EM-SPRINT-034-121119

HPC Wireless Services
46 Mill Plain Rd.
Floor 2
Danbury, CT, 06811
P.: 203.797.1112

November 15, 2012

ORIGINAL

RECEIVED
NOV 19 2012
CONNECTICUT
SITING COUNCIL

VIA OVERNIGHT COURIER

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051
Attn: Ms. Linda Roberts, Executive Director

Re: Sprint Spectrum, L.P. – exempt modification
303 Boxwood Lane, Danbury, Connecticut

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of Sprint Spectrum, L.P. ("Sprint"). Sprint is undertaking modifications to certain existing sites in its Connecticut system in order to implement updated technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Mayor of the City of Danbury.

Sprint plans to modify the existing wireless communications facility owned by Western Connecticut State University and located at 303 Boxwood Lane in the City of Danbury (coordinates 41°23'41.93" N, 73°29'12.27" W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to Sprint's operations at the site.

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

1. Sprint will replace three (3) existing CDMA antennas with three (3) dual-band panel antennas on existing mounts at a center line of approximately 89'. Six (6) RRHs

(remote radio heads) will be mounted to the existing frames adjacent to the antennas. Sprint will also install three (3) hybriflex cables along the existing coaxial cable run. The proposed modifications will not extend the height of the approximately 100' structure.

2. The proposed changes will not extend the site boundaries. Sprint will replace two (2) cabinets, add one (1) cabinet and install a fiber box on unistruts, all on the existing equipment pad. These changes will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

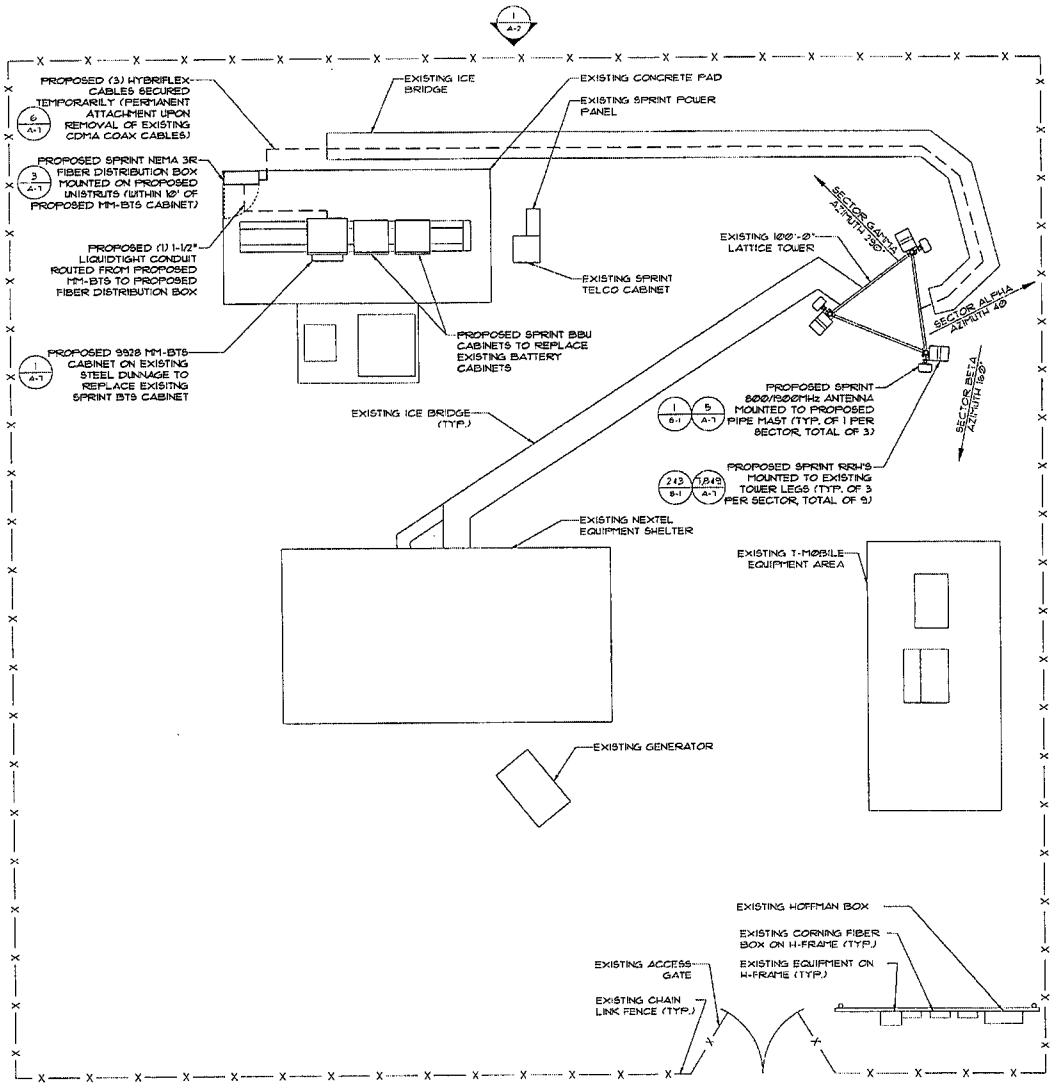
4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by EBI Consulting, Sprint's operations at the site will result in a power density of approximately 64.739%; the combined site operations will result in a total power density of approximately 91.919%.

Please feel free to contact me by phone at (860) 798-7454 or by e-mail at jgaudet@hpcwireless.com with questions concerning this matter. Thank you for your consideration.

Respectfully yours,

Jennifer Young Gaudet

cc: Honorable Mark Boughton, Mayor, City of Danbury
Western Connecticut State University (underlying property owner)




1 COMPOUND PLAN
SCALE = 1/4" = 1'-0"

## STRUCTURAL NOTE

1. SEE TOWER NOTES ON DWG. GN-2
2. REINFORCEMENT WORK TO BE COMPLETED AS REQUIRED IN DRAWINGS PROVIDED TO THE ARCHITECT BY KM CONSULTING ENGINEERS, TITLED "TOWER REINFORCEMENT DRAWINGS AND SPECIFICATIONS, DATED 9/21/2012
3. ARCHITECT MUST BE NOTIFIED UPON COMPLETION OF TOWER REINFORCEMENT WORK

Sprint VISION
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent
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WESTFORD, MA 01886
P: (978) 952-1600

Salient ARCHITECTS, LLC
New Jersey Office:
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Englewood, NJ 07631
P: 201-567-0032 - F: 201-567-0586
New England Office:
15 New England Executive Park
Burlington, MA 01803
P: 781-791-8010 - F: 781-791-8020



