

8/23/2016

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Notice of Exempt Modification
69 Wheeler Street, New Haven, CT 06512
N 41* 17' 45.71"
W 72* 53' 52.51"

Dear Ms. Bachman:

T-Mobile currently maintains 6 antennas at the 98-foot level of the existing 98-foot monopole at 69 Wheeler Street, New Haven, CT 06512. The tower is owned by Laydon Industries. T-Mobile now intends to replace the 3 existing antennas with 3 new antennas, for a total of 6 antennas. These antennas would be installed at the 98-foot level of the tower. The Structural Analysis is passing with a structural usage of 97.8% and a foundation usage of 93.3%

This facility was approved by the City of New Haven however they have no record of the original zoning docket number. The City of New Haven City Plan Department and Building Department confirmed this on 8/23/2016.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies ~ 16- 50j- 73, for construction that constitutes an exempt modification pursuant to R.C.S.A. ~ 16-50j- 72(b)(2). In accordance with R.C.S.A. g 16-50j-73, a copy of this letter is being sent to City of New Haven, Mayor Toni Harp, as well as the tower/property owner Laydon Industries.

The planned modifications to the facility fall squarely within those activities explicitly provided for its R.C.S.A. ~ 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard,
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. ~ 16-SOj-72(b)(2).

Sincerely,

Gregg Shappy
10 Industrial Ave.
Suite 3
Mahwah, NJ 07430
(845) 553-2045
gshappy@transcendwireless.com

Attachments

cc: City of New Haven, Mayor Toni Harp
Laydon Industries

SITE NUMBER: CTNH039A

69 WHEELER ST
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SITE NAME: NH039/LAYDON CONSTRUCTION

RF DESIGN GUIDELINE: 794DB

T-MOBILE TECHNICIAN SITE SAFETY NOTES	
LOCATION	SPECIAL RESTRICTIONS
SECTOR A: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
SECTOR B: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
SECTOR C: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 448-1116

Transcend Wireless

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1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



CHECKED BY: DR

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	07/25/16	ISSUED FOR CONSTRUCTION	VP
1	07/21/16	ISSUED FOR CONSTRUCTION	VP
0	04/22/16	ISSUED FOR REVIEW	MC

SITE NUMBER:
CTNH039A

SITE NAME:
NH039/LAYDON
CONSTRUCTION

SITE ADDRESS:
69 WHEELER ST
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL NOTES

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL STRUCTURAL NOTES

TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.

STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS COMPLETED BY HUDSON DESIGN ON BEHALF OF T-MOBILE ARE INCLUSIVE OF THE ENTIRE ANTENNA SUPPORT STRUCTURE (GLOBAL STRUCTURAL STABILITY ANALYSIS BY OTHERS), EXISTING TOWER PLATFORM, EXISTING ANTENNA MOUNTS AND ALL OTHER ASPECTS OF THE STRUCTURE THAT WILL SUPPORT THE T-MOBILE MODERNIZATION EQUIPMENT DEPLOYMENT AS DEPICTED HEREIN.

HUDSON DESIGN ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES



PROJECT SUMMARY

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT INSTALLATION

ZONING JURISDICTION: BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).

SITE ADDRESS: 69 WHEELER ST
NEW HAVEN, CT 06512

LATITUDE: 41° 17' 45.71" N

LONGITUDE: 72° 53' 52.51" W

JURISDICTION: NATIONAL, STATE & LOCAL CODES OR ORDINANCES

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY

APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE

DRIVING DIRECTIONS:

HEAD NORTHEAST ON GRIFFIN ROAD SOUTH TOWARD WEST NEWBERRY ROAD 0.6MI. TURN RIGHT ONTO DAY HILL ROAD 3.6MI. USE THE RIGHT LANE TO MERGE ONTO I-91 SOUTH VIA THE RAMP TO HARTFORD 0.4MI. MERGE ONTO I-91 SOUTH 45.1MI. TAKE EXIT 2 FOR HAMILTON STREET 0.3MI. CONTINUE ONTO IVES PLACE 0.1MI. TURN RIGHT ONTO EAST STREET 0.3MI. TURN LEFT ONTO WATER STREET 0.1MI. CONTINUE ONTO FORBES AVENUE 0.6MI. TURN LEFT ONTO GOODWIN STREET/WHEELER STREET 0.1MI. DESTINATION WILL BE ON THE RIGHT.

ARRIVE AT 69 WHEELER STREET NEW HAVEN, CT 06512.



CALL BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455 OR CALL 811
UNDERGROUND SERVICE ALERT



DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	2
GN-1	GENERAL NOTES	2
A-1	COMPOUND PLAN & EQUIPMENT PLAN	2
A-2	ANTENNA LAYOUT & ELEVATION	2
A-3	DETAILS	2
E-1	GROUNDING DIAGRAM	2

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR – TRANSCEND WIRELESS
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER – T-MOBILE
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
 SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT, + 2009 & 2013 CT AMENDMENTS
 ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
 LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

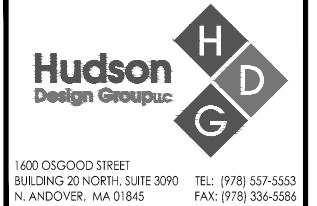
ABBREVIATIONS					
AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 448-1116



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



1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
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CHECKED BY: DR

