1012, FAX. (919) 755-1031, E-MAIL, INFO@FDH-INC.COM. ANY VARIATION OF THESE SPECIFICATIONS OR DRAWINGS WITHOUT CONSENT FROM FDH ENGINEERING, INC. WILL VOID ANY RESPONSIBILITY OR LIABILITY FOR DAMAGE (MATERIAL OR PHYSICAL) TOWARDS FDH ENGINEERING, INC.
4. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE TIA-1019-A STANDARD.

JOB SITE SAFETY & NOTES:

1. NEITHER THE PROFESSIONAL ACTIVITIES OF FDH ENGINEERING, INC. NOR THE PRESENCE OF FDH ENGINEERING, INC. OR EMPLOYEES AND SUB-CONSULTANTS AT THE CONSTRUCTION SITE, SHALL RELIEVE THE GENERAL CONTRACTOR AND OR SUBCONTRACTORS AND ANY OTHER ENTRY OF THEIR OBLIGATIONS, DUTIES AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ANY HEALTH OR SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES. THE GENERAL CONTRACTOR AND OR SUBCONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SAFETY, AND WARRANTS THAT THIS INTENT IS EVIDENT BY ACCEPTING THIS WORK.

STEEL:

1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST AISC CODE AND ASTM SPECIFICATIONS.
*ALL STEEL ANGLE SHALL BE ASTM A36 (Fy=36KSI) UNLESS OTHERWISE SPECIFIED.
2. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED WELDS WITH WELDING ELECTRODES E-80XX OR SPECIFIED HIGH STRENGTH BOLTS TO BE ASTM A325N, THREAD INCLUDED WITH SHEAR PLANE (UNLESS OTHERWISE NOTED).
3. ALL BOLTED CONNECTIONS TO BE INSTALLED TO A SNUG-TIGHTENED CONDITION IN ACCORDANCE WITH AISC 13 PART 16.2, "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" SECTION 8.1, UNLESS OTHERWISE SPECIFIED. WHEN "X" TYPE BOLTS ARE USED, CONTRACTOR MAY BE REQUIRED TO STACK ADDITIONAL WASHERS TO OBTAIN PROPER SNUG TIGHT INSTALLATION. ALL NUTS SHALL BE HEAVY HEX UNLESS OTHERWISE NOTED.
4. ALL STEEL, AFTER FABRICATION, SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123. ALL DAMAGED SURFACES, WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (EXISTING OR NEW) SHALL BE PAINTED WITH MULTIPLE COATS OF ZRC COLD GALVANIZING COMPOUND ACHIEVING A MINIMUM OF 4 MILS DRY FILM PER ASTM A 780.
5. ALL SHOP AND FIELD WELDING SHALL BE DONE BY WELDERS QUALIFIED AS DESCRIBED IN THE "AMERICAN WELDING SOCIETY'S STANDARD QUALIFICATION PROCEDURE" TO PERFORM THE TYPE OF WORK REQUIRED. CONTRACTOR IS REQUIRED TO PROVIDE FDH ENGINEERING, INC. WITH A PASSING CERTIFIED WELDING INSPECTION FOR ALL WELDS.
6. STRUCTURAL STEEL MAY NOT BE TORCH CUT FOR FABRICATION. ALL STEEL FABRICATION MUST FOLLOW AISC STANDARDS.

MISC. NOTES:

1. ALL MODIFICATIONS ARE ASSUMED TO BE MADE ON AN EMPTY TOWER. CONTRACTOR IS RESPONSIBLE TO MAKE PROVISIONS TO SUPPORT OR WORK AROUND EXISTING ANTENNAS AND TRANSMISSION LINES. MODIFICATIONS MUST BE CONTINUOUS THROUGH ALL AREAS SHOWN.
2. CONTRACTOR FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.

FABRICATION NOTES:

1. ALL DIMENSIONS ARE PRELIMINARY UNTIL FIELD VERIFIED BY CONTRACTOR. ANY CHANGES MUST BE APPROVED BY ENGINEER OF RECORD IN WRITING PRIOR TO FABRICATION AND INSTALLATION.
2. NEW STEEL MEMBERS MUST HAVE SINGLE DRILLED HOLES, SLOTTED AND DOUBLE DRILLED HOLES ARE NOT ACCEPTABLE MEANS OF FABRICATION.

SUBSTITUTES AND/OR EQUALS:

1. IF CONTRACTOR WISHES TO FURNISH OR USE A SUBSTITUTE ITEM OF MATERIAL OR EQUIPMENT, CONTRACTOR SHALL FIRST MAKE WRITTEN APPLICATION TO ENGINEER OF RECORD FOR ACCEPTANCE THEREOF, CERTIFYING THAT THE PROPOSED SUBSTITUTE WILL PERFORM ADEQUATELY THE FUNCTIONS AND ACHIEVE THE RESULTS CALLED FOR BY THE GENERAL DESIGN. BE SIMILAR IN SUBSTANCE TO THAT SPECIFIED AND SUITED TO THE SAME USE AS THAT SPECIFIED. ALL VARIATIONS OF THE PROPOSED SUBSTITUTE FROM THAT SPECIFIED WILL BE IDENTIFIED IN THE APPLICATION AND AVAILABLE MAINTENANCE, REPAIR AND REPLACEMENT SERVICE WILL BE INDICATED. THE APPLICATION WILL ALSO CONTAIN AN ITEMIZED ESTIMATE OF ALL COSTS OR CREDITS THAT WILL RESULT DIRECTLY OR INDIRECTLY FROM ACCEPTANCE OF SUCH SUBSTITUTE INCLUDING COSTS OF REDSIGN AND CLAIMS OF OTHER CONTRACTORS AFFECTED BY THE RESULTING CHANGE. ALL OF WHICH WILL BE CONSIDERED BY ENGINEER OF RECORD IN EVALUATION OF THE PROPOSED SUBSTITUTE. ENGINEER OF RECORD MAY REQUIRE CONTRACTOR TO FURNISH ADDITIONAL DATA ABOUT THE PROPOSED SUBSTITUTE.