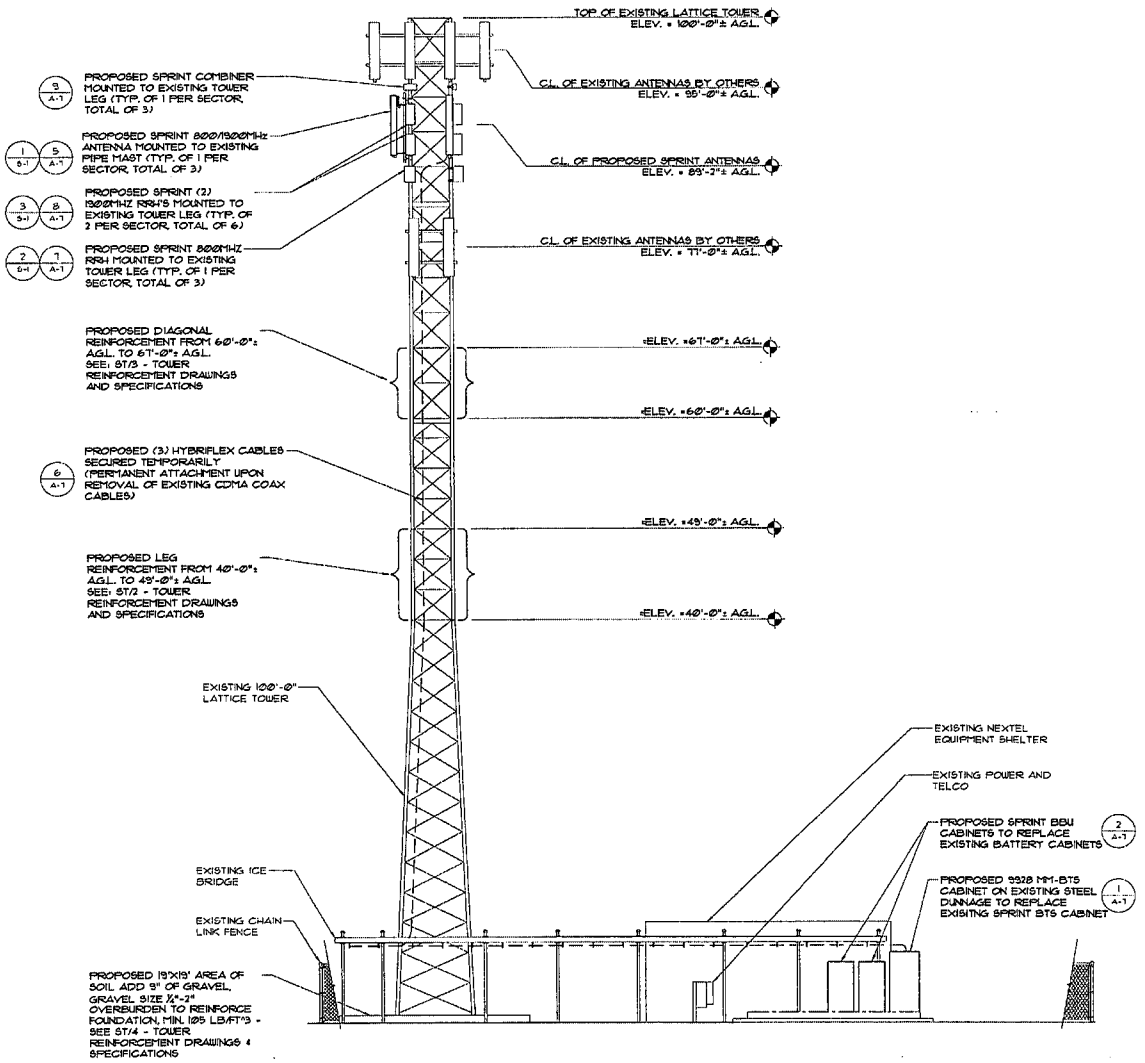
SUBMITTALS

| NO | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 06/04/12 | PRELIMINARY | PJP |
| 2 | 09/21/12 | AS PER CLIENT COMMENT | PG |
| 3 | 09/28/12 | ISSUED AS FINAL | AD |

SITE NUMBER: CT43XC836
SITE NAME: DANBURY-W. CT UNIVERSITY
SITE ADDRESS: 303 BOXWOOD LANE DANBURY, CT 06810

SHEET TITLE: COMPOUND PLAN

SALIENT PROJ. NO. CT43XC836
DATE:
CHECKED BY: ADC
SHEET NO: A-1




1 ELEVATION

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

## ANTENNA CONFIGURATION NOTE

ALL EXISTING CDMA ANTENNAS TO BE REMOVED / REPLACED WITH NETWORK VISION ANTENNAS FOR FINAL CONFIGURATION.

ANTENNA SEPARATION TO BE FIELD VERIFIED BY THE GENERAL CONTRACTOR.

## STRUCTURAL NOTE

1. SEE TOWER NOTES ON DWG. GN-2
2. REINFORCEMENT WORK TO BE COMPLETED AS REQUIRED IN DRAWINGS PROVIDED TO THE ARCHITECT BY KM CONSULTING ENGINEERS, TITLED "TOWER REINFORCEMENT DRAWINGS AND SPECIFICATIONS, DATED 9/21/2012
3. ARCHITECT MUST BE NOTIFIED UPON COMPLETION OF TOWER REINFORCEMENT WORK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New England Office:
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Burlington, MA 01803
P: 781-791-5018 - F: 781-791-5013


Charles J. Whalen A.I.A.
CT #.19239



SUBMITTALS

| NO | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 06/04/12 | PRELIMINARY | PJP |
| 2 | 09/21/12 | AS PER CLIENT COMMENT | PS |
| 3 | 09/28/12 | ISSUED AS FINAL | AD |

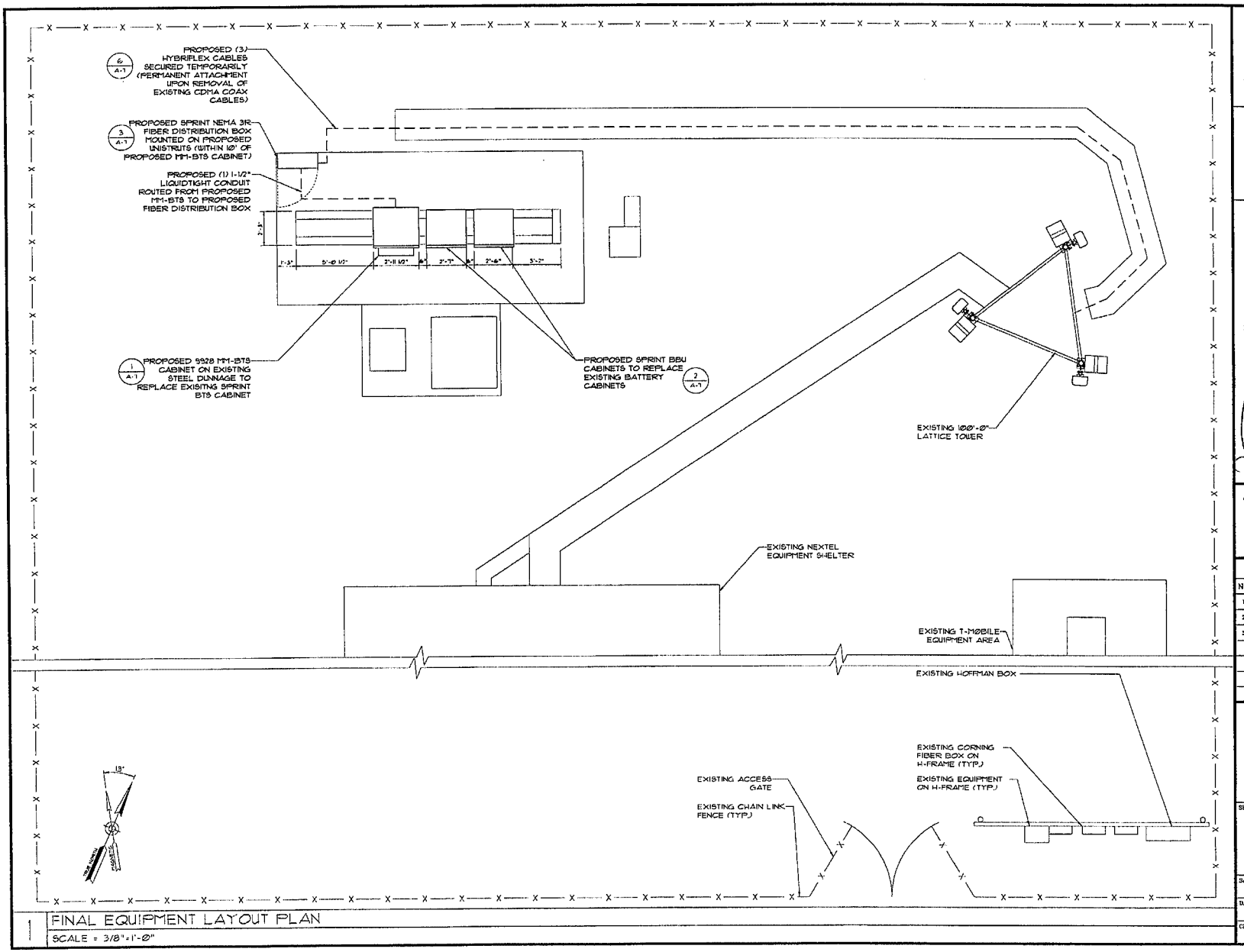
SITE NUMBER:
CT43XC836

SITE NAME:
DANBURY-W. CT UNIVERSITY

SITE ADDRESS:
303 BOXWOOD LANE
DANBURY, CT 06810

SHEET TITLE:
ELEVATION

SALIENT PROJ. NO: CT43XC836
DATE:
CHECKED BY: ADC
SHEET NO: A-2




1 FINAL EQUIPMENT LAYOUT PLAN

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


Sprint VISION
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
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New England Office:
15 New England Executive Park
Burlington, MA 01803
P: 781-791-0019 - F: 781-791-0018
Charles Nassiff, A.I.A.
CT # 10258




SUBMITTALS

| NO | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 05/24/12 | PRELIMINARY | PJP |
| 2 | 05/21/12 | AS PER CLIENT COMMENT | PG |
| 3 | 07/26/12 | ISSUED AS FINAL | AD |

SITE NUMBER:
CT43XC836

SITE NAME:
DANBURY-W. CT UNIVERSITY

SITE ADDRESS:
303 BOXWOOD LANE
DANBURY, CT 06810

SHEET TITLE:
ENLARGED EQUIPMENT CABINET LAYOUT

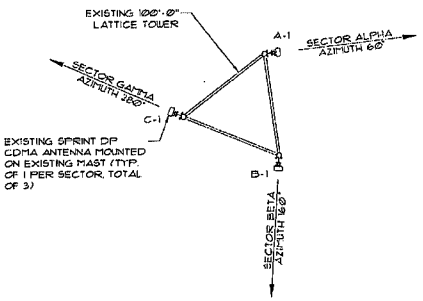
SALIENT PROJ. NO: CT43XC836

DATE:

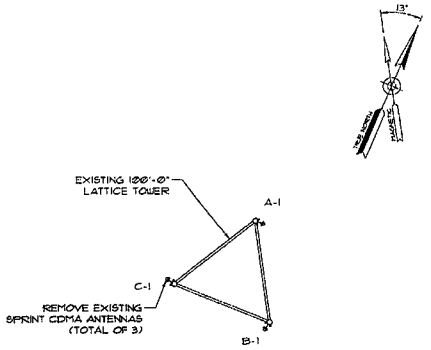
CHECKED BY: ADC

SHEET NO: A-5

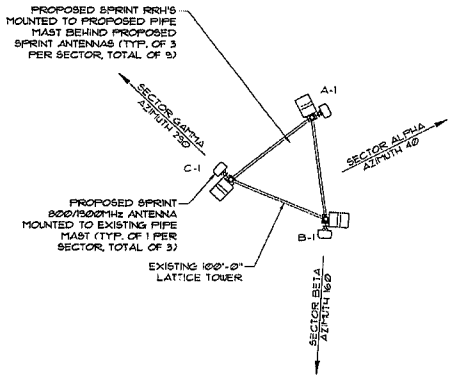
EXISTING ANTENNA PLAN




INTERIM ANTENNA PLAN




FINAL ANTENNA PLAN




## 1 ANTENNA SCENARIO

SCALE = N.T.S.

| | POSITION | ANTENNA STATUS | FREQUENCY (MHZ) | ANTENNA MAKE | ANTENNA MODEL | AZIMUTHS EXISTING (FOR REFERENCE) | AZIMUTHS PROPOSED | MECHANICAL DOWN TILT | ELECTRICAL DOWN TILT | RAD CENTER (A.G.L.) | *HYBRIFLEX CABLE LENGTH (FT.) | RRH MODEL | TOP COAX JUMPER SIZE (IN.) | *TOP COAX JUMPER LENGTH (FT.) | TOP COAX JUMPER MAKE | TOP COAX JUMPER MODEL | COMBINER | *COMBINER JUMPER LENGTH (FT.) | ANTENNA COLOR CODING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALPHA | A-1 | PROPOSED | 800/1900 | RFS | APXV8PP18-C-A20 | 60° | 40° | 0° | -6° | 89'-2" | 175 | (1) 800MHz | 1/2 | 10 | RFS | (2) LCF12-50J | -- | -- | TBD |
| | | | | | | | | 0° | -2° | | | (2) 1900MHz | 1/2 | 10 | RFS | (4) LCF12-50J | IBC1900HB-2 | 6 | |
| BETA | B-1 | PROPOSED | 800/1900 | RFS | APXV8PP18-C-A20 | 160° | 160° | 0° | -3° | 89'-2" | 175 | (1) 800MHz | 1/2 | 10 | RFS | (2) LCF12-50J | -- | -- | TBD |
| | | | | | | | | 0° | -2° | | | (2) 1900MHz | 1/2 | 10 | RFS | (4) LCF12-50J | IBC1900HB-2 | 6 | |
| GAMMA | C-1 | PROPOSED | 800/1900 | RFS | APXV8PP18-C-A20 | 210° | 290° | 0° | 0° | 89'-2" | 175 | (1) 800MHz | 1/2 | 10 | RFS | (2) LCF12-50J | -- | -- | TBD |
| | | | | | | | | 0° | 0° | | | (2) 1900MHz | 1/2 | 10 | RFS | (4) LCF12-50J | IBC1900HB-2 | 6 | |

* CONTRACTOR TO FIELD VERIFY ALL CABLE/JUMPER LENGTHS AGAINST CURRENT B.O.M.

## 2 RF SYSTEM SCHEDULE

SCALE = N.T.S.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MAHWAH, NJ 07495
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Sa Salient ARCHITECTS, LLC
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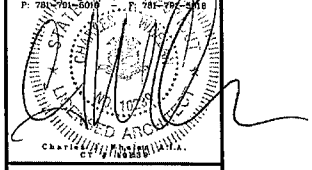





SUBMITTALS

| NO | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 06/04/12 | PRELIMINARY | PJP |
| 2 | 09/21/12 | AS PER CLIENT COMMENT | RS |
| 3 | 09/28/12 | ISSUED AS FINAL | AD |

SITE NUMBER: CT43XC836
SITE NAME: DANBURY-W. CT UNIVERSITY
SITE ADDRESS: 303 BOXWOOD LANE DANBURY, CT 06810

SHEET TITLE: ANTENNA SCENARIO AND RF SYSTEM SCHEDULE

SALIENT PROJ. NO: CT43XC836
DATE:
CHECKED BY: ADC
SHEET NO: A-6

KM Consulting Engineers, Inc.
Wireless Engineering and Project Management

October 3, 2012

Mr. Charles Whelan
Salient Associates, LLC
8 East Palisade Avenue
Englewood, NJ 07631

Re: Danbury
Salient Site No. CT43XC836
KM Project No. 120741.01

Dear Mr. Whelan:

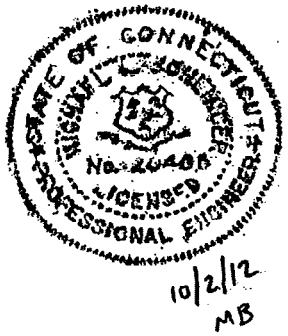
Further to your request, KM Consulting Engineers, Inc. (KMCE) has re-analyzed the CT43XC836 self support tower to include the proposed reinforcement as per KMCE drawings dated 9/21/12.

With the proposed modifications, KMCE finds the tower to have a stress rating of 99.6%, and therefore is deemed acceptable as per the TIA/EIA-222-F standards. See attached tnxTower output pages for more details.

Should you have any questions or comments, please do not hesitate to contact our office.

Sincerely,
**KM CONSULTING ENGINEERS, INC.**

Michael Bohlinger, PE
Principal
CT License No. 20405




10/2/12
MB

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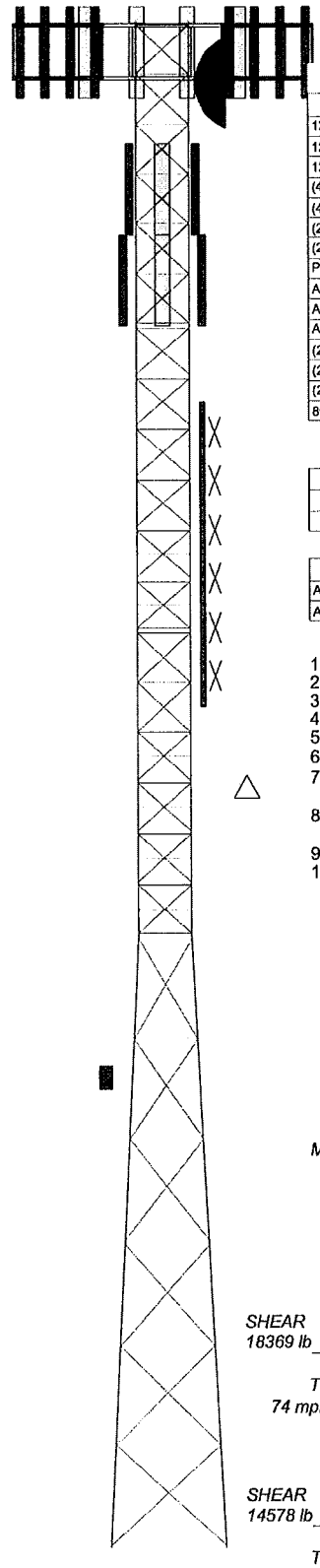
| Section | T14 | T13 | T12 | T11 | T10 | T9 | T8 | T7 | T6 | T5 | T4 | T3 | T2 | T1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Legs | P5x.375 (GR) | | A | | | P3x.3 (GR) | | | | P2.5x.276 (GR) | | | A500-50 | P2.5x.276 |
| Leg Grade | A500-50 | | | | | A500M-61 | | | | | | | | |
| Diagonals | L2 1/2x2 1/2x3/16 | L2x2x3/16 | | | | SR 3/4 | | SR (2) 5/8" SR | | SR 5/8 | | | | |
| Diagonal Grade | | | | | | A36 | | | | | | | | |
| Top Girts | N.A. | | 2L1 1/2x1 1/2x3/16 | | B | | | 2L1 1/2x1 1/2x3/16 | | | | L1 1/2x1 1/2x3/16 | | |
| Bottom Girts | N.A. | | C | | N.A. | | | C | | | N.A. | L1 1/2x1 1/2x3/16 | | |
| Horizontals | | N.A. | | | | | C | | | | N.A. | | | |
| Sec. Horizontals | N.A. | | L2 1/2x2 1/2x5/16 | | | | N.A. | L2x2x1/4 | | | N.A. | | | |
| Face Width (ft) 7.5 | 5.5 | | | | | | | | | | | | | 3.5 |
| # Panels @ (ft) | 6 @ 6.55556 | | | 4 @ 3.16667 | | | 2 @ 3.25 | | | 6 @ 3 | | | 6 @ 3.27778 | |
| Weight (lbs) 9374.2 | 2899.5 | 2737.8 | 310.7 | 272.0 | 302.6 | 290.5 | 501.9 | 287.0 | 249.3 | 187.4 | 187.4 | 187.4 | 187.4 | 772.2 |