APPROVED BY: DJC

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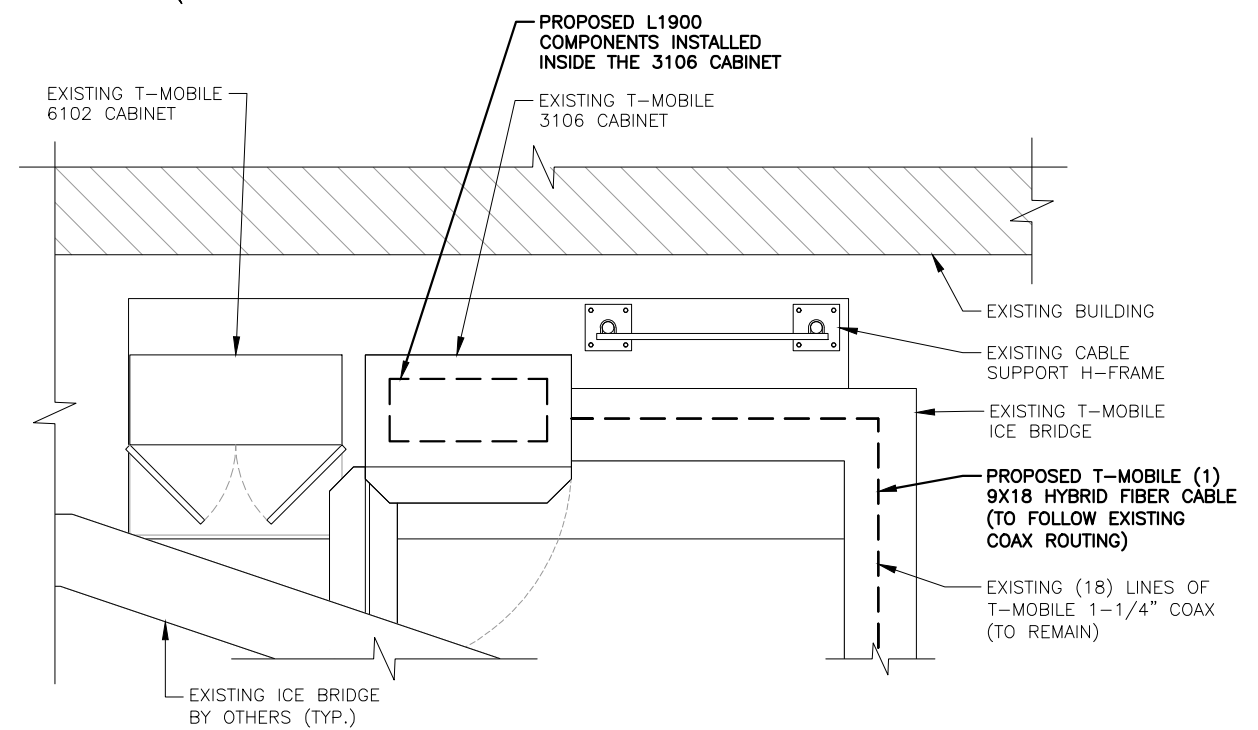
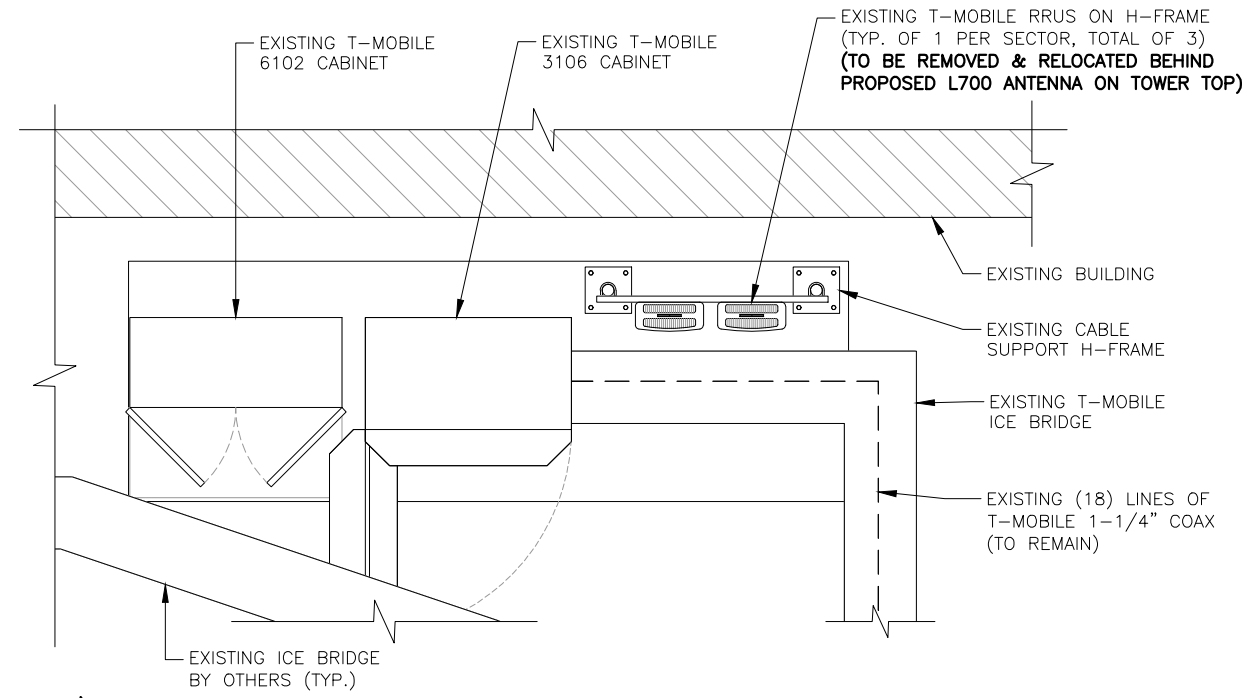
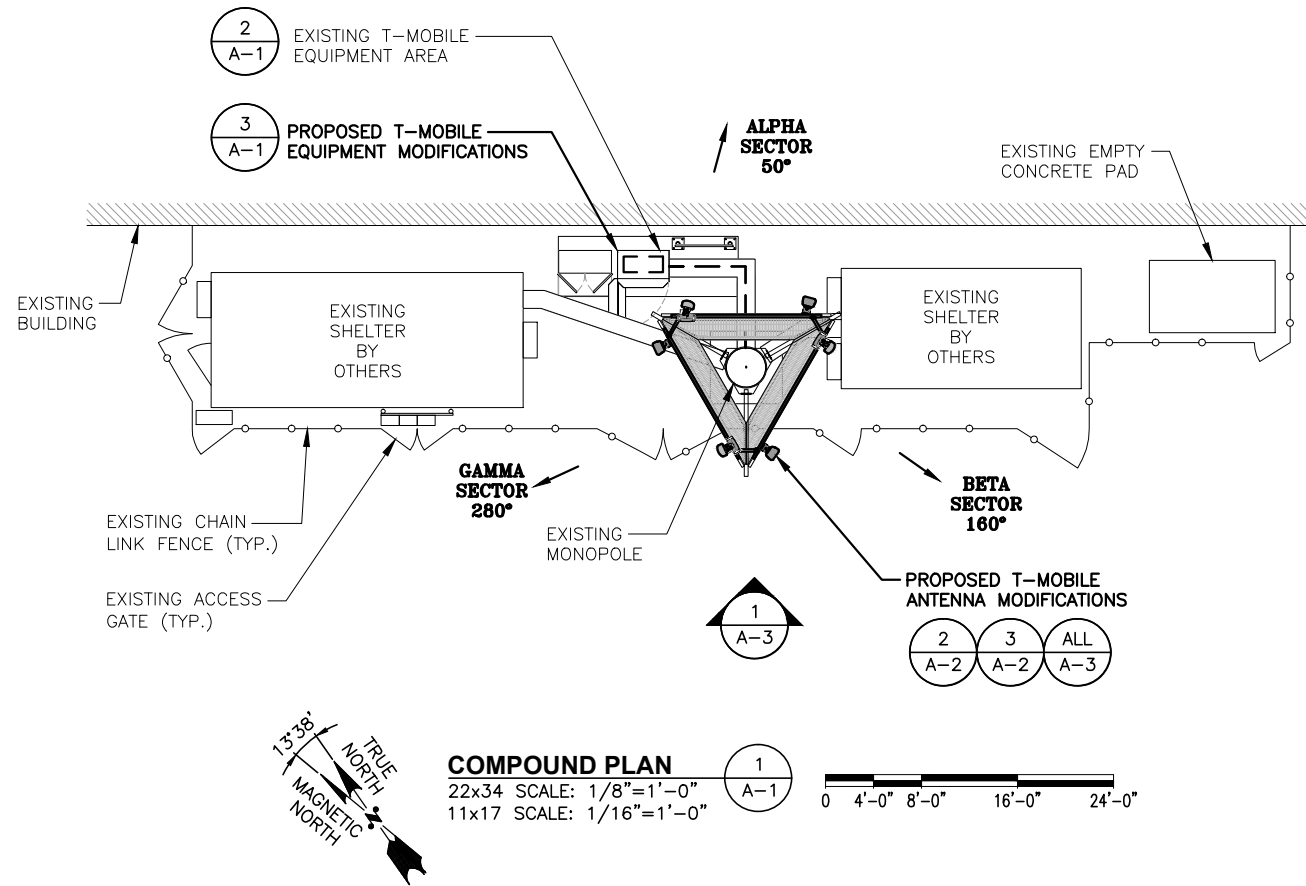
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 SITE ADDRESS:
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 NEW HAVEN COUNTY

SHEET TITLE
 GENERAL NOTES

SHEET NUMBER
GN-1

STRUCTURAL NOTES:
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY HDG, DATED: JULY 21, 2016 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

NOTE:
 *RF DATA BASED ON PRELIMINARY INFORMATION. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



T-MOBILE NORTHEAST LLC

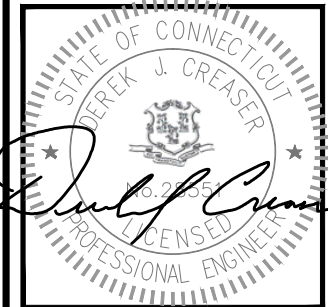
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SHEET TITLE
COMPOUND & EQUIPMENT PLAN

SHEET NUMBER
A-1

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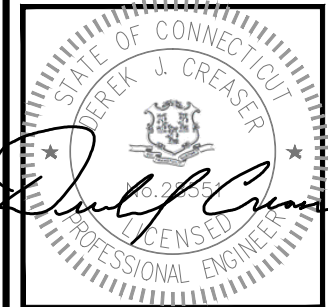
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Transcend Wireless

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

Hudson Design Group, Inc.

1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090
 N. ANDOVER, MA 01845
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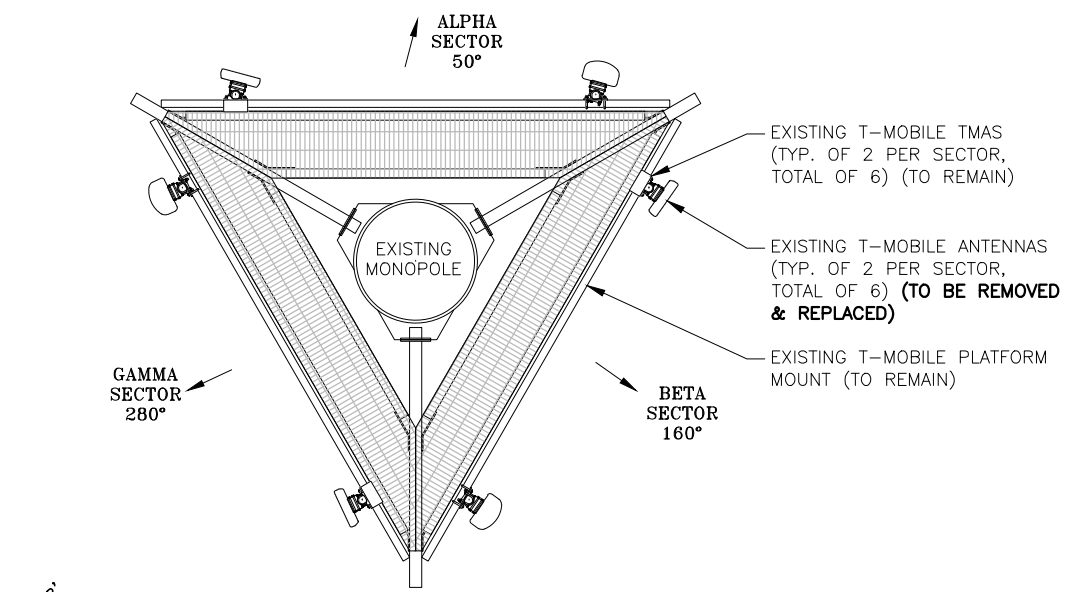
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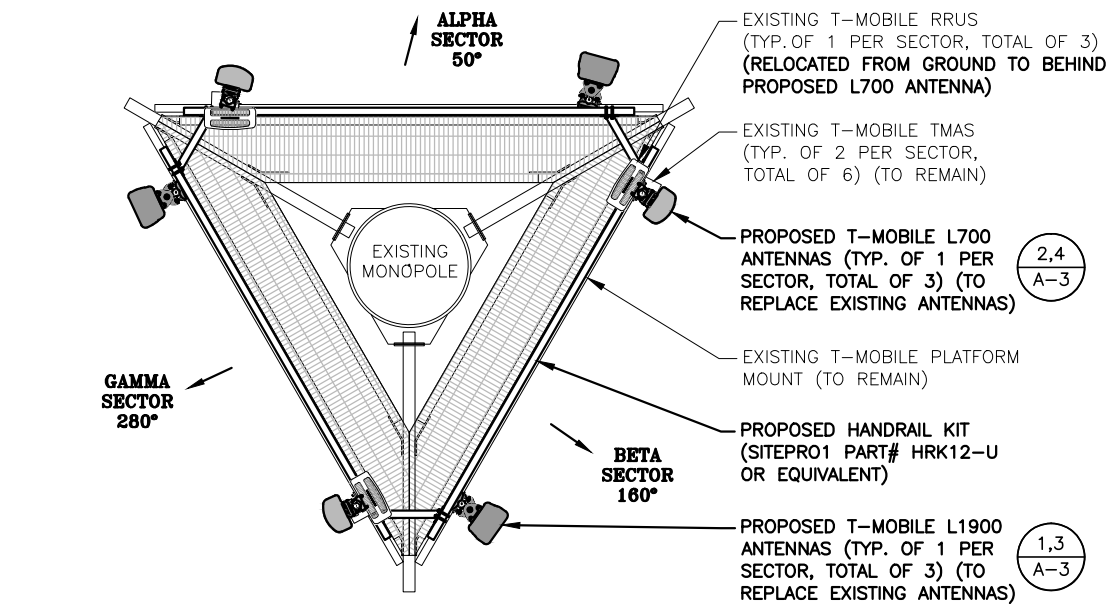
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 ANTENNA LAYOUT & ELEVATION