COLD GALVANIZATION/SURFACE PREPARATION NOTES:

1. CONTRACTOR TO USE ZINGA OR ZRC COLD GALVANIZATION COMPOUNDS OR APPROVED EQUIVALENT.
2. PREPARE RUSTED/CORRODED SURFACE FOR TREATMENT ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
3. CONTRACTOR TO APPLY (2) COATS OF COLD GALVANIZATION COMPOUND PER MANUFACTURER'S RECOMMENDATION. DRYING AND CURING TIMES MUST BE UTILIZED PER MANUFACTURER'S RECOMMENDATION.
4. APPLY ALL COATINGS BY BRUSH IN CALM WIND CONDITIONS. THE USE OF AEROSOL IS NOT PERMITTED.
5. IF THE TOWER IS PAINTED, BRUSH PAINT ALL TREATED AREAS TO MATCH TOWER AFTER COLD GALVANIZATION COMPOUND IS ALLOWED TO CURE.

SURFACE PREPARATION:

1. PREPARE SURFACE TO BE WELDED BY REMOVING PAINT OR GALVANIZATION TO BARE METAL USING POWER WIRE BRUSHING IN ACCORDANCE WITH SSPC-SP11. (STEEL STRUCTURES PAINTING COUNCIL). FOLLOWING POWER WIRE BRUSHING CONTRACTOR SHALL POLISH METAL SURFACE WITH HIGH SPEED GRINDER WITH 400+ GRT SANDPAPER.
2. AFTER NEW STEEL INSTALLATION CONTRACTOR TO BRUSH PAINT (2) COATS OF ZRC OR ZINGA COLD GALVANIZATION COMPOUND PER MANUFACTURER'S SPECIFICATIONS.

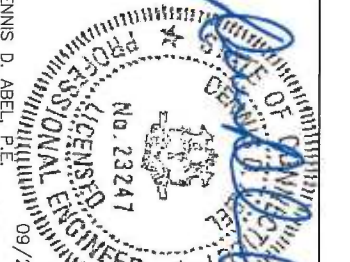
WELDING NOTES:

1. ALL WELDING TO THE EXISTING TOWER SHALL BE PERFORMED BY CERTIFIED WELDERS UTILIZING PROCEDURES QUALIFIED IN ACCORDANCE WITH AWS D1.1 AND AWS C5.4.
2. CONTRACTOR SHALL COMPLY WITH AWS D1.1 FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". CONTRACTOR SHALL SUBMIT CERTIFICATION OF WELDERS TO THE ENGINEER PRIOR TO COMMENCEMENT OF THE WORK.
3. CONTRACTOR RESPONSIBLE FOR TEMPORARY HEAT SHIELDING AS REQUIRED DURING WELDING.
4. CONTRACTOR RESPONSIBLE FOR VIEWING EXISTING TOWER FOR LOOSE AND FLAMMABLE MATERIAL PRIOR TO WELDING FLAT PLATE.
5. ALL WELDS TO BE VISUALLY INSPECTED BY A CERTIFIED WELD INSPECTOR PER AWS D1.1.

PREPARED BY:

 6521 MERIDEN DRIVE
 RALEIGH, NC 27616
 PHONE: 919-755-1012
 FAX: 919-755-1031

PREPARED FOR:


09/26/14
 DENNIS D. ABEL, P.E.
 CONNECTICUT LIC. NO. 23247


DRAWN BY: LWL
 CHECKED BY: JMS
 ENG APP'VD: DDA
 PROJECT NO: 146DCX1400

SUBMITTALS		
DATE	DESCRIPTION	REV
09/26/14	CONSTRUCTION	0

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SITE NAME:
E MAIN STREET
 SITE NUMBER:
 11201
 SITE ADDRESS:
 21 E MAIN STREET
 CLINTON, CT 06413

SHEET TITLE
 GENERAL NOTES
 SHEET NUMBER
N-2

67.5'

47.5'

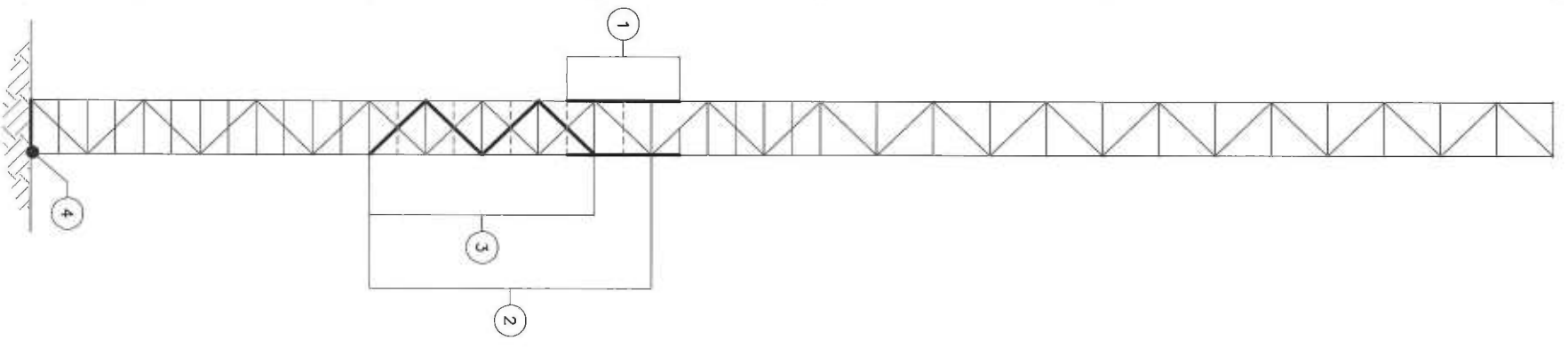
35.0'

