



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

VIA ELECTRONIC MAIL

March 20, 2019

Kyle Richers
Transcend Wireless
10 Industrial Avenue, Suite 3
Mahwah, New Jersey 07430

RE: **EM-T-MOBILE-103-190308** – T-Mobile notice of intent to modify an existing telecommunications facility located at 10 Willard Road, Norwalk, Connecticut

Dear Mr. Richers:

The Connecticut Siting Council (Council) is in receipt of your correspondence of March 18, 2019 submitted in response to the Council's March 13, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr



Robidoux, Evan

From: Kyle Richers <krichers@transcendwireless.com>
Sent: Monday, March 18, 2019 4:31 PM
To: Robidoux, Evan
Cc: CSC-DL Siting Council; 'Reid, Dan'
Subject: RE: Council Incomplete Letter for EM-T-MOBILE-103-190308-WillardRd-Norwalk CT11011D

Attachments: 18058.54 CT11011D Westport SNET- CMP4x2 - CD REV 2_19.03.18 S&S.pdf;
CT04761S-18V1-R1_Transcend Wireless_T-Mobile_Norwalk_Willard Rd
CT11011D_SA_RPT.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Good Morning,

Attached please find the updated structural analysis and updated construction drawings, in response to the letter sent from the Council earlier today. Please advise if this is acceptable, or if the Council needs anything else to proceed.

Thanks

Kyle

From: Robidoux, Evan <Evan.Robidoux@ct.gov>
Sent: Monday, March 18, 2019 8:20 AM
To: 'krichers@transcendwireless.com' <krichers@transcendwireless.com>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: Council Incomplete Letter for EM-T-MOBILE-103-190308-WillardRd-Norwalk

Please see the attached correspondence.

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

WESTPORT-SNET LL SITE ID: CT11011D 10 WILLARD ROAD (SNET LL) NORWALK, CT 06851

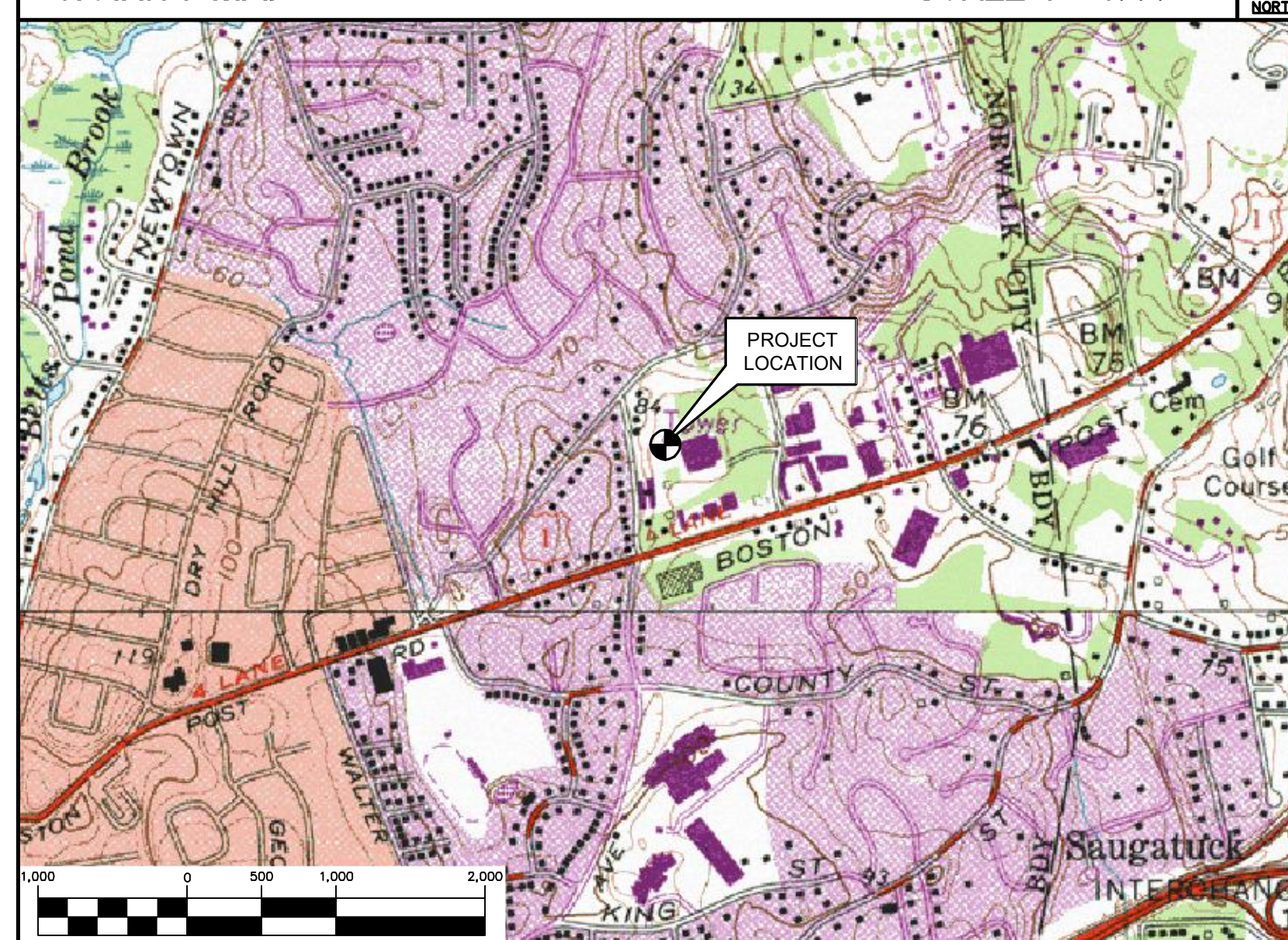
GENERAL NOTES

- ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2016 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
- CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
- CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
- CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
- CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
- CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
- LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
- THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
- DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
- ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
- ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
- ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
- CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
- THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
- COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
- CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM:	TO:
35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002	10 WILLARD ROAD NORWALK, CT 06851
1. HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.21 MI.
2. TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.14 MI.
3. TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187	1.89 MI.
4. TURN LEFT ONTO CT-305/OLD WINDSOR RD.	2.32 MI.
5. STAY STRAIGHT TO GO ONTO BLOOMFIELD AVE/CT-305.	0.01 MI.
6. MERGE ONTO I-91 S TOWARD HARTFORD	26.38 MI.
7. MERGE ONTO CT-15 S VIA EXIT 17 TOWARD E MAIN ST.	43.26 MI.
8. TAKE THE CT-57 EXIT, EXIT 42, TOWARD WESTON/WESTPORT	0.17 MI.
9. TURN RIGHT ONTO WESTON RD/CT-57	0.21 MI.
10. TURN SLIGHT RIGHT ONTO MAIN ST/CT-57	0.89 MI.
11. TURN RIGHT ONTO CANAL ST/CT-57. CONTINUE TO FOLLOW CT-57	0.39 MI.
12. TURN LEFT ONTO WILSON RD/CT-33	0.42 MI.
13. TURN SLIGHT RIGHT ONTO POST RD/US-1 S. CONTINUE TO FOLLOW US-1 S	1.59 MI.
14. TURN RIGHT ONTO WILLARD RD	0.08 MI.

VICINITY MAP



T-MOBILE RF CONFIGURATION

67D92M_2xAIR+1OP

PROJECT SUMMARY

- THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
 - REMOVE AND REPLACE SIX (6) EXISTING PANEL ANTENNAS, TYPICAL OF (2) PER SECTOR.
 - REMOVE THREE (3) REMOTE RADIO UNITS.
 - INSTALL THREE (3) PROPOSED REMOTE RADIO UNITS (RRUs) IN POSITION TWO (2), TYPICAL OF ONE (1) PER SECTOR.
 - INSTALL THREE (3) PROPOSED HYBRID CABLES/ (1) PER SECTOR FROM GROUND EQUIPMENT TO ANTENNAS.

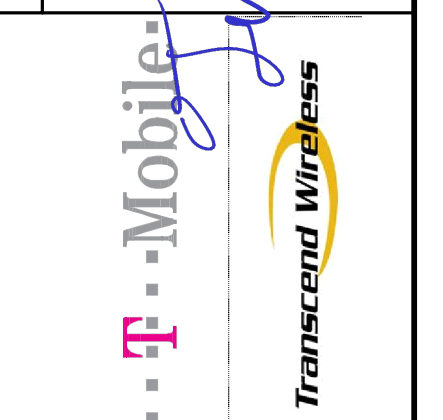
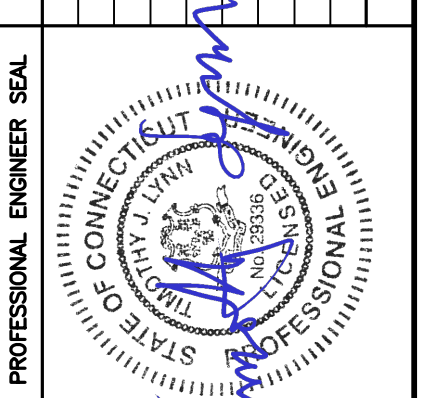
PROJECT INFORMATION

SITE NAME:	WESTPORT-SNET LL
SITE ID:	CT11011D
SITE ADDRESS:	10 WILLARD ROAD NORWALK, CT 06851
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-7'-41.69" N LONGITUDE: 73°-23'-24.86" W GROUND ELEVATION: 63'± AMSL
	SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

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C-2	COMPOUND PLAN AND ELEVATION	1
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REV.	DATE	BY	CHK'D BY	DESCRIPTION
2	03/18/19	TLL	CAG	ISSUED FOR CONSTRUCTION - UPDATED CODE REFERENCE
1	09/10/18	TLL	CAG	ISSUED FOR CONSTRUCTION
0	09/07/18	TLL	CAG	ISSUED FOR CONSTRUCTION



T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
WESTPORT-SNET LL
SITE ID: CT11011D
10 WILLARD ROAD
NORWALK, CT 06851

DATE:	06/27/18
SCALE:	AS NOTED
JOB NO.	18058.54

TITLE SHEET

T-1

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (TOWER AND ANTENNA MOUNTS): 90-110 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN WIND SPEED (OTHER STRUCTURE): 93 MPH (V_{50}) (EXPOSURE B)/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10 PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

- ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
- DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
- BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
- DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
- THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
- ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
- AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
- THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
- THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
- ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
- SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
- NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
- REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

- ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
 - STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
 - STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
 - STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
 - STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
 - PIPE---ASTM A53 (FY = 35 KSI)
 - CONNECTION BOLTS---ASTM A325-N
 - U-BOLTS---ASTM A36
 - ANCHOR RODS---ASTM F 1554
 - WELDING ELECTRODE---ASTM E 70XX
- CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
- STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
- PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
- FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
- INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
- AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
- ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
- THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
- CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
- STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
- LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
- SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
- MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
- FABRICATE BEAMS WITH MILL CAMBER UP.
- LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
- COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
- INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
- FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

ISSUED FOR CONSTRUCTION - UPDATED CODE REFERENCE	CAG	TUL	03/18/18
ISSUED FOR CONSTRUCTION	CAG	TUL	09/10/18
ISSUED FOR CONSTRUCTION	CAG	TUL	09/07/18
DESCRIPTION	DATE	DRAWN BY	CHK'D BY
REV.			
1			
2			

PROFESSIONAL ENGINEER SEAL
STATE OF CONNECTICUT
JAMES J. MURPHY, P.E.
No. 030300010
Professional Engineer
Mechanical

T-Mobile
Transcend Wireless

CENTEK engineering
Centered on Solutions
(203) 498-0390
(203) 498-3897 Fax
632 North Branford Road
Branford, CT 06405
www.CentekEng.com

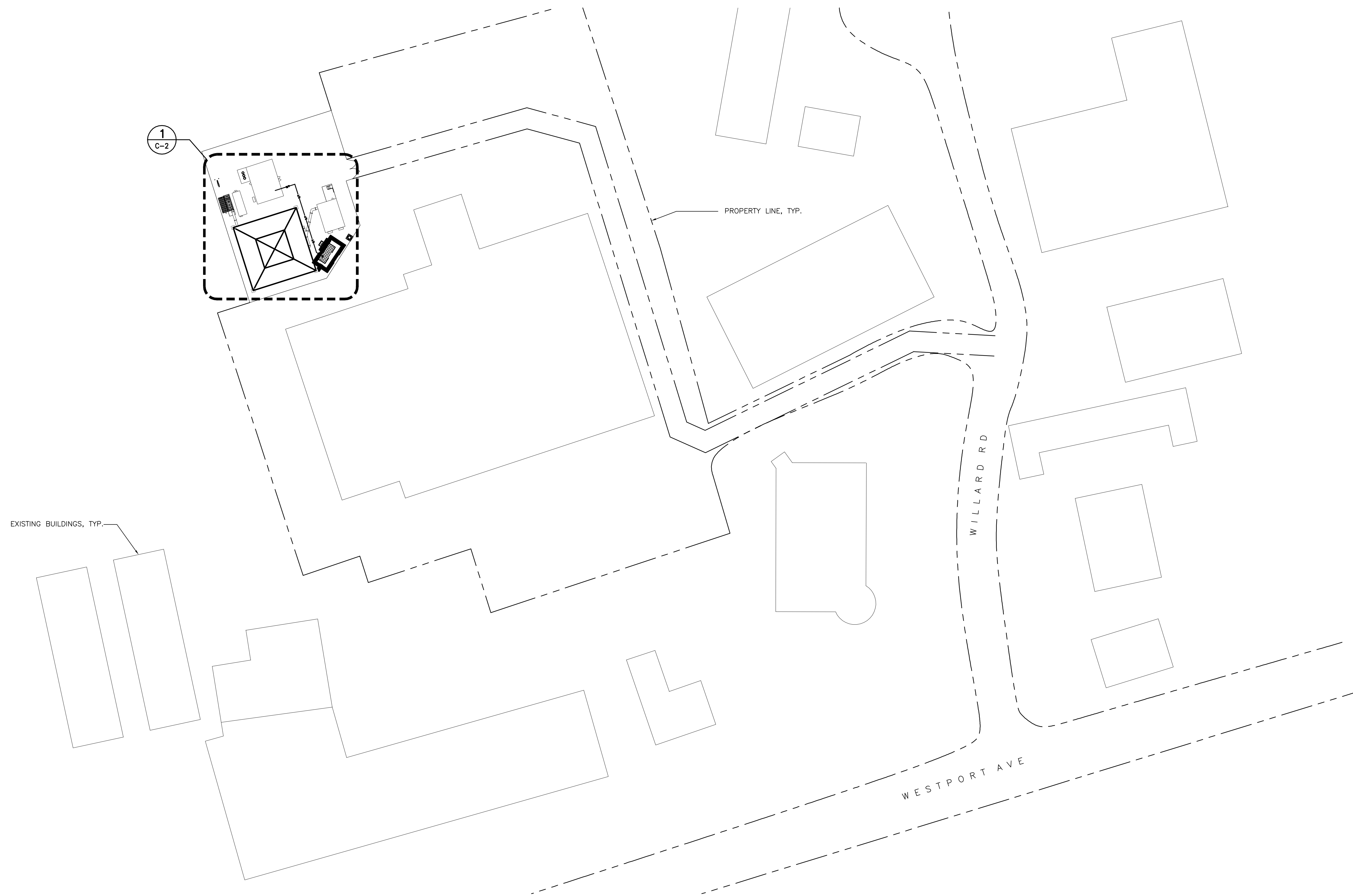
T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
WESTPORT-SNET LL
SITE ID: CT11011D
10 WILLARD ROAD
NORWALK, CT 06851

DATE: 06/27/18
SCALE: AS NOTED
JOB NO. 18058.54

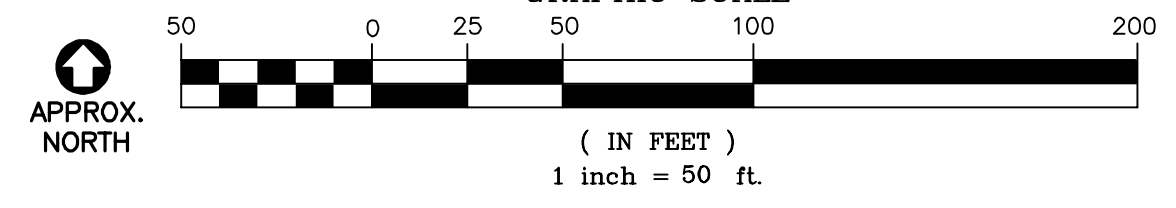
DESIGN BASIS
AND SITE NOTES

N-1

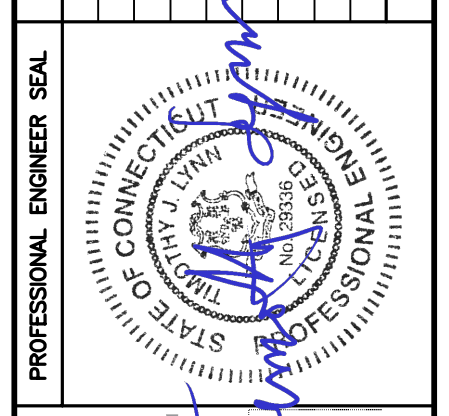
Sheet No. 2 of 6



1
C-1 **SITE LOCATION PLAN**
SCALE: 1" = 50'



REV.	DATE	DRAWN BY	CHK'D BY	ISSUED FOR CONSTRUCTION - UPDATED CODE REFERENCE
2	03/18/19	TLL	CAG	ISSUED FOR CONSTRUCTION
1	09/10/18	TLL	CAG	ISSUED FOR CONSTRUCTION
0	09/07/18	TLL	CAG	ISSUED FOR CONSTRUCTION



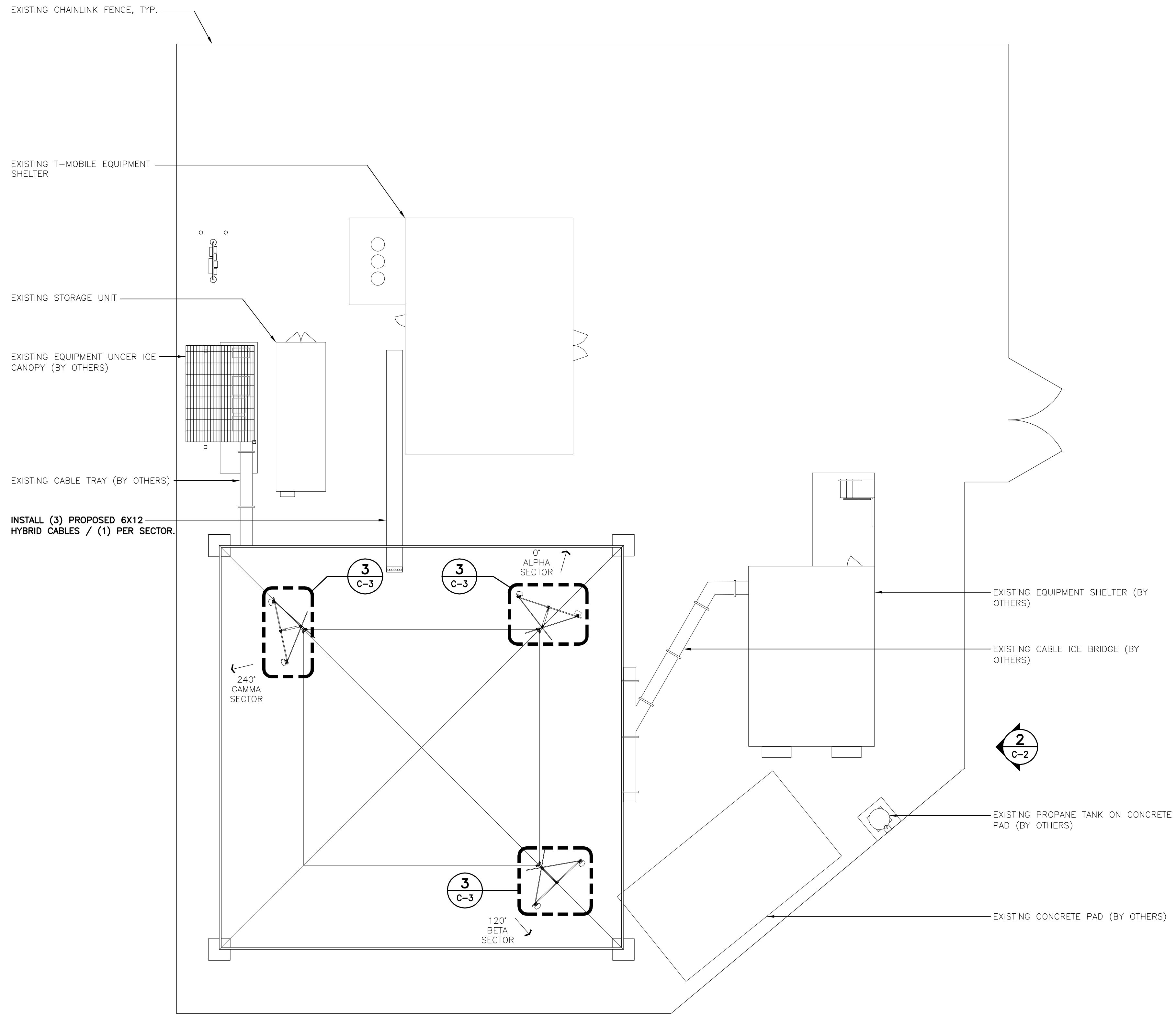
CEN TEK engineering
Centered on Solutions
(203) 498-0390
(203) 498-3397 Fax
632 North Willard Road
Branford, CT 06405
www.CenTekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
WESTPORT-SNET LL
SITE ID: CT11011D
10 WILLARD ROAD
NORWALK, CT 06851

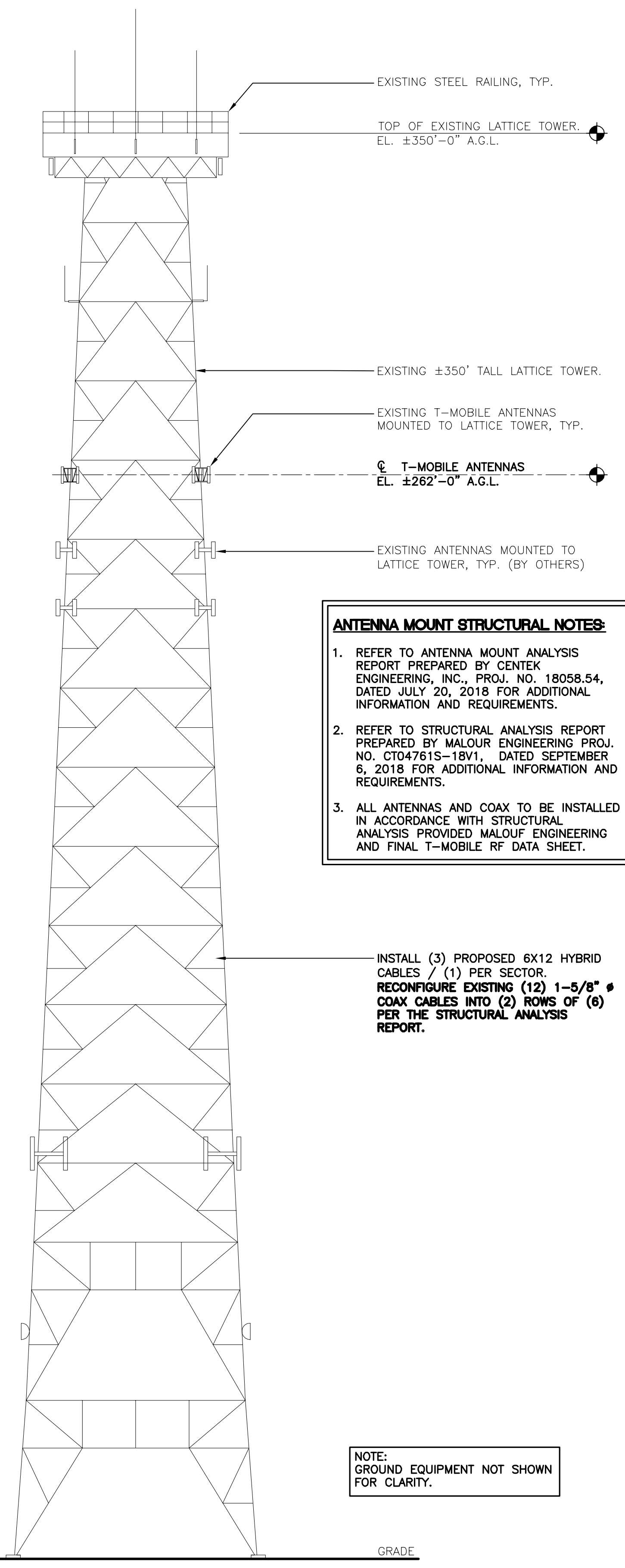
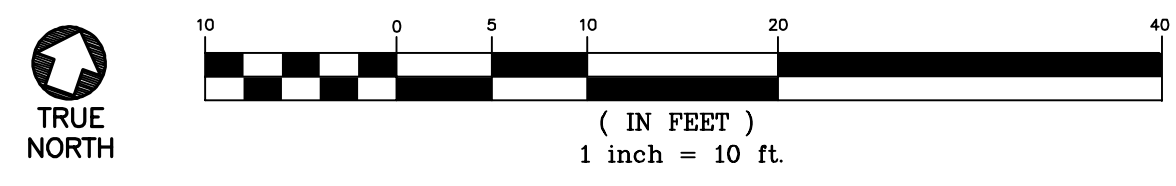
DATE: 06/27/18
SCALE: AS NOTED
JOB NO. 18058.54

SITE LOCATION PLAN

C-1
Sheet No. 3 of 6



1
C-2
COMPOUND PLAN
SCALE: 1" = 10'

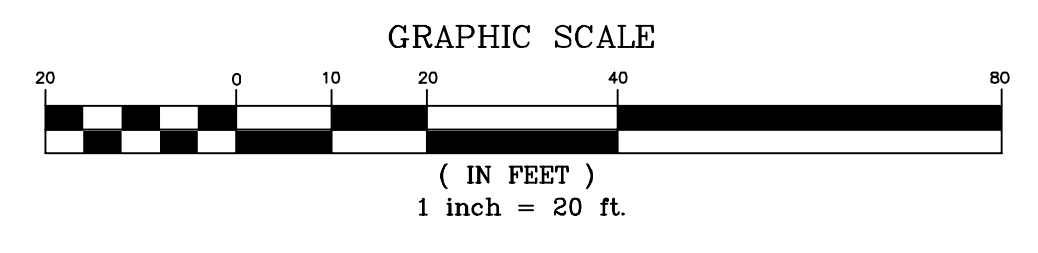


ANTENNA MOUNT STRUCTURAL NOTES:

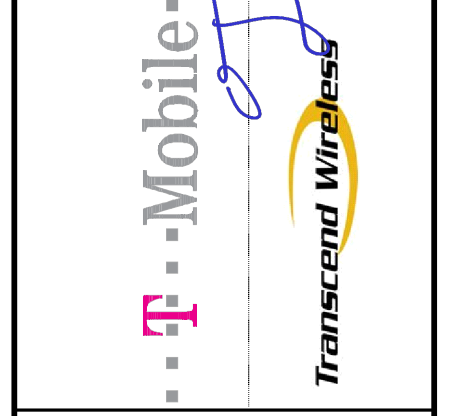
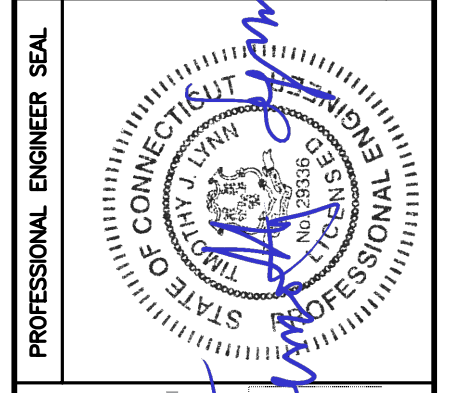
- REFER TO ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 18058.54, DATED JULY 20, 2018 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY MALOUR ENGINEERING PROJ. NO. CT04761S-18V1, DATED SEPTEMBER 6, 2018 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED MALOUR ENGINEERING AND FINAL T-MOBILE RF DATA SHEET.