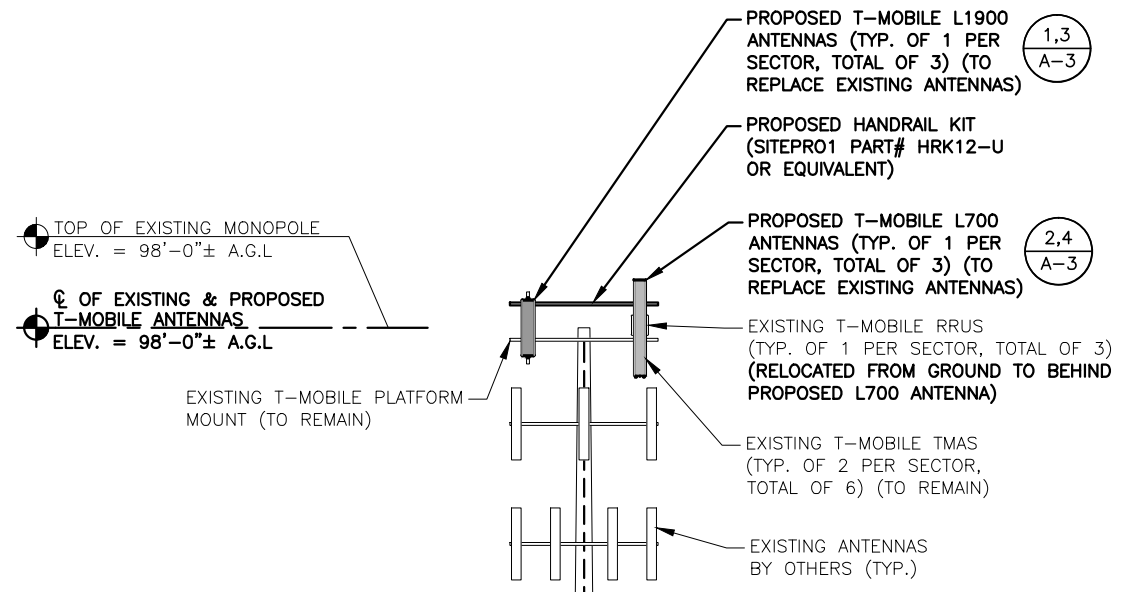
SHEET NUMBER
A-2



EXISTING ANTENNA PLAN (1)
 SCALE: N.T.S. A-2



PROPOSED ANTENNA PLAN (2)
 SCALE: N.T.S. A-2



TOP OF EXISTING MONOPOLE
 ELEV. = 98'-0"± A.G.L.
 C. OF EXISTING & PROPOSED T-MOBILE ANTENNAS
 ELEV. = 98'-0"± A.G.L.

EXISTING T-MOBILE PLATFORM MOUNT (TO REMAIN)

PROPOSED T-MOBILE L1900 ANTENNAS (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO REPLACE EXISTING ANTENNAS) (1,3) A-3

PROPOSED HANDRAIL KIT (SITEPRO1 PART# HRK12-U OR EQUIVALENT)

PROPOSED T-MOBILE L700 ANTENNAS (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO REPLACE EXISTING ANTENNAS) (2,4) A-3

EXISTING T-MOBILE RRUS (TYP. OF 1 PER SECTOR, TOTAL OF 3) (RELOCATED FROM GROUND TO BEHIND PROPOSED L700 ANTENNA)

EXISTING T-MOBILE TMS (TYP. OF 2 PER SECTOR, TOTAL OF 6) (TO REMAIN)

EXISTING ANTENNAS BY OTHERS (TYP.)

PROPOSED T-MOBILE (1) 9X18 HYBRID FIBER CABLE (TO FOLLOW EXISTING COAX ROUTING)

EXISTING (18) LINES OF T-MOBILE 1-1/4" COAX (TO REMAIN)

EXISTING MONOPOLE

PROPOSED L1900 COMPONENTS INSTALLED INSIDE THE 3106 CABINET

EXISTING T-MOBILE 3106 CABINET

EXISTING T-MOBILE 6102 CABINET

EXISTING SHELTER BY OTHERS

EXISTING BUILDING

EXISTING SHELTER BY OTHERS

EXISTING CHAIN LINK FENCE (TYP.)

GROUND LEVEL
 ELEV. = 0'-0"± A.G.L.

SOUTH ELEVATION (3)
 22x34 SCALE: 1/8"=1'-0" A-2
 11x17 SCALE: 1/16"=1'-0"
 0 4'-0" 8'-0" 16'-0" 24'-0"

STRUCTURAL NOTES:
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY HDG, DATED: JULY 21, 2016 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

NOTE:
 *RF DATA BASED ON PRELIMINARY INFORMATION. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

**T-MOBILE
 NORTHEAST LLC**

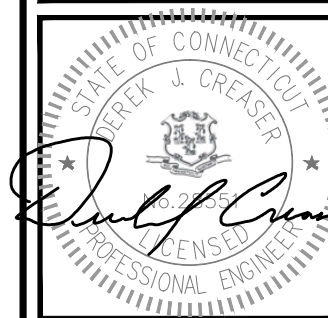
35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 448-1116

Transcend Wireless

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



1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586



CHECKED BY: DR

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	07/25/16	ISSUED FOR CONSTRUCTION	VP
1	07/21/16	ISSUED FOR CONSTRUCTION	VP
0	04/22/16	ISSUED FOR REVIEW	MC

SITE NUMBER:

CTNH039A

SITE NAME:

NH039/LAYDON
 CONSTRUCTION

SITE ADDRESS:

69 WHEELER ST
 NEW HAVEN, CT 06512
 NEW HAVEN COUNTY

SHEET TITLE

DETAILS

SHEET NUMBER

A-3

EXISTING ANTENNA MOUNTING PIPE (TYP. OF 2 PER SECTOR, TOTAL OF 6) (TO REMAIN)

PROPOSED HANDRAIL KIT (SITEPRO P/N HRK12-U OR EQUIVALENT)

EXISTING T-MOBILE PLATFORM MOUNT (TYP.)

PROPOSED T-MOBILE L1900 ANTENNA MOUNTED ON EXISTING MOUNTING PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO REPLACE EXISTING ANTENNAS)

☉ OF PROPOSED T-MOBILE ANTENNAS
 ELEV. = 98'-0"± A.G.L.

PROPOSED L1900 ANTENNA MOUNT

22x34 SCALE: 1"=1'-0"
 11x17 SCALE: 1/2"=1'-0"



EXISTING ANTENNA MOUNTING PIPE (TYP. OF 2 PER SECTOR, TOTAL OF 6) (TO REMAIN)

PROPOSED HANDRAIL KIT (SITEPRO P/N HRK12-U OR EQUIVALENT)

EXISTING T-MOBILE RRUS (TYP. OF 1 PER SECTOR, TOTAL OF 3) (RELOCATED FROM GROUND TO BEHIND PROPOSED L700 ANTENNA)

EXISTING T-MOBILE PLATFORM MOUNT (TYP.)

PROPOSED T-MOBILE L700 ANTENNA MOUNTED ON EXISTING MOUNTING PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO REPLACE EXISTING ANTENNAS)

☉ OF PROPOSED T-MOBILE ANTENNAS
 ELEV. = 98'-0"± A.G.L.