100.0 ft
80.0 ft
76.7 ft
73.3 ft
70.0 ft
66.7 ft
63.3 ft
60.0 ft
53.3 ft
50.0 ft
46.7 ft
43.3 ft
40.0 ft
20.0 ft
0.0 ft



## DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|---|---|---|
| 12' Boom Starmount | 98 | 800 MHz RRH (Sprint) | 89 |
| 12' Boom Starmount | 98 | 800 MHz RRH (Sprint) | 89 |
| 12' Boom Starmount | 98 | APX16PV-16PVL-X w/mount pipe (T-Mobile) | 83 |
| (4) DB844H90 | 98 | APX16PV-16PVL-X w/mount pipe (T-Mobile) | 83 |
| (4) DB844H90 | 98 | APX16PV-16PVL-X w/mount pipe (T-Mobile) | 83 |
| (2) 60"x12"x4" Panel Antenna | 98 | (2) ATMAA1412D-1A20 Twin TMA (T-Mobile) | 80 |
| (2) 71"x10"x5" Panel Antenna | 98 | (2) ATMAA1412D-1A20 Twin TMA (T-Mobile) | 80 |
| Parabolic Grid | 96 | 4-Bay 6810 w/Radome | 65 |
| APXVSPP18-C-A20 (Sprint) | 89 | 2.5" Tube x 2' Standoff (Sprint) | 30 |
| APXVSPP18-C-A20 (Sprint) | 89 | GPS (Sprint) | 30 |
| APXVSPP18-C-A20 (Sprint) | 89 | | |
| (2) 1900 MHz RRH (Sprint) | 89 | | |
| (2) 1900 MHz RRH (Sprint) | 89 | | |
| (2) 1900 MHz RRH (Sprint) | 89 | | |
| 800 MHz RRH (Sprint) | 89 | | |

## SYMBOL LIST

| MARK | SIZE | MARK | SIZE |
|---|---|---|---|
| A | P3x.3(GR) w/ 0.75" threaded rod | C | 2L1 1/2x1 1/2x3/16 |
| B | 2L1 1/2x1 1/2x1/8 | | |

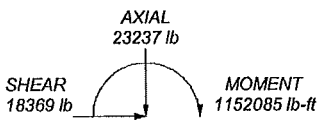
## MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---|---|---|---|---|---|
| A500-50 | 50 ksi | 62 ksi | A500M-61 | 61 ksi | 75 ksi |
| A36 | 36 ksi | 58 ksi | | | |

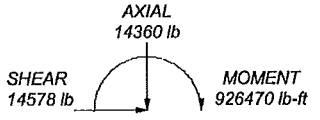
## TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. Grouted pipe f'c is 8 ksi
6. Weld together tower sections have flange connections.
7. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
8. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
9. Welds are fabricated with ER-70S-6 electrodes.
10. TOWER RATING: 99.6%

*MAX. CORNER REACTIONS AT BASE:*
*DOWN: 181005 lb*
*UPLIFT: -165909 lb*
*SHEAR: 12760 lb*




*TORQUE 1997 lb-ft*
*74 mph WIND - 0.5000 in ICE*




*TORQUE 2269 lb-ft*
*REACTIONS - 85 mph WIND*


*KM Consulting Engineers Inc.*
32 West Upper Ferry Road
Ewing, NJ. 08628
Phone: (609) 538-0400
FAX: (609) 538-8858


| | | | |
|---|---|---|---|
| Job: *CT43XC836 LC1* | | | |
| Project: *100 ft. Self Support Tower* | | | |
| Client: Salient Associates | Drawn by: Michael Bohlinger | App'd: | |
| Code: TIA/EIA-222-F | Date: 10/03/12 | Scale: NTS | |
| Path: K:\Salient Associates\Structural CT Sprint Job\CT43XC836 Engineering\CT43XC836 ref-forced en | | Dwg No. E-1 | |

# Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P lb | $SF*P_{allow}$ lb | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| T1 | 100 - 80 | Leg | P2.5x.276 | 3 | -28754.00 | 76501.53 | 37.6 | Pass |
| | | Diagonal | 5/8 | 10 | 6519.77 | 8833.52 | 73.8 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 17 | -4743.19 | 4905.28 | 96.7 | Pass |
| | | Top Girt | L1 1/2x1 1/2x3/16 | 5 | -2486.63 | 4427.01 | 56.2 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 8 | -1894.96 | 4427.01 | 42.8 | Pass |
| T2 | 80 - 76.6667 | Leg | P2.5x.276 (GR) | 63 | -36246.90 | 96899.10 | 37.4 | Pass |
| | | Diagonal | 5/8 | 67 | 7108.00 | 8833.52 | 80.5 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 65 | -3529.75 | 15516.40 | 22.7 | Pass |
| T3 | 76.6667 - 73.3333 | Leg | P2.5x.276 (GR) | 75 | -44249.20 | 96899.10 | 45.7 | Pass |
| | | Diagonal | 5/8 | 79 | 7489.52 | 8833.52 | 84.8 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 77 | -5457.26 | 15516.40 | 35.2 | Pass |
| T4 | 73.3333 - 70 | Leg | P2.5x.276 (GR) | 87 | -53226.30 | 96899.10 | 54.9 | Pass |
| | | Diagonal | 5/8 | 91 | 8089.33 | 8833.52 | 91.6 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 89 | -5316.05 | 15516.40 | 34.3 | Pass |
| T5 | 70 - 66.6667 | Leg | P2.5x.276 (GR) | 99 | -62460.10 | 96899.10 | 64.5 | Pass |
| | | Diagonal | 5/8 | 103 | 8250.62 | 8833.52 | 93.4 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 101 | -5251.07 | 15516.40 | 33.8 | Pass |
| T6 | 66.6667 - 63.3333 | Leg | P2.5x.276 (GR) | 111 | 68302.20 | 90119.07 | 75.8 | Pass |
| | | Diagonal | (2) 5/8" SR | 118 | 10893.00 | 17512.15 | 62.2 | Pass |
| | | Secondary Horizontal | L2x2x1/4 | 121 | -1430.50 | 16216.74 | 8.8 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 113 | -6423.47 | 15516.40 | 41.4 | Pass |
| T7 | 63.3333 - 60 | Leg | P2.5x.276 (GR) | 126 | 79292.20 | 90119.07 | 88.0 | Pass |
| | | Diagonal | (2) 5/8" SR | 136 | 12936.80 | 17512.15 | 73.9 | Pass |
| | | Secondary Horizontal | L2x2x1/4 | 140 | -1479.40 | 16216.74 | 9.1 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 129 | -8744.31 | 15516.40 | 56.4 | Pass |
| | | Bottom Girt | 2L1 1/2x1 1/2x3/16 | 130 | -6634.89 | 20683.36 | 32.1 | Pass |
| T8 | 60 - 53.3333 | Leg | P3x.3 (GR) | 144 | -108457.00 | 146901.93 | 73.8 | Pass |
| | | Diagonal | 3/4 | 160 | 11037.70 | 12720.27 | 86.8 | Pass |
| | | Horizontal | 2L1 1/2x1 1/2x3/16 | 154 | -10123.40 | 11995.48 | 84.4 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 147 | -4289.71 | 8998.86 | 47.7 | Pass |
| T9 | 53.3333 - 50 | Leg | P3x.3 (GR) | 165 | 114935.00 | 147140.53 | 78.1 | Pass |
| | | Diagonal | 3/4 | 169 | 11471.70 | 12720.27 | 90.2 | Pass |
| | | Secondary Horizontal | L2 1/2x2 1/2x5/16 | 176 | -2099.32 | 30157.66 | 7.0 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x1/8 | 166 | -8898.26 | 14414.26 | 61.7 | Pass |
| T10 | 50 - 46.6667 | Leg | P3x.3 (GR) | 180 | 128024.00 | 147140.53 | 87.0 | Pass |
| | | Diagonal | 3/4 | 184 | 12257.20 | 12720.27 | 96.4 | Pass |
| | | Secondary Horizontal | L2 1/2x2 1/2x5/16 | 191 | -2333.63 | 30157.66 | 7.7 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 181 | -8760.27 | 11995.48 | 73.0 | Pass |
| T11 | 46.6667 - 43.3333 | Leg | P3x.3(GR) w/ 0.75" threaded rod | 195 | -148853.00 | 192039.97 | 77.5 | Pass |
| | | Diagonal | 3/4 | 199 | 12674.80 | 12720.27 | 99.6 | Pass |
| | | Secondary Horizontal | L2 1/2x2 1/2x5/16 | 206 | -2578.20 | 30485.18 | 8.5 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 196 | -9141.64 | 11995.48 | 76.2 | Pass |
| T12 | 43.3333 - 40 | Leg | P3x.3(GR) w/ 0.75" threaded rod | 210 | -162265.00 | 198854.27 | 81.6 | Pass |
| | | Diagonal | 3/4 | 220 | 12294.90 | 12720.27 | 96.7 | Pass |
| | | Secondary Horizontal | L2 1/2x2 1/2x5/16 | 224 | -2810.52 | 30485.18 | 9.2 | Pass |
| | | Top Girt | 2L1 1/2x1 1/2x3/16 | 211 | -10192.20 | 12060.40 | 84.5 | Pass |
| | | Bottom Girt | 2L1 1/2x1 1/2x3/16 | 216 | -3619.00 | 9047.56 | 40.0 | Pass |
| T13 | 40 - 20 | Leg | P5x.375 (GR) | 228 | 157950.00 | 244417.54 | 64.6 | Pass |
| | | Diagonal | L2x2x3/16 | 241 | -3335.07 | 10575.34 | 31.5<br>38.8 (b) | Pass |
| T14 | 20 - 0 | Leg | P5x.375 (GR) | 249 | 166380.00 | 244417.54 | 68.1 | Pass |
| | | Diagonal | L2 1/2x2 1/2x3/16 | 253 | -2024.07 | 13140.91 | 15.4<br>33.8 (b) | Pass |