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

2
C-2
TOWER ELEVATION
SCALE: 1" = 20'



REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	03/18/19	TJL	CAG	ISSUED FOR CONSTRUCTION - UPDATED CODE REFERENCE
1	09/10/18	TJL	CAG	ISSUED FOR CONSTRUCTION
0	09/07/18	TJL	CAG	ISSUED FOR CONSTRUCTION



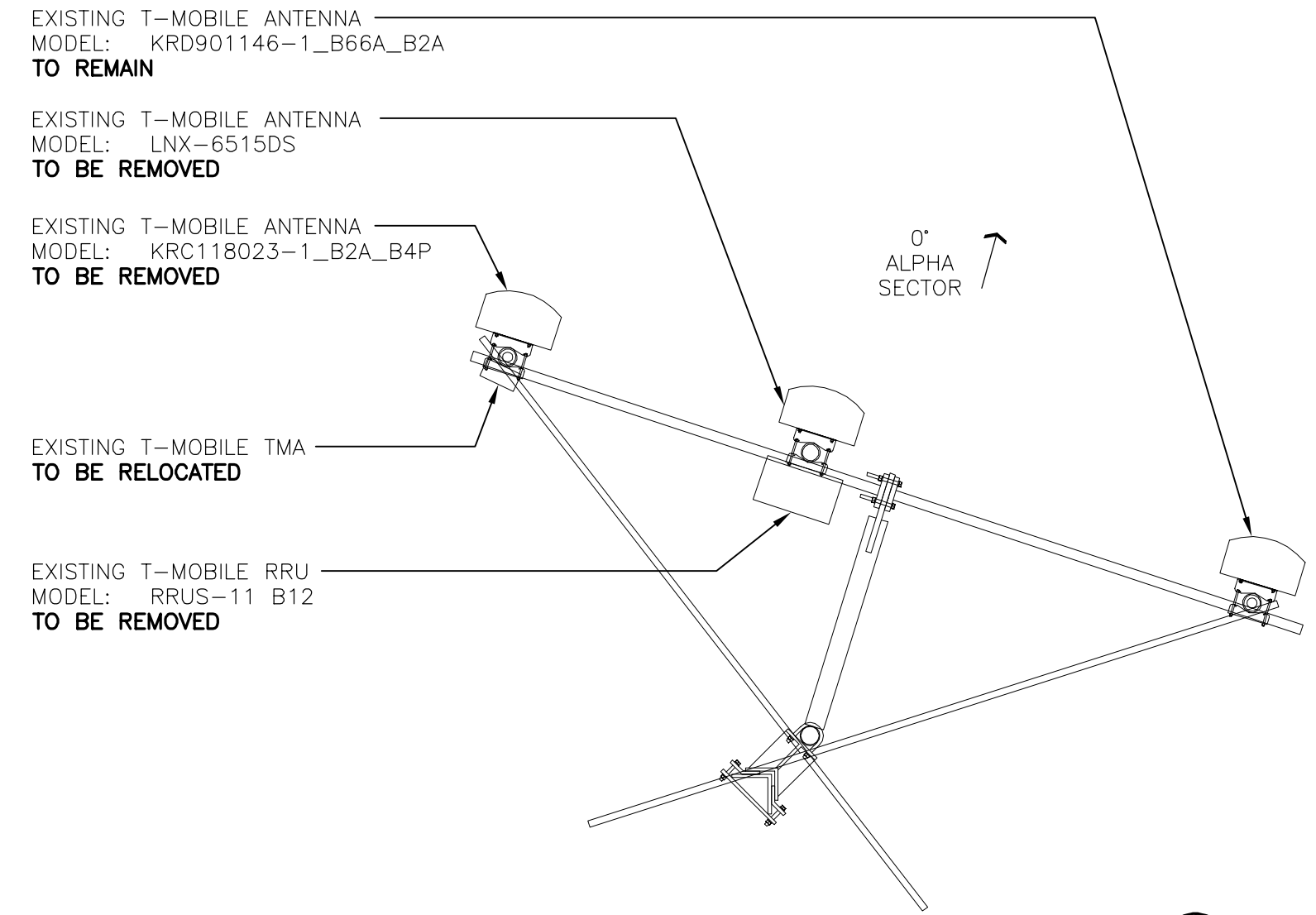
CEN TEK engineering
Centered on Solutions
203-498-0380
203-498-3387 Fax
622 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
WESTPORT-SNET LL
SITE ID: CT11011D
10 WILLARD ROAD
NORWALK, CT 06851

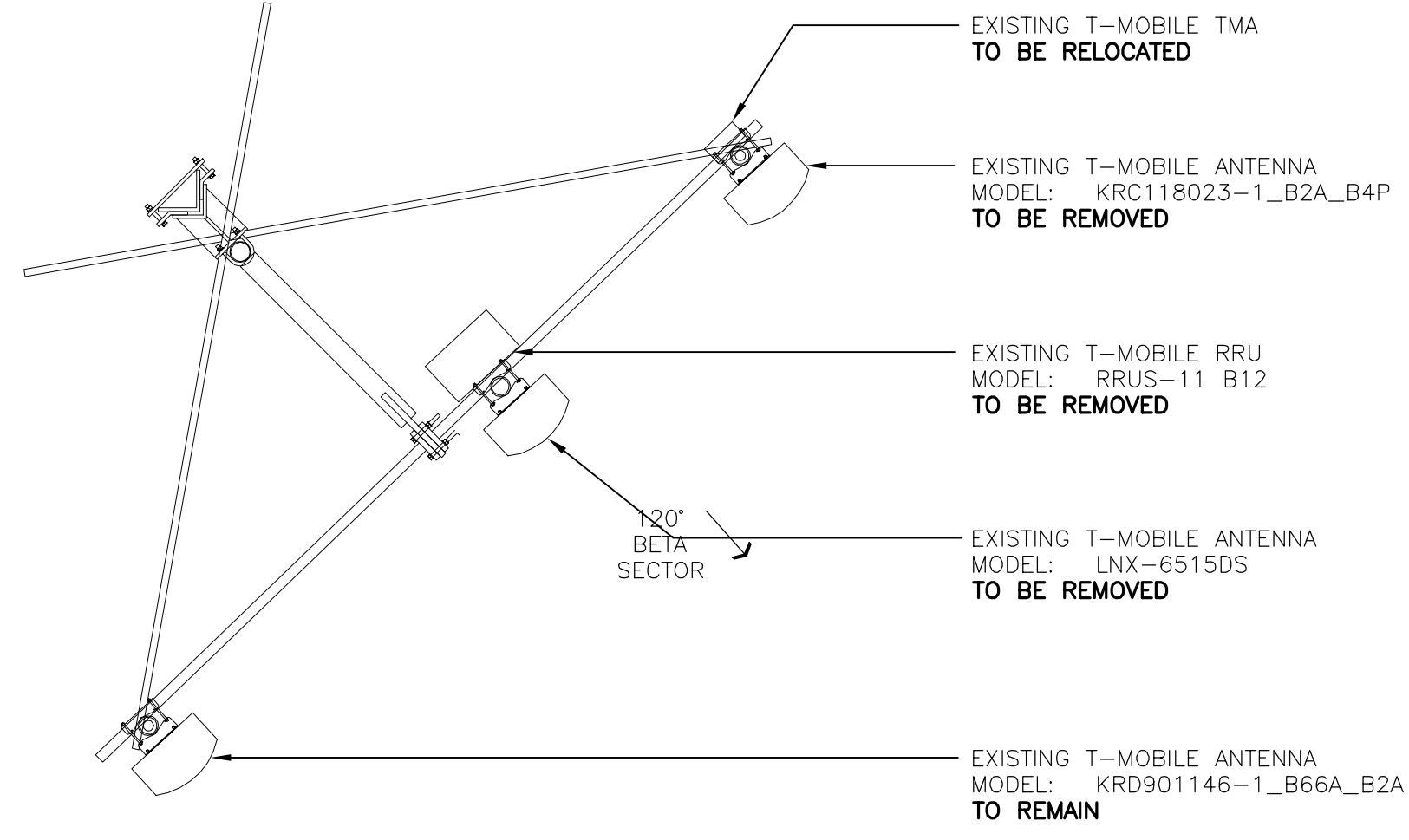
DATE: 06/27/18
SCALE: AS NOTED
JOB NO. 18058.54

COMPOUND PLAN
AND ELEVATION

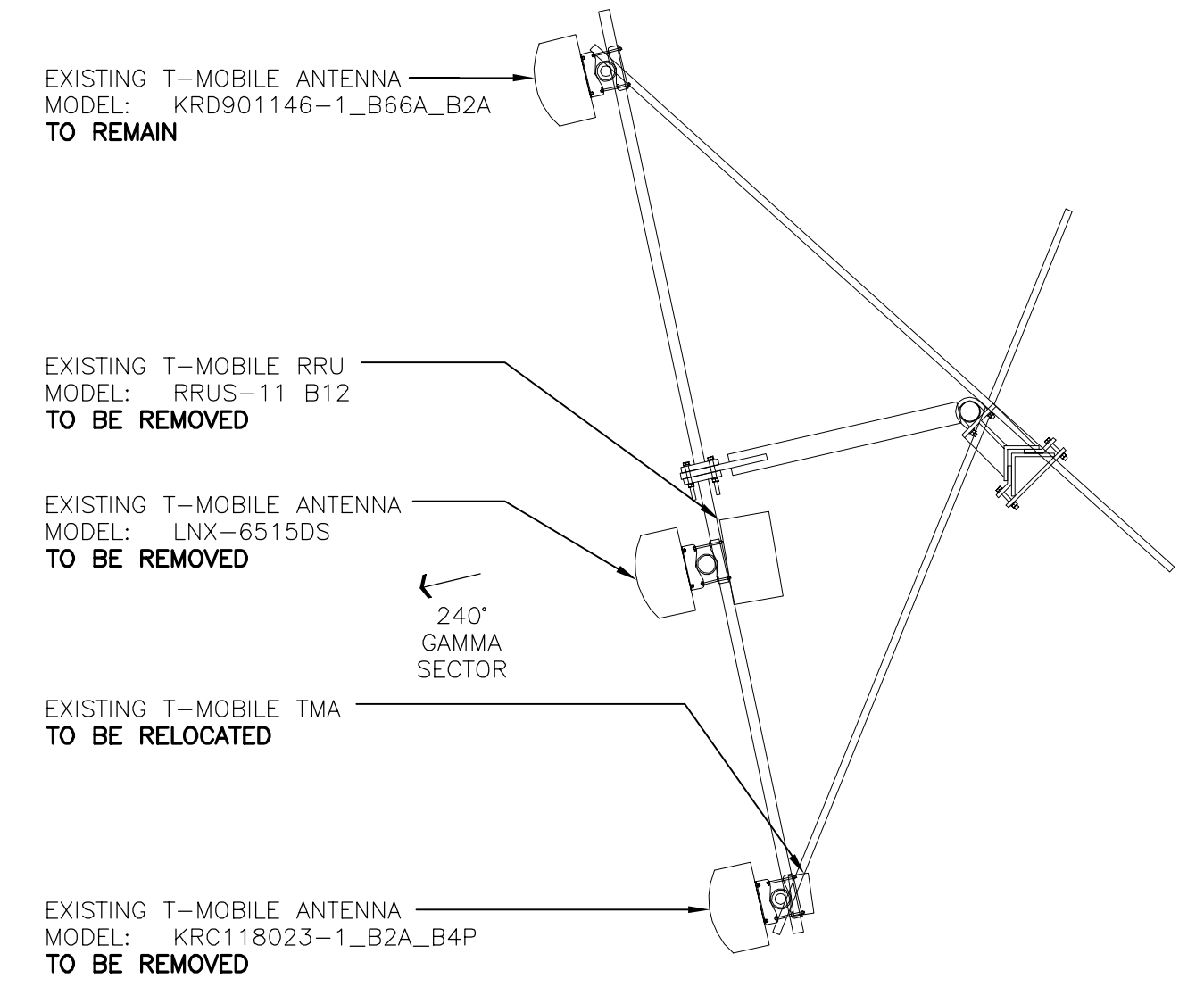
C-2
Sheet No. 4 of 6



1 EXISTING ANTENNA MOUNTING CONFIGURATION (ALPHA SECTOR) 54/56' ELEVATION
 C-3 SCALE: 1/2" = 1' APPROXIMATE NORTH



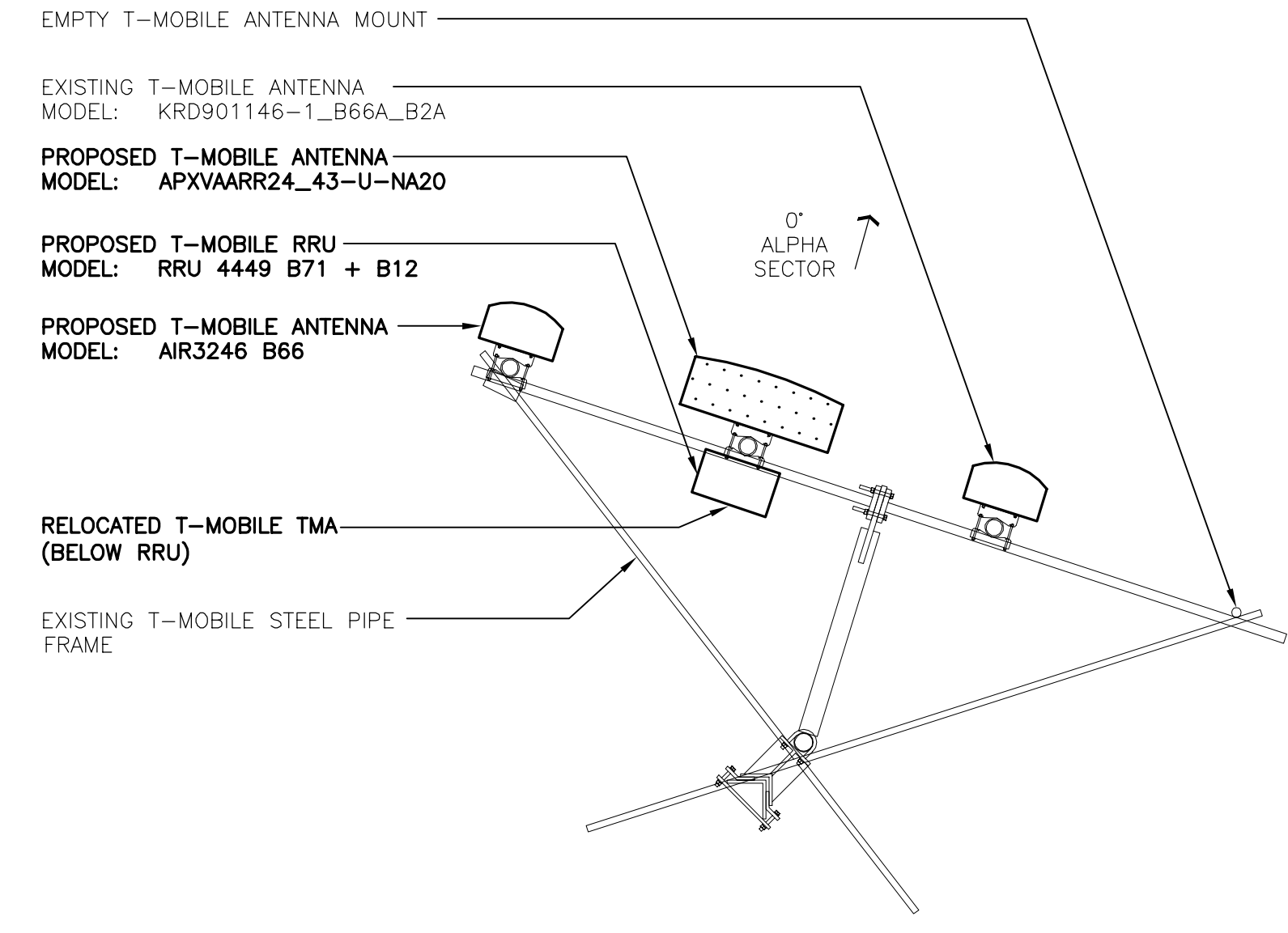
2 EXISTING ANTENNA MOUNTING CONFIGURATION (BETA SECTOR) 54/56' ELEVATION
 C-3 SCALE: 1/2" = 1' APPROXIMATE NORTH



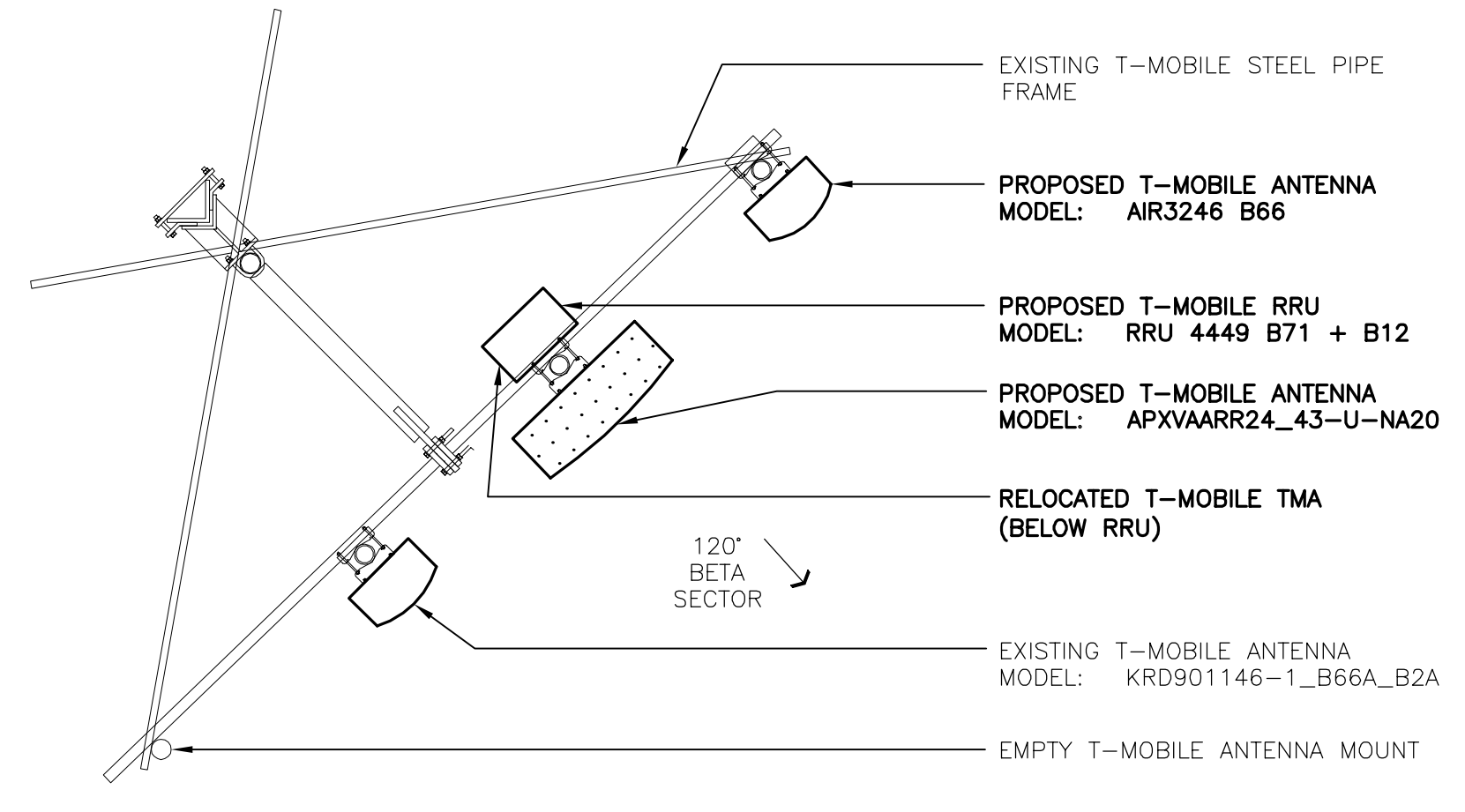
3 EXISTING ANTENNA MOUNTING CONFIGURATION (GAMMA SECTOR) 54/56' ELEVATION
 C-3 SCALE: 1/2" = 1' APPROXIMATE NORTH

ANTENNA MOUNT STRUCTURAL NOTES:

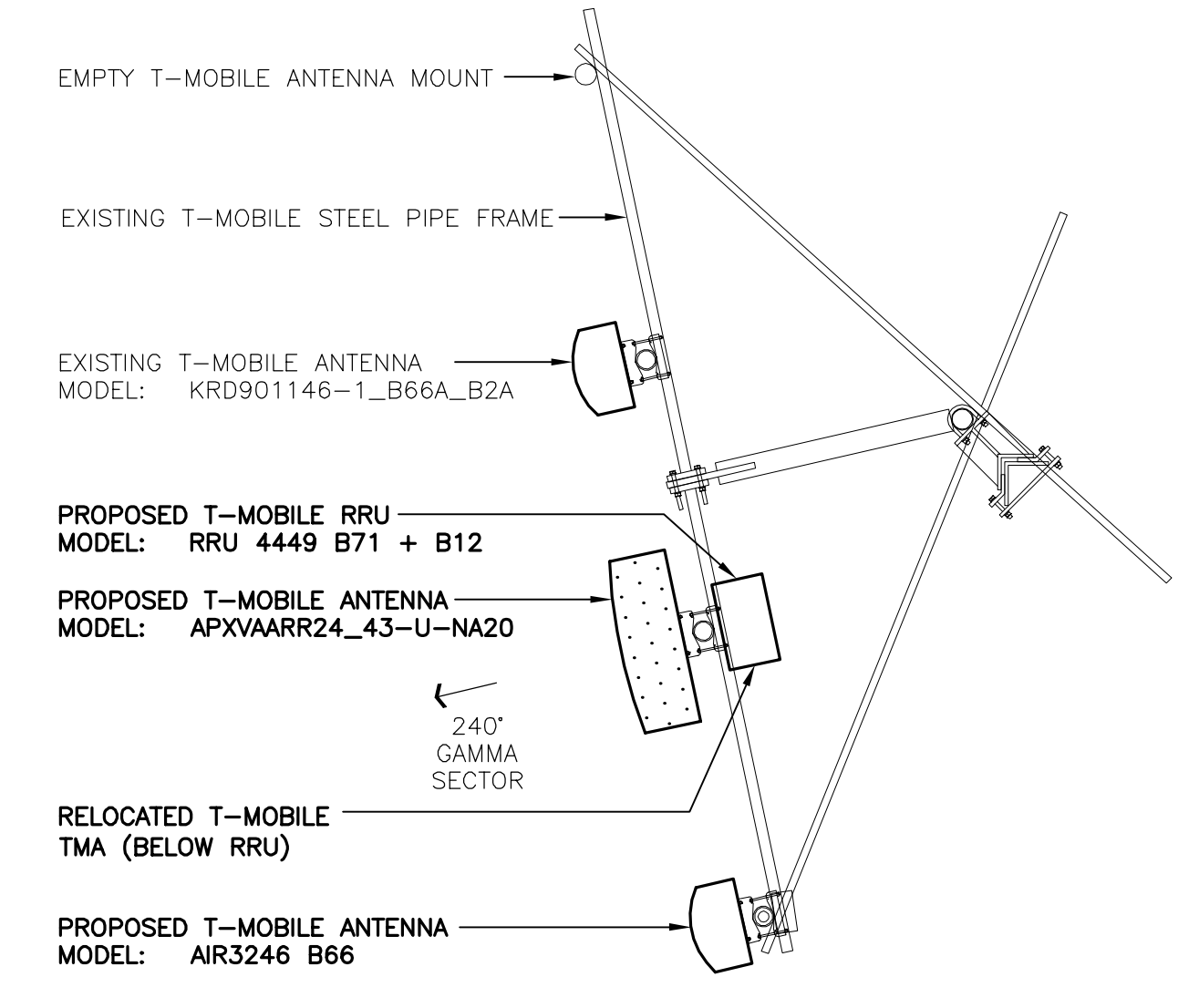
- REFER TO ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 18058.54, DATED JULY 20, 2018 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY MALOUP ENGINEERING PROJ. NO. CT047615-18V1, DATED SEPTEMBER 6, 2018 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED MALOUP ENGINEERING AND FINAL T-MOBILE RF DATA SHEET.



4 PROPOSED ANTENNA MOUNTING CONFIGURATION (ALPHA SECTOR) 54/56' ELEVATION
 C-3 SCALE: 1/2" = 1' APPROXIMATE NORTH



5 PROPOSED ANTENNA MOUNTING CONFIGURATION (BETA SECTOR) 54/56' ELEVATION
 C-3 SCALE: 1/2" = 1' APPROXIMATE NORTH



6 PROPOSED ANTENNA MOUNTING CONFIGURATION (GAMMA SECTOR) 54/56' ELEVATION
 C-3 SCALE: 1/2" = 1' APPROXIMATE NORTH

ISSUED FOR CONSTRUCTION - UPDATED CODE REFERENCE	CAG	T/L	03/18/19	REV.
ISSUED FOR CONSTRUCTION	CAG	T/L	09/10/18	2
ISSUED FOR CONSTRUCTION	CAG	T/L	09/07/18	1
DESCRIPTION	DATE	DATE	DATE	DATE
DESCRIPTION	DATE	DATE	DATE	DATE
DESCRIPTION	DATE	DATE	DATE	DATE

PROFESSIONAL ENGINEER SEAL
 STATE OF CONNECTICUT
 JEFFREY J. MALOUP
 PROFESSIONAL ENGINEER
 LICENSE NO. 15095
 EXPIRES 12/31/2020

T-Mobile
Transcend Wireless

CEN TEK engineering
 Centek on Solutions
 (203) 488-0380
 (203) 488-3387 Fax
 632 North Branford Road
 Branford, CT 06405
 www.CentekEng.com

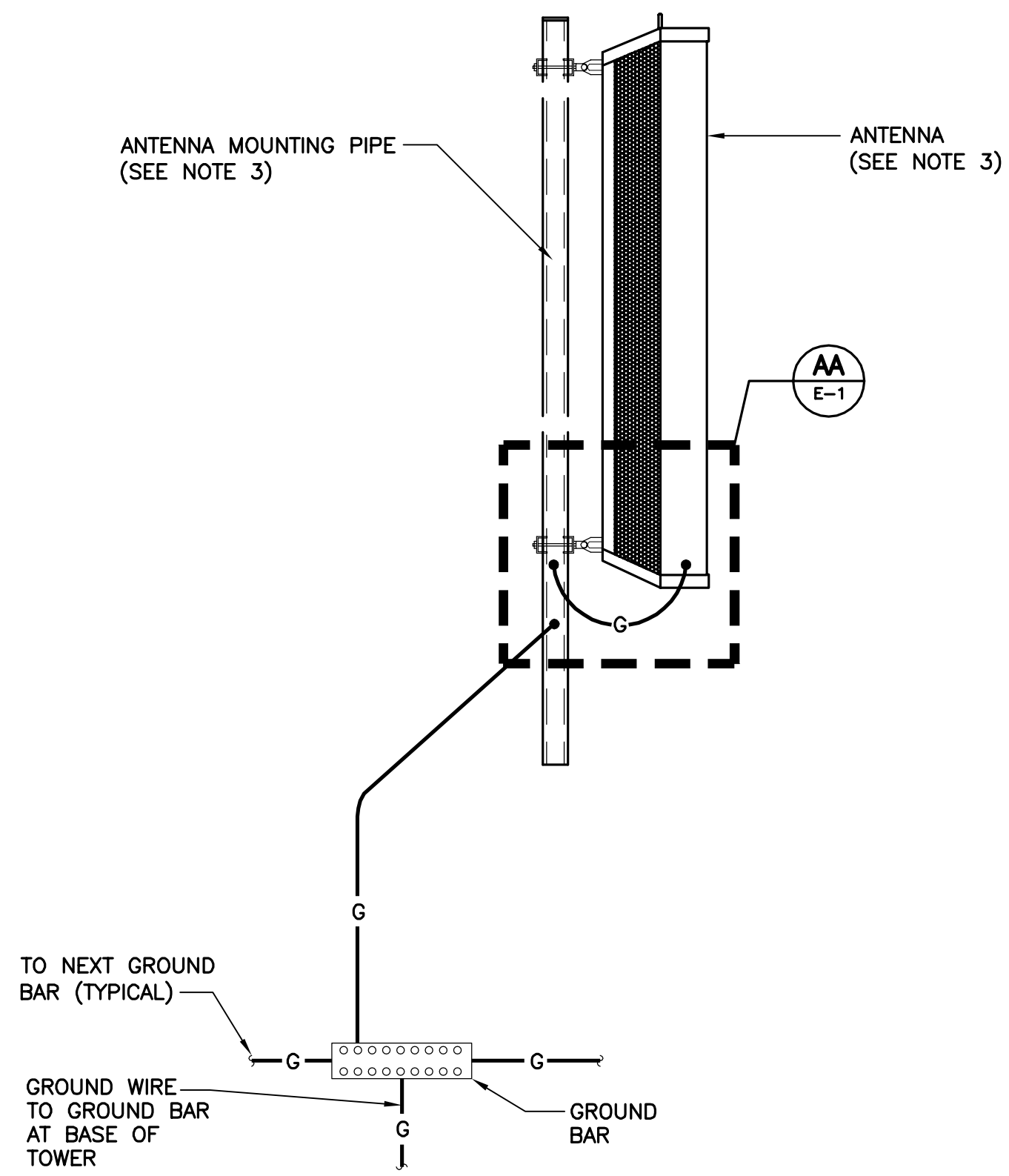
T-MOBILE NORTHEAST LLC
 WIRELESS COMMUNICATIONS FACILITY
WESTPORT-SNET LL
 SITE ID: CT11011D
 10 WILLARD ROAD
 NORWALK, CT 06851