PROPOSED L700 ANTENNA MOUNT

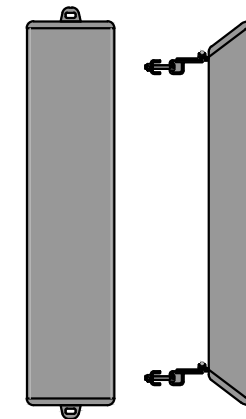
22x34 SCALE: 1"=1'-0"
 11x17 SCALE: 1/2"=1'-0"



L1900 ANTENNA DIMENSIONS

MODEL #	AIR 32 B66Aa/B2a
MANUF.	ERICSSON
WIDTH	12.9"
DEPTH	8.7"
HEIGHT	56.6"
WEIGHT	132.2 LBS

PLAN



FRONT SIDE

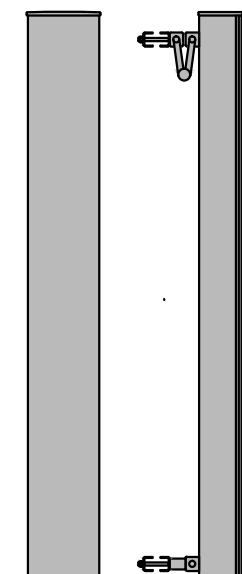
L1900 ANTENNA DETAIL

SCALE: N.T.S.

L700 ANTENNA DIMENSIONS

MODEL #	SBNH-1D6565C
MANUF.	COMMSCOPE
WIDTH	11.9"
DEPTH	7.1"
HEIGHT	96.5"
WEIGHT	60.85 LBS

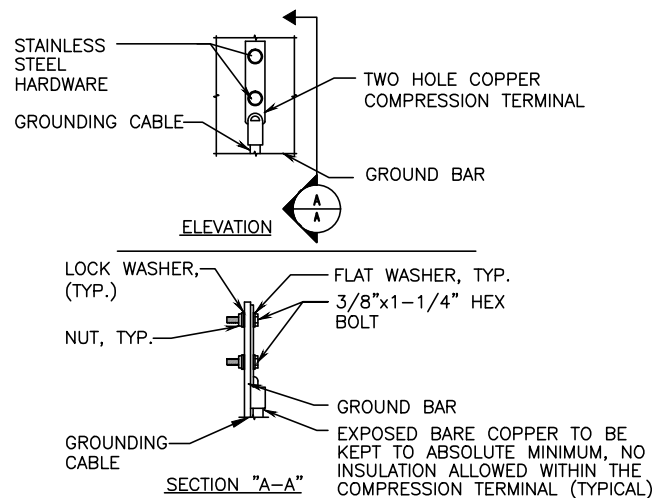
PLAN



FRONT SIDE

L700 ANTENNA DETAIL

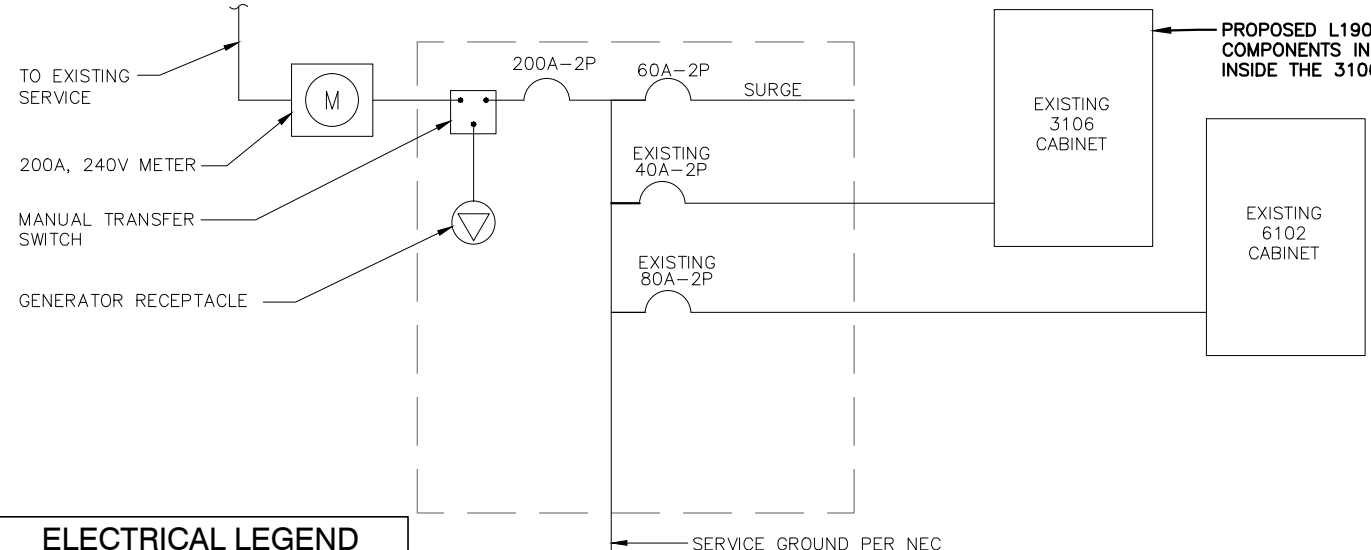
SCALE: N.T.S.



NOTE:
 1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 3. CADWELD DOWNLEADS FROM UPPER AGB/EGB, ALL EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL
 SCALE: N.T.S.

NOTE:
 G.C. TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.



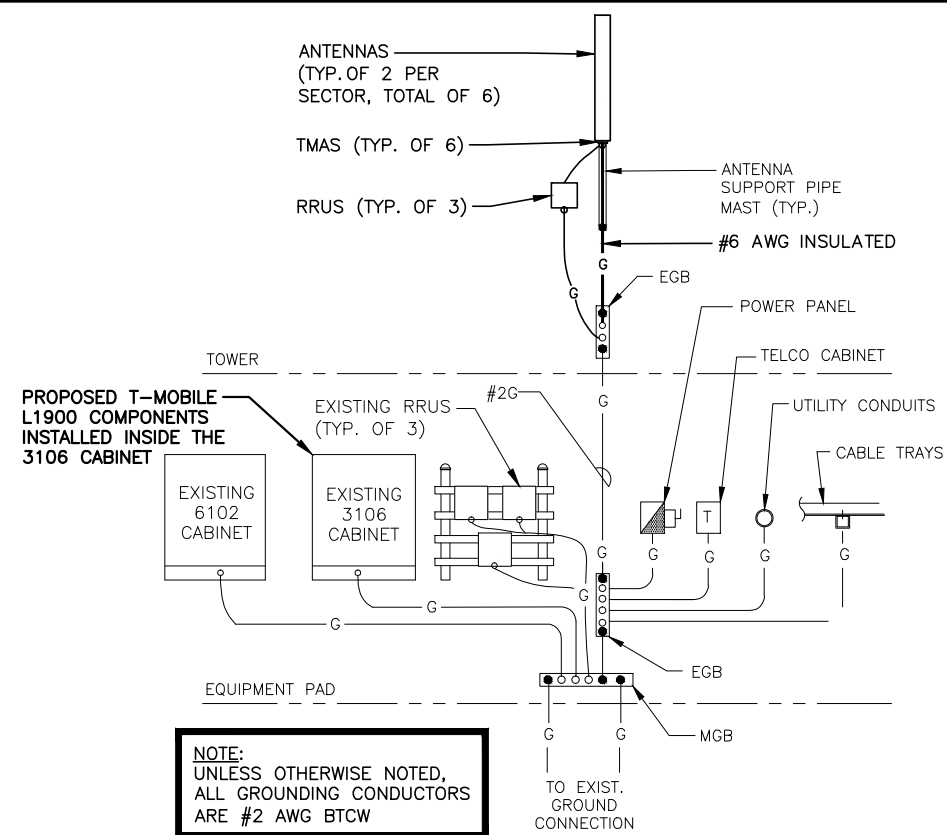
ONE LINE POWER DIAGRAM
 SCALE: N.T.S.

ELECTRICAL LEGEND

A	AMPERE	○	MECHANICAL CONNECTION
V	VOLT	●	CADWELD CONNECTION
KWH	KILOWATT - HOUR	○	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
C	CONDUIT	—	GROUND COPPER WIRE, SIZE AS NOTED
GRC	GALVANIZED RIGID CONDUIT	—	EXPOSED WIRING
BTW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)	—	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
G	GROUND	⊕	5/8" COPPER CLAD STAINLESS STEEL GROUND ROD
MGB	MASTER GROUND BAR	⊕	EXOTHERMIC (CAD WELD) OR MECHANICAL (COMPRESSION TYPE) CONNECTION
AGB/EGB	ANTENNA GROUND BAR / EQUIPMENT GROUND BAR	⊕	POWER PROTECTION CABINET
—	GROUND COPPER WIRE, SIZE AS NOTED	⊕	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

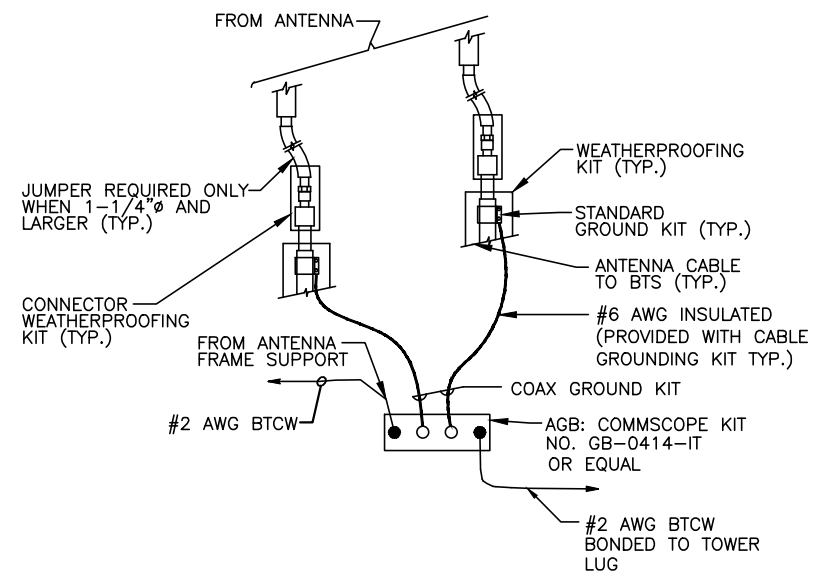
ELECTRICAL & GROUNDING NOTES:
ELECTRICAL & GROUNDING NOTES

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
- RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
- RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- GROUNDING SHALL COMPLY WITH NEC ART. 250.
- GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.