27.5'
25.0'

15.0'

5.0'

0.0'



TOWER ELEVATION
SCALE: NTS

- APPURTENANCES MAY INTERFERE WITH PROPOSED MODIFICATIONS.
- ALL MODIFICATIONS TO BE INSTALLED CONTINUOUSLY THROUGH EXISTING EQUIPMENT (UNLESS NOTED OTHERWISE). ALL EXISTING EQUIPMENT NOT TO BE DAMAGED OR TAKEN OFF AIR DURING INSTALLATION.
- ANTENNA GRAPHICS NOT SHOWN FOR CLARITY. SEE STRUCTURAL ANALYSIS REPORT FOR EXISTING ANTENNA LOADING.
- COAX GRAPHICS NOT SHOWN FOR CLARITY. SEE STRUCTURAL ANALYSIS REPORT FOR EXISTING COAX CONFIGURATION.

TOWER MODIFICATION SCHEDULE			
NO.	TYPE OF MODIFICATION	BOTTOM ELEV. (FT)	TOP ELEV. (FT)
1	INSTALLATION OF NEW ANGLE LEG REINFORCEMENT. SEE SHEET S-2 FOR DETAILS.	23.8±	28.8±
2	REMOVAL OF EXISTING SUBHORIZONTALS.	15.0±	27.5±
3	INSTALLATION OF NEW DIAGONALS. SEE S-3 FOR DETAILS.	15.0±	25.0±
4	INSTALLATION OF NEW BASE PLATE STIFFENERS. SEE S-4 FOR DETAILS.	-	0.0±

TOWER FINISH: GALVANIZED

PREPARED BY:

 6921 MERIDIAN DRIVE
 RALEIGH, NC 27616
 PHONE: 919-755-1012
 FAX: 919-755-1031

PREPARED FOR:

 CTI TOWERS

09/26/14
 DENNIS D. ABEL, P.E.
 PROFESSIONAL ENGINEER
 No. 23247
 CONNECTICUT LIC. NO. 23247

DRAWN BY: LWL
 CHECKED BY: JAS
 ENG APPVD: DDA
 PROJECT NO: 146DCX1400

SUBMITTALS		
DATE	DESCRIPTION	REV
09/26/14	CONSTRUCTION	0

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SITE NAME:
E MAIN STREET
 SITE NUMBER:
11201
 SITE ADDRESS:
**21 E MAIN STREET
 CLINTON, CT 06413**

SHEET TITLE
MODIFICATION SCHEDULE

SHEET NUMBER
S-1

ANGLE LEG REINFORCEMENT INSTALLATION SCHEDULE

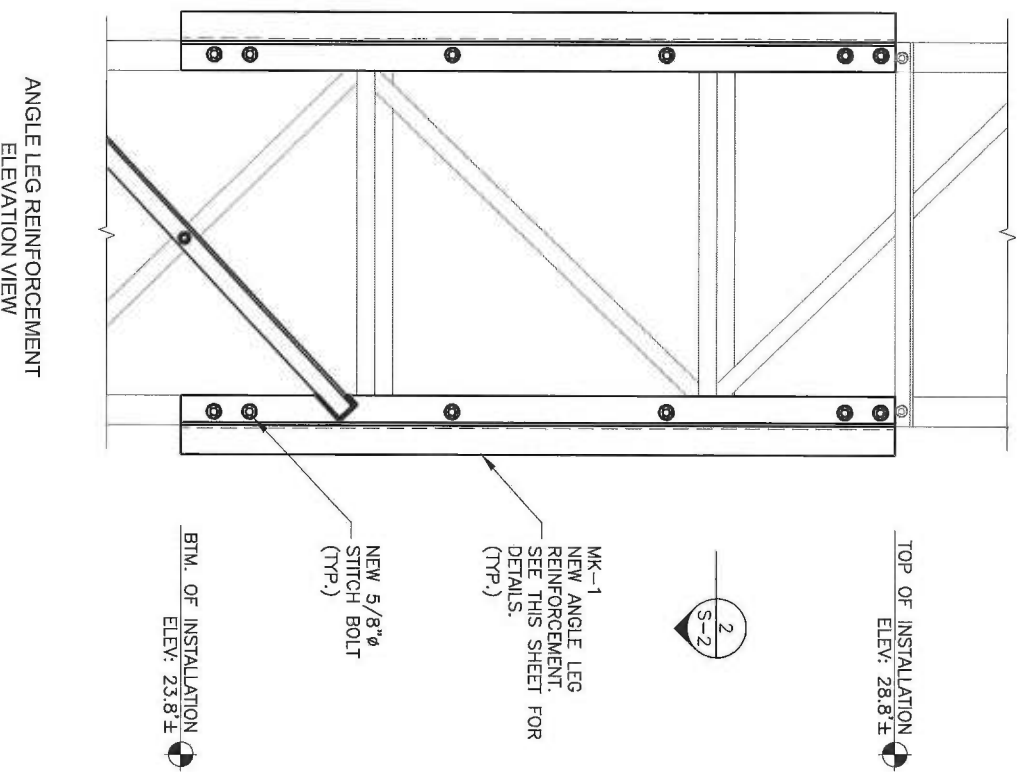
ELEVATION	EXISTING LEG SIZE	QTY.	NEW ANGLE REINFORCEMENT	PRELIMINARY LENGTH*	MAX BOLT SPACING	BOLT SIZE	HOLE SIZE	GAGE LINE**	EDGE DISTANCE***	BOLT GRADE
23.8 ± TO 28.8 ±	L2 1/2X2 1/2X1/4	8	L2 1/2X2 1/2X1/4	5'-0" ±	18"	(48) 5/8" φ	11/16" φ	1 3/8"	1 1/4"	A325N