DATE: 06/27/18
 SCALE: AS NOTED
 JOB NO. 18058.54

ANTENNA MOUNTING CONFIGURATION

C-3

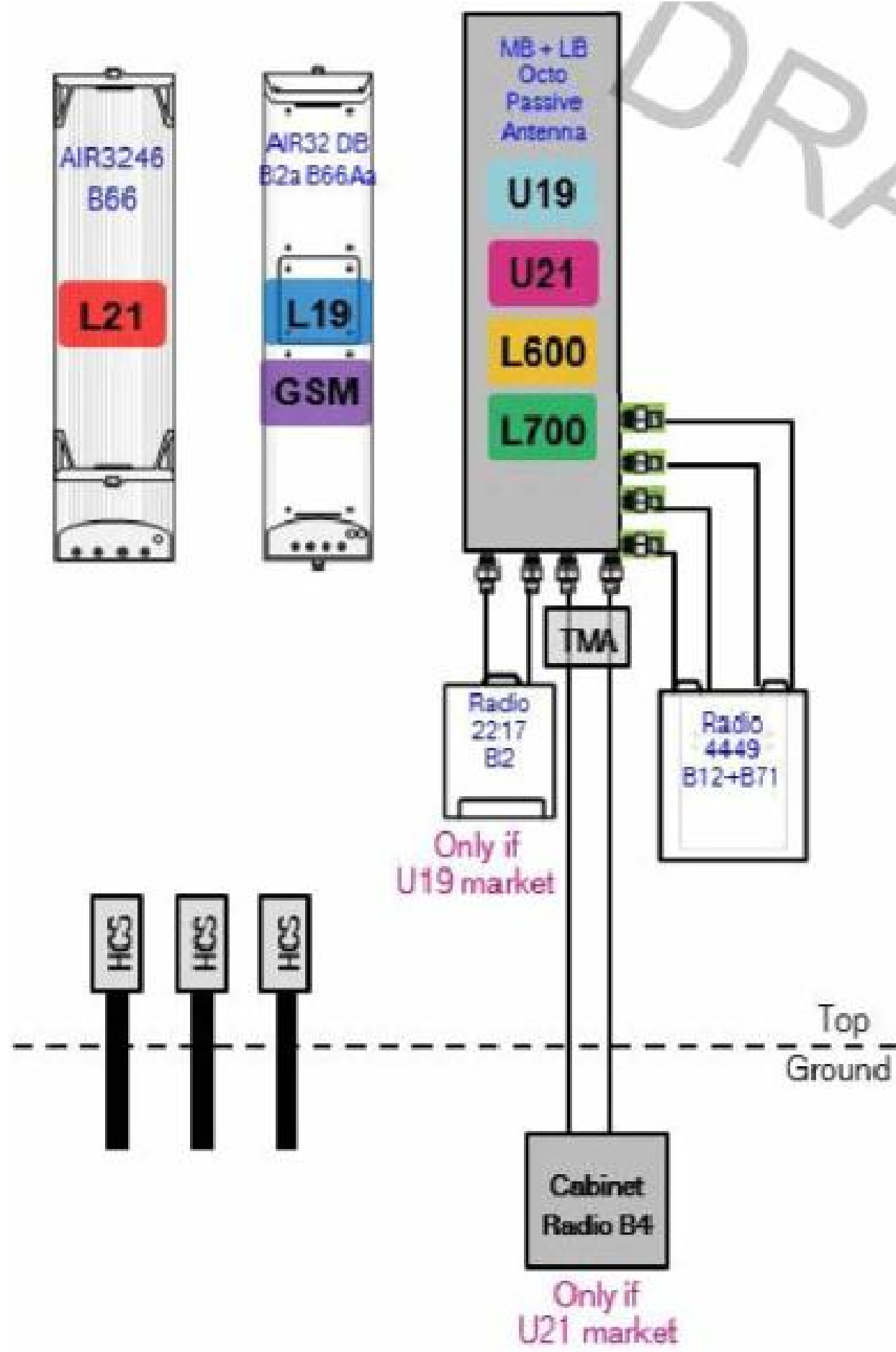
Sheet No. 5 of 6



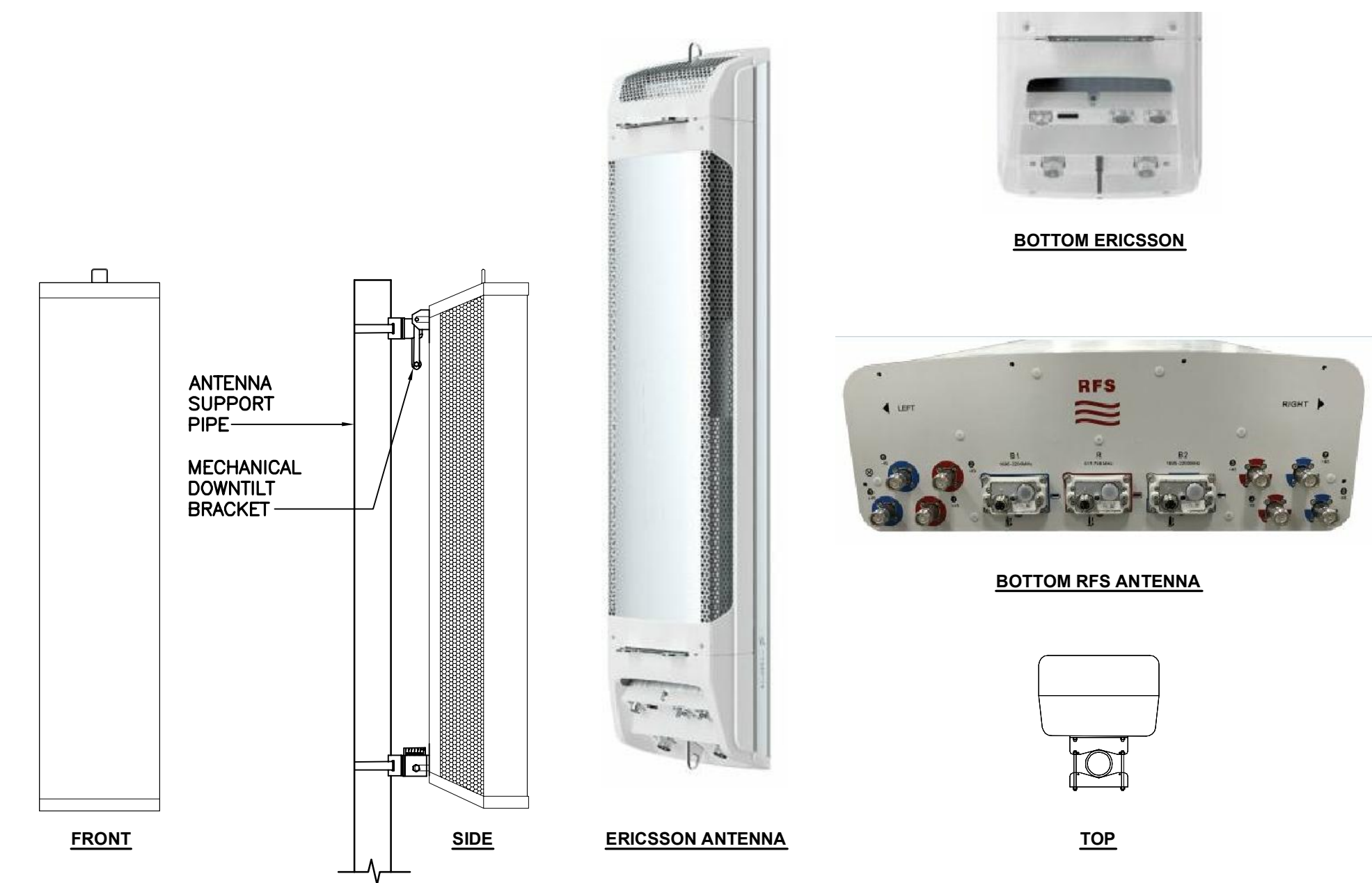
NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 TYPICAL ANTENNA GROUNDING DETAIL
E-1 SCALE: NONE

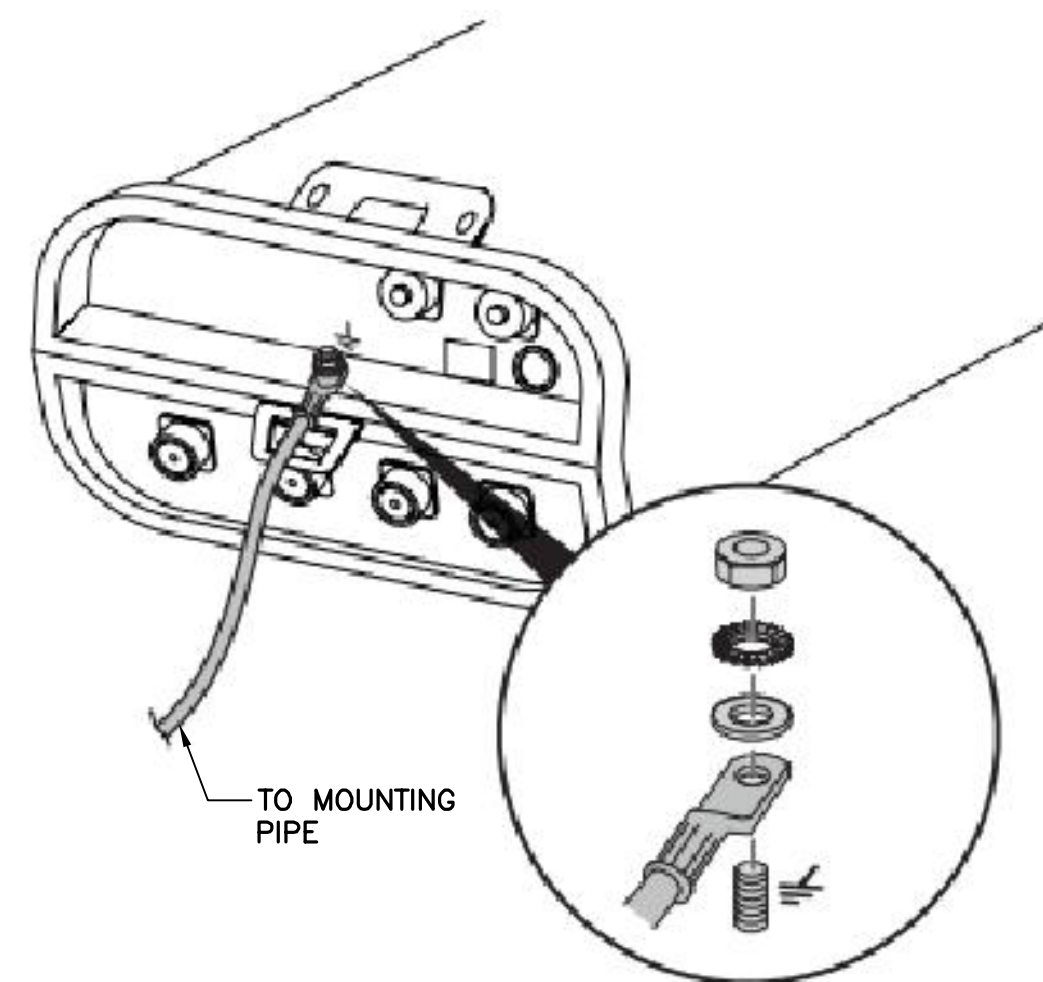


2 PROPOSED PLUMBING DIAGRAM
E-1 SCALE: NONE

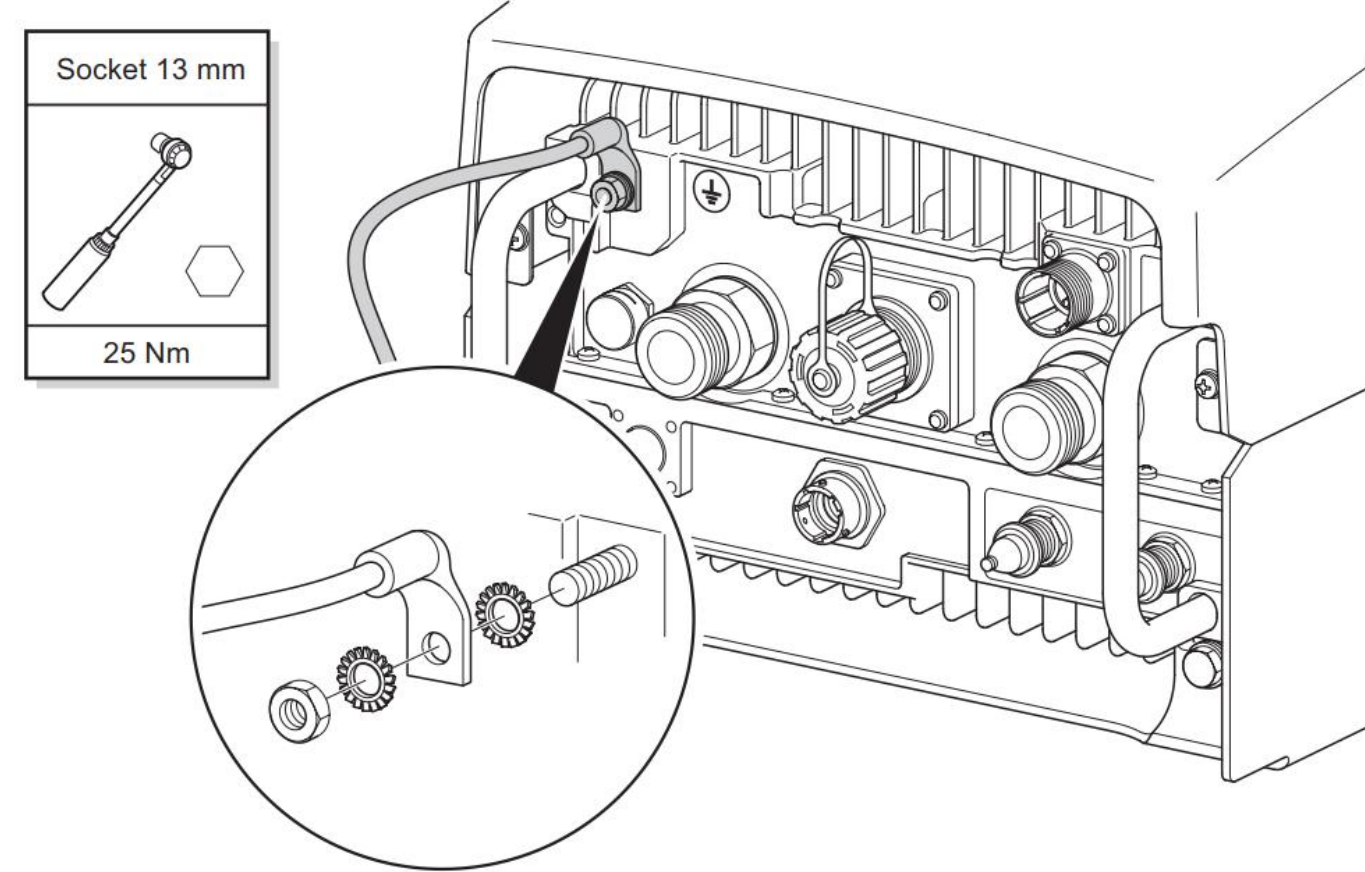


ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: KR901146-1_B66A_B2A	56.65"L x 12.87"W x 8.66"D	132.2 LBS.
MAKE: RFS MODEL: APXVAARR24_43-U-NA20	95.9"L x 24.0"W x 8.7"D	153 LBS.
MAKE: ERICSSON MODEL: AIR3246 B66	58.1"L x 15.7"W x 9.4"D	180 LBS.

3 PROPOSED ANTENNA DETAIL
E-1 SCALE: NONE



AA TYPICAL ANTENNA GROUNDING DETAIL
E-1 SCALE: NONE



4 TYPICAL RRU GROUNDING DETAIL
E-1 NOT TO SCALE

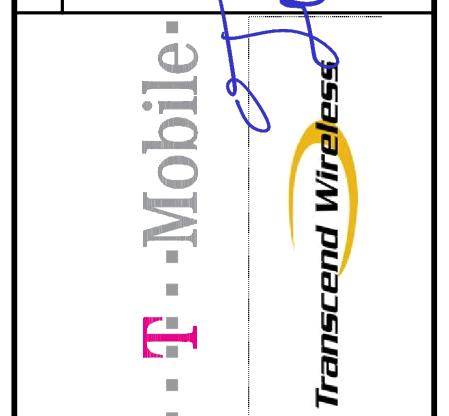
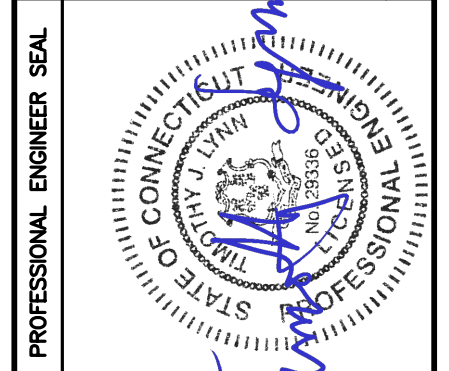


RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71B12	14.9"L x 13.2"W x 10.4"D	74 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 PROPOSED RRU DETAIL
E-1 SCALE: NONE

REV.	DATE	BY	CHK'D BY	DESCRIPTION
2	03/18/19	TLL		ISSUED FOR CONSTRUCTION - UPDATED CODE REFERENCE
1	09/10/18	TLL		ISSUED FOR CONSTRUCTION
0	09/07/18	TLL		ISSUED FOR CONSTRUCTION



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632 North Branford Road
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T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
WESTPORT-SNET LL
SITE ID: CT11011D
10 WILLARD ROAD
NORWALK, CT 06851

DATE: 06/27/18
SCALE: AS NOTED
JOB NO. 18058.54

TYPICAL ELECTRICAL DETAILS

Rigorous Structural Analysis Report



T-Mobile | Norwalk Willard Rd Site | #CT11011D
Owner: Fuller Development LLC | Norwalk Site
Norwalk, Connecticut

September 06, 2018

MEI PROJECT ID: CT04761S-18V1

MALOUF ENGINEERING INTL., INC.

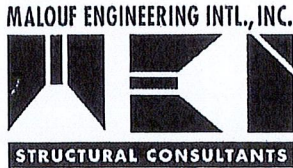


STRUCTURAL CONSULTANTS

17950 PRESTON ROAD, SUITE 720 ■ DALLAS, TEXAS 75252 ■ TEL. 972-783-2578 FAX 972-783-2583

www.maloufengineering.com





September 06, 2018

Mr. Kyle Richers
Transcend Wireless
 Mahwah, NJ 04730

RIGOROUS STRUCTURAL ANALYSIS

Structure/Make/Model:	351.67 ft Self-Supporting Tower	Not Known / Not Known	
Client/Site Name/#:	Transcend Wireless / T-Mobile	Norwalk Willard Rd #CT11011D	
Owner/Site Name/#:	Fuller Development LLC	Norwalk	
MEI Project ID:	CT04761S-18V1		
Location:	10 Willard Rd Norwalk, Connecticut 06851	Fairfield County FCC #1046320	
	LAT 41-07-41.8 N	LON	73-23-24.9 W

EXECUTIVE SUMMARY:

Malouf Engineering Int'l (MEI), as requested, has performed a rigorous structural analysis of the above-mentioned structure to assess the impact of the changed condition as noted in Table 1.

Based on the stress analysis performed, the existing structure **is in conformance** with the Int'l Building Code (IBC) / ANSI/TIA-222-G Standard for the loading considered under the criteria listed and referenced in the report sections – tower rated at 96.4% - Sub Bracing.

The installation of the proposed changed condition as noted in Table 1 is structurally acceptable. Existing/reserved T-Mobile (12) 1-5/8" coaxes to be reworked and bundled into two rows of six each. Please refer to Appendix 1 for Schematic Lines Layout. Please note that the T-Mobile appurtenance supporting mount capacity check is by others.

MEI appreciates the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or other projects, please contact us.

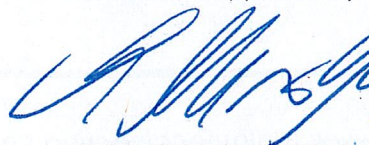
Respectfully submitted,

MALOUF ENGINEERING INT'L, INC.

Analysis performed by:

Krishna Manda, PE
 Sr. Project Engineer

Reviewed & Approved by:


 E. Mark Malouf, PE
 Connecticut #17715
 972-783-2578 ext. 106
 mmalouf@maloufengineering.com



9/6/2018

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1. INTRODUCTION & SCOPE

A rigorous structural analysis was performed by Malouf Engineering Int'l (MEI), as requested and authorized by Mr. Kyle Richers, Transcend Wireless, on behalf of T-Mobile, to determine the acceptance of the proposed changed conditions in conformance with the IBC / ANSI/TIA-222-G Standard, "Structural Standard for Antenna Supporting Structures and Antennas".

The scope of this independent analysis is to determine the overall stability and the adequacy of structural members, foundations, and member connections, as available and stated. This analysis considers the structure to have been properly installed and maintained with no structural defects. Installation procedures and related loading are not within the scope of this analysis and should be performed and evaluated by a competent person of the erection contractor.

The different report sections detail the applicable information used in this evaluation, relating to the tower data, the appurtenances configuration and the wind and ice loading considered.

2. SOURCE OF DATA

The following information has been used in this evaluation as source data that accurately represent the existing structure and the related appurtenances:

	Source	Information	Reference
STRUCTURE			
Tower	MEI Records	Previous Structural Analysis	ID CT04761S-18V0 Dated 07/03/2018
Foundation	MEI Records	Previous Structural Analysis	ID CT04761S-18V0 Dated 07/03/2018
Material Grade	As per supplied documents (GPD Analysis included specific material grades for the different components) - Refer to Appendix		
CURRENT APPURTENANCES			
	MEI Records	Previous Structural Analysis	ID CT04761S-18V0 Dated 07/03/2018
CHANGED CONDITION			
	Transcend Wireless Mr. Kyle Richers	T-Mobile RF Data Sheet	Dated 05/21/2018
		E-Mail Instructions	Dated 09/06/2018

Background Information:

Based on available information, the following is known regarding this structure:

DESIGNER / FABRICATOR	Not Known / Not Known
ORIGINAL DESIGN CRITERIA	TIA/EIA 222-Unknown
PRIOR STRUCTURAL MODIFICATIONS	As per GPD modification design Job #2012766.02 dated 06/27/2012; MEI Drawings ID CT04761S-16V0-R1 dated 08/11/2016 are considered properly installed for the purposes of this analysis.



3. ANALYSIS CRITERIA

The structural analysis performed used the following criteria:

CODE / STANDARD	2018 CT Building Code / 2015 Int'l Building Code / ANSI/TIA-222-G-4 Standard	
LOADING CASES	Full Wind:	120 Mph ultimate gust [equiv. 93 Mph (3-sec gust)] w/No Radial Ice**
	Iced Case:	50 Mph + 0.75" Radial Ice
	Service:	60 Mph
	Seismic:	$S_s = 0.230 / S_1 = 0.067$ / Site Class: D – Stiff Soil
STRUCTURE CRITERIA	Risk Category (Structural Class): Class II	
	Exposure Category: 'C' – Topographic Category: 1	

Appurtenances Configuration

The following appurtenances configuration is denoted by the *summation of Tables 1 & 2*:

Table 1: Tenant with Changed Condition Appurtenances Configuration

Elev (ft)	Tenant	Ant. #	Ant Qty	Appurtenance Model / Description	Mount Description	Line #	Line Qty	Line size & Location
262	T-Mobile [Final]	-	3	AIR-3246 B66 Panel Antennas	(3) 13ft T-Frame Mounts	-	3	HCS 6x12 Hybrid Fiber Cable
			3	APXVAARR24_43-U-NA20				
			3	AIR32 B66a/B2a Panel Antennas				
			3	KRY 112 144/2 TMA's				
			3	Radio 4449 - B71 + B12 Boxes				

Table 2: Remaining Tenants Current and Reserved/Future Appurtenances

Elev (ft)	Tenant	Ant #	Ants Qty	Appurtenance Model / Description	Mount Description	Line #	Line Qty	Line size & Location
365		40	1	12ft Whip Antenna + TMA	10ft Pipe Mount	25	1	7/8"-(FZ)
369.5		38	1	Whip Antenna	15ft Pipe Mount w/ Guys	34	1	1/2"-(FZ)
357	[Dead]	39	1	15ft Whip Antenna	4ft Pipe Mount	-	-	-
362		42	1	4ft Lightning Rod	14ft Mount	-	1	Grounding
		41	1	Beacon / Strobe				
355.5		31	1	4ft Whip Antenna	8ft Pipe Mount	38	1	1-5/8"-(FZ)
354.5		32	1	15ft Whip Antenna	8ft Pipe Mount	39	1	1-5/8"-(FZ)
354.5		30	1	10ft 4-Element Dipole Antenna	8ft Pipe Mount	24	1	7/8"-(FZ)
352			1	Top Stub Tower				
350.5		35			3ft Empty Sidearm Mount			
					Top Platform w/ Rails			
350	[Dead]					35-36	2	0.25" Cables
350	[Dead]					44	1	0.8" SO Cord
349.75		34	1	8ft Whip Antenna	Railing Mounted	32	1	7/8"-(FZ)
349.5		36	1	21ft Whip Antenna	Railing Mounted	37	1	7/8"-(FZ)
		37						
348.25		29	1	20ft 4-Element Dipole Antenna	6ft Pipe Mount	21	1	7/8"-(FZ)
347	AT&T	-	3	SBNHH-1D65A Panel Antennas	(3) Sector Mounts w/V-Stabilizer (Commscope MTC3615 AD A)	49-60	12	1-5/8"
		-	6	TPX-070821 Triplexer Boxes				
		-	3	RRUS-32 B2 Boxes				
		-	3	7770.00 Panel Antennas				
		-	3	RRUS-11 Boxes				
					46-47	6	3/4" DC Power [Existing/New]	
					48	2	5/8" Fiber-(FZ) [Existing/New]	

(Appurtenances continue on next page.)



Table 2: Remaining Tenants Current and Reserved/Future Appurtenances – Cont'd

Elev (ft)	Tenant	Ant #	Ant Qty	Appurtenance Model / Description	Mount Description	Line #	Line Qty	Line size & Location
347	AT&T	-	6	LGP21401 TMAs				
		-	3	DC6-48-60-18-8F Suppressors				
		-	3	OPA-65R-LCUU-H4 Panel Antennas				
		-	3	RRUS-32 Boxes				
344.5		-	6	7020 RET Motors				
343.6 7		27	1	3ft 3-Elem Yagi Antenna	8ft Pipe Mount on Sector Mount	30	1	1/2"-(FZ)
343.2 5		33	3	TA-2335-DAB Panel Antennas	8ft Pipe Mount	19	1	EW4.75'x2.5"-(FZ)
339.5					4-Way Walkway Platform w/ Rails			
338	[Dead]					45	1	3/4" R.C.
325					(4) Face Frames			
306		21			(4) 14ft Empty Pipe Mounts			
299	[Dead]					23	1	1-1/4"-(FZ)
269.2 5		20	2	OB Lights		40	1	0.6" SO Cord
255.5		17	1	12in Square Panel Antenna	Pipe Mount	1	1	7/8"-(FZ)
253		16			(2) 25ft Rest Platform w/ Rails			
245	Sprint	15	3	ALU-RRH 4x45 Boxes	(3) 13ft Sector Mounts	26- 28	3	HB114-1 1-1/4" Hybrid Cables-(FZ)
243.5	Sprint	14	3	APXVSP18-C-A20 Panel Antennas				
242.2	Sprint	13	3	RRH Boxes				
5			3	800 Ext. Notch Filters				
208.5		12	1	7ft 5-Elem Yagi Antenna	5ft Pipe Mount	31	1	1/2"-(FZ)
191.5		11			(4) Corner Rest Platforms			
186		10	2	Beacon Ice Shield	Leg Mounted			
182.5		9	2	Beacon / Strobe		41- 42	2	0.6" SO Cords
140	VzW [New]	-	3	JAHH-65B-R3B Panel Antennas	(3) D&D Welding 12ft Arch Boom Mounts + (2) BSAMNT-SBS-2-2 Side-By-Side Mounting Kit + (1) BSAMNT-SBS-2-3 Side-By-Side Mounting Kit		3	1-5/8" Hybrid Cables
			6	JAHH-45B-R3B Panel Antennas				
			3	B13 RRH4x30 Boxes				
			3	B66A RRH4x45W Boxes				
			3	B25 RRH4x30W Boxes				
			3	B5 RRH4x40W - LOC Boxes				
			3	RVZDC-6627-PF-48 OVP Boxes				
125	[Dead]					22	1	0.95"-(FZ)
		8			(2) 41ft Rest Platform w/ Rails			
100		7			4ft Rest Platform w/ Rails			
93		6	2	OB Lights		40		[Shared]
50.25		5			4ft Rest Platform w/ Rails			
47.5		4	1	3ft Dia. Dish (Az. 220°±)	4ft Sidearm Mount-NW Leg	20	1	7/8"-(FZ)
31		1	1	4ft Dia. Dish (Az. 200°±)	10ft Pipe Mount/Standoff-S Face	33	1	1/2"-(FZ)
26		2	1	GPS Antenna	Pipe Mount	29	1	1/2"-(FZ)
25		3			(4) Corner Rest Platforms			
16.67					(4) Face Frames			

Notes:

- *Final loading of T-Mobile has been considered. All antennas and coaxes not listed above are to be removed.**
- **As per 2012 IBC for ultimate 3-sec gust wind speed converted to nominal 3-sec gust wind speed as per Sect. 1609.3.1 as required to be used in ANSI/TIA-222-G Standard per exception 5 of Sect. 1609.1.1.
- All elevations are measured from tower base.
- Please note appurtenances not listed above are to be removed/not present as per data supplied.
- (I) = Internal; (E) = External; (FZ) = Within Face Zone; (OFZ) = Outside Face Zone - as per TIA-222-G.



6. The above appurtenances represent MEI's understanding of the appurtenances configuration. If different than above, the analysis is invalid. Please contact MEI if any discrepancies are found.

4. ANALYSIS PROCEDURE

The subject structure is analyzed for feasibility of the installation of the proposed changed condition previously noted. The data records furnished were reviewed and a computer stress analysis was performed in accordance with the TIA-222 Standard provisions and with the agreed scope of work terms and the results of this analysis are reported.

Analysis Program

The computer program used to model the structure is a rigorous Finite Element Analysis program, trnTower (ver. 8.04), (formerly RISATower), a commercially available program by Tower Numerics Inc. and the second is STAADPro v8i FEA program, a structural finite element program by Bentley Systems, Carlsbad, CA. The structure members are modeled using beam/truss members. The structural parameters and geometry of the members are included in the model. The dead and temperature loads and the wind loads are internally calculated by the programs for the different loading directions and then applied as external loads on the structure. This analysis comprised of the two different analytical models with combination of the above noted 2 software programs in order to evaluate the different portions of the tower accounting for the geometrical limitation in the trnTower software. Any applicable exemptions, as per Section 15.6 of the TIA-222-G Standard for existing structures originally designed in accordance with a previous revision of the TIA-222 Standard, have been taken.

This engineering study is based on the theoretical capacity of the members and is not a condition assessment of the structure. This analysis is based on information supplied, and therefore, its results are based on and as accurate as that supplied data. MEI has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural stress analysis:

- This existing tower is assumed, for the purpose of this analysis, to have been properly maintained and to be in good condition with no structural defects and with no deterioration to its member capacities ('as-new' condition).
- The tower member sizes and configuration are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated.
- The appurtenances configuration is as supplied and/or as stated in the report. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type & industry practice.
- Mounts/Platforms are considered adequate to support the loading. No actual analysis of the platform/mount itself is performed, with the analysis being limited to analyzing the structure.
- The soil parameters are as per data supplied or as assumed and stated in the calculations. Refer to the Appendix. If no data is available, the foundation system is assumed to support the structure with its new reactions.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per data supplied/available, and to have been properly installed and to be fully effective.

If any of the above assumptions are not valid or have been made in error, this analysis results may be invalidated, MEI should be contacted to review any contradictory information to determine its effect.

5. ANALYSIS RESULTS

The results of the structural stress analysis based on data available and with the previous listed criteria, indicated the following:

Note: The Wind loading controls over the Seismic loading as per TIA Section 2.7.

Table 3: Stress Analysis Results – AFTER NOTED MODIFICATIONS

Component Type	Maximum Stress Ratio	Controlling Elev. (ft) / Component	Pass/Fail	Comment
LEGS	93.5%	25 - 0	Pass	Bolts Control
DIAGONALS	87.8%	125 - 100	Pass	
HORIZONTALS	92.2%	150 - 125	Pass	
SUB BRACING	96.4%	50 - 25	Pass	
FOUNDATION	65.1%	Uplift	Pass	Geotechnical report not available. Based on soil parameters in supplied calcs in prev. SA.

Table 4: Serviceability Requirements

	Maximum Value	TIA Requirement (10dB)	Pass/Fail	Comment
TWIST/SWAY	0.012 Deg.	1.7125 Deg.	Pass	4ft Dish Elev. 31.00ft
	0.018 Deg.	2.35 Deg.	Pass	3ft Dish Elev. 47.50ft
	0.084 Deg.	4 Deg. from Vert. or Horiz. Axis	Pass	
HORIZONTAL DISPLACEMENT	4.349 In./ 0.103% of Ht.	3.0% of Height	Pass	

Notes:

1. Please note that the analysis results noted above are based on the combined analytical models using the 2 noted FEA programs.
2. The Maximum Stress Ratio is the percentage that the maximum load in the member is relative to the allowable load as determined by Code requirements.
3. Refer to the Appendix 1 for more details on the member loads.
4. A maximum stress ratio between 100% and 105% may be considered as *Acceptable* according to industry standard practice.