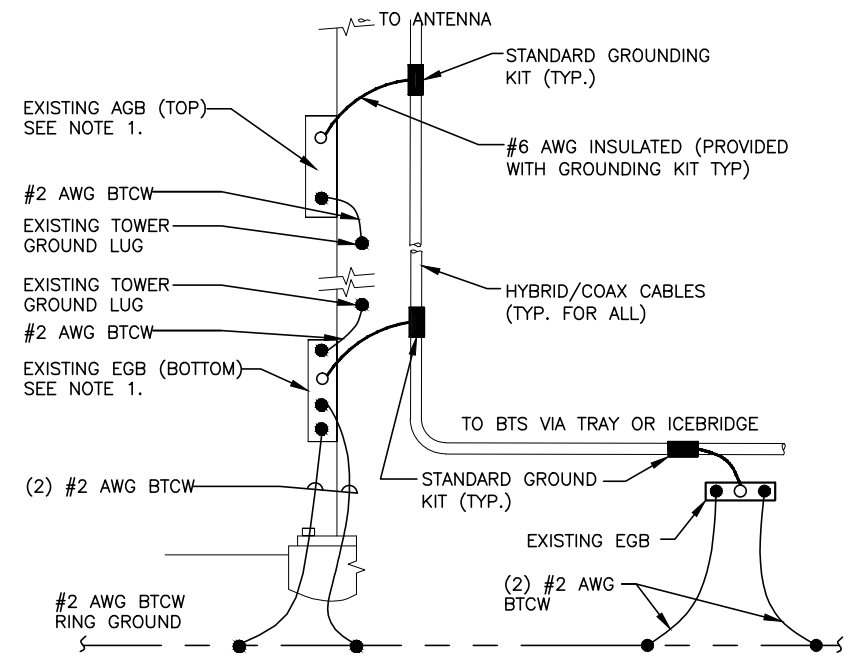
NOTE:
 UNLESS OTHERWISE NOTED, ALL GROUNDING CONDUCTORS ARE #2 AWG BTCW

GROUNDING RISER DIAGRAM
 SCALE: N.T.S.



NOTE:
 INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

TOWER TOP CABLE GROUNDING DETAIL
 SCALE: N.T.S.



NOTE:
 1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE ADDITIONAL AGB/EGB AS REQUIRED.
 2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

TOWER BOTTOM CABLE GROUNDING DETAIL
 SCALE: N.T.S.

- USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
- ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
- CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
- BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
- BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
- TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
- BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
- VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

T-MOBILE NORTHEAST LLC
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 648-1116

Transcend Wireless
 TRANSCEND WIRELESS
 10 INDUSTRIAL AVE
 MAHWAH, NJ 07430
 TEL: (201) 684-0055
 FAX: (201) 684-0066

Hudson Design Group
 1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5566

STATE OF CONNECTICUT
 BEREK J. CREASER
 16,235
 LICENSED PROFESSIONAL ENGINEER

CHECKED BY: DR
 APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	07/25/16	ISSUED FOR CONSTRUCTION	VP
1	07/21/16	ISSUED FOR CONSTRUCTION	VP
0	04/22/16	ISSUED FOR REVIEW	MC

SITE NUMBER:
 CTNH039A
 SITE NAME:
 NH039/LAYDON CONSTRUCTION
 SITE ADDRESS:
 69 WHEELER ST
 NEW HAVEN, CT 06512
 NEW HAVEN COUNTY

SHEET TITLE
GROUNDING DIAGRAM

SHEET NUMBER
E-1

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

T-Mobile Existing Facility

Site ID: CTNH039A

NH039/Laydon Construction
69 Wheeler Street
New Haven, CT 06512

August 18, 2016

EBI Project Number: 6216003631

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	20.06 %

August 18, 2016

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

Emissions Analysis for Site: **CTNH039A – NH039/Laydon Construction**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **69 Wheeler Street, New Haven, 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 approximately 467 $\mu\text{W}/\text{cm}^2$, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (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 **69 Wheeler Street, New Haven, 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 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.
- 4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 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.
- 6) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

- 7) 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.
- 8) For the following calculations the sample point was the top of a 6-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.
- 9) The antennas used in this modeling are the **Ericsson AIR32 B66Aa/B2A** & **Commscope SBNHH-1D65C** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope SBNHH-1D65C** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR32 B66Aa/B2A** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope SBNHH-1D65C** has a maximum gain of **15.1 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope SBNHH-1D65C** has a maximum gain of **13.6 dBd** at its main lobe at 700 MHz. 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.
- 10) The antenna mounting height centerline of the proposed antennas is **98 feet** above ground level (AGL).
- 11) 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.
- 12) 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:	Ericsson AIR32 B66Aa/B2A	Make / Model:	Ericsson AIR32 B66Aa/B2A	Make / Model:	Ericsson AIR32 B66Aa/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	98	Height (AGL):	98	Height (AGL):	98
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	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	3.97	Antenna B1 MPE%	3.97	Antenna C1 MPE%	3.97
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope SBNHH-1D65C	Make / Model:	Commscope SBNHH-1D65C	Make / Model:	Commscope SBNHH-1D65C
Gain:	15.1 dBd	Gain:	15.1 dBd	Gain:	15.1 dBd
Height (AGL):	98	Height (AGL):	98	Height (AGL):	98
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS) / 700 MHz	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS) / 700 MHz	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS) / 700 MHz
Channel Count	7	Channel Count	7	Channel Count	7
Total TX Power(W):	210	Total TX Power(W):	210	Total TX Power(W):	210
ERP (W):	6,511.95	ERP (W):	6,511.95	ERP (W):	6,511.95
Antenna A2 MPE%	3.10	Antenna B2 MPE%	3.10	Antenna C2 MPE%	3.10

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	7.06 %
Nextel	2.78 %
Clearwire	0.48 %
AT&T	9.74 %
Site Total MPE %:	20.06 %

T-Mobile Sector A Total:	7.06 %
T-Mobile Sector B Total:	7.06 %
T-Mobile Sector C Total:	7.06 %
Site Total:	20.06 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	98	19.83	AWS - 2100 MHz	1000	1.98%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	98	19.83	PCS - 1900 MHz	1000	1.98%
T-Mobile AWS - 2100 MHz UMTS	2	970.78	98	8.25	AWS - 2100 MHz	1000	0.82%
T-Mobile PCS - 1950 MHz UMTS	2	970.78	98	8.25	PCS - 1950 MHz	1000	0.82%
T-Mobile PCS - 1950 MHz GSM	2	970.78	98	8.25	PCS - 1950 MHz	1000	0.82%
T-Mobile 700 MHz LTE	1	687.26	98	2.92	700 MHz	467	0.63%
						Total*:	7.06%

NOTE: Totals may vary by 0.01% due to summing of remainders

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 A:	7.06 %
Sector B:	7.06 %
Sector C:	7.06 %
T-Mobile Per Sector Maximum:	7.06 %
Site Total:	20.06 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **20.06%** 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.

STRUCTURAL ANALYSIS REPORT

For

CTNH039A

NH039/LAYDON CONSTRUCTION

69 WHEELER STREET
NEW HAVEN, CT 06512

Antennas Mounted on the Monopole



Prepared for:

Transcend Wireless

T-Mobile

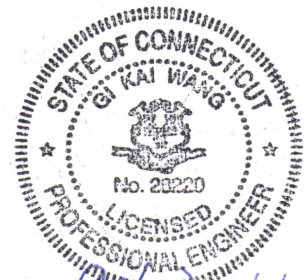
Dated: July 21, 2016

Prepared by:

Hudson
Design Group LLC



1600 Osgood Street Bldg. 20N Suite 3090
North Andover, MA 01845
(P) 978.557.5553 (F) 978.336.5586
www.hudsondesigngroupllc.com



Gi Kai Wang 7/21/2016



SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by T-MOBILE to conduct a structural evaluation of the 98' monopole supporting the proposed T-MOBILE's antennas located at elevation 98' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of T-MOBILE's existing and proposed antennas listed below.

Record drawings of the existing monopole were not available for our use. The previous structural analysis report prepared by Structural Components, LLC, dated April 26, 2012, was available and obtained for our use.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing monopole **is in conformance** with the ANSI/TIA-222-F Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **93.3%** - (Pole section L2 from EL.70' to EL.88' Controlling).



APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
T-MOBILE	(3) AIR 32 B66Aa/B2a Antennas	98'	Low Profile Platform
T-MOBILE	(3) SBNHH-1D65C Antennas	98'	Low Profile Platform
T-MOBILE	(6) TMA	98'	Low Profile Platform
T-MOBILE	(3) RRUS-11	98'	Low Profile Platform
	(6) RRUS-11	94'	T-Frame
	Surge Arrestor DC6-48-60-18-8F	94'	T-Frame
	(3) AM-X-CD-16-65 Antennas	91.5'	T-Frame
	(3) 7750 Antennas	91.5'	T-Frame
	(3) 7770 Antennas	91.5'	T-Frame
	(6) LGP21401 TMA	91.5'	T-Frame
	(6) LGP21900	91.5'	T-Frame
	(2) A-ANT-18G Dishes	82'	T-Frame
	(11) DB844G45ZAXY Antennas	80'	T-Frame
	(3) LLPX310R Antennas	80'	T-Frame
	(3) RRUS-11	80'	T-Frame

**Proposed T-MOBILE Appurtenances shown in Bold.*

T-MOBILE EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
T-MOBILE	(18) 1 1/4" Cables	98'	Inside Monopole
T-MOBILE	(1) Fiber Cable	98'	Inside Monopole

**Proposed T-MOBILE Coax Cables shown in Bold.*

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	23.6 %	88 – 98	PASS	
Pole Section-L2	93.3 %	70 – 88	PASS	Controlling
Pole Section-L3	81.1 %	48.68 – 70	PASS	
Pole Section-L4	89.1 %	20 – 48.68	PASS	
Pole Section-L5	85.6 %	0 – 20	PASS	



DESIGN CRITERIA:

1. EIA/TIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

County: New Haven
Wind Load: 85 mph (fastest mile)
105 mph (3 second gust)
Nominal Ice Thickness: 1/2 inch

2. Approximate height above grade to proposed antennas: 98'

***Calculations and referenced documents are attached.**

ASSUMPTIONS:

1. The monopole dimensions, member sizes and strength of material are as indicated in the previous structural analysis report prepared by Structural Components, LLC, dated April 26, 2012.
2. The appurtenances configuration is as stated in the previous structural analysis report prepared by Structural Components, LLC, dated April 26, 2012. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
3. The monopole and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
4. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.
5. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.
6. The foundation of the monopole was not checked due to lack of information. As-built foundation drawings and geotechnical report would be required to determine whether the foundation is capable of supporting the proposed loadings.



SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed antennas be mounted on the existing steel platform supported by the monopole.

Reference HDG's Latest Construction Drawings for all component and connection requirements.

ONGOING AND PERIODIC INSPECTION AND MAINTENANCE:

After the Contractor has successfully completed the installation and the work has been accepted, the Owner will be responsible for the ongoing and periodic inspection and maintenance of the monopole.

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire monopole structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

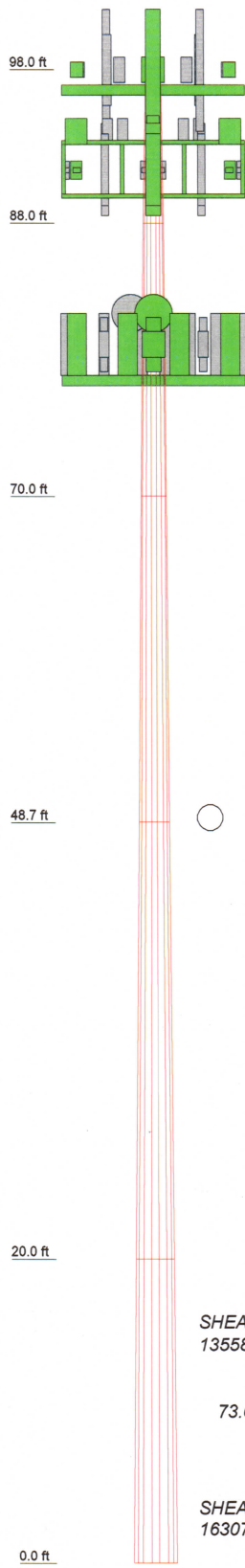


Photo 1: Photo illustrating the Monopole with Appurtenances shown.



CALCULATIONS

Section	1	2	3	4	5	
Length (ft)	10.00	18.00	21.32	28.88	20.00	
Number of Sides	18	18	18	18	18	
Thickness (in)	0.2500	0.1875	0.3240	0.3490	0.3800	
Top Dia (in)	12.7500	16.5000	20.0700	24.3130	30.0200	
Bot Dia (in)	16.5000	20.0700	24.3130	30.0200	34.0000	
Grade			A572-65			
Weight (lb)	388.1	659.7	1631.4	2899.1	2596.3	8174.7



DESIGNED APPURTENANCE LOADING

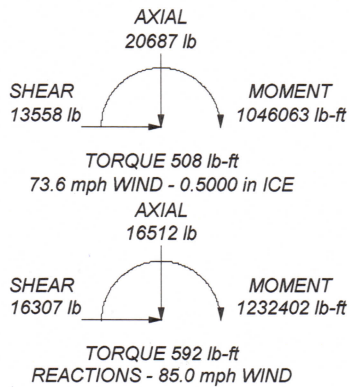
TYPE	ELEVATION	TYPE	ELEVATION
(2) RFS ATMAA1412D-1A20	98	Powerwave 7750	91.5
(2) RFS ATMAA1412D-1A20	98	Powerwave 7770	91.5
(2) RFS ATMAA1412D-1A20	98	Powerwave 7770	91.5
Ericsson RRUS-11	98	Powerwave 7770	91.5
Ericsson RRUS-11	98	(2) Powerwave TMA LGP21401	91.5
Ericsson RRUS-11	98	(2) Powerwave TMA LGP21401	91.5
AIR 32 B66Aa/B2a w/mount pipe (T-MOBILE - proposed)	98	(2) Powerwave TMA LGP21401	91.5
AIR 32 B66Aa/B2a w/mount pipe	98	(2) Powerwave LGP21900	91.5
AIR 32 B66Aa/B2a w/mount pipe	98	(2) Powerwave LGP21900	91.5
SBNHH-1D65C w/ Mount Pipe	98	(2) Powerwave LGP21900	91.5
SBNHH-1D65C w/ Mount Pipe	98	TA 602-3	91.5
SBNHH-1D65C w/ Mount Pipe	98	A-ANT-18G-24	82
SBNHH-1D65C w/ Mount Pipe	98	A-ANT-18G-24	82
PIROD 13' Low Profile Platform (Monopole) (T-MOBILE - existing)	97	(4) DB844G45ZAXY	80
(2) Ericsson RRUS-11 (ATI)	94	Argus LLPX310R	80
(2) Ericsson RRUS-11	94	Argus LLPX310R	80
(2) Ericsson RRUS-11	94	Argus LLPX310R	80
DC6-48-60-18-8F	94	Ericsson RRUS-11	80
KMW AM-X-CD-16-65-00T-RET	91.5	Ericsson RRUS-11	80
KMW AM-X-CD-16-65-00T-RET	91.5	Ericsson RRUS-11	80
KMW AM-X-CD-16-65-00T-RET	91.5	(3) DB844G45ZAXY (Nextel)	80
Powerwave 7750	91.5	(4) DB844G45ZAXY	80
Powerwave 7750	91.5	TA 602-3	78


MATERIAL STRENGTH


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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85.0 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 73.6 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50.0 mph wind.
5. TOWER RATING: 93.3%



 Hudson Design Group LLC 1600 Osgood Street Bldg. 20N Suite 3090 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	Job: CTNH039A
	Project: 98 ft monopole
	Client: T-MOBILE
	Code: TIA/EIA-222-F
	Path:
Drawn by: kw	App'd:
Date: 07/20/16	Scale: NTS
Dwg No.: E-1	

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Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Basic wind speed of 85.0 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56.0 pcf.