| Section No. | Elevation ft | Component Type | Size | Critical Element | P lb | $SF*P_{allow}$ lb | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Summary | | |
| | | | | | | Leg (T7) | 88.0 | Pass |
| | | | | | | Diagonal (T11) | 99.6 | Pass |
| | | | | | | Horizontal (T1) | 96.7 | Pass |
| | | | | | | Secondary Horizontal (T12) | 9.2 | Pass |
| | | | | | | Top Girt (T12) | 84.5 | Pass |
| | | | | | | Bottom Girt (T1) | 42.8 | Pass |
| | | | | | | Bolt Checks | 56.1 | Pass |
| | | | | | | **RATING =** | **99.6** | **Pass** |

# TOWER REINFORCEMENT DRAWINGS & SPECIFICATIONS



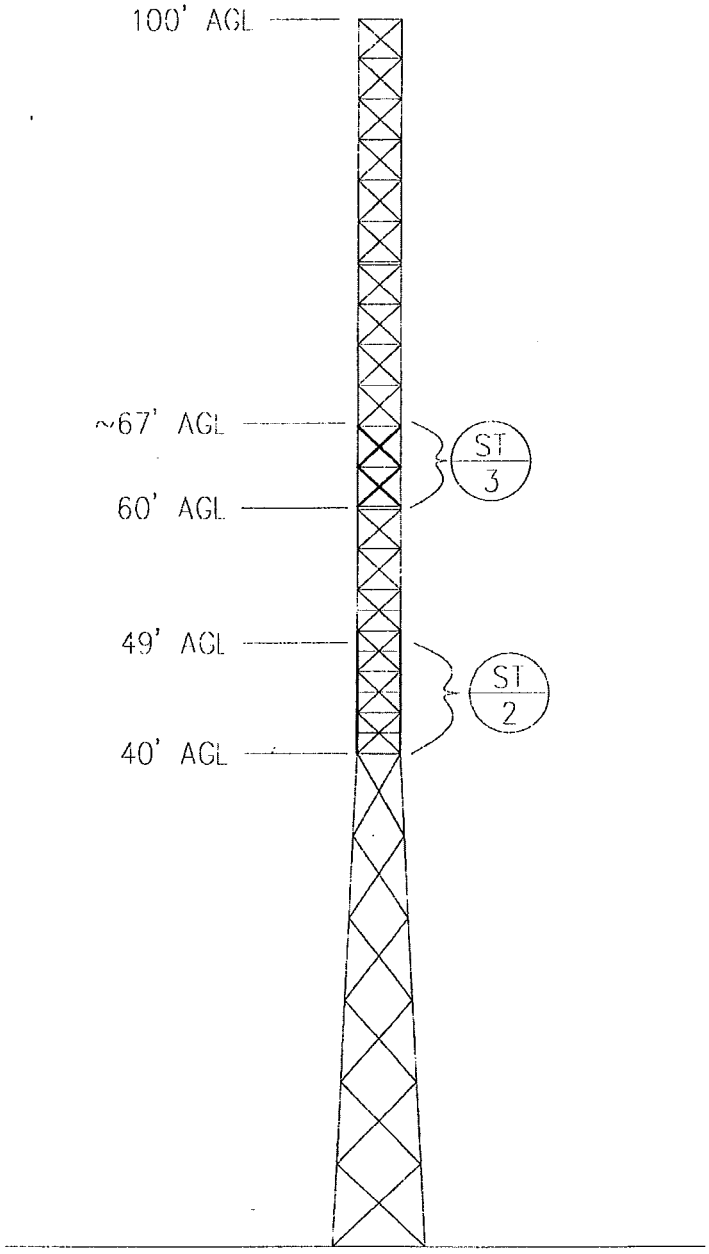
## SITE LOCATION: 303 BOXWOOD LANE, DANBURY, CT 06810

SCOPE:
THE PURPOSE OF THESE REINFORCING DETAILS AND SPECIFICATIONS IS TO REINFORCE THE TOWER MEMBERS. A THREADED BAR WILL BE STRAPPED TO THE TOWER LEGS FROM 40' TO 49' AGL. A THREADED BAR WILL BE CLIPPED TO THE EXISTING PIPE LEGS AND RAN ALONGSIDE THE EXISTING DIAGONALS FROM 60' TO 67' AGL. GRAVEL WILL BE ADDED ABOVE THE EXISTING PAD AND PIER FOUNDATION.

REINFORCING INCLUDES: CLAMPING A ¾"ø DYWIDAG GRADE 150 THREADED BAR TO THE TOWER LEGS ON ALL THREE FACES FROM 40' TO 50' AGL USING CLAMPS SPACED APPROXIMATELY 1'-6" ON CENTER. SECURING A ⅝"ø THREADED ROD TO THE EXISTING PIPE LEGS AND RAN ALONG THE EXISTING DIAGONAL MEMBERS USING ANGLE CLIPS. ADDING A 9" LAYER OF GRAVEL IN A 19'x19' AREA ABOVE THE EXISTING PAD AND PIER FOUNDATION.

THIS REINFORCEMENT IS REQUIRED AFTER ANALYZING THE TOWER. REFER TO STRUCTURAL ANALYSIS DATED AUGUST 23RD, 2012.

| | | | |
|---|---|---|---|
| OWNER: | KM Consulting Engineers, Inc.<br>*Wireless Engineering & Project Management*<br>32 West Upper Ferry Road Ewing, NJ 08628<br>Phone: (609) 538-0400 Fax: (609) 538-8858 | CLIENT: SALIENT ASSOCIATES<br>6 EAST PALISADES AVENUE<br>ENGLEWOOD, NJ 07631<br>(201) 567-0032 PH.<br>(201) 567-9556 FAX | REVISIONS:<br>1 11/8/12<br>NO. DATE |
| STATE OF CONNECTICUT MICHAEL L. BOLLINGER No. 20400 REGISTERED PROFESSIONAL ENGINEER<br>MICHAEL L. BOLLINGER, PE<br>CONNECTICUT PROFESSIONAL ENGINEER<br>LICENSE # 20400 11/8/12 | APPROVALS & DATE:<br>OWNER: _____ DATE: _____<br>S.A.C.: _____ DATE: _____<br>R / F.: _____ DATE: _____<br>CONST.: _____ DATE: _____ | PROJECT NAME:<br>CT43XC836<br>DANBURY<br>PROJECT ADDRESS:<br>303 BOXWOOD LANE<br>DANBURY, CT 06810 | DRAWING NO.:<br>T-1 |
| PROJECT #: 120741.01 | SITE ID #: | DRAWING TITLE: TITLE SHEET | P.C.: |
| CHKD: MLB | DRN: DJA | DATE: 9/21/12 | |