6. FINDINGS & RECOMMENDATIONS

- Based on the rigorous stress analysis results, the subject structure is **rated at 96.4%** of its support capacity (controlling component: Sub Bracing) with the proposed changed condition considered. Please refer to Table 3 and to Appendix 1 for more details of the analysis results.
- Based on the stress analysis performed, the existing structure **is in conformance** with the IBC / ANSI/TIA **222-G** Standard for the loading considered under the criteria listed and referenced in the report sections **after proper installation of the previous structural strengthening modifications** as per MEI drawings ID CT04761S-16V0-R1.
- Please note that no geotechnical data is available. However, based on soil parameters included in supplied data, the foundation is considered acceptable.
- **The installation of the proposed changed condition as noted in Table 1 is structurally acceptable.**
- T-Mobile Antenna support mounts capacity evaluated by others.
- Rework and bundle existing/reserve (12) 1-5/8" coaxes in two rows of six each. Refer to Appendix 1 for Schematic Tx-Line Layout.
- This structure is near its maximum support capacity for the appurtenances and loading criteria considered. Therefore, no changes to the configuration considered should be made without performing a new proper evaluation.

Rigging and temporary supports required for the erection/modification shall be determined, documented, furnished and installed by the erector/contractor accounting for the loads imposed on the structure due to the proposed construction method.

7. REPORT DISCLAIMER

The engineering services rendered by Malouf Engineering International, Inc. ('MEI') in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. MEI does not analyze the fabrication, including welding and connection capacities, except as included in this Report.

The analysis performed, and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

1. Proper alignment and plumbness.
2. Correct guy tensions, as applicable.
3. Correct bolt tightness or slip jacking of sleeved connections.
4. No significant deterioration or damage to any structural component.

Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-art" engineering and analysis procedures and formulae. MALOUF ENGINEERING INTERNATIONAL, INC. assumes no obligation to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will MALOUF ENGINEERING INTERNATIONAL, INC. have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of MALOUF ENGINEERING INTERNATIONAL, INC., if any, pursuant to this Report shall be limited to the total funds actually received by MALOUF ENGINEERING INTERNATIONAL, INC. for preparation of this Report.

Customer has requested MALOUF ENGINEERING INTERNATIONAL, INC. to prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested MALOUF ENGINEERING INTERNATIONAL, INC. to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of MALOUF ENGINEERING INTERNATIONAL, INC., Customer has informed MALOUF ENGINEERING INTERNATIONAL, INC. that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by MALOUF ENGINEERING INTERNATIONAL, INC. and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice. MALOUF ENGINEERING INTERNATIONAL, INC. shall have the right to rely upon the accuracy of the information supplied by the customer and shall not be held responsible for the Customer's misrepresentation or omission of relevant fact whether intentional or otherwise.

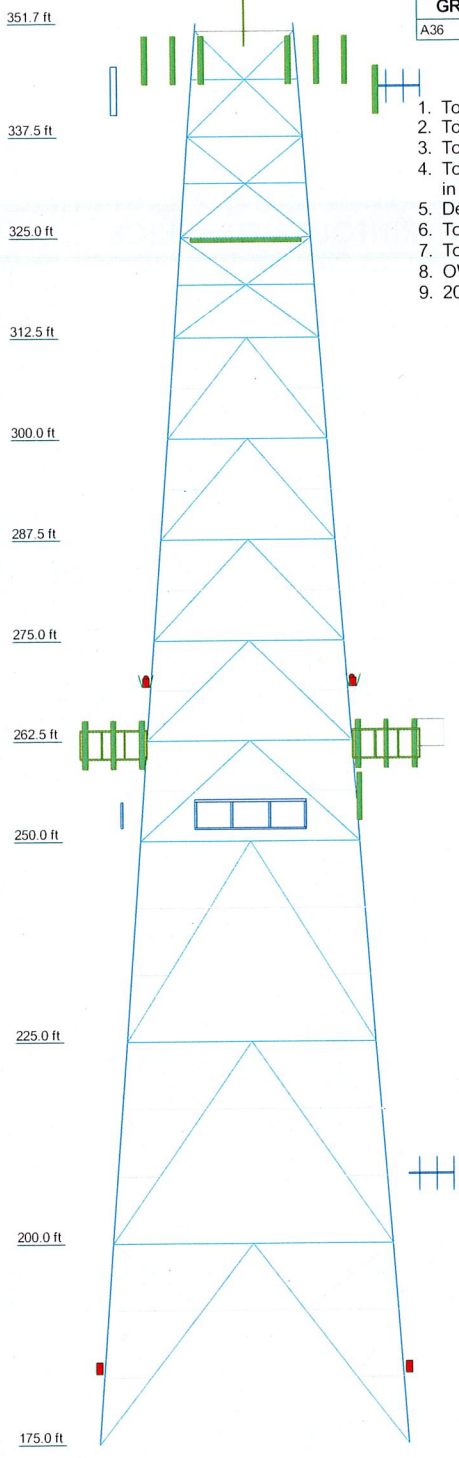
Customer hereby agrees and acknowledges that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than MALOUF ENGINEERING INTERNATIONAL, INC. in connection with the implementation of services including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor and that Customer and rigger, erector, or subcontractor will provide MALOUF ENGINEERING INTERNATIONAL, INC. with a Certificate of Insurance naming MALOUF ENGINEERING INTERNATIONAL, INC. as additional insured.



APPENDIX 1 - ANALYSIS PRINTOUT & GRAPHICS



Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	L8x8x1 1/8	L8x8x7/8	L8x8x3/4	L8x8x3/8	L8x8x3/8	L8x8x7/8	L6x6x7/8	L6x6x5/8	L6x6x5/8	L6x6x5/8	L6x6x5/8
Leg Grade	A500-46	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36
Diagonals	2L2 5x3.5x5/16 + 2L3x3.5x3/8	2L2 5x3.5x5/16 + 2L3x3.5x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8
Diagonal Grade	A500-46	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36
Top Girts	2L3 1/2x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8
Horizontals	2L3 1/2x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8
Sec. Horizontals	2L1 3/4x1 3/4x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16
Red. Horizontals	2L1 3/4x1 3/4x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16	2L2x2x3/16
Red. Diagonals	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8
Red. Sub-Horiz	2L2 1/2x3x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8
Red. Hips	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8
Inner Bracing	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8
Face Width (ft)	34.898	31.2115	27.485	25.6217	23.7584	21.8952	20.0319	18.1687	16.3054	14.4422	12.53
# Panels @ (ft)	3 @ 25	3 @ 25	3 @ 25	3 @ 25	3 @ 25	3 @ 25	3 @ 25	3 @ 25	3 @ 25	3 @ 25	3 @ 25
Weight (K)	100.9	97.7	94.5	91.3	88.1	84.9	81.7	78.5	75.3	72.1	68.9



SYMBOL LIST


MARK	SIZE	MARK	SIZE
A	2L2 1/2x2 1/2x1/4x3/8	B	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi	A500-46	46 ksi	62 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. OWNER - FULLER DEVELOPMENT LLC - NORWALK SITE
9. 2016 CSBC / 2012 IBC / ASCE 7-10 / 120 MPH ULT - RISK CAT. 2

 Malouf Engineering Int'l Inc. 17950 Preston Road, STE 720 Dallas, Texas 75252 Phone: (972) 783 2578 FAX: (972) 783 2583	Job: 350ft SST / Norwalk Willard Rd Site #CT11011D Project: CT04761S-18V1 - Top Tower Client: Transcend Wireless / T-Mobile Code: TIA-222-G Path:	Drawn by: KM Date: 09/06/18 Scale: NTS Dwg No.: E-1
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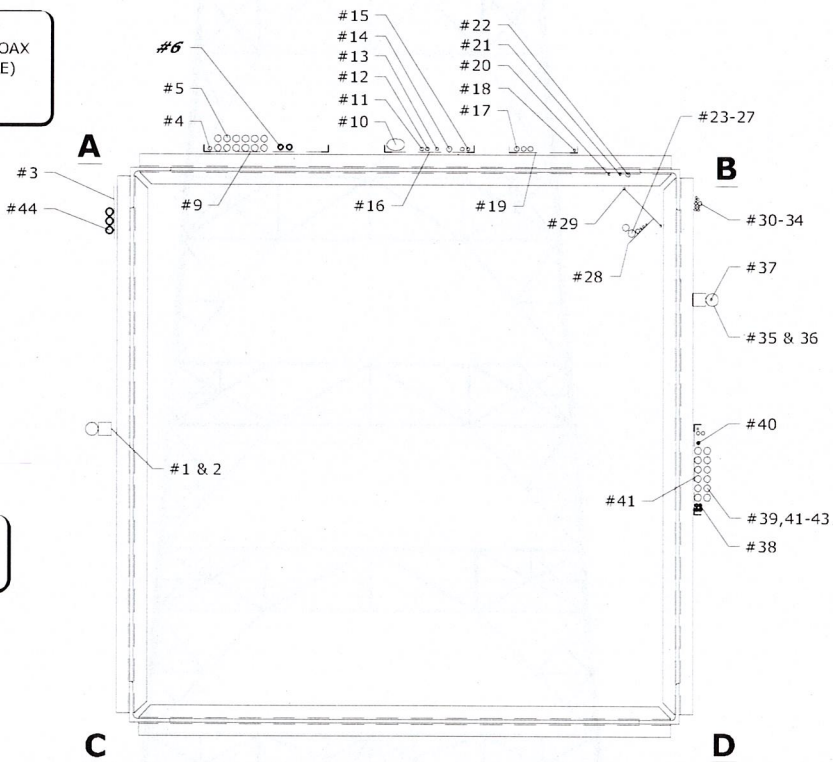
No.	QTY.	DESCRIPTION	ELEV.	TENANT
1	1	Conduit Shield	35'	E
2	1	Unused Conduit Supports	320'	E / WG "G"
3	1	Unused Waveguide Brackets	200'	E / WG "H"
4	1	7/8"	255'	E / #1
5	12	1 5/8" (RE-WORK/BUNDLE COAXES IN TWO ROWS)	262'	T-Mobile / E / #2-10, #12-14
6	3	HCS 6x12 Hybrid Cable	262'	T-Mobile / P
7	-	-	-	-
8	-	-	-	-
9	1	Feedline Ladder (Af)	265'	T-Mobile / E / WG "A"
10	1	EW 4.75" x 2.5"	343'	E / #19
11	1	7/8"	47'	E / #20
12	1	7/8"	348'	E / #21
13	1	0.95" Dead Cable	125'	E / #22
14	1	1 1/4" Dead Cable	299'	E / #23
15	2	7/8"	350'	E / #24, 25
16	1	Feedline Ladder (Af)	345'	E / WG "B"
17	3	HB114-1 1 1/4" Hybrid Cable	244'	Sprint / E / #26-28
18	1	LDF4-50A (1/2 FOAM)	26'	E / #29
19	1	Feedline Ladder (Af)	241'	Sprint / E / WG "C"
20	1	1/2"	343'	E / #30
21	1	1/2"	208'	E / #31
22	1	7/8"	349'	E / #32

23	2	1/2"	31'	E / #33, 34
24	1	1/2"	350'	E / #34
25	2	0.25" Dead Cables	350'	E / #35, 36
26	1	7/8"	349'	E / #37
27	2	1 5/8"	350'	E / #38, 39
28	1	Waveguide Brackets	348'	E / WG "D"
29	1	Climbing Ladder	350'	E
30	4	0.6" SO Cords	182'	E / #40-43
31	2	0.6" SO Cords	269'	E / #40,43
32	1	0.6" SO Cord	350'	E / #43
33	1	0.8" Dead SO Cord	350'	E / #44
34	1	3/4" Rigid Conduit Unused	338'	E / #45
35	1	Conduit Shield	35'	E
36	1	Unused Conduit Supports	320'	E / WG "E"
37	1	Grounding Cable	350'	E
38	4	3/4" DC Power Cable	347'	ATT / E
39	12	1 5/8"	347'	ATT / E / #49-60
40	1	5/8" Fiber Cable	347'	ATT / E
41	2	3/4" DC POWER CABLE	345'	ATT / E
42	1	5/8" FIBER CABLE	347'	ATT / E
43	1	Feedline Ladder (Af)	347'	ATT / E / WG "F"
44	3	1 5/8" Hybrid Cable	140'	VzW / NEW

NOTES:
 1) RE-WORK/BUNDLE (12) 1-5/8" COAX IN TWO ROWS ELEV. 262' (T-MOBILE)
 2) REMOVE ALL OTHER T-MOBILE COAXES NOT LISTED ABOVE.

LEGEND:
 E = EXISTING ○ #X
 P = PROPOSED ○ #X
 F = FUTURE ○ #X
 R = REMOVE ○ #X
 TO RELOCATE ○

CONTACT MEI IF LINE LAYOUT IS DIFFERENT FROM WHAT IS SHOWN BELOW.



101 PLAN: SCHEMATIC Tx-LINE LAYOUT
 SCALE: NOT TO SCALE

NOTES:
 1. TX LINE LAYOUT IS SCHEMATIC ONLY, BASED UPON MEI MAPPING (SUB: HTS) DATED 11/30/15 .
 2. NEW BRACKET SUPPORT SPECIFICATION BY OTHERS.



09/06/2018

MALOUF ENGINEERING INTERNATIONAL, INC.

 STRUCTURAL CONSULTANTS
 17950 PRESTON ROAD SUITE 720
 DALLAS, TEXAS 75252-5635
 972-783-2578 (fax: 2583)
 www.maloufengineering.com
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350FT SST/NORWALK WILLARD RD SITE #CT11011D
TOWER TxLINE LAYOUT
 MEI PROJECT ID: CT04761S-18V1
 SHEET NUMBER: **L01**
 REV: 0



Malouf Engineering International Inc.
17950 Preston Rd. Suite 720
Dallas, Texas. 75252 / p (972)-783-2578
maloufengineering.com

Job No
CT04761S-18V

Sheet No
1

Rev
0

Software licensed to Microsoft

Part 0 TO 175FT OF TOWER

Job Title 351.7ft Self Supporting Tower

Ref

By KM

Date 6-Sep-18

Chd HML

Client TRANSCEND WIRELESS / T-MOBILE

File CT04761S-18V1.std

Date/Time 06-Sep-2018 13:21

175ft

150ft

125ft

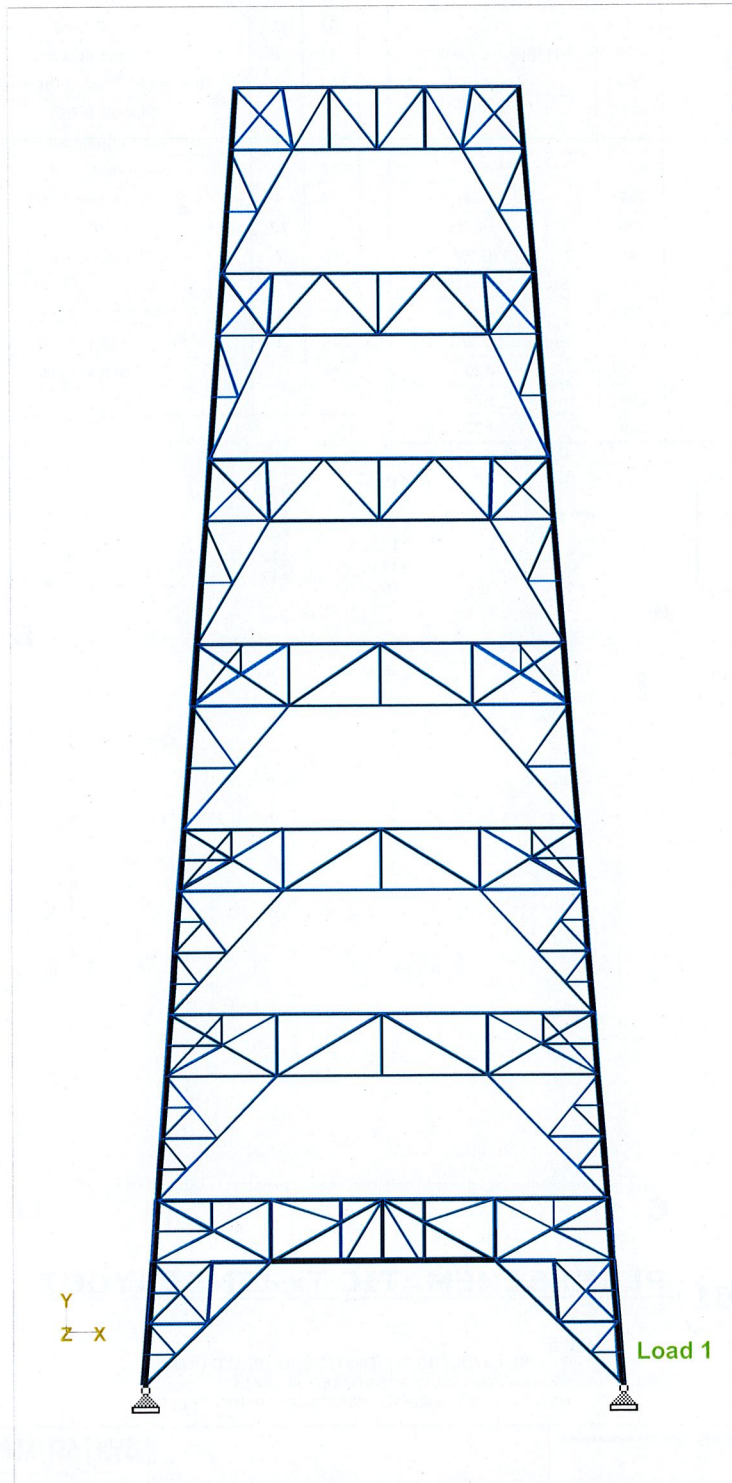
100ft

75ft

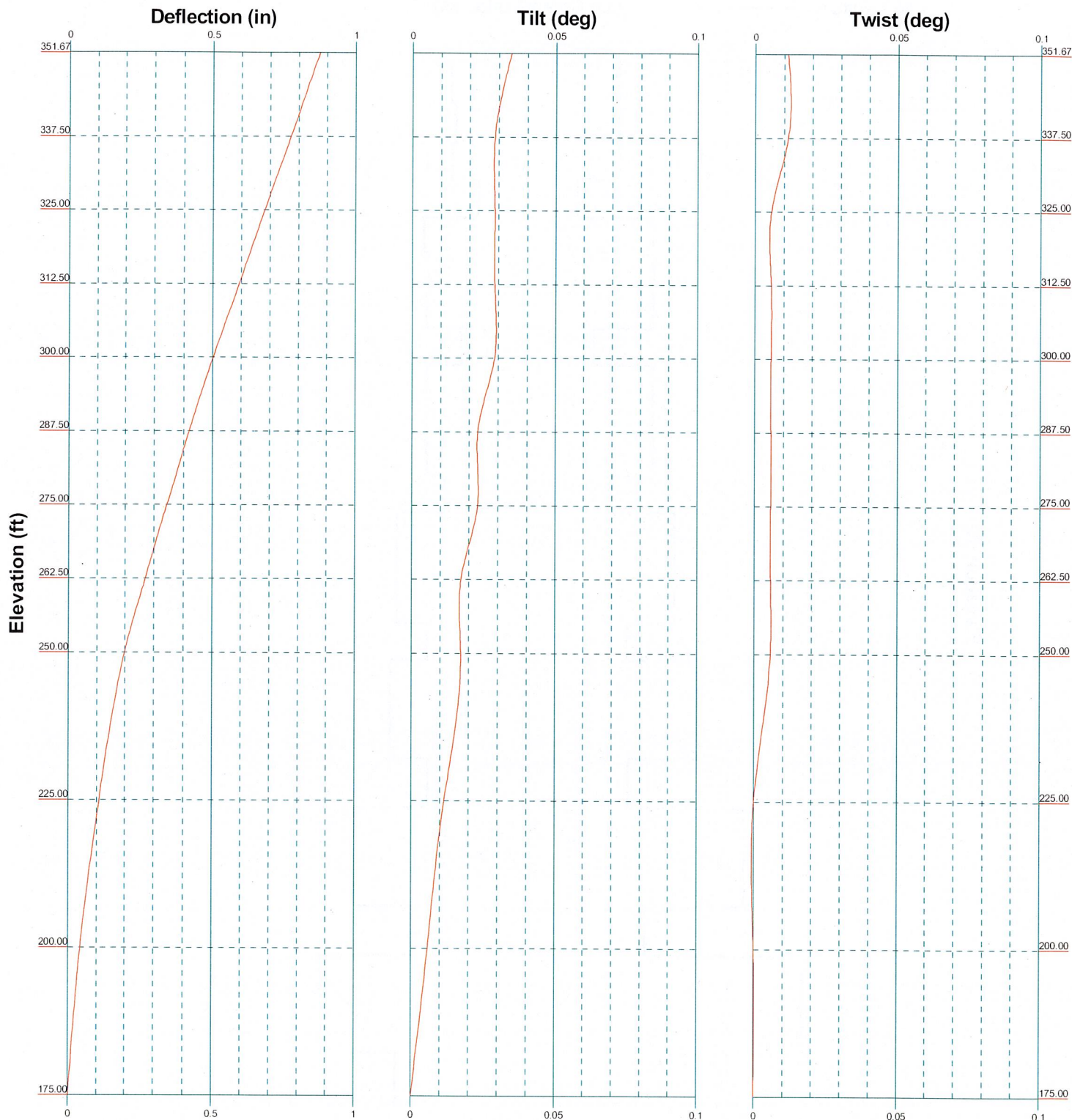
50ft

25ft

0ft



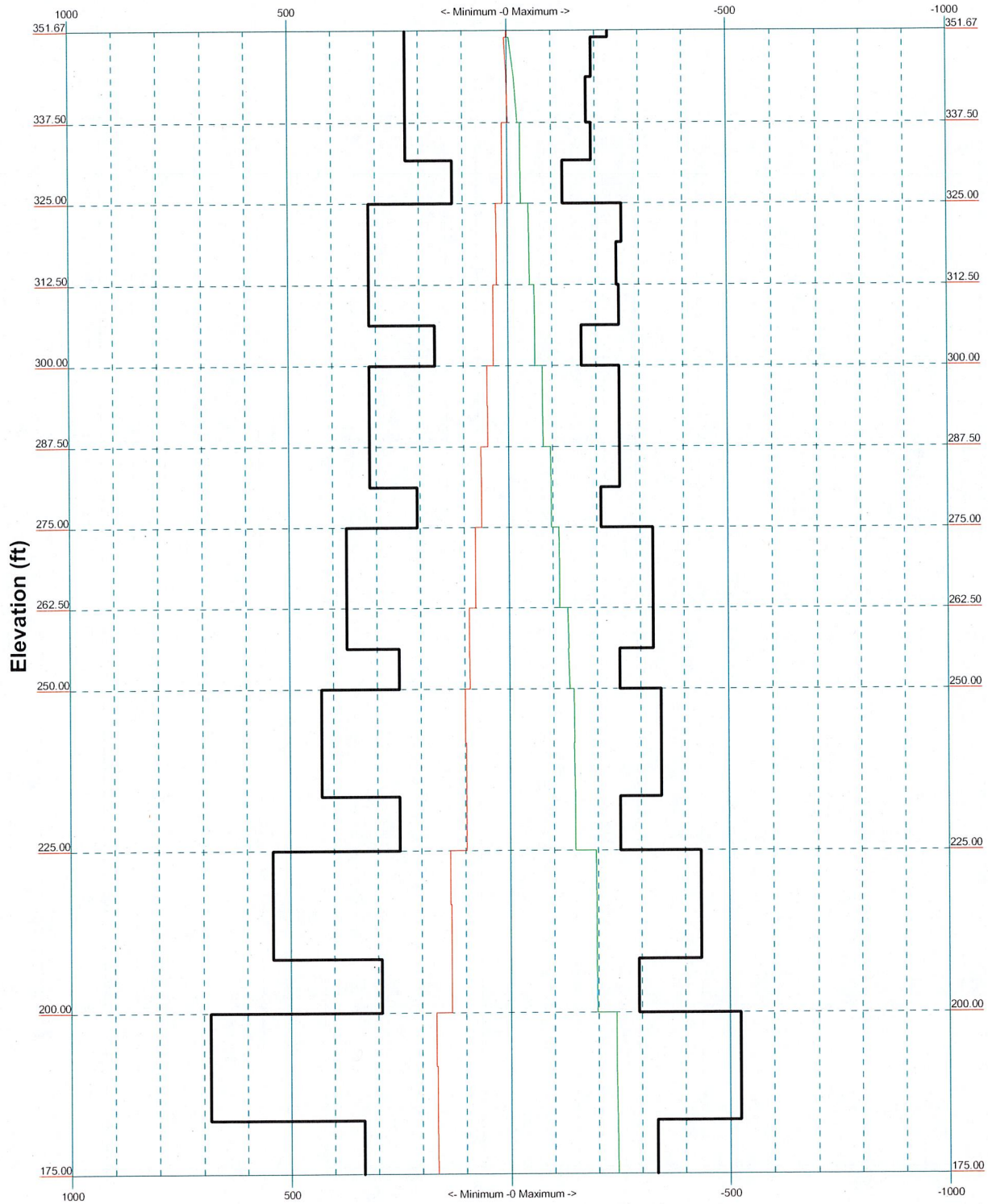
Tower Elevation 0 - 175ft



 <p>maloufengineering.com</p>	<p>Malouf Engineering Int'l Inc. 17950 Preston Road, STE 720 Dallas, Texas 75252 Phone: (972) 783 2578 FAX: (972) 783 2583</p>		<p>Job: 350ft SST / Norwalk Willard Rd Site #CT11011D</p>	
	<p>Project: CT04761S-18V1 - Top Tower</p>		<p>Client: Transcend Wireless / T-Mobile</p>	
	<p>Code: TIA-222-G</p>		<p>Drawn by: KM</p>	<p>App'd:</p>
	<p>Path:</p>		<p>Date: 09/06/18</p>	<p>Scale: NTS</p>
	<p></p>		<p>Dwg No. E-5</p>	<p></p>

TIA-222-G - 93 mph/50 mph 0.7500 in Ice Exposure C

Leg Capacity ——— Leg Compression (K)



Malouf Engineering Int'l Inc.
 17950 Preston Road, STE 720
 Dallas, Texas 75252
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Job: **350ft SST / Norwalk Willard Rd Site #CT11011D**
 Project: **CT04761S-18V1 - Top Tower**
 Client: Transcend Wireless / T-Mobile
 Code: TIA-222-G
 Path:
 Drawn by: KM App'd:
 Date: 09/06/18 Scale: NTS
 Dwg No. E-3

tnxTower Malouf Engineering Int'l Inc. 17950 Preston Road, STE 720 Dallas, Texas 75252 Phone: (972) 783 2578 FAX: (972) 783 2583	Job 350ft SST / Norwalk Willard Rd Site #CT11011D	Page 1 of 17
	Project CT04761S-18V1	Date 10:11:47 09/06/18
	Client Transcend Wireless / T-Mobile	Designed by KM

Tower Input Data

The main tower is a 4x free standing tower with an overall height of 351.67 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 12.33 ft at the top and 64.75 ft at the base.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).

Basic wind speed of 93 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

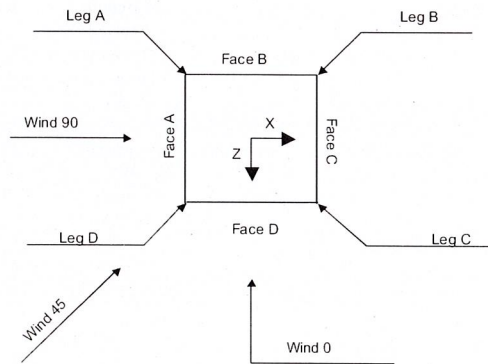
OWNER - FULLER DEVELOPMENT LLC - NORWALK SITE.