*CONTRACTOR TO FIELD VERIFY LENGTH PRIOR TO MATERIAL ORDERS.

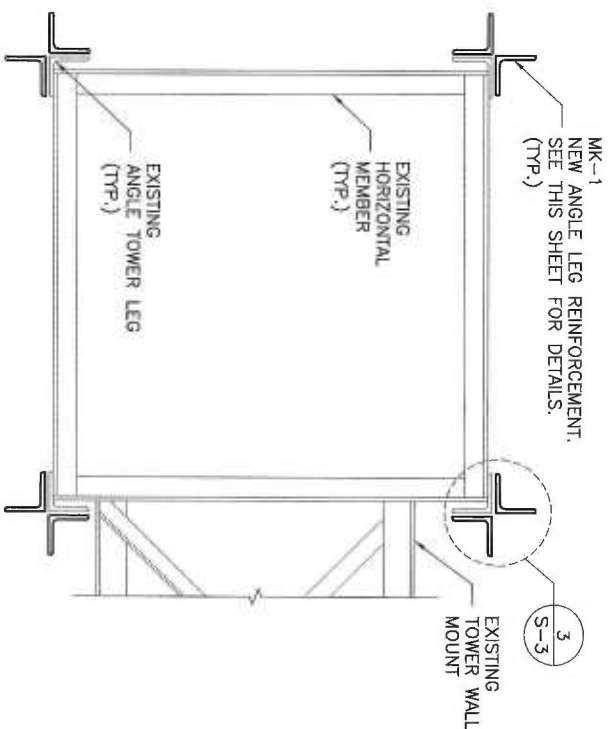
**DISTANCE FROM HEEL OF ANGLE TO CENTER OF BOLT HOLE.

***EDGE DISTANCE FROM CENTER OF BOLT HOLE TO EDGE OF CONNECTED PART.

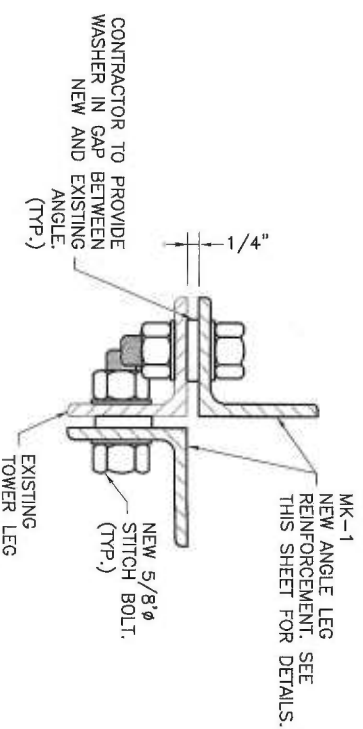
EXISTING MEMBER BOLTS NOT SHOWN FOR CLARITY.



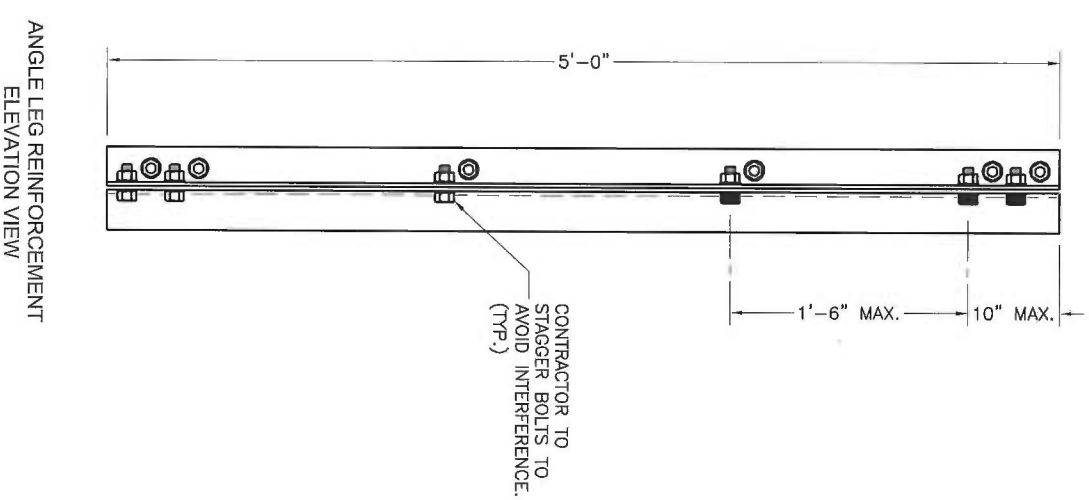
1 ELEVATION
S-2 NTS



2 ELEVATION
S-2 NTS



3 DETAIL
S-2 NTS

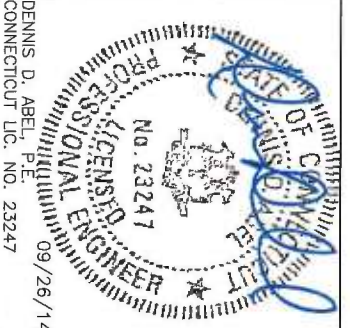


MK-1 ELEVATION
S-2 NTS



ENGINEERING INNOVATION

PREPARED FOR:



DRAWN BY: LWL
CHECKED BY: JAS
ENG APPVD: DDA
PROJECT NO: 146DCX1400

SUBMITTALS		
DATE	DESCRIPTION	REV
09/26/14	CONSTRUCTION	0

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SITE NAME:
E MAIN STREET
SITE NUMBER:
11201
SITE ADDRESS:
**21 E MAIN STREET
CLINTON, CT 06413**

SHEET TITLE
ANGLE LEG REINFORCEMENT DETAILS

SHEET NUMBER
S-2

PREPARED BY:

FDH
 ENGINEERING INNOVATION
 6921 MERIDEN DRIVE
 RALEIGH, NC 27616
 PHONE: 919-755-1012
 FAX: 919-755-1031

PREPARED FOR:

CTI TOWERS

STATE OF CONNECTICUT
 PROFESSIONAL ENGINEER
 No. 23247
 DENNIS D. ABEL, P.E.
 09/26/14
 CONNECTICUT LIC. NO. 23247

DRAWN BY: LWL
 CHECKED BY: JAS
 ENG. APPROV.: DDA
 PROJECT NO.: 146DCX1400

DATE	DESCRIPTION	REV
09/28/14	CONSTRUCTION	0

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SITE NAME:
E MAIN STREET
 SITE NUMBER:
11201
 SITE ADDRESS:
**21 E MAIN STREET
 CLINTON, CT 06413**