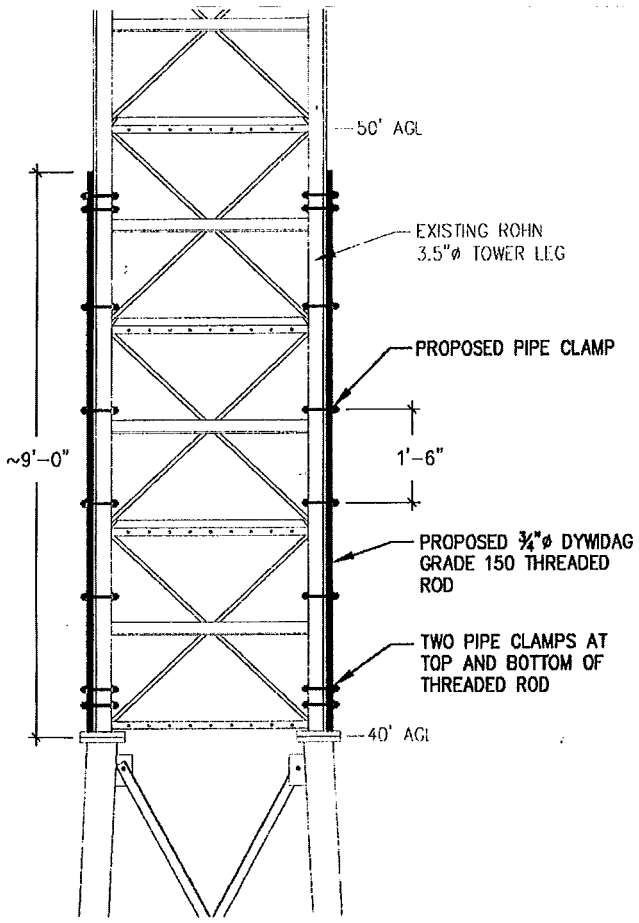



1 / ST-1 TOWER ELEVATION

SCALE: NTS

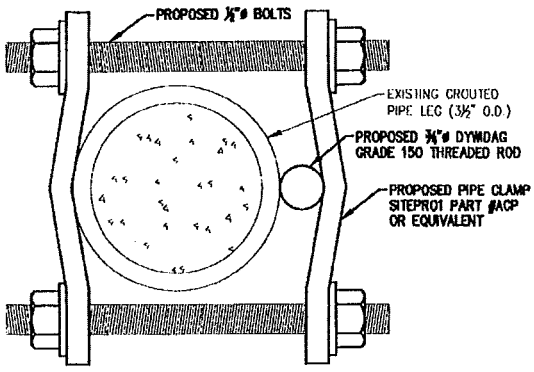
| | | | |
|---|---|---|---|
| OWNER: | KM Consulting Engineers, Inc.<br>*Wireless Engineering & Project Management*<br>32 West Upper Ferry Road Ewing, NJ 08628<br>Phone: (609) 538-0400 Fax: (609) 538-8858 | CLIENT:<br>SALIENT ASSOCIATES<br>8 EAST PALISADES AVENUE<br>ENLEWOOD, NJ 07631<br>(201) 567-0032 PH.<br>(201) 567-9556 FAX | REVISIONS:<br>1 11/8/12<br>NO. DATE |
| STATE OF CONNECTICUT<br>MICHAEL L. BOHLINGER, PE<br>CONNECTICUT PROFESSIONAL ENGINEER<br>LICENSE # 20405<br>1/18/12 | APPROVALS & DATE:<br>OWNER: _____ DATE: _____<br>S.A.C.: _____ DATE: _____<br>R / F.: _____ DATE: _____<br>CONST.: _____ DATE: _____ | PROJECT NAME:<br>CT43XC836<br>DANBURY<br>PROJECT ADDRESS:<br>303 BOXWOOD LANE<br>DANBURY, CT 06810 | DRAWING NO.:<br>**ST-1** |

| PROJECT # | SITE ID # | DRAWING TITLE: | P.C.: | CHKD: | DRN: | DATE: |
|---|---|---|---|---|---|---|
| 120741.01 | | TOWER ELEVATION | | MLB | DJA | 9/21/12 |




1 / ST-2 LEG REINFORCEMENT: 40'-50' AGL

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




2 / ST-2 SECTION A-A

SCALE: 6" = 1'

NOTES:
1. ALL MEMBERS, BOLTS HOLES, AND DIMENSIONS MUST BE FIELD VERIFIED PRIOR TO FABRICATION / PROCUREMENT OF REINFORCEMENT MATERIALS. ANY CHANGES TO THESE DRAWINGS AND SPECIFICATIONS OR CHANGES FOUND IN THE FIELD OF EXISTING TOWER MEMBERS MUST BE COMMUNICATED TO KM CONSULTING ENGINEERS INC. PRIOR TO INSTALLING REINFORCEMENT.

2. STEEL: ALL STEEL MEMBERS TO BE HOT-DIP GALVANIZED TO ASTM A-123.

3. IF STEEL IS FIELD CUT, ENDS OF STEEL MUST BE SPRAYED WITH COLD GALVANIZE ZRC.

SAFETY NOTICE!
INSTALLATION OF THESE TOWER MODIFICATIONS WILL REQUIRE TOWER CLIMBING AT HEIGHTS WHERE FALLING COULD HARM OR PROVE FATAL TO WORKERS. THESE DRAWINGS INDICATE ONLY THE REINFORCEMENT AND NOT THE MEANS, METHODS, AND REQUIRED CONTRACTOR SAFETY. THESE REINFORCEMENT MEMBERS SHOULD BE INSTALLED BY A QUALIFIED, PROFESSIONAL TOWER CLIMBING COMPANY. KM CONSULTING ENGINEERS INC. TAKES NO RESPONSIBILITY FOR THE CONTRACTORS SAFETY POLICIES, PRACTICES, AND METHODS.

CERTIFICATION OF INSTALLATION:
DURING OR UPON COMPLETION OF THESE MODIFICATIONS TO THE TOWER, A CERTIFICATION LETTER FROM A LICENSED PROFESSIONAL ENGINEER MUST BE SUBMITTED TO THE TOWER OWNER.

NOTES:
ANY INTERFERENCE OF EXISTING TOWER LEG STRUCTURE OR APPURTENANCES TO PROPOSED REINFORCEMENT, CONTRACTOR TO COORDINATE SHIFTING OF REINFORCEMENT ATTACHMENT WITH ENGINEER PRIOR TO INSTALL.

OWNER:

KM Consulting Engineers, Inc.
*Wireless Engineering & Project Management*
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT:

SALIENT ASSOCIATES
8 EAST PALISADES AVENUE
ENLEWOOD, NJ 07631
(201) 567-0032 PH.
(201) 567-9556 FAX

REVISIONS:

| NO. | DATE |
|---|---|
| 1 | 11/8/12 |

STATE OF CONNECTICUT
MICHAEL J. BOHLINGER
No. 20405
LICENSED PROFESSIONAL ENGINEER

MICHAEL J. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405, CT

11/8/12

APPROVALS & DATE:

OWNER: _____ DATE: _____

S.A.C.: _____ DATE: _____

R / F.: _____ DATE: _____

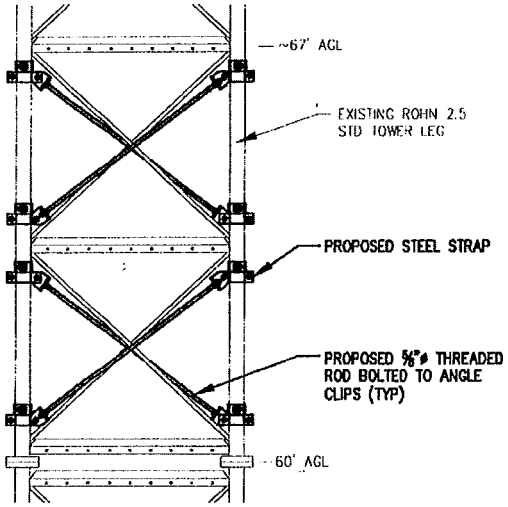
CONST.: _____ DATE: _____

PROJECT NAME:
CT43XC836
DANBURY

PROJECT ADDRESS:
303 BOXWOOD LANE
DANBURY, CT 06810

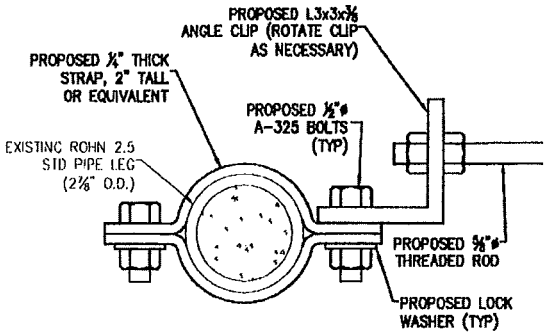
DRAWING NO.:
**ST-2**

| PROJECT #: | SITE ID #: | DRAWING TITLE: | P.C.: | CHKD: | DRN: | DATE: |
|---|---|---|---|---|---|---|
| 120741.01 | | LEG REINFORCEMENT | | MLB | DJA | 9/21/12 |



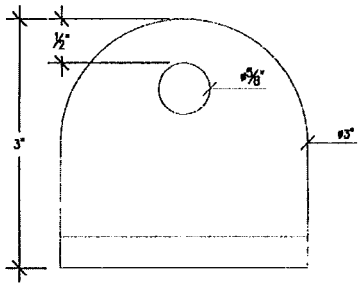

1 ST-3 DIAGONAL REINFORCEMENT: 60'–67' AGL

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



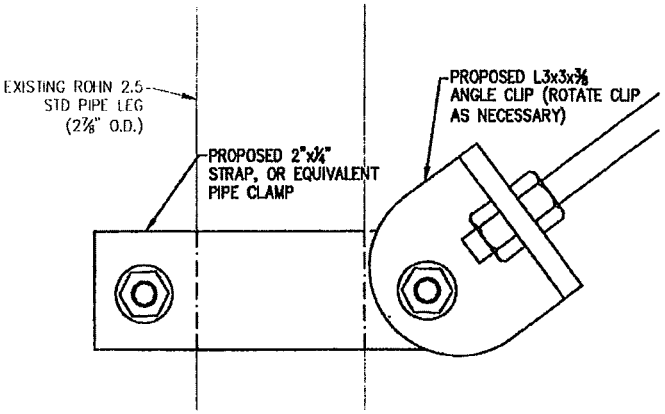

2 ST-3 THREADED ROD CLIP PLAN VIEW

SCALE: 3" = 1'




3 ST-3 ANGLE CLIP DETAIL

SCALE: 6"=1'-0"




4 ST-3 PIPE CLAMP DETAIL

SCALE: NTS

NOTES:
1. ALL MEMBERS, BOLTS HOLES, AND DIMENSIONS MUST BE FIELD VERIFIED PRIOR TO FABRICATION / PROCUREMENT OF REINFORCEMENT MATERIALS. ANY CHANGES TO THESE DRAWINGS AND SPECIFICATIONS OR CHANGES FOUND IN THE FIELD OF EXISTING TOWER MEMBERS MUST BE COMMUNICATED TO KM CONSULTING ENGINEERS INC. PRIOR TO INSTALLING REINFORCEMENT.