2016 CSBC / 2012 IBC / ASCE 7-10 / 120 MPH ULT - RISK CAT. 2.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

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



Square Tower

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Placement	#	Weight	
			ft	plf
Conduit Shield (E)	35.00 - 12.00	1	18.50	
Unused Conduit Supports (E / WG "G")	320.00 - 37.00	1	9.56	
1-5/8" (6x12)	140.00 -	3	1.78	

Description	Placement	#	Weight	
			ft	plf
Hybrid (HFT1206-24 SV2-xx) or Equiv. (VzW / New)	6.00			
Unused	200.00 -	1	1.25	

tnxTower Malouf Engineering Int'l Inc. 17950 Preston Road, STE 720 Dallas, Texas 75252 Phone: (972) 783 2578 FAX: (972) 783 2583	Job 350ft SST / Norwalk Willard Rd Site #CT11011D	Page 2 of 17
	Project CT04761S-18V1	Date 10:11:47 09/06/18
	Client Transcend Wireless / T-Mobile	Designed by KM

Description	Placement	#	Weight	
			ft	plf
Waveguide Brackets	27.00			
(E / WG "H")				
7/8 (E / #1)	255.50 - 6.00	1	0.54	
1 5/8 (Rework - Bundle / T-Mobile / E / #2-10, #12-14)	262.00 - 6.00	12	1.04	
HCS 6x12 Hybrid Fiber Cable	262.00 - 6.00	3	2.40	
(T-Mobile / P) Feedline Ladder (Af)	265.00 - 8.50	1	8.40	
(T-Mobile / E / WG "A")				
EW 4.75" x 2.5"	343.25 - 6.00	1	1.85	
(E / #19)				
7/8 (E / #20)	47.50 - 6.00	1	0.54	
7/8 (E / #21)	348.25 - 6.00	1	0.54	
0.95" Dead Cable	125.00 - 6.00	1	0.49	
(E / #22)				
1 1/4 Dead Cable	299.00 - 6.00	1	0.66	
(E / #23)				
7/8 (E / #24, 25)	350.00 - 6.00	2	0.54	
Feedline Ladder (Af)	345.00 - 8.50	1	8.50	
(E / WG "B")				
HB114-1 1/4" Hybrid Cable	244.00 - 0.00	3	1.08	
(Sprint / E / #26-28)				
LDF4-50A (1/2 FOAM)	26.00 - 0.00	1	0.15	
(E / #29)				
Feedline Ladder (Af)	241.00 - 2.00	1	8.45	
(Sprint / E / WG "C")				
1/2 (E / #30)	343.67 - 6.00	1	0.25	
1/2 (E / #31)	208.50 - 6.00	1	0.25	
7/8 (E / #32)	349.75 - 6.00	1	0.54	
1/2	31.00 - 6.00	2	0.25	

Description	Placement	#	Weight	
			ft	plf
(E / #33, 34)				
1/2 (E / #34)	350.00 - 6.00	1	0.25	
0.25" Dead Cables	350.00 - 6.00	2	0.26	
(E / #35, 36)				
7/8 (E / #37)	349.50 - 6.00	1	0.54	
1 5/8 (E / #38, 39)	350.00 - 6.00	2	1.04	
Waveguide Brackets	348.00 - 15.00	1	1.15	
(E / WG "D")				
Climbing Ladder	350.00 - 0.50	1	9.50	
(E)				
Safety Rail	350.00 - 0.00	1	2.75	
(E)				
0.6" SO Cords	182.50 - 0.00	4	0.35	
(E / #40-43)				
0.6" SO Cords	269.25 - 182.50	2	0.35	
(E / #40,43)				
0.6" SO Cord	350.00 - 269.25	1	0.35	
(E / #43)				
0.8" Dead SO Cord	350.00 - 14.00	1	0.40	
(E / #44)				
3/4" Rigid Conduit	338.00 - 0.00	1	1.13	
Unused				
(E / #45)				
Conduit Shield	35.00 - 12.00	1	18.50	
(E)				
Unused Conduit	320.00 - 37.00	1	9.56	
Supports				
(E / WG "E")				
Grounding Cable	350.00 - 0.00	1	0.25	
(E)				
3/4" DC Power Cable	347.00 - 6.00	6	0.80	
(ATT / New / E / #46,47)				
1 5/8 (ATT / E / #49-60)	347.00 - 6.00	12	1.04	
5/8" Fiber Cable	347.00 - 6.00	2	0.50	
(ATT / New / E / #48)				
Feedline Ladder (Af)	345.00 - 14.50	1	13.50	
(ATT / E / WG "F")				

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	Project CT04761S-18V1	Date 10:11:47 09/06/18
	Client Transcend Wireless / T-Mobile	Designed by KM

Discrete Tower Loads

Description	Placement	Weight	Description	Placement	Weight
	<i>ft</i>	<i>K</i>		<i>ft</i>	<i>K</i>
4ft Lightning Rod (E / #42)	364.00	0.01	15ft Whip Antenna (E / #32)	354.50	0.03
Beacon / Strobe (E / #41)	363.00	0.04	8ft Pipe Mount (E / #32)	351.00	0.04
14ft Mount (E / #41 / 42)	355.00	0.17	4ft Whip Antenna (E / #31)	355.50	0.01
12ft Whip Antenna (E / #40)	371.00	0.02	8ft Pipe Mount (E / #31)	351.00	0.04
TMA (E / #40)	353.00	0.03	10ft 4-Element Dipole (E / #30)	354.50	0.03
10ft Pipe Mount (E / #40)	360.00	0.05	8ft Pipe Mount (E / #30)	351.00	0.04
15ft Whip Antenna (E / #39)	364.50	0.03	20ft 4-Element Dipole (E / #29)	348.25	0.04
4ft Pipe Mount (E / #39)	356.25	0.02	6ft Pipe Mount (E / #29)	351.00	0.04
Top Stub Tower (E)	352.00	0.66	Top Platform w/ Rails (E)	350.50	17.00
Whip (E / #38)	369.50	0.02	3ft 3-Elem Yagi (Unknown / E / #27)	343.67	0.02
15ft Pipe Mount w/ Guys (E / #38)	355.50	0.13	8ft Pipe Mount on Sector Mount (Unknown / E / #27)	341.00	0.02
8ft Empty Pipe Mount (E / #37)	349.00	0.04	Raycap DC6-48-60-18-8F SUPPRESSOR (ATT / E)	347.00	0.02
21ft Whip Antenna (E / #36)	349.50	0.03	Raycap DC6-48-60-18-8F SUPPRESSOR (ATT / E)	347.00	0.02
3ft Empty Side Arm Mount (E / #35)	350.50	0.17	Raycap DC6-48-60-18-8F SUPPRESSOR (ATT / E)	347.00	0.02
8ft Whip Antenna (E / #34)	349.75	0.02	RRUS-11 (ATT / E / #25)	347.00	0.05
TA-2335-DAB Panel w/ Pipe Mount (E / #33)	343.25	0.06	RRUS-11 (ATT / E / #25)	347.00	0.05
TA-2335-DAB Panel w/ Pipe Mount (E / #33)	343.25	0.06	RRUS-11 (ATT / E / #25)	347.00	0.05
TA-2335-DAB Panel w/ Pipe Mount (E / #33)	343.25	0.06	7770.00 Panels w/ Pipe Mount (ATT / E / #24)	347.00	0.04
		0.11			0.09
		0.17			0.15

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Description	Placement	Weight	Description	Placement	Weight
	ft	K		ft	K
7770.00 Panels w/ Pipe Mount	347.00	0.04	RRUS-32 B2	347.00	0.14
(ATT / E / #24)		0.09	(ATT / New)		0.05
		0.15			0.07
7770.00 Panels w/ Pipe Mount	347.00	0.04			0.10
(ATT / E / #24)		0.09	RRUS-32 B2	347.00	0.05
		0.15	(ATT / New)		0.07
(2) LGP21401 TMA'S	347.00	0.02			0.10
(ATT / E / #24)		0.03	RRUS-32 B2	347.00	0.05
		0.04	(ATT / New)		0.07
(2) LGP21401 TMA'S	347.00	0.02			0.10
(ATT / E / #24)		0.03	Sector Mount w V-Stabilizer	347.00	0.72
		0.04	(Commscope MTC3615 AD		0.95
(2) LGP21401 TMA'S	347.00	0.02	A)		1.19
(ATT / E / #24)		0.03	(ATT / E)		
		0.04	Sector Mount w V-Stabilizer	347.00	0.72
(2) 7020 RET Motor	344.50	0.00	(Commscope MTC3615 AD		0.95
(ATT / E)		0.00	A)		1.19
		0.00	(ATT / E)		
(2) 7020 RET Motor	344.50	0.00	Sector Mount w V-Stabilizer	347.00	0.72
(ATT / E)		0.00	(Commscope MTC3615 AD		0.95
		0.00	A)		1.19
(2) 7020 RET Motor	344.50	0.00	(ATT / E)		
(ATT / E)		0.00	4-Way Walkway Platform w/	339.00	10.25
		0.00	Rails		13.32
SBNHH-1D65A w/ pipe mount	347.00	0.06	(E)		16.40
(ATT / New)		0.12	Corner Ladder	350.00 - 339.00	0.45
		0.18	(E)		0.59
SBNHH-1D65A w/ pipe mount	347.00	0.06			0.74
(ATT / New)		0.12	4-Way Face Frame	325.00	3.00
		0.18	(E)		3.90
SBNHH-1D65A w/ pipe mount	347.00	0.06			4.79
(ATT / New)		0.12	(4) 14ft Empty Pipe Mounts	306.00	0.06
		0.18	(E / #21)		0.09
(2) TPX-070821 Triplexer	347.00	0.01			0.13
(ATT / New)		0.01	OB Light	269.25	0.01
		0.02	(E / #20)		0.01
(2) TPX-070821 Triplexer	347.00	0.01			0.02
(ATT / New)		0.01	OB Light	269.25	0.01
		0.02	(E / #20)		0.01
(2) TPX-070821 Triplexer	347.00	0.01			0.02
(ATT / New)		0.01	AIR-3246 B66 Panel w/ Pipe	262.00	0.22
		0.02	Mount		0.29
OPA-65R-LCUU-H4 w/ Pipe Mounts	347.00	0.08	(T-Mobile / P)		0.37
(ATT / E)		0.13	AIR-3246 B66 Panel w/ Pipe	262.00	0.22
		0.20	Mount		0.29
OPA-65R-LCUU-H4 w/ Pipe Mounts	347.00	0.08	(T-Mobile / P)		0.37
(ATT / E)		0.13	AIR-3246 B66 Panel w/ Pipe	262.00	0.22
		0.20	Mount		0.29
OPA-65R-LCUU-H4 w/ Pipe Mounts	347.00	0.08	(T-Mobile / P)		0.37
(ATT / E)		0.13	APXVAARR24_43-U-NA20	262.00	0.18
		0.20	w/ Pipe Mount		0.32
RRUS-32	347.00	0.08	(T-Mobile / P)		0.46
(ATT / E)		0.10	APXVAARR24_43-U-NA20	262.00	0.18
		0.14	w/ Pipe Mount		0.32
RRUS-32	347.00	0.08	(T-Mobile / P)		0.46
(ATT / E)		0.10	APXVAARR24_43-U-NA20	262.00	0.18
		0.14	w/ Pipe Mount		0.32
RRUS-32	347.00	0.08	(T-Mobile / P)		0.46
(ATT / E)		0.10	AIR32 B66a/B2a Panel w/	262.00	0.15

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<i>Description</i>	<i>Placement</i>	<i>Weight</i>	<i>Description</i>	<i>Placement</i>	<i>Weight</i>
	<i>ft</i>	<i>K</i>		<i>ft</i>	<i>K</i>
Pipe Mount (T-Mobile / P)		0.22 0.28	APXVSPP18-C-A20 w / Pipe Mount	243.50	0.09 0.16
AIR32 B66a/B2a Panel w/ Pipe Mount (T-Mobile / P)	262.00	0.15 0.22 0.28	(Sprint / E / #14) RRH	242.25	0.24 0.05
AIR32 B66a/B2a Panel w/ Pipe Mount (T-Mobile / P)	262.00	0.15 0.22 0.28	(Sprint / E / #13)		0.07 0.09
KRY 112 144/2 TMA (T-Mobile / P)	262.00	0.01 0.02	RRH	242.25	0.05
KRY 112 144/2 TMA (T-Mobile / P)	262.00	0.01 0.02	(Sprint / E / #13)		0.07 0.09
KRY 112 144/2 TMA (T-Mobile / P)	262.00	0.01 0.02	RRH	242.25	0.05
RADIO 4449 - B71 + B12 (T-Mobile / P)	262.00	0.07 0.09 0.11	(Sprint / E / #13)		0.07 0.09
RADIO 4449 - B71 + B12 (T-Mobile / P)	262.00	0.07 0.09 0.11	800 Ext. Notch Filter (Sprint / E / #13)	242.25	0.01 0.02
RADIO 4449 - B71 + B12 (T-Mobile / P)	262.00	0.07 0.09 0.11	800 Ext. Notch Filter (Sprint / E / #13)	242.25	0.01 0.02
13ft T-Frame Mount (T-Mobile / E)	262.00	0.35 0.48 0.60	800 Ext. Notch Filter (Sprint / E / #13)	242.25	0.01 0.02
13ft T-Frame Mount (T-Mobile / E)	262.00	0.35 0.48 0.60	13ft Sector Mount (Sprint / E / #13-15)	244.25 - 241.50	0.57 0.78 0.98
13ft T-Frame Mount (T-Mobile / E)	262.00	0.35 0.48 0.60	13ft Sector Mount (Sprint / E / #13-15)	244.25 - 241.50	0.57 0.78 0.98
12" Square Panel w/ Pipe Mount (E / #17)	255.50	0.01 0.02 0.03	13ft Sector Mount (Sprint / E / #13-15)	244.25 - 241.50	0.57 0.78 0.98
25ft Rest Platform w/ Rails (E / #16)	251.50	2.65 3.58 4.50	7ft 5-Elem Yagi (E / #12)	208.50	0.01 0.02 0.03
25ft Rest Platform w/ Rails (E / #16)	251.50	2.65 3.58 4.50	5ft Pipe Mount (E / #12)	204.50	0.03 0.03 0.04
ALU-RRH 4x45 (Sprint / E / #15)	245.00	0.06 0.08 0.11	Corner Rest Platform (E / #11)	191.50	0.75 1.01 1.27
ALU-RRH 4x45 (Sprint / E / #15)	245.00	0.06 0.08 0.11	Corner Rest Platform (E / #11)	191.50	0.75 1.01 1.27
ALU-RRH 4x45 (Sprint / E / #15)	245.00	0.06 0.08 0.11	Corner Rest Platform (E / #11)	191.50	0.75 1.01 1.27
APXVSPP18-C-A20 w / Pipe Mount (Sprint / E / #14)	243.50	0.09 0.16 0.24	Beacon Ice Shield (E / #10)	186.00	0.10 0.14 0.17
APXVSPP18-C-A20 w / Pipe Mount (Sprint / E / #14)	243.50	0.09 0.16 0.24	Beacon Ice Shield (E / #10)	186.00	0.10 0.14 0.17
			Beacon / Strobe (E / #9)	182.50	0.14 0.18 0.22
			Beacon / Strobe (E / #9)	182.50	0.14 0.18

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Description	Placement	Weight	
		ft	K
41ft Rest Platform w/ Rails (E / #8)	125.00	0.22	3.75
		5.50	7.25
41ft Rest Platform w/ Rails (E / #8)	125.00	3.75	5.50
		7.25	0.45
4ft Rest Platform w/ Rails (E / #7)	100.00	0.61	0.77
OB Light (E / #6)	93.00	0.01	0.01
		0.02	0.01
OB Light (E / #6)	93.00	0.01	0.01
		0.02	0.45
4ft Rest Platform w/ Rails (E / #5)	50.25	0.61	0.77
4ft Side Arm (E / #4)	46.50	0.55	0.78
Corner Rest Platform (E / #3)	26.00	1.00	0.75
		1.01	1.27
Corner Rest Platform (E / #3)	26.00	0.75	1.01
		1.27	0.75
Corner Rest Platform (E / #3)	26.00	1.01	1.27
		0.75	1.01
Corner Rest Platform (E / #3)	26.00	1.27	0.75
		1.01	0.01
GPS w/ Pipe Mount (E / #2)	26.00	0.01	0.01
		0.01	0.16
10ft Pipe Mount w/ Standoff (E / #1)	34.00 - 24.00	0.12	0.19
		0.16	8.50
Face Frame w/ Knee Braces (E)	25.00 - 16.67	11.05	13.60
		0.11	0.19
(3) JAHH-65B-R3B w/ Pipe Mount (VzW / P / F)	140.00	0.27	0.14
(3) JAHH-45B-R3B w/ pipe mount (VzW / P / F)	140.00	0.22	0.32
(3) JAHH-45B-R3B w/ pipe mount (VzW / P / F)	140.00	0.14	0.22
		0.32	0.11
BSAMNT-SBS-2-3	140.00	0.11	0.12
Side-By-Side Mounting Kit (VzW / P)		0.12	0.07
BSAMNT-SBS-2-2	140.00	0.07	0.07
Side-By-Side Mounting Kit (VzW / P)		0.07	0.07

Description	Placement	Weight	
		ft	K
BSAMNT-SBS-2-2	140.00	0.07	0.07
Side-By-Side Mounting Kit (VzW / P)		0.07	0.06
B13 RRH4x30 (VzW / P)	140.00	0.08	0.10
		0.10	0.06
B13 RRH4x30 (VzW / P)	140.00	0.06	0.08
		0.10	0.06
B13 RRH4x30 (VzW / P)	140.00	0.06	0.08
		0.10	0.06
B66A RRH4x45W (VzW / P)	140.00	0.06	0.08
		0.11	0.06
B66A RRH4x45W (VzW / P)	140.00	0.06	0.08
		0.11	0.06
B66A RRH4x45W (VzW / P)	140.00	0.06	0.08
		0.11	0.06
B25 RRH4x30W (VzW / P)	140.00	0.06	0.08
		0.10	0.06
B25 RRH4x30W (VzW / P)	140.00	0.06	0.08
		0.10	0.06
B25 RRH4x30W (VzW / P)	140.00	0.06	0.08
		0.10	0.05
B5 RRH4x40W - LOC (VzW / F)	140.00	0.05	0.06
		0.08	0.05
B5 RRH4x40W - LOC (VzW / F)	140.00	0.05	0.06
		0.08	0.05
B5 RRH4x40W - LOC (VzW / F)	140.00	0.05	0.06
		0.08	0.03
RVZDC-6627-PF-48 OVP Box w/ Bracket (VzW / P)	140.00	0.07	0.11
RVZDC-6627-PF-48 OVP Box w/ Bracket (VzW / P)	140.00	0.03	0.07
RVZDC-6627-PF-48 OVP Box w/ Bracket (VzW / P)	140.00	0.03	0.11
D&D Welding 12ft Arch Boom Mount (VzW / P)	140.00	0.38	0.50
		0.63	0.38
D&D Welding 12ft Arch Boom Mount (VzW / P)	140.00	0.38	0.50
		0.63	0.38
D&D Welding 12ft Arch Boom Mount (VzW / P)	140.00	0.38	0.50
		0.63	0.50

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Dishes

Description	Elevation ft	Weight K
3ft Dish (E / #4)	47.50	0.09 0.13 0.17
4ft Dish (E / #1)	31.00	0.10 0.17 0.24

Load Combinations

Comb. No.	Description	Comb. No.	Description
1	Dead Only	19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
2	1.2 Dead+1.6 Wind 0 deg - No Ice	20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
3	0.9 Dead+1.6 Wind 0 deg - No Ice	21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
4	1.2 Dead+1.6 Wind 45 deg - No Ice	22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
5	0.9 Dead+1.6 Wind 45 deg - No Ice	23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
6	1.2 Dead+1.6 Wind 90 deg - No Ice	24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
7	0.9 Dead+1.6 Wind 90 deg - No Ice	25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
8	1.2 Dead+1.6 Wind 135 deg - No Ice	26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
9	0.9 Dead+1.6 Wind 135 deg - No Ice	27	Dead+ Wind 0 deg - Service
10	1.2 Dead+1.6 Wind 180 deg - No Ice	28	Dead+ Wind 45 deg - Service
11	0.9 Dead+1.6 Wind 180 deg - No Ice	29	Dead+ Wind 90 deg - Service
12	1.2 Dead+1.6 Wind 225 deg - No Ice	30	Dead+ Wind 135 deg - Service
13	0.9 Dead+1.6 Wind 225 deg - No Ice	31	Dead+ Wind 180 deg - Service
14	1.2 Dead+1.6 Wind 270 deg - No Ice	32	Dead+ Wind 225 deg - Service
15	0.9 Dead+1.6 Wind 270 deg - No Ice	33	Dead+ Wind 270 deg - Service
16	1.2 Dead+1.6 Wind 315 deg - No Ice	34	Dead+ Wind 315 deg - Service
17	0.9 Dead+1.6 Wind 315 deg - No Ice		
18	1.2 Dead+1.0 Ice+1.0 Temp		

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	351.67 - 337.5	0.874	28	0.0317	0.0091
T2	337.5 - 325	0.773	28	0.0314	0.0088
T3	325 - 312.5	0.681	28	0.0302	0.0083
T4	312.5 - 300	0.592	28	0.0287	0.0078
T5	300 - 287.5	0.502	28	0.0270	0.0070
T6	287.5 - 275	0.419	28	0.0247	0.0062
T7	275 - 262.5	0.343	28	0.0218	0.0054
T8	262.5 - 250	0.269	28	0.0193	0.0046
T9	250 - 225	0.198	28	0.0163	0.0036
T10	225 - 200	0.108	30	0.0108	0.0023
T11	200 - 175	0.042	32	0.0057	0.0011

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
371.00	12ft Whip Antenna	28	0.874	0.0317	0.0091	752849
369.50	Whip	28	0.874	0.0317	0.0091	752849
364.50	15ft Whip Antenna	28	0.874	0.0317	0.0091	752849

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
364.00	4ft Lightning Rod	28	0.874	0.0317	0.0091	752849
363.00	Beacon / Strobe	28	0.874	0.0317	0.0091	752849
360.00	10ft Pipe Mount	28	0.874	0.0317	0.0091	752849
356.25	4ft Pipe Mount	28	0.874	0.0317	0.0091	752849
355.50	15ft Pipe Mount w/ Guys	28	0.874	0.0317	0.0091	752849
355.00	14ft Mount	28	0.874	0.0317	0.0091	752849
354.50	15ft Whip Antenna	28	0.874	0.0317	0.0091	752849
353.00	TMA	28	0.874	0.0317	0.0091	752849
352.00	Top Stub Tower	28	0.874	0.0317	0.0091	752849
351.00	8ft Pipe Mount	28	0.869	0.0317	0.0091	752849
350.50	3ft Empty Side Arm Mount	28	0.866	0.0317	0.0091	752849
349.75	8ft Whip Antenna	28	0.860	0.0317	0.0091	752849
349.50	21ft Whip Antenna	28	0.859	0.0317	0.0091	752849
349.00	8ft Empty Pipe Mount	28	0.855	0.0317	0.0091	752849
348.25	20ft 4-Element Dipole	28	0.850	0.0317	0.0091	752849
347.00	Raycap DC6-48-60-18-8F SUPRESSOR	28	0.841	0.0317	0.0090	752849
344.50	(2) 7020 RET Motor	28	0.823	0.0316	0.0090	525004
343.67	3ft 3-Elem Yagi	28	0.818	0.0316	0.0089	470536
343.25	TA-2335-DAB Panel w/ Pipe Mount	28	0.815	0.0316	0.0089	447064
341.00	8ft Pipe Mount on Sector Mount	28	0.799	0.0316	0.0089	355190
339.00	4-Way Walkway Platform w/ Rails	28	0.784	0.0315	0.0088	320237
325.00	4-Way Face Frame	28	0.681	0.0302	0.0083	368816
306.00	(4) 14ft Empty Pipe Mounts	28	0.545	0.0279	0.0074	554483
269.25	OB Light	28	0.309	0.0207	0.0051	Inf
262.00	AIR-3246 B66 Panel w/ Pipe Mount	28	0.266	0.0192	0.0046	Inf
255.50	12" Square Panel w/ Pipe Mount	28	0.228	0.0177	0.0040	137637
251.50	25ft Rest Platform w/ Rails	28	0.206	0.0167	0.0037	87280
245.00	ALU-RRH 4x45	28	0.175	0.0152	0.0032	91127
243.50	APXVSP18-C-A20 w / Pipe Mount	28	0.169	0.0148	0.0032	98896
242.25	RRH	28	0.164	0.0145	0.0031	106458
241.50	13ft Sector Mount	28	0.161	0.0144	0.0031	111578
208.50	7ft 5-Elem Yagi	32	0.062	0.0075	0.0016	267193
204.50	5ft Pipe Mount	32	0.052	0.0066	0.0013	212815
191.50	Corner Rest Platform	32	0.025	0.0038	0.0007	262336
186.00	Beacon Ice Shield	32	0.016	0.0026	0.0005	393505
182.50	Beacon / Strobe	32	0.011	0.0018	0.0003	577137

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	351.67 - 337.5	3.242	4	0.1146	0.0351
T2	337.5 - 325	2.876	4	0.1138	0.0336
T3	325 - 312.5	2.540	4	0.1094	0.0319
T4	312.5 - 300	2.213	4	0.1040	0.0301
T5	300 - 287.5	1.880	4	0.0981	0.0267
T6	287.5 - 275	1.576	4	0.0895	0.0238
T7	275 - 262.5	1.295	4	0.0792	0.0209
T8	262.5 - 250	1.019	4	0.0699	0.0175
T9	250 - 225	0.755	4	0.0593	0.0135
T10	225 - 200	0.414	8	0.0393	0.0088
T11	200 - 175	0.158	12	0.0208	0.0043

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Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	351.67 - 337.5	Leg	L6x6x5/8	3	-23.59	179.77	13.1	Pass
		Diagonal	L3 1/2x3 1/2x5/16	14	-7.44	20.67	36.0	Pass
		Secondary Horizontal	L3x3x1/4	18	-1.89	15.87	11.9	Pass
		Top Girt	C8x11.5	5	-0.19	54.59	0.7	Pass
T2	337.5 - 325	Leg	L6x6x5/8	23	-30.34	180.87	16.8	Pass
		Diagonal	L3 1/2x3 1/2x5/16	34	-10.48	19.20	54.6	Pass
		Horizontal	C7x9.8	25	3.63	87.64	4.1	Pass
		Secondary Horizontal	L3x2 1/2x1/4	38	-0.46	8.46	5.4	Pass
T3	325 - 312.5	Leg	L6x6x7/8	43	-49.39	247.24	20.0	Pass
		Diagonal	L3 1/2x4x5/16	59	-11.65	20.13	57.9	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	47	6.17	63.37	9.7	Pass
		Secondary Horizontal	L3x2 1/2x1/4	63	-0.74	7.02	10.6	Pass
T4	312.5 - 300	Inner Bracing	2L2x2 1/2x1/4x3/8	53	0.01	69.01	0.8	Pass
		Leg	L6x6x7/8	68	-61.23	253.32	24.2	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	88	-14.69	21.60	68.0	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	84	-8.26	31.81	25.9	Pass
T5	300 - 287.5	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	82	-0.92	15.09	6.1	Pass
		Redund Diag 1 Bracing	L2 1/2x2x3/16	87	-0.76	4.69	16.1	Pass
		Inner Bracing	2L2x2 1/2x1/4x3/8	102	-0.02	3.55	0.9	Pass
		Leg	L6x6x7/8	105	-78.95	253.32	31.2	Pass
T6	287.5 - 275	Diagonal	2L2 1/2x2 1/2x5/16x3/8	125	-15.49	25.05	61.8	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	121	-9.94	26.71	37.2	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x1/4	123	-1.19	18.49	6.4	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x1/4	120	-0.92	8.41	10.9	Pass
T7	275 - 262.5	Inner Bracing	2L2 1/2x2 1/2x1/4x3/8	139	-0.02	5.50	1.1	Pass
		Leg	L6x6x7/8	142	-96.94	253.32	38.3	Pass
		Diagonal	2L2 1/2x2 1/2x5/16x3/8	162	-16.10	23.23	69.3	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	158	-10.72	22.98	46.6	Pass
T8	262.5 - 250	Redund Horz 1 Bracing	L2 1/2x2 1/2x1/4	156	-1.46	16.35	8.9	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x1/4	157	-1.07	7.74	13.8	Pass
		Inner Bracing	2L2 1/2x2 1/2x1/4x3/8	176	-0.02	4.61	1.2	Pass
		Leg	L8x8x3/4	179	-115.12	327.61	35.1	Pass
T9	250 - 237.5	Diagonal	2L2 1/2x2 1/2x1/4x3/8	201	-16.77	30.68	54.7	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	197	-11.60	19.98	58.1	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	193	-1.73	11.03	15.7	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	194	-1.21	5.50	22.1	Pass
T10	237.5 - 225	Redund Hip 1 Bracing	L3x3x1/4	195	-0.05	11.22	0.6	Pass
		Redund Hip Diagonal 1 Bracing	2L2 1/2x2 1/2x1/4x3/8	196	-0.11	9.97	1.1	Pass
		Inner Bracing	2L2 1/2x2 1/2x3/16x3/8	221	-0.02	3.03	1.6	Pass
		Leg	L8x8x3/4	224	-137.07	327.61	41.8	Pass
T11	225 - 212.5	Diagonal	2L2 1/2x2 1/2x1/4x3/8	246	-19.32	28.93	66.8	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	242	-13.92	17.73	78.5	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	250 - 225	Redund Horiz 1 Bracing	L2 1/2x2 1/2x3/16	238	-2.06	9.40	21.9	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	239	-1.39	5.22	26.6	Pass
		Redund Hip 1 Bracing	L3x3x1/4	260	-0.05	9.65	0.6	Pass
		Redund Hip Diagonal 1 Bracing	2L2 1/2x2 1/2x1/4x3/8	241	-0.11	8.81	1.2	Pass
		Inner Bracing	2L2 1/2x2 1/2x3/16x3/8	266	-0.02	2.60	1.7	Pass
		Leg	L8x8x7/8	269	-149.05	344.61	43.3	Pass
		Diagonal	2L2.5x3x5/16 + 2L3x3x3/8	303	-36.52	58.63	59.5 (b) 62.3	Pass
		Horizontal	2L3x2 1/2x1/4x3/8	297	-15.95	24.69	64.6	Pass
		Redund Horiz 1 Bracing	2L1 3/4x1 3/4x3/16	290	-2.24	18.90	11.9	Pass
		Redund Horiz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	291	-2.24	28.33	7.9	Pass
		Redund Diag 1 Bracing	2L2x2x3/16	292	-2.26	11.88	19.0	Pass
		Redund Diag 2 Bracing	2L2 1/2x2x3/16x3/8	307	-8.23	12.12	67.9	Pass
		Redund Hip 2 Bracing	L3 1/2x3 1/2x5/16	325	-0.18	9.30	1.9	Pass
		Redund Hip Diagonal 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	296	-0.14	6.33	2.3	Pass
		Redund Sub Horiz Bracing	2L2 1/2x2 1/2x1/4x3/8	294	-9.63	20.40	47.2	Pass
		Inner Bracing	2L2 1/2x2 1/2x1/4x3/8	331	-0.03	11.69	1.5	Pass
		Leg	L8x8x1 1/8	334	-198.20	434.78	45.6	Pass
		T10	225 - 200	Diagonal	2L2.5x3x5/16 + 2L3x3x3/8	368	-37.69	51.39
Horizontal	2L3x2 1/2x1/4x3/8			348	-18.38	51.94	35.4	Pass
Redund Horiz 1 Bracing	2L1 3/4x1 3/4x3/16			364	-2.98	17.87	16.7	Pass
Redund Horiz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8			356	-2.98	21.77	13.7	Pass
Redund Diag 1 Bracing	2L2x2x3/16			357	-2.73	10.92	25.0	Pass
Redund Diag 2 Bracing	2L2 1/2x2x3/16x3/8			353	-5.81	10.35	56.2	Pass
Redund Hip 2 Bracing	L4x4x3/8			390	-0.20	12.87	1.5	Pass
Redund Hip Diagonal 2 Bracing	2L2 1/2x2 1/2x1/4x3/8			361	-0.14	5.15	2.8	Pass
Redund Sub Horiz Bracing	2L2 1/2x2 1/2x1/4x3/8			359	-7.34	16.28	45.1	Pass
Inner Bracing	L3x3x1/4			396	-0.02	3.25	2.1	Pass
Leg	L8x8x1 1/8			399	-245.11	522.80	46.9	Pass
Diagonal	2L2.5x3.5x5/16 + 2L3x3.5x3/8			433	-41.90	70.20	59.7	Pass
Horizontal	2L3 1/2x2 1/2x1/4x3/8			413	-21.45	53.17	40.3	Pass
Redund Horiz 1 Bracing	2L1 3/4x1 3/4x3/16			420	-3.69	16.78	22.0	Pass
Redund Horiz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8			421	-3.69	17.25	21.4	Pass
Redund Diag 1 Bracing	2L2x2x3/16			422	-3.12	10.05	31.0	Pass
Redund Diag 2	2L2 1/2x2x3/16x3/8			418	-7.87	8.88	88.6	Pass
T11	200 - 175			Diagonal	2L2.5x3.5x5/16 + 2L3x3.5x3/8	433	-41.90	70.20
		Horizontal	2L3 1/2x2 1/2x1/4x3/8	413	-21.45	53.17	40.3	Pass
		Redund Horiz 1 Bracing	2L1 3/4x1 3/4x3/16	420	-3.69	16.78	22.0	Pass
		Redund Horiz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	421	-3.69	17.25	21.4	Pass
		Redund Diag 1 Bracing	2L2x2x3/16	422	-3.12	10.05	31.0	Pass
		Redund Diag 2	2L2 1/2x2x3/16x3/8	418	-7.87	8.88	88.6	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Bracing						
		Redund Hip 2	L4x4x3/8	455	-0.20	10.27	1.9	Pass
		Bracing						
		Redund Hip Diagonal 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	426	-0.15	4.26	3.5	Pass
		Redund Sub Horz	2L2 1/2x3x1/4x3/8	424	-10.63	14.08	75.5	Pass
		Bracing						
		Inner Bracing	2L3x2 1/2x1/4x3/8	461	-0.04	12.07	2.1	Pass

*Elev. 175-351.67ft - Modelled in TnxTower.