A wind speed of 73.6 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 50.0 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	98.00-88.00	10.00	0.00	18	12.7500	16.5000	0.2500	1.0000	A572-65 (65 ksi)
L2	88.00-70.00	18.00	0.00	18	16.5000	20.0700	0.1875	0.7500	A572-65 (65 ksi)
L3	70.00-48.68	21.32	0.00	18	20.0700	24.3130	0.3240	1.2960	A572-65 (65 ksi)
L4	48.68-20.00	28.68	0.00	18	24.3130	30.0200	0.3490	1.3960	A572-65 (65 ksi)
L5	20.00-0.00	20.00		18	30.0200	34.0000	0.3800	1.5200	A572-65 (65 ksi)

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	CAAA ft ² /ft	Weight plf
1 1/4 (T-MOBILE - existing) *****	A	No	Inside Pole	98.00 - 0.00	18	No Ice 1/2" Ice 0.00	0.66 0.66
1 5/8 Fiber Cable (T-MOBILE - proposed) *****	A	No	Inside Pole	98.00 - 0.00	1	No Ice 1/2" Ice 0.00	1.04 1.04
7/8 (AT&T)	A	No	Inside Pole	88.00 - 0.00	12	No Ice 1/2" Ice 0.00	0.54 0.54
1 5/8 Fiber Cable	A	No	Inside Pole	88.00 - 3.00	1	No Ice 1/2" Ice 0.00	1.04 1.04
597-6013 (5/16 COPPER) *****	A	No	Inside Pole	88.00 - 3.00	2	No Ice 1/2" Ice 0.00	0.03 0.03
1 5/8	A	No	Inside Pole	79.00 - 0.00	12	No Ice 0.00	1.04



Hudson Design Group LLC
 1600 Osgood Street Bldg. 20N Suite 3090
 North Andover, MA 01845
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 FAX: (978) 336-5586

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Client	T-MOBILE	Designed by	kw

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
(Nextel)						1/2" Ice	0.00	1.04
1/2"	A	No	Inside Pole	79.00 - 0.00	2	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
2" Rigid Conduit	A	No	Inside Pole	79.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
Switchblade	C	No	CaAa (Out Of Face)	70.00 - 0.00	1	No Ice	0.56	0.00
						1/2" Ice	0.67	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
PiROD 13' Low Profile Platform (Monopole) (T-MOBILE - existing)	A	None		0.0000	97.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
(2) RFS ATMAA1412D-1A20	A	From Face	2.00 0.00 0.00	0.0000	98.00	No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
(2) RFS ATMAA1412D-1A20	B	From Face	2.00 0.00 0.00	0.0000	98.00	No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
(2) RFS ATMAA1412D-1A20	C	From Face	2.00 0.00 0.00	0.0000	98.00	No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
Ericsson RRUS-11	A	From Face	2.00 0.00 0.00	0.0000	98.00	No Ice	3.26	1.38	50.70
						1/2" Ice	3.50	1.56	71.57
Ericsson RRUS-11	B	From Face	2.00 0.00 0.00	0.0000	98.00	No Ice	3.26	1.38	50.70
						1/2" Ice	3.50	1.56	71.57
Ericsson RRUS-11	C	From Face	2.00 0.00 0.00	0.0000	98.00	No Ice	3.26	1.38	50.70
						1/2" Ice	3.50	1.56	71.57

AIR 32 B66Aa/B2a w/mount pipe (T-MOBILE - proposed)	A	From Face	3.00 0.00 0.00	0.0000	98.00	No Ice	7.40	6.21	153.90
						1/2" Ice	7.97	7.14	215.61
AIR 32 B66Aa/B2a w/mount pipe	B	From Face	3.00 0.00 0.00	0.0000	98.00	No Ice	7.40	6.21	153.90
						1/2" Ice	7.97	7.14	215.61
AIR 32 B66Aa/B2a w/mount pipe	C	From Face	3.00 0.00 0.00	0.0000	98.00	No Ice	7.40	6.21	153.90
						1/2" Ice	7.97	7.14	215.61
SBNHH-1D65C w/ Mount Pipe	A	From Face	3.00 0.00 0.00	0.0000	98.00	No Ice	11.63	9.79	82.45
						1/2" Ice	12.35	11.31	171.76
SBNHH-1D65C w/ Mount Pipe	B	From Face	3.00 0.00 0.00	0.0000	98.00	No Ice	11.63	9.79	82.45
						1/2" Ice	12.35	11.31	171.76
SBNHH-1D65C w/ Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	98.00	No Ice	11.63	9.79	82.45
						1/2" Ice	12.35	11.31	171.76



Hudson Design Group LLC
 1600 Osgood Street Bldg. 20N Suite 3090
 North Andover, MA 01845
 Phone: (978) 557-5553
 FAX: (978) 336-5586

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Client	T-MOBILE	Designed by	kw

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	

(2) Ericsson RRUS-11 (AT&T)	A	From Face	0.00 0.00 0.00	0.0000	94.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	50.70 71.57
(2) Ericsson RRUS-11	B	From Face	0.00 0.00 0.00	0.0000	94.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	50.70 71.57
(2) Ericsson RRUS-11	C	From Face	0.00 0.00 0.00	0.0000	94.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	50.70 71.57
DC6-48-60-18-8F	C	From Face	0.00 0.00 0.00	0.0000	94.00	No Ice 1/2" Ice	1.27 1.46	1.27 1.46	20.00 35.12
KMW AM-X-CD-16-65-00T-RET	A	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	8.26 8.81	4.64 5.09	48.50 95.00
KMW AM-X-CD-16-65-00T-RET	B	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	8.26 8.81	4.64 5.09	48.50 95.00
KMW AM-X-CD-16-65-00T-RET	C	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	8.26 8.81	4.64 5.09	48.50 95.00
Powerwave 7750	A	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	5.92 6.36	2.91 3.26	39.00 71.64
Powerwave 7750	B	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	5.92 6.36	2.91 3.26	39.00 71.64
Powerwave 7750	C	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	5.92 6.36	2.91 3.26	39.00 71.64
Powerwave 7770	A	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	5.92 6.36	2.91 3.26	39.00 71.64
Powerwave 7770	B	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	5.92 6.36	2.91 3.26	39.00 71.64
Powerwave 7770	C	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	5.92 6.36	2.91 3.26	39.00 71.64
(2) Powerwave TMA LGP21401	A	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29
(2) Powerwave TMA LGP21401	B	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29
(2) Powerwave TMA LGP21401	C	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29
(2) Powerwave LGP21900	A	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70
(2) Powerwave LGP21900	B	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70
(2) Powerwave LGP21900	C	From Face	3.00 0.00 0.00	0.0000	91.50	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70



Hudson Design Group LLC
 1600 Osgood Street Bldg. 20N Suite 3090
 North Andover, MA 01845
 Phone: (978) 557-5553
 FAX: (978) 336-5586

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Project	98 ft monopole	Date	16:30:54 07/20/16
Client	T-MOBILE	Designed by	kw

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	
TA 602-3	A	None	0.00	0.0000	91.50	No Ice 1/2" Ice	11.59 15.44	11.59 15.44	774.00 990.00

(3) DB844G45ZAXY (Nextel)	A	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	7.00 7.41	3.97 4.34	21.00 64.04
(4) DB844G45ZAXY	B	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	7.00 7.41	3.97 4.34	21.00 64.04
(4) DB844G45ZAXY	C	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	7.00 7.41	3.97 4.34	21.00 64.04
Argus LLPX310R	A	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	4.83 5.18	1.95 2.21	29.00 54.88
Argus LLPX310R	B	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	4.83 5.18	1.95 2.21	29.00 54.88
Argus LLPX310R	C	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	4.83 5.18	1.95 2.21	29.00 54.88
Ericsson RRUS-11	A	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	50.70 71.57
Ericsson RRUS-11	B	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	50.70 71.57
Ericsson RRUS-11	C	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	50.70 71.57
TA 602-3	A	None	0.00	0.0000	78.00	No Ice 1/2" Ice	11.59 15.44	11.59 15.44	774.00 990.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb	
A-ANT-18G-24	A	Paraboloid w/Radome	From Face	1.00 0.00 0.00	0.0000		82.00	2.50	No Ice 1/2" Ice	4.90 5.20	41.00 81.00
A-ANT-18G-24	C	Paraboloid w/Radome	From Face	1.00 0.00 0.00	0.0000		82.00	2.50	No Ice 1/2" Ice	4.90 5.20	41.00 81.00

Load Combinations



Hudson Design Group LLC
 1600 Osgood Street Bldg. 20N Suite 3090
 North Andover, MA 01845
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<i>Comb. No.</i>	<i>Description</i>
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Reactions

<i>Location</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Vertical lb</i>	<i>Horizontal, X lb</i>	<i>Horizontal, Z lb</i>
Pole	Max. Vert	21	20687.45	22.50	-13544.23
	Max. H _x	11	16511.76	16160.42	-21.93
	Max. H _z	2	16511.76	-59.18	16271.84
	Max. M _x	2	1229459.33	-59.18	16271.84
	Max. M _z	5	1224948.89	-16215.67	74.16
	Max. Torsion	11	559.98	16160.42	-21.93
	Min. Vert	1	16511.76	0.00	0.00
	Min. H _x	5	16511.76	-16215.67	74.16
	Min. H _z	8	16511.76	30.63	-16289.12
	Min. M _x	8	-1231101.70	30.63	-16289.12
	Min. M _z	11	-1220277.17	16160.42	-21.93
	Min. Torsion	5	-591.83	-16215.67	74.16



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Project	98 ft monopole	Date	16:30:54 07/20/16
Client	T-MOBILE	Designed by	kw