2. STEEL: ALL STEEL MEMBERS TO BE HOT-DIP GALVANIZED TO ASTM A-123.

3. IF STEEL IS FIELD CUT, ENDS OF STEEL MUST BE SPRAYED WITH COLD GALVANIZE ZRC.

SAFETY NOTICE!
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CERTIFICATION OF INSTALLATION:
DURING OR UPON COMPLETION OF THESE MODIFICATIONS TO THE TOWER, A CERTIFICATION LETTER FROM A LICENSED PROFESSIONAL ENGINEER MUST BE SUBMITTED TO THE TOWER OWNER.

NOTES:
ANY INTERFERENCE OF EXISTING TOWER LEG STRUCTURE OR APPURTENANCES TO PROPOSED REINFORCEMENT, CONTRACTOR TO COORDINATE SHIFTING OF REINFORCEMENT ATTACHMENT WITH ENGINEER PRIOR TO INSTALL.

OWNER:

KM Consulting Engineers, Inc.
*Wireless Engineering & Project Management*
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT:

SALIENT ASSOCIATES
8 EAST PALISADES AVENUE
ENLEWOOD, NJ 07631
(201 567-0032 PH.
(201 567-9556 FAX

REVISIONS:

| NO. | DATE |
|---|---|
| 1 | 11/8/12 |

STATE OF CONNECTICUT
No. 20405
MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE
11/8/12

APPROVALS & DATE:

OWNER: _____ DATE: _____

S.A.C.: _____ DATE: _____

R / F.: _____ DATE: _____

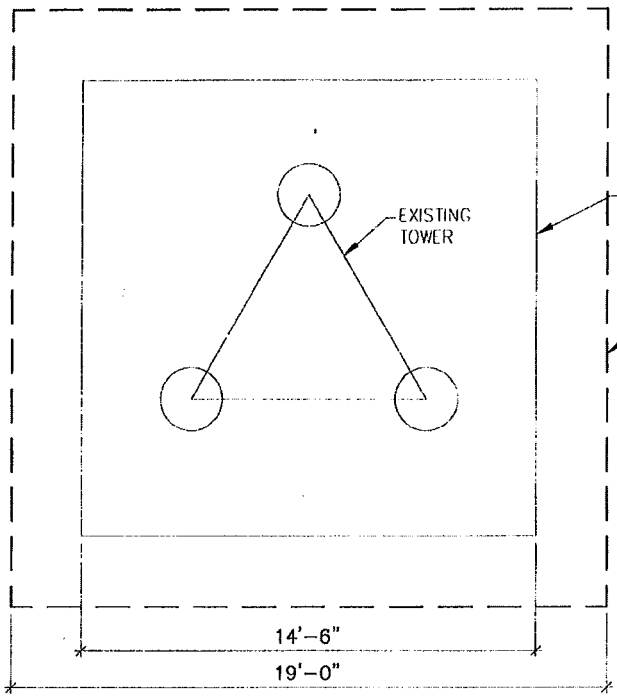
CONST.: _____ DATE: _____

PROJECT NAME:
CT43XC836
DANBURY

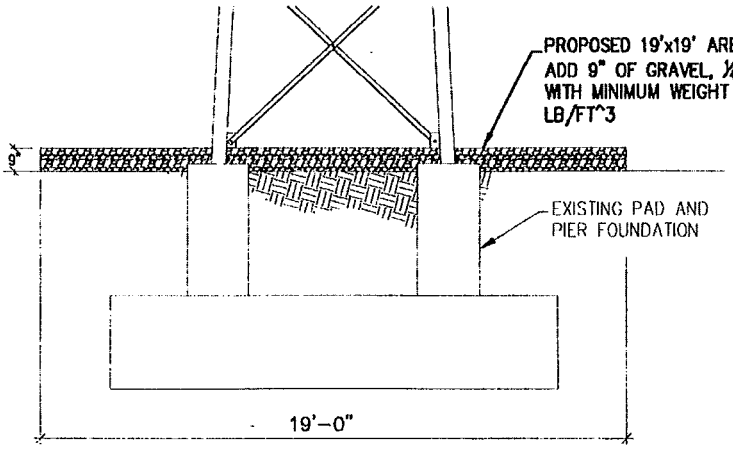
PROJECT ADDRESS:
303 BOXWOOD LANE
DANBURY, CT 06810

DRAWING NO.:
**ST-3**

| PROJECT #: | SITE ID #: | DRAWING TITLE: | P.C.: | CHKD: | DRN: | DATE: |
|---|---|---|---|---|---|---|
| 120741.01 | | DIAGONAL REINFORCEMENT | | MLB | DJA | 9/21/12 |




1 / ST-4 FOUNDATION REINFORCEMENT
SCALE: NTS




1 / ST-4 FOUNDATION REINFORCEMENT
SCALE: NTS

OWNER:

KM Consulting Engineers, Inc.
*Wireless Engineering & Project Management*
32 West Upper Ferry Road Ewing, NJ 08828
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT:
SALIENT ASSOCIATES
8 EAST PALISADES AVENUE
ENLEWOOD, NJ 07631
(201) 567-0032 PH.
(201) 567-9556 FAX

REVISIONS:

| NO. | DATE |
|---|---|
| 1 | 11/8/12 |

STATE OF CONNECTICUT
MICHAEL L. BOHLINGER
No. 20405
MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405
11/8/12

APPROVALS & DATE:
OWNER: _____ DATE: _____
S.A.C.: _____ DATE: _____
R / F.: _____ DATE: _____
CONST.: _____ DATE: _____

PROJECT NAME:
CT43XC836
DANBURY

PROJECT ADDRESS:
303 BOXWOOD LANE
DANBURY, CT 06810

DRAWING NO.:
**ST-4**

| PROJECT #: | SITE ID #: | DRAWING TITLE: | P.C.: | CHKD: | DRN: | DATE: |
|---|---|---|---|---|---|---|
| 120741.01 | | FOUNDATION REINFORCEMENT | | MLB | DJA | 9/21/12 |

## SECTION 1704
## SPECIAL INSPECTIONS

1704.1 General. Where application is made for construction as described in this section, the owner or the *registered design professional in responsible charge* acting as the owner's agent shall employ one or more *approved agencies* to perform inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections identified in Section 110.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the *building official*, for the inspection of the particular type of construction or operation requiring *special inspection*. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the *building official*. The special inspector shall provide written documentation to the building official demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

**Exceptions:**

1. *Special inspections* are not required for work of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. *Special inspections* are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

**1704.1.1 Statement of special inspections.** The applicant shall submit a statement of *special inspections* prepared by the *registered design professional in responsible charge* in accordance with Section 107.1 as a condition for issuance. This statement shall be in accordance with Section 1705.

**Exceptions:**

1. A statement of *special inspections* is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.
2. The statement of *special inspections* is permitted to be prepared by a qualified person *approved* by the *building official* for construction not designed by a *registered design professional*.

**1704.1.2 Report requirement.** Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the *building official*, and to the *registered design professional in responsible charge*. Reports shall indicate that work inspected was or was not completed in conformance to *approved construction documents*. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the *building official* and to the *registered design professional in responsible charge* prior to the completion of that phase of the work. A final report documenting required *special inspections* and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the applicant and the *building official*.

**1704.2 Inspection of fabricators.** Where fabrication of structural load-bearing members and assemblies is being performed

**1704.2.1 Fabrication and implementation procedures.** The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to *approved construction documents* and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

**Exception:** *Special inspections* as required by Section 1704.2 shall not be required where the fabricator is *approved* in accordance with Section 1704.2.2.

**1704.2.2 Fabricator approval.** *Special inspections* required by Section 1704 are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved special inspection* agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the *building official* stating that the work was performed in accordance with the *approved construction documents*.

**1704.3 Steel construction.** The *special inspections* for steel elements of buildings and structures shall be as required by Section 1704.3 and Table 1704.3.

**Exceptions:**

1. *Special inspection* of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.
2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.
   - 2.1. Single-pass fillet welds not exceeding $^5/_{16}$ inch (7.9 mm) in size.
   - 2.2. Floor and roof deck welding.
   - 2.3. Welded studs when used for structural diaphragm.
   - 2.4. Welded sheet steel for cold-formed steel members.
   - 2.5. Welding of stairs and railing systems.

**1704.3.1 Welding.** Welding inspection and welding inspector qualification shall be in accordance with this section.

**1704.3.1.1 Structural steel.** Welding inspection and welding inspector qualification for structural steel shall be in accordance with AWS D1.1.