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Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
T12	175 - 150	*Legs - A	ST L808018	266.81	522.8	51.03	89.87	Pass
		*Diagonals - B / Bolt Replacement One End Only	2L2.5x3x5/16 + 2L3x3x3/8	61.07	101.93	59.91	64	Pass
		*Horizontals - O / Added Redundant Braces	LD L35255 SP 0.4375	38.58	65	59.35	60.64	Pass
		*Red Horiz 1 - C (LLV)	ST L25203	1.31	13.41	9.77	8.24	Pass
		*Red Diag 1 - D	ST L30303	1.44	8.13	17.72	9.05	Pass
		*Red Horiz 2 - E	LD L25254 SP 0.375	1.85	53.8	3.44	5.82	Pass
		*Red Diag 2 - L	LD L30306 SP 0.4375	26.13	37.98	68.8	41.07	Pass
		*Red Sub Diagonal - M / New Reinforcement	2L3x2.5x1/4 + L3.5x2.5x3/8	40.49	59.54	68.01	42.43	Pass
		*Red Vertical - N	ST L30304	0.02	11.34	0.18	0.13	Pass
		*Red Sub Horizontal - F / Bolt Replacement	LD L30304 SP 0.4375	31.53	46.52	67.77	39.65	Pass
		*Hip Horizontal 2 - G	LD L40304 SP 0.375	3.46	89.16	3.88	10.88	Pass
		*Hip Diagonal 2 - K	LD L25254 SP 0.375	6.15	16.99	36.21	19.33	Pass
		*Hip Horz 2 Sub Braces - H (LLV)	ST L30254	0.24	17.78	1.35	1.51	Pass
		*Level 1 Internal Sub Diagonals - J	ST L30304	2.25	13.17	17.08	14.15	Pass
		*Level 1 Internal Horizontal - I	LD L40304 SP 0.375	4.98	71.54	6.96	15.66	Pass
		*Level 2 Internal Corner Diagonals - Q	ST L30304	2.29	9.62	23.82	14.4	Pass
		*Level 2 Internal Middle Diagonals - S	ST L30304	2.29	9.42	24.32	14.4	Pass
		*Level 2 Internal Corner Diagonals Sub Braces - P	ST L30254	2.18	12.19	17.89	13.71	Pass
		*Level 2 Internal Horizontal - R	LD L40304 SP 0.375	2.11	46.83	4.51	6.63	Pass
T13	150 - 125	*Legs - A	ST L808018	276.58	522.39	52.94	78.22	Pass
		*Diagonals - B / Reinforcement / Bolt Replacement	2L3x3.5x3/8 + 2L3x3.5x3/8	89.69	105.63	84.91	80.56	Pass
		*Horizontals - K / Added Redundant Braces	LD L35305 SP 0.4375	58.63	80.3	73.01	92.16	Pass
		*Red Horiz 1 - C (LLV)	ST L25204	1.76	22.08	7.97	11.07	Pass
		*Red Diag 1 - D	ST L30303	2.35	8.65	27.16	14.78	Pass
		*Red Horiz 2 - E	SD L25203 SP 0.375	5.92	16.82	35.2	18.61	Pass
		*Red Diag 2 - I / Replace Existing	LD L35356 SP 0.4375	56.07	71.18	78.77	88.14	Pass
		*Red Sub Diagonal - J / New Reinf. - Replace Bolts	2L3x2.5x1/4 + L3.5x2.5x3/8	46.22	55.38	83.46	38.75	Pass
		*Red Sub Horizontal - F / Add Kicker Internal	LD L40406 SP 0.5	41.6	55.51	74.94	65.39	Pass
		*Hip Horizontal 2 - G	SD L30254 SP 0.375	0	23.37	0	0	Pass
		*Hip Diagonal 2 - H	LD L25254 SP 0.375	0.01	16.35	0.06	0.03	Pass
		*Internal Corner Diagonals - M (LLH)	ST L35304	1.73	10.39	16.65	10.88	Pass
		*Internal Middle Diagonals - N (LLV)	ST L35304	1.52	9.45	16.09	9.56	Pass
		*Internal Corner Diagonals Sub Braces - L (LLV)	ST L30254	4.82	10.42	46.28	30.31	Pass

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Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
		*Internal Horizontal - O (LLV)	LD L40304 SP 0.375	3.74	39.7	9.42	11.76	Pass
T14	125 - 100	*Legs - A / Replace Bolts @ 103.5ft Approx.	ST L808016	352.59	497.74	70.84	46.54	Pass
		*Diagonals - B / Bolt Replacement One End Only	2L3x3.5x3/8 + 2L3x3.5x3/8	81.65	92.98	87.81	51.34	Pass
		*Horizontals - K / Added Redundant Braces	LD L40355 SP 0.4375	59.96	92.83	64.59	75.4	Pass
		*Red Horiz 1 - C (LLV)	ST L25203	1.49	12.93	11.52	9.37	Pass
		*Red Diag 1 - D	ST L30303	1.67	8.03	20.8	10.5	Pass
		*Red Horiz 2 - E	LD L25254 SP 0.4375	2.04	26.66	7.65	6.41	Pass
		*Red Diag 2 - I	LD L35356 SP 0.4375	48.75	63.66	76.58	76.63	Pass
		*Red Sub Diagonal - J / New Reinforcement	2L3x3x3/8 + L3.5x3x3/8	48.22	102.21	47.18	50.53	Pass
		*Red Sub Horizontal - F / Add Kicker Internal	LD L40406 SP 0.5	45.4	56.75	80	47.58	Pass
		*Hip Horizontal 2 - G	SD L30254 SP 0.375	0.01	14.86	0.07	0.03	Pass
		*Hip Diagonal 2 - H	LD L25254 SP 0.375	0	15.07	0	0	Pass
		*Internal Corner Diagonals - M	ST L35354	3.03	10.55	28.72	19.05	Pass
		*Internal Middle Diagonals - N	ST L35354	2.7	10.93	24.69	16.98	Pass
		*Internal Corner Diagonals Sub Braces - L	ST L35354	6.43	17.07	37.67	40.43	Pass
		*Internal Horizontal - O	LD L40354 SP 0.375	5.21	37.75	13.8	16.38	Pass
T15	100 - 75	*Legs - A / Replace Bolts @ 78.5ft Approx.	ST L808016	459.2	497.74	92.26	53.03	Pass
		*Diagonals - B	2L3x3.5x3/8 + 2L3x3.5x3/8	62.82	139	45.19	79	Pass
		*Horizontals - Q / New Reinforcement	2L3.5x3x5/16 + L4x3.5x3/8	49.18	97.93	50.22	77.31	Pass
		*Red Horiz 1 - C	ST L25253	1.44	9.37	15.37	9.05	Pass
		*Red Diag 1 - D	LD L25253 SP 0.375	1.18	15.4	7.66	3.71	Pass
		*Red Horiz 2 - E	LD L25254 SP 0.5	1.81	40.09	4.51	5.69	Pass
		*Red Diag 2 - M / Replace Existing Member	LD L35356 SP 0.4375	25.11	38	66.07	39.47	Pass
		*Red Sub Diagonal - O	LD L40408 SP 0.4375	62.84	75.65	83.06	39.51	Pass
		*Red Sub Horizontal - F / Add Kicker Internal	SD L35304 SP 0.5	17.64	24.98	70.61	55.46	Pass
		*Red Vertical Outside - N	ST L25254	0.04	6.48	0.62	0.25	Pass
		*Red Vertical Center - P	ST L25254	0	6.48	0	0	Pass
		*Hip Horizontal 1 - CC	ST L30303	0.07	7.1	0.99	0.44	Pass
		*Hip Horizontal 2 - G	LD L35254 SP 0.375	0.05	49.46	0.1	0.16	Pass
		*Hip Diagonal 2 - J	LD L25254 SP 0.375	0.01	33.01	0.03	0.03	Pass
		*Hip SubDiagonal 2 - K	ST L25253	0	6.63	0	0	Pass
		*Hip SubVertical 2 - L	ST L25253	0	17.13	0	0	Pass
		*Hip SubInternal 2 - I	ST L30303	0	7.1	0	0	Pass

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Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
		*Hip SubInternal 2 - H	ST L25253	0	8.1	0	0	Pass
		*Internal Corner Horizontal 1 - V	ST L30303	0.07	10.18	0.69	0.44	Pass
		*Internal Corner Diagonal 1 - U	ST L25253	0.05	8.8	0.57	0.31	Pass
		*Internal Corner Horizontal 2 - T	LD L30254 SP 0.375	4.19	40.08	10.45	13.17	Pass
		*Internal Corner Diagonal 2 - S	SD L30254 SP 0.375	2.36	43.73	5.4	7.42	Pass
		*Internal Corner Diagonal 2 - W	ST L30303	3.86	7.82	49.34	24.27	Pass
		*Internal Corner Horizontal 3 - R	LD L35254 SP 0.4375	5.87	53.92	10.89	18.45	Pass
		*Internal Corner Diagonal 3 - X	LD L30304 SP 0.375	5.46	47.01	11.61	17.17	Pass
T16	75 - 50	*Legs - A / Add Redundants / Replace Bolts	ST L808016	519.15	625.5	83	53.29	Pass
		*Diagonals - B	2L3x3.5x3/8 + 2L3x3.5x3/8	64.35	140.71	45.73	80.92	Pass
		*Horizontals - Q / New Reinforcement	2L4x3x1/4 + L4x3.5x3/8	52.34	76.37	68.53	65.82	Pass
		*Red Horiz 1 - C	ST L25253	1.13	8.72	12.96	7.1	Pass
		*Red Diag 1 - D	LD L25254 SP 0.375	5	38.59	12.96	15.72	Pass
		*Red Horiz 2 - E	LD L30254 SP 0.5	2.25	51.49	4.37	7.07	Pass
		*Red Diag 2 - M	LD L35356 SP 0.4375	27.33	70.68	38.67	61.86	Pass
		*Red Sub Diagonal - O / New Reinforcement	2L4x4x1/2 + L4x4x3/8	65.32	163.61	39.92	41.07	Pass
		*Red Sub Horizontal - F / Add Kicker Internal	SD L35304 SP 0.5	18.62	21.93	84.89	58.54	Pass
		*Red Vertical Outside - N	ST L25254	0.06	6.48	0.93	0.38	Pass
		*Red Vertical Center - P	ST L25254	0	6.48	0	0	Pass
		*Hip Horizontal 1 - CC	ST L30303	0.1	6.19	1.62	0.63	Pass
		*Hip Horizontal 2 - G	LD L35254 SP 0.375	0.06	46.3	0.13	0.19	Pass
		*Hip Diagonal 2 - J	LD L25254	0.03	29.89	0.1	0.09	Pass
		*Hip SubDiagonal 2 - K	ST L25253	0.01	5.97	0.17	0.06	Pass
		*Hip SubVertical 2 - L	ST L25253	0	17.13	0	0	Pass
		*Hip SubInternal 2 - I	ST L30303	0	6.19	0	0	Pass
		*Hip SubInternal 2 - H	ST L25253	0	7.06	0	0	Pass
		*Internal Corner Horizontal 1 - V	ST L30303	0.05	12.27	0.41	0.31	Pass
		*Internal Corner Diagonal 1 - U	ST L25253	0.05	7.25	0.69	0.31	Pass
		*Internal Corner Horizontal 2 - T	LD L30254 SP 0.375	4.98	37.03	13.45	15.66	Pass
		*Internal Corner Diagonal 2 - S	SD L30254 SP 0.375	2.85	40.52	7.03	8.96	Pass
		*Internal Corner Diagonal 2 - W	ST L30303	4.88	6.77	72.05	30.68	Pass
		*Internal Corner Horizontal 3 - R	LD L40356 SP 0.375	5.84	106.7	5.47	18.36	Pass
		*Internal Corner Diagonal 3 - X	LD L30304 SP 0.375	6.93	43.03	16.11	21.79	Pass
T17	50 - 25	*Legs - A / Replace Bolts @ 28.5ft Approx.	ST L808016	583.43	625.11	93.33	59.89	Pass
		*Diagonals - B	2L3x4x3/8 + 2L3x4x3/8	68.55	129.59	52.9	86.2	Pass

Job	350ft SST / Norwalk Willard Rd Site #CT11011D	Page	15 of 17
Project	CT04761S-18V1	Date	10:11:47 09/06/18
Client	Transcend Wireless / T-Mobile	Designed by	KM

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
		*Horizontals - X / New Reinforcement	2L4x3x5/16 + L4x3.5x3/8	56.86	79.09	71.89	71.5	Pass
		*Red Horiz 1 - E	ST L25254	1.34	9.95	13.46	8.43	Pass
		*Red Diag 1 - G	LD L25253 SP 0.4375	5.15	36.86	13.97	16.19	Pass
		*Red Horiz 2 - M	LD L25254 SP 0.5	3.43	33.58	10.21	10.78	Pass
		*Red Diag 2 - T	LD L35356 SP 0.4375	30.22	92.25	32.76	47.5	Pass
		*Red Sub Horiz 1 - C	ST L25254	2.62	24.86	10.54	16.47	Pass
		*Red Sub Diag 1 - D	ST L25254	2.82	15.38	18.34	25.53	Pass
		*Red Sub Diag 2 - F	ST L25254	4.97	13.28	37.42	45	Pass
		*Red Sub Horiz 2 - H	ST L25254	4.64	24.85	18.67	42.01	Pass
		*Red Sub Diag 3 - R	ST L25254	2.16	5.78	37.39	19.56	Pass
		*Red Sub Horiz 3 - S	ST L25254	2.88	8.06	35.72	26.08	Pass
		*Red Sub Diagonal - V / New Reinforcement	2L4x4x1/2 + L4x4x3/8	69.82	151.83	45.99	43.9	Pass
		*Red Sub Horizontal - N / Add Kicker Internal	SD L40304 SP 0.5	20.65	21.43	96.38	64.92	Pass
		*Red Vertical Outside - U	ST L25254	0.06	6.48	0.93	0.38	Pass
		*Red Vertical Center - W	ST L25254	0	6.48	0	0	Pass
		*Hip Horizontal 1 - I	ST L40406	0.09	24.95	0.36	0.57	Pass
		*Hip Horizontal 2 - J	LD L35255 SP 0.375	0.07	52.43	0.13	0.22	Pass
		*Hip Diagonal 2 - O	LD L25254 SP 0.375	0.01	27.15	0.04	0.03	Pass
		*Hip SubDiagonal 2 - Q	ST L25253	0.01	5.4	0.19	0.06	Pass
		*Hip SubVertical 2 - P	ST L25253	0	17.13	0	0	Pass
		*Hip SubInternal 2 - K	ST L30304	0	7.09	0	0	Pass
		*Hip SubInternal 2 - L	ST L25253	0	6.21	0	0	Pass
		*Internal Corner Horizontal 1 - C1	ST L30304	0.05	12.37	0.4	0.31	Pass
		*Internal Corner Diagonal 1 - B1	ST L30304	0.04	14.78	0.27	0.25	Pass
		*Internal Corner Horizontal 2 - A1	LD L30254 SP 0.375	4.99	32.65	15.28	15.69	Pass
		*Internal Corner Diagonal 2 - Z	LD L25254 SP 0.375	2.9	34.24	8.47	9.12	Pass
		*Internal Corner Diagonal 2 - D1	LD L25253 SP 0.375	4.89	15.55	31.44	15.37	Pass
		*Internal Corner Horizontal 3 - Y	LD L35255 SP 0.4375	5.63	56.66	9.94	17.7	Pass
		*Internal Corner Diagonal 3 - E1	LD L30304 SP 0.4375	6.91	39.65	17.43	21.72	Pass
T18	25 - 0	*Legs - A / Replace Splice Bolts @ 3.5ft Approx.	ST L808018	650.93	696.49	93.46	60.14	Pass
		*Diagonals - B	SD L60406 SP 0.5	68.38	102.1	66.97	73.71	Pass
		*Horizontals - L1	LD L50356 SP 0.4375	57.41	94.96	60.46	72.19	Pass
		*Red Horiz 1 - E	ST L25254	1.42	9.94	14.29	8.93	Pass
		*Red Diag 1 - G	LD L25254 SP 0.5	4.92	46.82	10.51	15.47	Pass
		*Red Horiz 2 - O	LD L35256 SP 0.4375	5.9	66.02	8.94	18.55	Pass

tnxTower Malouf Engineering Int'l Inc. 17950 Preston Road, STE 720 Dallas, Texas 75252 Phone: (972) 783 2578 FAX: (972) 783 2583	Job 350ft SST / Norwalk Willard Rd Site #CT11011D	Page 16 of 17
	Project CT04761S-18V1	Date 10:11:47 09/06/18
	Client Transcend Wireless / T-Mobile	Designed by KM

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
		*Red Diag 2 - T	LD L35356 SP 0.4375	30.31	89.22	33.97	31.76	Pass
		*Red Sub Horiz 1 - C	ST L25254	2.85	23.56	12.1	25.8	Pass
		*Red Sub Diag 1 - D	ST L25254	3.24	14.67	22.09	29.34	Pass
		*Red Sub Diag 2 - F	ST L25254	4.71	12.57	37.46	42.65	Pass
		*Red Sub Horiz 2 - H	ST L25254	4.46	23.56	18.93	40.38	Pass
		*Red Sub Diag 3 - R	ST L25254	1.83	5.31	34.45	16.57	Pass
		*Red Sub Horiz 3 - S	ST L25254	2.35	7.18	32.72	21.28	Pass
		*Red Sub Diagonal - V	LD L50506 SP 0.4375	60.79	155.95	38.98	28.08	Pass
		*Red Sub Horizontal - Q	ST C9X13	26.78	28.94	92.54	10.52	Pass
		*Red Vertical Outside - U	ST L25254	5.84	6.45	90.53	36.72	Pass
		*Red Vertical Center - Z	LD L30254 SP 0.5	0.03	43.37	0.07	0.09	Pass
		*Red Vertical Inner 1 - X	LD L25254 SP 0.375	15.03	51.22	29.34	47.25	Pass
		*Red Vertical Inner 2 - Y / Reinforcement DBL L	LD L30304 SP 0.5	18.79	37.02	50.76	59.07	Pass
		*Red Vertical Sub Diagonal - W	LD L25254 SP 0.5	18.3	20.49	89.3	57.53	Pass
		*Hip Horizontal 1 - I	ST L40406	0.12	22.23	0.54	0.75	Pass
		*Hip Diagonal 1 - J	LD L25254 SP 0.5	0.11	14.43	0.76	0.35	Pass
		*Hip Horizontal 2 - L	LD L35354 SP 0.4375	2.64	46.21	5.71	8.3	Pass
		*Hip Diagonal 2 - AI	LD L25254 SP 0.375	1.79	24.81	7.22	5.63	Pass
		*Hip SubDiagonal 2 - C1	ST L25253	0	4.86	0	0	Pass
		*Hip SubVertical 2 - B1	ST L25253	0	17.08	0	0	Pass
		*Hip SubInternal 2-1 - KK	LD L25253 SP 0.4375	3.54	24.2	14.63	11.13	Pass
		*Hip SubInternal 2-2 - K / Reinforcement DBL L	LD L25253 SP 0.4375	5.99	22.07	27.14	18.83	Pass
		*Internal-1 Sub Braces - N	ST L30304	1.97	8.94	22.02	12.39	Pass
		*Internal-1 Inner Horiz - M	LD L60355 SP 0.375	7.9	85.5	9.24	24.84	Pass
		*Internal-2 Corner Horizontal 1 - H1	LD L25253 SP 0.4375	0.11	27.08	0.41	0.35	Pass
		*Internal-2 Corner Diagonal 1 - G1	ST L25254	0.07	7.05	0.99	0.44	Pass
		*Internal-2 Corner Horizontal 2 - F1	LD L30254 SP 0.375	3.66	28.87	12.68	11.51	Pass
		*Internal-2 Corner Diagonal 2-1 - E1	LD L25254 SP 0.375	1.96	30.15	6.5	6.16	Pass
		*Internal-2 Corner Diagonal 2-2 - I1	LD L25253 SP 0.4375	3.03	13.74	22.05	9.53	Pass
		*Internal-2 Corner Horizontal 3 - D1	LD L35255 SP 0.4375	4.51	51.65	8.73	14.18	Pass
		*Internal-2 Corner Diagonal 3 - K2	LD L30254 SP 0.5	4.24	48.03	8.83	13.33	Pass
		*Internal-2 Corner Diagonal 3 - Sub1 - J1	ST L30304	0.17	12.76	1.33	1.07	Pass
		*Internal-2 Corner Diagonal 3 - Sub2 - K1	LD L30304 SP 0.5	0.01	53.07	0.02	0.03	Pass
T12	175-150	Reinforcement / Redundant Vertical / RV12	ST L25254	0.12	6.27	1.92	1.09	Pass
		Reinforcement / Internal / RI12	ST L25254	0.88	10.93	8.05	7.97	Pass

tnxTower Malouf Engineering Int'l Inc. 17950 Preston Road, STE 720 Dallas, Texas 75252 Phone: (972) 783 2578 FAX: (972) 783 2583	Job 350ft SST / Norwalk Willard Rd Site #CT11011D	Page 17 of 17
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	Client Transcend Wireless / T-Mobile	Designed by KM

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
T13	150-125	Reinforcement / Redundant Vertical / RV13	ST L25254	0.21	6.44	3.26	1.9	Pass
		Reinforcement / Internal / RI13	ST L25254	1.23	9.6	12.82	11.14	Pass
		Reinforcement / Internal Kicker / RK13	ST L30304	0.01	6.34	0.16	0.06	Pass
T14	100-125	Reinforcement / Redundant Vertical / RV14	ST L30304	0.18	11.39	1.58	1.13	Pass
		Reinforcement / Internal / RI14	ST L30304	1.09	13.08	8.33	6.85	Pass
		Reinforcement / Internal Kicker / RK14	ST L30304	0.01	5.67	0.18	0.06	Pass
T15	75-100	Reinforcement / Internal Kicker / RK15	ST L30304	0.01	6.83	0.15	0.06	Pass
T16	50-75	Reinforcement / Internal Kicker / RK16	ST L30304	0.01	6.46	0.15	0.06	Pass
		*Reinforcement / Red Sub Horiz 1 - C16	ST L25254	2.12	26.21	8.09	13.33	Pass
		*Reinforcement / Red Sub Diag 1 - D16	ST L25254	2.62	16.14	16.24	16.47	Pass
		*Reinforcement / Red Sub Diag 2 - F16	ST L25254	4.78	14.04	34.04	30.05	Pass
		*Reinforcement / Red Sub Horiz 2 - H16	ST L25254	4.11	26.21	15.68	25.84	Pass
		*Reinforcement / Red Sub Diag 3 - R16	ST L25254	1.82	6.35	28.67	11.44	Pass
		*Reinforcement / Red Sub Horiz 3 - S16	ST L25254	2.08	9.17	22.69	13.08	Pass
T17	25-50	*Reinforcement / Internal Kicker / RK17	ST L30304	0.01	6.11	0.16	0.06	Pass
T9	250-225	Red Horiz 1 - C	ST L25203	2.22	12.37	17.95	13.96	Pass
		Red Diag 1 - D	ST L30303	2.24	8.45	26.52	14.08	Pass
T10	225-200	Red Horiz 1 - C	ST L25204	2.84	12.61	22.53	17.86	Pass
		Red Diag 1 - D	ST L30303	2.6	7.77	33.45	16.35	Pass
T11	200-175	Red Horiz 1 - C	ST L25253	3.52	11.5	30.6	22.13	Pass
		Red Diag 1 - D	ST L30304	2.98	9.31	32	18.74	Pass

*Elev. 0-175ft – Tower modelled in Staad. Tower Members were considered as truss members and Loads are from Staad Analysis.



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Job No CT04761S-18V	Sheet No 1	Rev 0
Part 0 TO 175FT OF TOWER		
Ref		
By KM	Date 6-Sep-18	Chd HML
File CT04761S-18V1.std	Date/Time 06-Sep-2018 13:21	

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Job Title **351.7ft Self Supporting Tower**

Client **TRANSCEND WIRELESS / T-MOBILE**

Job Information

	Engineer	Checked	Approved
Name:	KM	HML	MM
Date:	6-Sep-18	6-Sep-18	6-Sep-18

Project ID	
Project Name	

Comments

T-MOBILE APPURTENANCE CHANGES - ELEV. 262FT
2016 CT SBC / 2012 IBC / ANSI/TIA-222-G
Vult=120MPH / Vasd=93MPH / 50MPH + 3/4" ICE / Vservice=60MPH
EXPOSURE 'C' / CLASS 'II' / TOPO 1
0 to 175ft of Tower Modelled

Structure Type	SPACE FRAME
----------------	-------------

Number of Nodes	804	Highest Node	820
Number of Elements	2008	Highest Beam	2024

Number of Basic Load Cases	-2
Number of Combination Load Cases	0

Included in this printout are data for:

All	The Whole Structure
-----	---------------------

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DEAD ONLY
Primary	2	1.2 DEAD+1.6 WIND 0 DEG - NO ICE
Primary	3	0.9 DEAD+1.6 WIND 0 DEG - NO ICE
Primary	4	1.2 DEAD+1.6 WIND 45 DEG - NO ICE
Primary	5	0.9 DEAD+1.6 WIND 45 DEG - NO ICE
Primary	6	1.2 DEAD+1.6 WIND 90 DEG - NO ICE
Primary	7	0.9 DEAD+1.6 WIND 90 DEG - NO ICE
Primary	8	1.2 DEAD+1.6 WIND 135 DEG - NO ICE
Primary	9	0.9 DEAD+1.6 WIND 135 DEG - NO ICE
Primary	10	1.2 DEAD+1.6 WIND 180 DEG - NO ICE
Primary	11	0.9 DEAD+1.6 WIND 180 DEG - NO ICE
Primary	12	1.2 DEAD+1.6 WIND 225 DEG - NO ICE
Primary	13	0.9 DEAD+1.6 WIND 225 DEG - NO ICE
Primary	14	1.2 DEAD+1.6 WIND 270 DEG - NO ICE
Primary	15	0.9 DEAD+1.6 WIND 270 DEG - NO ICE
Primary	16	1.2 DEAD+1.6 WIND 315 DEG - NO ICE
Primary	17	0.9 DEAD+1.6 WIND 315 DEG - NO ICE
Primary	18	1.2 DEAD+1.0 ICE+1.0 TEMP
Primary	19	1.2 DEAD+1.0 WIND 0 DEG+1.0 ICE+1.0



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Job No CT04761S-18V	Sheet No 2	Rev 0
Part 0 TO 175FT OF TOWER		
Ref		
By KM	Date 6-Sep-18	Chd HML
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Job Information Cont...