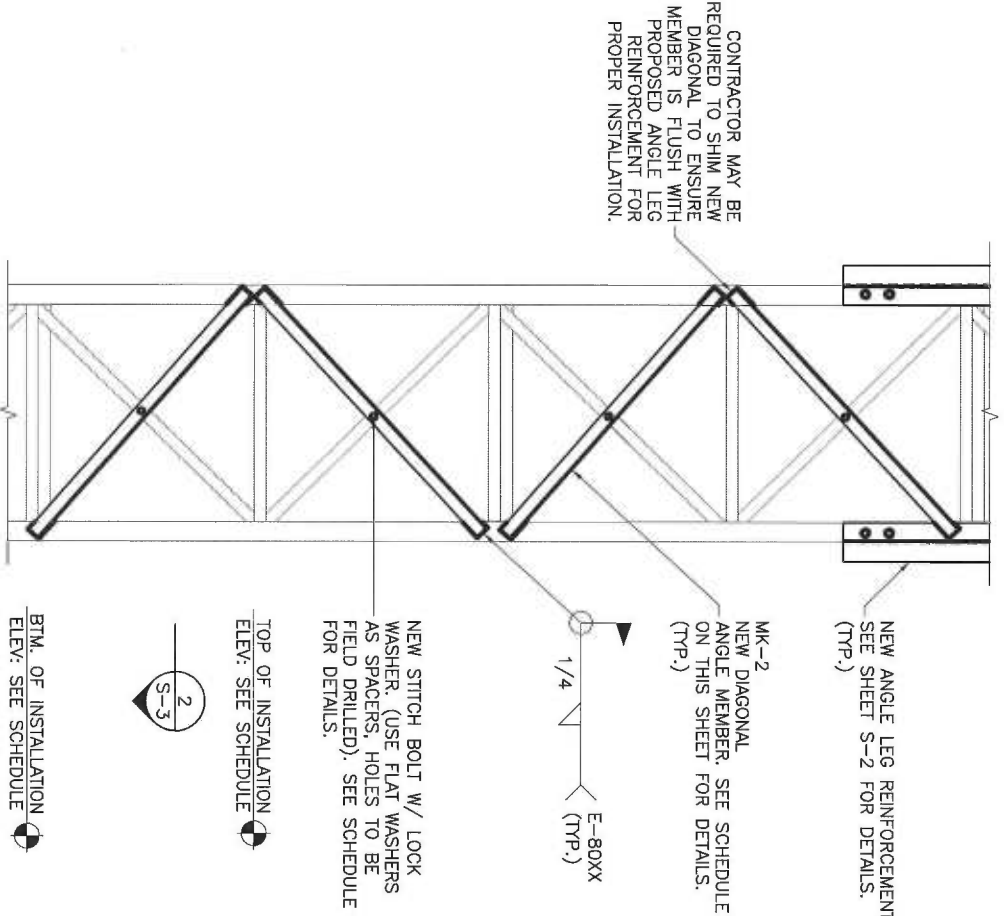
SHEET TITLE
**NEW DIAGONAL
 INSTALLATION DETAILS**
 SHEET NUMBER
S-3

MK-2 REPLACEMENT DIAGONAL SCHEDULE

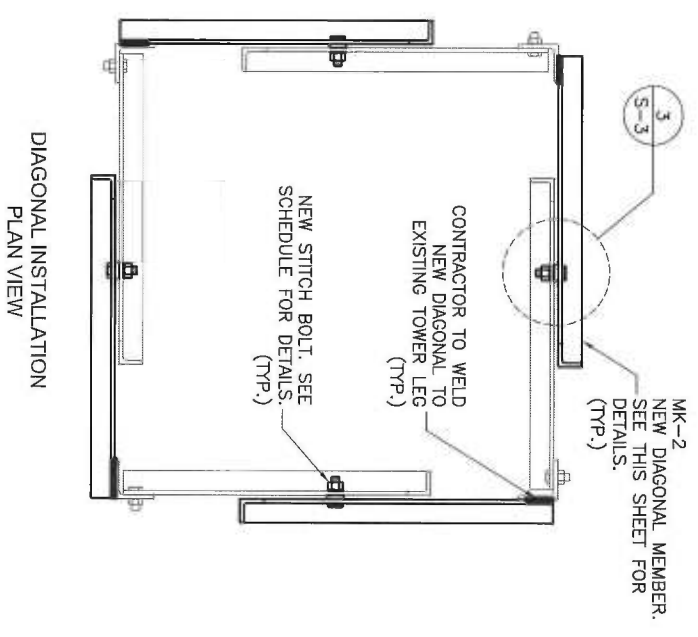
ELEVATION	PROPOSED MEMBER	ESTIMATED LENGTH, A*	STITCH BOLT SIZE	STITCH HOLE SIZE	GAGE LINE**	BOLT GRADE
22.5'± TO 25.0'±	(4) L1 3/4X1 3/4X1/4	3'-6"±	(4) 1/2"Ø	9/16"Ø	1"	A325N
20.0'± TO 22.5'±	(4) L1 3/4X1 3/4X1/4	3'-6"±	(4) 1/2"Ø	9/16"Ø	1"	A325N
17.5'± TO 20.0'±	(4) L1 3/4X1 3/4X1/4	3'-6"±	(4) 1/2"Ø	9/16"Ø	1"	A325N
15.0'± TO 17.5'±	(4) L1 3/4X1 3/4X1/4	3'-6"±	(4) 1/2"Ø	9/16"Ø	1"	A325N

4 BAYS REQUIRE DIAGONAL REPLACEMENT

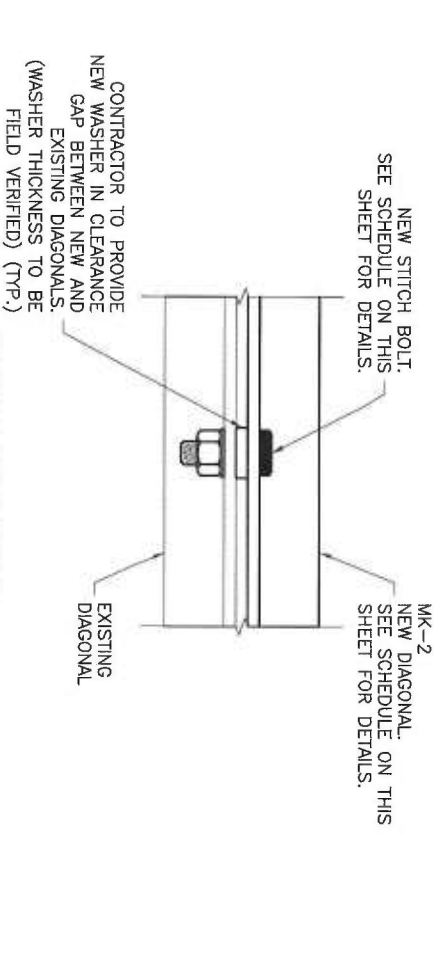
*CONTRACTOR TO FIELD VERIFY LENGTH PRIOR TO MATERIAL ORDERS.
 **DISTANCE FROM HEEL OF ANGLE TO CENTER OF BOLT HOLE.
 ***EDGE DISTANCE FROM CENTER OF BOLT HOLE TO EDGE OF CONNECTED PART.



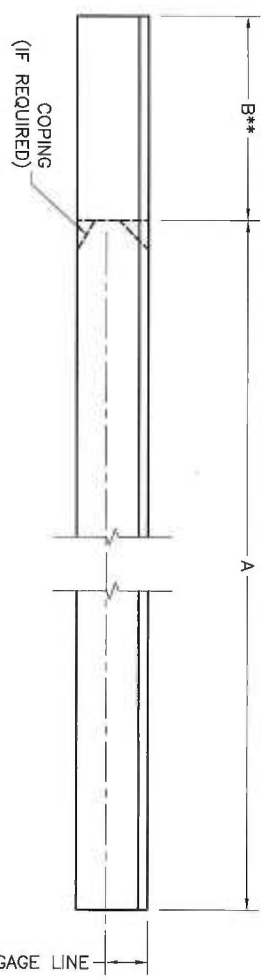
1
 S-3
ELEVATION
 NTS
 DIAGONAL INSTALLATION
 ELEVATION VIEW



2
 S-3
PLAN
 NTS
 DIAGONAL INSTALLATION
 PLAN VIEW



3
 S-3
DETAIL
 NTS
 DIAGONAL INSTALLATION
 PLAN VIEW



* ESTIMATED HOLE LOCATION. CONTRACTOR TO FIELD VERIFY LOCATION OF THIS HOLE PRIOR TO DRILLING HOLE TO ENSURE PROPER FIT. CONTRACTOR TO FIELD CUT EXCESS MATERIAL AFTER HOLE LOCATION IS VERIFIED.