**1704.3.1.2 Cold-formed steel.** Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks shall be in accordance with AWS D1.3.

**1704.3.1.3 Reinforcing steel.** Welding inspection and welding inspector qualification for reinforcing steel shall be in accordance with AWS D1.4 and ACI 318.

**1704.3.2 Details.** The special inspector shall perform an inspection of the steel frame to verify compliance with the details shown on the *approved construction documents*, such as bracing, stiffening, member locations and proper application of joint details at each connection.

**1704.3.3 High-strength bolts.** Installation of high-strength bolts shall be inspected in accordance with AISC 360.

**1704.3.3.1 General.** While the work is in progress, the special inspector shall determine that the requirements for bolts, nuts, washers and paint; bolted parts and installation and tightening in such standards are met. For bolts requiring pretensioning, the special inspector shall observe the preinstallation testing and calibration procedures when such procedures are required by the installation method or by project plans or specifications; determine that all plies of connected materials have been drawn together and properly snugged and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to the snug-tight con-

| | | | |
|---|---|---|---|
| OWNER: | KM Consulting Engineers, Inc.<br>*Wireless Engineering & Project Management*<br>32 West Upper Ferry Road Ewing, NJ 08628<br>Phone: (609) 538-0400 Fax: (609) 538-8658 | CLIENT: SALIENT ASSOCIATES<br>8 EAST PALISADES AVENUE<br>ENLEWOOD, NJ 07631<br>(201) 567-0032 PH<br>(201) 567-9656 FAX | REVISIONS:<br>1 11/8/12<br>NO. DATE |
| STATE OF CONNECTICUT<br>MICHAEL L. DOLLINGER<br>No. 20405<br>MICHAEL L. DOLLINGER, PE<br>CONNECTICUT PROFESSIONAL ENGINEER<br>LICENSE # 20405 CT<br>11/8/12 | APPROVALS & DATE:<br>OWNER: _____ DATE: _____<br>S.A.C.: _____ DATE: _____<br>R / F.: _____ DATE: _____<br>CONST.: _____ DATE: _____ | PROJECT NAME:<br>CT43XC836<br>DANBURY<br>PROJECT ADDRESS:<br>303 BOXWOOD LANE<br>DANBURY, CT 06810 | DRAWING NO.:<br>**ST-5** |
| PROJECT #: 120741.01 | SITE ID #: | DRAWING TITLE: SPECIAL INSPECTION NOTES | P.C.: CHKD: MLB DRN: DJA DATE: 9/21/12 |

TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

| VERIFICATION AND INSPECTION | CONTINUOUS | PERIODIC | REFERENCED STANDARD[a] | IBC REFERENCE |
|---|---|---|---|---|
| 1. Material verification of high-strength bolts, nuts and washers: | | | | |
| a. Identification markings to conform to ASTM standards specified in the approved construction documents. | - | X | AISC 360, Section A3.3 and applicable ASTM material standards | |
| b. Manufacturer's certificate of compliance required. | | X | | |
| 2. Inspection of high-strength bolting: | | | | |
| a. Snug-tight joints. | | X | AISC 360, Section M2.5 | 1704.3.3 |
| b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation. | | X | | |
| c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation. | X | | | |
| 3. Material verification of structural steel and cold-formed steel deck: | | | | |
| a. For structural steel, identification markings to conform to AISC 360. | - | X | AISC 360, Section M5.5 | |
| b. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents. | - | X | Applicable ASTM material standards | |
| c. Manufacturer's certified test reports. | | X | | |
| 4. Material verification of weld filler materials: | | | | |
| a. Identification markings to conform to AWS specification in the approved construction documents. | - | X | AISC 360, Section A3.5 and applicable AWS A5 documents | - |
| b. Manufacturer's certificate of compliance required. | - | X | | |
| 5. Inspection of welding: | | | | |
| a. Structural steel and cold-formed steel deck: | | | | |
| 1) Complete and partial joint penetration groove welds. | X | - | AWS D1.1 | 1704.3.1 |
| 2) Multipass fillet welds. | X | - | | |
| 3) Single-pass fillet welds > $^5/_{16}$" | X | - | | |
| 4) Plug and slot welds. | X | | | |
| 5) Single-pass fillet welds ≤ $^5/_{16}$" | - | X | | |
| 6) Floor and roof deck welds. | - | X | AWS D1.3 | |
| b. Reinforcing steel: | | | | |
| 1) Verification of weldability of reinforcing steel other than ASTM A 706. | | X | AWS D1.4 ACI 318: Section 3.5.2 | |
| 2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement. | X | | | |
| 3) Shear reinforcement. | X | | | |
| 4) Other reinforcing steel. | | X | | |
| 6. Inspection of steel frame joint details for compliance: | | | | |
| a. Details such as bracing and stiffening | | X | | 1704.3.2 |
| b. Member locations. | | X | | |
| c. Application of joint details at each connection | | X | | |

For SI: 1 inch = 25.4 mm

OWNER:

KM Consulting Engineers, Inc.
*Wireless Engineering & Project Management*
32 West Upper Ferry Road Ewing, NJ 08628
Phone: (609) 538-0400 Fax: (609) 538-8858

CLIENT:
SALIENT ASSOCIATES
6 EAST PALISADES AVENUE
ENLEWOOD, NJ 07631
(201) 567-0032 PH
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REVISIONS:

| NO. | DATE |
|---|---|
| 1 | 11/8/12 |

STATE OF CONNECTICUT
MICHAEL L. BOLLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE NO. 20[illegible]
11/8/12

APPROVALS & DATE:
OWNER: _____ DATE: _____
S.A.C.: _____ DATE: _____
R / F.: _____ DATE: _____
CONST.: _____ DATE: _____

PROJECT NAME:
CT43XC836
DANBURY

PROJECT ADDRESS:
303 BOXWOOD LANE
DANBURY, CT 06810

DRAWING NO.:
**ST-6**

| PROJECT #: | SITE ID #: | DRAWING TITLE: | P.C.: | CHKD: | DRN: | DATE: |
|---|---|---|---|---|---|---|
| 120741.01 | | SPECIAL INSPECTION NOTES | | MLB | DJA | 9/21/12 |

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

Sprint Existing Facility

Site ID: CT43XC836

Danbury W. CT University
303 Boxwood Lane
Danbury, CT 06810

**September 9, 2012**

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

September 9, 2012

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Emissions Values for Site **CT43XC836 - Danbury W. CT University**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 303 Boxwood Lane, Danbury, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 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 ($\mu W/cm^2$). The general population exposure limit for the cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band is 1000 $\mu W/cm^2$. 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 upgrades to the existing Sprint Wireless antenna facility located at 303 Boxwood Lane, Danbury, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. 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 emissions were calculated using the following assumptions:

1) 5 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
2) 1 CDMA Carrier (850 MHz ) was considered for each sector of the proposed installation
3) 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.
4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
5) The antenna used in this modeling is the RFS APXVSPP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

6) The antenna mounting height centerline of the proposed antennas is **89.2 feet** above ground level (AGL)
7) 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 calculation were done with respect to uncontrolled / general public and Controlled / Occupational threshold limits

| Site ID | CT43XC836 - Danbury W. CT University |
|---|---|
| Site Addresss | 303 Boxwood Lane, Danbury, CT 06810 |
| Site Type | Self Support Tower |

**Sector 1**

| Antenna Number | Antenna Make | Antenna Model | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1a | RFS | APXVSPP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 5 | 100 | 15.9 | 89.2 | 83.2 | 1/2 " | 0.5 | 0 | 3467.3685 | 180.0774 | 18.00774% |
| 1a | RFS | APXVSPP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 13.4 | 89.2 | 83.2 | 1/2 " | 0.5 | 0 | 389.96892 | 20.253 | 3.57196% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 21.580% | |

**Sector 2**

| Antenna Number | Antenna Make | Antenna Model | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2a | RFS | APXVSPP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 5 | 100 | 15.9 | 89.2 | 83.2 | 1/2 " | 0.5 | 0 | 3467.3685 | 180.0774 | 18.00774% |
| 2a | RFS | APXVSPP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 13.4 | 89.2 | 83.2 | 1/2 " | 0.5 | 0 | 389.96892 | 20.253 | 3.57196% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 21.580% | |

**Sector 3**

| Antenna Number | Antenna Make | Antenna Model | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3a | RFS | APXVSPP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 5 | 100 | 15.9 | 89.2 | 83.2 | 1/2 " | 0.5 | 0 | 3467.3685 | 180.0774 | 18.00774% |
| 3a | RFS | APXVSPP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 13.4 | 89.2 | 83.2 | 1/2 " | 0.5 | 0 | 389.96892 | 20.253 | 3.57196% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 21.580% | |

| Site Composite MPE% | |
|---|---|
| Carrier | MPE % |
| Sprint | 64.739% |
| T-Mobile | 15.610% |
| WCXI | 1.280% |
| Nextel | 12.290% |
| | |
| | |
| | |
| | |
| Total Site MPE % | 93.919% |

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## Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **64.739% (21.580% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **93.919%** 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

Scott Heffernan
RF Engineering Director

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