Type	L/C	Name
Primary	23	1.2 DEAD+1.0 WIND 180 DEG+1.0 ICE+1
Primary	24	1.2 DEAD+1.0 WIND 225 DEG+1.0 ICE+1
Primary	25	1.2 DEAD+1.0 WIND 270 DEG+1.0 ICE+1
Primary	26	1.2 DEAD+1.0 WIND 315 DEG+1.0 ICE+1
Primary	27	DEAD+WIND 0 DEG - SERVICE
Primary	28	DEAD+WIND 45 DEG - SERVICE
Primary	29	DEAD+WIND 90 DEG - SERVICE
Primary	30	DEAD+WIND 135 DEG - SERVICE
Primary	31	DEAD+WIND 180 DEG - SERVICE
Primary	32	DEAD+WIND 225 DEG - SERVICE
Primary	33	DEAD+WIND 270 DEG - SERVICE
Primary	34	DEAD+WIND 315 DEG - SERVICE

Supports

Node	X (lb/ft)	Y (lb/ft)	Z (lb/ft)	rX (kip ft/deg)	rY (kip ft/deg)	rZ (kip ft/deg)
224	Fixed	Fixed	Fixed	-	-	-
227	Fixed	Fixed	Fixed	-	-	-
230	Fixed	Fixed	Fixed	-	-	-
233	Fixed	Fixed	Fixed	-	-	-

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	476	6:1.2 DEAD+1.	6.508	-1.026	0.064	6.589	-0.000	-0.001	-0.004
Min X	478	15:0.9 DEAD+1.	-6.491	-0.915	0.076	6.556	-0.000	0.001	0.004
Max Y	423	5:0.9 DEAD+1.	2.751	0.741	-2.820	4.009	-0.003	-0.000	-0.003
Min Y	476	4:1.2 DEAD+1.	4.901	-1.333	-4.818	7.001	-0.003	-0.000	-0.003
Max Z	474	11:0.9 DEAD+1.	-0.023	-0.898	6.478	6.540	0.004	-0.001	-0.000
Min Z	476	2:1.2 DEAD+1.	-0.014	-1.019	-6.510	6.589	-0.004	0.001	-0.000
Max rX	798	8:1.2 DEAD+1.	0.842	-0.729	0.998	1.495	0.015	0.016	-0.004
Min rX	798	17:0.9 DEAD+1.	-0.891	0.422	-1.018	1.417	-0.011	-0.010	0.003
Max rY	798	8:1.2 DEAD+1.	0.842	-0.729	0.998	1.495	0.015	0.016	-0.004
Min rY	795	12:1.2 DEAD+1.	-0.882	-0.720	0.972	1.497	0.015	-0.016	0.004
Max rZ	462	14:1.2 DEAD+1.	-4.383	0.285	-0.092	4.393	-0.000	0.001	0.006
Min rZ	467	6:1.2 DEAD+1.	4.381	0.299	-0.088	4.392	-0.000	-0.001	-0.006
Max Rst	476	16:1.2 DEAD+1.	-4.949	-0.404	-4.998	7.045	-0.003	0.001	0.002

 Malouf Engineering International Inc. 17950 Preston Rd. Suite 720 Dallas, Texas. 75252 / p (972)-783-2578 maloufengineering.com	Job No CT04761S-18V	Sheet No 3	Rev 0
	Part 0 TO 175FT OF TOWER		
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Job Title 351.7ft Self Supporting Tower	By KM	Date 6-Sep-18	Chd HML
Client TRANSCEND WIRELESS / T-MOBILE	File CT04761S-18V1.std	Date/Time 06-Sep-2018 13:21	

Reactions

Node	L/C	Horizontal		Vertical	Moment		
		FX (kip)	FY (kip)		FZ (kip)	MX (kip'in)	MY (kip'in)
224	1:DEAD ONLY	10.009	108.199	-10.165	0.000	0.000	0.000
	2:1.2 DEAD+1.	-24.954	-264.581	59.987	0.000	0.000	0.000
	3:0.9 DEAD+1.	-27.949	-296.949	63.031	0.000	0.000	0.000
	4:1.2 DEAD+1.	-69.218	-462.102	70.155	0.000	0.000	0.000
	5:0.9 DEAD+1.	-72.213	-494.448	73.196	0.000	0.000	0.000
	6:1.2 DEAD+1.	-58.934	-262.711	25.161	0.000	0.000	0.000
	7:0.9 DEAD+1.	-61.933	-295.078	28.200	0.000	0.000	0.000
	8:1.2 DEAD+1.	-13.511	129.933	-37.804	0.000	0.000	0.000
	9:0.9 DEAD+1.	-16.513	97.527	-34.763	0.000	0.000	0.000
	10:1.2 DEAD+	48.906	523.736	-84.302	0.000	0.000	0.000
	11:0.9 DEAD+	45.903	491.291	-81.258	0.000	0.000	0.000
	12:1.2 DEAD+	93.248	721.222	-94.402	0.000	0.000	0.000
	13:0.9 DEAD+	90.247	688.755	-91.355	0.000	0.000	0.000
	14:1.2 DEAD+	82.897	522.044	-49.572	0.000	0.000	0.000
	15:0.9 DEAD+	79.899	489.598	-46.524	0.000	0.000	0.000
	16:1.2 DEAD+	37.442	129.254	13.510	0.000	0.000	0.000
	17:0.9 DEAD+	34.447	96.847	16.557	0.000	0.000	0.000
	18:1.2 DEAD+	22.907	247.143	-23.177	0.000	0.000	0.000
	19:1.2 DEAD+	11.556	128.520	-2.199	0.000	0.000	0.000
	20:1.2 DEAD+	-1.261	68.202	1.323	0.000	0.000	0.000
	21:1.2 DEAD+	2.325	129.387	-11.739	0.000	0.000	0.000
	22:1.2 DEAD+	16.020	248.913	-30.413	0.000	0.000	0.000
	23:1.2 DEAD+	34.541	369.030	-44.462	0.000	0.000	0.000
	24:1.2 DEAD+	47.387	429.348	-47.960	0.000	0.000	0.000
	25:1.2 DEAD+	43.782	368.203	-34.938	0.000	0.000	0.000
	26:1.2 DEAD+	30.077	248.630	-16.236	0.000	0.000	0.000
	27:DEAD+WIND	0.438	5.900	8.532	0.000	0.000	0.000
	28:DEAD+WIND	-10.988	-45.021	11.118	0.000	0.000	0.000
	29:DEAD+WIND	-8.356	6.426	-0.490	0.000	0.000	0.000
	30:DEAD+WIND	3.382	107.772	-16.699	0.000	0.000	0.000
	31:DEAD+WIND	19.502	209.458	-28.673	0.000	0.000	0.000
	32:DEAD+WIND	30.963	260.389	-31.232	0.000	0.000	0.000
	33:DEAD+WIND	28.308	208.986	-19.673	0.000	0.000	0.000
	34:DEAD+WIND	16.557	107.578	-3.431	0.000	0.000	0.000
227	1:DEAD ONLY	-9.971	109.693	-10.338	0.000	0.000	0.000
	2:1.2 DEAD+1.	24.083	-264.767	60.989	0.000	0.000	0.000
	3:0.9 DEAD+1.	27.067	-297.615	64.088	0.000	0.000	0.000
	4:1.2 DEAD+1.	-38.329	129.453	14.489	0.000	0.000	0.000
	5:0.9 DEAD+1.	-35.344	96.566	17.591	0.000	0.000	0.000
	6:1.2 DEAD+1.	-82.882	523.947	-49.802	0.000	0.000	0.000
	7:0.9 DEAD+1.	-79.894	491.021	-46.699	0.000	0.000	0.000
	8:1.2 DEAD+1.	-92.274	724.759	-95.839	0.000	0.000	0.000
	9:0.9 DEAD+1.	-89.282	691.815	-92.737	0.000	0.000	0.000
	10:1.2 DEAD+	-48.033	528.006	-85.785	0.000	0.000	0.000



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Part 0 TO 175FT OF TOWER

Job Title 351.7ft Self Supporting Tower

Ref

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Client TRANSCEND WIRELESS / T-MOBILE

File CT04761S-18V1.std

Date/Time 06-Sep-2018 13:21

Reactions Cont...

Node	L/C	Horizontal	Vertical	Horizontal	Moment		
		FX (kip)	FY (kip)	FZ (kip)	MX (kip in)	MY (kip in)	MZ (kip in)
	11:0.9 DEAD+	-45.040	495.080	-82.686	0.000	0.000	0.000
	12:1.2 DEAD+	14.472	133.582	-39.215	0.000	0.000	0.000
	13:0.9 DEAD+	17.464	100.696	-36.120	0.000	0.000	0.000
	14:1.2 DEAD+	58.930	-260.651	24.966	0.000	0.000	0.000
	15:0.9 DEAD+	61.918	-293.497	28.060	0.000	0.000	0.000
	16:1.2 DEAD+	68.314	-461.739	71.136	0.000	0.000	0.000
	17:0.9 DEAD+	71.299	-494.566	74.231	0.000	0.000	0.000
	18:1.2 DEAD+	-22.792	255.646	-24.131	0.000	0.000	0.000
	19:1.2 DEAD+	-12.051	136.167	-2.386	0.000	0.000	0.000
	20:1.2 DEAD+	-30.446	256.615	-16.627	0.000	0.000	0.000
	21:1.2 DEAD+	-43.695	376.904	-35.932	0.000	0.000	0.000
	22:1.2 DEAD+	-46.820	438.640	-49.538	0.000	0.000	0.000
	23:1.2 DEAD+	-33.857	378.435	-46.172	0.000	0.000	0.000
	24:1.2 DEAD+	-15.431	257.935	-31.925	0.000	0.000	0.000
	25:1.2 DEAD+	-2.207	137.712	-12.640	0.000	0.000	0.000
	26:1.2 DEAD+	0.914	75.931	0.995	0.000	0.000	0.000
	27:DEAD+WIND	-0.613	6.946	8.677	0.000	0.000	0.000
	28:DEAD+WIND	-16.745	108.876	-3.330	0.000	0.000	0.000
	29:DEAD+WIND	-28.285	210.869	-19.909	0.000	0.000	0.000
	30:DEAD+WIND	-30.705	262.758	-31.790	0.000	0.000	0.000
	31:DEAD+WIND	-19.279	211.942	-29.213	0.000	0.000	0.000
	32:DEAD+WIND	-3.108	109.946	-17.198	0.000	0.000	0.000
	33:DEAD+WIND	8.401	8.039	-0.646	0.000	0.000	0.000
	34:DEAD+WIND	10.815	-43.898	11.268	0.000	0.000	0.000
230	1:DEAD ONLY	-10.532	115.049	10.376	0.000	0.000	0.000
	2:1.2 DEAD+1.	-48.689	534.386	85.832	0.000	0.000	0.000
	3:0.9 DEAD+1.	-45.531	499.884	82.723	0.000	0.000	0.000
	4:1.2 DEAD+1.	-95.015	732.860	94.088	0.000	0.000	0.000
	5:0.9 DEAD+1.	-91.858	698.336	90.976	0.000	0.000	0.000
	6:1.2 DEAD+1.	-85.917	532.338	47.736	0.000	0.000	0.000
	7:0.9 DEAD+1.	-82.763	497.836	44.623	0.000	0.000	0.000
	8:1.2 DEAD+1.	-41.168	137.556	-16.237	0.000	0.000	0.000
	9:0.9 DEAD+1.	-38.017	103.093	-19.349	0.000	0.000	0.000
	10:1.2 DEAD+	23.392	-258.543	-60.948	0.000	0.000	0.000
	11:0.9 DEAD+	26.542	-292.968	-64.057	0.000	0.000	0.000
	12:1.2 DEAD+	69.802	-457.143	-69.156	0.000	0.000	0.000
	13:0.9 DEAD+	72.952	-491.547	-72.262	0.000	0.000	0.000
	14:1.2 DEAD+	60.679	-256.672	-22.899	0.000	0.000	0.000
	15:0.9 DEAD+	63.833	-291.096	-26.004	0.000	0.000	0.000
	16:1.2 DEAD+	15.889	138.456	41.208	0.000	0.000	0.000
	17:0.9 DEAD+	19.046	103.992	38.102	0.000	0.000	0.000
	18:1.2 DEAD+	-24.515	272.091	24.246	0.000	0.000	0.000
	19:1.2 DEAD+	-35.526	394.696	46.278	0.000	0.000	0.000
	20:1.2 DEAD+	-49.349	455.348	48.845	0.000	0.000	0.000



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Ref		
By KM	Date 6-Sep-18	Chd HML
Client TRANSCEND WIRELESS / T-MOBILE	File CT04761S-18V1.std	Date/Time 06-Sep-2018 13:21

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Job Title 351.7ft Self Supporting Tower

Reactions Cont...

Node	L/C	Horizontal		Vertical	Moment		
		FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
	21:1.2 DEAD+	-46.493	393.816	35.000	0.000	0.000	0.000
	22:1.2 DEAD+	-33.057	273.617	15.961	0.000	0.000	0.000
	23:1.2 DEAD+	-13.813	152.803	2.529	0.000	0.000	0.000
	24:1.2 DEAD+	0.019	92.129	-0.038	0.000	0.000	0.000
	25:1.2 DEAD+	-2.837	153.638	13.790	0.000	0.000	0.000
	26:1.2 DEAD+	-16.283	273.907	32.858	0.000	0.000	0.000
	27:DEAD+WIND	-19.705	216.398	29.261	0.000	0.000	0.000
	28:DEAD+WIND	-31.617	267.601	31.405	0.000	0.000	0.000
	29:DEAD+WIND	-29.262	215.863	19.474	0.000	0.000	0.000
	30:DEAD+WIND	-17.735	113.946	2.966	0.000	0.000	0.000
	31:DEAD+WIND	-1.119	11.673	-8.603	0.000	0.000	0.000
	32:DEAD+WIND	10.803	-39.556	-10.746	0.000	0.000	0.000
	33:DEAD+WIND	8.450	12.147	1.162	0.000	0.000	0.000
	34:DEAD+WIND	-3.090	114.144	17.704	0.000	0.000	0.000
233	1:DEAD ONLY	10.494	112.607	10.127	0.000	0.000	0.000
	2:1.2 DEAD+1.	49.491	528.953	84.274	0.000	0.000	0.000
	3:0.9 DEAD+1.	46.343	495.191	81.241	0.000	0.000	0.000
	4:1.2 DEAD+1.	-14.985	133.779	39.687	0.000	0.000	0.000
	5:0.9 DEAD+1.	-18.131	100.055	36.657	0.000	0.000	0.000
	6:1.2 DEAD+1.	-60.724	-259.584	-23.233	0.000	0.000	0.000
	7:0.9 DEAD+1.	-63.867	-293.269	-26.263	0.000	0.000	0.000
	8:1.2 DEAD+1.	-70.788	-458.259	-68.255	0.000	0.000	0.000
	9:0.9 DEAD+1.	-73.929	-491.924	-71.285	0.000	0.000	0.000
	10:1.2 DEAD+	-24.404	-259.208	-59.984	0.000	0.000	0.000
	11:0.9 DEAD+	-27.543	-292.893	-63.017	0.000	0.000	0.000
	12:1.2 DEAD+	40.169	136.329	-15.310	0.000	0.000	0.000
	13:0.9 DEAD+	37.029	102.605	-18.347	0.000	0.000	0.000
	14:1.2 DEAD+	85.855	529.269	47.436	0.000	0.000	0.000
	15:0.9 DEAD+	82.711	495.505	44.398	0.000	0.000	0.000
	16:1.2 DEAD+	95.904	728.020	92.568	0.000	0.000	0.000
	17:0.9 DEAD+	92.757	694.237	89.532	0.000	0.000	0.000
	18:1.2 DEAD+	24.401	260.681	23.063	0.000	0.000	0.000
	19:1.2 DEAD+	36.088	382.755	44.357	0.000	0.000	0.000
	20:1.2 DEAD+	16.687	261.973	31.071	0.000	0.000	0.000
	21:1.2 DEAD+	2.708	142.032	12.553	0.000	0.000	0.000
	22:1.2 DEAD+	-0.676	80.969	-0.687	0.000	0.000	0.000
	23:1.2 DEAD+	13.011	141.871	2.065	0.000	0.000	0.000
	24:1.2 DEAD+	32.424	262.727	15.379	0.000	0.000	0.000
	25:1.2 DEAD+	46.397	382.585	33.855	0.000	0.000	0.000
	26:1.2 DEAD+	49.775	443.670	47.120	0.000	0.000	0.000
	27:DEAD+WIND	19.930	212.979	28.631	0.000	0.000	0.000
	28:DEAD+WIND	3.312	110.768	17.067	0.000	0.000	0.000
	29:DEAD+WIND	-8.505	9.066	0.815	0.000	0.000	0.000
	30:DEAD+WIND	-11.136	-42.253	-10.765	0.000	0.000	0.000



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Part 0 TO 175FT OF TOWER

Job Title 351.7ft Self Supporting Tower

Ref

By KM

Date 6-Sep-18

Chd HML

Client TRANSCEND WIRELESS / T-MOBILE

File CT04761S-18V1.std

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Reactions Cont...

Node	L/C	Horizontal	Vertical	Horizontal	Moment		
		FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
	31:DEAD+WIND	0.786	9.150	-8.592	0.000	0.000	0.000
	32:DEAD+WIND	17.418	111.446	3.006	0.000	0.000	0.000
	33:DEAD+WIND	29.229	213.051	19.206	0.000	0.000	0.000
	34:DEAD+WIND	31.854	264.400	30.816	0.000	0.000	0.000



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Part **0 TO 175FT OF TOWER**

Job Title **351.7ft Self Supporting Tower**

Ref

By **KM**

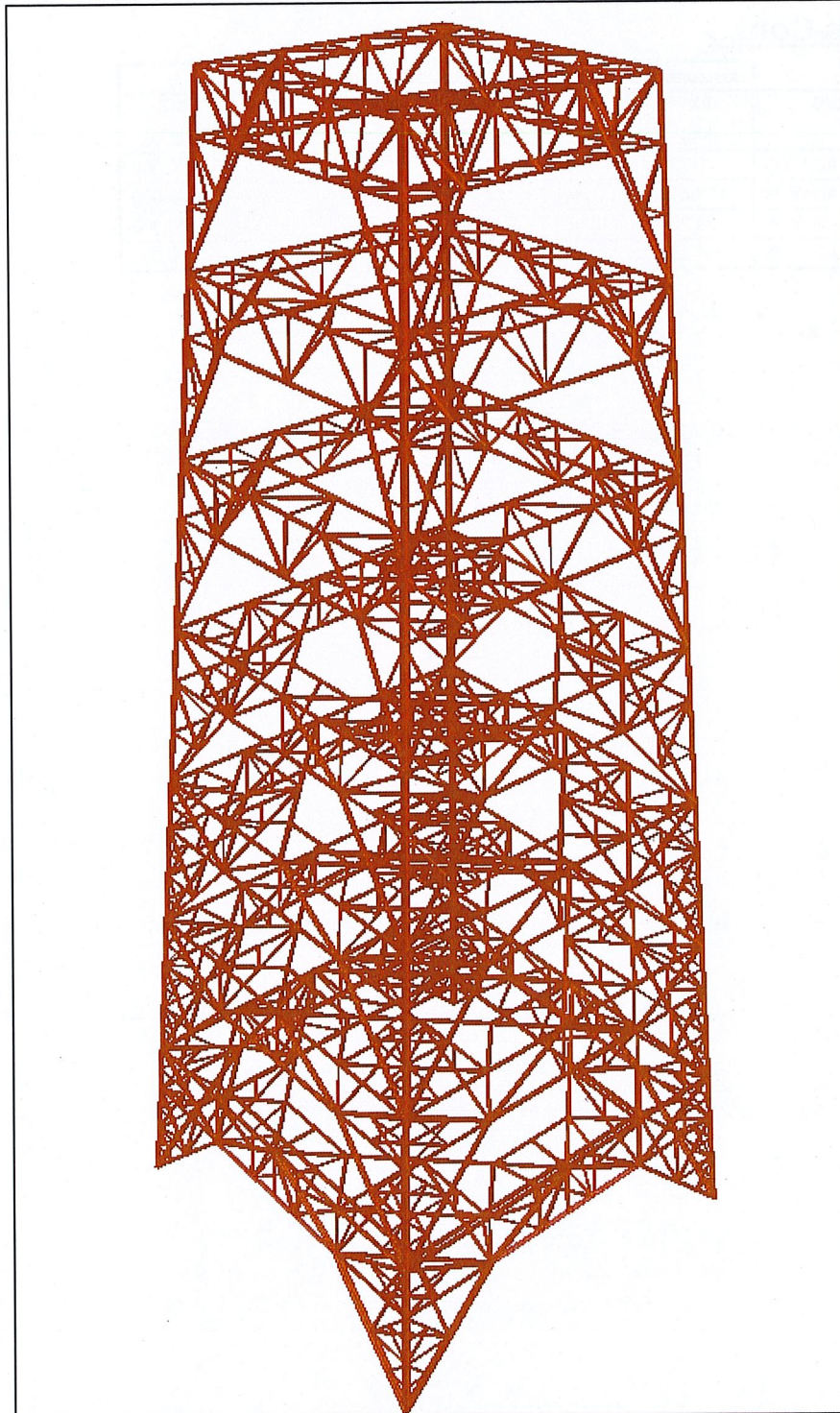
Date **6-Sep-18**

Chd **HML**

Client **TRANSCEND WIRELESS / T-MOBILE**

File **CT04761S-18V1.std**

Date/Time **06-Sep-2018 13:21**



Structure 0-175ft (3D Rendered View)

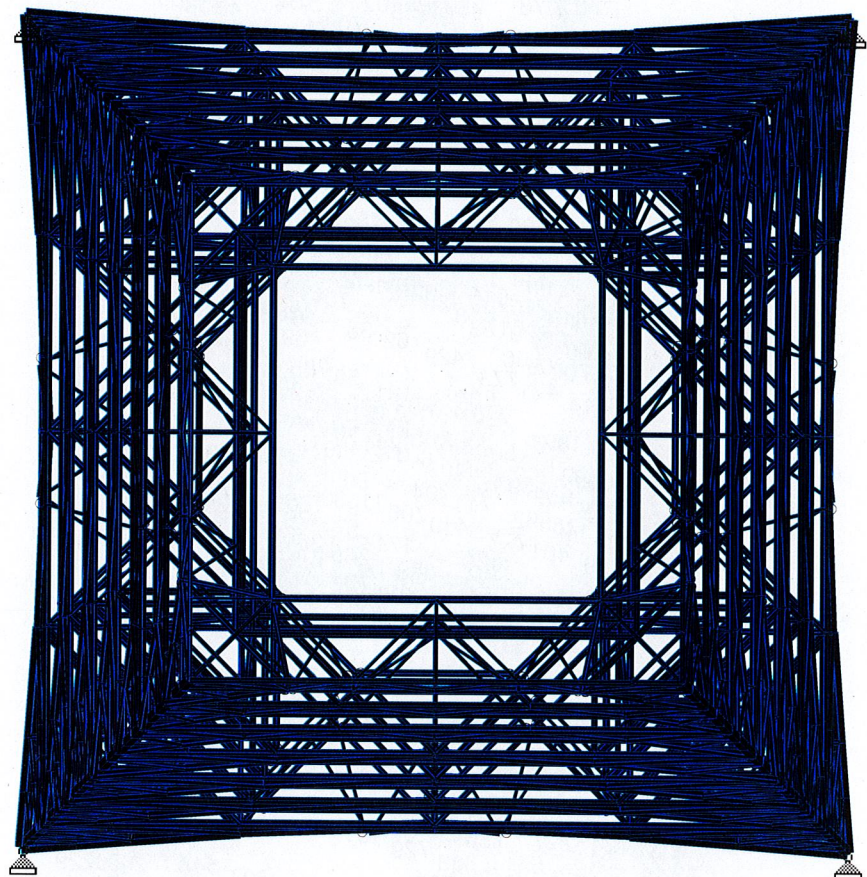


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Part 0 TO 175FT OF TOWER		
By KM	Date 6-Sep-18	Chd HML
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Y—X
 Z

Load 1

Structure 0-175ft (PLAN VIEW)



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Part 0 TO 175FT OF TOWER

Job Title 351.7ft Self Supporting Tower

Ref

By KM

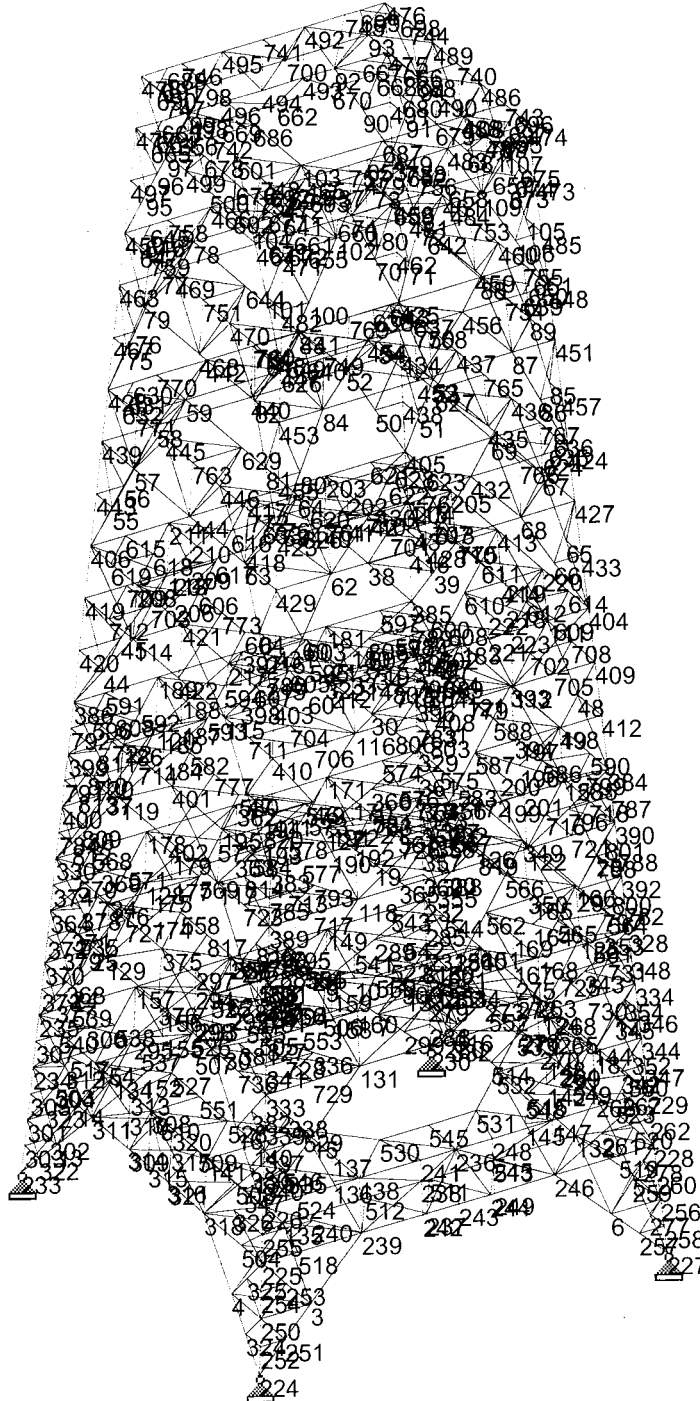
Date 6-Sep-18

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Structure 0-175ft (Node Numbers)



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Part 0 TO 175FT OF TOWER

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By KM

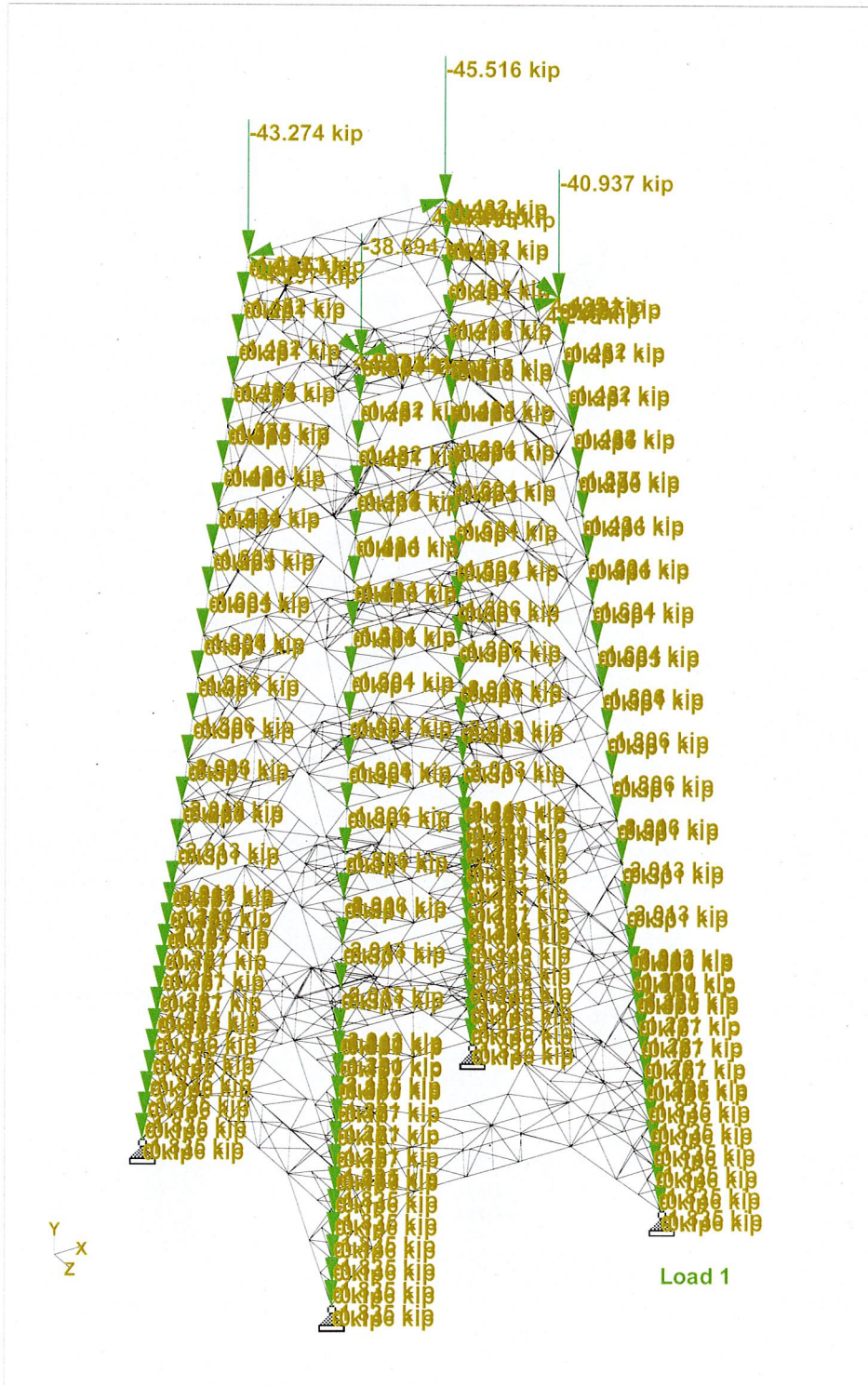
Date 6-Sep-18

Chd HML

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Whole Structure Loads 0.135317kip:1in 1 DEAD ONLY



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Part **0 TO 175FT OF TOWER**

Job Title **351.7ft Self Supporting Tower**

Ref

By **KM**

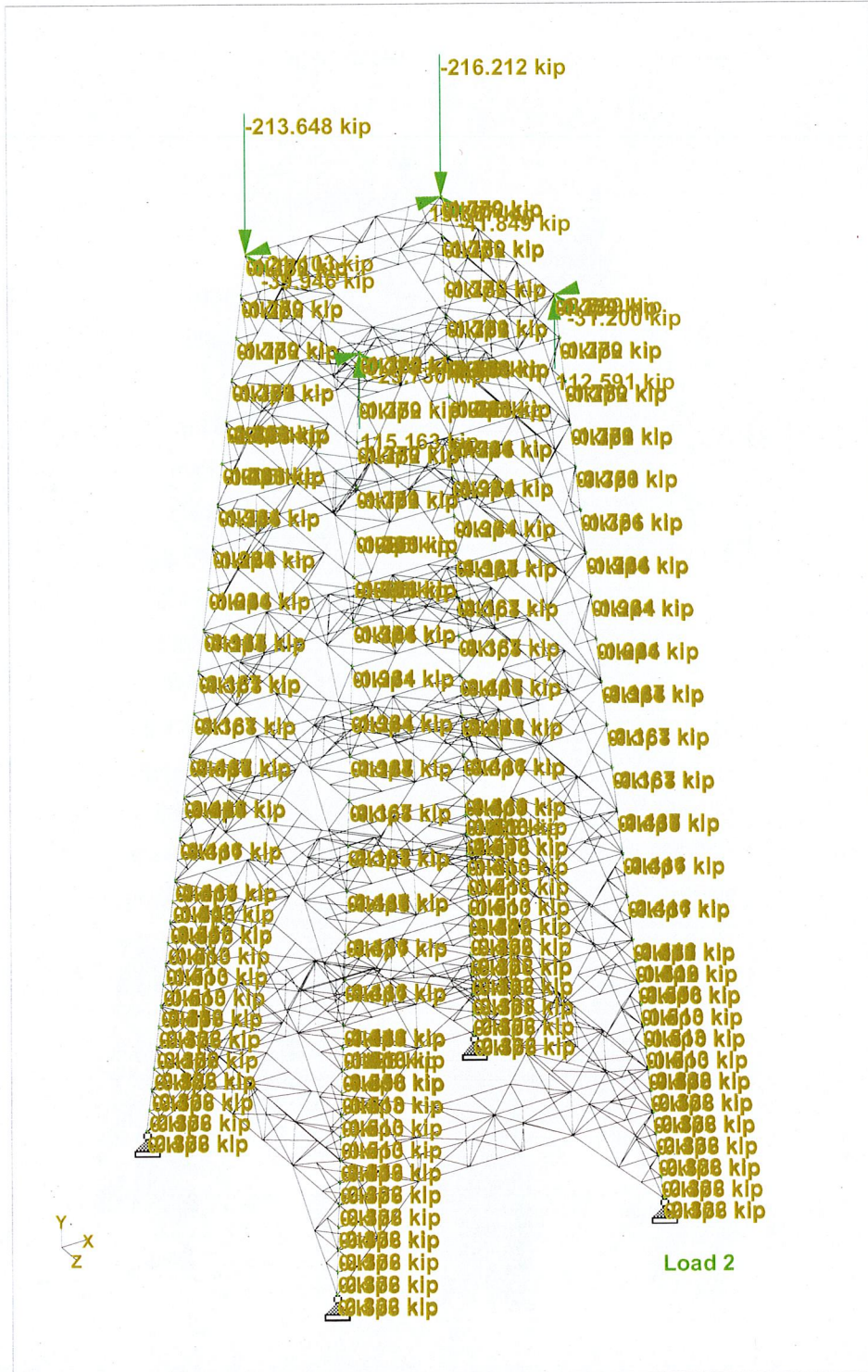
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Chd **HML**