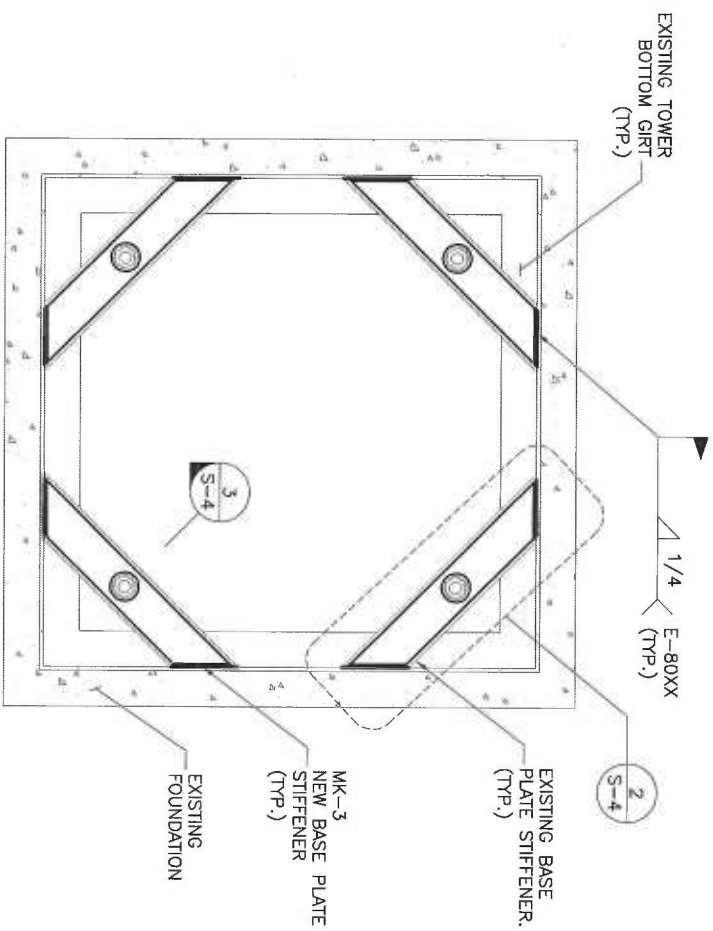
** "B" WE SUGGEST THE PRELIMINARY CUT LENGTH IS 6" LONGER THAN OUR ESTIMATED LENGTH FOR MEMBERS 10' OR LESS, & 12" FOR MEMBERS GREATER THAN 10'.

MK-2
 S-3
DETAIL
 NTS
 DIAGONAL
 FRONT VIEW

**NEW BASE PLATE
STIFFENER MATERIAL LIST**

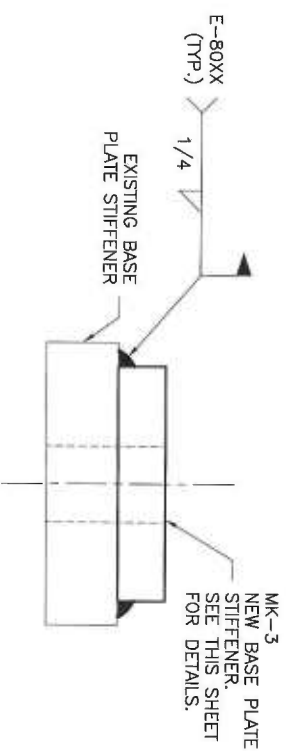
ELEVATION	QTY.	DESCRIPTION
0.0'±	(4) MK-3	NEW BASE PLATE STIFFENER
1 ELEVATION REQUIRES BASE PLATE STIFFENER INSTALLATION		

CONTRACTOR TO INSTALL NEW
BASE PLATE STIFFENER ON
EXISTING BASE PLATE STIFFENER.



BASE PLATE STIFFENER INSTALLATION
PLAN VIEW

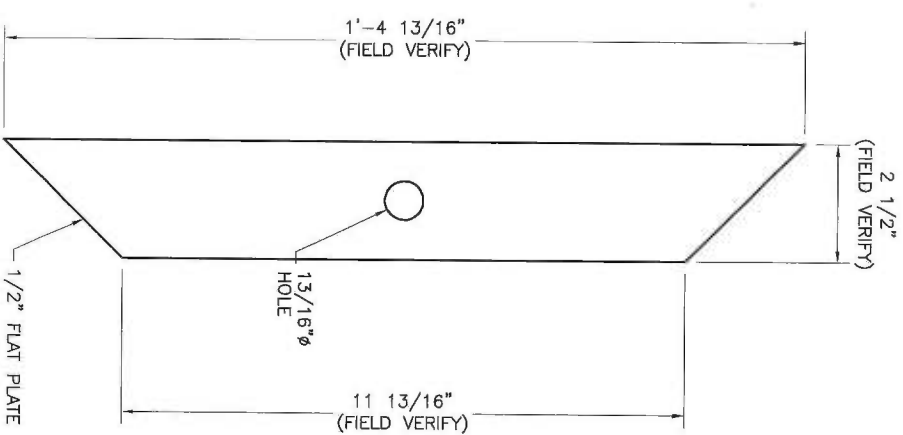
1 PLAN
S-4 NTS



BASE PLATE STIFFENER INSTALLATION
FRONT VIEW

2 DETAIL
S-4 NTS

CONTRACTOR TO FIELD VERIFY ALL
DIMENSIONS OF NEW BASE PLATE
STIFFENER.