Tower Mast Reaction Summary

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	16511.76	0.00	0.00	86.90	-6.59	0.00
Dead+Wind 0 deg - No Ice	16511.76	59.18	-16271.84	-1229459.33	-4903.27	91.30
Dead+Wind 30 deg - No Ice	16511.76	8172.06	-14111.85	-1066365.08	-617803.19	354.92
Dead+Wind 60 deg - No Ice	16511.76	14071.85	-8185.44	-618783.68	-1063193.10	546.61
Dead+Wind 90 deg - No Ice	16511.76	16215.67	-74.16	-6078.97	-1224948.89	591.83
Dead+Wind 120 deg - No Ice	16511.76	14015.66	8084.66	610638.40	-1058576.61	455.20
Dead+Wind 150 deg - No Ice	16511.76	8080.42	14100.38	1065703.06	-610249.99	189.00
Dead+Wind 180 deg - No Ice	16511.76	-30.63	16289.12	1231101.70	2476.72	-117.22
Dead+Wind 210 deg - No Ice	16511.76	-8099.20	14090.12	1064720.90	611635.97	-386.58
Dead+Wind 240 deg - No Ice	16511.76	-13982.77	8134.01	614621.89	1055669.44	-546.48
Dead+Wind 270 deg - No Ice	16511.76	-16160.42	21.93	1832.89	1220277.17	-559.98
Dead+Wind 300 deg - No Ice	16511.76	-14016.35	-8118.03	-613280.49	1058614.74	-429.42
Dead+Wind 330 deg - No Ice	16511.76	-8079.49	-14100.92	-1065563.94	610157.98	-189.18
Dead+Ice+Temp	20687.45	0.00	0.00	211.39	-86.31	0.00
Dead+Wind 0 deg+Ice+Temp	20687.45	45.23	-13530.47	-1043713.81	-3886.42	67.06
Dead+Wind 30 deg+Ice+Temp	20687.45	6793.45	-11732.72	-905092.23	-524458.10	296.28
Dead+Wind 60 deg+Ice+Temp	20687.45	11702.76	-6803.02	-524912.49	-902933.95	464.59
Dead+Wind 90 deg+Ice+Temp	20687.45	13487.93	-57.15	-4590.72	-1040498.03	508.42
Dead+Wind 120 deg+Ice+Temp	20687.45	11659.91	6726.06	518923.34	-899361.70	397.48
Dead+Wind 150 deg+Ice+Temp	20687.45	6723.77	11725.47	905025.73	-518635.87	173.95
Dead+Wind 180 deg+Ice+Temp	20687.45	-22.50	13544.23	1045353.03	1751.89	-87.71
Dead+Wind 210 deg+Ice+Temp	20687.45	-6735.46	11715.42	904075.17	519303.62	-321.51
Dead+Wind 240 deg+Ice+Temp	20687.45	-11631.86	6762.09	521863.41	896681.07	-464.44
Dead+Wind 270 deg+Ice+Temp	20687.45	-13443.96	15.58	1476.76	1036546.29	-482.97
Dead+Wind 300 deg+Ice+Temp	20687.45	-11660.47	-6752.62	-520743.37	899216.60	-376.86
Dead+Wind 330 deg+Ice+Temp	20687.45	-6723.03	-11725.90	-904600.72	518384.86	-174.05
Dead+Wind 0 deg - Service	16511.76	20.48	-5630.39	-426091.44	-1704.24	32.70
Dead+Wind 30 deg - Service	16511.76	2827.70	-4882.99	-369562.65	-214148.43	124.85
Dead+Wind 60 deg - Service	16511.76	4869.15	-2832.33	-214419.83	-368527.69	191.63
Dead+Wind 90 deg - Service	16511.76	5610.96	-25.66	-2044.81	-424588.86	207.08
Dead+Wind 120 deg - Service	16511.76	4849.71	2797.46	211715.84	-366919.35	158.93
Dead+Wind 150 deg - Service	16511.76	2795.99	4879.03	369451.42	-211527.79	65.54
Dead+Wind 180 deg - Service	16511.76	-10.60	5636.38	426784.16	853.15	-41.74
Dead+Wind 210 deg - Service	16511.76	-2802.49	4875.47	369110.96	211997.78	-135.94
Dead+Wind 240 deg - Service	16511.76	-4838.33	2814.54	213096.15	365901.62	-191.62
Dead+Wind 270 deg - Service	16511.76	-5591.84	7.59	696.87	422954.57	-195.95
Dead+Wind 300 deg - Service	16511.76	-4849.95	-2809.01	-212509.61	366925.40	-149.88
Dead+Wind 330 deg - Service	16511.76	-2795.67	-4879.21	-369281.37	211486.77	-65.54

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-16511.76	0.00	0.00	16511.76	0.00	0.000%
2	59.18	-16511.76	-16271.83	-59.18	16511.76	16271.84	0.000%
3	8172.06	-16511.76	-14111.85	-8172.06	16511.76	14111.85	0.000%
4	14071.85	-16511.76	-8185.44	-14071.85	16511.76	8185.44	0.000%
5	16215.66	-16511.76	-74.16	-16215.67	16511.76	74.16	0.000%
6	14015.66	-16511.76	8084.66	-14015.66	16511.76	-8084.66	0.000%
7	8080.42	-16511.76	14100.38	-8080.42	16511.76	-14100.38	0.000%
8	-30.63	-16511.76	16289.12	30.63	16511.76	-16289.12	0.000%
9	-8099.20	-16511.76	14090.12	8099.20	16511.76	-14090.12	0.000%
10	-13982.77	-16511.76	8134.01	13982.77	16511.76	-8134.01	0.000%



Hudson Design Group LLC
 1600 Osgood Street Bldg. 20N Suite 3090
 North Andover, MA 01845
 Phone: (978) 557-5553
 FAX: (978) 336-5586

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
11	-16160.42	-16511.76	21.93	16160.42	16511.76	-21.93	0.000%
12	-14016.35	-16511.76	-8118.03	14016.35	16511.76	8118.03	0.000%
13	-8079.49	-16511.76	-14100.92	8079.49	16511.76	14100.92	0.000%
14	0.00	-20687.45	0.00	0.00	20687.45	0.00	0.000%
15	45.23	-20687.45	-13530.45	-45.23	20687.45	13530.47	0.000%
16	6793.45	-20687.45	-11732.72	-6793.45	20687.45	11732.72	0.000%
17	11702.76	-20687.45	-6803.02	-11702.76	20687.45	6803.02	0.000%
18	13487.91	-20687.45	-57.15	-13487.93	20687.45	57.15	0.000%
19	11659.91	-20687.45	6726.06	-11659.91	20687.45	-6726.06	0.000%
20	6723.77	-20687.45	11725.47	-6723.77	20687.45	-11725.47	0.000%
21	-22.50	-20687.45	13544.21	22.50	20687.45	-13544.23	0.000%
22	-6735.46	-20687.45	11715.42	6735.46	20687.45	-11715.42	0.000%
23	-11631.86	-20687.45	6762.09	11631.86	20687.45	-6762.09	0.000%
24	-13443.94	-20687.45	15.58	13443.96	20687.45	-15.58	0.000%
25	-11660.46	-20687.45	-6752.62	11660.47	20687.45	6752.62	0.000%
26	-6723.03	-20687.45	-11725.89	6723.03	20687.45	11725.90	0.000%
27	20.48	-16511.76	-5630.39	-20.48	16511.76	5630.39	0.000%
28	2827.70	-16511.76	-4882.99	-2827.70	16511.76	4882.99	0.000%
29	4869.15	-16511.76	-2832.33	-4869.15	16511.76	2832.33	0.000%
30	5610.96	-16511.76	-25.66	-5610.96	16511.76	25.66	0.000%
31	4849.71	-16511.76	2797.46	-4849.71	16511.76	-2797.46	0.000%
32	2795.99	-16511.76	4879.03	-2795.99	16511.76	-4879.03	0.000%
33	-10.60	-16511.76	5636.37	10.60	16511.76	-5636.38	0.000%
34	-2802.49	-16511.76	4875.47	2802.49	16511.76	-4875.47	0.000%
35	-4838.33	-16511.76	2814.54	4838.33	16511.76	-2814.54	0.000%
36	-5591.84	-16511.76	7.59	5591.84	16511.76	-7.59	0.000%
37	-4849.95	-16511.76	-2809.01	4849.95	16511.76	2809.01	0.000%
38	-2795.67	-16511.76	-4879.21	2795.67	16511.76	4879.21	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	98 - 88	24.6280	28	2.2952	0.0037
L2	88 - 70	19.8686	28	2.2338	0.0036
L3	70 - 48.68	12.2614	28	1.7332	0.0022
L4	48.68 - 20	5.7321	28	1.1748	0.0011
L5	20 - 0	0.9055	28	0.4384	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
98.00	(2) RFS ATMAA1412D-1A20	28	24.6280	2.2952	0.0038	6724
97.00	PIROD 13' Low Profile Platform (Monopole)	28	24.1462	2.2933	0.0038	6724
94.00	(2) Ericsson RRUS-11	28	22.7043	2.2850	0.0038	6724
91.50	KMW AM-X-CD-16-65-00T-RET	28	21.5121	2.2714	0.0038	5181
82.00	A-ANT-18G-24	28	17.1547	2.1059	0.0033	2606
80.00	(3) DB844G45ZAXY	28	16.2850	2.0496	0.0031	2424
78.00	TA 602-3	28	15.4352	1.9890	0.0030	2265



Hudson Design Group LLC
 1600 Osgood Street Bldg. 20N Suite 3090
 North Andover, MA 01845
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Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
L1	98 - 88	Pole	TP16.5x12.75x0.25	1	-3533.87	670340.35	23.6	Pass
L2	88 - 70	Pole	TP20.07x16.5x0.1875	2	-5796.54	615139.48	93.3	Pass
L3	70 - 48.68	Pole	TP24.313x20.07x0.324	3	-8456.98	1282504.57	81.1	Pass
L4	48.68 - 20	Pole	TP30.02x24.313x0.349	4	-12848.10	1708679.32	89.1	Pass
L5	20 - 0	Pole	TP34x30.02x0.38	5	-16503.10	2108059.43	85.6	Pass
Summary								
Pole (L2)							93.3	Pass
RATING =							93.3	Pass