Client **TRANSCEND WIRELESS / T-MOBILE**

File **CT04761S-18V1.std**

Date/Time **06-Sep-2018 13:21**



Whole Structure Loads 0.642783kip:1in 2 1.2 DEAD+1.6 WIND 0 DEG - NO ICE



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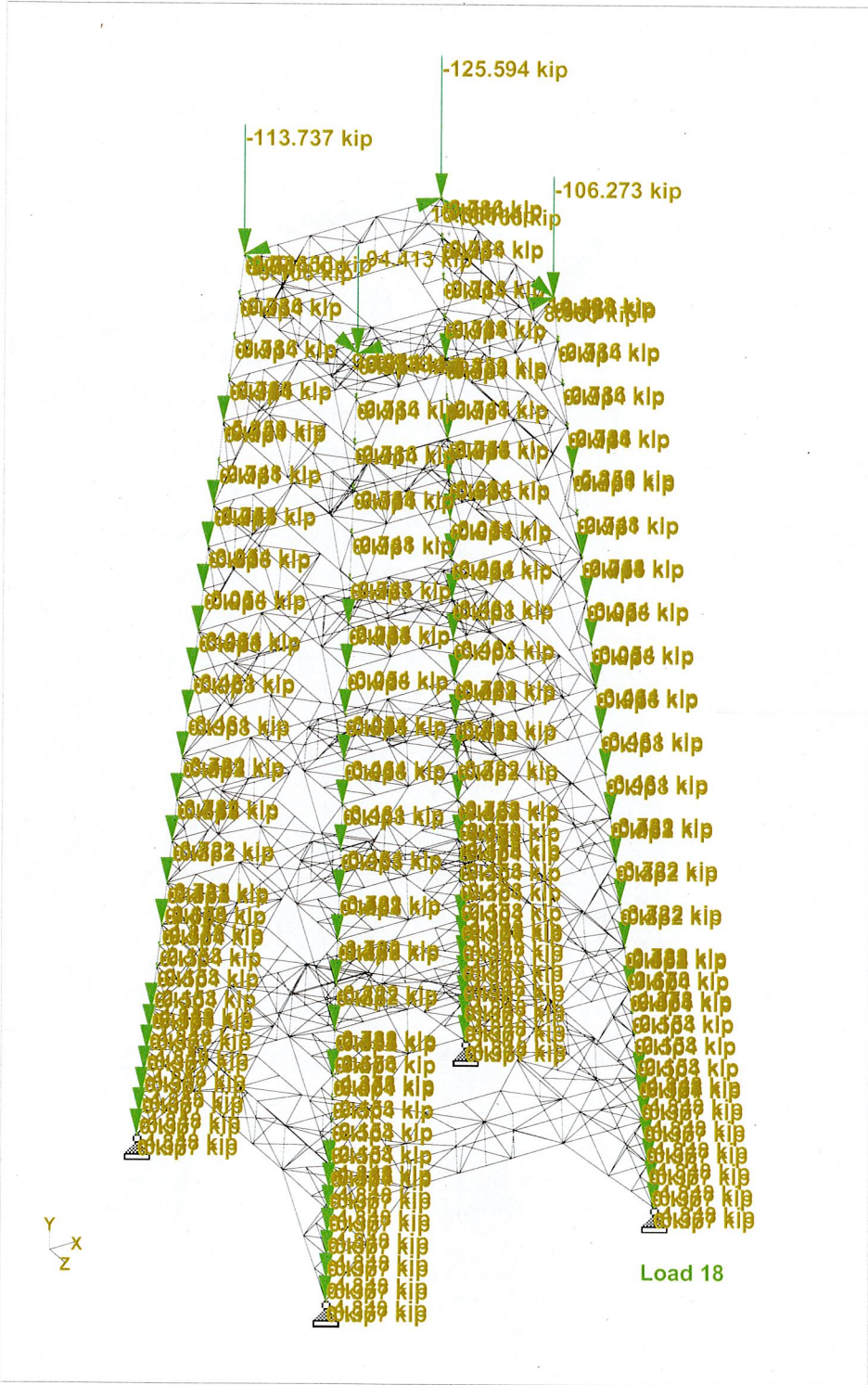
Job Title 351.7ft Self Supporting Tower

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By KM Date 6-Sep-18 Chd HML

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Whole Structure Loads 0.373382kip:1in 18 1.2 DEAD+1.0 ICE+1.0 TEMP



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Part 0 TO 175FT OF TOWER

Job Title 351.7ft Self Supporting Tower

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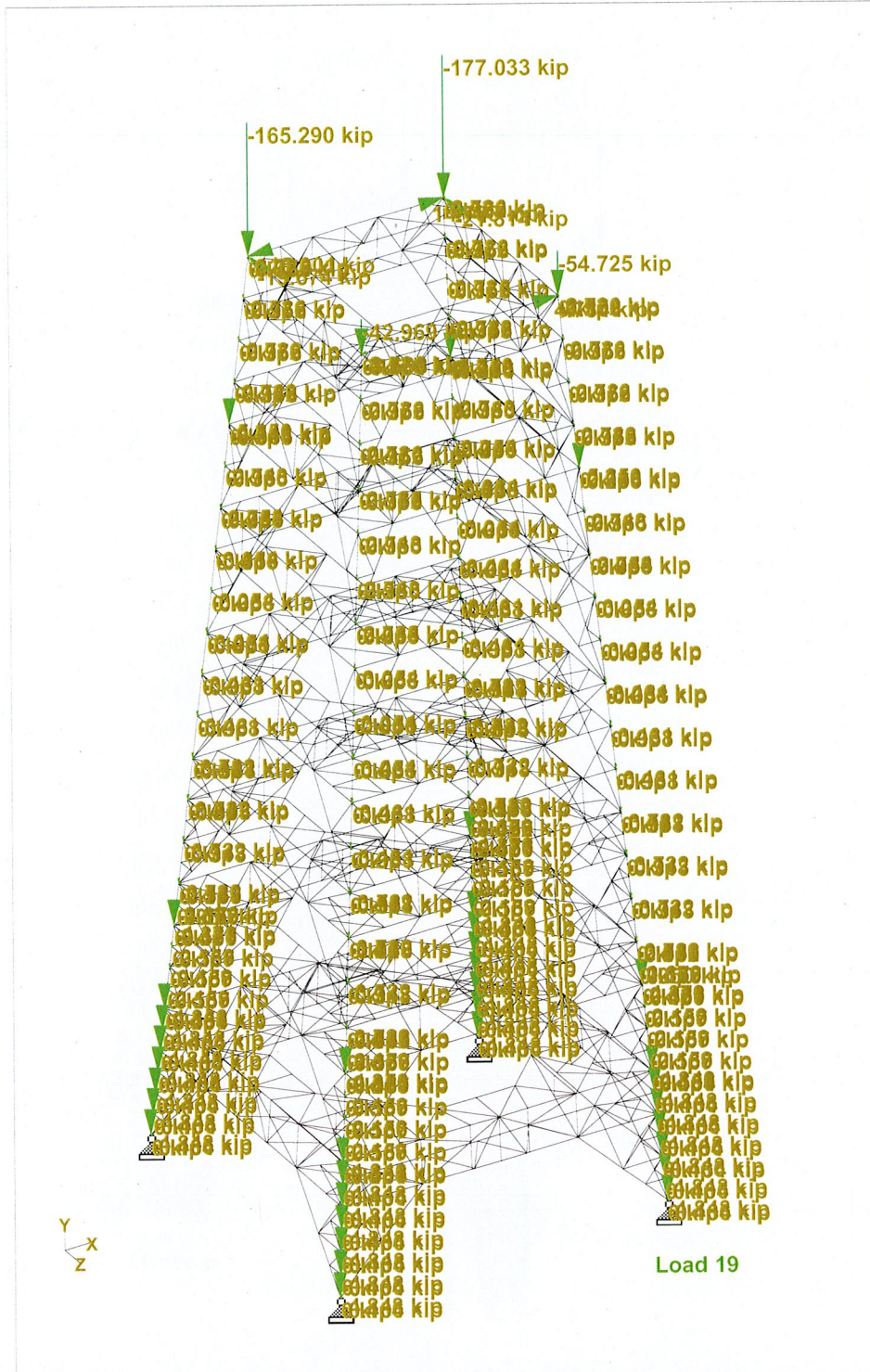
Date 6-Sep-18

Chd HML

Client TRANSCEND WIRELESS / T-MOBILE

File CT04761S-18V1.std

Date/Time 06-Sep-2018 13:21



Whole Structure Loads 0.526307kip:1in 19 1.2 DEAD+1.0 WIND 0 DEG+1.0 ICE+1.0 TEMP



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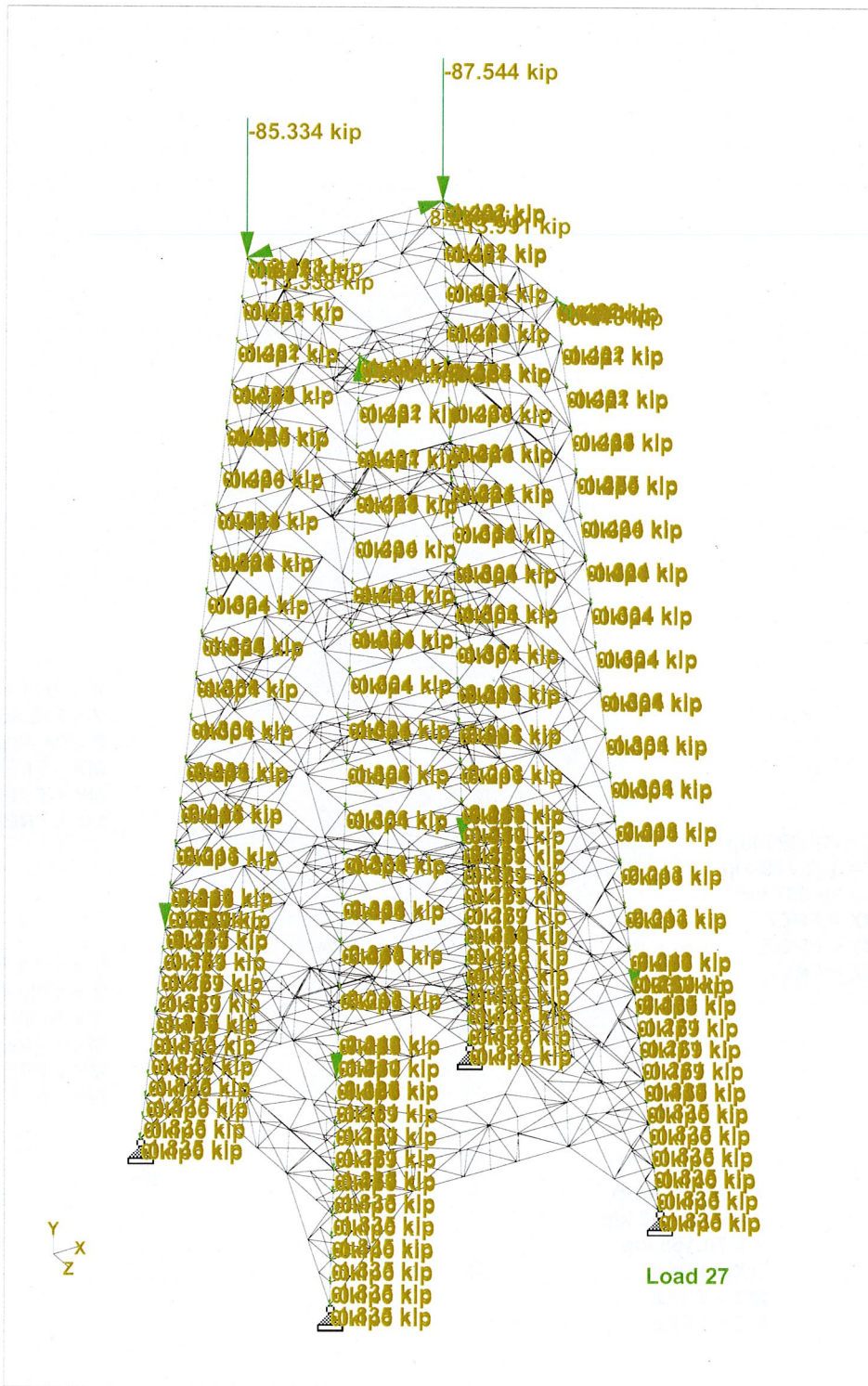
Job Title 351.7ft Self Supporting Tower

Part 0 TO 175FT OF TOWER

Ref	By KM	Date 6-Sep-18	Chd HML
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Client TRANSCEND WIRELESS / T-MOBILE

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Whole Structure Loads 0.260262kip:1in 27 DEAD+WIND 0 DEG - SERVICE



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Part 0 TO 175FT OF TOWER

Job Title 351.7ft Self Supporting Tower

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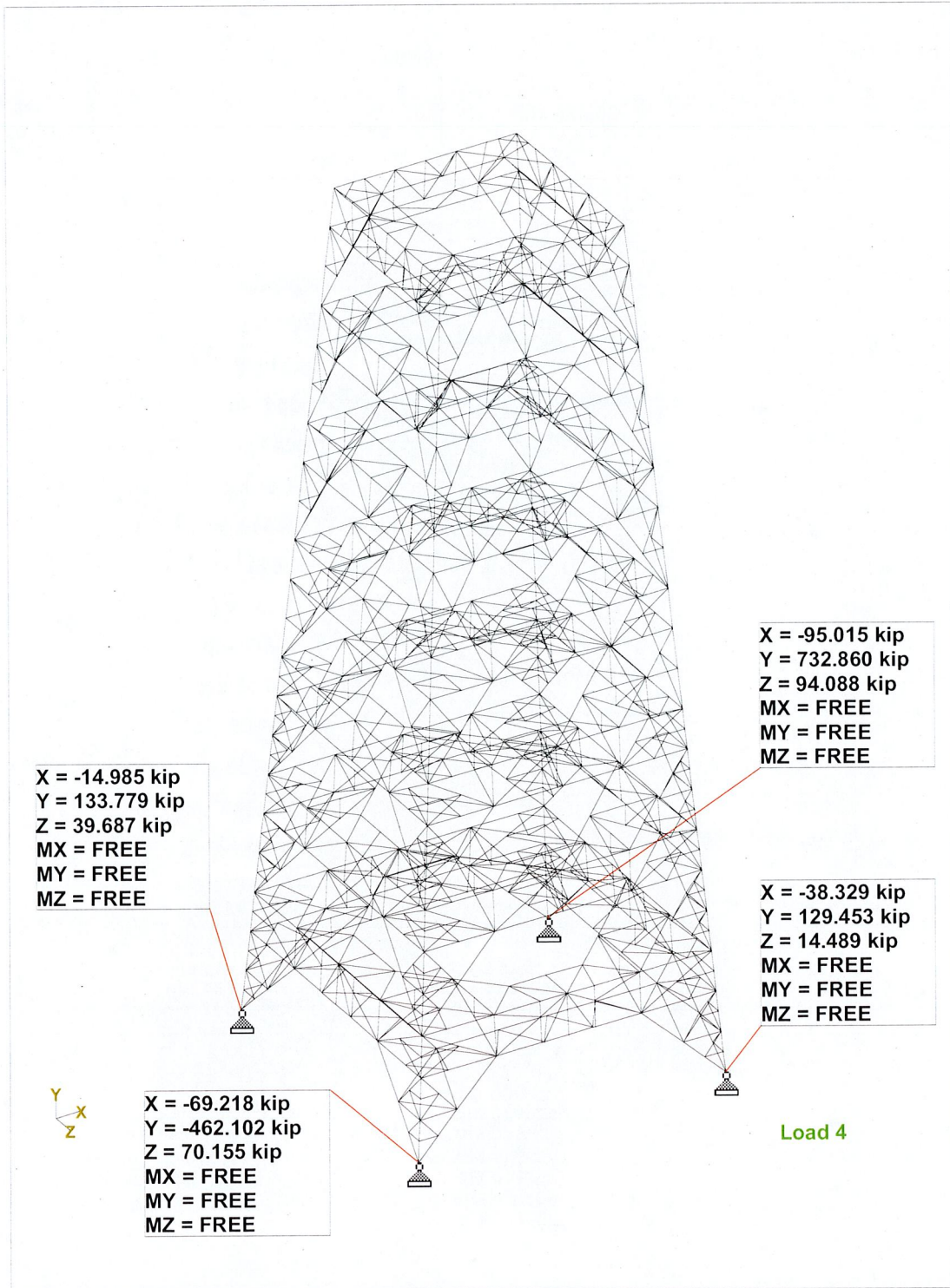
Date 6-Sep-18

Chd HML

Client TRANSCEND WIRELESS / T-MOBILE

File CT04761S-18V1.std

Date/Time 06-Sep-2018 13:21



Reactions

APPENDIX 2 – SOURCE / CHANGED CONDITION



RAN Template: 67D92M Outdoor	A&L Template: 67D92M_2xAIR+1OP	Power System Template: Custom
----------------------------------------	----------------------------------------------	-----------------------------------------

Section 1 - Site Information

Site ID: CT11011D	Site Name: Westport-SNET LL	Latitude: 41.1285180000
Status: Draft	Site Class: Self Support Tower	Longitude: -73.3899320000
Version: 2.1	Site Type: Structure Non Building	Address: 10 Willard Road (SNET LL)
Project Type: M-MIMO	Solution Type:	City, State: Norwalk(Westport), CT
Approved: Not Approved	Plan Year:	Region: NORTHEAST
Approved By: Not Approved	Market: CONNECTICUT	
Last Modified: 5/11/2018 2:12:56 PM	Vendor: Ericsson	
Last Modified By: GSM1900\AMurill9	Landlord: <undefined>	

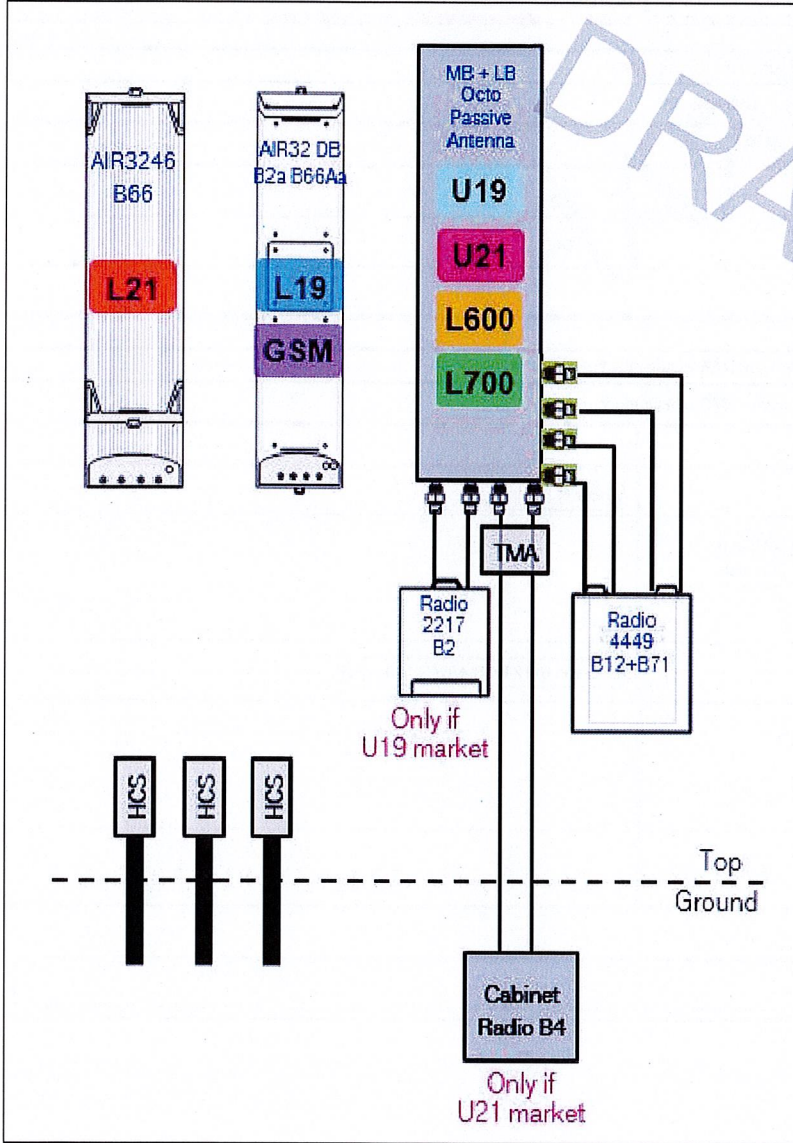
RAN Template: 67D92M Outdoor		AL Template: 67D92M_2xAIR+1OP		
Sector Count: 3	Antenna Count: 9	Coax Line Count: 6	TMA Count: 3	RRU Count: 3

Section 2 - Existing Template Images

---- This section is intentionally blank. ----

Section 3 - Proposed Template Images

67D92M_2xAIR+1OP.JPG



Notes:

RAN Template: 67D92M Outdoor	A&L Template: 67D92M_2xAIR+1OP	Power System Template: Custom
----------------------------------------	----------------------------------------------	-----------------------------------------

Section 5 - RAN Equipment

Existing RAN Equipment	
Template: 2C	
Enclosure	1
Enclosure Type	RBS 3106
Baseband	DUL20 DUW30 (x2) DUG20 RBS6601 (x2)
Radio	RU22 (x8)

Proposed RAN Equipment		
Template: 67D92M Outdoor		
Enclosure	1	2
Enclosure Type	RBS 6131	Ancillary Equipment
Baseband	BB 5216 L1900 L700 L600 BB 6630 L2100 DUW30 U1900 (DECOMMISSIONED) DUW30 U2100 DUG20 G1900	
Hybrid Cable System		Ericsson 6x12 HCS 4AWG 100m (x3)
Multiplexer	XMU L1900 L700 L600	
Radio	RU22 (x6) U2100	

RAN Scope of Work:

RAN Template: 67D92M Outdoor	A&L Template: 67D92M_2xAIR+1OP	Power System Template: Custom
----------------------------------------	----------------------------------------------	-----------------------------------------

Section 6 - A&L Equipment

Existing Template: 2C
Proposed Template: 67D92M_2xAIR+1OP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	0		0	
M. Tilt	0		0	
Height	262		262	
Ports	P1	P2	P3	P4
Active Tech.	G1900	U2100	L2100	
Dark Tech.				
Restricted Tech.				
Decomm. Tech.	U1900			
E. Tilt	3	3	3	
Cables	Fiber Jumper - 15 ft. (x2) 1-5/8" LMU Coax - 300 ft. (x2)	1-5/8" Coax - 300 ft. (x2)	Fiber Jumper - 15 ft.	
TMA's		Generic Twin Style 1B - AWS (AtAntenna)		
Diplexers / Combiners				
Radio				
Sector Equipment				
Unconnected Equipment:				
Scope of Work:				

RAN Template: 67D92M Outdoor	A&L Template: 67D92M_2xAIR+1OP	Power System Template: Custom
----------------------------------------	----------------------------------------------	-----------------------------------------

Sector 1 (Proposed) view from behind												
Coverage Type	A - Outdoor Macro											
Antenna	1			2				3			4	
Antenna Model	Ericsson - AIR3246 B66 (Octo)			RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			Empty Antenna Mount (Empty mount)	
Azimuth	0			0				0				
M. Tilt	0			0				0				
Height	262			262				262				
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Active Tech.	L210 0	L210 0	L210 0	L210 0		U210 0	L700 L600	L700 L600			L190 0 G190 0	L190 0 G190 0
Dark Tech.												
Restricted Tech.												
Decomm. Tech.												
E. Tilt												
Cables						Generic Feeder Coax (x2) Coax Jumper (x2)	Coax Jumper (x2)	Coax Jumper (x2)				
TMA's						Generic Twin Style 1B - AWS (Antenna)						
Diplexers / Combiners												
Radio								Radio 4449 B71+ B12 (Antenna)				
Sector Equipment												
Unconnected Equipment:												
Scope of Work:												

RAN Template: 67D92M Outdoor	A&L Template: 67D92M_2xAIR+1OP	Power System Template: Custom
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Sector 2 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	120		120	
M. Tilt	0		0	
Height	262		262	
Ports	P1	P2	P3	P4
Active Tech.	G1900	U2100	L2100	
Dark Tech.				
Restricted Tech.				
Decomm. Tech.	U1900			
E. Tilt	4	4	4	
Cables	Fiber Jumper - 15 ft. (x2) 1-5/8" LMU Coax - 340 ft. (x2)	1-5/8" Coax - 340 ft. (x2)	Fiber Jumper - 15 ft.	
TMIAs		Generic Twin Style 1B - AWS (AIAntenna)		
Diplexers / Combiners				
Radio				
Sector Equipment				
Unconnected Equipment:				
Scope of Work:				

RAN Template: 67D92M Outdoor	A&L Template: 67D92M_2xAIR+1OP	Power System Template: Custom
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Sector 2 (Proposed) view from behind												
Coverage Type	A - Outdoor Macro											
Antenna	1			2				3			4	
Antenna Model	Ericsson - AIR3246 B66 (Octo)			RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			Empty Antenna Mount (Empty mount)	
Azimuth	120			120				120				
M. Tilt	0			0				0				
Height	262			262				262				
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Active Tech.	L210 0	L210 0	L210 0	L210 0		U210 0	L700 L600	L700 L600			L190 0 G190 0	L190 0 G190 0
Dark Tech.												
Restricted Tech.												
Decomm. Tech.												
E. Tilt												
Cables						Gene ric Feed er Coax (x2) Coax Jump er (x2)	Coax Jump er (x2)	Coax Jump er (x2)				
TMA's						Gene ric Twin Style 1B - AWS (AtA nten na)						
Diplexers / Combiners												
Radio								Radi o 4449 B71+ B12 (At Ante nna)				
Sector Equipment												
Unconnected Equipment:												
Scope of Work:												

RAN Template: 67D92M Outdoor	A&L Template: 67D92M_2xAIR+1OP	Power System Template: Custom
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Sector 3 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	240		240	
M. Tilt	0		0	
Height	262		262	
Ports	P1	P2	P3	P4
Active Tech.	G1900	U2100	L2100	
Dark Tech.				
Restricted Tech.				
Decomm. Tech.	U1900			
E. Tilt	4	4	4	
Cables	Fiber Jumper - 15 ft. (x2) 1-5/8" LMU Coax - 300 ft. (x2)	1-5/8" Coax - 300 ft. (x2)	Fiber Jumper - 15 ft.	
TMIAs		Generic Twin Style 1B - AWS (AIAntenna)		
Diplexers / Combiners				
Radio				
Sector Equipment				
Unconnected Equipment:				
Scope of Work:				

RAN Template: 67D92M Outdoor	A&L Template: 67D92M_2xAIR+1OP	Power System Template: Custom
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Sector 3 (Proposed) view from behind												
Coverage Type	A - Outdoor Macro											
Antenna	1			2				3			4	
Antenna Model	Ericsson - AIR3246 B66 (Octo)			RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			Empty Antenna Mount (Empty mount)	
Azimuth	240			240				240				
M. Tilt	0			0				0				
Height	262			262				262				
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Active Tech.	L210 0	L210 0	L210 0	L210 0		U210 0	L700 L600	L700 L600			L190 0 G190 0	L190 0 G190 0
Dark Tech.												
Restricted Tech.												
Decomm. Tech.												
E. Tilt												
Cables						Gene ric Feed er Coax (x2) Coax Jump er (x2)	Coax Jump er (x2)	Coax Jump er (x2)				
TMA's						Gene ric Twin Style 1B - AWS (Ant enna)						
Diplexers / Combiners												
Radio								Radio 4449 B71+ B12 (Ant enna)				
Sector Equipment												
Unconnected Equipment:												
Scope of Work:												

From: Mark Malouf <mmalouf@maloufengineering.com>

Sent: Wednesday, September 5, 2018 4:39 PM

To: Kyle Richers <krichers@transcendwireless.com>

Cc: 'Dan Reid' <dreid@transcendwireless.com>; 'Jennifer Dupont' <jdupont@transcendwireless.com>; Krishna Manda <kmanda@maloufengineering.com>

Subject: RE: CT11011D CMP4 -- RF Data Clarification Needed

Importance: High

Kyle,

We have been working on the analysis on the Norwalk tower and have run into questions/need for clarification regarding the T-Mobile loading, particularly the feed lines and the mounts to be considered in the analysis

Existing loading in the forwarded RF sheet does not match the TMO loading used in the latest analysis / modification. It seems to be reflecting what was existing from 2016. Therefore, we will list the appurtenances as Final based on RF Sheet.

We need you to review and confirm or update our understanding of the loading and provide what frame mounts are being used, especially with such large and heavy panel antennas.

Proposed Final Loading from the RF sheet provided

(3) Ericsson AIR 3246 B66 Panel Antennas

(3) RFS APXVAARR24_43-U-NA20 Panel Antennas

(3) Ericsson AIR 32-B66A-B2A Panel Antennas

(3) Generic Twin Style 1B-AWS Antennas - Using ATMAA1412D-1A20 TMA's – Confirm **Model number for this should be Ericsson KRY 112 144/2**

(3) 4449 B71 + B12 RRU's

(6) Generic Feeder Coax - using 1-5/8" – Confirm – **Although the RFDS has 6 we will maintain our rights to (12) here unless structural issues prevent us. It will be (12) 1 5/8**

Ancillary / (3) Ericsson 6x12 HCS 4AWG 100m - Confirm **This quantity of 3 new 6x12 hybrids is correct.**

Frame Mounts – Provide Model **Passing mount analysis attached. We are using the existing mount we proposed for our last upgrade here that Malouf ran the SA on.**

-----All other appurtenances not listed above are to be removed

Please let us know about the above as soon as possible to keep project moving.

Thank you.

Best regards,

Mark Malouf, PE, SECB, IPF

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