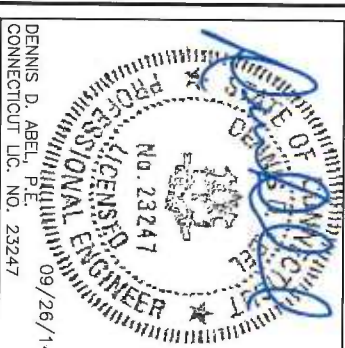
BASE PLATE STIFFENER INSTALLATION
PLAN VIEW

MK-3 DETAIL
S-4 NTS

PREPARED BY:



PREPARED FOR:



DRAWN BY: LWL
CHECKED BY: JAS
ENG APP'VD: DDA
PROJECT NO: 146DCX1400

DATE	DESCRIPTION	REV
09/26/14	CONSTRUCTION	0

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SITE NAME:
E MAIN STREET

SITE NUMBER:
11201

SITE ADDRESS:
21 E MAIN STREET
CLINTON, CT 06413

SHEET TITLE
BASE PLATE STIFFENER
INSTALLATION DETAILS

SHEET NUMBER

S-4



FDH Engineering, Inc., 6521 Meridien Drive, Raleigh, NC, 27616, Ph. 919.755.1012, Fax 919.755.1031

December 19, 2014

Ms. Mikala Mann
CTI Towers, Inc.
38 Pond Street, Suite 305
Franklin, MA 02038

RE: 67.5' Lattice Tower
CTI Towers Site Name: E Main St Clinton
CTI Towers Site ID: 11021
T-Mobile Site Name: Clinton/ I-95/ X63/ At_1
T-Mobile Site ID: CT11031B
Site Address: 21 E Main Street, Clinton, CT 06413
FDH Project Number: 146IDM1400

Dear Mikala:

Per your request, FDH Engineering, Inc. has reviewed the previous structural analysis and the revised loading for the 67.5' Lattice Tower located in Clinton, CT. The previous structural analysis report by FDH Engineering, Inc. (Project No. 146HAZ1400) dated November 21, 2014, stipulates the tower was analyzed with the appurtenance loading outlined in **Table 1** on the following page.

Based on the working percentage calculated in the previous analysis, the load resulting from the current configuration (see **Table 1**) combined with T-Mobile's revised loading (see **Table 2**), will not overstress the tower and will meet the requirements of the TIA/EIA-222-F standards, provided the modifications outlined in FDH engineering, Inc. (Project No. 146DCX1400) have been correctly installed. Furthermore, since no foundation information was available at the time of the analysis, we cannot comment on the capacity of the foundation at this time. The existing coax should be used with the existing and proposed equipment.

Our assessment has been made assuming all information provided to FDH Engineering, Inc. is accurate and that the tower has been properly erected and maintained.

In conclusion, the revised T-Mobile installation should meet or exceed all applicable standards and should therefore be considered safe. Should you require additional information, please do not hesitate to contact our office.

Sincerely,

Drew Alexander, EI
Project Engineer

Reviewed By:

Dennis D. Abel, PE
Director – Structural Engineering
CT PE License No. 23247



Table 1 – Previously Analyzed/Existing Appurtenance Loading

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type	Total EPA (ft ²)*
60	(3) RFS APX16DWV-16DWVS (3) Commscope LNX-6515DS-VTM (6) Ericsson KRY 112 71 (6) Andrew ECC1920-VPUB (3) Andrew Smart Bias T	(12) 7/8"	T-Mobile	60	(3) Standoff T-Arms (assumed CaAa = 3.75 ft ² ea.)	47.7

* Total EPA listed without ice per TIA standard and does not include mount area.

Table 2 – Revised Appurtenance Loading

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type	Total EPA (ft ²)*	EPA Increase (%)
60	(3) RFS APX16DWV-16DWVS (3) Commscope LNX-6515DS-VTM	(12) 7/8"	T-Mobile	60	(3) Standoff T-Arms (assumed CaAa = 3.75 ft ² ea.)	42.8	-10.3

* Total EPA listed without ice per TIA standard and does not include mount area.

EXHIBIT C

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11031B

Clinton / I-95 / X63 / AT_1
21 East Main Street
Clinton, CT 06413

October 1, 2014

EBI Project Number: 62145259

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	44.72 %

October 1, 2014

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11031B – Clinton / I-95 / X63 / AT_1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **21 East Main Street, Clinton, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 700 MHz Band is $467 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS and AWS bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **21 East Main Street, Clinton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation 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.

- 6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWVS-E-A20** has a maximum gain of **16.3 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antenna mounting height centerline of the proposed antennas is **60 feet** above ground level (AGL).
- 9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	60	Height (AGL):	60	Height (AGL):	60
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	# PCS Channels:	6
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	3,833.82	ERP (W):	3,833.82	ERP (W):	3,833.82
Antenna A1 MPE%	12.62	Antenna B1 MPE%	12.62	Antenna C1 MPE%	12.62
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	60	Height (AGL):	60	Height (AGL):	60
Frequency Bands	700 Mhz	Frequency Bands	700 Mhz	Frequency Bands	700 Mhz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	445.37	ERP (W):	445.37	ERP (W):	445.37
Antenna A2 MPE%	2.28	Antenna B2 MPE%	2.28	Antenna C2 MPE%	2.28

Site Composite MPE %	
Carrier	MPE%
T-Mobile	44.72
No Additional Carriers On Site	
Site Total MPE %:	44.72 %

T-Mobile Sector 1 Total:	14.91 %
T-Mobile Sector 2 Total:	14.91 %
T-Mobile Sector 3 Total:	14.91 %
Site Total:	44.72 %

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	14.91 %
Sector 2:	14.91 %
Sector 3 :	14.91 %
T-Mobile Total:	44.72 %
Site Total:	44.72 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **44.72%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.



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